



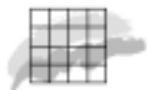
**National Environmental Research Institute**  
Ministry of the Environment · Denmark

# **Annual Danish Emissions Inventory Report to UNECE**

Inventories from the base year of the protocols  
to year 2001

*NERI Research Notes No. 184*

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to year 2001

*NERI Research Notes No. 184*  
**2003**

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## Data sheet

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Abstract: This report is a documentation report on the emission inventories for Denmark as reported to the UNECE Secretariat under the Convention on Long-range Transboundary Air Pollution due by 15 February 2003. The report contains information on Denmark's emission inventories regarding emissions of (1) NO<sub>x</sub>, CO, NMVOC, SO<sub>x</sub> and NH<sub>3</sub> for the years 1990-2001; (2) Particulate matter: TSP, PM10, PM2.5 for the years 2000-2001, (3) Heavy Metals: Pb, Cd, Hg, As, Cr, Cu, Ni, Se and Zn for the years 1990-2001, and (4) Polyaromatic hydrocarbons (PAH): Benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene and indeno(1,2,3-cd)pyrene for the years 1990-2001. Further, the report contains information on Danish activity data for (1) energy consumption, (2) transport energy consumption and agriculture livestock for the years 1990, 1995, 2000. Finally, the report includes projection data for (1) the emissions of SO<sub>x</sub>, NO<sub>x</sub>, NMVOC, and NH<sub>3</sub> for the years 2010, 2015 and 2020 (2) energy consumption for the years 2010, 2015 and 2020 (3) transport energy consumption for the years 2010, 2015 and 2020 and (4) for agriculture livestock for the year 2010.

Keywords: Emission Inventory; Emissions; Projections; UNECE; EMEP; NO<sub>x</sub>; CO; NMVOC; SO<sub>x</sub>; NH<sub>3</sub>; TSP; PM10; PM2.5; Pb; Cd; Hg; As; Cr; Cu; Ni; Se; Zn; Polyaromatic hydrocarbons; Benzo(a)pyrene, Benzo(b)fluoranthene; Benzo(k)fluoranthene; Indeno(1,2,3-cd)pyrene.

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## **Introduction**

According to the Guidelines for Estimating and Reporting Emission Data/2002/7 prepared by the Task Force on Emission Inventories and Projections the country party to the UNECE-Convention on Long-Range Transboundary Air Pollution shall annually submit an informative report to the secretariat.

This report is Denmark's Annual Emissions Inventory Report due May 2003. The report contains information on Denmark's inventories for all years from the base years of the protocols to 2001.

The following issues are addressed in the report:

- (a) The annual inventory information 1990-2001
- (b) Database information
- (c) Methodologies
- (d) References regarding methodologies, emission factors and activity data
- (e) Assumptions underlying the emission and removal estimates
- (f) Feedstocks and bunkers
- (g) Recalculations
- (h) Uncertainties
- (i) Information on quality assurance/quality control (QA/QC)
- (j) Changes with respect to the previous years

The report contains the following appendices:

Appendix 1:	Denmark's annual emission inventories to the UNECE Convention in NFR format
Appendix 2:	The specific methodologies regarding Stationary Combustion Plants
Appendix 3:	The specific methodologies regarding Fugitive Emissions from Fuels
Appendix 4:	The specific methodologies regarding Transport
Appendix 5:	The specific methodologies regarding Industrial Processes
Appendix 6:	The specific methodologies regarding Solvents
Appendix 7:	The specific methodologies regarding Agriculture
Appendix 8:	Uncertainty

### **(a) The annual inventory information 1990 - 2001**

The annual emission inventories for Denmark are given in [Appendix 1](#) and includes tables in NFR format for each year.

### **Emission Data – Sources and Trends**

#### Acidifying Gases

Figure 1 shows the emission of Danish acidifying gases in terms of acid equivalents. In 1990 the relative contribution in acid equivalents was almost equal for the three gases. In 2001 the most important acidification factor in Denmark was ammonia nitrogen and the relative contributions for SO<sub>2</sub>, NO<sub>x</sub> and NH<sub>3</sub> were 7%, 39% and 54%. However, regarding long range transport of air pollution SO<sub>2</sub> and NO<sub>x</sub> are still the most important pollutants.

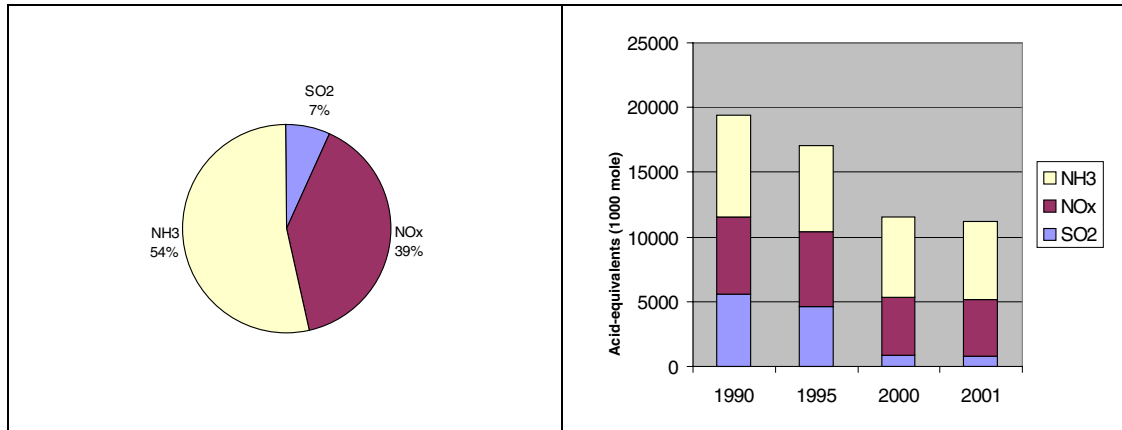


Figure 1. Relative contribution in 2001 in acid equivalents and time series.

### SO<sub>2</sub>

The main part of the SO<sub>2</sub> emissions originate from combustion of fossil fuels – mainly coal and oil – on public power and district heating plants. From 1980 to 2001 the total emission has decreased by 94%. The large reduction is mainly due to installation of desulphurization plants and use of fuels with lower content of sulphur in public power and district heating plants. Despite the large reduction of the SO<sub>2</sub> emissions these plants make up about half of the total emission. Also emissions from industrial combustion plants, non-industrial combustion plants and other mobile sources are important. National sea traffic (navigation and fishing) contributes with about 9% of the total SO<sub>2</sub> emission. This is due to the use of residual oil with high content of sulphur.

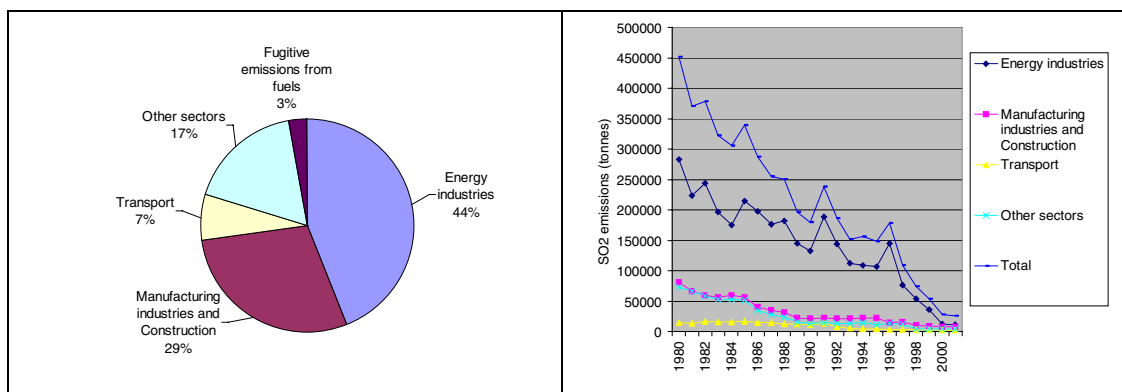


Figure 2. Relative contribution in 2001 and time series for SO<sub>2</sub>.

### NO<sub>x</sub>

The three largest - and almost equal in size – sources are combustion in energy industries (mainly public power and district heating plants), road transport and other mobile sources. The transport sector is the sector contributing the most to the emission of NO<sub>x</sub> and in 2001 40% of the Danish emissions of NO<sub>x</sub> stem from road transport, national navigation, railways and civil aviation. Also emissions from national fishing and off-road vehicles contribute significantly to the NO<sub>x</sub> emission. For non-industrial combustion plants the main sources are combustion of gas oil, natural gas and wood in residential plants. The emissions from public power plants and district heating plants have decreased by 60% from 1985 to 2001. In the same period the total emission has decreased by 31%. The reduction is due to the increasing use of catalyst cars and installation of low-NO<sub>x</sub>-burners and de-NO<sub>x</sub>-units on power and district heating plants.

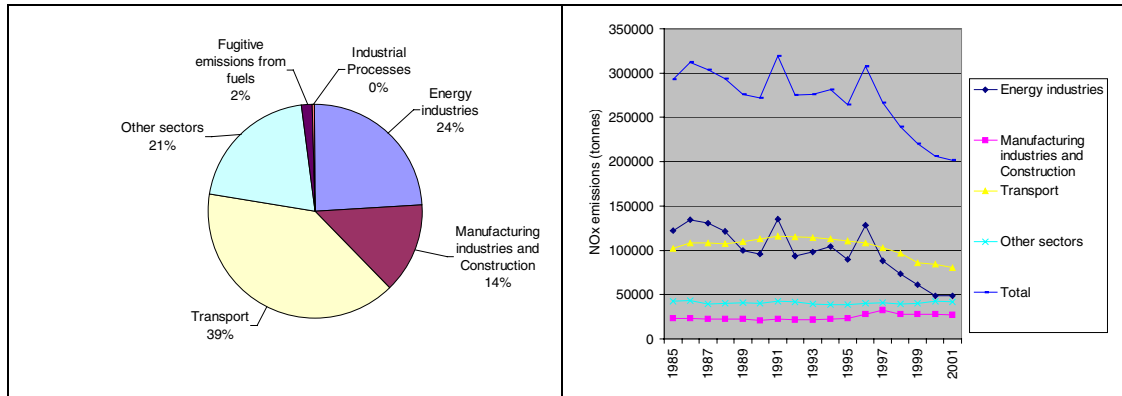


Figure 3. Relative contribution in 2001 and time series for NO<sub>x</sub>.

### NH<sub>3</sub>

Almost all atmospheric emissions of NH<sub>3</sub> result from agricultural activities. Only a minor part originates from road transport. This part is however increasing due to increasing use of catalyst cars. The major part of the emission from agriculture stems from livestock manure (78%) and the biggest losses of ammonia occur during the handling of the manure in stables and when spreading on fields. Other contributions come from crops (14%), artificial fertilisers (6%) and ammonia used for straw treatment (2%). The total ammonia emission has decreased by 28% from 1985 to 2001. This is due to the offensive National environmental policy during the last twenty years. Due to the Action Plan on the Aquatic Environment and the Ammonia Action Plan a series of measures to prevent loss of nitrogen in the agricultural production has been initiated. The measures have included i.e. demands on improved utilisation of nitrogen in husbandry manure, ban against application of husbandry manure in winter, demand on establishment of second growth, regulation of the number of animals per hectare and a ceiling for the supply of nitrogen to crops. So despite an increase in the livestock production the evaporation of ammonia has been reduced considerably.

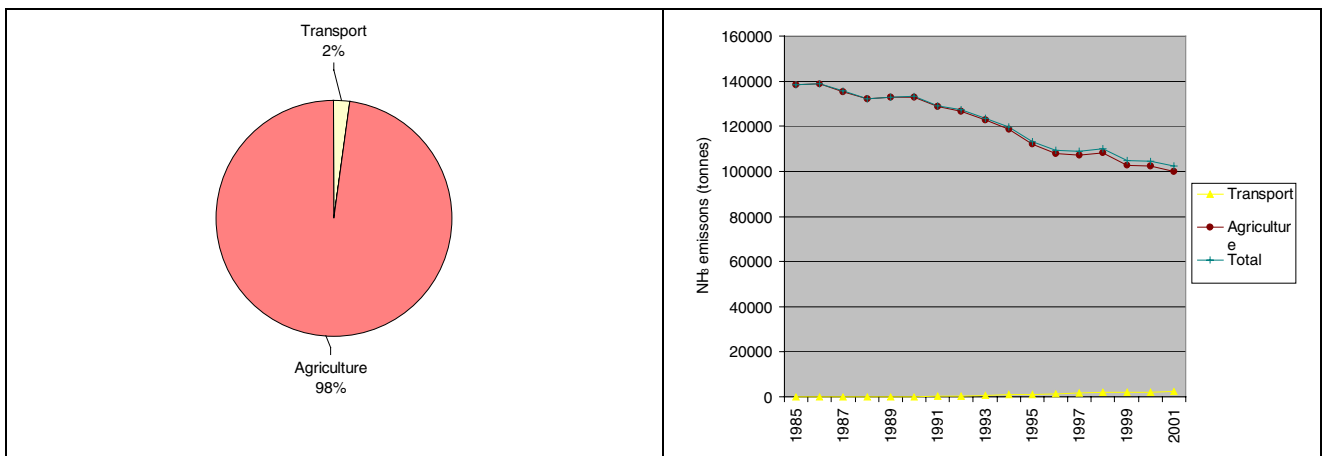


Figure 4. Relative contribution in 2001 and time series for NH<sub>3</sub>.

### Other Gases

#### NMVOC

The emissions of NMVOC originate from many different sources and can be divided into two main groups: Incomplete combustion and evaporation. The main sources to NMVOC emissions from incomplete combustion processes are road vehicles and other mobile sources such as national navigation vessels and off-road machinery. Road transportation vehicles are still the main contributors even though the emissions have declined since the introduction of catalyst cars in 1990. The evaporative emissions mainly originate from use of solvents. The emissions from energy industries have increased during the nineties because of increasing use

of stationary gas engines that have much higher emissions of NMVOC than conventional boilers. The total anthropogenic emissions have decreased by 35% from 1985 to 2001 mainly due to increasing use of catalyst cars and reduced emissions from the use of solvents.

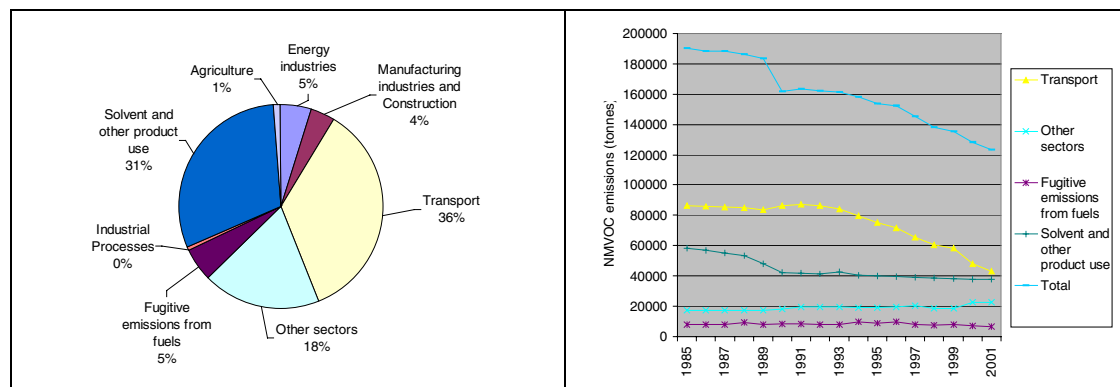


Figure 5. Relative contribution in 2001 and time series for NMVOC.

### CO

Even though catalyst cars were introduced in 1990, road transport still has the dominant share of the total CO emission. Also other mobile sources and non-industrial combustion plants contribute significantly to the total emission of this pollutant.

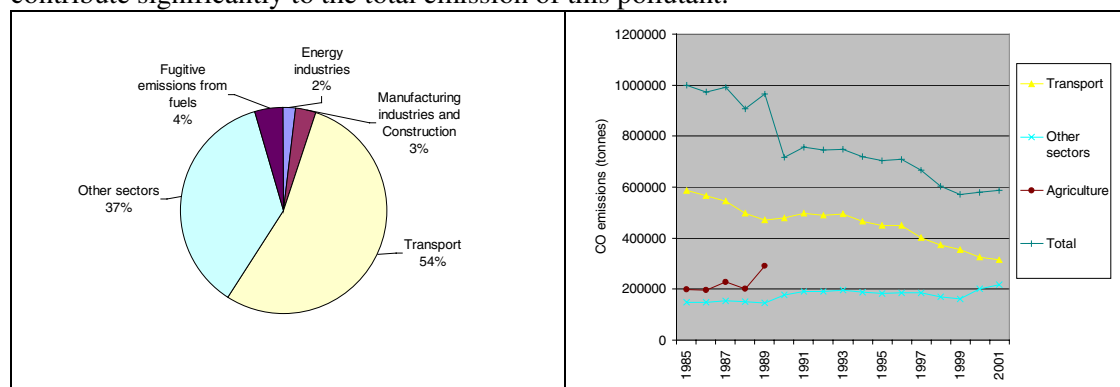


Figure 6. Relative contribution in 2001 and time series for CO.

### Heavy metals

Table 1. Total HM emissions for 1990 and 2001:

(kg)	As	Cd	Cr	Cu	Hg	Ni	Pb	Se	Zn
1990	1442	1166	6444	10119	3352	26420	122834	4198	35640
2001	708	782	2385	9263	2064	12927	6936	1645	25913
% red.	51	33	63	8	38	51	94	61	27

In general the most important sources of heavy metal emissions are combustion of fossil fuels and waste. Despite the increased consumption of these fuels, the heavy metal emissions have decreased substantially. The reductions are 8% and 94% for Cu and Pb, respectively. The reason for the reduced emissions is mainly the increased use of gas cleaning devices at power and district heating plants (including waste incineration plants). The large reduction in the Pb emission is due to gradual shift towards unleaded gasoline being essential for catalyst cars.

### PAH



The present emission inventory for PAH (poly aromatic hydrocarbons) includes the four PAH reported to UNECE: Benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene and indeno(1,2,3-cd) pyrene. The most important sources to emission of PAH are combustion of wood in the residential sector and road transportation. The increasing emission - the last couple of years - is due to increasing combustion of wood in the residential sector.

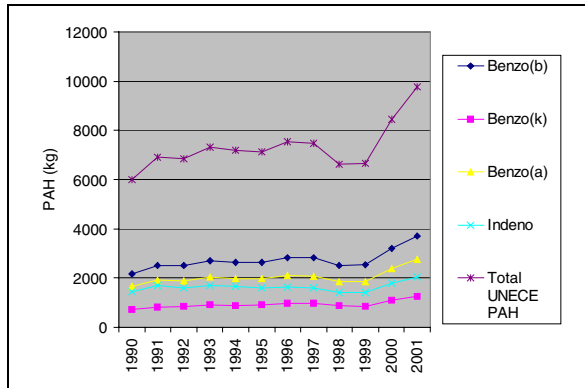


Figure 7. Time series for PAH.

### Particulate matter

The particulate matter (PM) emission inventory has been reported for the years 2000-2001. During last year a research project has been carried out to improve the Danish PM inventory and thus the inventory have been improved since the provisional inventory reported last year. The inventory includes: Total emission of particles TSP (Total Suspended Particles), emission of particles smaller than 10  $\mu\text{m}$  (PM10) and emission of particles smaller than 2.5  $\mu\text{m}$  (PM2.5).

The largest PM2.5 emission sources are transport (34%) and 'Other fuel combustion than energy industries' and 'Manufacturing industries' (39%). For the latter the most important sources are residential plants (52%) and off road vehicles and machinery in the agricultural/forestry sector (37%). The transport sector accounts for 34% of the PM2.5 emission and unlike the TSP emission exhaust emissions accounts for the major part (93%).

The largest TSP emission sources are agriculture and transport. The TSP emission from transport includes both exhaust emissions and the non-exhaust emissions from brake and tyre wear and road abrasion. The non-exhaust emission accounts for 77% of the TSP emission from transport.

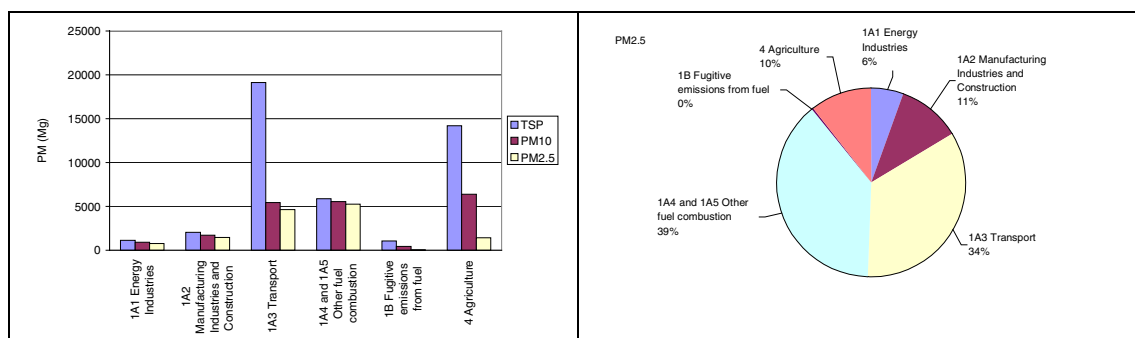


Figure 8. PM emissions for the main sector and relative contribution in 2001.

### (b) Database information

The emission inventory tables are made from the Danish CORINAIR-database (Illerup et al., 2003), and detailed information on the emission factors and activity data is electronically available. In Appendices 2-7 tables with emission factors used in the 1990 and 2001 emission inventories are shown.

The Danish databases are stored in Access 97 and are handled with software developed by the European Environmental Agency. For data handling the software tool is CollectER (Pulles et al., 1999a) and for the NFR reporting the software tool is ReportER (Pulles et al., 1999b).

### (c) Methodologies

#### The general methodology

Denmark's air emission inventories are based on the CORINAIR methodology. CORINAIR (COoRdination of Information on AIR emissions) is the most extensive European air emission inventory programme for national sector-wise emission estimations harmonised with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories (Houghton et al., 1997). To ensure estimates as timely, consistent, transparent, accurate and as comparable as possible, the inventory programme has developed calculation methodologies for most sub-sectors and software for storing and further data processing (EMEP/CORINAIR, 2002).

A thorough description of the CORINAIR inventory programme used for Danish emission estimations is given in (Illerup et al., 2000). The CORINAIR calculation principle is to

calculate the emissions as activities times emission factors. Activities are numbers referring to a specific process generating emissions, while an emission factor is the mass of emissions per unit activity. Information on activities to carry out the CORINAIR inventory is mainly based on official statistics. The most consistent emission factors have been used, either as measured values or default factors proposed by the CORINAIR methodology.

A list of all sub-sectors on the most detailed level is given in Illerup et al., 2000. Incorporated in the CORINAIR software is a feature to serve the specific UNFCCC and UNECE convention needs for emission reporting.

The CORINAIR methodology is the general methodology used. Some parts of the underlying methodologies are taken directly from the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories and some parts have been elaborated to reflect better national circumstances in accordance with the underlying principles of these guidelines. The underlying methodologies for each sector are described below.

#### The specific methodologies regarding Stationary Combustion Plants

*(NFR: 1A1 Energy Industries, 1A2 Manufacturing Industries and 1A4 Other sectors).*

The Danish emission inventory for stationary combustion plants is based on the CORINAIR system described in the Emission Inventory Guidebook 3<sup>rd</sup> edition. The inventory is based on activity rates from the Danish energy statistics and on emission factors for different fuels, plants and sectors.

The Danish Energy Authority aggregates fuel consumption rates in the official Danish energy statistics to SNAP categories.

For each of the fuel and SNAP categories (sector and e.g. type of plant) a set of general emission factors has been determined. Some emission factors refer to the EMEP/CorinAir Guidebook and some are country specific and refers to Danish legislation, Danish research reports or calculations based on emission data from a considerable number of plants.

Some of the large plants like e.g. power plants and municipal waste incineration plants are registered individually as large point sources and emission data from the actual plants are used. This enables use of plant specific emission factors that refers to emission measurements stated in annual environmental reports etc.

Improved emission factors for cogeneration plants <25MW<sub>e</sub> will be implemented next year.

Please refer to appendix 2 for further information about emission inventories for stationary combustion plants.

#### The specific methodologies regarding Fugitive Emissions from Fuels

*(NFR: Fugitive emissions from natural gas (1.B.2.b) and Fugitive emissions from oil (1.B.2.a)).*

##### *Fugitive emissions from natural gas (1.B.2.b)*

Natural gas transmission and distribution:

Inventories of NMVOC emission from gas transmission and distribution is based on annual environmental reports from the Danish gas transmission company, DONG and on a Danish inventory for the years 1999-2001 reported by the Danish gas sector (transmission and distribution companies).

Off-shore activities:

Rough estimates for the emission of NMVOC from extraction of oil and gas are made for the years 1994 to 2001. A project is going on to make consistent inventories from 1990.

*Fugitive emissions from oil (1.B.2. a)*

Oil Refineries – Petroleum products processing:

The VOC emissions from petroleum refinery processes cover non-combustion emissions from feed stock handling/storage, petroleum products processing, product storage/handling and flaring. SO<sub>2</sub> is also emitted from the non-combustion processes and includes emissions from products processing and sulphur recovery plants. The emission calculations are based on information from the Danish refineries and the Energy statistic.

Please refer to appendix 3 for further information about fugitive emissions from fuels.

The specific methodologies regarding Transport

*(NFR: 1A3b (Road transportation), 1A2f (Other-Industry), 1A3a (Civil aviation-Domestic), 1A3c (Railways), 1A3d (National Navigation), 1A4c (Agriculture/forestry/fisheries), 1A4b (Residential) and 1A5 (Other-Military)).*

The emissions from transport referring to SNAP category 07 (road transport) and the sub-categories in 08 (other mobile sources).

The European COPERT III emission model is used to calculate the Danish annual emissions for road traffic. In COPERT III the emissions are calculated for operationally hot engines, during cold start and fuel evaporation. The model also includes the emission effect of catalyst wear. Input data for vehicle stock and mileage is obtained from the Danish Road Directorate, and is grouped according to average fuel consumption and emission behaviour. For each group the emissions are estimated by combining vehicle and annual mileage numbers with hot emission factors, cold:hot ratios and evaporation factors (detailed methodology).

For air traffic the 2001 estimates are made on a city-pair level, using flight data from the Danish Civil Aviation Agency (CAA-DK) and LTO and distance related emission factors from the CORINAIR guidelines (detailed methodology). For previous years the background data consist of LTO/aircraft type statistics from Copenhagen Airport and total LTO numbers from CAA-DK. With appropriate assumptions a consistent time series of emissions is produced back to 1990 using also the findings from a Danish city-pair emission inventory in 1998 (Winther, 2001).

Off road working machines and equipment are grouped in the following sectors: Inland waterways, agriculture, forestry, industry and household and gardening. In general the emissions are calculated by combining information on the number of different machine types and their respective load factors, engine sizes, annual working hours and emission factors (detailed methodology).

Recalculations of the aviation emissions are made using the improved estimation method and by including the flights for Greenland and the Faroe Islands under domestic aviation as prescribed by the UNFCCC reporting guidelines. Previous year's estimates (1990-2000) are updated in accordance with this flight classification. For military and railways, updated 1990-2001, emission factors are used for gasoline and diesel derived from the road transport inventory results.

For transport the CO, SO<sub>2</sub>, NMVOC, NO<sub>x</sub> and TSP emissions are determined with the most accuracy, while the levels of the NH<sub>3</sub>, heavy metal and PAH emissions are significantly more uncertain. The overall uncertainty in 2001 for CO, SO<sub>2</sub>, NMVOC, NO<sub>x</sub> and TSP are about 45, 46, 48, 53 and 58 %, while the 1990-2001 emission trend uncertainties for the same five components are 8, 5, 12, 9 and 12 %, respectively.

An overall quality assurance and control of the inventory of transport emissions is achieved when operating the fuel balance approach for road transport, air traffic and off road working machines and equipment in parallel with the detailed methodology. Accordingly the fuel use and emission results are adjusted in a fuel balance ensuring that all statistical fuel sold is accounted for sector-wise in the calculations. Furthermore all time series of emissions in the NFR and SNAP source categories are examined and considerable changes are checked and explained. A comparison is also made to the previous year's estimate and any major changes are verified. As a last point a data transfer control is made from SNAP source categories to aggregated NFR source categories.

Please refer to appendix 4 for further information about emission inventories for transport.

#### The specific methodologies regarding Industrial Processes

*(NFR: 1A2a Iron and Steel, 1A2b Non-Ferrous Metals, 1A2f Other, 2B2, Nitric Acid Production, 2C Metal Production (steel plant) and 2D2 Beer Production)*

The Manufacturing Industry groups 1A2a, 1A2b and 1A2f includes the SNAP categories Grey Iron foundries (030303), Secondary Lead Production (030307), Secondary Zinc Production (030308) and Secondary Aluminium Production (030310). For these categories the emissions related to fuel combustion are included in 1A2 Manufacturing Industries and Construction (Appendix 2). Information on emissions of particulate matter and heavy metals is given in Appendix 5.

There is one nitric acid plant and one steel plant in Denmark. These two plants are registered as point sources and plant specific emissions are used.

A revision of the emission inventory for industrial processes is planned to take place in 2003.

#### The specific methodologies regarding Solvents

*(NFR: 3)*

The emission inventory for 'Solvents' is based on reports from the Danish Industry on emissions from various industrial sectors. The reporting is not annual and linear interpolation is used between the reporting years. It is important to notice that not all the use of solvents are included and no activity data has been available. Efforts are still to be made in the future inventory work to improve the emission estimates.

Please refer to appendix 6 for further information about emission inventories for solvents.

#### The specific methodologies regarding Agriculture

*(NFR: 4B, 4D, 4F)*

The emission from the agricultural sector includes emission of particulate matter and ammonia. The emission is registered in NFR tables 4B Manure Management and 4D Agricultural Soils. Table 4F Field Burning of Agricultural Wastes is only completed until 1989 because burning of plant residue has been prohibited since 1990.

This is the first approach to estimate the particle emission from the agricultural sector and the inventory is based on the CEPMEIP database established by TNO. The calculation of the ammonia emission is based on EMEP-CLRTAP Emission Inventory Guidebook. Data on activity and emissions are collected, evaluated and discussed in corporation with the Danish Institute of Agricultural Sciences and the Danish Agricultural Advisory Centre.

In Denmark a model based system is applied for calculation of the emission of ammonia (Hutchings et al., 2001). The numbers of animals, data for land-use and crop yield are taken

from the Agricultural Statistic (Statistic Denmark, 2002). Data foundation of particulate emission is primarily based on investigations of North European stables (Takai et al., 1998). Further data is collected from the Danish Environmental Protection Agency and the Danish Plant Directorate.

The uncertainties for ammonia emission from manure management and agricultural soils have been estimated. The estimated emission for particulate matter is connected with high uncertainties, which is estimated to be several hundred per cent. To ensure the data quality activity data and data for estimation of emission factors are collected and discussed in corporation with specialists and researcher at different institutes and research sections. It means that the emission inventory will be evaluated continuously according to the latest knowledge and information.

When calculating particle emission it is planned to include dust emission from arable farming, because it can be a considerable source. In the estimation of ammonia emission it is planned to incorporate emission from industrial waste applied on agricultural soils.

Please refer to appendix 7 for further information about emission inventories for agriculture.

#### **(d) References regarding methodologies, emission factors and activity data**

The documentation on the CORINAIR methodology can be obtained from the "EMEP/CORINAIR Atmospheric Emission Inventory Guidebook, 3rd edition (EMEP/CORINAIR, 2002). The documentation on the COPERT III is given in Ntziachristos et al. (2000).

The emission factors are partly based on the Joint EMEP/CORINAIR Atmospheric Emission Inventory Guidebook mentioned above and the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories, and partly on Danish legislation and measurements on Danish plants. In a few cases data on the emissions are deriving directly from measurements instead of calculations from emission factors. In appendices 2-7 references regarding methodologies, emission factors and activity data related to the sectors are given.

#### **(e) Assumptions underlying the emission and removal estimates**

The assumptions underlying the emission and removal estimates are in general related to the emission factors chosen and activity data used. Information on the emission factors chosen and activity data used is given in the appendices.

#### **(f) Feedstocks and bunkers**

##### Feedstocks

The Danish energy statistics includes non-energy use of three fuels: White spirit, lubricants and bitumen. These fuels have not been implemented in the Danish national approach. The fuels are, however, included in the reference approach. The emissions from some of the products produced on the basis of feedstock are taken into account in the national approach, e.g. emissions from the use of solvents and from incineration of plastic in municipal waste (Appendix 2).

##### Bunkers

In the Danish emission inventories presented in CRF, the distinction between domestic and international emissions from aviation and navigation is made in accordance with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories. In principle this means that fuel sold (and associated emissions) for flights/sea transportations starting from a seaport/airport in the Kingdom of Denmark, with destinations inside or outside the Kingdom of Denmark, are regarded as domestic or international, respectively.

For aviation the emissions associated with flights inside the Kingdom of Denmark are counted as domestic. The flights from Denmark to Greenland and the Faroe Islands are classified as domestic flights in the inventory background data.

The domestic/international fuel split (and associated emissions) for navigation is not determined with the same precision as for aviation. In this way no special effort has been made to investigate how the fuel quantities sold in Denmark and on the Faroe Islands are classified for vessels going to Greenland/Faroe Islands. For Greenland all marine fuel sales are treated as domestic. However it is considered that this uncertain fuel amount only contribute with a small part of the total fuel sold for navigation purposes in the Kingdom of Denmark.

### **(g) Recalculations**

Since the submission of the emissions inventory for 2000 to the UNECE the following main changes to the Danish emission inventories have been carried out:

#### **Energy:**

1990-2001. The emission factors for NMVOC and CO have been updated for stationary fuel combustion activities.

2000-2001: In 2002 a research project was carried out to improve emission inventories of particulate matter. The revised emission factors are used in the 2000 and 2001 inventory reported this year.

1990-2001. The emissions of CH<sub>4</sub> and NMVOC from natural gas distribution networks and pipelines have been updated according to Danish conditions.

#### **Transport:**

##### *Road traffic*

1990-2001. The emission factors PAHs (1990-2001) have been changed to the values proposed by COPERT III.

1985-2001. For exhaust TSP, PM10 and PM2.5 emissions have been calculated for other fuels than diesel.

2000-2001. As regards the sub-group vehicle tyre and brake wear small adjustments have been made to the emission factors previously used for TSP, PM10 and PM2.5. Furthermore TSP, PM10 and PM2.5 estimates are made for the sub-group 1A3bii Automobile road abrasion.

##### *Military*

1990-2001. New emission factors of traditional pollutants and PAHs for gasoline and diesel have been derived from the new road traffic estimates.

1990-2001. For PAHs the emission factors for jet fuel are set to zero until better knowledge becomes available.

##### *Railways*

1985-2000. New emission factors for gasoline (traditional pollutants and PAHs) and diesel (PAHs only) have been derived from the new road traffic estimates.

##### *Inland waterways, agriculture, forestry and industry*

1990-2001. New PAHs emission factors for gasoline, diesel and LPG have been derived from the new road traffic estimates.

#### *Air traffic*

1985-2001. The air traffic estimates are made up using city-pair statistics from the CAA-DK. Moreover the flights for Greenland and the Faroe Islands are included under domestic aviation as prescribed by the UNECE reporting guidelines. Previous years-estimates are updated in accordance with the new model.

1990-2001. For PAHs the emission factors for jet fuel are set to zero until better knowledge becomes available.

#### **Industry:**

2000-2001. Work is going on to estimate emissions from non-combustion activities, e.g. particle emissions. In the present submission particle emissions are estimated for grey iron foundries (snap 030303), secondary Zinc production (snap 030307), secondary Zinc production (snap 030308), lime production (snap 030312) and glass production (snap 030314 and 15).

#### **Agriculture:**

1985-2001. The ammonia emission now includes emissions from horses at small farms and from goats.

2000-2001. The Particulate matter emissions are estimated for the year 2000 and 2001, based on a database developed by TNO (<http://www.air.sk/tno/cepmeip/>) and a study of dust concentrations in livestock buildings in Northern Europe (Takai et al., 1998). The inventory comprehends dust emission from stables with poultry, cattle and pigs. There are no emissions from straw burning in Denmark due to the ban of this activity.

#### **POPs**

**PCB**, 1990 – 2001. Since 1986 it has been forbidden to sell and import PCB. It is estimated that the amount of PCB-containing equipment collected for disposal peaked in 1995 and has since then dropped markedly. An estimate of the emission of PCB to the air has not been possible to make.

**SCCP**, 1990 – 2001. The yearly consumption has not been more than 25 tonnes per year, but an estimation of the resulting emission to the air has not been possible.

#### **Dioxin:**

The emissions have only been estimated for 1998 and 2001:

- Category 2.A.7 includes e.g. insulation materials, tiles, bricks and glass.
- Category 1.A.2.f includes fish oil/meal, meat and bone meal, and green feed drying.
- Category 3D includes dioxin evaporating from wood preserved by PCP.
- Category 7 includes fires

#### **Projections**

The projections of SO<sub>2</sub>, NO<sub>x</sub>, NH<sub>3</sub> and NMVOC until 2010 are based on the Danish projection models for the four source categories: energy, industry, transport and agriculture as given in 'Projection Models 2010' (Illerup et al., 2002) ([http://www.dmu.dk/1\\_viden/2\\_Publikationer/3\\_fagrappporter/rapporter/FR414.pdf](http://www.dmu.dk/1_viden/2_Publikationer/3_fagrappporter/rapporter/FR414.pdf)).

From 2010 to 2020 the emissions are estimated according to the projected development in the fuel consumption of the various fuels and the results from projection models covering road transport and other mobile sources. The energy consumption data in table 2B-D is based on the Danish energy projection (sold fuel) until 2017 and it is assumed that the energy consumption in 2020 equals the energy consumption in 2017.



## (h) Uncertainties

A first attempt uncertainty estimate based on the Good Practice Guidance for CLRTAP Emission Inventories (2001) has been performed this year. Uncertainty estimates for stationary combustion plants, transport and agriculture are included this year. The aim is to include an increasing part of the emission sources during the next years.

The aggregation levels of the uncertainty estimates follow the main SNAP emission source categories. The estimated uncertainties are shown in Table 1. Calculation sheets for SO<sub>2</sub> and NO<sub>x</sub> are shown in appendix 8. The assumed uncertainty for activity rate and emission factors is shown in appendix 2, 4 and 7.

**Table 1 Uncertainty of emission inventories**

1)	Uncertainty [%]	Uncertainty in trend [%]
SO <sub>2</sub>	8	0,7
NO <sub>x</sub>	34	6
NMVOOC	37	12
CO	35	9
NH <sub>3</sub> <sup>2)</sup>	28	17
As	133	11
Cd	212	55
Cr	110	22
Cu	673	146
Hg	137	7
Ni	147	17
Pb	257	42
Se	142	24
Zn	209	32

1. The uncertainty estimates includes the sources stationary combustion plants and transport

2. The uncertainty estimates includes the sources agriculture and transport

## (i) Information on quality assurance/quality control (QA/QC)

In the preparation of Denmark's annual emission inventory several quality control (QC) procedures are carried out. The Danish QC includes:

- Check of time series of the NFR and SNAP source categories as they are found in the CORINAIR databases. Considerable trends and changes are checked and explained.
- Comparison to inventory of the previous year on the level of the categories of the NFR as well as on SNAP source categories. Any major changes are checked, verified, etc.
- Total emissions when aggregated to NFR source categories are compared to totals based on SNAP source categories (control of data transfer).
- A manual log table have been introduced in the emission databases to collect information about recalculations

A part from the UNFCCC's In-Depth-Reviews, Quality Assurance (QA) with independent review of the inventories has not yet been carried out. The IPCC has developed guidance on good practice. This work includes good practice guidance on QA/QC. Future work to improve the Danish emission inventories will include further elaboration on how formal QA/QC procedures could be implemented. A formal QA/QC plan has not yet been developed.

## **(j) Changes with respect to previous reporting**

As mentioned under (g) on recalculations several changes to the Danish emission inventories have been made.

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# **Appendix 1**

Denmark's annual emission inventories to the  
UNECE Convention in NFR format

**TABLE IV 1A: National sector emissions: Main pollutants, particulate matter and heavy metals**

Version 2002-1

COUNTRY: DK (as ISO2 code)  
 DATE: 14.02.2003 (as DD.MM.YYYY)  
 YEAR: 1980 (as YYYY, year of Emmissions)

These five yellow lines will not be read by UNECE! These lines can be modified freely for your own reference purposes.  
 Footnotes to the emission figures reported should be submitted together with the emission data, but in a separate document.  
 Please fill out the blue marked fields. You may use the aggregation levels instead of the gray marked fields in aggregation.  
 You must use for each field either a number or one of the following codes (capitals, no dots in between, see EB.AIR/GE.1/2002/2): NO, NA, NE, IE, C  
 Footnotes or any other information entered into this table will not be taken into account.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting											Additional reporting					
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx Gg NO <sub>2</sub>	CO Gg	NMVOG Gg	SOx Gg SO <sub>2</sub>	NH3 Gg	TSP Mg	PM10 Mg	PM2.5 Mg	Pb Mg	Cd Mg	Hg Mg	As Mg	Cr Mg	Cu Mg	Ni Mg	Se Mg	Zn Mg
I A 1 a	(a)	I A 1 a Public Electricity and Heat Production				273,98														
I A 1 b	(a)	I A 1 b Petroleum refining				9,52														
I A 1 c	(a)	I A 1 c Manufacture of Solid Fuels and Other Energy Industries																		
I A 2	(a)	I A 2 Manufacturing Industries and Construction	A			81,27														
I A 2 a	(a)	I A 2 a Iron and Steel																		
I A 2 b	(a)	I A 2 b Non-ferrous Metals																		
I A 2 c	(a)	I A 2 c Chemicals																		
I A 2 d	(a)	I A 2 d Pulp, Paper and Print																		
I A 2 e	(a)	I A 2 e Food Processing, Beverages and Tobacco																		
I A 2 f	(a)	I A 2 f Other (Please specify in a covering note)																		
I A 3 a ii (i)		I A 3 a ii Civil Aviation (Domestic, LTO)				0														
I A 3 a ii (ii)		I A 3 a ii Civil Aviation (Domestic, Cruise)				0														
I A 3 b	(a)	I A 3 b Road Transportation	A																	

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg			
I A 3 b i		I A 3 b i R.T., Passenger cars																		
I A 3 b ii		I A 3 b ii R.T., Light duty vehicles																		
I A 3 b iii		I A 3 b iii R.T., Heavy duty vehicles																		
I A 3 b iv		I A 3 b iv R.T., Mopeds & Motorcycles																		
I A 3 b v		I A 3 b v R.T., Gasoline evaporation																		
I A 3 b vi		I A 3 b vi R.T., Automobile tyre and brake wear																		
I A 3 b vii		I A 3 b vii R.T., Automobile road abrasion																		
I A 3 c	(a)	I A 3 c Railways																		
I A 3 d ii		I A 3 d ii National Navigation																		
I A 3 e	(a)	I A 3 e Other (Please specify in a covering note)	A																	
I A 3 e i		I A 3 e i Pipeline compressors																		
I A 3 e ii		I A 3 e ii Other mobile sources and machinery																		
I A 4 a	(a)	I A 4 a Commercial / Institutional																		
I A 4 b	(a)	I A 4 b Residential	A																	
I A 4 b i		I A 4 b i Residential plants																		
I A 4 b ii		I A 4 b ii Household and gardening (mobile)																		

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
1 A 4 c	(a)	1 A 4 c Agriculture / Forestry / Fishing	A																	
1 A 4 c i		1 A 4 c i Stationary																		
1 A 4 c ii		1 A 4 c ii Off-road Vehicles and Other Machinery					11,7													
1 A 4 c iii		1 A 4 c iii National Fishing					2,56													
1 A 5 a	(a)	1 A 5 a Other, Stationary (including Military)					3,43													
1 A 5 b	(a)	1 A 5 b Other, Mobile (Including military)					0,07													
1 B 1	(a)	1 B 1 Fugitive Emissions from Solid Fuels	A																	
1 B 1 a	(a)	1 B 1 a Coal Mining and Handling																		
1 B 1 b	(a)	1 B 1 b Solid fuel transformation																		
1 B 1 c	(a)	1 B 1 c Other (Please specify in a covering note)																		
1 B 2	(a)	1 B 2 Oil and natural gas	A																	
1 B 2 a	(a)	1 B 2 a Oil	A																	
1 B 2 a i	(a)	1 B 2 a i Exploration Production, Transport																		
1 B 2 a iv	(a)	1 B 2 a iv Refining / Storage																		
1 B 2 a v	(a)	1 B 2 a v Distribution of oil products																		
1 B 2 a vi	(a)	1 B 2 a vi Other																		
1 B 2 b	(a)	1 B 2 b Natural gas																		
1 B 2 c	(a)	1 B 2 c Venting and flaring																		

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
2 A	(a)	2 A MINERAL PRODUCTS (b) A	A																	
2 A 1	(a)	2 A 1 Cement Production																		
2 A 2	(a)	2 A 2 Lime Production																		
2 A 3	(a)	2 A 3 Limestone and Dolomite Use																		
2 A 4	(a)	2 A 4 Soda Ash Production and use																		
2 A 5	(a)	2 A 5 Asphalt Roofing																		
2 A 6	(a)	2 A 6 Road Paving with Asphalt																		
2 A 7	(a)	2 A 7 Other including Non Fuel Mining & Construction (Please specify in a covering note)																		
2 B	(a)	2 B CHEMICAL INDUSTRY A	A																	
2 B 1	(a)	2 B 1 Ammonia Production																		
2 B 2	(a)	2 B 2 Nitric Acid Production																		
2 B 3	(a)	2 B 3 Adipic Acid Production																		
2 B 4	(a)	2 B 4 Carbide Production																		
2 B 5	(a)	2 B 5 Other (Please specify in a covering note)																		
2 C	(a)	2 C METAL PRODUCTION																		
2 D	(a)	2 D OTHER PRODUCTION (b) A	A																	
2 D 1	(a)	2 D 1 Pulp and Paper																		
2 D 2	(a)	2 D 2 Food and Drink																		
2 G	(a)	2 G OTHER (Please specify in a covering note)																		

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.



NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
3 A	(a)	3 A PAINT APPLICATION																		
3 B	(a)	3 B DEGREASING AND DRY CLEANING																		
3 C	(a)	3 C CHEMICAL PRODUCTS, MANUFACTURE AND PROCESSING																		
3 D	(a)	3 D OTHER including products containing HMs and POPs (Please specify in a covering note)																		
4 B	(a)	4 B MANURE MANAGEMENT (c)	A																	
4 B 1	(a)	4 B 1 Cattle																		
4 B 1 a	(a)	4 B 1 a Dairy																		
4 B 1 b	(a)	4 B 1 b Non-Dairy																		
4 B 2	(a)	4 B 2 Buffalo																		
4 B 3	(a)	4 B 3 Sheep																		
4 B 4	(a)	4 B 4 Goats																		
4 B 5	(a)	4 B 5 Camels and Llamas																		
4 B 6	(a)	4 B 6 Horses																		
4 B 7	(a)	4 B 7 Mules and Asses																		
4 B 8	(a)	4 B 8 Swine																		
4 B 9	(a)	4 B 9 Poultry																		
4 B 13	(a)	4 B 13 Other																		
4 C	(a)	4 C RICE CULTIVATION																		

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP		A = Allowable Aggregation	Yearly minimum reporting										Additional reporting						
			Main Pollutants					Particulate matter			Priority metals			Other metals					
			NOx	CO	NM VOC	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
			Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
4 D	(a)	4 D AGRICULTURAL SOILS	A																
4 D 1	(a)	4 D 1 Direct Soil Emission																	
4 F	(a)	4 F FIELD BURNING OF AGRICULTURAL WASTES				0,34													
4 G	(a)	4 G OTHER (d)																	
5 B	(a)	5 B FOREST AND GRASSLAND CONVERSION																	
6 A	(a)	6 A SOLID WASTE DISPOSAL ON LAND																	
6 B	(a)	6 B WASTE-WATER HANDLING																	
6 C	(a)	6 C WASTE INCINERATION (e)																	
6 D	(a)	6 D OTHER WASTE (f)																	
	7 (a)	7 OTHER																	
		<b>National Total</b>				452,14													

Memo Items																		
1 A 3 a i (i)	(a)	International Aviation (LTO)				0,01												
1 A 3 a i (ii)	(a)	International Aviation (Cruise)				0,09												
1 A 3 d i	(a)	International Navigation				21,54												
5 E	(a)	5 E Other																
X		X (11 08 Volcanoes)																

(a) Sectors already reported to UNFCCC for NOx, CO, NMVOC, SO<sub>2</sub>.

(b) Including Product handling.

(c) Including NH<sub>3</sub> from Enteric Fermentation.

(d) Including PM sources.

(e) Excludes waste incineration for energy (this is included in 1 A 1).

(f) Includes accidental fires.

**Note 1:** Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

**Note 2:** The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

**TABLE IV 1A: National sector emissions: Main pollutants, particulate matter and heavy metals**

Version 2002-1

COUNTRY: DK (as ISO2 code)  
 DATE: 14.02.2003 (as DD.MM.YYYY)  
 YEAR: 1981 (as YYYY, year of Emmissions)

These five yellow lines will not be read by UNECE! These lines can be modified freely for your own reference purposes.

Footnotes to the emission figures reported should be submitted together with the emission data, but in a separate document.

Please fill out the blue marked fields. You may use the aggregation levels instead of the gray marked fields in aggregation.

You must use for each field either a number or one of the following codes (capitals, no dots in between, see EB.AIR/GE.1/2002/2): NO, NA, NE, IE, C

Footnotes or any other information entered into this table will not be taken into account.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting										Additional reporting					
				Main Pollutants					Particulate matter			Priority metals		Other metals					
		NOx	CO	NMVOC	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn	
		Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	
I A 1 a	(a)	I A 1 a Public Electricity and Heat Production																	
I A 1 b	(a)	I A 1 b Petroleum refining																	
I A 1 c	(a)	I A 1 c Manufacture of Solid Fuels and Other Energy Industries																	
I A 2	(a)	I A 2 Manufacturing Industries and Construction																	
I A 2 a	(a)	I A 2 a Iron and Steel																	
I A 2 b	(a)	I A 2 b Non-ferrous Metals																	
I A 2 c	(a)	I A 2 c Chemicals																	
I A 2 d	(a)	I A 2 d Pulp, Paper and Print																	
I A 2 e	(a)	I A 2 e Food Processing, Beverages and Tobacco																	
I A 2 f	(a)	I A 2 f Other (Please specify in a covering note)																	
I A 3 a ii (i)		I A 3 a ii Civil Aviation (Domestic, LTO)																	
I A 3 a ii (ii)		I A 3 a ii Civil Aviation (Domestic, Cruise)																	
I A 3 b	(a)	I A 3 b Road Transportation																	

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOC	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg			
I A 3 b i		I A 3 b i R.T., Passenger cars																		
I A 3 b ii		I A 3 b ii R.T., Light duty vehicles				1,1														
I A 3 b iii		I A 3 b iii R.T., Heavy duty vehicles				1,54														
I A 3 b iv		I A 3 b iv R.T., Mopeds & Motorcycles				3,91														
I A 3 b v		I A 3 b v R.T., Gasoline evaporation																		
I A 3 b vi		I A 3 b vi R.T., Automobile tyre and brake wear																		
I A 3 b vii		I A 3 b vii R.T., Automobile road abrasion																		
I A 3 c	(a)	I A 3 c Railways																		
I A 3 d ii		I A 3 d ii National Navigation				1,28														
I A 3 e	(a)	I A 3 e Other (Please specify in a covering note)	A			3,86														
I A 3 e i		I A 3 e i Pipeline compressors																		
I A 3 e ii		I A 3 e ii Other mobile sources and machinery				1,96														
I A 4 a	(a)	I A 4 a Commercial / Institutional				18,08														
I A 4 b	(a)	I A 4 b Residential	A																	
I A 4 b i		I A 4 b i Residential plants				29,65														
I A 4 b ii		I A 4 b ii Household and gardening (mobile)																		

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
1 A 4 c	(a)	1 A 4 c Agriculture / Forestry / Fishing	A																	
1 A 4 c i		1 A 4 c i Stationary																		
1 A 4 c ii		1 A 4 c ii Off-road Vehicles and Other Machinery					12,63													
1 A 4 c iii		1 A 4 c iii National Fishing					2,56													
1 A 5 a	(a)	1 A 5 a Other, Stationary (including Military)					3,12													
1 A 5 b	(a)	1 A 5 b Other, Mobile (Including military)					0,16													
1 B 1	(a)	1 B 1 Fugitive Emissions from Solid Fuels	A																	
1 B 1 a	(a)	1 B 1 a Coal Mining and Handling																		
1 B 1 b	(a)	1 B 1 b Solid fuel transformation																		
1 B 1 c	(a)	1 B 1 c Other (Please specify in a covering note)																		
1 B 2	(a)	1 B 2 Oil and natural gas	A																	
1 B 2 a	(a)	1 B 2 a Oil	A																	
1 B 2 a i	(a)	1 B 2 a i Exploration Production, Transport																		
1 B 2 a iv	(a)	1 B 2 a iv Refining / Storage																		
1 B 2 a v	(a)	1 B 2 a v Distribution of oil products																		
1 B 2 a vi	(a)	1 B 2 a vi Other																		
1 B 2 b	(a)	1 B 2 b Natural gas																		
1 B 2 c	(a)	1 B 2 c Venting and flaring																		

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
2 A	(a)	2 A MINERAL PRODUCTS (b) A	A																	
2 A 1	(a)	2 A 1 Cement Production																		
2 A 2	(a)	2 A 2 Lime Production																		
2 A 3	(a)	2 A 3 Limestone and Dolomite Use																		
2 A 4	(a)	2 A 4 Soda Ash Production and use																		
2 A 5	(a)	2 A 5 Asphalt Roofing																		
2 A 6	(a)	2 A 6 Road Paving with Asphalt																		
2 A 7	(a)	2 A 7 Other including Non Fuel Mining & Construction (Please specify in a covering note)																		
2 B	(a)	2 B CHEMICAL INDUSTRY A	A																	
2 B 1	(a)	2 B 1 Ammonia Production																		
2 B 2	(a)	2 B 2 Nitric Acid Production																		
2 B 3	(a)	2 B 3 Adipic Acid Production																		
2 B 4	(a)	2 B 4 Carbide Production																		
2 B 5	(a)	2 B 5 Other (Please specify in a covering note)																		
2 C	(a)	2 C METAL PRODUCTION																		
2 D	(a)	2 D OTHER PRODUCTION (b) A	A																	
2 D 1	(a)	2 D 1 Pulp and Paper																		
2 D 2	(a)	2 D 2 Food and Drink																		
2 G	(a)	2 G OTHER (Please specify in a covering note)																		

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting										Additional reporting						
				Main Pollutants					Particulate matter			Priority metals		Other metals						
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
3 A	(a)	3 A PAINT APPLICATION																		
3 B	(a)	3 B DEGREASING AND DRY CLEANING																		
3 C	(a)	3 C CHEMICAL PRODUCTS, MANUFACTURE AND PROCESSING																		
3 D	(a)	3 D OTHER including products containing HMs and POPs (Please specify in a covering note)																		
4 B	(a)	4 B MANURE MANAGEMENT (c)	A																	
4 B 1	(a)	4 B 1 Cattle																		
4 B 1 a	(a)	4 B 1 a Dairy																		
4 B 1 b	(a)	4 B 1 b Non-Dairy																		
4 B 2	(a)	4 B 2 Buffalo																		
4 B 3	(a)	4 B 3 Sheep																		
4 B 4	(a)	4 B 4 Goats																		
4 B 5	(a)	4 B 5 Camels and Llamas																		
4 B 6	(a)	4 B 6 Horses																		
4 B 7	(a)	4 B 7 Mules and Asses																		
4 B 8	(a)	4 B 8 Swine																		
4 B 9	(a)	4 B 9 Poultry																		
4 B 13	(a)	4 B 13 Other																		
4 C	(a)	4 C RICE CULTIVATION																		

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP		A = Allowable Aggregation	Yearly minimum reporting									Additional reporting						
			Main Pollutants				Particulate matter			Priority metals		Other metals						
			NOx	CO	NM VOC	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se
Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	
4 D	(a)	4 D AGRICULTURAL SOILS	A															
4 D 1	(a)	4 D 1 Direct Soil Emission																
4 F	(a)	4 F FIELD BURNING OF AGRICULTURAL WASTES				0,68												
4 G	(a)	4 G OTHER (d)																
5 B	(a)	5 B FOREST AND GRASSLAND CONVERSION																
6 A	(a)	6 A SOLID WASTE DISPOSAL ON LAND																
6 B	(a)	6 B WASTE-WATER HANDLING																
6 C	(a)	6 C WASTE INCINERATION (e)																
6 D	(a)	6 D OTHER WASTE (f)																
	7 (a)	7 OTHER																
		<b>National Total</b>				370,38												

Memo Items																		
1 A 3 a i (i)	(a)	International Aviation (LTO)				0,01												
1 A 3 a i (ii)	(a)	International Aviation (Cruise)				0,09												
1 A 3 d i	(a)	International Navigation				25,43												
5 E	(a)	5 E Other																
X		X (11 08 Volcanoes)																

(a) Sectors already reported to UNFCCC for NOx, CO, NMVOC, SO<sub>2</sub>.

(b) Including Product handling.

(c) Including NH<sub>3</sub> from Enteric Fermentation.

(d) Including PM sources.

(e) Excludes waste incineration for energy (this is included in 1 A 1).

(f) Includes accidental fires.

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.



**TABLE IV 1A: National sector emissions: Main pollutants, particulate matter and heavy metals**

Version 2002-1

COUNTRY: DK (as ISO2 code)  
 DATE: 14.02.2003 (as DD.MM.YYYY)  
 YEAR: 1982 (as YYYY, year of Emmissions)

These five yellow lines will not be read by UNECE! These lines can be modified freely for your own reference purposes.

Footnotes to the emission figures reported should be submitted together with the emission data, but in a separate document.

Please fill out the blue marked fields. You may use the aggregation levels instead of the gray marked fields in aggregation.

You must use for each field either a number or one of the following codes (capitals, no dots in between, see EB.AIR/GE.1/2002/2): NO, NA, NE, IE, C

Footnotes or any other information entered into this table will not be taken into account.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting											Additional reporting					
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx Gg NO <sub>2</sub>	CO Gg	NMVOG Gg	SOx Gg SO <sub>2</sub>	NH3 Gg	TSP Mg	PM10 Mg	PM2.5 Mg	Pb Mg	Cd Mg	Hg Mg	As Mg	Cr Mg	Cu Mg	Ni Mg	Se Mg	Zn Mg
I A 1 a	(a)	I A 1 a Public Electricity and Heat Production				229,36														
I A 1 b	(a)	I A 1 b Petroleum refining				14,08														
I A 1 c	(a)	I A 1 c Manufacture of Solid Fuels and Other Energy Industries																		
I A 2	(a)	I A 2 Manufacturing Industries and Construction	A			59,18														
I A 2 a	(a)	I A 2 a Iron and Steel																		
I A 2 b	(a)	I A 2 b Non-ferrous Metals																		
I A 2 c	(a)	I A 2 c Chemicals																		
I A 2 d	(a)	I A 2 d Pulp, Paper and Print																		
I A 2 e	(a)	I A 2 e Food Processing, Beverages and Tobacco																		
I A 2 f	(a)	I A 2 f Other (Please specify in a covering note)																		
I A 3 a ii (i)		I A 3 a ii Civil Aviation (Domestic, LTO)				0														
I A 3 a ii (ii)		I A 3 a ii Civil Aviation (Domestic, Cruise)				0														
I A 3 b	(a)	I A 3 b Road Transportation	A																	

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg			
I A 3 b i		I A 3 b i R.T., Passenger cars																		
I A 3 b ii		I A 3 b ii R.T., Light duty vehicles																		
I A 3 b iii		I A 3 b iii R.T., Heavy duty vehicles																		
I A 3 b iv		I A 3 b iv R.T., Mopeds & Motorcycles																		
I A 3 b v		I A 3 b v R.T., Gasoline evaporation																		
I A 3 b vi		I A 3 b vi R.T., Automobile tyre and brake wear																		
I A 3 b vii		I A 3 b vii R.T., Automobile road abrasion																		
I A 3 c	(a)	I A 3 c Railways																		
I A 3 d ii		I A 3 d ii National Navigation																		
I A 3 e	(a)	I A 3 e Other (Please specify in a covering note)	A																	
I A 3 e i		I A 3 e i Pipeline compressors																		
I A 3 e ii		I A 3 e ii Other mobile sources and machinery																		
I A 4 a	(a)	I A 4 a Commercial / Institutional																		
I A 4 b	(a)	I A 4 b Residential	A																	
I A 4 b i		I A 4 b i Residential plants																		
I A 4 b ii		I A 4 b ii Household and gardening (mobile)																		

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
1 A 4 c	(a)	1 A 4 c Agriculture / Forestry / Fishing	A																	
1 A 4 c i		1 A 4 c i Stationary																		
1 A 4 c ii		1 A 4 c ii Off-road Vehicles and Other Machinery					7,07													
1 A 4 c iii		1 A 4 c iii National Fishing					2,56													
1 A 5 a	(a)	1 A 5 a Other, Stationary (including Military)					3,18													
1 A 5 b	(a)	1 A 5 b Other, Mobile (Including military)					0,4													
1 B 1	(a)	1 B 1 Fugitive Emissions from Solid Fuels	A																	
1 B 1 a	(a)	1 B 1 a Coal Mining and Handling																		
1 B 1 b	(a)	1 B 1 b Solid fuel transformation																		
1 B 1 c	(a)	1 B 1 c Other (Please specify in a covering note)																		
1 B 2	(a)	1 B 2 Oil and natural gas	A																	
1 B 2 a	(a)	1 B 2 a Oil	A																	
1 B 2 a i	(a)	1 B 2 a i Exploration Production, Transport																		
1 B 2 a iv	(a)	1 B 2 a iv Refining / Storage																		
1 B 2 a v	(a)	1 B 2 a v Distribution of oil products																		
1 B 2 a vi	(a)	1 B 2 a vi Other																		
1 B 2 b	(a)	1 B 2 b Natural gas																		
1 B 2 c	(a)	1 B 2 c Venting and flaring																		

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
2 A	(a)	2 A MINERAL PRODUCTS (b) A	A																	
2 A 1	(a)	2 A 1 Cement Production																		
2 A 2	(a)	2 A 2 Lime Production																		
2 A 3	(a)	2 A 3 Limestone and Dolomite Use																		
2 A 4	(a)	2 A 4 Soda Ash Production and use																		
2 A 5	(a)	2 A 5 Asphalt Roofing																		
2 A 6	(a)	2 A 6 Road Paving with Asphalt																		
2 A 7	(a)	2 A 7 Other including Non Fuel Mining & Construction (Please specify in a covering note)																		
2 B	(a)	2 B CHEMICAL INDUSTRY A	A																	
2 B 1	(a)	2 B 1 Ammonia Production																		
2 B 2	(a)	2 B 2 Nitric Acid Production																		
2 B 3	(a)	2 B 3 Adipic Acid Production																		
2 B 4	(a)	2 B 4 Carbide Production																		
2 B 5	(a)	2 B 5 Other (Please specify in a covering note)																		
2 C	(a)	2 C METAL PRODUCTION																		
2 D	(a)	2 D OTHER PRODUCTION (b) A	A																	
2 D 1	(a)	2 D 1 Pulp and Paper																		
2 D 2	(a)	2 D 2 Food and Drink																		
2 G	(a)	2 G OTHER (Please specify in a covering note)																		

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants				Particulate matter			Priority metals			Other metals						
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
3 A	(a)	3 A PAINT APPLICATION																		
3 B	(a)	3 B DEGREASING AND DRY CLEANING																		
3 C	(a)	3 C CHEMICAL PRODUCTS, MANUFACTURE AND PROCESSING																		
3 D	(a)	3 D OTHER including products containing HMs and POPs (Please specify in a covering note)																		
4 B	(a)	4 B MANURE MANAGEMENT (c)	A																	
4 B 1	(a)	4 B 1 Cattle																		
4 B 1 a	(a)	4 B 1 a Dairy																		
4 B 1 b	(a)	4 B 1 b Non-Dairy																		
4 B 2	(a)	4 B 2 Buffalo																		
4 B 3	(a)	4 B 3 Sheep																		
4 B 4	(a)	4 B 4 Goats																		
4 B 5	(a)	4 B 5 Camels and Llamas																		
4 B 6	(a)	4 B 6 Horses																		
4 B 7	(a)	4 B 7 Mules and Asses																		
4 B 8	(a)	4 B 8 Swine																		
4 B 9	(a)	4 B 9 Poultry																		
4 B 13	(a)	4 B 13 Other																		
4 C	(a)	4 C RICE CULTIVATION																		

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NM VOC	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
4 D	(a)	4 D AGRICULTURAL SOILS	A																	
4 D 1	(a)	4 D 1 Direct Soil Emission																		
4 F	(a)	4 F FIELD BURNING OF AGRICULTURAL WASTES				0,84														
4 G	(a)	4 G OTHER (d)																		
5 B	(a)	5 B FOREST AND GRASSLAND CONVERSION																		
6 A	(a)	6 A SOLID WASTE DISPOSAL ON LAND																		
6 B	(a)	6 B WASTE-WATER HANDLING																		
6 C	(a)	6 C WASTE INCINERATION (e)																		
6 D	(a)	6 D OTHER WASTE (f)																		
	7 (a)	7 OTHER																		
<b>National Total</b>						378,71														

Memo Items																		
1 A 3 a i (i)	(a)	International Aviation (LTO)				0,01												
1 A 3 a i (ii)	(a)	International Aviation (Cruise)				0,09												
1 A 3 d i	(a)	International Navigation				24,26												
5 E	(a)	5 E Other																
X		X (11 08 Volcanoes)																

(a) Sectors already reported to UNFCCC for NOx, CO, NMVOC, SO<sub>2</sub>.

(b) Including Product handling.

(c) Including NH<sub>3</sub> from Enteric Fermentation.

(d) Including PM sources.

(e) Excludes waste incineration for energy (this is included in 1 A 1).

(f) Includes accidental fires.

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

**TABLE IV 1A: National sector emissions: Main pollutants, particulate matter and heavy metals**

Version 2002-1

COUNTRY: DK (as ISO2 code)  
 DATE: 14.02.2003 (as DD.MM.YYYY)  
 YEAR: 1983 (as YYYY, year of Emmissions)

These five yellow lines will not be read by UNECE! These lines can be modified freely for your own reference purposes.

Footnotes to the emission figures reported should be submitted together with the emission data, but in a separate document.

Please fill out the blue marked fields. You may use the aggregation levels instead of the gray marked fields in aggregation.

You must use for each field either a number or one of the following codes (capitals, no dots in between, see EB.AIR/GE.1/2002/2): NO, NA, NE, IE, C

Footnotes or any other information entered into this table will not be taken into account.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting					
				Main Pollutants				Particulate matter			Priority metals		Other metals					
				NOx Gg NO <sub>2</sub>	CO Gg	NMVOG Gg	SOx Gg SO <sub>2</sub>	NH3 Gg	TSP Mg	PM10 Mg	PM2.5 Mg	Pb Mg	Cd Mg	Hg Mg	As Mg	Cr Mg	Cu Mg	Ni Mg
I A 1 a	(a)	I A 1 a Public Electricity and Heat Production				181,99												
I A 1 b	(a)	I A 1 b Petroleum refining				14,9												
I A 1 c	(a)	I A 1 c Manufacture of Solid Fuels and Other Energy Industries																
I A 2	(a)	I A 2 Manufacturing Industries and Construction	A			56,44												
I A 2 a	(a)	I A 2 a Iron and Steel																
I A 2 b	(a)	I A 2 b Non-ferrous Metals																
I A 2 c	(a)	I A 2 c Chemicals																
I A 2 d	(a)	I A 2 d Pulp, Paper and Print																
I A 2 e	(a)	I A 2 e Food Processing, Beverages and Tobacco																
I A 2 f	(a)	I A 2 f Other (Please specify in a covering note)																
I A 3 a ii (i)		I A 3 a ii Civil Aviation (Domestic, LTO)				0												
I A 3 a ii (ii)		I A 3 a ii Civil Aviation (Domestic, Cruise)				0												
I A 3 b	(a)	I A 3 b Road Transportation	A															

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg			
I A 3 b i		I A 3 b i R.T., Passenger cars																		
I A 3 b ii		I A 3 b ii R.T., Light duty vehicles																		
I A 3 b iii		I A 3 b iii R.T., Heavy duty vehicles																		
I A 3 b iv		I A 3 b iv R.T., Mopeds & Motorcycles																		
I A 3 b v		I A 3 b v R.T., Gasoline evaporation																		
I A 3 b vi		I A 3 b vi R.T., Automobile tyre and brake wear																		
I A 3 b vii		I A 3 b vii R.T., Automobile road abrasion																		
I A 3 c	(a)	I A 3 c Railways																		
I A 3 d ii		I A 3 d ii National Navigation																		
I A 3 e	(a)	I A 3 e Other (Please specify in a covering note)	A																	
I A 3 e i		I A 3 e i Pipeline compressors																		
I A 3 e ii		I A 3 e ii Other mobile sources and machinery																		
I A 4 a	(a)	I A 4 a Commercial / Institutional																		
I A 4 b	(a)	I A 4 b Residential	A																	
I A 4 b i		I A 4 b i Residential plants																		
I A 4 b ii		I A 4 b ii Household and gardening (mobile)																		

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.



NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
1 A 4 c	(a)	1 A 4 c Agriculture / Forestry / Fishing	A																	
1 A 4 c i		1 A 4 c i Stationary																		
1 A 4 c ii		1 A 4 c ii Off-road Vehicles and Other Machinery					7,68													
1 A 4 c iii		1 A 4 c iii National Fishing					2,55													
1 A 5 a	(a)	1 A 5 a Other, Stationary (including Military)					3,27													
1 A 5 b	(a)	1 A 5 b Other, Mobile (Including military)					0,22													
1 B 1	(a)	1 B 1 Fugitive Emissions from Solid Fuels	A																	
1 B 1 a	(a)	1 B 1 a Coal Mining and Handling																		
1 B 1 b	(a)	1 B 1 b Solid fuel transformation																		
1 B 1 c	(a)	1 B 1 c Other (Please specify in a covering note)																		
1 B 2	(a)	1 B 2 Oil and natural gas	A																	
1 B 2 a	(a)	1 B 2 a Oil	A																	
1 B 2 a i	(a)	1 B 2 a i Exploration Production, Transport																		
1 B 2 a iv	(a)	1 B 2 a iv Refining / Storage																		
1 B 2 a v	(a)	1 B 2 a v Distribution of oil products																		
1 B 2 a vi	(a)	1 B 2 a vi Other																		
1 B 2 b	(a)	1 B 2 b Natural gas																		
1 B 2 c	(a)	1 B 2 c Venting and flaring																		

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
2 A	(a)	2 A MINERAL PRODUCTS (b) A	A																	
2 A 1	(a)	2 A 1 Cement Production																		
2 A 2	(a)	2 A 2 Lime Production																		
2 A 3	(a)	2 A 3 Limestone and Dolomite Use																		
2 A 4	(a)	2 A 4 Soda Ash Production and use																		
2 A 5	(a)	2 A 5 Asphalt Roofing																		
2 A 6	(a)	2 A 6 Road Paving with Asphalt																		
2 A 7	(a)	2 A 7 Other including Non Fuel Mining & Construction (Please specify in a covering note)																		
2 B	(a)	2 B CHEMICAL INDUSTRY A	A																	
2 B 1	(a)	2 B 1 Ammonia Production																		
2 B 2	(a)	2 B 2 Nitric Acid Production																		
2 B 3	(a)	2 B 3 Adipic Acid Production																		
2 B 4	(a)	2 B 4 Carbide Production																		
2 B 5	(a)	2 B 5 Other (Please specify in a covering note)																		
2 C	(a)	2 C METAL PRODUCTION																		
2 D	(a)	2 D OTHER PRODUCTION (b) A	A																	
2 D 1	(a)	2 D 1 Pulp and Paper																		
2 D 2	(a)	2 D 2 Food and Drink																		
2 G	(a)	2 G OTHER (Please specify in a covering note)																		

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
3 A	(a)	3 A PAINT APPLICATION																		
3 B	(a)	3 B DEGREASING AND DRY CLEANING																		
3 C	(a)	3 C CHEMICAL PRODUCTS, MANUFACTURE AND PROCESSING																		
3 D	(a)	3 D OTHER including products containing HMs and POPs (Please specify in a covering note)																		
4 B	(a)	4 B MANURE MANAGEMENT (c)	A																	
4 B 1	(a)	4 B 1 Cattle																		
4 B 1 a	(a)	4 B 1 a Dairy																		
4 B 1 b	(a)	4 B 1 b Non-Dairy																		
4 B 2	(a)	4 B 2 Buffalo																		
4 B 3	(a)	4 B 3 Sheep																		
4 B 4	(a)	4 B 4 Goats																		
4 B 5	(a)	4 B 5 Camels and Llamas																		
4 B 6	(a)	4 B 6 Horses																		
4 B 7	(a)	4 B 7 Mules and Asses																		
4 B 8	(a)	4 B 8 Swine																		
4 B 9	(a)	4 B 9 Poultry																		
4 B 13	(a)	4 B 13 Other																		
4 C	(a)	4 C RICE CULTIVATION																		

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting										Additional reporting						
				Main Pollutants					Particulate matter			Priority metals		Other metals						
				NOx	CO	NM VOC	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
4 D	(a)	4 D AGRICULTURAL SOILS	A																	
4 D 1	(a)	4 D 1 Direct Soil Emission																		
4 F	(a)	4 F FIELD BURNING OF AGRICULTURAL WASTES				0,55														
4 G	(a)	4 G OTHER (d)																		
5 B	(a)	5 B FOREST AND GRASSLAND CONVERSION																		
6 A	(a)	6 A SOLID WASTE DISPOSAL ON LAND																		
6 B	(a)	6 B WASTE-WATER HANDLING																		
6 C	(a)	6 C WASTE INCINERATION (e)																		
6 D	(a)	6 D OTHER WASTE (f)																		
	7 (a)	7 OTHER																		
<b>National Total</b>						322,9														

Memo Items																		
1 A 3 a i (i)	(a)	International Aviation (LTO)				0,01												
1 A 3 a i (ii)	(a)	International Aviation (Cruise)				0,09												
1 A 3 d i	(a)	International Navigation				21,11												
5 E	(a)	5 E Other																
X		X (11 08 Volcanoes)																

(a) Sectors already reported to UNFCCC for NOx, CO, NMVOC, SO<sub>2</sub>.

(b) Including Product handling.

(c) Including NH<sub>3</sub> from Enteric Fermentation.

(d) Including PM sources.

(e) Excludes waste incineration for energy (this is included in 1 A 1).

(f) Includes accidental fires.

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

**TABLE IV 1A: National sector emissions: Main pollutants, particulate matter and heavy metals**

Version 2002-1

COUNTRY: DK (as ISO2 code)  
 DATE: 14.02.2003 (as DD.MM.YYYY)  
 YEAR: 1984 (as YYYY, year of Emmissions)

These five yellow lines will not be read by UNECE! These lines can be modified freely for your own reference purposes.

Footnotes to the emission figures reported should be submitted together with the emission data, but in a separate document.

Please fill out the blue marked fields. You may use the aggregation levels instead of the gray marked fields in aggregation.

You must use for each field either a number or one of the following codes (capitals, no dots in between, see EB.AIR/GE.1/2002/2): NO, NA, NE, IE, C

Footnotes or any other information entered into this table will not be taken into account.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting											Additional reporting					
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx Gg NO <sub>2</sub>	CO Gg	NMVOG Gg	SOx Gg SO <sub>2</sub>	NH3 Gg	TSP Mg	PM10 Mg	PM2.5 Mg	Pb Mg	Cd Mg	Hg Mg	As Mg	Cr Mg	Cu Mg	Ni Mg	Se Mg	Zn Mg
I A 1 a	(a)	I A 1 a Public Electricity and Heat Production				161,1														
I A 1 b	(a)	I A 1 b Petroleum refining				14,59														
I A 1 c	(a)	I A 1 c Manufacture of Solid Fuels and Other Energy Industries																		
I A 2	(a)	I A 2 Manufacturing Industries and Construction	A			59,6														
I A 2 a	(a)	I A 2 a Iron and Steel																		
I A 2 b	(a)	I A 2 b Non-ferrous Metals																		
I A 2 c	(a)	I A 2 c Chemicals																		
I A 2 d	(a)	I A 2 d Pulp, Paper and Print																		
I A 2 e	(a)	I A 2 e Food Processing, Beverages and Tobacco																		
I A 2 f	(a)	I A 2 f Other (Please specify in a covering note)																		
I A 3 a ii (i)		I A 3 a ii Civil Aviation (Domestic, LTO)				0														
I A 3 a ii (ii)		I A 3 a ii Civil Aviation (Domestic, Cruise)				0														
I A 3 b	(a)	I A 3 b Road Transportation	A																	

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOC	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg			
I A 3 b i		I A 3 b i R.T., Passenger cars																		
I A 3 b ii		I A 3 b ii R.T., Light duty vehicles				1,55														
I A 3 b iii		I A 3 b iii R.T., Heavy duty vehicles				2,35														
I A 3 b iv		I A 3 b iv R.T., Mopeds & Motorcycles				5,99														
I A 3 b v		I A 3 b v R.T., Gasoline evaporation																		
I A 3 b vi		I A 3 b vi R.T., Automobile tyre and brake wear																		
I A 3 b vii		I A 3 b vii R.T., Automobile road abrasion																		
I A 3 c	(a)	I A 3 c Railways																		
I A 3 d ii		I A 3 d ii National Navigation				1,21														
I A 3 e	(a)	I A 3 e Other (Please specify in a covering note)	A			3,51														
I A 3 e i		I A 3 e i Pipeline compressors																		
I A 3 e ii		I A 3 e ii Other mobile sources and machinery				1,63														
I A 4 a	(a)	I A 4 a Commercial / Institutional				14,84														
I A 4 b	(a)	I A 4 b Residential	A																	
I A 4 b i		I A 4 b i Residential plants				24,07														
I A 4 b ii		I A 4 b ii Household and gardening (mobile)																		

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
1 A 4 c	(a)	1 A 4 c Agriculture / Forestry / Fishing	A																	
1 A 4 c i		1 A 4 c i Stationary																		
1 A 4 c ii		1 A 4 c ii Off-road Vehicles and Other Machinery					7,3													
1 A 4 c iii		1 A 4 c iii National Fishing					2,55													
1 A 5 a	(a)	1 A 5 a Other, Stationary (including Military)					3,9													
1 A 5 b	(a)	1 A 5 b Other, Mobile (Including military)					0,42													
1 B 1	(a)	1 B 1 Fugitive Emissions from Solid Fuels	A																	
1 B 1 a	(a)	1 B 1 a Coal Mining and Handling																		
1 B 1 b	(a)	1 B 1 b Solid fuel transformation																		
1 B 1 c	(a)	1 B 1 c Other (Please specify in a covering note)																		
1 B 2	(a)	1 B 2 Oil and natural gas	A																	
1 B 2 a	(a)	1 B 2 a Oil	A																	
1 B 2 a i	(a)	1 B 2 a i Exploration Production, Transport																		
1 B 2 a iv	(a)	1 B 2 a iv Refining / Storage																		
1 B 2 a v	(a)	1 B 2 a v Distribution of oil products																		
1 B 2 a vi	(a)	1 B 2 a vi Other																		
1 B 2 b	(a)	1 B 2 b Natural gas																		
1 B 2 c	(a)	1 B 2 c Venting and flaring																		

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
2 A	(a)	2 A MINERAL PRODUCTS (b) A	A																	
2 A 1	(a)	2 A 1 Cement Production																		
2 A 2	(a)	2 A 2 Lime Production																		
2 A 3	(a)	2 A 3 Limestone and Dolomite Use																		
2 A 4	(a)	2 A 4 Soda Ash Production and use																		
2 A 5	(a)	2 A 5 Asphalt Roofing																		
2 A 6	(a)	2 A 6 Road Paving with Asphalt																		
2 A 7	(a)	2 A 7 Other including Non Fuel Mining & Construction (Please specify in a covering note)																		
2 B	(a)	2 B CHEMICAL INDUSTRY A	A																	
2 B 1	(a)	2 B 1 Ammonia Production																		
2 B 2	(a)	2 B 2 Nitric Acid Production																		
2 B 3	(a)	2 B 3 Adipic Acid Production																		
2 B 4	(a)	2 B 4 Carbide Production																		
2 B 5	(a)	2 B 5 Other (Please specify in a covering note)																		
2 C	(a)	2 C METAL PRODUCTION																		
2 D	(a)	2 D OTHER PRODUCTION (b) A	A																	
2 D 1	(a)	2 D 1 Pulp and Paper																		
2 D 2	(a)	2 D 2 Food and Drink																		
2 G	(a)	2 G OTHER (Please specify in a covering note)																		

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.



NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting										Additional reporting						
				Main Pollutants					Particulate matter			Priority metals		Other metals						
				NOx	CO	NMVOc	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
3 A	(a)	3 A PAINT APPLICATION																		
3 B	(a)	3 B DEGREASING AND DRY CLEANING																		
3 C	(a)	3 C CHEMICAL PRODUCTS, MANUFACTURE AND PROCESSING																		
3 D	(a)	3 D OTHER including products containing HMs and POPs (Please specify in a covering note)																		
4 B	(a)	4 B MANURE MANAGEMENT (c)	A																	
4 B 1	(a)	4 B 1 Cattle																		
4 B 1 a	(a)	4 B 1 a Dairy																		
4 B 1 b	(a)	4 B 1 b Non-Dairy																		
4 B 2	(a)	4 B 2 Buffalo																		
4 B 3	(a)	4 B 3 Sheep																		
4 B 4	(a)	4 B 4 Goats																		
4 B 5	(a)	4 B 5 Camels and Llamas																		
4 B 6	(a)	4 B 6 Horses																		
4 B 7	(a)	4 B 7 Mules and Asses																		
4 B 8	(a)	4 B 8 Swine																		
4 B 9	(a)	4 B 9 Poultry																		
4 B 13	(a)	4 B 13 Other																		
4 C	(a)	4 C RICE CULTIVATION																		

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting								
				Main Pollutants					Particulate matter			Priority metals			Other metals						
				NOx	CO	NM VOC	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn	
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	
4 D	(a)	4 D AGRICULTURAL SOILS	A																		
4 D 1	(a)	4 D 1 Direct Soil Emission																			
4 F	(a)	4 F FIELD BURNING OF AGRICULTURAL WASTES					0,84														
4 G	(a)	4 G OTHER (d)																			
5 B	(a)	5 B FOREST AND GRASSLAND CONVERSION																			
6 A	(a)	6 A SOLID WASTE DISPOSAL ON LAND																			
6 B	(a)	6 B WASTE-WATER HANDLING																			
6 C	(a)	6 C WASTE INCINERATION (e)																			
6 D	(a)	6 D OTHER WASTE (f)																			
	7 (a)	7 OTHER																			
<b>National Total</b>				0	0	0	305,45														

Memo Items																		
1 A 3 a i (i)	(a)	International Aviation (LTO)					0,01											
1 A 3 a i (ii)	(a)	International Aviation (Cruise)					0,09											
1 A 3 d i	(a)	International Navigation					21,94											
5 E	(a)	5 E Other																
X		X (11 08 Volcanoes)																

(a) Sectors already reported to UNFCCC for NOx, CO, NMVOC, SO<sub>2</sub>.

(b) Including Product handling.

(c) Including NH<sub>3</sub> from Enteric Fermentation.

(d) Including PM sources.

(e) Excludes waste incineration for energy (this is included in 1 A 1).

(f) Includes accidental fires.

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

**TABLE IV 1A: National sector emissions: Main pollutants, particulate matter and heavy metals**

Version 2002-1

COUNTRY: DK (as ISO2 code)  
 DATE: 14.02.2003 (as DD.MM.YYYY)  
 YEAR: 1985 (as YYYY, year of Emmissions)

These five yellow lines will not be read by UNECE! These lines can be modified freely for your own reference purposes.  
 Footnotes to the emission figures reported should be submitted together with the emission data, but in a separate document.  
 Please fill out the blue marked fields. You may use the aggregation levels instead of the gray marked fields in aggregation.  
 You must use for each field either a number or one of the following codes (capitals, no dots in between, see EB.AIR/GE.1/2002/2): NO, NA, NE, IE, C  
 Footnotes or any other information entered into this table will not be taken into account.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting											Additional reporting					
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
I A 1 a	(a)	I A 1 a Public Electricity and Heat Production		119,45	6,91	0,93	205,58													
I A 1 b	(a)	I A 1 b Petroleum refining		2,82	0,31	0,1	8,98													
I A 1 c	(a)	I A 1 c Manufacture of Solid Fuels and Other Energy Industries																		
I A 2	(a)	I A 2 Manufacturing Industries and Construction	A	23,01	15,2	4,19	56,15	0												
I A 2 a	(a)	I A 2 a Iron and Steel																		
I A 2 b	(a)	I A 2 b Non-ferrous Metals																		
I A 2 c	(a)	I A 2 c Chemicals																		
I A 2 d	(a)	I A 2 d Pulp, Paper and Print																		
I A 2 e	(a)	I A 2 e Food Processing, Beverages and Tobacco																		
I A 2 f	(a)	I A 2 f Other (Please specify in a covering note)																		
I A 3 a ii (i)		I A 3 a ii Civil Aviation (Domestic, LTO)		0,32	1,02	0,18	0	0												
I A 3 a ii (ii)		I A 3 a ii Civil Aviation (Domestic, Cruise)		0,58	0,15	0,02	0													
I A 3 b	(a)	I A 3 b Road Transportation	A																	

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg			
I A 3 b i		I A 3 b i R.T., Passenger cars		53,83	540,48	47,28	1,41	0,05												
I A 3 b ii		I A 3 b ii R.T., Light duty vehicles		7,43	17,02	1,78	3,28	0,01												
I A 3 b iii		I A 3 b iii R.T., Heavy duty vehicles		28,24	7,55	3,14	6,93	0,01												
I A 3 b iv		I A 3 b iv R.T., Mopeds & Motorcycles		0,06	9,81	3,23	0,00	0,00												
I A 3 b v		I A 3 b v R.T., Gasoline evaporation				25,45														
I A 3 b vi		I A 3 b vi R.T., Automobile tyre and brake wear																		
I A 3 b vii		I A 3 b vii R.T., Automobile road abrasion																		
I A 3 c	(a)	I A 3 c Railways		3,4	0,51	0,21	1,15	0												
I A 3 d ii		I A 3 d ii National Navigation		8	8,94	4,94	4,19	0												
I A 3 e	(a)	I A 3 e Other (Please specify in a covering note)	A																	
I A 3 e i		I A 3 e i Pipeline compressors																		
I A 3 e ii		I A 3 e ii Other mobile sources and machinery																		
I A 4 a	(a)	I A 4 a Commercial / Institutional		2,51	0,84	0,1	13,84													
I A 4 b	(a)	I A 4 b Residential	A																	
I A 4 b i		I A 4 b i Residential plants		6,73	83,8	8,74	25,97													
I A 4 b ii		I A 4 b ii Household and gardening (mobile)		0,2	39,09	3,42	0	0												

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg			
1 A 4 c	(a)	1 A 4 c Agriculture / Forestry / Fishing	A																	
1 A 4 c i		1 A 4 c i Stationary																		
1 A 4 c ii		1 A 4 c ii Off-road Vehicles and Other Machinery		1,66	1,81	0,18	6,63													
1 A 4 c iii		1 A 4 c iii National Fishing		17,12	17,17	3,8	3,13	0												
1 A 5 a	(a)	1 A 5 a Other, Stationary (including Military)		12,25	1,59	0,5	1,33													
1 A 5 b	(a)	1 A 5 b Other, Mobile (Including military)		2,3	4,15	0,61	0,34	0												
1 B 1	(a)	1 B 1 Fugitive Emissions from Solid Fuels	A																	
1 B 1 a	(a)	1 B 1 a Coal Mining and Handling																		
1 B 1 b	(a)	1 B 1 b Solid fuel transformation			42,5															
1 B 1 c	(a)	1 B 1 c Other (Please specify in a covering note)																		
1 B 2	(a)	1 B 2 Oil and natural gas	A																	
1 B 2 a	(a)	1 B 2 a Oil	A																	
1 B 2 a i	(a)	1 B 2 a i Exploration Production, Transport																		
1 B 2 a iv	(a)	1 B 2 a iv Refining / Storage																		
1 B 2 a v	(a)	1 B 2 a v Distribution of oil products				3,31														
1 B 2 a vi	(a)	1 B 2 a vi Other				4,18														
1 B 2 b	(a)	1 B 2 b Natural gas																		
1 B 2 c	(a)	1 B 2 c Venting and flaring				0,03														
				1,7	1,1	0,48														

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting										Additional reporting						
				Main Pollutants					Particulate matter			Priority metals		Other metals						
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
2 A	(a)	2 A MINERAL PRODUCTS (b) A	A																	
2 A 1	(a)	2 A 1 Cement Production																		
2 A 2	(a)	2 A 2 Lime Production																		
2 A 3	(a)	2 A 3 Limestone and Dolomite Use																		
2 A 4	(a)	2 A 4 Soda Ash Production and use																		
2 A 5	(a)	2 A 5 Asphalt Roofing																		
2 A 6	(a)	2 A 6 Road Paving with Asphalt																		
2 A 7	(a)	2 A 7 Other including Non Fuel Mining & Construction (Please specify in a covering note)																		
2 B	(a)	2 B CHEMICAL INDUSTRY A	A																	
2 B 1	(a)	2 B 1 Ammonia Production																		
2 B 2	(a)	2 B 2 Nitric Acid Production																		
2 B 3	(a)	2 B 3 Adipic Acid Production																		
2 B 4	(a)	2 B 4 Carbide Production																		
2 B 5	(a)	2 B 5 Other (Please specify in a covering note)																		
2 C	(a)	2 C METAL PRODUCTION																		
2 D	(a)	2 D OTHER PRODUCTION (b) A	A																	
2 D 1	(a)	2 D 1 Pulp and Paper																		
2 D 2	(a)	2 D 2 Food and Drink																		
2 G	(a)	2 G OTHER (Please specify in a covering note)																		

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting								
				Main Pollutants					Particulate matter			Priority metals			Other metals						
				NOx	CO	NMVOc	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn	
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	
3 A	(a)	3 A PAINT APPLICATION																			
					39,11																
3 B	(a)	3 B DEGREASING AND DRY CLEANING																			
3 C	(a)	3 C CHEMICAL PRODUCTS, MANUFACTURE AND PROCESSING			0,82																
3 D	(a)	3 D OTHER including products containing HMs and POPs (Please specify in a covering note)			18,54																
4 B	(a)	4 B MANURE MANAGEMENT (c)	A																		
4 B 1	(a)	4 B 1 Cattle																			
4 B 1 a	(a)	4 B 1 a Dairy						27,25													
4 B 1 b	(a)	4 B 1 b Non-Dairy																			
4 B 2	(a)	4 B 2 Buffalo						13,3													
4 B 3	(a)	4 B 3 Sheep																			
4 B 4	(a)	4 B 4 Goats						0,08													
4 B 5	(a)	4 B 5 Camels and Llamas						0,02													
4 B 6	(a)	4 B 6 Horses																			
4 B 7	(a)	4 B 7 Mules and Asses						1,17													
4 B 8	(a)	4 B 8 Swine																			
4 B 9	(a)	4 B 9 Poultry						52,85													
4 B 13	(a)	4 B 13 Other						3,18													
								4,94													
4 C	(a)	4 C RICE CULTIVATION																			

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP		A = Allowable Aggregation	Yearly minimum reporting										Additional reporting						
			Main Pollutants					Particulate matter			Priority metals		Other metals						
			NOx	CO	NM VOC	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg		
4 D	(a)	4 D AGRICULTURAL SOILS	A																
4 D 1	(a)	4 D 1 Direct Soil Emission				1,49		35,29											
4 F	(a)	4 F FIELD BURNING OF AGRICULTURAL WASTES		0,99	198,36	13,41	0,5												
4 G	(a)	4 G OTHER (d)																	
5 B	(a)	5 B FOREST AND GRASSLAND CONVERSION																	
6 A	(a)	6 A SOLID WASTE DISPOSAL ON LAND																	
6 B	(a)	6 B WASTE-WATER HANDLING																	
6 C	(a)	6 C WASTE INCINERATION (e)																	
6 D	(a)	6 D OTHER WASTE (f)																	
	7 (a)	7 OTHER																	
<b>National Total</b>				292,5943673	998,3173808	190,1760413	339,4140548	138,1421917	0										

Memo Items																			
1 A 3 a i (i)	(a)	International Aviation (LTO)		0,61	0,45	0,09	0	0											
1 A 3 a i (ii)	(a)	International Aviation (Cruise)		5,34	0,68	0,16	0,04												
1 A 3 d i	(a)	International Navigation		33,36	2,84	0,89	18,44												
5 E	(a)	5 E Other																	
X		X (11 08 Volcanoes)																	

(a) Sectors already reported to UNFCCC for NOx, CO, NMVOC, SO<sub>2</sub>.

(b) Including Product handling.

(c) Including NH<sub>3</sub> from Enteric Fermentation.

(d) Including PM sources.

(e) Excludes waste incineration for energy (this is included in 1 A 1).

(f) Includes accidental fires.

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.



**TABLE IV 1A: National sector emissions: Main pollutants, particulate matter and heavy metals**

Version 2002-1

COUNTRY: DK (as ISO2 code)  
 DATE: 14.02.2003 (as DD.MM.YYYY)  
 YEAR: 1986 (as YYYY, year of Emmissions)

These five yellow lines will not be read by UNECE! These lines can be modified freely for your own reference purposes.

Footnotes to the emission figures reported should be submitted together with the emission data, but in a separate document.

Please fill out the blue marked fields. You may use the aggregation levels instead of the gray marked fields in aggregation.

You must use for each field either a number or one of the following codes (capitals, no dots in between, see EB.AIR/GE.1/2002/2): NO, NA, NE, IE, C

Footnotes or any other information entered into this table will not be taken into account.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting											Additional reporting					
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
I A 1 a	(a)	I A 1 a Public Electricity and Heat Production		131,04	7,25	1,02	188,38													
I A 1 b	(a)	I A 1 b Petroleum refining		3,15	0,34	0,11	9,56													
I A 1 c	(a)	I A 1 c Manufacture of Solid Fuels and Other Energy Industries																		
I A 2	(a)	I A 2 Manufacturing Industries and Construction	A	23,45	15,74	4,24	40,95	0												
I A 2 a	(a)	I A 2 a Iron and Steel																		
I A 2 b	(a)	I A 2 b Non-ferrous Metals																		
I A 2 c	(a)	I A 2 c Chemicals																		
I A 2 d	(a)	I A 2 d Pulp, Paper and Print																		
I A 2 e	(a)	I A 2 e Food Processing, Beverages and Tobacco																		
I A 2 f	(a)	I A 2 f Other (Please specify in a covering note)																		
I A 3 a ii (i)		I A 3 a ii Civil Aviation (Domestic, LTO)		0,33	1,03	0,18	0	0												
I A 3 a ii (ii)		I A 3 a ii Civil Aviation (Domestic, Cruise)		0,62	0,16	0,02	0													
I A 3 b	(a)	I A 3 b Road Transportation	A																	

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOC	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg			
I A 3 b i		I A 3 b i R.T., Passenger cars		54,51	517,51	46,53	0,93	0,05												
I A 3 b ii		I A 3 b ii R.T., Light duty vehicles		8,64	18,88	1,99	2,34	0,01												
I A 3 b iii		I A 3 b iii R.T., Heavy duty vehicles		31,16	8,30	3,47	4,59	0,01												
I A 3 b iv		I A 3 b iv R.T., Mopeds & Motorcycles		0,05	9,30	2,96	0,00	0,00												
I A 3 b v		I A 3 b v R.T., Gasoline evaporation				25,92														
I A 3 b vi		I A 3 b vi R.T., Automobile tyre and brake wear																		
I A 3 b vii		I A 3 b vii R.T., Automobile road abrasion																		
I A 3 c	(a)	I A 3 c Railways		3,42	0,51	0,21	0,7	0												
I A 3 d ii		I A 3 d ii National Navigation		9,21	8,91	4,88	5,48	0												
I A 3 e	(a)	I A 3 e Other (Please specify in a covering note)	A																	
I A 3 e i		I A 3 e i Pipeline compressors																		
I A 3 e ii		I A 3 e ii Other mobile sources and machinery																		
I A 4 a	(a)	I A 4 a Commercial / Institutional		2,5	2,37	0,2	8,44													
I A 4 b	(a)	I A 4 b Residential	A																	
I A 4 b i		I A 4 b i Residential plants		6,7	83,73	8,76	16,85													
I A 4 b ii		I A 4 b ii Household and gardening (mobile)		0,19	38,15	3,34	0	0												

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg			
1 A 4 c	(a)	1 A 4 c Agriculture / Forestry / Fishing	A																	
1 A 4 c i		1 A 4 c i Stationary																		
1 A 4 c ii		1 A 4 c ii Off-road Vehicles and Other Machinery		1,77	1,85	0,19	5,66													
1 A 4 c iii		1 A 4 c iii National Fishing		16,71	16,75	3,71	1,83	0												
1 A 5 a	(a)	1 A 5 a Other, Stationary (including Military)		13,69	1,79	0,57	1,45	0												
1 A 5 b	(a)	1 A 5 b Other, Mobile (Including military)		1,99	3,07	0,49	0,21	0												
1 B 1	(a)	1 B 1 Fugitive Emissions from Solid Fuels	A																	
1 B 1 a	(a)	1 B 1 a Coal Mining and Handling																		
1 B 1 b	(a)	1 B 1 b Solid fuel transformation			40,78															
1 B 1 c	(a)	1 B 1 c Other (Please specify in a covering note)																		
1 B 2	(a)	1 B 2 Oil and natural gas	A																	
1 B 2 a	(a)	1 B 2 a Oil	A																	
1 B 2 a i	(a)	1 B 2 a i Exploration Production, Transport																		
1 B 2 a iv	(a)	1 B 2 a iv Refining / Storage																		
1 B 2 a v	(a)	1 B 2 a v Distribution of oil products				3,38														
1 B 2 a vi	(a)	1 B 2 a vi Other				3,99														
1 B 2 b	(a)	1 B 2 b Natural gas																		
1 B 2 c	(a)	1 B 2 c Venting and flaring					0,05													
				2	1,3	0,57														

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting										Additional reporting						
				Main Pollutants					Particulate matter			Priority metals		Other metals						
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
2 A	(a)	2 A MINERAL PRODUCTS (b) A																		
2 A 1	(a)	2 A 1 Cement Production																		
2 A 2	(a)	2 A 2 Lime Production																		
2 A 3	(a)	2 A 3 Limestone and Dolomite Use																		
2 A 4	(a)	2 A 4 Soda Ash Production and use																		
2 A 5	(a)	2 A 5 Asphalt Roofing																		
2 A 6	(a)	2 A 6 Road Paving with Asphalt																		
2 A 7	(a)	2 A 7 Other including Non Fuel Mining & Construction (Please specify in a covering note)																		
2 B	(a)	2 B CHEMICAL INDUSTRY A																		
2 B 1	(a)	2 B 1 Ammonia Production																		
2 B 2	(a)	2 B 2 Nitric Acid Production																		
2 B 3	(a)	2 B 3 Adipic Acid Production																		
2 B 4	(a)	2 B 4 Carbide Production																		
2 B 5	(a)	2 B 5 Other (Please specify in a covering note)																		
2 C	(a)	2 C METAL PRODUCTION																		
2 D	(a)	2 D OTHER PRODUCTION (b) A																		
2 D 1	(a)	2 D 1 Pulp and Paper																		
2 D 2	(a)	2 D 2 Food and Drink																		
2 G	(a)	2 G OTHER (Please specify in a covering note)																		

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting								
				Main Pollutants					Particulate matter			Priority metals			Other metals						
				NOx	CO	NMVOc	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn	
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	
3 A	(a)	3 A PAINT APPLICATION																			
					37,23																
3 B	(a)	3 B DEGREASING AND DRY CLEANING																			
3 C	(a)	3 C CHEMICAL PRODUCTS, MANUFACTURE AND PROCESSING			1,73																
3 D	(a)	3 D OTHER including products containing HMs and POPs (Please specify in a covering note)			17,87																
4 B	(a)	4 B MANURE MANAGEMENT (c)	A																		
4 B 1	(a)	4 B 1 Cattle																			
4 B 1 a	(a)	4 B 1 a Dairy						26,55													
4 B 1 b	(a)	4 B 1 b Non-Dairy																			
4 B 2	(a)	4 B 2 Buffalo						12,43													
4 B 3	(a)	4 B 3 Sheep																			
4 B 4	(a)	4 B 4 Goats						0,1													
4 B 5	(a)	4 B 5 Camels and Llamas						0,02													
4 B 6	(a)	4 B 6 Horses																			
4 B 7	(a)	4 B 7 Mules and Asses						1,15													
4 B 8	(a)	4 B 8 Swine																			
4 B 9	(a)	4 B 9 Poultry						53,51													
4 B 13	(a)	4 B 13 Other						3,3													
4 C	(a)	4 C RICE CULTIVATION						5,58													

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP		A = Allowable Aggregation	Yearly minimum reporting										Additional reporting					
			Main Pollutants					Particulate matter			Priority metals		Other metals					
			NOx	CO	NM VOC	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se
Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	
4 D	(a)	4 D AGRICULTURAL SOILS	A															
4 D 1	(a)	4 D 1 Direct Soil Emission				1,48		36,01										
4 F	(a)	4 F FIELD BURNING OF AGRICULTURAL WASTES		0,98	195,61	13,22	0,49											
4 G	(a)	4 G OTHER (d)																
5 B	(a)	5 B FOREST AND GRASSLAND CONVERSION																
6 A	(a)	6 A SOLID WASTE DISPOSAL ON LAND																
6 B	(a)	6 B WASTE-WATER HANDLING																
6 C	(a)	6 C WASTE INCINERATION (e)																
6 D	(a)	6 D OTHER WASTE (f)																
	7 (a)	7 OTHER																
<b>National Total</b>				312,1105602	973,3326741	188,3112571	287,8654572	138,71453										

Memo Items																		
1 A 3 a i (i)	(a)	International Aviation (LTO)		0,63	0,5	0,1	0	0										
1 A 3 a i (ii)	(a)	International Aviation (Cruise)		5,68	0,72	0,17	0,05											
1 A 3 d i	(a)	International Navigation		42,23	3,59	1,13	24,77	0										
5 E	(a)	5 E Other																
X		X (11 08 Volcanoes)																

(a) Sectors already reported to UNFCCC for NOx, CO, NMVOC, SO<sub>2</sub>.

(b) Including Product handling.

(c) Including NH<sub>3</sub> from Enteric Fermentation.

(d) Including PM sources.

(e) Excludes waste incineration for energy (this is included in 1 A 1).

(f) Includes accidental fires.

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

**TABLE IV 1A: National sector emissions: Main pollutants, particulate matter and heavy metals**

Version 2002-1

COUNTRY: DK (as ISO2 code)  
 DATE: 14.02.2003 (as DD.MM.YYYY)  
 YEAR: 1987 (as YYYY, year of Emmissions)

These five yellow lines will not be read by UNECE! These lines can be modified freely for your own reference purposes.

Footnotes to the emission figures reported should be submitted together with the emission data, but in a separate document.

Please fill out the blue marked fields. You may use the aggregation levels instead of the gray marked fields in aggregation.

You must use for each field either a number or one of the following codes (capitals, no dots in between, see EB.AIR/GE.1/2002/2): NO, NA, NE, IE, C

Footnotes or any other information entered into this table will not be taken into account.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting											Additional reporting					
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
I A 1 a	(a)	I A 1 a Public Electricity and Heat Production		126,69	7,25	1,01	166,24													
I A 1 b	(a)	I A 1 b Petroleum refining		3,7	0,39	0,13	10,11													
I A 1 c	(a)	I A 1 c Manufacture of Solid Fuels and Other Energy Industries																		
I A 2	(a)	I A 2 Manufacturing Industries and Construction	A	22,65	16,56	4,42	35,03	0												
I A 2 a	(a)	I A 2 a Iron and Steel																		
I A 2 b	(a)	I A 2 b Non-ferrous Metals																		
I A 2 c	(a)	I A 2 c Chemicals																		
I A 2 d	(a)	I A 2 d Pulp, Paper and Print																		
I A 2 e	(a)	I A 2 e Food Processing, Beverages and Tobacco																		
I A 2 f	(a)	I A 2 f Other (Please specify in a covering note)																		
I A 3 a ii (i)		I A 3 a ii Civil Aviation (Domestic, LTO)		0,32	0,87	0,15	0	0												
I A 3 a ii (ii)		I A 3 a ii Civil Aviation (Domestic, Cruise)		0,67	0,18	0,02	0													
I A 3 b	(a)	I A 3 b Road Transportation	A																	

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
I A 3 b i		I A 3 b i R.T., Passenger cars		54,91	497,15	46,09	0,94	0,05												
I A 3 b ii		I A 3 b ii R.T., Light duty vehicles		9,09	20,16	2,12	2,45	0,01												
I A 3 b iii		I A 3 b iii R.T., Heavy duty vehicles		30,23	8,06	3,36	4,46	0,01												
I A 3 b iv		I A 3 b iv R.T., Mopeds & Motorcycles		0,05	9,10	2,83	0,00	0,00												
I A 3 b v		I A 3 b v R.T., Gasoline evaporation				25,86														
I A 3 b vi		I A 3 b vi R.T., Automobile tyre and brake wear																		
I A 3 b vii		I A 3 b vii R.T., Automobile road abrasion																		
I A 3 c	(a)	I A 3 c Railways		3,04	0,46	0,19	0,62	0												
I A 3 d ii		I A 3 d ii National Navigation		9,78	8,92	4,86	6,1	0												
I A 3 e	(a)	I A 3 e Other (Please specify in a covering note)	A																	
I A 3 e i		I A 3 e i Pipeline compressors																		
I A 3 e ii		I A 3 e ii Other mobile sources and machinery																		
I A 4 a	(a)	I A 4 a Commercial / Institutional		1,97	2,62	0,2	6,07													
I A 4 b	(a)	I A 4 b Residential	A																	
I A 4 b i		I A 4 b i Residential plants		6,25	91,6	9,24	14,17													
I A 4 b ii		I A 4 b ii Household and gardening (mobile)		0,19	37,84	3,31	0	0												

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.



NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg			
1 A 4 c	(a)	1 A 4 c Agriculture / Forestry / Fishing	A																	
1 A 4 c i		1 A 4 c i Stationary																		
1 A 4 c ii		1 A 4 c ii Off-road Vehicles and Other Machinery		1,69	1,82	0,18	5,1													
1 A 4 c iii		1 A 4 c iii National Fishing																		
1 A 5 a	(a)	1 A 5 a Other, Stationary (including Military)		11,36	1,53	0,5	1,3	0												
1 A 5 b	(a)	1 A 5 b Other, Mobile (Including military)		1,61	1,3	0,19	0,11	0												
1 B 1	(a)	1 B 1 Fugitive Emissions from Solid Fuels	A																	
1 B 1 a	(a)	1 B 1 a Coal Mining and Handling																		
1 B 1 b	(a)	1 B 1 b Solid fuel transformation			40,38															
1 B 1 c	(a)	1 B 1 c Other (Please specify in a covering note)																		
1 B 2	(a)	1 B 2 Oil and natural gas	A																	
1 B 2 a	(a)	1 B 2 a Oil	A																	
1 B 2 a i	(a)	1 B 2 a i Exploration Production, Transport																		
1 B 2 a iv	(a)	1 B 2 a iv Refining / Storage																		
1 B 2 a v	(a)	1 B 2 a v Distribution of oil products				3,45														
1 B 2 a vi	(a)	1 B 2 a vi Other				3,97														
1 B 2 b	(a)	1 B 2 b Natural gas																		
1 B 2 c	(a)	1 B 2 c Venting and flaring					0,07													
				1,46	0,95	0,41														

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
2 A	(a)	2 A MINERAL PRODUCTS (b) A																		
2 A 1	(a)	2 A 1 Cement Production																		
2 A 2	(a)	2 A 2 Lime Production																		
2 A 3	(a)	2 A 3 Limestone and Dolomite Use																		
2 A 4	(a)	2 A 4 Soda Ash Production and use																		
2 A 5	(a)	2 A 5 Asphalt Roofing																		
2 A 6	(a)	2 A 6 Road Paving with Asphalt																		
2 A 7	(a)	2 A 7 Other including Non Fuel Mining & Construction (Please specify in a covering note)																		
2 B	(a)	2 B CHEMICAL INDUSTRY A																		
2 B 1	(a)	2 B 1 Ammonia Production																		
2 B 2	(a)	2 B 2 Nitric Acid Production																		
2 B 3	(a)	2 B 3 Adipic Acid Production																		
2 B 4	(a)	2 B 4 Carbide Production																		
2 B 5	(a)	2 B 5 Other (Please specify in a covering note)																		
2 C	(a)	2 C METAL PRODUCTION																		
2 D	(a)	2 D OTHER PRODUCTION (b) A																		
2 D 1	(a)	2 D 1 Pulp and Paper																		
2 D 2	(a)	2 D 2 Food and Drink																		
2 G	(a)	2 G OTHER (Please specify in a covering note)																		

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting								
				Main Pollutants					Particulate matter			Priority metals			Other metals						
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn	
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	
3 A	(a)	3 A PAINT APPLICATION																			
3 B	(a)	3 B DEGREASING AND DRY CLEANING				35,35															
3 C	(a)	3 C CHEMICAL PRODUCTS, MANUFACTURE AND PROCESSING				2,63															
3 D	(a)	3 D OTHER including products containing HMs and POPs (Please specify in a covering note)				17,21															
4 B	(a)	4 B MANURE MANAGEMENT (c)	A																		
4 B 1	(a)	4 B 1 Cattle																			
4 B 1 a	(a)	4 B 1 a Dairy																			
4 B 1 b	(a)	4 B 1 b Non-Dairy																			
4 B 2	(a)	4 B 2 Buffalo																			
4 B 3	(a)	4 B 3 Sheep																			
4 B 4	(a)	4 B 4 Goats																			
4 B 5	(a)	4 B 5 Camels and Llamas																			
4 B 6	(a)	4 B 6 Horses																			
4 B 7	(a)	4 B 7 Mules and Asses																			
4 B 8	(a)	4 B 8 Swine																			
4 B 9	(a)	4 B 9 Poultry																			
4 B 13	(a)	4 B 13 Other																			
4 C	(a)	4 C RICE CULTIVATION																			

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP		A = Allowable Aggregation	Yearly minimum reporting										Additional reporting					
			Main Pollutants					Particulate matter			Priority metals		Other metals					
			NOx	CO	NM VOC	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se
Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	
4 D	(a)	4 D AGRICULTURAL SOILS	A															
4 D 1	(a)	4 D 1 Direct Soil Emission				1,46		36,72										
4 F	(a)	4 F FIELD BURNING OF AGRICULTURAL WASTES		1,14	227,07	15,35	0,57											
4 G	(a)	4 G OTHER (d)																
5 B	(a)	5 B FOREST AND GRASSLAND CONVERSION																
6 A	(a)	6 A SOLID WASTE DISPOSAL ON LAND																
6 B	(a)	6 B WASTE-WATER HANDLING																
6 C	(a)	6 C WASTE INCINERATION (e)																
6 D	(a)	6 D OTHER WASTE (f)																
	7 (a)	7 OTHER																
<b>National Total</b>				303,3657294	990,8323457	188,2479661	255,0902835	135,2949445										

Memo Items																		
1 A 3 a i (i)	(a)	International Aviation (LTO)		0,65	0,52	0,11	0	0										
1 A 3 a i (ii)	(a)	International Aviation (Cruise)		6,17	0,77	0,19	0,05											
1 A 3 d i	(a)	International Navigation		62,04	5,28	1,66	39,91											
5 E	(a)	5 E Other																
X		X (11 08 Volcanoes)																

(a) Sectors already reported to UNFCCC for NOx, CO, NMVOC, SO<sub>2</sub>.

(b) Including Product handling.

(c) Including NH<sub>3</sub> from Enteric Fermentation.

(d) Including PM sources.

(e) Excludes waste incineration for energy (this is included in 1 A 1).

(f) Includes accidental fires.

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

**TABLE IV 1A: National sector emissions: Main pollutants, particulate matter and heavy metals**

Version 2002-1

COUNTRY: DK (as ISO2 code)  
 DATE: 14.02.2003 (as DD.MM.YYYY)  
 YEAR: 1988 (as YYYY, year of Emmissions)

These five yellow lines will not be read by UNECE! These lines can be modified freely for your own reference purposes.

Footnotes to the emission figures reported should be submitted together with the emission data, but in a separate document.

Please fill out the blue marked fields. You may use the aggregation levels instead of the gray marked fields in aggregation.

You must use for each field either a number or one of the following codes (capitals, no dots in between, see EB.AIR/GE.1/2002/2): NO, NA, NE, IE, C

Footnotes or any other information entered into this table will not be taken into account.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting											Additional reporting					
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
I A 1 a	(a)	I A 1 a Public Electricity and Heat Production		117,37	7,22	0,99	168,26													
I A 1 b	(a)	I A 1 b Petroleum refining		4,06	0,43	0,14	13,48													
I A 1 c	(a)	I A 1 c Manufacture of Solid Fuels and Other Energy Industries																		
I A 2	(a)	I A 2 Manufacturing Industries and Construction	A	22,32	15,9	4,41	31,8	0												
I A 2 a	(a)	I A 2 a Iron and Steel																		
I A 2 b	(a)	I A 2 b Non-ferrous Metals																		
I A 2 c	(a)	I A 2 c Chemicals																		
I A 2 d	(a)	I A 2 d Pulp, Paper and Print																		
I A 2 e	(a)	I A 2 e Food Processing, Beverages and Tobacco																		
I A 2 f	(a)	I A 2 f Other (Please specify in a covering note)																		
I A 3 a ii (i)		I A 3 a ii Civil Aviation (Domestic, LTO)		0,33	0,93	0,16	0	0												
I A 3 a ii (ii)		I A 3 a ii Civil Aviation (Domestic, Cruise)		0,71	0,19	0,02	0,01													
I A 3 b	(a)	I A 3 b Road Transportation	A																	

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg			
I A 3 b i		I A 3 b i R.T., Passenger cars		55,83	449,76	44,16	0,94	0,05												
I A 3 b ii		I A 3 b ii R.T., Light duty vehicles		9,42	20,40	2,14	2,53	0,01												
I A 3 b iii		I A 3 b iii R.T., Heavy duty vehicles		29,73	7,94	3,31	4,38	0,01												
I A 3 b iv		I A 3 b iv R.T., Mopeds & Motorcycles		0,06	9,09	2,78	0,00	0,00												
I A 3 b v		I A 3 b v R.T., Gasoline evaporation				27,46														
I A 3 b vi		I A 3 b vi R.T., Automobile tyre and brake wear																		
I A 3 b vii		I A 3 b vii R.T., Automobile road abrasion																		
I A 3 c	(a)	I A 3 c Railways		3,15	0,47	0,2	0,64	0												
I A 3 d ii		I A 3 d ii National Navigation		8,5	9,13	5,03	4,35	0												
I A 3 e	(a)	I A 3 e Other (Please specify in a covering note)	A																	
I A 3 e i		I A 3 e i Pipeline compressors																		
I A 3 e ii		I A 3 e ii Other mobile sources and machinery																		
I A 4 a	(a)	I A 4 a Commercial / Institutional		1,51	2,46	0,19	4,1													
I A 4 b	(a)	I A 4 b Residential	A																	
I A 4 b i		I A 4 b i Residential plants		5,46	84,97	8,85	11,85													
I A 4 b ii		I A 4 b ii Household and gardening (mobile)		0,2	39,71	3,47	0	0												

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg			
1 A 4 c	(a)	1 A 4 c Agriculture / Forestry / Fishing	A																	
1 A 4 c i		1 A 4 c i Stationary																		
1 A 4 c ii		1 A 4 c ii Off-road Vehicles and Other Machinery		1,52	1,77	0,17	4,38													
1 A 4 c iii		1 A 4 c iii National Fishing		17,39	17,44	3,86	1,91	0												
1 A 5 a	(a)	1 A 5 a Other, Stationary (including Military)		12,81	1,72	0,56	0,99	0												
1 A 5 b	(a)	1 A 5 b Other, Mobile (Including military)		0,98	3,13	0,48	0,03	0												
1 B 1	(a)	1 B 1 Fugitive Emissions from Solid Fuels	A																	
1 B 1 a	(a)	1 B 1 a Coal Mining and Handling			30,99															
1 B 1 b	(a)	1 B 1 b Solid fuel transformation																		
1 B 1 c	(a)	1 B 1 c Other (Please specify in a covering note)																		
1 B 2	(a)	1 B 2 Oil and natural gas	A																	
1 B 2 a	(a)	1 B 2 a Oil	A																	
1 B 2 a i	(a)	1 B 2 a i Exploration Production, Transport																		
1 B 2 a iv	(a)	1 B 2 a iv Refining / Storage				3,52														
1 B 2 a v	(a)	1 B 2 a v Distribution of oil products				4														
1 B 2 a vi	(a)	1 B 2 a vi Other																		
1 B 2 b	(a)	1 B 2 b Natural gas																		
1 B 2 c	(a)	1 B 2 c Venting and flaring				1,37														
				1,52	0,99	0,43														

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting										Additional reporting						
				Main Pollutants					Particulate matter			Priority metals		Other metals						
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
2 A	(a)	2 A MINERAL PRODUCTS (b) A	A																	
2 A 1	(a)	2 A 1 Cement Production																		
2 A 2	(a)	2 A 2 Lime Production																		
2 A 3	(a)	2 A 3 Limestone and Dolomite Use																		
2 A 4	(a)	2 A 4 Soda Ash Production and use																		
2 A 5	(a)	2 A 5 Asphalt Roofing																		
2 A 6	(a)	2 A 6 Road Paving with Asphalt																		
2 A 7	(a)	2 A 7 Other including Non Fuel Mining & Construction (Please specify in a covering note)																		
2 B	(a)	2 B CHEMICAL INDUSTRY A	A																	
2 B 1	(a)	2 B 1 Ammonia Production																		
2 B 2	(a)	2 B 2 Nitric Acid Production																		
2 B 3	(a)	2 B 3 Adipic Acid Production																		
2 B 4	(a)	2 B 4 Carbide Production																		
2 B 5	(a)	2 B 5 Other (Please specify in a covering note)																		
2 C	(a)	2 C METAL PRODUCTION																		
2 D	(a)	2 D OTHER PRODUCTION (b) A	A																	
2 D 1	(a)	2 D 1 Pulp and Paper																		
2 D 2	(a)	2 D 2 Food and Drink																		
2 G	(a)	2 G OTHER (Please specify in a covering note)																		

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.



NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting										Additional reporting						
				Main Pollutants					Particulate matter			Priority metals		Other metals						
				NOx	CO	NMVOc	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
3 A	(a)	3 A PAINT APPLICATION																		
					33,47															
3 B	(a)	3 B DEGREASING AND DRY CLEANING																		
3 C	(a)	3 C CHEMICAL PRODUCTS, MANUFACTURE AND PROCESSING				3,5														
3 D	(a)	3 D OTHER including products containing HMs and POPs (Please specify in a covering note)				16,55														
4 B	(a)	4 B MANURE MANAGEMENT (c)	A																	
4 B 1	(a)	4 B 1 Cattle																		
4 B 1 a	(a)	4 B 1 a Dairy						24,29												
4 B 1 b	(a)	4 B 1 b Non-Dairy						11,11												
4 B 2	(a)	4 B 2 Buffalo																		
4 B 3	(a)	4 B 3 Sheep																		
4 B 4	(a)	4 B 4 Goats						0,14												
4 B 5	(a)	4 B 5 Camels and Llamas						0,02												
4 B 6	(a)	4 B 6 Horses																		
4 B 7	(a)	4 B 7 Mules and Asses						1,12												
4 B 8	(a)	4 B 8 Swine																		
4 B 9	(a)	4 B 9 Poultry						49,93												
4 B 13	(a)	4 B 13 Other						3,81												
4 C	(a)	4 C RICE CULTIVATION						7,03												

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP		A = Allowable Aggregation	Yearly minimum reporting										Additional reporting					
			Main Pollutants					Particulate matter			Priority metals		Other metals					
			NOx	CO	NM VOC	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se
Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	
4 D	(a)	4 D AGRICULTURAL SOILS	A															
4 D 1	(a)	4 D 1 Direct Soil Emission				1,47		34,66										
4 F	(a)	4 F FIELD BURNING OF AGRICULTURAL WASTES		1,01	201,12	13,6	0,5											
4 G	(a)	4 G OTHER (d)																
5 B	(a)	5 B FOREST AND GRASSLAND CONVERSION																
6 A	(a)	6 A SOLID WASTE DISPOSAL ON LAND																
6 B	(a)	6 B WASTE-WATER HANDLING																
6 C	(a)	6 C WASTE INCINERATION (e)																
6 D	(a)	6 D OTHER WASTE (f)																
7	(a)	7 OTHER																
<b>National Total</b>				293,8777917	905,7536048	186,2806696	250,1600936	132,1762087										

Memo Items																		
1 A 3 a i (i)	(a)	International Aviation (LTO)		0,7	0,6	0,13	0	0										
1 A 3 a i (ii)	(a)	International Aviation (Cruise)		6,56	0,82	0,2	0,05											
1 A 3 d i	(a)	International Navigation		78,67	6,69	2,11	51,89											
5 E	(a)	5 E Other																
X		X (11 08 Volcanoes)																

(a) Sectors already reported to UNFCCC for NOx, CO, NMVOC, SO<sub>2</sub>.

(b) Including Product handling.

(c) Including NH<sub>3</sub> from Enteric Fermentation.

(d) Including PM sources.

(e) Excludes waste incineration for energy (this is included in 1 A 1).

(f) Includes accidental fires.

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

**TABLE IV 1A: National sector emissions: Main pollutants, particulate matter and heavy metals**

Version 2002-1

COUNTRY: DK (as ISO2 code)  
 DATE: 14.02.2003 (as DD.MM.YYYY)  
 YEAR: 1989 (as YYYY, year of Emmissions)

These five yellow lines will not be read by UNECE! These lines can be modified freely for your own reference purposes.

Footnotes to the emission figures reported should be submitted together with the emission data, but in a separate document.

Please fill out the blue marked fields. You may use the aggregation levels instead of the gray marked fields in aggregation.

You must use for each field either a number or one of the following codes (capitals, no dots in between, see EB.AIR/GE.1/2002/2): NO, NA, NE, IE, C

Footnotes or any other information entered into this table will not be taken into account.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting											Additional reporting					
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx Gg NO <sub>2</sub>	CO Gg	NMVOG Gg	SOx Gg SO <sub>2</sub>	NH3 Gg	TSP Mg	PM10 Mg	PM2.5 Mg	Pb Mg	Cd Mg	Hg Mg	As Mg	Cr Mg	Cu Mg	Ni Mg	Se Mg	Zn Mg
I A 1 a	(a)	I A 1 a Public Electricity and Heat Production		95.76	6.92	0.94	134.59													
I A 1 b	(a)	I A 1 b Petroleum refining		4.26	0.45	0.15	10.82													
I A 1 c	(a)	I A 1 c Manufacture of Solid Fuels and Other Energy Industries																		
I A 2	(a)	I A 2 Manufacturing Industries and Construction	A	22.34	14.84	4.32	22.77	0												
I A 2 a	(a)	I A 2 a Iron and Steel																		
I A 2 b	(a)	I A 2 b Non-ferrous Metals																		
I A 2 c	(a)	I A 2 c Chemicals																		
I A 2 d	(a)	I A 2 d Pulp, Paper and Print																		
I A 2 e	(a)	I A 2 e Food Processing, Beverages and Tobacco																		
I A 2 f	(a)	I A 2 f Other (Please specify in a covering note)																		
I A 3 a ii (i)		I A 3 a ii Civil Aviation (Domestic, LTO)		0.35	0.92	0.16	0	0												
I A 3 a ii (ii)		I A 3 a ii Civil Aviation (Domestic, Cruise)		0.7	0.19	0.02	0.01													
I A 3 b	(a)	I A 3 b Road Transportation	A																	

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg			
I A 3 b i		I A 3 b i R.T., Passenger cars		55,25	421,13	42,48	0,68	0,05												
I A 3 b ii		I A 3 b ii R.T., Light duty vehicles		9,79	20,44	2,15	1,79	0,01												
I A 3 b iii		I A 3 b iii R.T., Heavy duty vehicles		30,78	8,20	3,42	3,02	0,01												
I A 3 b iv		I A 3 b iv R.T., Mopeds & Motorcycles		0,05	8,91	2,68	0,00	0,00												
I A 3 b v		I A 3 b v R.T., Gasoline evaporation				27,54														
I A 3 b vi		I A 3 b vi R.T., Automobile tyre and brake wear																		
I A 3 b vii		I A 3 b vii R.T., Automobile road abrasion																		
I A 3 c	(a)	I A 3 c Railways		2,92	0,56	0,2	0,39	0												
I A 3 d ii		I A 3 d ii National Navigation		9,52	9,65	5,3	6,11	0												
I A 3 e	(a)	I A 3 e Other (Please specify in a covering note)	A																	
I A 3 e i		I A 3 e i Pipeline compressors																		
I A 3 e ii		I A 3 e ii Other mobile sources and machinery																		
I A 4 a	(a)	I A 4 a Commercial / Institutional		1,26	2,51	0,2	1,95													
I A 4 b	(a)	I A 4 b Residential	A																	
I A 4 b i		I A 4 b i Residential plants		4,82	77,47	8,36	7,41													
I A 4 b ii		I A 4 b ii Household and gardening (mobile)		0,21	41,6	3,64	0	0												

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg			
1 A 4 c	(a)	1 A 4 c Agriculture / Forestry / Fishing	A																	
1 A 4 c i		1 A 4 c i Stationary																		
1 A 4 c ii		1 A 4 c ii Off-road Vehicles and Other Machinery		1,35	1,66	0,16	3,09													
1 A 4 c iii		1 A 4 c iii National Fishing		18,22	18,27	4,05	1,33	0												
1 A 5 a	(a)	1 A 5 a Other, Stationary (including Military)		14,51	2,06	0,7	2,04	0												
1 A 5 b	(a)	1 A 5 b Other, Mobile (Including military)		0,87	1,95	0,31	0,04	0												
1 B 1	(a)	1 B 1 Fugitive Emissions from Solid Fuels	A																	
1 B 1 a	(a)	1 B 1 a Coal Mining and Handling																		
1 B 1 b	(a)	1 B 1 b Solid fuel transformation			35,58															
1 B 1 c	(a)	1 B 1 c Other (Please specify in a covering note)																		
1 B 2	(a)	1 B 2 Oil and natural gas	A																	
1 B 2 a	(a)	1 B 2 a Oil	A																	
1 B 2 a i	(a)	1 B 2 a i Exploration Production, Transport																		
1 B 2 a iv	(a)	1 B 2 a iv Refining / Storage				3,6														
1 B 2 a v	(a)	1 B 2 a v Distribution of oil products				3,89														
1 B 2 a vi	(a)	1 B 2 a vi Other																		
1 B 2 b	(a)	1 B 2 b Natural gas																		
1 B 2 c	(a)	1 B 2 c Venting and flaring				0,08														
				1,34	0,87	0,38														

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
2 A	(a)	2 A MINERAL PRODUCTS (b) A	A																	
2 A 1	(a)	2 A 1 Cement Production																		
2 A 2	(a)	2 A 2 Lime Production																		
2 A 3	(a)	2 A 3 Limestone and Dolomite Use																		
2 A 4	(a)	2 A 4 Soda Ash Production and use																		
2 A 5	(a)	2 A 5 Asphalt Roofing																		
2 A 6	(a)	2 A 6 Road Paving with Asphalt																		
2 A 7	(a)	2 A 7 Other including Non Fuel Mining & Construction (Please specify in a covering note)																		
2 B	(a)	2 B CHEMICAL INDUSTRY A	A																	
2 B 1	(a)	2 B 1 Ammonia Production																		
2 B 2	(a)	2 B 2 Nitric Acid Production																		
2 B 3	(a)	2 B 3 Adipic Acid Production																		
2 B 4	(a)	2 B 4 Carbide Production																		
2 B 5	(a)	2 B 5 Other (Please specify in a covering note)																		
2 C	(a)	2 C METAL PRODUCTION																		
2 D	(a)	2 D OTHER PRODUCTION (b) A	A																	
2 D 1	(a)	2 D 1 Pulp and Paper																		
2 D 2	(a)	2 D 2 Food and Drink																		
2 G	(a)	2 G OTHER (Please specify in a covering note)																		

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting								
				Main Pollutants					Particulate matter			Priority metals			Other metals						
				NOx	CO	NMVOc	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn	
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	
3 A	(a)	3 A PAINT APPLICATION				29,44															
3 B	(a)	3 B DEGREASING AND DRY CLEANING																			
3 C	(a)	3 C CHEMICAL PRODUCTS, MANUFACTURE AND PROCESSING				3,06															
3 D	(a)	3 D OTHER including products containing HMs and POPs (Please specify in a covering note)				15,4															
4 B	(a)	4 B MANURE MANAGEMENT (c)	A																		
4 B 1	(a)	4 B 1 Cattle																			
4 B 1 a	(a)	4 B 1 a Dairy																			
4 B 1 b	(a)	4 B 1 b Non-Dairy																			
4 B 2	(a)	4 B 2 Buffalo																			
4 B 3	(a)	4 B 3 Sheep																			
4 B 4	(a)	4 B 4 Goats																			
4 B 5	(a)	4 B 5 Camels and Llamas																			
4 B 6	(a)	4 B 6 Horses																			
4 B 7	(a)	4 B 7 Mules and Asses																			
4 B 8	(a)	4 B 8 Swine																			
4 B 9	(a)	4 B 9 Poultry																			
4 B 13	(a)	4 B 13 Other																			
4 C	(a)	4 C RICE CULTIVATION																			

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP		A = Allowable Aggregation	Yearly minimum reporting										Additional reporting						
			Main Pollutants					Particulate matter			Priority metals		Other metals						
			NOx	CO	NM VOC	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
			Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
4 D	(a)	4 D AGRICULTURAL SOILS	A																
4 D 1	(a)	4 D 1 Direct Soil Emission				1,47				36,69									
4 F	(a)	4 F FIELD BURNING OF AGRICULTURAL WASTES																	
4 G	(a)	4 G OTHER (d)																	
5 B	(a)	5 B FOREST AND GRASSLAND CONVERSION																	
6 A	(a)	6 A SOLID WASTE DISPOSAL ON LAND																	
6 B	(a)	6 B WASTE-WATER HANDLING																	
6 C	(a)	6 C WASTE INCINERATION (e)																	
6 D	(a)	6 D OTHER WASTE (f)																	
	7	(a) 7 OTHER																	
<b>National Total</b>				275,7609356	963,7397903	183,6686972	196,7599946	132,7163401											

Memo Items																		
1 A 3 a i (i)	(a)	International Aviation (LTO)		0,76	0,69	0,14	0,01	0										
1 A 3 a i (ii)	(a)	International Aviation (Cruise)		6,72	0,87	0,2	0,05											
1 A 3 d i	(a)	International Navigation		80,45	6,84	2,15	52,42											
5 E	(a)	5 E Other																
X		X (11 08 Volcanoes)																

(a) Sectors already reported to UNFCCC for NOx, CO, NMVOC, SO<sub>2</sub>.

(b) Including Product handling.

(c) Including NH<sub>3</sub> from Enteric Fermentation.

(d) Including PM sources.

(e) Excludes waste incineration for energy (this is included in 1 A 1).

(f) Includes accidental fires.

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.



**TABLE IV 1A: National sector emissions: Main pollutants, particulate matter and heavy metals**

Version 2002-1

COUNTRY: DK (as ISO2 code)  
 DATE: 14.02.2003 (as DD.MM.YYYY)  
 YEAR: 1990 (as YYYY, year of Emmissions)

These five yellow lines will not be read by UNECE! These lines can be modified freely for your own reference purposes.

Footnotes to the emission figures reported should be submitted together with the emission data, but in a separate document.

Please fill out the blue marked fields. You may use the aggregation levels instead of the gray marked fields in aggregation.

You must use for each field either a number or one of the following codes (capitals, no dots in between, see EB.AIR/GE.1/2002/2): NO, NA, NE, IE, C

Footnotes or any other information entered into this table will not be taken into account.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting											Additional reporting						
				Main Pollutants					Particulate matter			Priority metals			Other metals						
				NOx Gg NO <sub>2</sub>	CO Gg	NMVOG Gg	SOx Gg SO <sub>2</sub>	NH3 Gg	TSP Mg	PM10 Mg	PM2.5 Mg	Pb Mg	Cd Mg	Hg Mg	As Mg	Cr Mg	Cu Mg	Ni Mg	Se Mg	Zn Mg	
I A 1 a	(a)	I A 1 a Public Electricity and Heat Production		91.72	8.51	1.09	125.42	0					12.67	0.6	2.6	0.86	4.7	2.96	7.62	2.64	15.31
I A 1 b	(a)	I A 1 b Petroleum refining		1.59	0.25	0.06	7.69						0.03	0.02	0.01	0.02	0.04	0.02	0.84	0.02	0
I A 1 c	(a)	I A 1 c Manufacture of Solid Fuels and Other Energy Industries		2.17	0.25	0.02	0														
I A 2	(a)	I A 2 Manufacturing Industries and Construction	A	21.17	14.3	4.08	21.19	0					1.9	0.32	0.16	0.34	1.06	0.76	12.12	0.59	1.44
I A 2 a	(a)	I A 2 a Iron and Steel											0.74	0.01		0.03	0.11		0.13	0.52	0.52
I A 2 b	(a)	I A 2 b Non-ferrous Metals											0.01	0				0			
I A 2 c	(a)	I A 2 c Chemicals																			
I A 2 d	(a)	I A 2 d Pulp, Paper and Print																			
I A 2 e	(a)	I A 2 e Food Processing, Beverages and Tobacco																			
I A 2 f	(a)	I A 2 f Other (Please specify in a covering note)																			
I A 3 a ii (i)		I A 3 a ii Civil Aviation (Domestic, LTO)		0.34	0.89	0.16	0	0					1.53	0			0	0.04	0	0	0.02
I A 3 a ii (ii)		I A 3 a ii Civil Aviation (Domestic, Cruise)		0.67	0.18	0.02	0							0			0	0.08	0	0	0.05
I A 3 b	(a)	I A 3 b Road Transportation	A																		

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg			
I A 3 b i		I A 3 b i R.T., Passenger cars		57,33	427,99	43,69	0,69	0,11				83,37	0,02			0,08	2,67	0,11	0,02	1,57
I A 3 b ii		I A 3 b ii R.T., Light duty vehicles		10,43	21,69	2,28	1,91	0,01				12,47	0,01			0,03	0,95	0,04	0,01	0,56
I A 3 b iii		I A 3 b iii R.T., Heavy duty vehicles		32,30	8,67	3,61	3,17	0,01				0,21	0,01			0,04	1,35	0,06	0,01	0,79
I A 3 b iv		I A 3 b iv R.T., Mopeds & Motorcycles		0,06	9,39	2,76	0,00	0,00				2,70	0,00			0,00	0,03	0,00	0,00	0,02
I A 3 b v		I A 3 b v R.T., Gasoline evaporation				28,43														
I A 3 b vi		I A 3 b vi R.T., Automobile tyre and brake wear																		
I A 3 b vii		I A 3 b vii R.T., Automobile road abrasion																		
I A 3 c	(a)	I A 3 c Railways		2,79	0,54	0,19	0,38	0				0,03	0			0	0,16	0,01	0	0,09
I A 3 d ii		I A 3 d ii National Navigation		9,09	9,57	5,27	5,51	0				0,68	0	0	0,05	0,02	0,08	2,62	0,05	0,13
I A 3 e	(a)	I A 3 e Other (Please specify in a covering note)	A																	
I A 3 e i		I A 3 e i Pipeline compressors																		
I A 3 e ii		I A 3 e ii Other mobile sources and machinery																		
I A 4 a	(a)	I A 4 a Commercial / Institutional		1,29	0,84	0,19	1,81					0,71	0,05	0,14	0,04	0,22	0,14	0,87	0,07	0,91
I A 4 b	(a)	I A 4 b Residential	A																	
I A 4 b i		I A 4 b i Residential plants		4,67	111,44	7,62	6,3					0,16	0,07	0,14	0,06	0,06	0,12	0,18	0,22	1,58
I A 4 b ii		I A 4 b ii Household and gardening (mobile)		0,21	41,53	3,63	0	0				1,43	0			0	0,04	0	0	0,02

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
<b>1 A 4 c</b>	(a)	<b>1 A 4 c Agriculture / Forestry / Fishing</b>	A																	
1 A 4 c i		1 A 4 c i Stationary																		
1 A 4 c ii		1 A 4 c ii Off-road Vehicles and Other Machinery		1,28	3,04	2,15	3,09				0,06	0,02	0,03	0,03	0,05	0,03	0,8	0,02	0,08	
1 A 4 c iii		1 A 4 c iii National Fishing																		
1 A 5 a	(a)	1 A 5 a Other, Stationary (including Military)		14,37	2,04	0,7	1,4	0			0,04	0	0,01	0,02	0,01	0,02	0,23	0,05	0,13	
1 A 5 b	(a)	1 A 5 b Other, Mobile (Including military)		0,49	0,42	0,06	0,02	0			0,06	0			0	0,06	0	0	0,04	
<b>1 B 1</b>	(a)	<b>1 B 1 Fugitive Emissions from Solid Fuels</b>	A																	
1 B 1 a	(a)	1 B 1 a Coal Mining and Handling																		
1 B 1 b	(a)	1 B 1 b Solid fuel transformation			34,76															
1 B 1 c	(a)	1 B 1 c Other (Please specify in a covering note)																		
<b>1 B 2</b>	(a)	<b>1 B 2 Oil and natural gas</b>	A																	
1 B 2 a	(a)	1 B 2 a Oil	A																	
1 B 2 a i	(a)	1 B 2 a i Exploration Production, Transport																		
1 B 2 a iv	(a)	1 B 2 a iv Refining / Storage																		
1 B 2 a v	(a)	1 B 2 a v Distribution of oil products				3,67														
1 B 2 a vi	(a)	1 B 2 a vi Other				4,22														
1 B 2 b	(a)	1 B 2 b Natural gas																		
1 B 2 c	(a)	1 B 2 c Venting and flaring				0,08														
				1,3	0,84	0,37	0													

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting								
				Main Pollutants					Particulate matter			Priority metals			Other metals						
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn	
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	
2 A	(a)	2 A MINERAL PRODUCTS (b) A	A																		
2 A 1	(a)	2 A 1 Cement Production																			
2 A 2	(a)	2 A 2 Lime Production																			
2 A 3	(a)	2 A 3 Limestone and Dolomite Use																			
2 A 4	(a)	2 A 4 Soda Ash Production and use																			
2 A 5	(a)	2 A 5 Asphalt Roofing																			
2 A 6	(a)	2 A 6 Road Paving with Asphalt																			
2 A 7	(a)	2 A 7 Other including Non Fuel Mining & Construction (Please specify in a covering note)																			
2 B	(a)	2 B CHEMICAL INDUSTRY A	A																		
2 B 1	(a)	2 B 1 Ammonia Production																			
2 B 2	(a)	2 B 2 Nitric Acid Production		0.81																	
2 B 3	(a)	2 B 3 Adipic Acid Production																			
2 B 4	(a)	2 B 4 Carbide Production																			
2 B 5	(a)	2 B 5 Other (Please specify in a covering note)																			
2 C	(a)	2 C METAL PRODUCTION																			
2 D	(a)	2 D OTHER PRODUCTION (b) A	A							0.06	0				0.04			0.55			
2 D 1	(a)	2 D 1 Pulp and Paper																			
2 D 2	(a)	2 D 2 Food and Drink																			
2 G	(a)	2 G OTHER (Please specify in a covering note)																			

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting								
				Main Pollutants					Particulate matter			Priority metals			Other metals						
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn	
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	
3 A	(a)	3 A PAINT APPLICATION				25,4															
3 B	(a)	3 B DEGREASING AND DRY CLEANING																			
3 C	(a)	3 C CHEMICAL PRODUCTS, MANUFACTURE AND PROCESSING				2,62															
3 D	(a)	3 D OTHER including products containing HMs and POPs (Please specify in a covering note)				14,25															
4 B	(a)	4 B MANURE MANAGEMENT (c)	A																		
4 B 1	(a)	4 B 1 Cattle																			
4 B 1 a	(a)	4 B 1 a Dairy																			
4 B 1 b	(a)	4 B 1 b Non-Dairy																			
4 B 2	(a)	4 B 2 Buffalo																			
4 B 3	(a)	4 B 3 Sheep																			
4 B 4	(a)	4 B 4 Goats																			
4 B 5	(a)	4 B 5 Camels and Llamas																			
4 B 6	(a)	4 B 6 Horses																			
4 B 7	(a)	4 B 7 Mules and Asses																			
4 B 8	(a)	4 B 8 Swine																			
4 B 9	(a)	4 B 9 Poultry																			
4 B 13	(a)	4 B 13 Other																			
4 C	(a)	4 C RICE CULTIVATION																			

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP		A = Allowable Aggregation	Yearly minimum reporting										Additional reporting							
			Main Pollutants					Particulate matter			Priority metals		Other metals							
			NOx	CO	NM VOC	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn	
Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg			
4 D	(a)	4 D AGRICULTURAL SOILS	A																	
4 D 1	(a)	4 D 1 Direct Soil Emission				1,08		39,48												
4 F	(a)	4 F FIELD BURNING OF AGRICULTURAL WASTES																		
4 G	(a)	4 G OTHER (d)																		
5 B	(a)	5 B FOREST AND GRASSLAND CONVERSION																		
6 A	(a)	6 A SOLID WASTE DISPOSAL ON LAND																		
6 B	(a)	6 B WASTE-WATER HANDLING																		
6 C	(a)	6 C WASTE INCINERATION (e)																		
6 D	(a)	6 D OTHER WASTE (f)																		
7	(a)	7 OTHER																		
<b>National Total</b>				272,257988	715,3845096	161,7441418	179,9093234	133,1580415	0			119,5657899	1,119407825	3,09	1,45	6,437039141	10,12933068	25,6458548	4,209407825	24,15078272

Memo Items																			
1 A 3 a i (i)	(a)	International Aviation (LTO)		0,74	0,6	0,12	0,01	0			0,49	0		0	0,09	0	0	0	0,05
1 A 3 a i (ii)	(a)	International Aviation (Cruise)		6,41	0,83	0,19	0,05				0,01			0,03	0,86	0,04	0,01	0,51	
1 A 3 d i	(a)	International Navigation		84,63	7,2	2,26	54,47			0,17	0,02	0,03	0,36	0,15	0,36	21,03	0,33	0,77	
5 E	(a)	5 E Other																	
X		X (11 08 Volcanoes)																	

(a) Sectors already reported to UNFCCC for NOx, CO, NMVOC, SO<sub>2</sub>.

(b) Including Product handling.

(c) Including NH<sub>3</sub> from Enteric Fermentation.

(d) Including PM sources.

(e) Excludes waste incineration for energy (this is included in 1 A 1).

(f) Includes accidental fires.

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

**TABLE IV 1A: National sector emissions: Main pollutants, particulate matter and heavy metals**

Version 2002-1

COUNTRY: DK (as ISO2 code)  
 DATE: 14.02.2003 (as DD.MM.YYYY)  
 YEAR: 1991 (as YYYY, year of Emmissions)

These five yellow lines will not be read by UNECE! These lines can be modified freely for your own reference purposes.

Footnotes to the emission figures reported should be submitted together with the emission data, but in a separate document.

Please fill out the blue marked fields. You may use the aggregation levels instead of the gray marked fields in aggregation.

You must use for each field either a number or one of the following codes (capitals, no dots in between, see EB.AIR/GE.1/2002/2): NO, NA, NE, IE, C

Footnotes or any other information entered into this table will not be taken into account.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting											Additional reporting						
				Main Pollutants					Particulate matter			Priority metals			Other metals						
				NOx Gg NO <sub>2</sub>	CO Gg	NMVOG Gg	SOx Gg SO <sub>2</sub>	NH3 Gg	TSP Mg	PM10 Mg	PM2.5 Mg	Pb Mg	Cd Mg	Hg Mg	As Mg	Cr Mg	Cu Mg	Ni Mg	Se Mg	Zn Mg	
I A 1 a	(a)	I A 1 a Public Electricity and Heat Production		131,14	9,55	1,4	182,04						12,97	0,7	2,71	1,34	3,92	3,05	12,52	0,33	16,4
I A 1 b	(a)	I A 1 b Petroleum refining		1,75	0,28	0,06	6,17						0,05	0,03	0,01	0,03	0,07	0,03	1,31	0,03	0,01
I A 1 c	(a)	I A 1 c Manufacture of Solid Fuels and Other Energy Industries		2,22	0,26	0,02	0						0	0	0	0	0	0	0	0	0
I A 2	(a)	I A 2 Manufacturing Industries and Construction	A	22,14	14,51	4,18	22,79	0					1,82	0,34	0,17	0,37	1,1	0,79	13,14	0,59	1,48
I A 2 a	(a)	I A 2 a Iron and Steel																			
I A 2 b	(a)	I A 2 b Non-ferrous Metals																			
I A 2 c	(a)	I A 2 c Chemicals																			
I A 2 d	(a)	I A 2 d Pulp, Paper and Print																			
I A 2 e	(a)	I A 2 e Food Processing, Beverages and Tobacco																			
I A 2 f	(a)	I A 2 f Other (Please specify in a covering note)																			
I A 3 a ii (i)		I A 3 a ii Civil Aviation (Domestic, LTO)		0,31	0,84	0,15	0	0					1,42	0		0	0,03	0	0	0	0,02
I A 3 a ii (ii)		I A 3 a ii Civil Aviation (Domestic, Cruise)		0,6	0,16	0,02	0							0		0	0,07	0	0	0	0,04
I A 3 b	(a)	I A 3 b Road Transportation	A																		

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HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg			
I A 3 b i		I A 3 b i R.T., Passenger cars		57,84	443,23	44,78	0,71	0,28				63,81	0,02			0,08	2,84	0,12	0,02	1,67
I A 3 b ii		I A 3 b ii R.T., Light duty vehicles		10,83	23,00	2,42	1,97	0,01				10,42	0,01			0,03	0,98	0,04	0,01	0,57
I A 3 b iii		I A 3 b iii R.T., Heavy duty vehicles		32,78	8,79	3,67	3,22	0,01				0,17	0,01			0,04	1,37	0,06	0,01	0,81
I A 3 b iv		I A 3 b iv R.T., Mopeds & Motorcycles		0,06	9,81	2,87	0,00	0,00				2,27	0,00			0,00	0,03	0,00	0,00	0,02
I A 3 b v		I A 3 b v R.T., Gasoline evaporation				27,69														
I A 3 b vi		I A 3 b vi R.T., Automobile tyre and brake wear																		
I A 3 b vii		I A 3 b vii R.T., Automobile road abrasion																		
I A 3 c	(a)	I A 3 c Railways		2,83	0,52	0,19	0,38	0				0,02	0			0	0,16	0,01	0	0,1
I A 3 d ii		I A 3 d ii National Navigation		10,86	9,94	5,42	6,67	0				0,52	0	0,01	0,06	0,03	0,09	3,17	0,06	0,15
I A 3 e	(a)	I A 3 e Other (Please specify in a covering note)	A																	
I A 3 e i		I A 3 e i Pipeline compressors																		
I A 3 e ii		I A 3 e ii Other mobile sources and machinery																		
I A 4 a	(a)	I A 4 a Commercial / Institutional		1,23	0,85	0,19	1,59					0,69	0,04	0,14	0,03	0,21	0,14	0,74	0,06	0,91
I A 4 b	(a)	I A 4 b Residential	A																	
I A 4 b i		I A 4 b i Residential plants		4,99	121,85	8,33	6,98					0,18	0,07	0,16	0,07	0,06	0,13	0,18	0,24	1,79
I A 4 b ii		I A 4 b ii Household and gardening (mobile)		0,21	42,19	3,69	0	0				1,06	0			0	0,04	0	0	0,02

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HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.



NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg			
1 A 4 c	(a)	1 A 4 c Agriculture / Forestry / Fishing	A																	
1 A 4 c i		1 A 4 c i Stationary																		
1 A 4 c ii		1 A 4 c ii Off-road Vehicles and Other Machinery		1,42	2,98	2,15	3,43				0,06	0,02	0,04	0,03	0,05	0,03	0,85	0,02	0,08	
1 A 4 c iii		1 A 4 c iii National Fishing																		
1 A 5 a	(a)	1 A 5 a Other, Stationary (including Military)		18,47	18,53	4,1	1,35	0			0,52	0			0,02	0,59	0,02	0	0,35	
1 A 5 b	(a)	1 A 5 b Other, Mobile (Including military)		14,63	2,09	0,71	1,18	0			0,04	0	0,01	0,01	0,01	0,01	0,1	0,05	0,13	
1 B 1	(a)	1 B 1 Fugitive Emissions from Solid Fuels	A																	
1 B 1 a	(a)	1 B 1 a Coal Mining and Handling																		
1 B 1 b	(a)	1 B 1 b Solid fuel transformation			43,43															
1 B 1 c	(a)	1 B 1 c Other (Please specify in a covering note)																		
1 B 2	(a)	1 B 2 Oil and natural gas	A																	
1 B 2 a	(a)	1 B 2 a Oil	A																	
1 B 2 a i	(a)	1 B 2 a i Exploration Production, Transport																		
1 B 2 a iv	(a)	1 B 2 a iv Refining / Storage																		
1 B 2 a v	(a)	1 B 2 a v Distribution of oil products					3,94													
1 B 2 a vi	(a)	1 B 2 a vi Other					3,63													
1 B 2 b	(a)	1 B 2 b Natural gas																		
1 B 2 c	(a)	1 B 2 c Venting and flaring					0,1													
				2,68	1,74	0,76	0													

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting										Additional reporting						
				Main Pollutants					Particulate matter			Priority metals		Other metals						
				NOx	CO	NMVOc	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
2 A	(a)	2 A MINERAL PRODUCTS (b) A	A																	
2 A 1	(a)	2 A 1 Cement Production																		
2 A 2	(a)	2 A 2 Lime Production																		
2 A 3	(a)	2 A 3 Limestone and Dolomite Use																		
2 A 4	(a)	2 A 4 Soda Ash Production and use																		
2 A 5	(a)	2 A 5 Asphalt Roofing																		
2 A 6	(a)	2 A 6 Road Paving with Asphalt																		
2 A 7	(a)	2 A 7 Other including Non Fuel Mining & Construction (Please specify in a covering note)																		
2 B	(a)	2 B CHEMICAL INDUSTRY A	A																	
2 B 1	(a)	2 B 1 Ammonia Production																		
2 B 2	(a)	2 B 2 Nitric Acid Production																		
2 B 3	(a)	2 B 3 Adipic Acid Production																		
2 B 4	(a)	2 B 4 Carbide Production																		
2 B 5	(a)	2 B 5 Other (Please specify in a covering note)																		
2 C	(a)	2 C METAL PRODUCTION																		
2 D	(a)	2 D OTHER PRODUCTION (b) A	A																	
2 D 1	(a)	2 D 1 Pulp and Paper																		
2 D 2	(a)	2 D 2 Food and Drink																		
2 G	(a)	2 G OTHER (Please specify in a covering note)																		

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting										Additional reporting						
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
3 A	(a)	3 A PAINT APPLICATION																		
					25.19															
3 B	(a)	3 B DEGREASING AND DRY CLEANING																		
3 C	(a)	3 C CHEMICAL PRODUCTS, MANUFACTURE AND PROCESSING				2.58														
3 D	(a)	3 D OTHER including products containing HMs and POPs (Please specify in a covering note)				14.09														
4 B	(a)	4 B MANURE MANAGEMENT (c)	A																	
4 B 1	(a)	4 B 1 Cattle																		
4 B 1 a	(a)	4 B 1 a Dairy																		
4 B 1 b	(a)	4 B 1 b Non-Dairy																		
4 B 2	(a)	4 B 2 Buffalo																		
4 B 3	(a)	4 B 3 Sheep																		
4 B 4	(a)	4 B 4 Goats																		
4 B 5	(a)	4 B 5 Camels and Llamas																		
4 B 6	(a)	4 B 6 Horses																		
4 B 7	(a)	4 B 7 Mules and Asses																		
4 B 8	(a)	4 B 8 Swine																		
4 B 9	(a)	4 B 9 Poultry																		
4 B 13	(a)	4 B 13 Other																		
4 C	(a)	4 C RICE CULTIVATION																		

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP		A = Allowable Aggregation	Yearly minimum reporting										Additional reporting							
			Main Pollutants					Particulate matter			Priority metals		Other metals							
			NOx	CO	NM VOC	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn	
Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg			
4 D	(a)	4 D AGRICULTURAL SOILS	A																	
4 D 1	(a)	4 D 1 Direct Soil Emission				1,07		37,6												
4 F	(a)	4 F FIELD BURNING OF AGRICULTURAL WASTES																		
4 G	(a)	4 G OTHER (d)																		
5 B	(a)	5 B FOREST AND GRASSLAND CONVERSION																		
6 A	(a)	6 A SOLID WASTE DISPOSAL ON LAND																		
6 B	(a)	6 B WASTE-WATER HANDLING																		
6 C	(a)	6 C WASTE INCINERATION (e)																		
6 D	(a)	6 D OTHER WASTE (f)																		
	7 (a)	7 OTHER																		
<b>National Total</b>				318,8463992	755,5301719	163,6055339	238,6453663	129,0786009				96,10265123	1,23068775	3,25	1,94	5,623438733	10,52691729	32,26481425	1,41068775	24,63877493

Memo Items																			
1 A 3 a i (i)	(a)	International Aviation (LTO)		0,7	0,57	0,11	0	0				0,47	0		0	0,08	0	0	0,05
1 A 3 a i (ii)	(a)	International Aviation (Cruise)		5,92	0,77	0,18	0,05					0		0,02	0,8	0,03	0	0,47	
1 A 3 d i	(a)	International Navigation		75,83	6,45	2,03	46,27				0,14	0,02	0,03	0,3	0,13	0,3	17,32	0,29	0,67
5 E	(a)	5 E Other																	
X		X (11 08 Volcanoes)																	

- (a) Sectors already reported to UNFCCC for NOx, CO, NMVOC, SO<sub>2</sub>.
- (b) Including Product handling.
- (c) Including NH<sub>3</sub> from Enteric Fermentation.
- (d) Including PM sources.
- (e) Excludes waste incineration for energy (this is included in 1 A 1).
- (f) Includes accidental fires.

**Note 1:** Main Pollutants should cover the timespan from 1980 to latest year.  
 HM should cover the timespan from 1990 to latest year.  
 PM should cover the timespan from 2000 to latest year.

**Note 2:** The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

**TABLE IV 1A: National sector emissions: Main pollutants, particulate matter and heavy metals**

Version 2002-1

COUNTRY: DK (as ISO2 code)  
 DATE: 14.02.2003 (as DD.MM.YYYY)  
 YEAR: 1992 (as YYYY, year of Emmissions)

These five yellow lines will not be read by UNECE! These lines can be modified freely for your own reference purposes.

Footnotes to the emission figures reported should be submitted together with the emission data, but in a separate document.

Please fill out the blue marked fields. You may use the aggregation levels instead of the gray marked fields in aggregation.

You must use for each field either a number or one of the following codes (capitals, no dots in between, see EB.AIR/GE.1/2002/2): NO, NA, NE, IE, C

Footnotes or any other information entered into this table will not be taken into account.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting											Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals							
				NOx Gg NO <sub>2</sub>	CO Gg	NMVOG Gg	SOx Gg SO <sub>2</sub>	NH3 Gg	TSP Mg	PM10 Mg	PM2.5 Mg	Pb Mg	Cd Mg	Hg Mg	As Mg	Cr Mg	Cu Mg	Ni Mg	Se Mg	Zn Mg		
I A 1 a	(a)	I A 1 a Public Electricity and Heat Production		88,98	8,87	1,49	136,39						11,8	0,66	2,56	1,15	3,55	2,76	11,46	0,29	15,55	
I A 1 b	(a)	I A 1 b Petroleum refining		2	0,33	0,07	7,32						0,08	0,05	0,02	0,05	0,12	0,05	2,29	0,04	0,01	
I A 1 c	(a)	I A 1 c Manufacture of Solid Fuels and Other Energy Industries		2,56	0,3	0,02	0						0	0	0	0	0	0	0	0	0	0
I A 2	(a)	I A 2 Manufacturing Industries and Construction	A	21,92	14,55	4,2	21,87	0					1,64	0,33	0,17	0,36	1,06	0,78	12,96	0,54	1,45	
I A 2 a	(a)	I A 2 a Iron and Steel																				
I A 2 b	(a)	I A 2 b Non-ferrous Metals																				
I A 2 c	(a)	I A 2 c Chemicals																				
I A 2 d	(a)	I A 2 d Pulp, Paper and Print																				
I A 2 e	(a)	I A 2 e Food Processing, Beverages and Tobacco																				
I A 2 f	(a)	I A 2 f Other (Please specify in a covering note)																				
I A 3 a ii (i)		I A 3 a ii Civil Aviation (Domestic, LTO)		0,32	0,81	0,15	0	0					1,38	0			0	0,03	0	0	0	0,02
I A 3 a ii (ii)		I A 3 a ii Civil Aviation (Domestic, Cruise)		0,58	0,15	0,02	0							0			0	0,07	0	0	0	0,04
I A 3 b	(a)	I A 3 b Road Transportation	A																			

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg			
I A 3 b i		I A 3 b i R.T., Passenger cars		58,61	434,50	43,89	0,53	0,46				57,10	0,02			0,09	2,99	0,12	0,02	1,76
I A 3 b ii		I A 3 b ii R.T., Light duty vehicles		10,68	23,18	2,42	1,25	0,01				10,33	0,01			0,03	0,95	0,04	0,01	0,56
I A 3 b iii		I A 3 b iii R.T., Heavy duty vehicles		32,04	8,62	3,60	2,05	0,01				0,17	0,01			0,04	1,34	0,06	0,01	0,79
I A 3 b iv		I A 3 b iv R.T., Mopeds & Motorcycles		0,07	10,26	2,90	0,00	0,00				2,23	0,00			0,00	0,03	0,00	0,00	0,02
I A 3 b v		I A 3 b v R.T., Gasoline evaporation				27,69														
I A 3 b vi		I A 3 b vi R.T., Automobile tyre and brake wear																		
I A 3 b vii		I A 3 b vii R.T., Automobile road abrasion																		
I A 3 c	(a)	I A 3 c Railways		2,99	0,53	0,2	0,26	0				0,01	0			0,01	0,17	0,01	0	0,1
I A 3 d ii		I A 3 d ii National Navigation		9,86	9,91	5,44	3,36	0				0,45	0	0,01	0,05	0,02	0,08	2,51	0,05	0,13
I A 3 e	(a)	I A 3 e Other (Please specify in a covering note)	A																	
I A 3 e i		I A 3 e i Pipeline compressors																		
I A 3 e ii		I A 3 e ii Other mobile sources and machinery																		
I A 4 a	(a)	I A 4 a Commercial / Institutional		1,15	0,77	0,2	1,35					0,63	0,04	0,13	0,03	0,18	0,12	0,56	0,05	0,86
I A 4 b	(a)	I A 4 b Residential	A																	
I A 4 b i		I A 4 b i Residential plants		4,56	123,79	8,46	6,07					0,16	0,07	0,15	0,06	0,05	0,12	0,15	0,2	1,73
I A 4 b ii		I A 4 b ii Household and gardening (mobile)		0,21	42,71	3,73	0	0				0,93	0			0	0,04	0	0	0,02

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg			
1 A 4 c	(a)	1 A 4 c Agriculture / Forestry / Fishing	A																	
1 A 4 c i		1 A 4 c i Stationary																		
1 A 4 c ii		1 A 4 c ii Off-road Vehicles and Other Machinery		1,28	2,38	2,14	2,89				0,07	0,03	0,04	0,03	0,06	0,03	1,06	0,02	0,07	
1 A 4 c iii		1 A 4 c iii National Fishing																		
1 A 5 a	(a)	1 A 5 a Other, Stationary (including Military)		14,87	2,09	0,7	1,22	0			0,03	0	0,01	0,02	0,01	0,02	0,19	0,05	0,13	
1 A 5 b	(a)	1 A 5 b Other, Mobile (Including military)		1,01	0,5	0,11	0,06	0			0,06	0			0	0,08	0	0	0,04	
1 B 1	(a)	1 B 1 Fugitive Emissions from Solid Fuels	A																	
1 B 1 a	(a)	1 B 1 a Coal Mining and Handling																		
1 B 1 b	(a)	1 B 1 b Solid fuel transformation			40,48															
1 B 1 c	(a)	1 B 1 c Other (Please specify in a covering note)																		
1 B 2	(a)	1 B 2 Oil and natural gas	A																	
1 B 2 a	(a)	1 B 2 a Oil	A																	
1 B 2 a i	(a)	1 B 2 a i Exploration Production, Transport																		
1 B 2 a iv	(a)	1 B 2 a iv Refining / Storage																		
1 B 2 a v	(a)	1 B 2 a v Distribution of oil products					4,2													
1 B 2 a vi	(a)	1 B 2 a vi Other					2,91													
1 B 2 b	(a)	1 B 2 b Natural gas																		
1 B 2 c	(a)	1 B 2 c Venting and flaring					0,04													
				2,76	1,8	0,78	0													

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting										Additional reporting						
				Main Pollutants					Particulate matter			Priority metals		Other metals						
				NOx	CO	NM VOC	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
2 A	(a)	2 A MINERAL PRODUCTS (b) A	A																	
2 A 1	(a)	2 A 1 Cement Production																		
2 A 2	(a)	2 A 2 Lime Production																		
2 A 3	(a)	2 A 3 Limestone and Dolomite Use																		
2 A 4	(a)	2 A 4 Soda Ash Production and use																		
2 A 5	(a)	2 A 5 Asphalt Roofing																		
2 A 6	(a)	2 A 6 Road Paving with Asphalt																		
2 A 7	(a)	2 A 7 Other including Non Fuel Mining & Construction (Please specify in a covering note)																		
2 B	(a)	2 B CHEMICAL INDUSTRY A	A																	
2 B 1	(a)	2 B 1 Ammonia Production																		
2 B 2	(a)	2 B 2 Nitric Acid Production																		
2 B 3	(a)	2 B 3 Adipic Acid Production																		
2 B 4	(a)	2 B 4 Carbide Production																		
2 B 5	(a)	2 B 5 Other (Please specify in a covering note)																		
2 C	(a)	2 C METAL PRODUCTION																		
2 D	(a)	2 D OTHER PRODUCTION (b) A	A																	
2 D 1	(a)	2 D 1 Pulp and Paper																		
2 D 2	(a)	2 D 2 Food and Drink																		
2 G	(a)	2 G OTHER (Please specify in a covering note)																		

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.



NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting								
				Main Pollutants					Particulate matter			Priority metals			Other metals						
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn	
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	
3 A	(a)	3 A PAINT APPLICATION																			
					24,97																
3 B	(a)	3 B DEGREASING AND DRY CLEANING																			
3 C	(a)	3 C CHEMICAL PRODUCTS, MANUFACTURE AND PROCESSING				2,53															
3 D	(a)	3 D OTHER including products containing HMs and POPs (Please specify in a covering note)				13,93															
4 B	(a)	4 B MANURE MANAGEMENT (c)	A																		
4 B 1	(a)	4 B 1 Cattle																			
4 B 1 a	(a)	4 B 1 a Dairy																			
4 B 1 b	(a)	4 B 1 b Non-Dairy																			
4 B 2	(a)	4 B 2 Buffalo																			
4 B 3	(a)	4 B 3 Sheep																			
4 B 4	(a)	4 B 4 Goats																			
4 B 5	(a)	4 B 5 Camels and Llamas																			
4 B 6	(a)	4 B 6 Horses																			
4 B 7	(a)	4 B 7 Mules and Asses																			
4 B 8	(a)	4 B 8 Swine																			
4 B 9	(a)	4 B 9 Poultry																			
4 B 13	(a)	4 B 13 Other																			
4 C	(a)	4 C RICE CULTIVATION																			

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP		A = Allowable Aggregation	Yearly minimum reporting										Additional reporting							
			Main Pollutants					Particulate matter			Priority metals		Other metals							
			NOx	CO	NM VOC	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn	
Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg			
4 D	(a)	4 D AGRICULTURAL SOILS	A																	
4 D 1	(a)	4 D 1 Direct Soil Emission				1,05		35,86												
4 F	(a)	4 F FIELD BURNING OF AGRICULTURAL WASTES																		
4 G	(a)	4 G OTHER (d)																		
5 B	(a)	5 B FOREST AND GRASSLAND CONVERSION																		
6 A	(a)	6 A SOLID WASTE DISPOSAL ON LAND																		
6 B	(a)	6 B WASTE-WATER HANDLING																		
6 C	(a)	6 C WASTE INCINERATION (e)																		
6 D	(a)	6 D OTHER WASTE (f)																		
	7 (a)	7 OTHER																		
<b>National Total</b>				275,1521041	745,2933704	161,9889645	185,9820264	127,2122564				87,51841579	1,21120763	3,09	1,75	5,236038162	10,2552975	31,42845341	1,27120763	23,62076305

Memo Items																		
1 A 3 a i (i)	(a)	International Aviation (LTO)		0,76	0,58	0,11	0,01	0			0,45	0		0	0,09	0	0	0,05
1 A 3 a i (ii)	(a)	International Aviation (Cruise)		6,11	0,79	0,18	0,05				0			0,02	0,82	0,03	0	0,48
1 A 3 d i	(a)	International Navigation		79,29	6,74	2,12	37,63	0		0,14	0,02	0,03	0,28	0,12	0,28	15,51	0,29	0,66
5 E	(a)	5 E Other																
X		X (11 08 Volcanoes)																

(a) Sectors already reported to UNFCCC for NOx, CO, NMVOC, SO<sub>2</sub>.

(b) Including Product handling.

(c) Including NH<sub>3</sub> from Enteric Fermentation.

(d) Including PM sources.

(e) Excludes waste incineration for energy (this is included in 1 A 1).

(f) Includes accidental fires.

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

**TABLE IV 1A: National sector emissions: Main pollutants, particulate matter and heavy metals**

Version 2002-1

COUNTRY: DK (as ISO2 code)  
 DATE: 14.02.2003 (as DD.MM.YYYY)  
 YEAR: 1993 (as YYYY, year of Emmissions)

These five yellow lines will not be read by UNECE! These lines can be modified freely for your own reference purposes.

Footnotes to the emission figures reported should be submitted together with the emission data, but in a separate document.

Please fill out the blue marked fields. You may use the aggregation levels instead of the gray marked fields in aggregation.

You must use for each field either a number or one of the following codes (capitals, no dots in between, see EB.AIR/GE.1/2002/2): NO, NA, NE, IE, C

Footnotes or any other information entered into this table will not be taken into account.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting											Additional reporting						
				Main Pollutants					Particulate matter			Priority metals			Other metals						
				NOx Gg NO <sub>2</sub>	CO Gg	NMVOG Gg	SOx Gg SO <sub>2</sub>	NH3 Gg	TSP Mg	PM10 Mg	PM2.5 Mg	Pb Mg	Cd Mg	Hg Mg	As Mg	Cr Mg	Cu Mg	Ni Mg	Se Mg	Zn Mg	
I A 1 a	(a)	I A 1 a Public Electricity and Heat Production		93,24	8,66	1,64	105,22						11,13	0,62	2,55	1,17	3,34	2,68	10,43	0,27	15,56
I A 1 b	(a)	I A 1 b Petroleum refining		2,03	0,33	0,07	7,53						0,08	0,05	0,02	0,05	0,12	0,05	2,24	0,04	0,01
I A 1 c	(a)	I A 1 c Manufacture of Solid Fuels and Other Energy Industries		2,59	0,3	0,02	0						0	0	0	0	0	0	0	0	0
I A 2	(a)	I A 2 Manufacturing Industries and Construction	A	21,58	14,18	4,14	20,87	0					1,43	0,29	0,16	0,31	0,94	0,73	10,91	0,48	1,45
I A 2 a	(a)	I A 2 a Iron and Steel																			
I A 2 b	(a)	I A 2 b Non-ferrous Metals																			
I A 2 c	(a)	I A 2 c Chemicals																			
I A 2 d	(a)	I A 2 d Pulp, Paper and Print																			
I A 2 e	(a)	I A 2 e Food Processing, Beverages and Tobacco																			
I A 2 f	(a)	I A 2 f Other (Please specify in a covering note)																			
I A 3 a ii (i)		I A 3 a ii Civil Aviation (Domestic, LTO)		0,34	0,79	0,14	0	0					1,33	0			0	0,03	0	0	0,02
I A 3 a ii (ii)		I A 3 a ii Civil Aviation (Domestic, Cruise)		0,56	0,15	0,02	0							0			0	0,07	0	0	0,04
I A 3 b	(a)	I A 3 b Road Transportation	A																		

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg			
I A 3 b i		I A 3 b i R.T., Passenger cars		57,40	438,75	43,79	0,31	0,64				24,48	0,02			0,09	3,08	0,13	0,02	1,81
I A 3 b ii		I A 3 b ii R.T., Light duty vehicles		10,73	24,11	2,52	0,48	0,01				4,59	0,01			0,03	0,93	0,04	0,01	0,55
I A 3 b iii		I A 3 b iii R.T., Heavy duty vehicles		31,67	8,54	3,56	0,78	0,01				0,08	0,01			0,04	1,33	0,05	0,01	0,78
I A 3 b iv		I A 3 b iv R.T., Mopeds & Motorcycles		0,07	10,54	2,94	0,00	0,00				0,99	0,00			0,00	0,03	0,00	0,00	0,02
I A 3 b v		I A 3 b v R.T., Gasoline evaporation				25,44														
I A 3 b vi		I A 3 b vi R.T., Automobile tyre and brake wear																		
I A 3 b vii		I A 3 b vii R.T., Automobile road abrasion																		
I A 3 c	(a)	I A 3 c Railways		3,09	0,46	0,19	0,1	0				0	0			0,01	0,18	0,01	0	0,1
I A 3 d ii		I A 3 d ii National Navigation		10,76	9,84	5,37	3,63	0				0,2	0	0,01	0,04	0,02	0,07	1,95	0,05	0,13
I A 3 e	(a)	I A 3 e Other (Please specify in a covering note)	A																	
I A 3 e i		I A 3 e i Pipeline compressors																		
I A 3 e ii		I A 3 e ii Other mobile sources and machinery																		
I A 4 a	(a)	I A 4 a Commercial / Institutional		1,26	0,82	0,2	1,31					0,55	0,03	0,13	0,03	0,16	0,11	0,48	0,05	0,81
I A 4 b	(a)	I A 4 b Residential	A																	
I A 4 b i		I A 4 b i Residential plants		5,09	129,45	8,83	6,68					0,18	0,08	0,16	0,07	0,06	0,14	0,13	0,24	1,94
I A 4 b ii		I A 4 b ii Household and gardening (mobile)		0,21	41,77	3,65	0	0				0,38	0			0	0,04	0	0	0,02

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
<b>1 A 4 c</b>	(a)	<b>1 A 4 c Agriculture / Forestry / Fishing</b>	A																	
1 A 4 c i		1 A 4 c i Stationary																		
1 A 4 c ii		1 A 4 c ii Off-road Vehicles and Other Machinery		1,25	2,13	1,98	2,83				0,07	0,03	0,03	0,03	0,06	0,03	1,1	0,02	0,07	
1 A 4 c iii		1 A 4 c iii National Fishing		18,29	18,34	4,06	1,34	0			0,19	0		0,02	0,59	0,02	0	0,35		
1 A 5 a	(a)	1 A 5 a Other, Stationary (including Military)		12,02	1,69	0,57	1	0			0,02	0	0,01	0,01	0,01	0,01	0,12	0,04	0,11	
1 A 5 b	(a)	1 A 5 b Other, Mobile (Including military)		1,3	0,83	0,15	0,03	0			0,12	0		0	0,13	0,01	0	0,08		
<b>1 B 1</b>	(a)	<b>1 B 1 Fugitive Emissions from Solid Fuels</b>	A																	
1 B 1 a	(a)	1 B 1 a Coal Mining and Handling																		
1 B 1 b	(a)	1 B 1 b Solid fuel transformation			35,48															
1 B 1 c	(a)	1 B 1 c Other (Please specify in a covering note)																		
<b>1 B 2</b>	(a)	<b>1 B 2 Oil and natural gas</b>	A																	
1 B 2 a	(a)	1 B 2 a Oil	A																	
1 B 2 a i	(a)	1 B 2 a i Exploration Production, Transport																		
1 B 2 a iv	(a)	1 B 2 a iv Refining / Storage																		
1 B 2 a v	(a)	1 B 2 a v Distribution of oil products				4,22														
1 B 2 a vi	(a)	1 B 2 a vi Other				3,07														
1 B 2 b	(a)	1 B 2 b Natural gas																		
1 B 2 c	(a)	1 B 2 c Venting and flaring				0,07														
				2,41	1,56	0,68	0													

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting										Additional reporting						
				Main Pollutants					Particulate matter			Priority metals		Other metals						
				NOx	CO	NM VOC	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
2 A	(a)	2 A MINERAL PRODUCTS (b) A	A																	
2 A 1	(a)	2 A 1 Cement Production																		
2 A 2	(a)	2 A 2 Lime Production																		
2 A 3	(a)	2 A 3 Limestone and Dolomite Use																		
2 A 4	(a)	2 A 4 Soda Ash Production and use																		
2 A 5	(a)	2 A 5 Asphalt Roofing																		
2 A 6	(a)	2 A 6 Road Paving with Asphalt																		
2 A 7	(a)	2 A 7 Other including Non Fuel Mining & Construction (Please specify in a covering note)																		
2 B	(a)	2 B CHEMICAL INDUSTRY A	A																	
2 B 1	(a)	2 B 1 Ammonia Production																		
2 B 2	(a)	2 B 2 Nitric Acid Production																		
2 B 3	(a)	2 B 3 Adipic Acid Production																		
2 B 4	(a)	2 B 4 Carbide Production																		
2 B 5	(a)	2 B 5 Other (Please specify in a covering note)																		
2 C	(a)	2 C METAL PRODUCTION																		
2 D	(a)	2 D OTHER PRODUCTION (b) A	A																	
2 D 1	(a)	2 D 1 Pulp and Paper																		
2 D 2	(a)	2 D 2 Food and Drink																		
2 G	(a)	2 G OTHER (Please specify in a covering note)																		

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting										Additional reporting						
				Main Pollutants					Particulate matter			Priority metals		Other metals						
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
3 A	(a)	3 A PAINT APPLICATION				24,75														
3 B	(a)	3 B DEGREASING AND DRY CLEANING																		
3 C	(a)	3 C CHEMICAL PRODUCTS, MANUFACTURE AND PROCESSING				2,48														
3 D	(a)	3 D OTHER including products containing HMs and POPs (Please specify in a covering note)				15,51														
4 B	(a)	4 B MANURE MANAGEMENT (c)	A																	
4 B 1	(a)	4 B 1 Cattle																		
4 B 1 a	(a)	4 B 1 a Dairy																		
4 B 1 b	(a)	4 B 1 b Non-Dairy																		
4 B 2	(a)	4 B 2 Buffalo																		
4 B 3	(a)	4 B 3 Sheep																		
4 B 4	(a)	4 B 4 Goats																		
4 B 5	(a)	4 B 5 Camels and Llamas																		
4 B 6	(a)	4 B 6 Horses																		
4 B 7	(a)	4 B 7 Mules and Asses																		
4 B 8	(a)	4 B 8 Swine																		
4 B 9	(a)	4 B 9 Poultry																		
4 B 13	(a)	4 B 13 Other																		
4 C	(a)	4 C RICE CULTIVATION																		

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP		A = Allowable Aggregation	Yearly minimum reporting										Additional reporting							
			Main Pollutants					Particulate matter			Priority metals		Other metals							
			NOx	CO	NM VOC	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn	
Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg			
4 D	(a)	4 D AGRICULTURAL SOILS	A																	
4 D 1	(a)	4 D 1 Direct Soil Emission				1,02		34,2												
4 F	(a)	4 F FIELD BURNING OF AGRICULTURAL WASTES																		
4 G	(a)	4 G OTHER (d)																		
5 B	(a)	5 B FOREST AND GRASSLAND CONVERSION																		
6 A	(a)	6 A SOLID WASTE DISPOSAL ON LAND																		
6 B	(a)	6 B WASTE-WATER HANDLING																		
6 C	(a)	6 C WASTE INCINERATION (e)																		
6 D	(a)	6 D OTHER WASTE (f)																		
7	(a)	7 OTHER																		
<b>National Total</b>				275,8817878	748,7195084	161,0800584	152,1105633	123,7063142				45,81768016	1,131599554	3,07	1,71	4,897997773	10,23192445	27,62119688	1,221599554	23,84995543

Memo Items																			
1 A 3 a i (i)	(a)	International Aviation (LTO)		0,78	0,59	0,11	0,01	0			0,46	0		0	0,09	0	0	0	0,05
1 A 3 a i (ii)	(a)	International Aviation (Cruise)		5,95	0,78	0,18	0,05				0			0,02	0,8	0,03	0	0	0,47
1 A 3 d i	(a)	International Navigation		117,98	10,04	3,16	65,64	0			0,23	0,03	0,04	0,48	0,2	0,48	27,28	0,45	1,04
5 E	(a)	5 E Other																	
X		X (11 08 Volcanoes)																	

(a) Sectors already reported to UNFCCC for NOx, CO, NMVOC, SO<sub>2</sub>.

(b) Including Product handling.

(c) Including NH<sub>3</sub> from Enteric Fermentation.

(d) Including PM sources.

(e) Excludes waste incineration for energy (this is included in 1 A 1).

(f) Includes accidental fires.

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.



**TABLE IV 1A: National sector emissions: Main pollutants, particulate matter and heavy metals**

Version 2002-1

COUNTRY: DK (as ISO2 code)  
 DATE: 14.02.2003 (as DD.MM.YYYY)  
 YEAR: 1994 (as YYYY, year of Emmissions)

These five yellow lines will not be read by UNECE! These lines can be modified freely for your own reference purposes.

Footnotes to the emission figures reported should be submitted together with the emission data, but in a separate document.

Please fill out the blue marked fields. You may use the aggregation levels instead of the gray marked fields in aggregation.

You must use for each field either a number or one of the following codes (capitals, no dots in between, see EB.AIR/GE.1/2002/2): NO, NA, NE, IE, C

Footnotes or any other information entered into this table will not be taken into account.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting											Additional reporting						
				Main Pollutants					Particulate matter			Priority metals			Other metals						
				NOx Gg NO <sub>2</sub>	CO Gg	NMVOG Gg	SOx Gg SO <sub>2</sub>	NH3 Gg	TSP Mg	PM10 Mg	PM2.5 Mg	Pb Mg	Cd Mg	Hg Mg	As Mg	Cr Mg	Cu Mg	Ni Mg	Se Mg	Zn Mg	
I A 1 a	(a)	I A 1 a Public Electricity and Heat Production		99,41	9,32	2,67	106,81	0					10,31	0,77	2,52	1,43	3,51	2,74	19,23	0,46	15,37
I A 1 b	(a)	I A 1 b Petroleum refining		1,89	0,35	0,04	2,68						0,1	0,08	0,08	0,04	0,2	0,08	2,74	0	0,08
I A 1 c	(a)	I A 1 c Manufacture of Solid Fuels and Other Energy Industries		2,94	0,34	0,02	0						0	0	0	0	0	0	0	0	0
I A 2	(a)	I A 2 Manufacturing Industries and Construction	A	22,65	14,42	4,19	22,5	0					1,47	0,34	0,18	0,36	1,06	0,78	12,8	0,52	1,62
I A 2 a	(a)	I A 2 a Iron and Steel																			
I A 2 b	(a)	I A 2 b Non-ferrous Metals																			
I A 2 c	(a)	I A 2 c Chemicals																			
I A 2 d	(a)	I A 2 d Pulp, Paper and Print																			
I A 2 e	(a)	I A 2 e Food Processing, Beverages and Tobacco																			
I A 2 f	(a)	I A 2 f Other (Please specify in a covering note)																			
I A 3 a ii (i)		I A 3 a ii Civil Aviation (Domestic, LTO)		0,35	0,95	0,17	0	0					1,64	0		0	0,03	0	0	0	0,02
I A 3 a ii (ii)		I A 3 a ii Civil Aviation (Domestic, Cruise)		0,58	0,15	0,02	0						0		0	0,07	0	0	0	0	0,04
I A 3 b	(a)	I A 3 b Road Transportation	A																		

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg			
I A 3 b i		I A 3 b i R.T., Passenger cars		55,07	410,80	40,91	0,32	0,94				5,21	0,02			0,09	3,20	0,13	0,02	1,88
I A 3 b ii		I A 3 b ii R.T., Light duty vehicles		11,21	24,46	2,55	0,52	0,01				0,22	0,01			0,03	0,99	0,04	0,01	0,58
I A 3 b iii		I A 3 b iii R.T., Heavy duty vehicles		32,55	8,71	3,65	0,84	0,01				0,00	0,01			0,04	1,42	0,06	0,01	0,84
I A 3 b iv		I A 3 b iv R.T., Mopeds & Motorcycles		0,07	10,79	2,89	0,00	0,00				0,05	0,00			0,00	0,03	0,00	0,00	0,02
I A 3 b v		I A 3 b v R.T., Gasoline evaporation				24,20														
I A 3 b vi		I A 3 b vi R.T., Automobile tyre and brake wear																		
I A 3 b vii		I A 3 b vii R.T., Automobile road abrasion																		
I A 3 c	(a)	I A 3 c Railways		2,8	0,42	0,18	0,1	0					0			0	0,16	0,01	0	0,1
I A 3 d ii		I A 3 d ii National Navigation		10,13	9,66	5,28	3,24	0				0,05	0	0,01	0,03	0,02	0,06	1,59	0,04	0,12
I A 3 e	(a)	I A 3 e Other (Please specify in a covering note)	A																	
I A 3 e i		I A 3 e i Pipeline compressors																		
I A 3 e ii		I A 3 e ii Other mobile sources and machinery																		
I A 4 a	(a)	I A 4 a Commercial / Institutional		1,24	0,84	0,33	1,87					0,51	0,04	0,12	0,03	0,16	0,11	0,69	0,04	0,8
I A 4 b	(a)	I A 4 b Residential	A																	
I A 4 b i		I A 4 b i Residential plants		4,87	123,81	8,61	5,91					0,16	0,08	0,15	0,06	0,05	0,12	0,1	0,21	1,83
I A 4 b ii		I A 4 b ii Household and gardening (mobile)		0,21	41,28	3,61	0	0				0,07	0			0	0,04	0	0	0,02

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
1 A 4 c	(a)	1 A 4 c Agriculture / Forestry / Fishing	A																	
1 A 4 c i		1 A 4 c i Stationary																		
1 A 4 c ii		1 A 4 c ii Off-road Vehicles and Other Machinery		1,24	1,87	1,89	4,26				0,07	0,03	0,03	0,04	0,07	0,04	1,26	0,03	0,07	
1 A 4 c iii		1 A 4 c iii National Fishing																		
1 A 5 a	(a)	1 A 5 a Other, Stationary (including Military)		18,08	18,13	4,01	1,32	0			0,03	0		0,02	0,58	0,02	0	0,34		
1 A 5 b	(a)	1 A 5 b Other, Mobile (Including military)		11,78	1,67	0,57	0,83	0			0,02	0	0,01	0,01	0,01	0,01	0,02	0,04	0,1	
1 B 1	(a)	1 B 1 Fugitive Emissions from Solid Fuels	A																	
1 B 1 a	(a)	1 B 1 a Coal Mining and Handling																		
1 B 1 b	(a)	1 B 1 b Solid fuel transformation			39,91															
1 B 1 c	(a)	1 B 1 c Other (Please specify in a covering note)																		
1 B 2	(a)	1 B 2 Oil and natural gas	A																	
1 B 2 a	(a)	1 B 2 a Oil	A																	
1 B 2 a i	(a)	1 B 2 a i Exploration Production, Transport																		
1 B 2 a iv	(a)	1 B 2 a iv Refining / Storage																		
1 B 2 a v	(a)	1 B 2 a v Distribution of oil products				5,86	4,27	0												
1 B 2 a vi	(a)	1 B 2 a vi Other		0	0	3	0	0												
1 B 2 b	(a)	1 B 2 b Natural gas																		
1 B 2 c	(a)	1 B 2 c Venting and flaring		0		0,41	0													
				2,61	1,55	0,67	0,52													

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting										Additional reporting						
				Main Pollutants					Particulate matter			Priority metals		Other metals						
				NOx	CO	NMVOc	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
2 A	(a)	2 A MINERAL PRODUCTS (b) A																		
2 A 1	(a)	2 A 1 Cement Production																		
2 A 2	(a)	2 A 2 Lime Production																		
2 A 3	(a)	2 A 3 Limestone and Dolomite Use																		
2 A 4	(a)	2 A 4 Soda Ash Production and use																		
2 A 5	(a)	2 A 5 Asphalt Roofing																		
2 A 6	(a)	2 A 6 Road Paving with Asphalt																		
2 A 7	(a)	2 A 7 Other including Non Fuel Mining & Construction (Please specify in a covering note)																		
2 B	(a)	2 B CHEMICAL INDUSTRY A																		
2 B 1	(a)	2 B 1 Ammonia Production																		
2 B 2	(a)	2 B 2 Nitric Acid Production																		
2 B 3	(a)	2 B 3 Adipic Acid Production																		
2 B 4	(a)	2 B 4 Carbide Production																		
2 B 5	(a)	2 B 5 Other (Please specify in a covering note)																		
2 C	(a)	2 C METAL PRODUCTION																		
2 D	(a)	2 D OTHER PRODUCTION (b) A																		
2 D 1	(a)	2 D 1 Pulp and Paper																		
2 D 2	(a)	2 D 2 Food and Drink																		
2 G	(a)	2 G OTHER (Please specify in a covering note)																		

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting								
				Main Pollutants					Particulate matter			Priority metals			Other metals						
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn	
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	
3 A	(a)	3 A PAINT APPLICATION																			
					24,54																
3 B	(a)	3 B DEGREASING AND DRY CLEANING																			
3 C	(a)	3 C CHEMICAL PRODUCTS, MANUFACTURE AND PROCESSING				2,43															
3 D	(a)	3 D OTHER including products containing HMs and POPs (Please specify in a covering note)																			
4 B	(a)	4 B MANURE MANAGEMENT (c)	A																		
4 B 1	(a)	4 B 1 Cattle																			
4 B 1 a	(a)	4 B 1 a Dairy																			
4 B 1 b	(a)	4 B 1 b Non-Dairy																			
4 B 2	(a)	4 B 2 Buffalo																			
4 B 3	(a)	4 B 3 Sheep																			
4 B 4	(a)	4 B 4 Goats																			
4 B 5	(a)	4 B 5 Camels and Llamas																			
4 B 6	(a)	4 B 6 Horses																			
4 B 7	(a)	4 B 7 Mules and Asses																			
4 B 8	(a)	4 B 8 Swine																			
4 B 9	(a)	4 B 9 Poultry																			
4 B 13	(a)	4 B 13 Other																			
4 C	(a)	4 C RICE CULTIVATION																			

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP		A = Allowable Aggregation	Yearly minimum reporting										Additional reporting							
			Main Pollutants					Particulate matter			Priority metals		Other metals							
			NOx	CO	NM VOC	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn	
Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg			
4 D	(a)	4 D AGRICULTURAL SOILS	A																	
4 D 1	(a)	4 D 1 Direct Soil Emission				1,14		34,64												
4 F	(a)	4 F FIELD BURNING OF AGRICULTURAL WASTES																		
4 G	(a)	4 G OTHER (d)																		
5 B	(a)	5 B FOREST AND GRASSLAND CONVERSION																		
6 A	(a)	6 A SOLID WASTE DISPOSAL ON LAND																		
6 B	(a)	6 B WASTE-WATER HANDLING																		
6 C	(a)	6 C WASTE INCINERATION (e)																		
6 D	(a)	6 D OTHER WASTE (f)																		
	7 (a)	7 OTHER																		
<b>National Total</b>				281,5442423	720,2297118	158,1631568	156,0114229	119,6992655				19,91608993	1,373172497	3,1	2	5,265862492	10,59932473	38,70220748	1,373172497	23,90724969

Memo Items																				
1 A 3 a i (i)	(a)	International Aviation (LTO)		0,78	0,45	0,08	0,01	0				0,15	0		0	0,09	0	0	0,06	
1 A 3 a i (ii)	(a)	International Aviation (Cruise)		6,56	0,86	0,2	0,05					0,01			0,03	0,89	0,04	0,01	0,52	
1 A 3 d i	(a)	International Navigation		132,61	11,28	3,55	69,63					0,25	0,03	0,05	0,51	0,21	0,51	28,82	0,5	1,15
5 E	(a)	5 E Other																		
X		X (11 08 Volcanoes)																		

(a) Sectors already reported to UNFCCC for NOx, CO, NMVOC, SO<sub>2</sub>.

(b) Including Product handling.

(c) Including NH<sub>3</sub> from Enteric Fermentation.

(d) Including PM sources.

(e) Excludes waste incineration for energy (this is included in 1 A 1).

(f) Includes accidental fires.

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

**TABLE IV 1A: National sector emissions: Main pollutants, particulate matter and heavy metals**

Version 2002-1

COUNTRY: DK (as ISO2 code)  
 DATE: 14.02.2003 (as DD.MM.YYYY)  
 YEAR: 1995 (as YYYY, year of Emmissions)

These five yellow lines will not be read by UNECE! These lines can be modified freely for your own reference purposes.

Footnotes to the emission figures reported should be submitted together with the emission data, but in a separate document.

Please fill out the blue marked fields. You may use the aggregation levels instead of the gray marked fields in aggregation.

You must use for each field either a number or one of the following codes (capitals, no dots in between, see EB.AIR/GE.1/2002/2): NO, NA, NE, IE, C

Footnotes or any other information entered into this table will not be taken into account.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting											Additional reporting					
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx Gg NO <sub>2</sub>	CO Gg	NMVOG Gg	SOx Gg SO <sub>2</sub>	NH3 Gg	TSP Mg	PM10 Mg	PM2.5 Mg	Pb Mg	Cd Mg	Hg Mg	As Mg	Cr Mg	Cu Mg	Ni Mg	Se Mg	Zn Mg
I A 1 a	(a)	I A 1 a Public Electricity and Heat Production		84,62	10,32	4,03	105,17	0				7,12	0,4	2,01	0,87	2,3	1,94	7,92	1,22	16,53
I A 1 b	(a)	I A 1 b Petroleum refining		1,95	0,38	0,04	1,25	0				0,07	0,05	0,05	0,03	0,14	0,05	1,91	0	0,06
I A 1 c	(a)	I A 1 c Manufacture of Solid Fuels and Other Energy Industries		3,04	0,36	0,03	0					0	0	0	0	0	0	0	0	0
I A 2	(a)	I A 2 Manufacturing Industries and Construction	A	23,2	14,31	4,21	22,72	0				1,36	0,32	0,18	0,35	1,01	0,76	12,2	0,49	1,56
I A 2 a	(a)	I A 2 a Iron and Steel																		
I A 2 b	(a)	I A 2 b Non-ferrous Metals																		
I A 2 c	(a)	I A 2 c Chemicals																		
I A 2 d	(a)	I A 2 d Pulp, Paper and Print																		
I A 2 e	(a)	I A 2 e Food Processing, Beverages and Tobacco																		
I A 2 f	(a)	I A 2 f Other (Please specify in a covering note)																		
I A 3 a ii (i)		I A 3 a ii Civil Aviation (Domestic, LTO)		0,37	1,04	0,19	0	0				1,79	0		0	0,04	0	0	0	0,02
I A 3 a ii (ii)		I A 3 a ii Civil Aviation (Domestic, Cruise)		0,58	0,15	0,02	0						0		0	0,07	0	0	0	0,04
I A 3 b	(a)	I A 3 b Road Transportation	A																	

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg			
I A 3 b i		I A 3 b i R.T., Passenger cars		52,95	396,23	38,63	0,33	1,18				5,27	0,02			0,10	3,25	0,13	0,02	1,91
I A 3 b ii		I A 3 b ii R.T., Light duty vehicles		10,79	23,17	2,45	0,50	0,02				0,23	0,01			0,03	0,97	0,04	0,01	0,57
I A 3 b iii		I A 3 b iii R.T., Heavy duty vehicles		31,92	8,48	3,64	0,85	0,01				0,00	0,01			0,04	1,45	0,06	0,01	0,85
I A 3 b iv		I A 3 b iv R.T., Mopeds & Motorcycles		0,07	10,96	2,96	0,00	0,00				0,05	0,00			0,00	0,03	0,00	0,00	0,02
I A 3 b v		I A 3 b v R.T., Gasoline evaporation				21,80														
I A 3 b vi		I A 3 b vi R.T., Automobile tyre and brake wear																		
I A 3 b vii		I A 3 b vii R.T., Automobile road abrasion																		
I A 3 c	(a)	I A 3 c Railways		2,84	0,48	0,19	0,1	0				0	0			0	0,16	0,01	0	0,1
I A 3 d ii		I A 3 d ii National Navigation		10,68	9,73	5,3	2,74	0				0,05	0	0,01	0,03	0,01	0,06	1,16	0,04	0,12
I A 3 e	(a)	I A 3 e Other (Please specify in a covering note)	A																	
I A 3 e i		I A 3 e i Pipeline compressors																		
I A 3 e ii		I A 3 e ii Other mobile sources and machinery																		
I A 4 a	(a)	I A 4 a Commercial / Institutional		1,27	0,83	0,38	1,2					0,44	0,03	0,12	0,03	0,13	0,1	0,63	0,04	0,77
I A 4 b	(a)	I A 4 b Residential	A																	
I A 4 b i		I A 4 b i Residential plants		4,88	117,95	8,49	5,37					0,15	0,08	0,14	0,07	0,05	0,12	0,07	0,2	1,84
I A 4 b ii		I A 4 b ii Household and gardening (mobile)		0,21	41,26	3,61	0	0				0,07	0			0	0,04	0	0	0,02

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.



NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
1 A 4 c	(a)	1 A 4 c Agriculture / Forestry / Fishing	A																	
1 A 4 c i		1 A 4 c i Stationary																		
1 A 4 c ii		1 A 4 c ii Off-road Vehicles and Other Machinery		1,4	1,68	1,87	2,86				0,08	0,04	0,03	0,05	0,09	0,04	1,69	0,03	0,06	
1 A 4 c iii		1 A 4 c iii National Fishing		18,07	18,12	4,01	1,32	0			0,03	0			0,02	0,58	0,02	0	0,34	
1 A 5 a	(a)	1 A 5 a Other, Stationary (including Military)		11,1	1,6	0,55	0,8	0			0,02	0	0,01	0,01	0,01	0,01	0,03	0,04	0,1	
1 A 5 b	(a)	1 A 5 b Other, Mobile (Including military)		1,72	0,85	0,19	0,05	0			0,1	0			0	0,14	0,01	0	0,08	
1 B 1	(a)	1 B 1 Fugitive Emissions from Solid Fuels	A																	
1 B 1 a	(a)	1 B 1 a Coal Mining and Handling																		
1 B 1 b	(a)	1 B 1 b Solid fuel transformation			44,1															
1 B 1 c	(a)	1 B 1 c Other (Please specify in a covering note)																		
1 B 2	(a)	1 B 2 Oil and natural gas	A																	
1 B 2 a	(a)	1 B 2 a Oil	A																	
1 B 2 a i	(a)	1 B 2 a i Exploration Production, Transport																		
1 B 2 a iv	(a)	1 B 2 a iv Refining / Storage																		
1 B 2 a v	(a)	1 B 2 a v Distribution of oil products				4,55	3,02													
1 B 2 a vi	(a)	1 B 2 a vi Other		0	0	3,21	0	0												
1 B 2 b	(a)	1 B 2 b Natural gas																		
1 B 2 c	(a)	1 B 2 c Venting and flaring		0		0,53	0													
				1,88	1,21	0,52	0,2													

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting										Additional reporting						
				Main Pollutants					Particulate matter			Priority metals		Other metals						
				NOx	CO	NMVOc	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
2 A	(a)	2 A MINERAL PRODUCTS (b) A	A																	
2 A 1	(a)	2 A 1 Cement Production																		
2 A 2	(a)	2 A 2 Lime Production																		
2 A 3	(a)	2 A 3 Limestone and Dolomite Use																		
2 A 4	(a)	2 A 4 Soda Ash Production and use																		
2 A 5	(a)	2 A 5 Asphalt Roofing																		
2 A 6	(a)	2 A 6 Road Paving with Asphalt																		
2 A 7	(a)	2 A 7 Other including Non Fuel Mining & Construction (Please specify in a covering note)																		
2 B	(a)	2 B CHEMICAL INDUSTRY A	A																	
2 B 1	(a)	2 B 1 Ammonia Production																		
2 B 2	(a)	2 B 2 Nitric Acid Production																		
2 B 3	(a)	2 B 3 Adipic Acid Production																		
2 B 4	(a)	2 B 4 Carbide Production																		
2 B 5	(a)	2 B 5 Other (Please specify in a covering note)																		
2 C	(a)	2 C METAL PRODUCTION																		
2 D	(a)	2 D OTHER PRODUCTION (b) A	A																	
2 D 1	(a)	2 D 1 Pulp and Paper																		
2 D 2	(a)	2 D 2 Food and Drink																		
2 G	(a)	2 G OTHER (Please specify in a covering note)																		

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
3 A	(a)	3 A PAINT APPLICATION				24,31														
3 B	(a)	3 B DEGREASING AND DRY CLEANING																		
3 C	(a)	3 C CHEMICAL PRODUCTS, MANUFACTURE AND PROCESSING				2,38														
3 D	(a)	3 D OTHER including products containing HMs and POPs (Please specify in a covering note)				13,44														
4 B	(a)	4 B MANURE MANAGEMENT (c)	A																	
4 B 1	(a)	4 B 1 Cattle																		
4 B 1 a	(a)	4 B 1 a Dairy							19,05											
4 B 1 b	(a)	4 B 1 b Non-Dairy							8,55											
4 B 2	(a)	4 B 2 Buffalo																		
4 B 3	(a)	4 B 3 Sheep																		
4 B 4	(a)	4 B 4 Goats							0,15											
4 B 5	(a)	4 B 5 Camels and Llamas							0,02											
4 B 6	(a)	4 B 6 Horses																		
4 B 7	(a)	4 B 7 Mules and Asses							0,99											
4 B 8	(a)	4 B 8 Swine																		
4 B 9	(a)	4 B 9 Poultry							40,98											
4 B 13	(a)	4 B 13 Other							5,05											
4 C	(a)	4 C RICE CULTIVATION							4,14											

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP		A = Allowable Aggregation	Yearly minimum reporting									Additional reporting								
			Main Pollutants					Particulate matter			Priority metals			Other metals						
			NOx	CO	NM VOC	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn	
Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg			
4 D	(a)	4 D AGRICULTURAL SOILS	A																	
4 D 1	(a)	4 D 1 Direct Soil Emission				1,33		33,03												
4 F	(a)	4 F FIELD BURNING OF AGRICULTURAL WASTES																		
4 G	(a)	4 G OTHER (d)																		
5 B	(a)	5 B FOREST AND GRASSLAND CONVERSION																		
6 A	(a)	6 A SOLID WASTE DISPOSAL ON LAND																		
6 B	(a)	6 B WASTE-WATER HANDLING																		
6 C	(a)	6 C WASTE INCINERATION (e)																		
6 D	(a)	6 D OTHER WASTE (f)																		
	7 (a)	7 OTHER																		
<b>National Total</b>				264,1395038	703,2065147	153,4855621	148,4839717	113,1644528				16,82516127	0,9534752	2,55	1,44	3,927376007	9,800784009	25,88432639	2,0934752	24,9875201

Memo Items																			
1 A 3 a i (i)	(a)	International Aviation (LTO)		0,84	0,51	0,12	0,01	0			0,18	0		0	0,1	0	0	0	0,06
1 A 3 a i (ii)	(a)	International Aviation (Cruise)		6,7	0,88	0,2	0,05				0,01			0,03	0,91	0,04	0,01	0,53	
1 A 3 d i	(a)	International Navigation		138,85	11,81	3,72	76,53			0,26	0,04	0,05	0,52	0,22	0,52	29,14	0,51	1,19	
5 E	(a)	5 E Other																	
X		X (11 08 Volcanoes)																	

(a) Sectors already reported to UNFCCC for NOx, CO, NMVOC, SO<sub>2</sub>.

(b) Including Product handling.

(c) Including NH<sub>3</sub> from Enteric Fermentation.

(d) Including PM sources.

(e) Excludes waste incineration for energy (this is included in 1 A 1).

(f) Includes accidental fires.

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

**TABLE IV 1A: National sector emissions: Main pollutants, particulate matter and heavy metals**

Version 2002-1

COUNTRY: DK (as ISO2 code)  
 DATE: 14.02.2003 (as DD.MM.YYYY)  
 YEAR: 1996 (as YYYY, year of Emmissions)

These five yellow lines will not be read by UNECE! These lines can be modified freely for your own reference purposes.

Footnotes to the emission figures reported should be submitted together with the emission data, but in a separate document.

Please fill out the blue marked fields. You may use the aggregation levels instead of the gray marked fields in aggregation.

You must use for each field either a number or one of the following codes (capitals, no dots in between, see EB.AIR/GE.1/2002/2): NO, NA, NE, IE, C

Footnotes or any other information entered into this table will not be taken into account.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting											Additional reporting					
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx Gg NO <sub>2</sub>	CO Gg	NMVOG Gg	SOx Gg SO <sub>2</sub>	NH3 Gg	TSP Mg	PM10 Mg	PM2.5 Mg	Pb Mg	Cd Mg	Hg Mg	As Mg	Cr Mg	Cu Mg	Ni Mg	Se Mg	Zn Mg
I A 1 a	(a)	I A 1 a Public Electricity and Heat Production		122,48	12,35	5,29	143,44					6,2	0,34	2,09	0,59	2,55	1,95	7,44	2,77	16,46
I A 1 b	(a)	I A 1 b Petroleum refining		2,36	0,37	0,03	1,13					0,07	0,05	0,05	0,03	0,13	0,05	1,84	0	0,05
I A 1 c	(a)	I A 1 c Manufacture of Solid Fuels and Other Energy Industries		3,63	0,43	0,03	0,01					0	0	0	0	0	0	0	0	0
I A 2	(a)	I A 2 Manufacturing Industries and Construction	A	27,73	14,76	4,49	14,08	0				1,29	0,3	0,17	0,34	0,98	0,76	11,64	0,44	1,61
I A 2 a	(a)	I A 2 a Iron and Steel																		
I A 2 b	(a)	I A 2 b Non-ferrous Metals																		
I A 2 c	(a)	I A 2 c Chemicals																		
I A 2 d	(a)	I A 2 d Pulp, Paper and Print																		
I A 2 e	(a)	I A 2 e Food Processing, Beverages and Tobacco																		
I A 2 f	(a)	I A 2 f Other (Please specify in a covering note)																		
I A 3 a ii (i)		I A 3 a ii Civil Aviation (Domestic, LTO)		0,37	0,98	0,18	0	0				1,64	0		0	0,04	0	0	0	0,02
I A 3 a ii (ii)		I A 3 a ii Civil Aviation (Domestic, Cruise)		0,6	0,16	0,02	0						0		0	0,07	0	0	0	0,04
I A 3 b	(a)	I A 3 b Road Transportation	A																	

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg			
I A 3 b i		I A 3 b i R.T., Passenger cars		50,99	394,95	37,38	0,34	1,37				5,31	0,02			0,10	3,28	0,13	0,02	1,93
I A 3 b ii		I A 3 b ii R.T., Light duty vehicles		10,85	23,11	2,48	0,52	0,02				0,23	0,01			0,03	1,00	0,04	0,01	0,59
I A 3 b iii		I A 3 b iii R.T., Heavy duty vehicles		31,49	8,35	3,61	0,87	0,01				0,00	0,01			0,04	1,48	0,06	0,01	0,87
I A 3 b iv		I A 3 b iv R.T., Mopeds & Motorcycles		0,07	11,53	3,17	0,00	0,00				0,05	0,00			0,00	0,03	0,00	0,00	0,02
I A 3 b v		I A 3 b v R.T., Gasoline evaporation				19,06														
I A 3 b vi		I A 3 b vi R.T., Automobile tyre and brake wear																		
I A 3 b vii		I A 3 b vii R.T., Automobile road abrasion																		
I A 3 c	(a)	I A 3 c Railways		2,81	0,47	0,18	0,1	0				0	0			0	0,16	0,01	0	0,1
I A 3 d ii		I A 3 d ii National Navigation		11,07	10,09	5,5	2,08	0				0,05	0	0,01	0,02	0,01	0,05	0,86	0,04	0,12
I A 3 e	(a)	I A 3 e Other (Please specify in a covering note)	A																	
I A 3 e i		I A 3 e i Pipeline compressors																		
I A 3 e ii		I A 3 e ii Other mobile sources and machinery																		
I A 4 a	(a)	I A 4 a Commercial / Institutional		1,4	0,95	0,52	1,66					0,31	0,03	0,1	0,02	0,1	0,08	0,56	0,04	0,68
I A 4 b	(a)	I A 4 b Residential	A																	
I A 4 b i		I A 4 b i Residential plants		5,2	118,71	8,79	5,62					0,16	0,08	0,15	0,06	0,05	0,13	0,08	0,21	1,96
I A 4 b ii		I A 4 b ii Household and gardening (mobile)		0,21	42,79	3,74	0	0				0,07	0			0	0,04	0	0	0,02

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg			
1 A 4 c	(a)	1 A 4 c Agriculture / Forestry / Fishing	A																	
1 A 4 c i		1 A 4 c i Stationary																		
1 A 4 c ii		1 A 4 c ii Off-road Vehicles and Other Machinery		1,62	1,76	1,9	4,93					0,09	0,04	0,03	0,05	0,11	0,05	1,98	0,04	0,06
1 A 4 c iii		1 A 4 c iii National Fishing		18,74	18,79	4,16	0,34	0				0,03	0		0,02	0,6	0,02	0	0	0,35
1 A 5 a	(a)	1 A 5 a Other, Stationary (including Military)		12,03	1,57	0,5	1,09					0,02	0	0,01	0,01	0,01	0,01	0,18	0,04	0,11
1 A 5 b	(a)	1 A 5 b Other, Mobile (Including military)		0,94	0,6	0,11	0,02	0				0,1	0		0	0,09	0	0	0	0,06
1 B 1	(a)	1 B 1 Fugitive Emissions from Solid Fuels	A																	
1 B 1 a	(a)	1 B 1 a Coal Mining and Handling																		
1 B 1 b	(a)	1 B 1 b Solid fuel transformation			44,52															
1 B 1 c	(a)	1 B 1 c Other (Please specify in a covering note)																		
1 B 2	(a)	1 B 2 Oil and natural gas	A																	
1 B 2 a	(a)	1 B 2 a Oil	A																	
1 B 2 a i	(a)	1 B 2 a i Exploration Production, Transport																		
1 B 2 a iv	(a)	1 B 2 a iv Refining / Storage																		
1 B 2 a v	(a)	1 B 2 a v Distribution of oil products				5,88	2,61													
1 B 2 a vi	(a)	1 B 2 a vi Other				2,78														
1 B 2 b	(a)	1 B 2 b Natural gas																		
1 B 2 c	(a)	1 B 2 c Venting and flaring		0		0,43	0													
				2,08	1,33	0,58	0,22													

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting										Additional reporting						
				Main Pollutants					Particulate matter			Priority metals		Other metals						
				NOx	CO	NMVOc	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
2 A	(a)	2 A MINERAL PRODUCTS (b) A	A																	
2 A 1	(a)	2 A 1 Cement Production																		
2 A 2	(a)	2 A 2 Lime Production																		
2 A 3	(a)	2 A 3 Limestone and Dolomite Use																		
2 A 4	(a)	2 A 4 Soda Ash Production and use																		
2 A 5	(a)	2 A 5 Asphalt Roofing																		
2 A 6	(a)	2 A 6 Road Paving with Asphalt																		
2 A 7	(a)	2 A 7 Other including Non Fuel Mining & Construction (Please specify in a covering note)																		
2 B	(a)	2 B CHEMICAL INDUSTRY A	A																	
2 B 1	(a)	2 B 1 Ammonia Production																		
2 B 2	(a)	2 B 2 Nitric Acid Production		0.5																
2 B 3	(a)	2 B 3 Adipic Acid Production																		
2 B 4	(a)	2 B 4 Carbide Production																		
2 B 5	(a)	2 B 5 Other (Please specify in a covering note)																		
2 C	(a)	2 C METAL PRODUCTION																		
2 D	(a)	2 D OTHER PRODUCTION (b) A	A																	
2 D 1	(a)	2 D 1 Pulp and Paper																		
2 D 2	(a)	2 D 2 Food and Drink				0.6														
2 G	(a)	2 G OTHER (Please specify in a covering note)																		

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.



NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants				Particulate matter			Priority metals			Other metals						
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
3 A	(a)	3 A PAINT APPLICATION																		
					24,09															
3 B	(a)	3 B DEGREASING AND DRY CLEANING																		
3 C	(a)	3 C CHEMICAL PRODUCTS, MANUFACTURE AND PROCESSING			2,33															
3 D	(a)	3 D OTHER including products containing HMs and POPs (Please specify in a covering note)			13,28															
4 B	(a)	4 B MANURE MANAGEMENT (c)	A																	
4 B 1	(a)	4 B 1 Cattle																		
4 B 1 a	(a)	4 B 1 a Dairy						18,44												
4 B 1 b	(a)	4 B 1 b Non-Dairy						8,45												
4 B 2	(a)	4 B 2 Buffalo																		
4 B 3	(a)	4 B 3 Sheep																		
4 B 4	(a)	4 B 4 Goats						0,16												
4 B 5	(a)	4 B 5 Camels and Llamas						0,02												
4 B 6	(a)	4 B 6 Horses																		
4 B 7	(a)	4 B 7 Mules and Asses						1												
4 B 8	(a)	4 B 8 Swine																		
4 B 9	(a)	4 B 9 Poultry						40,19												
4 B 13	(a)	4 B 13 Other						4,93												
4 C	(a)	4 C RICE CULTIVATION						4,27												

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP		A = Allowable Aggregation	Yearly minimum reporting									Additional reporting								
			Main Pollutants					Particulate matter			Priority metals			Other metals						
			NOx	CO	NM VOC	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn	
Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg			
4 D	(a)	4 D AGRICULTURAL SOILS	A																	
4 D 1	(a)	4 D 1 Direct Soil Emission				1,31		30,37												
4 F	(a)	4 F FIELD BURNING OF AGRICULTURAL WASTES																		
4 G	(a)	4 G OTHER (d)																		
5 B	(a)	5 B FOREST AND GRASSLAND CONVERSION																		
6 A	(a)	6 A SOLID WASTE DISPOSAL ON LAND																		
6 B	(a)	6 B WASTE-WATER HANDLING																		
6 C	(a)	6 C WASTE INCINERATION (e)																		
6 D	(a)	6 D OTHER WASTE (f)																		
7	(a)	7 OTHER																		
<b>National Total</b>				307,1797941	708,5686083	152,4131398	179,0526689	109,238272				15,62809001	0,874020957	2,61	1,12	4,130104791	9,863563359	24,8481467	3,614020957	25,04209576

Memo Items																			
1 A 3 a i (i)	(a)	International Aviation (LTO)		0,89	0,54	0,12	0,01	0			0,13	0		0	0,11	0	0	0,06	
1 A 3 a i (ii)	(a)	International Aviation (Cruise)		7,03	0,93	0,21	0,06				0,01			0,03	0,95	0,04	0,01	0,56	
1 A 3 d i	(a)	International Navigation		131,97	11,23	3,53	71,9			0,14	0,02	0,01	0,33	0,13	0,33	19,98	0,27	0,61	
5 E	(a)	5 E Other																	
X		X (11 08 Volcanoes)																	

(a) Sectors already reported to UNFCCC for NOx, CO, NMVOC, SO<sub>2</sub>.

(b) Including Product handling.

(c) Including NH<sub>3</sub> from Enteric Fermentation.

(d) Including PM sources.

(e) Excludes waste incineration for energy (this is included in 1 A 1).

(f) Includes accidental fires.

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

**TABLE IV 1A: National sector emissions: Main pollutants, particulate matter and heavy metals**

Version 2002-1

COUNTRY: DK (as ISO2 code)  
 DATE: 14.02.2003 (as DD.MM.YYYY)  
 YEAR: 1997 (as YYYY, year of Emmissions)

These five yellow lines will not be read by UNECE! These lines can be modified freely for your own reference purposes.

Footnotes to the emission figures reported should be submitted together with the emission data, but in a separate document.

Please fill out the blue marked fields. You may use the aggregation levels instead of the gray marked fields in aggregation.

You must use for each field either a number or one of the following codes (capitals, no dots in between, see EB.AIR/GE.1/2002/2): NO, NA, NE, IE, C

Footnotes or any other information entered into this table will not be taken into account.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting											Additional reporting					
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx Gg NO <sub>2</sub>	CO Gg	NMVOG Gg	SOx Gg SO <sub>2</sub>	NH3 Gg	TSP Mg	PM10 Mg	PM2.5 Mg	Pb Mg	Cd Mg	Hg Mg	As Mg	Cr Mg	Cu Mg	Ni Mg	Se Mg	Zn Mg
I A 1 a	(a)	I A 1 a Public Electricity and Heat Production		81,03	14,51	5,44	74,72	0				3,81	0,31	1,63	0,42	1,75	1,6	7,82	1,94	11,48
I A 1 b	(a)	I A 1 b Petroleum refining		2,01	0,31	0,01	1,17					0,04	0,02	0,01	0,02	0,05	0,02	1,04	0,02	0,01
I A 1 c	(a)	I A 1 c Manufacture of Solid Fuels and Other Energy Industries		4,75	0,55	0,04	0,01					0	0	0	0	0	0	0	0	0
I A 2	(a)	I A 2 Manufacturing Industries and Construction	A	32,12	17,58	4,69	15,38	0				1,18	0,28	0,16	0,3	0,91	0,76	10,14	0,42	1,59
I A 2 a	(a)	I A 2 a Iron and Steel										0,61	0,01		0,03	0,09		0,11	0,43	0,43
I A 2 b	(a)	I A 2 b Non-ferrous Metals										0,01	0				0			
I A 2 c	(a)	I A 2 c Chemicals																		
I A 2 d	(a)	I A 2 d Pulp, Paper and Print																		
I A 2 e	(a)	I A 2 e Food Processing, Beverages and Tobacco																		
I A 2 f	(a)	I A 2 f Other (Please specify in a covering note)																		
I A 3 a ii (i)		I A 3 a ii Civil Aviation (Domestic, LTO)		0,38	0,94	0,17	0	0				1,56	0			0	0,04	0	0	0,02
I A 3 a ii (ii)		I A 3 a ii Civil Aviation (Domestic, Cruise)		0,62	0,16	0,02	0						0			0	0,08	0	0	0,04
I A 3 b	(a)	I A 3 b Road Transportation	A																	

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg			
I A 3 b i		I A 3 b i R.T., Passenger cars		48,03	347,65	32,72	0,34	1,69				0,05	0,02			0,10	3,36	0,14	0,02	1,98
I A 3 b ii		I A 3 b ii R.T., Light duty vehicles		10,67	21,01	2,29	0,53	0,03				0,00	0,01			0,03	1,01	0,04	0,01	0,59
I A 3 b iii		I A 3 b iii R.T., Heavy duty vehicles		30,31	7,83	3,43	0,87	0,01				0,00	0,01			0,04	1,49	0,06	0,01	0,88
I A 3 b iv		I A 3 b iv R.T., Mopeds & Motorcycles		0,08	12,29	3,35	0,00	0,00				0,00	0,00			0,00	0,03	0,00	0,00	0,02
I A 3 b v		I A 3 b v R.T., Gasoline evaporation				17,40														
I A 3 b vi		I A 3 b vi R.T., Automobile tyre and brake wear																		
I A 3 b vii		I A 3 b vii R.T., Automobile road abrasion																		
I A 3 c	(a)	I A 3 c Railways		2,74	0,42	0,17	0,09	0				0	0			0	0,16	0,01	0	0,09
I A 3 d ii		I A 3 d ii National Navigation		9,65	10,35	5,71	1,84	0				0,02	0	0,01	0,02	0,01	0,05	0,71	0,04	0,11
I A 3 e	(a)	I A 3 e Other (Please specify in a covering note)	A																	
I A 3 e i		I A 3 e i Pipeline compressors																		
I A 3 e ii		I A 3 e ii Other mobile sources and machinery																		
I A 4 a	(a)	I A 4 a Commercial / Institutional		1,28	0,91	0,56	1,63					0,2	0,03	0,08	0,02	0,07	0,06	0,54	0,04	0,58
I A 4 b	(a)	I A 4 b Residential	A																	
I A 4 b i		I A 4 b i Residential plants		4,76	114,42	8,74	5					0,14	0,08	0,14	0,05	0,04	0,12	0,06	0,19	1,89
I A 4 b ii		I A 4 b ii Household and gardening (mobile)		0,23	45,02	3,94	0	0				0	0			0	0,04	0	0	0,02

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
1 A 4 c	(a)	1 A 4 c Agriculture / Forestry / Fishing	A																	
1 A 4 c i		1 A 4 c i Stationary																		
1 A 4 c ii		1 A 4 c ii Off-road Vehicles and Other Machinery		1,72	1,97	2,07	4,16				0,08	0,04	0,03	0,04	0,09	0,04	1,61	0,03	0,05	
1 A 4 c iii		1 A 4 c iii National Fishing																		
1 A 5 a	(a)	1 A 5 a Other, Stationary (including Military)		19,71	19,77	4,38	0,36	0			0	0		0,02	0,63	0,03	0	0,37		
1 A 5 b	(a)	1 A 5 b Other, Mobile (Including military)		12,05	1,67	0,55	1,17	0			0,02	0	0,01	0,01	0,01	0,01	0,2	0,04	0,11	
1 B 1	(a)	1 B 1 Fugitive Emissions from Solid Fuels	A																	
1 B 1 a	(a)	1 B 1 a Coal Mining and Handling																		
1 B 1 b	(a)	1 B 1 b Solid fuel transformation			45,68															
1 B 1 c	(a)	1 B 1 c Other (Please specify in a covering note)																		
1 B 2	(a)	1 B 2 Oil and natural gas	A																	
1 B 2 a	(a)	1 B 2 a Oil	A																	
1 B 2 a i	(a)	1 B 2 a i Exploration Production, Transport																		
1 B 2 a iv	(a)	1 B 2 a iv Refining / Storage																		
1 B 2 a v	(a)	1 B 2 a v Distribution of oil products				4,55	1,98													
1 B 2 a vi	(a)	1 B 2 a vi Other				2,35														
1 B 2 b	(a)	1 B 2 b Natural gas																		
1 B 2 c	(a)	1 B 2 c Venting and flaring		0		0,44	0													
				3	1,94	0,84	0,14													

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting										Additional reporting						
				Main Pollutants					Particulate matter			Priority metals		Other metals						
				NOx	CO	NMVOc	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
2 A	(a)	2 A MINERAL PRODUCTS (b) A																		
2 A 1	(a)	2 A 1 Cement Production																		
2 A 2	(a)	2 A 2 Lime Production																		
2 A 3	(a)	2 A 3 Limestone and Dolomite Use																		
2 A 4	(a)	2 A 4 Soda Ash Production and use																		
2 A 5	(a)	2 A 5 Asphalt Roofing																		
2 A 6	(a)	2 A 6 Road Paving with Asphalt																		
2 A 7	(a)	2 A 7 Other including Non Fuel Mining & Construction (Please specify in a covering note)																		
2 B	(a)	2 B CHEMICAL INDUSTRY A																		
2 B 1	(a)	2 B 1 Ammonia Production																		
2 B 2	(a)	2 B 2 Nitric Acid Production																		
2 B 3	(a)	2 B 3 Adipic Acid Production																		
2 B 4	(a)	2 B 4 Carbide Production																		
2 B 5	(a)	2 B 5 Other (Please specify in a covering note)																		
2 C	(a)	2 C METAL PRODUCTION																		
2 D	(a)	2 D OTHER PRODUCTION (b) A								0.07	0				0.05			0.63		
2 D 1	(a)	2 D 1 Pulp and Paper																		
2 D 2	(a)	2 D 2 Food and Drink				0.57														
2 G	(a)	2 G OTHER (Please specify in a covering note)																		

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting										Additional reporting						
				Main Pollutants					Particulate matter			Priority metals		Other metals						
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
3 A	(a)	3 A PAINT APPLICATION																		
					23,88															
3 B	(a)	3 B DEGREASING AND DRY CLEANING																		
3 C	(a)	3 C CHEMICAL PRODUCTS, MANUFACTURE AND PROCESSING				2,29														
3 D	(a)	3 D OTHER including products containing HMs and POPs (Please specify in a covering note)				13,12														
4 B	(a)	4 B MANURE MANAGEMENT (c)	A																	
4 B 1	(a)	4 B 1 Cattle																		
4 B 1 a	(a)	4 B 1 a Dairy																		
4 B 1 b	(a)	4 B 1 b Non-Dairy																		
4 B 2	(a)	4 B 2 Buffalo																		
4 B 3	(a)	4 B 3 Sheep																		
4 B 4	(a)	4 B 4 Goats																		
4 B 5	(a)	4 B 5 Camels and Llamas																		
4 B 6	(a)	4 B 6 Horses																		
4 B 7	(a)	4 B 7 Mules and Asses																		
4 B 8	(a)	4 B 8 Swine																		
4 B 9	(a)	4 B 9 Poultry																		
4 B 13	(a)	4 B 13 Other																		
4 C	(a)	4 C RICE CULTIVATION																		

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP		A = Allowable Aggregation	Yearly minimum reporting										Additional reporting							
			Main Pollutants					Particulate matter			Priority metals		Other metals							
			NOx	CO	NM VOC	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn	
Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg			
4 D	(a)	4 D AGRICULTURAL SOILS	A																	
4 D 1	(a)	4 D 1 Direct Soil Emission				1,27														
4 F	(a)	4 F FIELD BURNING OF AGRICULTURAL WASTES																		
4 G	(a)	4 G OTHER (d)																		
5 B	(a)	5 B FOREST AND GRASSLAND CONVERSION																		
6 A	(a)	6 A SOLID WASTE DISPOSAL ON LAND																		
6 B	(a)	6 B WASTE-WATER HANDLING																		
6 C	(a)	6 C WASTE INCINERATION (e)																		
6 D	(a)	6 D OTHER WASTE (f)																		
7	(a)	7 OTHER																		
<b>National Total</b>				266,8457604	665,5581393	145,1250962	109,4356468	108,9054809				7,91736418	0,804665722	2,07	0,91	3,213328613	9,643173262	22,51266005	3,184665722	20,93657228

Memo Items																				
1 A 3 a i (i)	(a)	International Aviation (LTO)		0,95	0,59	0,12	0,01	0				0,14	0		0	0,12	0	0	0,07	
1 A 3 a i (ii)	(a)	International Aviation (Cruise)		7,13	0,95	0,21	0,06					0,01		0,03	0,97	0,04	0,01	0,57		
1 A 3 d i	(a)	International Navigation		121,01	10,29	3,24	65,92					0,22	0,03	0,05	0,43	0,18	0,43	23,97	0,44	1,01
5 E	(a)	5 E Other																		
X		X (11 08 Volcanoes)																		

(a) Sectors already reported to UNFCCC for NOx, CO, NMVOC, SO<sub>2</sub>.

(b) Including Product handling.

(c) Including NH<sub>3</sub> from Enteric Fermentation.

(d) Including PM sources.

(e) Excludes waste incineration for energy (this is included in 1 A 1).

(f) Includes accidental fires.

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.



**TABLE IV 1A: National sector emissions: Main pollutants, particulate matter and heavy metals**

Version 2002-1

COUNTRY: DK (as ISO2 code)  
 DATE: 14.02.2003 (as DD.MM.YYYY)  
 YEAR: 1998 (as YYYY, year of Emmissions)

These five yellow lines will not be read by UNECE! These lines can be modified freely for your own reference purposes.

Footnotes to the emission figures reported should be submitted together with the emission data, but in a separate document.

Please fill out the blue marked fields. You may use the aggregation levels instead of the gray marked fields in aggregation.

You must use for each field either a number or one of the following codes (capitals, no dots in between, see EB.AIR/GE.1/2002/2): NO, NA, NE, IE, C

Footnotes or any other information entered into this table will not be taken into account.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting											Additional reporting						
				Main Pollutants					Particulate matter			Priority metals			Other metals						
				NOx Gg NO <sub>2</sub>	CO Gg	NMVOG Gg	SOx Gg SO <sub>2</sub>	NH3 Gg	TSP Mg	PM10 Mg	PM2.5 Mg	Pb Mg	Cd Mg	Hg Mg	As Mg	Cr Mg	Cu Mg	Ni Mg	Se Mg	Zn Mg	
I A 1 a	(a)	I A 1 a Public Electricity and Heat Production		66,03	12,16	6,16	53,34						3,31	0,3	1,51	0,41	1,34	1,38	6,05	1,61	11,68
I A 1 b	(a)	I A 1 b Petroleum refining		1,63	0,26	0	0,93						0,03	0,01	0	0,02	0,04	0,01	0,71	0,01	0
I A 1 c	(a)	I A 1 c Manufacture of Solid Fuels and Other Energy Industries		5,27	0,64	0,05	0,01						0	0	0	0	0	0	0	0	0
I A 2	(a)	I A 2 Manufacturing Industries and Construction	A	27,94	19,38	4,41	10,13	0					1,09	0,23	0,13	0,26	0,81	0,7	8,52	0,38	1,25
I A 2 a	(a)	I A 2 a Iron and Steel											0,62	0,01		0,03	0,09		0,11	0,43	0,43
I A 2 b	(a)	I A 2 b Non-ferrous Metals											0,01	0				0			
I A 2 c	(a)	I A 2 c Chemicals																			
I A 2 d	(a)	I A 2 d Pulp, Paper and Print																			
I A 2 e	(a)	I A 2 e Food Processing, Beverages and Tobacco																			
I A 2 f	(a)	I A 2 f Other (Please specify in a covering note)																			
I A 3 a ii (i)		I A 3 a ii Civil Aviation (Domestic, LTO)		0,34	0,84	0,15	0	0					1,4	0			0	0,03	0	0	0,02
I A 3 a ii (ii)		I A 3 a ii Civil Aviation (Domestic, Cruise)		0,58	0,15	0,02	0							0			0	0,07	0	0	0,04
I A 3 b	(a)	I A 3 b Road Transportation	A																		

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting								
				Main Pollutants					Particulate matter			Priority metals			Other metals						
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn	
Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg				
I A 3 b i		I A 3 b i R.T., Passenger cars		45,48	320,45	29,70	0,36	1,89				0,06	0,02				0,10	3,44	0,14	0,02	2,03
I A 3 b ii		I A 3 b ii R.T., Light duty vehicles		10,20	19,30	2,13	0,51	0,04				0,00	0,01				0,03	0,98	0,04	0,01	0,58
I A 3 b iii		I A 3 b iii R.T., Heavy duty vehicles		29,88	7,72	3,40	0,90	0,01				0,00	0,01				0,05	1,54	0,06	0,01	0,90
I A 3 b iv		I A 3 b iv R.T., Mopeds & Motorcycles		0,09	13,24	3,60	0,00	0,00				0,00	0,00				0,00	0,03	0,00	0,00	0,02
I A 3 b v		I A 3 b v R.T., Gasoline evaporation				15,79															
I A 3 b vi		I A 3 b vi R.T., Automobile tyre and brake wear																			
I A 3 b vii		I A 3 b vii R.T., Automobile road abrasion																			
I A 3 c	(a)	I A 3 c Railways		2,31	0,35	0,14	0,08	0				0	0				0	0,13	0,01	0	0,08
I A 3 d ii		I A 3 d ii National Navigation		7,8	10,05	5,59	1,67	0				0,02	0	0,01	0,02	0,01	0,05	0,99	0,03	0,1	
I A 3 e	(a)	I A 3 e Other (Please specify in a covering note)	A																		
I A 3 e i		I A 3 e i Pipeline compressors																			
I A 3 e ii		I A 3 e ii Other mobile sources and machinery																			
I A 4 a	(a)	I A 4 a Commercial / Institutional		1	0,74	0,41	0,4					0,15	0,02	0,06	0,02	0,05	0,04	0,32	0,03	0,45	
I A 4 b	(a)	I A 4 b Residential	A																		
I A 4 b i		I A 4 b i Residential plants		3,78	99,69	7,77	1,61					0,14	0,07	0,13	0,05	0,04	0,11	0,06	0,18	1,71	
I A 4 b ii		I A 4 b ii Household and gardening (mobile)		0,22	44,68	3,91	0	0				0	0				0	0,04	0	0	0,02

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
1 A 4 c	(a)	1 A 4 c Agriculture / Forestry / Fishing	A																	
1 A 4 c i		1 A 4 c i Stationary																		
1 A 4 c ii		1 A 4 c ii Off-road Vehicles and Other Machinery		1,2	1,51	1,74	1,62				0,07	0,04	0,03	0,04	0,09	0,04	1,66	0,03	0,05	
1 A 4 c iii		1 A 4 c iii National Fishing		19,56	19,62	4,35	0,36	0			0	0		0,02	0,63	0,03	0	0,37		
1 A 5 a	(a)	1 A 5 a Other, Stationary (including Military)		12,3	1,7	0,56	0,89	0			0,02	0	0,01	0,01	0,01	0,01	0,04	0,04	0,11	
1 A 5 b	(a)	1 A 5 b Other, Mobile (Including military)		1,3	0,65	0,15	0,04	0			0,12	0		0	0,11	0	0	0	0,06	
1 B 1	(a)	1 B 1 Fugitive Emissions from Solid Fuels	A																	
1 B 1 a	(a)	1 B 1 a Coal Mining and Handling																		
1 B 1 b	(a)	1 B 1 b Solid fuel transformation			27,36															
1 B 1 c	(a)	1 B 1 c Other (Please specify in a covering note)																		
1 B 2	(a)	1 B 2 Oil and natural gas	A																	
1 B 2 a	(a)	1 B 2 a Oil	A																	
1 B 2 a i	(a)	1 B 2 a i Exploration Production, Transport																		
1 B 2 a iv	(a)	1 B 2 a iv Refining / Storage																		
1 B 2 a v	(a)	1 B 2 a v Distribution of oil products				4,56	1,44													
1 B 2 a vi	(a)	1 B 2 a vi Other				1,95														
1 B 2 b	(a)	1 B 2 b Natural gas																		
1 B 2 c	(a)	1 B 2 c Venting and flaring					0,41													
				2,21	1,42	0,62	0,07													

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting										Additional reporting						
				Main Pollutants					Particulate matter			Priority metals		Other metals						
				NOx	CO	NMVOc	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
2 A	(a)	2 A MINERAL PRODUCTS (b) A	A																	
2 A 1	(a)	2 A 1 Cement Production																		
2 A 2	(a)	2 A 2 Lime Production																		
2 A 3	(a)	2 A 3 Limestone and Dolomite Use																		
2 A 4	(a)	2 A 4 Soda Ash Production and use																		
2 A 5	(a)	2 A 5 Asphalt Roofing																		
2 A 6	(a)	2 A 6 Road Paving with Asphalt																		
2 A 7	(a)	2 A 7 Other including Non Fuel Mining & Construction (Please specify in a covering note)																		
2 B	(a)	2 B CHEMICAL INDUSTRY A	A																	
2 B 1	(a)	2 B 1 Ammonia Production																		
2 B 2	(a)	2 B 2 Nitric Acid Production		0.35																
2 B 3	(a)	2 B 3 Adipic Acid Production																		
2 B 4	(a)	2 B 4 Carbide Production																		
2 B 5	(a)	2 B 5 Other (Please specify in a covering note)																		
2 C	(a)	2 C METAL PRODUCTION																		
2 D	(a)	2 D OTHER PRODUCTION (b) A	A							0.07	0				0.05			0.63		
2 D 1	(a)	2 D 1 Pulp and Paper																		
2 D 2	(a)	2 D 2 Food and Drink				0.5														
2 G	(a)	2 G OTHER (Please specify in a covering note)																		

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PM should cover the timespan from 2000 to latest year.

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NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting										Additional reporting						
				Main Pollutants					Particulate matter			Priority metals		Other metals						
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
3 A	(a)	3 A PAINT APPLICATION																		
					23,66															
3 B	(a)	3 B DEGREASING AND DRY CLEANING																		
3 C	(a)	3 C CHEMICAL PRODUCTS, MANUFACTURE AND PROCESSING				2,24														
3 D	(a)	3 D OTHER including products containing HMs and POPs (Please specify in a covering note)				12,96														
4 B	(a)	4 B MANURE MANAGEMENT (c)	A																	
4 B 1	(a)	4 B 1 Cattle																		
4 B 1 a	(a)	4 B 1 a Dairy																		
4 B 1 b	(a)	4 B 1 b Non-Dairy																		
4 B 2	(a)	4 B 2 Buffalo																		
4 B 3	(a)	4 B 3 Sheep																		
4 B 4	(a)	4 B 4 Goats																		
4 B 5	(a)	4 B 5 Camels and Llamas																		
4 B 6	(a)	4 B 6 Horses																		
4 B 7	(a)	4 B 7 Mules and Asses																		
4 B 8	(a)	4 B 8 Swine																		
4 B 9	(a)	4 B 9 Poultry																		
4 B 13	(a)	4 B 13 Other																		
4 C	(a)	4 C RICE CULTIVATION																		

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP		A = Allowable Aggregation	Yearly minimum reporting										Additional reporting							
			Main Pollutants					Particulate matter			Priority metals		Other metals							
			NOx	CO	NM VOC	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn	
Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg			
4 D	(a)	4 D AGRICULTURAL SOILS	A																	
4 D 1	(a)	4 D 1 Direct Soil Emission				1,22		28,43												
4 F	(a)	4 F FIELD BURNING OF AGRICULTURAL WASTES																		
4 G	(a)	4 G OTHER (d)																		
5 B	(a)	5 B FOREST AND GRASSLAND CONVERSION																		
6 A	(a)	6 A SOLID WASTE DISPOSAL ON LAND																		
6 B	(a)	6 B WASTE-WATER HANDLING																		
6 C	(a)	6 C WASTE INCINERATION (e)																		
6 D	(a)	6 D OTHER WASTE (f)																		
	7 (a)	7 OTHER																		
<b>National Total</b>				239,462,105	601,918,724	138,146,756	74,359,190	110,122,843				7,108,564,718	0,715,260,607	1,88	0,86	2,676,303,045	9,394,303,413	18,746,824,25	2,775,260,607	20,526,060,71

Memo Items																			
1 A 3 a i (i)	(a)	International Aviation (LTO)		0,98	0,59	0,12	0,01	0			0,14	0		0	0,12	0	0	0,07	
1 A 3 a i (ii)	(a)	International Aviation (Cruise)		7,7	1,03	0,23	0,06				0,01		0,03	1,05	0,04	0,01	0,62		
1 A 3 d i	(a)	International Navigation		121,39	10,33	3,25	60,17			0,21	0,03	0,05	0,37	0,16	0,37	19,96	0,41	0,96	
5 E	(a)	5 E Other																	
X		X (11 08 Volcanoes)																	

- (a) Sectors already reported to UNFCCC for NOx, CO, NMVOC, SO<sub>2</sub>.
- (b) Including Product handling.
- (c) Including NH<sub>3</sub> from Enteric Fermentation.
- (d) Including PM sources.
- (e) Excludes waste incineration for energy (this is included in 1 A 1).
- (f) Includes accidental fires.

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

**TABLE IV 1A: National sector emissions: Main pollutants, particulate matter and heavy metals**

Version 2002-1

COUNTRY: DK (as ISO2 code)  
 DATE: 14.02.2003 (as DD.MM.YYYY)  
 YEAR: 1999 (as YYYY, year of Emmissions)

These five yellow lines will not be read by UNECE! These lines can be modified freely for your own reference purposes.

Footnotes to the emission figures reported should be submitted together with the emission data, but in a separate document.

Please fill out the blue marked fields. You may use the aggregation levels instead of the gray marked fields in aggregation.

You must use for each field either a number or one of the following codes (capitals, no dots in between, see EB.AIR/GE.1/2002/2): NO, NA, NE, IE, C

Footnotes or any other information entered into this table will not be taken into account.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting											Additional reporting					
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx Gg NO <sub>2</sub>	CO Gg	NMVOG Gg	SOx Gg SO <sub>2</sub>	NH <sub>3</sub> Gg	TSP Mg	PM10 Mg	PM2.5 Mg	Pb Mg	Cd Mg	Hg Mg	As Mg	Cr Mg	Cu Mg	Ni Mg	Se Mg	Zn Mg
I A 1 a	(a)	I A 1 a Public Electricity and Heat Production		53,21	11	5,76	35,83				2,87	0,3	1,54	0,45	1,37	1,35	4,28	1,47	11,47	
I A 1 b	(a)	I A 1 b Petroleum refining		1,5	0,27	0,01	0,53				0,03	0,01	0	0,02	0,04	0,01	0,7	0,01	0	
I A 1 c	(a)	I A 1 c Manufacture of Solid Fuels and Other Energy Industries		5,68	0,67	0,05	0,01													
I A 2	(a)	I A 2 Manufacturing Industries and Construction	A	27,93	18,16	4,65	8,75	0			1,03	0,2	0,13	0,22	0,72	0,68	6,6	0,35	1,34	
I A 2 a	(a)	I A 2 a Iron and Steel								0,62	0,01		0,03	0,09			0,11	0,43	0,43	
I A 2 b	(a)	I A 2 b Non-ferrous Metals								0,01	0				0					
I A 2 c	(a)	I A 2 c Chemicals																		
I A 2 d	(a)	I A 2 d Pulp, Paper and Print																		
I A 2 e	(a)	I A 2 e Food Processing, Beverages and Tobacco																		
I A 2 f	(a)	I A 2 f Other (Please specify in a covering note)																		
I A 3 a ii (i)		I A 3 a ii Civil Aviation (Domestic, LTO)		0,3	0,81	0,14	0	0			1,39	0			0	0,03	0	0	0,02	
I A 3 a ii (ii)		I A 3 a ii Civil Aviation (Domestic, Cruise)		0,52	0,13	0,02	0	0			0	0	0	0	0	0,06	0	0	0,04	
I A 3 b	(a)	I A 3 b Road Transportation	A																	

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
I A 3 b i		I A 3 b i R.T., Passenger cars		36,60	303,48	27,81	0,29	2,00				0,06	0,02			0,10	3,48	0,14	0,02	2,04
I A 3 b ii		I A 3 b ii R.T., Light duty vehicles		10,11	19,30	2,18	0,29	0,04				0,00	0,01			0,03	1,00	0,04	0,01	0,59
I A 3 b iii		I A 3 b iii R.T., Heavy duty vehicles		28,98	7,39	3,29	0,50	0,01				0,00	0,01			0,05	1,56	0,06	0,01	0,92
I A 3 b iv		I A 3 b iv R.T., Mopeds & Motorcycles		0,09	12,82	3,26	0,00	0,00				0,00	0,00			0,00	0,03	0,00	0,00	0,02
I A 3 b v		I A 3 b v R.T., Gasoline evaporation				15,52														
I A 3 b vi		I A 3 b vi R.T., Automobile tyre and brake wear																		
I A 3 b vii		I A 3 b vii R.T., Automobile road abrasion																		
I A 3 c	(a)	I A 3 c Railways		2,4	0,37	0,15	0,04	0				0	0			0	0,14	0,01	0	0,08
I A 3 d ii		I A 3 d ii National Navigation		7,01	10,34	5,79	1,71	0				0,02	0	0	0,02	0,01	0,05	1,06	0,03	0,09
I A 3 e	(a)	I A 3 e Other (Please specify in a covering note)	A																	
I A 3 e i		I A 3 e i Pipeline compressors																		
I A 3 e ii		I A 3 e ii Other mobile sources and machinery																		
I A 4 a	(a)	I A 4 a Commercial / Institutional		1,33	0,88	0,54	0,46					0,23	0,03	0,1	0,02	0,07	0,06	0,4	0,03	0,68
I A 4 b	(a)	I A 4 b Residential	A																	
I A 4 b i		I A 4 b i Residential plants		3,69	86,96	6,2	1,5					0,12	0,07	0,11	0,04	0,04	0,11	0,06	0,17	1,68
I A 4 b ii		I A 4 b ii Household and gardening (mobile)		0,23	46,66	4,08	0	0				0	0			0	0,04	0	0	0,02

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HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.



NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
1 A 4 c	(a)	1 A 4 c Agriculture / Forestry / Fishing	A																	
1 A 4 c i		1 A 4 c i Stationary																		
1 A 4 c ii		1 A 4 c ii Off-road Vehicles and Other Machinery		1,43	1,66	2,06	1,38				0,07	0,04	0,03	0,04	0,08	0,04	1,55	0,03	0,06	
1 A 4 c iii		1 A 4 c iii National Fishing																		
1 A 5 a	(a)	1 A 5 a Other, Stationary (including Military)		20,35	20,49	4,53	0,37	0			0	0		0,02	0,66	0,03	0	0,39		
1 A 5 b	(a)	1 A 5 b Other, Mobile (Including military)		12,42	2,73	1,17	0,87	0			0,02	0	0,01	0,01	0,01	0,01	0,02	0,04	0,11	
1 B 1	(a)	1 B 1 Fugitive Emissions from Solid Fuels	A																	
1 B 1 a	(a)	1 B 1 a Coal Mining and Handling																		
1 B 1 b	(a)	1 B 1 b Solid fuel transformation			24,16															
1 B 1 c	(a)	1 B 1 c Other (Please specify in a covering note)																		
1 B 2	(a)	1 B 2 Oil and natural gas	A																	
1 B 2 a	(a)	1 B 2 a Oil	A																	
1 B 2 a i	(a)	1 B 2 a i Exploration Production, Transport																		
1 B 2 a iv	(a)	1 B 2 a iv Refining / Storage				4,56	1,36													
1 B 2 a v	(a)	1 B 2 a v Distribution of oil products				1,53														
1 B 2 a vi	(a)	1 B 2 a vi Other																		
1 B 2 b	(a)	1 B 2 b Natural gas																		
1 B 2 c	(a)	1 B 2 c Venting and flaring		0		0,42	0													
				4,81	3,11	1,35	0,05													

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting										Additional reporting						
				Main Pollutants					Particulate matter			Priority metals		Other metals						
				NOx	CO	NMVOc	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
2 A	(a)	2 A MINERAL PRODUCTS (b) A																		
2 A 1	(a)	2 A 1 Cement Production																		
2 A 2	(a)	2 A 2 Lime Production																		
2 A 3	(a)	2 A 3 Limestone and Dolomite Use																		
2 A 4	(a)	2 A 4 Soda Ash Production and use																		
2 A 5	(a)	2 A 5 Asphalt Roofing																		
2 A 6	(a)	2 A 6 Road Paving with Asphalt																		
2 A 7	(a)	2 A 7 Other including Non Fuel Mining & Construction (Please specify in a covering note)																		
2 B	(a)	2 B CHEMICAL INDUSTRY A																		
2 B 1	(a)	2 B 1 Ammonia Production																		
2 B 2	(a)	2 B 2 Nitric Acid Production																		
2 B 3	(a)	2 B 3 Adipic Acid Production																		
2 B 4	(a)	2 B 4 Carbide Production																		
2 B 5	(a)	2 B 5 Other (Please specify in a covering note)																		
2 C	(a)	2 C METAL PRODUCTION																		
2 D	(a)	2 D OTHER PRODUCTION (b) A																		
2 D 1	(a)	2 D 1 Pulp and Paper																		
2 D 2	(a)	2 D 2 Food and Drink																		
2 G	(a)	2 G OTHER (Please specify in a covering note)																		

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
3 A	(a)	3 A PAINT APPLICATION				23,44														
3 B	(a)	3 B DEGREASING AND DRY CLEANING																		
3 C	(a)	3 C CHEMICAL PRODUCTS, MANUFACTURE AND PROCESSING				2,19														
3 D	(a)	3 D OTHER including products containing HMs and POPs (Please specify in a covering note)				12,9														
4 B	(a)	4 B MANURE MANAGEMENT (c)	A																	
4 B 1	(a)	4 B 1 Cattle																		
4 B 1 a	(a)	4 B 1 a Dairy																		
4 B 1 b	(a)	4 B 1 b Non-Dairy																		
4 B 2	(a)	4 B 2 Buffalo																		
4 B 3	(a)	4 B 3 Sheep																		
4 B 4	(a)	4 B 4 Goats																		
4 B 5	(a)	4 B 5 Camels and Llamas																		
4 B 6	(a)	4 B 6 Horses																		
4 B 7	(a)	4 B 7 Mules and Asses																		
4 B 8	(a)	4 B 8 Swine																		
4 B 9	(a)	4 B 9 Poultry																		
4 B 13	(a)	4 B 13 Other																		
4 C	(a)	4 C RICE CULTIVATION																		

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP		A = Allowable Aggregation	Yearly minimum reporting										Additional reporting							
			Main Pollutants					Particulate matter			Priority metals		Other metals							
			NOx	CO	NM VOC	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn	
Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg			
4 D	(a)	4 D AGRICULTURAL SOILS	A																	
4 D 1	(a)	4 D 1 Direct Soil Emission				1,19		25,68												
4 F	(a)	4 F FIELD BURNING OF AGRICULTURAL WASTES																		
4 G	(a)	4 G OTHER (d)																		
5 B	(a)	5 B FOREST AND GRASSLAND CONVERSION																		
6 A	(a)	6 A SOLID WASTE DISPOSAL ON LAND																		
6 B	(a)	6 B WASTE-WATER HANDLING																		
6 C	(a)	6 C WASTE INCINERATION (e)																		
6 D	(a)	6 D OTHER WASTE (f)																		
	7	(a) 7 OTHER																		
<b>National Total</b>				220,031,915.6	572,079,404.8	135,440,279.8	53,969,340.31	104,917.55				6,618,237.885	0,695,689.246	1,92	0.85	2,628,462.4	9,457,172.123	15,069,824.74	2,595,689.246	20,668,924.89

Memo Items																				
1 A 3 a i (i)	(a)	International Aviation (LTO)		1,04	0,61	0,11	0,01	0				0,12	0	0	0	0	0,12	0,01	0	0,07
1 A 3 a i (ii)	(a)	International Aviation (Cruise)		8,19	1,08	0,24	0,07	0				0	0,01	0	0	0,03	1,11	0,05	0,01	0,65
1 A 3 d i	(a)	International Navigation		114,13	9,71	3,05	60,58					0,2	0,03	0,04	0,38	0,16	0,38	21,07	0,4	0,94
5 E	(a)	5 E Other																		
X		X (11 08 Volcanoes)																		

- (a) Sectors already reported to UNFCCC for NOx, CO, NMVOC, SO<sub>2</sub>.
- (b) Including Product handling.
- (c) Including NH<sub>3</sub> from Enteric Fermentation.
- (d) Including PM sources.
- (e) Excludes waste incineration for energy (this is included in 1 A 1).
- (f) Includes accidental fires.

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.  
 HM should cover the timespan from 1990 to latest year.  
 PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

**TABLE IV 1A: National sector emissions: Main pollutants, particulate matter and heavy metals**

Version 2002-1

COUNTRY: DK (as ISO2 code)  
 DATE: 14.02.2003 (as DD.MM.YYYY)  
 YEAR: 2000 (as YYYY, year of Emmissions)

These five yellow lines will not be read by UNECE! These lines can be modified freely for your own reference purposes.

Footnotes to the emission figures reported should be submitted together with the emission data, but in a separate document.

Please fill out the blue marked fields. You may use the aggregation levels instead of the gray marked fields in aggregation.

You must use for each field either a number or one of the following codes (capitals, no dots in between, see EB.AIR/GE.1/2002/2): NO, NA, NE, IE, C

Footnotes or any other information entered into this table will not be taken into account.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting											Additional reporting					
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx Gg NO <sub>2</sub>	CO Gg	NMVOG Gg	SOx Gg SO <sub>2</sub>	NH <sub>3</sub> Gg	TSP Mg	PM10 Mg	PM2.5 Mg	Pb Mg	Cd Mg	Hg Mg	As Mg	Cr Mg	Cu Mg	Ni Mg	Se Mg	Zn Mg
I A 1 a	(a)	I A 1 a Public Electricity and Heat Production		44,5	10,14	5,53	12,14		986,56	816,88	685,35	3,11	0,3	1,58	0,47	1,08	1,05	3,36	0,86	12,24
I A 1 b	(a)	I A 1 b Petroleum refining		1,31	0,25	0	0,61		142,25	129,02	122,4	0,03	0,02	0,01	0,02	0,04	0,02	0,85	0,02	0
I A 1 c	(a)	I A 1 c Manufacture of Solid Fuels and Other Energy Industries		2,55	0,71	0,05	0,01		2,57	2,57	2,57									
I A 2	(a)	I A 2 Manufacturing Industries and Construction	A	27,97	19,32	4,9	7,39	0	1928,38	1691,48	1499,06	1,1	0,2	0,15	0,22	0,74	0,72	6,74	0,34	1,52
I A 2 a	(a)	I A 2 a Iron and Steel							192,8	57,84	8,68	0,69	0,01		0,03	0,11		0,13	0,48	0,48
I A 2 b	(a)	I A 2 b Non-ferrous Metals							34,28	30,86	14,15	0,01	0				0			0
I A 2 c	(a)	I A 2 c Chemicals																		
I A 2 d	(a)	I A 2 d Pulp, Paper and Print																		
I A 2 e	(a)	I A 2 e Food Processing, Beverages and Tobacco																		
I A 2 f	(a)	I A 2 f Other (Please specify in a covering note)																		
I A 3 a ii (i)		I A 3 a ii Civil Aviation (Domestic, LTO)		0,27	0,78	0,14	0	0	1,69	1,69	1,69	1,37	0		0	0,03	0	0	0	0,02
I A 3 a ii (ii)		I A 3 a ii Civil Aviation (Domestic, Cruise)		0,46	0,11	0,01	0	0	1,71	1,71	1,71	0	0	0	0	0	0,06	0	0	0,03
I A 3 b	(a)	I A 3 b Road Transportation	A																	

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg			
I A 3 b i		I A 3 b i R.T., Passenger cars		37,33	274,09	23,78	0,20	2,16	733,34	733,34	733,34	0,05	0,02			0,10	3,45	0,14	0,02	2,03
I A 3 b ii		I A 3 b ii R.T., Light duty vehicles		10,06	17,67	2,00	0,06	0,05	1765,52	1765,52	1765,52	0,00	0,01			0,03	1,00	0,04	0,01	0,59
I A 3 b iii		I A 3 b iii R.T., Heavy duty vehicles		27,02	6,95	3,11	0,09	0,01	1416,32	1416,32	1416,32	0,00	0,01			0,04	1,52	0,06	0,01	0,89
I A 3 b iv		I A 3 b iv R.T., Mopeds & Motorcycles		0,09	13,27	3,20	0,00	0,00	54,09	54,09	54,09	0,00	0,00			0,00	0,03	0,00	0,00	0,02
I A 3 b v		I A 3 b v R.T., Gasoline evaporation				9,53														
I A 3 b vi		I A 3 b vi R.T., Automobile tyre and brake wear							5031,80	625,57	323,50									
I A 3 b vii		I A 3 b vii R.T., Automobile road abrasion							9750,91	489,61	0,00									
I A 3 c	(a)	I A 3 c Railways		2,13	0,35	0,14	0,01	0	161,74	161,74	161,74	0	0			0	0,12	0,01	0	0,07
I A 3 d ii		I A 3 d ii National Navigation		7,09	10,93	6,13	1,64	0	424,6	403,99	384,41	0,02	0	0	0,02	0,01	0,06	1,11	0,03	0,09
I A 3 e	(a)	I A 3 e Other (Please specify in a covering note)	A																	
I A 3 e i		I A 3 e i Pipeline compressors																		
I A 3 e ii		I A 3 e ii Other mobile sources and machinery																		
I A 4 a	(a)	I A 4 a Commercial / Institutional		1,09	0,79	0,54	0,33		136,44	131,99	123,04	0,18	0,02	0,04	0,02	0,02	0,03	0,23	0,03	0,16
I A 4 b	(a)	I A 4 b Residential	A																	
I A 4 b i		I A 4 b i Residential plants		4,86	124,26	9,77	1,55		2818,02	2680,29	2536,86	0,13	0,09	0,14	0,04	0,03	0,12	0,05	0,14	2,01
I A 4 b ii		I A 4 b ii Household and gardening (mobile)		0,25	49,53	4,33	0	0	27,02	27,02	27,02	0	0			0	0,05	0	0	0,03

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
1 A 4 c	(a)	1 A 4 c Agriculture / Forestry / Fishing	A																	
1 A 4 c i		1 A 4 c i Stationary																		
1 A 4 c ii		1 A 4 c ii Off-road Vehicles and Other Machinery		1,48	1,54	2,11	1,38		128,66	102,25	81,31	0,06	0,03	0,03	0,03	0,06	0,03	1,15	0,02	0,07
1 A 4 c iii		1 A 4 c iii National Fishing		21,52	21,75	4,8	0,4	0	2176,36	2068,2	1965,45	0	0		0,02	0,7	0,03	0	0,41	
1 A 5 a	(a)	1 A 5 a Other, Stationary (including Military)		12,5	2,86	1,23	0,88	0	398,09	378,27	359,44	0,02	0	0,01	0,01	0,01	0,01	0,02	0,04	0,11
1 A 5 b	(a)	1 A 5 b Other, Mobile (Including military)		0,51	0,4	0,06	0,01	0	18,58	18,58	18,58	0,11	0	0	0	0	0,06	0	0	0,04
1 B 1	(a)	1 B 1 Fugitive Emissions from Solid Fuels	A																	
1 B 1 a	(a)	1 B 1 a Coal Mining and Handling			21,78				962,25	384,9	38,49									
1 B 1 b	(a)	1 B 1 b Solid fuel transformation																		
1 B 1 c	(a)	1 B 1 c Other (Please specify in a covering note)																		
1 B 2	(a)	1 B 2 Oil and natural gas	A																	
1 B 2 a	(a)	1 B 2 a Oil	A																	
1 B 2 a i	(a)	1 B 2 a i Exploration Production, Transport																		
1 B 2 a iv	(a)	1 B 2 a iv Refining / Storage				4,98	0,98													
1 B 2 a v	(a)	1 B 2 a v Distribution of oil products				1,07														
1 B 2 a vi	(a)	1 B 2 a vi Other																		
1 B 2 b	(a)	1 B 2 b Natural gas		0		0,42	0													
1 B 2 c	(a)	1 B 2 c Venting and flaring		3,12	2,02	0,88	0,05		1,01	1,01	1,01									

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting										Additional reporting						
				Main Pollutants					Particulate matter			Priority metals		Other metals						
				NOx	CO	NMVOc	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
2 A	(a)	2 A MINERAL PRODUCTS (b) A	A																	
2 A 1	(a)	2 A 1 Cement Production																		
2 A 2	(a)	2 A 2 Lime Production																		
2 A 3	(a)	2 A 3 Limestone and Dolomite Use																		
2 A 4	(a)	2 A 4 Soda Ash Production and use																		
2 A 5	(a)	2 A 5 Asphalt Roofing																		
2 A 6	(a)	2 A 6 Road Paving with Asphalt																		
2 A 7	(a)	2 A 7 Other including Non Fuel Mining & Construction (Please specify in a covering note)																		
2 B	(a)	2 B CHEMICAL INDUSTRY A	A																	
2 B 1	(a)	2 B 1 Ammonia Production																		
2 B 2	(a)	2 B 2 Nitric Acid Production		0,41																
2 B 3	(a)	2 B 3 Adipic Acid Production																		
2 B 4	(a)	2 B 4 Carbide Production																		
2 B 5	(a)	2 B 5 Other (Please specify in a covering note)																		
2 C	(a)	2 C METAL PRODUCTION																		
2 D	(a)	2 D OTHER PRODUCTION (b) A	A							0,07	0				0,05			0,63		
2 D 1	(a)	2 D 1 Pulp and Paper																		
2 D 2	(a)	2 D 2 Food and Drink				0,47														
2 G	(a)	2 G OTHER (Please specify in a covering note)																		

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

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PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.



NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting										Additional reporting						
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
3 A	(a)	3 A PAINT APPLICATION																		
3 B	(a)	3 B DEGREASING AND DRY CLEANING			23,22															
3 C	(a)	3 C CHEMICAL PRODUCTS, MANUFACTURE AND PROCESSING			2,14															
3 D	(a)	3 D OTHER including products containing HMs and POPs (Please specify in a covering note)			12,64															
4 B	(a)	4 B MANURE MANAGEMENT (c)	A																	
4 B 1	(a)	4 B 1 Cattle																		
4 B 1 a	(a)	4 B 1 a Dairy					17,2	612,39	275,56	61,26										
4 B 1 b	(a)	4 B 1 b Non-Dairy					7,9	1187,55	534,37	118,8										
4 B 2	(a)	4 B 2 Buffalo																		
4 B 3	(a)	4 B 3 Sheep																		
4 B 4	(a)	4 B 4 Goats					0,12													
4 B 5	(a)	4 B 5 Camels and Llamas					0,01													
4 B 6	(a)	4 B 6 Horses																		
4 B 7	(a)	4 B 7 Mules and Asses					1,03													
4 B 8	(a)	4 B 8 Swine																		
4 B 9	(a)	4 B 9 Poultry					40,59	9289,81	4180,61	928,6										
4 B 13	(a)	4 B 13 Other					5,01	2542,71	1144,58	254,06										
4 C	(a)	4 C RICE CULTIVATION					4,68													

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP		A = Allowable Aggregation	Yearly minimum reporting										Additional reporting							
			Main Pollutants					Particulate matter			Priority metals		Other metals							
			NOx	CO	NM VOC	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn	
Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg			
4 D	(a)	4 D AGRICULTURAL SOILS	A																	
4 D 1	(a)	4 D 1 Direct Soil Emission				1,19		25,7												
4 F	(a)	4 F FIELD BURNING OF AGRICULTURAL WASTES																		
4 G	(a)	4 G OTHER (d)																		
5 B	(a)	5 B FOREST AND GRASSLAND CONVERSION																		
6 A	(a)	6 A SOLID WASTE DISPOSAL ON LAND																		
6 B	(a)	6 B WASTE-WATER HANDLING																		
6 C	(a)	6 C WASTE INCINERATION (e)																		
6 D	(a)	6 D OTHER WASTE (f)																		
7	(a)	7 OTHER																		
<b>National Total</b>				206,5205503	579,4892803	128,3735683	27,73311967	104,4593825	42927,45063	20309,84881	13688,43965	6,957320226	0,705311967	1,96	0,86	2,296559854	9,113034905	13,92718378	1,995311967	21,44119674

Memo Items																				
1 A 3 a i (i)	(a)	International Aviation (LTO)		1,08	0,64	0,12	0,01	0	3,95	3,95	3,95	0,12	0	0	0	0	0,13	0,01	0	0,08
1 A 3 a i (ii)	(a)	International Aviation (Cruise)		8,39	1,11	0,25	0,07	0	33,96	33,96	33,96	0	0,01	0	0	0,03	1,14	0,05	0,01	0,67
1 A 3 d i	(a)	International Navigation		117,19	9,97	3,13	65,2		7617,74	7236,85	6875,01	0,22	0,03	0,04	0,43	0,18	0,43	24,38	0,43	1
5 E	(a)	5 E Other																		
X		X (11 08 Volcanoes)																		

(a) Sectors already reported to UNFCCC for NOx, CO, NMVOC, SO<sub>2</sub>.

(b) Including Product handling.

(c) Including NH<sub>3</sub> from Enteric Fermentation.

(d) Including PM sources.

(e) Excludes waste incineration for energy (this is included in 1 A 1).

(f) Includes accidental fires.

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

**TABLE IV 1A: National sector emissions: Main pollutants, particulate matter and heavy metals**

Version 2002-1

COUNTRY: DK (as ISO2 code)  
 DATE: 14.02.2003 (as DD.MM.YYYY)  
 YEAR: 2001 (as YYYY, year of Emmissions)

These five yellow lines will not be read by UNECE! These lines can be modified freely for your own reference purposes.

Footnotes to the emission figures reported should be submitted together with the emission data, but in a separate document.

Please fill out the blue marked fields. You may use the aggregation levels instead of the gray marked fields in aggregation.

You must use for each field either a number or one of the following codes (capitals, no dots in between, see EB.AIR/GE.1/2002/2): NO, NA, NE, IE, C

Footnotes or any other information entered into this table will not be taken into account.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting										Additional reporting						
				Main Pollutants					Particulate matter			Priority metals		Other metals						
				NOx Gg NO <sub>2</sub>	CO Gg	NMVOG Gg	SOx Gg SO <sub>2</sub>	NH <sub>3</sub> Gg	TSP Mg	PM10 Mg	PM2.5 Mg	Pb Mg	Cd Mg	Hg Mg	As Mg	Cr Mg	Cu Mg	Ni Mg	Se Mg	Zn Mg
I A 1 a	(a)	I A 1 a Public Electricity and Heat Production		44,79	11,14	6,02	10,46		1112,53	906,05	751,92	2,36	0,33	1,49	0,36	1,22	1,21	3,49	0,57	13,51
I A 1 b	(a)	I A 1 b Petroleum refining		1,62	0,26	0	0,67		11,37	9,1	7,96	0,04	0,02	0,01	0,02	0,06	0,02	1,07	0,02	0
I A 1 c	(a)	I A 1 c Manufacture of Solid Fuels and Other Energy Industries		2,5	0,69	0,05	0,01		2,51	2,51	2,51									
I A 2	(a)	I A 2 Manufacturing Industries and Construction	A	27,38	18,45	4,88	7,34	0	1833,44	1605,41	1423	1,09	0,18	0,16	0,19	0,68	0,7	5,45	0,32	1,66
I A 2 a	(a)	I A 2 a Iron and Steel							171,4	51,42	7,71	0,62	0,01		0,03	0,09		0,11	0,43	0,43
I A 2 b	(a)	I A 2 b Non-ferrous Metals							34,68	31,23	14,31	0,01	0				0			0
I A 2 c	(a)	I A 2 c Chemicals																		
I A 2 d	(a)	I A 2 d Pulp, Paper and Print																		
I A 2 e	(a)	I A 2 e Food Processing, Beverages and Tobacco																		
I A 2 f	(a)	I A 2 f Other (Please specify in a covering note)																		
I A 3 a ii (i)		I A 3 a ii Civil Aviation (Domestic, LTO)		0,27	0,78	0,13	0	0	1,68	1,68	1,68	1,34	0		0	0,03	0	0	0	0,02
I A 3 a ii (ii)		I A 3 a ii Civil Aviation (Domestic, Cruise)		0,51	0,12	0,02	0	0	1,91	1,91	1,91	0	0	0	0	0	0,06	0	0	0,04
I A 3 b	(a)	I A 3 b Road Transportation	A																	

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting								
				Main Pollutants					Particulate matter			Priority metals			Other metals						
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn	
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	
I A 3 b i		I A 3 b i R.T., Passenger cars		33,75	267,41	21,76	0,20	2,27	693,63	693,63	693,63	0,05	0,02				0,10	3,44	0,14	0,02	2,02
I A 3 b ii		I A 3 b ii R.T., Light duty vehicles		9,98	16,60	1,94	0,06	0,05	1702,94	1702,94	1702,94	0,00	0,01				0,03	1,01	0,04	0,01	0,60
I A 3 b iii		I A 3 b iii R.T., Heavy duty vehicles		26,53	6,72	2,99	0,09	0,01	1331,86	1331,86	1331,86	0,00	0,01				0,05	1,54	0,06	0,01	0,91
I A 3 b iv		I A 3 b iv R.T., Mopeds & Motorcycles		0,09	11,80	2,57	0,00	0,00	45,55	45,55	45,55	0,00	0,00				0,00	0,03	0,00	0,00	0,02
I A 3 b v		I A 3 b v R.T., Gasoline evaporation				7,77															
I A 3 b vi		I A 3 b vi R.T., Automobile tyre and brake wear							5025,28	624,72	323,06										
I A 3 b vii		I A 3 b vii R.T., Automobile road abrasion							9738,40	488,97	0,00										
I A 3 c	(a)	I A 3 c Railways		1,98	0,32	0,13	0,01	0	149,92	149,92	149,92	0	0				0	0,11	0	0	0,07
I A 3 d ii		I A 3 d ii National Navigation		6,92	10,92	6,04	1,38	0	419,95	399,58	380,22	0,02	0	0	0,02	0,01	0,06	1,12	0,03	0,09	
I A 3 e	(a)	I A 3 e Other (Please specify in a covering note)	A																		
I A 3 e i		I A 3 e i Pipeline compressors																			
I A 3 e ii		I A 3 e ii Other mobile sources and machinery																			
I A 4 a	(a)	I A 4 a Commercial / Institutional		1,11	0,82	0,58	0,25		142,11	138,86	130,68	0,17	0,02	0,03	0,01	0,02	0,02	0,14	0,02	0,19	
I A 4 b	(a)	I A 4 b Residential	A																		
I A 4 b i		I A 4 b i Residential plants		5,15	141,01	10,65	1,56		2983,33	2838,96	2686,01	0,13	0,11	0,15	0,04	0,03	0,14	0,04	0,15	2,31	
I A 4 b ii		I A 4 b ii Household and gardening (mobile)		0,25	49,6	4,34	0	0	27,06	27,06	27,06	0	0				0	0,05	0	0	0,03

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting									Additional reporting							
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
<b>1 A 4 c</b>	(a)	<b>1 A 4 c Agriculture / Forestry / Fishing</b>	A																	
1 A 4 c i		1 A 4 c i Stationary																		
1 A 4 c ii		1 A 4 c ii Off-road Vehicles and Other Machinery		1,4	1,36	1,78	1,35		114,74	90,99	71,51	0,05	0,02	0,02	0,03	0,06	0,03	1,07	0,02	0,06
1 A 4 c iii		1 A 4 c iii National Fishing		21,47	21,78	4,8	0,4	0	2169,34	2061,54	1959,12	0	0		0,02	0,7	0,03	0	0,41	
1 A 5 a	(a)	1 A 5 a Other, Stationary (including Military)		11,92	1,61	0,53	0,83	0	375,94	357,16	339,32	0,02	0	0,01	0,01	0,01	0,01	0,01	0,04	0,1
1 A 5 b	(a)	1 A 5 b Other, Mobile (Including military)		0,61	0,3	0,07	0	0	39,27	39,27	39,27	0,09	0	0	0	0	0,05	0	0	0,03
<b>1 B 1</b>	(a)	<b>1 B 1 Fugitive Emissions from Solid Fuels</b>	A																	
1 B 1 a	(a)	1 B 1 a Coal Mining and Handling			23,51				1038,6	415,44	41,54									
1 B 1 b	(a)	1 B 1 b Solid fuel transformation																		
1 B 1 c	(a)	1 B 1 c Other (Please specify in a covering note)																		
<b>1 B 2</b>	(a)	<b>1 B 2 Oil and natural gas</b>	A																	
1 B 2 a	(a)	1 B 2 a Oil	A																	
1 B 2 a i	(a)	1 B 2 a i Exploration Production, Transport																		
1 B 2 a iv	(a)	1 B 2 a iv Refining / Storage				4,34	0,67													
1 B 2 a v	(a)	1 B 2 a v Distribution of oil products				1,07														
1 B 2 a vi	(a)	1 B 2 a vi Other																		
1 B 2 b	(a)	1 B 2 b Natural gas		0		0,44	0													
1 B 2 c	(a)	1 B 2 c Venting and flaring		3,35	2,17	0,95	0,05		1,08	1,08	1,08	0	0	0	0	0	0	0	0	0

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting										Additional reporting						
				Main Pollutants					Particulate matter			Priority metals		Other metals						
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
2 A	(a)	2 A MINERAL PRODUCTS (b) A																		
2 A 1	(a)	2 A 1 Cement Production																		
2 A 2	(a)	2 A 2 Lime Production																		
2 A 3	(a)	2 A 3 Limestone and Dolomite Use																		
2 A 4	(a)	2 A 4 Soda Ash Production and use																		
2 A 5	(a)	2 A 5 Asphalt Roofing																		
2 A 6	(a)	2 A 6 Road Paving with Asphalt																		
2 A 7	(a)	2 A 7 Other including Non Fuel Mining & Construction (Please specify in a covering note)																		
2 B	(a)	2 B CHEMICAL INDUSTRY A																		
2 B 1	(a)	2 B 1 Ammonia Production																		
2 B 2	(a)	2 B 2 Nitric Acid Production																		
2 B 3	(a)	2 B 3 Adipic Acid Production																		
2 B 4	(a)	2 B 4 Carbide Production																		
2 B 5	(a)	2 B 5 Other (Please specify in a covering note)																		
2 C	(a)	2 C METAL PRODUCTION																		
2 D	(a)	2 D OTHER PRODUCTION (b) A																		
2 D 1	(a)	2 D 1 Pulp and Paper																		
2 D 2	(a)	2 D 2 Food and Drink																		
2 G	(a)	2 G OTHER (Please specify in a covering note)																		

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP			A = Allowable Aggregation	Yearly minimum reporting										Additional reporting						
				Main Pollutants					Particulate matter			Priority metals			Other metals					
				NOx	CO	NMVOG	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn
				Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg
3 A	(a)	3 A PAINT APPLICATION				23,22														
3 B	(a)	3 B DEGREASING AND DRY CLEANING																		
3 C	(a)	3 C CHEMICAL PRODUCTS, MANUFACTURE AND PROCESSING				2,14														
3 D	(a)	3 D OTHER including products containing HMs and POPs (Please specify in a covering note)				12,64														
4 B	(a)	4 B MANURE MANAGEMENT (c)	A																	
4 B 1	(a)	4 B 1 Cattle																		
4 B 1 a	(a)	4 B 1 a Dairy					16,81	600,67	270,29	60,09										
4 B 1 b	(a)	4 B 1 b Non-Dairy					7,16	1236,83	556,55	123,73										
4 B 2	(a)	4 B 2 Buffalo																		
4 B 3	(a)	4 B 3 Sheep																		
4 B 4	(a)	4 B 4 Goats					0,13													
4 B 5	(a)	4 B 5 Camels and Llamas					0,01													
4 B 6	(a)	4 B 6 Horses																		
4 B 7	(a)	4 B 7 Mules and Asses					1,03													
4 B 8	(a)	4 B 8 Swine																		
4 B 9	(a)	4 B 9 Poultry					40,76	9830,57	4423,96	982,65										
4 B 13	(a)	4 B 13 Other					5,03	2523,27	1135,84	252,12										
4 C	(a)	4 C RICE CULTIVATION					4,8													

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

NFR sectors to be reported to CLRTAP		A = Allowable Aggregation	Yearly minimum reporting										Additional reporting							
			Main Pollutants					Particulate matter			Priority metals		Other metals							
			NOx	CO	NM VOC	SOx	NH3	TSP	PM10	PM2.5	Pb	Cd	Hg	As	Cr	Cu	Ni	Se	Zn	
Gg NO <sub>2</sub>	Gg	Gg	Gg SO <sub>2</sub>	Gg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg	Mg			
4 D	(a)	4 D AGRICULTURAL SOILS	A																	
4 D 1	(a)	4 D 1 Direct Soil Emission				1,21		24,22												
4 F	(a)	4 F FIELD BURNING OF AGRICULTURAL WASTES																		
4 G	(a)	4 G OTHER (d)																		
5 B	(a)	5 B FOREST AND GRASSLAND CONVERSION																		
6 A	(a)	6 A SOLID WASTE DISPOSAL ON LAND																		
6 B	(a)	6 B WASTE-WATER HANDLING																		
6 C	(a)	6 C WASTE INCINERATION (e)																		
6 D	(a)	6 D OTHER WASTE (f)																		
7	(a)	7 OTHER																		
<b>National Total</b>				201,987,743	587,376,605	123,505,957	25,334,513	102,285,711	433,359,848	204,034,769	13,552,355	6,066,299	0,725,451	1,87	0,71	2,377,256	9,266,735	12,778,159	1,635,451	23,125,137

Memo Items																				
1 A 3 a i (i)	(a)	International Aviation (LTO)		1,07	0,62	0,11	0,01	0	3,91	3,91	3,91	0,11	0	0	0	0	0,13	0,01	0	0,08
1 A 3 a i (ii)	(a)	International Aviation (Cruise)		8,53	1,12	0,25	0,07	0	34,47	34,47	34,47	0	0,01	0	0	0,03	1,15	0,05	0,01	0,68
1 A 3 d i	(a)	International Navigation		98,72	8,4	2,64	54,37		60,99,24	57,94,28	55,04,57	0,18	0,02	0,04	0,34	0,15	0,34	19,05	0,35	0,82
5 E	(a)	5 E Other																		
X		X (11 08 Volcanoes)																		

- (a) Sectors already reported to UNFCCC for NOx, CO, NMVOC, SO<sub>2</sub>.
- (b) Including Product handling.
- (c) Including NH<sub>3</sub> from Enteric Fermentation.
- (d) Including PM sources.
- (e) Excludes waste incineration for energy (this is included in 1 A 1).
- (f) Includes accidental fires.

Note 1: Main Pollutants should cover the timespan from 1980 to latest year.

HM should cover the timespan from 1990 to latest year.

PM should cover the timespan from 2000 to latest year.

Note 2: The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.



**TABLE IV IB: National sector emissions: Persistent organic pollutants**  
Version 2002-1

COUNTRY: DK (as ISO2 code)  
DATE: 14.02.2003 (as DD.MM.YYYY)  
YEAR: 1990 (as YYYY, year of Emissions)

These five yellow lines will not be read by UNECE! These lines can be modified freely for your own reference purposes.  
Footnotes to the emission figures reported should be submitted together with the emission data, but in a separate document.  
Please fill out the blue marked fields. You may use the aggregation levels instead of the gray marked fields in aggregation.  
You must use for each field either a number or one of the following codes (capitals, no dots in between, see EB.AIR/GE.1/2002/2): NO, NA, NE, IE, C  
Footnotes or any other information entered into this table will not be taken into account.

NFR sectors to be reported to CLRTAP		Yearly minimum reporting																		Additional reporting								
		ANNEX I (1)									ANNEX II (2)									ANNEX III (3)					OTHER (4)			
		kg Aldrin	kg Chlordane	kg Dibromobenzene	kg Dieldrin	kg Endrin	kg Heptachlor	kg Hexachloro-biphenyl	kg Mirex	kg Toxaphene	kg DDE	kg DDT	kg PCB	g/l-Toq Dioxin	Mg gamma-hexachlorocyclohexane	Mg hexachlorobenzene	PAH		Mg pyrene (1,2,3,4)-biphenyl	Mg Total PAH	kg PCB	kg PCP	kg SCCP					
																	Mg fluoranthene	Mg benz[a]anthracene										
		Aggregation																										
1.A.1.a	1.A.1.a Public Electricity and Heat Production															0.00	0.00	0.00	0.00									
1.A.1.b	1.A.1.b Petroleum refining															0.00	0.00	0.00	0.00									
1.A.1.c	1.A.1.c Manufacture of Solid fuels and Other Energy Industries															0.00	0.00	0.00	0.00									
1.A.2	1.A.2 Manufacturing Industries and Construction															0.00	0.00	0.00	0.00									
1.A.2.a	1.A.2.a Iron and Steel															0.00	0.00	0.00	0.00									
1.A.2.b	1.A.2.b Non-ferrous Metals																											
1.A.2.c	1.A.2.c Chemicals																											
1.A.2.d	1.A.2.d Pulp, Paper and Print																											
1.A.2.e	1.A.2.e Food Processing, Beverages & Tobacco																											
1.A.2.f	1.A.2.f Other (Please specify in a covering note)																											
1.A.3.a.ii(i)	1.A.3.a.ii Civil Aviation (Domestic, ITO)															0.00	0.00	0.00	0.00									
1.A.3.a.ii(ii)	1.A.3.a.ii Civil Aviation (Domestic, Cruise)																											
1.A.3.b	1.A.3.b Road Transportation																											
1.A.3.b.i	1.A.3.b.i R.T., Passenger cars															0.00	0.00	0.00	0.00									
1.A.3.b.ii	1.A.3.b.ii R.T., Light duty vehicles															0.00	0.00	0.00	0.00									
1.A.3.b.iii	1.A.3.b.iii R.T., Heavy duty vehicles															0.00	0.00	0.00	0.00									
1.A.3.b.iv	1.A.3.b.iv R.T., Mopeds & Motorcycles															0.00	0.00	0.00	0.00									
1.A.3.b.v	1.A.3.b.v R.T., Gasoline evaporation															0.00	0.00	0.00	0.00									
1.A.3.b.vi	1.A.3.b.vi R.T., Automobile tyre and brake wear																											
1.A.3.b.vii	1.A.3.b.vii R.T., Automobile road abrasion																											
1.A.3.c	1.A.3.c Railways															0.00	0.00	0.00	0.00									





4 C	4 C RICE CULTIVATION																							
4 D	4 D AGRICULTURAL SOILS																							
4 D 1	4 D 1 Direct Soil Emission																							
4 F	4 F FIELD BURNING OF AGRICULTURAL WASTES																							
4 G	4 G OTHER (c)																							
5 B	5 B FOREST AND GRASSLAND CONVERSION																							
6 A	6 A SOLID WASTE DISPOSAL ON LAND																							
6 B	6 B WASTEWATER HANDLING																							
6 C	6 C WASTE INCINERATION (d)																							
6 D	6 D OTHER WASTE (e)																							
	7 OTHER																							
	National Total	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NE	NE	1.80	2.10	0.70	1.40			NO	NO	NE

Memo Items																								
1 a 3 a i (i)	International Aviation (LTO)															0.000	0.000	0.000	0.000					
1 a 3 a i (ii)	International Aviation (Cruise)																							
1 a 3 d	International Marine (b)																							
5 E	5 E Other																							
X	X (11 08 Volcanoes)																							

(a) Including Handling;

(b) Including NH<sub>3</sub> from Enteric Fermentation;

(c) Including PM sources;

(d) Excludes waste incineration for energy (this is included in 1 A 1);

(e) Includes accidental fires.

Notes 1: POPs should cover the timespan from 1990 to the latest year.

(1) The POPs listed in annex I to the Protocol on POPs are substances scheduled for elimination; DDT and PCBs are also listed in annex I;

(2) The POPs listed in annex II to the Protocol on POPs are substances scheduled for restrictions on use;

(3) The POPs listed in annex III to the Protocol on POPs are substances referred to in article 3, para. 5 (a), of the Protocol. Polycyclic aromatic hydrocarbons (PAHs): For the purpose of the emission inventories, the following four indicator compounds should be used: benzo(b)pyrene, benzo(k)fluoranthene, benzo(k)fluoranthene and indeno(1,2,3-cd)pyrene. HCB is also included in annex I to the Protocol as a substance for elimination.

(4) See article 8 of the Protocol (Research, development and monitoring: reporting voluntary).

Note 2: The A-Allowed Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.

**TABLE IV IB: National sector emissions: Persistent organic pollutants**  
Version 2002-1

COUNTRY: DK (as ISO2 code)  
 DATE: 14.02.2003 (as DD.MM.YYYY)  
 YEAR: 1991 (as YYYY, year of Emissions)

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 Please fill out the blue marked fields. You may use the aggregation levels instead of the gray marked fields in aggregation.  
 You must use for each field either a number or one of the following codes (capitals, no dots in between, see EB.AIR/GE.1/2002/2): NO , NA , NE , IE , C  
 Footnotes or any other information entered into this table will not be taken into account.

NFR sectors to be reported to CLRTAP		Yearly minimum reporting																		Additional reporting			
		ANNEX I (1)									ANNEX II (2)					ANNEX III (3)				OTHER (4)			
		kg	kg	kg	kg	kg	kg	kg	kg	kg	g I-Teq	g I-Teq	g I-Teq	g I-Teq	g I-Teq	Mg	Mg	Mg	Mg	Mg	kg	kg	kg
		As	Ashlin	Chloride	Chlorobenzene	Dibutyltin	Endrin	Heptachlor	Hexachloro-biphenyl	Mirex	Toxaphene	HCH	DDT	PCB	DDX	gamma-bromocyclohexane	fluoranthene	Benzo(a)pyrene	fluoranthene, Non(a)	pyrene (1,2,3-cd)	Benzo	Total PAH	PCB
1.A.1.a	1.A.1.a Public Electricity and Heat Production														0.00	0.00	0.00	0.00	0.00				
1.A.1.b	1.A.1.b Petroleum refining														0.00	0.00	0.00	0.00	0.00				
1.A.1.c	1.A.1.c Manufacture of Solid fuels and Other Energy Industries														0.00	0.00	0.00	0.00	0.00				
1.A.2	1.A.2 Manufacturing Industries and Construction														0.00	0.00	0.00	0.00	0.00				
1.A.2.a	1.A.2.a Iron and Steel														0.00	0.00	0.00	0.00	0.00				
1.A.2.b	1.A.2.b Non-ferrous Metals																						
1.A.2.c	1.A.2.c Chemicals																						
1.A.2.d	1.A.2.d Pulp, Paper and Print																						
1.A.2.e	1.A.2.e Food Processing, Beverages & Tobacco																						
1.A.2.f	1.A.2.f Other (Please specify in a covering note)																						
1.A.3.a.ii(i)	1.A.3.a.ii Civil Aviation (Domestic, ITO)														0.00	0.00	0.00	0.00	0.00				
1.A.3.a.ii(ii)	1.A.3.a.ii Civil Aviation (Domestic, Cruise)																						
1.A.3.b	1.A.3.b Road Transportation																						
1.A.3.b.i	1.A.3.b.i R.T., Passenger cars														0.00	0.00	0.00	0.00	0.00				
1.A.3.b.ii	1.A.3.b.ii R.T., Light duty vehicles														0.00	0.00	0.00	0.00	0.00				
1.A.3.b.iii	1.A.3.b.iii R.T., Heavy duty vehicles														0.00	0.00	0.00	0.00	0.00				
1.A.3.b.iv	1.A.3.b.iv R.T., Mopeds & Motorcycles														0.00	0.00	0.00	0.00	0.00				
1.A.3.b.v	1.A.3.b.v R.T., Gasoline evaporation																						
1.A.3.b.vi	1.A.3.b.vi R.T., Automobile tyre and brake wear																						
1.A.3.b.vii	1.A.3.b.vii R.T., Automobile road abrasion																						
1.A.3.c	1.A.3.c Railways														0.00	0.00	0.00	0.00	0.00				









**TABLE IV IB: National sector emissions: Persistent organic pollutants**  
Version 2002-1

COUNTRY: DK (as ISO2 code)  
DATE: 14.02.2003 (as DD.MM.YYYY)  
YEAR: 1992 (as YYYY, year of Emissions)

These five yellow lines will not be read by UNECE! These lines can be modified freely for your own reference purposes.  
Footnotes to the emission figures reported should be submitted together with the emission data, but in a separate document.  
Please fill out the blue marked fields. You may use the aggregation levels instead of the gray marked fields in aggregation.  
You must use for each field either a number or one of the following codes (capitals, no dots in between, see EB.AIR/GE.1/2002/2): NO, NA, NE, IE, C  
Footnotes or any other information entered into this table will not be taken into account.

NFR sectors to be reported to CLRTAP		Yearly minimum reporting																		Additional reporting			
		ANNEX I (1)						ANNEX II (2)						ANNEX III (3)						OTHER (4)			
		kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	g I-Toq	Mg	Mg	Mg	Mg	Mg	kg	kg	kg	
1.A.1.a	1.A.1.a Public Electricity and Heat Production															0.00	0.00	0.00	0.00				
1.A.1.b	1.A.1.b Petroleum refining															0.00	0.00	0.00	0.00				
1.A.1.c	1.A.1.c Manufacture of Solid fuels and Other Energy Industries															0.00	0.00	0.00	0.00				
1.A.2	1.A.2 Manufacturing Industries and Construction															0.00	0.00	0.00	0.00				
1.A.2.a	1.A.2.a Iron and Steel															0.00	0.00	0.00	0.00				
1.A.2.b	1.A.2.b Non-ferrous Metals																						
1.A.2.c	1.A.2.c Chemicals																						
1.A.2.d	1.A.2.d Pulp, Paper and Print																						
1.A.2.e	1.A.2.e Food Processing, Beverages & Tobacco																						
1.A.2.f	1.A.2.f Other (Please specify in a covering note)																						
1.A.3.a.ii(i)	1.A.3.a.ii Civil Aviation (Domestic, ITO)															0.00	0.00	0.00	0.00				
1.A.3.a.ii(ii)	1.A.3.a.ii Civil Aviation (Domestic, Cruise)																						
1.A.3.b	1.A.3.b Road Transportation																						
1.A.3.b.i	1.A.3.b.i R.T., Passenger cars															0.00	0.00	0.00	0.00				
1.A.3.b.ii	1.A.3.b.ii R.T., Light duty vehicles															0.00	0.00	0.00	0.00				
1.A.3.b.iii	1.A.3.b.iii R.T., Heavy duty vehicles															0.00	0.00	0.00	0.00				
1.A.3.b.iv	1.A.3.b.iv R.T., Mopeds & Motorcycles															0.00	0.00	0.00	0.00				
1.A.3.b.v	1.A.3.b.v R.T., Gasoline evaporation															0.00	0.00	0.00	0.00				
1.A.3.b.vi	1.A.3.b.vi R.T., Automobile tyre and brake wear																						
1.A.3.b.vii	1.A.3.b.vii R.T., Automobile road abrasion																						
1.A.3.c	1.A.3.c Railways															0.00	0.00	0.00	0.00				







**TABLE IV IB: National sector emissions: Persistent organic pollutants**  
Version 2002-1

COUNTRY: DK (as ISO2 code)  
DATE: 14.02.2003 (as DD.MM.YYYY)  
YEAR: 1993 (as YYYY, year of Emmissions)

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Footnotes to the emission figures reported should be submitted together with the emission data, but in a separate document.  
Please fill out the blue marked fields. You may use the aggregation levels instead of the gray marked fields in aggregation.  
You must use for each field either a number or one of the following codes (capital, no dots in between, see EB.AIR/GE.1/2002/2): NO, NA, NE, IE, C  
Footnotes or any other information entered into this table will not be taken into account.

NFR sectors to be reported to CLRTAP		Yearly minimum reporting																				Additional reporting			
		ANNEX I (1)								ANNEX II (2)					ANNEX III (3)							OTHER (4)			
		kg	kg	kg	kg	kg	kg	kg	kg	PCB	DDE	DDT	PCB	g I-Toq	Mg	Mg	Mg	Mg	Mg	kg	PCB	PCP	kg	SCCP	
1 A 1 a	1 A 1 a Public Electricity and Heat Production														0.00	0.00	0.00	0.00							
1 A 1 b	1 A 1 b Petroleum refining														0.00	0.00	0.00	0.00							
1 A 1 c	1 A 1 c Manufacture of Solid fuels and Other Energy Industries														0.00	0.00	0.00	0.00							
1 A 2	1 A 2 Manufacturing Industries and Construction														0.00	0.00	0.00	0.00							
1 A 2 a	1 A 2 a Iron and Steel														0.00	0.00	0.00	0.00							
1 A 2 b	1 A 2 b Non-ferrous Metals																								
1 A 2 c	1 A 2 c Chemicals																								
1 A 2 d	1 A 2 d Pulp, Paper and Print																								
1 A 2 e	1 A 2 e Food Processing, Beverages & Tobacco																								
1 A 2 f	1 A 2 f Other (Please specify in a covering note)																								
1 A 3 a ii (i)	1 A 3 a ii Civil Aviation (Domestic, ITO)														0.00	0.00	0.00	0.00							
1 A 3 a ii (ii)	1 A 3 a ii Civil Aviation (Domestic, Cruise)																								
1 A 3 b	1 A 3 b Road Transportation																								
1 A 3 b i	1 A 3 b i R.T., Passenger cars														0.00	0.00	0.00	0.00							
1 A 3 b ii	1 A 3 b ii R.T., Light duty vehicles														0.00	0.00	0.00	0.00							
1 A 3 b iii	1 A 3 b iii R.T., Heavy duty vehicles														0.00	0.00	0.00	0.00							
1 A 3 b iv	1 A 3 b iv R.T., Mopeds & Motorcycles														0.00	0.00	0.00	0.00							
1 A 3 b v	1 A 3 b v R.T., Gasoline evaporation														0.00	0.00	0.00	0.00							
1 A 3 b vi	1 A 3 b vi R.T., Automobile tyre and brake wear																								
1 A 3 b vii	1 A 3 b vii R.T., Automobile road abrasion																								
1 A 3 c	1 A 3 c Railways														0.00	0.00	0.00	0.00							









**TABLE IV IB: National sector emissions: Persistent organic pollutants**  
Version 2002-1

COUNTRY: DK (as ISO2 code)  
DATE: 14.02.2003 (as DD.MM.YYYY)  
YEAR: 1994 (as YYYY, year of Emissions)

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Footnotes to the emission figures reported should be submitted together with the emission data, but in a separate document.  
Please fill out the blue marked fields. You may use the aggregation levels instead of the gray marked fields in aggregation.  
You must use for each field either a number or one of the following codes (capital, no dots in between, see EB.AIR/GE.1/2002/2): NO, NA, NE, IE, C  
Footnotes or any other information entered into this table will not be taken into account.

NFR sectors to be reported to CLRTAP		Yearly minimum reporting																		Additional reporting				
		ANNEX I (1)						ANNEX II (2)						ANNEX III (3)						OTHER (4)				
		kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	g I-Toq	BPOX	Mg	Mg	Mg	Mg	Mg	kg	kg	kg	kg
As	Adkin	Chlordane	Chlorobenzene	Dieldrin	Endrin	Heptachlor	Heptachloro-biphenyl	Mirex	Toxaphene	DDE	DDEP	PCB	Dioxin	Polynuclear aromatic hydrocarbon	Polynuclear aromatic hydrocarbon	PAH	Polynuclear aromatic hydrocarbon	Polynuclear aromatic hydrocarbon	Polynuclear aromatic hydrocarbon	Total L4	PCB	PCP	SCCP	
1.A.1.a	1.A.1.a Public Electricity and Heat Production														0.00	0.00	0.00	0.00						
1.A.1.b	1.A.1.b Petroleum refining														0.00	0.00	0.00	0.00						
1.A.1.c	1.A.1.c Manufacture of Solid fuels and Other Energy Industries														0.00	0.00	0.00	0.00						
1.A.2	1.A.2 Manufacturing Industries and Construction														0.00	0.00	0.00	0.00						
1.A.2.a	1.A.2.a Iron and Steel														0.00	0.00	0.00	0.00						
1.A.2.b	1.A.2.b Non-ferrous Metals																							
1.A.2.c	1.A.2.c Chemicals																							
1.A.2.d	1.A.2.d Pulp, Paper and Print																							
1.A.2.e	1.A.2.e Food Processing, Beverages & Tobacco																							
1.A.2.f	1.A.2.f Other (Please specify in a covering note)																							
1.A.3.a.ii(i)	1.A.3.a.ii Civil Aviation (Domestic, ITO)														0.00	0.00	0.00	0.00						
1.A.3.a.ii(ii)	1.A.3.a.ii Civil Aviation (Domestic, Cruise)																							
1.A.3.b	1.A.3.b Road Transportation																							
1.A.3.b.i	1.A.3.b.i R.T., Passenger cars														0.00	0.00	0.00	0.00						
1.A.3.b.ii	1.A.3.b.ii R.T., Light duty vehicles														0.00	0.00	0.00	0.00						
1.A.3.b.iii	1.A.3.b.iii R.T., Heavy duty vehicles														0.00	0.00	0.00	0.00						
1.A.3.b.iv	1.A.3.b.iv R.T., Mopeds & Motorcycles														0.00	0.00	0.00	0.00						
1.A.3.b.v	1.A.3.b.v R.T., Gasoline evaporation														0.00	0.00	0.00	0.00						
1.A.3.b.vi	1.A.3.b.vi R.T., Automobile tyre and brake wear																							
1.A.3.b.vii	1.A.3.b.vii R.T., Automobile road abrasion																							
1.A.3.c	1.A.3.c Railways														0.00	0.00	0.00	0.00						







**TABLE IV B: National sector emissions: Persistent organic pollutants**  
Version 2002-1

COUNTRY: DK (as ISO2 code)  
 DATE: 14.02.2003 (as DD.MM.YYYY)  
 YEAR: 1995 (as YYYY, year of Emissions)

These five yellow lines will not be read by UNECE! These lines can be modified freely for your own reference purposes.  
 Footnotes to the emission figures reported should be submitted together with the emission data, but in a separate document.  
 Please fill out the blue marked fields. You may use the aggregation levels instead of the gray marked fields in aggregation.  
 You must use for each field either a number or one of the following codes (capital, no dots in between, see EB.AIR/GE.1/2002/2): NO, NA, NE, IE, C  
 Footnotes or any other information entered into this table will not be taken into account.

NFR sectors to be reported to CLRTAP		Yearly minimum reporting																		Additional reporting								
		ANNEX I (1)						ANNEX II (2)						ANNEX III (3)						OTHER (4)								
A.C. Abbreviable Aggregation		kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg						
		Ashlin	Chloroac	Chlorobenz	Dibutyltin	Erskin	Heptachlor	Hexachloro-biphenyl	Mercur	Toluene	PCB	PCH	PCH	PCH	DOP	PCB	g I-Toq	DDX	pyrene fluoranthene	benzo(a)pyrene	PAH	fluoranthene benzo(a)pyrene	pyrene (1,2,3,4)	Benzo	total 1,4	PCB	PCP	SCP
1.A.1.a	1.A.1.a Public Electricity and Heat Production																											
1.A.1.b	1.A.1.b Petroleum refining																	0.001	0.000	0.010	0.010							
1.A.1.c	1.A.1.c Manufacture of Solid fuels and Other Energy Industries																	0.000	0.001	0.000	0.000							
1.A.2	1.A.2 Manufacturing Industries and Construction																	0.017	0.007	0.010	0.010							
1.A.2.a	1.A.2.a Iron and Steel																											
1.A.2.b	1.A.2.b Non-ferrous Metals																											
1.A.2.c	1.A.2.c Chemicals																											
1.A.2.d	1.A.2.d Pulp, Paper and Print																											
1.A.2.e	1.A.2.e Food Processing, Beverages & Tobacco																											
1.A.2.f	1.A.2.f Other (Please specify in a covering note)																											
1.A.3.a.ii(i)	1.A.3.a.ii Civil Aviation (Domestic, ITO)																	0.000	0.000	0.000	0.000							
1.A.3.a.ii(ii)	1.A.3.a.ii Civil Aviation (Domestic, Cruise)																											
1.A.3.b	1.A.3.b Road Transportation																											
1.A.3.b.i	1.A.3.b.i R.T., Passenger cars																	0.000	0.000	0.010	0.000							
1.A.3.b.ii	1.A.3.b.ii R.T., Light duty vehicles																	0.010	0.000	0.010	0.010							
1.A.3.b.iii	1.A.3.b.iii R.T., Heavy duty vehicles																	0.000	0.010	0.010	0.000							
1.A.3.b.iv	1.A.3.b.iv R.T., Mopeds & Motorcycles																	0.000	0.000	0.010	0.000							
1.A.3.b.v	1.A.3.b.v R.T., Gasoline evaporation																											
1.A.3.b.vi	1.A.3.b.vi R.T., Automobile tyre and brake wear																											
1.A.3.b.vii	1.A.3.b.vii R.T., Automobile road abrasion																											
1.A.3.c	1.A.3.c Railways																	0.000	0.001	0.000	0.000							















4 C	4 C RICE CULTIVATION																					
4 D	4 D AGRICULTURAL SOILS																					
4 D 1	4 D 1 Direct Soil Emission																					
4 F	4 F FIELD BURNING OF AGRICULTURAL WASTES																					
4 G	4 G OTHER (c)																					
5 B	5 B FOREST AND GRASSLAND CONVERSION																					
6 A	6 A SOLID WASTE DISPOSAL ON LAND																					
6 B	6 B WASTEWATER HANDLING																					
6 C	6 C WASTE INCINERATION (d)																					
6 D	6 D OTHER WASTE (e)																					
	7 OTHER																					
	<b>National Total</b>	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	2.05	2.05	0.98	1.64	NO	NO	NE

<i>Memo Items</i>																						
1 a 3 a i (i)	International Aviation (LTO)															0.000	0.000	0.000	0.000			
1 a 3 a i (B)	International Aviation (Cruise)																					
1 a 3 d i	International Marine (b)																					
5 E	5 E Other																					
X	X (11 08 Volcanoes)																					

- (a) Including Handling;  
 (b) Including NH3 from Enteric Fermentation;  
 (c) Including PM sources;  
 (d) Excludes waste incineration for energy (this is included in 1 A 1);  
 (e) Includes accidental fires.

**Notes 1:** POPs should cover the timespan from 1990 to the latest year.

(1) The POPs listed in annex I to the Protocol on POPs are substances scheduled for elimination; DDT and PCBs are also listed in annex I;

(2) The POPs listed in annex II to the Protocol on POPs are substances scheduled for restrictions on use;

(3) The POPs listed in annex III to the Protocol on POPs are substances referred to in article 3, para. 5 (a), of the Protocol. Polycyclic aromatic hydrocarbons (PAHs): For the purpose of the emission inventories, the following four indicator compounds should be used: benzo(b)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene and indeno(1,2,3-cd)pyrene. HCB is also included in annex I to the Protocol as a substance for elimination.

(4) See article 8 of the Protocol (Research, development and monitoring: reporting voluntary).

**Note 2:** The A=Allowable Aggregation illustrates the level of aggregation that can be used if more detailed information is not available. Grey cells show which sectors can be aggregated into the sector marked A. Black cells occur when two possible levels of aggregation are possible.





















1.A.3.d.ii	1.A.3.d.ii National Navigation																			
1.A.3.e	1.A.3.e Other (Please specify in a covering note)	A											0.001	0.000	0.001	0.000				
1.A.3.e.i	1.A.3.e.i Pipeline compressors																			
1.A.3.e.ii	1.A.3.e.ii Other mobile sources and machinery																			
1.A.4.a	1.A.4.a Commercial / Institutional																			
1.A.4.b	1.A.4.b Residential	A											0.002	0.022	0.040	0.000				
1.A.4.b.i	1.A.4.b.i Residential plants																			
1.A.4.b.ii	1.A.4.b.ii Household and gardening (mobile)												1.075	2.000	0.600	1.100				
1.A.4.c	1.A.4.c Agriculture / Forestry / Fishing	A											0.000	0.000	0.000	0.000				
1.A.4.c.i	1.A.4.c.i Stationary																			
1.A.4.c.ii	1.A.4.c.ii Off-road Vehicles and Other Machinery												0.105	0.100	0.030	0.118				
1.A.4.c.iii	1.A.4.c.iii National Fishing												0.004	0.000	0.000	0.004				
1.A.5.a	1.A.5.a Other, Stationary (including Military)												0.001	0.000	0.000	0.001				
1.A.5.b	1.A.5.b Other, Mobile (Including military)																			
1.B.1	1.B.1 Fugitive Emissions from Solid Fuels	A											0.000	0.001	0.001	0.000				
1.B.1.a	1.B.1.a Coal Mining and Handling																			
1.B.1.b	1.B.1.b Solid fuel transformation																			
1.B.1.c	1.B.1.c Other (Please specify in a covering note)																			
1.B.2	1.B.2 Oil and natural gas	A																		
1.B.2.a	1.B.2.a Oil																			
1.B.2.a.i	1.B.2.a.i Exploration Production, Transport																			
1.B.2.a.iv	1.B.2.a.iv Refining / Storage																			
1.B.2.a.v	1.B.2.a.v Distribution of oil products																			
1.B.2.a.vi	1.B.2.a.vi Other																			
1.B.2.b	1.B.2.b Natural gas																			
1.B.2.c	1.B.2.c Venting and flaring																			
2.A	2.A MINERAL PRODUCTS (a)	A																		
2.A.1	2.A.1 Cement Production																			
2.A.2	2.A.2 Lime Production																			
2.A.3	2.A.3 Limestone and Dolomite Use																			
2.A.4	2.A.4 Soda Ash Production and use																			







**TABLE IV B: National sector emissions: Persistent organic pollutants**  
Version 2002-1

COUNTRY: DK (as ISO2 code)  
DATE: 14.02.2003 (as DD.MM.YYYY)  
YEAR: 2000 (as YYYY, year of Emissions)

These five yellow lines will not be read by UNECE! These lines can be modified freely for your own reference purposes.  
Footnotes to the emission figures reported should be submitted together with the emission data, but in a separate document.  
Please fill out the blue marked fields. You may use the aggregation levels instead of the gray marked fields in aggregation.  
You must use for each field either a number or one of the following codes (capitals, no dots in between, see EB.AIR/GE.1/2002/2): NO, NA, NE, IE, C  
Footnotes or any other information entered into this table will not be taken into account.

NFR sectors to be reported to CLRTAP		Yearly minimum reporting																		Additional reporting					
		ANNEX I (1)									ANNEX II (2)				ANNEX III (3)					OTHER (4)					
		Chloroacrolein	Chloroacetone	Chlorobenzene	Dibutyltin	Ethinyl	Heptachlor	Hexachloro-biphenyl	Mirex	Toxaphene	DDE	DDEP	PCB	p,p'-DDE	Dioxin	PCDD	PCDF	PCB	PAH				PCB	PCP	SCCP
																			benzo(a)anthracene	benzo(a)pyrene	benzo(b)fluoranthene	benzo(k)fluoranthene			
kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	g I-Teq	Mg	Mg	Mg	Mg	Mg	Mg	kg	kg	kg			
Agg	Agg	Agg	Agg	Agg	Agg	Agg	Agg	Agg	Agg	Agg	Agg	Agg	Agg	Agg	Agg	Agg	Agg	Agg	Agg	Agg	Agg	Agg			
1.A.1.a	1.A.1.a Public Electricity and Heat Production																								
1.A.1.b	1.A.1.b Petroleum refining														0.001	0.000	0.001	0.001							
1.A.1.c	1.A.1.c Manufacture of Solid fuels and Other Energy Industries														0.000	0.001	0.000	0.000							
1.A.2	1.A.2 Manufacturing Industries and Construction														0.000	0.000	0.000	0.000							
1.A.2.a	1.A.2.a Iron and Steel														0.000	0.000	0.000	0.000							
1.A.2.b	1.A.2.b Non-ferrous Metals																								
1.A.2.c	1.A.2.c Chemicals																								
1.A.2.d	1.A.2.d Pulp, Paper and Print																								
1.A.2.e	1.A.2.e Food Processing, Beverages & Tobacco																								
1.A.2.f	1.A.2.f Other (Please specify in a covering note)																								
1.A.3.a.ii(i)	1.A.3.a.ii Civil Aviation (Domestic, ITO)														0.000	0.000	0.000	0.000							
1.A.3.a.ii(ii)	1.A.3.a.ii Civil Aviation (Domestic, Cruise)																								
1.A.3.b	1.A.3.b Road Transportation																								
1.A.3.b.i	1.A.3.b.i R.T., Passenger cars														0.000	0.000	0.000	0.000							
1.A.3.b.ii	1.A.3.b.ii R.T., Light duty vehicles														0.001	0.001	0.001	0.001							
1.A.3.b.iii	1.A.3.b.iii R.T., Heavy duty vehicles														0.000	0.001	0.001	0.001							
1.A.3.b.iv	1.A.3.b.iv R.T., Mopeds & Motorcycles														0.000	0.001	0.001	0.000							
1.A.3.b.v	1.A.3.b.v R.T., Gasoline evaporation														0.000	0.000	0.000	0.000							
1.A.3.b.vi	1.A.3.b.vi R.T., Automobile tyre and brake wear																								
1.A.3.b.vii	1.A.3.b.vii R.T., Automobile road abrasion																								
1.A.3.c	1.A.3.c Railways														0.000	0.001	0.001	0.000							







**TABLE IV IB: National sector emissions: Persistent organic pollutants**  
Version 2002-1

COUNTRY: DK (as ISO2 code)  
DATE: 14.02.2003 (as DD.MM.YYYY)  
YEAR: 2001 (as YYYY, year of Emissions)

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Footnotes to the emission figures reported should be submitted together with the emission data, but in a separate document.  
Please fill out the blue marked fields. You may use the aggregation levels instead of the gray marked fields in aggregation.  
You must use for each field either a number or one of the following codes (capitals, no dots in between, see EB.AIR/GE.1/2002/2): NO, NA, NE, IE, C  
Footnotes or any other information entered into this table will not be taken into account.

NFR sectors to be reported to CLRTAP		Yearly minimum reporting																	Additional reporting							
		ANNEX I (1)							ANNEX II (2)					ANNEX III (3)					OTHER (4)							
		kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg					
Acetylene	Alkyl	Chloride	Chlorobenzene	Dibutyltin	Erkenin	Heptachlor	Hexachloro-biphenyl	Mirex	Toxaphene	HCH	DDE	PCB	g I-Toq	BDDX	pyrene benzo(a)	fluoranthene	benzo(a)	PAH	fluoranthene benzo(a)	pyrene (1,2,3,4)	BaP	Total PAH	PCB	PCP	SCCP	
1.A.1.a	1.A.1.a Public Electricity and Heat Production													7.7		0.001	0.000	0.000	0.010							
1.A.1.b	1.A.1.b Petroleum refining															0.000	0.001	0.000	0.000							
1.A.1.c	1.A.1.c Manufacture of Solid fuels and Other Energy Industries																									
1.A.2	1.A.2 Manufacturing Industries and Construction																									
1.A.2.a	1.A.2.a Iron and Steel																									
1.A.2.b	1.A.2.b Non-ferrous Metals													0.324												
1.A.2.c	1.A.2.c Chemicals													0.0024												
1.A.2.d	1.A.2.d Pulp, Paper and Print																									
1.A.2.e	1.A.2.e Food Processing, Beverages & Tobacco																									
1.A.2.f	1.A.2.f Other (Please specify in a covering note)																									
1.A.3.a.ii(i)	1.A.3.a.ii Civil Aviation (Domestic, ITO)															0.000	0.000	0.000	0.000							
1.A.3.a.ii(ii)	1.A.3.a.ii Civil Aviation (Domestic, Cruise)																									
1.A.3.b	1.A.3.b Road Transportation													1.5												
1.A.3.b.i	1.A.3.b.i R.T., Passenger cars															0.010	0.004	0.010	0.000							
1.A.3.b.ii	1.A.3.b.ii R.T., Light duty vehicles															0.010	0.010	0.010	0.010							
1.A.3.b.iii	1.A.3.b.iii R.T., Heavy duty vehicles															0.000	0.010	0.010	0.000							
1.A.3.b.iv	1.A.3.b.iv R.T., Mopeds & Motorcycles															0.000	0.000	0.000	0.000							
1.A.3.b.v	1.A.3.b.v R.T., Gasoline evaporation																									
1.A.3.b.vi	1.A.3.b.vi R.T., Automobile tyre and brake wear																									
1.A.3.b.vii	1.A.3.b.vii R.T., Automobile road abrasion																									
1.A.3.c	1.A.3.c Railways													0.75		0.000	0.001	0.001	0.000							









**TABLE IV 2A: Five-yearly, Minimum reporting of projected national total emissions of main pollutants**

Version 2002-1

COUNTRY: DK (as ISO2 code)  
 DATE: 14022003 (as DD.MM.YYYY)  
 YEAR: 2010-2020 (as YYYY, year of Emmissions)

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Footnotes to the emission figures reported should be submitted together with the emission data, but in a separate document.

Please fill out the blue marked fields.

You must use for each field either a number or one of the following codes (capitals, no dots in between, see EB.AIR/GE.1/2002/2): NO , NA , NE , IE , C

Footnotes or any other information entered into this table will not be taken into account.

Pollutant:	UNIT	Current legislation projections <sup>a)</sup>			Current reduction plans		
		2010	2015	2020	2010	2015	2020
Sulphur oxides (SO <sub>x</sub> as SO <sub>2</sub> )	Gg	56	50	50			
Nitrogen oxides (NO <sub>x</sub> as NO <sub>2</sub> )	Gg	146	130	120			
Non-methane volatile organic compounds (NMVOC)	Gg	83	80	75			
Ammonia (NH <sub>3</sub> )	Gg	83	83	83			

<sup>a)</sup> Current legislation projections should be based on the activity projections as reported in tables IV 2B, IV 2C, IV 2D, and IV 2E in annex IV.

Note:

For the definition of 'current legislation projections' and 'current reduction plans' please refer to paragraph 24 of the guidelines (chap. V).

**TABLE IV 2B: Five-yearly, Minimum reporting of energy consumption data**

Version 2002-1

COUNTRY: DK (as ISO2 code)  
 DATE: 14.02.2003 (as DD.MM.YYYY)  
 YEAR: 1990 (as YYYY, year of Emmissions)

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Footnotes to the emission figures reported should be submitted together with the emission data, but in a separate document.

Please fill out the blue marked fields.

You must use for each field either a number or one of the following codes (capitals, no dots in between, see EB.AIR/GE.1/2002/2): NO , NA , NE , IE , C

Footnotes or any other information entered into this table will not be taken into account.

SOURCE/FUEL:		Hard coal	Brown coal	Other solid fuels	Natural Gas	Derived gases	Heavy fuel oil	Other liquid fuels	Hydrogen	Biomass	Renewable	Crude oil	Nuclear	Hydro
UNIT:		TJ	TJ	TJ	TJ	TJ	TJ	TJ	TJ	TJ	TJ	TJ	TJ	TJ
NFR 1A1a	Power Plants	236441,01	IE	15470,8	17575,03	IE	10044,94	2250	NO	8257,1	NE		NO	NE
NFR 1A1b,c	Conversion	NO	NO	NO	9132,6	IE	1309,2	13978,1	NO		NE			
NFR 1A2a-f	Industry	15042,9	IE	NO	23423,16	IE	21049,9	15616,4	NO	5786	NE			
NFR 1A4a,bi,ci	Residential/ Commercial	3264	IE	NO	19584,8	IE	3324	65245,35	NO	15781,3	NE			
NFR 1A3aii,b,c,dii,eii + 1A4bii,cii,ciii + 1A5b	Transport	NO	NO	NO	IE		3559,81	157106,42	IE	NE	NE			
	Non-energy use <sup>a)</sup>	NE			NE	NE	NE	NE	NE	NE				
	<b>TOTAL</b>	254747,91	IE	15470,8	69715,59	IE	39287,85	254196,27	NO	29824,4	NE		NO	NE
	Refinery input											308682		

<sup>a)</sup> Should include use of all fuels, including feedstocks for petrochemical industry.

Notes:

Fuels used in this table are defined in terms of relation to the IPCC/IEA and CORINAIR NAPFUE categories in annex III, table IIIC, to these guidelines.

Nuclear, Hydro, Renewable: Primary energy equivalent for non-fossil fuels should be reported according to the total primary energy supply (TPES) convention of converting electricity into primary energy,

i.e. electricity generated in nuclear power plants with 33% efficiency, hydro, solar and wind with 100% efficiency and geothermal with 10% efficiency.

Energy consumption should be reported both for historical (1990, 1995 and 2000) and projection years (2010, 2015 and 2020) as in the table above.

If data for this sectoral resolution are not available, they may be submitted in a different aggregation (consistent with NFR) with documentation on the aggregation used.

**TABLE IV 2B: Five-yearly, Minimum reporting of energy consumption data**

Version 2002-1

COUNTRY: DK (as ISO2 code)  
 DATE: 14.02.2003 (as DD.MM.YYYY)  
 YEAR: 1995 (as YYYY, year of Emmissions)

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Footnotes to the emission figures reported should be submitted together with the emission data, but in a separate document.

Please fill out the blue marked fields.

You must use for each field either a number or one of the following codes (capitals, no dots in between, see EB.AIR/GE.1/2002/2): NO , NA , NE , IE , C

Footnotes or any other information entered into this table will not be taken into account.

SOURCE/FUEL:		Hard coal	Brown coal	Other solid fuels	Natural Gas	Derived gases	Heavy fuel oil	Other liquid fuels	Hydrogen	Biomass	Renewable	Crude oil	Nuclear	Hydro
UNIT:		TJ	TJ	TJ	TJ	TJ	TJ	TJ	TJ	TJ	TJ	TJ	TJ	TJ
NFR 1A1a	Power Plants	254813,74	IE	22837,88	45422,79	IE	13341,82	1303,7	NO	11877,9	NE		NO	NE
NFR 1A1b,c	Conversion	NO	NO	NO	13013,85	IE	2333,79	20886,19	NO	56,5	NE			
NFR 1A2a-f	Industry	16722,84	IE	NO	37169,78	IE	22197,36	16175,29	NO	7224,4	NE			
NFR 1A4a,bi,ci	Residential/ Commercial	2295,4	IE	NO	31425,5	IE	3421,55	57430,59	NO	16129,4	NE			
NFR 1A3a,ii,b,c,d,ii,e,ii + 1A4b,ii,c,ii,c,iii + 1A5b	Transport	NO	NO	NO	IE		1572,93	179250,16		IE	NE			
	Non-energy use <sup>a)</sup>	NE			NE	NE	NE	NE	NE	NE				
	<b>TOTAL</b>	273831,98	IE	22837,88	127031,92	IE	42867,45	275045,93	NO	35288,2	NE		NO	NE
	Refinery input											415310		

<sup>a)</sup> Should include use of all fuels, including feedstocks for petrochemical industry.

**Notes:**

Fuels used in this table are defined in terms of relation to the IPCC/IEA and CORINAIR NAPFUE categories in annex III, table IIIC, to these guidelines.

Nuclear, Hydro, Renewable: Primary energy equivalent for non-fossil fuels should be reported according to the total primary energy supply (TPES) convention of converting electricity into primary energy, i.e. electricity generated in nuclear power plants with 33% efficiency, hydro, solar and wind with 100% efficiency and geothermal with 10% efficiency.

Energy consumption should be reported both for historical (1990, 1995 and 2000) and projection years (2010, 2015 and 2020) as in the table above.

If data for this sectoral resolution are not available, they may be submitted in a different aggregation (consistent with NFR) with documentation on the aggregation used.

**TABLE IV 2B: Five-yearly, Minimum reporting of energy consumption data**

Version 2002-1

COUNTRY: DK (as ISO2 code)  
 DATE: 14.02.2003 (as DD.MM.YYYY)  
 YEAR: 2000 (as YYYY, year of Emmissions)

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Please fill out the blue marked fields.

You must use for each field either a number or one of the following codes (capitals, no dots in between, see EB.AIR/GE.1/2002/2): NO , NA , NE , IE , C

Footnotes or any other information entered into this table will not be taken into account.

SOURCE/FUEL:		Hard coal	Brown coal	Other solid fuels	Natural Gas	Derived gases	Heavy fuel oil	Other liquid fuels	Hydrogen	Biomass	Renewable	Crude oil	Nuclear	Hydro
UNIT:		TJ	TJ	TJ	TJ	TJ	TJ	TJ	TJ	TJ	TJ	TJ	TJ	TJ
NFR 1A1a	Power Plants	153175,67	IE	29710,43	76128,41	IE	5484,47	1216,36	NO	14262,66	NE		NO	NE
NFR 1A1b,c	Conversion	NO	NO	NO	25204,03	IE	1322,99	15219,73	NO	32,51	NE			
NFR 1A2a-f	Industry	11620,78	IE	545,39	39916,91	IE	16648,53	14293,52	NO	5905,51	NE			
NFR 1A4a,bi,ci	Residential/ Commercial	1124,41	IE	NO	35619,16	IE	2090,31	42341,64	NO	18321,38	NE			
NFR 1A3a,ii,b,c,d,ii,e,ii + 1A4b,ii,c,ii,c,iii + 1A5b	Transport	NO	NO	NO	IE		1508,81	189510,34		IE	NE			
	Non-energy use <sup>a)</sup>	NE			NE	NE	NE	NE	NE	NE				
	<b>TOTAL</b>	165920,86	IE	30255,82	176868,51	IE	27055,11	262581,59	NO	38522,06	NE		NO	NE
	Refinery input											346270		

<sup>a)</sup> Should include use of all fuels, including feedstocks for petrochemical industry.

Notes:

Fuels used in this table are defined in terms of relation to the IPCC/IEA and CORINAIR NAPFUE categories in annex III, table IIIC, to these guidelines.

Nuclear, Hydro, Renewable: Primary energy equivalent for non-fossil fuels should be reported according to the total primary energy supply (TPES) convention of converting electricity into primary energy, i.e. electricity generated in nuclear power plants with 33% efficiency, hydro, solar and wind with 100% efficiency and geothermal with 10% efficiency.

Energy consumption should be reported both for historical (1990, 1995 and 2000) and projection years (2010, 2015 and 2020) as in the table above.

If data for this sectoral resolution are not available, they may be submitted in a different aggregation (consistent with NFR) with documentation on the aggregation used.

**TABLE IV 2B: Five-yearly, Minimum reporting of energy consumption data**

Version 2002-1

COUNTRY: DK (as ISO2 code)  
 DATE: 07.02.2003 (as DD.MM.YYYY)  
 YEAR: 2010 (as YYYY, year of Emmissions)

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Footnotes or any other information entered into this table will not be taken into account.

SOURCE/FUEL:		Hard coal	Brown coal	Other solid fuels	Natural Gas	Derived gases	Heavy fuel oil	Other liquid fuels	Hydrogen	Biomass	Renewable	Crude oil	Nuclear	Hydro
UNIT:		TJ	TJ	TJ	TJ	TJ	TJ	TJ	TJ	TJ	TJ	TJ	TJ	TJ
NFR 1A1a	Power Plants	215628,3217	0	36872,95899	110231,2103	0	20589,27594	35744,24419	0	32301,45576	28284,76388		0	114
NFR 1A1b,c	Conversion	0	0	0	44622,1168	0	4801,6593	10711,7567	0	0	0			
NFR 1A2a-f	Industry	11970,99408	0	159	49885,38769	0	18352,99854	21453,60085	0	7040,920767	1498,384352			
NFR 1A4a,bi,ci	Residential/ Commercial	1501	0	1166	48141	0	2318	58426	0	20696	4849			
NFR 1A3aii,b,c,dii,eii + 1A4bii,cii,ciii + 1A5b	Transport	0	0	0	0	0	0	189231,5196	0	0	0			
	Non-energy use <sup>a)</sup>	0			0	0	9745,0831	880,788	0	0				
	<b>TOTAL</b>	<b>229100,6693</b>	<b>0</b>	<b>38197,95899</b>	<b>252879,483</b>	<b>0</b>	<b>55806,65654</b>	<b>316448,3225</b>	<b>0</b>	<b>60037,99881</b>	<b>34632,27205</b>		<b>0</b>	<b>114</b>
Refinery input												350110		

<sup>a)</sup> Should include use of all fuels, including feedstocks for petrochemical industry.

**Notes:**

Fuels used in this table are defined in terms of relation to the IPCC/IEA and CORINAIR NAPFUE categories in annex III, table IIIC, to these guidelines.

Nuclear, Hydro, Renewable: Primary energy equivalent for non-fossil fuels should be reported according to the total primary energy supply (TPES) convention of converting electricity into primary energy, i.e. electricity generated in nuclear power plants with 33% efficiency, hydro, solar and wind with 100% efficiency and geothermal with 10% efficiency.

Energy consumption should be reported both for historical (1990, 1995 and 2000) and projection years (2010, 2015 and 2020) as in the table above.

If data for this sectoral resolution are not available, they may be submitted in a different aggregation (consistent with NFR) with documentation on the aggregation used.

**TABLE IV 2B: Five-yearly, Minimum reporting of energy consumption data**

Version 2002-1

COUNTRY: DK (as ISO2 code)  
 DATE: 07.02.2003 (as DD.MM.YYYY)  
 YEAR: 2015 (as YYYY, year of Emmissions)

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Please fill out the blue marked fields.

You must use for each field either a number or one of the following codes (capitals, no dots in between, see EB.AIR/GE.1/2002/2): NO , NA , NE , IE , C

Footnotes or any other information entered into this table will not be taken into account.

SOURCE/FUEL:		Hard coal	Brown coal	Other solid fuels	Natural Gas	Derived gases	Heavy fuel oil	Other liquid fuels	Hydrogen	Biomass	Renewable	Crude oil	Nuclear	Hydro
UNIT:		TJ	TJ	TJ	TJ	TJ	TJ	TJ	TJ	TJ	TJ	TJ	TJ	TJ
NFR 1A1a	Power Plants	168584,1155	0	34462,74638	157195,1919	0	19022,11743	35847,4827	0	25513,93809	28242,12284		0	104,4
NFR 1A1b,c	Conversion	0	0	0	36559,11364	0	4801,6593	10712,73004	0	0	0			
NFR 1A2a-f	Industry	13237,99408	0	170	52851,38769	0	20015,99854	23268,60085	0	7427,920767	1603,384352			
NFR 1A4a,bi,ci	Residential/ Commercial	1584	0	1146	48638	0	2348	56886	0	20852	4865			
NFR 1A3a,ii,b,c,d,ii,e,ii + 1A4b,ii,c,ii,c,iii + 1A5b	Transport	0	0	0	0	0	0	194605,7393	0	0	0			
	Non-energy use <sup>a)</sup>	0			0	0	9745,0831	880,788	0	0				
	<b>TOTAL</b>	183406,4631	0	35778,74638	295243,4614	0	55932,49803	322201,754	0	53793,48114	34710,63101		0	104,4
	Refinery input											350109,9452		

<sup>a)</sup> Should include use of all fuels, including feedstocks for petrochemical industry.

**Notes:**

Fuels used in this table are defined in terms of relation to the IPCC/IEA and CORINAIR NAPFUE categories in annex III, table IIIC, to these guidelines.

Nuclear, Hydro, Renewable: Primary energy equivalent for non-fossil fuels should be reported according to the total primary energy supply (TPES) convention of converting electricity into primary energy, i.e. electricity generated in nuclear power plants with 33% efficiency, hydro, solar and wind with 100% efficiency and geothermal with 10% efficiency.

Energy consumption should be reported both for historical (1990, 1995 and 2000) and projection years (2010, 2015 and 2020) as in the table above.

If data for this sectoral resolution are not available, they may be submitted in a different aggregation (consistent with NFR) with documentation on the aggregation used.

**TABLE IV 2B: Five-yearly, Minimum reporting of energy consumption data**

Version 2002-1

COUNTRY: DK (as ISO2 code)  
 DATE: 07.02.2003 (as DD.MM.YYYY)  
 YEAR: 2020 (as YYYY, year of Emmissions)

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Please fill out the blue marked fields.

You must use for each field either a number or one of the following codes (capitals, no dots in between, see EB.AIR/GE.1/2002/2): NO , NA , NE , IE , C

Footnotes or any other information entered into this table will not be taken into account.

SOURCE/FUEL:		Hard coal	Brown coal	Other solid fuels	Natural Gas	Derived gases	Heavy fuel oil	Other liquid fuels	Hydrogen	Biomass	Renewable	Crude oil	Nuclear	Hydro
UNIT:		TJ	TJ	TJ	TJ	TJ	TJ	TJ	TJ	TJ	TJ	TJ	TJ	TJ
NFR 1A1a	Power Plants	165742,7122	0	34251,56888	178261,9391	0	16438,10404	23488,8975	0	25786,7141	28140,55388		0	104,4
NFR 1A1b,c	Conversion	0	0	0	36166,80244	0	4801,6593	10713,98149	0	0	0			
NFR 1A2a-f	Industry	13675,99408	0	174	53822,38769	0	20606,99854	23913,60085	0	7556,920767	1638,384352			
NFR 1A4a,bi,ci	Residential/ Commercial	1611	0	1137	49109	0	2359	56245	0	20920	4872			
NFR 1A3aii,b,c,dii,eii + 1A4bii,cii,ciii + 1A5b	Transport	0	0	0	0	0	0	196613,1163	0	0	0			
	Non-energy use <sup>a)</sup>	0			0	0	9745,0831	880,788	0	0				
	<b>TOTAL</b>	181030,0598	0	35562,56888	317359,8973	0	53950,48464	311855,7973	0	54263,25715	34651,06205		0	104,4
Refinery input												350109,9452		

<sup>a)</sup> Should include use of all fuels, including feedstocks for petrochemical industry.

Notes:

Fuels used in this table are defined in terms of relation to the IPCC/IEA and CORINAIR NAPFUE categories in annex III, table IIIC, to these guidelines.

Nuclear, Hydro, Renewable: Primary energy equivalent for non-fossil fuels should be reported according to the total primary energy supply (TPES) convention of converting electricity into primary energy, i.e. electricity generated in nuclear power plants with 33% efficiency, hydro, solar and wind with 100% efficiency and geothermal with 10% efficiency.

Energy consumption should be reported both for historical (1990, 1995 and 2000) and projection years (2010, 2015 and 2020) as in the table above.

If data for this sectoral resolution are not available, they may be submitted in a different aggregation (consistent with NFR) with documentation on the aggregation used.

**TABLE IV 2C: Five-yearly, Minimum reporting of electricity and heat production and consumption**

Version 2002-1

COUNTRY: DK (as ISO2 code)  
 DATE: 07.02.2003 (as DD.MM.YYYY)  
 YEAR: 2010 (as YYYY, year of Emmissions)

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 Footnotes to the emission figures reported should be submitted together with the emission data, but in a separate document.  
 Please fill out the blue marked fields.

You must use for each field either a number or one of the following codes (capitals, no dots in between, see EB.AIR/GE.1/2002/2): NO , NA , NE , IE , C  
 Footnotes or any other information entered into this table will not be taken into account.

SOURCE/FUEL:		Electricity	Heat
UNIT:		TJ	TJ
Gross production		189763,442	143288,149
Own use and losses <sup>a)</sup>		10960,4073	31040,1489
Import – Export <sup>b)</sup>		-48975,1151	
<i>Final consumption</i>			
NFR 1A2a-f	Industry	41327	7660
NFR 1A4a,bi,ci	Commercial	87632	104588
NFR 1A3ai,b,c,dii,eii + 1A4bii,cii,ciii + 1A5b	Transport	868,91971	0
	<b>TOTAL</b>	<b>129827,92</b>	<b>112248</b>

<sup>a)</sup> Includes own use in power plants and conversion sector (NFR 1A1a,b,c) and transmission and distribution losses.

<sup>b)</sup> Please indicate the sign, i.e. if Exports are larger than Imports the number given should be negative.

Notes:

<sup>1)</sup> If data in the statistics are reported in GWh they can be converted to TJ, i.e. 1 GWh = 3.6 TJ.

<sup>2)</sup> Electricity and heat production and consumption should be reported both for historical (1990, 1995 and 2000) and projection years (2010, 2015 and 2020) as in the table above. If data on final consumption are not available for this sectoral resolution, they may be submitted in a different aggregation (consistent with NFR) with documentation on the aggregation used.



**TABLE IV 2C: Five-yearly, Minimum reporting of electricity and heat production and consumption**

Version 2002-1

COUNTRY: DK (as ISO2 code)  
 DATE: 07.02.2003 (as DD.MM.YYYY)  
 YEAR: 2015 (as YYYY, year of Emmissions)

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 Footnotes or any other information entered into this table will not be taken into account.

SOURCE/FUEL:	Electricity	Heat
UNIT:	TJ	TJ
Gross production	200824,213	145914,533
Own use and losses <sup>a)</sup>	11666,6481	31542,533
Import – Export <sup>b)</sup>	-49961,645	
<i>Final consumption</i>		
NFR 1A2a-f	Industry	45233
NFR 1A4a,bi,ci	Commercial	93094
NFR 1A3ai,b,c,dii,eii + 1A4bii,cii,ciii + 1A5b	Transport	868,91971
	<b>TOTAL</b>	<b>139195,92</b>

<sup>a)</sup> Includes own use in power plants and conversion sector (NFR 1A1a,b,c) and transmission and distribution losses.

<sup>b)</sup> Please indicate the sign, i.e. if Exports are larger than Imports the number given should be negative.

Notes:

<sup>1)</sup> If data in the statistics are reported in GWh they can be converted to TJ, i.e. 1 GWh = 3.6 TJ.

<sup>2)</sup> Electricity and heat production and consumption should be reported both for historical (1990, 1995 and 2000) and projection years (2010, 2015 and 2020) as in the table above. If data on final consumption are not available for this sectoral resolution, they may be submitted in a different aggregation (consistent with NFR) with documentation on the aggregation used.

**TABLE IV 2C: Five-yearly, Minimum reporting of electricity and heat production and consumption**

Version 2002-1

COUNTRY: DK (as ISO2 code)  
 DATE: 07.02.2003 (as DD.MM.YYYY)  
 YEAR: 2020 (as YYYY, year of Emmissions)

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 Footnotes or any other information entered into this table will not be taken into account.

SOURCE/FUEL:		Electricity	Heat
UNIT:		TJ	TJ
Gross production		209249,435	146640,164
Own use and losses <sup>a)</sup>		11951,1237	31533,1638
Import – Export <sup>b)</sup>		-54342,3918	
<i>Final consumption</i>			
NFR 1A2a-f	Industry	46747	8203
NFR 1A4a,bi,ci	Commercial	95340	106904
NFR 1A3ai,b,c,dii,eii + 1A4bii,cii,ciii + 1A5b	Transport	868,91971	0
	<b>TOTAL</b>	<b>142955,92</b>	<b>115107</b>

<sup>a)</sup> Includes own use in power plants and conversion sector (NFR 1A1a,b,c) and transmission and distribution losses.

<sup>b)</sup> Please indicate the sign, i.e. if Exports are larger than Imports the number given should be negative.

Notes:

<sup>1)</sup> If data in the statistics are reported in GWh they can be converted to TJ, i.e. 1 GWh = 3.6 TJ.

<sup>2)</sup> Electricity and heat production and consumption should be reported both for historical (1990, 1995 and 2000) and projection years (2010, 2015 and 2020) as in the table above. If data on final consumption are not available for this sectoral resolution, they may be submitted in a different aggregation (consistent with NFR) with documentation on the aggregation used.

**TABLE IV 2D: Five-yearly, Minimum reporting of energy consumption data for transport sector**

Version 2002-1

COUNTRY: DK (as ISO2 code)  
 DATE: 14.02.2003 (as DD.MM.YYYY)  
 YEAR: 1990 (as YYYY, year of Emmissions)

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 Footnotes or any other information entered into this table will not be taken into account.

SOURCE/FUEL:		Petrol	LPG	Diesel	CNG	Hydrogen	Heavy fuel oil	Kerosene
UNIT:		TJ	TJ	TJ	TJ	TJ	TJ	TJ
NFR 1A3bi	Passenger Cars	63452,97	12,28	5801,35	NO	NO		
NFR 1A3bii	Light Duty Vehicles	3130,96	NO	11189,53	NO	NO		
NFR 1A3biii	Heavy Duty Vehicles	52,9	NO	42955,91		NO		
NFR 1A3biv	Mopeds and Motorcycles	678,24	NO		NO	NO		
NFR 1A3c	Railways	18,95	NA	4010,01	NO	NO		
NFR 1A3eii + 1A4bii,cii + 1A5b	Other Off-road	1456,66	NO	14345,16	NO	NO		1497
NFR 1A3aai	Civil Aviation	113,59				NO		2891,15
NFR 1A3dii + 1A4ciii	National Shipping	456	44	13509			3845	26
<i>Aggregated categories</i>								
NFR 1A3bi-iv	Road Transportation	67315,07	12,28	59946,79	NO	NO		
NFR 1A3c,eii + 1A4bii,cii + 1A5b	Off-road	1475,61	0	18355,17	NO	NO		1497
NFR 1A3aai	Civil Aviation	113,59				NO		2891,15
NFR 1A3dii + 1A4ciii	National Shipping	456	44	13509	0	0	3845	26
<b>TOTAL</b>		69360,27	56,28	91810,96	0	0	3845	4414,15

Note:

Fuels used in this table are defined in terms of relation to the IPCC/IEA and CORINAIR NAPFUE categories in annex III, table IIIC, of the present guidelines.

Data on energy consumption in transport for 1990, 1995 and 2000 (historical years) should be provided on a sectoral resolution as in the table above. If possible, projected energy consumption for years 2010, 2015 and 2020 should also be reported following the same format. However, recognizing the fact that the projections might often be prepared at a higher sectoral resolution, aggregated categories can also be used to report historical data if detailed information cannot be obtained.

LPG - liquefied petroleum gas; CNG - compressed natural gas.

**TABLE IV 2D: Five-yearly, Minimum reporting of energy consumption data for transport sector**

Version 2002-1

COUNTRY: DK (as ISO2 code)  
 DATE: 14.02.2003 (as DD.MM.YYYY)  
 YEAR: 1995 (as YYYY, year of Emmissions)

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 Footnotes or any other information entered into this table will not be taken into account.

SOURCE/FUEL:		Petrol	LPG	Diesel	CNG	Hydrogen	Heavy fuel oil	Kerosene
UNIT:		TJ	TJ	TJ	TJ	TJ	TJ	TJ
NFR 1A3bi	Passenger Cars	76817,37	12,4	6540,6	NO	NO		
NFR 1A3bii	Light Duty Vehicles	3358,34	NO	11814	NO	NO		
NFR 1A3biii	Heavy Duty Vehicles	55,48	NO	45658,39		NO		
NFR 1A3biv	Mopeds and Motorcycles	728,15	NO		NO	NO		
NFR 1A3c	Railways	10,22	NA	4093,26	NO	NO		
NFR 1A3eii + 1A4bii,cii + 1A5b	Other Off-road	1449,69	NO	15901,1	NO	NO		1646
NFR 1A3aai	Civil Aviation	132,42				NO		2619,16
NFR 1A3dii + 1A4ciii	National Shipping	452	18	14629		NO	1592	5
<i>Aggregated categories</i>								
NFR 1A3bi-iv	Road Transportation	80959,34	12,4	64012,99				
NFR 1A3c,eii + 1A4bii,cii + 1A5b	Off-road	1459,91		19994,36				1646
NFR 1A3aai	Civil Aviation	132,42				NO		2619,16
NFR 1A3dii + 1A4ciii	National Shipping	452	18	14629	0	NO	1592	5
<b>TOTAL</b>		83003,67	30,4	98636,35	0	0	1592	4270,16

Note:

Fuels used in this table are defined in terms of relation to the IPCC/IEA and CORINAIR NAPFUE categories in annex III, table IIIC, of the present guidelines.

Data on energy consumption in transport for 1990, 1995 and 2000 (historical years) should be provided on a sectoral resolution as in the table above. If possible, projected energy consumption for years 2010, 2015 and 2020 should also be reported following the same format. However, recognizing the fact that the projections might often be prepared at a higher sectoral resolution, aggregated categories can also be used to report historical data if detailed information cannot be obtained.

LPG - liquefied petroleum gas; CNG - compressed natural gas.

**TABLE IV 2D: Five-yearly, Minimum reporting of energy consumption data for transport sector**

Version 2002-1

COUNTRY: DK (as ISO2 code)  
 DATE: 14.02.2003 (as DD.MM.YYYY)  
 YEAR: 2000 (as YYYY, year of Emmissions)

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Footnotes or any other information entered into this table will not be taken into account.

SOURCE/FUEL:		Petrol	LPG	Diesel	CNG	Hydrogen	Heavy fuel oil	Kerosene
UNIT:		TJ	TJ	TJ	TJ	TJ	TJ	TJ
NFR 1A3bi	Passenger Cars	78985,19	1,05	9270,25	NO	NO		
NFR 1A3bii	Light Duty Vehicles	3740,4	NO	13112,52	NO	NO		
NFR 1A3biii	Heavy Duty Vehicles	47,72	NO	46813,66		NO		
NFR 1A3biv	Mopeds and Motorcycles	914,26	NO		NO	NO		
NFR 1A3c	Railways	7,72	NA	3078,73	NO	NO		
NFR 1A3eii + 1A4bii,cii + 1A5b	Other Off-road	1740,18	NO	17304,46	NO	NO		1146
NFR 1A3aai	Civil Aviation	101,4				NO		2055,37
NFR 1A3dii + 1A4ciii	National Shipping	600	13	13077	NO	NO	1509	26
<i>Aggregated categories</i>								
NFR 1A3bi-iv	Road Transportation	83687,57	1,05	69196,43	NO	NO		
NFR 1A3c,eii + 1A4bii,cii + 1A5b	Off-road	1747,9		20383,19	NO	NO		1146
NFR 1A3aai	Civil Aviation	101,4				NO		2055,37
NFR 1A3dii + 1A4ciii	National Shipping	600	13	13077	NO	NO	1509	26
<b>TOTAL</b>		86136,87	14,05	102656,62	0	0	1509	3227,37

Note:

Fuels used in this table are defined in terms of relation to the IPCC/IEA and CORINAIR NAPFUE categories in annex III, table IIIC, of the present guidelines.

Data on energy consumption in transport for 1990, 1995 and 2000 (historical years) should be provided on a sectoral resolution as in the table above. If possible, projected energy consumption for years 2010, 2015 and 2020 should also be reported following the same format. However, recognizing the fact that the projections might often be prepared at a higher sectoral resolution, aggregated categories can also be used to report historical data if detailed information cannot be obtained.

LPG - liquefied petroleum gas; CNG - compressed natural gas.

**TABLE IV 2D: Five-yearly, Minimum reporting of energy consumption data for transport sector**

Version 2002-1

COUNTRY: DK (as ISO2 code)  
 DATE: 07.02.2003 (as DD.MM.YYYY)  
 YEAR: 2010 (as YYYY, year of Emmissions)

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SOURCE/FUEL:		Petrol	LPG	Diesel	CNG	Hydrogen	Heavy fuel oil	Kerosene
UNIT:		TJ	TJ	TJ	TJ	TJ	TJ	TJ
NFR 1A3bi	Passenger Cars	87562,2547	0	11462,117	0	0		
NFR 1A3bii	Light Duty Vehicles	8531,2922	0	30170,5214	0	0		
NFR 1A3biii	Heavy Duty Vehicles	0	0	41863,2285	0	0		
NFR 1A3biv	Mopeds and Motorcycles	0	0		0	0		
NFR 1A3c	Railways	0	0	2727,70643	0	0		
NFR 1A3eii + 1A4bii,cii + 1A5b	Other Off-road	IE	IE	IE	IE	0		
NFR 1A3aii	Civil Aviation	0				0		2897,72241
NFR 1A3dii + 1A4ciii	National Shipping	0		3016,677		0	0	
<i>Aggregated categories</i>								
NFR 1A3bi-iv	Road Transportation	96093,5469	0	83495,8668	0	0		
NFR 1A3c,eii + 1A4bii,cii + 1A5b	Off-road	0	0	2727,70643	0	0		
NFR 1A3aii	Civil Aviation	0				0		2897,72241
NFR 1A3dii + 1A4ciii	National Shipping	0		3016,677		0	0	
<b>TOTAL</b>		96093,5469	0	89240,2503	0	0	0	2897,72241

Note:

Fuels used in this table are defined in terms of relation to the IPCC/IEA and CORINAIR NAPFUE categories in annex III, table IIIC, of the present guidelines.

Data on energy consumption in transport for 1990, 1995 and 2000 (historical years) should be provided on a sectoral resolution as in the table above. If possible, projected energy consumption for years 2010, 2015 and 2020 should also be reported following the same format. However, recognizing the fact that the projections might often be prepared at a higher sectoral resolution, aggregated categories can also be used to report historical data if detailed information cannot be obtained.

LPG - liquefied petroleum gas; CNG - compressed natural gas.

**TABLE IV 2D: Five-yearly, Minimum reporting of energy consumption data for transport sector**

Version 2002-1

COUNTRY: DK (as ISO2 code)  
 DATE: 07.02.2003 (as DD.MM.YYYY)  
 YEAR: 2015 (as YYYY, year of Emmissions)

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Footnotes or any other information entered into this table will not be taken into account.

SOURCE/FUEL:		Petrol	LPG	Diesel	CNG	Hydrogen	Heavy fuel oil	Kerosene
UNIT:		TJ	TJ	TJ	TJ	TJ	TJ	TJ
NFR 1A3bi	Passenger Cars	88146,1666	0	11567,0927	0	0		
NFR 1A3bii	Light Duty Vehicles	9056,54072	0	32028,0385	0	0		
NFR 1A3biii	Heavy Duty Vehicles	0	0	43732,3151	0	0		
NFR 1A3biv	Mopeds and Motorcycles	0	0		0	0		
NFR 1A3c	Railways	0	0	2727,70643	0	0		
NFR 1A3eii + 1A4bii,cii + 1A5b	Other Off-road	IE	IE	IE	IE	0		
NFR 1A3aai	Civil Aviation	0				0		3331,20232
NFR 1A3dii + 1A4ciii	National Shipping	0		3016,677		0	0	
<i>Aggregated categories</i>								
NFR 1A3bi-iv	Road Transportation	97202,7073	0	87327,4462	0	0		
NFR 1A3c,eii + 1A4bii,cii + 1A5b	Off-road	0	0	2727,70643	0	0		
NFR 1A3aai	Civil Aviation	0				0		3331,20232
NFR 1A3dii + 1A4ciii	National Shipping	0		3016,677		0	0	
<b>TOTAL</b>		97202,7073	0	93071,8297	0	0	0	3331,20232

Note:

Fuels used in this table are defined in terms of relation to the IPCC/IEA and CORINAIR NAPFUE categories in annex III, table IIIC, of the present guidelines.

Data on energy consumption in transport for 1990, 1995 and 2000 (historical years) should be provided on a sectoral resolution as in the table above. If possible, projected energy consumption for years 2010, 2015 and 2020 should also be reported following the same format. However, recognizing the fact that the projections might often be prepared at a higher sectoral resolution, aggregated categories can also be used to report historical data if detailed information cannot be obtained.

LPG - liquefied petroleum gas; CNG - compressed natural gas.

**TABLE IV 2D: Five-yearly, Minimum reporting of energy consumption data for transport sector**

Version 2002-1

COUNTRY: DK (as ISO2 code)  
 DATE: 07.02.2003 (as DD.MM.YYYY)  
 YEAR: 2020 (as YYYY, year of Emmissions)

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 Footnotes or any other information entered into this table will not be taken into account.

SOURCE/FUEL:		Petrol	LPG	Diesel	CNG	Hydrogen	Heavy fuel oil	Kerosene
UNIT:		TJ	TJ	TJ	TJ	TJ	TJ	TJ
NFR 1A3bi	Passenger Cars	88233,6204	0	11588,8046	0	0		
NFR 1A3bii	Light Duty Vehicles	9269,28807	0	32780,4097	0	0		
NFR 1A3biii	Heavy Duty Vehicles	0	0	44479,9497	0	0		
NFR 1A3biv	Mopeds and Motorcycles	0	0		0	0		
NFR 1A3c	Railways	0	0	2727,70643	0	0		
NFR 1A3eii + 1A4bii,cii + 1A5b	Other Off-road	IE	IE	IE	IE	0		
NFR 1A3aii	Civil Aviation	0				0		3516,66035
NFR 1A3dii + 1A4ciii	National Shipping	0		3016,677		0	0	
<i>Aggregated categories</i>								
NFR 1A3bi-iv	Road Transportation	97502,9085	0	88849,164	0	0		
NFR 1A3c,eii + 1A4bii,cii + 1A5b	Off-road	0	0	2727,70643	0	0		
NFR 1A3aii	Civil Aviation	0				0		3516,66035
NFR 1A3dii + 1A4ciii	National Shipping	0		3016,677		0	0	
<b>TOTAL</b>		97502,9085	0	94593,5474	0	0	0	3516,66035

Note:

Fuels used in this table are defined in terms of relation to the IPCC/IEA and CORINAIR NAPFUE categories in annex III, table IIIC, of the present guidelines.

Data on energy consumption in transport for 1990, 1995 and 2000 (historical years) should be provided on a sectoral resolution as in the table above. If possible, projected energy consumption for years 2010, 2015 and 2020 should also be reported following the same format. However, recognizing the fact that the projections might often be prepared at a higher sectoral resolution, aggregated categories can also be used to report historical data if detailed information cannot be obtained.

LPG - liquefied petroleum gas; CNG - compressed natural gas.



**TABLE IV 2E: Five-yearly, Minimum reporting of agricultural activity data**

Version 2002-1

COUNTRY: DK (as ISO2 code)  
 DATE: 14.02.2003 (as DD.MM.YYYY)  
 YEAR: 1990 (as YYYY, year of Emissions)

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You must use for each field either a number or one of the following codes (capitals, no dots in between, see EB.AIR/GE.1/2002/2): NO , NA , NE , IE , C

Footnotes or any other information entered into this table will not be taken into account.

SOURCE/UNIT :		head	N
		1000	Gg
NFR 4B1a	Dairy Cattle; Slurry-based system	753115	
NFR 4B1a	Dairy Cattle; Straw-based system		
NFR 4B1b	Non-Dairy Cattle; Slurry-based system	1485982	
NFR 4B1b	Non-Dairy Cattle; Straw-based system		
NFR 4B3	Sheep	76601	
NFR 4B4	Goats	8400	
NFR 4B6	Horses	135000	
NFR 4B7	Mules and Asses	0	
NFR 4B8	Swine; Slurry-based system	6341294	
NFR 4B8	Swine; Straw-based system		
NFR 4B9	Laying Hens	4326935	
NFR 4B9	Broilers	9802327	
NFR 4B9	Turkeys	ie	
NFR 4B9	Other Poultry	750486	
NFR 4B13	Other Animals	3764230	
NFR 4Di	N-fertilizer use – Urea		9,2
NFR 4Di	N-fertilizer use - other N-fertilizers		391,2
<i>Aggregated categories</i>			
NFR 4B1a	Dairy Cattle	753115	
NFR 4B1b	Non-Dairy Cattle	1485982	
NFR 4B3,4	Sheep and Goats	85001	
NFR 4B6,7,13	Horses, Mules and Asses, Other	3899230	
NFR 4B8	Swine	6341294	
NFR 4B9	Poultry	14879748	
NFR 4Di	N-fertilizer use		400,4

**Note:**

If possible, both historical (1990, 1995 and 2000) and projection data (2010, 2015 and 2020) should be reported in this format. Whenever disaggregated data are not available, the aggregated format can be used for both historical and projection data. For example, if it is not possible to provide split into slurry and straw systems, report total number of animals only. Similarly for poultry or nitrogen (N) fertilizer use, aggregates should be reported if data on lower resolution could not be found.

**TABLE IV 2E: Five-yearly, Minimum reporting of agricultural activity data**

Version 2002-1

COUNTRY: DK (as ISO2 code)  
 DATE: 14.02.2003 (as DD.MM.YYYY)  
 YEAR: 1995 (as YYYY, year of Emissions)

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Footnotes to the emission figures reported should be submitted together with the emission data, but in a separate document.

Please fill out the blue marked fields.

You must use for each field either a number or one of the following codes (capitals, no dots in between, see EB.AIR/GE.1/2002/2): NO , NA , NE , IE , C

Footnotes or any other information entered into this table will not be taken into account.

SOURCE/UNIT :		head	N
		1000	Gg
NFR 4B1a	Dairy Cattle; Slurry-based system	702473	
NFR 4B1a	Dairy Cattle; Straw-based system		
NFR 4B1b	Non-Dairy Cattle; Slurry-based system	1387900	
NFR 4B1b	Non-Dairy Cattle; Straw-based system		
NFR 4B3	Sheep	67255	
NFR 4B4	Goats	9200	
NFR 4B6	Horses	142500	
NFR 4B7	Mules and Asses	0	
NFR 4B8	Swine; Slurry-based system	7429949	
NFR 4B8	Swine; Straw-based system		
NFR 4B9	Laying Hens	4297002	
NFR 4B9	Broilers	12584873	
NFR 4B9	Turkeys	ie	
NFR 4B9	Other Poultry	946164	
NFR 4B13	Other Animals	1849942	
NFR 4Di	N-fertilizer use – Urea		9,5
NFR 4Di	N-fertilizer use - other N-fertilizers		306,4
<i>Aggregated categories</i>			
NFR 4B1a	Dairy Cattle	702473	
NFR 4B1b	Non-Dairy Cattle	1387900	
NFR 4B3,4	Sheep and Goats	76455	
NFR 4B6,7,13	Horses, Mules and Asses, Other	1992442	
NFR 4B8	Swine	7429949	
NFR 4B9	Poultry	17828039	
NFR 4Di	N-fertilizer use		315,9

**Note:**

If possible, both historical (1990, 1995 and 2000) and projection data (2010, 2015 and 2020) should be reported in this format. Whenever disaggregated data are not available, the aggregated format can be used for both historical and projection data. For example, if it is not possible to provide split into slurry and straw systems, report total number of animals only. Similarly for poultry or nitrogen (N) fertilizer use, aggregates should be reported if data on lower resolution could not be found.

**TABLE IV 2E: Five-yearly, Minimum reporting of agricultural activity data**

Version 2002-1

COUNTRY: DK (as ISO2 code)  
 DATE: 14.02.2003 (as DD.MM.YYYY)  
 YEAR: 2000 (as YYYY, year of Emissions)

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Footnotes to the emission figures reported should be submitted together with the emission data, but in a separate document.

Please fill out the blue marked fields.

You must use for each field either a number or one of the following codes (capitals, no dots in between, see EB.AIR/GE.1/2002/2): NO , NA , NE , IE , C

Footnotes or any other information entered into this table will not be taken into account.

SOURCE/UNIT :		head	N
		1000	Gg
NFR 4B1a	Dairy Cattle; Slurry-based system	635519	
NFR 4B1a	Dairy Cattle; Straw-based system		
NFR 4B1b	Non-Dairy Cattle; Slurry-based system	1232407	
NFR 4B1b	Non-Dairy Cattle; Straw-based system		
NFR 4B3	Sheep	67738	
NFR 4B4	Goats	10500	
NFR 4B6	Horses	150000	
NFR 4B7	Mules and Asses	0	
NFR 4B8	Swine; Slurry-based system	9553489	
NFR 4B8	Swine; Straw-based system		
NFR 4B9	Laying Hens	3680647	
NFR 4B9	Broilers	16046632	
NFR 4B9	Turkeys	ie	
NFR 4B9	Other Poultry	848616	
NFR 4B13	Other Animals	2198898	
NFR 4Di	N-fertilizer use – Urea		1,5
NFR 4Di	N-fertilizer use - other N-fertilizers		250
<i>Aggregated categories</i>			
NFR 4B1a	Dairy Cattle	635519	
NFR 4B1b	Non-Dairy Cattle	1232407	
NFR 4B3,4	Sheep and Goats	78238	
NFR 4B6,7,13	Horses, Mules and Asses, Other	2348898	
NFR 4B8	Swine	9553489	
NFR 4B9	Poultry	20575895	
NFR 4Di	N-fertilizer use		251,5

**Note:**

If possible, both historical (1990, 1995 and 2000) and projection data (2010, 2015 and 2020) should be reported in this format. Whenever disaggregated data are not available, the aggregated format can be used for both historical and projection data. For example, if it is not possible to provide split into slurry and straw systems, report total number of animals only. Similarly for poultry or nitrogen (N) fertilizer use, aggregates should be reported if data on lower resolution could not be found.

**TABLE IV 2E: Five-yearly, Minimum reporting of agricultural activity data**

Version 2002-1

COUNTRY: DK (as ISO2 code)  
 DATE: 14.02.2003 (as DD.MM.YYYY)  
 YEAR: 2010 (as YYYY, year of Emissions)

These five yellow lines will not be read by UNECE! These lines can be modified freely for your own reference purposes.

Footnotes to the emission figures reported should be submitted together with the emission data, but in a separate document.

Please fill out the blue marked fields.

You must use for each field either a number or one of the following codes (capitals, no dots in between, see EB.AIR/GE.1/2002/2): NO , NA , NE , IE , C

Footnotes or any other information entered into this table will not be taken into account.

SOURCE/UNIT :		head	N
		1000	Gg
NFR 4B1a	Dairy Cattle; Slurry-based system	559073	
NFR 4B1a	Dairy Cattle; Straw-based system		
NFR 4B1b	Non-Dairy Cattle; Slurry-based system	1151184	
NFR 4B1b	Non-Dairy Cattle; Straw-based system		
NFR 4B3	Sheep	81286	
NFR 4B4	Goats	15000	
NFR 4B6	Horses	165000	
NFR 4B7	Mules and Asses	0	
NFR 4B8	Swine; Slurry-based system	11502114	
NFR 4B8	Swine; Straw-based system		
NFR 4B9	Laying Hens	4052922	
NFR 4B9	Broilers	17857757	
NFR 4B9	Turkeys	ie	
NFR 4B9	Other Poultry	790328	
NFR 4B13	Other Animals	2198898	
NFR 4Di	N-fertilizer use – Urea		1
NFR 4Di	N-fertilizer use - other N-fertilizers		219,2
<i>Aggregated categories</i>			
NFR 4B1a	Dairy Cattle	559073	
NFR 4B1b	Non-Dairy Cattle	1151184	
NFR 4B3,4	Sheep and Goats	96286	
NFR 4B6,7,13	Horses, Mules and Asses, Other	2363898	
NFR 4B8	Swine	11502114	
NFR 4B9	Poultry	22701007	
NFR 4Di	N-fertilizer use		220,2

**Note:**

If possible, both historical (1990, 1995 and 2000) and projection data (2010, 2015 and 2020) should be reported in this format. Whenever disaggregated data are not available, the aggregated format can be used for both historical and projection data. For example, if it is not possible to provide split into slurry and straw systems, report total number of animals only. Similarly for poultry or nitrogen (N) fertilizer use, aggregates should be reported if data on lower resolution could not be found.

## Appendix 2

# The specific methodologies regarding Stationary Combustion plants

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## 2 Stationary Combustion Plants

Stationary combustion plants are part of the NFR sectors *1A1 Energy industries, 1A2 Manufacturing industries and 1A4 Other sectors*.

### 2.1 Methodology and references

The Danish emission inventory is based on the CORINAIR (CORe INventory on AIR emissions) system, which is a European program for air emission inventories. CORINAIR includes methodology structure and software for inventories. The methodology is described in the Emission Inventory Guidebook 3<sup>rd</sup> edition (EMEP/CORINAIR, 2002), prepared by the UNECE/EMEP Task Force on Emissions Inventories and Projections. Emission data are stored in an Access database, and data transferred to the NFR format.

The inventory of emissions from combustion processes in the NFR sources *1A1 Energy industries, 1A2 Manufacturing industries and 1A4 Other sectors* is based on activity rates from the Danish energy statistics. Emission factors for different fuels, plants and sectors have been determined. Some large plants like e.g. power plants are registered individually as large point sources and emission data from the actual plants are used.

#### 2.1.1 SNAP / NFR source categories

In the Danish emission database all activity rates and emissions are defined in SNAP sector categories (Selected Nomenclature for Air Pollution). 11 main categories are defined; categories that are further divided into a second and third level of snap. The NFR sources *1A1, 1A2 and 1A4* are included in SNAP 01, 02, 03 and 08.

SNAP 01 includes power plants, district-heating plants, petroleum refining plants and oil/gas extraction. SNAP 02 includes commercial and institutional plants, residential plants and plants in agriculture, forestry and aquaculture. SNAP 03 includes industrial combustion in boilers, gas turbines and stationary engines and industrial combustion in processes. SNAP 08 includes amongst others mobile sources in households & gardening, in agriculture, in forestry, in industry and in national fishing. Mobile sources are not further discussed in this Appendix, please refer to Appendix 4.

Emission inventories are prepared from a complete emission database based on the SNAP categories. Aggregation to EMEP source categories in the NFR format is based on a correspondence list between SNAP and NFR source categories which is included in the *Guidelines for estimating and reporting emission data (2002)*. An emission source correspondence list of NFR sources *1A1, 1A2 and 1A4* is shown in Appendix 2.5.

In Denmark all municipal waste incineration is utilised for heat and power production. Thus incineration of waste is included in NFR categories *1A1, 1A2 and 1A4*.

#### 2.1.2 Large point sources

Large point sources like power plants, industrial plants and refineries are included as point sources in the Danish emission database. Each point source might consist of more than one part e.g. a power plant with several units.

By registering the plants as point sources in the database it is possible to use plant specific emission factors for the plants. Plant specific emission data are obtained from:

- Annual environmental reports

- Annual plant specific reporting of SO<sub>2</sub> and NO<sub>x</sub> from power plants >25MW<sub>e</sub> prepared for the Danish Energy Authority due to Danish legislation (Bekendtgørelse 885, 1991)
- Emission data reported by Elsam and E2, the two major electricity suppliers
- Emission data reported from industrial plants

Annual environmental reports from the plants include a considerable number of emission data sets. In general emission data from annual environmental reports are based on emission measurements, but some emissions might have been calculated from general emission factors. Only some of the pollutants included in the CLRTAP inventory is reported in the annual environmental reports or in other plant specific reports. Emission of the remaining pollutants is based on general emission factors for the fuel and source category.

In the year 2001 63 large point sources within NFR source category 1A1, 1A2 and 1A4 are specified in the Danish emission database. These point sources includes:

- Power plants and cogeneration plants (combined heat and power plants)
- Municipal waste incineration plants
- A few large industrial plants
- Petroleum refining plants

The fuel consumption of large point sources in 1A1, 1A2 and 1A4 is 320 PJ (2001). This corresponds to 53% of the overall fuel consumption of 1A1, 1A2 and 1A4.

A list of large point sources 2001 and the fuel consumption rates is shown in Appendix 2.2. A table showing which large point source emissions are based on plant specific emission factors is also included in the appendix. The number of large point sources registered in the emission databases has been increasing from 1990 till 2001. Before 1990 no large point sources has been registered.

### 2.1.3 Area sources

Fuels not combusted in large point sources are included as sector specific area sources in the emission database. Plants like residential boilers, small district heating plants, small cogeneration plants and industrial plants are defined as area sources. Emissions from area sources are based on fuel consumption data and emission factors. Further information about emission factors is given below.

### 2.1.4 Activity rates, fuel consumption

The fuel consumption rates are based on the official Danish energy statistics prepared by the Danish Energy Authority. The Danish Energy Authority aggregates fuel consumption rates to SNAP categories. Some fuel categories of the official Danish energy statistics are added to obtain a less detailed fuel aggregation level.

The Danish energy statistics does not specify fuel consumption rates in specific industries. Thus all fuel consumption of 1A2 *Manufacturing industries and construction* is included in 1A2f *Other*.

Traded and not traded fuels are included in the Danish energy statistics. Thus e.g. an estimation of the annual consumption of not traded wood is included.

Emissions from petroleum coke bought abroad and combusted in Danish residential plants (border trade of 251 TJ) are included in the inventory.

The fuel consumption of district heating and power producing plants are each year reported by the plant owners to the Danish Energy Authority. The fuel consumption of large point sources specified in the Danish emission databases refers to a plant specific database from the Danish Energy Authority. The fuel consumption of area sources is calculated as total fuel consumption minus fuel consumption of large point sources.

Emissions from non-energy use of fuels are not included in the Danish national approach.

Fuel rates of NFR sources 1A1, 1A2 and 1A4 is shown in Appendix 2.3. Fuel rates in NFR table 2B are aggregated according to the fuel correspondence list included in *ReportER II version 2.3 Beta*.

### 2.1.5 Emission factors

For each fuel and SNAP (sector and e.g. type of plant) a set of general emission factors has been determined. The emission factors are either national referenced or based on the EMEP/CorinAir Guidebook. Emission factors for area sources year 2001 are shown in Appendix 2.1. For some pollutants time series of the emission factors are also shown.

Most country specific emission factors refers to:

- Danish legislation
- Danish research reports
- Calculations based on plant specific emissions from a considerable number of power plants
- Calculations based on plant specific emissions from a considerable number of municipal waste incineration plants

References of each area source emission factor are shown in Appendix 2.1. Note that SO<sub>2</sub>, NO<sub>x</sub> and TSP emissions from large point sources are often based on emission measurements and thus they are plant specific. Emissions of CO, NMVOC and metals are also plant specific for some plants. If emissions are not stated in annual environmental reports or other plant specific reports the general area source emission factor is used.

## 2.2 Recalculation and changes

### Emission factors for CO and NMVOC, 1990-2000

Emission factors for CO and NMVOC have been revised. Some emission factors have been changed and now refer to the EMEP Guidebook or to Danish references. Consistency of factors has been improved. References of the emission factors have been included in the 2001 emission database.

### Emission factors for NO<sub>x</sub> and SO<sub>2</sub>

A similar revision of NO<sub>x</sub> and SO<sub>2</sub> has been initiated. A few of the emission factors have been changed but a more systematic control of the emission factor time series will be performed this year. Note that plant specific emissions of SO<sub>2</sub> and NO<sub>x</sub> are often available and thus for a considerable part of the fuel consumption the general emission factors are not used.

### TSP, PM10 and PM2,5

A first attempt inventory of TSP, PM10 and PM2,5 emission was reported last year. This inventory was based primarily on the emission factors in the TNO CEPMEIP database. In 2002 a research project was carried out to improve emission inventories of particulate matter. The revised emission factors are used in the 2000 and 2001 inventory reported this year.

### Correction of errors

Some corrections of emission factor errors (1990-2000) have been carried out since last year. The corrections are registered in a (manual) log table in the emission database. The errors however have not influenced the total emission considerably.



## 2.3 Uncertainty

Estimation of uncertainty is based on Good Practice Guidance for CLRTAP Emission Inventories (Pulles, et al. 2001) that is similar to the tier 1 methodology in the IPCC Good Practice Guidance.

Source categories in the uncertainty estimates follow the SNAP main sectors thus 3 categories of stationary combustion plants are considered.

Uncertainty of fuel rates are assumed to be 2% based on Pulles et al. (2001). Uncertainty of emission factors are taken from this reference assuming that uncertainty is always in the lower end of the interval given in chapter 2.3.3 b. Uncertainties of PM emission factors are not included and have not been estimated yet. Estimated uncertainties of SO<sub>2</sub>, NO<sub>x</sub>, NMVOC, CO and metals from stationary combustion plants are shown in Table 1. In general the calculated uncertainties in this first attempt estimation are assumed to be overestimated due to the fact that a considerable part of e.g. SO<sub>2</sub> and NO<sub>x</sub> emissions in the Danish inventory is based on emissions measurements. Calculation sheets are shown in appendix 4.6.

Table 1 Uncertainty

Pollutant	Uncertainty of emission inventory [%]	Uncertainty of emission trend [%]
SO <sub>2</sub>	7	0,6
NO <sub>x</sub>	15	3,2
NMVOC	36	24
Co	44	3
As	130	11
Cd	220	58
Cr	85	8
Cu	130	14
Hg	138	7
Ni	127	14
Pb	103	11
Se	141	23
Zn	162	12

## 2.4 QA/QC and verification

A formal QA/QC plan has not yet been developed, but a number of quality control (QC) procedures are performed. The Danish QC includes:

- Check of time series of the NFR and SNAP source categories. Considerable changes are checked and explained.
- Comparison to inventory of the previous year. Any major changes are verified.
- Total emissions when aggregated to NFR source categories are compared to totals based on SNAP source categories (control of data transfer).
- A manual log table have been introduced in the emission databases to collect information about recalculations

In addition to the general QC procedures some additional QC are performed for stationary combustion plants:

### General:

- The emission from each large point source is compared to the emission reported the previous year.
- Some automated checks have been prepared for the emission databases:
  1. Check of units for fuel rate, emission factor and plant specific emissions
  2. Check of emission factors of large point sources. Emission factors of pollutants that are not plant specific should be the same as the emission factor that are defined for area sources.

### 3. Additional checks of database consistency

- Most emission factor references are now implemented in the emission database itself.
- The IPCC CRF reference approach validates the fuel consumption rates and CO<sub>2</sub> emissions of fuel combustion. Fuel consumption rates are within 1,9% difference (1990-2001) and CO<sub>2</sub> emissions are within 1,7% difference.

#### Country specific emission factors:

- Annual environmental reports are kept for subsequent control of plant specific emission data
- QA/QC checks of the country specific emission factors have not been performed but most factors are based on work from companies that have implemented some QA/QC work. The two major power plant owners / operators in Denmark: E2 and Elsam both obtained the ISO 14001 certification for environmental management system. Danish Gas Technology Centre and dk-Teknik both run accredited laboratories for emission measurements.

#### Uncertainty

QA/QC of uncertainty estimates have not yet been performed.

## **2.5 Future improvements**

Some improvements are planned for the future greenhouse gas emissions inventory.

Control of time series for NO<sub>x</sub> and SO<sub>2</sub> emission factors is planned.

A research project aiming at improving emission factors for cogeneration plants (combined heat and power production) <25MW<sub>e</sub> will be reported in May 2003 (Nielsen & Illerup 2003). The emission factors that are determined in this work are better documented than the emission factors used presently. E.g. N<sub>2</sub>O emission measurements have been performed on a considerable number of plants. In addition to improvements of the emission factors themselves it will be possible to make better estimates of uncertainties.

The first attempt uncertainty analyse that has been reported this year is expected to be improved next year when more country specific uncertainties for fuel consumption and emission factors have been incorporated.

## **2.6 References**

EMEP/CORINAIR 2002: EMEP/CORINAIR Emission Inventory Guidebook - 3rd edition October 2002 UPDATE. Technical report No 30. European Environment Agency, Copenhagen. Available: [http://reports.eea.eu.int/EMEP\\_CORINAIR3/en](http://reports.eea.eu.int/EMEP_CORINAIR3/en) (June 13, 2003).

Penman, J., Kruger, D, Galbally, I., Hiraishi, T., Nyenzi, B., Emmanuel, S., Buendia, L., Hoppaus, R., Martinsen, T., Meijer, J., Miwa, K., & Tanabe, K. (Eds) 2000: Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories. The Intergovernmental Panel on Climate Change (IPCC). IPCC National Greenhouse Gas Inventories Programme. Available: [http://www.ipcc-nggip.iges.or.jp/public/gp/gp\\_gaum.htm](http://www.ipcc-nggip.iges.or.jp/public/gp/gp_gaum.htm) (June 13, 2003).

Bekendtgørelse om begrænsning af udledning af svovldioxid og kvælstofoxider fra kraftværker (Kvotebekendtgørelsen). Bekendtgørelse 885 af 18/12/1991 (Danish legislation)

Nielsen, M. & Wit J. d. 1997: Emissionsforhold for gasdrevne kraftvarmeanlæg <25MW<sub>e</sub>. Arbejdsrapport fra Miljøstyrelsen nr. 17 (In Danish)

DGC 2003: Estimated by Danish Gas Technology Centre, mail 10.04.2003

Jensen, B. G., Lindroth, M. & Sørensen, J. B. 2002: Kontrol af indberetning af CO<sub>2</sub>-udledning fra el-producenter i 2001, Carl Bro for Energistyrelsens 6. kontor (mail 13.08.2002) (In Danish, not published)

Pulles, T., Aardenne J. v., Tooley, L. & Rypdal, K. 2001: Good Practice Guidance for CLRTAP Emission Inventories, Draft chapter for the UNECE CORINAIR Guidebook, 7 November 2001, 42 pp.

Houghton, J. T., Meira Filho, L. G., Lim, B., Tréanton, K., Mamaty, I., Bonduki, Y. Griggs, D. J. & Callander, B. A. (Eds) 1997: Greenhouse Gas Inventory Reporting Instructions. Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories, Vol 1, 2 and 3. The Intergovernmental Panel on Climate Change (IPCC), IPCC WGI Technical Support Unit, United Kingdom. Available: <http://www.ipcc-nggip.iges.or.jp/public/gl/invs1.htm> (June 13, 2003)

Nielsen, M. & Illerup, J.B. 2003: Emissionsfaktorer og emissionsopgørelse for decentral kraftvarme. Eltra PSO projekt 3141. Kortlægning af emissioner fra decentrale kraftvarmeværker. Delrapport 6. Danmarks Miljøundersøgelser. 116 s. –Faglig rapport fra DMU nr. 442. (In Danish). Available: <http://faglige-rapporter.dmu.dk> (June13, 2003)

# Appendix 2 tables

## Appendix 2.1 Emission factors

June 2003

Table 2 Emission factors 2001 (a)

fuel	NFR source	snap	unit1	unit2	CH4	Reference	N2O	Reference	SO2	Reference	NOx	Reference	NMVOC	Reference	CO	Reference	
AGRICUL. WASTES	1A1a	010102	g	GJ	32	C 1	4	C 1	100	CS 5 19	153	SC 28	50	C 1	50	CS 3	
AGRICUL. WASTES	1A1a	010103	g	GJ	32	C 1	4	C 1	100	CS 5 19	156	CS 4	50	C 1	50	CS 3	
AGRICUL. WASTES	1A1a	010202	g	GJ	32	C 1	4	C 1	100	CS 5 19	153	CS 28	50	C 1	325	CS 4 5	
AGRICUL. WASTES	1A1a	010203	g	GJ	32	C 1	4	C 1	100	CS 5 19	156	CS 4	50	C 1	325	CS 4 5	
AGRICUL. WASTES	1A2f	030102	g	GJ	32	C 1	4	C 1	100	CS 5 19	153	CS 28	50	C 1	325	CS 4 5	
AGRICUL. WASTES	1A2f	030105	g	GJ	32	C 1	4	C 1	100	CS 5 19	153	CS 28	50	C 1	325	CS 4 5	
AGRICUL. WASTES	1A4a	0201	g	GJ	200	C 1	4	C 1	100	CS 5 19	153	CS 28	600	C 1	325	CS 4 5	
AGRICUL. WASTES	1A4b	0202	g	GJ	200	C 1	4	C 1	100	CS 5 19	153	CS 28	600	C 1	4000	CS 1 6 7	
AGRICUL. WASTES	1A4c	0203	g	GJ	200	C 1	4	C 1	100	CS 5 19	153	CS 28	600	C 1	325	CS 4 5	
AGRICUL. WASTES	1A4c	020302	g	GJ	200	C 1	4	C 1	100	CS 5 19	153	CS 28	600	C 1	325	CS 4 5	
BIOGAS	1A1a	010102	g	GJ	4	C 1	2	C 1	11	CS 26	31	CS 4	4	C 1	36	CS 8	
BIOGAS	1A1a	010103	g	GJ	4	C 1	2	C 1	11	CS 26	31	CS 4	4	C 1	36	CS 8	
BIOGAS	1A1a	010105	g	GJ	434	CS 2	2	C 1	11	CS 26	605	CS 2	4	C 1	255	CS 2	
BIOGAS	1A1a	010203	g	GJ	4	C 1	2	C 1	11	CS 26	31	CS 4	4	C 1	36	CS 8	
BIOGAS	1A1c	010405	g	GJ	434	CS 2	2	C 1	11	CS 26	605	CS 2	4	C 1	255	CS 2	
BIOGAS	1A1c	010505	g	GJ	434	CS 2	2	C 1	11	CS 26	605	CS 2	4	C 1	255	CS 2	
BIOGAS	1A2f	0301	g	GJ	4	C 1	2	C 1	11	CS 26	31	CS 4	4	C 1	36	CS 8	
BIOGAS	1A2f	030102	g	GJ	4	C 1	2	C 1	11	CS 26	66	CS 4	4	C 1	36	CS 8	
BIOGAS	1A2f	030105	g	GJ	434	CS 2	2	C 1	11	CS 26	605	CS 2	4	C 1	255	CS 2	
BIOGAS	1A4a	0201	g	GJ	4	C 1	2	C 1	11	CS 26	31	CS 4	4	C 1	36	CS 8	
BIOGAS	1A4a	020103	g	GJ	4	C 1	2	C 1	11	CS 26	31	CS 4	4	C 1	36	CS 8	
BIOGAS	1A4a	020105	g	GJ	434	CS 2	2	C 1	11	CS 26	605	CS 2	4	C 1	255	CS 2	
BIOGAS	1A4c	0203	g	GJ	4	C 1	2	C 1	11	CS 26	31	CS 4	4	C 1	36	CS 8	
BIOGAS	1A4c	020304	g	GJ	434	CS 2	2	C 1	11	CS 26	605	CS 2	4	C 1	255	CS 2	
LIQUID BIOMASS FUEL	1A1a	010203	g	GJ	32	CS 15	4	C 4	100	CS 15	153	CS 15	50	CS 15	325	CS 15	
LIQUID BIOMASS FUEL	1A4c	020304	g	GJ	200	CS 15	4	C 4	100	CS 15	153	CS 15	600	CS 15	325	CS 15	
GAS OIL	1A1a	0101	g	GJ	1.5	C 1	2	C 1	23	CS 27	65	CS 28	1.5	C 1	15	CS 3	
GAS OIL	1A1a	010101	g	GJ	1.5	C 1	2	C 1	23	CS 27	65	CS 28	1.5	C 1	15	CS 3	
GAS OIL	1A1a	010102	g	GJ	1.5	C 1	2	C 1	23	CS 27	65	CS 28	1.5	C 1	15	CS 3	
GAS OIL	1A1a	010103	g	GJ	1.5	C 1	2	C 1	23	CS 27	52	CS 4	1.5	C 1	15	CS 3	
GAS OIL	1A1a	010104	g	GJ	1.5	C 1	2	C 1	23	CS 27	350	C 1	2	C 1	15	CS 3	
GAS OIL	1A1a	010105	g	GJ	1.5	C 1	2	C 1	23	CS 27	700	-	-	100	C 1	100	C 1
GAS OIL	1A1a	010202	g	GJ	1.5	C 1	2	C 1	23	CS 27	65	CS 28	1.5	C 1	30	C 1	
GAS OIL	1A1a	010203	g	GJ	1.5	C 1	2	C 1	23	CS 27	52	CS 4	1.5	C 1	30	C 1	
GAS OIL	1A1a	010205	g	GJ	1.5	C 1	2	C 1	23	CS 27	700	-	-	100	C 1	100	C 1
GAS OIL	1A2f	0301	g	GJ	1.5	C 1	2	C 1	23	CS 27	52	CS 4	1.5	C 1	30	C 1	
GAS OIL	1A2f	030102	g	GJ	1.5	C 1	2	C 1	23	CS 27	52	CS 4	1.5	C 1	30	C 1	
GAS OIL	1A2f	030103	g	GJ	1.5	C 1	2	C 1	23	CS 27	52	CS 4	1.5	C 1	30	C 1	
GAS OIL	1A2f	030104	g	GJ	1.5	C 1	2	C 1	23	CS 27	350	C 1	2	C 1	15	CS 3	
GAS OIL	1A2f	030105	g	GJ	1.5	C 1	2	C 1	23	CS 27	700	-	-	100	C 1	100	C 1
GAS OIL	1A2f	030106	g	GJ	1.5	C 1	2	C 1	23	CS 27	52	CS 4	1.5	C 1	30	C 1	
GAS OIL	1A4a	0201	g	GJ	1.5	C 1	2	C 1	23	CS 27	52	CS 4	3	C 1	30	C 1	
GAS OIL	1A4a	020103	g	GJ	1.5	C 1	2	C 1	23	CS 27	52	CS 4	3	C 1	30	C 1	
GAS OIL	1A4a	020105	g	GJ	1.5	C 1	2	C 1	23	CS 27	700	-	-	100	C 1	100	C 1
GAS OIL	1A4b	0202	g	GJ	1.5	C 1	2	C 1	23	CS 27	52	CS 4	3	C 1	43	C 1	
GAS OIL	1A4c	020304	g	GJ	1.5	C 1	2	C 1	23	CS 27	700	-	-	100	C 1	100	C 1
KEROSENE	1A2f	0301	g	GJ	7	C 1	2	C 1	23	CS 27	73	C 1	3	C 1	20	C 1	
KEROSENE	1A4a	0201	g	GJ	7	C 1	2	C 1	23	CS 30	73	C 1	3	C 1	20	C 1	
KEROSENE	1A4b	0202	g	GJ	7	C 1	2	C 1	23	CS 30	73	C 1	3	C 1	20	C 1	
KEROSENE	1A4c	0203	g	GJ	7	C 1	2	C 1	23	CS 30	73	C 1	3	C 1	20	C 1	
LPG	1A1a	010203	g	GJ	1	C 1	1	C 1	1	-	50	C 1	2	C 1	25	C 1	
LPG	1A2f	0301	g	GJ	1	C 1	2	C 1	1	-	50	C 1	2	C 1	25	C 1	
LPG	1A4a	0201	g	GJ	1	C 1	2	C 1	1	-	50	C 1	2	C 1	25	C 1	
LPG	1A4b	0202	g	GJ	1	C 1	2	C 1	1	-	50	C 1	2	C 1	25	C 1	
MUNICIP. WASTES	1A1a	010102	g	GJ	6	C 1	4	C 1	69	CS 9	150	CS 9	9	C 1	10	CS 9	

MUNICIP. WASTES	1A1a	010103	g	GJ	6	C	1	4	C	1	69	CS	9	150	CS	9	9	C	1	10	CS	9
MUNICIP. WASTES	1A1a	010104	g	GJ	6	C	1	4	C	1	69	CS	9	150	CS	9	9	C	1	10	CS	9
MUNICIP. WASTES	1A1a	010105	g	GJ	6	C	1	4	C	1	69	CS	9	150	CS	9	9	C	1	10	CS	9
MUNICIP. WASTES	1A1a	010203	g	GJ	6	C	1	4	C	1	69	CS	9	150	CS	9	9	C	1	10	CS	9
MUNICIP. WASTES	1A4a	0201	g	GJ	6	C	1	4	C	1	69	CS	9	150	CS	9	9	C	1	10	CS	9
MUNICIP. WASTES	1A4a	020103	g	GJ	6	C	1	4	C	1	69	CS	9	150	CS	9	9	C	1	10	CS	9
NATURAL GAS	1A1a	0101	g	GJ	6	CS	14	1	C	1	0,3	CS	17	100	CS	18	2	CS	14	15	CS	3
NATURAL GAS	1A1a	010101	g	GJ	6	CS	14	1	C	1	0,3	CS	17	88	CS	9	2	CS	14	15	CS	3
NATURAL GAS	1A1a	010102	g	GJ	6	CS	14	1	C	1	0,3	CS	17	88	CS	9	2	CS	14	15	CS	3
NATURAL GAS	1A1a	010103	g	GJ	15	CS	11	1	C	1	0,3	CS	17	30	CS	4	2	CS	14	15	CS	3
NATURAL GAS	1A1a	010104	g	GJ	4	CS	2	1	C	1	0,3	CS	17	88	CS	9	1	CS	2	7	CS	10
NATURAL GAS	1A1a	010105	g	GJ	573	CS	2	1	C	1	0,3	CS	17	193	CS	2	163	CS	2	169	CS	2
NATURAL GAS	1A1a	010202	g	GJ	6	CS	14	1	C	1	0,3	CS	17	100	CS	18	2	CS	14	28	CS	4
NATURAL GAS	1A1a	010203	g	GJ	15	CS	11	1	C	1	0,3	CS	17	30	CS	4	2	CS	14	28	CS	4
NATURAL GAS	1A1b	010304	g	GJ	4	CS	2	1	C	1	0,3	CS	17	174	CS	2	1	CS	2	7	CS	10
NATURAL GAS	1A1c	010405	g	GJ	573	CS	2	1	C	1	0,3	CS	17	193	CS	2	163	CS	2	169	CS	2
NATURAL GAS	1A1c	010502	g	GJ	6	CS	14	1	C	1	0,3	CS	17	100	CS	18	2	CS	14	28	CS	4
NATURAL GAS	1A1c	010504	g	GJ	4	CS	2	1	C	1	0,3	CS	17	174	CS	2	1	CS	2	7	CS	10
NATURAL GAS	1A1c	010505	g	GJ	573	CS	2	1	C	1	0,3	CS	17	193	CS	2	163	CS	2	169	CS	2
NATURAL GAS	1A2f	0301	g	GJ	6	CS	14	1	C	1	0,3	CS	17	30	CS	4	2	CS	14	28	CS	4
NATURAL GAS	1A2f	030103	g	GJ	15	CS	11	1	C	1	0,3	CS	17	30	CS	4	2	CS	14	28	CS	4
NATURAL GAS	1A2f	030104	g	GJ	4	CS	2	1	C	1	0,3	CS	17	174	CS	2	1	CS	2	7	CS	10
NATURAL GAS	1A2f	030105	g	GJ	573	CS	2	1	C	1	0,3	CS	17	193	CS	2	163	CS	2	169	CS	2
NATURAL GAS	1A2f	030106	g	GJ	15	CS	11	1	C	1	0,3	CS	17	30	CS	4	2	CS	14	28	CS	4
NATURAL GAS	1A4a	0201	g	GJ	6	CS	14	1	C	1	0,3	CS	17	30	CS	4	2	CS	14	28	CS	4
NATURAL GAS	1A4a	020103	g	GJ	15	CS	11	1	C	1	0,3	CS	17	30	CS	4	2	CS	14	28	CS	4
NATURAL GAS	1A4a	020104	g	GJ	4	CS	2	1	C	1	0,3	CS	17	174	CS	2	1	CS	2	7	CS	10
NATURAL GAS	1A4a	020105	g	GJ	573	CS	2	1	C	1	0,3	CS	17	193	CS	2	163	CS	2	169	CS	2
NATURAL GAS	1A4b	0202	g	GJ	6	CS	14	1	C	1	0,3	CS	17	30	CS	4	4	CS	11	20	CS	11
NATURAL GAS	1A4b	020202	g	GJ	15	CS	11	1	C	1	0,3	CS	17	30	CS	4	4	CS	11	20	CS	11
NATURAL GAS	1A4b	020204	g	GJ	573	CS	2	1	C	1	0,3	CS	17	193	CS	2	163	CS	2	169	CS	2
NATURAL GAS	1A4c	0203	g	GJ	6	CS	14	1	C	1	0,3	CS	17	30	CS	4	2	CS	14	28	CS	4
NATURAL GAS	1A4c	020303	g	GJ	4	CS	2	1	C	1	0,3	CS	17	174	CS	2	1	CS	2	7	CS	10
NATURAL GAS	1A4c	020304	g	GJ	573	CS	2	1	C	1	0,3	CS	17	193	CS	2	163	CS	2	169	CS	2
ORIMULSION (Orimulsion)	1A1a	010101	g	GJ	3	CS	16	2	C	16	10	CS	16	88	CS	9	3	CS	16	15	CS	16
PETROLEUM COKE	1A2f	0301	g	GJ	15	C	1	3	C	1	573	CS	24	50	C	1	1,5	C	1	61	CS	4
PETROLEUM COKE	1A4a	0201	g	GJ	15	C	1	3	C	1	573	CS	24	50	C	1	1,5	C	1	1000	C	1
PETROLEUM COKE	1A4b	0202	g	GJ	15	C	1	3	C	1	573	CS	24	50	C	1	1,5	C	1	1000	C	1
PETROLEUM COKE	1A4c	0203	g	GJ	15	C	1	3	C	1	573	CS	24	50	C	1	1,5	C	1	1000	C	1
REFINERY GAS	1A1b	010303	g	GJ	2	C	1	2	C	1	0,3	CS	23	30	CS	23	4	C	1	15	C	1
REFINERY GAS	1A1b	010304	g	GJ	2	C	1	2	C	1	0,3	CS	23	174	CS	23	4	C	1	15	C	1
RESIDUAL OIL	1A1a	0101	g	GJ	3	C	1	2	C	1	315	CS	20	240	CS	18	3	C	1	15	CS	3
RESIDUAL OIL	1A1a	010101	g	GJ	3	C	1	2	C	1	315	CS	20	240	CS	18	3	C	1	15	CS	3
RESIDUAL OIL	1A1a	010102	g	GJ	3	C	1	2	C	1	315	CS	20	240	CS	18	3	C	1	15	CS	3
RESIDUAL OIL	1A1a	010103	g	GJ	3	C	1	2	C	1	315	CS	20	142	CS	4	3	C	1	15	CS	3
RESIDUAL OIL	1A1a	010104	g	GJ	3	C	1	2	C	1	315	CS	20	142	CS	4	3	C	1	15	C	1
RESIDUAL OIL	1A1a	010202	g	GJ	3	C	1	2	C	1	315	CS	20	240	CS	18	3	C	1	30	C	1
RESIDUAL OIL	1A1a	010203	g	GJ	3	C	1	2	C	1	315	CS	20	142	CS	4	3	C	1	30	C	1
RESIDUAL OIL	1A1b	010303	g	GJ	3	C	1	2	C	1	315	CS	20	142	CS	4	3	C	1	30	C	1
RESIDUAL OIL	1A2f	0301	g	GJ	3	C	1	2	C	1	344	CS	25	130	CS	28	3	C	1	30	C	1
RESIDUAL OIL	1A2f	030102	g	GJ	3	C	1	2	C	1	344	CS	25	130	CS	28	3	C	1	30	C	1
RESIDUAL OIL	1A2f	030103	g	GJ	3	C	1	2	C	1	344	CS	25	142	CS	4	3	C	1	30	C	1
RESIDUAL OIL	1A2f	030104	g	GJ	3	C	1	2	C	1	344	CS	25	142	CS	4	3	C	1	15	C	1
RESIDUAL OIL	1A2f	030105	g	GJ	3	C	1	2	C	1	344	CS	25	142	CS	4	3	C	1	100	C	1
RESIDUAL OIL	1A4a	0201	g	GJ	3	C	1	2	C	1	344	CS	25	130	CS	28	3	C	1	30	C	1
RESIDUAL OIL	1A4a	020105	g	GJ	3	C	1	2	C	1	344	CS	25	142	CS	4	3	C	1	100	C	1
RESIDUAL OIL	1A4b	0202	g	GJ	3	C	1	2	C	1	344	CS	25	130	CS	28	3	C	1	30	C	1
RESIDUAL OIL	1A4c	0203	g	GJ	3	C	1	2	C	1	344	CS	25	130	CS	28	3	C	1	30	C	1
RESIDUAL OIL	1A4c	020302	g	GJ	3	C	1	2	C	1	344	CS	25	130	CS	28	3	C	1	30	C	1
RESIDUAL OIL	1A4c	020304	g	GJ	3	C	1	2	C	1	344	CS	25	142	CS	4	3	C	1	100	C	1
STEAM COAL	1A1a	010101	g	GJ	1,5	C	1	3	C	1	39	CS	21	139	CS	21	1,5	C	1	10	CS	3
STEAM COAL	1A1a	010102	g	GJ	1,5	C	1	3	C	1	39	CS	21	139	CS	21	1,5	C	1	10	CS	3

STEAM COAL	1A1a	010103	g	GJ	15	C	1	3	C	1	464	CS	20	95	CS	4	1,5	C	1	10	CS	3
STEAM COAL	1A1a	010202	g	GJ	15	C	1	3	C	1	464	CS	20	95	CS	4	15	C	1	10	CS	3
STEAM COAL	1A1a	010203	g	GJ	15	C	1	3	C	1	464	CS	20	95	CS	4	15	C	1	10	CS	3
STEAM COAL	1A2f	0301	g	GJ	15	C	1	3	C	1	464	CS	20	95	CS	4	15	C	1	10	C	1
STEAM COAL	1A4b	0202	g	GJ	15	C	1	3	C	1	464	CS	20	95	CS	4	15	C	1	10	C	1
STEAM COAL	1A4c	0203	g	GJ	15	C	1	3	C	1	464	CS	20	95	CS	4	15	C	1	10	C	1
WOOD AND SIMIL.	1A1a	010102	g	GJ	32	C	1	4	C	1	25	CS	22	130	CS	22	48	C	1	50	CS	3
WOOD AND SIMIL.	1A1a	010103	g	GJ	32	C	1	4	C	1	25	CS	22	130	CS	22	48	C	1	50	CS	3
WOOD AND SIMIL.	1A1a	010105	g	GJ	32	C	1	4	C	1	25	CS	22	130	CS	22	48	C	1	50	CS	3
WOOD AND SIMIL.	1A1a	010202	g	GJ	32	C	1	4	C	1	25	CS	22	130	CS	22	48	C	1	240	CS	4
WOOD AND SIMIL.	1A1a	010203	g	GJ	32	C	1	4	C	1	25	CS	22	130	CS	22	48	C	1	240	CS	4
WOOD AND SIMIL.	1A1a	010205	g	GJ	32	C	1	4	C	1	25	CS	22	130	CS	22	48	C	1	240	CS	4
WOOD AND SIMIL.	1A2f	0301	g	GJ	32	C	1	4	C	1	25	CS	22	130	CS	22	48	C	1	240	CS	4
WOOD AND SIMIL.	1A2f	030102	g	GJ	32	C	1	4	C	1	25	CS	22	130	CS	22	48	C	1	240	CS	4
WOOD AND SIMIL.	1A2f	030103	g	GJ	32	C	1	4	C	1	25	CS	22	130	CS	22	48	C	1	240	CS	4
WOOD AND SIMIL.	1A4a	0201	g	GJ	200	C	1	4	C	1	25	CS	22	130	CS	22	600	C	1	240	CS	4
WOOD AND SIMIL.	1A4a	020105	g	GJ	200	C	1	4	C	1	25	CS	22	130	CS	22	600	C	1	240	CS	4
WOOD AND SIMIL.	1A4b	0202	g	GJ	200	C	1	4	C	1	25	CS	22	130	CS	22	600	C	1	9000	CS	12 13
WOOD AND SIMIL.	1A4c	0203	g	GJ	200	C	1	4	C	1	25	CS	22	130	CS	22	600	C	1	240	CS	4

- Emission Inventory Guidebook 3rd edition, prepared by the UNECE/EMEP Task Force on Emissions Inventories and Projections
- Emissionsforhold for gasdrevne kraftvarmeanlæg <25MW<sub>e</sub>, Arbejdsrapport fra Miljøstyrelsen nr 17 1997 (In Danish)
- Elsam, Bo Sander, mail 17-05-2002
- Luftvejledningen, Begrænsning af luftforurening fra virksomheder, Vejledning fra Miljøstyrelsen Nr. 2 2001 (Danish legislation)
- Halm til energiformål, Teknik – Miljø – Økonomi, 2. udgave, 1998, Videncenter for halm og flisfyring (In Danish)
- Emissioner fra halm- og flisfyr, dk-Teknik 1990 (In Danish)
- Danish Technological Institute, personal communication
- dk-Teknik, personal communication
- Calculation based on annual environmental reports of Danish plants year 2000
- Technical note from Danish Gas Technology Centre, Eltra PSO 2002 (In Danish, not published)
- Energi- og miljøoversigt, Danish Gas Technology Centre 2000 (In Danish)
- Miljøprojekt 149/1990 Emissionsundersøgelse for pejs og brændeovne, Miljøstyrelsen (In Danish)
- Miljøprojekt 249/1994 Emissioner af dioxiner fra pejs og brændeovne, Miljøstyrelsen (In Danish)
- Naturgas – Energi og miljø, Danish Gas Technology Centre, 2000 (In Danish)
- Same emission factors as agricultural waste (straw) is assumed
- Same emission factors as residual oil assumed
- Calculation based on S content of natural gas 6mg(S)/m<sub>3</sub> gas. S content from the Danish natural gas transmission company DONG
- Indberetning af SO<sub>2</sub> og NO<sub>x</sub> emissioner, Eltra og Elkraft System (Reporting of SO<sub>2</sub> and NO<sub>x</sub> emissions from power plants >25MW<sub>e</sub> due to Danish legislation)
- Fyring med biomassebaserede restprodukter, Miljøprojekt nr. 358 1997, Miljøstyrelsen
- Indberetning af SO<sub>2</sub> og NO<sub>x</sub> emissioner, Eltra og Elkraft System, antaget ingen røggasrensning for arealkilder (Reporting of SO<sub>2</sub> and NO<sub>x</sub> emissions from power plants >25MW<sub>e</sub> due to Danish legislation)
- Average of large point sources 2000
- Træ til energiformål, Teknik – Miljø – Økonomi, 2. udgave, 1999, Videncenter for halm og flisfyring (In Danish)
- Same emission factor as for natural gas assumed
- Bekendtgørelse om begrænsning af svovlindholdet i visse flydende og faste brændstoffer, Bekendtgørelse 698 af 22/09/1998 (Danish legislation)
- Assumed 0,7% S. Product data from Shell and Statoil
- S content stated by plant owners (~200 ppm H<sub>2</sub>S)
- Assumed 0,05% S. Bilag 750, Kom 97/0105 and product sheets from Q8, Shell and Statoil
- Bekendtgørelse om begrænsning af emissioner af svovldioxid, kvælstofoxider og støv fra store fyringsanlæg, Bekendtgørelse 689 af 15/10/1990 (Danish legislation)
- 
- Product sheet from Shell

Table 3 Emission factors 2001 (b)

fuel	NFR source	snap	unit1	unit2	As	Reference	Cd	Reference	Cr	Reference	Cu	Reference	Hg	Reference	Ni	Reference	Pb	Reference	Se	Reference	Zn	Reference								
AGRICUL. WASTES	all	all	mg	GJ			0,62	CS	1	0,62	CS	1	1,06	CS	1	0,53	CS	1	3,22	CS	1		8,39	CS	1					
LIQUID BIOMASS FUEL	all	all	mg	GJ			0,62	CS	1	0,62	CS	1	1,06	CS	1	0,53	CS	1	3,22	CS	1		8,39	CS	1					
GAS OIL	all	all	mg	GJ	1,17	CS	0,23	CS	1	0,94	CS	1	1,17	CS	1	0,64	CS	1	2,34	CS	1	4,68	CS	1	11,7	CS	1			
MUNICIP. WASTES	all	all	mg	GJ	3,53	CS	9,21	CS	1	32,97	CS	1	31,8	CS	1	58,7	CS	1	55,4	CS	1	137,5	CS	1	359,5	CS	1			
ORIMULSION	all	all	mg	GJ	14,07	CS	13,5	CS	1	33,33	CS	1	12,96	CS	1	4,3	CS	1	642	CS	1	23,46	CS	1	12,3	CS	1	2,72	CS	1
PETROLEUM COKE	all	all	mg	GJ	3,2	CS	0,1	CS	1	2,3	CS	1	3,1	CS	1	1,7	CS	1	4,4	CS	1	6	CS	1	0,5	CS	1	10,5	CS	1
RESIDUAL OIL	all	all	mg	GJ	14,07	CS	13,5	CS	1	33,33	CS	1	12,96	CS	1	4,3	CS	1	642	CS	1	23,46	CS	1	12,3	CS	1	2,72	CS	1
STEAM COAL	all	all	mg	GJ	3,2	CS	0,1	CS	1	2,3	CS	1	3,1	CS	1	1,7	CS	1	4,4	CS	1	6	CS	1	0,5	CS	1	10,5	CS	1
WOOD AND SIMIL.	all	all	mg	GJ			6,8	CS	1			6,8	CS	1			3,4	CS	1					136	CS	1				

1) Illerup, J. B.; Geertinger, A.; Hoffmann, L.; Christiansen, K. (1999): Emissionsfaktorer for tungmetaller 1990-1996, Danmarks Miljøundersøgelser. 66 s. - Faglig rapport fra DMU nr. 301

Table 4 Emission factors 2001 (c)

fuel	NFR source	snap	unit1	unit2	Benzo(a) pyrene	Reference	Benzo(b) flouran-thene	Reference	Benzo(k) flouran-thene	Reference	Indeno-(1,2,3-c,d)-pyrene	Reference	
AGRICUL. WASTES	1A1a	010102	microgr	GJ	1,6	CS	1	1,4	CS	1	1,6	CS	1
AGRICUL. WASTES	1A1a	010103	microgr	GJ	1529	CS	2	3452	CS	2	1400	CS	2
AGRICUL. WASTES	1A1a	010202	microgr	GJ	1529	CS	2	3452	CS	2	1400	CS	2
AGRICUL. WASTES	1A1a	010203	microgr	GJ	1529	CS	2	3452	CS	2	1400	CS	2
AGRICUL. WASTES	1A2f	all	microgr	GJ	1529	CS	2	3452	CS	2	1400	CS	2
AGRICUL. WASTES	1A4	all	microgr	GJ	12956	CS	2	12828	CS	2	6912	CS	2
LIQUID BIOMASS FUEL	all	all	microgr	GJ	1529	CS	3	3452	CS	3	1400	CS	3
GAS OIL	1A1a	all	microgr	GJ	109,6	CS	4	475,41	CS	4	93,21	CS	4
GAS OIL	1A2f	all	microgr	GJ	80	CS	4	42	CS	4	66	CS	4
GAS OIL	1A4	all	microgr	GJ	80	CS	4	42	CS	4	66	CS	4
MUNICIP. WASTES	1A1a	all	microgr	GJ	67	CS	5	571	CS	5			
NATURAL GAS	1A2f	030103	microgr	GJ	1,5	CS	6	3,1	CS	6	2	CS	6
NATURAL GAS	1A4b	020202	microgr	GJ	0,133	CS	6	0,663	CS	6	0,265	CS	6
ORIMULSION	1A1a	010101	microgr	GJ	109,6	CS	7	475,41	CS	7	93,21	CS	7
PETROLEUM COKE	all	all	microgr	GJ	3184	CS	5	9554	CS	5			
RESIDUAL OIL	1A1	all	microgr	GJ	109,6	CS	4	475,41	CS	4	93,21	CS	4
RESIDUAL OIL	1A2f	all	microgr	GJ	80	CS	4	42	CS	4	66	CS	4
RESIDUAL OIL	1A4	all	microgr	GJ	80	CS	4	42	CS	4	66	CS	4
STEAM COAL	1A1a	all	microgr	GJ	0,14	CS	4	0,29	CS	4	0,29	CS	4
STEAM COAL	1A2f	0301	microgr	GJ	23	CS	4	929	CS	4	929	CS	4
STEAM COAL	1A4	all	microgr	GJ	59524	CS	4	63492	CS	4	1984	CS	4
WOOD AND SIMIL.	1A1 and 1A2	all	microgr	GJ	6,46	CS	4	1292,52	CS	4	1292,52	CS	4
WOOD AND SIMIL.	1A4	all	microgr	GJ	168707	CS	4	221769	CS	4	73469	CS	4

1. Elsam, Bo Sander e-mail 11-10-2001
2. Emissioner fra halm- og flisstyr, Arb. rap fra MST nr 5 1996, bilagsrapport
3. Same emission factors as for agricultural waste (straw) is assumed
4. TNO-report TNO-MEP-R95/247
5. Utslipp til luft av noen miljøgifter i Norge
6. Stated by Danish Gas Technology Centre
7. Same emission factors as for residual oil is assumed



Table 5 Emission factors 2001 (d)

fuel	NFR source	snap	unit1	unit2	TSP	Reference	PM10	Reference	PM2,5	Reference			
AGRICUL. WASTES	1A1a	010102	g	GJ	8	CS	3	6	CS	2	4	CS	2
AGRICUL. WASTES	1A1a	010103	g	GJ	8	CS	3	6	CS	2	4	CS	2
AGRICUL. WASTES	1A1a	010202	g	GJ	21	CS	1	15	CS	2	12	CS	2
AGRICUL. WASTES	1A1a	010203	g	GJ	21	CS	1	15	CS	2	12	CS	2
AGRICUL. WASTES	1A2f	030102	g	GJ	21	CS	1	15	CS	2	12	CS	2
AGRICUL. WASTES	1A2f	030105	g	GJ	21	CS	1	15	CS	2	12	CS	2
AGRICUL. WASTES	1A4a	0201	g	GJ	21	CS	1	15	CS	2	12	CS	2
AGRICUL. WASTES	1A4b	0202	g	GJ	234	CS	4	222	CS	5	211	CS	5
AGRICUL. WASTES	1A4c	0203	g	GJ	21	CS	1	15	CS	2	12	CS	2
AGRICUL. WASTES	1A4c	020302	g	GJ	21	CS	1	15	CS	2	12	CS	2
BIOGAS	all	all	g	GJ	1,5	CS	6	1,5	CS	7	1,5	CS	7
LIQUID BIO FUEL	all	all	g	GJ	19	CS	8	19	CS	8	19	CS	8
GAS OIL	all	all	g	GJ	5	C	9	5	C	9	5	C	9
KEROSENE	all	all	g	GJ	5	C	9	5	C	9	5	C	9
LPG	all	all	g	GJ	0,2	C	9	0,2	C	9	0,2	C	9
MUNICIP. WASTES	1A1a	all	g	GJ	6	CS	10	5	CS	11	4	CS	11
MUNICIP. WASTES	1A4a	all	g	GJ	100	C	9	95	C	9	90	C	9
NATURAL GAS	all	all	g	GJ	0,1	C	9	0,1	C	9	0,1	C	9
ORIMULSION	1A1a	010101	g	GJ	1,9	CS	12	1,8	CS	12	1,6	CS	12
PETROLEUM COKE	1A2f	0301	g	GJ	10	C	9	7	C	9	3	C	9
PETROLEUM COKE	1A4	all	g	GJ	100	C	9	60	C	9	30	C	9
REFINERY GAS	all	all	g	GJ	5	C	9	5	C	9	5	C	9
RESIDUAL OIL	1A1a	all	g	GJ	3	C	9	3	C	9	2,5	C	9
RESIDUAL OIL	1A1b	010303	g	GJ	50	C	9	40	C	9	35	C	9
RESIDUAL OIL	1A2f	all	g	GJ	14	CS	6	10,5	CS	13	7	CS	13
RESIDUAL OIL	1A4a	0201	g	GJ	14	CS	6	10,5	CS	13	7	CS	13
RESIDUAL OIL	1A4a	020105	g	GJ	60	C	9	50	C	9	40	C	9
RESIDUAL OIL	1A4b	0202	g	GJ	14	CS	6	10,5	CS	13	7	CS	13
RESIDUAL OIL	1A4c	0203	g	GJ	14	CS	6	10,5	CS	13	7	CS	13
RESIDUAL OIL	1A4c	020302	g	GJ	14	CS	6	10,5	CS	13	7	CS	13
RESIDUAL OIL	1A4c	020304	g	GJ	60	C	9	50	C	9	40	C	9
STEAM COAL	1A1a	010101	g	GJ	3	CS	12	2,6	CS	12	2,1	CS	12
STEAM COAL	1A1a	010102	g	GJ	3	CS	12	2,6	CS	12	2,1	CS	12
STEAM COAL	1A1a	010103	g	GJ	3	CS	12	2,6	CS	12	2,1	CS	12
STEAM COAL	1A1a	010202	g	GJ	6	C	9	6	C	9	5	C	9
STEAM COAL	1A1a	010203	g	GJ	6	C	9	6	C	9	5	C	9
STEAM COAL	1A2f	0301	g	GJ	17	CS	6	12	CS	14	7	CS	14
STEAM COAL	1A4b	0202	g	GJ	17	CS	6	12	CS	14	7	CS	14
STEAM COAL	1A4c	0203	g	GJ	17	CS	6	12	CS	14	7	CS	14
WOOD AND SIMIL.	1A1a	010102	g	GJ	8	CS	3 12	6	CS	3 12	4	CS	3 12
WOOD AND SIMIL.	1A1a	010103	g	GJ	8	CS	3 12	6	CS	3 12	4	CS	3 12
WOOD AND SIMIL.	1A1a	010105	g	GJ	8	CS	3 12	6	CS	3 12	4	CS	3 12
WOOD AND SIMIL.	1A1a	010202	g	GJ	19	CS	1	13	CS	2	10	CS	2
WOOD AND SIMIL.	1A1a	010203	g	GJ	19	CS	1	13	CS	2	10	CS	2
WOOD AND SIMIL.	1A1a	010205	g	GJ	19	CS	1	13	CS	2	10	CS	2
WOOD AND SIMIL.	1A2f	all	g	GJ	19	CS	1	13	CS	2	10	CS	2
WOOD AND SIMIL.	1A4a	0201	g	GJ	143	CS	1	143	C	9	135	C	9
WOOD AND SIMIL.	1A4a	020105	g	GJ	143	CS	1	143	C	9	135	C	9
WOOD AND SIMIL.	1A4b	0202	g	GJ	150	C	9	143	C	9	135	C	9
WOOD AND SIMIL.	1A4c	0203	g	GJ	143	CS	1	143	C	9	135	C	9

1. Danish legislation, Luftvejledningen. Vejledning fra Miljøstyrelsen nr 2 2001
2. Particulate size distribution for wood combustion in power plants stated by TNO
3. Eltra PSO 3141, Temporary report
4. The Danish Technological Institute, rough estimate
5. Particulate size distribution for wood combustion in residential plants stated by TNO
6. Danish legislation. Bekendtgørelse om begrænsning af emissioner af svovldioxid, kvælstofoxider og støv fra store fyringsanlæg. Bekendtgørelse nr 689 af 15/10/1990
7. All TSP emission is assumed to be <2,5µm
8. Same emission factor as for agricultural waste (straw) is assumed
9. TNO CEPMEIP database
10. Implied emission factor calculation based on annual environmental reports of a large number of municipal waste incineration plants, 2000
11. Particulate size distribution is unknown. The PM10 fraction is assumed to equal 85% of TSP and the PM2,5 fraction is assumed to equal 70% of TSP
12. Feltstudier af Forbrændingsaerosoler, EFP -98 Projekt, Aerosollaboratoriet DTU, FLS Miljø, Forskningscenter Risø, Elsam, Energi E2 (in Danish)
13. Particulate size distribution for residual oil combustion stated by TNO
14. Particulate size distribution for coal combustion stated by TNO

Table 6 Emission factors of NMVOC [g/GJ] Time series of area sources

fuel_gr_abbr	snap_id	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
STEAM COAL	0101	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5
STEAM COAL	Other	15	15	15	15	15	15	15	15	15	15	15	15
PETROLEUM COKE	all	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5
WOOD AND SIMIL.	01 and 03	48	48	48	48	48	48	48	48	48	48	48	48
WOOD AND SIMIL.	0201, 0202 and 0203	600	600	600	600	600	600	600	600	600	600	600	600
MUNICIP. WASTES	all	9	9	9	9	9	9	9	9	9	9	9	9
AGRICUL. WASTES	01 and 03	50	50	50	50	50	50	50	50	50	50	50	50
AGRICUL. WASTES	02	600	600	600	600	600	600	600	600	600	600	600	600
RESIDUAL OIL	all	3	3	3	3	3	3	3	3	3	3	3	3
GAS OIL	010105, 010205, 020105, 020304, 030105									100	100	100	100
GAS OIL	010104, 030104									2	2	2	2
GAS OIL	01 and 03 Other	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5
GAS OIL	02 other	3	3	3	3	3	3	3	3	3	3	3	3
KEROSENE	all	3	3	3	3	3	3	3	3	3	3	3	3
LIQUID BIOMASS FUEL	010203												50
LIQUID BIOMASS FUEL	020304												600
ORIMULSION (Orimulsion)	0101						3	3	3	3	3	3	3
NATURAL GAS	Engines: 010105, 010405, 010505, 020105, 020204, 020304, 030105	163	163	163	163	163	163	163	163	163	163	163	163
NATURAL GAS	Gas turbines: 010104, 010304, 010504, 020104, 020303, 030104	1	1	1	1	1	1	1	1	1	1	1	1
NATURAL GAS	0202 (-02)	4	4	4	4	4	4	4	4	4	4	4	4
NATURAL GAS	Other	2	2	2	2	2	2	2	2	2	2	2	2
LPG	all	2	2	2	2	2	2	2	2	2	2	2	2
REFINERY GAS	all	4	4	4	4	4	4	4	4	4	4	4	4
BIOGAS	all	4	4	4	4	4	4	4	4	4	4	4	4

Table 7 Emission factors of CO [g/GJ] Time series of area sources

fuel_gr_abbr	snap_id	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
STEAM COAL	all	10	10	10	10	10	10	10	10	10	10	10	10
PETROLEUM COKE	010102				61								
PETROLEUM COKE	02	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
PETROLEUM COKE	03	61	61	61	61	61	61	61	61	61	61	61	61
WOOD AND SIMIL.	0101			50	50	50	50	50	50	50	50	50	50
WOOD AND SIMIL.	0102 and 0201	400	373	347	320	293	267	240	240	240	240	240	240
WOOD AND SIMIL.	0202	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000
WOOD AND SIMIL.	0203 and 0301	400	373	347	320	293	267	240	240	240	240	240	240
MUNICIP. WASTES	all	100	85	70	55	40	25	10	10	10	10	10	10
AGRICUL. WASTES	0101	50	50	50	50	50	50	50	50	50	50	50	50
AGRICUL. WASTES	0102 and 0201	600	554	508	463	417	371	325	325	325	325	325	325
AGRICUL. WASTES	0202	8500	8500	8500	8500	8500	7500	6500	5500	4500	4000	4000	4000
AGRICUL. WASTES	0203 and 0301	600	554	508	463	417	371	325	325	325	325	325	325
RESIDUAL OIL	0101	15	15	15	15	15	15	15	15	15	15	15	15
RESIDUAL OIL	0102, 0103, 02	30	30	30	30	30	30	30	30	30	30	30	30
RESIDUAL OIL	0301 (-02 and -03)	30	30	30	30	30	30	30	30	30	30	30	30
RESIDUAL OIL	030104										15	15	15
RESIDUAL OIL	030105												100
GAS OIL	0101 (not -05)	15	15	15	15	15	15	15	15	15	15	15	15
GAS OIL	010105									100	100	100	100
GAS OIL	0102 (not -05) and 0103 and 0104	30	30	30	30	30	30	30	30	30	30	30	30
GAS OIL	010205											100	100
GAS OIL	0201 (-03)	30	30	30	30	30	30	30	30	30	30	30	30
GAS OIL	020105											100	100
GAS OIL	0202 (-02)	43	43	43	43	43	43	43	43	43	43	43	43
GAS OIL	0203 (-02)	30	30	30	30	30	30	30	30				
GAS OIL	020304											100	100
GAS OIL	0301 (-02, -03)	30	30	30	30	30	30	30	30	30	30	30	30
GAS OIL	030104											15	15
GAS OIL	030105											100	100
GAS OIL	030106	30	30	30	30	30	30	30	30	30	30	30	30
KEROSENE	all	20	20	20	20	20	20	20	20	20	20	20	20
LIQUID BIOMASS FUEL	all												325
ORIMULSION (Orimulsion)	0101						15	15	15	15	15	15	15
NATURAL GAS	0101 (-01, -02, -03)	15	15	15	15	15	15	15	15	15	15	15	15
NATURAL GAS	010104, 010304, 010504, 020104, 020303, 030104	7	7	7	7	7	7	7	7	7	7	7	7
NATURAL GAS	010105, 010405, 010505, 020105, 020204, 020304, 030105	212	212	212	212	212	212	203	195	186	178	169	169
NATURAL GAS	0202 (-02)	20	20	20	20	20	20	20	20	20	20	20	20
NATURAL GAS	Other	28	28	28	28	28	28	28	28	28	28	28	28
LPG	all	25	25	25	25	25	25	25	25	25	25	25	25
REFINERY GAS	all	15	15	15	15	15	15	15	15	15	15	15	15
BIOGAS	010105, 010405, 010505, 020105, 020304, 030105									255	255	255	255
BIOGAS	Other	36	36	36	36	36	36	36	36	36	36	36	36

## Appendix 2.2 Large point sources

Table 8 Large point sources, fuel consumption in 2001 (1A1, 1A2 and 1A4)

lps_id	lps_name	part_id	snap_id	fuel	fuel cons. [GJ]	NFR source
001	Amagervaerket	01	010101	STEAM COAL	2785006	1A1a
001	Amagervaerket	01	010101	RESIDUAL OIL	124657	1A1a
001	Amagervaerket	02	010101	STEAM COAL	2765850	1A1a
001	Amagervaerket	02	010101	RESIDUAL OIL	148840	1A1a
001	Amagervaerket	03	010101	STEAM COAL	14334732	1A1a
001	Amagervaerket	03	010101	RESIDUAL OIL	126698	1A1a
002	Svanemoellevaerket	05	010101	NATURAL GAS	1882525	1A1a
002	Svanemoellevaerket	07	010104	NATURAL GAS	4344799	1A1a
003	H.C.Oerstedsvaerket	03	010101	RESIDUAL OIL	1177110	1A1a
003	H.C.Oerstedsvaerket	03	010101	NATURAL GAS	1688830	1A1a
003	H.C.Oerstedsvaerket	07	010101	RESIDUAL OIL	1931452	1A1a
003	H.C.Oerstedsvaerket	07	010101	NATURAL GAS	2327121	1A1a
004	Kyndbyvaerket	22	010101	RESIDUAL OIL	103088	1A1a
004	Kyndbyvaerket	26	010101	RESIDUAL OIL	187734	1A1a
004	Kyndbyvaerket	28	010101	RESIDUAL OIL	89515	1A1a
004	Kyndbyvaerket	41	010105	GAS OIL	1009	1A1a
004	Kyndbyvaerket	51	010104	GAS OIL	6186	1A1a
004	Kyndbyvaerket	52	010104	GAS OIL	7801	1A1a
005	Masnedeovaerket	12	010102	WOOD AND SIMIL.	95934	1A1a
005	Masnedeovaerket	12	010102	AGRICUL. WASTES	484060	1A1a
005	Masnedeovaerket	12	010102	GAS OIL	1108	1A1a
005	Masnedeovaerket	31	010104	GAS OIL	5584	1A1a
007	Stigsnaesvaerket	01	010101	STEAM COAL	330455	1A1a
007	Stigsnaesvaerket	01	010101	RESIDUAL OIL	67899	1A1a
007	Stigsnaesvaerket	02	010101	STEAM COAL	5558569	1A1a
007	Stigsnaesvaerket	02	010101	RESIDUAL OIL	250782	1A1a
008	Asnaesvaerket	01	010101	RESIDUAL OIL	144268	1A1a
008	Asnaesvaerket	03	010101	STEAM COAL	2173576	1A1a
008	Asnaesvaerket	03	010101	RESIDUAL OIL	66746	1A1a
008	Asnaesvaerket	04	010101	STEAM COAL	7479179	1A1a
008	Asnaesvaerket	04	010101	RESIDUAL OIL	82560	1A1a
008	Asnaesvaerket	05	010101	RESIDUAL OIL	266167	1A1a
008	Asnaesvaerket	05	010101	ORIMULSION	30243677	1A1a
009	Statoi Raffinaderi	01	010306	RESIDUAL OIL	765537	1A1b
009	Statoi Raffinaderi	01	010306	REFINERY GAS	6909888	1A1b
010	Avedoevaerket	01	010101	STEAM COAL	17199365	1A1a
010	Avedoevaerket	01	010101	RESIDUAL OIL	63657	1A1a
010	Avedoevaerket	01	010101	GAS OIL	40018	1A1a
010	Avedoevaerket	02	010104	AGRICUL. WASTES	101730	1A1a
010	Avedoevaerket	02	010104	RESIDUAL OIL	1715776	1A1a
010	Avedoevaerket	02	010104	NATURAL GAS	1279897	1A1a
011	Fynsvaerket	03	010101	STEAM COAL	1684670	1A1a
011	Fynsvaerket	03	010101	WOOD AND SIMIL.	920	1A1a
011	Fynsvaerket	03	010101	MUNICIP. WASTES	185500	1A1a
011	Fynsvaerket	03	010101	AGRICUL. WASTES	10070	1A1a
011	Fynsvaerket	03	010101	RESIDUAL OIL	98330	1A1a
011	Fynsvaerket	03	010101	NATURAL GAS	7666490	1A1a
011	Fynsvaerket	07	010101	STEAM COAL	10731460	1A1a
011	Fynsvaerket	07	010101	RESIDUAL OIL	88460	1A1a
011	Fynsvaerket	08	010101	MUNICIP. WASTES	2623520	1A1a
011	Fynsvaerket	08	010101	GAS OIL	42420	1A1a
012	Studstrupvaerket	03	010101	STEAM COAL	15240450	1A1a
012	Studstrupvaerket	03	010101	RESIDUAL OIL	132130	1A1a
012	Studstrupvaerket	04	010101	STEAM COAL	11462760	1A1a
012	Studstrupvaerket	04	010101	AGRICUL. WASTES	28160	1A1a
012	Studstrupvaerket	04	010101	RESIDUAL OIL	136920	1A1a
014	Vendsysselveaerket	03	010101	STEAM COAL	19831710	1A1a
014	Vendsysselveaerket	03	010101	RESIDUAL OIL	206640	1A1a
014	Vendsysselveaerket	03	010101	GAS OIL	15280	1A1a
017	Shell Raffinaderi	01	010306	RESIDUAL OIL	677392	1A1b
017	Shell Raffinaderi	01	010306	REFINERY GAS	4866618	1A1b
017	Shell Raffinaderi	05	010304	REFINERY GAS	2457089	1A1b
018	Skaerbaekvaerket	01	010101	RESIDUAL OIL	85000	1A1a
018	Skaerbaekvaerket	03	010101	GAS OIL	25000	1A1a
018	Skaerbaekvaerket	03	010101	NATURAL GAS	6950000	1A1a
019	Enstedvaerket	03	010101	STEAM COAL	27937970	1A1a
019	Enstedvaerket	03	010101	RESIDUAL OIL	153050	1A1a
019	Enstedvaerket	04	010101	AGRICUL. WASTES	1549480	1A1a
019	Enstedvaerket	04	010101	RESIDUAL OIL	15520	1A1a
020	Esbjergvaerket	03	010101	STEAM COAL	19474710	1A1a
020	Esbjergvaerket	03	010101	RESIDUAL OIL	74420	1A1a
022	Oestkraft	05	010102	RESIDUAL OIL	17990	1A1a
022	Oestkraft	06	010102	STEAM COAL	723407	1A1a
022	Oestkraft	06	010102	WOOD AND SIMIL.	31020	1A1a
022	Oestkraft	06	010102	RESIDUAL OIL	29102	1A1a
023	Danisco Ingredients	01	030102	STEAM COAL	552101	1A2f
023	Danisco Ingredients	01	030102	NATURAL GAS	10500	1A2f
024	Dansk Naturgas Behandlingsanlaeg	01	010502	NATURAL GAS	352650,31	1A1c
025	Horsens Kraftvarmevaerk	01	010102	MUNICIP. WASTES	875920	1A1a
025	Horsens Kraftvarmevaerk	02	010104	NATURAL GAS	878260	1A1a
026	Herningvaerket	01	010102	RESIDUAL OIL	21650	1A1a
026	Herningvaerket	01	010102	NATURAL GAS	3806740	1A1a
027	Vestforbraendingen	01	010102	MUNICIP. WASTES	2086623	1A1a

027	Vestforbraendingen	01	010102	GAS OIL	17862	1A1a
027	Vestforbraendingen	02	010102	MUNICIP. WASTES	3007981	1A1a
028	Amagerforbraendingen	01	010102	MUNICIP. WASTES	3019970	1A1a
029	Randersvaerket	01	010102	STEAM COAL	3229268	1A1a
029	Randersvaerket	01	010102	BIOGAS	23338	1A1a
029	Randersvaerket	02	010102	GAS OIL	46594	1A1a
030	Grenaavaerket	01	010102	STEAM COAL	1017827	1A1a
030	Grenaavaerket	01	010102	WOOD AND SIMIL.	217337	1A1a
030	Grenaavaerket	01	010102	MUNICIP. WASTES	130991	1A1a
030	Grenaavaerket	01	010102	AGRICUL. WASTES	853970	1A1a
030	Grenaavaerket	01	010102	RESIDUAL OIL	77083	1A1a
030	Grenaavaerket	01	010102	GAS OIL	7470	1A1a
031	Hilleroedvaerket	01	010104	NATURAL GAS	3190810	1A1a
032	Helsingoeruvaerket	01	010104	NATURAL GAS	2066843	1A1a
033	Staalvalsevaerket	01	030102	NATURAL GAS	1803744	1A2f
034	Stora Dalum	01	030102	NATURAL GAS	1054807,5	1A2f
035	Assens Sukkerfabrik	01	030102	STEAM COAL	445279,5	1A2f
035	Assens Sukkerfabrik	01	030102	RESIDUAL OIL	306379,05	1A2f
035	Assens Sukkerfabrik	01	030102	BIOGAS	17020	1A2f
036	Kolding Kraftvarmevaerk	01	010103	MUNICIP. WASTES	762059	1A1a
036	Kolding Kraftvarmevaerk	02	010103	MUNICIP. WASTES	285185	1A1a
037	Maabjergvaerket	02	010102	WOOD AND SIMIL.	432000	1A1a
037	Maabjergvaerket	02	010102	MUNICIP. WASTES	1720000	1A1a
037	Maabjergvaerket	02	010102	AGRICUL. WASTES	408000	1A1a
037	Maabjergvaerket	02	010102	NATURAL GAS	218000	1A1a
038	Soenderborg Kraftvarmevaerk	01	010102	MUNICIP. WASTES	461825	1A1a
038	Soenderborg Kraftvarmevaerk	02	010104	NATURAL GAS	910366	1A1a
039	Kara Affaldsforbraendingsanlaeg	01	010102	MUNICIP. WASTES	1962022	1A1a
039	Kara Affaldsforbraendingsanlaeg	01	010102	NATURAL GAS	16851	1A1a
040	Viborg Kraftvarmevaerk	01	010104	NATURAL GAS	2398896,9	1A1a
042	Nordforbraendingen	01	010102	MUNICIP. WASTES	1018068	1A1a
045	Aalborg Portland	01	030311	STEAM COAL	4718457,5	1A2f
045	Aalborg Portland	01	030311	PETROLEUM COKE	7656733	1A2f
045	Aalborg Portland	01	030311	MUNICIP. WASTES	795492	1A2f
045	Aalborg Portland	01	030311	RESIDUAL OIL	784	1A2f
046	Aarhus Nord	01	010102	MUNICIP. WASTES	1211385	1A1a
046	Aarhus Nord	02	010102	MUNICIP. WASTES	648292	1A1a
047	Reno Nord	01	010103	MUNICIP. WASTES	1487290	1A1a
048	Silkeborg Kraftvarmevaerk	01	010104	NATURAL GAS	3571656	1A1a
049	Rensningsanlaegget Lynetten	01	020103	MUNICIP. WASTES	12669	1A4a
049	Rensningsanlaegget Lynetten	01	020103	GAS OIL	44010	1A4a
049	Rensningsanlaegget Lynetten	01	020103	BIOGAS	84512	1A4a
050	I/S Fasan	01	010203	MUNICIP. WASTES	754394	1A1a
051	AVV Forbraendingsanlaeg	01	010103	MUNICIP. WASTES	632966	1A1a
052	I/S REFA Kraftvarmevaerk	01	010103	MUNICIP. WASTES	1040783	1A1a
053	Svendborg Kraftvarmevaerk	01	010102	MUNICIP. WASTES	470264	1A1a
053	Svendborg Kraftvarmevaerk	01	010102	NATURAL GAS	6727	1A1a
054	Kommunekemi	02	010102	MUNICIP. WASTES	651702	1A1a
054	Kommunekemi	02	010102	RESIDUAL OIL	40171	1A1a
054	Kommunekemi	02	010102	GAS OIL	7604	1A1a
054	Kommunekemi	03	010102	MUNICIP. WASTES	637250	1A1a
054	Kommunekemi	03	010102	RESIDUAL OIL	49654	1A1a
054	Kommunekemi	03	010102	GAS OIL	9110	1A1a
054	Kommunekemi	04	010104	NATURAL GAS	1000	1A1a
055	I/S Faelles Forbraending	01	010203	MUNICIP. WASTES	235484	1A1a
056	Vestfyns Forbraending	01	010203	MUNICIP. WASTES	242970	1A1a
058	I/S Reno Syd	01	010103	MUNICIP. WASTES	614638	1A1a
059	I/S Kraftvarmevaerk Thisted	01	010103	MUNICIP. WASTES	562958	1A1a
059	I/S Kraftvarmevaerk Thisted	01	010103	AGRICUL. WASTES	943	1A1a
060	Knudmosevaerket	01	010103	MUNICIP. WASTES	341618	1A1a
060	Knudmosevaerket	01	010103	NATURAL GAS	27263	1A1a
061	Kavo I/S Energien	01	010103	MUNICIP. WASTES	699867	1A1a
062	VEGA	01	010203	MUNICIP. WASTES	574350	1A1a
063	Hadsund Bys Fjernvarmevaerk	01	010203	WOOD AND SIMIL.	30286	1A1a
063	Hadsund Bys Fjernvarmevaerk	01	010203	MUNICIP. WASTES	198468	1A1a
064	Aars Fjernvarmeforsyning	01	010103	WOOD AND SIMIL.	6410	1A1a
064	Aars Fjernvarmeforsyning	01	010103	MUNICIP. WASTES	520526	1A1a
065	Haderslev Kraftvarmevaerk	01	010103	MUNICIP. WASTES	615093	1A1a
065	Haderslev Kraftvarmevaerk	01	010103	NATURAL GAS	53	1A1a
066	Frederikshavn Affaldskraftvarmevaerk	01	010103	MUNICIP. WASTES	370380	1A1a
066	Frederikshavn Affaldskraftvarmevaerk	01	010103	GAS OIL	1260	1A1a
067	Vejen Kraftvarmevaerk	01	010103	MUNICIP. WASTES	409800	1A1a
068	Bofa I/S	01	010203	MUNICIP. WASTES	189372	1A1a
068	Bofa I/S	01	010203	RESIDUAL OIL	561	1A1a
069	DTU	01	010104	NATURAL GAS	1325022	1A1a
070	Naestved Kraftvarmevaerk	01	010104	NATURAL GAS	446555	1A1a
071	Maricogen	01	030104	NATURAL GAS	2249317	1A2f
072	Hjoerring KVV	01	010104	NATURAL GAS	1473666	1A1a

Table 9 Large point sources, plant specific emissions (NFR 1A1, 1A2 and 1A4)

lps_id	lps_name	part_id	snap_id	ipcc_id	SO <sub>2</sub> Mg	NO <sub>x</sub> Mg	NM/VOG Mg	CO Mg	TSP Mg	PM10 Mg 1)	PM2.5 Mg 1)	As kg	Cd kg	Cr kg	Cu kg	Hg kg	Ni kg	Pb kg	Se kg	Zn kg				
001	Amagervaerket	01	010101	1A1a	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x			
		02	010101	1A1a	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x			
		03	010101	1A1a	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x			
002	Svanemoellevaerket	05	010101	1A1a		x																		
		07	010104	1A1a		x																		
003	H.C.Oerstedsvaerket	03	010101	1A1a	x	x							x	x	x	x	x	x	x	x	x			
		05	010101	1A1a	x	x																		
		07	010101	1A1a	x	x						x	x	x	x	x	x	x	x	x	x	x		
004	Kyndbyvaerket	21	010101	1A1a	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x			
		22	010101	1A1a	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x		
		26	010101	1A1a	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x		
		28	010101	1A1a	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x		
		41	010105	1A1a	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x		
		51	010104	1A1a	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x		
		52	010104	1A1a	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x		
005	Masnedoevaerket	12	010102	1A1a	x	x																		
		31	010104	1A1a	x	x																		
007	Stignsaesvaerket	01	010101	1A1a	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x		
		02	010101	1A1a	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x		
008	Asnaesvaerket	02	010101	1A1a	x	x																		
		03	010101	1A1a	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x		
		04	010101	1A1a	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x		
		05	010101	1A1a	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x		
009	Statoil Raffinaderi	01	010306	1A1b	x																			
010	Avedoevaerket	01	010101	1A1a	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x		
		02	010104	1A1a	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x		
011	Fynsvaerket	03	010101	1A1a	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x		
		07	010101	1A1a	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x		
		08	010101	1A1a	x	x		x	x	x	x													
012	Studstrupvaerket	03	010101	1A1a	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x		
		04	010101	1A1a	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x		
014	Vendsysselveaerket	03	010101	1A1a	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x		
017	Shell Raffinaderi	01	010306	1A1b	x	x																		
		05	010304	1A1b		x																		
018	Skaerbaekvaerket	01	010101	1A1a	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x		
		03	010101	1A1a	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x		
019	Enstedvaerket	03	010101	1A1a	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x		
		04	010101	1A1a	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x		
020	Esbjergvaerket	03	010101	1A1a	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x		
022	Oestkraft	06	010102	1A1a	x	x																		
024	Dansk Naturgas Behandleri	01	010502	1A1c		x																		
025	Horsens Kraftvarmevaerk	01	010102	1A1a	x	x		x	x	x	x													
		02	010104	1A1a		x																		
026	Herningvaerket	01	010102	1A1a	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x		
027	Vestforbraendingen	01	010102	1A1a	x	x		x	x	x	x													
		02	010102	1A1a	x	x		x	x	x	x													
028	Amagerforbraendingen	01	010102	1A1a	x	x		x	x	x	x													
029	Randersvaerket	01	010102	1A1a	x	x			x	x	x													
030	Grenaavaerket	01	010102	1A1a	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
031	Hilleroedvaerket	01	010104	1A1a		x																		
032	Helsingoeruvaerket	01	010104	1A1a		x																		
034	Stora Dalum	01	030102	1A2f		x																		
035	Assens Sukkerfabrik	01	030102	1A2f	x				x	x	x													
036	Kolding Kraftvarmevaerk	01	010103	1A1a	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
		02	010103	1A1a	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
037	Maabjergvaerket	02	010102	1A1a	x	x	x		x	x	x	x												
038	Soenderborg Kraftvarmevaerk	01	010102	1A1a	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
		02	010104	1A1a		x																		
039	Kara Affaldsforbraending-sanlaeg	01	010102	1A1a	x			x	x	x	x													
040	Viborg Kraftvarmevaerk	01	010104	1A1a		x																		
042	Nordforbraendingen	01	010102	1A1a	x			x	x	x	x													
045	Aalborg Portland	01	030311	1A2f	x	x		x	x	x	x													
046	Aarhus Nord	01	010102	1A1a	x				x	x	x													
		02	010102	1A1a	x				x	x	x													
047	Reno Nord	01	010103	1A1a	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
048	Silkeborg Kraftvarmevaerk	01	010104	1A1a		x																		
049	Rensningsanlaegget Lynetten	01	020103	1A4a	x				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
050	I/S Fasan	01	010203	1A1a	x	x		x	x	x	x	x												
051	AVV Forbraedingsanlaeg	01	010103	1A1a					x	x	x													
052	I/S REFA Kraftvarmevaerk	01	010103	1A1a					x	x	x													
053	Svendborg Kraftvarmevaerk	01	010102	1A1a	x	x		x	x	x	x													
054	Kommunekemi	02	010102	1A1a	x			x	x	x	x													
		03	010102	1A1a	x			x	x	x	x													
055	I/S Faelles Forbraending	01	010203	1A1a	x			x	x	x	x													
056	Vestfyns Forbraending	01	010203	1A1a	x	x		x	x	x	x													
058	I/S Reno Syd	01	010103	1A1a	x		x		x	x	x	x												
059	I/S Kraftvarmevaerk Thisted	01	010103	1A1a	x			x	x	x	x													
060	Knudmosevaerket	01	010103	1A1a	x			x	x	x	x													
061	Kavo I/S Energien	01	010103	1A1a	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

lps_id	lps_name	part_id	snap_id	ipcc_id	SO <sub>2</sub> Mg	NO <sub>x</sub> Mg	NMVOG Mg	CO Mg	TSP Mg	PM10 Mg 1)	PM2.5 Mg1)	As kg	Cd kg	Cr kg	Cu kg	Hg kg	Ni kg	Pb kg	Se kg	Zn kg
062	VEGA	01	010203	1A1a	x			x	x	x	x								x	
063	Hadsund Bys Fjernvarmeværk	01	010203	1A1a	x			x	x	x	x								x	
064	Aars Fjernvarmeforsyning	01	010103	1A1a	x			x	x	x	x								x	
065	Haderslev Kraftvarmeværk	01	010103	1A1a	x	x		x	x	x	x								x	
066	Fredenskhavn Af-faldskraftvarmeværk	01	010103	1A1a	x	x		x	x	x	x								x	
067	Vejen Kraftvarmeværk	01	010103	1A1a	x	x		x	x	x	x								x	
068	Bofa I/S	01	010203	1A1a	x			x	x	x	x								x	
069	DTU	01	010104	1A1a		x														
070	Næstved Kraftvarmeværk	01	010104	1A1a		x														
071	Maricogen	01	030104	1A2f		x														
072	Hjørring KVV	01	010104	1A1a		x														
<b>TOTAL</b>					<b>11675</b>	<b>44890</b>	<b>12</b>	<b>3398</b>	<b>1257</b>	<b>1033</b>	<b>861</b>	<b>232</b>	<b>51</b>	<b>241</b>	<b>246</b>	<b>318</b>	<b>1212</b>	<b>1774</b>	<b>545</b>	<b>111</b>

1. Based on particle size distribution

## Appendix 2.3 Fuel rate

fuel	fuel_gr_abbr	NFR source	rate_TJ
102	STEAM COAL	1A1a	163987
102	STEAM COAL	1A2f	10181
102	STEAM COAL	1A4b	49
102	STEAM COAL	1A4c	1234
110	PETROLEUM COKE	1A2f	7785
110	PETROLEUM COKE	1A4a	12
110	PETROLEUM COKE	1A4b	262
110	PETROLEUM COKE	1A4c	3
111	WOOD AND SIMIL.	1A1a	6135
111	WOOD AND SIMIL.	1A2f	6150
111	WOOD AND SIMIL.	1A4a	633
111	WOOD AND SIMIL.	1A4b	14102
111	WOOD AND SIMIL.	1A4c	198
114	MUNICIP. WASTES	1A1a	32114
114	MUNICIP. WASTES	1A2f	795
114	MUNICIP. WASTES	1A4a	128
117	AGRICUL. WASTES	1A1a	8856
117	AGRICUL. WASTES	1A2f	0
117	AGRICUL. WASTES	1A4a	0
117	AGRICUL. WASTES	1A4b	2901
117	AGRICUL. WASTES	1A4c	1940
118	SEWAGE SLUDGE	1A2f	0
121	OTHER SOL. FUEL	1A1a	32114
121	OTHER SOL. FUEL	1A2f	795
121	OTHER SOL. FUEL	1A4a	128
203	RESIDUAL OIL	1A1a	8689
203	RESIDUAL OIL	1A1b	1670
203	RESIDUAL OIL	1A2f	7852
203	RESIDUAL OIL	1A4a	203
203	RESIDUAL OIL	1A4b	27
203	RESIDUAL OIL	1A4c	1651
204	GAS OIL	1A1a	1600
204	GAS OIL	1A2f	3505
204	GAS OIL	1A4a	4781
204	GAS OIL	1A4b	31506
204	GAS OIL	1A4c	8911
205	DIESEL OIL	1A2f	9663
205	DIESEL OIL	1A4c	16958
206	KEROSENE	1A2f	26
206	KEROSENE	1A4a	80
206	KEROSENE	1A4b	159
206	KEROSENE	1A4c	24
208	MOTOR GASOLINE	1A2f	140
208	MOTOR GASOLINE	1A4b	1164
208	MOTOR GASOLINE	1A4c	572
215	LIQUID BIOMASS FUEL	1A1a	191
215	LIQUID BIOMASS FUEL	1A4c	1
225	ORIMULSION	1A1a	30244
301	NATURAL GAS	1A1a	80675
301	NATURAL GAS	1A1b	0
301	NATURAL GAS	1A1c	24628
301	NATURAL GAS	1A2f	42910
301	NATURAL GAS	1A4a	7578
301	NATURAL GAS	1A4b	31077
301	NATURAL GAS	1A4c	6582
303	LPG	1A1a	0
303	LPG	1A2f	2390
303	LPG	1A4a	119
303	LPG	1A4b	722
303	LPG	1A4c	19
308	REFINERY GAS	1A1b	14234
309	BIOGAS	1A1a	1748
309	BIOGAS	1A1c	29
309	BIOGAS	1A2f	110
309	BIOGAS	1A4a	982
309	BIOGAS	1A4c	178



## Appendix 2.5 NFR SNAP correspondence list

Table 10 Correspondence list of IPCC source categories 1A1, 1A2 and 1A4 and SNAP

snap_id	snap_name	NFR source
01	Combustion in energy and transformation industries	
0101	Public power	1A1a
010101	Combustion plants >= 300 MW (boilers)	1A1a
010102	Combustion plants >= 50 and < 300 MW (boilers)	1A1a
010103	Combustion plants < 50 MW (boilers)	1A1a
010104	Gas turbines	1A1a
010105	Stationary engines	1A1a
0102	District heating plants	1A1a
010201	Combustion plants >= 300 MW (boilers)	1A1a
010202	Combustion plants >= 50 and < 300 MW (boilers)	1A1a
010203	Combustion plants < 50 MW (boilers)	1A1a
010204	Gas turbines	1A1a
010205	Stationary engines	1A1a
0103	Petroleum refining plants	1A1b
010301	Combustion plants >= 300 MW (boilers)	1A1b
010302	Combustion plants >= 50 and < 300 MW (boilers)	1A1b
010303	Combustion plants < 50 MW (boilers)	1A1b
010304	Gas turbines	1A1b
010305	Stationary engines	1A1b
010306	Process furnaces	1A1b
0104	Solid fuel transformation plants	1A1c
010401	Combustion plants >= 300 MW (boilers)	1A1c
010402	Combustion plants >= 50 and < 300 MW (boilers)	1A1c
010403	Combustion plants < 50 MW (boilers)	1A1c
010404	Gas turbines	1A1c
010405	Stationary engines	1A1c
010406	Coke oven furnaces	1A1c
010407	Other (coal gasification, liquefaction, ...)	1A1c
0105	Coal mining, oil/gas extraction, pipeline compressors	
010501	Combustion plants >= 300 MW (boilers)	1A1c
010502	Combustion plants >= 50 and < 300 MW (boilers)	1A1c
010503	Combustion plants < 50 MW (boilers)	1A1c
010504	Gas turbines	1A1c
010505	Stationary engines	1A1c
02	Non-industrial combustion plants	
0201	Commercial and institutional plants (t)	1A4a
020101	Combustion plants >= 300 MW (boilers)	1A4a
020102	Combustion plants >= 50 and < 300 MW (boilers)	1A4a
020103	Combustion plants < 50 MW (boilers)	1A4a
020104	Stationary gas turbines	1A4a
020105	Stationary engines	1A4a
020106	Other stationary equipments (n)	1A4a
0202	Residential plants	1A4b
020201	Combustion plants >= 50 MW (boilers)	1A4b
020202	Combustion plants < 50 MW (boilers)	1A4b
020203	Gas turbines	1A4b
020204	Stationary engines	1A4b
020205	Other equipments (stoves, fireplaces, cooking,...)	1A4b
0203	Plants in agriculture, forestry and aquacultu	1A4c
020301	Combustion plants >= 50 MW (boilers)	1A4c
020302	Combustion plants < 50 MW (boilers)	1A4c
020303	Stationary gas turbines	1A4c
020304	Stationary engines	1A4c
020305	Other stationary equipments (n)	1A4c
03	Combustion in manufacturing industry	
0301	Comb. in boilers, gas turbines and stationary	1A2f
030101	Combustion plants >= 300 MW (boilers)	1A2f
030102	Combustion plants >= 50 and < 300 MW (boilers)	1A2f
030103	Combustion plants < 50 MW (boilers)	1A2f
030104	Gas turbines	1A2f
030105	Stationary engines	1A2f
030106	Other stationary equipments (n)	1A2f
0302	Proces furnaces without contact	
030203	Blast furnace cowpers	1A2a

030204	Plaster furnaces	1A2f
030205	Other furnaces	1A2f
0303	Processes with contact	
030301	Sinter and pelletizing plants	1A2a
030302	Reheating furnaces steel and iron	1A2a
030303	Gray iron foundries	1A2a
030304	Primary lead production	1A2b
030305	Primary zinc production	1A2b
030306	Primary copper production	1A2b
030307	Secondary lead production	1A2b
030308	Secondary zinc production	1A2b
030309	Secondary copper production	1A2b
030310	Secondary aluminium production	1A2b
030311	Cement (f)	1A2f
030312	Lime (includ. iron and steel and paper pulp industr.)(f)	1A2f
030313	Asphalt concrete plants	1A2f
030314	Flat glass (f)	1A2f
030315	Container glass (f)	1A2f
030316	Glass wool (except binding) (f)	1A2f
030317	Other glass (f)	1A2f
030318	Mineral wool (except binding)	1A2f
030319	Bricks and tiles	1A2f
030320	Fine ceramic materials	1A2f
030321	Paper-mill industry (drying processes)	1A2d
030322	Alumina production	1A2b
030323	Magnesium production (dolomite treatment)	1A2b
030324	Nickel production (thermal process)	1A2b
030325	Enamel production	1A2f
030326	Other	1A2f
08	Other mobile sources and machinery	
0804	Maritime activities	
080403	National fishing	1A4c
0806	Agriculture	1A4c
0807	Forestry	1A4c
0808	Industry	1A2f
0809	Household and gardening	1A4b

## Appendix 2.6 Uncertainty calculations

Table 11 Uncertainty estimation, SO<sub>2</sub>

SNAP	Gas	Base year emission	Year t emission	Activity data uncertainty	Emission factor uncertainty	Combined uncertainty	Combined uncertainty as % of total national emissions in year t	Type A sensitivity	Type B sensitivity	Uncertainty in trend in national emissions introduced by emission factor uncertainty	Uncertainty in trend in national emissions introduced by activity data uncertainty	Uncertainty introduced into the trend in total national emissions	
		Input data Mg SO <sub>2</sub>	Input data Mg SO <sub>2</sub>	Input data %	Input data %	Input data %	Input data %	Input data %	Input data %	Input data %	Input data %	Input data %	
01	SO <sub>2</sub>	133114	11139	2	10	10,198	5,675	-0,035	0,079	-0,353	0,222	0,417	
02	SO <sub>2</sub>	11197	3160	2	20	20,100	2,644	0,009	0,019	0,180	0,053	0,187	
03	SO <sub>2</sub>	20430	7115	2	10	10,198	3,181	0,027	0,044	0,265	0,125	0,293	
Total	SO <sub>2</sub>	164741	21415				49,320					0,295	
Total uncertainties		Overall uncertainty in the year (%):					6,958	Trend uncertainty (%):					0,555

Table 12 Uncertainty estimation, NO<sub>x</sub>

SNAP	Gas	Base year emission	Year t emission	Activity data uncertainty	Emission factor uncertainty	Combined uncertainty	Combined uncertainty as % of total national emissions in year t	Type A sensitivity	Type B sensitivity	Uncertainty in trend in national emissions introduced by emission factor uncertainty	Uncertainty in trend in national emissions introduced by activity data uncertainty	Uncertainty introduced into the trend in total national emissions	
		Input data Mg NO <sub>x</sub>	Input data Mg NO <sub>x</sub>	Input data %	Input data %	Input data %	Input data %	Input data %	Input data %	Input data %	Input data %	Input data %	
01	NO <sub>x</sub>	95479	48909	2	20	20,100	13,757	-0,102	0,4331	-2,035	1,225	2,376	
02	NO <sub>x</sub>	7237	7662	2	50	50,040	5,247	0,025	0,0663	1,251	0,188	1,265	
03	NO <sub>x</sub>	9508	14517	2	20	20,100	4,235	0,078	0,1333	1,551	0,377	1,596	
Total	NO <sub>x</sub>	112224	71088				234,733					9,790	
Total uncertainties		Overall uncertainty in the year (%):					15,400	Trend uncertainty (%):					3,168

Table 13 Uncertainty estimation, NMVOC

SNAP	Gas	Base year emission	Year t emission	Activity data uncertainty	Emission factor uncertainty	Combined uncertainty	Combined uncertainty as % of total national emissions in year t	Type A sensitivity	Type B sensitivity	Uncertainty in trend in national emissions introduced by emission factor uncertainty	Uncertainty in trend in national emissions introduced by activity data uncertainty	Uncertainty introduced into the trend in total national emissions	
		Input data Mg NMVOC	Input data Mg NMVOC	Input data %	Input data %	Input data %	Input data %	Input data %	Input data %	Input data %	Input data %	Input data %	
01	NMVOC	1164	6070	2	50	50,040	14,884	0,346	0,5657	17,282	1,600	17,356	
02	NMVOC	9958	13020	2	50	50,040	32,949	-0,299	1,2522	-14,960	3,542	15,373	
03	NMVOC	619	841	2	50	50,040	2,207	-0,044	0,0839	-2,219	0,237	2,232	
Total	NMVOC	11741	19932				1312,053					542,556	
Total uncertainties		Overall uncertainty in the year (%):					36,128	Trend uncertainty (%):					24,196

Table 14 Uncertainty estimation, CO

SNAP	Gas	Base year emission	Year t emission	Activity data uncertainty	Emission factor uncertainty	Combined uncertainty	Combined uncertainty as % of total national emissions in year t	Type A sensitivity	Type B sensitivity	Uncertainty in trend in national emissions introduced by emission factor uncertainty	Uncertainty in trend in national emissions introduced by activity data uncertainty	Uncertainty introduced into the trend in total national emissions	
		Input data	Input data	Input data	Input data								
		Mg CO	Mg CO	%	%	%	%	%	%	%	%	%	
01	CO	9008	12100	2	20	20,100	1,321	-0,056	0,149	-1,124	0,421	1,200	
02	CO	115324	143190	2	50	50,040	44,863	0,050	2,033	2,476	5,750	6,260	
03	CO	3995	6140	2	20	20,100	0,759	0,006	0,086	0,126	0,242	0,273	
Total	CO	128326	161430				2014,965					40,703	
Total uncertainties				Overall uncertainty in the year (%):				44,418	Trend uncertainty (%):				3,259

Table 15 Uncertainty estimation, Pb

SNAP	Gas	Base year emission	Year t emission	Activity data uncertainty	Emission factor uncertainty	Combined uncertainty	Combined uncertainty as % of total national emissions in year t	Type A sensitivity	Type B sensitivity	Uncertainty in trend in national emissions introduced by emission factor uncertainty	Uncertainty in trend in national emissions introduced by activity data uncertainty	Uncertainty introduced into the trend in total national emissions	
		Input data	Input data	Input data	Input data								
		kg Pb	kg Pb	%	%	%	%	%	%	%	%	%	
01	Pb	12699	2402	2	100	100,020	53,721	-0,069	0,149	-6,900	0,421	6,913	
02	Pb	939	356	2	1000	1000,002	79,514	0,006	0,022	5,900	0,062	5,901	
03	Pb	2482	1714	2	100	100,020	38,346	0,064	0,106	6,355	0,301	6,362	
Total	Pb	16120	4472				10678,82					123,084	
Total uncertainties				Overall uncertainty in the year (%):				103,34	Trend uncertainty (%):				11,094

Table 16 Uncertainty estimation, Hg

SNAP	Gas	Base year emission	Year t emission	Activity data uncertainty	Emission factor uncertainty	Combined uncertainty	Combined uncertainty as % of total national emissions in year t	Type A sensitivity	Type B sensitivity	Uncertainty in trend in national emissions introduced by emission factor uncertainty	Uncertainty in trend in national emissions introduced by activity data uncertainty	Uncertainty introduced into the trend in total national emissions	
		Input data	Input data	Input data	Input data								
		kg Hg	kg Hg	%	%	%	%	%	%	%	%	%	
01	Hg	2609	1492	2	100	100,020	80,050	-0,027	0,483	-2,657	1,367	2,988	
02	Hg	317	208	2	1000	1000,002	111,754	0,005	0,067	5,448	0,191	5,452	
03	Hg	162	164	2	100	100,020	8,792	0,021	0,053	2,133	0,150	2,138	
Total	Hg	3088	1865				18974,33					43,224	
Total uncertainties				Overall uncertainty in the year (%):				137,75	Trend uncertainty (%):				6,574

## Appendix 3

### The specific methodologies regarding Fugitive Emissions from Fuels

#### 3.1 Methodology and references

##### Fugitive emissions from solid fuels (1.B.1.a)

###### Storage and handling of coal:

Coal mining is not occurring in Denmark, but power plants use a considerable amount of coal. Emissions from storage and handling of coal are included in the Danish inventory.

Coal import refers to the official Danish energy statistics.

Table 1 Emission factors for coal storage and handling in Denmark

Year	Unit	CO 1)	TSP 2)	PM10 2)	PM2,5 2)
1990	g/Mg coal imported	3390	-	-	-
1991	g/Mg coal imported	3390	-	-	-
1992	g/Mg coal imported	3390	-	-	-
1993	g/Mg coal imported	3390	-	-	-
1994	g/Mg coal imported	3390	-	-	-
1995	g/Mg coal imported	3390	-	-	-
1996	g/Mg coal imported	3390	-	-	-
1997	g/Mg coal imported	3390	-	-	-
1998	g/Mg coal imported	3390	-	-	-
1999	g/Mg coal imported	3395	-	-	-
2000	g/Mg coal imported	3395	150	60	6
2001	g/Mg coal imported	3395	150	60	6

1) Haaland, T. (1992): Emission af drivhusgasser i Danmark 1975-90 med særlig henblik på energisektorens bidrag. Fysisk Lab. III. Danmarks Tekniske Højskole.

2) TNO CEPMEIP database

##### Fugitive emissions from natural gas (1.B.2.b)

###### Natural gas transmission and distribution:

Inventories of fugitive NMVOC emission from gas transmission and distribution is based on CH<sub>4</sub> emissions stated in annual environmental reports from the Danish gas transmission company, DONG and on a Danish inventory for the years 1999-2001 reported by the Danish gas sector (transmission and distribution companies). The inventories from the Danish gas sector for the years 1999-2001 are based on the work carried out by Marcogas and the International Gas

Union (IGU). NMVOC emissions estimates are based on the Danish natural gas composition in the year 2000.

In 1990-1999 the fugitive emissions from the storage facilities and the gas treatment plant are included in the transmission emission factors below. In 2000-2001 they are registered separately and added (Table 3).

Table 2 Emissions from natural gas transmission

TRANSMISSION		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Transmission rate Mm <sup>3</sup> 1)	2739	3496	3616	3992	4321	4689	5705	6956	6641	6795	7079	7289
CH <sub>4</sub>	CH <sub>4</sub> emission Mg 2)		310	93	186	151	536	183	235	156	191	86	157
	CH <sub>4</sub> IEF kg/Mm <sup>3</sup> 3)	88,619	88,619	25,653	46,642	34,981	114,27	36,000	33,784	23,490	28,109	12,149	21,539
NMVOC	NMVOC emission Mg 4)		94	28	57	46	163	56	72	45	56	26	48
	NMVOC IEF kg/Mm <sup>3</sup> 5)	27,018	27,018	7,821	14,220	10,665	34,839	10,976	10,300	6,776	8,241	3,704	6,567

- 1) In 1990-1997 transmission rates refers to Danish energy statistics, in 1998 transmission rate refers to the annual environmental report of DONG, in 1999-2001 emissions refers to DONG/Danish Gas Technology Centre
- 2) In 1991-95 CH<sub>4</sub> emissions are based on the annual environmental report from DONG for the year 1995. In 1996-99 the CH<sub>4</sub> emission refers to the annual environmental reports from DONG for the years 1996-99. In 2000-2001 the CH<sub>4</sub> emission refers to DONG/Danish Gas Technology Centre
- 3) IEF = Emission / transmission rate. In 1990 the IEF is assumed to be the same as in 1991
- 4) Calculation based on the CH<sub>4</sub> emission and the average gas quality in the year 2000
- 5) IEF = Emission / transmission rate. In 1990 the emission factor is assumed to equal the emission factor in 1991

Table 3 Additional fugitive emissions from natural gas storage facilities and venting in gas treatment plant

	CH <sub>4</sub>		NMVOC	
	2000	2001	2000	2001
Gas treatment plant	7,55 Mg	0 Mg	2,27	0
Gas storage facilities	76,48 Mg	72,68 Mg	23,05	21,42

Table 4 Emissions from natural gas distribution

DISTRIBUTION		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Distribution rate Mm <sup>3</sup> 1)	1574	1814	1921	2185	2362	2758	3254	3276	3403	3297	3181	3675
CH <sub>4</sub>	CH <sub>4</sub> emission Mg 2)										43	49	56
	CH <sub>4</sub> IEF kg/Mm <sup>3</sup> 3)	14,561	14,561	14,561	14,561	14,561	14,561	14,561	14,561	14,561	13,042	15,404	15,238
NMVOC	NMVOC emission Mg 4)										13,110	14,939	17,073
	NMVOC IEF kg/Mm <sup>3</sup> 5)	4,439	4,439	4,439	4,439	4,439	4,439	4,439	4,439	4,439	3,976	4,696	4,646

- 1) In 1999-2001 distribution rates refers to DONG / Danish Gas Technology Centre / Danish gas distribution companies, In 1990-98 distribution rates are estimated from the Danish energy statistics. Distribution rates are assumed to equal total Danish consumption rate minus the consumption rates of sectors that receive the gas at high pressure. The following consumers are assumed to receive high pressure gas: Town gas production companies, production platforms and power plants
- 2) Danish Gas Technology Centre / DONG/ Danish gas distribution companies
- 3) In the years 1999-2001 IEF=CH<sub>4</sub> emission / distribution rate. In 1990-1998 an average IEF of 1999-2001 is assumed.
- 4) Calculation based on the CH<sub>4</sub> emission and the average gas quality in the year 2000
- 5) IEF=NMVOC emission / distribution rate. In 1990-1998 an average IEF for 1999-2001 is assumed

In the year 2001 the length of transmission pipelines including off-shore pipeline is 1439 km. The length of distribution pipelines is 19550 km (cast iron 0 km, steel 2442 km, plastics 17108 km). Two natural gas storages are in operation in Denmark. In 2001 the gas input was 399 Mm<sup>3</sup> and the withdrawal was 491 Mm<sup>3</sup>.

Off-shore activities - Production of oil and gas (CRF: 1.B.2.b SNAP: 050303):

The emissions of VOC from offshore activities have been estimated to be about 2000 tons/year, of this 350 tons/year NMVOC and 1630 tons/year CH<sub>4</sub>. The estimates are made from 1994 to 2001 and the

uncertainty of the emission data is very high. A project is going on to make consistence emission inventories from 1990 to 2001 for oil and gas production including emissions from gas terminals and ships. Emissions from flaring are included in 'Stationary combustion plants', Appendix 4.

### **Fugitive emissions from oil (1.B.2.a)**

Oil Refineries – Petroleum products processing:

In the production process at the refineries a part of the volatile hydrocarbons (VOC) is emitted to the atmosphere. It is assumed that CH<sub>4</sub> accounts for 1 % and NMVOC for 99% of the emissions. The VOC emissions from petroleum refinery processes cover non-combustion emissions from feed stock handling/storage, petroleum products processing, product storage/handling and flaring. SO<sub>2</sub> is also emitted from the non-combustion processes and includes emissions from products processing and sulphur recovery plants. The emission calculations are based on information form the Danish refineries and the Energy statistic (Table 5).

## **3.2 Recalculation and changes**

### Coal mining and handling

The coal import 1990-2000 has been recalculated based on the new energy statistics. The PM emissions have been added in the years 200-2001.

### Natural gas

The NMVOC emissions from transmission and distribution of natural gas have been recalculated. Both emission factors and activity rates have been updated according to new knowledge.

## **3.3 Uncertainty**

Uncertainty estimates have not been carried out yet.

Table 5 Oil Refineries. Processed crude oil, emissions and emission factors

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Crude oil (1000)	7263	7798	8232	8356	8910	9802	10522	7910	7906	8106	8406	8284
CH4 emission	37	39	42	43	57	48	62	45	45	45	50	44
CH4 emission factor	5.094314	5.001282	5.102041	5.146003	6.397306	4.89696	5.892416	5.689001	5.69188	5.551443	5.948132	5.311444
NM VOC emission	3667	3937	4203	4219	5855	4546	5875	4547	4558	4558	4983	4338
NM VOC emission factor	504,8878	504,873	510,5685	504,9067	657,1268	463,7829	558,3539	574,842	576,5242	562,2995	592,7909	523,6601



# Appendix 4

## The specific methodologies regarding Transport

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## 4 Transport

The emissions from transport referring to SNAP category 07 (road transport) and the sub-categories in 08 (other mobile sources) are made up in the following NFR categories:

Table 1 Inventory sub-categories for transport according to SNAP and NFR classification

SNAP classification	NFR classification
07 Road transport	1A3b Transport-Road
0801 Military	1A5 Other
0802 Railways	1A3c Railways
0803 Inland waterways	1A3d Transport-Navigation
080402 National sea traffic	1A3d Transport-Navigation
080403 National fishing	
080404 International sea traffic	
080501 Dom. airport traffic (LTO < 1000 m)	1A3a Transport-Civil aviation
080502 Int. airport traffic (LTO < 1000 m)	1A3a Transport-Civil aviation (international)
080503 Dom. cruise traffic (> 1000 m)	1A3a Transport-Civil aviation
080504 Int. cruise traffic (> 1000 m)	1A3a Transport-Civil aviation (international)
0806 Agriculture	1A4c Agriculture/forestry/fisheries
0807 Forestry	1A4c Agriculture/forestry/fisheries
0808 Industry	1A2f Industry-Other
0809 Household and gardening	1A4b Residential

### 4.1 Methodology and references for Road Transport

For road transport the detailed methodology is used to make annual estimates of the Danish emissions as described in the EMEP/CORINAIR Emission Inventory Guidebook (EMEP/CORINAIR, 2002). The actual calculations are made with the European COPERT III model (Ntziachristos et al. 2000). In COPERT III fuel use and emission simulations can be made for operationally hot engines taking into account gradually stricter emission standards and emission degradation due to catalyst wear. Furthermore the emission effects of cold start and evaporation are simulated.

#### 4.1.1 Vehicle fleet and mileage data

Corresponding to the COPERT fleet classification all present and future vehicles in the Danish traffic are grouped into vehicle layers. This is a sub-division of all vehicle classes into groups of vehicles with the same average fuel use and emission behaviour. An overview of the different layers with years of implementation is given in appendix 4.1.

Table 2 Model vehicle classes, trip speeds and mileage split

Vehicle classe	Fuel type	Engine size/weight	Trip speed			Mileage [%]		
			Urban	Rural	Highway	Urban	Rural	Highway
PC	Gasoline	< 1.4 l.	40	70	100	35	46	19
PC	Gasoline	1.4 – 2 l.	40	70	100	35	46	19
PC	Gasoline	> 2 l.	40	70	100	35	46	19
PC	Diesel	< 2 l.	40	70	100	35	46	19
PC	Diesel	> 2 l.	40	70	100	35	46	19
PC	LPG		40	70	100	35	46	19
PC	2-stroke		40	70	100	35	46	19
LDV	Gasoline		40	65	80	35	50	15
LDV	Diesel		40	65	80	35	50	15
Trucks	Gasoline		35	60	80	32	47	21
Trucks	Diesel	3.5 – 7.5 tonnes	35	60	80	32	47	21
Trucks	Diesel	7.5 – 16 tonnes	35	60	80	32	47	21
Trucks	Diesel	16 – 32 tonnes	35	60	80	19	45	36
Trucks	Diesel	> 32 tonnes	35	60	80	19	45	36
Urban buses	Diesel		30	50	70	51	41	8
Coaches	Diesel		35	60	80	32	47	21
Mopeds	Gasoline		30	30	-	81	19	0
Motorcycles	Gasoline	2 stroke	40	70	100	47	39	14
Motorcycles	Gasoline	< 250 cc.	40	70	100	47	39	14
Motorcycles	Gasoline	250 – 750 cc.	40	70	100	47	39	14
Motorcycles	Gasoline	> 750 cc.	40	70	100	47	39	14

From the Danish Road Directorate information of the vehicle stock and annual mileage is obtained. This covers data for the number of vehicles, annual mileage, mileage split between urban, rural and highway driving and the respective average speeds.

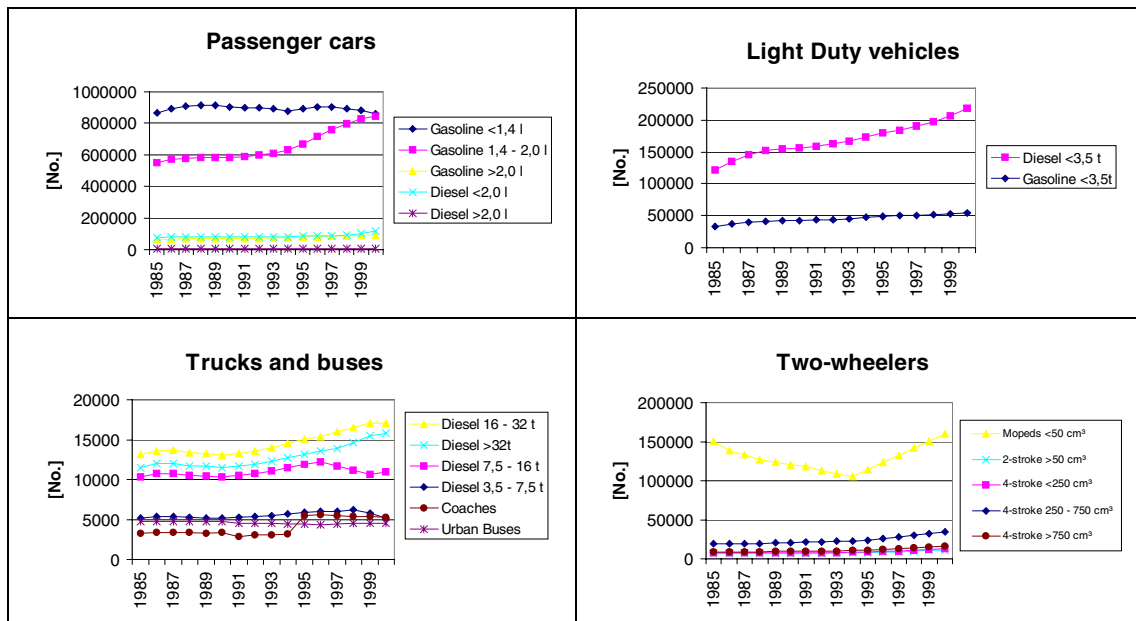


Figure 1 No. of vehicles in sub-classes in 1985-2001

The number of vehicles and annual mileages respectively, are provided per first registration year for all vehicle sub-classes. Subsequently the vehicle numbers are summed up in layers,  $j$ , for each year,  $y$ , by using the correspondance between layers and first registration year,  $i$ :

$$N_{j,y} = \sum_{i=FYear(j)}^{LYear(j)} N_{i,y} \quad (1)$$

Weighted annual mileages per layer are calculated as the sum of all mileage driven per first registration year divided with the total number of vehicles in the specific layer.

$$M_{j,y} = \frac{\sum_{i=FYear(j)}^{LYear(j)} N_{i,y} \cdot M_{i,y}}{\sum_{i=FYear(j)}^{LYear(j)} N_{i,y}} \quad (2)$$

Both vehicle numbers and weighted annual mileages per layer are shown in appendix 4.1.

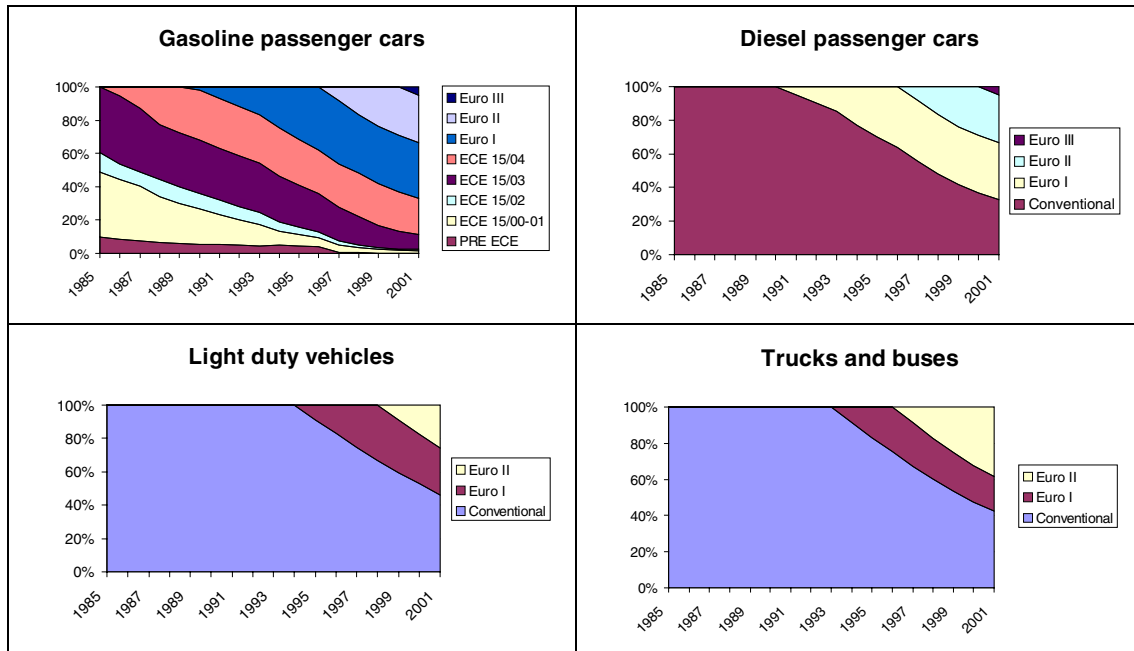


Figure 2 Layer distribution of vehicle numbers per vehicle type in 1985-2001

Trip speed dependent fuel use and emission factors are taken from the COPERT model using trip speeds as shown in table 1. The factors are listed in appendix 4.2 for all emission components except particulates, heavy metals and PAHs. For new layers not represented by actual data, the emission factors are scaled according to reduction factors, see Ntziachristos et al. (2000) or Illerup et al. (2002).

#### 4.1.2 Deterioration factors

For three-way catalyst cars the emissions of  $\text{NO}_x$  and NMVOC (and CO) gradually increase due to catalyst wear and are therefore modified as a function of total mileage by the so-called deterioration factors. Even though the emission curves may be serrated for the individual vehicles, on average the emissions from catalyst cars stabilise after a given cut-off mileage is reached due to OBD (On Board Diagnostics) and the Danish inspection and maintenance programme. For each forecast year the deterioration factors are calculated per first registration year by using deterioration coefficients and cut-off mileages as given in Ntziachristos et al. (2000) or Illerup et al. (2002) for the corresponding layer. The deterioration coefficients are given for the two driving cycles "Urban driving Cycle" (UDF) and "Extra Urban driving Cycle" (EUDF: urban and rural), with trip speeds of 19 and 63 km/h, respectively.

Firstly the deterioration factors are calculated for the correspondent trip speeds of 19 and 63 km h<sup>-1</sup> in each case determined by the total cumulated mileage less than or exceeding the cut-off mileage. The formulas 3 and 4 show the calculations for the "Urban driving Cycle":

$$UDF = U_A \cdot MTC + U_B, MTC < U_{MAX} \quad (3)$$

$$UDF = U_A \cdot U_{MAX} + U_B, MTC \geq U_{MAX} \quad (4)$$

Where UDF is the urban deterioration factors,  $U_A$  and  $U_B$  the urban deterioration coefficients,  $MTC$  = total cumulated mileage,  $U_{MAX}$  urban cut-off mileage.

In the case of trip speeds below 19 km h<sup>-1</sup> the deterioration factor, DF, equals UDF, whereas for trip speeds exceeding 63 km h<sup>-1</sup>  $DF = EUDF$ . For trip speeds between 19 and 63 km h<sup>-1</sup> the deterioration factor, DF, is found as an interpolation between UDF and EUDF. Secondly the deterioration factors, one for each of the three road types, are aggregated into layers by taking into account the vehicle numbers and annual mileages per first registration year:

$$DF_{j,y} = \frac{\sum_{i=FYear(j)}^{LYear(j)} DF_{i,y} \cdot N_{i,y} \cdot M_{i,y}}{\sum_{i=FYear(j)}^{LYear(j)} DF_{i,y} \cdot N_{i,y}} \quad (5)$$

Where DF is the deterioration factor.

#### 4.1.3 Emissions and fuel use for hot engines

Emissions and fuel use results for operationally hot engines are calculated for each year and layer and road type. The procedure is to combine fuel use and emission factors (and deterioration factors for catalyst vehicles), number of vehicles annual mileage numbers and their road type shares given in table 1. For non-catalyst vehicles this yields:

$$E_{j,k,y} = EF_{j,k,y} \cdot S_k \cdot N_{j,y} \cdot M_{j,y} \quad (6)$$

Here  $E$  = fuel use/emission,  $EF$  = fuel use/emission factor,  $S$  = road type share,  $k$  = road type.

For catalyst vehicles the calculations becomes:

$$E_{j,k,y} = DF_{j,k,y} \cdot EF_{j,k,y} \cdot S_k \cdot N_{j,y} \cdot M_{j,y} \quad (7)$$

#### 4.1.4 Extra emissions and fuel use for cold engines

Extra emissions of  $SO_2$ ,  $NO_x$  and NMVOC (as well as  $CO$ ,  $PM$ ,  $CH_4$ ,  $CO_2$  and  $FC$ ) from cold start are simulated separately. In the model each trip is associated with an amount of cold start emission and is assumed to take place under urban driving conditions. The number of trips are distributed evenly in months. Firstly cold emission factors are calculated as the hot emission factor times the cold:hot emission ratio. Secondly the extra emission factor during cold start is found by subtracting the hot emission factor from the cold emission factor. Lastly this extra factor is applied on the fraction of the total mileage driven with a cold engine (the  $\beta$ -factor) for all vehicles in the specific layer.

The cold:hot ratios depend on the average trip length and the monthly ambient temperature distribution and are equivalent for gasoline fuelled conventional passenger cars and vans and for diesel passenger cars and vans, respectively, see Ntziachristos et al. (2000). For conventional gasoline and all diesel vehicles the extra emissions become:

$$CE_{j,y} = \beta \cdot N_{j,y} \cdot M_{j,y} \cdot EF_{U,j,y} \cdot (CEr - 1) \quad (8)$$

Where CE is the cold extra emissions,  $\beta$  = cold driven fraction, CER = Cold:Hot ratio.

For catalyst cars the cold:hot ratio is also trip speed dependent. The ratio is however unaffected by catalyst wear. The EURO I ratio is used for all future catalyst technologies. However, in order to comply with gradually stricter emission standards the catalyst light-off temperature must be reached in even shorter time periods for future EURO standards. Correspondingly the  $\beta$ -factor for gasoline vehicles is step-wise reduced for EURO II onwards.

For catalyst vehicles the cold extra emissions are found from:

$$CE_{j,y} = \beta_{red} \cdot \beta_{EUROI} \cdot N_{j,y} \cdot M_{j,y} \cdot EF_{U,j,y} \cdot (CER_{EUROI} - 1) \quad (9)$$

Where  $\beta_{red}$  = the  $\beta$  reduction factor.

#### 4.1.5 Evaporative emissions from gasoline vehicles

For each year evaporative emissions of hydrocarbons are simulated in the forecast model as hot and warm running loss, hot and warm soak, and diurnal emissions. All emission types are influenced by RVP (Reid Vapour Pressure) and ambient temperature. The emission factors are shown in Ntziachristos et al. (2000).

Running loss emissions originate from vapour generated in the fuel tank during operation. The distinction between hot and warm running loss emissions depend on the engine temperature. In the model hot and warm running loss occur for hot and cold engines, respectively. The emissions are calculated as the annual mileage – broken down on cold and hot mileage totals using the  $\beta$ -factor - times respective emission factors. For vehicles equipped with evaporation control (catalyst cars) the emission factors are only one tenth of the uncontrolled factors used by conventional gasoline vehicles.

$$R_{j,y} = N_{j,y} \cdot M_{j,y} \cdot ((1 - \beta) \cdot HR + \beta \cdot WR) \quad (10)$$

Where R is the running loss emissions and HR and WR the hot and warm running loss emission factors, respectively.

In the model hot and warm soak emissions for carburettor vehicles also occurs for hot and cold engines, respectively. These emissions are calculated as number of trips – broken down into cold and hot trip numbers using the  $\beta$ -factor - times respective emission factors:

$$S_{j,y}^C = N_{j,y} \cdot \frac{M_{j,y}}{l_{trip}} \cdot ((1 - \beta) \cdot HS + \beta \cdot WS) \quad (11)$$

Where  $S^C$  is the soak emissions,  $l_{trip}$  = the average trip length and HS and WS is the hot and warm soak emission factors, respectively. Since all catalyst vehicles are assumed to be carbon canister controlled no soak emissions are estimated for this vehicle type. Average maximum and minimum temperatures per month are used in combination with diurnal emission factors to estimate the diurnal emissions from uncontrolled vehicles  $E^d(U)$ :

$$E_{j,y}^d(U) = 365 \cdot N_{j,y} \cdot e^d(U) \quad (12)$$

Each forecast year's total is the sum of each layer's running loss, soak and diurnal emissions.

#### 4.1.6 Fuel use balance

The calculated fuel use in the model must equal the statistical fuel sale totals from the Danish Energy Authority (DEA) according to the UNECE emissions reporting format. The standard

approach to achieve a fuel balance in annual emission inventories is to multiply the annual mileage with a fuel balance factor derived as the ratio between simulated and statistical fuel figures for gasoline and diesel, respectively. This method is also used in the present model.

For gasoline vehicles all mileage numbers are equally scaled in order to obtain a gasoline fuel equilibrium. For diesel fuel the balance is made by adjusting the mileage for light and heavy duty vehicles and buses, given that the mileage and fuel consumption factors for these vehicles are regarded as the most uncertain parameters in the diesel engine emission simulations.

The final 1990-2001 fuel use and emission factors are shown in appendix 4.3, and the total fuel use and emissions are shown in appendix 4.4 and 4.5 per vehicle category and as grand totals, respectively, for all emission components other than particulates, heavy metals and PAHs. Final 1990 and 2001 emission factors and total emissions for the three latter groups of emission components are shown in appendix 4.6-4.8.

#### **4.1.7 Non-exhaust particulate emissions from road transport**

The TSP, PM10 and PM2.5 emissions arising from tyre and brake wear (SNAP 0706) and road abrasion (SNAP 0707) are estimated for the years 2000 and 2001 as prescribed by the UNECE convention reporting format. The emissions are calculated by multiplying the total annual mileage per vehicle category with the correspondent average emission factors for each source type. The calculation procedure is consistent with the COPERT III model approach used to estimate the Danish national emissions coming from exhaust. The evaluation of emission factors used and a more thorough explanation of the calculations is given by Nielsen et al. (2003) and Winther (2003). The emission factors and total emissions for 2001 are shown in appendix 4.9.

## **4.2 Methodologies and references for other mobile sources**

The off road sector is divided into several sub-sectors; sea transport, fishery, air traffic, railways, military and the working machinery and materiel in the industry, forestry, agriculture and household and gardening sectors. The emission calculations are made using the detailed method for air traffic and off road working machinery and equipment, while for the remaining sectors the simple method is used.

### **4.2.1 Activity data**

The activity data for air traffic consist of air traffic statistics provided by the Danish Civil Aviation Agency (CAA-DK) and Copenhagen Airport. For 2001 records are given per flight by CAA-DK as data for aircraft type and origin and destination airports. Prior to 2001 detailed LTO/aircraft type statistics are provided by Copenhagen Airport (for this airport only), while CAA-DK has given information of total take off numbers for other Danish airports. Fuel statistics for jet fuel use and aviation gasoline are obtained from the DEA.

For off road working machinery and equipment the number of different types of machines, their load factors, engine sizes and annual working hours are taken from the Danish EPA (1992 and 1993). Fuel use statistics for diesel, gasoline and LPG are obtained from the DEA in relevant sectors.

The activity data for military, railways, sea transport and fishery consist of fuel use information provided by the DEA. For sea transport the basis is fuel sold in Danish ports and the traffic is defined as either national or international depending on the destination of the vessels in question as prescribed by the UNECE emission reporting format.

For all sectors fuel use figures are given in appendix 4.10 for the years 1990 and 2001.

#### **4.2.2 Emission factors**

For military ground material and railways aggregated emission factors for gasoline and diesel are derived from the road traffic emission simulations made with the COPERT model. The emission factors for the remaining sectors come from the EMEP/CORINAIR guidebook, see CORINAIR (1999). For all sectors emission factors are given in appendix 4.11 for the years 1990 and 2001 for all emission components other than particulates, heavy metals and PAHs. Final 1990 and 2001 emission factors for the three latter groups of emission components are shown in appendix 4.6-4.8.

#### **4.2.3 Calculation method**

For military aircraft, railways, national sea traffic, fishing and aviation the emissions are estimated with the simple method using fuel related emission factors and fuel use from the DEA.

For aviation the estimates are made separately for Landing and Take Offs (LTOs < 3000 ft) and cruise (> 3000 ft). From 2001 the estimates are made on a city-pair level by combining activity data and emission factors and subsequently group the emission results into domestic and international totals. In a final step a fuel balance is made. The fuel ratio between model estimates and statistical sales is used to modify the model results of cruise fuel use and emissions according to the domestic and international cruise shares.

Prior to 2001 the calculation scheme is firstly to estimate each year's fuel use and emissions for LTO. Secondly the total cruise fuel use is found year by year as the statistical fuel use total minus the calculated fuel use for LTO. Lastly the cruise fuel use is split into domestic and international parts by using the results from a Danish city pair emission inventory in 1998 (Winther, 2001a). For more details of this latter fuel allocation procedure, see Winther (2001b).

Off road working machines and equipment are placed in the sectors: Inland waterways, agriculture, forestry, industri and household and gardening. In general the fuel use and emissions are calculated by combining information of the number of different machine types and their respective load factors, engine sizes, annual working hours, and fuel use and emission factors. The simulations take into account the implementation of a two stage emission legislation directive depending on engine size for relevant types of diesel fuelled machinery. Stage I and II of the directive becomes effective for new machinery in use in 1999-2001 and 1999-2003 respectively.

A fuel balance is made for diesel between statistical sales and estimated fuel consumption and the ratio is used to scale the annual working hours used in the emission calculations for all machinery types. The final simulated fuel use for gasoline and LPG is maintained by adjusting the amount of fuel used in the simulations for road traffic and household.

The calculated emissions for other mobile sources are shown per sector in appendix 4.11 for the years 1990 and 2001 for all emission components other than particulates, heavy metals and PAHs. Final 1990 and 2001 total emissions for the three latter groups of emission components are shown in appendix 4.6-4.8.

### **4.3 Recalculations**

#### *Road traffic*

As regards road traffic the 1990-2001 PAH emission factors have been changed to the values proposed by COPERT III. Exhaust TSP, PM10 and PM2.5 emissions have been calculated for other fuels than diesel for the years 1985-2001. In terms of non-exhaust emissions for vehicle tyre and brake wear (2000-2001) small adjustments have been made to the emission factors



previously used for TSP, PM10 and PM2.5. Furthermore TSP, PM10 and PM2.5 estimates are made for the sub-group "road abrasion" in 2000 and 2001.

#### *Military*

New emission factors of traditional pollutants and PAHs for gasoline and diesel have been derived from the new road traffic estimates. For PAHs the emission factors for jet fuel are set to zero until better knowledge becomes available.

#### *Railways*

New emission factors for gasoline (traditional pollutants and PAHs) and diesel (PAHs only) have been derived from the new road traffic estimates.

#### *Inland waterways, agriculture, forestry and industry*

New PAHs emission factors for gasoline, diesel and LPG have been derived from the new road traffic estimates.

#### *Air traffic*

From 2001 air traffic estimates are made up using city-pair statistics from the CAA-DK. Moreover the flights for Greenland and the Faroe Islands are included under domestic aviation as prescribed by the UNECE reporting guidelines. Previous years estimates (1985-2000) are updated in accordance with the new model. For PAHs the emission factors for jet fuel are set to zero until better knowledge becomes available.

## 4.4 Uncertainties

Uncertainty estimates are made for road transport and other mobile sources using the guidelines and emission factor uncertainties formulated in the Good Practice Guidance for CLRTAP Emission Inventories by Pulles et al. (2001). However, for TSP the latter source indicate no uncertainty factor. Instead the uncertainty factor used is based on own judgement. The uncertainty factors for activity data is assumed to be 2 and 10% for road transport and other mobile sources based on own judgement.

No uncertainty estimates are made for exhaust PM<sub>10</sub> and PM<sub>2.5</sub> as well as for the non-exhaust particulate emissions arising from tyre, brake and asphalt wear. The uncertainty estimates should be regarded as preliminary only and may be subject to changes in future inventory documentations. The calculations are shown in appendix 4.12.

Table 3 Uncertainties for UNECE emission factors and total emissions in 2001 and as a trend

	Emission factor uncertainties [%]		Emission uncertainties [%]	
	Road	Other	Overall 2001	Trend
SO <sub>2</sub>	50	50	46	5
NO <sub>x</sub>	50	100	53	9
NM VOC	50	100	48	12
CO	50	100	45	8
NH <sub>3</sub>	1000	1000	997	917
TSP	50	100	58	12
Arsenic	1000	1000	1000	7
Cadmium	1000	1000	787	97
Chromium	1000	1000	787	104
Copper	1000	1000	828	36
Mercury	1000	1000	1000	12
Nickel	1000	1000	845	70
Lead	1000	1000	964	19

Selenium	1000	1000	758	110
Zinc	1000	1000	809	56
Dioxins	1000	1000	816	115
Flouranthene	1000	1000	782	60
Benzo(b) flouranthene	1000	1000	771	24
Benzo(k) flouranthene	1000	1000	778	5
Benzo(a) pyrene	1000	1000	827	17
Benzo(g,h,i) perylene	1000	1000	779	67
indeno(1,2,3-c,d) pyrene	1000	1000	744	41

## 4.5 Quality assurance/quality control (QA/QC)

For road transport the detailed methodology and the fuel balance approach provide a quality control of the emission estimations. Firstly the bottom up approach (detailed methodology) is used as described in the sections 1.1 to 1.5. Secondly the estimates are modified according to a fuel balance using the statistical sale figures for road transportation fuel in Denmark, as described in section 1.6. The usage of the fuel balance approach ensures that all fuel for road transport is accounted for in the estimations and that no double counting of emissions for working equipment and machinery is made.

Also for air traffic and off road machinery and working equipment the fuel balance approach and the detailed method are worked in parallel, see section 2.3. This enables the computation of more accurate sub-sectoral estimates and makes the level of total sector-wise emission contributions to be in compliance with anticipated results derived directly from national fuel statistics.

For the remaining transport sectors the simple method ensure that all fuel is accounted for in the emission estimations.

As a part of the general QA/QC work all time series of emissions in the NFR and SNAP source categories are examined and considerate changes are checked and explained. Moreover a comparison is made to the previous year's estimate, and any major changes are verified. As a last point a data transfer control is made from SNAP source categories to aggregated NFR source categories.

## 4.6 References

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## Appendix 4.1: Fleet data 1990-2001 for road transport (No. vehicles)

Sector	Subsector	Tech	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Passenger Cars	Gasoline <1,4 l	PRE ECE	46209	44014	42804	36466	39959	37597	37130	3434	2761	2103	1744	1614
Passenger Cars	Gasoline <1,4 l	ECE 15/00-01	187912	161642	139010	119424	80742	67991	53302	44338	31104	22511	17980	15837
Passenger Cars	Gasoline <1,4 l	ECE 15/02	86959	80041	73306	66422	50119	43384	35052	26097	17585	10873	7348	5544
Passenger Cars	Gasoline <1,4 l	ECE 15/03	300791	294878	288227	280146	261998	250043	235177	215301	183113	147111	118929	97930
Passenger Cars	Gasoline <1,4 l	ECE 15/04	272012	270182	268686	268154	265860	262990	259954	265188	264791	254032	235890	219216
Passenger Cars	Gasoline <1,4 l	Euro I	10000	49608	87121	122067	177991	230063	282488	289374	275572	273582	270268	267260
Passenger Cars	Gasoline <1,4 l	Euro II								58502	119142	170981	209279	205833
Passenger Cars	Gasoline <1,4 l	Euro III												34695
Passenger Cars	Gasoline 1,4 - 2,0 l	PRE ECE	35940	34233	33292	28362	31079	29242	28879	2671	2148	1635	1356	1255
Passenger Cars	Gasoline 1,4 - 2,0 l	ECE 15/00-01	127631	109641	94188	80844	54600	45991	36079	30465	21520	15647	12537	11077
Passenger Cars	Gasoline 1,4 - 2,0 l	ECE 15/02	55063	50674	46402	42040	31712	27445	22173	16509	11141	6870	4642	3500
Passenger Cars	Gasoline 1,4 - 2,0 l	ECE 15/03	174545	170750	166596	161592	150612	143386	133413	122642	103931	83270	67222	55300
Passenger Cars	Gasoline 1,4 - 2,0 l	ECE 15/04	180298	178950	177873	177525	176045	174195	172298	176155	179510	172582	160800	149915
Passenger Cars	Gasoline 1,4 - 2,0 l	Euro I	10000	45647	82427	119744	184854	250826	322960	330407	315731	313279	309587	306414
Passenger Cars	Gasoline 1,4 - 2,0 l	Euro II								80440	163821	235099	287758	283021
Passenger Cars	Gasoline 1,4 - 2,0 l	Euro III												47705
Passenger Cars	Gasoline >2,0 l	PRE ECE	3423	3260	3171	2701	2960	2785	2750	254	205	156	129	120
Passenger Cars	Gasoline >2,0 l	ECE 15/00-01	10781	9234	7914	6781	4567	3849	3022	2619	1881	1366	1110	986
Passenger Cars	Gasoline >2,0 l	ECE 15/02	4392	4043	3702	3355	2531	2191	1770	1318	888	549	371	280
Passenger Cars	Gasoline >2,0 l	ECE 15/03	24667	24157	23595	22912	21429	20432	19053	17571	14934	12016	9722	8009
Passenger Cars	Gasoline >2,0 l	ECE 15/04	15679	15524	15390	15339	15120	14844	14546	14977	23975	22975	21251	19699
Passenger Cars	Gasoline >2,0 l	Euro I	10000	13961	17871	21674	28044	34257	40813	41567	31121	30887	30519	30193
Passenger Cars	Gasoline >2,0 l	Euro II								7313	14893	21373	26160	25729
Passenger Cars	Gasoline >2,0 l	Euro III												4337
Passenger Cars	Diesel <2,0 l	Euro I		4041	8031	11912	18412	24751	31440	31580	31998	35415	39518	43826
Passenger Cars	Diesel <2,0 l	Euro II								7316	15312	24505	33856	37328
Passenger Cars	Diesel <2,0 l	Euro III												6313
Passenger Cars	Diesel <2,0 l	Conventional	79709	75788	72288	68529	62139	58843	55000	48153	43893	43004	42861	42885
Passenger Cars	Diesel >2,0 l	Euro I		213	423	627	969	1303	1655	1662	1684	1864	2087	2313
Passenger Cars	Diesel >2,0 l	Euro II								385	806	1290	1789	1971
Passenger Cars	Diesel >2,0 l	Euro III												332
Passenger Cars	Diesel >2,0 l	Conventional	3702	3556	3425	3281	3040	2905	2746	2461	2266	2237	2228	2229
Passenger Cars	LPG	Conventional	286	286	288	289	289	301	311	172	97	44	32	63
Passenger Cars	2-Stroke	Conventional	5417	4804	4308	3747	3029	2443	1665	1248	761	400	300	200

Sector	Subsector	Tech	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Light Duty Veh.	Gasoline <3,5t	Conventional	42333	43215	44179	45486	47261	44601	41519	37209	34454	31489	28488	25423
Light Duty Veh.	Gasoline <3,5t	Euro I						4259	8524	12645	17212	16632	15979	15527
Light Duty Veh.	Gasoline <3,5t	Euro II										4705	9299	14017
Light Duty Veh.	Diesel <3,5 t	Conventional	155543	158781	162324	167129	173650	163877	152553	142109	131572	122992	115695	105397
Light Duty Veh.	Diesel <3,5 t	Euro I						15648	31318	48292	65727	64964	64894	64370
Light Duty Veh.	Diesel <3,5 t	Euro II										18376	37766	58112
Heavy Duty Veh.	Gasoline >3,5 t	Conventional	250	255	260	268	279	288	295	261	274	253	257	249
Heavy Duty Veh.	Diesel 3,5 - 7,5 t	Conventional	5108	5214	5330	5488	5205	4891	4532	3999	3692	3079	2406	1979
Heavy Duty Veh.	Diesel 3,5 - 7,5 t	Euro I					497	1004	1506	1440	1435	1269	1057	951
Heavy Duty Veh.	Diesel 3,5 - 7,5 t	Euro II								529	1087	1487	1703	1990
Heavy Duty Veh.	Diesel 7,5 - 16 t	Conventional	10286	10500	10734	11052	10482	9850	9126	7800	6603	5613	5085	4210
Heavy Duty Veh.	Diesel 7,5 - 16 t	Euro I					1001	2022	3033	2808	2566	2314	2235	2024
Heavy Duty Veh.	Diesel 7,5 - 16 t	Euro II								1032	1945	2710	3600	4234
Heavy Duty Veh.	Diesel 16 - 32 t	Conventional	13034	13306	13602	14005	13283	12481	11564	10720	9832	8982	7933	6814
Heavy Duty Veh.	Diesel 16 - 32 t	Euro I					1268	2562	3844	3859	3821	3702	3486	3276
Heavy Duty Veh.	Diesel 16 - 32 t	Euro II								1419	2896	4336	5616	6853
Heavy Duty Veh.	Diesel >32t	Conventional	11446	11684	11944	12298	11664	10960	10154	9337	8720	8180	7361	6527
Heavy Duty Veh.	Diesel >32t	Euro I					1114	2250	3376	3362	3389	3371	3234	3138
Heavy Duty Veh.	Diesel >32t	Euro II								1236	2568	3949	5211	6564
Buses	Urban Buses	Conventional	4753	4561	4522	4490	4083	3635	3261	2946	2792	2542	2319	2319
Buses	Urban Buses	Euro I					390	746	1084	1060	972	913	852	852
Buses	Urban Buses	Euro II								390	729	1053	1345	1345
Buses	Coaches	Conventional	3327	2868	3007	3086	2927	4507	4156	3662	3369	3007	2724	2724
Buses	Coaches	Euro I					280	925	1381	1318	1173	1080	1001	1001
Buses	Coaches	Euro II								485	879	1246	1579	1579
Mopeds	<50 cm <sup>3</sup>	Conventional	120000	118000	113000	109000	105000	114167	123333	132500	141667	150833	150522	149460
Mopeds	<50 cm <sup>3</sup>	97/24/EC I											9478	15540
Motorcycles	2-stroke >50 cm <sup>3</sup>	Conventional	6617	6804	6904	7111	7406	7672	8214	8980	9598	10385	11054	11367
Motorcycles	4-stroke <250 cm <sup>3</sup>	Conventional	7499	7712	7824	8059	8394	8695	9310	10177	10878	11769	11916	11367
Motorcycles	4-stroke <250 cm <sup>3</sup>	97/24/EC											613	1074
Motorcycles	4-stroke 250-750 cm <sup>3</sup>	Conventional	20622	21207	21516	22162	23083	23911	25602	27986	29914	32365	32768	33910
Motorcycles	4-stroke 250-750 cm <sup>3</sup>	97/24/EC											1685	2953
Motorcycles	4-stroke >750 cm <sup>3</sup>	Conventional	9374	9639	9780	10074	10492	10869	11637	12721	13597	14712	14894	15414
Motorcycles	4-stroke >750 cm <sup>3</sup>	97/24/EC											766	1342

## Appendix 4.1: Mileage data 1990-2001 for road transport (km)

Sector	Subsector	Tech	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Passenger Cars	Gasoline <1,4 l	PRE ECE	10352	11120	11847	12282	12679	12387	12152	11935	11988	11407	11507	11922
Passenger Cars	Gasoline <1,4 l	ECE 15/00-01	12073	12735	13119	13036	12679	12387	12152	11935	11988	11407	11507	11922
Passenger Cars	Gasoline <1,4 l	ECE 15/02	13225	13605	14495	15028	15513	13532	12152	11935	11988	11407	11507	11922
Passenger Cars	Gasoline <1,4 l	ECE 15/03	16370	16830	16920	16820	16701	15701	14867	14403	14225	13135	12591	11922
Passenger Cars	Gasoline <1,4 l	ECE 15/04	19941	20341	20763	20356	19947	18688	17564	16233	15648	14567	14356	12416
Passenger Cars	Gasoline <1,4 l	Euro I	22535	23984	25041	25397	25885	24768	23130	22344	21207	19362	18497	18409
Passenger Cars	Gasoline <1,4 l	Euro II								25981	25671	23766	24054	22954
Passenger Cars	Gasoline <1,4 l	Euro III												25954
Passenger Cars	Gasoline 1,4 - 2,0 l	PRE ECE	10352	11120	11847	12282	12679	12387	12152	11935	11988	11407	11507	11922
Passenger Cars	Gasoline 1,4 - 2,0 l	ECE 15/00-01	12073	12735	13119	13036	12679	12387	12152	11935	11988	11407	11507	11922
Passenger Cars	Gasoline 1,4 - 2,0 l	ECE 15/02	13225	13605	14495	15028	15513	13532	12152	11935	11988	11407	11507	11922
Passenger Cars	Gasoline 1,4 - 2,0 l	ECE 15/03	16370	16830	16920	16820	16701	15701	14867	14403	14225	13135	12591	11922
Passenger Cars	Gasoline 1,4 - 2,0 l	ECE 15/04	19941	20341	20763	20356	19947	18688	17564	16233	15648	14567	14356	12416
Passenger Cars	Gasoline 1,4 - 2,0 l	Euro I	22535	23984	25041	25397	25885	24768	23130	22344	21207	19362	18497	18409
Passenger Cars	Gasoline 1,4 - 2,0 l	Euro II								25981	25671	23766	24054	22954
Passenger Cars	Gasoline 1,4 - 2,0 l	Euro III												25954
Passenger Cars	Gasoline >2,0 l	PRE ECE	10352	11120	11847	12282	12679	12387	12152	11935	11988	11407	11507	11922
Passenger Cars	Gasoline >2,0 l	ECE 15/00-01	12073	12735	13119	13036	12679	12387	12152	11935	11988	11407	11507	11922
Passenger Cars	Gasoline >2,0 l	ECE 15/02	13225	13605	14495	15028	15513	13532	12152	11935	11988	11407	11507	11922
Passenger Cars	Gasoline >2,0 l	ECE 15/03	16370	16830	16920	16820	16701	15701	14867	14403	14225	13135	12591	11922
Passenger Cars	Gasoline >2,0 l	ECE 15/04	19941	20341	20763	20356	19947	18688	17564	16233	15648	14567	14356	12416
Passenger Cars	Gasoline >2,0 l	Euro I	22535	23984	25041	25397	25885	24768	23130	22344	21207	19362	18497	18409
Passenger Cars	Gasoline >2,0 l	Euro II								25981	25671	23766	24054	22954
Passenger Cars	Gasoline >2,0 l	Euro III												25954
Passenger Cars	Diesel <2,0 l	Euro I		44822	44911	43972	44800	44746	43410	41641	39363	38090	35677	34320
Passenger Cars	Diesel <2,0 l	Euro II								47992	47256	46753	45221	42794
Passenger Cars	Diesel <2,0 l	Euro III												48385
Passenger Cars	Diesel <2,0 l	Conventional	30874	30888	30400	29591	29501	29228	28169	27809	27304	27242	26288	22832
Passenger Cars	Diesel >2,0 l	Euro I		44822	44911	43972	44800	44746	43410	41641	39363	38090	35677	34320
Passenger Cars	Diesel >2,0 l	Euro II								47992	47256	46753	45221	42794
Passenger Cars	Diesel >2,0 l	Euro III												48385
Passenger Cars	Diesel >2,0 l	Conventional	30874	30888	30400	29591	29501	29228	28169	27809	27304	27242	26288	22832
Passenger Cars	LPG	Conventional	16370	16830	16920	16820	16701	15701	14867	12868	14225	13135	12591	11922
Passenger Cars	2-Stroke	Conventional	16370	16830	16920	16820	16701	15701	14867	12868	14225	13135	12591	11922

Sector	Subsector	Tech	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Light Duty Veh.	Gasoline <3,5t	Conventional	20255	20573	21208	21167	21003	20157	20005	19559	18762	17644	18101	16619
Light Duty Veh.	Gasoline <3,5t	Euro I						20157	20005	19559	18762	17644	18101	16619
Light Duty Veh.	Gasoline <3,5t	Euro II										17644	18101	16619
Light Duty Veh.	Diesel <3,5 t	Conventional	40234	40672	38721	37230	38732	36909	37282	37023	35010	33919	32789	32130
Light Duty Veh.	Diesel <3,5 t	Euro I						36909	37282	37023	35010	33919	32789	32130
Light Duty Veh.	Diesel <3,5 t	Euro II										33919	32789	32130
Heavy Duty Veh.	Gasoline >3,5 t	Conventional	24464	24848	25614	25565	25367	24346	24162	21140	21559	20756	22009	23191
Heavy Duty Veh.	Diesel 3,5 - 7,5 t	Conventional	41061	41509	39516	37996	39528	37666	38048	30803	31809	33314	34246	44099
Heavy Duty Veh.	Diesel 3,5 - 7,5 t	Euro I					39528	37666	38048	30803	31809	33314	34246	44099
Heavy Duty Veh.	Diesel 3,5 - 7,5 t	Euro II								30803	31809	33314	34246	44099
Heavy Duty Veh.	Diesel 7,5 - 16 t	Conventional	49634	50175	47767	45929	47781	45532	45991	43199	42348	38844	37550	20945
Heavy Duty Veh.	Diesel 7,5 - 16 t	Euro I					47781	45532	45991	43199	42348	38844	37550	20945
Heavy Duty Veh.	Diesel 7,5 - 16 t	Euro II								43199	42348	38844	37550	20945
Heavy Duty Veh.	Diesel 16 - 32 t	Conventional	68996	69748	66402	63845	66422	63294	63934	64717	65653	66302	64092	68254
Heavy Duty Veh.	Diesel 16 - 32 t	Euro I					66422	63294	63934	64717	65653	66302	64092	68254
Heavy Duty Veh.	Diesel 16 - 32 t	Euro II								64717	65653	66302	64092	68254
Heavy Duty Veh.	Diesel >32t	Conventional	68996	69748	66402	63845	66422	63294	63934	64717	65653	66302	64092	68254
Heavy Duty Veh.	Diesel >32t	Euro I					66422	63294	63934	64717	65653	66302	64092	68254
Heavy Duty Veh.	Diesel >32t	Euro II								64717	65653	66302	64092	68254
Buses	Urban Buses	Conventional	104096	107730	104029	103324	108850	103224	103953	103313	102311	99070	95765	93590
Buses	Urban Buses	Euro I					108850	103224	103953	103313	102311	99070	95765	93590
Buses	Urban Buses	Euro II								103313	102311	99070	95765	93590
Buses	Coaches	Conventional	93315	98696	98846	98624	108850	90022	85021	83545	82509	80371	77850	76121
Buses	Coaches	Euro I					108850	90022	85021	83545	82509	80371	77850	76121
Buses	Coaches	Euro II								83545	82509	80371	77850	76121
Mopeds	<50 cm <sup>3</sup>	Conventional	2056	2137	2235	2304	2315	2211	2188	2141	2151	1751	1614	1175
Mopeds	<50 cm <sup>3</sup>	97/24/EC I											1614	1175
Motorcycles	2-stroke >50 cm <sup>3</sup>	Conventional	5815	6072	6372	6557	6584	6279	6220	6106	6168	5827	6029	5563
Motorcycles	4-stroke <250 cm <sup>3</sup>	Conventional	5815	6072	6372	6557	6584	6279	6220	6106	6168	5827	6029	5563
Motorcycles	4-stroke <250 cm <sup>3</sup>	97/24/EC											6029	5563
Motorcycles	4-stroke 250-750 cm <sup>3</sup>	Conventional	5815	6072	6372	6557	6584	6279	6220	6106	6168	5827	6029	5563
Motorcycles	4-stroke 250-750 cm <sup>3</sup>	97/24/EC											6029	5563
Motorcycles	4-stroke >750 cm <sup>3</sup>	Conventional	5815	6072	6372	6557	6584	6279	6220	6106	6168	5827	6029	5563
Motorcycles	4-stroke >750 cm <sup>3</sup>	97/24/EC											6029	5563

## Appendix 4.2: Basis emission factors (g/km)

Sector	Subsector	Tech	FCu	FCr	FCh	CO2u	CO2r	CO2h	CH4u	CH4r	CH4h	N2Ou	N2Or	N2Oh
Passenger Cars	Gasoline <1,4 l	PRE ECE	67,499	55,000	62,743	216	176	201	0,092	0,029	0,026	0,005	0,005	0,005
Passenger Cars	Gasoline <1,4 l	ECE 15/00-01	58,240	44,460	48,600	186	142	155	0,092	0,029	0,026	0,005	0,005	0,005
Passenger Cars	Gasoline <1,4 l	ECE 15/02	53,248	45,170	51,200	170	144	164	0,092	0,029	0,026	0,005	0,005	0,005
Passenger Cars	Gasoline <1,4 l	ECE 15/03	53,248	45,170	51,200	170	144	164	0,092	0,029	0,026	0,005	0,005	0,005
Passenger Cars	Gasoline <1,4 l	ECE 15/04	51,420	43,440	47,700	164	139	153	0,092	0,029	0,026	0,005	0,005	0,005
Passenger Cars	Gasoline <1,4 l	Euro I	51,136	37,996	43,936	164	121	140	0,038	0,018	0,021	0,053	0,016	0,035
Passenger Cars	Gasoline <1,4 l	Euro II	51,136	37,996	43,936	164	121	140	0,038	0,018	0,021	0,053	0,016	0,035
Passenger Cars	Gasoline <1,4 l	Euro III	51,136	37,996	43,936	164	121	140	0,038	0,018	0,021	0,053	0,016	0,035
Passenger Cars	Gasoline 1,4 - 2,0 l	PRE ECE	79,277	67,000	76,386	253	214	244	0,092	0,029	0,026	0,005	0,005	0,005
Passenger Cars	Gasoline 1,4 - 2,0 l	ECE 15/00-01	67,779	51,090	60,300	217	163	193	0,092	0,029	0,026	0,005	0,005	0,005
Passenger Cars	Gasoline 1,4 - 2,0 l	ECE 15/02	61,731	50,686	59,680	197	162	191	0,092	0,029	0,026	0,005	0,005	0,005
Passenger Cars	Gasoline 1,4 - 2,0 l	ECE 15/03	61,731	50,686	59,680	197	162	191	0,092	0,029	0,026	0,005	0,005	0,005
Passenger Cars	Gasoline 1,4 - 2,0 l	ECE 15/04	61,652	49,112	52,052	197	157	166	0,092	0,029	0,026	0,005	0,005	0,005
Passenger Cars	Gasoline 1,4 - 2,0 l	Euro I	65,920	44,020	48,040	211	141	154	0,039	0,017	0,016	0,053	0,016	0,035
Passenger Cars	Gasoline 1,4 - 2,0 l	Euro II	65,920	44,020	48,040	211	141	154	0,039	0,017	0,016	0,053	0,016	0,035
Passenger Cars	Gasoline 1,4 - 2,0 l	Euro III	65,920	44,020	48,040	211	141	154	0,039	0,017	0,016	0,053	0,016	0,035
Passenger Cars	Gasoline >2,0 l	PRE ECE	96,536	80,000	88,267	309	256	282	0,092	0,029	0,026	0,005	0,005	0,005
Passenger Cars	Gasoline >2,0 l	ECE 15/00-01	73,798	57,090	66,300	236	183	212	0,092	0,029	0,026	0,005	0,005	0,005
Passenger Cars	Gasoline >2,0 l	ECE 15/02	75,270	63,260	70,700	241	202	226	0,092	0,029	0,026	0,005	0,005	0,005
Passenger Cars	Gasoline >2,0 l	ECE 15/03	75,270	63,260	70,700	241	202	226	0,092	0,029	0,026	0,005	0,005	0,005
Passenger Cars	Gasoline >2,0 l	ECE 15/04	71,055	58,080	69,900	227	186	223	0,092	0,029	0,026	0,005	0,005	0,005
Passenger Cars	Gasoline >2,0 l	Euro I	79,370	46,400	51,050	254	148	163	0,040	0,017	0,010	0,053	0,016	0,035
Passenger Cars	Gasoline >2,0 l	Euro II	79,370	46,400	51,050	254	148	163	0,040	0,017	0,010	0,053	0,016	0,035
Passenger Cars	Gasoline >2,0 l	Euro III	79,370	46,400	51,050	254	148	163	0,040	0,017	0,010	0,053	0,016	0,035
Passenger Cars	Diesel <2,0 l	Euro I	52,722	42,225	47,406	167	133	150	0,004	0,005	0,009	0,027	0,027	0,027
Passenger Cars	Diesel <2,0 l	Euro II	52,722	42,225	47,406	167	133	150	0,004	0,005	0,009	0,027	0,027	0,027
Passenger Cars	Diesel <2,0 l	Euro III	52,722	42,225	47,406	167	133	150	0,004	0,005	0,009	0,027	0,027	0,027
Passenger Cars	Diesel <2,0 l	Conventional	57,529	41,209	50,089	182	130	158	0,004	0,005	0,009	0,027	0,027	0,027
Passenger Cars	Diesel >2,0 l	Euro I	52,722	42,225	47,406	167	133	150	0,004	0,005	0,009	0,027	0,027	0,027
Passenger Cars	Diesel >2,0 l	Euro II	52,722	42,225	47,406	167	133	150	0,004	0,005	0,009	0,027	0,027	0,027
Passenger Cars	Diesel >2,0 l	Euro III	52,722	42,225	47,406	167	133	150	0,004	0,005	0,009	0,027	0,027	0,027
Passenger Cars	Diesel >2,0 l	Conventional	57,529	41,209	50,089	182	130	158	0,004	0,005	0,009	0,027	0,027	0,027
Passenger Cars	LPG	Conventional	59,000	45,000	54,000	176	135	161	0,080	0,035	0,025	0,015	0,015	0,015
Passenger Cars	2-Stroke	Conventional	111,500	66,000	56,900	357	211	182	0,150	0,040	0,025	0,005	0,005	0,005



Sector	Subsector	Tech	FCu	FCr	FCh	CO2u	CO2r	CO2h	CH4u	CH4r	CH4h	N2Ou	N2Or	N2Oh
Light Duty Vehicles	Gasoline <3,5t	Conventional	82,270	59,883	56,470	263	191	181	0,150	0,040	0,025	0,006	0,006	0,006
Light Duty Vehicles	Gasoline <3,5t	Euro I	96,450	70,388	66,450	308	225	212	0,038	0,020	0,016	0,053	0,016	0,035
Light Duty Vehicles	Gasoline <3,5t	Euro II	96,450	70,388	66,450	308	225	212	0,038	0,020	0,016	0,053	0,016	0,035
Light Duty Vehicles	Diesel <3,5 t	Conventional	76,718	65,934	72,142	242	208	228	0,005	0,005	0,005	0,017	0,017	0,017
Light Duty Vehicles	Diesel <3,5 t	Euro I	68,860	58,185	63,660	218	184	201	0,005	0,005	0,005	0,017	0,017	0,017
Light Duty Vehicles	Diesel <3,5 t	Euro II	68,860	58,185	63,660	218	184	201	0,005	0,005	0,005	0,017	0,017	0,017
Heavy Duty Vehicles	Gasoline >3,5 t	Conventional	225,000	150,000	165,000	719	480	528	0,140	0,110	0,070	0,006	0,006	0,006
Heavy Duty Vehicles	Diesel 3,5 - 7,5 t	Conventional	95,822	87,060	109,160	303	275	345	0,085	0,023	0,020	0,030	0,030	0,030
Heavy Duty Vehicles	Diesel 3,5 - 7,5 t	Euro I	95,822	87,060	109,160	303	275	345	0,085	0,023	0,020	0,030	0,030	0,030
Heavy Duty Vehicles	Diesel 3,5 - 7,5 t	Euro II	95,822	87,060	109,160	303	275	345	0,085	0,023	0,020	0,030	0,030	0,030
Heavy Duty Vehicles	Diesel 7,5 - 16 t	Conventional	186,796	147,006	169,108	590	465	534	0,085	0,023	0,020	0,030	0,030	0,030
Heavy Duty Vehicles	Diesel 7,5 - 16 t	Euro I	186,796	147,006	169,108	590	465	534	0,085	0,023	0,020	0,030	0,030	0,030
Heavy Duty Vehicles	Diesel 7,5 - 16 t	Euro II	186,796	147,006	169,108	590	465	534	0,085	0,023	0,020	0,030	0,030	0,030
Heavy Duty Vehicles	Diesel 16 - 32 t	Conventional	295,313	227,040	230,740	933	717	729	0,175	0,080	0,070	0,030	0,030	0,030
Heavy Duty Vehicles	Diesel 16 - 32 t	Euro I	295,313	227,040	230,740	933	717	729	0,175	0,080	0,070	0,030	0,030	0,030
Heavy Duty Vehicles	Diesel 16 - 32 t	Euro II	295,313	227,040	230,740	933	717	729	0,175	0,080	0,070	0,030	0,030	0,030
Heavy Duty Vehicles	Diesel >32t	Conventional	392,838	311,460	297,380	1241	984	940	0,175	0,080	0,070	0,030	0,030	0,030
Heavy Duty Vehicles	Diesel >32t	Euro I	392,838	311,460	297,380	1241	984	940	0,175	0,080	0,070	0,030	0,030	0,030
Heavy Duty Vehicles	Diesel >32t	Euro II	392,838	311,460	297,380	1241	984	940	0,175	0,080	0,070	0,030	0,030	0,030
Buses	Urban Buses	Conventional	315,796	253,287	219,035	998	800	692	0,175	0,080	0,070	0,030	0,030	0,030
Buses	Urban Buses	Euro I	315,796	253,287	219,035	998	800	692	0,175	0,080	0,070	0,030	0,030	0,030
Buses	Urban Buses	Euro II	315,796	253,287	219,035	998	800	692	0,175	0,080	0,070	0,030	0,030	0,030
Buses	Coaches	Conventional	281,771	214,600	198,320	890	678	627	0,175	0,080	0,070	0,030	0,030	0,030
Buses	Coaches	Euro I	281,771	214,600	198,320	890	678	627	0,175	0,080	0,070	0,030	0,030	0,030
Buses	Coaches	Euro II	281,771	214,600	198,320	890	678	627	0,175	0,080	0,070	0,030	0,030	0,030
Mopeds	<50 cm³	Conventional	25,000	25,000	0,000	80	80	0	0,219	0,000	0,000	0,001	0,000	0,000
Mopeds	<50 cm³	97/24/EC I	25,000	25,000	0,000	80	80	0	0,219	0,000	0,000	0,001	0,000	0,000
Motorcycles	2-stroke >50 cm³	Conventional	30,368	32,375	36,950	97	104	118	0,150	0,150	0,150	0,002	0,002	0,002
Motorcycles	4-stroke <250 cm³	Conventional	23,180	26,718	35,640	74	85	114	0,200	0,200	0,200	0,002	0,002	0,002
Motorcycles	4-stroke <250 cm³	97/24/EC	23,180	26,718	35,640	74	85	114	0,200	0,200	0,200	0,002	0,002	0,002
Motorcycles	4-stroke 250 - 750 cm³	Conventional	28,620	28,640	34,700	92	92	111	0,200	0,200	0,200	0,002	0,002	0,002
Motorcycles	4-stroke 250 - 750 cm³	97/24/EC	28,620	28,640	34,700	92	92	111	0,200	0,200	0,200	0,002	0,002	0,002
Motorcycles	4-stroke >750 cm³	Conventional	37,500	34,354	38,620	120	110	123	0,200	0,200	0,200	0,002	0,002	0,002
Motorcycles	4-stroke >750 cm³	97/24/EC	37,500	34,354	38,620	120	110	123	0,200	0,200	0,200	0,002	0,002	0,002

Sector	Subsector	Tech	COu	CO <sub>r</sub>	CO <sub>h</sub>	NO <sub>xu</sub>	NO <sub>xr</sub>	NO <sub>xh</sub>	NMVOCu	NMVOCr	NMVOCh
Passenger Cars	Gasoline <1,4 l	PRE ECE	27,505	19,333	15,520	1,849	2,062	2,023	2,262	1,568	1,221
Passenger Cars	Gasoline <1,4 l	ECE 15/00-01	18,966	14,480	18,620	1,849	2,062	2,023	1,770	1,227	1,095
Passenger Cars	Gasoline <1,4 l	ECE 15/02	15,859	8,200	8,260	1,619	2,102	2,909	1,757	1,032	0,924
Passenger Cars	Gasoline <1,4 l	ECE 15/03	16,752	8,793	7,620	1,680	2,253	3,276	1,757	1,032	0,924
Passenger Cars	Gasoline <1,4 l	ECE 15/04	9,087	4,956	4,292	1,691	2,089	2,662	1,388	0,866	0,672
Passenger Cars	Gasoline <1,4 l	Euro I	1,898	0,557	3,176	0,314	0,356	0,593	0,175	0,064	0,082
Passenger Cars	Gasoline <1,4 l	Euro II	1,898	0,557	3,176	0,314	0,356	0,593	0,175	0,064	0,082
Passenger Cars	Gasoline <1,4 l	Euro III	1,898	0,557	3,176	0,314	0,356	0,593	0,175	0,064	0,082
Passenger Cars	Gasoline 1,4 - 2,0 l	PRE ECE	27,505	19,333	15,520	2,164	2,683	3,130	2,262	1,568	1,221
Passenger Cars	Gasoline 1,4 - 2,0 l	ECE 15/00-01	18,966	14,480	18,620	2,164	2,683	3,130	1,770	1,227	1,095
Passenger Cars	Gasoline 1,4 - 2,0 l	ECE 15/02	15,859	8,200	8,260	1,831	2,377	3,283	1,757	1,032	0,924
Passenger Cars	Gasoline 1,4 - 2,0 l	ECE 15/03	16,752	8,793	7,620	1,917	2,580	3,472	1,757	1,032	0,924
Passenger Cars	Gasoline 1,4 - 2,0 l	ECE 15/04	9,087	4,956	4,292	2,122	2,757	3,524	1,388	0,866	0,672
Passenger Cars	Gasoline 1,4 - 2,0 l	Euro I	2,583	0,937	2,402	0,323	0,349	0,530	0,138	0,066	0,067
Passenger Cars	Gasoline 1,4 - 2,0 l	Euro II	2,583	0,937	2,402	0,323	0,349	0,530	0,138	0,066	0,067
Passenger Cars	Gasoline 1,4 - 2,0 l	Euro III	2,583	0,937	2,402	0,323	0,349	0,530	0,138	0,066	0,067
Passenger Cars	Gasoline >2,0 l	PRE ECE	27,505	19,333	15,520	2,860	4,090	5,500	2,262	1,568	1,221
Passenger Cars	Gasoline >2,0 l	ECE 15/00-01	18,966	14,480	18,620	2,860	4,090	5,500	1,770	1,227	1,095
Passenger Cars	Gasoline >2,0 l	ECE 15/02	15,859	8,200	8,260	2,066	2,675	3,680	1,757	1,032	0,924
Passenger Cars	Gasoline >2,0 l	ECE 15/03	16,752	8,793	7,620	2,806	3,441	4,604	1,757	1,032	0,924
Passenger Cars	Gasoline >2,0 l	ECE 15/04	9,087	4,956	4,292	2,293	2,750	3,687	1,388	0,866	0,672
Passenger Cars	Gasoline >2,0 l	Euro I	3,838	0,814	0,976	0,427	0,406	0,521	0,232	0,147	0,105
Passenger Cars	Gasoline >2,0 l	Euro II	3,838	0,814	0,976	0,427	0,406	0,521	0,232	0,147	0,105
Passenger Cars	Gasoline >2,0 l	Euro III	3,838	0,814	0,976	0,427	0,406	0,521	0,232	0,147	0,105
Passenger Cars	Diesel <2,0 l	Euro I	0,432	0,109	0,165	0,679	0,488	0,619	0,073	0,028	0,020
Passenger Cars	Diesel <2,0 l	Euro II	0,432	0,109	0,165	0,679	0,488	0,619	0,073	0,028	0,020
Passenger Cars	Diesel <2,0 l	Euro III	0,432	0,109	0,165	0,679	0,488	0,619	0,073	0,028	0,020
Passenger Cars	Diesel <2,0 l	Conventional	0,651	0,472	0,384	0,520	0,433	0,528	0,141	0,081	0,052
Passenger Cars	Diesel >2,0 l	Euro I	0,432	0,109	0,165	0,679	0,488	0,619	0,073	0,028	0,020
Passenger Cars	Diesel >2,0 l	Euro II	0,432	0,109	0,165	0,679	0,488	0,619	0,073	0,028	0,020
Passenger Cars	Diesel >2,0 l	Euro III	0,432	0,109	0,165	0,679	0,488	0,619	0,073	0,028	0,020
Passenger Cars	Diesel >2,0 l	Conventional	0,651	0,472	0,384	0,824	0,723	0,861	0,141	0,081	0,052
Passenger Cars	LPG	Conventional	2,043	2,373	9,723	2,203	2,584	2,861	1,002	0,632	0,465

Sector	Subsector	Tech	COu	CO <sub>r</sub>	CO <sub>h</sub>	NO <sub>xu</sub>	NO <sub>xr</sub>	NO <sub>xh</sub>	NMVOCu	NMVOCr	NMVOCh
Passenger Cars	2-Stroke	Conventional	20,700	7,500	8,700	0,300	1,020	0,720	15,250	7,160	5,875
Light Duty Vehicles	Gasoline <3,5t	Conventional	14,925	6,075	7,389	2,671	3,118	3,387	1,727	0,689	0,421
Light Duty Vehicles	Gasoline <3,5t	Euro I	4,187	0,862	1,087	0,427	0,400	0,429	0,181	0,090	0,062
Light Duty Vehicles	Gasoline <3,5t	Euro II	4,187	0,862	1,087	0,427	0,400	0,429	0,181	0,090	0,062
Light Duty Vehicles	Diesel <3,5 t	Conventional	1,124	1,009	1,060	1,673	0,843	0,834	0,126	0,101	0,096
Light Duty Vehicles	Diesel <3,5 t	Euro I	0,393	0,328	0,423	1,138	0,975	1,022	0,126	0,101	0,096
Light Duty Vehicles	Diesel <3,5 t	Euro II	0,393	0,328	0,423	1,138	0,975	1,022	0,126	0,101	0,096
Heavy Duty Vehicles	Gasoline >3,5 t	Conventional	70,000	55,000	55,000	4,500	7,500	7,500	6,860	5,390	3,430
Heavy Duty Vehicles	Diesel 3,5 - 7,5 t	Conventional	3,156	2,170	1,777	3,247	2,169	2,615	1,688	1,082	0,838
Heavy Duty Vehicles	Diesel 3,5 - 7,5 t	Euro I	3,156	2,170	1,777	3,247	2,169	2,615	1,688	1,082	0,838
Heavy Duty Vehicles	Diesel 3,5 - 7,5 t	Euro II	3,156	2,170	1,777	3,247	2,169	2,615	1,688	1,082	0,838
Heavy Duty Vehicles	Diesel 7,5 - 16 t	Conventional	3,156	2,170	1,777	6,684	4,293	4,091	1,688	1,082	0,838
Heavy Duty Vehicles	Diesel 7,5 - 16 t	Euro I	3,156	2,170	1,777	6,684	4,293	4,091	1,688	1,082	0,838
Heavy Duty Vehicles	Diesel 7,5 - 16 t	Euro II	3,156	2,170	1,777	6,684	4,293	4,091	1,688	1,082	0,838
Heavy Duty Vehicles	Diesel 16 - 32 t	Conventional	3,156	2,170	1,777	12,561	9,060	7,610	1,598	1,025	0,788
Heavy Duty Vehicles	Diesel 16 - 32 t	Euro I	3,156	2,170	1,777	12,561	9,060	7,610	1,598	1,025	0,788
Heavy Duty Vehicles	Diesel 16 - 32 t	Euro II	3,156	2,170	1,777	12,561	9,060	7,610	1,598	1,025	0,788
Heavy Duty Vehicles	Diesel >32t	Conventional	3,156	2,170	1,777	18,269	13,523	11,517	1,598	1,025	0,788
Heavy Duty Vehicles	Diesel >32t	Euro I	3,156	2,170	1,777	18,269	13,523	11,517	1,598	1,025	0,788
Heavy Duty Vehicles	Diesel >32t	Euro II	3,156	2,170	1,777	18,269	13,523	11,517	1,598	1,025	0,788
Buses	Urban Buses	Conventional	4,687	3,204	2,494	15,288	11,731	9,853	1,138	0,696	0,479
Buses	Urban Buses	Euro I	4,687	3,204	2,494	15,288	11,731	9,853	1,138	0,696	0,479
Buses	Urban Buses	Euro II	4,687	3,204	2,494	15,288	11,731	9,853	1,138	0,696	0,479
Buses	Coaches	Conventional	3,227	2,053	1,612	12,210	8,260	7,844	1,713	1,090	0,837
Buses	Coaches	Euro I	3,227	2,053	1,612	12,210	8,260	7,844	1,713	1,090	0,837
Buses	Coaches	Euro II	3,227	2,053	1,612	12,210	8,260	7,844	1,713	1,090	0,837
Mopeds	<50 cm <sup>3</sup>	Conventional	15,000	15,000	0,000	0,030	0,030	0,000	8,781	9,000	0,000
Mopeds	<50 cm <sup>3</sup>	97/24/EC I	15,000	15,000	0,000	0,030	0,030	0,000	8,781	9,000	0,000
Motorcycles	2-stroke >50 cm <sup>3</sup>	Conventional	23,380	25,490	27,500	0,032	0,088	0,133	9,190	8,252	8,210
Motorcycles	4-stroke <250 cm <sup>3</sup>	Conventional	22,380	26,300	38,600	0,130	0,242	0,362	1,350	0,760	1,120
Motorcycles	4-stroke <250 cm <sup>3</sup>	97/24/EC	22,380	26,300	38,600	0,130	0,242	0,362	1,350	0,760	1,120
Motorcycles	4-stroke 250 - 750 cm <sup>3</sup>	Conventional	20,440	21,517	25,810	0,136	0,251	0,374	1,150	0,744	0,810
Motorcycles	4-stroke 250 - 750 cm <sup>3</sup>	97/24/EC	20,440	21,517	25,810	0,136	0,251	0,374	1,150	0,744	0,810
Motorcycles	4-stroke >750 cm <sup>3</sup>	Conventional	14,880	18,030	24,300	0,148	0,266	0,392	2,320	1,410	0,990
Motorcycles	4-stroke >750 cm <sup>3</sup>	97/24/EC	14,880	18,030	24,300	0,148	0,266	0,392	2,320	1,410	0,990

Sector	Subsector	Tech	NH3u	NH3r	NH3h
Passenger Cars	Gasoline <1,4 l	PRE ECE	0,002	0,002	0,002
Passenger Cars	Gasoline <1,4 l	ECE 15/00-01	0,002	0,002	0,002
Passenger Cars	Gasoline <1,4 l	ECE 15/02	0,002	0,002	0,002
Passenger Cars	Gasoline <1,4 l	ECE 15/03	0,002	0,002	0,002
Passenger Cars	Gasoline <1,4 l	ECE 15/04	0,002	0,002	0,002
Passenger Cars	Gasoline <1,4 l	Euro I	0,07	0,1	0,1
Passenger Cars	Gasoline <1,4 l	Euro II	0,07	0,1	0,1
Passenger Cars	Gasoline <1,4 l	Euro III	0,07	0,1	0,1
Passenger Cars	Gasoline 1,4 - 2,0 l	PRE ECE	0,002	0,002	0,002
Passenger Cars	Gasoline 1,4 - 2,0 l	ECE 15/00-01	0,002	0,002	0,002
Passenger Cars	Gasoline 1,4 - 2,0 l	ECE 15/02	0,002	0,002	0,002
Passenger Cars	Gasoline 1,4 - 2,0 l	ECE 15/03	0,002	0,002	0,002
Passenger Cars	Gasoline 1,4 - 2,0 l	ECE 15/04	0,002	0,002	0,002
Passenger Cars	Gasoline 1,4 - 2,0 l	Euro I	0,07	0,1	0,1
Passenger Cars	Gasoline 1,4 - 2,0 l	Euro II	0,07	0,1	0,1
Passenger Cars	Gasoline 1,4 - 2,0 l	Euro III	0,07	0,1	0,1
Passenger Cars	Gasoline >2,0 l	PRE ECE	0,002	0,002	0,002
Passenger Cars	Gasoline >2,0 l	ECE 15/00-01	0,002	0,002	0,002
Passenger Cars	Gasoline >2,0 l	ECE 15/02	0,002	0,002	0,002
Passenger Cars	Gasoline >2,0 l	ECE 15/03	0,002	0,002	0,002
Passenger Cars	Gasoline >2,0 l	ECE 15/04	0,002	0,002	0,002
Passenger Cars	Gasoline >2,0 l	Euro I	0,07	0,1	0,1
Passenger Cars	Gasoline >2,0 l	Euro II	0,07	0,1	0,1
Passenger Cars	Gasoline >2,0 l	Euro III	0,07	0,1	0,1
Passenger Cars	Diesel <2,0 l	Euro I	0,001	0,001	0,001
Passenger Cars	Diesel <2,0 l	Euro II	0,001	0,001	0,001
Passenger Cars	Diesel <2,0 l	Euro III	0,001	0,001	0,001
Passenger Cars	Diesel <2,0 l	Conventional	0,001	0,001	0,001
Passenger Cars	Diesel >2,0 l	Euro I	0,001	0,001	0,001
Passenger Cars	Diesel >2,0 l	Euro II	0,001	0,001	0,001
Passenger Cars	Diesel >2,0 l	Euro III	0,001	0,001	0,001
Passenger Cars	Diesel >2,0 l	Conventional	0,001	0,001	0,001
Passenger Cars	LPG	Conventional	0	0	0

Sector	Subsector	Tech	NH3u	NH3r	NH3h
Passenger Cars	2-Stroke	Conventional	0,002	0,002	0,002
Light Duty Vehicles	Gasoline <3,5t	Conventional	0,002	0,002	0,002
Light Duty Vehicles	Gasoline <3,5t	Euro I	0,07	0,1	0,1
Light Duty Vehicles	Gasoline <3,5t	Euro II	0,07	0,1	0,1
Light Duty Vehicles	Diesel <3,5 t	Conventional	0,001	0,001	0,001
Light Duty Vehicles	Diesel <3,5 t	Euro I	0,001	0,001	0,001
Light Duty Vehicles	Diesel <3,5 t	Euro II	0,001	0,001	0,001
Heavy Duty Vehicles	Gasoline >3,5 t	Conventional	0,002	0,002	0,002
Heavy Duty Vehicles	Diesel 3,5 - 7,5 t	Conventional	0,003	0,003	0,003
Heavy Duty Vehicles	Diesel 3,5 - 7,5 t	Euro I	0,003	0,003	0,003
Heavy Duty Vehicles	Diesel 3,5 - 7,5 t	Euro II	0,003	0,003	0,003
Heavy Duty Vehicles	Diesel 7,5 - 16 t	Conventional	0,003	0,003	0,003
Heavy Duty Vehicles	Diesel 7,5 - 16 t	Euro I	0,003	0,003	0,003
Heavy Duty Vehicles	Diesel 7,5 - 16 t	Euro II	0,003	0,003	0,003
Heavy Duty Vehicles	Diesel 16 - 32 t	Conventional	0,003	0,003	0,003
Heavy Duty Vehicles	Diesel 16 - 32 t	Euro I	0,003	0,003	0,003
Heavy Duty Vehicles	Diesel 16 - 32 t	Euro II	0,003	0,003	0,003
Heavy Duty Vehicles	Diesel >32t	Conventional	0,003	0,003	0,003
Heavy Duty Vehicles	Diesel >32t	Euro I	0,003	0,003	0,003
Heavy Duty Vehicles	Diesel >32t	Euro II	0,003	0,003	0,003
Buses	Urban Buses	Conventional	0,003	0,003	0,003
Buses	Urban Buses	Euro I	0,003	0,003	0,003
Buses	Urban Buses	Euro II	0,003	0,003	0,003
Buses	Coaches	Conventional	0,003	0,003	0,003
Buses	Coaches	Euro I	0,003	0,003	0,003
Buses	Coaches	Euro II	0,003	0,003	0,003
Mopeds	<50 cm <sup>3</sup>	Conventional	0,001	0,001	0
Mopeds	<50 cm <sup>3</sup>	97/24/EC I	0,001	0,001	0
Motorcycles	2-stroke >50 cm <sup>3</sup>	Conventional	0,002	0,002	0,002
Motorcycles	4-stroke <250 cm <sup>3</sup>	Conventional	0,002	0,002	0,002
Motorcycles	4-stroke <250 cm <sup>3</sup>	97/24/EC	0,002	0,002	0,002
Motorcycles	4-stroke 250 - 750 cm <sup>3</sup>	Conventional	0,002	0,002	0,002
Motorcycles	4-stroke 250 - 750 cm <sup>3</sup>	97/24/EC	0,002	0,002	0,002
Motorcycles	4-stroke >750 cm <sup>3</sup>	Conventional	0,002	0,002	0,002
Motorcycles	4-stroke >750 cm <sup>3</sup>	97/24/EC	0,002	0,002	0,002

### Appendix 4.3: Fuel use factors (MJ/km) and emission factors (g/km)

Year	Sector	FCu (MJ/km)	FCr (MJ/km)	FCh (MJ/km)	CO2u	CO2r	CO2h	CH4u	CH4r	CH4h	N2Ou	N2Or	N2Oh
1990	Passenger Cars	3,082	2,054	2,318	223	149	168	0,143	0,027	0,024	0,008	0,007	0,008
1991	Passenger Cars	3,121	2,036	2,297	226	148	166	0,157	0,026	0,024	0,011	0,008	0,010
1992	Passenger Cars	3,133	2,020	2,276	227	146	165	0,165	0,025	0,023	0,014	0,009	0,011
1993	Passenger Cars	3,161	2,003	2,255	229	145	163	0,181	0,025	0,023	0,017	0,009	0,013
1994	Passenger Cars	3,162	1,981	2,226	229	143	161	0,189	0,024	0,022	0,021	0,010	0,016
1995	Passenger Cars	3,213	1,960	2,202	233	142	160	0,208	0,023	0,021	0,025	0,011	0,018
1996	Passenger Cars	3,275	1,945	2,182	237	141	158	0,234	0,022	0,021	0,028	0,012	0,020
1997	Passenger Cars	3,225	1,912	2,142	234	139	155	0,215	0,020	0,019	0,032	0,013	0,023
1998	Passenger Cars	3,201	1,901	2,128	232	138	154	0,198	0,018	0,017	0,034	0,013	0,024
1999	Passenger Cars	3,383	1,886	2,110	245	137	153	0,234	0,016	0,015	0,036	0,014	0,026
2000	Passenger Cars	3,207	1,875	2,097	232	136	152	0,187	0,014	0,014	0,038	0,015	0,027
2001	Passenger Cars	3,241	1,865	2,085	235	135	151	0,188	0,013	0,013	0,040	0,015	0,028
1990	Light Duty Vehicles	3,842	2,792	3,007	282	205	221	0,038	0,009	0,007	0,016	0,016	0,016
1991	Light Duty Vehicles	3,872	2,792	3,007	284	205	221	0,040	0,009	0,007	0,016	0,016	0,016
1992	Light Duty Vehicles	3,873	2,790	3,002	284	205	220	0,042	0,010	0,008	0,016	0,016	0,016
1993	Light Duty Vehicles	3,907	2,790	2,999	286	205	220	0,044	0,010	0,008	0,016	0,016	0,016
1994	Light Duty Vehicles	3,945	2,791	3,002	289	205	220	0,044	0,010	0,008	0,016	0,016	0,016
1995	Light Duty Vehicles	3,937	2,771	2,979	289	203	219	0,044	0,009	0,007	0,016	0,016	0,016
1996	Light Duty Vehicles	3,973	2,752	2,959	291	202	217	0,046	0,009	0,007	0,017	0,016	0,016
1997	Light Duty Vehicles	3,900	2,732	2,939	286	200	216	0,041	0,009	0,007	0,017	0,016	0,017
1998	Light Duty Vehicles	3,851	2,714	2,918	282	199	214	0,040	0,008	0,007	0,018	0,016	0,017
1999	Light Duty Vehicles	4,000	2,697	2,901	293	198	213	0,042	0,008	0,007	0,018	0,016	0,017
2000	Light Duty Vehicles	3,816	2,681	2,883	280	197	211	0,036	0,008	0,007	0,018	0,016	0,017
2001	Light Duty Vehicles	3,821	2,663	2,866	280	195	210	0,034	0,007	0,006	0,019	0,016	0,018

Year	Sector	FCu (MJ/km)	FCr (MJ/km)	FCh (MJ/km)	CO2u	CO2r	CO2h	CH4u	CH4r	CH4h	N2Ou	N2Or	N2Oh
1990	Heavy Duty Vehicles	11,965	9,685	10,256	879	712	754	0,151	0,067	0,063	0,030	0,030	0,030
1991	Heavy Duty Vehicles	12,016	9,691	10,226	883	712	751	0,151	0,066	0,062	0,030	0,030	0,030
1992	Heavy Duty Vehicles	12,023	9,677	10,218	883	711	751	0,152	0,066	0,062	0,030	0,030	0,030
1993	Heavy Duty Vehicles	11,898	9,723	10,189	874	714	749	0,150	0,067	0,062	0,030	0,030	0,030
1994	Heavy Duty Vehicles	11,929	9,663	10,141	877	710	745	0,146	0,065	0,061	0,030	0,030	0,030
1995	Heavy Duty Vehicles	11,911	9,673	10,013	875	711	736	0,142	0,064	0,059	0,030	0,030	0,030
1996	Heavy Duty Vehicles	11,938	9,657	10,026	877	710	737	0,137	0,061	0,058	0,030	0,030	0,030
1997	Heavy Duty Vehicles	12,176	9,836	10,152	895	723	746	0,133	0,061	0,057	0,030	0,030	0,030
1998	Heavy Duty Vehicles	12,246	9,904	10,209	900	728	750	0,129	0,059	0,056	0,030	0,030	0,030
1999	Heavy Duty Vehicles	12,389	10,028	10,306	910	737	757	0,126	0,059	0,055	0,030	0,030	0,030
2000	Heavy Duty Vehicles	12,422	10,055	10,329	913	739	759	0,121	0,057	0,053	0,030	0,030	0,030
2001	Heavy Duty Vehicles	12,685	10,273	10,476	932	755	770	0,121	0,057	0,053	0,030	0,030	0,030
1990	2-wheelers	1,173	1,245	1,578	85	90	114	0,209	0,130	0,192	0,001	0,001	0,002
1991	2-wheelers	1,182	1,242	1,578	86	90	114	0,208	0,127	0,193	0,001	0,001	0,002
1992	2-wheelers	1,178	1,253	1,578	85	91	114	0,209	0,137	0,192	0,001	0,001	0,002
1993	2-wheelers	1,190	1,249	1,578	86	90	114	0,207	0,133	0,192	0,001	0,001	0,002
1994	2-wheelers	1,188	1,258	1,578	86	91	114	0,207	0,141	0,193	0,001	0,001	0,002
1995	2-wheelers	1,182	1,254	1,578	86	91	114	0,208	0,137	0,193	0,001	0,001	0,002
1996	2-wheelers	1,185	1,256	1,578	86	91	114	0,208	0,139	0,193	0,001	0,001	0,002
1997	2-wheelers	1,186	1,257	1,578	86	91	114	0,208	0,140	0,192	0,001	0,001	0,002
1998	2-wheelers	1,186	1,257	1,578	86	91	114	0,208	0,140	0,193	0,001	0,001	0,002
1999	2-wheelers	1,195	1,264	1,578	86	91	114	0,207	0,146	0,192	0,001	0,002	0,002
2000	2-wheelers	1,198	1,265	1,572	87	92	114	0,202	0,150	0,193	0,001	0,002	0,002
2001	2-wheelers	1,210	1,272	1,568	88	92	113	0,199	0,158	0,193	0,002	0,002	0,002

Year	Sector	SO2u	SO2r	SO2h	NOxu	NOxr	NOxh	NMVOCu	NMVOCr	NMVOCh	COu	COr	COh
1990	Passenger Cars	0,031	0,020	0,023	1,791	2,142	2,763	2,527	0,929	0,787	26,382	7,625	7,554
1991	Passenger Cars	0,030	0,019	0,023	1,718	2,014	2,609	2,520	0,864	0,732	26,666	7,061	7,065
1992	Passenger Cars	0,021	0,014	0,016	1,649	1,901	2,475	2,416	0,804	0,681	25,631	6,538	6,663
1993	Passenger Cars	0,012	0,008	0,009	1,595	1,798	2,356	2,402	0,746	0,633	25,790	6,025	6,323
1994	Passenger Cars	0,012	0,008	0,009	1,488	1,624	2,149	2,200	0,654	0,555	23,663	5,243	5,741
1995	Passenger Cars	0,013	0,008	0,009	1,430	1,495	1,993	2,157	0,584	0,497	23,607	4,701	5,507
1996	Passenger Cars	0,013	0,008	0,009	1,393	1,395	1,875	2,176	0,526	0,449	24,352	4,267	5,365
1997	Passenger Cars	0,013	0,008	0,009	1,283	1,240	1,694	1,835	0,435	0,376	20,485	3,464	4,975
1998	Passenger Cars	0,013	0,008	0,009	1,197	1,129	1,549	1,619	0,382	0,329	18,258	3,057	4,674
1999	Passenger Cars	0,011	0,006	0,007	1,053	0,888	1,200	1,647	0,301	0,255	19,037	2,333	3,140
2000	Passenger Cars	0,007	0,004	0,005	1,027	0,893	1,232	1,335	0,277	0,238	15,805	2,309	4,104
2001	Passenger Cars	0,007	0,004	0,005	0,958	0,796	1,107	1,261	0,234	0,203	15,723	2,064	4,048
1990	Light Duty Vehicles	0,312	0,233	0,255	1,960	1,117	1,141	0,546	0,171	0,135	5,044	1,620	1,823
1991	Light Duty Vehicles	0,314	0,233	0,254	1,979	1,118	1,143	0,568	0,172	0,135	5,242	1,622	1,826
1992	Light Duty Vehicles	0,202	0,150	0,164	1,981	1,138	1,165	0,586	0,177	0,138	5,453	1,666	1,881
1993	Light Duty Vehicles	0,079	0,058	0,063	2,004	1,147	1,176	0,620	0,179	0,140	5,785	1,688	1,908
1994	Light Duty Vehicles	0,080	0,058	0,064	2,006	1,135	1,162	0,618	0,176	0,138	5,767	1,661	1,874
1995	Light Duty Vehicles	0,080	0,058	0,063	1,945	1,115	1,144	0,605	0,170	0,134	5,616	1,553	1,758
1996	Light Duty Vehicles	0,080	0,057	0,062	1,907	1,091	1,121	0,612	0,163	0,130	5,646	1,441	1,636
1997	Light Duty Vehicles	0,079	0,057	0,062	1,811	1,064	1,094	0,543	0,154	0,125	4,957	1,317	1,500
1998	Light Duty Vehicles	0,078	0,056	0,062	1,735	1,050	1,082	0,507	0,149	0,122	4,638	1,232	1,410
1999	Light Duty Vehicles	0,045	0,031	0,034	1,725	1,025	1,058	0,536	0,141	0,117	4,820	1,111	1,273
2000	Light Duty Vehicles	0,009	0,006	0,007	1,629	1,018	1,052	0,459	0,137	0,115	4,159	1,064	1,229
2001	Light Duty Vehicles	0,009	0,006	0,007	1,593	0,998	1,032	0,442	0,130	0,111	3,903	0,964	1,119



Year	Sector	SO2u	SO2r	SO2h	NOxu	NOxr	NOxh	NMVOCu	NMVOCr	NMVOCh	COu	COr	COh
1990	Heavy Duty Vehicles	1,119	0,906	0,960	12,379	9,166	8,502	1,527	1,007	0,792	3,707	2,411	1,857
1991	Heavy Duty Vehicles	1,124	0,907	0,957	12,423	9,174	8,460	1,532	1,007	0,792	3,687	2,414	1,862
1992	Heavy Duty Vehicles	0,731	0,588	0,622	12,435	9,145	8,456	1,532	1,011	0,792	3,700	2,413	1,866
1993	Heavy Duty Vehicles	0,278	0,227	0,238	12,272	9,212	8,433	1,538	1,008	0,792	3,707	2,420	1,872
1994	Heavy Duty Vehicles	0,279	0,226	0,237	11,939	8,820	8,092	1,475	0,986	0,775	3,588	2,323	1,814
1995	Heavy Duty Vehicles	0,278	0,226	0,234	11,490	8,527	7,722	1,439	0,964	0,761	3,411	2,225	1,757
1996	Heavy Duty Vehicles	0,279	0,226	0,235	11,123	8,241	7,455	1,396	0,938	0,745	3,260	2,156	1,704
1997	Heavy Duty Vehicles	0,285	0,230	0,238	10,798	8,035	7,206	1,331	0,903	0,721	3,070	2,044	1,632
1998	Heavy Duty Vehicles	0,286	0,232	0,239	10,374	7,747	6,917	1,283	0,876	0,700	2,941	1,970	1,586
1999	Heavy Duty Vehicles	0,159	0,129	0,133	10,019	7,524	6,684	1,233	0,849	0,680	2,793	1,883	1,534
2000	Heavy Duty Vehicles	0,029	0,024	0,024	9,598	7,227	6,410	1,193	0,826	0,663	2,686	1,824	1,500
2001	Heavy Duty Vehicles	0,030	0,024	0,025	9,526	7,161	6,252	1,148	0,803	0,645	2,625	1,770	1,467
1990	2-wheelers	0,003	0,004	0,005	0,064	0,164	0,340	6,532	4,283	2,011	16,842	19,852	27,917
1991	2-wheelers	0,003	0,003	0,004	0,068	0,161	0,340	6,249	4,379	2,011	17,073	19,753	27,917
1992	2-wheelers	0,003	0,003	0,004	0,066	0,171	0,340	6,372	4,042	2,011	16,972	20,099	27,917
1993	2-wheelers	0,003	0,003	0,004	0,071	0,167	0,340	6,033	4,187	2,011	17,250	19,950	27,917
1994	2-wheelers	0,003	0,003	0,004	0,070	0,175	0,340	6,097	3,880	2,011	17,197	20,267	27,917
1995	2-wheelers	0,003	0,003	0,004	0,068	0,171	0,340	6,271	4,023	2,011	17,055	20,119	27,917
1996	2-wheelers	0,003	0,003	0,004	0,069	0,173	0,340	6,184	3,960	2,011	17,126	20,184	27,917
1997	2-wheelers	0,003	0,003	0,004	0,069	0,174	0,340	6,153	3,931	2,011	17,152	20,214	27,917
1998	2-wheelers	0,003	0,003	0,004	0,069	0,174	0,340	6,145	3,924	2,011	17,158	20,221	27,917
1999	2-wheelers	0,003	0,003	0,004	0,073	0,180	0,340	5,895	3,704	2,011	17,363	20,448	27,917
2000	2-wheelers	0,003	0,003	0,004	0,077	0,186	0,342	5,549	3,417	1,980	17,021	20,004	27,414
2001	2-wheelers	0,003	0,003	0,004	0,084	0,196	0,345	5,073	3,064	1,933	16,990	19,880	26,948

Year	Sector	NH3u	NH3r	NH3h
1990	Passenger Cars	0,004	0,004	0,004
1991	Passenger Cars	0,008	0,011	0,011
1992	Passenger Cars	0,012	0,017	0,017
1993	Passenger Cars	0,016	0,023	0,023
1994	Passenger Cars	0,023	0,032	0,032
1995	Passenger Cars	0,027	0,039	0,039
1996	Passenger Cars	0,032	0,045	0,045
1997	Passenger Cars	0,037	0,053	0,053
1998	Passenger Cars	0,040	0,057	0,057
1999	Passenger Cars	0,043	0,061	0,061
2000	Passenger Cars	0,046	0,065	0,065
2001	Passenger Cars	0,048	0,069	0,069
1990	Light Duty Vehicles	0,001	0,001	0,001
1991	Light Duty Vehicles	0,001	0,001	0,001
1992	Light Duty Vehicles	0,001	0,001	0,001
1993	Light Duty Vehicles	0,001	0,001	0,001
1994	Light Duty Vehicles	0,001	0,001	0,001
1995	Light Duty Vehicles	0,002	0,002	0,002
1996	Light Duty Vehicles	0,003	0,003	0,003
1997	Light Duty Vehicles	0,003	0,004	0,004
1998	Light Duty Vehicles	0,004	0,005	0,005
1999	Light Duty Vehicles	0,004	0,006	0,006
2000	Light Duty Vehicles	0,005	0,007	0,007
2001	Light Duty Vehicles	0,005	0,007	0,007

Year	Sector	NH3u	NH3r	NH3h
1990	Heavy Duty Vehicles	0,003	0,003	0,003
1991	Heavy Duty Vehicles	0,003	0,003	0,003
1992	Heavy Duty Vehicles	0,003	0,003	0,003
1993	Heavy Duty Vehicles	0,003	0,003	0,003
1994	Heavy Duty Vehicles	0,003	0,003	0,003
1995	Heavy Duty Vehicles	0,003	0,003	0,003
1996	Heavy Duty Vehicles	0,003	0,003	0,003
1997	Heavy Duty Vehicles	0,003	0,003	0,003
1998	Heavy Duty Vehicles	0,003	0,003	0,003
1999	Heavy Duty Vehicles	0,003	0,003	0,003
2000	Heavy Duty Vehicles	0,003	0,003	0,003
2001	Heavy Duty Vehicles	0,003	0,003	0,003
1990	2-wheelers	0,001	0,001	0,002
1991	2-wheelers	0,001	0,001	0,002
1992	2-wheelers	0,001	0,001	0,002
1993	2-wheelers	0,001	0,001	0,002
1994	2-wheelers	0,001	0,001	0,002
1995	2-wheelers	0,001	0,001	0,002
1996	2-wheelers	0,001	0,001	0,002
1997	2-wheelers	0,001	0,001	0,002
1998	2-wheelers	0,001	0,001	0,002
1999	2-wheelers	0,001	0,002	0,002
2000	2-wheelers	0,001	0,002	0,002
2001	2-wheelers	0,002	0,002	0,002

#### Appendix 4.4: Fuel use (GJ) and emissions (tons) per vehicle category

Year	Sector	FC (GJ)	CO2	CH4	N2O	SO2	Nox	NMVOC	NH3	CO
1990	Passenger Cars	69608254	5043700	2079	214	687	57332	71086	110	427990
1991	Passenger Cars	73816548	5348323	2334	280	709	57836	71423	281	443231
1992	Passenger Cars	77348442	5603904	2467	347	526	58614	70458	464	434504
1993	Passenger Cars	79376296	5750620	2719	407	307	57397	68127	639	438753
1994	Passenger Cars	82258416	5959390	2876	511	318	55069	63930	940	410796
1995	Passenger Cars	83450719	6046096	3038	587	329	52947	59334	1178	396227
1996	Passenger Cars	84286667	6106833	3288	651	335	50991	55425	1374	394948
1997	Passenger Cars	86483699	6265962	3139	761	344	48026	49139	1694	347652
1998	Passenger Cars	88522087	6413827	2975	833	356	45484	44559	1894	320454
1999	Passenger Cars	89328184	6473548	3347	877	294	36597	42347	2004	303479
2000	Passenger Cars	88595697	6421379	2769	938	203	37329	32628	2159	274087
2001	Passenger Cars	88434195	6410500	2751	981	202	33750	28933	2273	267408
1990	Light Duty Vehicles	23115080	1695295	149	112	1906	10428	3091	8	21687
1991	Light Duty Vehicles	23957024	1757050	159	115	1974	10830	3248	8	23002
1992	Light Duty Vehicles	23479719	1721818	160	112	1248	10678	3305	8	23176
1993	Light Duty Vehicles	23450531	1719549	167	112	481	10731	3389	8	24109
1994	Light Duty Vehicles	24974574	1831494	167	120	516	11211	3480	9	24458
1995	Light Duty Vehicles	24505598	1796982	164	121	504	10790	3295	16	23171
1996	Light Duty Vehicles	25221292	1849446	170	127	519	10851	3235	24	23111
1997	Light Duty Vehicles	25453281	1866574	159	132	526	10671	2991	31	21012
1998	Light Duty Vehicles	24752576	1815060	151	132	509	10197	2750	37	19304
1999	Light Duty Vehicles	25246216	1851344	157	134	290	10113	2817	42	19299
2000	Light Duty Vehicles	25282013	1853875	141	139	59	10060	2415	49	17666
2001	Light Duty Vehicles	25520318	1871549	135	143	60	9976	2282	52	16600

Year	Sector	FC (GJ)	CO2	CH4	N2O	SO2	NOx	NMVOC	NH3	CO
1990	Heavy Duty Vehicles	33933165	2493335	298	96	3174	32300	3614	9	8675
1991	Heavy Duty Vehicles	34424256	2529455	301	98	3220	32781	3671	9	8792
1992	Heavy Duty Vehicles	33656314	2473020	295	96	2046	32044	3600	9	8622
1993	Heavy Duty Vehicles	33365322	2451618	292	95	780	31668	3560	9	8537
1994	Heavy Duty Vehicles	35732489	2625577	295	103	836	32553	3654	10	8705
1995	Heavy Duty Vehicles	36314627	2668322	293	105	849	31921	3638	10	8483
1996	Heavy Duty Vehicles	37071644	2723943	290	107	867	31494	3613	10	8346
1997	Heavy Duty Vehicles	37390997	2747438	282	106	875	30309	3433	10	7827
1998	Heavy Duty Vehicles	38573775	2834318	281	109	902	29875	3403	10	7719
1999	Heavy Duty Vehicles	39122406	2874658	275	109	503	28975	3293	10	7387
2000	Heavy Duty Vehicles	38127592	2801560	259	106	89	27017	3110	10	6950
2001	Heavy Duty Vehicles	38708387	2844209	257	106	91	26531	2991	10	6725
1990	2-wheelers	618260	44739	93	1	2	59	2984	1	9392
1991	2-wheelers	647664	46867	98	1	2	59	3092	1	9806
1992	2-wheelers	673027	48702	101	1	2	65	3136	1	10261
1993	2-wheelers	693419	50178	104	1	2	65	3175	1	10540
1994	2-wheelers	704846	51004	106	1	2	70	3139	1	10790
1995	2-wheelers	714032	51669	107	1	2	73	3210	1	10957
1996	2-wheelers	755112	54642	113	1	2	74	3420	1	11533
1997	2-wheelers	803775	58163	121	1	2	79	3632	1	12287
1998	2-wheelers	866101	62673	130	1	2	86	3905	1	13242
1999	2-wheelers	833407	60307	124	1	2	86	3613	1	12825
2000	2-wheelers	879655	63654	130	1	2	95	3472	1	13267
2001	2-wheelers	790185	57180	116	1	2	91	2820	1	11803

#### Appendix 4.5: Total emissions (tons) for road transport 1990-2001

Year	SO2	NOx	NMVOC	CH4	CO	CO2	NH3	N2O
1990	5769	100118	80774	2620	467745	9277069	128	423
1991	5905	101506	81436	2891	484830	9681694	299	494
1992	3822	101402	80499	3024	476563	9847443	482	556
1993	1571	99862	78250	3283	481940	9971964	656	615
1994	1671	98904	74203	3444	454750	10467465	959	735
1995	1684	95730	69476	3602	438837	10563069	1204	813
1996	1723	93410	65693	3862	437939	10734864	1408	886
1997	1746	89086	59195	3700	388778	10938138	1735	1000
1998	1769	85642	54617	3536	360719	11125879	1943	1074
1999	1089	75772	52070	3904	342989	11259857	2058	1121
2000	353	74501	41624	3299	311969	11140469	2219	1185
2001	355	70348	37026	3259	302537	11183436	2336	1230

## Appendix 4.6: Emission factors and total emissions of TSP, PM10 and PM2.5 for 1990 and 2001

Year	SNAP ID	Category	Fuel type	Mode	TSP [g/GJ]	PM10 [g/GJ]	PM2.5 [g/GJ]
1990	070101	Passenger cars	Diesel	Highway driving	79,48	79,48	79,48
1990	070101	Passenger cars	Gasoline 2-stroke	Highway driving	48,15	48,15	48,15
1990	070101	Passenger cars	Gasoline conventional	Highway driving	12,33	12,33	12,33
1990	070101	Passenger cars	Gasoline catalyst	Highway driving	0,34	0,34	0,34
1990	070101	Passenger cars	LPG	Highway driving	10,06	10,06	10,06
1990	070102	Passenger cars	Diesel	Rural driving	75,13	75,13	75,13
1990	070102	Passenger cars	Gasoline 2-stroke	Rural driving	41,51	41,51	41,51
1990	070102	Passenger cars	Gasoline conventional	Rural driving	14,24	14,24	14,24
1990	070102	Passenger cars	Gasoline catalyst	Rural driving	0,37	0,37	0,37
1990	070102	Passenger cars	LPG	Rural driving	14,49	14,49	14,49
1990	070103	Passenger cars	Diesel	Urban driving	117,16	117,16	117,16
1990	070103	Passenger cars	Gasoline 2-stroke	Urban driving	24,57	24,57	24,57
1990	070103	Passenger cars	Gasoline conventional	Urban driving	13,98	13,98	13,98
1990	070103	Passenger cars	Gasoline catalyst	Urban driving	0,32	0,32	0,32
1990	070103	Passenger cars	LPG	Urban driving	12,16	12,16	12,16
1990	070201	Light duty vehicles	Diesel	Highway driving	104,48	104,48	104,48
1990	070201	Light duty vehicles	Gasoline conventional	Highway driving	16,17	16,17	16,17
1990	070201	Light duty vehicles	Gasoline catalyst	Highway driving	0,00	0,00	0,00
1990	070202	Light duty vehicles	Diesel	Rural driving	107,73	107,73	107,73
1990	070202	Light duty vehicles	Gasoline conventional	Rural driving	15,25	15,25	15,25
1990	070202	Light duty vehicles	Gasoline catalyst	Rural driving	0,00	0,00	0,00
1990	070203	Light duty vehicles	Diesel	Urban driving	126,74	126,74	126,74
1990	070203	Light duty vehicles	Gasoline conventional	Urban driving	9,12	9,12	9,12
1990	070203	Light duty vehicles	Gasoline catalyst	Urban driving	0,00	0,00	0,00
1990	070301	Heavy duty vehicles	Diesel	Highway driving	45,30	45,30	45,30
1990	070301	Heavy duty vehicles	Gasoline	Highway driving	55,35	55,35	55,35
1990	070302	Heavy duty vehicles	Diesel	Rural driving	54,49	54,49	54,49
1990	070302	Heavy duty vehicles	Gasoline	Rural driving	60,88	60,88	60,88
1990	070303	Heavy duty vehicles	Diesel	Urban driving	61,38	61,38	61,38
1990	070303	Heavy duty vehicles	Gasoline	Urban driving	40,59	40,59	40,59
1990	0704	Mopeds	Gasoline		109,59	109,59	109,59
1990	070501	Motorcycles	Gasoline	Highway driving	32,95	32,95	32,95
1990	070502	Motorcycles	Gasoline	Rural driving	39,46	39,46	39,46
1990	070503	Motorcycles	Gasoline	Urban driving	39,78	39,78	39,78

Year	SNAP ID	Category	Fuel type	Mode	TSP [g/GJ]	PM10 [g/GJ]	PM2.5 [g/GJ]
2001	070101	Passenger cars	Diesel	Highway driving	45,07	45,07	45,07
2001	070101	Passenger cars	Gasoline 2-stroke	Highway driving	48,15	48,15	48,15
2001	070101	Passenger cars	Gasoline conventional	Highway driving	10,44	10,44	10,44
2001	070101	Passenger cars	Gasoline catalyst	Highway driving	0,34	0,34	0,34
2001	070101	Passenger cars	LPG	Highway driving	10,06	10,06	10,06
2001	070102	Passenger cars	Diesel	Rural driving	31,03	31,03	31,03
2001	070102	Passenger cars	Gasoline 2-stroke	Rural driving	41,51	41,51	41,51
2001	070102	Passenger cars	Gasoline conventional	Rural driving	11,67	11,67	11,67
2001	070102	Passenger cars	Gasoline catalyst	Rural driving	0,38	0,38	0,38
2001	070102	Passenger cars	LPG	Rural driving	14,49	14,49	14,49
2001	070103	Passenger cars	Diesel	Urban driving	61,51	61,51	61,51
2001	070103	Passenger cars	Gasoline 2-stroke	Urban driving	24,57	24,57	24,57
2001	070103	Passenger cars	Gasoline conventional	Urban driving	11,17	11,17	11,17
2001	070103	Passenger cars	Gasoline catalyst	Urban driving	0,33	0,33	0,33
2001	070103	Passenger cars	LPG	Urban driving	11,62	11,62	11,62
2001	070201	Light duty vehicles	Diesel	Highway driving	68,42	68,42	68,42
2001	070201	Light duty vehicles	Gasoline conventional	Highway driving	16,17	16,17	16,17
2001	070201	Light duty vehicles	Gasoline catalyst	Highway driving	0,24	0,24	0,24
2001	070202	Light duty vehicles	Diesel	Rural driving	66,60	66,60	66,60
2001	070202	Light duty vehicles	Gasoline conventional	Rural driving	15,25	15,25	15,25
2001	070202	Light duty vehicles	Gasoline catalyst	Rural driving	0,23	0,23	0,23
2001	070203	Light duty vehicles	Diesel	Urban driving	87,70	87,70	87,70
2001	070203	Light duty vehicles	Gasoline conventional	Urban driving	8,75	8,75	8,75
2001	070203	Light duty vehicles	Gasoline catalyst	Urban driving	0,17	0,17	0,17
2001	070301	Heavy duty vehicles	Diesel	Highway driving	28,55	28,55	28,55
2001	070301	Heavy duty vehicles	Gasoline	Highway driving	55,35	55,35	55,35
2001	070302	Heavy duty vehicles	Diesel	Rural driving	34,52	34,52	34,52
2001	070302	Heavy duty vehicles	Gasoline	Rural driving	60,88	60,88	60,88
2001	070303	Heavy duty vehicles	Diesel	Urban driving	39,62	39,62	39,62
2001	070303	Heavy duty vehicles	Gasoline	Urban driving	40,59	40,59	40,59
2001	0704	Mopeds	Gasoline		109,59	109,59	109,59
2001	070501	Motorcycles	Gasoline	Highway driving	33,00	33,00	33,00
2001	070502	Motorcycles	Gasoline	Rural driving	39,46	39,46	39,46
2001	070503	Motorcycles	Gasoline	Urban driving	39,82	39,82	39,82



Year	SNAP ID	Category	Fuel type	Mode	TSP [g/GJ]	PM10 [g/GJ]	PM2.5 [g/GJ]
1990	0801	Military	Diesel		69,87		
1990	0801	Military	Jet fuel	< 3000 ft			
1990	0801	Military	Jet fuel	> 3000 ft			
1990	0801	Military	Gasoline				
1990	0801	Military	Aviation gasoline				
1990	0802	Railways	Diesel		52,52		
1990	0802	Railways	Kerosene				
1990	0802	Railways	Gasoline				
1990	0803	Inland waterways	Diesel		164,83		
1990	0803	Inland waterways	Gasoline				
1990	080402	National sea traffic	Residual oil		139,36		
1990	080402	National sea traffic	Diesel		42,15		
1990	080402	National sea traffic	Kerosene				
1990	080402	National sea traffic	LPG				
1990	080403	Fishing	Residual oil		139,36		
1990	080403	Fishing	Diesel		42,15		
1990	080403	Fishing	Kerosene				
1990	080403	Fishing	Gasoline				
1990	080403	Fishing	LPG				
1990	080404	International sea traffic	Residual oil		200,49		
1990	080404	International sea traffic	Diesel		42,15		
1990	080501	Air traffic, other airports	Jet fuel	Dom. < 3000 ft			
1990	080501	Air traffic, other airports	Aviation gasoline				
1990	080502	Air traffic, other airports	Jet fuel	Int. < 3000 ft			
1990	080502	Air traffic, other airports	Aviation gasoline				
1990	080503	Air traffic, other airports	Jet fuel	Dom. > 3000 ft			
1990	080504	Air traffic, other airports	Jet fuel	Int. > 3000 ft			
1990	0806	Agriculture	Diesel		128,88		
1990	0806	Agriculture	Gasoline				
1990	0807	Forestry	Diesel		150,34		
1990	0807	Forestry	Gasoline				
1990	0808	Industry	Diesel		123,27		
1990	0808	Industry	Gasoline				
1990	0808	Industry	LPG				
1990	0809	Household and gardening	Gasoline				
1990	080501	Air traffic, Copenhagen airport	Jet fuel	Dom. < 3000 ft			
1990	080501	Air traffic, Copenhagen airport	Aviation gasoline				
1990	080502	Air traffic, Copenhagen airport	Jet fuel	Int. < 3000 ft			
1990	080502	Air traffic, Copenhagen airport	Aviation gasoline				
1990	080503	Air traffic, Copenhagen airport	Jet fuel	Dom. > 3000 ft			
1990	080504	Air traffic, Copenhagen airport	Jet fuel	Int. > 3000 ft			

Year	SNAP ID	Category	Fuel type	Mode	TSP [g/GJ]	PM10 [g/GJ]	PM2.5 [g/GJ]
2001	0801	Military	Diesel		43,74	43,74	43,74
2001	0801	Military	Jet fuel	< 3000 ft	1,16	1,16	1,16
2001	0801	Military	Jet fuel	> 3000 ft	1,16	1,16	1,16
2001	0801	Military	Gasoline		4,43	4,43	4,43
2001	0801	Military	Aviation gasoline		10,00	10,00	10,00
2001	0802	Railways	Diesel		52,52	52,52	52,52
2001	0802	Railways	Kerosene		121,95	115,85	110,06
2001	0802	Railways	Gasoline		4,43	4,43	4,43
2001	0803	Inland waterways	Diesel		164,83	156,59	148,76
2001	0803	Inland waterways	Gasoline		23,25	23,25	23,25
2001	080402	National sea traffic	Residual oil		139,40	132,43	125,81
2001	080402	National sea traffic	Diesel		42,15	40,04	38,04
2001	080402	National sea traffic	Kerosene		97,56	92,68	88,05
2001	080402	National sea traffic	LPG		12,44	12,44	12,44
2001	080403	Fishing	Residual oil		139,40	132,43	125,81
2001	080403	Fishing	Diesel		42,15	40,04	38,04
2001	080403	Fishing	Kerosene		97,56	92,68	88,05
2001	080403	Fishing	Gasoline		23,25	23,25	23,25
2001	080403	Fishing	LPG		12,44	12,44	12,44
2001	080404	International sea traffic	Residual oil		200,50	190,48	180,95
2001	080404	International sea traffic	Diesel		42,15	40,04	38,04
2001	080501	Air traffic, other airports	Jet fuel	Dom. < 3000 ft	1,16	1,16	1,16
2001	080501	Air traffic, other airports	Aviation gasoline		10,00	10,00	10,00
2001	080502	Air traffic, other airports	Jet fuel	Int. < 3000 ft	1,16	1,16	1,16
2001	080502	Air traffic, other airports	Aviation gasoline		10,00	10,00	10,00
2001	080503	Air traffic, other airports	Jet fuel	Dom. > 3000 ft	1,16	1,16	1,16
2001	080504	Air traffic, other airports	Jet fuel	Int. > 3000 ft	1,16	1,16	1,16
2001	0806	Agriculture	Diesel		127,14	120,78	114,74
2001	0806	Agriculture	Gasoline		23,25	23,25	23,25
2001	0807	Forestry	Diesel		134,27	127,55	121,17
2001	0807	Forestry	Gasoline		23,25	23,25	23,25
2001	0808	Industry	Diesel		111,07	105,52	100,24
2001	0808	Industry	Gasoline		23,25	23,25	23,25
2001	0808	Industry	LPG		12,44	12,44	12,44
2001	0809	Household and gardening	Gasoline		23,25	23,25	23,25
2001	080501	Air traffic, Copenhagen airport	Jet fuel	Dom. < 3000 ft	1,16	1,16	1,16
2001	080501	Air traffic, Copenhagen airport	Aviation gasoline		10,00	10,00	10,00
2001	080502	Air traffic, Copenhagen airport	Jet fuel	Int. < 3000 ft	1,16	1,16	1,16
2001	080502	Air traffic, Copenhagen airport	Aviation gasoline		10,00	10,00	10,00
2001	080503	Air traffic, Copenhagen airport	Jet fuel	Dom. > 3000 ft	1,16	1,16	1,16
2001	080504	Air traffic, Copenhagen airport	Jet fuel	Int. > 3000 ft	1,16	1,16	1,16

Year	SNAP ID	Category	Fuel type	Mode	TSP [tons]	PM10 [tons]	PM2.5 [tons]
1990	070101	Passenger cars	Diesel	Highway driving	56,91	56,91	56,91
1990	070101	Passenger cars	LPG	Highway driving	0,02	0,02	0,02
1990	070101	Passenger cars	Gasoline 2-stroke	Highway driving	1,38	1,38	1,38
1990	070101	Passenger cars	Gasoline conventional	Highway driving	91,16	91,16	91,16
1990	070101	Passenger cars	Gasoline catalyst	Highway driving	0,06	0,06	0,06
1990	070102	Passenger cars	Diesel	Rural driving	153,2	153,2	153,2
1990	070102	Passenger cars	LPG	Rural driving	0,06	0,06	0,06
1990	070102	Passenger cars	Gasoline 2-stroke	Rural driving	4,79	4,79	4,79
1990	070102	Passenger cars	Gasoline conventional	Rural driving	324,69	324,69	324,69
1990	070102	Passenger cars	Gasoline catalyst	Rural driving	0,21	0,21	0,21
1990	070103	Passenger cars	Diesel	Urban driving	356,89	356,89	356,89
1990	070103	Passenger cars	LPG	Urban driving	0,08	0,08	0,08
1990	070103	Passenger cars	Gasoline 2-stroke	Urban driving	4,47	4,47	4,47
1990	070103	Passenger cars	Gasoline conventional	Urban driving	440,89	440,89	440,89
1990	070103	Passenger cars	Gasoline catalyst	Urban driving	0,31	0,31	0,31
1990	070201	Light duty vehicles	Diesel	Highway driving	241,69	241,69	241,69
1990	070201	Light duty vehicles	Gasoline conventional	Highway driving	4,12	4,12	4,12
1990	070201	Light duty vehicles	Gasoline catalyst	Highway driving	0	0	0
1990	070202	Light duty vehicles	Diesel	Rural driving	892,12	892,12	892,12
1990	070202	Light duty vehicles	Gasoline conventional	Rural driving	16,12	16,12	16,12
1990	070202	Light duty vehicles	Gasoline catalyst	Rural driving	0	0	0
1990	070203	Light duty vehicles	Diesel	Urban driving	1225,18	1225,18	1225,18
1990	070203	Light duty vehicles	Gasoline conventional	Urban driving	14,06	14,06	14,06
1990	070203	Light duty vehicles	Gasoline catalyst	Urban driving	0	0	0
1990	070301	Heavy duty vehicles	Diesel	Highway driving	342,43	342,43	342,43
1990	070301	Heavy duty vehicles	Gasoline	Highway driving	0,37	0,37	0,37
1990	070302	Heavy duty vehicles	Diesel	Rural driving	772,38	772,38	772,38
1990	070302	Heavy duty vehicles	Gasoline	Rural driving	1,17	1,17	1,17
1990	070303	Heavy duty vehicles	Diesel	Urban driving	745,88	745,88	745,88
1990	070303	Heavy duty vehicles	Gasoline	Urban driving	0,91	0,91	0,91
1990	0704	Mopeds	Gasoline		29,6	29,6	29,6
1990	070501	Motorcycles	Gasoline	Highway driving	2,27	2,27	2,27
1990	070502	Motorcycles	Gasoline	Rural driving	5,07	5,07	5,07
1990	070503	Motorcycles	Gasoline	Urban driving	6	6	6

Year	SNAP ID	Category	Fuel type	Mode	TSP [tons]	PM10 [tons]	PM2.5 [tons]
1990	0801	Military	Diesel		10,21		
1990	0801	Military	Gasoline		0		
1990	0801	Military	Aviation gasoline		0		
1990	0801	Military	Jet fuel	< 3000 ft	0		
1990	0801	Military	Jet fuel	> 3000 ft	0		
1990	0802	Railways	Diesel		210,61		
1990	0802	Railways	Kerosene		0		
1990	0802	Railways	Gasoline		0		
1990	0803	Inland waterways	Diesel		50,21		
1990	0803	Inland waterways	Gasoline		0		
1990	080402	National sea traffic	Residual oil		496,11		
1990	080402	National sea traffic	Diesel		117,29		
1990	080402	National sea traffic	Kerosene		0		
1990	080402	National sea traffic	LPG		0		
1990	080403	Fishing	Residual oil		39,78		
1990	080403	Fishing	Diesel		439,35		
1990	080403	Fishing	Kerosene		0		
1990	080403	Fishing	Gasoline		0		
1990	080403	Fishing	LPG		0		
1990	080404	International sea traffic	Residual oil		5742,86		
1990	080404	International sea traffic	Diesel		490,37		
1990	080501	Air traffic, other airports	Jet fuel	Dom. < 3000 ft	0		
1990	080501	Air traffic, other airports	Aviation gasoline		0		
1990	080502	Air traffic, other airports	Jet fuel	Int. < 3000 ft	0		
1990	080502	Air traffic, other airports	Aviation gasoline		0		
1990	080503	Air traffic, other airports	Jet fuel	Dom. > 3000 ft	0		
1990	080504	Air traffic, other airports	Jet fuel	Int. > 3000 ft	0		
1990	0806	Agriculture	Diesel		1829,47		
1990	0806	Agriculture	Gasoline		0		
1990	0807	Forestry	Diesel		0,62		
1990	0807	Forestry	Gasoline		0		
1990	0808	Industry	Diesel		997,39		
1990	0808	Industry	Gasoline		0		
1990	0808	Industry	LPG		0		
1990	0809	Household and gardening	Gasoline		0		
1990	080501	Air traffic, Copenhagen airport		Dom. < 3000 ft	0		
1990	080502	Air traffic, Copenhagen airport		Int. < 3000 ft	0		
1990	080503	Air traffic, Copenhagen airport		Dom. > 3000 ft	0		
1990	080504	Air traffic, Copenhagen airport		Int. > 3000 ft	0		

Year	SNAP ID	Category	Fuel type	Mode	TSP [tons]	PM10 [tons]	PM2.5 [tons]
2001	70101	Passenger cars	Diesel	Highway driving	81,04	81,04	81,04
2001	70101	Passenger cars	LPG	Highway driving	0	0	0
2001	70101	Passenger cars	Gasoline 2-stroke	Highway driving	0,05	0,05	0,05
2001	70101	Passenger cars	Gasoline conv.	Highway driving	32,67	32,67	32,67
2001	70101	Passenger cars	Gasoline catalyst	Highway driving	3,35	3,35	3,35
2001	70102	Passenger cars	Diesel	Rural driving	118,16	118,16	118,16
2001	70102	Passenger cars	LPG	Rural driving	0,01	0,01	0,01
2001	70102	Passenger cars	Gasoline 2-stroke	Rural driving	0,13	0,13	0,13
2001	70102	Passenger cars	Gasoline conv.	Rural driving	79,76	79,76	79,76
2001	70102	Passenger cars	Gasoline catalyst	Rural driving	8,11	8,11	8,11
2001	70103	Passenger cars	Diesel	Urban driving	271,01	271,01	271,01
2001	70103	Passenger cars	LPG	Urban driving	0,01	0,01	0,01
2001	70103	Passenger cars	Gasoline 2-stroke	Urban driving	0,1	0,1	0,1
2001	70103	Passenger cars	Gasoline conv.	Urban driving	89,52	89,52	89,52
2001	70103	Passenger cars	Gasoline catalyst	Urban driving	9,69	9,69	9,69
2001	70201	Light duty vehicles	Diesel	Highway driving	216,85	216,85	216,85
2001	70201	Light duty vehicles	Gasoline conv.	Highway driving	2,54	2,54	2,54
2001	70201	Light duty vehicles	Gasoline catalyst	Highway driving	0,05	0,05	0,05
2001	70202	Light duty vehicles	Diesel	Rural driving	643,03	643,03	643,03
2001	70202	Light duty vehicles	Gasoline conv.	Rural driving	8,45	8,45	8,45
2001	70202	Light duty vehicles	Gasoline catalyst	Rural driving	0,17	0,17	0,17
2001	70203	Light duty vehicles	Diesel	Urban driving	825,78	825,78	825,78
2001	70203	Light duty vehicles	Gasoline conv.	Urban driving	5,92	5,92	5,92
2001	70203	Light duty vehicles	Gasoline catalyst	Urban driving	0,15	0,15	0,15
2001	70301	Heavy duty vehicles	Diesel	Highway driving	306,71	306,71	306,71
2001	70301	Heavy duty vehicles	Gasoline	Highway driving	0,49	0,49	0,49
2001	70302	Heavy duty vehicles	Diesel	Rural driving	563,06	563,06	563,06
2001	70302	Heavy duty vehicles	Gasoline	Rural driving	1,09	1,09	1,09
2001	70303	Heavy duty vehicles	Diesel	Urban driving	459,78	459,78	459,78
2001	70303	Heavy duty vehicles	Gasoline	Urban driving	0,74	0,74	0,74
2001	704	Mopeds	Gasoline		23,26	23,26	23,26
2001	70501	Motorcycles	Gasoline	Highway driving	3,12	3,12	3,12
2001	70502	Motorcycles	Gasoline	Rural driving	8,69	8,69	8,69
2001	70503	Motorcycles	Gasoline	Urban driving	10,48	10,48	10,48

Year	SNAP ID	Category	Fuel type	Mode	TSP [tons]	PM10 [tons]	PM2.5 [tons]
2001	801	Military	Diesel		38,7	38,7	38,7
2001	801	Military	Gasoline		0	0	0
2001	801	Military	Aviation gasoline		0,07	0,07	0,07
2001	801	Military	Jet fuel	< 3000 ft	0,05	0,05	0,05
2001	801	Military	Jet fuel	> 3000 ft	0,45	0,45	0,45
2001	802	Railways	Diesel		149,89	149,89	149,89
2001	802	Railways	Gasoline		0,03	0,03	0,03
2001	803	Inland waterways	Gasoline		12,42	12,42	12,42
2001	803	Inland waterways	Diesel		59,97	56,97	54,12
2001	80402	National sea traffic	Residual oil		210,93	200,39	190,37
2001	80402	National sea traffic	Diesel		136,58	129,75	123,27
2001	80402	National sea traffic	Kerosene		0,05	0,05	0,05
2001	80403	Fishing	Diesel		375,49	356,71	338,88
2001	80403	Fishing	Kerosene		0,15	0,14	0,13
2001	80403	Fishing	Gasoline		0,07	0,07	0,07
2001	80403	Fishing	LPG		0,24	0,24	0,24
2001	80404	International sea traffic	Residual oil		5197,7	4937,81	4690,92
2001	80404	International sea traffic	Diesel		901,55	856,47	813,65
2001	80501	Air traffic, other airports	Jet fuel	Dom. < 3000 ft	0,31	0,31	0,31
2001	80501	Air traffic, other airports	Aviation gasoline		0,99	0,99	0,99
2001	80502	Air traffic, other airports	Jet fuel	Int. < 3000 ft	0,28	0,28	0,28
2001	80502	Air traffic, other airports	Aviation gasoline		0,07	0,07	0,07
2001	80503	Air traffic, other airports	Jet fuel	Dom. > 3000 ft	0,68	0,68	0,68
2001	80504	Air traffic, other airports	Jet fuel	Int. > 3000 ft	3,04	3,04	3,04
2001	806	Agriculture	Diesel		2155,46	2047,69	1945,3
2001	806	Agriculture	Gasoline		11,85	11,85	11,85
2001	807	Forestry	Diesel		0,66	0,63	0,59
2001	807	Forestry	Gasoline		1,38	1,38	1,38
2001	808	Industry	Diesel		1073,32	1019,65	968,67
2001	808	Industry	Gasoline		3,26	3,26	3,26
2001	808	Industry	LPG		29,58	29,58	29,58
2001	809	Household and gardening	Gasoline		27,06	27,06	27,06
2001	080501	Air traffic, Copenhagen airport		Dom. < 3000 ft	0,39	0,39	0,39
2001	080502	Air traffic, Copenhagen airport		Int. < 3000 ft	3,56	3,56	3,56
2001	080503	Air traffic, Copenhagen airport		Dom. > 3000 ft	1,23	1,23	1,23
2001	080504	Air traffic, Copenhagen airport		Int. > 3000 ft	31,43	31,43	31,43

## Appendix 4.7: Heavy metal emission factors and total emissions for 1990 and 2001

Year	SNAP ID	Category	Fuel type	Mode	Arsenic [g/GJ]	Cadmium [g/GJ]	Chromium [g/GJ]	Copper [g/GJ]	Mercury [g/GJ]	Nickel [g/GJ]	Lead [g/GJ]	Selenium [g/GJ]	Zinc [g/GJ]
1990	070101	Passenger cars	Diesel	Highway driving		0,000234	0,001171	0,039812		0,001639	0,000000	0,000234	0,023419
1990	070101	Passenger cars	Gasoline 2-stroke	Highway driving		0,000297	0,001486	0,050529		0,002081	1,471201	0,000297	0,029723
1990	070101	Passenger cars	Gasoline conventional	Highway driving		0,000225	0,001124	0,038216		0,001574	1,471201	0,000225	0,022480
1990	070101	Passenger cars	Gasoline catalyst	Highway driving		0,000195	0,000974	0,033126		0,001364	1,471201	0,000195	0,019486
1990	070101	Passenger cars	LPG	Highway driving		0,000000	0,000000	0,000000		0,000000	0,000000	0,000000	0,000000
1990	070102	Passenger cars	Diesel	Rural driving		0,000234	0,001171	0,039812		0,001639	0,000000	0,000234	0,023419
1990	070102	Passenger cars	Gasoline 2-stroke	Rural driving		0,000297	0,001486	0,050529		0,002081	1,471201	0,000297	0,029723
1990	070102	Passenger cars	Gasoline conventional	Rural driving		0,000224	0,001122	0,038145		0,001571	1,471201	0,000224	0,022438
1990	070102	Passenger cars	Gasoline catalyst	Rural driving		0,000195	0,000974	0,033126		0,001364	1,471201	0,000195	0,019486
1990	070102	Passenger cars	LPG	Rural driving		0,000000	0,000000	0,000000		0,000000	0,000000	0,000000	0,000000
1990	070103	Passenger cars	Diesel	Urban driving		0,000234	0,001171	0,039812		0,001639	0,000000	0,000234	0,023419
1990	070103	Passenger cars	Gasoline 2-stroke	Urban driving		0,000297	0,001486	0,050529		0,002081	1,471201	0,000297	0,029723
1990	070103	Passenger cars	Gasoline conventional	Urban driving		0,000225	0,001127	0,038320		0,001578	1,471201	0,000225	0,022541
1990	070103	Passenger cars	Gasoline catalyst	Urban driving		0,000195	0,000974	0,033126		0,001364	1,471201	0,000195	0,019486
1990	070103	Passenger cars	LPG	Urban driving		0,000000	0,000000	0,000000		0,000000	0,000000	0,000000	0,000000
1990	070201	Light duty vehicles	Diesel	Highway driving		0,000234	0,001171	0,039812		0,001639	0,000000	0,000234	0,023419
1990	070201	Light duty vehicles	Gasoline conventional	Highway driving		0,000297	0,001486	0,050529		0,002081	1,471201	0,000297	0,029723
1990	070201	Light duty vehicles	Gasoline catalyst	Highway driving		0,000000	0,000000	0,000000		0,000000	1,471201	0,000000	0,000000
1990	070202	Light duty vehicles	Diesel	Rural driving		0,000234	0,001171	0,039812		0,001639	0,000000	0,000234	0,023419
1990	070202	Light duty vehicles	Gasoline conventional	Rural driving		0,000297	0,001486	0,050529		0,002081	1,471201	0,000297	0,029723
1990	070202	Light duty vehicles	Gasoline catalyst	Rural driving		0,000000	0,000000	0,000000		0,000000	1,471201	0,000000	0,000000
1990	070203	Light duty vehicles	Diesel	Urban driving		0,000234	0,001171	0,039812		0,001639	0,000000	0,000234	0,023419
1990	070203	Light duty vehicles	Gasoline conventional	Urban driving		0,000297	0,001486	0,050529		0,002081	1,471201	0,000297	0,029723
1990	070203	Light duty vehicles	Gasoline catalyst	Urban driving		0,000000	0,000000	0,000000		0,000000	1,471201	0,000000	0,000000
1990	070301	Heavy duty vehicles	Diesel	Highway driving		0,000234	0,001171	0,039812		0,001639	0,000000	0,000234	0,023419
1990	070301	Heavy duty vehicles	Gasoline	Highway driving		0,000297	0,001486	0,050529		0,002081	1,471201	0,000297	0,029723
1990	070302	Heavy duty vehicles	Diesel	Rural driving		0,000234	0,001171	0,039812		0,001639	0,000000	0,000234	0,023419
1990	070302	Heavy duty vehicles	Gasoline	Rural driving		0,000297	0,001486	0,050529		0,002081	1,471201	0,000297	0,029723
1990	070303	Heavy duty vehicles	Diesel	Urban driving		0,000234	0,001171	0,039812		0,001639	0,000000	0,000234	0,023419
1990	070303	Heavy duty vehicles	Gasoline	Urban driving		0,000297	0,001486	0,050529		0,002081	1,471201	0,000297	0,029723
1990	0704	Mopeds	Gasoline			0,000297	0,001486	0,050529		0,002081	1,471201	0,000297	0,029723
1990	070501	Motorcycles	Gasoline	Highway driving		0,000297	0,001486	0,050529		0,002081	1,471201	0,000297	0,029723
1990	070502	Motorcycles	Gasoline	Rural driving		0,000297	0,001486	0,050529		0,002081	1,471201	0,000297	0,029723
1990	070503	Motorcycles	Gasoline	Urban driving		0,000297	0,001486	0,050529		0,002081	1,471201	0,000297	0,029723

Year	SNAP ID	Category	Fuel type	Mode	Arsenic [g/GJ]	Cadmium [g/GJ]	Chromium [g/GJ]	Copper [g/GJ]	Mercury [g/GJ]	Nickel [g/GJ]	Lead [g/GJ]	Selenium [g/GJ]	Zinc [g/GJ]
2001	070101	Passenger cars	Diesel	Highway driving		0,000234	0,001171	0,039812		0,001639	0,000000	0,000234	0,023419
2001	070101	Passenger cars	Gasoline 2-stroke	Highway driving		0,000228	0,001141	0,038813		0,001598	0,000685	0,000228	0,022831
2001	070101	Passenger cars	Gasoline conventional	Highway driving		0,000228	0,001141	0,038813		0,001598	0,000685	0,000228	0,022831
2001	070101	Passenger cars	Gasoline catalyst	Highway driving		0,000228	0,001141	0,038813		0,001598	0,000685	0,000228	0,022831
2001	070101	Passenger cars	LPG	Highway driving		0,000000	0,000000	0,000000		0,000000	0,000000	0,000000	0,000000
2001	070102	Passenger cars	Diesel	Rural driving		0,000234	0,001171	0,039812		0,001639	0,000000	0,000234	0,023419
2001	070102	Passenger cars	Gasoline 2-stroke	Rural driving		0,000228	0,001141	0,038813		0,001598	0,000685	0,000228	0,022831
2001	070102	Passenger cars	Gasoline conventional	Rural driving		0,000228	0,001141	0,038813		0,001598	0,000685	0,000228	0,022831
2001	070102	Passenger cars	Gasoline catalyst	Rural driving		0,000228	0,001141	0,038813		0,001598	0,000685	0,000228	0,022831
2001	070102	Passenger cars	LPG	Rural driving		0,000000	0,000000	0,000000		0,000000	0,000000	0,000000	0,000000
2001	070103	Passenger cars	Diesel	Urban driving		0,000234	0,001171	0,039812		0,001639	0,000000	0,000234	0,023419
2001	070103	Passenger cars	Gasoline 2-stroke	Urban driving		0,000228	0,001141	0,038813		0,001598	0,000685	0,000228	0,022831
2001	070103	Passenger cars	Gasoline conventional	Urban driving		0,000228	0,001141	0,038813		0,001598	0,000685	0,000228	0,022831
2001	070103	Passenger cars	Gasoline catalyst	Urban driving		0,000228	0,001141	0,038813		0,001598	0,000685	0,000228	0,022831
2001	070103	Passenger cars	LPG	Urban driving		0,000000	0,000000	0,000000		0,000000	0,000000	0,000000	0,000000
2001	070201	Light duty vehicles	Diesel	Highway driving		0,000234	0,001171	0,039812		0,001639	0,000000	0,000234	0,023419
2001	070201	Light duty vehicles	Gasoline conventional	Highway driving		0,000228	0,001141	0,038813		0,001598	0,000685	0,000228	0,022831
2001	070201	Light duty vehicles	Gasoline catalyst	Highway driving		0,000228	0,001141	0,038813		0,001598	0,000685	0,000228	0,022831
2001	070202	Light duty vehicles	Diesel	Rural driving		0,000234	0,001171	0,039812		0,001639	0,000000	0,000234	0,023419
2001	070202	Light duty vehicles	Gasoline conventional	Rural driving		0,000228	0,001141	0,038813		0,001598	0,000685	0,000228	0,022831
2001	070202	Light duty vehicles	Gasoline catalyst	Rural driving		0,000228	0,001141	0,038813		0,001598	0,000685	0,000228	0,022831
2001	070203	Light duty vehicles	Diesel	Urban driving		0,000234	0,001171	0,039812		0,001639	0,000000	0,000234	0,023419
2001	070203	Light duty vehicles	Gasoline conventional	Urban driving		0,000228	0,001141	0,038813		0,001598	0,000685	0,000228	0,022831
2001	070203	Light duty vehicles	Gasoline catalyst	Urban driving		0,000228	0,001141	0,038813		0,001598	0,000685	0,000228	0,022831
2001	070301	Heavy duty vehicles	Diesel	Highway driving		0,000234	0,001171	0,039812		0,001639	0,000000	0,000234	0,023419
2001	070301	Heavy duty vehicles	Gasoline	Highway driving		0,000228	0,001141	0,038813		0,001598	0,000685	0,000228	0,022831
2001	070302	Heavy duty vehicles	Diesel	Rural driving		0,000234	0,001171	0,039812		0,001639	0,000000	0,000234	0,023419
2001	070302	Heavy duty vehicles	Gasoline	Rural driving		0,000228	0,001141	0,038813		0,001598	0,000685	0,000228	0,022831
2001	070303	Heavy duty vehicles	Diesel	Urban driving		0,000234	0,001171	0,039812		0,001639	0,000000	0,000234	0,023419
2001	070303	Heavy duty vehicles	Gasoline	Urban driving		0,000228	0,001141	0,038813		0,001598	0,000685	0,000228	0,022831
2001	0704	Mopeds	Gasoline			0,000228	0,001141	0,038813		0,001598	0,000685	0,000228	0,022831
2001	070501	Motorcycles	Gasoline	Highway driving		0,000228	0,001141	0,038813		0,001598	0,000685	0,000228	0,022831
2001	070502	Motorcycles	Gasoline	Rural driving		0,000228	0,001141	0,038813		0,001598	0,000685	0,000228	0,022831
2001	070503	Motorcycles	Gasoline	Urban driving		0,000228	0,001141	0,038813		0,001598	0,000685	0,000228	0,022831



Year	SNAP ID	Category	Fuel type	Mode	Arsenic [mg/GJ]	Cadmium [mg/GJ]	Chromium [mg/GJ]	Copper [mg/GJ]	Mercury [mg/GJ]	Nickel [mg/GJ]	Lead [mg/GJ]	Selenium [mg/GJ]	Zinc [mg/GJ]
1990	0801	Military	Diesel			0,23	1,17	39,81		1,64		0,23	23,42
1990	0801	Military	Jet fuel	< 3000 ft		0,23	1,14	38,81		1,60		0,23	22,83
1990	0801	Military	Jet fuel	> 3000 ft		0,23	1,14	38,81		1,60		0,23	22,83
1990	0801	Military	Gasoline			0,23	1,14	38,81		1,60	1471,20	0,23	22,83
1990	0801	Military	Aviation gasoline			0,23	1,14	38,81		1,60	12785,39	0,23	22,83
1990	0802	Railways	Diesel			0,23	1,17	39,81		1,64		0,23	23,42
1990	0802	Railways	Kerosene										
1990	0802	Railways	Gasoline			0,23	1,14	38,81		1,60	1471,20	0,23	22,83
1990	0803	Inland waterways	Diesel			0,23	1,17	39,81		1,64		0,23	23,42
1990	0803	Inland waterways	Gasoline			0,23	1,14	38,81		1,60	1471,20	0,23	22,83
1990	080402	National sea traffic	Residual oil		12,22	0,73	4,89	12,22	0,49	733,50	4,89	9,78	22,00
1990	080402	National sea traffic	Diesel		1,17	0,23	0,94	1,17	1,17	1,64	2,34	4,68	11,71
1990	080402	National sea traffic	Kerosene										
1990	080402	National sea traffic	LPG										
1990	080403	Fishing	Residual oil		12,22	0,73	4,89	12,22	0,49	733,50	4,89	9,78	22,00
1990	080403	Fishing	Diesel		1,17	0,23	0,94	1,17	1,17	1,64	2,34	4,68	11,71
1990	080403	Fishing	Kerosene										
1990	080403	Fishing	Gasoline			0,23	1,14	38,81		1,60	1471,20	0,23	22,83
1990	080403	Fishing	LPG										
1990	080404	International sea traffic	Residual oil		12,22	0,73	4,89	12,22	0,49	733,50	4,89	9,78	22,00
1990	080404	International sea traffic	Diesel		1,17	0,23	0,94	1,17	1,17	1,64	2,34	4,68	11,71
1990	080501	Air traffic, other airports	Jet fuel	Dom. < 3000 ft		0,23	1,14	38,81		1,60		0,23	22,83
1990	080501	Air traffic, other airports	Aviation gasoline			0,23	1,14	38,81		1,60	13505,69	0,23	22,83
1990	080502	Air traffic, other airports	Jet fuel	Int. < 3000 ft		0,23	1,14	38,81		1,60		0,23	22,83
1990	080502	Air traffic, other airports	Aviation gasoline			0,23	1,14	38,81		1,60	13505,69	0,23	22,83
1990	080503	Air traffic, other airports	Jet fuel	Dom. > 3000 ft		0,23	1,14	38,81		1,60		0,23	22,83
1990	080504	Air traffic, other airports	Jet fuel	Int. > 3000 ft		0,23	1,14	38,81		1,60		0,23	22,83
1990	0806	Agriculture	Diesel			0,23	1,17	39,81		1,64		0,23	23,42
1990	0806	Agriculture	Gasoline			0,23	1,14	38,81		1,60	1471,20	0,23	22,83
1990	0807	Forestry	Diesel			0,23	1,17	39,81		1,64		0,23	23,42
1990	0807	Forestry	Gasoline			0,23	1,14	38,81		1,60	1471,20	0,23	22,83
1990	0808	Industry	Diesel			0,23	1,17	39,81		1,64		0,23	23,42
1990	0808	Industry	Gasoline			0,23	1,14	38,81		1,60	1471,20	0,23	22,83
1990	0808	Industry	LPG										
1990	0809	Household and gardening	Gasoline			0,23	1,14	38,81		1,60	1471,20	0,23	22,83
1990	080501	Air traffic, CPH. airport	Jet fuel	Dom. < 3000 ft		0,23	1,14	38,81		1,60		0,23	22,83
1990	080501	Air traffic, CPH. airport	Aviation gasoline			0,23	1,14	38,81		1,60	13505,69	0,23	22,83
1990	080502	Air traffic, CPH. airport	Jet fuel	Int. < 3000 ft		0,23	1,14	38,81		1,60		0,23	22,83
1990	080502	Air traffic, CPH. airport	Aviation gasoline			0,23	1,14	38,81		1,60	13505,69	0,23	22,83
1990	080503	Air traffic, CPH. airport	Jet fuel	Dom. > 3000 ft		0,23	1,14	38,81		1,60		0,23	22,83
1990	080504	Air traffic, CPH. airport	Jet fuel	Int. > 3000 ft		0,23	1,14	38,81		1,60		0,23	22,83

Year	SNAP ID	Category	Fuel type	Mode	Arsenic [mg/GJ]	Cadmium [mg/GJ]	Chromium [mg/GJ]	Copper [mg/GJ]	Mercury [mg/GJ]	Nickel [mg/GJ]	Lead [mg/GJ]	Selenium [mg/GJ]	Zinc [mg/GJ]
2001	0801	Military	Diesel			0,23	1,17	39,81		1,64		0,23	23,42
2001	0801	Military	Jet fuel	< 3000 ft	0,00	0,23	1,14	38,81	0,00	1,60	0,00	0,23	22,83
2001	0801	Military	Jet fuel	> 3000 ft	0,00	0,23	1,14	38,81	0,00	1,60	0,00	0,23	22,83
2001	0801	Military	Gasoline			0,23	1,14	38,81		1,60	0,68	0,23	22,83
2001	0801	Military	Aviation gasoline		0,00	0,23	1,14	38,81	0,00	1,60	12785,39	0,23	22,83
2001	0802	Railways	Diesel			0,23	1,17	39,81		1,64		0,23	23,42
2001	0802	Railways	Kerosene										
2001	0802	Railways	Gasoline			0,23	1,14	38,81		1,60	0,68	0,23	22,83
2001	0803	Inland waterways	Diesel			0,23	1,17	39,81		1,64		0,23	23,42
2001	0803	Inland waterways	Gasoline			0,23	1,14	38,81		1,60	0,68	0,23	22,83
2001	080402	National sea traffic	Residual oil		12,22	0,73	4,89	12,22	0,49	733,50	4,89	9,78	22,00
2001	080402	National sea traffic	Diesel		1,17	0,23	0,94	1,17	1,17	1,64	2,34	4,68	11,71
2001	080402	National sea traffic	Kerosene										
2001	080402	National sea traffic	LPG										
2001	080403	Fishing	Residual oil		12,22	0,73	4,89	12,22	0,49	733,50	4,89	9,78	22,00
2001	080403	Fishing	Diesel		1,17	0,23	0,94	1,17	1,17	1,64	2,34	4,68	11,71
2001	080403	Fishing	Kerosene										
2001	080403	Fishing	Gasoline			0,23	1,14	38,81		1,60	0,68	0,23	22,83
2001	080403	Fishing	LPG										
2001	080404	International sea traffic	Residual oil		12,22	0,73	4,89	12,22	0,49	733,50	4,89	9,78	22,00
2001	080404	International sea traffic	Diesel		1,17	0,23	0,94	1,17	1,17	1,64	2,34	4,68	11,71
2001	080501	Air traffic, other airports	Jet fuel	Dom. < 3000 ft		0,23	1,14	38,81		1,60	0,00	0,23	22,83
2001	080501	Air traffic, other airports	Aviation gasoline			0,23	1,14	38,81		1,60	13505,69	0,23	22,83
2001	080502	Air traffic, other airports	Jet fuel	Int. < 3000 ft		0,23	1,14	38,81		1,60	0,00	0,23	22,83
2001	080502	Air traffic, other airports	Aviation gasoline			0,23	1,14	38,81		1,60	13505,69	0,23	22,83
2001	080503	Air traffic, other airports	Jet fuel	Dom. > 3000 ft		0,23	1,14	38,81		1,60	0,00	0,23	22,83
2001	080504	Air traffic, other airports	Jet fuel	Int. > 3000 ft		0,23	1,14	38,81		1,60	0,00	0,23	22,83
2001	0806	Agriculture	Diesel			0,23	1,17	39,81		1,64		0,23	23,42
2001	0806	Agriculture	Gasoline			0,23	1,14	38,81		1,60	0,68	0,23	22,83
2001	0807	Forestry	Diesel			0,23	1,17	39,81		1,64		0,23	23,42
2001	0807	Forestry	Gasoline			0,23	1,14	38,81		1,60	0,68	0,23	22,83
2001	0808	Industry	Diesel			0,23	1,17	39,81		1,64		0,23	23,42
2001	0808	Industry	Gasoline			0,23	1,14	38,81		1,60	0,68	0,23	22,83
2001	0808	Industry	LPG										
2001	0809	Household and gardening	Gasoline			0,23	1,14	38,81		1,60	0,68	0,23	22,83
2001	080501	Air traffic, CPH. airport	Jet fuel	Dom. < 3000 ft		0,23	1,14	38,81		1,60		0,23	22,83
2001	080501	Air traffic, CPH. airport	Aviation gasoline			0,23	1,14	38,81		1,60	13505,69	0,23	22,83
2001	080502	Air traffic, CPH. airport	Jet fuel	Int. < 3000 ft	0,00	0,23	1,14	38,81	0,00	1,60	0,00	0,23	22,83
2001	080502	Air traffic, CPH. airport	Aviation gasoline		0,00	0,23	1,14	38,81	0,00	1,60	13505,69	0,23	22,83
2001	080503	Air traffic, CPH. airport	Jet fuel	Dom. > 3000 ft	0,00	0,23	1,14	38,81	0,00	1,60	0,00	0,23	22,83
2001	080504	Air traffic, CPH. airport	Jet fuel	Int. > 3000 ft	0,00	0,23	1,14	38,81	0,00	1,60	0,00	0,23	22,83

Year	SNAP ID	Category	Fuel type	Mode	Arsenic [kg]	Cadmium [kg]	Chromium [kg]	Copper [kg]	Mercury [kg]	Nickel [kg]	Lead [kg]	Selenium [kg]	Zinc [kg]
1990	070101	Passenger cars	Diesel	Highway driving	0	0,17	0,84	28,51	0	1,17	0	0,17	16,77
1990	070101	Passenger cars	LPG	Highway driving	0	0	0	0	0	0	0	0	0
1990	070101	Passenger cars	Gasoline 2-stroke	Highway driving	0	0,01	0,04	1,45	0	0,06	42,27	0,01	0,85
1990	070101	Passenger cars	Gasoline conventional	Highway driving	0	1,66	8,31	282,6	0	11,64	10879,46	1,66	166,24
1990	070101	Passenger cars	Gasoline catalyst	Highway driving	0	0,04	0,18	6,08	0	0,25	270	0,04	3,58
1990	070102	Passenger cars	Diesel	Rural driving	0	0,48	2,39	81,18	0	3,34	0	0,48	47,75
1990	070102	Passenger cars	LPG	Rural driving	0	0	0	0	0	0	0	0	0
1990	070102	Passenger cars	Gasoline 2-stroke	Rural driving	0	0,03	0,17	5,83	0	0,24	169,71	0,03	3,43
1990	070102	Passenger cars	Gasoline conventional	Rural driving	0	5,11	25,58	869,71	0	35,81	33543,34	5,11	511,59
1990	070102	Passenger cars	Gasoline catalyst	Rural driving	0	0,11	0,56	18,89	0	0,78	839,14	0,11	11,11
1990	070103	Passenger cars	Diesel	Urban driving	0	0,71	3,57	121,28	0	4,99	0	0,71	71,34
1990	070103	Passenger cars	LPG	Urban driving	0	0	0	0	0	0	0	0	0
1990	070103	Passenger cars	Gasoline 2-stroke	Urban driving	0	0,05	0,27	9,19	0	0,38	267,59	0,05	5,41
1990	070103	Passenger cars	Gasoline conventional	Urban driving	0	7,11	35,54	1208,33	0	49,75	46390,57	7,11	710,78
1990	070103	Passenger cars	Gasoline catalyst	Urban driving	0	0,19	0,96	32,71	0	1,35	1452,54	0,19	19,24
1990	070201	Light duty vehicles	Diesel	Highway driving	0	0,54	2,71	92,1	0	3,79	0	0,54	54,18
1990	070201	Light duty vehicles	Gasoline conventional	Highway driving	0	0,08	0,38	12,86	0	0,53	374,42	0,08	7,56
1990	070201	Light duty vehicles	Gasoline catalyst	Highway driving	0	0	0	0	0	0	0	0	0
1990	070202	Light duty vehicles	Diesel	Rural driving	0	1,94	9,69	329,68	0	13,57	0	1,94	193,93
1990	070202	Light duty vehicles	Gasoline conventional	Rural driving	0	0,31	1,57	53,41	0	2,2	1555,09	0,31	31,42
1990	070202	Light duty vehicles	Gasoline catalyst	Rural driving	0	0	0	0	0	0	0	0	0
1990	070203	Light duty vehicles	Diesel	Urban driving	0	2,26	11,32	384,85	0	15,84	0	2,26	226,38
1990	070203	Light duty vehicles	Gasoline conventional	Urban driving	0	0,46	2,29	77,94	0	3,21	2269,41	0,46	45,85
1990	070203	Light duty vehicles	Gasoline catalyst	Urban driving	0	0	0	0	0	0	0	0	0
1990	070301	Heavy duty vehicles	Diesel	Highway driving	0	1,77	8,85	300,92	0	12,39	0	1,77	177,01
1990	070301	Heavy duty vehicles	Gasoline	Highway driving	0	0	0,01	0,34	0	0,01	9,75	0	0,2
1990	070302	Heavy duty vehicles	Diesel	Rural driving	0	3,32	16,6	564,34	0	23,23	0	3,32	331,96
1990	070302	Heavy duty vehicles	Gasoline	Rural driving	0	0,01	0,03	0,97	0	0,04	28,38	0,01	0,57
1990	070303	Heavy duty vehicles	Diesel	Urban driving	0	2,84	14,23	483,78	0	19,92	0	2,84	284,57
1990	070303	Heavy duty vehicles	Gasoline	Urban driving	0	0,01	0,03	1,13	0	0,05	32,81	0,01	0,66
1990	0704	Mopeds	Gasoline		0	0,08	0,4	13,65	0	0,56	397,38	0,08	8,03
1990	070501	Motorcycles	Gasoline	Highway driving	0	0,02	0,1	3,48	0	0,14	101,24	0,02	2,05
1990	070502	Motorcycles	Gasoline	Rural driving	0	0,04	0,19	6,49	0	0,27	188,98	0,04	3,82
1990	070503	Motorcycles	Gasoline	Urban driving	0	0,04	0,22	7,62	0	0,31	221,98	0,04	4,48
1990	0801	Military	Diesel		0	0,03	0,17	5,82	0	0,24	0	0,03	3,42
1990	0801	Military	Gasoline		0	0	0	0,04	0	0	1,45	0	0,02
1990	0801	Military	Aviation gasoline		0	0	0,01	0,19	0	0,01	62,82	0	0,11
1990	0801	Military	Jet fuel	< 3000 ft	0	0,03	0,17	5,81	0	0,24	0	0,03	3,42
1990	0801	Military	Jet fuel	> 3000 ft	0	0,31	1,54	52,28	0	2,15	0	0,31	30,76

Year	SNAP ID	Category	Fuel type	Mode	Arsenic [kg]	Cadmium [kg]	Chromium [kg]	Copper [kg]	Mercury [kg]	Nickel [kg]	Lead [kg]	Selenium [kg]	Zinc [kg]
1990	0802	Railways	Diesel		0	0,94	4,7	159,65	0	6,57	0	0,94	93,91
1990	0802	Railways	Kerosene		0	0	0	0	0	0	0	0	0
1990	0802	Railways	Gasoline		0	0	0,02	0,74	0	0,03	27,89	0	0,43
1990	0803	Inland waterways	Diesel		0	0,07	0,36	12,13	0	0,5	0	0,07	7,13
1990	0803	Inland waterways	Gasoline		0	0,1	0,51	17,36	0	0,71	657,87	0,1	10,21
1990	080402	National sea traffic	Residual oil		43,52	2,61	17,41	43,52	1,74	2611,1	17,41	34,81	78,33
1990	080402	National sea traffic	Diesel		3,26	0,65	2,61	3,26	3,26	4,56	6,51	13,03	32,58
1990	080402	National sea traffic	Kerosene		0	0	0	0	0	0	0	0	0
1990	080402	National sea traffic	LPG		0	0	0	0	0	0	0	0	0
1990	080403	Fishing	Residual oil		3,49	0,21	1,4	3,49	0,14	209,36	1,4	2,79	6,28
1990	080403	Fishing	Diesel		12,2	2,44	9,76	12,2	12,19	17,09	24,39	48,82	122,04
1990	080403	Fishing	Kerosene		0	0	0	0	0	0	0	0	0
1990	080403	Fishing	Gasoline		0	0	0,01	0,35	0	0,01	13,24	0	0,21
1990	080403	Fishing	LPG		0	0	0	0	0	0	0	0	0
1990	080404	International sea traffic	Residual oil		350,17	21,01	140,07	350,17	14,04	21010,45	140,07	280,14	630,31
1990	080404	International sea traffic	Diesel		13,62	2,72	10,9	13,62	13,61	19,07	27,22	54,49	136,21
1990	080501	Air traffic, other airports	Jet fuel	Dom. < 3000 ft	0	0,09	0,43	14,7	0	0,61	0	0,09	8,65
1990	080501	Air traffic, other airports	Aviation gasoline		0	0,02	0,12	4,07	0	0,17	1417,38	0,02	2,4
1990	080502	Air traffic, other airports	Jet fuel	Int. < 3000 ft	0	0,03	0,16	5,28	0	0,22	0	0,03	3,11
1990	080502	Air traffic, other airports	Aviation gasoline		0	0,01	0,03	1,19	0	0,05	414,08	0,01	0,7
1990	080503	Air traffic, other airports	Jet fuel	Dom. > 3000 ft	0	0,21	1,04	35,34	0	1,46	0	0,21	20,79
1990	080504	Air traffic, other airports	Jet fuel	Int. > 3000 ft	0	0,37	1,84	62,6	0	2,58	0	0,37	36,83
1990	0806	Agriculture	Diesel		0	3,32	16,62	565,14	0	23,27	0	3,32	332,43
1990	0806	Agriculture	Gasoline		0	0,1	0,49	16,56	0	0,68	627,87	0,1	9,74
1990	0807	Forestry	Diesel		0	0	0	0,16	0	0,01	0	0	0,1
1990	0807	Forestry	Gasoline		0	0,01	0,06	1,92	0	0,08	72,88	0,01	1,13
1990	0808	Industry	Diesel		0	1,89	9,47	322,13	0	13,26	0	1,89	189,49
1990	0808	Industry	Gasoline		0	0,03	0,13	4,55	0	0,19	172,55	0,03	2,68
1990	0808	Industry	LPG		0	0	0	0	0	0	0	0	0
1990	0809	Household/gardening	Gasoline		0	0,22	1,11	37,82	0	1,56	1433,6	0,22	22,25
1990	080501	Air traffic, CPH. airport		Dom. < 3000 ft	0	0,1	0,51	17,46	0	0,72	116,72	0,1	10,27
1990	080502	Air traffic, CPH. airport		Int. < 3000 ft	0	0,47	2,33	79,29	0	3,26	75,8	0,47	46,64
1990	080503	Air traffic, CPH. airport		Dom. > 3000 ft	0	0,27	1,33	45,05	0	1,86	0	0,27	26,5
1990	080504	Air traffic, CPH. airport		Int. > 3000 ft	0	4,72	23,58	801,63	0	33,01	0	4,72	471,55

Year	SNAP ID	Category	Fuel type	Mode	Arsenic [kg]	Cadmium [kg]	Chromium [kg]	Copper [kg]	Mercury [kg]	Nickel [kg]	Lead [kg]	Selenium [kg]	Zinc [kg]
2001	70101	Passenger cars	Diesel	Highway driving	0	0,42	2,11	71,59	0	2,95	0	0,42	42,11
2001	70101	Passenger cars	LPG	Highway driving	0	0	0	0	0	0	0	0	0
2001	70101	Passenger cars	Gasoline 2-stroke	Highway driving	0	0	0	0,04	0	0	0	0	0,03
2001	70101	Passenger cars	Gasoline conventional	Highway driving	0	0,71	3,57	121,51	0	5	2,14	0,71	71,47
2001	70101	Passenger cars	Gasoline catalyst	Highway driving	0	2,22	11,11	377,96	0	15,56	6,67	2,22	222,33
2001	70102	Passenger cars	Diesel	Rural driving	0	0,89	4,46	151,63	0	6,24	0	0,89	89,19
2001	70102	Passenger cars	LPG	Rural driving	0	0	0	0	0	0	0	0	0
2001	70102	Passenger cars	Gasoline 2-stroke	Rural driving	0	0	0	0,12	0	0,01	0	0	0,07
2001	70102	Passenger cars	Gasoline conventional	Rural driving	0	1,56	7,8	265,37	0	10,93	4,68	1,56	156,1
2001	70102	Passenger cars	Gasoline catalyst	Rural driving	0	4,82	24,1	819,45	0	33,74	14,46	4,82	482,02
2001	70103	Passenger cars	Diesel	Urban driving	0	1,03	5,16	175,41	0	7,22	0	1,03	103,18
2001	70103	Passenger cars	LPG	Urban driving	0	0	0	0	0	0	0	0	0
2001	70103	Passenger cars	Gasoline 2-stroke	Urban driving	0	0	0	0,16	0	0,01	0	0	0,09
2001	70103	Passenger cars	Gasoline conventional	Urban driving	0	1,83	9,14	310,96	0	12,8	5,49	1,83	182,92
2001	70103	Passenger cars	Gasoline catalyst	Urban driving	0	6,75	33,76	1148,12	0	47,27	20,26	6,75	675,36
2001	70201	Light duty vehicles	Diesel	Highway driving	0	0,74	3,71	126,18	0	5,19	0	0,74	74,22
2001	70201	Light duty vehicles	Gasoline conventional	Highway driving	0	0,04	0,18	6,08	0	0,25	0,11	0,04	3,58
2001	70201	Light duty vehicles	Gasoline catalyst	Highway driving	0	0,05	0,24	8,32	0	0,34	0,15	0,05	4,89
2001	70202	Light duty vehicles	Diesel	Rural driving	0	2,26	11,3	384,41	0	15,83	0	2,26	226,12
2001	70202	Light duty vehicles	Gasoline conventional	Rural driving	0	0,13	0,63	21,51	0	0,89	0,38	0,13	12,65
2001	70202	Light duty vehicles	Gasoline catalyst	Rural driving	0	0,17	0,86	29,38	0	1,21	0,52	0,17	17,28
2001	70203	Light duty vehicles	Diesel	Urban driving	0	2,2	11,02	374,87	0	15,43	0	2,2	220,51
2001	70203	Light duty vehicles	Gasoline conventional	Urban driving	0	0,15	0,77	26,24	0	1,08	0,46	0,15	15,44
2001	70203	Light duty vehicles	Gasoline catalyst	Urban driving	0	0,21	1,05	35,75	0	1,47	0,63	0,21	21,03
2001	70301	Heavy duty vehicles	Diesel	Highway driving	0	2,51	12,58	427,76	0	17,61	0	2,51	251,62
2001	70301	Heavy duty vehicles	Gasoline	Highway driving	0	0	0,01	0,34	0	0,01	0,01	0	0,2
2001	70302	Heavy duty vehicles	Diesel	Rural driving	0	3,82	19,1	649,47	0	26,74	0	3,82	382,04
2001	70302	Heavy duty vehicles	Gasoline	Rural driving	0	0	0,02	0,69	0	0,03	0,01	0	0,41
2001	70303	Heavy duty vehicles	Diesel	Urban driving	0	2,72	13,59	462,05	0	19,02	0	2,72	271,79
2001	70303	Heavy duty vehicles	Gasoline	Urban driving	0	0	0,02	0,71	0	0,03	0,01	0	0,42
2001	704	Mopeds	Gasoline		0	0,05	0,24	8,24	0	0,34	0,15	0,05	4,85
2001	70501	Motorcycles	Gasoline	Highway driving	0	0,02	0,11	3,67	0	0,15	0,06	0,02	2,16
2001	70502	Motorcycles	Gasoline	Rural driving	0	0,05	0,25	8,55	0	0,35	0,15	0,05	5,03
2001	70503	Motorcycles	Gasoline	Urban driving	0	0,06	0,3	10,21	0	0,42	0,18	0,06	6,01
2001	801	Military	Diesel		0	0,2	1,04	35,22	0	1,45	0	0,2	20,72
2001	801	Military	Gasoline		0	0	0	0	0	0	0	0	0

Year	SNAP ID	Category	Fuel type	Mode	Arsenic [kg]	Cadmium [kg]	Chromium [kg]	Copper [kg]	Mercury [kg]	Nickel [kg]	Lead [kg]	Selenium [kg]	Zinc [kg]
2001	801	Military	Aviation gasoline		0	0	0,01	0,27	0	0,01	88,27	0	0,16
2001	801	Military	Jet fuel	< 3000 ft	0	0,01	0,05	1,67	0	0,07	0	0,01	0,98
2001	801	Military	Jet fuel	> 3000 ft	0	0,09	0,44	14,99	0	0,62	0	0,09	8,82
2001	802	Railways	Diesel		0	0,66	3,34	113,61	0	4,68	0	0,66	66,84
2001	802	Railways	Gasoline		0	0	0,01	0,25	0	0,01	0	0	0,15
2001	803	Inland waterways	Gasoline		0	0,12	0,61	20,73	0	0,85	0,37	0,12	12,19
2001	803	Inland waterways	Diesel		0	0,08	0,43	14,48	0	0,6	0	0,08	8,52
2001	80402	National sea traffic	Residual oil		18,49	1,1	7,4	18,49	0,74	1109,9	7,4	14,8	33,29
2001	80402	National sea traffic	Diesel		3,79	0,75	3,05	3,79	3,79	5,31	7,58	15,17	37,95
2001	80402	National sea traffic	Kerosene		0	0	0	0	0	0	0	0	0
2001	80403	Fishing	Diesel		10,42	2,05	8,37	10,42	10,42	14,61	20,85	41,69	104,32
2001	80403	Fishing	Kerosene		0	0	0	0	0	0	0	0	0
2001	80403	Fishing	Gasoline		0	0	0	0,12	0	0	0	0	0,07
2001	80403	Fishing	LPG		0	0	0	0	0	0	0	0	0
2001	80404	International sea traffic	Residual oil		316,79	18,92	126,77	316,79	12,7	19015,02	126,77	253,53	570,32
2001	80404	International sea traffic	Diesel		25,03	4,92	20,11	25,03	25,03	35,08	50,05	100,1	250,47
2001	80501	Air traffic, other airports	Jet fuel	Dom. < 3000 ft	0	0,06	0,3	10,3	0	0,42	0	0,06	6,06
2001	80501	Air traffic, other airports	Aviation gasoline		0	0,02	0,11	3,83	0	0,16	1332,53	0,02	2,25
2001	80502	Air traffic, other airports	Jet fuel	Int. < 3000 ft	0	0,06	0,28	9,48	0	0,39	0	0,06	5,57
2001	80502	Air traffic, other airports	Aviation gasoline		0	0	0,01	0,28	0	0,01	98,35	0	0,17
2001	80503	Air traffic, other airports	Jet fuel	Dom. > 3000 ft	0	0,14	0,67	22,85	0	0,94	0	0,14	13,44
2001	80504	Air traffic, other airports	Jet fuel	Int. > 3000 ft	0	0,6	2,99	101,73	0	4,19	0	0,6	59,84
2001	806	Agriculture	Diesel		0	3,9	19,84	674,91	0	27,8	0	3,9	397,05
2001	806	Agriculture	Gasoline		0	0,12	0,58	19,78	0	0,82	0,35	0,12	11,64
2001	807	Forestry	Diesel		0	0	0,01	0,2	0	0,01	0	0	0,11
2001	807	Forestry	Gasoline		0	0,01	0,07	2,3	0	0,09	0,04	0,01	1,35
2001	808	Industry	Diesel		0	2,22	11,31	384,7	0	15,85	0	2,22	226,32
2001	808	Industry	Gasoline		0	0,03	0,16	5,44	0	0,22	0,1	0,03	3,2
2001	808	Industry	LPG		0	0	0	0	0	0	0	0	0
2001	809	Household/gardening	Gasoline		0	0,27	1,33	45,17	0	1,86	0,8	0,27	26,57
2001	080501	Air traffic, CPH. airport		Dom. < 3000 ft	0	0,07	0,37	12,68	0	0,52	10,8	0,07	7,46
2001	080502	Air traffic, CPH. airport		Int. < 3000 ft	0	0,7	3,48	118,62	0	4,89	15,64	0,7	69,78
2001	080503	Air traffic, CPH. airport		Dom. > 3000 ft	0	0,24	1,21	41,11	0	1,7	0	0,24	24,19
2001	080504	Air traffic, CPH. airport		Int. > 3000 ft	0	6,23	30,89	1051,68	0	43,36	0	6,23	618,65

## Appendix 4.8: PAH emission factors and total emissions for 1990 and 2001

Year	SNAP ID	Category	Fuel type	Mode	Dioxins/ Furans [g/GJ]	Flouranthene [g/GJ]	Benzo(b) flouranthene [g/GJ]	Benzo(k) flouranthene [g/GJ]	Benzo(a) pyrene [g/GJ]	Benzo(g,h,i) perylene [g/GJ]	indeno(1,2,3-c,d) pyrene [g/GJ]
1990	070101	Passenger cars	Diesel	Highway driving	7.01E-10	1.79E-02	1.54E-03	1.34E-03	1.33E-03	2.81E-03	1.19E-03
1990	070101	Passenger cars	Gasoline 2-stroke	Highway driving							
1990	070101	Passenger cars	Gasoline conventional	Highway driving	9.18E-09	7.78E-03	3.76E-04	1.28E-04	2.05E-04	1.24E-03	4.40E-04
1990	070101	Passenger cars	Gasoline catalyst	Highway driving	1.03E-08	1.34E-03	1.72E-04	1.25E-04	1.53E-04	2.68E-04	1.87E-04
1990	070101	Passenger cars	LPG	Highway driving							
1990	070102	Passenger cars	Diesel	Rural driving	8.52E-10	2.18E-02	1.88E-03	1.63E-03	1.62E-03	3.41E-03	1.44E-03
1990	070102	Passenger cars	Gasoline 2-stroke	Rural driving							
1990	070102	Passenger cars	Gasoline conventional	Rural driving	1.03E-08	8.73E-03	4.22E-04	1.44E-04	2.30E-04	1.39E-03	4.94E-04
1990	070102	Passenger cars	Gasoline catalyst	Rural driving	1.15E-08	1.49E-03	1.92E-04	1.39E-04	1.71E-04	2.99E-04	2.08E-04
1990	070102	Passenger cars	LPG	Rural driving							
1990	070103	Passenger cars	Diesel	Urban driving	5.33E-10	1.36E-02	1.17E-03	1.02E-03	1.01E-03	2.13E-03	9.02E-04
1990	070103	Passenger cars	Gasoline 2-stroke	Urban driving							
1990	070103	Passenger cars	Gasoline conventional	Urban driving	6.95E-09	5.89E-03	2.85E-04	9.70E-05	1.55E-04	9.38E-04	3.33E-04
1990	070103	Passenger cars	Gasoline catalyst	Urban driving	6.18E-09	8.05E-04	1.04E-04	7.48E-05	9.20E-05	1.61E-04	1.12E-04
1990	070103	Passenger cars	LPG	Urban driving							
1990	070201	Light duty vehicles	Diesel	Highway driving	4.87E-10	1.24E-02	1.07E-03	9.32E-04	9.25E-04	1.95E-03	8.25E-04
1990	070201	Light duty vehicles	Gasoline conventional	Highway driving	8.69E-09	7.37E-03	3.56E-04	1.21E-04	1.94E-04	1.17E-03	4.16E-04
1990	070201	Light duty vehicles	Gasoline catalyst	Highway driving	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1990	070202	Light duty vehicles	Diesel	Rural driving	5.33E-10	1.36E-02	1.17E-03	1.02E-03	1.01E-03	2.13E-03	9.02E-04
1990	070202	Light duty vehicles	Gasoline conventional	Rural driving	8.20E-09	6.95E-03	3.36E-04	1.14E-04	1.83E-04	1.11E-03	3.93E-04
1990	070202	Light duty vehicles	Gasoline catalyst	Rural driving	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1990	070203	Light duty vehicles	Diesel	Urban driving	3.98E-10	1.02E-02	8.76E-04	7.62E-04	7.56E-04	1.59E-03	6.74E-04
1990	070203	Light duty vehicles	Gasoline conventional	Urban driving	4.90E-09	4.15E-03	2.01E-04	6.84E-05	1.09E-04	6.61E-04	2.35E-04
1990	070203	Light duty vehicles	Gasoline catalyst	Urban driving	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1990	070301	Heavy duty vehicles	Diesel	Highway driving	1.01E-09	1.97E-03	5.03E-04	5.62E-04	8.31E-05	7.11E-05	1.29E-04
1990	070301	Heavy duty vehicles	Gasoline	Highway driving							
1990	070302	Heavy duty vehicles	Diesel	Rural driving	1.03E-09	2.02E-03	5.15E-04	5.75E-04	8.50E-05	7.27E-05	1.32E-04
1990	070302	Heavy duty vehicles	Gasoline	Rural driving							
1990	070303	Heavy duty vehicles	Diesel	Urban driving	8.31E-10	1.63E-03	4.16E-04	4.64E-04	6.86E-05	5.87E-05	1.07E-04
1990	070303	Heavy duty vehicles	Gasoline	Urban driving							
1990	0704	Mopeds	Gasoline								
1990	070501	Motorcycles	Gasoline	Highway driving	1.36E-08	1.15E-02	5.58E-04	1.90E-04	3.04E-04	1.84E-03	6.53E-04
1990	070502	Motorcycles	Gasoline	Rural driving	1.63E-08	1.38E-02	6.68E-04	2.28E-04	3.64E-04	2.20E-03	7.82E-04
1990	070503	Motorcycles	Gasoline	Urban driving	1.64E-08	1.39E-02	6.73E-04	2.30E-04	3.67E-04	2.22E-03	7.88E-04

Year	SNAP ID	Category	Fuel type	Mode	Dioxins/ Furans [g/GJ]	Flouranthene [g/GJ]	Benzo(b) flouranthene [g/GJ]	Benzo(k) flouranthene [g/GJ]	Benzo(a) pyrene [g/GJ]	Benzo(g,h,i) perylene [g/GJ]	indeno(1,2,3-c,d) pyrene [g/GJ]
2001	070101	Passenger cars	Diesel	Highway driving	7.32E-10	1.36E-02	9.32E-04	7.28E-04	8.33E-04	1.66E-03	7.77E-04
2001	070101	Passenger cars	Gasoline 2-stroke	Highway driving							
2001	070101	Passenger cars	Gasoline conventional	Highway driving	9.43E-09	7.99E-03	3.86E-04	1.32E-04	2.11E-04	1.27E-03	4.52E-04
2001	070101	Passenger cars	Gasoline catalyst	Highway driving	1.06E-08	1.38E-03	1.77E-04	1.28E-04	1.57E-04	2.75E-04	1.92E-04
2001	070101	Passenger cars	LPG	Highway driving							
2001	070102	Passenger cars	Diesel	Rural driving	8.36E-10	1.55E-02	1.07E-03	8.32E-04	9.53E-04	1.90E-03	8.89E-04
2001	070102	Passenger cars	Gasoline 2-stroke	Rural driving							
2001	070102	Passenger cars	Gasoline conventional	Rural driving	1.05E-08	8.86E-03	4.28E-04	1.46E-04	2.33E-04	1.41E-03	5.01E-04
2001	070102	Passenger cars	Gasoline catalyst	Rural driving	1.18E-08	1.54E-03	1.97E-04	1.43E-04	1.76E-04	3.07E-04	2.14E-04
2001	070102	Passenger cars	LPG	Rural driving							
2001	070103	Passenger cars	Diesel	Urban driving	5.50E-10	1.02E-02	7.01E-04	5.47E-04	6.26E-04	1.25E-03	5.84E-04
2001	070103	Passenger cars	Gasoline 2-stroke	Urban driving							
2001	070103	Passenger cars	Gasoline conventional	Urban driving	6.79E-09	5.75E-03	2.78E-04	9.47E-05	1.52E-04	9.16E-04	3.25E-04
2001	070103	Passenger cars	Gasoline catalyst	Urban driving	6.41E-09	8.34E-04	1.07E-04	7.75E-05	9.53E-05	1.67E-04	1.16E-04
2001	070103	Passenger cars	LPG	Urban driving							
2001	070201	Light duty vehicles	Diesel	Highway driving	5.20E-10	1.09E-02	8.32E-04	6.86E-04	7.32E-04	1.50E-03	6.68E-04
2001	070201	Light duty vehicles	Gasoline conventional	Highway driving	8.69E-09	7.37E-03	3.56E-04	1.21E-04	1.94E-04	1.17E-03	4.16E-04
2001	070201	Light duty vehicles	Gasoline catalyst	Highway driving	7.39E-09	9.62E-04	1.24E-04	8.93E-05	1.10E-04	1.92E-04	1.34E-04
2001	070202	Light duty vehicles	Diesel	Rural driving	5.69E-10	1.20E-02	9.11E-04	7.50E-04	8.01E-04	1.64E-03	7.31E-04
2001	070202	Light duty vehicles	Gasoline conventional	Rural driving	8.20E-09	6.95E-03	3.36E-04	1.14E-04	1.83E-04	1.11E-03	3.93E-04
2001	070202	Light duty vehicles	Gasoline catalyst	Rural driving	6.97E-09	9.08E-04	1.17E-04	8.43E-05	1.04E-04	1.82E-04	1.27E-04
2001	070203	Light duty vehicles	Diesel	Urban driving	4.08E-10	8.59E-03	6.54E-04	5.39E-04	5.75E-04	1.18E-03	5.25E-04
2001	070203	Light duty vehicles	Gasoline conventional	Urban driving	4.70E-09	3.99E-03	1.92E-04	6.56E-05	1.05E-04	6.34E-04	2.25E-04
2001	070203	Light duty vehicles	Gasoline catalyst	Urban driving	4.01E-09	5.22E-04	6.72E-05	4.85E-05	5.97E-05	1.04E-04	7.28E-05
2001	070301	Heavy duty vehicles	Diesel	Highway driving	1.00E-09	1.97E-03	5.01E-04	5.60E-04	8.27E-05	7.07E-05	1.29E-04
2001	070301	Heavy duty vehicles	Gasoline	Highway driving							
2001	070302	Heavy duty vehicles	Diesel	Rural driving	1.01E-09	1.97E-03	5.03E-04	5.62E-04	8.30E-05	7.10E-05	1.29E-04
2001	070302	Heavy duty vehicles	Gasoline	Rural driving							
2001	070303	Heavy duty vehicles	Diesel	Urban driving	8.09E-10	1.59E-03	4.05E-04	4.52E-04	6.68E-05	5.72E-05	1.04E-04
2001	070303	Heavy duty vehicles	Gasoline	Urban driving							
2001	0704	Mopeds	Gasoline								
2001	070501	Motorcycles	Gasoline	Highway driving	1.37E-08	1.16E-02	5.61E-04	1.91E-04	3.06E-04	1.85E-03	6.57E-04
2001	070502	Motorcycles	Gasoline	Rural driving	1.64E-08	1.39E-02	6.71E-04	2.29E-04	3.66E-04	2.21E-03	7.85E-04
2001	070503	Motorcycles	Gasoline	Urban driving	1.65E-08	1.40E-02	6.77E-04	2.31E-04	3.69E-04	2.23E-03	7.93E-04



Year	SNAP ID	Category	Fuel type	Mode	Dioxins/ Furans [ng/GJ]	Flouranthene [microg/GJ]	Benzo(b) flouranthene [microg/GJ]	Benzo(k) flouranthene [microg/GJ]	Benzo(a) pyrene [microg/GJ]	Benzo(g,h,i) perylene [microg/GJ]	indeno(1,2,3-c,d) pyrene [microg/GJ]
1990	0801	Military	Diesel		0.71	4391.42	570.64	568.31	289.75	550.01	290.13
1990	0801	Military	Jet fuel	< 3000 ft	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1990	0801	Military	Jet fuel	> 3000 ft	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1990	0801	Military	Gasoline		6.27	5257.47	277.33	116.39	141.99	824.70	299.87
1990	0801	Military	Aviation gasoline		5.11	4328.53	209.06	71.27	114.03	688.95	244.70
1990	0802	Railways	Diesel		0.70	1365.92	348.03	388.90	57.47	49.17	89.40
1990	0802	Railways	Kerosene								
1990	0802	Railways	Gasoline		6.27	5257.47	277.33	116.39	141.99	824.70	299.87
1990	0803	Inland waterways	Diesel		0.71	4391.42	570.64	568.31	289.75	550.01	290.13
1990	0803	Inland waterways	Gasoline		5.11	4328.53	209.06	71.27	114.03	688.95	244.70
1990	080402	National sea traffic	Residual oil		13.42	5190.00	270.00	50.00	20.00	70.00	30.00
1990	080402	National sea traffic	Diesel		12.01	7420.00	640.00	300.00	150.00	1430.00	1180.00
1990	080402	National sea traffic	Kerosene								
1990	080402	National sea traffic	LPG								
1990	080403	Fishing	Residual oil		13.42	5190.00	270.00	50.00	20.00	70.00	30.00
1990	080403	Fishing	Diesel		12.01	7420.00	640.00	300.00	150.00	1430.00	1180.00
1990	080403	Fishing	Kerosene								
1990	080403	Fishing	Gasoline		11.42	3420.09	342.47	146.12	244.29	488.58	244.29
1990	080403	Fishing	LPG								
1990	080404	International sea traffic	Residual oil		13.42	4120.00	200.00	90.00	70.00	260.00	200.00
1990	080404	International sea traffic	Diesel		12.01	7420.00	640.00	300.00	150.00	1430.00	1180.00
1990	080501	Air traffic, other airports	Jet fuel	Dom. < 3000 ft	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1990	080501	Air traffic, other airports	Aviation gasoline		5.11	4328.53	209.06	71.27	114.03	688.95	244.70
1990	080502	Air traffic, other airports	Jet fuel	Int. < 3000 ft	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1990	080502	Air traffic, other airports	Aviation gasoline		5.11	4328.53	209.06	71.27	114.03	688.95	244.70
1990	080503	Air traffic, other airports	Jet fuel	Dom. > 3000 ft	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1990	080504	Air traffic, other airports	Jet fuel	Int. > 3000 ft	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1990	0806	Agriculture	Diesel		0.71	4391.42	570.64	568.31	289.75	550.01	290.13
1990	0806	Agriculture	Gasoline		5.11	4328.53	209.06	71.27	114.03	688.95	244.70
1990	0807	Forestry	Diesel		0.71	4391.42	570.64	568.31	289.75	550.01	290.13
1990	0807	Forestry	Gasoline		5.11	4328.53	209.06	71.27	114.03	688.95	244.70
1990	0808	Industry	Diesel		0.71	4391.42	570.64	568.31	289.75	550.01	290.13
1990	0808	Industry	Gasoline		5.11	4328.53	209.06	71.27	114.03	688.95	244.70
1990	0808	Industry	LPG								
1990	0809	Household and gardening	Gasoline		5.11	4328.53	209.06	71.27	114.03	688.95	244.70
1990	080501	Air traffic, CPH. airport	Jet fuel	Dom. < 3000 ft	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1990	080501	Air traffic, Copenhagen airport	Aviation gasoline		5.11	4328.53	209.06	71.27	114.03	688.95	244.70
1990	080502	Air traffic, Copenhagen airport	Jet fuel	Int. < 3000 ft	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1990	080502	Air traffic, Copenhagen airport	Aviation gasoline		5.11	4328.53	209.06	71.27	114.03	688.95	244.70
1990	080503	Air traffic, Copenhagen airport	Jet fuel	Dom. > 3000 ft	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1990	080504	Air traffic, Copenhagen airport	Jet fuel	Int. > 3000 ft	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Year	SNAP ID	Category	Fuel type	Mode	Dioxins/ Furans [ng/GJ]	Flouranthene [microg/GJ]	Benzo(b) flouranthene [microg/GJ]	Benzo(k) flouranthene [microg/GJ]	Benzo(a) pyrene [microg/GJ]	Benzo(g,h,i) perylene [microg/GJ]	indeno(1,2,3-c,d) pyrene [microg/GJ]
2001	0801	Military	Diesel		0.71	4349.86	510.47	495.91	255.72	464.46	264.30
2001	0801	Military	Jet fuel	< 3000 ft	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2001	0801	Military	Jet fuel	> 3000 ft	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2001	0801	Military	Gasoline		6.89	2151.74	179.80	115.04	118.07	357.51	178.80
2001	0801	Military	Aviation gasoline		5.11	4328.53	209.06	71.27	114.03	688.95	244.70
2001	0802	Railways	Diesel		0.72	1411.28	359.58	401.81	59.38	50.80	92.37
2001	0802	Railways	Kerosene								
2001	0802	Railways	Gasoline		6.89	2151.74	179.80	115.04	118.07	357.51	178.80
2001	0803	Inland waterways	Diesel		0.71	4349.86	510.47	495.91	255.72	464.46	264.30
2001	0803	Inland waterways	Gasoline		5.11	4328.53	209.06	71.27	114.03	688.95	244.70
2001	080402	National sea traffic	Residual oil		13.42	5190.00	270.00	50.00	20.00	70.00	30.00
2001	080402	National sea traffic	Diesel		12.01	7420.00	640.00	300.00	150.00	1430.00	1180.00
2001	080402	National sea traffic	Kerosene								
2001	080402	National sea traffic	LPG								
2001	080403	Fishing	Residual oil		13.42	5190.00	270.00	50.00	20.00	70.00	30.00
2001	080403	Fishing	Diesel		12.01	7420.00	640.00	300.00	150.00	1430.00	1180.00
2001	080403	Fishing	Kerosene								
2001	080403	Fishing	Gasoline		11.42	3420.00	342.00	146.00	244.00	489.00	244.00
2001	080403	Fishing	LPG								
2001	080404	International sea traffic	Residual oil		13.42	4120.00	200.00	90.00	70.00	260.00	200.00
2001	080404	International sea traffic	Diesel		12.01	7420.00	640.00	300.00	150.00	1430.00	1180.00
2001	080501	Air traffic, other airports	Jet fuel	Dom. < 3000 ft	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2001	080501	Air traffic, other airports	Aviation gasoline		5.11	4328.53	209.06	71.27	114.03	688.95	244.70
2001	080502	Air traffic, other airports	Jet fuel	Int. < 3000 ft	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2001	080502	Air traffic, other airports	Aviation gasoline		5.11	4328.53	209.06	71.27	114.03	688.95	244.70
2001	080503	Air traffic, other airports	Jet fuel	Dom. > 3000 ft	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2001	080504	Air traffic, other airports	Jet fuel	Int. > 3000 ft	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2001	0806	Agriculture	Diesel		0.71	4349.86	510.47	495.91	255.72	464.46	264.30
2001	0806	Agriculture	Gasoline		5.11	4328.53	209.06	71.27	114.03	688.95	244.70
2001	0807	Forestry	Diesel		0.71	4349.86	510.47	495.91	255.72	464.46	264.30
2001	0807	Forestry	Gasoline		5.11	4328.53	209.06	71.27	114.03	688.95	244.70
2001	0808	Industry	Diesel		0.71	4349.86	510.47	495.91	255.72	464.46	264.30
2001	0808	Industry	Gasoline		5.11	4328.53	209.06	71.27	114.03	688.95	244.70
2001	0808	Industry	LPG								
2001	0809	Household and gardening	Gasoline		5.11	4328.53	209.06	71.27	114.03	688.95	244.70
2001	080501	Air traffic, Copenhagen airport	Jet fuel	Dom. < 3000 ft	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2001	080501	Air traffic, Copenhagen airport	Aviation gasoline		5.11	4328.53	209.06	71.27	114.03	688.95	244.70
2001	080502	Air traffic, Copenhagen airport	Jet fuel	Int. < 3000 ft	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2001	080502	Air traffic, Copenhagen airport	Aviation gasoline		5.11	4328.53	209.06	71.27	114.03	688.95	244.70
2001	080503	Air traffic, Copenhagen airport	Jet fuel	Dom. > 3000 ft	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2001	080504	Air traffic, Copenhagen airport	Jet fuel	Int. > 3000 ft	0.00	0.00	0.00	0.00	0.00	0.00	0.00

SNAP ID	Category	Fuel type	Mode	Dioxins/ Furans [g]	Flouranthene [kg]	Benzo(b) flouranthene [kg]	Benzo(k) flouranthene [kg]	Benzo(a) pyrene [kg]	Benzo(g,h,i) perylene [kg]	indeno(1,2,3-c,d) pyrene [kg]	
1990	070101	Passenger cars	Diesel	Highway driving	0	12.83	1.1	0.96	0.95	2.01	0.85
1990	070101	Passenger cars	LPG	Highway driving	0	0	0	0	0	0	0
1990	070101	Passenger cars	Gasoline 2-stroke	Highway driving	0	0	0	0	0	0	0
1990	070101	Passenger cars	Gasoline conventional	Highway driving	0.07	57.51	2.78	0.95	1.52	9.15	3.25
1990	070101	Passenger cars	Gasoline catalyst	Highway driving	0	0.25	0.03	0.02	0.03	0.05	0.03
1990	070102	Passenger cars	Diesel	Rural driving	0	44.41	3.82	3.33	3.3	6.95	2.94
1990	070102	Passenger cars	LPG	Rural driving	0	0	0	0	0	0	0
1990	070102	Passenger cars	Gasoline 2-stroke	Rural driving	0	0	0	0	0	0	0
1990	070102	Passenger cars	Gasoline conventional	Rural driving	0.23	199.07	9.61	3.28	5.24	31.68	11.25
1990	070102	Passenger cars	Gasoline catalyst	Rural driving	0.01	0.85	0.11	0.08	0.1	0.17	0.12
1990	070103	Passenger cars	Diesel	Urban driving	0	41.45	3.57	3.1	3.08	6.49	2.75
1990	070103	Passenger cars	LPG	Urban driving	0	0	0	0	0	0	0
1990	070103	Passenger cars	Gasoline 2-stroke	Urban driving	0	0	0	0	0	0	0
1990	070103	Passenger cars	Gasoline conventional	Urban driving	0.22	185.79	8.97	3.06	4.89	29.57	10.5
1990	070103	Passenger cars	Gasoline catalyst	Urban driving	0.01	0.8	0.1	0.07	0.09	0.16	0.11
1990	070201	Light duty vehicles	Diesel	Highway driving	0	28.78	2.48	2.16	2.14	4.51	1.91
1990	070201	Light duty vehicles	Gasoline conventional	Highway driving	0	1.87	0.09	0.03	0.05	0.3	0.11
1990	070201	Light duty vehicles	Gasoline catalyst	Highway driving	0	0	0	0	0	0	0
1990	070202	Light duty vehicles	Diesel	Rural driving	0	112.71	9.71	8.44	8.38	17.65	7.47
1990	070202	Light duty vehicles	Gasoline conventional	Rural driving	0.01	7.34	0.35	0.12	0.19	1.17	0.42
1990	070202	Light duty vehicles	Gasoline catalyst	Rural driving	0	0	0	0	0	0	0
1990	070203	Light duty vehicles	Diesel	Urban driving	0	98.32	8.47	7.36	7.31	15.39	6.52
1990	070203	Light duty vehicles	Gasoline conventional	Urban driving	0.01	6.41	0.31	0.11	0.17	1.02	0.36
1990	070203	Light duty vehicles	Gasoline catalyst	Urban driving	0	0	0	0	0	0	0
1990	070301	Heavy duty vehicles	Diesel	Highway driving	0.01	14.92	3.8	4.25	0.63	0.54	0.98
1990	070301	Heavy duty vehicles	Gasoline	Highway driving	0	0	0	0	0	0	0
1990	070302	Heavy duty vehicles	Diesel	Rural driving	0.01	28.64	7.3	8.16	1.21	1.03	1.87
1990	070302	Heavy duty vehicles	Gasoline	Rural driving	0	0	0	0	0	0	0
1990	070303	Heavy duty vehicles	Diesel	Urban driving	0.01	19.82	5.05	5.64	0.83	0.71	1.3
1990	070303	Heavy duty vehicles	Gasoline	Urban driving	0	0	0	0	0	0	0
1990	0704	Mopeds	Gasoline		0	0	0	0	0	0	0
1990	070501	Motorcycles	Gasoline	Highway driving	0	0.79	0.04	0.01	0.02	0.13	0.04
1990	070502	Motorcycles	Gasoline	Rural driving	0	1.78	0.09	0.03	0.05	0.28	0.1
1990	070503	Motorcycles	Gasoline	Urban driving	0	2.1	0.1	0.03	0.06	0.33	0.12
1990	0801	Military	Diesel		0	0.64	0.08	0.08	0.04	0.08	0.04
1990	0801	Military	Gasoline		0	0.01	0	0	0	0	0
1990	0801	Military	Aviation gasoline		0	0.02	0	0	0	0	0
1990	0801	Military	Jet fuel	< 3000 ft	0	0	0	0	0	0	0

SNAP ID	Category	Fuel type	Mode	Dioxins/ Furans [g]	Flouranthene [kg]	Benzo(b) flouranthene [kg]	Benzo(k) flouranthene [kg]	Benzo(a) pyrene [kg]	Benzo(g,h,i) perylene [kg]	indeno(1,2,3-c,d) pyrene [kg]
1990	0801	Military								
1990	0802	Railways								
1990	0802	Railways								
1990	0802	Railways								
1990	0803	Inland waterways								
1990	0803	Inland waterways								
1990	080402	National sea traffic								
1990	080402	National sea traffic								
1990	080402	National sea traffic								
1990	080402	National sea traffic								
1990	080403	Fishing								
1990	080403	Fishing								
1990	080403	Fishing								
1990	080403	Fishing								
1990	080403	Fishing								
1990	080404	International sea traffic								
1990	080404	International sea traffic								
1990	080501	Air traffic, other airports	Dom. < 3000 ft							
1990	080501	Air traffic, other airports								
1990	080502	Air traffic, other airports	Int. < 3000 ft							
1990	080502	Air traffic, other airports								
1990	080503	Air traffic, other airports	Dom. > 3000 ft							
1990	080504	Air traffic, other airports	Int. > 3000 ft							
1990	0806	Agriculture								
1990	0806	Agriculture								
1990	0807	Forestry								
1990	0807	Forestry								
1990	0808	Industry								
1990	0808	Industry								
1990	0808	Industry								
1990	0809	Household and gardening								
1990	080501	Air traffic, Copenhagen airport	Dom. < 3000 ft							
1990	080502	Air traffic, Copenhagen airport	Int. < 3000 ft							
1990	080503	Air traffic, Copenhagen airport	Dom. > 3000 ft							
1990	080504	Air traffic, Copenhagen airport	Int. > 3000 ft							

Year	SNAP ID	Category	Fuel type	Mode	Dioxins/ Furans [g]	Flouranthene [kg]	Benzo(b) flouranthene [kg]	Benzo(k) flouranthene [kg]	Benzo(a) pyrene [kg]	Benzo(g,h,i) perylene [kg]	indeno(1,2,3-c,d) pyrene [kg]
2001	70101	Passenger cars	Diesel	Highway driving	0	24.45	1.68	1.31	1.5	2.98	1.4
2001	70101	Passenger cars	LPG	Highway driving	0	0	0	0	0	0	0
2001	70101	Passenger cars	Gasoline 2-stroke	Highway driving	0	0	0	0	0	0	0
2001	70101	Passenger cars	Gasoline conventional	Highway driving	0.03	25.03	1.21	0.41	0.66	3.98	1.41
2001	70101	Passenger cars	Gasoline catalyst	Highway driving	0.1	13.4	1.72	1.24	1.53	2.68	1.87
2001	70102	Passenger cars	Diesel	Rural driving	0	59.19	4.06	3.17	3.63	7.23	3.38
2001	70102	Passenger cars	LPG	Rural driving	0	0	0	0	0	0	0
2001	70102	Passenger cars	Gasoline 2-stroke	Rural driving	0	0	0	0	0	0	0
2001	70102	Passenger cars	Gasoline conventional	Rural driving	0.07	60.59	2.93	1	1.6	9.64	3.43
2001	70102	Passenger cars	Gasoline catalyst	Rural driving	0.25	32.43	4.17	3.01	3.71	6.49	4.52
2001	70103	Passenger cars	Diesel	Urban driving	0	45.03	3.09	2.41	2.76	5.5	2.58
2001	70103	Passenger cars	LPG	Urban driving	0	0	0	0	0	0	0
2001	70103	Passenger cars	Gasoline 2-stroke	Urban driving	0	0	0	0	0	0	0
2001	70103	Passenger cars	Gasoline conventional	Urban driving	0.05	46.1	2.23	0.76	1.21	7.34	2.61
2001	70103	Passenger cars	Gasoline catalyst	Urban driving	0.19	24.68	3.17	2.29	2.82	4.94	3.44
2001	70201	Light duty vehicles	Diesel	Highway driving	0	34.67	2.64	2.17	2.32	4.75	2.12
2001	70201	Light duty vehicles	Gasoline conventional	Highway driving	0	1.15	0.06	0.02	0.03	0.18	0.07
2001	70201	Light duty vehicles	Gasoline catalyst	Highway driving	0	0.21	0.03	0.02	0.02	0.04	0.03
2001	70202	Light duty vehicles	Diesel	Rural driving	0.01	115.55	8.79	7.24	7.73	15.82	7.06
2001	70202	Light duty vehicles	Gasoline conventional	Rural driving	0	3.85	0.19	0.06	0.1	0.61	0.22
2001	70202	Light duty vehicles	Gasoline catalyst	Rural driving	0.01	0.69	0.09	0.06	0.08	0.14	0.1
2001	70203	Light duty vehicles	Diesel	Urban driving	0	80.89	6.16	5.07	5.41	11.07	4.94
2001	70203	Light duty vehicles	Gasoline conventional	Urban driving	0	2.69	0.13	0.04	0.07	0.43	0.15
2001	70203	Light duty vehicles	Gasoline catalyst	Urban driving	0	0.48	0.06	0.04	0.05	0.1	0.07
2001	70301	Heavy duty vehicles	Diesel	Highway driving	0.01	21.12	5.38	6.01	0.89	0.76	1.38
2001	70301	Heavy duty vehicles	Gasoline	Highway driving	0	0	0	0	0	0	0
2001	70302	Heavy duty vehicles	Diesel	Rural driving	0.02	32.19	8.2	9.17	1.35	1.16	2.11
2001	70302	Heavy duty vehicles	Gasoline	Rural driving	0	0	0	0	0	0	0
2001	70303	Heavy duty vehicles	Diesel	Urban driving	0.01	18.43	4.7	5.25	0.78	0.66	1.21
2001	70303	Heavy duty vehicles	Gasoline	Urban driving	0	0	0	0	0	0	0
2001	704	Mopeds	Gasoline		0	0	0	0	0	0	0
2001	70501	Motorcycles	Gasoline	Highway driving	0	1.1	0.05	0.02	0.03	0.17	0.06
2001	70502	Motorcycles	Gasoline	Rural driving	0	3.06	0.15	0.05	0.08	0.49	0.17
2001	70503	Motorcycles	Gasoline	Urban driving	0	3.69	0.18	0.06	0.1	0.59	0.21
2001	801	Military	Diesel		0	3.85	0.45	0.44	0.23	0.41	0.23
2001	801	Military	Gasoline		0	0	0	0	0	0	0

Year	SNAP ID	Category	Fuel type	Mode	Dioxins/ Furans [g]	Flouranthene [kg]	Benzo(b) flouranthene [kg]	Benzo(k) flouranthene [kg]	Benzo(a) pyrene [kg]	Benzo(g,h,i) perylene [kg]	indeno(1,2,3-c,d) pyrene [kg]
2001	801	Military	Aviation gasoline		0	0.03	0	0	0	0	0
2001	801	Military	Jet fuel	< 3000 ft	0	0	0	0	0	0	0
2001	801	Military	Jet fuel	> 3000 ft	0	0	0	0	0	0	0
2001	802	Railways	Diesel		0	4.03	1.03	1.15	0.17	0.14	0.26
2001	802	Railways	Gasoline		0	0.01	0	0	0	0	0
2001	803	Inland waterways	Gasoline		0	2.31	0.11	0.04	0.06	0.37	0.13
2001	803	Inland waterways	Diesel		0	1.58	0.19	0.18	0.09	0.17	0.1
2001	80402	National sea traffic	Residual oil		0.02	7.85	0.41	0.08	0.03	0.11	0.05
2001	80402	National sea traffic	Diesel		0.04	24.04	2.07	0.97	0.49	4.63	3.82
2001	80402	National sea traffic	Kerosene		0	0	0	0	0	0	0
2001	80403	Fishing	Diesel		0.11	66.1	5.7	2.67	1.34	12.74	10.51
2001	80403	Fishing	Kerosene		0	0	0	0	0	0	0
2001	80403	Fishing	Gasoline		0	0.01	0	0	0	0	0
2001	80403	Fishing	LPG		0	0	0	0	0	0	0
2001	80404	International sea traffic	Residual oil		0.35	106.81	5.18	2.33	1.81	6.74	5.18
2001	80404	International sea traffic	Diesel		0.26	158.71	13.69	6.42	3.21	30.59	25.24
2001	80501	Air traffic, other airports	Jet fuel	Dom. < 3000 ft	0	0	0	0	0	0	0
2001	80501	Air traffic, other airports	Aviation gasoline		0	0.43	0.02	0.01	0.01	0.07	0.02
2001	80502	Air traffic, other airports	Jet fuel	Int. < 3000 ft	0	0	0	0	0	0	0
2001	80502	Air traffic, other airports	Aviation gasoline		0	0.03	0	0	0	0.01	0
2001	80503	Air traffic, other airports	Jet fuel	Dom. > 3000 ft	0	0	0	0	0	0	0
2001	80504	Air traffic, other airports	Jet fuel	Int. > 3000 ft	0	0	0	0	0	0	0
2001	806	Agriculture	Diesel		0.01	73.74	8.65	8.41	4.34	7.87	4.48
2001	806	Agriculture	Gasoline		0	2.21	0.11	0.04	0.06	0.35	0.12
2001	807	Forestry	Diesel		0	0.02	0	0	0	0	0
2001	807	Forestry	Gasoline		0	0.26	0.01	0	0.01	0.04	0.01
2001	808	Industry	Diesel		0.01	42.03	4.93	4.79	2.47	4.49	2.55
2001	808	Industry	Gasoline		0	0.61	0.03	0.01	0.02	0.1	0.03
2001	808	Industry	LPG		0	0	0	0	0	0	0
2001	809	Household and gardening	Gasoline		0.01	5.04	0.24	0.08	0.13	0.8	0.28
2001	080501	Air traffic, Copenhagen airport		Dom. < 3000 ft	0	0	0	0	0	0	0
2001	080502	Air traffic, Copenhagen airport		Int. < 3000 ft	0	0.01	0	0	0	0	0
2001	080503	Air traffic, Copenhagen airport		Dom. > 3000 ft	0	0	0	0	0	0	0
2001	080504	Air traffic, Copenhagen airport		Int. > 3000 ft	0	0	0	0	0	0	0

## Appendix 4.9: Non-exhaust emission factors and total non-exhaust emissions of TSP, PM10 and PM2.5 in 2001

Vehicle category	Brake wear (mg/km)			Tyre wear (mg/km)			Road abrasion (mg/km)		
	TSP	PM <sub>10</sub>	PM <sub>2.5</sub>	TSP	PM <sub>10</sub>	PM <sub>2.5</sub>	TSP	PM <sub>10</sub>	PM <sub>2.5</sub>
Passenger cars	6	5.9	2.4	69	3.5	2.5	145	7.3	0
Light duty vehicles	7.5	7.4	3.0	90	4.5	3.2	190	9.5	0
Heavy duty vehicles	32.25	31.6	12.9	371.25	18.6	13.0	783	39.2	0
Buses	32.25	31.6	12.9	371.25	18.6	13.0	783	39.2	0
Mopeds	1.5	1.5	0.6	17.25	0.9	0.6	36.5	1.85	0
Motorcycles	3	2.9	1.2	34.5	1.7	1.2	73	3.7	0

Vehicle category	Brake wear (tons)			Tyre wear (tons)			Road abrasion (tons)			Total (tons)		
	TSP	PM <sub>10</sub>	PM <sub>2.5</sub>	TSP	PM <sub>10</sub>	PM <sub>2.5</sub>	TSP	PM <sub>10</sub>	PM <sub>2.5</sub>	TSP	PM <sub>10</sub>	PM <sub>2.5</sub>
Passenger cars	222	218	89	2,555	130	91	5,369	270	0	8,146	618	180
Light duty vehicles	62	61	25	741	37	26	1,565	78	0	2,368	176	51
Heavy duty vehicles	87	86	35	1,005	50	35	2,119	106	0	3,211	242	70
Buses	27	26	11	307	15	11	647	32	0	981	74	21
Mopeds	0	0	0	3	0	0	7	0	0	11	1	0
Motorcycles	1	1	1	15	1	1	31	2	0	48	4	1
Grand total	399	391	160	4,626	233	163	9,738	489	0	14,764	1,114	323

## Appendix 4.10: Fuel use and emission factors for other mobile sources 1990 and 2001

Year	SNAP ID	Category	Fuel type	Mode	Fuel [GJ]	SO <sub>2</sub> [g/GJ]	NO <sub>x</sub> [g/GJ]	NM VOC [g/GJ]	CH <sub>4</sub> [g/GJ]	CO [g/GJ]	CO <sub>2</sub> [kg/GJ]	NH <sub>3</sub> [g/GJ]	N <sub>2</sub> O [g/GJ]
1990	0801	Military	Diesel		146162	93,68	778,10	83,81	6,66	250,19	74	0,28	4,04
1990	0801	Military	Gasoline		986	2,28	871,06	1129,29	33,78	6687,29	73	1,63	2,24
1990	0801	Military	Aviation gasoline		4913	4,57	859,00	1242,60	21,90	6972,00	73	1,60	2,00
1990	0801	Military	Jet fuel	< 3000 ft	149678	4,60	250,57	24,94	2,65	229,89	72		2,30
1990	0801	Military	Jet fuel	> 3000 ft	1347105	4,60	250,57	24,94	2,65	229,89	72		2,30
1990	0802	Railways	Diesel		4010007	93,68	691,26	43,21	4,76	103,48	74	0,20	2,04
1990	0802	Railways	Kerosene		70	5,00	50,00	3,00	7,00	20,00	72		2,00
1990	0802	Railways	Gasoline		18954	2,28	871,06	1129,29	33,78	6687,29	73	1,63	2,24
1990	0803	Inland waterways	Diesel		304613	93,68	1249,33	270,13	4,35	595,20	74	0,17	3,05
1990	0803	Inland waterways	Gasoline		447167	2,28	64,34	10809,58	108,10	18485,08	73	0,10	0,52
1990	080402	National sea traffic	Residual oil		3559806	1466,99	1393,64	56,92	1,76	180,93	78		4,89
1990	080402	National sea traffic	Diesel		2782388	93,68	1334,89	54,52	1,69	173,30	74		4,68
1990	080402	National sea traffic	Kerosene		452	4,60	50,00	3,00	7,00	20,00	72		2,00
1990	080402	National sea traffic	LPG		1794		1249,00	384,90	20,30	443,00	65		2,00
1990	080403	Fishing	Residual oil		285426	1466,99	1393,64	56,92	1,76	180,93	78		4,89
1990	080403	Fishing	Diesel		10422380	93,68	1334,89	54,52	1,69	173,30	74		4,68
1990	080403	Fishing	Kerosene		25787	4,60	50,00	3,00	7,00	20,00	72		2,00
1990	080403	Fishing	Gasoline		9001	2,28	64,34	10809,58	108,10	18485,08	73	0,10	0,52
1990	080403	Fishing	LPG		42320		1249,00	384,90	20,30	443,00	65		2,00
1990	080404	International sea traffic	Residual oil		28644252	1711,49	2127,14	56,92	1,76	180,93	78		4,89
1990	080404	International sea traffic	Diesel		11632674	468,38	2037,47	54,52	1,69	173,30	74		4,68
1990	080501	Air traffic, other airports	Jet fuel	Dom. < 3000 ft	378795	2,30	310,41	16,54	1,76	100,94	72		6,35
1990	080501	Air traffic, other airports	Aviation gasoline		104947	4,57	859,00	1242,60	21,90	6972,00	73	1,60	2,00
1990	080502	Air traffic, other airports	Jet fuel	Int. < 3000 ft	136077	2,30	306,48	18,38	1,95	177,11	72		6,90
1990	080502	Air traffic, other airports	Aviation gasoline		30660	4,57	859,00	1242,60	21,90	6972,00	73	1,60	2,00
1990	080503	Air traffic, other airports	Jet fuel	Dom. > 3000 ft	910427	2,30	315,28	8,51	0,90	79,30	72		2,30
1990	080504	Air traffic, other airports	Jet fuel	Int. > 3000 ft	1612988	2,30	242,81	6,20	0,66	54,25	72		2,30



Year	SNAP ID	Category	Fuel type	Mode	Fuel [GJ]	SO <sub>2</sub> [g/GJ]	NO <sub>x</sub> [g/GJ]	NM VOC [g/GJ]	CH <sub>4</sub> [g/GJ]	CO [g/GJ]	CO <sub>2</sub> [kg/GJ]	NH <sub>3</sub> [g/GJ]	N <sub>2</sub> O [g/GJ]
1990	0806	Agriculture	Diesel		14194891	93,68	1273,14	190,59	4,43	424,13	74	0,18	3,10
1990	0806	Agriculture	Gasoline		426773	2,28	244,33	1022,05	51,10	24741,09	73	0,12	1,80
1990	0807	Forestry	Diesel		4105	93,68	1255,79	238,29	4,37	526,70	74	0,17	3,06
1990	0807	Forestry	Gasoline		49540	2,28	48,66	18095,47	180,95	33391,26	73	0,10	0,48
1990	0808	Industry	Diesel		8091042	93,68	1285,59	176,89	4,48	395,14	74	0,18	3,13
1990	0808	Industry	Gasoline		117286	2,28	216,67	3096,74	119,76	44820,30	73	0,11	1,63
1990	0808	Industry	LPG		1991975		621,12	838,51	62,11	931,68	65		
1990	0809	Household and gardening	Gasoline		974445	2,28	213,71	3726,00	116,17	42616,59	73	0,11	1,61
1990	080501	Air traffic, Copenhagen airport	Jet fuel	Dom. < 3000 ft	441215	2,30	280,41	23,40	2,49	144,24	72		5,03
1990	080501	Air traffic, Copenhagen airport	Aviation gasoline		8642	4,57	859,00	1242,60	21,90	6972,00	73	1,60	2,00
1990	080502	Air traffic, Copenhagen airport	Jet fuel	Int. < 3000 ft	2037255	2,30	326,94	34,43	3,66	159,73	72		3,76
1990	080502	Air traffic, Copenhagen airport	Aviation gasoline		5612	4,57	859,00	1242,60	21,90	6972,00	73	1,60	2,00
1990	080503	Air traffic, Copenhagen airport	Jet fuel	Dom. > 3000 ft	1160709	2,30	330,34	9,28	0,99	93,07	72		2,30
1990	080504	Air traffic, Copenhagen airport	Jet fuel	Int. > 3000 ft	20653862	2,30	291,18	8,79	0,93	36,07	72		2,30

Year	SNAP ID	Category	Fuel type	Mode	Fuel [GJ]	SO <sub>2</sub> [g/GJ]	NO <sub>x</sub> [g/GJ]	NM VOC [g/GJ]	CH <sub>4</sub> [g/GJ]	CO [g/GJ]	CO <sub>2</sub> [kg/GJ]	NH <sub>3</sub> [g/GJ]	N <sub>2</sub> O [g/GJ]
2001	0801	Military	Diesel		884792	2,34	557,55	62,48	5,03	175,12	74	0,30	4,58
2001	0801	Military	Jet fuel	< 3000 ft	42908	4,60	250,57	24,94	2,65	229,89	72	0,00	2,30
2001	0801	Military	Jet fuel	> 3000 ft	386176	4,60	250,57	24,94	2,65	229,89	72	0,00	2,30
2001	0801	Military	Gasoline		0	2,28	397,09	400,36	35,56	3516,78	73	27,87	10,55
2001	0801	Military	Aviation gasoline		6904	4,57	859,00	1242,60	21,90	6972,00	73	1,60	2,00
2001	0802	Railways	Diesel		2853837	2,34	691,26	43,21	4,76	103,48	74	0,20	2,04
2001	0802	Railways	Kerosene		0	5,00	50,00	3,00	7,00	20,00	72	0,00	2,00
2001	0802	Railways	Gasoline		6373	2,28	397,09	400,36	35,56	3516,78	73	27,87	10,55
2001	0803	Inland waterways	Diesel		363808	23,42	1249,33	4,35	4,35	595,20	74	0,17	3,05
2001	0803	Inland waterways	Gasoline		534065	2,28	64,34	10809,58	108,10	18485,08	73	0,10	0,52
2001	080402	National sea traffic	Residual oil		1513156	702,68	1393,60	56,90	1,76	180,90	78		4,90
2001	080402	National sea traffic	Diesel		3240423	93,68	1334,90	54,50	1,69	173,30	74	0,00	4,70
2001	080402	National sea traffic	Kerosene		522	4,60	50,00	3,00	7,00	20,00	72	2,00	2,00
2001	080402	National sea traffic	LPG		0	0,00	1249,00	384,90	20,30	443,00	65	0,00	2,00
2001	080403	Fishing	Residual oil		0	702,68	1393,60	56,90	1,76	180,90	78		4,90
2001	080403	Fishing	Diesel		8908320	93,68	1334,90	54,50	1,69	173,30	74	0,00	4,70
2001	080403	Fishing	Kerosene		1496	4,60	50,00	3,00	7,00	20,00	72		2,00
2001	080403	Fishing	Gasoline		3022	2,28	64,34	10809,60	108,10	18485,10	73	0,10	0,52
2001	080403	Fishing	LPG		19182	0,00	1249,00	384,90	20,30	443,00	65	0,00	2,00
2001	080404	International sea traffic	Residual oil		25923684	1710,72	2127,10	56,90	1,76	180,90	78		4,90
2001	080404	International sea traffic	Diesel		21388985	468,38	2037,50	54,50	1,69	173,30	74		4,70
2001	080501	Air traffic, other airports	Jet fuel	Dom. < 3000 ft	265380	2,30	326,18	16,96	1,80	116,87	72		7,66
2001	080501	Air traffic, other airports	Aviation gasoline		98664	4,57	859,00	1242,60	21,90	6972,00	73	1,60	2,00
2001	080502	Air traffic, other airports	Jet fuel	Int. < 3000 ft	244140	2,30	306,48	18,38	1,95	177,11	72		6,90
2001	080502	Air traffic, other airports	Aviation gasoline		7282	4,57	859,00	1242,60	21,90	6972,00	73	1,60	2,00
2001	080503	Air traffic, other airports	Jet fuel	Dom. > 3000 ft	588726	2,30	323,65	8,91	0,95	89,93	72		2,30
2001	080504	Air traffic, other airports	Jet fuel	Int. > 3000 ft	2621135	2,30	242,81	6,20	0,66	54,25	72		2,30

Year	SNAP ID	Category	Fuel type	Mode	Fuel [GJ]	SO <sub>2</sub> [g/GJ]	NO <sub>x</sub> [g/GJ]	NMVOC [g/GJ]	CH <sub>4</sub> [g/GJ]	CO [g/GJ]	CO <sub>2</sub> [kg/GJ]	NH <sub>3</sub> [g/GJ]	N <sub>2</sub> O [g/GJ]
2001	0806	Agriculture	Diesel		16953370	23,42	1258,27	189,04	4,43	424,13	74	0,18	3,10
2001	0806	Agriculture	Gasoline		509707	2,28	244,33	1022,05	51,10	24741,09	73	0,12	1,80
2001	0807	Forestry	Diesel		4903	23,42	1144,55	216,87	4,37	517,55	74	0,17	3,06
2001	0807	Forestry	Gasoline		59167	2,28	48,66	18095,47	180,95	33391,26	73	0,10	0,48
2001	0808	Industry	Diesel		9663366	23,42	1174,86	166,55	4,48	394,44	74	0,18	3,13
2001	0808	Industry	Gasoline		140078	2,28	216,67	3096,74	119,76	44820,30	73	0,11	1,63
2001	0808	Industry	LPG		2379073	0,00	621,12	838,51	62,11	931,68	65	0,19	3,11
2001	0809	Household and gardening	Gasoline		1163807	2,28	213,71	3726,00	116,17	42616,59	73	0,11	1,61
2001	080501	Air traffic, Copenhagen airport	Jet fuel	Dom. < 3000 ft	325930	2,30	301,48	20,93	2,22	156,45	72		6,25
2001	080501	Air traffic, Copenhagen airport	Aviation gasoline		800	4,57	859,00	1242,60	21,90	6972,00	73	1,60	2,00
2001	080502	Air traffic, Copenhagen airport	Jet fuel	Int. < 3000 ft	3055248	2,30	322,85	29,96	3,18	169,60	72	0,00	3,81
2001	080502	Air traffic, Copenhagen airport	Aviation gasoline		1158	4,57	859,00	1242,60	21,90	6972,00	73	1,60	2,00
2001	080503	Air traffic, Copenhagen airport	Jet fuel	Dom. > 3000 ft	1059388	2,30	302,98	9,70	1,03	63,23	72	0,00	2,30
2001	080504	Air traffic, Copenhagen airport	Jet fuel	Int. > 3000 ft	27098054	2,30	291,18	8,79	0,93	36,07	72	0,00	2,30

Year	SNAP ID	Category	Fuel type	Mode	Fuel [GJ]	TSP [g/GJ]	PM10 [g/GJ]	PM2.5 [g/GJ]
2001	0801	Military	Diesel		884792	43,74	43,74	43,74
2001	0801	Military	Jet fuel	< 3000 ft	42908	1,16	1,16	1,16
2001	0801	Military	Jet fuel	> 3000 ft	386176	1,16	1,16	1,16
2001	0801	Military	Gasoline		0	4,43	4,43	4,43
2001	0801	Military	Aviation gasoline		6904	10,00	10,00	10,00
2001	0802	Railways	Diesel		2853837	52,52	52,52	52,52
2001	0802	Railways	Kerosene		0	121,95	115,85	110,06
2001	0802	Railways	Gasoline		6373	4,43	4,43	4,43
2001	0803	Inland waterways	Diesel		363808	164,83	156,59	148,76
2001	0803	Inland waterways	Gasoline		534065	23,25	23,25	23,25
2001	080402	National sea traffic	Residual oil		1513156	139,40	132,43	125,81
2001	080402	National sea traffic	Diesel		3240423	42,15	40,04	38,04
2001	080402	National sea traffic	Kerosene		522	97,56	92,68	88,05
2001	080402	National sea traffic	LPG		0	12,44	12,44	12,44
2001	080403	Fishing	Residual oil		0	139,40	132,43	125,81
2001	080403	Fishing	Diesel		8908320	42,15	40,04	38,04
2001	080403	Fishing	Kerosene		1496	97,56	92,68	88,05
2001	080403	Fishing	Gasoline		3022	23,25	23,25	23,25
2001	080403	Fishing	LPG		19182	12,44	12,44	12,44
2001	080404	International sea traffic	Residual oil		25923684	200,50	190,48	180,95
2001	080404	International sea traffic	Diesel		21388985	42,15	40,04	38,04
2001	080501	Air traffic, other airports	Jet fuel	Dom. < 3000 ft	265380	1,16	1,16	1,16
2001	080501	Air traffic, other airports	Aviation gasoline		98664	10,00	10,00	10,00
2001	080502	Air traffic, other airports	Jet fuel	Int. < 3000 ft	244140	1,16	1,16	1,16
2001	080502	Air traffic, other airports	Aviation gasoline		7282	10,00	10,00	10,00
2001	080503	Air traffic, other airports	Jet fuel	Dom. > 3000 ft	588726	1,16	1,16	1,16
2001	080504	Air traffic, other airports	Jet fuel	Int. > 3000 ft	2621135	1,16	1,16	1,16

Year	SNAP ID	Category	Fuel type	Mode	Fuel [GJ]	TSP [g/GJ]	PM10 [g/GJ]	PM2.5 [g/GJ]
2001	0806	Agriculture	Diesel		16953370	127,14	120,78	114,74
2001	0806	Agriculture	Gasoline		509707	23,25	23,25	23,25
2001	0807	Forestry	Diesel		4903	134,27	127,55	121,17
2001	0807	Forestry	Gasoline		59167	23,25	23,25	23,25
2001	0808	Industry	Diesel		9663366	111,07	105,52	100,24
2001	0808	Industry	Gasoline		140078	23,25	23,25	23,25
2001	0808	Industry	LPG		2379073	12,44	12,44	12,44
2001	0809	Household and gardening	Gasoline		1163807	23,25	23,25	23,25
2001	080501	Air traffic, Copenhagen airport	Jet fuel	Dom. < 3000 ft	325930	1,16	1,16	1,16
2001	080501	Air traffic, Copenhagen airport	Aviation gasoline		800	10,00	10,00	10,00
2001	080502	Air traffic, Copenhagen airport	Jet fuel	Int. < 3000 ft	3055248	1,16	1,16	1,16
2001	080502	Air traffic, Copenhagen airport	Aviation gasoline		1158	10,00	10,00	10,00
2001	080503	Air traffic, Copenhagen airport	Jet fuel	Dom. > 3000 ft	1059388	1,16	1,16	1,16
2001	080504	Air traffic, Copenhagen airport	Jet fuel	Int. > 3000 ft	27098054	1,16	1,16	1,16

## Appendix 4.11: Total emissions per sector for other mobile sources 1990 and 2001

Year	Sector	SNAP ID	SO <sub>2</sub> [tons]	NO <sub>x</sub> [tons]	NMVOC [tons]	CH <sub>4</sub> [tons]	CO [tons]	CO <sub>2</sub> [ktons]	N <sub>2</sub> O [tons]	TSP [tons]	PM10 [tons]	PM2.5 [tons]
2001	Military	801	4	607	75	6	302	97	5	39	39	39
2001	Railways	802	7	1975	126	14	318	212	6	150	150	150
2001	Inland waterways	803	10	489	5775	59	10089	66	1	72	69	67
2001	National sea traffic	80402	1367	6434	263	8	835	358	23	348	330	314
2001	Fishing	80403	835	11916	526	16	1608	661	42	376	357	339
2001	International sea traffic	80404	54366	98722	2641	82	8396	3605	228	6099	5794	5505
2001	Air traffic, Dom. < 3000 ft.	80501	2	270	135	3	775	50	4	2	2	2
2001	Air traffic, Int. < 3000 ft.	80502	8	1068	107	10	620	238	13	4	4	4
2001	Air traffic, Dom. > 3000 ft.	80503	4	512	16	2	120	119	4	2	2	2
2001	Air traffic, Int. > 3000 ft.	80504	68	8527	255	27	1120	2140	68	34	34	34
2001	Agriculture	806	398	21457	3726	101	19801	1292	54	2167	2060	1957
2001	Forestry	807	0	8	1072	11	1978	5	0	2	2	2
2001	Industry	808	227	12861	4038	208	12306	880	38	1106	1052	1002
2001	Household and gardening	809	3	249	4336	135	49598	85	2	27	27	27
1990	Military	801	21	494	57	5	422	119	4			
1990	Railways	802	376	2788	195	20	542	298	8			
1990	Inland waterways	803	30	409	4916	50	8447	55	1			
1990	National sea traffic	80402	5483	8678	355	11	1127	484	30			
1990	Fishing	80403	1395	14365	698	20	2044	799	50			
1990	International sea traffic	80404	54473	84632	2265	70	7199	3095	195			
1990	Air traffic, Dom. < 3000 ft.	80501	2	339	158	4	894	67	5			
1990	Air traffic, Int. < 3000 ft.	80502	5	739	118	9	602	159	9			
1990	Air traffic, Dom. > 3000 ft.	80503	5	667	18	2	177	149	5			
1990	Air traffic, Int. > 3000 ft.	80504	51	6406	192	20	832	1603	51			
1990	Agriculture	806	1331	18176	3142	85	16579	1082	45			
1990	Forestry	807	1	8	897	9	1656	4	0			
1990	Industry	808	758	11664	3465	174	10310	737	26			
1990	Household and gardening	809	2	208	3631	113	41528	71	2			

## Appendix 4.12: Uncertainty estimate calculation scheme for NO<sub>x</sub> in transport

	IPCC Source category	Gas	Base year	Year t	Activity data	Emission factor	Combined	Combined uncertainty as	
			emission	emission	uncertainty	uncertainty	uncertainty	% of total national emissions in year t	
			Input data	Input data	Input data	Input data			
			Gg Nox	Gg Nox	%	%	%	%	
Road Transportation	07	Nox	100118	70348	2	50	50.040	14.951	
Other mobile sources	08	Nox	149573	165095	10	100	100.499	70.471	
	Total	Nox	249691	235443				5189.687	
<b>Total uncertainties</b>			<b>Overall uncertainty 2001 (%):</b>					<b>72.039</b>	

	IPCC Source category	Gas	Type A	Type B sensitivity	Uncertainty i trend in national emissions introduced by emission factor uncertainty	Uncertainty in trend in national emissions introduced by activity data uncertainty	Uncertainty introduced into the trend in total national emissions
			sensitivity				
			%	%	%	%	%
Road Transportation	07	Nox	-0.095964042	0.2817	-4.798202104	0.796879564	4.86392439
Other mobile sources	08	Nox	0.095775104	0.6612	9.577510359	9.350772491	13.38527739
	Total	Nox					202.8234113
<b>Total uncertainties</b>			<b>Trend uncertainty (%):</b>				<b>14.242</b>

## Appendix 5

### The specific methodologies regarding Industrial Processes

#### NFR Table 1A, categories: 1 A 2 a, 1 A 2 b and 1 A 2.

*NFR Table 1 A, Category: Row 1 A 2 a. SNAP 03 03 03: Grey Iron foundries.*

The activity factors, emission factors and emissions for this activity are given in table 1. This contribution to emissions constitutes the total in this category of the NFR.

Table 1. Activities, emission factors and emissions in NFR category 1 A 2 a.

Year	Activity Mg	Emission									
		TSP	PM10	PM2.5	Pb	Cd	As	Cr	Ni	Se	Zn
1997	85100				0,61	0,01	0,03	0,09	0,11	0,43	0,43
1998	85800				0,62	0,01	0,03	0,09	0,11	0,43	0,43
1999	86000				0,62	0,01	0,03	0,09	0,11	0,43	0,43
2000	96400	192,8	57,84	8,68	0,69	0,01	0,03	0,11	0,13	0,48	0,48
2001	85700	171,4	51,42	7,71	0,62	0,01	0,03	0,09	0,11	0,43	0,43
Emission factor		2000	600	90	7200	140	300	1100	1300	5000	5000
Emission factor unit		g/Mg	g/Mg	g/Mg	mg/Mg	mg/Mg	mg/Mg	mg/Mg	mg/Mg	mg/Mg	mg/Mg

For the activity data reference is made to the Committee of Associations of European Foundries (CAEF) which is an organisation of the European foundry industry, where production data for the Danish foundry industry for 1997-2001 is found <http://www.caef-eurofoundry.org/>

As regards the emission factors for the emissions of particulate matter reference is made to the Netherlands Organisation for Applied Scientific Research, TNO, and the CEPMEIP database. CEPMEIP: The Co-ordinated European Programme on Particulate Matter Emission Inventories, Projections and Guidance, <http://www.air.sk/tno/cepmeip/>. The CEPMEIP database has levels of emission factors which are "1: low", "2: medium", "3: medium high" and "4: high". For the activity of grey iron foundries the judgement of emission factors in the database is equal for all these levels. For the emission factors for heavy metals reference is made to the EMEP guidebook.

*NFR Table 1 A, Category: Row 1 A 2 b. SNAP 03 03 07: Secondary lead production, SNAP 03 03 07: Secondary zinc production and SNAP 03 03 10: Secondary aluminium production.*

Most of these activities with minor contributions to emissions were introduced to the inventory for the obligation to report on emissions of particles from year 2000. Further introduction of these activities is to be considered in future work on the inventory.



The activity factors, emission factors and emissions for these activities are given in Table 2. The total contribution to emissions for these activities constitutes the total emissions in this category of the NFR.

References to activity data are Statistics Denmark, Sales Statistics for manufacturing industries. For secondary zinc production is used the product grouping number 7904 0000 00 and 7907 0000 00 for year 2001 of this statistics and for secondary aluminium production is used the product grouping number 7601 2091 00 for years 2000 and 2001.

For the emission factors for particulate matter the reference is the CEPMEIP database. For secondary lead production is used the judgement for the level of the emission as "low". For secondary zinc production and secondary aluminium production the emission factors for all levels in the CEPMEIP database are equal.

Table 2. Activities, emission factors and emissions for emissions in NFR category 1 A 2 b.

Year	SNAP	Activity Mg	Emission Mg				
			TSP	PM10	PM2.5	Pb	
2000	030307	lead	5000	1,50	1,43	0,75	0,0088
	030308	zinc	1257	0,63	0,50	0,38	
	030310	aluminium	32147	32,15	28,93	13,02	
		Total NFR 1 A 2 b		34,28	30,86	14,15	0,01
2001	030307	lead	5000	1,50	1,43	0,75	0,0088
	030308	zinc	1257	0,63	0,50	0,38	
	030310	aluminium	32553	32,55	29,30	13,18	
		Total NFR 1 A 2 b		34,68	31,23	14,31	0,01
Emission Factor	030307	lead	emf	300	285	150	1750
Emission Factor	030308	zinc	emf	500	400	300	
Emission Factor	030310	aluminium	emf	1000	900	405	
Emission Factor unit			emf unit	g/Mg	g/Mg	g/Mg	mg/Mg

*NFR Table 1 A, Category: Row 1 A 2. SNAP 03 03 12: Lime production.*

This activity was introduced in the inventory due to the obligation to report on emissions of particles from year 2000. The lime production activity as far as emissions due to decarbonizing is accounted for in SNAP 04 06 12.

The activity factors, emission factors and emissions for this activity are given in table 3. This contribution to emissions constitutes only a minor part of the total of emissions in this category of the NFR.

Table 3. Activities, emission factors and emissions for lime production in NFR category 1 A 2.

Year	Activity Mg	Emission Mg		
		TSP	PM10	PM2.5
2000	92002	27,601	13,80	2,76
2001	96486	28,946	14,47	2,89
Emission factor		300	150	30
Emission factor unit		g/Mg	g/Mg	g/Mg

For the activity data reference is made to Statistics Denmark, Sales Statistics for manufacturing industries. The activity is the sum of activities in the product grouping numbers 2522 1000 01 and 2522 1000 02 of this statistics.

For the emission factors for the emissions of particulate matter the reference is the CEPMEIP database. The emission factors used here for lime production refer to "1: low".

*NFR Table 1 A, Category: Row 1 A 2. SNAP 03 03 14: Flat glass and SNAP 03 03 15 Container glass.*

These activities are to be worked upon, updated and improved in the future. At present the inventories contains the following. This contribution to emissions constitutes only a minor part of the total of emissions in this category of the NFR.

For the years 1990-2001 the production of container glass, is estimated to result in emissions of SO<sub>x</sub> NMVOC and heavy metals as shown in Table 4.

Table 4. Emissions of SO<sub>x</sub>, NMVOC and heavy metals from activity SNAP 030315, Container glass production.

Year	Emission Mg										
	SO <sub>2</sub> +SO <sub>3</sub>	NMVOC	Ar	Cd	Cr	Cu	Hg	Ni	Pb	Se	Zn
1990	71,67	1,476	0,020	0,025	0,394	0,098	0,008	0,312	1,164	0,328	0,164
1991	69,48	1,431	0,019	0,024	0,382	0,095	0,008	0,302	1,081	0,302	0,143
1992	63,37	1,305	0,017	0,022	0,348	0,087	0,007	0,276	0,928	0,261	0,116
1993	61,40	1,265	0,017	0,021	0,034	0,084	0,007	0,267	0,857	0,239	0,098
1994	65,64	1,352	0,018	0,023	0,360	0,090	0,008	0,285	0,856	0,255	0,105
1995	61,18	1,260	0,017	0,021	0,336	0,084	0,007	0,266	0,756	0,224	0,084
1996	61,18	1,260	0,017	0,021	0,336	0,084	0,007	0,266	0,700	0,210	0,070
1997	61,18	1,260	0,017	0,021	0,336	0,084	0,007	0,266	0,658	0,196	0,056
1998	61,18	1,260	0,017	0,021	0,336	0,084	0,007	0,266	0,658	0,196	0,056
1999	61,18	1,260	0,017	0,021	0,336	0,084	0,007	0,266	0,658	0,196	0,056
2000	61,18	1,260	0,017	0,021	0,336	0,084	0,007	0,266	0,658	0,196	0,056
2001	61,18	1,260	0,017	0,021	0,336	0,084	0,007	0,266	0,658	0,196	0,056

The reference for the emission factors used is mainly the EMEP guidebook, besides Pb, Se and Zn, where country specific values are used referring to

Illerup et. al. (1999). The emission factors herein are used for years 1990-2001 as shown in Table 5.

Table 5. Emission factors for Pb, Se and Zn from container glass production, based on Illerup et. al. (1999).

Year	Pb g/Mg product		Se g/Mg product		Zn g/Mg product		Remark
	Interval	Mean	Interval	Mean	Interval	Mean	
1990	2,6-11,6	7,1	0,05-4,0	2,0	0,7-1,2	1,0	Measurement
1991		6,8		1,9		0,9	Interpolation
1992		6,4		1,8		0,8	Interpolation
1993		6,1		1,7		0,7	Interpolation
1994		5,7		1,7		0,7	Interpolation
1995		5,4		1,6		0,6	Interpolation
1996		5,0		1,5		0,5	Interpolation
1997	1,1-8,3	4,7	0,8-1,9	1,4	0,4	0,4	Measurement
1998		4,7		1,4		0,4	Extrapolation
1999		4,7		1,4		0,4	Extrapolation
2000		4,7		1,4		0,4	Extrapolation
2001		4,7		1,4		0,4	Extrapolation

For the estimation of emission of particulate matter preliminary figures for production of flat glass has been introduced based on activity data found in the CEPMEIP database. For the years 2000-2001 production of flat glass and container glass, are estimated to result in yearly emission of particulate matter as shown in Table 5.

Table 5. Yearly emission of particulate matter from glass production for years 2000 and 2001.

Production	SNAP	Emission Mg		
		TSP	PM10	PM2,5
Flat glass	030314	10,57	9,51	8,45
Container glass	030315	4,20	3,78	3,36
	Total	14,77	13,29	11,81

The reference for the emission factors used are the CEPMEIP database, level "low".

*References:*

CEPMEIP database. (CEPMEIP: **C**o-ordinated **E**uropean Programme on **P**articulate **M**atter **E**mission **I**nventories, **P**rojections and **G**uidance). Web reference: <http://www.air.sk/tno/cepmeip/>.

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Illerup, J.B.; Geertinger, A.; Hoffmann, L.; Christiansen, K. 1999: Emissions faktorer for tungmetaller 1990 - 1996. (Emission factors for Heavy Metals 1990 - 1996). Danmarks Miljøundersøgelser. 66 s. - Faglig rapport fra DMU nr. 301. In Danish. Summary in English. [http://www.dmu.dk/1\\_viden/2\\_Publikationer/3\\_fagrapporter/rapporter/fr301.pdf](http://www.dmu.dk/1_viden/2_Publikationer/3_fagrapporter/rapporter/fr301.pdf)

## **Appendix 6**

# **The specific methodologies regarding Solvents**

Methodology and references

### **Solvent and other product use (CRF: 3 SNAP: 06)**

Use of solvents is an important source of evaporation of NMVOC and contributed in 2000 with approximately 26 % of the total NMVOC emission. The most important sectors for industrial use of solvents are: Car repairing and treatment, chemical industry, paint application in iron and steel industry, paint manufacturing, the plastic industry, the foodstuff industry, preservation of wood and the printing industry. For these sectors the Government and the industries agreed to reduce the emissions of NMVOC by 40 % from 1988 to 2000. The reduction targets for each trade was estimated by trades and companies.

As a part of an agreement between the Danish Industry and the Danish Environmental Protection Agency the emissions from various industries have been reported to the Danish EPA. The reporting is not annual and linear interpolation is used between the reporting years.

In the Danish inventory emission estimates for solvent use are made for paint application (SNAP category 0601) in the sectors: construction and buildings, domestic use, boat building and wood. Chemical product manufacturing and processing includes: polyester processing, polyurethane processing, polystyrene foam processing, paint manufacturing, glues manufacturing and other product manufacturing and processing (SNAP category 0603). The use of solvents in "Other use of solvents and related activities" (SNAP category 0604) takes places in the sectors: printing industry, fat, edible and non edible oil extraction, application of glues and adhesives, underseal treatment and conservation of vehicles, domestic solvent use and other uses (Reference: Report from the Danish EPA, 1995, no. 50, VOC reduction plants (in Danish).

It is important to notice that not all the use of solvents are included in this agreement and no activity data has been available. Efforts are still to be made in the future inventory work to improve the emission estimates.

Table 1 Use of solvents. NMVOC emissions for various sectors (Reference: Report from the Danish EPA, 1995, no. 50, VOC reduction plants (in Danish))

		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
0601	<b>Paint application</b>	0											
060101	Paint application : manufacture of automobiles												
060102	Paint application : car repairing	0	0	0	0	0	0	0	0	0	0		
060103	Paint application : construction and buildings	9452	9497	9542	9586	9631	9676	9721	9766	9810	9855	9900	9900
060104	Paint application : domestic use (except 06.01.07)	9452	9497	9542	9586	9631	9676	9721	9766	9810	9855	9900	9900
060105	Paint application : coil coating												
060106	Paint application : boat building	0	0	0	0	0	0	0	0	0	0		
060107	Paint application : wood	6500	6192	5884	5576	5276	4960	4652	4344	4036	3728	3420	3420
060108	Other industrial paint application	0	0	0	0	0	0	0	0	0	0		
060109	Other non industrial paint application												
0603	<b>Chemical products manufacturing or processing</b>												
060301	Polyester processing	470	478	486	494	502	510	518	526	534	542	550	550
060302	Polyvinylchloride processing												
060303	Polyurethane processing	3	3	3	3	3	3	3	4	4	4	4	4
060304	Polystyrene foam processing (c)	920	919	918	917	916	915	913	913	912	911	910	910
060305	Rubber processing												
060306	Pharmaceutical products manufacturing												
060307	Paints manufacturing	300	298	296	294	292	290	288	286	284	282	280	280
060308	Inks manufacturing												
060309	Glues manufacturing	24	23	22	20	19	18	17	16	14	13	12	12
0603010	Asphalt blowing												
0603011	Adhesive, magnetic tapes, films and photographs												
060314	Other	930	877	823	770	716	663	610	556	503	449	396	396
0604	<b>Other use of solvents and related activities</b>												
060401	Glass wool enduction												
060402	Mineral wool enduction												
060403	Printing industry	1575	1462	1349	1235	1122	1009	896	783	669	556	443	443
060404	Fat, edible and non edible oil extraction	1920	1893	1866	1839	1812	1785	1758	1731	1704	1777	1650	1650
060405	Application of glues and adhesives	2700	2580	2460	2340	2220	2100	1980	1860	1740	1620	1500	1500
060406	Preservation of wood	0	0	0	0	0	0	0	0	0	0		
060407	Underseal treatment and conservation of vehicles	1400	1345	1290	1290	1180	1125	1070	1015	960	905	850	850
060408	Domestic solvent use (other than paint application)	6653	6807	6961	7115	7269	7423	7576	7730	7884	8038	8192	8192
060409	Vehicles dewaxing												
060411	Domestic use of pharmaceutical products (k)												
060412	Other (preservation of seeds,...)	0	0	0	1696	0	0	0	0	0	0		

Reference: Danish EPA, 1995, Report no. 50, VOC reduction plants (in Danish)

## **Appendix 7**

# **The specific methodologies regarding Agriculture**

### **7.1 Ammonia emission**

7.1.2 Methods and assumptions

7.1.3 References – sources of information

7.1.4 Emission

7.1.4.1 Manure Management

Number of animal and N-excretion

Stable types

Emission factors

1.1.1 7.1.4.2 Agricultural Soils

1.1.2 Grazing

Synthetic fertiliser

Crops

Ammonia treated straw

Straw burning

7.1.5 Uncertainties

7.1.6 Information of quality assurance/quality control  
(QA/QC)

7.1.7 Recalculations

7.1.8 Improvements

### **7.2 Emission of particulate matter**

7.2.1 Methods and assumptions

7.2.2 References – sources of information

7.2.3 Emission

7.2.4 Uncertainties

7.2.5 Information of quality assurance/quality control  
(QA/QC)

7.2.6 Improvements

### **References**

**Appendix 7.1 Ammonia emission from agricultural activities 1985 – 2001**

**Appendix 7.2 Animal categories, stable systems and N-excretion**

**Appendix 7.3 Distribution of stable types 1985 - 2001**

**Appendix 7.4 Emission factors used for calculation of NH<sub>3</sub> emission from husbandry manure**

**Appendix 7.5 Ammonia emission from spreading of husbandry manure**

## 7 The specific methodologies regarding Agriculture

The emission from the agricultural sector includes emission of ammonia and particulate matter. The following description of the methodology is separated in two parts corresponding to the ammonia emission and the emission of particulate matter.

### 7.1 Ammonia emission

The majority of the Danish ammonia emission, corresponding to 98%, originates from the agricultural sector. The remaining 2% originates from traffic. The emission from agricultural activities includes emission from livestock manure, synthetic fertiliser, emission from crops, ammonia treated straw used for feeding and other small sources.

$$E_{NH_3, total} = E_{NH_3, livestock\ manure} + E_{NH_3, artificial\ fertilizer} + E_{NH_3, plants} + E_{NH_3, enteric\ fermentation} + E_{NH_3, others}$$

Figure 1 shows the distribution of sources of  $NH_3$  emission from the agricultural sector. The main part of the emission comes from manure, corresponding to 79%. Other contributions originate from use of synthetic fertiliser and crops, which contribute with 6% and 14% respectively. Emissions from ammonia treated straw, sewage sludge applied to soils and emission from burning of straw amount to less than 2%.

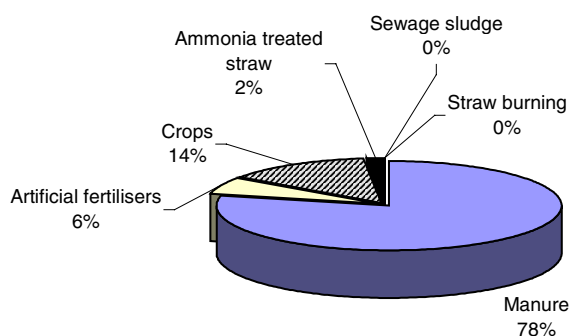


Figure 1 Ammonia emission from the agricultural sector (2001).

The total emission of  $NH_3$  is estimated to 82.100 tonnes  $NH_3$ -N in 2001. In the period 1985 to 2001 the emission is decreased with 31.600 tonnes  $NH_3$ -N, which responds to a 28 % reduction. This is due to the offensive National environmental policy during the last twenty years. Due to the Action Plan on the Aquatic Environment and the Ammonia Action Plan a series of measures to prevent loss of nitrogen in the



agricultural production has been initiated. The measures have included i.e. demands on improved utilisation of nitrogen in husbandry manure, ban against application of husbandry manure during the winter season, demand on establishment of second growth, regulation of the number of animals per hectare and a ceiling for the supply of nitrogen to crops. So despite an increase in the livestock production the evaporation of ammonia has been reduced considerably. In appendix 7.1 the ammonia emission from different sources for each year is listed.

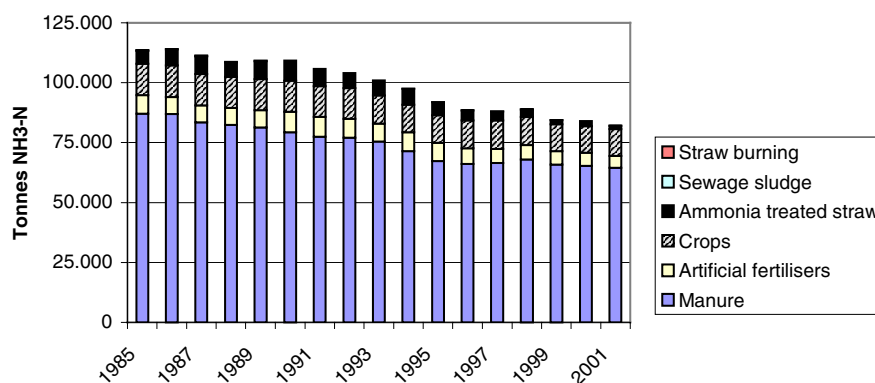


Figure 2. Ammonia emission from the agricultural sector 1985 to 2001

### 7.1.1 Methods and assumptions

The calculation of the emission is based on the EMEP-CLRTAP Emission Inventory Guidebook. The emissions from agricultural activities include NRF table 4B Manure Management and table 4D Agricultural Soils. Table 4F Field burning of agricultural wastes is only registered until 1989, because burning of plant residue has been prohibited since 1990 and only may take place in connection with cultivation of grass for seed. The emission from straw burning from the seed grass production is very small and hence not included in the emission inventory.

In Denmark a model-based system is applied for calculation of the emission of ammonia (Hutchings et al. 2001). The system is based on a large number of different livestock categories depending on type of livestock and weight class. Further each category is separated in to different stable type systems. For each of these categories the NH<sub>3</sub> emission is calculated and includes information on N-excretion, days of grassing, nitrogen content in manure, the distribution of the different types of manure and NH<sub>3</sub> evaporation in stables, during storage and in relation to the application of manure on the fields. The system has been developed in close co-operation with the Danish Institute of Agricultural Sciences and the Danish Agricultural Advisory Centre.

### 7.1.2 References – sources of information

Data on activities and emissions are collected, evaluated and discussed in co-operation with research institutes in the agricultural sector and the administration. These institutes are Statistics Denmark, the Danish Institute of Agricultural Sciences, the Danish Agricultural Advisory Centre, Danish Environmental Protection Agency and the Danish Plant Directorate. Table 1 shows the topics where the different institutions collaborate.

Table 1. List of institutes involved in the emission inventory

References	Abbreviation	Data / information
National Environmental Research Institute ( <a href="http://www.dmu.dk">http://www.dmu.dk</a> )	NERI	-reporting -data collecting
Statistics Denmark - Agricultural Statistic ( <a href="http://www.dst.dk">http://www.dst.dk</a> )	DS	-no. of animal -milk yield -slaughtering data -land use -crop production
Danish Institute of Agricultural Sciences ( <a href="http://www.agrsci.dk">http://www.agrsci.dk</a> )	DIAS	-N-excretion -feeding situation -NH <sub>3</sub> emissions factor
The Danish Agricultural Advisory Centre ( <a href="http://www.lr.dk">http://www.lr.dk</a> )	AAC	-stable type -grazing situation -manure application time and methods
Danish Environmental Protection Agency ( <a href="http://www.mst.dk">http://www.mst.dk</a> )	EPA	-sewage sludge used as fertiliser
The Danish Plant Directorate ( <a href="http://www.plantedirektoratet.dk">http://www.plantedirektoratet.dk</a> )	PD	-organic farming -synthetic fertiliser

### 7.1.3 Emission

The description of method for estimating the ammonia emission is separated in two parts. The first part covers the emission from manure management and the second part covers the emission from agricultural soils according to the reporting format in NFR.

#### 7.1.3.1 Manure Management

In livestock production the main part of the ammonia emission originates from stables – this corresponds to 44%. In connection to storage the evaporation makes up approximately 16%. The emission from manure spreading in the field is estimated to 37%. The remaining 3% occur from manure left by grassing animals.

Table 2 shows the animal categories in NFR, which is relevant for Denmark and information about number of animal types and stable

system for each category. In appendix 7.2 a detailed list of the different categories and stable systems are given.

Table 2. Livestock categories

Ammonia emission from livestock production			
NFR		Include	No. of categories (animal type/stable system)
4B	Manure Management		
4B 1a	Dairy Cattle	Dairy Cattle (large and Jersey)	9
4B 1b	Non-Dairy	Calves, heifers, bulls, suckling cattle (large and Jersey)	22
4B 3	Sheep	Breeding ewes	1
4B 4	Goats		1
4B 6	Horses	400 kg, 600 kg, 800 kg	3
4B 8	Swine	Sows, piglets, slaughter pigs	17
4B 9	Poultry	hens, pullet, broilers, turkey, geese, duck	16
4B 13	Other	Fur farming	4
		Sewage sludge	-

### **Livestock production and N-excretion**

For each animal category and stable type the ammonia emission is calculated, which include the number of animal, N-excretion, straw amendments, the amount of produced liquid and solid manure and ammonia emission factors.

$$E_{\text{NH}_3} = (\text{No. of animal} * N_{\text{excretion}}) + N_{\text{input, straw}} - \text{NH}_3_{\text{stable}} - \text{NH}_3_{\text{storage}} - \text{NH}_3_{\text{grass}} - \text{NH}_3_{\text{spreading}}$$

The number of animals is collected from the Statistic Denmark, Agricultural Statistic ([www.dst.dk](http://www.dst.dk)). The N-excretion rates are based on either per year or per produced animal. This means that for e.g. dairy cattle the emission calculation is based on the number of dairy cattle recorded by Statistics Denmark, whereas for bull calves, slaughter pigs and broilers the emission is calculated from production data. Excretion of nitrogen from livestock is based on published Danish standard data (Poulsen et al. 2001). These data includes the nitrogen utilization in the fodder, milk yield and litter. The data are updated every second or third year with average efficacy levels obtain from a large number of feeding plans. In appendix 7.2 the N-excretion rates in 2001 for each livestock category are listed.

### **Stable types**

A systematic statement of the stabling of husbandry does not exist and the stabling is therefore based on estimate (Rasmussen, J.B. and Lundgaard, N.H., pers. comm. 2002). The structural development in the agricultural sector influences the change of stable types. The last few year new stables are build and tied-up stables are replaced by bigger stables with loose-holding systems (Danish Agricultural Advisory Centre). In 1985 85% of the dairy cattle were kept in tied-up stables and in 2001 this part is reduced to 40%. In appendix 7.3 the distribution of stable type in the period 1985-2001 is listed. In loose-holding systems the cattle have more space and this will increase the ammonia emission per animal compared to the tied-up stables.

### **Emission factors**

The emission factors used in calculations of the ammonia emission from husbandry manure are listed in appendix 7.4. The emission factors are based on data from The Danish Institute of Agricultural Sciences.

The emission from stables is thus determined by a number of different conditions, depending on stable type and the different kinds of manure disposal systems placed in these stables. Danish Institute of Agricultural Sciences has carried out a number of emission surveys and estimated emission coefficients for different types of stables (Poulsen et al. 2001).

Livestock manure is collected either as solid manure or as slurry depending on the stable type. In table 3 is shown the emission factors used for storage of manure. It is assumed that the part of solid manure taken directly from the stable into the field is 80% from cattle, 25% from pigs, 50% sows, 15% from poultry and 5% from hens (Poulsen et al. 2001). The remaining part of the solid manure is deposited in stock piles in the field before field application.

By law all slurry tanks have to be covered by a crust in order to reduce the ammonia emission. However, an investigation shows that 20% of the tanks with pig slurry and 5% of tanks with cattle slurry were incompletely covered in 1999 (COWI 2000). This information has been incorporated in the emission inventory.

Table 3. Emission factors for storage (Poulsen et al 2001).

<b>Animal category</b>	<b>liquid manure</b>	<b>Slurry</b>	<b>Solid manure</b>	<b>Deep litter</b>	
	<b>Loss of NH<sub>3</sub>-N in % of N ab stable</b>				
Cattle	2	2.2	5	8.8	
Pig	2	3.4	25	12.5	Sows
	2	3.4	25	25	Piglets
	2	3.4	25	18.8	Slaughter pigs
Poultry	-	2	5	9.5	Hens and pullet
	-	-	-	12.8	Broilers
	-	-	-	15	Tyrkey, geese and ducks
Fur farming	0	2	15	-	
Sheep/goats	-	-	-	5	
Horses	-	-	-	5	

There is no statistical information on how the farmer handles the manure in practice. Therefore data for time of spreading, application methods and spreading in growing crops or on bare soil, is based on estimate (Andersen et al. 2001). On this foundation a weighted emission factor is estimated for solid manure and slurry respectively. In 2001 the emission factor for solid and liquid manure is estimated to 13.7% and 6.4% of N ab storage, respectively. Table 4 shows the data basis for estimation of emission factor year 2001.

The weighted emission factor therefore vary from year to year depending on changes in the practice of spreading. As a consequence of the Action Plan on the Aquatic Environment and the Ammonia Action Plan an increasing part of the slurry will be incorporated directly in the soil, which will reduce the ammonia emission. In appendix 7.5 the estimated weighted emission factor for the years 1985 to 2001 is given.

Table 4. Estimate for application method, time of spreading and time before the manure is incorporated in the soil 2001 (Andersen et al, 2001).

Application methods	Time of spreading	Percentage distribution of manure	Time before incorporation in soil				
			0	< 12 hours	>12 hours	not incorporated	
2001			pct.	pct.	pct.	pct.	
<b>Liquid manure</b>							
Incorporated	winter-spring	10	10	-	-	-	
Incorporated	summer-autumn	3	3	-	-	-	
Trailing horses	winter-spring	58	-	10	5	43	
Trailing horses	spring-summer	4	-	0	0	4	
Trailing horses	late summer-autumn	8	-	3	0	5	
Broad spreading	winter-spring	14	-	6	2	6	
Broad spreading	spring-summer	1	-	0	0	1	
Broad spreading	late summer-autumn	2	-	½	1	½	
Total			100	13	19,5	8	59,5
<b>Solid manure</b>							
Broad spreading	winter-spring	60	-	37	14	9	
Broad spreading	spring-summer	0	-	-	-	-	
Broad spreading	late summer-autumn	40	-	26	5	9	
Total			100	-	63	19	18

### 7.1.3.2 Agricultural Soils

Table 5 shows the different emission sources from agricultural soils, in accordance to the reporting in NFR tables.

Table 5. Emission source included in the ammonia emission from agricultural soils

Ammonia emission from Agricultural Soils		
NFR		Include
4D	Agricultural Soils	
4D 1	Direct Soil Emission	Grazing animal Synthetic fertiliser Crops Ammonia treated straw Straw burning on fields (until 1989)

### **Grazing**

It is assumed that 15% of the manure from dairy cattle is deposited in the field, which corresponding to 55 days per year. For heifers 54% of the nitrogen in the manure are estimated deposited during grazing, 61% for suckling cattle, 50% for horses and 73% for sheep and goats.

An emission factor of 7% of the total nitrogen content is assumed to evaporate as  $\text{NH}_3$  (Jarvis et al. 1998a, Jarvis et al. 1989b, Bussink 1994). The emission factor is used on all animal categories.

### **Synthetic fertiliser**

Since the early nineteenth there has been a decreasing use of synthetic fertiliser. This is due to the increased demand of utilising nitrogen in manure as outlined in the Action Plan on the Aquatic Environment. Further there has been a change in composition of the different fertilisers types. At present urea makes up less than 1% of the total nitrogen used as fertiliser (table 6). It is estimated that 2,2% of the total nitrogen used in synthetic fertiliser is emitted as ammonia in 2001.

Data on the use of synthetic fertiliser is based on the sale estimations collected by The Danish Plant Directorate (2001). Data for emission factors are collected by Danish Institute of Agricultural Sciences (Sommer et al. 1992, 1994 and 1996).

Table 6. Synthetic fertiliser consumption 2001 and emission factors.

<b>Synthetic fertiliser year 2001</b>	<b>Emission factor<sup>1</sup> [dec. pct.]</b>	<b>Consumption<sup>2</sup> [Mio. kg N]</b>
<u>Fertiliser type</u>		
Calcium and boron calcium nitrate	0.02	0.4
Ammonium sulphate	0.05	2.6
Calcium ammonium nitrate and other nitrate types	0.02	100.2
Ammonium nitrate	0.02	20.5
Liquid ammonia	0.01	7.8
Urea	0.15	1.1
Other nitrogen fertiliser	0.05	10.3
NPK-fertiliser	0.02	82.7
Diammonphosphate	0.05	0.7
Other NP fertiliser types	0.02	2.2
NK fertiliser	0.02	5.3
Emission of $\text{NH}_3\text{-N}$ from synthetic fertiliser		233.7

<sup>1</sup> Danish Institute of Agricultural Sciences (Sommer et al. 1992, 1994 and 1996)

<sup>2</sup> The Danish Plant Directorate 2001

### **Crops**

At present the farmed area covers 62% of the total surface area in Denmark. The last decades the farmed area has decreased and this development is expected to continue and be replaced by forest, semi-natural areas, roads and buildings. Information concerning farmed areas and cultivation of different crop types are collected by Statistics Denmark.

Literature research shows that the volatilisation from crop types differs considerably (Andersen et al. 1999). Recent investigation of four different crop types measured in two seasons shows that the volatilisation is between 0-5 kg NH<sub>3</sub>-N per hectare (Schjoerring & Mattsson 2001). Until more precisely data are available an average emission of 5 kg NH<sub>3</sub>-N for cash crops and 3 kg NH<sub>3</sub>-N for grass is used. The emission from organic farming is estimated to half the emission from conventional crops. A change in emission factors will have a substantial influence because the contribution from crop amounts to approximately 14% of the total ammonia emission.

Table 7. Emission factor used to estimate the emission of ammonia from crops

Emission factor	Crops	
	Conventional kg N/ha	Organic farming kg N/ha
Cash crops, beets and silage maize	5	2,5
Grass/clover in rotation	3	1,5
Permanent grass	3	1,5

### **Ammonia treated straw**

Ammonia is used for conservation of straw for feeding and to improve the nitrogen content. Investigations show that 80-90% of the supplied ammonia emits (Andersen et al. 1999). However, the emission can be reduced further if the right dose is used. Therefore it is estimated that the emission factor is 65% of the applied ammonia. Information on ammonia used for treatment of straw is collected from ammonia suppliers.

In The Ammonia Action Plan different measures to reduce the ammonia emission has been initiated, which include a ban of treated straw from 2003.

### **Straw burning**

As mentioned earlier field burning was banned in 1989. In the period until 1990 the amount of straw burned in the field was based on data from Statistics Denmark.

#### **7.1.4 Uncertainties**

Table 8 shows the estimated uncertainties for different emission sources, which is based on expert judgement (Gyldenkerne 2003). The uncertainties for activity data are relative small because they are based on National statistics and include measures based on a large number of data. For manure management the uncertainty for activity data and emission factor is estimated to 2% and 20%, respectively. The uncertainty for the emission factor is mainly related to spreading conditions, which are based on estimation.

For agricultural soil the uncertainty for activity data is estimated to be 5%. The uncertainty for the emission factor is estimated to be 30%, due to uncertainties for the emission from crops.

Table 8. The estimated uncertainty associated with activities and emission factor for NH<sub>3</sub>

Emission source	Uncertainty		Quantitative estimation of uncertainty	
	Activity data	Emission factor	Activity data	Emission factor
<b>NFR</b>				
<b>4B Manure Management</b>				
Stable	*	*	2%	20%
Storage	*	*		
Spreading	*	**		
<b>4D Agricultural Soils</b>				
Grazing animal	*	**	5%	30%
Synthetic fertiliser	*	*		
Crops	*	**		
Ammonia treated straw	*	**		
Burning of straw on field (until 1989)	*	**		

\* uncertainty < 20%,

\*\* uncertainty 20-50%

\*\*\* uncertainty > 50%

### 7.1.5 Information of quality assurance/quality control (QA/QC)

Activity data and data for estimations of emission factors are collected and discussed in co-operation with specialists and researcher at different institutes and research sections (table 1). It means that both the data and the methods will be evaluated continuously according to the latest knowledge and information. The total emission and the emissions from each source are compared to previous year. Thus, considerable variations can reveal miscalculations or change in methods.

### 7.1.6 Recalculations

The emission from the period 1985 to 2000 has been changed, because of a revision in the number of horses. Investigation from Statistics Denmark shows that the total number of horses is considerably higher than earlier assumed. The reason is that the Agricultural Statistic only includes farms bigger than 5 hectare. However, many horses are registered on small farms or riding schools. From now the number of horses are based on stud books collected at the Danish Advisory Centre. Furthermore, the emission inventory now includes goats. These changes have resulted in an increasing ammonia emission by 1-2% in the period 1985 to 2000.

### 7.1.7 Improvements

It is planned to incorporate emissions from industrial waste used as fertiliser in the emission inventory. Data will be collected from the Danish Environmental Protection Agency.



In recent year focus has been on reduction of ammonia emissions by means of technical measures in both stables and storage of manure. A number of investigations to estimate the effects on the emission have been initiated. However, when data is available it is planned to implement the reduction effect in the emission inventory.

## **7.2 Emission of particulate matter from the agricultural sector**

Recently, there has been an increasing interest to evaluate the particulate emission from the agricultural sector. Investigations have shown that farmers as well as the livestock increases the risk of developing lung- and respiratory related diseases by this particulate emission (Hartung og Seedorf, 1999) since the particles are able to carry bacteria, viruses and other organic compounds. This paper is the first approach to evaluate the particulate emission from the Danish agricultural sector.

### **7.2.1 Methods and assumptions**

The calculation of this emission inventory is based on the CEPMEIP database established by TNO (<http://www.air.sk/tno/cepmeip/>). Data foundation of particulate emission is primarily based on investigations of North European stables (Takai et al. 1998). Due to the lack of data this inventory only includes emissions from stables. It is planned to incorporate particulate emission from arable farming – i.e. harvesting and field preparation by machines.

The particle emission includes primary particles in the form of dust from stables. Three main types of stables, cattle-, pigs- and poultry stable, are included in this inventory. Furthermore poultry is divided into two categories – “poultry, chickens” and “poultry, other”. Thus, the emission is registered in NFR table 4B Manure Management.

### **7.2.2 References – sources of information**

The number of animals is based on Statistics Denmark, Agricultural Statistic ([www.dst.dk](http://www.dst.dk)). The emission factor for cattle, pigs and “poultry, chickens” is based on Takai, et al. (1998), and for “poultry, other” the value from the CEPMEIP database has been used.

### **7.2.3 Emission**

The emission is calculated as the sum of activities (a) multiplied by the emission factors (ef) for each activity. The emission is estimated as Total Suspended Particulate (TSP):

$$E_{\text{total, TSP}} = \sum a_i \cdot ef_i$$

In Takai, et al. (1998), dust emissions from stables are estimated as “Inhalable dust”. This is defined as particles that can be transported into the body by the respiratory system. Approximately, “inhalable dust” can be equalised with TSP (Hinz, T. 2002 and ISO/CEN, 1993).

For each source of emission, the proportion of PM<sub>2.5</sub> and PM<sub>10</sub> is estimated – i.e. particles with a diameter smaller than 2,5 µm and 10 µm, respectively. The distribution of particle size is based on CEP-MEIP database, where PM<sub>2.5</sub> contribute with 10% of TSP and PM<sub>10</sub> constitute 45% of TSP. This distribution is in accordance with measurements from an investigation made in Finland on 15 pig stables (Louhekainen et al. 1987a).

In 2001 the particle emission from agricultural activities is estimated to 14.200 tons ( $E_{TSP}$ ) – see table 1. The main part of the emission originates from pig stables, whereas emission from poultry and cattle are minor sources.

Table 1. Emission factors used to estimate the PM emission from agricultural activities

PM Emission from animal production 2001	No. of animal	Emission factor			Emission			
		1000 head	PM 10	PM 2.5	TSP	PM 10	PM 2.5	TSP
<u>Animal category</u>			[g/head/ year]		[Mg/year]	[Mg/year]	[Mg/year]	
Poultry, chickens <sup>1</sup>	19329		47.3	10.5	105.1	914	203	2031
Poultry, other poultry <sup>2</sup>	889		249.2	55.3	553.1	222	49	492
Stock, cattle <sup>3</sup>	1907		433.6	96.4	963.6	827	184	1838
Livestock, pigs <sup>4</sup>	10110		437.6	97.2	972.4	4424	983	9831
Emission, total						6387	1419	14191

<sup>1</sup> Laying hens and broilers; <sup>2</sup> Turkey, geese and duck; <sup>3</sup> Dairy cattle and Non-Dairy (heifer, bulls, calves and suckling cattle); <sup>4</sup> Sows and slaughter pigs (Weaners under and over 50 kg)

In the period of 1990 to 2001, using the same method for the whole period, it is seen that the total emission of particles ( $E_{TSP}$ ) has increased with 13% (fig. 1). The increase is due to increasing livestock production – especially for the pig production.

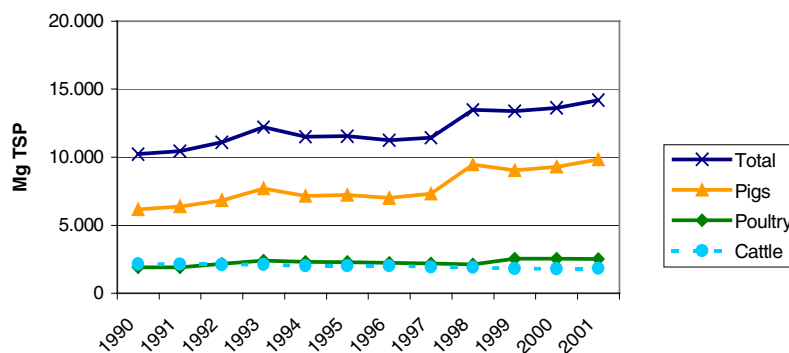


Figure 1. Particle emission from the agricultural sector

The main part of the dust emission from stables originates from feeding and bedding. A smaller part originates from hair, skin, insects and grain pollen (Klimont et al. 2002). The amount of emission depends of the type of livestock, animal density and the age and activity of the animals. Furthermore, feeding strategy, the stable system and the physical conditions like ventilation, temperature, light and humidity has an effect on the amount of particle emission. Therefore, the emission from different types of stable systems can vary considerably (Takai et al.1998, Klimont et al. 2002). For example, high humidity in pig- and cattle stables with deep litter reduces the dust emission. Therefor the emission from theses stable types is smaller than stables with tied-up systems.

So far, the method to estimate the particle emission only depends of the number of animals. However, it is necessary to take into account the variation in emission from different stable systems. Nevertheless, at this stage it is necessary to gain more knowledge of the latter.

Experiments have shown that the dust emission can be reduced markedly by adding lipids into the feed as well as by spraying the stables with an oil-water mixture. In this way, the emission can be reduced by up to 85 % (Takai & Pedersen, 2000).

#### 7.2.4 Uncertainties

The estimation of the particle emission is connected with high uncertainties in the order of several hundred percent. One reason is that the number of measurements of dust in stables is very limited and that the few existing measurements vary considerably. Likewise, the contribution of PM2.5 and PM10 is uncertain.

#### 7.2.5 Information of quality assurance/quality control (QA/QC)

In the preparation of this emission inventory, we have been in contact with the Danish Institute of Agricultural Science (DIAS). They have been involved in the measurements of the dust emission from stables. DIAS has confirmed that the emission factors used in the inventory are the most reliable estimates. DIAS points out the necessity of including emission data from different stable system as soon as they are available.

When using the CEPMEIP database, the total emission from the agricultural sector is estimated to be lower than the Danish calculation. Unfortunately, it has not been possible to see how the emission factors have been estimated in the CEPMEIP database. However, it is apparent that, there is a discrepancy in the aggregation of the number of animals for each category.

Table 2. Emission of PM difference in use of methods

<b>Emission inventory</b>	<b>PM emission tons TPS 2001</b>
CEPMEIP	13,800
DK	14,200

In a report prepared by TNO, the particulate emission from 15 European countries has been estimated (Berdowski et al. 1997). Here it appears that the emission from the agricultural sector contributes with approximately 5% of the total emission. In Denmark the emission from the agricultural activities makes up about 24% of the total emission. The higher emission is due to the fact that the agricultural production is relatively big compared to the size of the country.

### 7.2.6 Improvements

In future, it is planned to include dust emission from arable farming. Inventory from Finland shows that dust emission from arable farming contributes approximately 25% of the total emission from the agricultural sector (Karvosenoja and al. 2001og Louhekainen et al. 1987b). As it can be seen, the particle emission from this source is substantial and it is therefore important to apply in future emission inventories.

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### Appendix 7.1 Ammonia emission from agricultural activities 1985 - 2001

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
<b>NH3-N emission</b>	† NH3-N	† NH3-N	† NH3-N	† NH3-N	† NH3-N	† NH3-N	† NH3-N	† NH3-N	† NH3-N	† NH3-N	† NH3-N	† NH3-N	† NH3-N	† NH3-N	† NH3-N	† NH3-N	† NH3-N
Manure	87.048	86.856	83.365	82.447	81.215	79.249	77.358	77.091	75.449	71.497	67.294	66.095	66.376	67.910	65.732	65.228	64.413
Artificial fertilisers	7.870	7.315	7.332	7.146	7.444	8.662	8.427	7.866	7.569	7.861	7.605	6.644	6.171	6.234	5.787	5.582	5.143
Crops	13.165	13.130	13.071	12.979	12.911	12.987	12.889	12.819	11.795	11.481	11.583	11.632	11.782	11.658	11.243	11.146	11.203
Ammonia treated straw	5.385	6.621	7.348	5.968	7.409	8.393	7.118	6.319	6.240	6.672	5.464	4.168	3.687	3.046	1.710	2.031	1.333
Sewage sludge	34	38	41	45	55	62	67	75	82	86	90	88	75	76	74	69	67
Straw burning	255	221	207	167	234	0	0	0	0	0	0	0	0	0	0	0	0
<b>Sum*</b>	<b>113.756</b>	<b>114.180</b>	<b>111.365</b>	<b>108.752</b>	<b>109.268</b>	<b>109.353</b>	<b>105.859</b>	<b>104.170</b>	<b>101.134</b>	<b>97.596</b>	<b>92.036</b>	<b>88.627</b>	<b>88.092</b>	<b>88.924</b>	<b>84.547</b>	<b>84.056</b>	<b>82.159</b>

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
<b>NH3 emission</b>	† NH3	† NH3	† NH3	† NH3	† NH3	† NH3	† NH3	† NH3	† NH3	† NH3	† NH3	† NH3	† NH3	† NH3	† NH3	† NH3	† NH3
Manure	105.898	105.664	101.418	100.301	98.801	96.410	94.110	93.784	91.787	86.979	81.866	80.408	80.750	82.616	79.966	79.353	78.361
Artificial fertilisers	9.574	8.898	8.920	8.694	9.056	10.538	10.252	9.569	9.208	9.563	9.252	8.083	7.507	7.584	7.041	6.791	6.257
Crops	16.016	15.973	15.902	15.789	15.707	15.800	15.681	15.595	14.349	13.967	14.091	14.151	14.334	14.182	13.678	13.559	13.630
Ammonia treated straw	6.551	8.055	8.939	7.260	9.014	10.210	8.659	7.688	7.591	8.117	6.647	5.070	4.485	3.705	2.080	2.471	1.621
Sewage sludge	41	46	50	55	67	75	81	91	99	104	109	107	92	92	90	84	82
Straw burning	310	269	252	203	285	0	0	0	0	0	0	0	0	0	0	0	0
<b>Sum*</b>	<b>138.390</b>	<b>138.905</b>	<b>135.481</b>	<b>132.301</b>	<b>132.929</b>	<b>133.032</b>	<b>128.783</b>	<b>126.727</b>	<b>123.034</b>	<b>118.730</b>	<b>111.966</b>	<b>107.819</b>	<b>107.168</b>	<b>108.180</b>	<b>102.855</b>	<b>102.258</b>	<b>99.950</b>

\* includes emission from goats and emission from horses on small farms and riding schools

**Appendix 7.2 Animal categories, stable systems and N-excretion**

Livestock	Stabletype	Stable type	Manure type	N-excretion
Category		Allocation		2001
		dec.pct.		kg/head
Horses á 400 kg	Deep litter (boxes)	1,000	Deep litter	38,00
Horses á 600 kg	Deep litter (boxes)	1,000	Deep litter	50,00
Horses á 800 kg	Deep litter (boxes)	1,000	Deep litter	63,00
Bull, 0 - 6 mo., large	Deep litter (boxes)	0,910	Deep litter	11,60
	Deep litter, solid floor	0,090	Deep litter	11,60
Bull, 0 - 6 mo., jersey	Deep litter (boxes)	0,910	Deep litter	8,80
	Deep litter, solid floor	0,090	Deep litter	8,80
Bull, 6 mo. - 440 kg., large	Tied-up with liquid and solid manure	0,090	Solid manure	8,30
		0,090	+ liquid manure	16,00
	Tied-up with slurry	0,090	Slurry	24,30
	Slatted floor-boxes	0,300	Slurry	24,30
	Deep litter (all)	0,000	Deep litter	24,30
	Deep litter, solid floor	0,350	Deep litter	24,30
	Deep litter, slatted floor	0,110	Deep litter	14,58
		0,110	+ Slurry	9,72
	Deep litter, slatted floor, scrapes	0,020	Deep litter	14,58
		0,020	+ Slurry	9,72
	Deep litter, solid floor, scrapes	0,040	Deep litter	14,58
		0,040	+ Slurry	9,72
Bull, 0 - 6 mo.-328 kg, jersey	Tied-up with liquid and solid manure	0,090	Solid manure	6,20
		0,090	+ liquid manure	12,00
	Tied-up with slurry	0,090	Slurry	18,20
	Slatted floor-boxes	0,300	Slurry	18,20
	Deep litter (all)	0,000	Deep litter	18,20
	Deep litter, solid floor	0,350	Deep litter	18,20
	Deep litter, slatted floor	0,110	Deep litter	10,92
		0,110	+ Slurry	7,28
	Deep litter, slatted floor, scrapes	0,020	Deep litter	10,92
		0,020	+ Slurry	7,28
	Deep litter, solid floor, scrapes	0,040	Deep litter	10,92
		0,040	+ Slurry	7,28
Heifer, 0 - 6 mo., large	Deep litter (boxes)	0,890	Deep litter	5,80
	Deep litter, solid floor	0,110	Deep litter	5,80
Heifer, 0 - 6 mo., jersey	Deep litter (boxes)	0,890	Deep litter	4,90
	Deep litter, solid floor	0,110	Deep litter	4,90
Heifer, 6 mo. - calving, large	Tied-up with liquid and solid manure	0,080	Solid manure	11,90
		0,080	+ liquid manure	18,90
	Tied-up with slurry	0,080	Slurry	30,80
	Slatted floor-boxes	0,260	Slurry	30,80
	Loose-holding with beds, slatted floor	0,160	Slurry	30,80
	Deep litter (all)	0,000	Deep litter	30,80
	Deep litter, solid floor	0,270	Deep litter	30,80
	Deep litter, slatted floor	0,090	Deep litter	18,48
		0,090	+ Slurry	12,32
	Deep litter, slatted floor, scrapes	0,020	Deep litter	18,48
		0,020	+ Slurry	12,32
	Deep litter, solid floor, scrapes	0,040	Deep litter	18,48
		0,040	+ Slurry	12,32
Heifer, 6 mo. - calving, jersey	Tied-up with liquid and solid manure	0,080	Solid manure	8,30
		0,080	+ liquid manure	13,70
	Tied-up with slurry	0,080	Slurry	22,00
	Slatted floor-boxes	0,260	Slurry	22,00
	Loose-holding with beds, slatted floor	0,160	Slurry	22,00
	Deep litter (all)	0,000	Deep litter	22,00
	Deep litter, solid floor	0,270	Deep litter	22,00
	Deep litter, slatted floor	0,090	Deep litter	13,20
		0,090	+ Slurry	8,80
	Deep litter, slatted floor, scrapes	0,020	Deep litter	13,20
		0,020	+ Slurry	8,80
	Deep litter, solid floor, scrapes	0,040	Deep litter	13,20
Dairy cows, large	Tied-up with liquid and solid manure	0,150	Solid manure	62,60
		0,150	+ liquid manure	65,42
	Tied-up with slurry	0,250	Slurry	128,02
	Loose-holding with beds, slatted floor	0,360	Slurry	128,02
	Loose-holding with beds, slatted floor, scrapes	0,040	Slurry	128,02
	Loose-holding with beds, solid floor	0,090	Slurry	128,02
	Deep litter (all)	0,000	Deep litter	128,02
	Deep litter, slatted floor	0,070	Deep litter	76,81
		0,070	+ Slurry	51,21
	Deep litter, slatted floor, scrapes	0,010	Deep litter	76,81
		0,010	+ Slurry	51,21
	Deep litter, solid floor, scrapes	0,030	Deep litter	76,81
		0,030	+ Slurry	51,21



**Appendix 7.2 Animal categories, stable systems and N-excretion**

Livestock	Stabletype	Stable type	Manure type	N-excretion
Category	Allocation	Allocation	Allocation	2001
		dec.pct.		kg/head
Dairy cows, jersey	Tied-up with liquid and solid manure	0,150	Solid manure	51,75
		0,150	+ liquid manure	54,05
	Tied-up with slurry	0,250	Slurry	105,80
		0,360	Slurry	105,80
	Loose-holding with beds, slatted floor	0,040	Slurry	105,80
		0,090	Slurry	105,80
	Loose-holding with beds, slatted floor, scrapes	0,000	Deep litter	105,80
		0,070	Deep litter	63,48
	Loose-holding with beds, solid floor	0,070	+ Slurry	42,32
		0,010	Deep litter	63,48
Deep litter (all)	0,010	+ Slurry	42,32	
	0,030	Deep litter	63,48	
Deep litter, slatted floor	0,030	+ Slurry	42,32	
	0,080	Solid manure	20,57	
Suckling cattle	Tied-up with liquid and solid manure	0,080	+ liquid manure	36,50
		0,440	Deep litter	57,06
	Deep litter (all)	0,480	Deep litter	57,06
	Deep litter, solid floor			
Breeding ewe	Deep litter (all)	1,000	Deep litter	16,95
Goats	Deep litter (all)	1,000	Deep litter	16,95
Sows	Full slatted floor	0,130	Slurry	26,39
		0,550	Slurry	26,39
	Partly slatted floor	0,060	Solid manure	6,37
		0,060	+ liquid manure	20,02
	Solid floor	0,100	Deep litter	26,39
		0,070	Deep litter	8,71
	Deep litter	0,070	+ Slurry	17,68
		0,060	Deep litter	8,71
	Deep litter + slatted floor	0,060	+ Slurry	17,68
		0,030	Slurry	26,39
Deep litter + solid floor	0,360	Slurry	0,64	
	0,490	Slurry	0,64	
Outdoor sows	0,050	Solid manure	0,21	
	0,050	+ liquid manure	0,43	
Piglets	Full slatted floor	0,050	Deep litter	0,64
		0,050	Deep litter	0,32
Partly slatted floor	0,050	+ Slurry	0,32	
	0,570	Slurry	3,12	
Solid floor	0,330	Slurry	3,12	
	0,040	Solid manure	1,01	
Slaughter pigs	Full slatted floor	0,040	+ liquid manure	2,11
		0,010	Deep litter	3,12
Partly slatted floor	0,050	Deep litter	1,56	
	0,050	+ Slurry	1,56	
Solid floor				
Outdoor hens (100 pcs.)		1,000	Deep litter	23,75
		1,000	+ Solid manure	47,49
		1,000	+ Solid manure	7,92
Ecological hens (100 pcs.)		1,000	Deep litter	25,95
		1,000	+ Solid manure	51,91
		1,000	+ Solid manure	8,65
Scrabbe hens (100 pcs.)		1,000	Deep litter	28,00
		1,000	+ Solid manure	56,85
Battery hens, manure house (100 pcs.)		1,000	Solid manure	64,68
Battery hens, manure tank (100 pcs.)		1,000	Slurry	64,68
Battery hens, manure cellar (100 pcs.)		1,000	Solid manure	64,68
HPR-hens (egg for hatching) (100 pcs.)		1,000	Deep litter	60,79
		1,000	+ Solid manure	29,94
Pullet, consumption, net (100 pcs.)		1,000	Slurry	10,70
Pullet, consumption, floor (100 pcs.)		1,000	Deep litter	10,70
Pullet, egg for hatching (100 pcs.)		1,000	Deep litter	13,94
Broilers, conv. 40/37 days (1000 pcs.)		1,000	Deep litter	53,34
Broilers, skrabe(81 days) (1000 pcs.)		1,000	Deep litter	63,36
Turkey, male (100 pcs.)		1,000	Deep litter	87,82
Turkey, female (100 pcs.)		1,000	Deep litter	48,11
Ducks (100 pcs.)		1,000	Deep litter	17,26
Geese (100 pcs.)		1,000	Deep litter	56,08
Mink	Slurry system	0,500	Slurry	4,59
		0,500	Solid manure	1,07
		0,500	+ liquid manure	3,52
Foxes	Slurry system	0,050	Slurry	11,48
		0,950	Solid manure	2,68
		0,950	+ liquid manure	8,79

**Appendix 7.3 Distribution of stable types 1985 - 2001**

Livestock category	Stablety and manure systems	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
		Stable type dec.pt.	Stable type dec.pt.	Stable type dec.pt.	Stable type dec.pt.	Stable type dec.pt.	Stable type dec.pt.	Stable type dec.pt.	Stable type dec.pt.	Stable type dec.pt.	Stable type dec.pt.	Stable type dec.pt.	Stable type dec.pt.	Stable type dec.pt.	Stable type dec.pt.	Stable type dec.pt.	Stable type dec.pt.	Stable type dec.pt.
<b>Horses</b>	Deep litter (boxes)	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
<b>Cattle</b>																		
Bull, 0-6 mth.	Deep litter (boxes)	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	0,91
	Deep litter, solid floor	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,09
Bull, 6 mth.-440 kg (jersey = 328 kg)	Tied-up with liquid and solid manure	0,25	0,24	0,23	0,22	0,21	0,20	0,19	0,17	0,16	0,15	0,14	0,13	0,12	0,11	0,11	0,10	0,09
	Tied-up with slurry	0,25	0,24	0,23	0,22	0,21	0,20	0,19	0,17	0,16	0,15	0,14	0,13	0,12	0,11	0,11	0,10	0,09
	Slatted floor-boxes	0,45	0,44	0,43	0,43	0,42	0,41	0,40	0,40	0,39	0,38	0,37	0,37	0,36	0,35	0,35	0,32	0,30
	Deep litter (all)	0,05	0,05	0,04	0,04	0,03	0,03	0,03	0,02	0,02	0,02	0,01	0,01	0,00	0,00	0,00	0,00	0,00
	Deep litter, solid floor	0,00	0,02	0,04	0,06	0,08	0,10	0,12	0,14	0,16	0,18	0,20	0,22	0,24	0,27	0,27	0,31	0,35
	Deep litter, slatted floor	0,00	0,01	0,02	0,03	0,03	0,04	0,05	0,06	0,07	0,08	0,08	0,09	0,10	0,11	0,11	0,11	0,11
	Deep litter, slatted floor, scrapes	0,00	0,00	0,00	0,00	0,01	0,01	0,01	0,01	0,01	0,01	0,02	0,02	0,02	0,02	0,02	0,02	0,02
	Deep litter, solid floor, scrapes	0,00	0,00	0,01	0,01	0,01	0,01	0,02	0,02	0,02	0,02	0,03	0,03	0,03	0,04	0,04	0,04	0,04
Heifer, 0-6 mth.	Deep litter (boxes)	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	0,89
	Deep litter, solid floor	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,11
Heifer, 6 mth.-calving	Tied-up with liquid and solid manure	0,25	0,24	0,23	0,22	0,20	0,19	0,18	0,17	0,16	0,15	0,13	0,12	0,11	0,10	0,10	0,09	0,08
	Tied-up with slurry	0,25	0,24	0,23	0,22	0,20	0,19	0,18	0,17	0,16	0,15	0,13	0,12	0,11	0,10	0,10	0,09	0,08
	Slatted floor-boxes	0,45	0,44	0,43	0,42	0,41	0,40	0,39	0,38	0,37	0,36	0,35	0,34	0,33	0,32	0,32	0,29	0,26
	Loose-holding with beds, slatted floor	0,00	0,01	0,01	0,02	0,03	0,04	0,04	0,05	0,06	0,07	0,07	0,08	0,09	0,10	0,10	0,13	0,16
	Deep litter (all)	0,05	0,05	0,04	0,04	0,03	0,03	0,03	0,02	0,02	0,02	0,01	0,01	0,00	0,00	0,00	0,00	0,00
	Deep litter, solid floor	0,00	0,02	0,04	0,06	0,07	0,09	0,11	0,13	0,15	0,17	0,18	0,20	0,22	0,24	0,24	0,25	0,27
	Deep litter, slatted floor	0,00	0,01	0,01	0,02	0,03	0,04	0,04	0,05	0,06	0,07	0,07	0,08	0,09	0,10	0,10	0,09	0,09
	Deep litter, slatted floor, scrapes	0,00	0,00	0,00	0,00	0,00	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,02	0,02	0,02	0,02
	Deep litter, solid floor, scrapes	0,00	0,00	0,00	0,01	0,01	0,01	0,01	0,02	0,02	0,02	0,02	0,03	0,03	0,03	0,03	0,04	0,04
Dairy cows	Tied-up with liquid and solid manure	0,40	0,39	0,38	0,37	0,36	0,35	0,35	0,34	0,33	0,32	0,31	0,30	0,30	0,30	0,30	0,18	0,15
	Tied-up with slurry	0,45	0,45	0,44	0,44	0,44	0,44	0,43	0,43	0,43	0,43	0,42	0,42	0,36	0,30	0,30	0,28	0,25
	Loose-holding with beds, slatted floor	0,09	0,10	0,11	0,11	0,12	0,13	0,14	0,15	0,16	0,16	0,17	0,18	0,21	0,24	0,24	0,34	0,36
	Loose-holding with beds, slatted floor, scrapes	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,02	0,03	0,03	0,03	0,04
	Loose-holding with beds, solid floor	0,04	0,04	0,04	0,04	0,04	0,04	0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,06	0,09
	Deep litter (all)	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
	Deep litter, slatted floor	0,01	0,01	0,01	0,02	0,02	0,03	0,03	0,03	0,04	0,04	0,05	0,05	0,06	0,08	0,08	0,07	0,07
	Deep litter, slatted floor, scrapes	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,01	0,01	0,01	0,01
	Deep litter, solid floor, scrapes	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,02	0,02	0,02	0,03	0,03
Suckling cattle	Tied-up with liquid and solid manure	0,10	0,10	0,10	0,10	0,10	0,10	0,10	0,10	0,10	0,10	0,10	0,10	0,10	0,10	0,10	0,09	0,08
	Deep litter (all)	0,90	0,87	0,83	0,80	0,76	0,73	0,69	0,66	0,62	0,59	0,55	0,52	0,48	0,45	0,45	0,45	0,44
	Deep litter, solid floor	0,00	0,03	0,07	0,10	0,14	0,17	0,21	0,24	0,28	0,31	0,35	0,38	0,42	0,45	0,45	0,46	0,48

**Appendix 7.3 Distribution of stable types 1985 - 2001**

Livestock category	Stability and manure systems	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	
		Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable
		type	type	type	type	type	type	type	type	type	type	type	type	type	type	type	type	type	type
		dec. pct.	dec. pct.	dec. pct.	dec. pct.	dec. pct.	dec. pct.	dec. pct.	dec. pct.	dec. pct.	dec. pct.	dec. pct.	dec. pct.	dec. pct.	dec. pct.	dec. pct.	dec. pct.	dec. pct.	
<b>Sheep</b>		1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	
<b>Goats</b>		1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	
<b>Pigs</b>																			
Sows (incl. 22-25 pigs to 7.5 kg)	Full slatted floor	0,03	0,04	0,05	0,06	0,07	0,09	0,10	0,10	0,11	0,12	0,12	0,13	0,13	0,14	0,14	0,14	0,13	
	Partly slatted floor	0,50	0,51	0,52	0,53	0,55	0,56	0,57	0,57	0,57	0,57	0,57	0,57	0,57	0,57	0,57	0,56	0,55	
	Solid floor	0,44	0,41	0,38	0,36	0,33	0,30	0,27	0,25	0,22	0,20	0,17	0,15	0,12	0,10	0,07	0,07	0,06	
	Deep litter	0,04	0,04	0,04	0,04	0,05	0,05	0,05	0,05	0,06	0,06	0,07	0,07	0,08	0,09	0,09	0,10	0,10	
	Deep litter + slatted floor	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,01	0,01	0,02	0,02	0,03	0,03	0,04	0,04	0,06	0,07	
	Deep litter + solid floor	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,01	0,01	0,02	0,02	0,03	0,03	0,04	0,04	0,05	0,06	
Outdoor sows	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,01	0,01	0,01	0,02	0,02	0,02	0,03	0,03	0,03	0,03		
Piglets, 7.5-30 kg	Full slatted floor	0,40	0,43	0,46	0,49	0,51	0,54	0,57	0,60	0,57	0,54	0,51	0,49	0,46	0,43	0,40	0,38	0,36	
	Partly slatted floor	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,24	0,27	0,31	0,34	0,38	0,41	0,45	0,47	0,49	
	Solid floor	0,35	0,32	0,29	0,26	0,24	0,21	0,18	0,15	0,14	0,12	0,11	0,09	0,08	0,06	0,05	0,05	0,05	
	Deep litter (to-clima stables)	0,05	0,05	0,05	0,05	0,05	0,05	0,05	0,05	0,05	0,05	0,05	0,05	0,05	0,05	0,05	0,05	0,05	
	Deep litter + slatted floor	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,01	0,01	0,02	0,03	0,04	0,04	0,05	0,05	0,05	
Slaughter pigs, 30-98.3 kg (75 kg slaughter weight)	Full slatted floor	0,29	0,33	0,38	0,42	0,47	0,51	0,56	0,60	0,60	0,60	0,60	0,60	0,60	0,60	0,60	0,58	0,57	
	Partly slatted floor	0,30	0,29	0,27	0,26	0,24	0,23	0,21	0,20	0,21	0,23	0,24	0,25	0,26	0,28	0,29	0,31	0,33	
	Solid floor	0,40	0,36	0,33	0,29	0,26	0,22	0,19	0,15	0,14	0,12	0,11	0,09	0,08	0,06	0,05	0,05	0,04	
	Deep litter	0,01	0,02	0,02	0,03	0,03	0,04	0,04	0,05	0,04	0,04	0,03	0,03	0,02	0,02	0,01	0,01	0,01	
Partly slatted floor and partley deep litter	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,01	0,01	0,02	0,03	0,04	0,04	0,05	0,05	0,05		
<b>Poultry</b>																			
Outdoor hens, scrape-area	Deep litter + solid manure	0,00	0,00	0,00	0,00	0,00	0,00	0,01	0,02	0,04	0,05	0,06	0,07	0,08	0,09	0,09	0,09	0,09	
Ecological hens, scrape-area	Deep litter + solid manure	0,00	0,00	0,00	0,00	0,00	0,00	0,01	0,02	0,04	0,05	0,06	0,07	0,10	0,12	0,14	0,15	0,15	
Scrape hens, scrape-area	Deep litter + solid manure	0,07	0,08	0,09	0,09	0,10	0,11	0,11	0,12	0,12	0,13	0,13	0,13	0,15	0,17	0,18	0,18	0,17	
Battery hens, manure cellar	Solid manure	0,60	0,59	0,58	0,57	0,55	0,54	0,52	0,49	0,47	0,44	0,41	0,39	0,36	0,32	0,29	0,26	0,26	
	manure tank	Slurry	0,14	0,14	0,13	0,13	0,12	0,12	0,11	0,11	0,10	0,09	0,08	0,07	0,06	0,05	0,05	0,05	
manure house	Solid manure	0,19	0,19	0,20	0,21	0,22	0,23	0,23	0,24	0,24	0,25	0,25	0,26	0,25	0,25	0,24	0,27	0,27	
HPR-hens (egg for hatching)	Deep litter + solid manure	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	
Pullet, consumption, net, slur	Slurry	0,22	0,21	0,20	0,19	0,18	0,17	0,16	0,15	0,14	0,13	0,12	0,11	0,10	0,08	0,07	0,08	0,07	
Pullet, consumption, floor	Deep litter	0,52	0,53	0,54	0,55	0,56	0,57	0,58	0,60	0,61	0,62	0,63	0,64	0,65	0,66	0,67	0,69	0,67	
Pullet, egg for hatching, floor	Deep litter	0,26	0,26	0,26	0,26	0,26	0,26	0,26	0,26	0,26	0,26	0,26	0,26	0,26	0,26	0,26	0,23	0,25	
Broilers, conv. 39 days)	Deep litter	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	
Broilers, skrabe (81 days)	Deep litter	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	
Turkey, male (133 days)	Deep litter	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	
Turkey, female (133 days)	Deep litter	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	
Ducks (52 days)	Deep litter	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	
Geese (91 days)	Deep litter	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	
<b>Mink</b>																			
	Slurry system	0,10	0,12	0,13	0,15	0,17	0,18	0,20	0,20	0,22	0,23	0,25	0,26	0,28	0,29	0,30	0,42	0,50	
	Solid manure and black liquid	0,90	0,88	0,87	0,85	0,83	0,82	0,80	0,80	0,78	0,77	0,75	0,74	0,73	0,71	0,70	0,58	0,50	
<b>Foxes</b>																			
	Slurry system	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,02	0,05	
	Solid manure and black liquid	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	0,98	0,95	

**Appendix 7.4 Emission factors used for calculation of NH3 emission from husbandry manure**

Livestock category	Stabletype	Manuretype	Stable	Storage	Spreading	Grassing
			Loss of NH3-N	Loss of NH3-N	Loss of NH3-N	Loss of NH3-N
			pct. of N ab Anima	pct. of N ab Stable	pct. of N ab Storage	pct. of N ab Animal
<b>Horses</b>	Deep litter (boxes)	Deep litter	15,0	5,0	6,8	7,0
<b>Cattle</b>					6,8	
Bull, 0 - 6 mo., large	Deep litter (all)	Deep litter	6,0	8,8	6,8	7,0
Bull, 0 - 6 mo., jersey	Deep litter (all)	Deep litter	6,0	8,8	6,8	7,0
Bull, 6 mo. - 440 kg., large	Tied-up	Solid manure	5,0	5,0	6,8	7,0
		+ Black liquid	5,0	2,0	14,1	7,0
	Tied-up	Slurry	3,0	2,2	14,1	7,0
	Slatted floor-boxes	Slurry	8,0	2,2	14,1	7,0
	Deep litter (all)	Deep litter	6,0	8,8	6,8	7,0
	Deep litter, solid floor	Deep litter	6,0	8,8	6,8	7,0
	Deep litter, slatted floor	Deep litter	6,0	8,8	6,8	7,0
Bull, 0 - 6 mo., large		+ Slurry	8,0	2,2	14,1	7,0
	Deep litter, slatted floor, scrapes	Deep litter	6,0	8,8	6,8	7,0
		+ Slurry	6,0	2,2	14,1	7,0
	Deep litter, solid floor, scrapes	Deep litter	6,0	8,8	6,8	7,0
		+ Slurry	10,0	2,2	14,1	7,0
Bull, 6 mo. - 328 kg, jersey	Tied-up	Solid manure	5,0	5,0	6,8	7,0
		+ Black liquid	5,0	2,0	14,1	7,0
	Tied-up	Slurry	3,0	2,2	14,1	7,0
	Slatted floor-boxes	Slurry	8,0	2,2	14,1	7,0
	Deep litter (all)	Deep litter	6,0	8,8	6,8	7,0
	Deep litter, solid floor	Deep litter	6,0	8,8	6,8	7,0
	Deep litter, slatted floor	Deep litter	6,0	8,8	6,8	7,0
		+ Slurry	8,0	2,2	14,1	7,0
	Deep litter, slatted floor, scrapes	Deep litter	6,0	8,8	6,8	7,0
		+ Slurry	6,0	2,2	14,1	7,0
	Deep litter, solid floor, scrapes	Deep litter	6,0	8,8	6,8	7,0
		+ Slurry	10,0	2,2	14,1	7,0
Heifer, 0 - 6 mo., large	Deep litter (all)	Deep litter	6,0	8,8	6,8	7,0
Heifer, 0 - 6 mo., jersey	Deep litter (all)	Deep litter	6,0	8,8	6,8	7,0
Heifer, 6 mo. - calving, large	Tied-up	Solid manure	5,0	5,0	6,8	7,0
		+ Black liquid	5,0	2,0	14,1	7,0
	Tied-up	Slurry	3,0	2,2	14,1	7,0
	Slatted floor-boxes	Slurry	8,0	2,2	14,1	7,0
	Loose-holding with beds, slatted floor	Slurry	8,0	2,2	14,1	7,0
	Deep litter (all)	Deep litter	6,0	8,8	6,8	7,0
	Deep litter, solid floor	Deep litter	6,0	8,8	6,8	7,0
	Deep litter, slatted floor	Deep litter	6,0	8,8	6,8	7,0
		+ Slurry	8,0	2,2	14,1	7,0
	Deep litter, slatted floor, scrapes	Deep litter	6,0	8,8	6,8	7,0
		+ Slurry	6,0	2,2	14,1	7,0
	Deep litter, solid floor, scrapes	Deep litter	6,0	8,8	6,8	7,0
		+ Slurry	10,0	2,2	14,1	7,0
Heifer, 6 mo. - calving, jersey	Tied-up	Solid manure	5,0	5,0	6,8	7,0
		+ Black liquid	5,0	2,0	14,1	7,0
	Tied-up	Slurry	3,0	2,2	14,1	7,0
	Slatted floor-boxes	Slurry	8,0	2,2	14,1	7,0
	Loose-holding with beds, slatted floor	Slurry	8,0	2,2	14,1	7,0
	Deep litter (all)	Deep litter	6,0	8,8	6,8	7,0
	Deep litter, solid floor	Deep litter	6,0	8,8	6,8	7,0
	Deep litter, slatted floor	Deep litter	6,0	8,8	6,8	7,0
		+ Slurry	8,0	2,2	14,1	7,0
	Deep litter, slatted floor, scrapes	Deep litter	6,0	8,8	6,8	7,0
		+ Slurry	6,0	2,2	14,1	7,0
	Deep litter, solid floor, scrapes	Deep litter	6,0	8,8	6,8	7,0
		+ Slurry	10,0	2,2	14,1	7,0
Dairy cows, large	Tied-up	Solid manure	5,0	5,0	6,8	7,0
		+ Black liquid	5,0	2,0	14,1	7,0
	Tied-up	Slurry	3,0	2,2	14,1	7,0
	Loose-holding with beds, slatted floor	Slurry	8,0	2,2	14,1	7,0
	Loose-holding with beds, slatted floor, scri	Slurry	6,0	2,2	14,1	7,0
	Loose-holding with beds, solid floor	Slurry	10,0	2,2	14,1	7,0
	Deep litter (all)	Deep litter	6,0	8,8	6,8	7,0
	Deep litter, slatted floor	Deep litter	6,0	8,8	6,8	7,0
		+ Slurry	8,0	2,2	14,1	7,0
	Deep litter, slatted floor, scrapes	Deep litter	6,0	8,8	14,1	7,0
		+ Slurry	6,0	2,2	14,1	7,0
	Deep litter, solid floor, scrapes	Deep litter	6,0	8,8	6,8	7,0
		+ Slurry	10,0	2,2	14,1	7,0

**Appendix 7+A43.4 Emission factors used for calculation of ammonia emission from husbandry manure**

Livestock category	Stabletype	Manuretype	Stable	Storage	Spreading	Grassing	
			Loss of NH3-N	Loss of NH3-N	Loss of NH3-N	Loss of NH3-N	
			pct. of N ab Anima	pct. of N ab Stable	pct. of N ab Storage	pct. of N ab Animal	
Dairy cows, jersey	Tied-up	Solid manure	5,0	5,0	6,8	7,0	
		+ Black liquid	5,0	2,0	14,1	7,0	
	Tied-up	Slurry	3,0	2,2	14,1	7,0	
	Loose-holding with beds, slatted floor	Slurry	8,0	2,2	14,1	7,0	
	Loose-holding with beds, slatted floor, sci	Slurry	6,0	2,2	14,1	7,0	
	Loose-holding with beds, solid floor, scra	Slurry	10,0	2,2	14,1	7,0	
	Deep litter (all)	Deep litter	6,0	8,8	6,8	7,0	
	Deep litter, slatted floor	Deep litter	6,0	8,8	6,8	7,0	
		+ Slurry	8,0	2,2	14,1	7,0	
	Deep litter, slatted floor, scrapes	Deep litter	6,0	8,8	6,8	7,0	
		+ Slurry	6,0	2,2	14,1	7,0	
	Deep litter, solid floor, scrapes	Deep litter	6,0	8,8	6,8	7,0	
	+ Slurry	10,0	2,2	14,1	7,0		
Suckling cattle	Tied-up	Solid manure	5,0	5,0	6,8	7,0	
		+ Black liquid	5,0	2,0	14,1	7,0	
	Deep litter (all)	Deep litter	6,0	8,8	6,8	7,0	
	Deep litter, solid floor	Deep litter	6,0	8,8	6,8	7,0	
<b>Sheep and goats</b>							
Breeding ewe	Deep litter	Deep litter	15,0	5,0	6,8	7,0	
Goats	Deep litter	Deep litter	15,0	5,0	6,8	7,0	
<b>Pigs</b>							
Sows (incl. 22 piglets to 1.5 kg)	Full slatted floor	Slurry	20,0	3,4	14,1	7,0	
	Partly slatted floor	Slurry	10,0	3,4	14,1	7,0	
	Solid floor	Solid manure	16,0	25,0	6,8	7,0	
		+ Black liquid	16,0	2,0	14,1	7,0	
	Deep litter	Deep litter	15,0	12,5	6,8	7,0	
	Deep litter + slatted floor	Deep litter	15,0	12,5	6,8	7,0	
		+ Slurry	12,0	3,4	14,1	7,0	
	Deep litter + solid floor	Deep litter	15,0	12,5	6,8	7,0	
		+ Slurry	14,0	3,4	14,1	7,0	
		Slurry					
	Piglets, 7.5-30 kg	Outdoor sows	Slurry	16,0	3,4	14,1	7,0
		Full slatted floor	Slurry	10,0	3,4	14,1	7,0
Partly slatted floor		Slurry	25,0	25,0	6,8	7,0	
Solid floor		Solid manure	25,0	2,0	14,1	7,0	
		+ Black liquid	15,0	25,0	6,8	7,0	
Deep litter (to-clima stables)		Deep litter	15,0	25,0	6,8	7,0	
Deep litter + slatted floor		Deep litter	10,0	3,4	14,1	7,0	
		+ Slurry	16,0	3,4	14,1	7,0	
Partly slatted floor		Slurry	12,0	3,4	14,1	7,0	
Solid floor		Slurry	18,0	25,0	6,8	7,0	
Deep litter		Solid manure	18,0	2,0	14,1	7,0	
		+ Black liquid	15,0	18,8	6,8	7,0	
Slaughter pigs, 30-100 kg (76.3 kg slaughter weight)	Partly slatted floor	Slurry	15,0	18,8	6,8	7,0	
	Solid floor	Slurry	15,0	18,8	6,8	7,0	
	Deep litter	Solid manure	12,0	3,4	14,1	7,0	
		+ Black liquid	18,0	2,0	14,1	7,0	
	Deep litter	Deep litter	15,0	18,8	6,8	7,0	
	Partley slatted floor and partley deep litter	Deep litter	15,0	18,8	6,8	7,0	
	+ Slurry	12,0	3,4	14,1	7,0		
<b>Poultry</b>							
Hens (100 pcs)	Outdoor hens, scrape-area	Deep litter	25,0	9,5	6,8	7,0	
		+ Solid manure	40,0	5,0	6,8	7,0	
		+ Solid manure	0,0	0,0	6,8	7,0	
	Ecological hens, scrape-area	Deep litter	25,0	9,5	6,8	7,0	
	fedder bowl	+ Solid manure	40,0	5,0	6,8	7,0	
	fri-area	+ Solid manure	0,0	0,0	6,8	7,0	
	Scrape hens, scrape-area	Deep litter	25,0	9,5	6,8	7,0	
	fedder bowl	+ Solid manure	40,0	5,0	6,8	7,0	
	Battery hens, manure house	Solid manure	12,0	5,0	6,8	7,0	
	manure tank	Slurry	10,0	2,0	14,1	7,0	
	manure cellar	Solid manure	10,0	5,0	6,8	7,0	
	HPR-hens (egg for hatching)	Deep litter	25,0	9,5	6,8	7,0	
	+ Solid manure	40,0	5,0	6,8	7,0		
Pullet (100 prod. pcs.) (119 days)	Pullet, consumption, net, slurry tank	Slurry	40,0	5,0	14,1	7,0	
	Pullet, consumption, floor	Deep litter	25,0	9,5	6,8	7,0	
	Pullet, egg for hatching, floor	Deep litter	25,0	9,5	6,8	7,0	
Broilers (1000 prod. pcs.)	Broilers, conv. 39 days)	Deep litter	20,0	12,8	6,8	7,0	
	Broilers, skraibe (81 days)	Deep litter	25,0	12,8	6,8	7,0	
Turkey, male (100 pcs.)	Turkey, male (133 days)	Deep litter	20,0	15,0	6,8	7,0	
Turkey, female (100 pcs.)	Turkey, female (133 days)	Deep litter	20,0	15,0	6,8	7,0	
Ducks (100 pcs.)	Ducks (52 days)	Deep litter	20,0	15,0	6,8	7,0	
Geese (100 pcs.)	Geese (91 days)	Deep litter	20,0	15,0	6,8	7,0	
<b>Fur farming</b>							
Mink	Slurry system	Slurry	25,0	2,0	14,1	7,0	
	Solid manure	Solid manure	35,0	15,0	6,8	7,0	
	Black liquid	+ Black liquid	35,0	0,0	14,1	7,0	
Foxes	Slurry system	Slurry	25,0	2,0	14,1	7,0	
	Solid manure	Solid manure	35,0	15,0	6,8	7,0	
	Black liquid	+ Black liquid	35,0	0,0	14,1	7,0	

Appendix 7.5 Ammonia emission from spreading of husbandry manure

Manure type	methods	Crops	Time for application	Time before incorporation	Emission factor <sup>2</sup>	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001		
						Pct. of N ab storage																		
Liquid manure	Incorporated	-/+	winter-spring	0	2,0	0	0	0	0	0	0	0	0	1	1	1	1	1	2	2	5	10		
			Summer-autumn	0	2,0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	2	2	2	3	
	Trailing horses	-	-	winter-spring	< 12(6) hours	7,5	0	0	0	0	0	0	1	2	3	4	6	7	8	9	10	9	10	
				winter-spring	> 12(6) hours	10,5	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5	5	5	5
		+	+	winter-spring	not incorporated	20,5	0	0	0	0	0	0	3	7	10	13	17	20	23	27	30	32	43	
				Spring-summer	not incorporated	6,5	0	0	0	0	0	0	1	2	3	3	4	5	5	4	4	4	4	
		+	+	Late summer-autumn	not incorporated	2,5	0	0	0	0	0	0	1	1	2	3	3	4	4	4	4	4	4	5
				Late summer-autumn	< 12(6) hours	10,5	0	0	0	0	0	0	1	1	2	2	3	3	3	3	2	2	2	3
		-	-	Late summer-autumn	> 12(6) hours	20,5	0	0	0	0	0	0	0	0	1	1	1	2	2	1	1	0	0	0
				Late summer-autumn	not incorporated	25,5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Broad spreading <sup>1</sup>	-	-	winter-spring	< 12(6) hours	8,0	26	27	28	29	30	26	25	24	23	22	21	20	18	17	15	14	6
					winter-spring	> 12(6) hours	11,0	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	+		+	winter-spring	not incorporated	21,0	15	15	15	15	15	20	20	20	20	20	20	20	20	18	17	15	14	6
				Spring-summer	not incorporated	31,0	8	8	8	8	8	8	7	6	5	4	3	2	2	2	2	2	2	1
	+		+	Late summer-autumn	not incorporated	31,0	7	7	7	7	7	7	6	5	5	4	3	2	2	2	1	1	1	0,5
				Late summer-autumn	< 12(6) hours	11,0	2	3	3	4	4	4	4	4	4	3	3	3	3	3	2	2	2	1
	-		-	Late summer-autumn	> 12(6) hours	21,0	8	7	7	6	6	6	5	4	4	3	3	3	2	2	1	1	1	0,5
				Late summer-autumn	not incorporated	26,0	29	28	27	26	25	24	20	16	12	8	4	0	0	0	0	0	0	0
	<i>Sum</i>						100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
	Solid manure		Broad spreading	-	winter-spring	< 12(6) hours	4,5	13	16	19	22	25	26	26	27	28	29	29	30	32	33	35	38	49
winter-spring		> 12(6) hours			6,0	18	16	14	12	10	11	11	12	13	14	14	15	15	15	15	15	14	14	
-		-		winter-spring	not incorporated	11,0	19	18	17	16	15	14	14	13	12	11	11	10	10	10	10	9	10	
				Spring-summer	not incorporated	16,0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+		+		Late summer-autumn	not incorporated	16,0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
				Late summer-autumn	< 12(6) hours	6,0	13	16	19	22	25	25	25	25	25	25	25	25	25	25	25	25	26	18
-		-		Late summer-autumn	> 12(6) hours	11,0	13	11	9	7	5	5	5	5	5	5	5	5	5	5	5	5	5	3
				Late summer-autumn	not incorporated	13,5	24	23	22	21	20	19	19	18	17	16	16	15	13	12	10	9	9	6
<i>Kontrol:</i>						100	100	100	100	100	100	100	100	100	100	100	100	100	100	100,00	100,00			
<b>Weigthed emission factor</b>						<b>1985</b>	<b>1986</b>	<b>1987</b>	<b>1988</b>	<b>1989</b>	<b>1990</b>	<b>1991</b>	<b>1992</b>	<b>1993</b>	<b>1994</b>	<b>1995</b>	<b>1996*</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>		
Liquid manure ( $NH_3$ -N i pct. af total N)						19,83	19,61	19,39	19,17	18,95	19,38	18,56	17,75	16,93	16,11	15,30	14,48	14,43	14,38	14,34	14,12	13,69		
Solid manure ( $NH_3$ -N i pct. af total N)						9,21	8,94	8,67	8,40	8,13	8,03	7,93	7,83	7,73	7,63	7,53	7,43	7,28	7,13	6,98	6,80	6,37		

1) Prohibition on broadspreading of liquid manure per. 1. aug. 2003.

2) Based on Sommer, 1998

# Appendix 8 Uncertainty

June 2003

## Uncertainty of SO<sub>2</sub> emission inventory

SNAP	Gas	Base year emission	Year t emission	Activity data uncertainty	Emission factor uncertainty	Combined uncertainty	Combined uncertainty as % of total national emissions in year t	Type A sensitivity	Type B sensitivity	Uncertainty i trend in national emissions introduced by emission factor uncertainty	Uncertainty in trend in national emissions introduced by activity data uncertainty	Uncertainty introduced into the trend in total national emissions	
		Input data	Input data	Input data	Input data								
		Mg SO2	Mg SO2	%	%	%	%	%	%	%	%	%	
01	SO2	133114	11139	2	10	10,198	4,613	-0,039	0,0619	-0,391	0,175	0,428	
02	SO2	11197	3160	2	20	20,100	2,580	0,009	0,0176	0,181	0,050	0,188	
03	SO2	20430	7115	2	10	10,198	2,947	0,024	0,0395	0,240	0,112	0,265	
07	SO2	5769	355	2	50	50,040	0,720	-0,002	0,002	-0,121	0,006	0,121	
08	SO2	9403	2855	10	50	50,990	5,912	0,009	0,016	0,436	0,224	0,490	
Total	SO2	179914	24625				72,092					0,543	
<b>Total uncertainties</b>				<b>Overall uncertainty i the year (%):</b>				<b>8,491</b>	<b>Trend uncertainty (%):</b>				<b>0,737</b>

## Uncertainty of NO<sub>x</sub> emission inventory

SNAP	Gas	Base year emission	Year t emission	Activity data uncertainty	Emission factor uncertainty	Combined uncertainty	Combined uncertainty as % of total national emissions in year t	Type A sensitivity	Type B sensitivity	Uncertainty i trend in national emissions introduced by emission factor uncertainty	Uncertainty in trend in national emissions introduced by activity data uncertainty	Uncertainty introduced into the trend in total national emissions	
		Input data	Input data	Input data	Input data								
		Mg SO2	Mg SO2	%	%	%	%	%	%	%	%	%	
01	NOx	95479	48909	2	20	20,100	4,960	-0,078	0,1811	-1,560	0,512	1,642	
02	NOx	7237	7662	2	50	50,040	1,934	0,009	0,0284	0,435	0,080	0,442	
03	NOx	9508	14517	2	20	20,100	1,472	0,028	0,0537	0,558	0,152	0,578	
07	NOx	100118	70348	2	50	50,040	17,760	-0,011	0,2604	-0,574	0,737	0,934	
08	NOx	57797	56778	10	100	100,499	28,788	0,053	0,2102	5,308	2,972	6,084	
Total	NOx	270139	198214				1174,635					41,109	
<b>Total uncertainties</b>				<b>Overall uncertainty i the year (%):</b>				<b>34,273</b>	<b>Trend uncertainty (%):</b>				<b>6,412</b>

# National Environmental Research Institute

The National Environmental Research Institute, NERI, is a research institute of the Ministry of the Environment. In Danish, NERI is called *Danmarks Miljøundersøgelser (DMU)*.

NERI's tasks are primarily to conduct research, collect data, and give advice on problems related to the environment and nature.

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## Publications:

NERI publishes professional reports, technical instructions, and the annual report. A R&D projects' catalogue is available in an electronic version on the World Wide Web.

Included in the annual report is a list of the publications from the current year.