LE GOUVERNEMENT
DU GRAND-DUCHÉ DE LUXEMBOURG
Ministère de l'Environnement

Luxembourg's National Inventory Report 1990-2004

Submission under the United Nations Framework Convention on Climate Change

Luxembourg, 17 April 2007

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1 Introduction

The Guidelines for the preparation of National Communications by Parties included in Annex I of the United Nation Framework Convention on Climate Change (*UNFCCC*), published on 3rd September 2004, determine in paragraph 38 that 'Annex I Parties shall submit to the COP, through the Secretariat, a National Inventory Report (*NIR*) containing detailed and complete information on their inventories'.

The present NIR documents Luxembourg's greenhouse gas (*GHG*) emission inventory in accordance with the revised UNFCCC reporting guidelines on annual inventories. It is aimed at complying with decisions 11/CP.4, 3/CP.5 and 18/CP.8 of the Conference of the Parties, and the Council Decision 280/2004/EC concerning a Mechanism for Monitoring Community GHG emissions and for implementing the Kyoto Protocol. It includes a description of the methodologies and data sources used for estimating emissions by sources and removals by sinks, a discussion of these estimates and their trends (including an analysis of the key source categories), and information on recalculation, uncertainties, quality assessment and quality control.

The GHG inventory reviewed in the present NIR contains information on anthropogenic emissions by sources and removals by sinks for direct greenhouse gases (CO_2, CH_4, N_2O, PFCs, HFCs, and SF_6), indirect GHG (CO, NOx, NMVOCs) and SO_2. It covers the period 1990-2004 and corresponds to Luxembourg's submission to both the UNFCCC Secretariat and the European Commission on 27 March 2007 (submission referenced as 'Submission 2007 v1.1'). A copy of the e-mail accompanying this submission is reproduced in Annex IV and the complete inventory year 2004 is given in Annex I to this report.

Complete CRF tables, for the years 1990 to 2004, are provided together with this report both on CD-ROM and in the Central Data Repository of the ReportNet tool of the EIONET network of the European Environment Agency (*EEA*).[1]

1.1 Description of Luxembourg's National GHG Inventory System

1.1.1 National Inventory Compiler

The Ministry of the Environment acts as the 'National Inventory Compiler' (*NIC*). In this respect, the Ministry is responsible for transmitting the inventories (and its associated NIR) to the European Commission and to the UNFCCC Secretariat. However, in conformity with the law of 27 November 1980, which created an Environment Agency,[2] the national GHG inventories, as well as the NIR, are prepared by the Air/Noise department of this Agency. All the material, estimates and calculation sheets, as well as the documentation on scientific papers and the basic data needed for the inventories compilation, are stored and archived within the Agency; the Ministry keeping only copies of the inventories (CRF tables) and of the related reports (such as the NIR) in its archives. It is worth noticing that the Environment Agency is also responsible for preparing emission

[1] http://cdr.eionet.europa.eu/lu/eu/ghgmm/envrgjxpg

[2] The Environment Agency is directly linked to the Ministry of the Environment and works under its supervision.

inventories under the Convention on Long Range Transboundary Air Pollution (*CLRTAP*) and the EU emission ceilings Directive (*NEC*).

Acting as the NIC, the Ministry is controlling the data delivered by the Agency, notably with the help of the CRF Reporter software that helps performing the completeness and inventory checks. It is also the Ministry that generates the final MS Excel CRF tables and prepares the official submission using CRF Reporter.

Submission v1.1 of March 2007 is the first one that has been realized by transferring all the data tables into – and therefore using – CRF Reporter. The version of the software that has been used is 3.1.11. Annex III indicates the issues and problems encountered by Luxembourg while transferring data into and using this version of CRF Reporter.

During the year 2007, and with the help of a consultant, it is intended to develop further the national GHG inventory system allowing for a full observance of the obligations of the Kyoto Protocol.[3] This work will be realized concomitantly with the verification and the completion of GHG inventories to be carried out in line with the IPCC Good Practice Guidance and Uncertainty Management in National GHG Inventories as well as the IPCC Good Practice Guidance for LULUCF.

1.1.2 Current inventories: main characteristics

Data used to produce the annual air emission (including GHG) inventories are mainly:

- taken from official statistical datasets calculated by the National Statistics Office (*STATEC*);
- coming from information supplied directly by the operators of industrial or other activities;
- extracted from statistical information received from other ministries (for example Ministry of Economic Affairs and External Trade for energy).

However, some of the information necessary to prepare the inventories is not available in Luxembourg. In these cases, data from other European countries or from the literature were taken as default data.

Inventories have been compiled according to the CORINAIR/EMEP methodology using software tools developed for the EEA:

- **CollectER II** (*Collect Emission Register*) is a tool dedicated to national air emission experts in order to update a national emission inventory. It is part of a set of software tools developed by ETC/ACC to assist national experts in compiling an air emissions inventory. The program CollectER II therefore includes the following main functions:
  - it supports collecting air emissions data of area and point sources;
  - it stores these data in an emission inventory in a spatial resolved database, using EUROSTAT´s NUTS territorial definition.

[3] Decision 15/CMP.1, part II (Reporting of supplementary information under Article 7, paragraph 2, D. National systems in accordance with Article 5, paragraph 1).

- **ReportER II** (*Report Emission Register*) is a software tool determined for national experts on air emissions. Based on the national emissions inventory data stored in the CollectER annual inventory databases, the latest version (December 2002) of ReportER can create a set of UNFCCC reports and UNECE/CLRTAP/EMEP reports.

- **COPERT III** (*Computer Programme to Calculate Emissions from Road Transport*) is an MS Windows software tool for the calculation of emissions from road transport. [4] Furthermore, emissions from internal combustion engines used in off road applications are also covered. The emissions calculated include all major pollutants (CO, NOx, VOC, PM) and several more (N_2O, NH_3, SO_2, ...).

Hence, mostly CORINAIR or IPCC Tier 1 approaches have been used for estimating GHG emissions, except when COPERT III was used (COPERT III is referred in IPCC Guidelines as a Tier 3 method).[5]

For some gases or activities, the lack of background data led Luxembourg to rely on (sometimes strong) hypotheses. The main ones are described below:

- F-gases: a first analysis and estimation of the emissions generated by the use of fluorinated greenhouse gas types – HFCs, PFCs and SF_6 – has been performed end 1999 by the Environment Agency and the CRTE (*Centre de Ressources des Technologies pour l'Environnement*). This analysis indicated that there are emission sources or emissions due to applications for both HFCs and SF_6 – but none for PFCs – and provided estimated amounts in CO_2-eq. for the years 1995, 2000 and 2005. On the basis of that study, it had been decided that estimates for the year 1995 would be used for the GHG inventories prior to the year 2000 and that estimates for the year 2000 would be used from that year onwards (this explains the break in the serie between 1999 and 2000 for F-gases in tables 3 and 4 below);

- Solvent and Other product use (CRF 3): the total emissions of Volatile Organic Compounds (*VOC*) due to solvents and other product use has been taken as the starting point for calculating resulting CO_2 emissions. For those activities for which information was available, these emissions of VOC are themselves based on estimates of the various solvent containing products application or consumption in Luxembourg as they were known for the early '90s. On the other hand, for those activities for which no information on consumption or application of solvent containing products were available for Luxembourg, standard consumption estimates of these products for the neighbouring countries or for Europe as a whole have been used;

- LULUCF (CRF 5): a first estimate of carbon captured by the forests and other woody biomass in Luxembourg has suggested an amount of 294 930 t of CO_2 per year. This value has been reported in all the GHG inventories from 1990 onwards since the area covered by forests in Luxembourg has barely changed: 88 620 ha in 1990, 89 740 in 2002 (last available year). As regards emissions of N_2O in the context of LULUCF, an estimate has been calculated in the

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[4] Chariton Kouridis, Leonidas Ntziachristos and Zissis Samaras, *COPERT III - Computer programme to calculate emissions from road transport - user manual (version 2.1)*.Technical Report N°50, European Environment Agency, Copenhagen, 2000.

[5] However, in our CRF Tables, this method is referred to as a CORINAIR method (CR notation key).

early '90s with the help of the French CITEPA. It concluded to an amount of around 70 t of N_2O, a value that has been reported in all GHG inventories since 1990;

- Waste (CRF 6): a value of 10 000 t of CO_2 has been included in each annual GHG inventory since 1990. This value corresponds to the carbon dioxide emissions resulting from the combustion of the non-biomass fraction of municipal waste in the sole incineration plant of the country.

As regards road traffic, air emissions are calculated with the help of COPERT III which deals only with data relating to the national vehicle fleet. In other words, air emissions are based on the estimated actual fuel consumption of the car fleet registered in Luxembourg. However, due to the impact of 'fuel export' in Luxembourg (see Chapter 2.1 below), CO_2, CH_4 and N_2O emissions, and only those so far, are corrected to reflect this particularity.[6] The correction is based on total road fuel sales data.

As regards quality control and assessments, it is worth noticing that Luxembourg has not yet developed a fully operational QA/QC system and has not yet performed uncertainty analyses.

Finally, until today, confidentiality of data has not been a major problem in the making of air emissions inventories.

1.2 Key Category Analysis

The identification of key categories is described in the IPCC Good Practice Guidance (IPCC-GPG, 2000), Chapter 7 and in the IPCC Good Practice Guidance for Land Use, Land-Use Change and Forestry (IPCC-GPG-LULUCF, 2003), chapter 5.4. It stipulates that a key category is one that is prioritised within the National System because its estimate has a significant influence on a country's total inventory of greenhouse gases in terms of the absolute level of emissions or removals, the trend in emissions or removals, or both.

All notations, descriptions of identification and results for key categories included in this chapter are based on the IPCC Good Practice Guidance.

The identification includes all reported greenhouse gases CO_2, CH_4, N_2O, HFC, PFC and SF_6, and all IPCC categories.

The presented key category analysis was performed by the Ministry of the Environment on the basis of submission 2007 v1.1 to the UNFCCC. It comprises a level assessment for all years between 1990 and 2004, as well as a trend assessment for the trend of the year 2004 with respect to base year emissions. It was not yet possible to follow the recommendations stipulated in the IPCC-GPG-LULUCF that suggest to first identify key source categories excluding LULUCF and then to repeat the key category analysis for the full inventory including LULUCF categories. Indeed, as indicated

[6] Other gases than CO_2, CH_4 and N_2O have not yet been corrected for 'fuel export' due to the lack of information on the characteristics of transit vehicles fuelling in Luxembourg.

above, LULUCF emissions are based on rough estimates kept unchanged during the period 1990-2004. Performing therefore a key source analysis including LULUCF would not have much sense.

1.2.1 Key Categories

This chapter presents the results of Luxemburg's key category analysis.

The identified key categories are listed in Table 1. The key source categories comprise 12 365.44 Gg CO_2 eq. in the year 2004, which is a share of 96.7% of Luxembourg's 2004 total GHG emissions (without LULUCF).

Table 1 – Key categories based on emission data recorded in submission 2007 v1.1 to the UNFCCC

IPCC	IPCC source category	Fuel	Gas	Gg CO_2eq	Share in National Total Emissions
1 A 1 a	Public Electricity and Heat Production	Gaseous	CO2	371.10	2.90%
1 A 1 a	Public Electricity and Heat Production	Solid	CO2	0.00	0.00%
1 A 2 a	Iron and Steel	Gaseous	CO2	250.08	1.96%
1 A 2 a	Iron and Steel	Solid	CO2	1.89	0.01%
1 A 2 f	Other	Gaseous	CO2	1573.33	12.30%
1 A 2 f	Other	Liquid	CO2	328.59	2.57%
1 A 2 f	Other	Solid	CO2	333.64	2.61%
1 A 3 b	Road Transportation	Diesel oil	CO2	5182.76	40.53%
1 A 3 b	Road Transportation	Diesel oil	N2O	190.21	1.49%
1 A 3 b	Road Transportation	Gasoline	CO2	1771.77	13.85%
1 A 3 b	Road Transportation	Gasoline	N2O	67.09	0.52%
1 A 4 a	Commercial/Institutional	Gaseous	CO2	271.49	2.12%
1 A 4 a	Commercial/Institutional	Liquid	CO2	342.34	2.68%
1 A 4 a	Commercial/Institutional	Solid	CO2	3.94	0.03%
1 A 4 b	Residential	Gaseous	CO2	271.49	2.12%
1 A 4 b	Residential	Liquid	CO2	344.64	2.69%
1 A 4 b	Residential	Solid	CO2	3.94	0.03%
1 A 4 c	Agriculture/Forestry/Fisheries	Liquid	CO2	75.13	0.59%
2 A 1	Cement Production		CO2	445.01	3.48%
2 C 1	Iron and Steel Production		CO2	240.31	1.88%
4 A 1	Cattle		CH4	150.99	1.18%
4 D 1	Direct Soil Emissions		N2O	145.70	1.14%

Table 2 – Key categories (qualitative) based on emission data recorded in submission 2007 v1.1 to the UNFCCC

IPCC	IPCC source category	Fuel	Gas	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2004
				LA	LA	LA	LA	LA	LA	LA	LA	LA	LA	LA	LA	LA	LA	LA	TA
1 A 1 a	Public Electricity and Heat Production	Gaseous	CO2					X	X	X	X	X	X	X	X	X	X	X	X
1 A 1 a	Public Electricity and Heat Production	Solid	CO2	X	X	X	X	X	X	X	X								
1 A 2 a	Iron and Steel	Gaseous	CO2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
1 A 2 a	Iron and Steel	Solid	CO2	X	X	X	X	X	X	X	X								X
1 A 2 f	Other	Gaseous	CO2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
1 A 2 f	Other	Liquid	CO2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
1 A 2 f	Other	Solid	CO2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
1 A 3 b	Road Transportation	Diesel oil	CO2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
1 A 3 b	Road Transportation	Diesel oil	N2O						X	X	X	X	X	X	X	X	X	X	X
1 A 3 b	Road Transportation	Gasoline	CO2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
1 A 3 b	Road Transportation	Gasoline	N2O									X			X				
1 A 4 a	Commercial/ Institutional	Gaseous	CO2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
1 A 4 a	Commercial/ Institutional	Liquid	CO2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
1 A 4 a	Commercial/ Institutional	Solid	CO2		X	X	X												
1 A 4 b	Residential	Gaseous	CO2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
1 A 4 b	Residential	Liquid	CO2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
1 A 4 b	Residential	Solid	CO2			X	X												
1 A 4 c	Agriculture/ Forestry/ Fisheries	Liquid	CO2						X	X	X	X	X	X	X	X	X		
2 A 1	Cement Production		CO2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2 C 1	Iron and Steel Production		CO2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4 A 1	Cattle		CH4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
4 D 1	Direct Soil Emissions		N2O	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	

** LA = Level Assessment*

** TA = Trend Assessment*

The identification of key source categories follows the Tier 1 method - quantitative approach described in the Good Practice Guidance (IPCC-GPG, 2000), Chapter 7 *Methodological Choice and Recalculation* but not, as indicated above, the IPCC Good Practice Guidance for Land Use, Land-Use Change and Forestry (IPCC-GPG-LULUCF, 2003), Chapter 5.4 *Methodological Choice – Identification of key categories*.

The analysis includes all GHG reported under UNFCCC: CO_2, CH_4, N_2O, HFC, PFC and SF_6. All IPCC categories are included.

As indicated above, key categories were only identified for the inventory excluding LULUCF. Therefore, the identification of key categories consisted of four steps:

- Identifying categories;
- Level Assessment excluding LULUCF;
- Trend Assessment excluding LULUCF;
- Qualitative considerations.

1.3 QA/QC procedures

As regards quality control, it is worth noticing that Luxembourg has not yet developed a fully operational QA/QC system. However, for verification of the country-specific emission factors the default emission factors of the Revised 1996 IPCC Guidelines for National Greenhouse gas Inventories have been used.

1.4 Uncertainty Assessment

As regards assessments, Luxembourg has not yet performed uncertainty analyses.

1.5 Completeness

Explanations for NE are provided in **CRF TABLE 9(a) COMPLETENESS - INFORMATION ON NOTATION KEYS.**

1.6 Planned improvements

The main plain improvements are as follows:

- General improvements:
  - revising the emission factors;
  - revising the activity data;
  - changing methodology from CORINAIR (simple) to higher Tier;
  - providing more detailed information for specific methods;
  - verification procedures.
- Sector specific improvements:
  - Sector 1 A 4: revising energy split between commercial/institutional and residential;
  - Sector 2: improve the F-gases emissions estimates;
  - Sector 3: update the estimates of VOC used;
  - Sector 5: analyze how to estimate LULUCF categories;
  - Sector 6: re-allocate waste incineration in the correct category.

- Elements of QA/QC System (GPG 2000):
  - a body (service, group of persons) responsible for coordinating QA/QC activities;
  - reporting, documentation, and archiving procedures;
  - a QA/QC plan: e.g. system for transparent documentation and archiving, and basic Tier 1 QC;
  - general QC procedures (Tier 1);
  - source category-specific QC procedures (Tier 2);
  - QA review procedures.

2 Trend in total emissions

According to the Kyoto Protocol, Luxembourg's GHG emissions will have to be 8% below base year emissions during the five-year commitment period from 2008 to 2012. The European Community and its Member States also have a common reduction target of 8%, which they decided to achieve jointly. In April 2002 the Council of the EC has adopted a decision, the so-called 'burden sharing agreement'[7] which includes reduction targets for each EC Member State. Luxembourg agreed to reduce its GHG emissions for 2008–2012 by 28% compared to base year emissions.

When analyzing emissions trends for Luxembourg, one should keep in mind that the IPCC methodology used for compiling GHG inventories is raising some peculiar issues for small countries, in particular because of the 'territory' or 'origin' principle underpinning it. Therefore, GHG emissions structure and development have to be examined bearing in mind that Luxembourg:

- has a widely open economy with an important cross-border workforce. By the end of 2004, around 113 000 commuters from neighbouring countries came everyday to work in Luxembourg and represented about 40% of the salaried employment or a quarter of the resident population. The cross-border employment growth rate has been around an average of 8.4% annually between 1990 and 2004;
- has clearly become a crossroads for international traffic. By its location at the centre of the western European traffic axes, the country faces important road traffic in transit for both goods (freight transport) and passengers (tourists on their way to southern Europe). The strong impact on GHG emissions of this constantly growing traffic in transit is reinforced by the increasing number of commuters that goes hand in hand with the economic development of the country;
- faces a strong population growth, due to immigration. For instance, between 1990 and 2004, population was multiplied by 1.2 (from 380 000 to 452 000 inhabitants);
- has to cope with the potential impact of single projects on its total GHG emissions. As an example, one can mention a gas-vapour turbine of 380 MW operating since mid-2002. This power plant has been allocated more than 1 million tonnes of carbon dioxide (CO_2) in the first Luxembourg's National Allocation Plan (*NAP*). This amount equals to one-third of the total quantity of allowances allocated to the emissions trading sector covered by Directive 2003/87/EC;
- was dependent highly on electricity imports until the nineties. This situation led the country to develop its own resources by giving preference to renewables and energy-efficient techniques. These efforts in promoting electricity production from renewables had, and still has, no effects on the national CO_2 emissions according to the IPCC methodology, as it replaces electricity which was imported beforehand. Even worse, cogeneration plants, and in general national electricity production based on fossil fuels, even though with energy-efficient

[7] Council Decision of 25 April 2002 (2002/358/CE) concerning the approval, on behalf of the EC, of the KP to the UNFCCC and the joint fulfilment of commitments thereunder.

technologies (as the gas-vapour turbine mentioned above), has a negative impact on Luxembourg's GHG emissions and its 'Kyoto balance'.

2.1 Description of emission trends for aggregated GHG emissions

Looking at the period between 1990 and 2004, GHG emissions of Luxembourg have been rather stable up to 1994. Between 1995 and 1998 they have decreased significantly. But since 1999, they have increased constantly from year to year, mainly because energy consumption and fuels sales in the transport sector have increased.

The variations in those 15 years were essentially caused by changes of production techniques, changes of fuel types and changes of energy use. A major example for a production technique change took place in the iron and steel industry, where steel production process was modified – move from blast furnaces to electric arc furnaces – and, therefore, solid fuels (coke) were replaced to a very large extent by electricity. Due to that technological change, the total energy consumption in steel industry was significantly reduced (see Figure 8 in Chapter 2.3). Changes also occurred for the industrial and domestic sectors, where the consumption of liquid fuels (residual oil, gasoline) was reduced in favour of natural gas.

More precisely, throughout the period 1990-2004, the main greenhouse gas has remained carbon dioxide, which accounts for around 93% to 95% of total GHG emissions (excluding LULUCF). However, the structure of CO_2 emissions has evolved with an increase in fuel combustion, which accounted for 83% of total GHG emissions (excluding LULUCF) for the base year (1990) and climbed up to 88% in 2004.

Road transport, and more precisely 'fuel export' (i.e. fuel sold in Luxembourg but mostly consumed abroad), is one of the culprit for this development. Indeed, in 1990, fuel combustion from the transport sector accounted for 21,5% of total GHG emissions (excluding LULUCF). Then, with nearly 7 millions of tonnes of CO_2, this percentage reached 55% in 2004. CO_2 emissions due solely to 'fuel export' amounted to about 1.9 millions of tonnes in 1990 and reached almost 5.2 millions of tonnes in 2004, i.e. roughly a threefold increase (the same comparison shows only a twofold increase for road fuel consumed by the national vehicle fleet). In 2004, 'fuel export' represented 76.5% of CO_2 emissions due to the transport sector and more than 40% of total GHG emissions (excluding LULUCF). For 1990, these percentages were, respectively, 71.5% and 14.5%.

The small size of Luxembourg, and therefore of its economy, has also striking impacts on GHG emissions developments in other areas than transport. The structure of the economy, the related energy demand and the energy and emissions balances may vary significantly, whether a new economic activity starts its operations or an existing one ceases them. This characteristic explains, for instance, the reduction of emissions pertaining to the industrial sector: with 7.2 millions of tonnes in 1990, CO_2 emissions from industrial processes and fuel combustion in industry accounted for 57% of total GHG emissions (excluding LULUCF). They could eventually be reduced to 2.5 millions of tonnes in 1998 – i.e. to 29% of total GHG emissions – mainly after the restructuring of the steel industry took place in the mid-nineties (move from blast furnaces to electric arc furnaces indicated above). At that time, GHG emissions of Luxembourg were one third below their base year level.

Table 3 to Table 7 and Figure 1 to Figure 7 below illustrate the developments and characteristics highlighted above.

Comment 1: reference year compensation

As indicated above, the IPCC methodology is based on the 'territory' or 'origin' principle. This approach lead to GHG emissions inventories appearing worse than it would have been if the real in and outflows of the country would be correctly reflected in the inventories. If the polluters principle would have been applied, then, in 2004 e.g., GHG emissions would have been 2.54 millions of tonnes of CO_2-eq. lower than indicated in Table 3. Indeed, for 2004, electricity imports by Luxembourg – which are not to be accounted for in the national GHG inventories – are estimated having generated 2.63 millions of tonnes of CO_2-eq., whereas emissions from 'fuel export' amounted to 5.17 millions of tonnes of CO_2-eq.

The IPCC methodology also penalizes Luxembourg in its attempts to develop an efficient and 'coal-poor' national electricity production aiming at replacing imported energy. For many years Luxembourg has promoted, both financially and technically, the installation of highly efficient co-generation power plants. Moreover, a gas-vapour turbine of 350 MW has been built and electricity production from renewables has been noticeably increased. Consequently, since 2003, electricity imports, with an estimated CO_2-eq. emission factor of 0.78 (1000 tonnes of CO_2 per GWh), have been reduced by more than 2000 GWh and substituted by a national electricity production whose mean emission factor is estimated being 0.41. Luxembourg thus improved the European GHG balance by more than 1 million of tonnes of CO_2-eq., whereas, in the same time, its own GHG inventories have been burdened by the emissions generated by the 'coal-poor' and energy-efficient installations it has supported.

Comment 2: the base year issue for Luxembourg

In Council Decision 2002/358/EC of 25 April 2002 concerning the approval, on behalf of the European Community, of the Kyoto Protocol to the United Nations Framework Convention on Climate Change and the joint fulfilment of commitments thereunder,[8] the various commitments of the Member States were expressed as percentage changes from the base year. It was foreseen that, in 2006, the respective emission levels would be expressed in terms of tons of CO_2 equivalent (see Council Decision C(2006)6468 of 14 December 2006). In this context, Luxembourg made a statement to the Council Conclusions of 4 March 2002 (6810/02) to take into account its special national circumstances and its assumptions concerning its base year emission level. More precisely, the report on the in-depth review of the first National Communication of Luxembourg (doc. FCCC/IDR1/LUX of 17 October 1997) mentioned an amount of 13.9 millions of tonnes of CO_2 equivalent for Luxembourg in 1990. This level of emission was definitely used as the basis for calculating Luxembourg's Kyoto reduction target. Therefore, Luxembourg asks for due consideration of this situation, as well as of the special circumstances described in this chapter of this report, when taking a final decision on its assigned amount.

[8] OJ L130, 15.5.2002 (see also document FCCC/CP/2002/2).

Table 3 – Luxembourg's GHG emissions and removals 1990-2004: by main gases

Gg (1000 t.) CO_2 equivalent	1990 (base year)	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
CO_2	12104.44	12382.86	12172.16	12518.85	11622.86	9157.55	9216.78	8569.30	7742.34	8316.24	8827.76	9096.11	10030.68	10486.28	11978.01
	95.41%	*95.47%*	*95.24%*	*95.33%*	*94.97%*	*93.68%*	*93.57%*	*92.95%*	*92.11%*	*92.38%*	*92.45%*	*92.54%*	*93.07%*	*93.23%*	*93.66%*
fuel combustion	10528.80	10856.30	10745.55	11024.54	10309.26	8194.41	8300.64	7728.03	7084.52	7626.17	8109.87	8434.71	9221.33	9739.23	11210.98
	82.99%	*83.70%*	*84.07%*	*83.95%*	*84.24%*	*83.83%*	*84.27%*	*83.82%*	*84.29%*	*84.72%*	*84.94%*	*85.81%*	*85.56%*	*86.59%*	*87.66%*
fuel combustion from transport sector	*2724.47*	*3317.22*	*3574.99*	*3633.52*	*3665.55*	*3452.55*	*3532.57*	*3802.12*	*3984.09*	*4343.90*	*4977.76*	*5222.59*	*5419.96*	*6018.90*	*6986.62*
	21.48%	*25.58%*	*27.97%*	*27.67%*	*29.95%*	*35.32%*	*35.86%*	*41.24%*	*47.40%*	*48.26%*	*52.13%*	*53.13%*	*50.29%*	*53.51%*	*54.63%*
of which, 'fuel export' (share)	71.50%	76.62%	69.13%	69.65%	69.54%	67.38%	67.79%	69.53%	70.16%	71.49%	73.03%	73.36%	73.65%	76.44%	76.44%
industrial processes	1556.59	1507.48	1407.50	1475.13	1294.38	943.86	896.78	821.87	638.36	670.58	698.54	642.24	790.14	727.84	747.81
	12.27%	*11.62%*	*11.01%*	*11.23%*	*10.58%*	*9.66%*	*9.10%*	*8.91%*	*7.59%*	*7.45%*	*7.32%*	*6.53%*	*7.33%*	*6.47%*	*5.85%*
other sources (1)	19.05	19.08	19.11	19.18	19.22	19.28	19.36	19.40	19.46	19.49	19.35	19.16	19.21	19.21	19.22
	0.15%	*0.15%*	*0.15%*	*0.15%*	*0.16%*	*0.20%*	*0.20%*	*0.21%*	*0.23%*	*0.22%*	*0.20%*	*0.19%*	*0.18%*	*0.17%*	*0.15%*
CH_4 (2)	364.22	356.95	347.42	352.52	344.72	352.79	359.46	357.63	358.03	359.18	354.67	352.26	353.61	351.69	348.96
	2.87%	*2.75%*	*2.72%*	*2.68%*	*2.82%*	*3.61%*	*3.65%*	*3.88%*	*4.26%*	*3.99%*	*3.71%*	*3.58%*	*3.28%*	*3.13%*	*2.73%*
N_2O (3)	201.50	213.90	244.90	244.90	254.20	248.00	257.30	275.90	288.30	310.00	319.30	334.80	347.20	362.70	415.40
	1.59%	*1.65%*	*1.92%*	*1.86%*	*2.08%*	*2.54%*	*2.61%*	*2.99%*	*3.43%*	*3.44%*	*3.34%*	*3.41%*	*3.22%*	*3.22%*	*3.25%*
F-gases (4)	16.53	16.53	16.53	16.53	16.53	16.53	16.53	16.53	16.53	16.53	46.58	46.58	46.58	46.58	46.58
	0.13%	*0.13%*	*0.13%*	*0.13%*	*0.14%*	*0.17%*	*0.17%*	*0.18%*	*0.20%*	*0.18%*	*0.49%*	*0.47%*	*0.43%*	*0.41%*	*0.36%*
Total GHG excluding LULUCF	12686.69	12970.24	12781.00	13132.79	12238.30	9774.87	9850.07	9219.35	8405.20	9001.95	9548.31	9829.76	10778.08	11247.25	12788.95
	100.00%	*100.00%*	*100.00%*	*100.00%*	*100.00%*	*100.00%*	*100.00%*	*100.00%*	*100.00%*	*100.00%*	*100.00%*	*100.00%*	*100.00%*	*100.00%*	*100.00%*
LULUCF (5)	-273.23	-273.23	-273.23	-273.23	-273.23	-273.23	-273.23	-273.23	-273.23	-273.23	-273.23	-273.23	-273.23	-273.23	-273.23

Source: Environment Agency and Ministry

Notes

(1) the other CO_2 sources are emissions from solvent and other product use (CRF 3) and from waste incineration (CRF 6C).

(2) the methane emissions are converted in CO_2 equivalents by multiplying the emissions by 21, i.e. the global warming potential (GWP) value for methane based on the effects of GHG over a 100-year time horizon.

(3) the nitrous oxide emissions are converted in CO_2 equivalents by multiplying the emissions by 310, i.e. the global warming potential (GWP) value for nitrous oxide based on the effects of GHG over a 100-year time horizon.

(4) the F-gases are those not covered by the Montreal Protocol, i.e. the HFCs, PFCs and SF6 expressed in CO_2 equivalents using the the global warming potential (GWP) values based on the effects of GHG over a 100-year time horizon.
These emissions are estimates based on different sources, amongst which a study conducted end 1999. This explains the break in the serie between 1999 and 2000.

(5) the land-use, land-use change and forestry emissions are based on constant estimates of 294.93 Gg of CO_2 for changes in forest and other woody biomass stocks (CRF 5A) and 0,07 Gg of N_2O (i.e. 21,7 Gg CO_2 eq.) for other sinks (CRF 5E).

Table 4 – Luxembourg's GHG emissions and removals 1990-2004: by main gases and sectors

Gg (1000 t.) CO_2 equivalent	1990 (base year)	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
CO_2 emissions including net CO_2	11809.51	12087.93	11877.23	12223.92	11327.93	8862.62	8921.85	8274.37	7447.41	8021.31	8532.83	8801.18	9735.75	10191.35	11683.08
from LULUCF (1)	*95.13%*	*95.20%*	*94.96%*	*95.06%*	*94.67%*	*93.27%*	*93.16%*	*92.49%*	*91.58%*	*91.90%*	*92.00%*	*92.10%*	*92.68%*	*92.87%*	*93.35%*
CO_2 emissions excluding net CO_2	12104.44	12382.86	12172.16	12518.85	11622.86	9157.55	9216.78	8569.30	7742.34	8316.24	8827.76	9096.11	10030.68	10486.28	11978.01
from LULUCF	*95.41%*	*95.47%*	*95.24%*	*95.33%*	*94.97%*	*93.68%*	*93.57%*	*92.95%*	*92.11%*	*92.38%*	*92.45%*	*92.54%*	*93.07%*	*93.23%*	*93.66%*
CH_4 (2) emissions including net CH_4	364.22	356.95	347.42	352.52	344.72	352.79	359.46	357.63	358.03	359.18	354.67	352.26	353.61	351.69	348.96
from LULUCF (1)	*2.93%*	*2.81%*	*2.78%*	*2.74%*	*2.88%*	*3.71%*	*3.75%*	*4.00%*	*4.40%*	*4.11%*	*3.82%*	*3.69%*	*3.37%*	*3.20%*	*2.79%*
CH_4 (2) emissions excluding net CH_4	364.22	356.95	347.42	352.52	344.72	352.79	359.46	357.63	358.03	359.18	354.67	352.26	353.61	351.69	348.96
from LULUCF	*2.87%*	*2.75%*	*2.72%*	*2.68%*	*2.82%*	*3.61%*	*3.65%*	*3.88%*	*4.26%*	*3.99%*	*3.71%*	*3.58%*	*3.28%*	*3.13%*	*2.73%*
N_2O (3) emissions including net N_2O	223.20	235.60	266.60	266.60	275.90	269.70	279.00	297.60	310.00	331.70	341.00	356.50	368.90	384.40	437.10
from LULUCF (1)	*1.80%*	*1.86%*	*2.13%*	*2.07%*	*2.31%*	*2.84%*	*2.91%*	*3.33%*	*3.81%*	*3.80%*	*3.68%*	*3.73%*	*3.51%*	*3.50%*	*3.49%*
N_2O (3) emissions excluding net N_2O	201.50	213.90	244.90	244.90	254.20	248.00	257.30	275.90	288.30	310.00	319.30	334.80	347.20	362.70	415.40
from LULUCF	*1.59%*	*1.65%*	*1.92%*	*1.86%*	*2.08%*	*2.54%*	*2.61%*	*2.99%*	*3.43%*	*3.44%*	*3.34%*	*3.41%*	*3.22%*	*3.22%*	*3.25%*
HFCs (4)	13.62	13.62	13.62	13.62	13.62	13.62	13.62	13.62	13.62	13.62	43.06	43.06	43.06	43.06	43.06
	0.11%	*0.10%*	*0.11%*	*0.10%*	*0.11%*	*0.14%*	*0.14%*	*0.15%*	*0.16%*	*0.15%*	*0.45%*	*0.44%*	*0.40%*	*0.38%*	*0.34%*
PFCs (4)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
	NA	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
SF_6 (4)	2.91	2.91	2.91	2.91	2.91	2.91	2.91	2.91	2.91	2.91	3.52	3.52	3.52	3.52	3.52
	0.02%	*0.02%*	*0.02%*	*0.02%*	*0.02%*	*0.03%*	*0.03%*	*0.03%*	*0.03%*	*0.03%*	*0.04%*	*0.04%*	*0.03%*	*0.03%*	*0.03%*
1. Energy	10642.35	10989.81	10914.68	11197.24	10486.85	8368.95	8489.52	7936.35	7304.40	7867.54	8363.90	8705.92	9513.76	10048.00	11572.24
	83.89%	*84.73%*	*85.40%*	*85.26%*	*85.69%*	*85.62%*	*86.19%*	*86.08%*	*86.90%*	*87.40%*	*87.60%*	*88.57%*	*88.27%*	*89.34%*	*90.49%*
2. Industrial Processes	1573.12	1524.01	1424.03	1491.66	1310.91	960.39	913.31	838.40	654.89	687.11	745.12	688.82	836.72	774.42	794.39
	12.40%	*11.75%*	*11.14%*	*11.36%*	*10.71%*	*9.83%*	*9.27%*	*9.09%*	*7.79%*	*7.63%*	*7.80%*	*7.01%*	*7.76%*	*6.89%*	*6.21%*
3. Solvents and Other Product Use	9.05	9.08	9.11	9.18	9.22	9.28	9.36	9.40	9.46	9.49	9.35	9.16	9.21	9.21	9.22
	0.07%	*0.07%*	*0.07%*	*0.07%*	*0.08%*	*0.09%*	*0.10%*	*0.10%*	*0.11%*	*0.11%*	*0.10%*	*0.09%*	*0.09%*	*0.08%*	*0.07%*
4. Agriculture	419.62	409.62	395.68	397.63	394.03	398.74	399.11	396.02	396.84	398.20	390.54	390.02	386.12	382.10	379.16
	3.31%	*3.16%*	*3.10%*	*3.03%*	*3.22%*	*4.08%*	*4.05%*	*4.30%*	*4.72%*	*4.42%*	*4.09%*	*3.97%*	*3.58%*	*3.40%*	*2.96%*
5. LULUCF (5)	-273.23	-273.23	-273.23	-273.23	-273.23	-273.23	-273.23	-273.23	-273.23	-273.23	-273.23	-273.23	-273.23	-273.23	-273.23
	NA	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
6. Waste	42.55	37.72	37.51	37.09	37.30	37.51	38.77	39.19	39.61	39.61	39.40	35.83	32.26	33.52	33.94
	0.34%	*0.29%*	*0.29%*	*0.28%*	*0.30%*	*0.38%*	*0.39%*	*0.43%*	*0.47%*	*0.44%*	*0.41%*	*0.36%*	*0.30%*	*0.30%*	*0.27%*
7. Other	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	NA	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Total GHG including LULUCF	12413.46	12697.01	12507.77	12859.56	11965.07	9501.64	9576.84	8946.12	8131.97	8728.72	9275.08	9556.53	10504.85	10974.02	12515.72
	100.00%	*100.00%*	*100.00%*	*100.00%*	*100.00%*	*100.00%*	*100.00%*	*100.00%*	*100.00%*	*100.00%*	*100.00%*	*100.00%*	*100.00%*	*100.00%*	*100.00%*
Total GHG excluding LULUCF	12686.69	12970.24	12781.00	13132.79	12238.30	9774.87	9850.07	9219.35	8405.20	9001.95	9548.31	9829.76	10778.08	11247.25	12788.95
	100.00%	*100.00%*	*100.00%*	*100.00%*	*100.00%*	*100.00%*	*100.00%*	*100.00%*	*100.00%*	*100.00%*	*100.00%*	*100.00%*	*100.00%*	*100.00%*	*100.00%*

Source: Environment Agency and Ministry

Notes

(1) these percentages are relative to the total GHG emissions including LULUCF.

(2) the methane emissions are converted in CO_2 equivalents by multiplying the emissions by 21, i.e. the global warming potential (GWP) value for methane based on the effects of GHG over a 100-year time horizon.

(3) the nitrous oxide emissions are converted in CO_2 equivalents by multiplying the emissions by 310, i.e. the global warming potential (GWP) value for nitrous oxide based on the effects of GHG over a 100-year time horizon.

(4) the F-gases are those not covered by the Montreal Protocol, i.e. the HFCs, PFCs and SF6 expressed in CO_2 equivalents using the the global warming potential (GWP) values based on the effects of GHG over a 100-year time horizon.
These emissions are estimates based on different sources, amongst which a study conducted end 1999. This explains the break in the serie between 1999 and 2000.

(5) the land-use change and forestry emissions are based on constant estimates of 294.93 Gg of CO_2 for changes in forest and other woody biomass stocks (CRF 5A) and 0,07 Gg of N_2O (i.e. 21,7 Gg CO_2 eq.) for other sinks (CRF 5E).

Figure 1 – Luxembourg's GHG emissions 1990-2004 without LULUCF

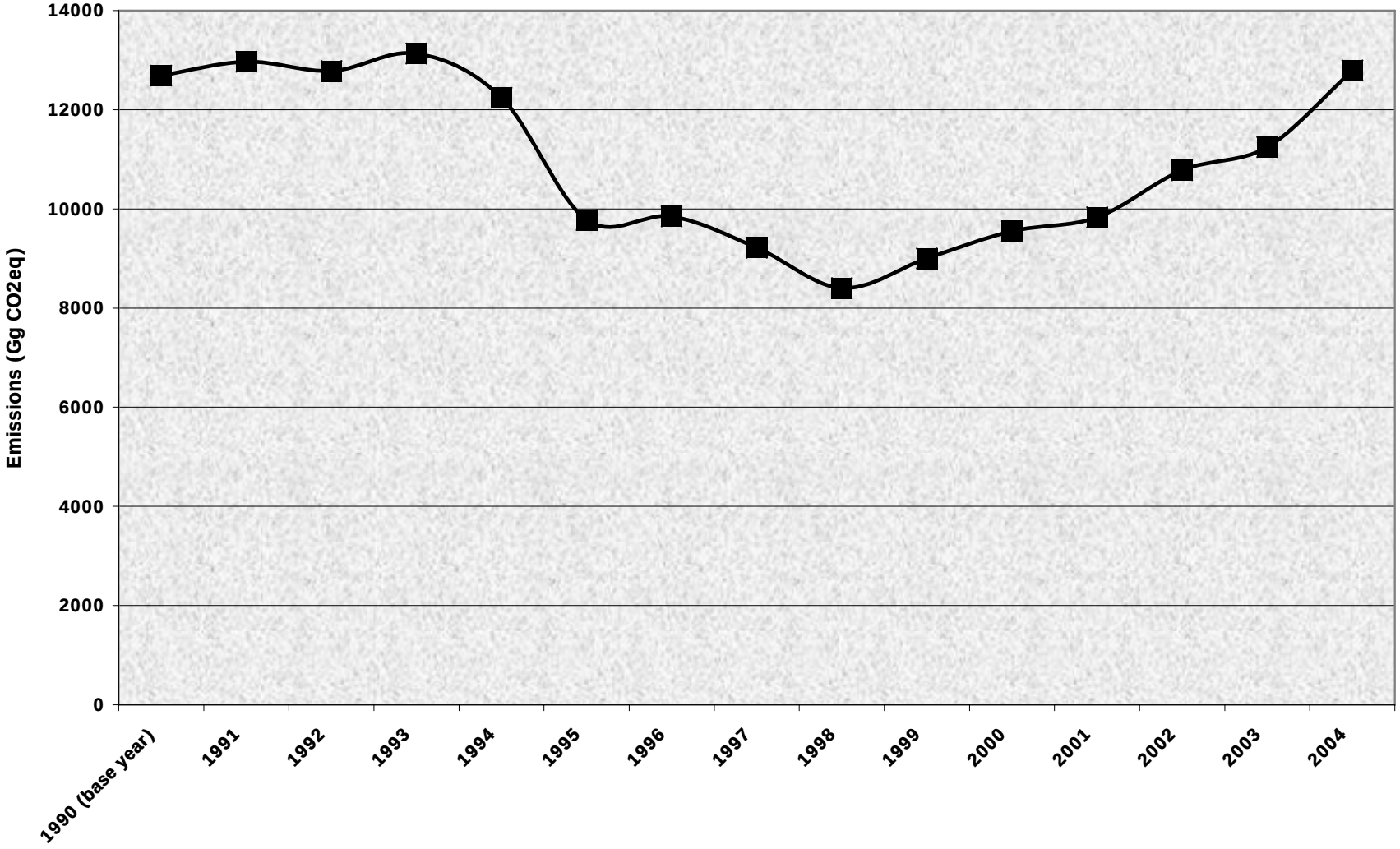


Figure 2 – Luxembourg's CO_2 emissions 1990-2004 without LULUCF

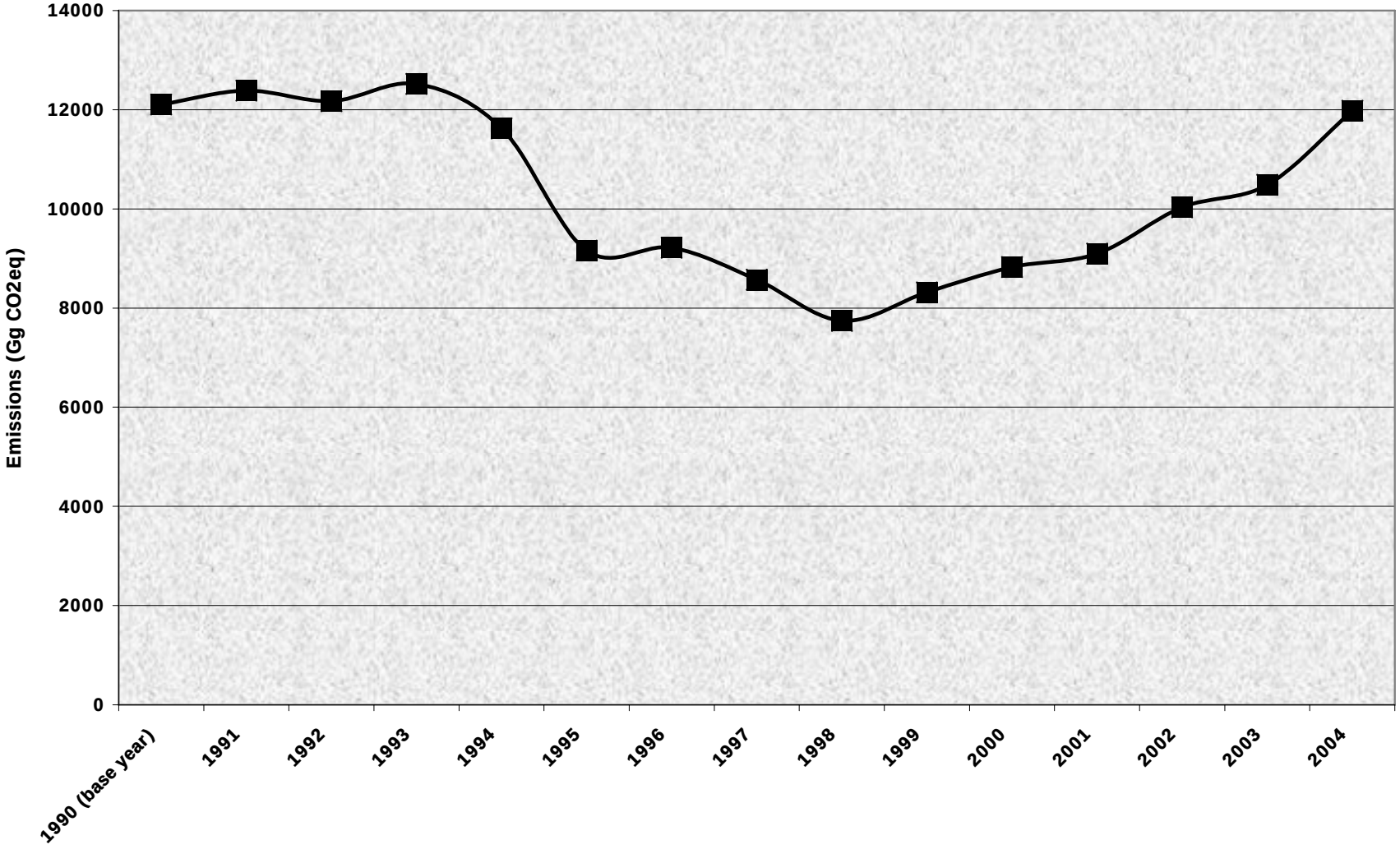


Figure 3 – Luxembourg's CH_4 and N_2O emissions (in CO_2 eq) 1990-2004

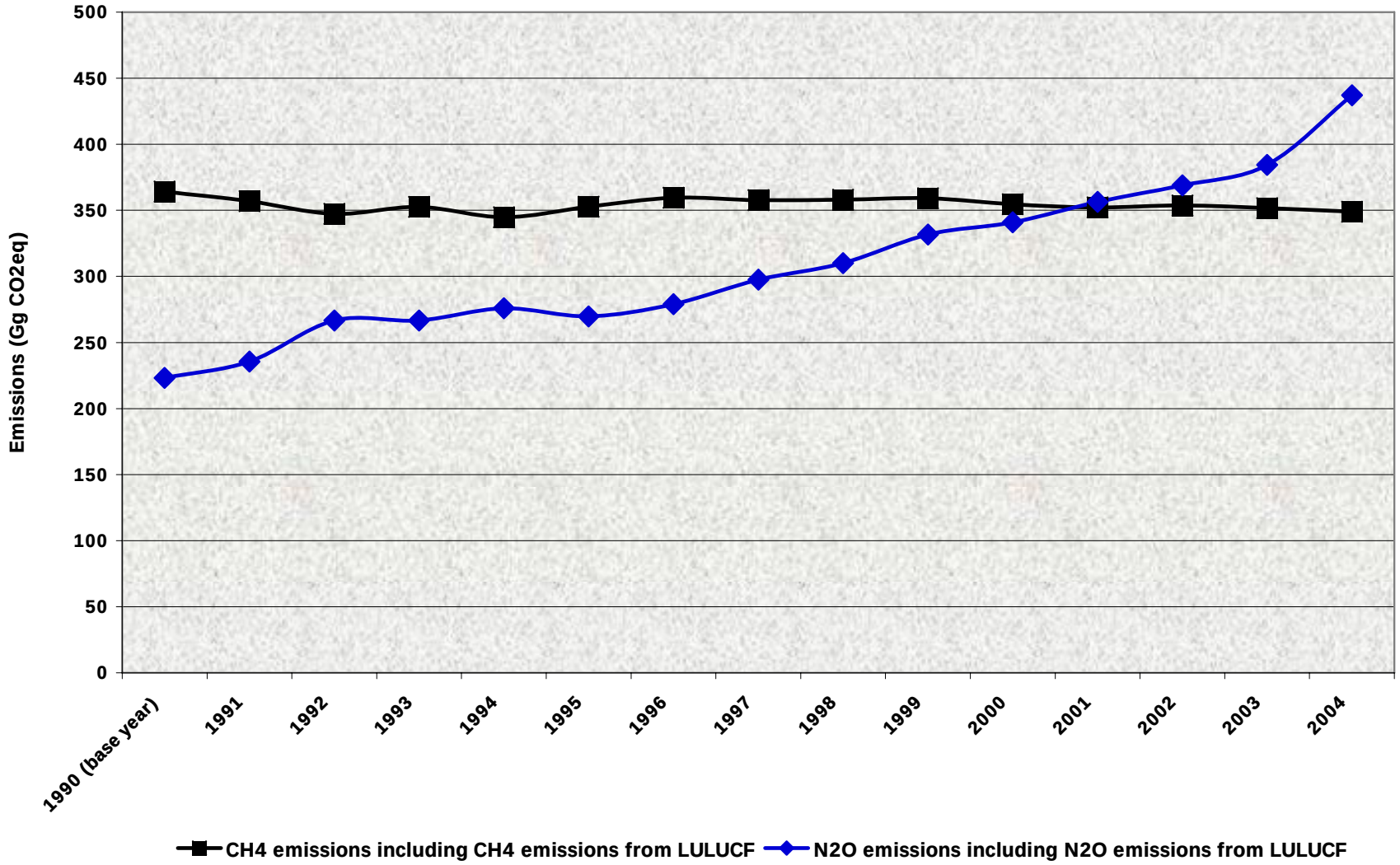


Figure 4 – Luxembourg's HFcs and SF_6 emissions (in CO_2 eq) 1990-2004

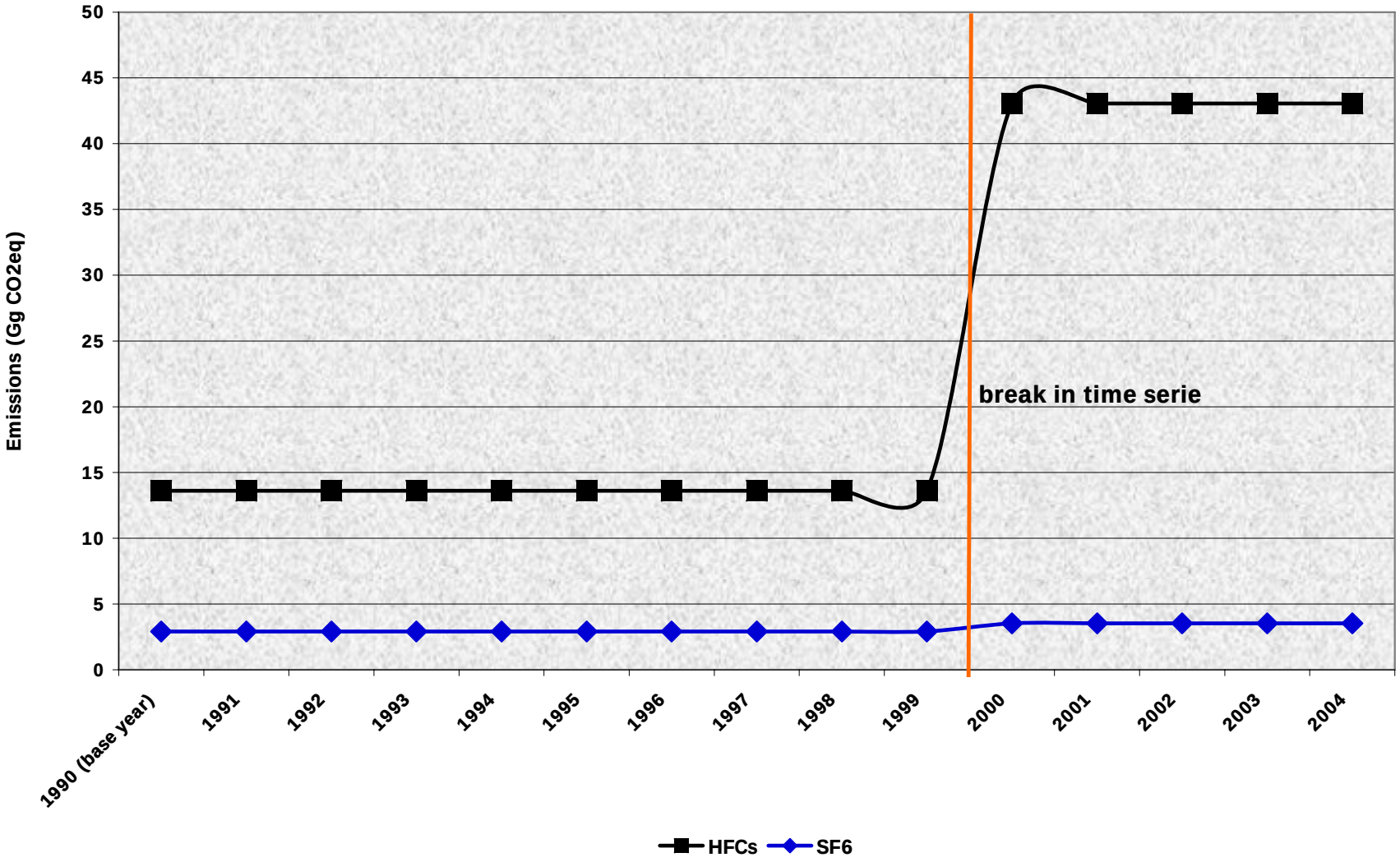


Table 5 – Primary energy consumption (excluding air transport) 1990-2004

1000 toe	1990 (base year)	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
solid fuels & coal	1198.61	1099.27	1034.88	1073.87	928.05	527.59	501.20	319.20	116.62	115.50	128.26	112.03	94.10	79.94	96.22
	34.32%	*29.92%*	*28.04%*	*28.58%*	*25.74%*	*16.74%*	*15.63%*	*10.23%*	*3.89%*	*3.68%*	*3.86%*	*3.19%*	*2.58%*	*2.06%*	*2.23%*
liquid fuels (excl. kerosene)	1456.42	1711.93	1768.12	1767.28	1723.27	1554.27	1592.53	1638.96	1682.32	1777.20	1916.19	2032.22	2060.74	2241.71	2545.66
	41.70%	*46.60%*	*47.90%*	*47.03%*	*47.80%*	*49.32%*	*49.66%*	*52.50%*	*56.15%*	*56.62%*	*57.67%*	*57.81%*	*56.46%*	*57.74%*	*59.11%*
kerosene	127.60	132.97	128.79	127.72	162.15	183.86	199.82	229.35	289.80	326.99	311.64	337.06	365.19	380.44	413.96
natural gas	477.55	496.86	517.89	537.96	542.83	619.38	679.47	696.24	703.01	729.21	745.47	852.06	1170.77	1183.02	1333.47
	13.67%	*13.53%*	*14.03%*	*14.32%*	*15.06%*	*19.66%*	*21.19%*	*22.30%*	*23.47%*	*23.23%*	*22.43%*	*24.24%*	*32.08%*	*30.47%*	*30.97%*
electricity (imports)	318.22	322.65	327.21	336.34	370.05	409.85	399.29	429.16	452.41	469.72	485.74	473.73	279.92	327.01	276.25
	9.11%	*8.78%*	*8.86%*	*8.95%*	*10.26%*	*13.01%*	*12.45%*	*13.75%*	*15.10%*	*14.96%*	*14.62%*	*13.48%*	*7.67%*	*8.42%*	*6.41%*
waste incineration (with heat	26.84	27.92	28.16	26.94	26.34	25.15	19.40	23.14	26.41	31.62	30.77	28.15	26.72	31.42	34.37
recovery)	*0.77%*	*0.76%*	*0.76%*	*0.72%*	*0.73%*	*0.80%*	*0.60%*	*0.74%*	*0.88%*	*1.01%*	*0.93%*	*0.80%*	*0.73%*	*0.81%*	*0.80%*
wood	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.40	15.40	15.40	15.40	15.40	15.40
	0.43%	*0.41%*	*0.41%*	*0.40%*	*0.42%*	*0.48%*	*0.47%*	*0.48%*	*0.50%*	*0.49%*	*0.46%*	*0.44%*	*0.42%*	*0.40%*	*0.36%*
biogas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.29	1.12	2.02	2.28	3.72	5.00
	0.00%	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.01%*	*0.03%*	*0.06%*	*0.06%*	*0.10%*	*0.12%*
Total (excl. kerosene)	3492.64	3673.63	3691.26	3757.39	3605.54	3151.24	3206.89	3121.70	2995.90	3138.94	3322.95	3515.61	3649.93	3882.22	4306.37

Source: Ministry of Economic Affairs and External Trade, Energy Department and FiFo Köln

Figure 5 – Primary energy consumption (excluding air transport) 1990-2004

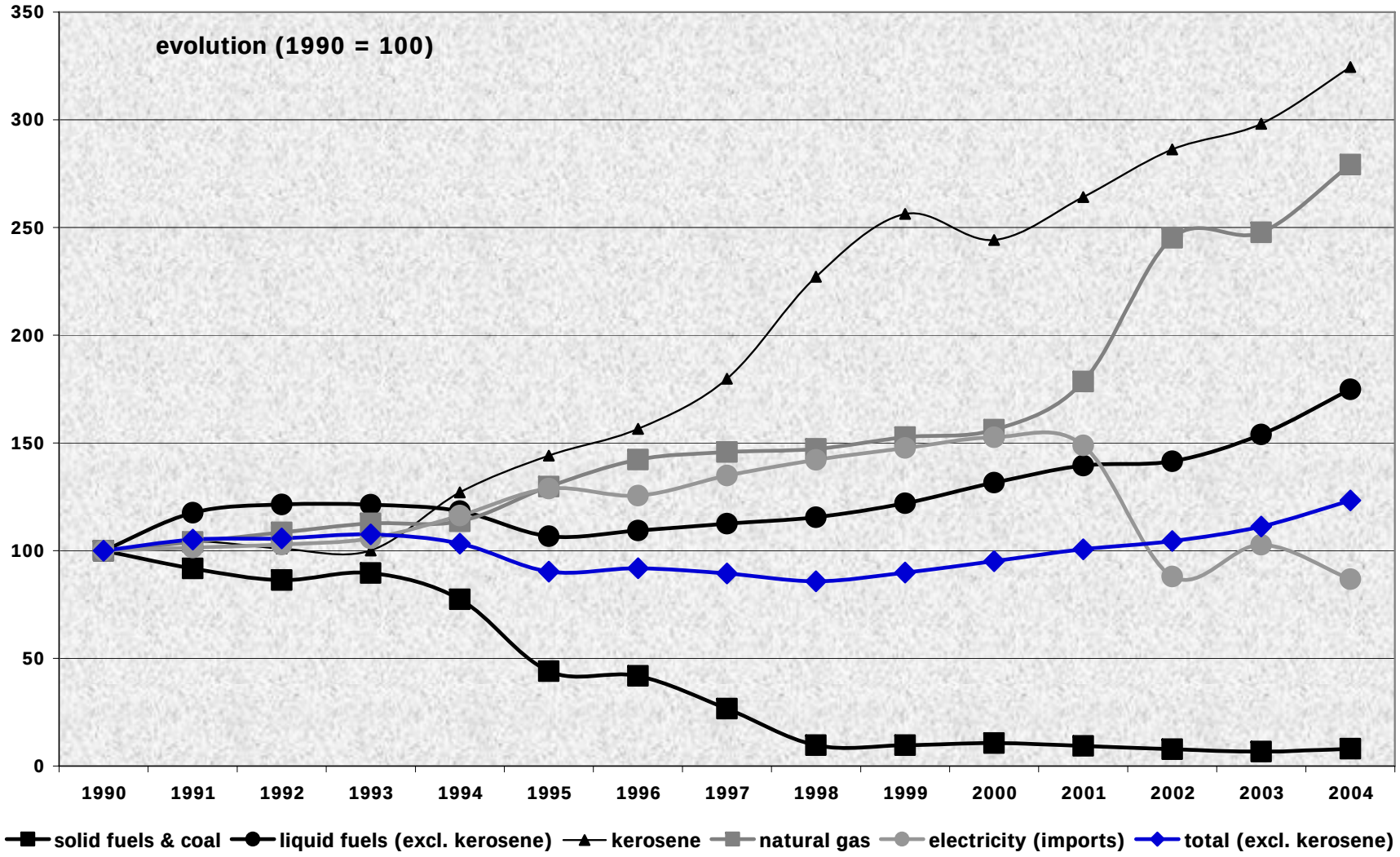


Table 6 – Final energy consumption (excluding air transport) 1990-2004

1000 toe	1990 (base year)	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
solid fuels & coal, blast furnaces gas	1021.28	909.03	852.52	888.65	782.74	448.24	434.28	281.20	116.62	115.50	128.26	112.03	94.10	79.94	96.22
	30.84%	*26.13%*	*24.38%*	*24.93%*	*22.72%*	*14.79%*	*14.02%*	*9.28%*	*3.96%*	*3.74%*	*3.92%*	*3.31%*	*2.77%*	*2.22%*	*2.40%*
solid fuels & coal	819.56	736.47	704.10	733.06	651.29	382.99	374.29	248.93	116.62	115.50	128.26	112.03	94.10	79.94	96.22
blast furnaces gas	201.72	172.56	148.42	155.59	131.45	65.25	59.99	32.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00
liquid fuels (excl. kerosene)	1453.61	1703.86	1750.48	1755.69	1718.68	1552.32	1585.14	1634.81	1681.99	1776.83	1915.99	2031.88	2060.51	2241.59	2545.48
	43.89%	*48.98%*	*50.06%*	*49.24%*	*49.89%*	*51.21%*	*51.17%*	*53.96%*	*57.05%*	*57.61%*	*58.58%*	*60.02%*	*60.64%*	*62.26%*	*63.45%*
kerosene	127.60	132.97	128.79	127.72	162.15	183.86	199.82	229.35	289.80	326.99	311.64	337.06	365.19	380.44	413.96
natural gas	464.14	487.02	507.24	527.48	525.22	571.29	627.00	648.61	655.32	679.43	692.52	708.62	703.73	704.09	768.93
	14.01%	*14.00%*	*14.51%*	*14.80%*	*15.25%*	*18.85%*	*20.24%*	*21.41%*	*22.23%*	*22.03%*	*21.17%*	*20.93%*	*20.71%*	*19.56%*	*19.17%*
electricity	357.63	363.04	364.75	378.03	400.27	430.70	422.96	435.93	456.15	473.77	491.69	484.32	487.84	517.26	538.50
	10.80%	*10.44%*	*10.43%*	*10.60%*	*11.62%*	*14.21%*	*13.65%*	*14.39%*	*15.47%*	*15.36%*	*15.03%*	*14.31%*	*14.36%*	*14.37%*	*13.42%*
heat, cogeneration & biomass	15.40	15.40	22.00	15.40	18.00	28.84	28.47	28.86	38.09	38.96	42.31	48.45	51.90	57.27	62.66
	0.46%	*0.44%*	*0.63%*	*0.43%*	*0.52%*	*0.95%*	*0.92%*	*0.95%*	*1.29%*	*1.26%*	*1.29%*	*1.43%*	*1.53%*	*1.59%*	*1.56%*
heat & cogeneration	0.00	0.00	0.00	0.00	3.00	13.84	13.07	13.46	22.69	23.56	26.91	33.05	36.50	41.87	47.26
biomass	15.40	15.40	22.00	15.40	15.00	15.00	15.40	15.40	15.40	15.40	15.40	15.40	15.40	15.40	15.40
Total (excl. kerosene)	3312.06	3478.35	3496.99	3565.25	3444.91	3031.39	3097.85	3029.41	2948.17	3084.49	3270.77	3385.30	3398.08	3600.15	4011.79

Source: Ministry of Economic Affairs and External Trade, Energy Department and FiFo Köln

Figure 6 – Final energy consumption (excluding air transport) 1990-2004

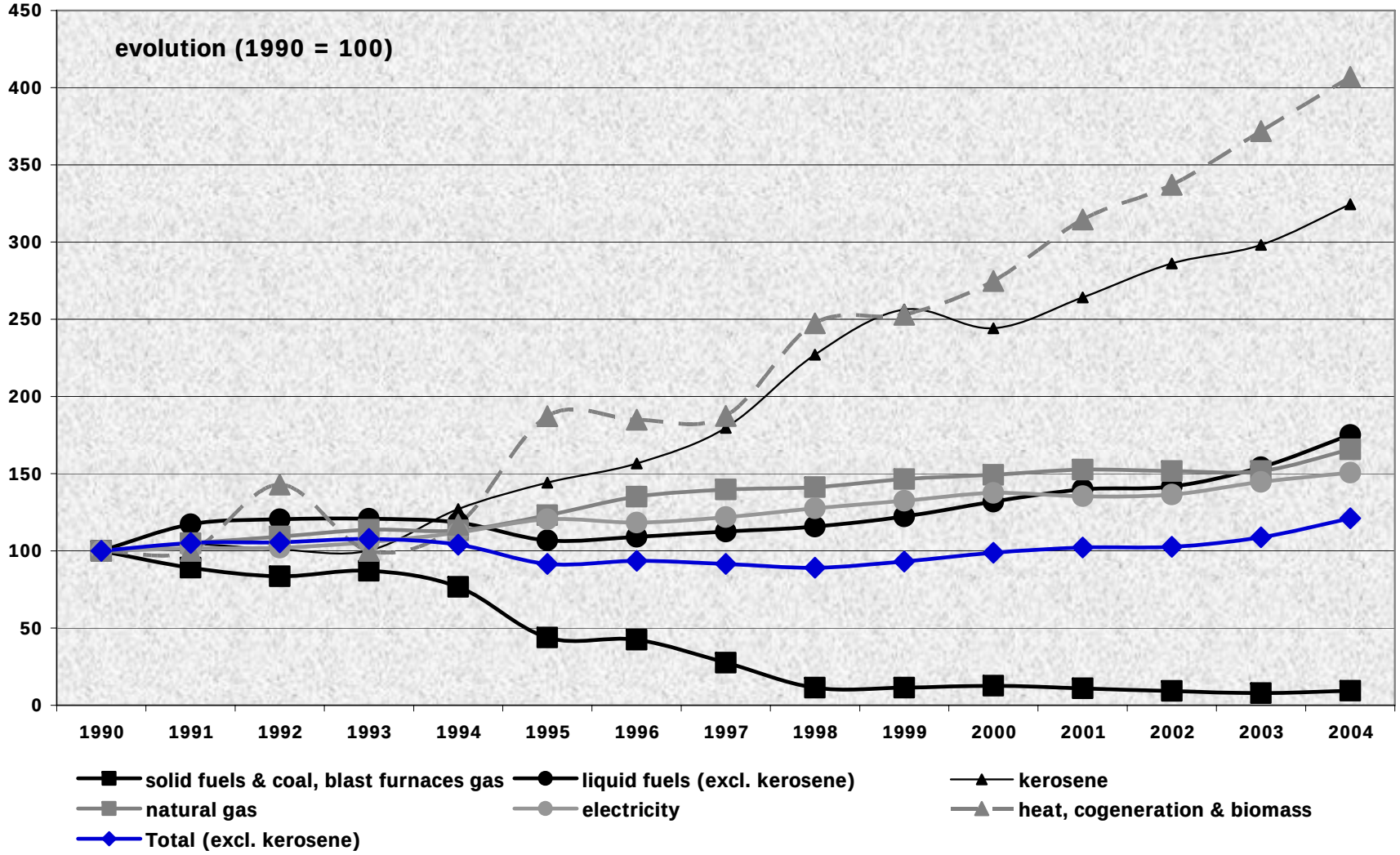


Table 7 – Energy balance for electric power 1990-2004

GWh	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
imports	4708.28	4713.87	4517.87	4453.75	5026.76	5707.38	5725.89	6040.48	6388.99	6212.79	6465.87	6389.20	6390.70	6562.18	6505.06
national production	626.24	676.37	662.49	669.79	626.80	537.67	503.77	414.77	343.23	371.12	428.47	842.18	2785.42	2784.39	3372.70
cogeneration	0.00	0.00	0.00	0.00	30.00	99.84	122.35	124.83	198.03	205.15	227.96	321.41	341.50	382.28	421.44
thermic power stations	558.72	622.11	594.14	607.83	505.96	346.53	307.87	205.38	45.38	52.29	51.74	374.43	2312.42	2285.48	2787.37
of which, gas-vapour turbine 350 MW	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*323.03*	*2275.65*	*2237.29*	*2731.06*
hydro-electricity	67.52	54.26	68.35	61.96	90.84	91.30	73.55	81.71	94.75	95.53	119.46	114.39	97.38	73.94	95.64
wind	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.74	4.61	17.14	24.74	23.70	24.73	26.17	39.40
biomass	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.46	1.01	4.54	8.20	9.30	15.13	20.34
photovoltaic	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.05	0.08	1.40	8.50
Total	5334.52	5390.24	5180.36	5123.54	5653.56	6245.06	6229.66	6455.25	6732.22	6583.91	6894.34	7231.39	9176.12	9346.57	9877.75
exports	754.92	715.17	542.95	394.41	565.57	744.15	808.06	846.96	924.12	654.97	736.85	1066.79	2939.92	2799.41	3131.58
conversion uses and losses	389.32	395.43	334.28	318.06	364.83	434.15	431.95	418.98	428.05	340.97	359.49	414.82	450.53	475.68	428.98
net inland consumption	4190.27	4279.65	4303.13	4411.08	4723.16	5066.76	4989.66	5189.31	5380.05	5587.98	5798.00	5749.79	5785.67	6071.48	6317.19
Total	5334.52	5390.24	5180.36	5123.54	5653.56	6245.06	6229.66	6455.25	6732.22	6583.91	6894.34	7231.39	9176.12	9346.57	9877.75

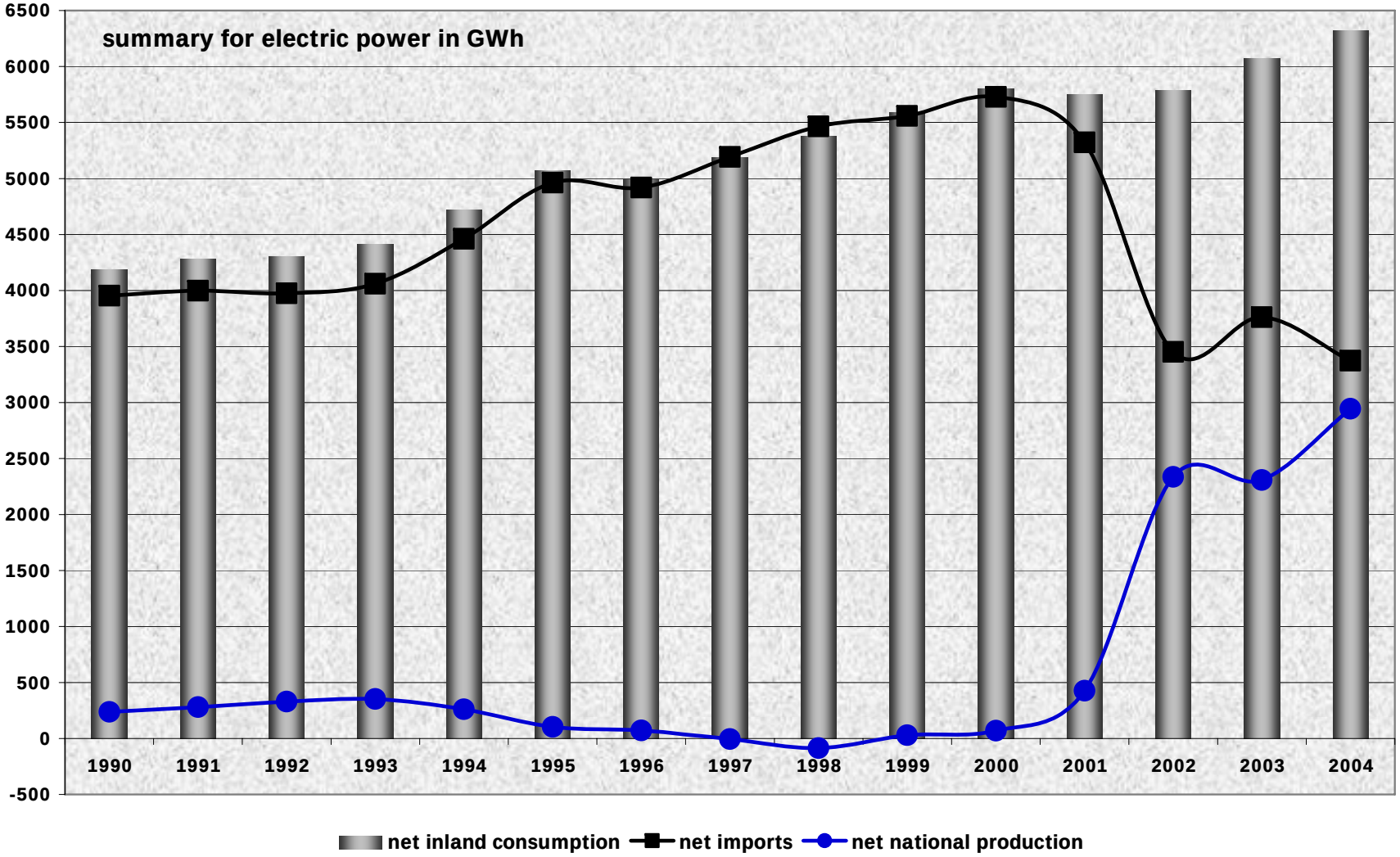
Summary in GWh	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
net imports	3953.36	3998.70	3974.92	4059.35	4461.19	4963.24	4917.84	5193.52	5464.86	5557.82	5729.01	5322.42	3450.78	3762.77	3373.47
net national production (1)	236.91	280.95	328.21	351.73	261.97	103.52	71.82	-4.21	-84.81	30.15	68.99	427.37	2334.89	2308.71	2943.71
net inland consumption	4190.27	4279.65	4303.13	4411.08	4723.16	5066.76	4989.66	5189.31	5380.05	5587.98	5798.00	5749.79	5785.67	6071.48	6317.19
net inland consumption in Mio. MJ	15072.91	15394.42	15478.88	15867.20	16989.80	18225.75	17948.41	18666.59	19352.70	20100.64	20856.11	20682.68	20811.76	21839.86	22723.69
net inland consumption in 1000 toe	360.01	367.69	369.71	378.98	405.79	435.31	428.69	445.84	462.23	480.10	498.14	494.00	497.08	521.64	542.75

Source: Ministry of Economic Affairs and External Trade, Energy Department and FiFo Köln

Notes

(1) the net national production is the difference between the national production and the conversion process uses and losses.

Figure 7 – Energy balance for electric power 1990-2004



2.2 Description of emission trends by GHG (ref. tables 3 & 4)

2.2.1 Carbon dioxide – CO_2

CO_2 is by far the biggest contributor to the total GHG emissions of Luxembourg. The main cause of CO_2 emissions is combustion of fossil fuels. Another important source of CO_2 is industrial processes, i. e., in the case of Luxembourg, mainly carbon oxidizing of pig iron from steel industry (basic oxygen furnace steel production) and decarbonizing of mineral input in clinker and glass industry.

CO_2 emissions have decreased with the closing down of blast furnaces, whilst CO_2 emissions from liquid fuel and natural gas combustion have increased due to higher fuel consumption in the transport and in the electricity production sectors. Both trends have crossed in 1998, resulting in a minimum reached for national total GHG emissions.

2.2.2 Methane – CH_4

Methane emissions are caused above all in the agricultural sector by enteric fermentation and by manure production and management. As agriculture in general, and life stock in particular, have been rather stable in the time period considered here, the corresponding methane emissions have not varied very much.

Another important source of methane emissions is waste treatment (solid waste, waste water). All major solid waste landfills in Luxembourg have a methane recovery system and respect the provisions of the EU Council Directive 1999/31/CE on the landfill of waste.

2.2.3 Nitrous oxide – N_2O

A large part of nitrous oxide emissions are caused by agricultural soils. Another important source, which has generated increasing N_2O emissions since 1990, is road transport, where incomplete NO_X reduction in catalytic converters of gasoline motor vehicles leads to N_2O emissions.

2.2.4 Hydrofluorocarbons – HFCs

In a first study done end of 1999 by the Environment Agency and the CRTE, the situation of fluorinated GHG emissions in Luxembourg was analyzed. Estimates of emissions of hydrofluorocarbons (*HFCs*), perfluorocarbons (*PFCs*) and sulphur hexafluoride (*SF_6*) were done. They indicated that there are some emissions of HFCs and of SF_6 in Luxembourg, but no emissions of PFCs however. The increase in HFCs emissions between 1990 and 2004 can be explained by more wide spread use of mobile and stationary cooling equipments.

In Luxembourg refrigerators are recycled systematically at the end of their life-cycle. Refrigerant fluids and gases of the thermal insulation foams are recovered. This happens currently for approximately 15 000 refrigerators every year, which represent 65% of all end of service refrigerators.

2.2.5 Sulphur hexafluoride – SF_6

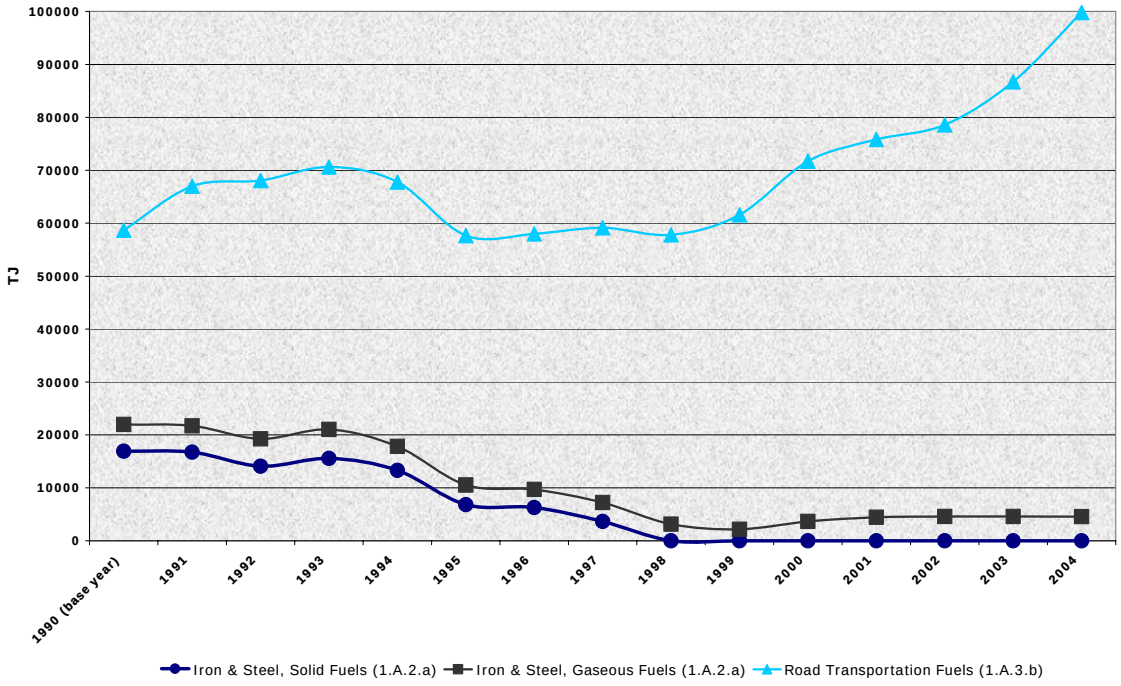
Emissions data of SF_6 were taken from the same analysis as those of HFCs. In that study, SF_6 emissions are expected to grow in the time period between 1995 and 2010 because of a higher use of high voltage electrical devices, and because a higher amount of SF_6 is expected to be emitted from noise reduction windows.

2.3 Description of emission trends by category (ref. Table 4)

2.3.1 Energy

Due to their importance, the CO_2 emissions of the energy sector determine the trend of the overall annual GHG emissions of Luxembourg. Moreover they reflect the fact that the iron and steel industry has abandoned their blast furnaces between 1994 and 1998, and that fossil fuel consumption as well as road fuels sales have continued to increase after 1998. Many other emission trends are hidden by those two phenomena due to their importance in the national total GHG emissions.

Figure 8 – Evolution of fuels consumption in the iron & steel and road transportation sectors (TJ)



2.3.2 Industrial Processes

Carbon dioxide is the determining GHG in that category. Other GHG are HFCs and SF_6, however, they are of minor importance in the context of emissions of industrial process, and therefore they are not discussed here, but in the sections of the text dealing with fluorinated gases.

For industrial processes; the major carbon dioxide emission sources are (emission values of 1990):

- iron and steel industry (sintering of iron ore, basic oxygen furnace steel plants): 966 kt;
- clinker/cement production: 551 kt;
- glass production: 40 kt.

While the process emissions of iron and steel industry were reduced since 1990, with the move from blast furnaces to electric arc furnaces, the process emissions of the clinker/cement and of the glass production stayed rather stable.

2.3.3 Solvent and Other Product Use

Emissions of VOCs have increased between 1990 and 1999 because of an increase in activities implying solvents use. After the introduction of paints with lower solvent concentrations, emissions have curbed and could be reduced compared to the maximum of 1999.

The estimation of VOC emissions of Luxembourg is partly based on data of 1994. However, in order to better reflect developments in solvent applications in the last years, an update of the estimations of VOC emissions must be done.

2.3.4 Agriculture

Methane

The rather stable emission value is determined by the number of cattle. These numbers of cattle did not change dramatically during the period 1990-2004: from 217 451 heads to 186 725 for bovine animals and from 75 463 heads and 84 611 for pigs.

Nitrous oxide

As it is the case for methane, N_2O emissions from agricultural soils were rather stable at a level of some 470 t of N_2O, due to the fact that the surface area of agricultural land, both the surface and the way of using it, did not change significantly between 1990 and 2004: total surface used in agriculture varied from 126 298 ha in 1990 to 128 073 ha in 2004.

2.3.5 Land Use, Land Use Change and Forestry (LULUCF)

A first estimation of the amounts of carbon captured by vegetation in Luxembourg has suggested a value of 294 930 t of CO_2 eq. per year. This value has been included in all annual inventories since 1990.

2.3.6 Waste

A value of 10 kt of CO_2 per year has been reported in all annual inventories since 1990 for the incineration of domestic waste. This figure corresponds to the emissions of carbon dioxide from the combustion of the non-biomass fraction of waste.

Waste disposal on land, waste water treatment and sludge spreading caused methane emissions of some 1.55 kt in 1990 and 1.14 kt in 2004. The impact on air emissions of the systematic recovery of refrigerant fluids and of the recycling of the various municipal waste fractions needs to be analysed in more detail to further improve the inventories.

2.4 Indirect GHG and SO_2

Indirect GHG are calculated in Luxembourg in the context of the Geneva Convention of 1979 on Long Range Transboundary Air Pollution (*CLRTAP*) using the CollectER software provided by the European Environment Agency. Air emissions of road transport calculated with the COPERT III software are based on national vehicle fleet data and, in a second phase, are adjusted, using total

fuel sales, to reflect the important share of fuel exports.[9] This correction is done only for the main GHG (CO_2, CH_4 and N_2O); hence 'not estimated' entries for the other gases (NOx, CO, NMVOC and SO_2) in CRF Table 1. As a result, for Luxembourg, there are differences in the way GHG and indirect GHG data are calculated. For that reason the emissions of indirect GHG, and SO_2 in particular, are not analyzed here.

[9] See Chapter 2.1 above.

3 Energy (CRF sector 1)

3.1 Overview of the energy sector

Between 1990 and 2004, the national total of carbon dioxide emissions has been strongly influenced by varying fuel consumption levels in industry, in particular in steel industry, as well as in road transport. There are several industrial sites which have relatively high levels of GHG emissions, and which, therefore, have had a large impact on the national total. In the transport sector, road fuel consumption, and even more so road fuel sales,[10] has a very important weight in the national energy balance, and, consequently, has also a very important impact on the national total of CO_2 emissions.

The passage from blast furnaces to electric arc furnaces in the steel industry allowed to significantly reduce GHG emissions of that sector between 1994 and 1997. Due to the importance of iron and steel industry in Luxembourg, this evolution hid many other trends in CO_2 emissions between 1990 and 1998. After 1998, the increase of road fuel sales and, to a lesser extent, of electric energy production has lead to a rather steep increase of CO_2 emissions in these sectors and, by extension, of the national CO_2 total. Again, trends in other sectors have been mostly hidden by these two phenomena occurring in the transport and the electric energy production sectors.

3.1.1 Emission Trend

The final energy consumption of Luxembourg has increased by almost 30% between 1990 and 2004. It has passed through a minimum between 1995 and 1998 (see Table 8).

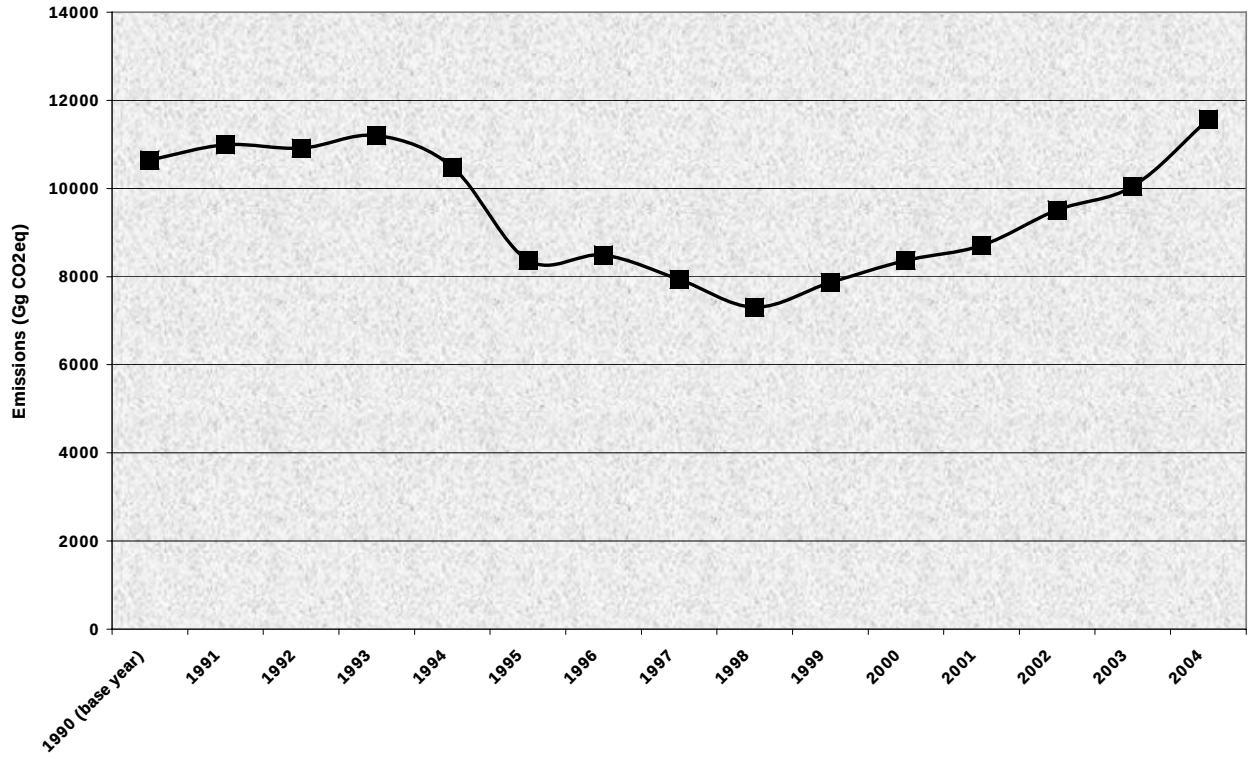
Table 8 – Final energy consumption 1990-2004 (ktoe)

Year	Total	Solid fuels (coal, coke, wood, biomass)	Liquid fuels	Natural gas	Electricity	heat & cogeneration	blast furnaces' gas
1970	3735.40	1285.40	1230.00	10.00	210.00	0.00	1000.00
1980	3422.37	1356.95	1048.95	360.15	310.17	0.00	346.15
1990	3399.79	834.32	1583.83	439.84	351.56	0.00	190.24
1991	3576.91	751.26	1838.66	450.74	363.45	0.00	172.80
1992	3583.32	718.86	1881.10	469.46	365.17	0.00	148.73
1993	3654.22	748.46	1883.51	488.19	378.47	0.00	155.59
1994	3607.77	666.69	1882.14	525.22	400.27	2.00	131.45
1995	3215.21	398.39	1734.00	574.45	430.85	12.27	65.25
1996	3298.54	389.69	1785.83	627.00	422.96	13.07	59.99
1997	3258.61	264.33	1864.12	648.60	435.92	13.46	32.18
1998	3237.95	132.02	1971.77	655.32	456.15	22.69	0.00
1999	3411.23	130.90	2103.82	679.18	473.77	23.56	0.00
2000	3582.85	144.20	2227.62	692.52	491.60	26.91	0.00
2001	3773.15	178.23	2368.94	708.62	484.31	33.05	0.00
2002	3763.27	109.50	2425.70	703.74	487.83	36.50	0.00
2003	3994.14	95.34	2622.03	712.99	517.26	46.52	0.00
2004	4400.00	111.00	2960.00	769.00	547.00	47.00	0.00

Source: Ministry of Economic Affairs and External Trade, STATEC

[10] See tables 5 and 6 in Chapter 2.

Figure 9 – GHG Emission in IPCC Sector 1 Energy



As Table 8 shows, in 1990 big amounts of solid fuels were still used in the iron and steel industry. However, the passage from blast furnace technology to electric arc furnaces between 1994 and 1998 has lead to a drastic reduction of solid fuel use.

Blast furnace gas is a side product of iron production in blast furnaces that can be used as gaseous fuel. That was the case in Luxembourg until 1997 where blast furnace gas was used by the iron and steel industry for heating purposes and for electric energy production.

In CORINAIR, solid fuels, coke in particular, do not appear as fuel of blast furnaces for the iron and steel industry. However, blast furnace gas is seen as gaseous fuel in the CORINAIR methodology when it is used as such. Hence, as solid fuels of the iron and steel industry do not appear explicitly in the inventory compilation, those fuels are not included in the energy balance for the emission inventories and instead of solid fuels, blast furnace gas appears in this balance. This has to be taken into account when comparing energy balances with those resulting from the emission inventories.

In 2004, the most important fuel type group are the liquid fuels, with gasoline being the first liquid fuel in terms of volumes sold. The liquid fuel consumption in Luxembourg is much lower than the level of fuels sales, because large amounts of road fuels are bought by foreign drivers passing through Luxembourg and using most of that fuel abroad ('fuel exports'). It has been estimated that more than 70% of road fuels sold in Luxembourg are burned abroad by vehicles registered abroad (see Table 3 in Chapter 2 above).

The importance of natural gas has increased constantly and significantly since 1990. In 2004, natural gas consumption ranked second after the consumption of liquid fuels.

3.2 Fuel Combustion Activities

3.2.1 Source category description

In 1990 more than 90% of the electrical energy of Luxembourg was imported. In 1990 one medium size power plant of some 70 MW was owned by the iron and steel company ARBED. That power plant was run mainly on blast furnace gas, and it was phased out in 1997 after the last blast furnace went out of service.

In the early 1990s, small cogeneration plants appeared. Their installation was encouraged financially by the Government. A few industrial companies installed gas turbines to produce electrical energy and heat in parallel (for example Good Year and Dupont de Nemours). In 2000, a power plant with a gas-vapour turbine of 380 MW started to be built in Esch-sur-Alzette. It started its operations in mid-2002. Almost all these plants are running with natural gas. Gasoil remains, however, the emergency fuel in case of natural gas supply interruptions.

Small industrial plants or subsectors are not considered individually. Their CO_2 emissions as a whole were estimated based on the fuel consumption or production data of the respective subsectors and on the energy consumption of the industrial sector as whole.

Table 9 – Electric energy production (in MWh)

Year	Total	Thermic (1)	Renewables (2)	Cogeneration
1970	1347.50	1260.98	86.52	0.00
1980	914.55	828.31	86.24	0.00
1990	626.24	558.72	67.52	0.00
1991	676.37	622.11	54.26	0.00
1992	662.49	594.14	68.35	0.00
1993	669.79	607.83	61.96	0.00
1994	592.07	505.96	86.11	0.00
1995	527.68	346.53	81.33	99.82
1996	466.07	306.24	53.46	106.36
1997	415.66	213.96	92.14	109.56
1998	396.14	104.76	107.11	184.27
1999	375.28	51.62	133.12	190.54
2000	438.10	51.50	170.12	216.48
2001	864.40	374.14	146.34	343.93
2002	2822.82	2327.85	131.56	363.42
2003	2784.39	2285.48	116.63	382.28
2004	3373.52	2787.37	164.58	421.57

Source: Ministry of Economic Affairs and External Trade, STATEC

Notes

(1) including the gas-vapour turbine of 350 MW since, so far, heat is not yet used (hence, classified as a thermic power plant

(2) small hydro-electric power plant, wind turbines, solar (photovoltaic cells), biogas

3.2.2 Key Sources

The methodology and results of the key source analysis are presented in Chapter 1, Table 1 and

Table 2. Table 10 on the next page presents the key source categories of category 1 A Fuel Combustion Activities.

Table 10 – Key sources of Category 1A Fuel Combustion Activities

IPCC Category / Source Categories	Key sources		
	GHG	KS-Assessment	
1 A 1 a Public Electricity and Heat Production: Gaseous Fuels	CO2	LA: 1994-2004	TA: 2004
1 A 1 a Public Electricity and Heat Production: Solid Fuels	CO2	LA: 1990-1997	
1 A 2 a Iron and Steel: Gaseous Fuels	CO2	LA: 1990-2004	
1 A 2 a Iron and Steel: Solid Fuels	CO2	LA: 1990-1997	TA: 2004
1 A 2 f Other: Gaseous Fuels	CO2	LA: 1990-2004	TA: 2004
1 A 2 f Other: Liquid Fuels	CO2	LA: 1990-2004	TA: 2004
1 A 2 f Other: Solid Fuels	CO2	LA: 1990-2004	TA: 2004
1 A 3 b Road Transportation: Diesel oil	CO2	LA: 1990-2004	TA: 2004
1 A 3 b Road Transportation: Diesel oil	N2O	LA: 1995-2004	TA: 2004
1 A 3 b Road Transportation: Gasoline	CO2	LA: 1990-2004	TA: 2004
1 A 3 b Road Transportation: Gasoline	N2O	LA: 1998 & 2001	
1 A 4 a Commercial/Institutional: Gaseous Fuels	CO2	LA: 1990-2004	
1 A 4 a Commercial/Institutional: Liquid Fuels	CO2	LA: 1990-2004	
1 A 4 a Commercial/Institutional: Solid Fuels	CO2	LA: 1991-1993	
1 A 4 b Residential: Gaseous Fuels	CO2	LA: 1990-2004	
1 A 4 b Residential: Liquid Fuels	CO2	LA: 1990-2004	
1 A 4 b Residential: Solid Fuels	CO2	LA: 1992-1993	
1 A 4 c Agriculture/Forestry/Fisheries: Liquid Fuels	CO2	LA: 1995-2003	

** LA = Level Assessment*

** TA = Trend Assessment*

3.3 IPCC Sector 1 A 1 Energy industries

Sector Overview

IPCC Category 1 A 1 a Public Electricity and Heat Production is the only source in IPCC Sector 1 A 1 Energy industries. The share in total CO_2 emissions from sector 1.A.1 is 12.0% for the year 1990 and 3.4 % for the year 2004.

Emission trend

In the following tables the emission trends of IPCC Sector 1 A 1 Energy industries are presented. An emission trend description in given in the relevant subchapters.

Table 11 – CO_2 emission trend of IPCC Sector 1 A 1 Energy industries

GHG source and sink categories	Total energy	Fuel combustion	Sector 1 A 1	Sector 1 A 1 a	Sector 1 A 1 b	Sector 1 A 1 c
	CO_2 (Gg)					
1990	10 528.80	10 528.80	1 267.76	1 267.76	NO	NO
1991	10 856.30	10 856.30	1 210.81	1 210.81	NO	NO

GHG source and sink categories	Total energy	Fuel combustion	Sector 1 A 1	Sector 1 A 1 a	Sector 1 A 1 b	Sector 1 A 1 c
	CO_2 (Gg)					
1992	10 745.55	10 745.55	1 106.79	1 106.79	NO	NO
1993	11 024.54	11 024.54	1 197.08	1 197.08	NO	NO
1994	10 309.26	10 309.26	996.32	996.32	NO	NO
1995	8 194.41	8 194.41	785.47	785.47	NO	NO
1996	8 300.64	8 300.64	682.75	682.75	NO	NO
1997	7 728.03	7 728.03	402.34	402.34	NO	NO
1998	7 084.52	7 084.52	68.61	68.61	NO	NO
1999	7 626.17	7 626.17	103.17	103.17	NO	NO
2000	8 109.87	8 109.87	254.87	254.87	NO	NO
2001	8 434.71	8 434.71	266.14	266.14	NO	NO
2002	9 221.33	9 221.33	266.14	266.14	NO	NO
2003	9 739.23	9 739.23	266.14	266.14	NO	NO
2004	11 210.98	11 210.98	383.13	383.13	NO	NO
Trend 2003-2004	*15.1%*	*15.1%*	*44.0%*	*44.0%*	*NA*	*NA*
Trend 1990-2004	*6.5%*	*6.5%*	*-69.8%*	*-69.8%*	*NA*	*NA*
Share in National Total GHG 1990	*84.8%*	*84.8%*	*10.2%*	*10.2%*	*NA*	*NA*
Share in National Total GHG 2004	*89.6%*	*89.6%*	*3.1%*	*3.1%*	*NA*	*NA*

Table 12 – CH_4 emission trend of IPCC Sector 1 A 1 Energy industries

GHG source and sink categories	Total energy	Fuel combustion	Sector 1 A 1	Sector 1 A 1 a	Sector 1 A 1 b	Sector 1 A 1 c
	CH4 (Gg)					
1990	2.75	1.44	NE (but ≈ 0)	NE (but ≈ 0)	NO	NO
1991	3.11	1.71	NE (but ≈ 0)	NE (but ≈ 0)	NO	NO
1992	3.33	1.87	NE (but ≈ 0)	NE (but ≈ 0)	NO	NO
1993	3.50	1.98	NE (but ≈ 0)	NE (but ≈ 0)	NO	NO
1994	3.29	1.80	NE (but ≈ 0)	NE (but ≈ 0)	NO	NO
1995	3.44	1.69	NE (but ≈ 0)	NE (but ≈ 0)	NO	NO
1996	3.68	1.81	NE (but ≈ 0)	NE (but ≈ 0)	NO	NO
1997	3.72	1.81	NE (but ≈ 0)	NE (but ≈ 0)	NO	NO
1998	3.68	1.75	NE (but ≈ 0)	NE (but ≈ 0)	NO	NO
1999	3.67	1.61	NE (but ≈ 0)	NE (but ≈ 0)	NO	NO
2000	3.83	1.72	0.01	0.01	NO	NO
2001	3.91	1.73	0.01	0.01	NO	NO
2002	4.33	1.56	0.01	0.01	NO	NO
2003	4.37	1.58	0.01	0.01	NO	NO
2004	4.36	1.45	0.01	0.01	NO	NO
Trend 2003-2004	*-0.2%*	*-8.2%*	*0.0%*	*0.0%*	*NA*	*NA*
Trend 1990-2004	*58.5%*	*0.7%*	*0.0%*	*0.0%*	*NA*	*NA*
Share in National Total GHG 1990	*0.5%*	*0.2%*	*NA*	*NA*	*NA*	*NA*

GHG source and sink categories	Total energy	Fuel combustion	Sector 1 A 1	Sector 1 A 1 a	Sector 1 A 1 b	Sector 1 A 1 c
	CH4 (Gg)					
Share in National Total GHG 2004	*0.7%*	*0.2%*	*0.0%*	*0.0%*	*NA*	*NA*

Table 13 – N_2O emission trend of IPCC Sector 1 A 1 Energy industries

GHG source and sink categories	Total energy	Fuel combustion	Sector 1 A 1	Sector 1 A 1 a	Sector 1 A 1 b	Sector 1 A 1 c
	N2O (Gg)					
1990	0.18	0.18	NE (but ≈ 0)	NE (but ≈ 0)	NO	NO
1991	0.22	0.22	NE (but ≈ 0)	NE (but ≈ 0)	NO	NO
1992	0.32	0.32	NE (but ≈ 0)	NE (but ≈ 0)	NO	NO
1993	0.32	0.32	NE (but ≈ 0)	NE (but ≈ 0)	NO	NO
1994	0.35	0.35	NE (but ≈ 0)	NE (but ≈ 0)	NO	NO
1995	0.33	0.33	NE (but ≈ 0)	NE (but ≈ 0)	NO	NO
1996	0.36	0.36	NE (but ≈ 0)	NE (but ≈ 0)	NO	NO
1997	0.42	0.42	NE (but ≈ 0)	NE (but ≈ 0)	NO	NO
1998	0.46	0.46	NE (but ≈ 0)	NE (but ≈ 0)	NO	NO
1999	0.53	0.53	NE (but ≈ 0)	NE (but ≈ 0)	NO	NO
2000	0.56	0.56	NE (but ≈ 0)	NE (but ≈ 0)	NO	NO
2001	0.61	0.61	NE (but ≈ 0)	NE (but ≈ 0)	NO	NO
2002	0.65	0.65	NE (but ≈ 0)	NE (but ≈ 0)	NO	NO
2003	0.70	0.70	NE (but ≈ 0)	NE (but ≈ 0)	NO	NO
2004	0.87	0.87	0.01	0.01	NO	NO
Trend 2003-2004	*24.3%*	*24.3%*	*NA*	*NA*	*NA*	*NA*
Trend 1990-2004	*383.3%*	*383.3%*	*NA*	*NA*	*NA*	*NA*
Share in National Total GHG 1990	*0.4%*	*0.4%*	*NA*	*NA*	*NA*	*NA*
Share in National Total GHG 2004	*2.2%*	*2.2%*	*0.0%*	*0.0%*	*NA*	*NA*

IPCC Category 1 A 1 a Public Electricity and Heat Production

Key Source: *CO2: gaseous and solid fuels*

Source Category Description

In this source category, small combined heat and power installations (*CHP*) (SNAP 010103) are included, as well as a power plant run until 1997 by steel industry (SNAP 010102).

The share in total GHG emissions (including LULUCF) from sector 1 A 1 a is for:

- CO_2 emissions: 10% for the year 1990 and 3% for the year 2004. The emission trend in the period 1990 – 2004 was about -70% whereas the emission trend in period 2003 – 2004 was about 44%;

- CH_4 emissions: due to very small amounts of that gas in Gg, no relevant trend could be identified;
- N_2O emissions: due to very small amounts of that gas in Gg, no relevant trend could be identified.

SNAP 010102 Public power, combustion plants, 50 - 300 MW (boilers)
One installation of this source type existed in Luxembourg until 1997 in a site called '*Terres Rouges*'. It was a power station run by the steel industry. Between 1990 and 1997 it was fed with blast furnace gas, natural gas and residual oil. The activity rates are based on information received from the operator ARBED and from TÜV (1990).

SNAP 010103 - Public power, combustion plants < 50 MW
This source type includes CHP installations which have appeared at the beginning of the '90s. Those installations generally use combustion engines, and they are run on natural gas, and on gasoil in emergency cases if the natural gas supply is cut. This source type has been in the annual emission inventories since 1994. The activity rates have been estimated by the Environment Agency based on the available information on the total of the installed electrical power of these installations and based on a typical annual fuel consumption of this type of installations.

Methodology
The CORINAIR (simple) methodology is applied.

Emission factors
CO2-, CH_4- und N_2O-emission factors are taken from CORINAIR Guidebook (1996). The selected emission factors for the whole time series are listed in the following table.

Table 14 – Emission factors of Category 1 A 1 a Public Electricity and Heat Production

IPCC Category	Source Categories	SNAP	Fuel		Emission factor [kg/GJ]		Reference
1 A 1a	Combustion plants < 50 MW (boilers)	010103	204A	Gas oil	CO2	70.0	CORINAIR, B111-55, Tab 29
					CH4	0.6	CORINAIR GB, B112-15, Tab 7
					N20	1.0	CORINAIR GB, B112-10, Tab 10
			301A	Natural gas	CO2	55.0	CORINAIR, B111-55, Tab 29
					CH4	1.2	CORINAIR GB, B112-15, Tab 7
					N20	1.0	CORINAIR GB, B112-10, Tab 10
	Combustion plants ≥ 50 MW, <300 MW	010102	203A	Residual oil	CO2	75.0	CORINAIR, B111-55, Tab 29
					CH4	5.0	CORINAIR GB, B112-15, Tab 7
					N20	2.4	CORINAIR GB, B112-10, Tab 10
			301A	Natural gas	CO2	55.0	CORINAIR, B111-55, Tab 29
					CH4	1.0	CORINAIR GB, B112-15, Tab 7
					N20	0.8	CORINAIR GB, B112-10, Tab 10
			305A	Blast furnace gas	CO2	258.0	internal study
					CH4	0.25	CORINAIR GB, B112-15, Tab 7
					N20	0.8	CORINAIR GB, B112-10, Tab 10

Activity data

The activity data of SNAP 010102 are based on consumption data of steel industry, provided by the plant operator, and on statistical data published by STATEC (Statistical Yearbook, tables C.3001, C.3400 and C.3450 to C.3458). Beside that, estimations of the Environment Agency were necessary to determine more detailed energy consumption data of the CHP installations (internal study). For SNAP activity 010103, fuels 204A and 301A, the activity data were estimated on the basis of an internal study.

Table 15 – Activity data in Category 1 A 1 a Public Electricity and Heat Production

SNAP	010102				010103	
Activity	Combustion plants >= 50 MW, <300 MW				Combustion plants < 50MW (CHP)	
Fuel	203A	301A	305A		204A	301A
Unit	[t]	[GJ]	[GJ]	[GJ]	[GJ]	[GJ]
1990		117000	448000	4784265	0	0
1991	6931	284171	356133	4534554	0	0
1992	9671	396511	384803	4092601	0	0
1993	6750	276750	382216	4477919	0	0
1994	1805	74005	626600	3510531	21755	874913
1995	1755	71955	756250	2666289	21755	874913
1996	1129	46289	980706	2227745	21755	874913
1997	1327	54407	803967	1176200	21755	874913
1998	0	0	0	0	29510	1186762
1999	0	0	0	0	44372	1784475
2000	0	0	0	0	109619	4408346
2001	0	0	0	0	114466	4603252
2002	0	0	0	0	114466	4603252
2003	0	0	0	0	114466	4603252
2004	0	0	0	0	164785	6626812
Reference	1990: TÜV (1990); 1991-1998: ARBED: Chaudière HP (PA-EB)		1990-1998: ARBED: Chaudiere HP (PA-EB)		Internal Study (see above)	

Table 16 – Conversion factors of various fuel types

Fuel type	Conversion factor LHV	Unit	Reference
203A, residual oil	41.00	GJ/t	CORINAIR Guidebook (1996): Combustion in Energy & transformation industries-ps010101 Activities 010101– 010105, Tab. 21, B111-42.
204A gas oil	42.70	GJ/t	
301A natural gas	37.35	GJ/1000m3	Inquiry Service du gaz, Ville de Luxembourg

** LHV = lower heat value*

Recalculations

No recalculations were made.

Category specific QA/QC procedures

For verification of the country-specific emission factors the following references are used:

- the Default Emission Factors of the Revised 1996 IPCC Guidelines for National GHG Inventories;
- the emission factor which is used in Belgium (Belgium NIR 2006), where a similar technology is used.

No further sector specific QA/QC procedures were made.

Planned improvements

- Revising the emission factor, e.g.:
  - revising the emission factor for gas oil; seems to be very low;
  - revising the emission factor for natural gas CO_2-EF; since it is below IPCC default value of 56.1 kg/GJ.
- Revising the activity data.
- Providing more specific source/estimation method of EF for blast furnace gas.
- Providing information on estimation methods used in internal studies.
- Verification procedures for plant specific data.

IPCC Category 1.A.1.b. Petroleum Refining

The IPCC Category 1.A.1.b. Petroleum Refining does not exist in Luxembourg.

IPCC Category 1.A.1.c. Manufacture of Solid Fuels and Other Energy Industries

The IPCC Category 1.A.1.c. Manufacture of Solid Fuels and Other Energy Industries does not exist in Luxembourg.

3.4 IPCC Sector 1 A 2 Manufacturing industries and construction

Sector Overview

In IPCC Sector 1 A 2 Manufacturing industries and construction the following IPCC categories are identified:

- IPCC Category 1 A 2 a Iron and Steel;
- IPCC Category 1 A 2 b Non-Ferrous Metals;
- IPCC Category 1 A 2 f Other.

The share in total CO_2 emissions from sector 1 A 2 is 50.2% for the year 1990 and 22.6% for the year 2004.

Emission trend

In the following tables the emission trends of IPCC Sector 1 A 2 Manufacturing industries and construction are presented. A description of the emission trend is given in the relevant subchapters.

Table 17 – CO_2 emission trend of IPCC Sector 1 A 2 Manufacturing industries and construction

GHG source and sink categories	Total Energy	Fuel combus-tion	Sector 1 A 2	Sector 1 A 2 a	Sector 1 A 2 b	Sector 1 A 2 c	Sector 1 A 2 d	Sector 1 A 2 e	Sector 1 A 2 f
					CO2 (Gg)				
1990	10 528.80	10 528.80	5 290.61	3 235.15	37.79	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	2 017.67
1991	10 856.30	10 856.30	4 762.09	3 078.68	37.79	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	1 645.62
1992	10 745.55	10 745.55	4 543.90	2 703.43	37.79	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	1 802.68
1993	11 024.54	11 024.54	4 636.83	2 975.65	37.79	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	1 623.39
1994	10 309.26	10 309.26	4 314.67	2 580.10	37.79	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	1 696.78
1995	8 194.41	8 194.41	2 618.77	1 389.05	37.79	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	1 191.93
1996	8 300.64	8 300.64	2 609.29	1 281.44	37.79	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	1 290.06
1997	7 728.03	7 728.03	2 080.48	844.18	37.79	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	1 198.51
1998	7 084.52	7 084.52	1 501.53	173.49	37.79	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	1 290.25
1999	7 626.17	7 626.17	1 708.82	120.90	37.79	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	1 550.13
2000	8 109.87	8 109.87	1 644.69	202.46	52.20	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	1 390.03
2001	8 434.71	8 434.71	1 561.17	245.28	52.20	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	1 263.69
2002	9 221.33	9 221.33	2 186.18	253.59	52.20	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	1 880.39
2003	9 739.23	9 739.23	2 130.86	253.59	52.20	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	1 825.07
2004	11 210.98	11 210.98	2 528.26	251.97	40.73	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	2 235.56
Trend 2003-2004	*15.1%*	*15.1%*	*18.6%*	*-0.6%*	*-22.0%*	*NA*	*NA*	*NA*	*22.5%*
Trend 1990-2004	*6.5%*	*6.5%*	*-52.2%*	*-92.2%*	*7.8%*	*NA*	*NA*	*NA*	*10.8%*
Share in National Total GHG 1990	*83.0%*	*83.0%*	*42.6%*	*26.1%*	*0.3%*	*NA*	*NA*	*NA*	*16.3%*
Share in National Total GHG 2004	*87.7%*	*87.7%*	*20.2%*	*2.0%*	*0.3%*	*NA*	*NA*	*NA*	*17.9%*

Table 18 – CH_4 emission trend of IPCC Sector 1 A 2 Manufacturing industries and construction

GHG source and sink categories	Total Energy	Fuel combustion	Sector 1 A 2	Sector 1 A 2 a	Sector 1 A 2 b	Sector 1 A 2 c	Sector 1 A 2 d	Sector 1 A 2 e	Sector 1 A 2 f
	CH4 (Gg)								
1990	2.75	1.44	0.03	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	0.03
1991	3.11	1.71	0.03	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	0.03
1992	3.33	1.87	0.03	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	0.03
1993	3.50	1.98	0.03	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	0.03
1994	3.29	1.80	0.05	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	0.05
1995	3.44	1.69	0.03	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	0.03
1996	3.68	1.81	0.05	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	0.05
1997	3.72	1.81	0.03	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	0.03
1998	3.68	1.75	0.03	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	0.03
1999	3.67	1.61	0.05	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	0.05
2000	3.83	1.72	0.03	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	0.03
2001	3.91	1.73	0.03	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	0.03
2002	4.33	1.56	0.01	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	0.01

GHG source and sink categories	Total Energy CH4 (Gg)	Fuel combustion	Sector 1 A 2	Sector 1 A 2 a	Sector 1 A 2 b	Sector 1 A 2 c	Sector 1 A 2 d	Sector 1 A 2 e	Sector 1 A 2 f
2003	4.37	1.58	0.01	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	0.01
2004	4.36	1.45	0.04	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	0.04
Trend 2003-2004	*-0.2%*	*-8.2%*	*300.0%*	*NA*	*NA*	*NA*	*NA*	*NA*	*300.0%*
Trend 1990-2004	*58.5%*	*0.7%*	*33.3%*	*NA*	*NA*	*NA*	*NA*	*NA*	*33.3%*
Share in National Total GHG 1990	*0.5%*	*0.2%*	*0.0%*	*NA*	*NA*	*NA*	*NA*	*NA*	*0.0%*
Share in National Total GHG 2004	*0.8%*	*0.3%*	*0.0%*	*NA*	*NA*	*NA*	*NA*	*NA*	*0.0%*

Table 19 – N_2O emission trend of IPCC Sector 1 A 2 Manufacturing industries and construction

GHG source and sink categories	Total Energy	Fuel combustion	Sector 1 A 2	Sector 1 A 2 a	Sector 1 A 2 b	Sector 1 A 2 c	Sector 1 A 2 d	Sector 1 A 2 e	Sector 1 A 2 f
					N2O (Gg)				
1990	0.18	0.18	0.03	0.01	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	0.02
1991	0.22	0.22	0.02	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	0.02
1992	0.32	0.32	0.02	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	0.02
1993	0.32	0.32	0.02	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	0.02
1994	0.35	0.35	0.02	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	0.02
1995	0.33	0.33	0.01	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	0.01
1996	0.36	0.36	0.01	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	0.01
1997	0.42	0.42	0.02	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	0.02
1998	0.46	0.46	0.02	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	0.02
1999	0.53	0.53	0.03	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	0.03
2000	0.56	0.56	0.02	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	0.02
2001	0.61	0.61	0.01	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	0.01
2002	0.65	0.65	0.01	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	0.01
2003	0.70	0.70	0.01	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	0.01
2004	0.87	0.87	0.04	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	0.04
Trend 2003-2004	*24.3%*	*24.3%*	*100.0%*	*NA*	*NA*	*NA*	*NA*	*NA*	*100.0%*
Trend 1990-2004	*383.3%*	*383.3%*	*-33.3%*	*-100%*	*NA*	*NA*	*NA*	*NA*	*0.0%*
Share in National Total GHG 1990	*0.4%*	*0.4%*	*0.1%*	*0.0%*	*NA*	*NA*	*NA*	*NA*	*0.0%*
Share in National Total GHG 2004	*2.2%*	*2.2%*	*0.0%*	*NA*	*NA*	*NA*	*NA*	*NA*	*0.0%*

IPCC Category 1 A 2 a Iron and Steel

Key Source: *CO2: solid and gaseous fuels*

Source Category Description

During the period under review (1990 to 2004), the iron and steel industry has been the most important industrial activity in Luxembourg, both in terms of energy consumption and in terms of value added. As indicated above, it has undergone a restructuring process during the '90s, which led to big changes in its air emissions. Today, its specific energy consumption is much lower than it was in 1990, but the steel industry has still relatively high energy consumption.

Category 1 A 2 a Iron and Steel enfolds emissions from fuel combustion in iron and steel industry. CO_2 emissions from ore reduction in blast furnaces are included in category 2 C 1.

The share in total GHG emissions (including LULUCF) from sector 1 A 2 a is for:

- CO_2 emission 26% for the year 1990 and 2% for the year 2004. The emission trend in the period 1990 – 2004 was about -92% whereas the emission trend in period 2003 – 2004 was less than 1%;
- N_2O emission less than 1 %.

Table 20 – Source categories of iron and steel industry included in the inventories

SNAP code	Source
030203	Blast furnace cowpers
030301	Sinter and pelletizing plants
030302	Reheating furnaces steel and iron
030303	Grey iron foundries

030203 - Blast furnace cowpers

Blast furnace cowpers have been used until 1997. They were fed with blast furnace gas and with natural gas. The related fuel consumption data were received directly from the operator.

030301 - Sinter and pelletizing plants

The sinter plant has been used until 1997. Its activity data, i.e. fuel consumption and production, have been established in detail for the year 1990 based on information received from the operator. The fuel consumptions of the following years have been estimated based on the data of 1990 and on the production of sintered ore of 1990 and of the respective year.

030302 - Reheating furnaces steel and iron

The reheating furnaces have been used during the whole period considered here, i. e. 1990 - 2004. Their operation is directly related to steel rolling. Their activity data (fuel combustion data) were received from the operator.

030303 - Grey iron foundries

The activity data of those foundries have been estimated in the early '90s, and no new data have been received since. The activity data and the emission factors were established at that time. Ac-

cording to the TÜV study, the activity data included in the inventory are based on personal information received orally from the operators. Those values in the inventories have been kept rather constant over the time period.

Table 21 – Steel production and final energy consumption

Year	Steel production [1000 t]	Energy consumption (1000 toe*)
1990	3560	1488
1991	3379	1359
1992	3068	1188
1993	3293	1331
1994	3073	1278
1995	2613	1037
1996	2501	976
1997	2580	823
1998	2477	333
1999	2600	342
2000	2571	351
2001	2725	**
2002	2736	**
2003	2675	**
2004	2684	**
Reference	STATEC, Statistical Yearbook, tables C.3400, C.3451 & C.3502	

* 1 toe = 41,8 GJ

** no official data available from iron and steel industry so far

Methodology

The CORINAIR (simple) methodology is applied. The sinter production site is considered as large point source.

Emission factors

The selected emission factors are listed in the following table.

Table 22 – Emission factors of Category 1 A 2 a Iron and steel industry

IPCC Category	Source Categories	SNAP	Fuel		CO2 Emission factor [kg/GJ]	Reference
1 A 2 a	Blast furnace cowpers	030203	305A	Blast furnace gas	258.00	internal study
	Sinter and pelletizing plants	030301	107A	Coke oven coke	97.11	
			301A	Natural gas	55.00	CORINAIR, B111-55, Tab 29
			305A	Blast furnace gas	256.00	internal study
	Reheating furnaces steel and iron	030302	301A	Natural gas	55.00	CORINAIR, B111-55, Tab 29
			305A	Blast furnace gas	258.00	internal study
	Grey iron foundries	030303	101A	Coking coal	152.00	

Activity data
Fuel consumption data were received from the operator.

Table 23 – Activity data of Category 1 A 2 a Iron and steel industry - Blast furnace cowpers

SNAP code	030203	
Activity	Blast furnace cowpers	
Fuel	301a	305a
Unit	[GJ]	[GJ]
1990	1658 234	5 207 600
1991	1683 837	4 674 985
1992	1457 697	4 044 813
1993	1400 749	4 518 372
1994	928 413	3 930 783
1995	564 130	1 944 721
1996	482 460	1 744 102
1997	292 469	968 417
1998	0	0
1999	0	0
2000	0	0
2001	0	0
2002	0	0
2003	0	0
2004	0	0
Reference	plant specific	plant specific

Recalculations
No recalculations were made.

Sector specific QA/QC procedures
No category specific QA/QC procedures were investigated.

Planned improvements

- Revising emission factors.
- Revising the CO_2 emission factor for 101A coking coal: the current emission factor is too high; the IPCC default factor is 94,6 kg/GJ (25,8 t C/TJ coal).

IPCC Category 1 A 2 b Non-Ferrous Metals

Key Sources: *no*

Source Category Description
Liquefied petrol gas (*LPG*) is an important fuel used in secondary aluminium production. For some of the years, the fuel combustion data have been transmitted to the Environment Agency by the operator.

The share in total GHG emissions (including LULUCF) from sector 1 A 2 b is for CO_2 emissions less than 1% for the year 1990 and 2004. The emission trend in the period 1990 – 2004 was about -22% whereas the emission trend in period 2003 – 2004 was about 8%.

Methodology
The CORINAIR (simple) methodology is applied.

Emission factors
The selected emission factors are listed in the following table.

Table 24 – Emission factors of Category 1 A 2 b Secondary aluminium production

IPCC Category	Source Categories	SNAP	Fuel		CO2 Emission factor [kg/GJ]	Reference
1 A 2 b	Secondary aluminium production	030310	303A	Liquefied petroleum gas	62	CORINAIR, B111-55, Tab 29

Activity data
The Activity data of Category 1 A 2 b Secondary aluminium production are listed in the following table.

Table 25 – Activity data of Category 1 A 2 b Secondary aluminium production

SNAP code	030310
Activity	Secondary aluminium production
Fuel	LPG
Unit	[GJ]
1990	609 450
1991	609 450
1992	609 450
1993	609 450
1994	609 450
1995	609 450
1996	609 450
1997	609 450
1998	609 450
1999	609 450
2000	841 950
2001	841 950
2002	841 950
2003	841 950
2004	656 987
Reference	1990-1999: (TÜV 1990); 2000-2004: plant specific data

Recalculations
No recalculations were made.

Sector specific QA/QC procedures
No category specific QA/QC procedures were investigated.

Planned improvements
Revising the emission factor.

IPCC Category 1 A 2 c Chemicals

The IPCC Category 1 A 2 c Chemicals does not exist in Luxembourg.

IPCC Category 1 A 2 d Pulp, Paper and Print

The IPCC Category 1 A 2 d Pulp, Paper and Print does not exist in Luxembourg.

IPCC Category 1 A 2 f Other

Key Sources: *CO_2: gaseous, liquid, solid*

Source Category Description
Beside the activities of the iron and steel industry, this source category includes a number of other industrial activities (see list below).

Table 26 – Activities of other industries included in the inventories

SNAP code	Source
030102	Combustion in boilers, combustion plants, 50 - 300 MW
030103	Combustion in boilers, < 50 MW
030104	Gas turbines
030104	Gas turbines (LPS)
030311	Clinker
030314	Flat glass
030320	Fine ceramic materials

030102 - Combustion in boilers, combustion plants, 50 - 300 MW
Under this SNAP code, larger industrial boilers are included. They use residual oil or natural gas as fuel. The information about the fuel combustion in these boilers were received directly from the operator.

030103 - Combustion in boilers, < 50 MW
This source includes smaller combustion installations. As the number of this kind of boilers is higher, they have not been treated individually. No precise fuel combustion data are known about this large group of installations.

The share in total GHG emissions (including LULUCF) from sector 1 A 2 f is for:

- CO_2 emission 15% for the year 1990 and 18% for the year 2004. The emission trend in the period 1990 – 2004 was about 11% whereas the emission trend in period 2003 – 2004 was about 23%:
- CH_4 emission less than 1% in the year 1990 and 2004. The emission trend in the period 1990 – 2004 was about 33 % whereas the emission trend in period 2003 – 2004 was about 300%;
- N_2O emission less than 1% in the year 1990 and 2004.

Methodology
The CORINAIR (simple) methodology is applied.

Emission factors
CO2 emission factors are taken from CORINAIR Guidebook (1996). The selected emission factors for the whole time series are listed in the following table.

Table 27 - Emission factors of Category 1 A 2 f

IPCC Category	Source Categories	SNAP	Fuel		Emission factor [kg/GJ]		Reference
1 A 2 f	Combustion in boilers, 50 - 300 MW	030102	301A	Natural gas	CO2	62.0	CORINAIR Guidebook (1996): Combustion in Energy & transformation industries - ps010101 Activities 010101 – 010105 - Selection of relevant fuels from NAPFUE and lower heating values for boilers, gas turbines and stationary engines, B111-52 through B111-58.
					CH4	1.0	
					N2O	0.8	
			203A	Residual oil	CO2	75.0	
					CH4	5.0	
					N2O	2.4	
	Combustion in boilers, < 50 MW	030103	101A	Coking coal	CO2	93.0	
					CH4	25.0	
					N2O	4.0	CORINAIR Guidebook (1996): Combustion in Energy & transformation industries - ps010101 Activities 010101 – 010105 - Selection of relevant fuels from NAPFUE and lower heating values for boilers, gas turbines and stationary engines, B111-52 through B111-58.
			104A	Patent fuels	CO2	98.0	
					CH4	15.0	
					N2O	3.5	
			203A	Residual oil	CO2	75.0	
					CH4	5.0	
					N2O	2.4	
			204A	Gas oil	CO2	70.0	
					CH4	2.5	
					N2O	2.4	
			301A	Natural gas	CO2	55.0	
					CH4	1.0	
					N2O	0.8	
			303A	Liquefied petroleum gas	CO2	62.0	
					CH4	2.5	
					N2O	2.0	

Activity data

The Activity data of Category 1 A 2 f Other are listed in the following table.

Table 28 – Activity data of Category 1 A 2 f Other - Combustion Plants, 50 MW – 300 MW

SNAP	030102	
Activity	Combustion Plants, 50 MW – 300 MW	
Fuel	203A	301A
Unit	[GJ]	[GJ]
1990	1 280 000	952 000
1991	1 757 178	1 120 000
1992	1 302 324	1 138 777
1993	1 335 026	1 094 055
1994	1 276 412	1 047 838
1995	1 156 364	1 107 755
1996	842 714	1 044 469
1997	0	1 190 306
1998	0	1 187 072
1999	0	1 233 554
2000	0	1 147 017
2001	0	965 035
2002	0	1 006 519
2003	0	1 006 519
2004	0	1 080 592
Reference	1990: TÜV (1991); 1991 – 2004 : plant specific data	1990: TÜV (1991); 1991 – 2004 : plant specific data

Table 29 – Activity data of Category 1 A 2 f Other - Combustion Plants, < 50 MW

SNAP	030103						
Activity	Combustion Plants, < 50 MW						
Fuel	101A	104A	203A	204A	301A	303A	305A
Unit	[GJ]	[GJ]	[GJ]	[GJ]	[GJ]	[GJ]	[GJ]
1990	273686	43 024	400 000	3 509 623	1 549 733	588 000	2 920 000
1991	266 893	0	605 734	2 166 860	841 212	496 500	2 590 927
1992	301 073	443 223	653 499	3 711 684	1 362 376	471 950	2 504 140
1993	213 037	416 117	665 471	2 382 749	1 332 734	337 300	2 419 227
1994	432 225	1 190 475	427 179	3 168 761	2 260 773	207 400	1 767 950
1995	211 140	327 272	371 132	2 399 223	4 020 738	163 050	129 757
1996	343 026	792 740	280 317	4 023 800	3 250 868	233 550	67 632
1997	304 654	0	216 193	3 497 719	4 463 504	160 550	26 930
1998	244 861	57 110	185 976	4 703 184	4 791 469	762 050	0
1999	294 892	1 227 505	139 318	1 594 763	6 389 999	863 937	0
2000	275 471	434 772	172 843	3 557 941	5 095 352	552 150	0
2001	176 349	690 750	212 610	2 226 494	1 015 265	817 231	0

SNAP	030103						
Activity	Combustion Plants, < 50 MW						
Fuel	101A	104A	203A	204A	301A	303A	305A
Unit	[GJ]	[GJ]	[GJ]	[GJ]	[GJ]	[GJ]	[GJ]
2002	182 178	702 834	195 541	1 248 109	1 952 925	0	0
2003	196 533	0	160 061	2 122 128	1 666 036	181 700	0
2004	192 386	1 006 077	61 418	3 221 322	2 891 096	0	0
Reference	STATEC: national statistics and energy balance; plant specific data						

Recalculations
No recalculations were made.

Sector specific QA/QC procedures
No category specific QA/QC procedures were investigated.

Planned improvements
Revising the emission factors.

Source Category Description
030104 - Gas turbines (LPS)
In this activity group gas turbines of industrial CHP power plants are included. One major gas-vapour turbine (380 MW) has been built in the south of Luxembourg near Esch-sur-Alzette. It is run on natural gas.

Emission factors
CO_2-emission factors are taken from CORINAIR Guidebook (1996). The selected emission factors for the whole time series are listed in the following table.

Table 30 – Emission factors of Category 1 A 2 f Other - Gas turbines

IPCC Category	Source Categories	SNAP	Fuel		CO2 Emission factor [kg/GJ]	Reference
1 A 2 f	Gas turbines / Gas turbines (LPS)	030104	204A	Gas oil	70.0	CORINAIR Guidebook (1996): B111-52 B111-58.
			301A	Natural gas	55.0	

Activity data
The operator communicates fuel consumption data annually to the Environment Agency.

Table 31 – Activity data of Category 1 A 2 f Other - Gas turbines

SNAP code	030104		
Activity	Gas turbines		Gas-vapour turbine (380 MW)
Fuel	204a	301a	301
Unit	[GJ]	[GJ]	[GJ]
1990	0	0	0
1991	0	0	0
1992	0	0	0
1993	0	0	0
1994	641	358 560	0
1995	664	602 000	0
1996	995	902 000	0
1997	995	902 000	0
1998	1 526	1 384 000	0
1999	1 526	1 384 000	0
2000	1 526	1 384 000	0
2001	1 526	3 808 441	0
2002	4 410	3 733 742	14 982 000
2003	4 410	3 733 742	14 720 760
2004	992	3 176 835	17 900 000
Reference	STATEC: national statistics; emission measurement reports	STATEC: national statistics; emission measurement reports	STATEC: national statistics; emission measurement reports

Recalculations
No recalculations were made.

Sector specific QA/QC procedures
No category specific QA/QC procedures were investigated.

Planned improvements
Revising the emission factors.

Source Category Description
030311 - Clinker (LPS)
One industrial site produces clinker in Luxembourg. It is included in the inventory as a large point source (*LPS*). Its major fuel has been hard coal, but use is also made of residual oil, natural gas and special types of waste, for example shreddered tyres. The consumption data of these fuels are transmitted annually to the Environment Agency by the operator. Its production has decreased from 1048 kt clinker in 1990 to 847 kt in 2004 and, consequently, hard coal consumption has dropped from 3,6 PJ in 1990 to 2 PJ in 2004.

Emission factors

CO_2 emission factors for residual oil and natural gas are taken from CORINAIR Guidebook (1996). CO_2 emission factors for solid fuels are plant specific data. The selected emission factors for the whole time series are listed in the following table.

Table 32 – Emission factors of Category 1 A 2 f Other - Cement

IPCC Category	Source Categories	SNAP	Fuel		CO2 Emission factor [kg/GJ]	Reference
1 A 2 f	Cement	030311	104A	Patent fuels	99.46	plant specific
			121B	Other solid fuel	102.6	plant specific
			203A	Residual oil	75.0	CORINAIR Guidebook (1996):
			301A	Natural gas	55.0	B111-52 B111-58.

Activity data

The activity data are listed in the following table.

Table 33 – Activity data of Category 1 A 2 f Other - Cement

SNAP	030311				
Activity	Cement (Intermoselle) LPS				
Fuel		104	203	301	other solid fuel
Unit	[t product]	[GJ]	[GJ]	[GJ]	[t]
1990	1 048 000	3 561 653	186 601	-	-
1991	1 048 000	3 391 352	92 783	-	-
1992	1 013 452	3 442 128	86 699	-	-
1993	1 013 452	2 844 970	122 690	-	-
1994	950 854	3 317 450	110 998	-	-
1995	848 455	3 083 719	107 180	-	-
1996	837 518	3 042 623	96 601	-	-
1997	865 659	3 369 318	144 047	9 122	-
1998	870 053	2 941 888	92 425	9 041	-
1999	913 265	3 150 721	72 819	8 239	6 212
2000	965 369	3 152 003	92 386	9 343	9 527
2001	843 608	2 149 050	73 390	7 875	20 716
2002	874 577	2 144 750	61 459	7 925	24 440
2003	770 000	NE	NE	NE	NE
2004	847 389	2 001 550	91 676	8 698	23 942
Reference	Plant specific data	Plant specific data	Plant specific data	Plant specific data	Plant specific data

Recalculations

No recalculations were made.

Sector specific QA/QC procedures

No category specific QA/QC procedures were investigated.

Planned improvements

- Revising the emission factors;
- Revising the activity data.

Source Category Description

030314 - Flat glass (LPS)

Since 1990 there are mainly two float glass plants in Luxembourg which major fuel input is natural gas (they also use small amounts of LPG). Their production has been rather stable since 1990 and is estimated at 400 kt per year. Natural gas consumption increased from 2,7 PJ in 1990 to a bit more than 3 PJ in 2004. That increase in energy consumption, in parallel with a rather constant production level, is caused by a gradual reduction in the energy efficiency of the production line due to aging, according to the operators.

For some of the years considered here, the operators transmitted fuel consumption data to the Environment Agency. Both units are handled as LPSs.

Emission factors

The selected emission factors for the whole time series are listed in the following table.

Table 34 – Emission factors of Category 1 A 2 f Other - Flat glass

IPCC Category	Source Categories	SNAP	Fuel	CO2 Emission factor [kg/GJ]		Reference
1 A 2 f	Flat glass	030314	301A	Natural gas	55.0	CORINAIR Guidebook (1996): B111-52 B111-58.

Activity data

The activity data are listed in the following table.

Table 35 – Activity data of Category 1 A 2 f Other - Flatglass

SNAP code	30314			
Activity	Flatglass (Luxguard I) LPS	Flatglass (Luxguard I) LPS	Flatglass (Luxguard II)LPS	Flatglass (Luxguard II) LPS
Fuel	-	301	-	301
Unit	[t product]	[GJ]	[t product]	[GJ]
1990	200 000	1 263 244	200 000	1 496 616
1991	200 000	986 043	200 000	1 526 487
1992	200 000	1 393 642	200 000	1 495 615
1993	200 000	1 482 307	200 000	1 562 757
1994	200 000	1 544 938	200 000	1 634 645
1995	200 000	1 567 629	200 000	1 638 883
1996	200 000	1 608 504	200 000	1 642 711
1997	200 000	1 608 504	200 000	1 642 711
1998	200 000	1 608 504	200 000	1 167 094

SNAP code	30314			
Activity	Flatglass (Luxguard I) LPS	Flatglass (Luxguard I) LPS	Flatglass (Luxguard II)LPS	Flatglass (Luxguard II) LPS
Fuel	-	301	-	301
Unit	[t product]	[GJ]	[t product]	[GJ]
1999	200 000	1 608 504	200 000	1 568 700
2000	200 000	1 608 504	200 000	1 568 700
2001	200 000	1 608 504	200 000	1 432 465
2002	200 000	1 645 075	200 000	1 486 226
2003	200 000	1 645 075	200 000	1 486 226
2004	216 365	1 412 876	200 000	1 558 277
Reference	1990-2003: operation permit recorded data; 2004: data from operator	Plant specific data	operation permit recorded data	Plant specific data

Recalculations
No recalculations were made.

Sector specific QA/QC procedures
No category specific QA/QC procedures were investigated.

Planned improvements

- Revising the emission factors;
- Revising the activity data.

Source Category Description
030320 - Fine ceramic materials
One major production site of ceramic materials exists in Luxembourg and it uses natural gas as fuel.

Methodology / Methodological Issues
The CORINAIR (simple) methodology is applied.

Emission factors
The selected emission factors for the whole time series are listed in the following table.

Table 36 – Emission factors of Category 1 A 2 f Other - Fine ceramic materials

IPCC Category	Source Categories	SNAP	Fuel		CO2 Emission factor [kg/GJ]	Reference
1 A 2 f	Fine ceramic materials	030320	301A	Natural gas	55.0	CORINAIR Guidebook (1996): B111-52 B111-58.

Activity data
The activity data are listed in the following table.

Table 37 – Activity data of Category 1 A 2 f Other - Fine ceramic materials

SNAP code	030320
Activity	Fine ceramic materials
Fuel	301A
Unit	[GJ]
1990	198 124
1991	198 124
1992	198 124
1993	198 124
1994	198 124
1995	198 124
1996	198 124
1997	198 124
1998	198 124
1999	198 124
2000	198 124
2001	198 124
2002	198 124
2003	198 124
2004	198 124
Reference	plant specific data

Recalculations
No recalculations were made.

Sector specific QA/QC procedures
No category specific QA/QC procedures were investigated.

Planned improvements

- Revising the emission factors;
- Revising the activity data.

3.5 IPCC Sector 1 A 3 Transport

Sector Overview

The IPCC Sector 1 A 3 Transport the following sources are identified:

- IPCC Category 1.A.3.b. Road Transportation;
- IPCC Category 1.A.3.c. Railways;
- IPCC Category 1.A.3.d. Navigation.

Emission trend

In the following tables the emission trends of IPCC Sector 1 A 3 Transport are presented. An emission trend description is given in the relevant subchapters.

Table 38 – CO_2 emission trend of IPCC Sector 1 A 3 Transport

GHG source and sink categories	Total Energy	Fuel combustion	Sector 1 A 3	Sector 1 A 3 a	Sector 1 A 3 b	Sector 1 A 3 c	Sector 1 A 3 d	Sector 1 A 3 e
	CO2 (Gg)							
1990	10 528.80	10 528.80	2 724.47	NE (but ≈ 0)	2 692.97	25.90	5.60	NO
1991	10 856.30	10 856.30	3 317.22	NE (but ≈ 0)	3 285.72	25.90	5.60	NO
1992	10 745.55	10 745.55	3 574.99	NE (but ≈ 0)	3 543.49	25.90	5.60	NO
1993	11 024.54	11 024.54	3 633.52	NE (but ≈ 0)	3 602.02	25.90	5.60	NO
1994	10 309.26	10 309.26	3 665.55	NE (but ≈ 0)	3 637.23	22.72	5.60	NO
1995	8 194.41	8 194.41	3 452.55	NE (but ≈ 0)	3 428.55	18.40	5.60	NO
1996	8 300.64	8 300.64	3 532.57	NE (but ≈ 0)	3 508.57	18.40	5.60	NO
1997	7 728.03	7 728.03	3 802.12	NE (but ≈ 0)	3 778.12	18.40	5.60	NO
1998	7 084.52	7 084.52	3 984.09	NE (but ≈ 0)	3 960.09	18.40	5.60	NO
1999	7 626.17	7 626.17	4 343.90	NE (but ≈ 0)	4 319.90	18.40	5.60	NO
2000	8 109.87	8 109.87	4 977.76	NE (but ≈ 0)	4 953.76	18.40	5.60	NO
2001	8 434.71	8 434.71	5 222.59	NE (but ≈ 0)	5 198.59	18.40	5.60	NO
2002	9 221.33	9 221.33	5 419.96	NE (but ≈ 0)	5 393.77	20.59	5.60	NO
2003	9 739.23	9 739.23	6 018.90	NE (but ≈ 0)	5 992.71	20.59	5.60	NO
2004	11 210.98	11 210.98	6 986.62	NE (but ≈ 0)	6 960.43	20.59	5.60	NO
Trend 2003-2004	*15.1%*	*15.1%*	*16.1%*	*NA*	*16.1%*	*0.0%*	*0.0%*	*NA*
Trend 1990-2004	*6.5%*	*6.5%*	*156.4%*	*NA*	*158.5%*	*-20.5%*	*0.0%*	*NA*
Share in National Total GHG 1990	*84.8%*	*84.8%*	*21.9%*	*NA*	*21.7%*	*0.2%*	*0.0%*	*NA*
Share in National Total GHG 2004	*89.6%*	*89.6%*	*55.8%*	*NA*	*55.6%*	*0.2%*	*0.0%*	*NA*

Table 39 – CH_4 emission trend of IPCC Sector 1 A 3 Transport

GHG source and sink categories	Total Energy	Fuel combus-tion	Sector 1 A 3	Sector 1 A 3 a	Sector 1 A 3 b	Sector 1 A 3 c	Sector 1 A 3 d	Sector 1 A 3 e
	CH4 (Gg)							
1990	2.75	1.44	0.87	NE (but ≈ 0)	0.86	NE (but ≈ 0)	0.01	NO
1991	3.11	1.71	0.94	NE (but ≈ 0)	0.93	NE (but ≈ 0)	0.01	NO
1992	3.33	1.87	1.16	NE (but ≈ 0)	1.15	NE (but ≈ 0)	0.01	NO
1993	3.50	1.98	1.17	NE (but ≈ 0)	1.16	NE (but ≈ 0)	0.01	NO
1994	3.29	1.80	1.25	NE (but ≈ 0)	1.24	NE (but ≈ 0)	0.01	NO
1995	3.44	1.69	1.20	NE (but ≈ 0)	1.19	NE (but ≈ 0)	0.01	NO
1996	3.68	1.81	1.24	NE (but ≈ 0)	1.23	NE (but ≈ 0)	0.01	NO
1997	3.72	1.81	1.28	NE (but ≈ 0)	1.27	NE (but ≈ 0)	0.01	NO
1998	3.68	1.75	1.26	NE (but ≈ 0)	1.25	NE (but ≈ 0)	0.01	NO
1999	3.67	1.61	1.10	NE (but ≈ 0)	1.09	NE (but ≈ 0)	0.01	NO
2000	3.83	1.72	1.28	NE (but ≈ 0)	1.27	NE (but ≈ 0)	0.01	NO
2001	3.91	1.73	1.27	NE (but ≈ 0)	1.26	NE (but ≈ 0)	0.01	NO
2002	4.33	1.56	1.22	NE (but ≈ 0)	1.21	NE (but ≈ 0)	0.01	NO
2003	4.37	1.58	1.24	NE (but ≈ 0)	1.23	NE (but ≈ 0)	0.01	NO
2004	4.36	1.45	1.10	NE (but ≈ 0)	1.09	NE (but ≈ 0)	0.01	NO
Trend 2003-2004	*-0.2%*	*-8.2%*	*-11.3%*	*NA*	*-11.4%*	*NA*	*0.0%*	*NA*
Trend 1990-2004	*58.5%*	*0.7%*	*26.4%*	*NA*	*26.7%*	*NA*	*0.0%*	*NA*
Share in National Total GHG 1990	*0.5%*	*0.2%*	*0.1%*	*NA*	*0.1%*	*NA*	*0.0%*	*NA*
Share in National Total GHG 2004	*0.8%*	*0.3%*	*0.2%*	*NA*	*0.2%*	*NA*	*0.0%*	*NA*

Table 40 – N_2O emission trend of IPCC Sector 1 A 3 Transport

GHG source and sink categories	Total Energy	Fuel combustion	Sector 1 A 3	Sector 1 A 3 a	Sector 1 A 3 b	Sector 1 A 3 c	Sector 1 A 3 d	Sector 1 A 3 e
	N2O (Gg)							
1990	0.18	0.18	0.15	NE (but ≈ 0)	0.14	0.01	NE (but ≈ 0)	NO
1991	0.22	0.22	0.18	NE (but ≈ 0)	0.17	0.01	NE (but ≈ 0)	NO
1992	0.32	0.32	0.28	NE (but ≈ 0)	0.27	0.01	NE (but ≈ 0)	NO
1993	0.32	0.32	0.28	NE (but ≈ 0)	0.27	0.01	NE (but ≈ 0)	NO
1994	0.35	0.35	0.31	NE (but ≈ 0)	0.30	0.01	NE (but ≈ 0)	NO
1995	0.33	0.33	0.30	NE (but ≈ 0)	0.30	NE (but ≈ 0)	NE (but ≈ 0)	NO
1996	0.36	0.36	0.33	NE (but ≈ 0)	0.33	NE (but ≈ 0)	NE (but ≈ 0)	NO
1997	0.42	0.42	0.38	NE (but ≈ 0)	0.38	NE (but ≈ 0)	NE (but ≈ 0)	NO
1998	0.46	0.46	0.42	NE (but ≈ 0)	0.42	NE (but ≈ 0)	NE (but ≈ 0)	NO

GHG source and sink categories	Total Energy	Fuel combustion	Sector 1 A 3	Sector 1 A 3 a	Sector 1 A 3 b	Sector 1 A 3 c	Sector 1 A 3 d	Sector 1 A 3 e
				N2O (Gg)				
1999	0.53	0.53	0.48	NE (but ≈ 0)	0.48	NE (but ≈ 0)	NE (but ≈ 0)	NO
2000	0.56	0.56	0.54	NE (but ≈ 0)	0.54	NE (but ≈ 0)	NE (but ≈ 0)	NO
2001	0.61	0.61	0.58	NE (but ≈ 0)	0.58	NE (but ≈ 0)	NE (but ≈ 0)	NO
2002	0.65	0.65	0.62	NE (but ≈ 0)	0.61	0.01	NE (but ≈ 0)	NO
2003	0.70	0.70	0.69	NE (but ≈ 0)	0.68	0.01	NE (but ≈ 0)	NO
2004	0.87	0.87	0.84	NE (but ≈ 0)	0.83	0.01	NE (but ≈ 0)	NO
Trend 2003-2004	*24.3%*	*24.3%*	*21.7%*	*NA*	*22.1%*	*0.0%*	*NA*	*NA*
Trend 1990-2004	*383.3%*	*383.3%*	*460.0%*	*NA*	*492.9%*	*0.0%*	*NA*	*NA*
Share in National Total GHG 1990	*0.4%*	*0.4%*	*0.4%*	*NA*	*0.3%*	*0.0%*	*NA*	*NA*
Share in National Total GHG 2004	*2.2%*	*2.2%*	*2.1%*	*NA*	*2.1%*	*0.0%*	*NA*	*NA*

IPCC Category 1 A 3 a Civil aviation

In Luxembourg, there is only one airport for commercial aviation. Therefore all flights, coming to Luxembourg or going out from Luxembourg, are international flights. For that reason, emissions of bunker fuel consumption related to aviation are not included in the national total of Luxembourg, but are rather added as memo item under international bunkers.

IPCC Category 1 A 3 b Road Transportation

Key Sources

The methodology and results of the key source analysis is presented in Chapter 1. Table 41 presents the key source categories of IPCC Category 1 A 3 b Road Transportation.

Table 41 – Key sources of Category 1 A 3 b Road Transportation

IPCC Category / Source Categories	Key sources		
	GHG	KS-Assessment*	
1 A 3 b Road Transportation: Diesel oil	CO2	LA: 1990-2004	TA: 2004
1 A 3 b Road Transportation: Diesel oil	N2O	LA: 1995-2004	TA: 2004
1 A 3 b Road Transportation: Gasoline	CO2	LA: 1990-2004	TA: 2004
1 A 3 b Road Transportation: Gasoline	N2O	LA: 1998 & 2001	

**LA = Level Assessment*

**TA = Trend Assessment*

Source Category Description

The main COPERT III categories can be allocated to the UNECE classification as follows:

- Passenger Cars M1
- Light Duty Vehicles N1
- Heavy Duty Vehicles N2, N3
- Urban Buses & Coaches M2, M3
- Two Wheelers L1, L2, L3, L4, L5

The share in total GHG emissions (including LULUCF) from sector 1 A 2 f is for:

- CO_2 emission 22% for the year 1990 and 56% for the year 2004. The emission trend in the period 1990 – 2004 was about 159% whereas the emission trend in period 2003 – 2004 was about 16%;
- CH_4 emission less than 1% in the year 1990 and 2004. The emission trend in the period 1990 – 2004 was about 27% whereas the emission trend in period 2003 – 2004 was about -11%;
- N_2O emission less than 1% in the year 1990 and about 2% for 2004. The emission trend in the period 1990 – 2004 was about 492% whereas the emission trend in period 2003 – 2004 was about 22%.

Table 42 – CO_2 emission from 'fuel export' in the Category 1 A 3 b Road Transportation

	CO2 emission from 'fuel export' in the Category 1 A 3 b Road Transportation			
	Gasoline [t]	Diesel [t]	LPG [t]	Total [t]
1990	785 400	1 034 293	9 533	1 829 226
1991	1 007 000	1 419 000	10 208	2 436 208
1992	891 000	1 482 000	7 732	2 380 732
1993	904 000	1 526 000	9 258	2 439 258
1994	960 000	1 482 000	9 325	2 451 325
1995	876 000	1 356 000	9 085	2 241 085
1996	889 693	1 416 799	6 659	2 313 151
1997	984 222	1 566 125	2 831	2 553 178
1998	1 004 651	1 703 759	5 474	2 713 884
1999	1 090 534	1 910 321	6 937	3 007 792
2000	1 128 233	2 390 227	6 131	3 524 591
2001	1 143 817	2 566 813	8 166	3 718 796
2002	1 126 675	2 745 607	8 175	3 880 457
2003	1 157 648	3 313 021	6 433	4 477 102
2004	1 212 383	4 244 387	5 342	5 462 112
Reference	Environment Agency			

Methodology
The emissions of Category 1 A 3 b Road Transportation are estimated in two steps:

1	COPERT III: estimation of the annual fuel consumption of the vehicle fleet registered in Luxembourg	• Emission factor: default data from the COPERT III • Activity data (1990 – 2005): fleet statistic provided by the SNCT (*Société Nationale de Controle Technique*)
2	CO_2 Emission 'fuel export' from road transport which is the difference between: • CO_2 Emission estimated by COPERT III, and • CO_2 Emission estimated from the Energy Balance for total road transport	• Ministry of Economic Affairs and External Trade, Energy Directorate • Environment Agency

Road traffic emissions have been calculated using the COPERT III software, which is referred in IPCC Guidelines as a Tier 3 method. [11] The input data were based on car fleet statistics of the vehicles registered in Luxembourg (SNCT 1990 - 2005). The emission factors are default data from the COPERT III.[12] Thus the annual fuel consumption of the Luxembourg vehicle fleet could be estimated. That fuel consumption is lower than the road fuels sales in Luxembourg, because many foreign drivers passing through Luxemburg refuel their vehicle in Luxembourg ('fuel export') since fuel prices are lower in Luxembourg than in the neighbouring countries.

Air emissions of road traffic calculated with COPERT III reflect Luxembourg's vehicle fleet. CO_2, CH_4 and N_2O emissions of road traffic have been adjusted to reflect 'fuel exports' by taking total Luxembourg's road fuels sales as a basis. The inventory values of the other air pollutants in the CRF tables could not be updated that way, hence being marked as 'not estimated'.

Air emissions of road traffic are calculated with the COPERT III software. Total emission estimates are calculated default emission factors of COPERT III and estimated activity data (e.g. annual vehicle kilometres).

[11] However, in our CRF Tables, this method is referred to as a CORINAIR method (CR notation key).

[12] Chariton Kouridis, Leonidas Ntziachristos and Zissis Samaras, *COPERT III - Computer programme to calculate emissions from road transport - user manual (version 2.1)*.Technical Report N°50, European Environment Agency, Copenhagen, 2000.

Emission types[13]

$E_{TOTAL} = E_{HOT} + E_{COLD} + E_{EVAP}$

with

- E_{TOTAL}: total emissions of any pollutant for the spatial and temporal resolution of the application
- E_{HOT}: emissions during stabilised (hot) engine operation
- E_{COLD}: emissions during transient thermal engine operation (cold start)
- E_{EVAP}: emissions from fuel evaporation. Emissions from evaporation are only relevant for NMVOC species from gasoline powered vehicles.

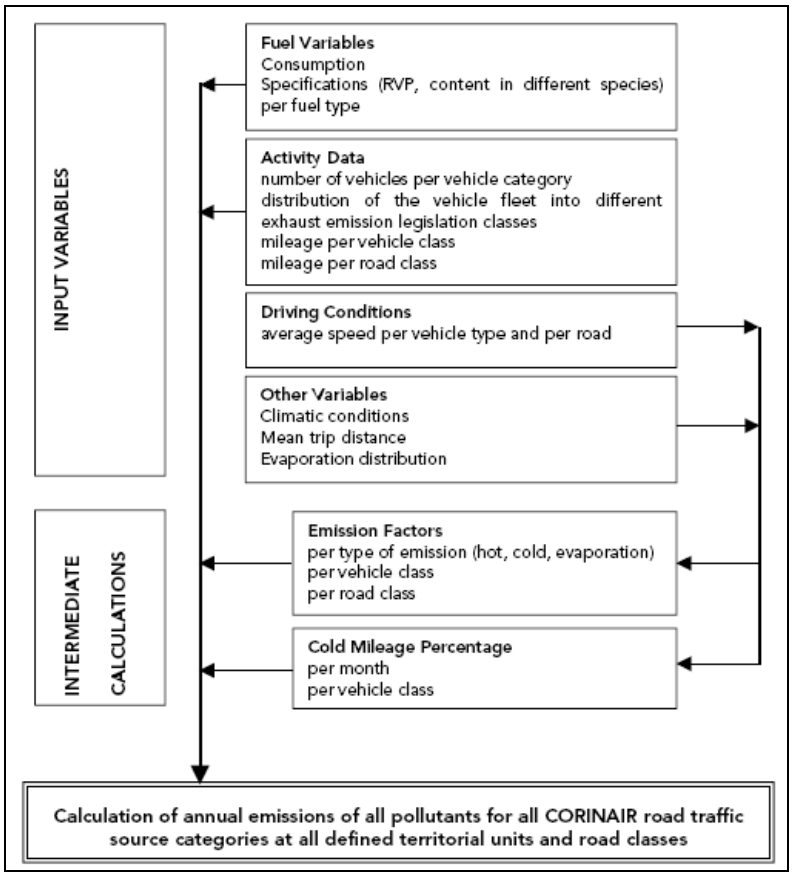
Emissions under different driving conditions[14]

$E_{TOTAL} = E_{URBAN} + E_{RURAL} + E_{HIGHWAY}$

with

- E_{URBAN}, E_{RURAL}, $E_{HIGHWAY}$: total emissions of any pollutant for the respective driving situation.

Figure 10 – Flow chart of the application of the baseline methodology in COPERT III



[13] Ntziachristos, L. & Samaras, Z. (2000) p. 13

[14] Ntziachristos, L. & Samaras, Z. (2000) p. 14

Emission factors

The used emission factors are listed in the following tables.

Table 43 – Abbreviations used in the COPERT III

FCu	FCr	FCh	N2Oh	N2Or	N2Ou	CH4h	CH4r	CH4u
fuel consumption, urban	fuel consumption, rural	fuel consumption, highway	Nitrous oxide, highway	Nitrous oxide, rural	Nitrous oxide, urban	Methane, highway	Methane, rural	Methane, urban

Table 44 – Emission factors - Hot stabilized driving - Passenger cars (Gasoline)

Technology		FCu	FCr	FCh	N2Oh	N2Or	N2Ou	CH4h	CH4r	CH4u
Gasoline <1,4 l	PRE ECE	67.499	55.000	60.813	0.005	0.005	0.005	0.022	0.043	0.092
	ECE 15/00-01	58.240	46.520	46.835	0.005	0.005	0.005	0.022	0.043	0.092
	ECE 15/02 / ECE 15/03	53.248	46.240	49.232	0.005	0.005	0.005	0.022	0.043	0.092
	ECE 15/04	51.420	44.740	46.140	0.005	0.005	0.005	0.022	0.043	0.092
	Improved Conventional	44.923	42.723	63.898	0.005	0.005	0.005	0.023	0.044	0.092
	Open Loop	49.431	45.771	62.466	0.005	0.005	0.005	0.023	0.044	0.092
	Euro I - 91/441/EEC	51.136	40.256	41.621	0.035	0.016	0.053	0.019	0.022	0.038
	Euro II - 94/12/EC	51.136	40.256	41.621	0.035	0.016	0.053	0.004	0.005	0.008
	Euro III - 98/69/EC Stage2000	51.136	40.256	41.621	0.035	0.016	0.053	0.003	0.003	0.006
Gasoline 1,4 - 2,0 l	PRE ECE	79.277	67.000	74.031	0.005	0.005	0.005	0.022	0.043	0.092
	ECE 15/00-01	67.779	49.700	58.240	0.005	0.005	0.005	0.022	0.043	0.092
	ECE 15/02 / ECE 15/03	61.731	50.048	57.444	0.005	0.005	0.005	0.022	0.043	0.092
	ECE 15/04	61.700	51.620	50.535	0.005	0.005	0.005	0.022	0.043	0.092
	Improved Conventional	57.008	50.388	71.528	0.005	0.005	0.005	0.023	0.044	0.092
	Open Loop	57.561	51.921	74.776	0.005	0.005	0.005	0.023	0.044	0.092
	Euro I - 91/441/EEC	65.920	48.440	45.570	0.035	0.016	0.053	0.015	0.022	0.039
	Euro II - 94/12/EC	65.920	48.440	45.570	0.035	0.016	0.053	0.003	0.005	0.008
	Euro III - 98/69/EC Stage2000	65.920	48.440	45.570	0.035	0.016	0.053	0.002	0.003	0.005
Gasoline >2,0 l	PRE ECE	96.536	80.000	86.197	0.005	0.005	0.005	0.022	0.043	0.092
	ECE 15/00-01	73.798	55.700	64.240	0.005	0.005	0.005	0.022	0.043	0.092
	ECE 15/02 / ECE 15/03	75.270	64.500	68.298	0.005	0.005	0.005	0.022	0.043	0.092
	ECE 15/04	71.055	54.780	67.730	0.005	0.005	0.005	0.022	0.043	0.092
	Euro I - 91/441/EEC	79.370	53.210	47.663	0.035	0.016	0.053	0.010	0.023	0.040
	Euro II - 94/12/EC	79.370	53.210	47.663	0.035	0.016	0.053	0.002	0.005	0.010
	Euro III - 98/69/EC Stage2000	79.370	53.210	47.663	0.035	0.016	0.053	0.002	0.004	0.006
Reference		COPERT III								

Table 45 – Emission factors - Hot stabilized driving - Passenger cars (Diesel, LPG, 2-stroke)

Technology		FCu	FCr	FCh	N2Oh	N2Or	N2Ou	CH4h	CH4r	CH4u
Diesel <2,0 l	Conventional	57.529	43.849	46.859	0.027	0.027	0.027	0.008	0.004	0.004
	Euro I - 91/441/EEC / Euro II - 94/12/EC	52.722	43.982	45.454	0.027	0.027	0.027	0.008	0.004	0.004
	Euro III - 98/69/EC Stage2000	52.722	43.982	45.454	0.027	0.027	0.027	0.007	0.004	0.003
Diesel >2,0 l	Conventional	57.529	43.849	46.859	0.027	0.027	0.027	0.008	0.004	0.004
	Euro I - 91/441/EEC / Euro II - 94/12/EC	52.722	43.982	45.454	0.027	0.027	0.027	0.008	0.004	0.004
	Euro III - 98/69/EC Stage2000	52.722	43.982	45.454	0.027	0.027	0.027	0.007	0.004	0.003
LPG	Conventional	59.000	45.000	54.000	0.015	0.015	0.015	0.025	0.035	0.080
	Euro I - 91/441/EEC	49.145	45.045	51.730	0.015	0.015	0.015	0.025	0.035	0.080
	Euro II - 94/12/EC	49.145	45.045	51.730	0.015	0.015	0.015	0.005	0.007	0.017
	Euro III - 98/69/EC Stage2000	49.145	45.045	51.730	0.015	0.015	0.015	0.004	0.005	0.012
2-Stroke	Conventional	111.515	66.000	56.925	0.005	0.005	0.005	0.025	0.040	0.150
Reference		COPERT III								

Table 46 – Emission factors - Hot stabilized driving - Light duty vehicles

Technology		FCu	FCr	FCh	N2Oh	N2Or	N2Ou	CH4h	CH4r	CH4u
Gasoline < 3.5 t	Conventional	82.270	62.690	60.572	0.006	0.006	0.006	0.025	0.040	0.150
	Euro I - 93/59/EEC	96.450	73.650	71.288	0.035	0.016	0.053	0.019	0.022	0.038
	Euro II - 96/69/EC	96.450	73.650	71.288	0.035	0.016	0.053	0.004	0.005	0.009
	Euro III - 98/69/EC Stage2000	96.450	73.650	71.288	0.035	0.016	0.053	0.003	0.003	0.005
Diesel < 3.5 t	Conventional	76.718	65.978	87.858	0.017	0.017	0.017	0.005	0.005	0.005
	Euro I - 93/59/EEC	68.860	58.340	78.045	0.017	0.017	0.017	0.005	0.005	0.005
	Euro II - 96/69/EC	68.860	58.340	78.045	0.017	0.017	0.017	0.005	0.005	0.005
	Euro III - 98/69/EC Stage2000	68.860	58.340	78.045	0.017	0.017	0.017	0.003	0.003	0.003
Reference		COPERT III								

Table 47 – Emission factors - Hot stabilized driving - Heavy Duty Vehicles

Technology		FCu	FCr	FCh	N2Oh	N2Or	N2Ou	CH4h	CH4r	CH4u
Gas.	Conventional < 3.5 t	82.270	62.690	60.572	0.006	0.006	0.006	0.025	0.040	0.150
Diesel3.5 - 7.5 t	Conventional	86.583	87.060	130.040	0.030	0.030	0.030	0.020	0.023	0.085
	Euro I - 91/542/EEC Stage I	86.583	87.060	130.040	0.030	0.030	0.030	0.015	0.017	0.064
	Euro II - 91/542/EEC Stage II	86.583	87.060	130.040	0.030	0.030	0.030	0.014	0.016	0.060
	Euro III - 2000 Standards	86.583	87.060	130.040	0.030	0.030	0.030	0.010	0.011	0.042

Technology		FCu	FCr	FCh	N2Oh	N2Or	N2Ou	CH4h	CH4r	CH4u
Diesel7.5 - 16.0	Conventional	174.954	147.006	192.299	0.030	0.030	0.030	0.020	0.023	0.085
	Euro I - 91/542/EEC Stage I	174.954	147.006	192.299	0.030	0.030	0.030	0.015	0.017	0.064
	Euro II - 91/542/EEC Stage II	174.954	147.006	192.299	0.030	0.030	0.030	0.014	0.016	0.060
	Euro III - 2000 Standards	174.954	147.006	192.299	0.030	0.030	0.030	0.010	0.011	0.042
Diesel 16 - 32 t	Conventional	277.186	227.040	253.570	0.030	0.030	0.030	0.070	0.080	0.175
	Euro I - 91/542/EEC Stage I	277.186	227.040	253.570	0.030	0.030	0.030	0.053	0.052	0.087
	Euro II - 91/542/EEC Stage II	277.186	227.040	253.570	0.030	0.030	0.030	0.045	0.048	0.079
	Euro III - 2000 Standards	277.186	227.040	253.570	0.030	0.030	0.030	0.032	0.034	0.055
Diesel > 32 t	Conventional	370.585	311.460	326.983	0.030	0.030	0.030	0.070	0.080	0.175
	Euro I - 91/542/EEC Stage I	370.585	311.460	326.983	0.030	0.030	0.030	0.053	0.052	0.087
	Euro II - 91/542/EEC Stage II	370.585	311.460	326.983	0.030	0.030	0.030	0.045	0.048	0.079
	Euro III - 2000 Standards	370.585	311.460	326.983	0.030	0.030	0.030	0.032	0.034	0.055
Reference		COPERT III								

Table 48 – Emission factors - Hot stabilized driving - Urban busses and Coaches

Technology		FCu	FCr	FCh	N2Oh	N2Or	N2Ou	CH4h	CH4r	CH4u
Urban busses	Conventional	278.906	315.796	191.976	0.030	0.030	0.030	0.070	0.080	0.175
	Euro I - 91/542/EEC Stage I	278.906	315.796	191.976	0.030	0.030	0.030	0.000	0.000	0.131
	Euro II - 91/542/EEC Stage II	278.906	315.796	191.976	0.030	0.030	0.030	0.000	0.000	0.122
	Euro III - 2000 Standards	278.906	315.796	191.976	0.030	0.030	0.030	0.000	0.000	0.086
Coaches	Conventional	262.182	214.600	209.577	0.030	0.030	0.030	0.070	0.080	0.175
	Euro I - 91/542/EEC Stage I	262.182	214.600	209.577	0.030	0.030	0.030	0.053	0.052	0.087
	Euro II - 91/542/EEC Stage II	262.182	214.600	209.577	0.030	0.030	0.030	0.045	0.048	0.079
	Euro III - 2000 Standards	262.182	214.600	209.577	0.030	0.030	0.030	0.032	0.034	0.055
Reference		COPERT III								

Table 49 – Emission factors - Hot stabilized driving -Mopeds < 50 cm3 and Motorcycles (MC)

Technology		FCu	FCr	FCh	N2Oh	N2Or	N2Ou	CH4h	CH4r	CH4u
Mopeds >50 cm³	Conventional	25.000	25.000	0.000	0.000	0.000	0.001	0.000	0.000	0.219
	97/24/EC Stage I	25.000	25.000	0.000	0.000	0.000	0.001	0.000	0.000	0.099
	97/24/EC StageII	25.000	25.000	0.000	0.000	0.000	0.001	0.000	0.000	0.048
MC 4-stroke < 250 cm3	Conventional	23.180	24.064	34.053	0.002	0.002	0.002	0.200	0.200	0.200
	97/24/EC	26.100	25.834	31.518	0.002	0.002	0.002	0.200	0.200	0.200
MC 4-stroke 250-750 cm3	Conventional	28.620	27.460	33.428	0.002	0.002	0.002	0.200	0.200	0.200
	97/24/EC	26.100	25.834	31.518	0.002	0.002	0.002	0.200	0.200	0.200
MC 4-stroke > 750 cm3	Conventional	37.500	33.652	37.684	0.002	0.002	0.002	0.200	0.200	0.200
	97/24/EC	26.100	25.834	31.518	0.002	0.002	0.002	0.200	0.200	0.200
Reference		COPERT III								

Table 50 – Emission factors - Cold start phase - Passenger cars (Gasoline)

Technology		FC1U	FC2U	FC3U	FC4U	FC5U	FC6U	FC7U	FC8U	FC9U	FC10U	FC11U	FC12U
Gasoline <1,4 l, Gasoline 1,4 - 2,0 l, Gasoline >2,0 l	PRE ECE ECE 15/00-01 ECE 15/02 ECE 15/03 ECE 15/04 Euro I - 91/441/EEC Euro II - 94/12/EC Euro III - 98/69/EC Stage2000	1.474	1.459	1.420	1.378	1.348	1.317	1.299	1.307	1.334	1.379	1.428	1.459
Reference		COPERT III											

Table 51 – Emission factors - Cold start phase - Passenger cars (Diesel, LPG, 2-stroke)

Technology		FC1U	FC2U	FC3U	FC4U	FC5U	FC6U	FC7U	FC8U	FC9U	FC10U	FC11U	FC12U
Diesel <2,0 l, Diesel >2,0 l	Conventional Euro I - 91/441/EEC Euro II - 94/12/EC Euro III - 98/69/EC Stage2000	1.343	1.330	1.296	1.258	1.231	1.204	1.189	1.195	1.221	1.259	1.302	1.330
LPG	Conventional Euro I - 91/441/EEC Euro II - 94/12/EC Euro III - 98/69/EC Stage2000	1.474	1.459	1.420	1.378	1.348	1.317	1.299	1.307	1.336	1.379	1.428	1.459
Reference		COPERT III											

Table 52 – Emission factors - Cold start phase - Light duty vehicles

Technology		FC1U	FC2U	FC3U	FC4U	FC5U	FC6U	FC7U	FC8U	FC9U	FC10U	FC11U	FC12U
Gasoline < 3.5 t	Conventional Euro I - 93/59/EEC Euro II - 96/69/EC Euro III - 98/69/EC Stage2000	1.474	1.459	1.420	1.378	1.348	1.317	1.300	1.307	1.336	1.379	1.428	1.459
Diesel < 3.5 t	Conventional Euro I - 93/59/EEC Euro II - 96/69/EC Euro III - 98/69/EC Stage2000	1.343	1.330	1.296	1.258	1.231	1.204	1.189	1.195	1.221	1.259	1.302	1.330
Reference		COPERT III											

Table 53 – CO_2 implied emission factor (IEF) for 'fuel export' in Category 1 A 3 b Road Transportation

	gasoline			diesel		
	fuel consumption 'fuel export'	CO2 emission 'fuel export'	IEF	fuel consumption 'fuel export'	CO2 emission 'fuel export'	IEF
	[t]	[t]	[t/t]	[t]	[t]	[t/t]
1990	252 000	785 400	3.12	328 000	1 034 293	3.15
1991	323 000	1 007 000	3.12	450 000	1 419 000	3.15
1992	286 000	891 000	3.12	470 000	1 482 000	3.15
1993	290 000	904 000	3.12	484 000	1 526 000	3.15
1994	308 000	960 000	3.12	470 000	1 482 000	3.15
1995	281 000	876 000	3.12	430 000	1 356 000	3.15
1996	285 463	889 693	3.12	449 302	1 416 799	3.15
1997	315 793	984 222	3.12	496 657	1 566 125	3.15
1998	322 348	1 004 651	3.12	540 304	1 703 759	3.15
1999	349 904	1 090 534	3.12	605 810	1 910 321	3.15
2000	362 000	1 128 233	3.12	758 000	2 390 227	3.15
2001	367 000	1 143 817	3.12	814 000	2 566 813	3.15
2002	361 500	1 126 675	3.12	870 700	2 745 607	3.15
2003	371 438	1 157 648	3.12	1 050 641	3 313 021	3.15
2004	389 000	1 212 383	3.12	1 346 000	4 244 387	3.15
Reference	Environment Agency					

	LPG			TOTAL		
	fuel consumption 'fuel export'	CO2 emission 'fuel export'	IEF	fuel consumption 'fuel export'	CO2 emission 'fuel export'	IEF
	[t]	[t]	[t/t]	[t]	[t]	[t/t]
1990	3 250	9 533	2.93	583 250	1 829 226	3.14
1991	3 480	10 208	2.93	776 480	2 436 208	3.14
1992	2 636	7 732	2.93	758 636	2 380 732	3.14
1993	3 156	9 258	2.93	777 156	2 439 258	3.14
1994	3 179	9 325	2.93	781 179	2 451 325	3.14
1995	3 097	9 085	2.93	714 097	2 241 085	3.14
1996	2 270	6 659	2.93	737 035	2 313 151	3.14
1997	965	2 831	2.93	813 415	2 553 178	3.14
1998	1 866	5 474	2.93	864 518	2 713 884	3.14
1999	2 365	6 937	2.93	958 079	3 007 792	3.14
2000	2 090	6 131	2.93	1 122 090	3 524 591	3.14
2001	2 784	8 166	2.93	1 183 784	3 718 796	3.14
2002	2 787	8 175	2.93	1 234 987	3 880 457	3.14
2003	2 193	6 433	2.93	1 424 272	4 477 102	3.14
2004	1 821	5 342	2.93	1 736 821	5 462 112	3.14
Reference	Environment Agency					

Activity data

The activity data are listed in the following tables.

Table 54 – Activity data - vehicles - gasoline

	gasoline, cyl. < 1,4 litres								
	Pré ECE	ECE 15/00 et 15/01	ECE 15/02	ECE 15/03	ECE 15/04	b. fermée (91/441/CEE et 88/76/CEE)	94/12/CEE (Euro II)	98/69/CE Stage 2000 (Euro III)	98/69/CE Stage 2005 (Euro IV)
1990	335	629	2089	17 017	49 784	1 516	0	0	
1991	335	629	2089	17 017	49 784	1 516	0	0	
1992	478	838	1973	15 366	45 476	28 182	0	0	
1993	478	838	1973	15 366	45 476	28 182	0	0	
1994	472	648	1260	12 430	42 070	32 243	0	0	
1995	453	490	764	9 644	38 264	35 602	0	0	
1996	470	400	489	7 322	34 361	38 727	0	0	
1997	449	337	331	5 482	30 746	35 559	6 617	0	
1998	437	284	229	3 954	26 982	32 360	13 171	0	
1999	453	258	168	2 748	23 461	29 252	19 677	0	
2000	463	246	129	1 904	19 830	26 243	25 503	0	
2001	457	245	105	1 250	16 233	23 133	29 199	0	
2002	475	257	90	872	12 973	20 189	31 494	0	
2003	522	261	84	625	10 008	17 421	23 520	10 626	
2004	483	272	80	474	7 676	14 836	20 892	13 912	
Reference	SNCT 1990 - 2005								

	gasoline, cyl. 1,4 - 2,0 litres								
	Pré ECE	ECE 15/00 et 15/01	ECE 15/02	ECE 15/03	ECE 15/04	b. fermée (91/441/CEE et 88/76/CEE)	94/12/CEE (Euro II)	98/69/CE Stage 2000 (Euro III)	98/69/CE Stage 2005 (Euro IV)
1990	343	692	1 974	13 626	50 348	5 479	0	0	
1991	343	692	1 974	13 626	50 348	5 479	0	0	
1992	517	929	2 093	12 938	59 771	42 033	0	0	
1993	517	929	2 093	12 938	59 771	42 033	0	0	
1994	504	758	1 466	10 808	55 945	49 409	0	0	
1995	494	625	993	8 622	51 342	56 064	0	0	
1996	487	534	720	6 775	46 398	62 269	0	0	
1997	460	458	549	5 167	41 544	57 854	9 150	0	
1998	438	399	427	3 873	36 392	52 835	18 458	0	
1999	452	377	354	2 885	31 617	42 412	27 824	0	
2000	477	376	319	2 160	27 400	43 437	35 054	0	
2001	501	371	273	1 526	22 652	38 166	40 014	0	
2002	528	394	257	1 112	18 585	33 480	44 358	0	

	gasoline, cyl. 1,4 - 2,0 litres								
	Pré ECE	ECE 15/00 et 15/01	ECE 15/02	ECE 15/03	ECE 15/04	b. fermée (91/441/CEE et 88/76/CEE)	94/12/CEE (Euro II)	98/69/CE Stage 2000 (Euro III)	98/69/CE Stage 2005 (Euro IV)
2003	551	390	235	848	15133	29125	33154	14392	
2004	509	410	257	703	12404	25161	29345	19397	
Reference	SNCT 1990 - 2005								

	gasoline, cyl. > 2,0 litres								
	Pré ECE	ECE 15/00 et 15/01	ECE 15/02	ECE 15/03	ECE 15/04	b. fermée (91/441/CEE et 88/76/CEE)	94/12/CEE (Euro II)	98/69/CE Stage 2000 (Euro III)	98/69/CE Stage 2005 (Euro IV)
1990	388	411	977	4 253	10 216	4 280	0	0	
1991	388	411	977	4 253	10 216	4 280	0	0	
1992	603	735	1351	4 262	18 806	14 534	0	0	
1993	603	735	1351	4 262	18 806	14 534	0	0	
1994	634	649	1059	3 839	18 352	18 154	0	0	
1995	610	557	805	3 307	17 348	21 071	0	0	
1996	611	498	637	2 825	16 233	23 632	0	0	
1997	593	440	508	2 378	14 953	22 519	3 928	0	
1998	592	394	406	1 923	13 393	20 826	8 216	0	
1999	617	379	351	1 514	11 826	18 675	12 644	0	
2000	633	369	303	1 257	10 309	16 700	15 829	0	
2001	655	364	257	992	8 685	14 499	18 093	0	
2002	662	367	241	846	7 400	12 756	19 975	0	
2003	673	360	225	736	6 312	11 204	14 945	6 782	
2004	584	381	254	714	5 533	9 995	13 218	9 187	
Reference	SNCT 1990 - 2005								

Table 55 – Activity data - vehicles - gasoline

	Diesel, cyl. < 2,0 litres					Diesel, cyl. > 2,0 litres				
	Pré 91/441/CEE	91/441/CEE (Euro I)	94/12/CEE (Euro II)	98/69/CE Stage 2000 (Euro III)	98/69/CE Stage 2005 (Euro IV)	Pré 91/441/CEE	91/441/CEE (Euro I)	94/12/CEE (Euro II)	98/69/CE Stage 2000 (Euro III)	98/69/CE Stage 2005 (Euro IV)
1990	16 926	0	0	0		8 320	0	0	0	
1991	16 926	0	0	0		8 320	0	0	0	
1992	20 121	3 995	0	0		9 276	1 164	0	0	
1993	20 121	3 995	0	0		9 276	1 164	0	0	
1994	18 026	8 382	0	0		8 423	2 712	0	0	
1995	15 928	12 713	0	0		7 601	4 758	0	0	
1996	13 974	17 861	0	0		6 871	7 095	0	0	
1997	12 280	16 284	7 114	0		6 163	6 709	3 027	0	

	Diesel, cyl. < 2,0 litres					Diesel, cyl. > 2,0 litres				
	Pré 91/441/CEE	91/441/CEE (Euro I)	94/12/CEE (Euro II)	98/69/CE Stage 2000 (Euro III)	98/69/CE Stage 2005 (Euro IV)	Pré 91/441/CEE	91/441/CEE (Euro I)	94/12/CEE (Euro II)	98/69/CE Stage 2000 (Euro III)	98/69/CE Stage 2005 (Euro IV)
1998	10 516	14 412	15 353	0		5 392	6 067	6 516	0	
1999	8 963	12 395	25 257	0		4 624	5 351	10 094	0	
2000	7 640	10 770	36 296	0		3 898	4 683	13 944	0	
2001	6 445	9 269	48 087	0		3 236	4 092	18 124	0	
2002	5 193	8 014	59 729	0		2 686	3 566	22 727	0	
2003	4 125	6 931	33 804	37 172		2 191	3 110	13 513	15 510	
2004	3 334	6 014	28 500	56 296		1 887	2 837	11 515	23 131	
Reference	SNCT 1990 - 2005									

Table 56 – Activity data - vehicles - LPG

	LPG				
	Pré 91/441/ CEE	91/441/ CEE (Euro I)	94/12/ CEE (Euro II)	98/69/ CE Stage 2000 (Euro III)	98/69/CE Stage 2005 (Euro IV)
1990	564	0	0	0	564
1991	564	0	0	0	564
1992	377	13	0	0	377
1993	377	13	0	0	377
1994	304	25	0	0	304
1995	250	42	0	0	250
1996	221	65	0	0	221
1997	193	60	17	0	193
1998	174	58	38	0	174
1999	149	60	66	0	149
2000	131	60	94	0	131
2001	97	48	98	0	97
2002	74	53	89	0	74
2003	67	44	99	20	67
2004	52	50	90	26	52
Reference	SNCT 1990 - 2005				

Table 57 – Activity data - Light duty vehicles (N1)

	gasoline					diesel				
	Pré 91/542/CEE Stage I	91/542/CEE Stage I (Euro I)	91/542/CEE Stage II (Euro II)	Standards 2000 (Euro III)	Standards 2005 (Euro IV)	Pré 91/441/CEE	91/441/CEE (Euro I)	94/12/CEE (Euro II)	98/69/CE Stage 2000 (Euro III)	98/69/CE Stage 2005 (Euro IV)
1990	6495	0	0	0		5677	0	0	0	
1991	6495	0	0	0		5677	0	0	0	
1992	4323	0	0	0		7047	0	0	0	

	gasoline					diesel				
	Pré 91/542/CEE Stage I	91/542/CEE Stage I (Euro I)	91/542/CEE Stage II (Euro II)	Standards 2000 (Euro III)	Standards 2005 (Euro IV)	Pré 91/441/CEE	91/441/CEE (Euro I)	94/12/CEE (Euro II)	98/69/CE Stage 2000 (Euro III)	98/69/CE Stage 2005 (Euro IV)
1993	4323	0	0	0		7047	0	0	0	
1994	4097	24	0	0		7314	261	0	0	
1995	3733	156	0	0		6816	1417	0	0	
1996	3331	156	0	0		6356	2583	0	0	
1997	2962	410	0	0		5817	3921	0	0	
1998	2595	539	35	0		5264	5345	393	0	
1999	2322	651	162	0		4744	7064	2455	0	
2000	2007	752	262	0		4287	8822	4502	0	
2001	1685	797	322	0		3709	10752	6843	0	
2002	1447	838	370	0		3234	12380	8766	0	
2003	1219	871	303	121		2734	13635	5372	5083	
2004	1057	427	296	154		2357	3007	4913	7077	
Reference	SNCT 1990 - 2005									

Table 58 – Activity data - Heavy duty vehicles (N2,N3)

	gasoline	diesel, PTMA: 3,5 - 7,5 t					diesel, PTMA: 7,5 - 16 t				
	Pré 91/441/CEE	Pré 91/542/CEE Stage I	91/542/CEE Stage I (Euro I)	91/542/CEE Stage II (Euro II)	Standards 2000 (Euro III)	Standards 2005 (Euro IV)	Pré 91/441/CEE	91/441/CEE (Euro I)	94/12/CEE (Euro II)	98/69/CE Stage 2000 (Euro III)	98/69/CE Stage 2005 (Euro IV)
1990	68	796	0	0	0		750	0	0	0	
1991	68	796	0	0	0		750	0	0	0	
1992	51	696	7	0	0		1597	9	0	0	
1993	51	696	7	0	0		1597	9	0	0	
1994	51	664	49	0	0		1463	70	0	0	
1995	49	629	78	0	0		1355	147	0	0	
1996	45	584	99	9	0		1254	209	23	0	
1997	43	542	95	40	0		1144	207	122	0	
1998	43	493	95	69	0		1052	211	230	0	
1999	41	440	101	111	0		980	218	384	0	
2000	37	395	98	147	0		873	216	520	0	
2001	35	351	93	212	0		784	199	458	0	
2002	35	304	88	261	0		679	189	523	0	
2003	35	277	82	196	110		621	181	428	195	
2004	18	257	77	194	153		552	168	415	263	
Reference	SNCT 1990 - 2005										

	diesel, PTMA: 16 -32 t					diesel, PTMA: > 32 t				
	Pré 91/441/CEE	91/441/CEE (Euro I)	94/12/CEE (Euro II)	98/69/CE Stage 2000 (Euro III)	98/69/CE Stage 2005 (Euro IV)	Pré 91/441/CEE	91/441/CEE (Euro I)	94/12/CEE (Euro II)	98/69/CE Stage 2000 (Euro III)	98/69/CE Stage 2005 (Euro IV)
1990	4087	0	0	0		12	0	0	0	
1991	4087	0	0	0		12	0	0	0	
1992	4523	75	0	0		14	1	0	0	
1993	4523	75	0	0		14	1	0	0	
1994	4190	430	0	0		14	2	0	0	
1995	3643	1003	0	0		15	7	0	0	
1996	3238	1423	136	0		14	8	1	0	
1997	2863	1357	874	0		14	8	5	0	
1998	2532	1191	1930	0		16	8	9	0	
1999	2246	1066	3144	0		15	9	13	0	
2000	1952	961	4678	0		14	9	15	0	
2001	1635	821	5507	0		20	13	9	0	
2002	1415	702	5631	0		29	7	9	0	
2003	1242	616	3775	2466		32	6	15	16	
2004	1053	507	2937	3400		4	8	14	21	
Reference	SNCT 1990 - 2005									

Table 59 – Activity data - Urban busses and Coaches

	Urban busses					Coaches				
	Pré 91/542/CEE Stage I	91/542/CEE Stage I (Euro I)	91/542/CEE Stage II (Euro II)	Standards 2000 (Euro III)	Standards 2005 (Euro IV)	Pré 91/542/CEE Stage I	91/542/CEE Stage I (Euro I)	91/542/CEE Stage II (Euro II)	Standards 2000 (Euro III)	Standards 2005 (Euro IV)
1990	375	0	0	0		375	0	0	0	
1991	375	0	0	0		375	0	0	0	
1992	45	3	0	0		798	5	0	0	
1993	45	3	0	0		798	5	0	0	
1994	40	7	0	0		755	44	0	0	
1995	33	8	0	0		691	150	0	0	
1996	32	9	3	0		643	222	9	0	
1997	28	9	7	0		575	220	108	0	
1998	20	9	16	0		492	212	203	0	
1999	17	9	19	0		426	198	320	0	
2000	16	9	34	0		378	192	432	0	
2001	14	9	48	0		317	177	561	0	
2002	9	9	57			276	175	653	0	
2003	6	11	44	20		229	157	544	222	
2004	4	8	42	27		194	142	524	345	
Reference	SNCT 1990 - 2005									

Table 60 – Activity data - motorcycles (L1, L2, L3, L4, L5)

	motorcycles			
	Cyl. < 50 cm3, all 2 stroke engines	Cyl. < 250 cm3, 4 stroke engines	Cyl. 250 - 750 cm3, 4 stroke engines	Cyl. > 750 cm3, 4 stroke engines
1990	19 312	1 002	2 356	1 634
1991	19 312	1 002	2 356	1 634
1992	19 806	1 711	4 025	2 792
1993	19 806	1 711	4 025	2 792
1994	19 962	1 665	4 261	3 237
1995	20 130	1 564	4 308	2 405
1996	20 287	1 513	4 365	3 961
1997	20 494	1 464	4 469	4 281
1998	20 755	1 408	4 437	4 622
1999	21 073	1 377	4 535	5 053
2000	21 451	1 437	4 805	5 549
2001	21 793	1 416	4 849	5 730
2002	22 231	1 481	5 016	6 219
2003	22 818	1 518	5 204	6 691
2004	23 340	1 653	5 558	7 289
Reference	SNCT 1990 - 2005			

Table 61 – Road transport - Total fuel sold road transport – inland consumption and 'fuel export'

	TOTAL			Gasoline		
	Total fuel sold road transport	fuel consumption in LU	'fuel export'	Total fuel sold road transport	fuel consumption in LU	'fuel export'
	[t]	[t]	[t]	[t]	[t]	[t]
1990	855 750	264 500	583 250	412 000	160 000	252 000
1991	1 040 980	264 500	776 480	483 000	160 000	323 000
1992	1 125 970	367 334	758 636	523 000	237 000	286 000
1993	1 144 490	367 334	777 156	527 000	237 000	290 000
1994	1 152 460	371 281	781 179	545 000	237 000	308 000
1995	1 087 340	373 247	714 097	514 000	233 000	281 000
1996	1 114 930	377 895	737 035	514 830	229 367	285 463
1997	1 199 520	386 105	813 415	542 030	226 237	315 793
1998	1 262 910	398 392	864 518	544 570	222 222	322 348
1999	958 079	414 981	958 079	349 904	217 126	349 904
2000	1 573 320	451 230	1 122 090	582 000	220 000	362 000
2001	1 651 980	468 196	1 183 784	572 000	205 000	367 000
2002	1 715 160	480 173	1 234 987	557 500	196 000	361 500
2003	1 904 445	480 173	1 424 272	567 438	196 000	371 438
2004	1 904 445	480 173	1 736 821	565 000	176 000	389 000
Reference	SNCT 1990 - 2005					

	Diesel			LPG		
	Total fuel sold road transport [t]	fuel consumption in LU [t]	"fuel export" [t]	Total fuel sold road transport [t]	fuel consump-tion in LU [t]	"fuel export" [t]
1990	432 000	104 000	328 000	3 750	500	3 250
1991	554 000	104 000	450 000	3 980	500	3 480
1992	600 000	130 000	470 000	2 970	334	2 636
1993	614 000	130 000	484 000	3 490	334	3 156
1994	604 000	134 000	470 000	3 460	281	3 179
1995	570 000	140 000	430 000	3 340	247	3 097
1996	597 590	148 288	449 302	2 510	240	2 270
1997	656 300	159 643	496 657	1 190	225	965
1998	716 250	175 946	540 304	2 090	224	1 866
1999	605 810	197 630	605 810	2 365	225	2 365
2000	989 000	231 000	758 000	2 320	230	2 090
2001	1 077 000	263 000	814 000	2 980	196	2 784
2002	1 154 700	284 000	870 700	2 960	173	2 787
2003	1 334 641	284 000	1 050 641	2 366	173	2 193
2004	1 645 000	299 000	1 346 000	1 994	173	1 821
Reference	SNCT 1990 - 2005					

Recalculations
No recalculations were made.

Sector specific QA/QC procedures
No category specific QA/QC procedures were investigated.

Planned improvements
Using COPERT IV.

IPCC Category 1.A.3.c. Railways

Key Sources: *no*

Source Category Description
This emission source is of minor importance in the transport category, because transportation by rail uses mainly electrical energy.
The share in total GHG emissions (including LULUCF) from sector 1 A 2 f is for:

- CO_2 emission less than 1% for the year 1990 and 2004. The emission trend in the period 1990 – 2004 was about 21%;
- N_2O emission less than 1% in the year 1990 and 2004.

Methodology
The CORINAIR (simple) methodology is applied.

Emission factors
The selected emission factors are listed in the following table.

Table 62 – Emission factors of Category 1 A 3 c Railways

IPCC Category	Source Categories	SNAP	Fuel		CO2 Emission factor [kg/GJ]	Reference
1 A 3 c	Railways	080200	204A	Gas oil	70.0	CORINAIR

Activity data
The activity data are listed in the following table.

Table 63 – Activity data of Category 1 A 3 c Railways

SNAP	80200
Activity	Railways
Fuel	204a
Unit	[GJ]
1990	370 000
1991	370 000
1992	370 000
1993	370 000
1994	324 584
1995	262 817
1996	262 817
1997	262 817
1998	262 817
1999	262 817
2000	262 817
2001	262 817
2002	294 118
2003	294 118
2004	294 118
Reference	CFL (2003)

Recalculations
No recalculations were made.

Sector specific QA/QC procedures
No category specific QA/QC procedures were investigated.

Planned improvements

- Revising the emission factors due to new information from the railway company CFL (*Chemins de Fer Luxembourgeois*);
- Revising the activity data.

IPCC Category 1 A 3 d Navigation

Key Sources: *no*

Source Category Description

As Luxembourg has no direct access to the sea, there are no maritime activities taking place. Similarly, Luxembourg has no domestic shipping activities, but only some shipping activities on the Moselle River, a border river with Germany. These can also be seen as international movements. Nevertheless, the related emissions are of minor importance since the share in total GHG emissions (including LULUCF) from sector 1 A 3 d is for CO_2 and CH_4 emissions represented less than 1% between 1990 and 2004.

Methodology

The CORINAIR (simple) methodology is applied.

Emission factors

The selected emission factors are listed in the following table.

Table 64 – Emission factors of Category 1 A 3 d Navigation

IPCC Category	Source Categories	SNAP	Fuel		CO2 Emission factor [kg/GJ]	Reference
1 A 3 d	Navigation	080300	205A	Diesel Oil	70.0	CORINAIR

Activity data

The activity data are listed in the following table.

Table 65 – Activity data of Category 1 A 3 d Navigation

SNAP code	80300
Activity	Inland waterways
Fuel	204a
Unit	[GJ]
1990	80 000
1991	80 000
1992	80 000
1993	80 000
1994	80 000
1995	80 000
1996	80 000

SNAP code	80300
Activity	Inland waterways
Fuel	204a
Unit	[GJ]
1997	80 000
1998	80 000
1999	80 000
2000	80 000
2001	80 000
2002	80 000
2003	80 000
2004	80 000
Reference	TÜV 1990

Recalculations
No recalculations were made.

Sector specific QA/QC procedures
No category specific QA/QC procedures were investigated.

Planned improvements

- Revising the emission factors;
- Revising the activity data.

IPCC Category 1 A 3 e Other Transportation

The IPCC Category1 A 3 e Other Transportation does not exist in Luxembourg.

3.6 IPCC Sector 1 A 4 Other sectors

Sector Overview

In this source category, mainly non-industrial combustion of the commercial, institutional and residential sectors are included. Also some emissions from combustion in agriculture are represented here.

Table 66 – Activities of Other sectors

SNAP code	Source
020103	Non-industrial commercial and institutional combustion plants <50 MW
020202	Non-industrial residential combustion plants < 50 MW
020302	Non-industrial combustion plants in agriculture, forestry and aquaculture

Emission trend

In the following tables the emission trends of IPCC Sector 1 A 4 Other Sectors are presented. An emission trend description is given in the relevant subchapters.

Table 67 – CO_2 emission trend of IPCC Sector 1 A 4 Other Sectors

GHG source and sink categories	Total Energy	Fuel combustion	Sector 1 A 4	Sector 1 A 4 a	Sector 1 A 4 b	Sector 1 A 4 c
						CO2 (Gg)
1990	10 528.80	10 528.80	1 245.96	582.89	585.19	77.88
1991	10 856.30	10 856.30	1 566.18	743.00	745.30	77.88
1992	10 745.55	10 745.55	1 519.87	719.84	722.15	77.88
1993	11 024.54	11 024.54	1 557.11	738.49	740.74	77.88
1994	10 309.26	10 309.26	1 332.72	626.27	628.57	77.88
1995	8 194.41	8 194.41	1 337.62	628.72	631.02	77.88
1996	8 300.64	8 300.64	1 476.03	699.30	701.60	75.13
1997	7 728.03	7 728.03	1 443.09	682.83	685.13	75.13
1998	7 084.52	7 084.52	1 530.29	726.43	728.73	75.13
1999	7 626.17	7 626.17	1 470.28	696.45	698.70	75.13
2000	8 109.87	8 109.87	1 232.55	577.56	579.86	75.13
2001	8 434.71	8 434.71	1 384.81	653.69	655.99	75.13
2002	9 221.33	9 221.33	1 349.05	635.81	638.11	75.13
2003	9 739.23	9 739.23	1 323.33	622.95	625.25	75.13
2004	11 210.98	11 210.98	1 312.97	617.77	620.07	75.13
Trend 2003-2004	*15.1%*	*15.1%*	*-0.8%*	*-0.8%*	*-0.8%*	*0.0%*
Trend 1990-2004	*6.5%*	*6.5%*	*5.4%*	*6.0%*	*6.0%*	*-3.5%*
Share in National Total GHG 1990	*84.8%*	*84.8%*	*10.0%*	*4.7%*	*4.7%*	*0.6%*
Share in National Total GHG 2004	*89.6%*	*89.6%*	*10.5%*	*4.9%*	*5.0%*	*0.6%*

Table 68 – CH_4 emission trend of IPCC Sector 1 A 4 Other Sectors

GHG source and sink categories	Total Energy	Fuel combustion	Sector 1 A 4	Sector 1 A 4 a	Sector 1 A 4 b	Sector 1 A 4 c
				CH4 (Gg)		
1990	2.75	1.44	0.54	0.26	0.26	0.02
1991	3.11	1.71	0.74	0.36	0.36	0.02
1992	3.33	1.87	0.68	0.33	0.33	0.02
1993	3.50	1.98	0.78	0.38	0.38	0.02
1994	3.29	1.80	0.50	0.24	0.24	0.02
1995	3.44	1.69	0.46	0.22	0.22	0.02
1996	3.68	1.81	0.52	0.25	0.25	0.02
1997	3.72	1.81	0.50	0.24	0.24	0.02
1998	3.68	1.75	0.46	0.22	0.22	0.02
1999	3.67	1.61	0.46	0.22	0.22	0.02

2000	3.83	1.72	0.40	0.19	0.19	0.02
2001	3.91	1.73	0.42	0.20	0.20	0.02
2002	4.33	1.56	0.32	0.15	0.15	0.02
2003	4.37	1.58	0.32	0.15	0.15	0.02
2004	4.36	1.45	0.30	0.14	0.14	0.02
Trend 2003-2004	*-0.2%*	*-8.2%*	*-6.3%*	*-6.7%*	*-6.7%*	*0.0%*
Trend 1990-2004	*58.5%*	*0.7%*	*-44.4%*	*-46.2%*	*-46.2%*	*0.0%*
Share in National Total GHG 1990	*0.5%*	*0.2%*	*0.1%*	*0.0%*	*0.0%*	*0.0%*
Share in National Total GHG 2004	*0.7%*	*0.2%*	*0.1%*	*0.0%*	*0.0%*	*0.0%*

Table 69 – N_2O emission trend of IPCC Sector 1 A 4 Other Sectors

GHG source and sink categories	Total Energy	Fuel combustion	Sector 1 A 4	Sector 1 A 4 a	Sector 1 A 4 b	Sector 1 A 4 c
			N2O (Gg)			
1990	0.18	0.18	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)
1991	0.22	0.22	0.02	0.01	0.01	NE (but ≈ 0)
1992	0.32	0.32	0.02	0.01	0.01	NE (but ≈ 0)
1993	0.32	0.32	0.02	0.01	0.01	NE (but ≈ 0)
1994	0.35	0.35	0.02	0.01	0.01	NE (but ≈ 0)
1995	0.33	0.33	0.02	0.01	0.01	NE (but ≈ 0)
1996	0.36	0.36	0.02	0.01	0.01	NE (but ≈ 0)
1997	0.42	0.42	0.02	0.01	0.01	NE (but ≈ 0)
1998	0.46	0.46	0.02	0.01	0.01	NE (but ≈ 0)
1999	0.53	0.53	0.02	0.01	0.01	NE (but ≈ 0)
2000	0.56	0.56	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)
2001	0.61	0.61	0.02	0.01	0.01	NE (but ≈ 0)
2002	0.65	0.65	0.02	0.01	0.01	NE (but ≈ 0)
2003	0.70	0.70	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)
2004	0.87	0.87	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)	NE (but ≈ 0)
Trend 2003-2004	*24.3%*	*24.3%*	*NA*	*NA*	*NA*	*NA*
Trend 1990-2004	*383.3%*	*383.3%*	*NA*	*NA*	*NA*	*NA*
Share in National Total GHG 1990	*0.4%*	*0.4%*	*NA*	*NA*	*NA*	*NA*
Share in National Total GHG 2004	*2.2%*	*2.2%*	*NA*	*NA*	*NA*	*NA*

Key Sources
The methodology and results of the key source analysis is presented in Chapter 1.Table 70 presents the key source categories of PCC Sector 1 A 4 Other sectors.

Table 70 - Key sources of IPCC Sector 1 A 4 Other sectors

IPCC Category / Source Categories	Key sources		
	GHG	KS-Assessment	
1 A 4 a Commercial/Institutional: Gaseous Fuels	CO2	LA: 1990-2004	
1 A 4 a Commercial/Institutional: Liquid Fuels	CO2	LA: 1990-2004	
1 A 4 a Commercial/Institutional: Solid Fuels	CO2	LA: 1991-1993	
1 A 4 b Residential: Gaseous Fuels	CO2	LA: 1990-2004	
1 A 4 b Residential: Liquid Fuels	CO2	LA: 1990-2004	
1 A 4 b Residential: Solid Fuels	CO2	LA: 1992-1993	
1 A 4 c Agriculture/Forestry/Fisheries: Liquid Fuels	CO2	LA: 1995-2003	

** LA = Level Assessment*

** TA = Trend Assessment*

IPCC Category 1 A 4 a Commercial/Institutional

Key Sources: *CO2: Gaseous, Liquid, solid*

Source Category Description
020103 - Non-industrial commercial and institutional combustion plants <50 MW
The consumption of hard coal, lignite, wood, gasoil and natural gas in the so-called '*secteur domestique*' is documented in STATEC's Statistical Yearbook. Those statistical data have been taken as a basis for these source types.

As there is no split in those national statistics data between commercial and institutional consumption on one hand, and residential combustion on the other hand, the statistical data have been distributed arbitrarily, i.e. 50% to each of the subsectors.

The share in total GHG emissions (including LULUCF) from sector 1 A 4 a is for:

- CO_2 emission 5% for the year 1990 and 2004. The emission trend in the period 1990 – 2004 was about 6% whereas the emission trend in period 2003 – 2004 was about -1%;
- CH_4 emission less than 1% in the year 1990 and 2004;
- N_2O emission less than 1% in the year 1990 and 2004.

Methodology
The CORINAIR (simple) methodology is applied.

Emission factors
The selected emission factors are listed in the following table.

Table 71 – Emission factors of Category 1 A 4 a - Commercial/Institutional

IPCC Category	Source Categories	SNAP	Fuel	Emission factor [kg/GJ]			Reference
1 A 4 a	Commercial/ Institutional	020103	104A	Patent fuels	CO2	98.0	CORINAIR, B111-55, Tab 29
					CH4	150.0	CORINAIR, B111-52, Tab 27
			106A	Lignite	CO2	108.0	CORINAIR, B111-55, Tab 29
					CH4	350.0	CORINAIR, B111-52, Tab 27
			111A	Wood	CO2	100.0	CORINAIR, B111-55, Tab 29
					CH4	320.0	CORINAIR, B111-52, Tab 27
			204A	Gas oil	CO2	70.0	CORINAIR, B111-55, Tab 29
					CH4	10.5	CORINAIR, B111-52, Tab 27
			301A	Natural gas	CO2	55.0	CORINAIR, B111-55, Tab 29
					CH4	5.0	CORINAIR, B111-52, Tab 27

Activity data

The activity data are listed in the following table.

Table 72 – Activity data of Commercial/institutional Combustion Plants, < 50 MW

SNAP code	020103				
Activity	Commercial / institutional Combustion Plants, < 50 MW				
Fuel	104a	106a	111a	204a	301a
Unit	[GJ]	[GJ]	[GJ]	[GJ]	[GJ]
1990	366 250	108 098	322 300	4 732 000	3 710 464
1991	761 800	179 902	322 300	5 918 600	4 265 573
1992	673 900	152 756	322 300	5 713 500	4 315 658
1993	966 900	147 160	322 300	5 361 900	4 591 125
1994	297 395	71 355	322 300	5 186 100	4 116 245
1995	209 000	53 215	321 860	5 099 600	4 464 058
1996	250 173	56 019	321 860	5 249 349	5 477 815
1997	187 473	51 888	321 860	5 343 608	5 178 233
1998	115 368	38 401	321 860	5 836 116	5 499 148
1999	92 796	33 165	321 860	5 663 900	5 223 680
2000	93 841	25 286	321 860	4 869 700	4 086 405
2001	103 246	23 849	321 860	5 434 000	4 738 598
2002	22 990	15 457	184 030	5 308 600	4 732 569
2003	22 990	14 844	184 030	4 723 400	5 244 549
2004	20 900	17 507	184 030	4 890 600	4 936 155
Reference	STATEC Statistical Yearbook, tables C.3502, C.3503 & C.3516	STATEC Statistical Yearbook, tables C.3502, C.3503 & C.3516	STATEC Statistical Yearbook, tables C.3502, C.3503 & C.3516	STATEC Statistical Yearbook, tables C.3502, C.3503 & C.3516	STATEC Statistical Yearbook, tables C.3502, C.3503 & C.3516

Recalculations
No recalculations were made.

Sector specific QA/QC procedures
No category specific QA/QC procedures were investigated.

Planned improvements

- Revising the emission factors;
- Revising the activity data;
- Sector 1 A 4: revising Energy split between commercial/institutional and residential.

IPCC Category 1 A 4 b Residential

Key Sources: *CO2: Gaseous, Liquid, solid*

Source Category Description
020202 - Non-industrial residential combustion plants < 50 MW
The consumption of hard coal, lignite, wood, gasoil and natural gas in the so-called '*secteur domestique*' is documented in STATEC's Statistical Yearbook. Those statistical data have been taken as a basis for these source types.

As there is no split in those national statistics data between commercial and institutional consumption on one hand, and residential combustion on the other hand, the statistical data have been distributed arbitrarily, i.e. 50% to each of the subsectors.

The share in total GHG emissions (including LULUCF) from sector 1 A 4 b Residential is for:

- CO_2 emission 5% for the year 1990 and 2004. The emission trend in the period 1990 – 2004 was about 6% whereas the emission trend in period 2003 – 2004 was about -1%;
- CH_4 emission less than 1% in the year 1990 and 2004;
- N_2O emission less than 1% in the year 1990 and 2004.

Methodology
The CORINAIR (simple) methodology is applied.

Emission factors
The selected emission factors are listed in the following table.

Table 73 – Emission factors of Category 1 A 4 b - Residential

IPCC Category	Source Categories	SNAP	Fuel	Emission factor [kg/GJ]			Reference
1 A 4 b	Commercial/ Institutional	020102	104A	Patent fuels	CO2	98.0	CORINAIR, B111-55, Tab 29
					CH4	150.0	CORINAIR, B111-52, Tab 27
			106A	Lignite	CO2	108.0	CORINAIR, B111-55, Tab 29
					CH4	350.0	CORINAIR, B111-52, Tab 27
			111A	Wood	CO2	100.0	CORINAIR, B111-55, Tab 29
					CH4	320.0	CORINAIR, B111-52, Tab 27
			204A	Gas oil	CO2	70.0	CORINAIR, B111-55, Tab 29
					CH4	10.5	CORINAIR, B111-52, Tab 27
			301A	Natural gas	CO2	98.0	CORINAIR, B111-55, Tab 29
					CH4	5.0	CORINAIR, B111-52, Tab 27

Activity data

The activity data are listed in the following table.

Table 74 – Activity data of Category 1 A 4 b - Residential combustion Plants, < 50 MW

SNAP code	020102				
Activity	Residential combustion Plants, < 50 MW				
Fuel	104a	106a	111a	204a	301a
Unit	GJ/a	GJ/a	GJ/a	GJ/a	GJ/a
1990	366 250	108 098	322 300	4 732 000	3 710 464
1991	761 800	179 902	322 300	5 918 600	4 265 573
1992	673 900	152 756	322 300	5 713 500	4 315 658
1993	966 900	147 160	322 300	5 361 900	4 591 125
1994	297 395	71 355	322 300	5 186 100	4 116 245
1995	209 000	53 215	321 860	5 099 600	4 464 058
1996	250 173	56 019	321 860	5 249 349	5 477 815
1997	187 473	51 888	321 860	5 343 608	5 178 233
1998	115 368	38 401	321 860	5 836 116	5 499 148
1999	92 796	33 165	321 860	5 663 200	5 223 680
2000	93 841	25 286	321 860	4 869 700	4 086 405
2001	103 246	23 849	321 860	5 434 000	4 738 598
2002	22 990	15 457	184 030	5 308 600	4 732 569
2003	22 990	14 844	184 030	4 723 400	5 244 549
2004	20 900	17 507	184 030	4 890 600	4 936 155
Reference	STATEC Statistical Yearbook, tables C.3502, C.3503 & C.3516	STATEC Statistical Yearbook, tables C.3502, C.3503 & C.3516	STATEC Statistical Yearbook, tables C.3502, C.3503 & C.3516	STATEC Statistical Yearbook, tables C.3502, C.3503 & C.3516	STATEC Statistical Yearbook, tables C.3502, C.3503 & C.3516

Recalculations
No recalculations were made.

Sector specific QA/QC procedures
No category specific QA/QC procedures were investigated.

Planned improvements

- Revising the emission factors;
- Revising the activity data;
- Sector 1 A 4: revising Energy split between commercial/institutional and residential.

IPCC Category 1 A 4 c Agriculture/forestry

Key Sources: *CO_2: liquid fuels*

Source Category Description
020302 - Non-industrial combustion plants in agriculture, forestry and aquaculture
The consumption data of this activity group is a first estimation. It is of lower importance, as the energy consumption (wood) of this source type is rather low.

080600 – Tractors and harvesters used in agriculture
This category includes emissions from tractors and harvesters used in agriculture.

The share in total GHG emissions (including LULUCF) from sector 1 A 4 c is for:

- CO_2 emission 1% for the year 1990 and 2004. The emission trend in the period 1990 – 2004 was about 4%;
- CH_4 emission less than 1% in the year 1990 and 2004;
- N_2O emission less than 1% in the year 1990 and 2004.

Methodology
The CORINAIR (simple) methodology is applied.

Emission factors
The selected emission factors are listed in the following table.

Table 75 – Emission factors of Category 1 A 4 c Agriculture/forestry – combustion Plants, < 50 MW

IPCC Category	Source Categories	SNAP	Fuel		Emission factor [kg/GJ]		Reference
1 A 4 c	Agriculture/ for-estry	020302	111A	Wood	CO2	100.0	CORINAIR, B111-55, Tab 29
					CH4	320.0	CORINAIR, B111-52, Tab 27
			301A	Natural gas	CO2	55.0	CORINAIR, B111-55, Tab 29
					CH4	5.0	CORINAIR, B111-52, Tab 27
		080600	205A	Diesel	CO2	73.8	CORINAIR, B111-52

Activity data

The activity data are listed in the following table.

Table 76 – Activity data of Category 1 A 4 c Agriculture/forestry – combustion Plants, < 50 MW

SNAP code	020203	
Activity	Agriculture/forestry – combustion Plants, < 50 MW	
Fuel	111A	301A
Unit	GJ/a	GJ/a
1990	64 460	50 000
1991	64 460	50 000
1992	64 460	50 000
1993	64 460	50 000
1994	64 460	50 000
1995	64 460	50 000
1996	70 000	0
1997	70 000	0
1998	70 000	0
1999	70 000	0
2000	70 000	0
2001	70 000	0
2002	70 000	0
2003	70 000	0
2004	70 000	0
Reference		

Table 77 – Activity data of Category 1 A 4 c Agriculture/forestry – Tractors & harvesters used in agriculture

SNAP	080600	
Activity	080600/N09 Tractors used in agriculture	080600/N10 Harvesters used in agriculture
Fuel	205A	205A
Unit	[GJ]	[GJ]
1990 - 2004	427435	551 026
Reference	TÜV 1990	TÜV 1990

Recalculations
No recalculations were made.

Sector specific QA/QC procedures
No category specific QA/QC procedures were investigated.

Planned improvements

- Revising the emission factors;
- Revising the activity data.

3.7 IPCC Sector 1 A 5 Other

Emissions from IPCC Sector 1 A 5 Other do not exist in Luxembourg.

3.8 Comparison of the Sectoral Approach with the Reference Approach

Documentation to TABLE 1.A(b) SECTORAL BACKGROUND DATA FOR ENERGY CO_2 FROM FUEL COMBUSTION ACTIVITIES - REFERENCE APPROACH

Documentation to TABLE 1.A(c) COMPARISON OF CO_2 EMISSIONS FROM FUEL COMBUSTION

- 1 AA Other Fuels: Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated as being equal or very close to zero.
- 1 A B Fuel Combustion - Reference Approach: Data for the Reference Approach are coming from Eurostat databases on energy. The data have been extracted from Eurostat's web site on 13 and 14 February 2007.
- The unit for the Conversion factor is Eurostat's default since we use Eurostat's default factors.
- The unit for the fraction of carbon oxidized is the default one too.

On the following pages, we have reproduced (Tables 78 and 79) these two tables for the year 2004. For the other years, please refer to the CD-ROM containing all the CRF tables.

3.9 Feedstocks

Non-energy use of fuels is considered in the national energy balance. Table 80 below reproduces the standard CRF table for the Reference Approach in 2004 where the total amount of C and CO_2 from feedstocks and non-energy use of fuels can be found for that year. For the other years, please refer to the CD-ROM containing all the CRF tables.

Table 78 – CRF table 1 A (b) Sectoral background data for energy - CO_2 from Fuel Combustion Activities - Reference Approach

TABLE 1.A(b) SECTORAL BACKGROUND DATA FOR ENERGY
CO_2 from Fuel Combustion Activities - Reference Approach (IPCC Worksheet 1-1)
(Sheet 1 of 1)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

FUEL TYPES			Unit	Production	Imports	Exports	International bunkers	Stock change	Apparent consumption	Conversion factor (TJ/Unit)	NCV/ GCV[1]	Apparent consumption (TJ)	Carbon emission factor (t C/TJ)	Carbon content (Gg C)	Carbon stored (Gg C)	Net carbon emissions (Gg C)	Fraction of carbon oxidized	Actual CO_2 emissions (Gg CO_2)
Liquid Fossil	Primary Fuels	Crude Oil	Gg	NO	NO	NO		NO	NO	NA	NCV	NA,NO	NA	NA,NO	NO	NA,NO	NA	NA,NO
		Orimulsion	Gg	NO	NO	NO		NO	NO	NA	NCV	NA,NO	NA	NA,NO	NO	NA,NO	NA	NA,NO
		Natural Gas Liquids	Gg	NO	NO	NO		NO	NO	NA	NCV	NA,NO	NA	NA,NO	NO	NA,NO	NA	NA,NO
	Secondary Fuels	Gasoline	Gg		549.00	1.00	NO	2.00	546.00	44.00	NCV	24 024.00	18.90	454.05	NO	454.05	0.99	1 648.21
		Jet Kerosene	Gg		412.00	NO	413.34	3.00	-4.34	43.00	NCV	-186.59	19.50	-3.64	NO	-3.64	0.99	-13.21
		Other Kerosene	Gg		NO	NO	NO	NO	NO	NA	NCV	NA,NO	NA	NA,NO	NO	NA,NO	NA	NA,NO
		Shale Oil	Gg		NO	NO		NO	NO	NA	NCV	NA,NO	NA	NA,NO	NO	NA,NO	NA	NA,NO
		Gas / Diesel Oil	Gg		1 963.00	6.00	NO	8.00	1 949.00	42.30	NCV	82 442.70	20.20	1 665.34	NO	1 665.34	0.99	6 045.19
		Residual Fuel Oil	Gg		4.00	NO	NO	NO	4.00	42.82	NCV	171.27	21.10	3.61	NO	3.61	0.99	13.12
		Liquefied Petroleum Gas (LPG)	Gg		20.00	7.00		NO	13.00	46.00	NCV	598.00	17.20	10.29	NO	10.29	0.99	37.34
		Ethane	Gg		NO	NO		NO	NO	NA	NCV	NA,NO	NA	NA,NO	NO	NA,NO	NA	NA,NO
		Naphtha	Gg		NO	NO		NO	NO	NA	NCV	NA,NO	NA	NA,NO	NO	NA,NO	NA	NA,NO
		Bitumen	Gg		8.00	NO		NO	8.00	37.70	NCV	301.60	22.00	6.64	6.64	0.00	0.99	0.00
		Lubricants	Gg		5.00	NO	NO	NO	5.00	42.30	NCV	211.50	20.00	4.23	2.12	2.12	0.99	7.68
		Petroleum Coke	Gg		NO	NO		NO	NO	NA	NCV	NA,NO	NA	NA,NO	NO	NA,NO	NA	NA,NO
		Refinery Feedstocks	Gg		NO	NO		NO	NO	NA	NCV	NA,NO	NA	NA,NO	NO	NA,NO	NA	NA,NO
		Other Oil	Gg		NO	NO		NO	NO	NA	NCV	NA,NO	NA	NA,NO	NO	NA,NO	NA	NA,NO
Other Liquid Fossil												NA,NO		NA,NO	NO	NA,NO		NA,NO
White Spirit			Gg	NO	NO	NO	NO	NO	NO	NA	NCV	NA,NO	NA	NA,NO	NO	NA,NO	NA	NA,NO
Liquid Fossil Totals												107 562.48		2 140.52	8.75	2 131.77		7 738.33
Solid Fossil	Primary Fuels	Anthracite[2]	Gg	NO	IE	NO		NO	IE,NO	NA	NCV	IE,NA,NO	NA	IE,NA,NO	IE	IE,NA,NO	0.98	IE,NA,NO
		Coking Coal	Gg	NO	NO	NO		NO	NO	NA	NCV	NA,NO	NA	NA,NO	NO	NA,NO	NA	NA,NO
		Other Bituminous Coal	Gg	NO	129.00	NO	NO	NO	129.00	29.30	NCV	3 779.70	25.80	97.52	NO	97.52	0.98	350.41
		Sub-bituminous Coal	Gg	NO	NO	NO	NO	NO	NO	NA	NCV	NA,NO	NA	NA,NO	NO	NA,NO	NA	NA,NO
		Lignite	Gg	NO	NO	NO		NO	NO	9.00	NCV	NO	27.60	NO	NO	NO	0.98	NO
		Oil Shale	Gg	NO	NO	NO		NO	NO	NA	NCV	NA,NO	NA	NA,NO	NO	NA,NO	NA	NA,NO
		Peat	Gg	NO	NO	NO		NO	NO	NA	NCV	NA,NO	NA	NA,NO	NO	NA,NO	NA	NA,NO
	Secondary Fuels	BKB[3] and Patent Fuel	Gg		8.00	NO		NO	8.00	20.00	NCV	160.00	25.80	4.13	NO	4.13	0.98	14.83
		Coke Oven/Gas Coke	Gg		NO	NO		NO	NO	NA	NCV	NA,NO	NA	NA,NO	NO	NA,NO	NA	NA,NO
Other Solid Fossil												NA,NO		NA,NO	NO	NA,NO		NA,NO
Other non-specified			Gg	NO	NO	NO	NO	NO	NO	NA	NCV	NA,NO	NA	NA,NO	NO	NA,NO	NA	NA,NO
Solid Fossil Totals												3 939.70		101.64	IE,NO	101.64		365.24
Gaseous Fossil		Natural Gas (Dry)	Gg	NO	50 215.00	NO		NO	50 215.00	1.00	NCV	50 215.00	15.30	768.29	NO	768.29	1.00	2 802.98
Other Gaseous Fossil												NA,NO		NA,NO	NO	NA,NO		NA,NO
Other non-specified			Gg	NO	NO	NO	NO	NO	NO	NA	NCV	NA,NO	NA	NA,NO	NO	NA,NO	NA	NA,NO
Gaseous Fossil Totals												50 215.00		768.29	NO	768.29		2 802.98
Total												161 717.18		3 010.46	8.75	3 001.71		10 906.55
Biomass total												852.00		25.47	NO	25.47		93.41
		Solid Biomass	Gg	643.00	NO	NO		NO	643.00	1.00	NCV	643.00	29.90	19.23	NO	19.23	1.00	70.49
		Liquid Biomass	Gg	NO	NO	NO		NO	NO	NA	NCV	NA,NO	NA	NA,NO	NO	NA,NO	NA	NA,NO
		Gas Biomass	Gg	209.00	NO	NO		NO	209.00	1.00	NCV	209.00	29.90	6.25	NO	6.25	1.00	22.91

[1] To convert quantities in previous columns to energy units, use net calorific values (NCV) and write NCV in this column. If gross calorific values (GCV) are used, write GCV in this column.
[2] If data for Anthracite are not available separately, include with Other Bituminous Coal.
[3] BKB: Brown coal/peat briquettes.

Table 79 – CRF table 1.A(c) Comparison of CO_2 emissions from fuel combustion

TABLE 1.A(c) COMPARISON OF CO2 EMISSIONS FROM FUEL COMBUSTION
(Sheet 1 of 1)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

FUEL TYPES	REFERENCE APPROACH			SECTORAL APPROACH [1]		DIFFERENCE [2]	
	Apparent energy consumption [3] (PJ)	Apparent energy consumption (excluding non-energy use and feedstocks) [4] (PJ)	CO_2 emissions (Gg)	Energy consumption (PJ)	CO_2 emissions (Gg)	Energy consumption (%)	CO_2 emissions (%)
Liquid Fuels (excluding international bunkers)	107.56	107.05	7 738.33	111.54	8 130.08	-4.02	-4.82
Solid Fuels (excluding international bunkers) [5]	3.94	3.94	365.24	3.47	343.41	13.50	6.36
Gaseous Fuels	50.22	50.22	2 802.98	49.27	2 737.49	1.91	2.39
Other [5]	NA,NO	NO	NA,NO	IE,NE,NO	IE,NE,NO	NA	NA
Total [5]	*161.72*	*161.20*	*10 906.55*	*164.28*	*11 210.98*	*-1.87*	*-2.72*

[1] "Sectoral approach" is used to indicate the approach (if different from the Reference approach) used by the Party to estimate CO_2 emissions from fuel combustion as reported in table 1.A(a), sheets 1-4.

[2] Difference in CO_2 emissions estimated by the Reference approach (RA) and the Sectoral approach (SA) (difference = 100% x ((RA-SA)/SA)). For calculating the difference in energy consumption between the two approaches, data as reported in the column "Apparent energy consumption (excluding non-energy use and feedstocks)" are used for the Reference approach.

[3] Apparent energy consumption data shown in this column are as in table 1.A(b).

[4] For the purposes of comparing apparent energy consumption from the Reference approach with energy consumption from the Sectoral approach, Parties should, in this column, subtract from the apparent energy consumption (Reference approach) the energy content corresponding to the fuel quantities used as feedstocks and/or for non-energy purposes, in accordance with the accounting of energy use in the Sectoral approach

[5] Emissions from biomass are not included.

Note: The Reporting Instructions of the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories require that estimates of CO_2 emissions from fuel combustion, derived using a detailed Sectoral approach, be compared to those from the Reference approach (Worksheet 1-1 of the IPCC Guidelines, Volume 2, Workbook). This comparison is to assist in verifying the Sectoral data.

Table 80 – CRF table 1.A(d) Sectoral background data for energy - Feedstocks and Non-Energy Use of Fuels

TABLE 1.A(d) SECTORAL BACKGROUND DATA FOR ENERGY
Feedstocks and Non-Energy Use of Fuels
(Sheet 1 of 1)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

FUEL TYPE	ACTIVITY DATA AND RELATED INFORMATION		IMPLIED EMISSION FACTOR	ESTIMATE	Additional information (a)			
	Fuel quantity (TJ)	Fraction of carbon stored	Carbon emission factor (t C/TJ)	Carbon stored in non-energy use of fuels (Gg C)	CO_2 not emitted ($Gg\ CO_2$)	Subtracted from energy sector (specify source category)	Associated CO_2 emissions (Gg)	Allocated under (Specify source category, e.g. Waste Incineration)
Naphtha (1)	NO	NO	NO	NO	NO	NA	NO	NA
Lubricants	211.50	0.50	20.00	2.12	7.76	NA	NE	NE
Bitumen	301.60	1.00	22.00	6.64	24.33	NA	NE	NE
Coal Oils and Tars (from Coking Coal)	NO	NO	NO	NO	NO	NA	NO	NA
Natural Gas (1)	NO	NO	NO	NO	NO	NA	NO	NA
Gas/Diesel Oil (1)	NO	NO	NO	NO	NO	NA	NO	NA
LPG (1)	NO	NO	NO	NO	NO	NA	NO	NA
Ethane (1)	NO	NO	NO	NO	NO	NA	NO	NA
Other *(please specify)*				NO				
White Spirit	NO	NO	NO	NO	NO	NA	NO	NA
Kerosene/Jet Fuels	NO	NO	NO	NO	NO	NA	NO	NA
Motor Spirit	NO	NO	NO	NO	NO	NA	NO	NA
Total				8.75	32.08			
Total amount of C and CO_2 from feedstocks and non-energy use of fuels that is included as emitted CO_2 in the Reference approach				2.12	7.76			

(1) Enter data for those fuels that are used as feedstocks (fuel used as raw materials for manufacture of products such as plastics or fertilizers) or for other non-energy use (fuels not used as fuel or transformed into another fuel (e.g. bitumen for road construction, lubricants)).

(a) The fuel lines continue from the table to the left.

A fraction of energy carriers is stored in such products as plastics or asphalt. The non-stored fraction of the carbon in the energy carrier or product is oxidized, resulting in carbon dioxide emissions, either during use of the energy carriers in the industrial production (e.g. fertilizer production), or during use of the products (e.g. solvents, lubricants), or in both (e.g. monomers). To report associated emissions, use the above table.

Documentation box:

- Parties should provide detailed explanations on the fuel combustion sub-sector, including information related to feedstocks, in the corresponding part of Chapter 3: Energy (CRF sub-sector 1.A) of the NIR. Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.
- The above table is consistent with the IPCC Guidelines. Parties that take into account the emissions associated with the use and disposal of these feedstocks could continue to use their methodology, but should indicate this in this documentation box and provide a reference to the relevant section of the NIR where further explanation can be found.

3.10 IPCC Sector 1 B Fugitive emissions from fuels

IPCC Sector 1 B 1 Solid fuels

No emissions reported nor estimated

IPCC Sector 1 B 2 Oil and natural gas

Key Sources: *no*

Source Category Description
Methane emissions from natural gas distribution have been reestimated in 2006 and included in the inventories. These emissions are due to leaks or to accidental events. No other fugitive emissions from fuels were estimated nor reported (SNAP code 0506, Distribution of fossil fuels, natural gas distribution networks).

IPCC Category 1.B.2.B.3 Transmission and IPCC Category 1.B.2.B.3 - natural gas transmission:

- CH_4 emissions recorded are due to leaks or to accidental events in gas transmission and distribution. Includes therefore CRF categories 1.B.2.B.4 and 1.B.2.B.5.

The share in total GHG emissions (including LULUCF) from sector 1 B is for:

- CH_4 emission less than 1% in the year 1990 and 2004. The emission trend in the period 1990 – 2004 was about 122% whereas the emission trend in period 2003 – 2004 was about 4%.

Table 81 – CH_4 emission trend of IPCC Sector 1 B 2 Oil and natural gas

GHG source and sink categories	Total Energy	Fuel combustion	Sector 1 B	Sector 1 B 2 a
	CH4 (Gg)			
1990	2.75	1.44	1.31	1.31
1991	3.11	1.71	1.40	1.40
1992	3.33	1.87	1.46	1.46
1993	3.50	1.98	1.52	1.52
1994	3.29	1.80	1.49	1.49
1995	3.44	1.69	1.75	1.75
1996	3.68	1.81	1.87	1.87
1997	3.72	1.81	1.91	1.91
1998	3.68	1.75	1.93	1.93
1999	3.67	1.61	2.06	2.06
2000	3.83	1.72	2.11	2.11
2001	3.91	1.73	2.18	2.18
2002	4.33	1.56	2.77	2.77
2003	4.37	1.58	2.79	2.79
2004	4.36	1.45	2.91	2.91

GHG source and sink categories	Total Energy	Fuel combustion	Sector 1 B	Sector 1 B 2 a
	CH4 (Gg)			
Trend 2003-2004	*-0.2%*	*-8.2%*	*4.3%*	*4.3%*
Trend 1990-2004	*58.5%*	*0.7%*	*122.1%*	*122.1%*
Share in National Total GHG 1990	*0.5%*	*0.2%*	*0.2%*	*0.2%*
Share in National Total GHG 2004	*0.7%*	*0.2%*	*0.5%*	*0.5%*

Methodology

In the basic emission inventory, the source types are categorized according to the SNAP nomenclature, emissions are calculated according to the CORINAIR/EMEP methodology. A redistribution is done automatically by the CollectER/ReportER software to produce the CRF table categories according to the IPCC guidelines.

The activity data were taken from communications from the operators of the installations, partly in the context of the permitting procedure. If such data were not available, the activity values were derived from statistical information on energy consumption and on production for example, published by the national statistical office STATEC or by other statistical offices.

The emission factors were taken from measurement reports or from specific air pollution literature. Many emission factors have been used in the emission inventories of the early nineties already. Their origin has been documented in a report by TÜV Rheinland.

Emission factor

In general the CO_2 emission factors below have been used for the various fuels. They were taken from CORINAIR/EMEP or from the TÜV study '*Emissionskataster für das Großherzogtum Luxemburg*' done in 1990 by TÜV Rheinland (Köln) with the Environment Agency.

Table 82 – CO_2 emission factors used for various fuels of IPCC sector 1 B 2 Oil and natural gas

Fuel type	Emission factor (kg CO2/GJ)	Reference
Hard coal, patent fuels	98.0	CORINAIR
Coke, coking coal	93.0	CORINAIR
Lignite (brown coal)	108.0	CORINAIR
Tires	99.46	CORINAIR
Gasolines	*	COPERT
Diesel	*	COPERT
Gasoil	70.0	CORINAIR
Residual oil	75.0	CORINAIR
Natural gas	55.0	CORINAIR
LPG	62.0	CORINAIR
BF gas	258.0	Internal study

** see COPERT III default values*

Table 83 – CH_4 emission factors used for various fuels of IPCC sector 1 B 2. Oil and natural gas

Fuel type	Emission factor (g CH4/GJ) electricity and heat production	Emission factor (g CH4/GJ) manufacturing industries and construction	Emission factor (g CH4/GJ) other sectors
Hard coal, patent fuels	-	15	150
Coke, coking coal	-	25	-
Lignite (brown coal)	-	-	350
Wood	-	-	320
Gasolines	*	*	*
Diesel	*	*	*
Gasoil	0.6	2.5	10.5
Residual oil	-	5.0	-
Natural gas	1.2	1.0	5.0
LPG	-	-	-
BF gas	0.25	0.25	-
Reference	CORINAIR, COPERT	CORINAIR, COPERT	CORINAIR, COPERT

** see COPERT III default values*

Table 84 – N_2O emission factors used for various fuels of IPCC sector 1 B 2. Oil and natural gas

Fuel type	Emission factor (kg N2O/GJ) electricity and heat production	Emission factor (kg N2O/GJ) manufacturing industries & construction	Emission factor (kg N2O/GJ) other sectors
Hard coal, patent fuels	-	3,5	1,9
Coke, coking coal	-	4,0	-
Lignite (brown coal)	-	-	1,9
Wood	-	-	1,9
Gasolines	*	*	*
Diesel	*	*	*
Gasoil	1,0	2,4	1,0
Residual oil	-	2,4	-
Natural gas	1,0	0,8	0,8
LPG	-	-	-
BF gas	0,8	2,4	-
Reference	CORINAIR, COPERT	CORINAIR, COPERT	CORINAIR, COPERT

** see COPERT III default values*

Activity data
The activity data are listed in the following table.

Table 85 – Activity data of IPCC sector 1 B 2 Oil and natural gas

SNAP	50402	50502	50503	50601	50603
Activity	Other handling and storage	Transport and depots	Service stations (+ refuelling of cars)	Gas distribution networks pipelines	Distribution networks
Unit	[GJ]	[GJ]	[GJ]	[GJ]	[GJ]
1990	33 008 893	18 247 913	18 228 158	19 394 216	19 394 216
1991	39 032 241	21 224 333	21 191 847	20 800 000	20 800 000
1992	42 123 806	22 973 309	22 945 213	21 680 000	21 680 000
1993	40 708 259	23 133 105	23 117 301	22 520 000	22 520 000
1994	40 650 912	23 935 597	23 920 671	22 080 000	22 080 000
1995	38 221 624	22 580 404	22 566 356	25 920 000	25 920 000
1996	41 654 021	22 613 329	22 601 037	27 640 000	27 640 000
1997	43 312 830	23 808 726	23 795 117	28 320 000	28 320 000
1998	48 006 372	23 930 329	23 906 623	28 600 000	28 600 000
1999	49 478 625	24 903 592	24 892 617	30 520 000	30 520 000
2000	55 086 843	25 552 873	25 541 459	31 191 000	31 191 000
2001	60 461 449	25 117 824	25 108 166	32 311 000	32 311 000
2002	63 665 188	24 476 445	24 476 445	48 986 000	33 000 000
2003	75 014 591	24 910 528	24 910 528	49 498 000	33 000 000
2004	83 797 725	24 188 900	24 188 900	55 794 000	34 197 000
Reference	STATEC, Statistical Yearbook, table C.3517	STATEC, Statistical Yearbook, table C.3517	Ministry of Economic Affairs and External Trade, Activity Reports, fuels imports (gasoline)	Ministry of Economic Affairs and External Trade, Activity Reports, natural gas imports ; STATEC, Statistical Yearbook, table C.3513	Ministry of Economic Affairs and External Trade, Activity Reports, natural gas imports

Recalculations
No recalculations were made.

Sector specific QA/QC procedures
No category specific QA/QC procedures were investigated.

Planned improvements

- Revising the emission factors;
- Revising the activity data;
- Providing more background data.

4 Industrial Processes (CRF sector 2)

4.1 Overview of the sector

In Luxembourg industrial process emissions include emissions of industrial installations, of F-gases use and of the food sector. In this context the most important emitting activities are clinkers (cement), iron and steel and flat glass productions. The sub sector of fluorinated gases utilization shows increasing emissions mainly due to an increasing use of fluorinated gases for air conditioning. The food sector is a minor source of CO_2 process emissions.

4.1.1 Emission Trend

In the following tables the emission trends of IPCC Sector 2 Industrial Processes are presented. An emission trend description is given in the relevant subchapters.

Table 86 – CO_2 emission trend of IPCC Sector 2 Industrial Processes

GHG source and sink categories	Sector 2	Sector 2 A	Sector 2 A 1	Sector 2 A 7	Sector 2 C	Sector 2 C 1	Sector 2 D	Sector 2 D 2
	CO2 (Gg)							
1990	1 556.59	590.62	550.62	40.00	961.78	961.78	4.19	4.19
1991	1 507.48	590.62	550.62	40.00	913.44	913.44	3.42	3.42
1992	1 407.50	572.47	532.47	40.00	829.76	829.76	5.27	5.27
1993	1 475.13	572.47	532.47	40.00	898.44	898.44	4.22	4.22
1994	1 294.38	539.58	499.58	40.00	750.64	750.64	4.16	4.16
1995	943.86	485.78	445.78	40.00	454.23	454.23	3.85	3.85
1996	896.78	480.03	440.03	40.00	413.26	413.26	3.49	3.49
1997	821.87	494.82	454.82	40.00	324.10	324.10	2.95	2.95
1998	638.36	497.12	457.12	40.00	137.49	137.49	3.75	3.75
1999	670.58	519.83	479.83	40.00	146.68	146.68	4.07	4.07
2000	698.54	564.01	507.21	56.80	131.13	131.13	3.40	3.40
2001	642.24	500.03	443.23	56.80	138.97	138.97	3.24	3.24
2002	790.14	516.30	459.50	56.80	270.05	270.05	3.79	3.79
2003	727.84	461.36	404.56	56.80	262.69	262.69	3.79	3.79
2004	747.81	504.08	445.01	59.07	240.31	240.31	3.42	3.42
Trend 2003-2004	*2.7%*	*9.3%*	*10.0%*	*4.0%*	*-8.5%*	*-8.5%*	*-9.8%*	*-9.8%*
Trend 1990-2004	*-52.0%*	*-14.7%*	*-19.2%*	*47.7%*	*-75.0%*	*-75.0%*	*-18.4%*	*-18.4%*
Share in National Total GHG 1990	*12.5%*	*4.8%*	*4.4%*	*0.3%*	*7.7%*	*7.7%*	*0.0%*	*0.0%*
Share in National Total GHG 2004	*6.0%*	*4.0%*	*3.6%*	*0.5%*	*1.9%*	*1.9%*	*0.0%*	*0.0%*

4.1.2 Key Sources

The methodology and results of the key source analysis is presented in Chapter 1. Table 87 presents the key source categories of IPCC Category 2 Industrial processes.

Table 87 – Key sources of Category 2 Industrial processes

IPCC Category / Source Categories	Key sources		
	GHG	KS-Assessment*	
2 A 1 Cement Production	CO2	LA: 1994-2004	TA: 2004
2 C 1 Iron and steel Production	CO2	LA: 1994-2004	TA: 2004

** LA = Level Assessment*

** TA = Trend Assessment*

4.2 IPCC Sector 2 A Mineral Product

IPCC Category 2 A 1 Clinker / cement

Key Sources: CO_2

Source Category Description
Clinker production process implies that mineral carbonates are transformed into oxides under elimination of CO_2. That decarbonisation process leads to high amounts of CO_2 emissions.

The share in total GHG emissions (including LULUCF) from sector 2 A 1 is for CO_2 emissions about 4 % for the year 1990 and 2004. The emission trend in the period 1990 – 2004 was about -19% whereas the emission trend in period 2003 – 2004 was about 10%.

Methodology
The CORINAIR (simple) methodology is applied.

Emission factors
The emission factor for CO_2 was calculated based on information from the operator about the raw material composition and the process. The value of that factor is 525.4 kg CO_2/t clinker produced. The CO_2-emission factor are plant specific.

Activity data
The activity data of the clinker production were received from the operator of the plant.

Table 88 – Activity data of Cement (decarbonizing)

SNAP	40612
Activity	Cement (decarbonizing)
Unit	t prod./a
1990	1 048 000
1991	1 048 000
1992	1 013 452
1993	1 013 452
1994	950 854
1995	848 455
1996	837 518
1997	865 659
1998	870 053
1999	913 265
2000	965 369
2001	843 608
2002	874 577
2003	770 000
2004	847 389
Reference	Intermoselle, Rumelange (Luxembourg), 1990-2005

Recalculations
No recalculations were made.

Sector specific QA/QC procedures

- For verification of the country-specific emission factors the following reference has been used: the Default Emission Factors of the Revised 1996 IPCC Guidelines for National GHG Inventories;
- No further category specific QA/QC procedures were made.

Planned improvements

- Revising the emission factors using the IPCC default emission factor of 507.1 kg CO2/$t_{clinker}$;
- Revising the methodology (Tier 2).

IPCC Category 2 A 2 Lime

The IPCC Category 2 A 2 Lime does not exist in Luxembourg.

IPCC Category 2 A 3 Limestone and Dolomite Use

These materials are mainly used in steelworks in Luxembourg and are therefore (and contrary to the IPCC guidelines) accounted for in CRF category 2 C. It is worth noticing that their use was decreasing at the same time Luxembourg's steelworks were moving from blast furnaces to electric arc furnaces (*EAF*) during the 90s. Since the use of these materials in other sectors than iron & steel is not known with enough precision but is expected to be very low in Luxembourg, the emissions to be accounted for under category 2 A 3 are estimated being equal or very close to zero.

IPCC Category 2 A 4 Soda Ash Use

Though this activity is not estimated, it is expected to be very low in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

IPCC Category 2 A 5 Asphalt Roofing & IPCC Category 2 A 6 Road Paving with Asphalt

Key source: *no*

Source Category Description
The emissions of fuel combustion of IPCC Category 2 A 5 Asphalt Roofing and IPCC Category 2 A 6 Road Paving with Asphalt are included in IPCC Category 1 A 4. The process emissions for this category is not known with enough precision but is expected to be very low (i.e. close to zero) in Luxembourg.

Methodology
The CORINAIR (simple) methodology is applied.

Emission factors
Emission factors = 0.

Activity data
The activity data are listed in the following table.

Table 89 – Activity data of Asphalt roofing materials and Road paving with asphalt

SNAP	40610	40611
Activity	Asphalt roofing materials	Road paving with asphalt
Unit	[t prod.]	[t prod.]
1990	604	393 776
1991	604	393 776
1992	604	393 776
1993	604	393 776
1994	604	445 503

SNAP	40610	40611
Activity	Asphalt roofing materials	Road paving with asphalt
Unit	[t prod.]	[t prod.]
1995	604	445 503
1996	612	445 503
1997	620	445 503
1998	620	445 503
1999	620	445 503
2000	620	445 503
2001	620	445 503
2002	620	445 503
2003	620	445 503
2004	620	445 503
Reference		

IPCC Category 2 A 7 Mineral Products – Other – Glass

Key Sources: *no*

Source Category Description

Some of the mineral input materials used in float glass production contain carbonates. Those carbonates release CO_2 during the melting process of the glass. The following source category is identified:

040613 *Glass (decarbonizing)*

The share in total GHG emissions (including LULUCF) from sector 2 A 7 Mineral Products–Other – Glass is for CO_2 emissions less than 1 % for the year 1990 and 2004. The emission trend in the period 1990 – 2004 was about 48% whereas the emission trend in period 2003 – 2004 was about 4%.

Methodology

The CORINAIR (simple) methodology is applied.

Emission factors

The emission factor for CO_2 was calculated based on information from TÜV 1990 and on information from the operator about the raw material composition and the process. The value of the factor is 100 kg of CO_2/t glass produced. As of 2000, the factor has been increased to 142 kg of CO_2/t glass produced, based on new information received from the operator.

Activity data
The activity data of the glass production were received from the operator of the plants.

Table 90 – Activity data of 'Glass (decarbonizing)

SNAP Activity Unit	40613 'Glass (decarbonizing) [t prod.]
1990	400 000
1991	400 000
1992	400 000
1993	400 000
1994	400 000
1995	400 000
1996	400 000
1997	400 000
1998	400 000
1999	400 000
2000	400 000
2001	400 000
2002	400 000
2003	400 000
2004	416 000
Reference	Production value taken from the operation permits of Luxguard I and II

Recalculations
No recalculations were made.

Sector specific QA/QC procedures
No category specific QA/QC procedures were investigated.

Planned improvements

- Revising the emission factors;
- Revising the activity data.

IPCC Category 2 A G Other - Cooling plants

Key Sources: *no*

Source Category Description
From IPCC Category 2 A G Other - Cooling plants result only NH_3 emissions.

Methodology
The CORINAIR (simple) methodology is applied.

Emission factors
Emission factors = 0.

Activity data
The activity data are listed in the following table.

Table 91 – Activity data of Cooling plants

SNAP	40700
Activity	Cooling plants
Unit	t prod./a
1990	35 000
1991	35 000
1992	35 000
1993	35 000
1994	35 000
1995	35 000
1996	35 000
1997	35 000
1998	35 000
1999	35 000
2000	35 000
2001	35 000
2002	35 000
2003	35 000
2004	35 000
Reference	

Recalculations
No recalculations were made.

Sector specific QA/QC procedures
No category specific QA/QC procedures were investigated.

Planned improvements

- Removal of this activity.

4.3 IPCC Sector 2 B Chemistry

The IPCC Sector 2 B Chemistry does not exist in Luxembourg.

Planned improvements

Incorporation of this activity using data of UN Industrial Commodity Statistics Yearbook for ammonia production in Luxembourg.

4.4 IPCC Sector 2 C Metal Production

IPCC Category 2 C 1 Iron and steel

Key Sources: CO_2

Source Category Description

040209 Decarbonizing of iron ore during sintering

Iron ore was used to produce the sinter product, which is the input material for the blast furnaces. The iron ore contains carbonates which release CO_2 during the sintering process.

40206 Basic oxygen furnace steel production

In the basic oxygen furnace, pig iron is transformed to steel. During the process, the carbon (*C*) content of the metal is reduced, and C is released as CO_2. Therefore those CO_2 emissions are considered to be process emissions.

040207 Electric arc furnace steel production

Steel production using electric arc furnaces uses carbon electrodes and carbon (coal) as reacting agent in the production process. The oxidation of carbon results in CO_2 emissions.

40202 Blast furnace charging

Blast furnace charging and rolling mills were also a minor CO_2 emission source of steel production.

The share in total GHG emissions (including LULUCF) from sector 2 A 1 is for CO_2 emissions about 8% for the year 1990 and about 2% for the year 2004. The emission trend in the period 1990 – 2004 was about -75% whereas the emission trend in period 2003 – 2004 was about 9%.

Methodology

The CORINAIR (simple) methodology is applied.

Emission factors

The selected emission factors are listed in the following table.

Table 92 – Emission factors of Category 2 C 1 Iron and steel (except SNAP 040207)

IPCC Category	Source Categories	SNAP		CO2 Emission factor	Reference
2 C 1	Iron and steel	40202	Blast furnace charging		TÜV 1990
		40203	Pig iron tapping		
		40206	Basic oxygen furnace steel plant	162 kg of CO2 / t steel	TÜV 1990
		040209	Sinter and pelletizing plant	79.2 kg of CO2 / t sinter product	plant specific

Table 93 – Emission factors of SNAP 040207 Electric furnace steel plant

Year Unit	040207 Electric furnace steel plant [kg of CO2 / t steel]
1990	-
1991	-
1992	-
1993	56.0
1994	56.0
1995	56.0
1996	59.4
1997	74.1
1998	55.2
1999	56.0
2000	51.0
2001	51.0
2002	98.2
2003	98.2
2004	89.5
Reference	Annual declaration by the operator

Activity data

The activity data are listed in the following table.

Table 94 – Activity data for Blast furnace charging, Pig iron tapping, and Basic oxygen furnace steel plant

SNAP Activity Unit	40202 Blast furnace charging [t]	40203 Pig iron tapping [t]	40206 Basic oxygen furnace steel plant [t]
1990	2 645 200	2 645 200	3 560 290
1991	2 463 000	2 463 000	3 379 440
1992	2 255 200	2 255 200	3 068 463
1993	2 412 000	2 412 000	3 288 847

SNAP	40202	40203	40206
Activity	Blast furnace charging	Pig iron tapping	Basic oxygen furnace steel plant
Unit	[t]	[t]	[t]
1994	1 926 890	1 926 890	2 627 278
1995	1 028 230	1 028 230	1 410 469
1996	829 010	829 010	1 168 070
1997	438 030	438 030	597 814
	Operation closed		
Reference	STATEC Statistical Yearbook, table C.3451 (pig iron ('*fonte*') production)	STATEC Statistical Yearbook, table C.3451 (pig iron ('*fonte*') production)	STATEC Statistical Yearbook, table C.3453 (LDAC O.B.M steel production)

Table 95 – Activity data for Electric furnace steel plant

SNAP	40207		40207	
Activity	Electric furnace steel plant		Electric furnace steel plant	
Fuel	-	301	Anthracite	Cabon
Unit	[t prod]	[GJ]	[t]	[t]
1990	0	0	0	0
1991	0	0	0	0
1992	0	0	0	0
1993	4 095	0	0	0
1994	445 990	0	0	0
1995	1 202 668	0	0	0
1996	1 333 758	0	0	0
1997	1 982 405	0	0	0
1998	2 476 909	0	0	0
1999	2 600 324	0	0	0
2000	2 571 243	0	0	0
2001	2 724 679	0	34 401	10 854
2002	2 736 000	0	25 845	25 582
2003	2 675 000	0	25 845	25 582
2004	2 684 000	2476537	16 639	27 403
Reference	STATEC Statistical Yearbook, tables C.3453 (EAF steel production), C.3001 and C.3400 (steel)			

Table 96 – Activity data for Rolling mills and Sinter plants

SNAP Activity Unit	40208 Rolling mills [t prod.]	40209 Sinter plants [t prod.]
1990	3 950 035	4 804 000
1991	3 813 383	4 567 000
1992	3 590 214	4 152 000
1993	3 941 165	4 561 000
1994	4 194 627	3 747 000
1995	3 708 547	1 977 700
1996	3 437 568	1 810 970
1997	3 886 926	1 002 815
1998	3 983 009	0
1999	4 238 583	0
2000	4 571 252	0
2001	4 518 537	0
2002	4 467 000	0
2003	3 988 000	0
2004	4 083 000	0
Reference	STATEC Statistical Yearbook, tables C.3001 and C.3451	Data from the operator

Recalculations
No recalculations were made.

Category specific QA/QC procedures
No category specific QA/QC procedures were investigated.

Planned improvements

- Revising the emission factors;
- Revising the methodology (Tier 2).

IPCC Category 2 C 2 Ferroalloys Production

In Luxembourg there are now dedicated plants for producing ferroalloys.

IPCC Category 2 C 3 Aluminium Production

In Luxembourg the production of aluminium products is made out of aluminium scrap (i.e. aluminium products are made of recycled aluminium).

IPCC Category 2 C 4 Aluminium and Magnesium Foundries

In Luxembourg the production of aluminium products is made out of aluminium scrap (i.e. aluminium products are made of recycled aluminium).

IPCC Category 2 C 5 Other - Copper processing

The only non-ferrous metallurgy in Luxembourg is relating to copper.

4.5 IPCC Sector 2 D Other Production

IPCC Category 2 D 2 Other Production - Food and Drink

Key Sources: *no*

Source Category Description
Bread baking, beer brewing, wine and spirits production lead to minor emissions of CO_2.
The share in total GHG emissions (including LULUCF) from sector 2 D 2 is for:

- CO_2 emission less than 1% for the year 1990 and 2004. The emission trend in the period 1990 – 2004 was about -18% whereas the emission trend in period 2003 – 2004 was about-10%.

Methodology
The CORINAIR (simple) methodology is applied.

Emission factors
The selected emission factors are listed in the following table.

Table 97 – Emission factor for IPCC Category 2 D 2 Other Production - Food and Drink

IPCC Category	Source Categories	SNAP		CO2 Emission factor [kg/GJ]	Reference
2 D 2	Other Production - Food and Drink	40605	Bread	7.4	TÜV (1990)
		40606	Wine	100.0	TÜV (1990)
		40607	Beer	40.0	TÜV (1990)
		40608	Spirits	400.0	

Activity data
The activity data are listed in the following table.

Table 98 – Activity of data for Bread, Wine, Beer and Spirits

SNAP Activity Unit	40605 Bread [t]	40606 Wine [kl]	40607 Beer [kl]	40608 Spirits [kl (100% vol.)]
1990	18 300	15112.0	59983.9	349.3
1991	18 679	8571.3	57233.3	329.5
1992	18 937	27122.7	56912.6	360.1
1993	19 210	16926.8	55787.3	382.1
1994	19 484	17499.8	53111.7	359.5
1995	19 781	14965.4	51840.0	340.4
1996	20 044	12761.7	48345.3	316.7
1997	20 303	7470.8	48054.6	331.4
1998	20 567	15971.1	46851.9	314.7
1999	20 878	18427.7	44959.7	496.0
2000	21 009	13193.1	43842.3	439.7
2001	21 142	13482.6	39667.6	378.1
2002	21 341	15387.2	38602.1	1368.7
2003	21 341	12308.5	39069.4	349.8
2004	21 706	15582.8	37727.2	387.5
Reference	STATEC, old Statistical Yearbook, table M.202 (bread consumption per inhabitants), new Statistical Yearbook, table B.1100 (calculated population)	STATEC Statistical Yearbook, table C.2200 (vineyards yield)	STATEC Statistical Yearbook, table C.3403 (beer produced)	STATEC Statistical Yearbook, table C.3402 (spirits quantities taxed and denaturated)

** kl =1000 litres*

Recalculations

No recalculations were made.

Category specific QA/QC procedures

No category specific QA/QC procedures were investigated.

Planned improvements

- Revising the emission factors;
- Revising the activity data;
- Consideration of the biogenic share of the food sector.

4.6 IPCC Sector 2F Consumption of Halocarbons and SF_6

4.6.1 Sector overview

A first estimation of the emissions of fluorinated GHG types (HFCs, PFCs and SF_6) was done end of 1999 by the Environment Agency of Luxembourg and Luxembourg's *Centre de Ressources des Technologies pour l'Environnement* (*CRTE*). The emissions' estimates in Table 99 below are part of the results of that work.

The following sources are identified:

2(I) F	Consumption of Halocarbons and SF_6;
2(I) F1	Refrigeration and Air Conditioning Equipment;
2(I) F 2	Foam Blowing;
2(I) F 4	Aerosols/Metered Dose Inhalers;
2(I) F 7	Electrical Equipment;
2(I) F 8	Other (windows containing SF_6).

Table 99 – Emissions of fluorinated greenhouse gases in Luxembourg

Application	1995	2000	2005
		[t of CO2 eq]	
Stationary cooling installations	2 088	12 670	33 720
Mobile cooling installations	4 160	21 388	39 006
High voltage electrical equipments	576	956	956
Vaporizers (medical applications)	4	2 737	3 650
Filling of car tires	0	0	0
Noise reduction windows	2 332	2 565	2 822
Foam blowing	7 366	6 266	6 266
Sum	16 526	46 582	86 420

The data in Table 99 should be seen as first estimates since they have not been done using activity data and emission factors, but using other methods, like for example deriving data for Luxembourg on the basis of statistical data of other European countries and comparing the population sizes of Luxembourg and of those countries. Neither PFCs applications nor PFCs emission sources have been found in Luxembourg so far.

For the inventories, it has been assumed that the estimates of 1995 in Table 99 can be included in the emission inventories of the years 1990 through 1999, and the estimates of 2000 can be used for the inventories from 2000 through 2004.

A reevaluation of the emission sources and of the emissions of those fluorinated GHG is done, and results can be expected in the first half of the year 2007.

Documentation to TABLE 2(II) SECTORAL REPORT FOR INDUSTRIAL PROCESSES - EMISSIONS OF HFCs, PFCs AND SF_6

- 2.F Consumption of Halocarbons and SF_6: Estimates of F-gases emissions are coming from a study realized end 1999 that for the first time tried to evaluate the actual consumption of F-gases in the country following a top-down approach. This study has not been updated since. From that study, F-gases have been distributed amongst 5 CRF categories: 2.F.1, 2.F.2, 2.F.4, 2.F.8 and 2.F.9. It has also been decided to use the 1990 F-gases estimates for the years 1990-1999 and the 2000 estimates for the subsequent years.
- 2.F.9 noise reduction windows: Estimates of F-gases emissions are coming from a study realized end 1999 that for the first time tried to evaluate the actual consumption of F-gases in the country following a top-down approach. This study has not been updated since.
- The value recorded relate only to SF_6 consumption and the GWP used is 23900.
- 2.F.P1 Production: The study realized end 1999 that for the first time tried to evaluate the actual consumption of F-gases in the country (see notes for Table 2.F) did not focus on potential emissions.
- 2.F.P2 Import: The study realized end 1999 that for the first time tried to evaluate the actual consumption of F-gases in the country (see notes for Table 2.F) did not focus on potential emissions.
- 2.F.P3 Export: The study realized end 1999 that for the first time tried to evaluate the actual consumption of F-gases in the country (see notes for Table 2.F) did not focus on potential emissions.
- 2.F.P4 Destroyed amount: The study realized end 1999 that for the first time tried to evaluate the actual consumption of F-gases in the country (see notes for Table 2.F) did not focus on potential emissions.

Table 100 – CO_2 emission trend of IPCC Sector 2F Consumption of Halocarbons and SF_6

GHG source and sink categories	Sector 2F Consumption of Halocarbons	Sector 2F Consumption of SF6
	CO2 (Gg)	
1990	13.62	0.000122
1991	13.62	0.000122
1992	13.62	0.000122
1993	13.62	0.000122
1994	13.62	0.000122
1995	13.62	0.000122
1996	13.62	0.000122
1997	13.62	0.000122

GHG source and sink categories	Sector 2F Consumption of Halocarbons	Sector 2F Consumption of SF6
	CO2 (Gg)	
1998	13.62	0.000122
1999	13.62	0.000122
2000	43.06	0.000147
2001	43.06	0.000147
2002	43.06	0.000147
2003	43.06	0.000147
2004	43.06	0.000147
Trend 2003-2004	*0.0%*	*0.0%*
Trend 1990-2004	*216.2%*	*21.1%*
Share in National Total GHG 1990	*0.1%*	*0.0%*
Share in National Total GHG 2004	*0.3%*	*0.0%*

Recalculations

No recalculations were made.

Category specific QA/QC procedures

No category specific QA/QC procedures were investigated.

Planned improvements

- Revising the emission factors;
- Revising the activity data.

5 Solvents and other product use (CRF sector 3)

5.1 Sector Overview

In Luxembourg the sector of solvents and other product use has been estimated to generate NMVOC emissions from the following sources:

Table 101 – Source categories in IPCC Sector 3 Solvents and other product use

IPCC Category		SNAP	
3 A	Paint application	0601	Paint application
		060102	car repairing
		060103	construction and buildings
		060104	domestic use
		060105	coil coating
		060107	wood coating
		060108	Other industrial paint application
		060109	Other non-industrial paint application
3 B	Degreasing and Dry Cleaning	0602	Degreasing, dry cleaning and electronics
		060201	Metal degreasing
		060202	Dry cleaning
3 C	Chemical Products, Manufacture and Processing	0603	Chemical products manufacturing and processing
		060302	Polyvinyle chloride processing
		060305	Rubber processing
		060307	Paints manufacturing
3 D	Other	0604	Other use of solvents and related activities
		060403	Printing industry
		060405	Application of glues and adhesives
		060406	Preservation of wood
		060407	Under seal treatment and conservation of vehicles
		060408	Domestic solvent use (other than paint application

It has not yet been estimated how many of the emissions of this sector would have to be counted as CO_2 emissions. A conservative approach is to suppose a complete oxidation of the carbon of the NMVOC emissions to CO_2. The complete transformation to CO_2 has been taken as a basis to establish the data of the CRF tables of this sector. The CO_2 emissions resulting from oxidation of NMVOC emissions are estimated to be 9 kt of CO_2 per year approximately. This value shows that the impact of emissions from solvents and other products have a very limited impact on the national totals of greenhouse gas emissions of Luxembourg.

An estimation of nitrous oxide emissions from anaesthetic use has not yet been made.

5.1.1 Emission trend

The share in total GHG emissions (including LULUCF) from sector 3:

- CO_2 emission about 0.1% for the year 1990 and 2004. The emission trend in the period 1990 – 2004 was about 2%;
- NMVOC emission less than 1% for the year 1990 and 2004. The emission trend in the period 1990 – 2004 was about -18%.

Table 102 – CO_2 emission trend of IPCC Sector 3 Solvents and other Product Use

GHG source and sink categories	Sector 3	Sector 3 A	Sector 3 B	Sector 3 C	Sector 3 D
			CO2 (Gg)		
1990	9.05	4.22	0.84	0.00	3.99
1991	9.08	4.24	0.84	0.00	4.00
1992	9.11	4.24	0.84	0.00	4.03
1993	9.18	4.26	0.84	0.00	4.08
1994	9.22	4.28	0.84	0.00	4.10
1995	9.28	4.29	0.84	0.00	4.15
1996	9.36	4.31	0.84	0.00	4.21
1997	9.40	4.33	0.84	0.00	4.23
1998	9.46	4.34	0.84	0.00	4.28
1999	9.49	4.36	0.84	0.00	4.29
2000	9.35	4.31	0.84	0.00	4.20
2001	9.16	4.26	0.84	0.00	4.06
2002	9.21	4.27	0.84	0.00	4.10
2003	9.21	4.27	0.84	0.00	4.10
2004	9.22	4.28	0.84	0.00	4.10
Trend 2003-2004	*0.1%*	*0.2%*	*0.0%*	*NA*	*0.0%*
Trend 1990-2004	*1.9%*	*1.4%*	*0.0%*	*NA*	*2.8%*
Share in National Total GHG 1990	*0.1%*	*0.0%*	*0.0%*	*NA*	*0.0%*
Share in National Total GHG 2004	*0.1%*	*0.0%*	*0.0%*	*NA*	*0.0%*

Table 103 – NMVOC emission trend of IPCC Sector 3 Solvents and other Product Use

GHG source and sink categories	Sector 3	Sector 3 A	Sector 3 B	Sector 3 C	Sector 3 D
			NMVOC (Gg)		
1990	3.75	1.35	0.27	0.85	1.28
1991	3.76	1.36	0.27	0.85	1.28
1992	3.77	1.36	0.27	0.85	1.29
1993	3.80	1.37	0.27	0.85	1.31
1994	3.76	1.37	0.27	0.80	1.32
1995	3.76	1.38	0.27	0.78	1.33

GHG source and sink categories	Sector 3	Sector 3 A	Sector 3 B	Sector 3 C	Sector 3 D
			NMVOC (Gg)		
1996	3.78	1.38	0.27	0.78	1.35
1997	3.79	1.39	0.27	0.77	1.36
1998	3.80	1.39	0.27	0.77	1.37
1999	3.14	1.40	0.27	0.09	1.38
2000	3.09	1.38	0.27	0.09	1.35
2001	3.03	1.37	0.27	0.09	1.30
2002	3.05	1.37	0.27	0.09	1.32
2003	3.05	1.37	0.27	0.09	1.32
2004	3.05	1.37	0.27	0.09	1.32
Trend 2003-2004	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
Trend 1990-2004	*-18.7%*	*1.5%*	*0.0%*	*-89.4%*	*3.1%*
Share in National Total GHG 1990	*0.1%*	*0.1%*	*0.1%*	*0.1%*	*0.1%*
Share in National Total GHG 2004	*0.1%*	*0.1%*	*0.1%*	*0.1%*	*0.1%*

5.1.2 Methodological issues

Activity data were taken from the TÜV (1990) and were left unchanged in most cases. The emission factors were also taken from that TÜV (1990). As the organic solvents concentrations of paints have been reduced in the '90s, the emission factors for NMVOC have been somewhat reduced in order to reflect that trend.

Documentation to TABLE 3 SECTORAL REPORT FOR SOLVENT AND OTHER PRODUCT USE

- 3 Solvent and Other Product Use: N_2O estimates: since there are no methodologies in the IPCC Guidelines for calculating the emissions of this gas and since we do not have a national methodology to do so, we were not able to estimate N_2O emissions for solvent and other product use.
- 3 C Chemical Products, Manufacture and Processing: Chemical products data are not yet recorded. However, we have an estimate of the NMVOC generated by the chemical activities.
- 3 D 1 Use of N_2O for Anaesthesia: Activity data for anaesthesia is not known with enough precision but is expected to be very low (i.e. close to zero) in Luxembourg. NE could therefore be replaced by a zero value when showing data in Gg at two digits level. However, since "0 is not an option", and NO would be somewhat misleading, we have kept the notation key NE.
- 3 D 2 Fire Extinguishers: Activity data for fire extinguishers is not known with enough precision but is expected to be very low (i.e.close to zero) in Luxembourg. NE could therefore be replaced by a zero value when showing data in Gg at two digits level. However, since "0 is not an option", and NO would be somewhat misleading, we have kept the notation key NE.

- 3 D 3 N2O from Aerosol Cans: Activity data for aerosol cans is not known with enough precision but is expected to be very low (i.e. close to zero) in Luxembourg. NE could therefore be replaced by a zero value when showing data in Gg at two digits level. However, since "0 is not an option", and NO would be somewhat misleading, we have kept the notation key NE.
- The implied emission factor should be looked at with caution due to the very low activity value recorded.
- 3 D 5 other use of solvent and related activities: CO_2 emissions: These emissions relates to both the chemical activities (CRF category 3.C) and the other use of solvents and related activities (CRF category 3.D.5).
- NMVOC emissions: these emissions relate only to the other use of solvents and related activities (CRF category 3.D.5). Those NMVOC emissions from chemical activities are recorded in Table 3.C.

Activity data
The activity data are listed in the following table.

Table 104 – Activity data for IPCC Category 6 A Paint Application

SNAP	60102	60103	60104	60105	60106	60108	60109
Activity	Car repairing	Paint application: Construction and buildings	Paint application: Domestic use	Coil coating	Boat building	Other industrial paint application	Other non industrial paint application
Unit	[t paint]	[t paint]	[t paint]	[t paint]	[t paint]	[t paint]	[t paint]
1990	250	1 800	1 566	250	0	250	250
1991	250	1 800	1 598	250	0	250	250
1992	250	1 800	1 620	250	0	250	250
1993	250	1 800	1 644	250	0	250	250
1994	250	1 800	1 667	250	0	250	250
1995	250	1 800	1 692	250	0	250	250
1996	250	1 800	1 715	250	0	250	250
1997	250	1 800	1 737	250	0	250	250
1998	250	1 800	1 760	250	0	250	250
1999	250	1 800	1 786	250	0	250	250
2000	250	1 800	1 809	250	0	250	250
2001	250	1 800	1 820	250	0	250	250
2002	250	1 800	1 837	250	0	250	250
2003	250	1 800	1 837	250	0	250	250
2004	250	1800	1851	250	0	250	250
Reference	TÜV (1990)						

Table 105 – Activity data for IPCC Category 6 B

SNAP	60201	60202
Activity	Metal degreasing	Dry cleaning
Unit	t solv.	t solv.
1990	200	86
1991	200	86
1992	200	86
1993	200	86
1994	200	86
1995	200	86
1996	200	86
1997	200	86
1998	200	86
1999	200	86
2000	200	86
2001	200	86
2002	200	86
2003	200	86
2004	200	86
Reference	TÜV (1990)	

Table 106 – Activity data for IPCC Category 6 C

SNAP	60302	60305	60307	60311
Activity	PolyvinylChloride processing	Rubber processing	Paints manufactur-ing	PolyvinylChloride processing
Unit	t prod.	t solv.	t solv.	t prod.
1990	13 000	711	190	13 000
1991	13 000	711	190	13 000
1992	13 000	711	190	13 000
1993	13 000	711	190	13 000
1994	13 000	441	190	13 000
1995	13 000	350	190	13 000
1996	13 000	310	190	13 000
1997	13 000	280	190	13 000
1998	13 000	250	190	13 000
1999	13 000	250	190	13 000
2000	13 000	250	190	13 000
2001	13 000	250	190	13 000
2002	13 000	250	190	13 000
2003	13 000	250	190	13 000
2004	13 000	250	190	13 000
Reference	TÜV (1990)			

Table 107 – Activity data for IPCC Category 6 D

SNAP	60403	60405	60406	60407	60408
Activity	Printing industry	Application of glues and adhesives	Preservation of wood	Underseal treatment of vehicles	Domestic solvent use
Unit	[kg ink]	[t paint]	[t paint]	[t solv.]	[inhab.]
1990	487 000	955	300	3	1 018
1991	487 000	975	300	3	1 040
1992	487 000	988	300	3	1 054
1993	487 000	1 002	300	3	1 069
1994	487 000	1 017	300	3	1 084
1995	487 000	1 032	300	3	1 101
1996	487 000	1 046	300	3	1 115
1997	487 000	1 059	300	3	1 130
1998	487 000	1 073	300	3	1 145
1999	487 000	1 089	300	3	1 162
2000	487 000	1 103	300	3	1 177
2001	487 000	1 110	300	3	1 184
2002	487 000	1 120	300	3	1 195
2003	487 000	1 120	300	3	1 195
2004	487 000	1 120	300	3	1 204
Reference	TÜV (1990)				STATEC

Table 108 – Activity data for IPCC Category 6 D

SNAP	60502	60503	60504	60507	60508
Activity	Refrigeration, air condition. (HFC, SF6)	Refrigeration, air condition. (NH3)	Foam blowing (except 060304) (HFC,PFC)	Electrical equip-ments (SF6)	Other (NMVOC, N2O, SF6, HFC, PFC)
Unit	[t solv.]	[t]	[t solv.]	[t SF6]	[t]
1990	34	35 000	9	2	10
1991	34	35 000	9	2	10
1992	34	35 000	9	2	10
1993	34	35 000	9	2	10
1994	34	35 000	9	2	10
1995	34	35 000	9	2	10
1996	34	35 000	9	2	10
1997	34	35 000	9	2	10
1998	34	35 000	9	2	10
1999	34	35 000	9	2	10
2000	170	35 000	9	5	11
2001	170	35 000	9	5	11
2002	170	35 000	9	5	11
2003	170	35 000	9	5	11
2004	170	35000	9	5	11
Reference	TÜV (1990)				

Recalculations
No recalculations were made.

Category specific QA/QC procedures
No category specific QA/QC procedures were investigated.

Planned improvements

- Revising the emission factors;
- Revising the activity data;
- Reflection on the methodology.

6 Agriculture (CRF sector 4)

6.1 Overview

In Luxembourg agricultural activities mainly include meat production, dairy products and cultivation of various crops for food and animal food production. There are no activities like rice cultivation, prescribed burning of savannas' or field burning of agricultural residues.
Among the 6 types of agricultural sources of the IPCC nomenclature, 3 source types exist in Luxembourg:

- 4 A Enteric fermentation;
- 4 B Manure management;
- 4 D Agricultural soils.

Luxembourg has chosen 'Option, B' for the CRF tables on enteric fermentation and manure management (hence, mature dairy cattle, mature non-dairy cattle and young cattle rather than the less detailed 'Option A' distinguishing only between dairy and non-dairy cattle). It is worth underlying that a bug in CRF Reporter v. 3.1.11 in managing these two options leads to the indication of misplaced IE notation keys in aggregated nodes (see Annex III to this NIR for details).

6.1.1 Emission Trend

The share in total GHG emissions (including LULUCF) from sector 4 Agriculture:

- CH_4 emission about 2% for the year 1990 and 2004. The emission trend in the period 1990 – 2004 was about -15%;
- N_2O emission about 1.2% for the year 1990 and 2004. The emission trend in the period 1990 – 2004 was less than 1%.

Table 109 – CH_4 emission trend of IPCC Sector 4 A Agriculture - Enteric Fermentation

GHG source and sink categories	Sector 4	Sector 4 A	Sector 4 A 1	Dairy Cattle	Non-Dairy Cattle	Mature Dairy Cattle	Mature Non-Dairy Cattle	Young Cattle
				CH4 (Gg)				
1990	13.04	9.37	9.17	IE	IE	7.17	1.65	0.34
1991	12.57	9.18	8.98	IE	IE	6.77	1.86	0.35
1992	11.90	8.59	8.39	IE	IE	6.23	1.83	0.34
1993	12.00	8.57	8.37	IE	IE	6.11	1.93	0.33
1994	11.83	8.50	8.29	IE	IE	5.97	2.00	0.33
1995	12.05	8.62	8.41	IE	IE	5.92	2.15	0.34
1996	12.07	8.63	8.42	IE	IE	5.84	2.23	0.35
1997	11.92	8.39	8.17	IE	IE	5.64	2.19	0.34
1998	11.96	8.33	8.09	IE	IE	5.60	2.17	0.33
1999	12.02	8.29	8.04	IE	IE	5.49	2.22	0.32
2000	11.66	8.09	7.85	IE	IE	5.28	2.25	0.32

GHG source and sink categories	Sector 4	Sector 4 A	Sector 4 A 1	Dairy Cattle	Non-Dairy Cattle	Mature Dairy Cattle	Mature Non-Dairy Cattle	Young Cattle
	CH4 (Gg)							
2001	11.63	8.09	7.84	IE	IE	5.22	2.31	0.32
2002	11.45	7.92	7.66	IE	IE	5.13	2.23	0.30
2003<	11.26	7.65	7.37	IE	IE	4.95	2.13	0.29
2004	11.12	7.52	7.24	IE	IE	4.86	2.09	0.29
Trend 2003-2004	*-1.2%*	*-1.6%*	*-1.8%*	*NA*	*NA*	*-1.8%*	*-1.7%*	*-1.8%*
Trend 1990-2004	*-14.8%*	*-19.7%*	*-21.0%*	*NA*	*NA*	*-32.2%*	*26.6%*	*-16.3%*
Share in National Total GHG 1990	*2.2%*	*1.6%*	*1.6%*	*NA*	*NA*	*1.2%*	*0.3%*	*0.1%*
Share in National Total GHG 2004	*1.9%*	*1.3%*	*1.2%*	*NA*	*NA*	*0.8%*	*0.4%*	*0.0%*

GHG source and sink categories	Sector 4	Sector 4 A	Sector 4 A 3	Sector 4 A 6	Sector 4 A 8	Sector 4 A 9
	CH4 (Gg)					
1990	13.04	9.37	0.06	0.03	0.11	0.005
1991	12.57	9.18	0.06	0.03	0.10	0.004
1992	11.90	8.59	0.05	0.03	0.10	0.004
1993	12.00	8.57	0.05	0.03	0.11	0.004
1994	11.83	8.50	0.06	0.04	0.10	0.004
1995	12.05	8.62	0.06	0.04	0.11	0.004
1996	12.07	8.63	0.06	0.04	0.11	0.004
1997	11.92	8.39	0.06	0.04	0.12	0.005
1998	11.96	8.33	0.06	0.04	0.12	0.005
1999	12.02	8.29	0.06	0.05	0.13	0.004
2000	11.66	8.09	0.06	0.06	0.12	0.005
2001	11.63	8.09	0.07	0.06	0.12	0.006
2002	11.45	7.92	0.07	0.06	0.12	0.006
2003	11.26	7.65	0.07	0.06	0.13	0.006
2004	11.12	7.52	0.08	0.07	0.13	0.005
Trend 2003-2004	*-1.2%*	*-1.6%*	*3.1%*	*6.9%*	*0.6%*	*-7.5%*
Trend 1990-2004	*-14.8%*	*-19.7%*	*33.8%*	*114.1%*	*12.1%*	*7.9%*
Share in National Total GHG 1990	*2.2%*	*1.6%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
Share in National Total GHG 2004	*1.9%*	*1.3%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*

Table 110 – CH_4 emission trend of IPCC Sector 4 B Agriculture - Manure Management

GHG source and sink categories	Sector 4	Sector 4 B	Sector 4 B 1	Dairy Cattle	Non-Dairy Cattle	Mature Dairy Cattle	Mature Non-Dairy Cattle	Young Cattle
				CH4 (Gg)				
1990	13.04	3.67	1.51	IE	IE	1.24	0.22	0.05
1991	12.57	3.39	1.48	IE	IE	1.18	0.25	0.05
1992	11.90	3.32	1.38	IE	IE	1.08	0.25	0.05
1993	12.00	3.42	1.37	IE	IE	1.06	0.26	0.05
1994	11.83	3.32	1.36	IE	IE	1.04	0.27	0.05
1995	12.05	3.43	1.37	IE	IE	1.03	0.29	0.05
1996	12.07	3.44	1.37	IE	IE	1.01	0.31	0.05
1997	11.92	3.53	1.33	IE	IE	0.98	0.30	0.05
1998	11.96	3.63	1.31	IE	IE	0.97	0.30	0.05
1999	12.02	3.73	1.31	IE	IE	0.95	0.31	0.05
2000	11.66	3.57	1.27	IE	IE	0.92	0.31	0.05
2001	11.63	3.54	1.27	IE	IE	0.91	0.32	0.05
2002	11.45	3.53	1.24	IE	IE	0.89	0.31	0.04
2003	11.26	3.61	1.20	IE	IE	0.86	0.30	0.04
2004	11.12	3.59	1.18	IE	IE	0.84	0.29	0.04
Trend 2003-2004	*-1.2%*	*-0.5%*	*-1.7%*	*NA*	*NA*	*-1.8%*	*-1.5%*	*-1.8%*
Trend 1990-2004	*-14.8%*	*-2.2%*	*-22.4%*	*NA*	*NA*	*-32.2%*	*31.9%*	*-16.3%*
Share in National Total GHG 1990	*2.2%*	*0.6%*	*0.3%*	*NA*	*NA*	*0.2%*	*0.0%*	*0.0%*
Share in National Total GHG 2004	*1.9%*	*0.6%*	*0.2%*	*NA*	*NA*	*0.1%*	*0.0%*	*0.0%*

GHG source and sink categories	Sector 4	Sector 4 B	Sector 4 B 3	Sector 4 B 6	Sector 4 B 8	Sector 4 B 9
			CH4 (Gg)			
1990	13.04	9.37	0.0012	0.0027	2.03	0.12
1991	12.57	9.18	0.0012	0.0029	1.79	0.11
1992	11.90	8.59	0.0011	0.0029	1.83	0.11
1993	12.00	8.57	0.0011	0.0030	1.93	0.11
1994	11.83	8.50	0.0012	0.0033	1.85	0.11
1995	12.05	8.62	0.0012	0.0034	1.96	0.10
1996	12.07	8.63	0.0011	0.0035	1.95	0.11
1997	11.92	8.39	0.0013	0.0036	2.08	0.12
1998	11.96	8.33	0.0013	0.0037	2.19	0.12
1999	12.02	8.29	0.0013	0.0044	2.31	0.11
2000	11.66	8.09	0.0013	0.0050	2.16	0.13
2001	11.63	8.09	0.0014	0.0049	2.11	0.15
2002	11.45	7.92	0.0015	0.0049	2.14	0.14
2003	11.26	7.65	0.0015	0.0054	2.27	0.14

GHG source and sink categories	Sector 4	Sector 4 B	Sector 4 B 3	Sector 4 B 6	Sector 4 B 8	Sector 4 B 9
	CH4 (Gg)					
2004	11.12	7.52	0.0016	0.0058	2.28	0.13
Trend 2003-2004	*-1.2%*	*-1.6%*	*3.1%*	*6.9%*	*0.6%*	*-7.5%*
Trend 1990-2004	*-14.8%*	*-19.7%*	*33.8%*	*114.1%*	*12.1%*	*7.9%*
Share in National Total GHG 1990	*2.2%*	*1.6%*	*0.0%*	*0.0%*	*0.3%*	*0.0%*
Share in National Total GHG 2004	*1.9%*	*1.3%*	*0.0%*	*0.0%*	*0.4%*	*0.0%*

Table 111 – N_2O emission trend of IPCC Sector 4 D Agriculture - Manure Management

GHG source and sink categories	Sector 4	Sector 4 D 1
	N2O [Gg]	
1990	0.47	0.47
1991	0.47	0.47
1992	0.47	0.47
1993	0.47	0.47
1994	0.47	0.47
1995	0.47	0.47
1996	0.47	0.47
1997	0.47	0.47
1998	0.47	0.47
1999	0.47	0.47
2000	0.47	0.47
2001	0.47	0.47
2002	0.47	0.47
2003	0.47	0.47
2004	0.47	0.47
Trend 2003-2004	*0.0%*	*0.0%*
Trend 1990-2004	*0.0%*	*0.0%*
Share in National Total GHG 1990	*1.2%*	*1.2%*
Share in National Total GHG 2004	*1.2%*	*1.2%*

6.1.2 Key Sources

The key category analysis is presented in Chapter 1. This chapter includes information about the key sources in the IPCC Sector *4 Agriculture*. Key sources within this category are presented in the following table.

Table 112 – Key sources of Category 4 Agriculture

IPCC Category	Source Categories	Key Sources	
		GHG	KS-Assessment*
4 A 1	Cattle	CH4	LA 1990-2004
4 D 1	Direct Soil Emissions	N2O	LA 1990-2004

** LA = Level Assessment*

** TA = Trend Assessment*

6.1.3 Methodology

For the sub-sector *4 A Enteric Fermentation,* the Tier I method has been applied to all animal types except cattle, where the Tier II method has been applied; for the sub sector *4 B Manure Management,* the Tier II method has been applied to all animal types.

6.2 IPCC Sector 4 A Enteric fermentation

Key Sources : *CH_4: cattle*

Source Category Description

- 4 A Mature Non-Dairy Cattle: This category covers breast-feeding cattle, non-dairy female cattle and male cattle.
- 4 A Young Cattle: This category covers calves and growing heifers.
- 4 A Buffalo: No regular presence of buffalos in Luxembourg.
- 4 A Goats: The number of goats is recorded in agricultural statistics since 2000 only.
- 4 A Camels and Llamas: No regular presence of camels and llamas in Luxembourg.
- 4 A Mules and Asses: The number of mules and asses is not recorded in agricultural statistics.

Methodology

To estimate methane emissions from enteric fermentation, the Tier I method has been applied to all animal types except cattle. The Tier II method has been applied to cattle.

Emission factors

The emission factors indicated below have been established during the re-evaluation of methane emissions from agriculture in 2006.

Table 113 – Emission factors used to estimate methane emissions from enteric fermentation

Animal type	Emission factor [kg methane/animal*year]
Mature dairy cattle	121.8
Mature non-dairy cattle, females	60.5
Mature non-dairy cattle, males	58.6
Young cattle, calves	0.7
Young cattle, growing cattle	2.7
Sheep	7.9
Goats	4.6
Horses	18.0
Mules and Asses	9.8
Swine	1.5
Poultry	0.1

Activity data

The activity data are the livestock data reported in the national statistics.

Table 114 – Activity data for manure management

Activity	Mature Dairy Cattle	Mature Non-Dairy Cattle	Mature Non-Dairy Cattle - female	Mature Non-Dairy Cattle - male	Young Cattle	Young Cattle - Calves	Young Cattle -Growing Heif-ers
	[capita]	[capita]	[capita]	[capita]	[capita]	[capita]	[capita]
1990	58 840	27 490	22 048	5 442	131 121	1375	129746
1991	55 604	30 943	25 319	5 624	132 997	1811	131186
1992	51 110	30 441	25 713	4 728	127 784	1437	126347
1993	50 182	32 028	27 314	4 714	126 668	1427	125241
1994	48 978	33 131	28 884	4 247	126 635	1766	124869
1995	48 599	35 668	30 732	4 936	129 620	1823	127797
1996	47 953	37 053	31 989	5 064	132 921	1839	131082
1997	46 305	36 423	30 847	5 576	129 607	3892	125715
1998	45 952	35 966	30 696	5 270	126 822	3489	123333
1999	45 102	36 909	32 097	4 812	125 851	4547	121304
2000	43 346	37 254	32 871	4 383	124 472	4444	120028
2001	42 854	38 260	33 427	4 833	124 079	5132	118947
2002	42 076	36 970	32 782	4 188	118 211	5032	113179
2003	40 599	35 319	31 499	3 820	113 756	3933	109823
2004	39 879	34 704	31 133	3 571	112 142	4470	107672
Reference	STATEC Statistical Yearbook, table C.2107						

Activity	Sheep [capita]	Goats [capita]	Horses [capita]	Mules & Asses [capita]	Swine [capita]	Poultry [capita]
1990	7 281	-	1 722	-	75 463	69 021
1991	7 726	-	1 829	-	66 592	63 559
1992	6 924	-	1 835	-	67 837	60 281
1993	6 775	-	1 925	-	71 800	63 444
1994	7 744	-	2 123	-	68 854	60 451
1995	7 552	-	2 164	-	72 640	55 618
1996	7 152	-	2 198	-	72 494	61 855
1997	8 009	-	2 295	-	77 149	66 293
1998	8 237	-	2 342	-	81 392	68 364
1999	8 220	-	2 818	-	85 830	62 061
2000	7 971	297	3 154	-	80 141	72 634
2001	8 476	311	3 126	-	78 540	85 316
2002	9 104	1 103	3 117	-	79 665	78 926
2003	9 446	1 878	3 449	-	84 140	80 502
2004	9 743	2 010	3 686	-	84 611	74 462
Reference	STATEC Statistical Yearbook, table C.2107					

Recalculations
In 2006, a re-evaluation of methane emissions of agriculture has been done for Luxembourg for the years 1990 through 2004. Those results have been included into the emission inventories from 1990 through 2004.

Sector specific QA/QC procedures
No category specific QA/QC procedures were investigated.

Planned improvements

- For transparency issue:
    - Providing information on gross energy intake of cattle;
    - milk yield data of dairy cattle.
- Revising emission factors, e.g.
    - Revising emission factors for young cattle, which are lower than adult cattle.
- applying the IPCC recommended methane conversion rate.

6.3 IPCC Sector 4 B Manure management

Key Sources: *no*

Source Category Description

- 4 B Manure Management: The nitrogen excretion per AWMS cannot be calculated since the nitrogen excretion per head of animal is not yet estimated for Luxembourg. The default factors suggested for Western Europe in the IPCC Guidelines (Table 4-20) have to be further investigated to decide whether or not they might be applied to Luxembourg's situation as regards manure management of animals.
    - Additional information: the allocation of AWMS for dry lot is included in solid storage. The MCF are coming from Table 4-8 of the IPCC Guidelines, Volume 3. Reference Manual.
- 4 B Mature Non-Dairy Cattle: This category covers breast-feeding cattle, non-dairy female cattle and male cattle.
- 4 B Young Cattle: This category covers calves and growing heifers.
- 4 B Buffalo: No regular presence of buffalos in Luxembourg.
- 4 B Goats: The number of goats is recorded in agricultural statistics since 2000 only.
- 4 B Camels and Lamas: No regular presence of camels and llamas in Luxembourg.
- 4 B Mules and Asses: The number of mules and asses is not recorded in agricultural statistics.

Methodology

To estimate methane emissions from manure management, the Tier II method has been applied to all animal types.

Emission factors

The used emission factors are listed in the following table.

Table 115 – CH_4 Emission factors used to estimate methane emissions from manure management

	Emission factor [kg methane/animal*year]
Mature dairy cattle	21.15
Mature non-dairy cattle, females	8.78
Mature non-dairy cattle, males	5.00
Young cattle, calves	0.11
Young cattle, growing cattle	0.38
Sheep	0.16
Goats	0.10
Horses	1.57
Mules and Asses	0.86
Swine	26.92
Poultry	1.77

Activity data
The activity data are livestock data reported in the national statistics and are listed in Table 114 above.

Recalculations
In 2006, a re-evaluation of methane emissions of agriculture has been done for Luxembourg for the years 1990 through 2004. Those results have been included into the emission inventories from 1990 through 2004.

Sector specific QA/QC procedures
No category specific QA/QC procedures were investigated.

Planned improvements

- For transparency issues:
    - Providing more background information (eg. N excretion data per animal category, feed intake);
    - volatile solids (VS) excretion values.
- Revising the emission factor:
    - IPCC default N2O emission factors;
    - IPCC default B0 and MCF values.

6.4 IPCC Sector 4 D 1 Agricultural soils - direct soil emissions

Key Sources: *N_20:direct soil emission*

Source Category Description
Nitrous oxide emissions from agricultural soils are estimated by using emission factors in relation with the mass of fertilizers used. For fallows (cultures without fertilizer use) an area-based emission factor is used in relation with the respective agricultural surface areas.

Methodology
Those emission factors are used in combination with national statistical data (Statistical Yearbook, tables C.2100 and C.2104) and information from ASTA (*Administration des Services Techniques de l'Agriculture*).

Emission factors
The emission factors listed below have been used to estimate N_2O emissions from agricultural soils.

Table 116 – Emission factor for N_2O in Category 4 D 1 Agricultural soils - direct soil emissions

Source category (SNAP)		Emission factor for N2O
1001	Cultures with fertilizer	
	100102 Arable land crops	86.04 g/kg fertilizer
	100104 Market gardening	83.3 g/kg fertilizer
	100105 Grassland	86.05g/kg fertilizer
1002	Cultures without fertilizer	
	100206 Fallows	2 900 g/ha

Activity data

The activity data are listed in the following table.

Table 117 – Activity data of Category 4 D 1 Agricultural soils - direct soil emissions

SNAP	100102	100104	100105	100206
Activity	Fertilizers - arable land crops	Market gardening	Grassland	Without fertilizers - fallows
Unit	kg	kg	kg	ha
1990	2 468 450	840	3 039 520	272
1991	2 468 450	840	3 039 520	296
1992	2 468 450	840	3 039 520	293
1993	2 468 450	840	3 039 520	1 847
1994	2 468 450	840	3 039 520	1 955
1995	2 468 450	840	3 039 520	1 773
1996	2 468 450	840	3 039 520	1 228
1997	2 468 450	840	3 039 520	882
1998	2 468 450	840	3 039 520	971
1999	2 719 000	840	2 843 000	1 646
2000	2 719 000	840	2 843 000	1 527
2001	2 719 000	840	2 843 000	2 274
2002	2 719 000	840	2 843 000	1 857
2003	2 719 000	840	2 843 000	1 812
2004	2 719 000	840	2 843 000	1 197
Reference	ASTA (100102, 100104 & 100105) and STATEC Statistical Yearbook, table C.2100 (100206)			

Recalculations

No recalculations were made.

Sector specific QA/QC procedures

No category specific QA/QC procedures were investigated.

Planned improvements

- Transparency issues:
    - Providing information regarding fertilizers, both synthetic N-fertilizer and animal waste applied to agricultural soils.
- Revising emission factor:
    - Using the IPCC default EF (12.5g N_2O/kgN).
- Completeness issue:
    - Estimation emissions from 4 D 2 Pasture, Range and Paddock Manure;
    - Estimation emissions from 4 D 3 Indirect emissions.

7 LULUCF (CRF sector 5)

7.1 Overview

Geographically Luxembourg is situated in an area with temperate maritime climate, with an annual average temperature of 9°C approximately. Luxembourg has some 89 000 ha of forests (mainly European oak, beech and coniferous trees), and some 128 000 ha of agriculturally used land (utilized agricultural area). Rivers, lakes and wetlands cover a surface of some 2 586 ha.[15]

Luxembourg has estimates of the methane and nitrous oxide emissions of its land-use change and forestry sector. These estimations do not take into account the latest decisions regarding estimation methodologies to be applied for emission inventories. In particular, the new CRF tables for the LULUCF sector have not yet been filled in.

Emissions of N_2O from forests in Luxembourg have been estimated at the beginning of the '90s with help from the French CITEPA. Those values have been included in all emission inventories since 1990.

A first estimation of carbon absorption by vegetation has been done by the *Administration des Eaux et Forêts*. It indicates that annually 294 930 t of carbon dioxide are absorbed by vegetation in Luxembourg. This CO_2 absorption value has been included in the emission inventories for all years.

Due to the fact that these estimates are first rough approximations, the emission data are only recorded in IPCC Sector 5 G.

7.1.1 Emission trend

The share in total GHG emissions (including LULUCF) from IPCC Sector 5 Land Use, Land Use Change and Forestry is for CO_2 emissions about 2.4% for the year 1990 and 2004 and for N_2O emission about 0.2% for the year 1990 and 2004.

Table 118 – Emissions and absorption of LULUCF in Luxembourg, 1990 -2004

SNAP code	SNAP category	N2O (t)	CO2 (kt)	CRF Tables
111104	Broadleaf forests	17.9	0.0	5 G
111110	Broadleaf forests	26.1	0.0	5 G
111204	Coniferous forests	26.0	0.0	5 G
112102	Temperate forests	0.0	-294.93	5 G
	Sum	68.0	-294.93	

[15] Ministère de l'Environnement, *L'Environnement en Chiffres 2002-2003*, Luxembourg, 2003, p.76-77 (http://www.environnement.public.lu/functions/apropos_du_site/mev/publications_MEV/Publications_transversales_MEV/Environnement_en_Chiffres_2002_2003/index.html).

7.1.2 Key Sources

The methodology and results of the key source analysis is presented in Chapter 1. In IPCC Sector 5 there are no key source categories.

7.2 IPCC Sector 5 G Other

Forests

Key Sources: *no*

Source Category Description

A first estimation of carbon absorption by vegetation has been done by the *Administration des Eaux et Forêts*. It indicates that annually 294 930 t of carbon dioxide are absorbed by vegetation in Luxembourg. This CO_2 absorption value has been included in the emission inventories for all years.

Methodology

Emissions of N_2O from forests in Luxembourg have been estimated at the beginning of the '90s with help from the French CITEPA. Those values have been included in all emission inventories since 1990. The activity data (surface areas) have been taken from national statistics.

- 5 G Other:
  - For CO_2, the amount indicated corresponds to the estimated annual carbon absorption by the vegetation in Luxembourg;
  - For N_2O, it corresponds to the annual estimated emissions by broadleaf and coniferous forests of the country.

Emission factor

The selected emission factors are listed in the following table.

Table 119 – Emission factors for N_2O from IPCC Sector 5 G Other - managed forests

IPCC Category		SNAP		Emission factor [N2O kg/ha]		Reference
5 E	Other	111104	Managed broadleaf forests, European oak	N2O	0.1758	
		111110	Managed broadleaf forests, beech	N2O	0.1758	
		111204	Managed coniferous forests, Norway spruce	N2O	0.8667	

Activity data

The activity data are listed in the following table.

Table 120 – Activity data of IPCC Sector 5 G Other - managed forests

SNAP	111104	111110	111204
Activity	Managed decidu. forests, European oak	Beech	Managed coniferous forest, Norway spruce
Unit	[ha]	[ha]	[ha]
1990	24 000	35 000	30 000
1991	24 000	35 000	30 000
1992	24 000	35 000	30 000
1993	24 000	35 000	30 000
1994	24 000	35 000	30 000
1995	24 000	35 000	30 000
1996	24 000	35 000	30 000
1997	24 000	35 000	30 000
1998	24 000	35 000	30 000
1999	24 000	35 000	30 000
2000	24 000	35 000	30 000
2001	24 000	35 000	30 000
2002	24 000	35 000	30 000
2003	24 000	35 000	30 000
2004	24 000	35 000	30 000
Reference	Administration des Eaux et Forêts		

Recalculations
No recalculations were made.

Sector specific QA/QC procedures
No category specific QA/QC procedures were investigated.

Planned improvements

Comprehensive revision.

Other land

Key Sources: *no*

Source Category Description
Methane and nitrous oxide emissions of rivers and lakes have been estimated by using emission factors and activity data described below.

Emission factor
The selected emission factors are listed in the following table.

Table 121 – Emission factors for N_2O and CH_4 for IPCC Sector 5 G Other - Rivers and Lakes

IPCC Category	Source Categories	SNAP		Emission factor [g/ha]		Reference
5 E	Other	110601	Lakes	N2O	14.2	
				CH4	1300.0	
		111110	Rivers	N2O	-	
				CH4	1300.0	

Activity data

The activity data are listed in the following table.

Table 122 – Activity data of IPCC Sector 5 G Other - Rivers and Lakes

SNAP	110601	110702
Activity	Waters - Lakes	Animals - mammals
Unit	ha	capita
1990	525	100 000
1991	525	100 000
1992	525	100 000
1993	525	100 000
1994	525	100 000
1995	525	100 000
1996	525	100 000
1997	525	100 000
1998	525	100 000
1999	525	100 000
2000	525	100 000
2001	525	100 000
2002	525	100 000
2003	525	100 000
2004	525	100 000
Reference	CITEPA (1993)	

Recalculations

No recalculations were made.

Sector specific QA/QC procedures

No category specific QA/QC procedures were investigated.

Planned improvements

Comprehensive revision.

Other sources

Key Sources: *no*

Source Category Description
Methane and CO_2 emissions of SNAP 110702 Animals, mammal are identified within this Source Category.

Emission factor
The selected emission factors are listed in the following table.

Table 123 – Emission factors for IPCC Sector 5 G Other - Other sources

IPCC Category	Source Categories	SNAP		Emission factor [kg/capita]		Reference
5 G	Other	110702	Animals, mammal	CO2	100	
				CH4	8	

Activity data
The activity data are listed in the following table.

Table 124 – Activity data of IPCC Sector 5 G Other - Other sources

SNAP	110702
Activity	Animals - mammals
Unit	capita
1990	100 000
1991	100 000
1992	100 000
1993	100 000
1994	100 000
1995	100 000
1996	100 000
1997	100 000
1998	100 000
1999	100 000
2000	100 000
2001	100 000
2002	100 000
2003	100 000
2004	100 000
Reference	CITEPA (1993)

Recalculations
No recalculations were made.

Sector specific QA/QC procedures

No category specific QA/QC procedures were investigated.

Planned improvements

Comprehensive revision.

8 Waste (CRF sector 6)

8.1 Overview

In Luxembourg, municipal solid waste is partly dumped, partly incinerated. There are two dumping sites (SIDEC and SIGRE) and one incinerator (SIDOR). SIDEC and SIGRE were already in service in 1990. At the site of SIGRE, a methane recovery system has been installed in 2000. At SIDEC, such a system has been installed in 2002. The incinerator SIDOR was also already in service in 1990.

Wastewater handling, sludge spreading and compost production are other emission sources of the waste sector.

8.1.1 Emission Trend

The share in total GHG emissions (including LULUCF) from sector 6 Waste is for CO_2 emissions as well as for CH_4 emission less than 1% for the year 1990 and 2004

Table 125 – CO_2 emission trend of IPCC Sector 6 Waste

GHG source and sink categories	Sector 6	Sector 6 C
	CO2 [Gg]	
1990	10.00	10.00
1991	10.00	10.00
1992	10.00	10.00
1993	10.00	10.00
1994	10.00	10.00
1995	10.00	10.00
1996	10.00	10.00
1997	10.00	10.00
1998	10.00	10.00
1999	10.00	10.00
2000	10.00	10.00
2001	10.00	10.00
2002	10.00	10.00
2003	10.00	10.00
2004	10.00	10.00
Trend 2003-2004	*0.0%*	*0.0%*
Trend 1990-2004	*0.0%*	*0.0%*
Share in National Total GHG 1990	*0.1%*	*0.1%*
Share in National Total GHG 2004	*0.1%*	*0.1%*

Table 126 – CH_4 emission trend of IPCC Sector 6 Waste

GHG source and sink categories	Sector 6	Sector 6 A
	CH4 [Gg]	
1990	1.55	1.55
1991	1.32	1.32
1992	1.31	1.31
1993	1.29	1.29
1994	1.30	1.30
1995	1.31	1.31
1996	1.37	1.37
1997	1.39	1.39
1998	1.41	1.41
1999	1.41	1.41
2000	1.40	1.40
2001	1.23	1.23
2002	1.06	1.06
2003	1.12	1.12
2004	1.14	1.14
Trend 2003-2004	*1.8%*	*1.8%*
Trend 1990-2004	*-26.5%*	*-26.5%*
Share in National Total GHG 1990	*0.3%*	*0.3%*
Share in National Total GHG 2004	*0.2%*	*0.2%*

8.1.2 Key Sources

According to the key source analysis, which is presented in Chapter 1.2, in the sector 6 Waste there are no key sources.

8.2 IPCC Sector 6 A Solid Waste Disposal on Land

Key Sources : *no*

Source Category Description

In IPCC 6 A the following source category is identified:

090401 Managed waste disposal on land

A detailed calculation of the methane generation from managed municipal waste disposal on land has been done in 2006 at the Environment Agency.

Methodology

The Tier II method has been applied.

Documentation of TABLE 6 SECTORAL REPORT FOR WASTE:

- the time lag to consider for annual MSW at SWDS has not yet been estimated in Luxembourg. Indeed, during the period, some landfill sites have been closed down and others extended so to limit these sites to two now in Luxembourg. Methods on how to count the 'active years' of these sites have not yet been established.
- 6.A Solid Waste Disposal on Land: the total population is the population estimated/calculated by the National Statistical Institute STATEC on the 31st of December of each year. It is difficult to estimate the 'urban population' in Luxembourg since the country is tiny and, in its southern part, which is also the most populated, villages and small cities are lying very close to each other. Hence, it is recommended, for this inventory, to work anyway on the basis of the total population.
- the waste generation rate per capita is calculated since 1995 (the first year for which sufficiently detailed figures coming from the municipalities on municipal waste are available). The fact that the data have to be transmitted to the central administration by each of the 118 municipalities of the country explains why the 2004 data are still not yet estimated (currently processed in fact). Also, the relatively high figures for waste generation rate per capita is explained by the fact that, every working day, more than 100 000 commuters (i.e. around a quarter of the resident population) are crossing Luxembourg's borders to come to work. They, of course, generate important quantities of waste that are then divided by the resident population to obtain per capita figures.

Emission factors

The CH_4 emission factor has been recalculated in 2006. The selected emission factors for the whole time series are listed in the following table.

Table 127 – Emission factors of IPCC Sector 6 A Solid Waste Disposal on Land

IPCC Category	Source Categories	SNAP		Emission factor [t/Gg waste]		Reference
6 A	Solid Waste Disposal on Land	090401	Managed waste disposal on land	CO2	62.5	
				CH4	49.0	Internal study (2006)

Activity data

Activity data for Managed waste disposal on land is taken from STATEC.

Table 128 – Activity data of IPCC Sector 6 A Solid Waste Disposal on Land

SNAP	90401
Activity	Managed waste disposal on land
Unit	[t/a]
1990	87634
1991	74540
1992	53672
1993	66029

SNAP	90401
Activity	Managed waste disposal on land
Unit	[t/a]
1994	64074
1995	68670
1996	94064
1997	77023
1998	75737
1999	67117
2000	61728
2001	65118
2002	65952
2003	67327
2004	59459
Reference	STATEC Statistical Yearbook, table A.3300

Recalculations
A detailed calculation of the methane emissions from managed municipal waste disposal on land has been done in 2006 at the Environment Agency. The results of that analysis have been included in the inventories of 1990 through 2004.

Sector specific QA/QC procedures
No Sector specific QA/QC procedures have been done.

Planned improvements

- The CO_2 emissions of solid waste disposal on land have not yet been included in the CRF tables, and this will be done. So far emissions from other GHG or pollutants have not been estimated. That may have to be done;
- CO_2 is accounted for, but it is biogenic; therefore a re-estimation has to be done;
- A more detailed analysis of GHG emissions of the waste sector should allow to further clarify the emission situation. In particular in the context of incineration of municipal waste, a more detailed analysis should allow to decide which emission data to include in the national annual totals of GHG;
- Providing more background parameters (DOC, DOCf, MCF, half life time).

8.3 IPCC Sector 6 B Wastewater Handling

Key Sources : *no*

Source Category Description

In IPCC Sector 6 B Waste Water Handling:

091001 *Waste water treatment, industry*

091002 *Waste water treatment, residential + commercial*

Methodology

The emission estimation of waste water handling is based on the annual population numbers and corresponding emission factors. A country specific methodology was applied.

Emission factors

The selected emission factors for the whole time series are listed in the following table.

Table 129 – Emission factors of IPCC Sector 6 B Wastewater Handling

IPCC Category	Source Categories	SNAP		Emission factor		Reference
6 B	Wastewater Handling	091001	Waste water treatment, industry	CH4	500 g CH4/inhabitant	
		091002	Waste water treatment, residential + commercial	N2O	40 g N2O/inhabitant	

Activity data

Activity data for Wastewater Handling, i.e. the number of inhabitants, have been taken from national statistics STATEC.

Table 130 – Activity data of IPCC Sector 6 B waste water handling

SNAP	91001	91002
Activity	Waste water treatment, industry	Waste water treatment, residential + domestic
Unit	inhab.	inhab.
1990	192200	192200
1991	194800	194800
1992	197400	197400
1993	200100	200100
1994	202850	202850
1995	205800	205800
1996	208450	208450
1997	211050	211050
1998	213700	213700
1999	216800	216800
2000	219500	219500
2001	222000	222000
2002	224150	224150
2003	225800	225800
2004	227500	227500
Reference	STATEC Statistical Yearbook, table B.1100	STATEC Statistical Yearbook, table B.1100

The sum of both column 91001 and 91002 gives the total population of the country (or, each column corresponds to the half of the total population of Luxembourg).

Recalculations
No recalculations were made.

Category specific QA/QC procedures
No Sector specific QA/QC procedures have been done.

Planned improvements

- A more detailed analysis of GHG emissions of the waste sector should allow to further clarifying the emission situation;
- A differentiation between 6B1 and 6B2;
- Revising the emission factors;
- Revising the activity data;
- Using the IPCC default method for N2O emissions.

8.4 IPCC Sector 6 C Waste incineration

Key Sources : *no*

Source Category Description
The only existing incinerator of municipal waste, SIDOR, is a major CO_2 emission source in that sector. CO_2 emissions were estimated at 125 kt in 1990, however a big part of those emissions result from biomass combustion. It is estimated that 10 kt of CO_2 (non-biomass combustion) should be included into the national total. This CO_2 emission estimation from waste incineration (*090201 Incineration of domestic and municipal wastes*) should be seen as a first estimation, a more precise calculation remains to be done.

Also, it is worth noticing that waste incineration in Luxembourg is nowadays going with heat/energy recovery. It should then be investigated more deeply where this energy recovered is used and, consequently, whether emissions should be reported in CRF/IPCC sector 6.C or 1.A.1.a.

Methodology / Activity data / Emission / Implied Emission Factor
An emission of 10 kt of CO2 has been estimated for the whole time series 1990 through 2004.

Documentation to TABLE 6.C SECTORAL BACKGROUND DATA FOR WASTE Waste Incineration

- 6 C 1 Biogenic: the emissions of the biogenic fraction that is burned in the sole incinerator of the country is not yet estimated.
- 6 C 2 Other (non-biogenic): a value of 10 Gg of CO_2 is reported every year though the quantities of refusals incinerated varies from year to year. The reason stems from the fact that the emissions are a first relatively rough estimation of the non-biogenic fraction that is burned in

the sole incinerator of the country.

- 6 C 2 Non-biomass Incineration: a value of 10 Gg of CO_2 is reported every year though the quantities of refusals incinerated varies from year to year. The reason stems from the fact that the emissions are a first relatively rough estimation of the non-biogenic fraction that is burned in the sole incinerator of the country.

Table 131 – Activity data, Emission and Implied Emission Factor for 6 D Waste Incineration

SNAP	90201 Incineration, domestic or municipal wastes		
	Activity	Emission	IEF
Unit	[t]	[t]	[t/t]
1990	135969	10 000	0.074
1991	142262	10 000	0.070
1992	141851	10 000	0.070
1993	134947	10 000	0.074
1994	132030	10 000	0.076
1995	126091	10 000	0.079
1996	97552	10 000	0.103
1997	115559	10 000	0.087
1998	113280	10 000	0.088
1999	129693	10 000	0.077
2000	125992	10 000	0.079
2001	124402	10 000	0.080
2002	126318	10 000	0.079
2003	123830	10 000	0.079
2004	133819	10 000	0.079
Reference	STATEC Statistical Yearbook, table A.3300		

Recalculations
No recalculations were made.

Category specific QA/QC procedures
No Sector specific QA/QC procedures have been done.

Planned improvements

- Revising the emission factors;
- Revising the activity data;
- A more detailed analysis of GHG emissions of the waste sector should allow to further clarify the emission situation. In particular in the context of incineration of municipal waste, a more detailed analysis should allow to decide which emission data to include in the national annual totals of GHG;

- Decide, on the basis of more precise information on the waste incineration process at SIDOR, whether or not emissions should be accounted for, totally or partially, in the waste or the energy sectors.

8.5 IPCC Sector 6 D Other - Sludge spreading and Compost production

Key Sources: *no*

Source Category Description

In IPCC Sector 6 D Other the following source categories are identified:

091003 *Sludge spreading*

091005 *Compost production*

Sludge from waste water treatment plants and compost production sites generate CO_2 and CH_4 emissions.

Methodology

The CORINAIR (simple) methodology is applied. For compost production: the mass of dry compost is 33.3% of the mass of humid sludge.

Emission factors

The selected emission factors for the whole time series are listed in the following table.

Table 132 – Emission factors of IPCC Sector 6 B Sludge spreading and Compost production

IPCC Category	Source Categories	SNAP		Emission factor [t / Gg waste]		Reference
6 D	Other	091003	Sludge spreading	CO2	35	
				CH4	19	
		091005	Compost production	CO2	150	

Activity data

Activity data for sludge spreading and compost production have been taken from the Environment Agency (internal report).

Table 133 – Activity data of IPCC Sector 6 D Other - Sludge spreading and Compost production

SNAP	91003	91005
Activity	Sludge spreading	Compost production from waste
Unit	[kt]	[t]
1990	30	1 200
1991	30	1 200
1992	30	1 200
1993	30	1 200
1994	12	6 746
1995	15	4 199
1996	9	3 677
1997	10	8 042
1998	10	13 343
1999	10	13 865
2000	10	18 585
2001	10	17 044
2002	10	19 212
2003	10	19 212
2004	8	25 837
Reference	Environment Agency	Environment Agency

Recalculations

No recalculations were made.

Category specific QA/QC procedures

No category specific QA/QC procedures were investigated.

Planned improvements

- A more detailed analysis of GHG emissions of the waste sector should allow to further clarify the emission situation;
- Revising the emission factors;
- Revising the activity data;
- CO_2 emission is accounted for, but composting is biological decomposition of organic material, so it's biogenic;
- CH_4 emission for composting is missing.

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Annex I – CRF Tables 2004

This Annex includes all the CRF Excel sheets generated by CRF Reporter v3.1.11 for the inventory year 2004.

TABLE 1 SECTORAL REPORT FOR ENERGY
(Sheet 1 of 2)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2	CH_4	N_2O	NO_X	CO	NMVOC	SO_2
	(Gg)						
Total Energy	11,210.98	4.36	0.87	8.03	8.69	2.16	2.50
A. Fuel Combustion Activities (Sectoral Approach)	11,210.98	1.45	0.87	8.03	8.69	1.47	2.50
1. Energy Industries	383.13	0.01	0.01	0.68	0.07	0.33	0.03
a. Public Electricity and Heat Production	383.13	0.01	0.01	0.68	0.07	0.33	0.03
b. Petroleum Refining	NO	NO	NO	NO	NO	NO	NO
c. Manufacture of Solid Fuels and Other Energy Industries	NO	NO	NO	NO	NO	NO	NO
2. Manufacturing Industries and Construction	2,528.26	0.04	0.02	5.42	2.66	0.05	1.50
a. Iron and Steel	251.97	NE	NE	0.35	0.07	NE	NE
b. Non-Ferrous Metals	40.73	NE	NE	0.01	NE	NE	0.01
c. Chemicals	NE	NE	NE	NE	NE	NE	NE
d. Pulp, Paper and Print	NE	NE	NE	NE	NE	NE	NE
e. Food Processing, Beverages and Tobacco	NE	NE	NE	NE	NE	NE	NE
f. Other *(as specified in table 1.A(a) sheet 2)*	2,235.56	0.04	0.02	5.06	2.59	0.05	1.49
Other non-specified	2,235.56	0.04	0.02	5.06	2.59	0.05	1.49
3. Transport	6,986.62	1.10	0.84	0.42	0.17	0.07	0.04
a. Civil Aviation	NE,NO	NE,NO	NE,NO	NE	NE	NE	NE
b. Road Transportation	6,960.43	1.09	0.83	NE	NE	NE	NE
c. Railways	20.59	NE,NO	0.01	0.34	0.14	0.07	0.03
d. Navigation	5.60	0.01	NE,NO	0.08	0.03	NE	0.01
e. Other Transportation *(as specified in table 1.A(a) sheet 3)*	NO	NO	NO	NO	NO	NO	NO
Other non-specified	NO	NO	NO	NO	NO	NO	NO

TABLE 1 SECTORAL REPORT FOR ENERGY
(Sheet 2 of 2)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2	CH_4	N_2O	NO_X	CO	NMVOC	SO_2
	(Gg)						
4. Other Sectors	1,312.97	0.30	NE	1.51	5.79	1.02	0.93
a. Commercial/Institutional	617.77	0.14	NE	0.50	1.80	0.13	0.43
b. Residential	620.07	0.14	NE	0.50	2.91	0.68	0.43
c. Agriculture/Forestry/Fisheries	75.13	0.02	NE	0.51	1.08	0.21	0.07
5. Other *(as specified in table 1.A(a) sheet 4)*	IE,NO	IE,NO	IE,NO	IE	IE	IE	IE
a. Stationary	IE,NO	IE,NO	IE,NO	IE	IE	IE	IE
Building and plant site fuel powered machinery	IE,NO	IE,NO	IE,NO	IE	IE	IE	IE
b. Mobile	IE,NO	IE,NO	IE,NO	IE	IE	IE	IE
Off-road vehicles and other machinery, airport and military vehicles	IE,NO	IE,NO	IE,NO	IE	IE	IE	IE
B. Fugitive Emissions from Fuels	IE,NE,NO	2.91	NO	NE,NO	NE,NO	0.69	NE,NO
1. Solid Fuels	NO	NO	NO	NO	NO	NO	NO
a. Coal Mining and Handling	NO	NO	NO	NO	NO	NO	
b. Solid Fuel Transformation	NO	NO	NO	NO	NO	NO	NO
c. Other *(as specified in table 1.B.1)*	NO	NO	NO	NO	NO	NO	NO
Other non-specified	NO	NO	NO	NO	NO	NO	NO
2. Oil and Natural Gas	IE,NE,NO	2.91	NO	NE,NO	NE,NO	0.69	NE,NO
a. Oil	NE,NO	NE,NO	NO	NE	NE	0.53	NE
b. Natural Gas	IE,NO	2.91				0.16	NE
c. Venting and Flaring	NO	NO	NO	NO	NO	NO	NO
Venting	NO	NO				NO	NO
Flaring	NO	NO	NO	NO	NO	NO	NO
d. Other *(as specified in table 1.B.2)*	NO	NO	NO	NO	NO	NO	NO
Other non-specified	NO	NO	NO	NO	NO	NO	NO
Memo Items: [(1)]							
International Bunkers	1,290.42	NE	NE	NE	NE	NE	NE
Aviation	1,290.42	NE	NE	NE	NE	NE	NE
Marine	NE	NE	NE	NE	NE	NE	NE
Multilateral Operations	IE	IE	IE	IE	IE	IE	IE
CO_2 Emissions from Biomass	43.80						

(1) Countries are asked to report emissions from international aviation and marine bunkers and multilateral operations, as well as CO_2 emissions from biomass, under Memo Items. These emissions should not be included in the national total emissions from the Energy sector. Amounts of biomass used as fuel are included in the national energy consumption but the corresponding CO_2 emissions are not included in the national total as it is assumed that the biomass is produced in a sustainable manner. If the biomass is harvested at an unsustainable rate, net CO_2 emissions are accounted for as a loss of biomass stocks in the Land Use, Land-Use Change and Forestry sector.

Documentation Box:

Parties should provide detailed explanations on the Energy sector in Chapter 3: Energy (CRF sector 1) of the NIR. Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

1.AA.2 Manufacturing Industries and Construction:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.2.C Chemicals:Though this activity is not estimated yet with precision, it is expected to be very low in Luxembourg because fuel combustion is used mainly for heating purposes and not for production activities. The former being negligible, the emissions are equal or very close to zero.. Hence, the emissions are estimated being equal or very close to zer

1.AA.2.D Pulp, Paper and Print:Though this activity is not estimated yet with precision, it is expected to be very low in Luxembourg because fuel combustion is used mainly for heating purposes and not for production activities. The former being negligible, the emissions are equ very close to zero.. Hence, the emissions are estimated being equal or very close to zer

1.AA.2.E Food Processing, Beverages and Tobacco:Though this activity is not estimated yet with precision, it is expected to be very low in Luxembourg because fuel combustion is used mainly for heating purposes and not for production activities. The former being negligible, the emissions are equal or very close to zero.. Hence, the emissions are estimated being equal or very close to zer

1.AA.2.F Other (please specify):This category includes combustion in boilers less than 300 MW, combustion in gas turbines and combustion in the following production sectors: clinker, flat glass and fine ceramics materials.

1.AA.2.F Biomass:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.2.F Other Fuels:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.3.A Civil Aviation:There are no domestic passenger or freight flights within Luxembourg's borders. Only some private flights are occuring (flight clubs, entertaining flights (for gliders e.g.), etc.). Fuel combustion of gasoline for these flights is negligible, hence emissions are equal or very close to zero

1.AA.3.B Road Transportation:The estimations have been realized using COPERT. The emission factors are default data froml COPERT III. See NIR, section 3.5.

1.AA.5.A Building and plant site fuel powered machinery:It is not possible to distinguish liquid fuel use for stationary machinery from the data used to estimate emissions from gasoline and diesel oil since the share of these specific activities is not estimated for the moment (that would require getting information directly from the operators). Consequently, the notation key IE has been use

1.AA.5.A Liquid Fuels:It is not possible to distinguish liquid fuel use for stationary machinery from the data used to estimate emissions from gasoline and diesel oil since the share of these specific activities is not estimated for the moment (that would require getting information directly from the operators). Consequently, the notation key IE has been use

1.AA.5.B Off-road vehicles and other machinery, airport and military vehicles:It is not possible to distinguish liquid fuel use for specific activities (military activities, ground transportation at the airport, etc.) from the data used to estimate emissions from gasoline and diesel oil since the share of these specific activities is not estimated for the moment (that would require getting information directly from the operators). Consequently, the notation key IE has been u

1.AA.5.B Liquid Fuels:It is not possible to distinguish liquid fuel use for specific activities (military activities, ground transportation at the airport, etc.) from the data used to estimate emissions from gasoline and diesel oil since the share of these specific activities is not estimated for the moment (that would require getting information directly from the operators). Consequently, the notation key IE has been us

1.B.2 Oil and Natural Gas:The estimations have been realized using COPERT. See NIR, section 3.8.

1.C1.B Marine:Luxembourg has no coastline, hence no sea harbours. However, some ships are navigating the seas displaying a Luxembourgish flag (Luxembourg is granting sea navigation licences). It is, however, not clear if these ships have to be included or not under memo items in our inventory. Hence, no estimations have been performed ye

1.C2 Multilateral Operations:This source of emissions is not distinguished from the other sources and therefore is included elsewhere in other categories.

TABLE 1.A(a) SECTORAL BACKGROUND DATA FOR ENERGY
Fuel Combustion Activities - Sectoral Approach
(Sheet 1 of 4)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	AGGREGATE ACTIVITY DATA		IMPLIED EMISSION FACTORS [2]				EMISSIONS		
	Consumption		CO_2	CH_4	N_2O		CO_2	CH_4	N_2O
	(TJ)	NCV/GCV[1]	(t/TJ)	(kg/TJ)			(Gg)		
1.A. Fuel Combustion	164,718.10	NCV					11,210.98	1.45	0.87
Liquid Fuels	111,536.66	NCV	72.89	1.08	0.18		8,130.08	0.12	0.02
Solid Fuels	3,470.99	NCV	98.94	11.52	NE,NO		343.41	0.04	NE,NO
Gaseous Fuels	49,272.40	NCV	55.56	1.22	0.41		2,737.49	0.06	0.02
Biomass	438.06	NCV	99.99	319.59	NE,NO [3]			0.14	NE,NO
Other Fuels	IE,NE,NO	NCV	IE,NE,NO	IE,NE,NO	IE,NE,NO		IE,NE,NO	IE,NE,NO	IE,NE,NO
1.A.1. Energy Industries	6,791.60	NCV					383.13	0.01	0.01
Liquid Fuels	164.79	NCV	73.00	NE,NO	NE,NO		12.03	NE,NO	NE,NO
Solid Fuels	NO	NCV	NO	NO	NO		NO	NO	NO
Gaseous Fuels	6,626.81	NCV	56.00	1.51	1.51		371.10	0.01	0.01
Biomass	NE,NO	NCV	NE,NO	NE,NO	NE,NO [3]		NE,NO	NE,NO	NE,NO
Other Fuels	IE,NO	NCV	IE,NO	IE,NO	IE,NO		IE,NO	IE,NO	IE,NO
a. Public Electricity and Heat Production	6,791.60	NCV					383.13	0.01	0.01
Liquid Fuels	164.79	NCV	73.00	NE	NE		12.03	NE	NE
Solid Fuels	NO	NCV	NO	NO	NO		NO	NO	NO
Gaseous Fuels	6,626.81	NCV	56.00	1.51	1.51		371.10	0.01	0.01
Biomass	NE	NCV	NE	NE	NE [3]		NE	NE	NE
Other Fuels	IE	NCV	IE	IE	IE		IE	IE	IE
b. Petroleum Refining	NO	NCV					NO	NO	NO
Liquid Fuels	NO	NCV	NO	NO	NO		NO	NO	NO
Solid Fuels	NO	NCV	NO	NO	NO		NO	NO	NO
Gaseous Fuels	NO	NCV	NO	NO	NO		NO	NO	NO
Biomass	NO	NCV	NO	NO	NO [3]		NO	NO	NO
Other Fuels	NO	NCV	NO	NO	NO		NO	NO	NO
c. Manufacture of Solid Fuels and Other Energy Industries	NO	NCV					NO	NO	NO
Liquid Fuels	NO	NCV	NO	NO	NO		NO	NO	NO
Solid Fuels	NO	NCV	NO	NO	NO		NO	NO	NO
Gaseous Fuels	NO	NCV	NO	NO	NO		NO	NO	NO
Biomass	NO	NCV	NO	NO	NO [3]		NO	NO	NO
Other Fuels	NO	NCV	NO	NO	NO		NO	NO	NO

Note: All footnotes for this table are given at the end of the table on sheet 4.

Note: For the coverage of fuel categories, refer to the IPCC Guidelines (Volume 1. Reporting Instructions - Common Reporting Framework, section 1.2, p. 1.19). If some derived gases (e.g. gas works, gas, coke oven gas, blast furnace gas) are considered, Parties should provide information on the allocation of these derived gases under the above fuel categories (liquid, solid, gaseous, biomass and other fuels) in the NIR (see also documentation box at the end of sheet 4 of this table).

TABLE 1.A(a) SECTORAL BACKGROUND DATA FOR ENERGY
Fuel Combustion Activities - Sectoral Approach
(Sheet 2 of 4)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	AGGREGATE ACTIVITY DATA		IMPLIED EMISSION FACTORS [2]				EMISSIONS		
	Consumption		CO_2	CH_4	N_2O		CO_2	CH_4	N_2O
	(TJ)	NCV/GCV[1]	(t/TJ)	(kg/TJ)			(Gg)		
1.A.2 Manufacturing Industries and Construction	41,091.33	NCV					2,528.26	0.04	0.02
Liquid Fuels	4,923.88	NCV	75.01	2.03	2.03		369.32	0.01	0.01
Solid Fuels	3,394.18	NCV	98.85	5.89	NE		335.53	0.02	NE
Gaseous Fuels	32,773.28	NCV	55.64	0.31	0.31		1,823.41	0.01	0.01
Biomass	NE	NCV	NE	NE	NE	[3]	NE	NE	NE
Other Fuels	NE	NCV	NE	NE	NE		NE	NE	NE
a. Iron and Steel	4,559.25	NCV					251.97	NE	NE
Liquid Fuels	NE	NCV	NE	NE	NE		NE	NE	NE
Solid Fuels	12.42	NCV	152.16	NE	NE		1.89	NE	NE
Gaseous Fuels	4,546.83	NCV	55.00	NE	NE		250.08	NE	NE
Biomass	NE	NCV	NE	NE	NE	[3]	NE	NE	NE
Other Fuels	NE	NCV	NE	NE	NE		NE	NE	NE
b. Non-Ferrous Metals	656.99	NCV					40.73	NE	NE
Liquid Fuels	656.99	NCV	62.00	NE	NE		40.73	NE	NE
Solid Fuels	NE	NCV	NE	NE	NE		NE	NE	NE
Gaseous Fuels	NE	NCV	NE	NE	NE		NE	NE	NE
Biomass	NE	NCV	NE	NE	NE	[3]	NE	NE	NE
Other Fuels	NE	NCV	NE	NE	NE		NE	NE	NE
c. Chemicals	NE	NCV					NE	NE	NE
Liquid Fuels	NE	NCV	NE	NE	NE		NE	NE	NE
Solid Fuels	NE	NCV	NE	NE	NE		NE	NE	NE
Gaseous Fuels	NE	NCV	NE	NE	NE		NE	NE	NE
Biomass	NE	NCV	NE	NE	NE	[3]	NE	NE	NE
Other Fuels	NE	NCV	NE	NE	NE		NE	NE	NE
d. Pulp, Paper and Print	NE	NCV					NE	NE	NE
Liquid Fuels	NE	NCV	NE	NE	NE		NE	NE	NE
Solid Fuels	NE	NCV	NE	NE	NE		NE	NE	NE
Gaseous Fuels	NE	NCV	NE	NE	NE		NE	NE	NE
Biomass	NE	NCV	NE	NE	NE	[3]	NE	NE	NE
Other Fuels	NE	NCV	NE	NE	NE		NE	NE	NE
e. Food Processing, Beverages and Tobacco	NE	NCV					NE	NE	NE
Liquid Fuels	NE	NCV	NE	NE	NE		NE	NE	NE
Solid Fuels	NE	NCV	NE	NE	NE		NE	NE	NE
Gaseous Fuels	NE	NCV	NE	NE	NE		NE	NE	NE
Biomass	NE	NCV	NE	NE	NE	[3]	NE	NE	NE
Other Fuels	NE	NCV	NE	NE	NE		NE	NE	NE
f. Other *(please specify)* [4]	35,875.09	NCV					2,235.56	0.04	0.02
Other non-specified									
Liquid Fuels	4,266.89	NCV	77.01	2.34	2.34		328.59	0.01	0.01
Solid Fuels	3,381.75	NCV	98.66	5.91	NE		333.64	0.02	NE
Gaseous Fuels	28,226.45	NCV	55.74	0.35	0.35		1,573.33	0.01	0.01
Biomass	NE	NCV	NE	NE	NE	[3]	NE	NE	NE
Other Fuels	NE	NCV	NE	NE	NE		NE	NE	NE

Note: All footnotes for this table are given at the end of the table on sheet 4.

TABLE 1.A(a) SECTORAL BACKGROUND DATA FOR ENERGY
Fuel Combustion Activities - Sectoral Approach
(Sheet 3 of 4)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	AGGREGATE ACTIVITY DATA		IMPLIED EMISSION FACTORS [2]				EMISSIONS		
	Consumption		CO_2	CH_4	N_2O		CO_2	CH_4	N_2O
	(TJ)	NCV/GCV[1]	(t/TJ)	(kg/TJ)			(Gg)		
1.A.3 Transport	95,616.71	NCV					6,986.62	1.10	0.84
Liquid Fuels	95,616.71	NCV	73.07	0.10	0.10		6,986.62	0.01	0.01
Solid Fuels	NE,NO	NCV	NE,NO	NE,NO	NE,NO		NE,NO	NE,NO	NE,NO
Gaseous Fuels	NE,NO	NCV	NE,NO	NE,NO	NE,NO		NE,NO	NE,NO	NE,NO
Biomass	NE,NO	NCV	NE,NO	NE,NO	NE,NO		NE,NO	NE,NO	NE,NO
Other Fuels	NE,NO	NCV	NE,NO	NE,NO	NE,NO [3]		NE,NO	NE,NO	NE,NO
a. Civil Aviation	NE,NO	NCV					NE,NO	NE,NO	NE,NO
Aviation Gasoline	NE	NCV	NE	NE	NE		NE	NE	NE
Jet Kerosene	NO	NCV	NO	NO	NO		NO	NO	NO
b. Road Transportation	95,242.60	NCV					6,960.43	1.09	0.83
Gasoline	24,808.80	NCV	71.42	NE	NE		1,771.77	NE	NE
Diesel Oil	70,334.16	NCV	73.69	NE	NE		5,182.76	NE	NE
Liquefied Petroleum Gases (LPG)	NE	NCV	NE	NE	NE		NE	NE	NE
Other Liquid Fuels (please specify)	99.63	NCV					5.90	NE	NE
Residual Fuel Oil	99.63	NCV	59.22	NE	NE		5.90	NE	NE
Gaseous Fuels	NE	NCV	NE	NE	NE		NE	NE	NE
Biomass	NE	NCV	NE	NE	NE [3]		NE	NE	NE
Other Fuels *(please specify)*	NE	NCV					NE	NE	NE
Other non-specified	NE	NCV	NE	NE	NE		NE	NE	NE
c. Railways	294.12	NCV					20.59	NE,NO	0.01
Liquid Fuels	294.12	NCV	70.01	NE	34.00		20.59	NE	0.01
Solid Fuels	NE	NCV	NE	NE	NE		NE	NE	NE
Gaseous Fuels	NO	NCV	NO	NO	NO		NO	NO	NO
Other Fuels (*please specify)*	NE	NCV					NE	NE	NE
Other non-specified	NE	NCV	NE	NE	NE		NE	NE	NE
d. Navigation	80.00	NCV					5.60	0.01	NE,NO
Residual Oil (Residual Fuel Oil)	NO	NCV	NO	NO	NO		NO	NO	NO
Gas/Diesel Oil	80.00	NCV	70.00	125.00	NE		5.60	0.01	NE
Gasoline	NO	NCV	NO	NO	NO		NO	NO	NO
Other Liquid Fuels *(please specify)*	NE	NCV					NE	NE	NE
Other non-specified	NE	NCV	NE	NE	NE		NE	NE	NE
Solid Fuels	NO	NCV	NO	NO	NO		NO	NO	NO
Gaseous Fuels	NO	NCV	NO	NO	NO		NO	NO	NO
Other Fuels (*please specify)*	NE	NCV					NE	NE	NE
Other non-specified	NE	NCV	NE	NE	NE		NE	NE	NE
e. Other Transportation *(please specify)* [5]	NO	NCV					NO	NO	NO
Other non-specified	NO	NCV					NO	NO	NO
Liquid Fuels	NO	NCV	NO	NO	NO		NO	NO	NO
Solid Fuels	NO	NCV	NO	NO	NO		NO	NO	NO
Gaseous Fuels	NO	NCV	NO	NO	NO		NO	NO	NO
Biomass	NO	NCV	NO	NO	NO [3]		NO	NO	NO
Other Fuels	NO	NCV	NO	NO	NO		NO	NO	NO

Note: All footnotes for this table are given at the end of the table on sheet 4.

TABLE 1.A(a) SECTORAL BACKGROUND DATA FOR ENERGY
Fuel Combustion Activities - Sectoral Approach
(Sheet 4 of 4)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	AGGREGATE ACTIVITY DATA		IMPLIED EMISSION FACTORS [2]			EMISSIONS		
	Consumption		CO_2	CH_4	N_2O	CO_2	CH_4	N_2O
	(TJ)	NCV/GCV [1]	(t/TJ)	(kg/TJ)		(Gg)		
1.A.4 Other Sectors	21,218.46	NCV				1,312.97	0.30	NE
Liquid Fuels	10,831.28	NCV	70.36	9.23	NE	762.11	0.10	NE
Solid Fuels	76.81	NCV	102.59	260.37	NE	7.88	0.02	NE
Gaseous Fuels	9,872.31	NCV	55.00	4.05	NE	542.98	0.04	NE
Biomass	438.06	NCV	99.99	319.59	NE [3]	43.80	0.14	NE
Other Fuels	NE	NCV	NE	NE	NE	NE	NE	NE
a. Commercial/Institutional	10,049.19	NCV				617.77	0.14	NE
Liquid Fuels	4,890.60	NCV	70.00	10.22	NE	342.34	0.05	NE
Solid Fuels	38.41	NCV	102.59	260.37	NE	3.94	0.01	NE
Gaseous Fuels	4,936.16	NCV	55.00	4.05	NE	271.49	0.02	NE
Biomass	184.03	NCV	99.98	326.03	NE [3]	18.40	0.06	NE
Other Fuels	NE	NCV	NE	NE	NE	NE	NE	NE
b. Residential	10,081.59	NCV				620.07	0.14	NE
Liquid Fuels	4,923.00	NCV	70.01	10.16	NE	344.64	0.05	NE
Solid Fuels	38.41	NCV	102.59	260.37	NE	3.94	0.01	NE
Gaseous Fuels	4,936.16	NCV	55.00	4.05	NE	271.49	0.02	NE
Biomass	184.03	NCV	99.98	326.03	NE [3]	18.40	0.06	NE
Other Fuels	NE	NCV	NE	NE	NE	NE	NE	NE
c. Agriculture/Forestry/Fisheries	1,087.68	NCV				75.13	0.02	NE
Liquid Fuels	1,017.68	NCV	73.82	NE	NE	75.13	NE	NE
Solid Fuels	NE	NCV	NE	NE	NE	NE	NE	NE
Gaseous Fuels	NE	NCV	NE	NE	NE	NE	NE	NE
Biomass	70.00	NCV	100.00	285.71	NE [3]	7.00	0.02	NE
Other Fuels	NE	NCV	NE	NE	NE	NE	NE	NE
1.A.5 Other ***(Not specified elsewhere)*** [6]	IE,NO	NCV				IE,NO	IE,NO	IE,NO
a. Stationary ***(please specify)*** [7]	IE,NO	NCV				IE,NO	IE,NO	IE,NO
Building and plant site fuel powered machinery								
Liquid Fuels	IE	NCV	IE	IE	IE	IE	IE	IE
Solid Fuels	NO	NCV	NO	NO	NO	NO	NO	NO
Gaseous Fuels	NO	NCV	NO	NO	NO	NO	NO	NO
Biomass	NO	NCV	NO	NO	NO [3]	NO	NO	NO
Other Fuels	NO	NCV	NO	NO	NO	NO	NO	NO
b. Mobile ***(please specify)*** [8]	IE,NO	NCV				IE,NO	IE,NO	IE,NO
Off-road vehicles and other machinery, airport and military vehicles								
Liquid Fuels	IE	NCV	IE	IE	IE	IE	IE	IE
Solid Fuels	NO	NCV	NO	NO	NO	NO	NO	NO
Gaseous Fuels	NO	NCV	NO	NO	NO	NO	NO	NO
Biomass	NO	NCV	NO	NO	NO [3]	NO	NO	NO
Other Fuels	NO	NCV	NO	NO	NO	NO	NO	NO

[1] If activity data are calculated using net calorific values (NCV) as specified by the IPCC Guidelines, write NCV in this column. If gross calorific values (GCV) are used, write GCV in this column.

[2] Accurate estimation of CH_4 and N_2O emissions depends on combustion conditions, technology and emission control policy, as well as on fuel characteristics. Therefore, caution should be used when comparing the implied emission factors across countries.

[3] Although carbon dioxide emissions from biomass are reported in this table, they will not be included in the total CO_2 emissions from fuel combustion. The value for total CO_2 from biomass is recorded in Table1 sheet 2 under the Memo Items.

[4] Use the cell below to list all activities covered under "f. Other".

[5] Use the cell below to list all activities covered under "e. Other transportation".

[6] Include military fuel use under this category.

[7] Use the cell below to list all activities covered under "1.A.5.a Other - stationary".

[8] Use the cell below to list all activities covered under "1.A.5.b Other - mobile".

Documentation Box:

• Parties should provide detailed explanations on the fuel combustion sub-sector in the corresponding part of Chapter 3: Energy (CRF sub-sector 1.A) of the NIR. Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

• If estimates are based on GCV, use this documentation box to provide reference to the relevant section of the NIR where the information necessary to allow the calculation of the activity data based on NCV can be found.

• If some derived gases (e.g. gas works gas, coke oven gas, blast furnace gas) are considered, use this documentation box to provide a reference to the relevant section of the NIR containing the information on the allocation of these derived gases under the above fuel categories (liquid, soild, gaseous, biomass and other fuels).

1.AA Other Fuels:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.1 Biomass:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.1 Other Fuels:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.1.A Biomass:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.1.A Municipal Solid Waste (Garbage):There is only one incineration plant for municipal waste in Luxembourg. The heat generated by this activity is recovered, hence emissions should normally be reported in this CRF category. However, so far, they are reported under CRF category 6.C.2 and for the non-biogenic part only (see documentation box in Table 6.A,C).

1.AA.2 Manufacturing Industries and Construction:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.2 Biomass:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.2 Other Fuels:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.2.A Liquid Fuels:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.2.A Biomass:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.2.A Other Fuels:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.2.B Solid Fuels:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.2.B Gaseous Fuels:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.2.B Biomass:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.2.B Other Fuels:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.2.C Chemicals:Though this activity is not estimated yet with precision, it is expected to be very low in Luxembourg because fuel combustion is used mainly for heating purposes and not for production activities. The former being negligible, the emissions are equal or very close to zero.. Hence, the emissions are estimated being equal or very close to zero.

1.AA.2.C Liquid Fuels:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.2.C Solid Fuels:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.2.C Gaseous Fuels:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.2.C Biomass:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.2.C Other Fuels:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.2.D Pulp, Paper and Print:Though this activity is not estimated yet with precision, it is expected to be very low in Luxembourg because fuel combustion is used mainly for heating purposes and not for production activities. The former being negligible, the emissions are equal or very close to zero.. Hence, the emissions are estimated being equal or very close to zero.

1.AA.2.D Liquid Fuels:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.2.D Solid Fuels:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.2.D Gaseous Fuels:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.2.D Biomass:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.2.D Other Fuels:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.2.E Food Processing, Beverages and Tobacco:Though this activity is not estimated yet with precision, it is expected to be very low in Luxembourg because fuel combustion is used mainly for heating purposes and not for production activities. The former being negligible, the emissions are equal or very close to zero,. Hence, the emissions are estimated being equal or very close to zero.

1.AA.2.E Liquid Fuels:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.2.E Solid Fuels:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.2.E Gaseous Fuels:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.2.E Biomass:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.2.E Other Fuels:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.2.F Other (please specify):This category includes combustion in boilers less than 300 MW, combustion in gas turbines and combustion in the following production sectors: clinker, flat glass and fine ceramics materials.

1.AA.2.F Biomass:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.2.F Other Fuels:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.2.F Biomass:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.2.F Other Fuels:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.3 Other Fuels:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.3.A Civil Aviation:There are no domestic passenger or freight flights within Luxembourg's borders. Only some private flights are occuring (flight clubs, entertaining flights (for gliders e.g.), etc.). Fuel combustion of gasoline for these flights is negligible, hence emissions are equal or very close to zero.

1.AA.3.A Aviation Gasoline:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg (as indicated in the previous note). Hence, the emissions are estimated being equal or very close to zero.

1.AA.3.B Road Transportation:The estimations have been realized using COPERT. The emission factors are default data fromI COPERT III. See NIR, section 3.5.

1.AA.3.B LPG:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.3.B Gaseous Fuels:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.3.B Biomass:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.3.B Other non-specified:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.3.C Solid Fuels:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.3.C Other non-specified:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.3.D Other non-specified:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.3.D Other non-specified:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.4 Other Fuels:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.4.A Other Fuels:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.4.B Other Fuels:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.4.C Solid Fuels:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.4.C Gaseous Fuels:Though the use of this type of fuel is not estimated with precision from 1996 onwards, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.4.C Other Fuels:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

1.AA.5.A Building and plant site fuel powered machinery:It is not possible to distinguish liquid fuel use for stationary machinery from the data used to estimate emissions from gasoline and diesel oil since the share of these specific activities is not estimated for the moment (that would require getting information directly from the operators). Consequently the notation key IE has been used.

1.AA.5.A Liquid Fuels:It is not possible to distinguish liquid fuel use for stationary machinery from the data used to estimate emissions from gasoline and diesel oil since the share of these specific activities is not estimated for the moment (that would require getting information directly from the operators). Consequently, the notation key IE has been used.

1.AA.5.B Off-road vehicles and other machinery, airport and military vehicles:It is not possible to distinguish liquid fuel use for specific activities (military activities, ground transportation at the airport, etc.) from the data used to estimate emissions from gasoline and diesel oil since the share of these specific activities is not estimated for the moment (that would require getting information directly from the operators). Consequently, the notation key IE has been used.

1.AA.5.B Liquid Fuels:It is not possible to distinguish liquid fuel use for specific activities (military activities, ground transportation at the airport, etc.) from the data used to estimate emissions from gasoline and diesel oil since the share of these specific activities is not estimated for the moment (that would require getting information directly from the operators). Consequently, the notation key IE has been used.

TABLE 1.A(b) SECTORAL BACKGROUND DATA FOR ENERGY
CO_2 from Fuel Combustion Activities - Reference Approach (IPCC Worksheet 1-1)
(Sheet 1 of 1)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

FUEL TYPES			Unit	Production	Imports	Exports	International bunkers	Stock change	Apparent consumption	Conversion factor (TJ/Unit)	NCV/ GCV [1]	Apparent consumption (TJ)	Carbon emission factor (t C/TJ)	Carbon content (Gg C)	Carbon stored (Gg C)	Net carbon emissions (Gg C)	Fraction of carbon oxidized	Actual CO_2 emissions (Gg CO_2)
Liquid Fossil	Primary Fuels	Crude Oil	Gg	NO	NO	NO		NO	NO	NA	NCV	NA,NO	NA	NA,NO	NO	NA,NO	NA	NA,NO
		Orimulsion	Gg	NO	NO	NO		NO	NO	NA	NCV	NA,NO	NA	NA,NO	NO	NA,NO	NA	NA,NO
		Natural Gas Liquids	Gg	NO	NO	NO		NO	NO	NA	NCV	NA,NO	NA	NA,NO	NO	NA,NO	NA	NA,NO
	Secondary Fuels	Gasoline	Gg		549.00	1.00	NO	2.00	546.00	44.00	NCV	24,024.00	18.90	454.05	NO	454.05	0.99	1,648.21
		Jet Kerosene	Gg		412.00	NO	413.34	3.00	-4.34	43.00	NCV	-186.59	19.50	-3.64	NO	-3.64	0.99	-13.21
		Other Kerosene	Gg		NO	NO	NO	NO	NO	NA	NCV	NA,NO	NA	NA,NO	NO	NA,NO	NA	NA,NO
		Shale Oil	Gg		NO	NO		NO	NO	NA	NCV	NA,NO	NA	NA,NO	NO	NA,NO	NA	NA,NO
		Gas / Diesel Oil	Gg		1,963.00	6.00	NO	8.00	1,949.00	42.30	NCV	82,442.70	20.20	1,665.34	NO	1,665.34	0.99	6,045.19
		Residual Fuel Oil	Gg		4.00	NO	NO	NO	4.00	42.82	NCV	171.27	21.10	3.61	NO	3.61	0.99	13.12
		Liquefied Petroleum Gas (LPG)	Gg		20.00	7.00		NO	13.00	46.00	NCV	598.00	17.20	10.29	NO	10.29	0.99	37.34
		Ethane	Gg		NO	NO		NO	NO	NA	NCV	NA,NO	NA	NA,NO	NO	NA,NO	NA	NA,NO
		Naphtha	Gg		NO	NO		NO	NO	NA	NCV	NA,NO	NA	NA,NO	NO	NA,NO	NA	NA,NO
		Bitumen	Gg		8.00	NO		NO	8.00	37.70	NCV	301.60	22.00	6.64	6.64	0.00	0.99	0.00
		Lubricants	Gg		5.00	NO	NO	NO	5.00	42.30	NCV	211.50	20.00	4.23	2.12	2.12	0.99	7.68
		Petroleum Coke	Gg		NO	NO		NO	NO	NA	NCV	NA,NO	NA	NA,NO	NO	NA,NO	NA	NA,NO
		Refinery Feedstocks	Gg		NO	NO		NO	NO	NA	NCV	NA,NO	NA	NA,NO	NO	NA,NO	NA	NA,NO
		Other Oil	Gg		NO	NO		NO	NO	NA	NCV	NA,NO	NA	NA,NO	NO	NA,NO	NA	NA,NO
Other Liquid Fossil												NA,NO		NA,NO	NO	NA,NO		NA,NO
White Spirit			Gg	NO	NO	NO	NO	NO	NO	NA	NCV	NA,NO	NA	NA,NO	NO	NA,NO	NA	NA,NO
Liquid Fossil Totals												107,562.48		2,140.52	8.75	2,131.77		7,738.33
Solid Fossil	Primary Fuels	Anthracite [2]	Gg	NO	IE	NO		NO	IE,NO	NA	NCV	IE,NA,NO	NA	IE,NA,NO	IE	IE,NA,NO	0.98	IE,NA,NO
		Coking Coal	Gg	NO	NO	NO		NO	NO	NA	NCV	NA,NO	NA	NA,NO	NO	NA,NO	NA	NA,NO
		Other Bituminous Coal	Gg	NO	129.00	NO	NO	NO	129.00	29.30	NCV	3,779.70	25.80	97.52	NO	97.52	0.98	350.41
		Sub-bituminous Coal	Gg	NO	NO	NO	NO	NO	NO	NA	NCV	NA,NO	NA	NA,NO	NO	NA,NO	NA	NA,NO
		Lignite	Gg	NO	NO	NO		NO	NO	9.00	NCV	NO	27.60	NO	NO	NO	0.98	NO
		Oil Shale	Gg	NO	NO	NO		NO	NO	NA	NCV	NA,NO	NA	NA,NO	NO	NA,NO	NA	NA,NO
		Peat	Gg	NO	NO	NO		NO	NO	NA	NCV	NA,NO	NA	NA,NO	NO	NA,NO	NA	NA,NO
	Secondary Fuels	BKB [3] and Patent Fuel	Gg		8.00	NO		NO	8.00	20.00	NCV	160.00	25.80	4.13	NO	4.13	0.98	14.83
		Coke Oven/Gas Coke	Gg		NO	NO		NO	NO	NA	NCV	NA,NO	NA	NA,NO	NO	NA,NO	NA	NA,NO
Other Solid Fossil												NA,NO		NA,NO	NO	NA,NO		NA,NO
Other non-specified			Gg	NO	NO	NO	NO	NO	NO	NA	NCV	NA,NO	NA	NA,NO	NO	NA,NO	NA	NA,NO
Solid Fossil Totals												3,939.70		101.64	IE,NO	101.64		365.24
Gaseous Fossil		Natural Gas (Dry)	Gg	NO	50,215.00	NO		NO	50,215.00	1.00	NCV	50,215.00	15.30	768.29	NO	768.29	1.00	2,802.98
Other Gaseous Fossil												NA,NO		NA,NO	NO	NA,NO		NA,NO
Other non-specified			Gg	NO	NO	NO	NO	NO	NO	NA	NCV	NA,NO	NA	NA,NO	NO	NA,NO	NA	NA,NO
Gaseous Fossil Totals												50,215.00		768.29	NO	768.29		2,802.98
Total												161,717.18		3,010.46	8.75	3,001.71		10,906.55
Biomass total												852.00		25.47	NO	25.47		93.41
		Solid Biomass	Gg	643.00	NO	NO		NO	643.00	1.00	NCV	643.00	29.90	19.23	NO	19.23	1.00	70.49
		Liquid Biomass	Gg	NO	NO	NO		NO	NO	NA	NCV	NA,NO	NA	NA,NO	NO	NA,NO	NA	NA,NO
		Gas Biomass	Gg	209.00	NO	NO		NO	209.00	1.00	NCV	209.00	29.90	6.25	NO	6.25	1.00	22.91

[1] To convert quantities in previous columns to energy units, use net calorific values (NCV) and write NCV in this column. If gross calorific values (GCV) are used, write GCV in this column.
[2] If data for Anthracite are not available separately, include with Other Bituminous Coal.
[3] BKB: Brown coal/peat briquettes.

Documentation Box:
Parties should provide detailed explanations on the fuel combustion sub-sector, including information relating to CO2 from the Reference approach, in the corresponding part of Chapter 3: Energy (CRF sub-sector 1.A) of the NIR. Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

1.AB Fuel Combustion - Reference Approach:(1) Data for the Reference Approach are coming from Eurostat databases on energy. The data have been extracted from Eurostat's web site on 13 and 14 February 2007. (2) The unit for the Conversion factor is Eurostat's default since we use Eurostat's default factors. (3) The unit for the fraction of carbon oxidized is the default one too.

TABLE 1.A(c) COMPARISON OF CO2 EMISSIONS FROM FUEL COMBUSTION
(Sheet 1 of 1)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

FUEL TYPES	REFERENCE APPROACH			SECTORAL APPROACH [1]		DIFFERENCE [2]	
	Apparent energy consumption [3] (PJ)	Apparent energy consumption (excluding non-energy use and feedstocks) [4] (PJ)	CO_2 emissions (Gg)	Energy consumption (PJ)	CO_2 emissions (Gg)	Energy consumption (%)	CO_2 emissions (%)
Liquid Fuels (excluding international bunkers)	107.56	107.05	7,738.33	111.54	8,130.08	-4.02	-4.82
Solid Fuels (excluding international bunkers) [5]	3.94	3.94	365.24	3.47	343.41	13.50	6.36
Gaseous Fuels	50.22	50.22	2,802.98	49.27	2,737.49	1.91	2.39
Other [5]	NA,NO	NO	NA,NO	IE,NE,NO	IE,NE,NO	NA	NA
Total [5]	***161.72***	***161.20***	***10,906.55***	***164.28***	***11,210.98***	***-1.87***	***-2.72***

[1] "Sectoral approach" is used to indicate the approach (if different from the Reference approach) used by the Party to estimate CO_2 emissions from fuel combustion as reported in table 1.A(a), sheets 1-4.

[2] Difference in CO_2 emissions estimated by the Reference approach (RA) and the Sectoral approach (SA) (difference = 100% x ((RA-SA)/SA)). For calculating the difference in energy consumption between the two approaches, data as reported in the column "Apparent energy consumption (excluding non-energy use and feedstocks)" are used for the Reference approach.

[3] Apparent energy consumption data shown in this column are as in table 1.A(b).

[4] For the purposes of comparing apparent energy consumption from the Reference approach with energy consumption from the Sectoral approach, Parties should, in this column, subtract from the apparent energy consumption (Reference approach) the energy content corresponding to the fuel quantities used as feedstocks and/or for non-energy purposes, in accordance with the accounting of energy use in the Sectoral approach

[5] Emissions from biomass are not included.

Note: The Reporting Instructions of the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories require that estimates of CO_2 emissions from fuel combustion, derived using a detailed Sectoral approach, be compared to those from the Reference approach (Worksheet 1-1 of the IPCC Guidelines, Volume 2, Workbook). This comparison is to assist in verifying the Sectoral data.

Documentation Box:

Parties should provide detailed explanations on the fuel combustion sub-sector, including information related to the comparison of CO_2 emissions calculated using the Sectoral approach with those calculated using the Reference approach, in the corresponding part of Chapter 3: Energy (CRF sub-sector 1.A) of the NIR. Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

If the CO_2 emission estimates from the two approaches differ by more than 2 per cent, Parties should briefly explain the cause of this difference in this documentation box and provide a reference to relevant section of the NIR where this difference is explained in more detail.

1.AA Other Fuels:Though the use of this type of fuel is not estimated yet with precision, it is expected to be very low for this activity in Luxembourg. Hence, the emissions are estimated being equal or ve

1.AB Fuel Combustion - Reference Approach:(1) Data for the Reference Approach are coming from Eurostat databases on energy. The data have been extracted from Eurostat's web site on 13 and 14 F

TABLE 1.A(d) SECTORAL BACKGROUND DATA FOR ENERGY
Feedstocks and Non-Energy Use of Fuels
(Sheet 1 of 1)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

FUEL TYPE	ACTIVITY DATA AND RELATED INFORMATION		IMPLIED EMISSION FACTOR	ESTIMATE	Additional information[a]			
	Fuel quantity (TJ)	Fraction of carbon stored	Carbon emission factor (t C/TJ)	Carbon stored in non-energy use of fuels (Gg C)	CO_2 not emitted ($Gg\ CO_2$)	Subtracted from energy sector *(specify source category)*	Associated CO_2 emissions (Gg)	Allocated under *(Specify source category, e.g. Waste Incineration)*
Naphtha [1]	NO	NO	NO	NO	NO	NA	NO	NA
Lubricants	211.50	0.50	20.00	2.12	7.76	NA	NE	NE
Bitumen	301.60	1.00	22.00	6.64	24.33	NA	NE	NE
Coal Oils and Tars (from Coking Coal)	NO	NO	NO	NO	NO	NA	NO	NA
Natural Gas [1]	NO	NO	NO	NO	NO	NA	NO	NA
Gas/Diesel Oil [1]	NO	NO	NO	NO	NO	NA	NO	NA
LPG [1]	NO	NO	NO	NO	NO	NA	NO	NA
Ethane [1]	NO	NO	NO	NO	NO	NA	NO	NA
Other *(please specify)*				NO				
White Spirit	NO	NO	NO	NO	NO	NA	NO	NA
Kerosene/Jet Fuels	NO	NO	NO	NO	NO	NA	NO	NA
Motor Spirit	NO	NO	NO	NO	NO	NA	NO	NA
Total				8.75	32.08			
Total amount of C and CO_2 from feedstocks and non-energy use of fuels that is included as emitted CO_2 in the Reference approach				2.12	7.76			

A fraction of energy carriers is stored in such products as plastics or asphalt. The non-stored fraction of the carbon in the energy carrier or product is oxidized, resulting in carbon dioxide emissions, either during use of the energy carriers in the industrial production (e.g. fertilizer production), or during use of the products (e.g. solvents, lubricants), or in both (e.g. monomers). To report associated emissions, use the above table.

[1] Enter data for those fuels that are used as feedstocks (fuel used as raw materials for manufacture of products such as plastics or fertilizers) or for other non-energy use (fuels not used as fuel or transformed into another fuel (e.g. bitumen for road construction, lubricants)).

[a] The fuel lines continue from the table to the left.

Documentation box:

• Parties should provide detailed explanations on the fuel combustion sub-sector, including information related to feedstocks, in the corresponding part of Chapter 3: Energy (CRF sub-sector 1.A) of the NIR. Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

• The above table is consistent with the IPCC Guidelines. Parties that take into account the emissions associated with the use and disposal of these feedstocks could continue to use their methodology, but should indicate this in this documentation box and provide a reference to the relevant section of the NIR where further explanation can be found.

TABLE 1.B.1 SECTORAL BACKGROUND DATA FOR ENERGY
Fugitive Emissions from Solid Fuels
(Sheet 1 of 1)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA	IMPLIED EMISSION FACTORS		EMISSIONS		
	Amount of fuel produced	CH_4 [1]	CO_2	CH_4		CO_2
				Recovery/Flaring [2]	Emissions [3]	
	(Mt)	(kg/t)		(Gg)		
1. B. 1. a. Coal Mining and Handling	NO			NO	NO	NO
i. Underground Mines [4]	NO	NO	NO	NO	NO	NO
Mining Activities		NO	NO	NO	NO	NO
Post-Mining Activities		NO	NO	NO	NO	NO
ii. Surface Mines [4]	NO	NO	NO	NO	NO	NO
Mining Activities		NO	NO	NO	NO	NO
Post-Mining Activities		NO	NO	NO	NO	NO
1. B. 1. b. Solid Fuel Transformation	NO	NO	NO	NO	NO	NO
1. B. 1. c. Other ***(please specify)*** [5]				NO	NO	NO
Other non-specified	NO	NO	NO	NO	NO	NO

(1) The IEFs for CH_4 are estimated on the basis of gross emissions as follows: (CH_4 emissions + amounts of CH_4 flared/recovered) / activity data.

(2) Amounts of CH4 drained (recovered), utilized or flared.

(3) Final CH4 emissions after subtracting the amounts of CH4 utilized or recovered.

(4) In accordance with the IPCC Guidelines, emissions from Mining Activities and Post-Mining Activities are calculated using the activity data of the amount of fuel produced for Underground Mines and Surface Mines.

(5) This category is to be used for reporting any other solid-fuel-related activities resulting in fugitive emissions, such as emissions from abandoned mines and waste piles.

Note: There are no clear references to the coverage of 1.B.1.b. and 1.B.1.c. in the IPCC Guidelines. Make sure that the emissions entered here are not reported elsewhere. If they are reported under another source category, indicate this by using notation key IE and making the necessary reference in Table 9 (completeness).

Documentation box:
• Parties should provide detailed explanations on the fugitive emissions from source category 1.B.1 Solid Fuels, in the corresponding part of Chapter 3: Energy (CRF source category 1.B.1) of the NIR. Use this documentation box to provide
• Regarding data on the amount of fuel produced entered in the above table, specify in this documentation box whether the fuel amount is based on the run-of-mine (ROM) production or on the saleable production.
• If entries are made for "Recovery/Flaring", indicate in this documentation box whether CH_4 is flared or recovered and provide a reference to the section in the NIR where further details on recovery/flaring can be found.
• If estimates are reported under 1.B.1.b. and 1.B.1.c., use this documentation box to provide information regarding activities covered under these categories and to provide a reference to the section in the NIR where the background information can be found.

TABLE 1.B.2 SECTORAL BACKGROUND DATA FOR ENERGY
Fugitive Emissions from Oil, Natural Gas and Other Sources
(Sheet 1 of 1)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA [1]			IMPLIED EMISSION FACTORS			EMISSIONS		
	Description [1]	Unit [1]	Value	CO_2	CH_4	N_2O	CO_2	CH_4	N_2O
				(kg/unit) [2]			(Gg)		
1. B. 2. a. Oil [3]							NE,NO	NE,NO	NO
I. Exploration	*number of wells drilled*		NO	NO	NO	NO	NO	NO	NO
ii. Production [4]	*oil produced*		NO	NO	NO		NO	NO	
iii. Transport	*oil loaded in tankers*		NO	NO	NO		NO	NO	
iv. Refining / Storage	*oil refined*		NO	NO	NO	NO	NO	NO	NO
v. Distribution of Oil Products	*oil refined*	PJ	109.79	NE	NE		NE	NE	
vi. Other	*other n.i.e.*		NO	NO	NO		NO	NO	
1. B. 2. b. Natural Gas							IE,NO	2.91	
i. Exploration	*gas exploration*		NO	NO	NO		NO	NO	
ii. Production [4] / Processing	*gas produced*		NO	NO	NO		NO	NO	
iii. Transmission	*gas consumed*	PJ	51.75	NO	56,231.88		NO	2.91	
iv. Distribution	*gas consumed*	TJ	IE	IE	IE		IE	IE	
v. Other Leakage	*(specify)*		IE	IE	IE		IE	IE	
at industrial plants and power stations	*gas leakage*		IE	IE	IE		IE	IE	
in residential and commercial sectors	*gas leakage*		IE	IE	IE		IE	IE	
1. B. 2. c. Venting [5]							NO	NO	
i. Oil	*oil produced*		NO	NO	NO		NO	NO	
ii. Gas	*gas produced*		NO	NO	NO		NO	NO	
iii. Combined	*combined oil and gas production*		NO	NO	NO		NO	NO	
Flaring							NO	NO	NO
i. Oil	*gas consumed*		NO	NO	NO	NO	NO	NO	NO
ii. Gas	*gas consumed*		NO	NO	NO	NO	NO	NO	NO
iii. Combined	*combined oil and gas consumption*		NO	NO	NO	NO	NO	NO	NO
1.B.2.d. Other *(please specify)* [6]							NO	NO	NO
Other non-specified	*other n.i.e.*		NO	NO	NO	NO	NO	NO	NO

[1] Specify the activity data used in the Description column (see examples). Specify the unit of the activity data in the Unit column using one of the following units: PJ, Tg, 10^6 m^3, 10^6 bbl/yr, km, number of sources (e.g. wells).

[2] The unit of the implied emission factor will depend on the unit of the activity data used, and is therefore not specified in this column.

[3] Use the category also to cover emissions from combined oil and gas production fields. Natural gas processing and distribution from these fields should be included under 1.B.2.b.ii and 1.B.2.b.iv, respectively.

[4] If using default emission factors, these categories will include emissions from production other than venting and flaring.

[5] If using default emission factors, emissions from Venting and Flaring from all oil and gas production should be accounted for under Venting.

[6] For example, fugitive CO_2 emissions from production of geothermal power could be reported here.

Documentation box:

• Parties should provide detailed explanations on the fugitive emissions from source category 1.B.2 Oil and Natural Gas, in the corresponding part of Chapter 3: Energy (CRF source category 1.B.2) of the NIR. Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

• Regarding data on the amount of fuel produced entered in this table, specify in this documentation box whether the fuel amount is based on the raw material production or on the saleable production. Note cases where more than one type of activity data is used to estimate emissions.

• Venting and Flaring: Parties using the IPCC software could report venting and flaring emissions together, indicating this in this documentation box.

• If estimates are reported under "1.B.2.d Other", use this documentation box to provide information regarding activities covered under this category and to provide a reference to the section in the NIR where background information can be found.

1.B.2.B.3 Transmission:Natural gas transmission: CH4 emissions recorded are due to leaks or to accidental events in gas transmission and distribution. Includes therefore CRF categories 1.B.2.B.4 and 1.B.2.B.5.

TABLE 1.C SECTORAL BACKGROUND DATA FOR ENERGY
International Bunkers and Multilateral Operations
(Sheet 1 of 1)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA	IMPLIED EMISSION FACTORS			EMISSIONS		
	Consumption (TJ)	CO_2	CH_4	N_2O	CO_2	CH_4	N_2O
		(t/TJ)			(Gg)		
Aviation Bunkers	17,926.20				1,290.42	NE	NE
Jet Kerosene	17,926.20	71.99	NE	NE	1,290.42	NE	NE
Gasoline	NE	NE	NE	NE	NE	NE	NE
Marine Bunkers	NE				NE	NE	NE
Gasoline	NE	NE	NE	NE	NE	NE	NE
Gas/Diesel Oil	NE	NE	NE	NE	NE	NE	NE
Residual Fuel Oil	NE	NE	NE	NE	NE	NE	NE
Lubricants	NE	NE	NE	NE	NE	NE	NE
Coal	NE	NE	NE	NE	NE	NE	NE
Other *(please specify)*	NE				NE	NE	NE
Other non-specified	NE	NE	NE	NE	NE	NE	NE
Multilateral Operations [1]	IE	IE	IE	IE	IE	IE	IE

Additional information

Fuel consumption	Distribution [a] (per cent)	
	Domestic	International
Aviation	NE,NO	100.00
Marine	100.00	NE

[a] For calculating the allocation of fuel consumption, the sums of fuel consumption for domestic navigation and aviation (table 1.A(a)) and for international bunkers (table 1.C) are used.

[1] Parties may choose to report or not report the activity data and implied emission factors for multilateral operations consistent with the principle of confidentiality stated in the UNFCCC reporting guidelines. In any case, Parties should report the emissions from multilateral operations, where available, under the Memo Items section of the Summary tables and in the Sectoral report table for energy.

Note: In accordance with the IPCC Guidelines, international aviation and

Documentation box:

• Parties should provide detailed explanations on the fuel combustion sub-sector, including international bunker fuels, in the corresponding part of Chapter 3: Energy (CRF sub-sector 1.A) of the NIR. Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

• Provide in this documentation box a brief explanation on how the consumption of international marine and aviation bunker fuels was estimated and separated from domestic consumption, and include a reference to the section of the NIR where the explanation is provided in more detail.

1.C1.A Gasoline:Though this category is not yet estimated with precision, gasoline consumption is expected to be very low in Luxembourg. Hence, the

1.C1.B Marine:Luxembourg has no coastline, hence no sea harbours. However, some ships are navigating the seas displaying a Luxembourgish flag (

TABLE 2(I) SECTORAL REPORT FOR INDUSTRIAL PROCESSES
(Sheet 1 of 2)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2	CH_4	N_2O	$HFCs^{(1)}$		$PFCs^{(1)}$		SF_6		NO_x	CO	NMVOC	SO_2
				P	A	P	A	P	A				
	(Gg)			CO_2 equivalent (Gg)				(Gg)					
Total Industrial Processes	747.81	NA,NE,NO	NE,NO	NA,NE,NO	43.06	NA,NO	NA,NO	NA,NE,NO	0.00	0.44	4.42	0.77	0.21
A. Mineral Products	504.08	NO	NO							NE,NO	NE,NO	NE,NO	NE,NO
1. Cement Production	445.01												NE
2. Lime Production	NO												
3. Limestone and Dolomite Use	NE												
4. Soda Ash Production and Use	NE												
5. Asphalt Roofing	NE										NE	NE	
6. Road Paving with Asphalt	NE									NE	NE	NE	NE
7. Other *(as specified in table 2(I).A-G)*	59.07	NO	NO							NO	NO	NO	NO
Glass Production	59.07	NO	NO							NO	NO	NO	NO
B. Chemical Industry	NO	NO	NO	NA	NA	NA	NA	NA	NA	NA,NO	NA,NO	NA,NO	NA,NO
1. Ammonia Production	NO	NO	NO							NO	NO	NO	NO
2. Nitric Acid Production			NO							NO			
3. Adipic Acid Production	NO		NO							NO	NO	NO	
4. Carbide Production	NO	NO								NO	NO	NO	NO
5. Other *(as specified in table 2(I).A-G)*	NO	NO	NO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon Black		NO											
Ethylene	NO	NO	NO										
Dichloroethylene		NO											
Styrene		NO											
Methanol		NO											
C. Metal Production	240.31	NA,NE,NO	NE	NE	NA,NE	NO	NO	NE,NO	NE,NO	0.44	4.42	0.65	0.21
1. Iron and Steel Production	240.31	NA,NE,NO								0.44	4.42	0.65	0.21
2. Ferroalloys Production	NO	NO								NO	NO	NO	NO
3. Aluminium Production	NE	NE				NO	NO			NE	NE	NE	NE
4. SF_6 Used in Aluminium and Magnesium Foundries								NO	NO				
5. Other *(as specified in table 2(I).A-G)*	NE	NE	NE	NE	NA,NE	NO	NA,NO	NE	NE	NE	NE	NE	NE
Copper processing	NE	NE	NE	NE	NE	NO	NO	NE	NE	NE	NE	NE	NE

Note: P = Potential emissions based on Tier 1 approach of the IPCC Guidelines. A = Actual emissions based on Tier 2 approach of the IPCC Guidelines. This applies only to source categories where methods exist for both tiers.

(1) The emissions of HFCs and PFCs are to be expressed as CO_2 equivalent emissions. Data on disaggregated emissions of HFCs and PFCs are to be provided in Table 2(II).

TABLE 2(I) SECTORAL REPORT FOR INDUSTRIAL PROCESSES
(Sheet 2 of 2)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2	CH_4	N_2O	$HFCs^{(1)}$		$PFCs^{(1)}$		SF_6		NO_x	CO	NMVOC	SO_2
				P	A	P	A	P	A				
	(Gg)			CO_2 equivalent (Gg)						(Gg)			
D. Other Production	3.42									NE	NE	0.12	NE
1. Pulp and Paper										NE	NE	NE	NE
2. Food and Drink[2]	3.42											0.12	
E. Production of Halocarbons and SF_6					NO		NO		NO				
1. By-product Emissions					NO		NO		NO				
Production of HCFC-22					NO								
Other					NO		NO		NO				
2. Fugitive Emissions					NO		NO		NO				
3. Other *(as specified in table 2(II))*					NO		NO		NO				
Other non-specified					NO		NO		NO				
F. Consumption of Halocarbons and SF_6				NE	43.06	NO	NO	NE	0.00				
1. Refrigeration and Air Conditioning Equipment				NE	34.06	NO	NO	NO	NO				
2. Foam Blowing				NE	6.27	NO	NO	NO	NO				
3. Fire Extinguishers				NE	NE	NO	NO	NO	NO				
4. Aerosols/ Metered Dose Inhalers				NE	2.74	NO	NO	NO	NO				
5. Solvents				NE	NE	NO	NO	NO	NO				
6. Other applications using ODS[3] substitutes				NE	NE	NO	NO	NO	NO				
7. Semiconductor Manufacture				NE	NE	NO	NO	NO	NO				
8. Electrical Equipment				NA	NA	NO	NO	NE	0.00				
9. Other *(as specified in table 2(II)*				NO	NO	NO	NO	NE	0.00				
noise reduction windows				NO	NO	NO	NO	NE	0.00				
G. Other *(as specified in tables 2(I).A-G and 2(II))*	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Other non-specified	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO

Note: P = Potential emissions based on Tier 1 approach of the IPCC Guidelines. A = Actual emissions based on Tier 2 approach of the IPCC Guidelines. This applies only to source categories where methods exist for both tiers.

(1) The emissions of HFCs and PFCs are to be expressed as CO_2 equivalent emissions. Data on disaggregated emissions of HFCs and PFCs are to be provided in Table 2(II).

(2) CO_2 from Food and Drink Production (e.g. gasification of water) can be of biogenic or non-biogenic origin. Only information on CO_2 emissions of non-biogenic origin should be reported.

(3) ODS: ozone-depleting substances.

Documentation box:
Parties should provide detailed explanations on the industrial processes sector in Chapter 4: Industrial processes (CRF sector 2) of the NIR. Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.
2.A.3 Limestone and Dolomite Use:These materials are mainly used in steelworks in Luxembourg and are therefore (and contrary to the IPCC guidelines) accounted for in CRF category 2.C. It is worth noticing that their use was decreasing at the same time Luxembourg's steelworks were moving from blast furnaces to electric arc furnaces (EAF) during the 90s. Since the use of these materials in other sectors than iron & steel is not known with enough precision but is expected to be very low in Luxembourg, the emissions to be accounted for under category 2.A.3 are estimated being equal or very close to zero.
2.A.5 Asphalt Roofing:Emissions for this category is not known with enough precision but is expected to be very low (i.e.close to zero) in Luxembourg.
2.C.2 Ferroalloys Production:In Luxembourg there are now dedicated plants for producing ferroalloys.
2.C.3 Aluminium Production:In Luxembourg the production of aluminium products is made out of aluminium scrap (i.e. aluminium products are made of recycled aluminium).
2.C.5 Copper processing:The only non-ferrous metallurgy in Luxembourg is relating to copper.
2.E Production of Halocarbons and SF6:Estimates of F-gases emissions are coming from a study realized end 1999 that for the first time tried to evaluate the actual consumption of F-gases in the country following a top-down approach. This study has not been updated since.
2.F Consumption of Halocarbons and SF6:Estimates of F-gases emissions are coming from a study realized end 1999 that for the first time tried to evaluate the actual consumption of F-gases in the country following a top-down approach. This study has not been updated since. From that study, F-gases have been distributed amongst 5 CRF categories: 2.F.1, 2.F.2, 2.F.4, 2.F.8 and 2.F.9. It has also been decided to use the 1990 F-gases estimates for the years 1990-1999 and the 2000 estimates for the subsequent years.
2.F.9 noise reduction windows:(1) The value recorded relate only to SF6 consumption and the GWP used is 23900. (2) Estimates of F-gases emissions are coming from a study realized end 1999 that for the first time tried to evaluate the actual consumption of F-gases in the country following a top-down approach. This study has not been updated since.
2.G Other non-specified:This activity results only in NH3 emissions.

TABLE 2(I).A-G SECTORAL BACKGROUND DATA FOR INDUSTRIAL PROCESSES
Emissions of CO_2, CH_4 and N_2O
(Sheet 1 of 2)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA		IMPLIED EMISSION FACTORS [2]			EMISSIONS					
	Production/Consumption quantity		CO_2	CH_4	N_2O	CO_2		CH_4		N_2O	
						Emissions[3]	Recovery[4]	Emissions[3]	Recovery[4]	Emissions[3]	Recovery[4]
	Description [1]	(kt)	(t/t)			(Gg)					
A. Mineral Products						504.08	NE,NO	NO	NO	NO	NO
1. Cement Production	clinker production	847.00	0.53			445.01	NE				
2. Lime Production	lime production	NO	NO			NO	NO				
3. Limestone and Dolomite Use	limestone and dolomite use	NE	NE			NE	NE				
4. Soda Ash						NE	NE				
Soda Ash Production	soda ash production	NE	NE			NE	NE				
Soda Ash Use	soda ash use	NE	NE			NE	NE				
5. Asphalt Roofing	asphalt roofing production	0.62	NE			NE	NE				
6. Road Paving with Asphalt	asphalt production	445.50	NE			NE	NE				
7. Other *(please specify)*						59.07	NE	NO	NO	NO	NO
Glass Production	float glass production	400.00	0.15	NO	NO	59.07	NE	NO	NO	NO	NO
B. Chemical Industry						NO	NO	NO	NO	NO	NO
1. Ammonia Production[5]	ammonia production	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2. Nitric Acid Production	nitric acid production	NO			NO					NO	NO
3. Adipic Acid Production	adipic acid production	NO	NO		NO	NO	NO			NO	NO
4. Carbide Production	carbide production	NO	NO	NO		NO	NO	NO	NO		
Silicon Carbide	silicon carbide production	NO	NO	NO		NO	NO	NO	NO		
Calcium Carbide	calcium carbide production	NO	NO	NO		NO	NO	NO	NO		
5. Other *(please specify)*						NO	NO	NO	NO	NO	NO
Carbon Black	carbon black production	NO		NO				NO	NO		
Ethylene	ethylene production	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Dichloroethylene	dichloroethylene production	NO		NO				NO	NO		
Styrene	styrene production	NO		NO				NO	NO		
Methanol	methanol production	NO		NO				NO	NO		

[1] Where the IPCC Guidelines provide options for activity data, e.g. cement production or clinker production for estimating the emissions from Cement Production, specify the activity data used (as shown in the example in parentheses) in order to make the choice of emission factor more transparent and to facilitate comparisons of implied emission factors.
[2] The implied emission factors (IEF) are estimated on the basis of gross emissions as follows: IEF = (emissions plus amounts recovered, oxidized, destroyed or transformed) / activity data.
[3] Final emissions are to be reported (after subtracting the amounts of emission recovery, oxidation, destruction or transformation).
[4] Amounts of emission recovery, oxidation, destruction or transformation.
[5] To avoid double counting, make offsetting deductions for fuel consumption (e.g. natural gas) in Ammonia Production, first for feedstock use of the fuel, and then for a sequestering use of the feedstock.

TABLE 2(I).A-G SECTORAL BACKGROUND DATA FOR INDUSTRIAL PROCESSES
Emissions of CO_2, CH_4 and N_2O
(Sheet 2 of 2)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA		IMPLIED EMISSION FACTORS [2]			EMISSIONS					
	Production/Consumption quantity		CO_2	CH_4	N_2O	CO_2		CH_4		N_2O	
	Description [1]	(kt)	(t/t)			Emissions [3]	Recovery [4]	Emissions [3]	Recovery [4]	Emissions [3]	Recovery [4]
						(Gg)					
C. Metal Production						240.31	NA,NE,NO	NA,NE,NO	NA,NE,NO	NE	NE
1. Iron and Steel Production			0.09	NA,NE,NO		240.31	NA,NE,NO	NA,NE,NO	NA,NE,NO		
Steel	steel production	2,684.00	0.09	NE		240.31	NE	NE	NE		
Pig Iron	pig iron production	NO	NA	NA		NA	NA	NA	NA		
Sinter	sinter production	NO	NA	NA		NA	NA	NA	NA		
Coke	coke production in non-integrated plants	NO	NO	NO		NO	NO	NO	NO		
Other *(please specify)*						NE	NE	NE	NE		
Rolling mills products	rolling mills products	4,083.00	NE	NE		NE	NE	NE	NE		
2. Ferroalloys Production	ferroalloys production	NO	NO	NO		NO	NO	NO	NO		
3. Aluminium Production	aluminium production from aluminium scrap	NE	NE	NE		NE	NE	NE	NE		
4. SF_6 Used in Aluminium and Magnesium Foundries											
5. Other *(please specify)*						NE	NE	NE	NE	NE	NE
Copper processing	copper processing	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
D. Other Production						3.42	NE				
1. Pulp and Paper											
2. Food and Drink	bread, wine, beer, spirits production	NE	NE			3.42	NE				
G. Other *(please specify)*						NO	NO	NO	NO	NO	NO
Other non-specified	cooling plants	35.00	NO	NO	NO	NO	NO	NO	NO	NO	NO

[1] Where the IPCC Guidelines provide options for activity data, e.g. cement production or clinker production for estimating the emissions from Cement Production, specify the activity data used (as shown in the example in parentheses) in order to make the choice of emission factor more transparent and to facilitate comparisons of implied emission factors.

[2] The implied emission factors (IEF) are estimated on the basis of gross emissions as follows: IEF = (emissions + amounts recovered, oxidized, destroyed or transformed) / activity data.

[3] Final emissions are to be reported (after subtracting the amounts of emission recovery, oxidation, destruction or transformation).

[4] Amounts of emission recovery, oxidation, destruction or transformation.

Documentation box:

• Parties should provide detailed explanations on the industrial processes sector in Chapter 4: Industrial processes (CRF sector 2) of the NIR. Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

• In relation to metal production, more specific information (e.g. data on virgin and recycled steel production) could be provided in this documentation box, or in the NIR, together with a reference to the relevant section.

• Confidentiality: Where only aggregate figures for activity data are provided, e.g. due to reasons of confidentiality, a note indicating this should be provided in this documentation box.

2.A.3 Limestone and Dolomite Use:These materials are mainly used in steelworks in Luxembourg and are therefore (and contrary to the IPCC guidelines) accounted for in CRF category 2.C. It is worth noticing that their use was decreasing at the same time Luxembourg's steelworks were moving from blast furnaces to electric arc furnaces (EAF) during the 90s. Since the use of these materials in other sectors than iron & steel is not known with enough precision but is expected to be very low in Luxembourg, the emissions to be accounted for under category 2.A.3 are estimated being equal or very close to zero.

2.A.4.1 Soda Ash Production:Though this activity is not estimated, it is expected to be very low in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

2.A.4.2 Soda Ash Use:Though this activity is not estimated, it is expected to be very low in Luxembourg. Hence, the emissions are estimated being equal or very close to zero.

2.A.5 Asphalt Roofing:Emissions for this category is not known with enough precision but is expected to be very low (i.e.close to zero) in Luxembourg.

2.C.1.2 Pig Iron:The last blast furnace of Luxembourg ceased to work in September 1997.

2.C.1.3 Sinter:The last blast furnace of Luxembourg ceased to work in September 1997.

2.C.1.4 Coke:There was no non-integrated coke plants in Luxembourg while blast furnaces were in activity (i.e. up to September 2007). Hence coke emissions are embedded in those for steel and pig iron.

2.C.2 Ferroalloys Production:In Luxembourg there are now dedicated plants for producing ferroalloys.

2.C.3 Aluminium Production:In Luxembourg the production of aluminium products is made out of aluminium scrap (i.e. aluminium products are made of recycled aluminium).

2.C.4.1 Aluminium Foundries:In Luxembourg the production of aluminium products is made out of aluminium scrap (i.e. aluminium products are made of recycled aluminium).

2.C.5 Copper processing:The only non-ferrous metallurgy in Luxembourg is relating to copper.

2.G Other non-specified:This activity results only in NH3 emissions.

TABLE 2(II) SECTORAL REPORT FOR INDUSTRIAL PROCESSES - EMISSIONS OF HFCs, PFCs AND SF_6
(Sheet 1 of 2)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	HFC-23	HFC-32	HFC-41	HFC-43-10mee	HFC-125	HFC-134	HFC-134a	HFC-152a	HFC-143	HFC-143a	HFC-227ea	HFC-236fa	HFC-245ca	Unspecified mix of listed HFCs (1)	Total HFCs	CF_4	C_2F_6	C_3F_8	C_4F_{10}	c-C_4F_8	C_5F_{12}	C_6F_{14}	Unspecified mix of listed PFCs (1)	Total PFCs	SF_6
	(t) (2)													CO_2 equivalent (Gg)	CO_2 equivalent (Gg)	(t) (2)							CO_2 equivalent (Gg)	CO_2 equivalent (Gg)	(t) (2)
Total Actual Emissions of Halocarbons (by chemical) and SF_6	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	43.06		NO	NO	NO	NO	NO	NO	NO	NO		0.15
C. Metal Production	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NO	NO	NO	NO	NO	NO	NO	NO		NE,NO
Aluminium Production																NO	NO	NO	NO	NO	NO	NO	NO		
SF_6 Used in Aluminium Foundries																									NO
SF_6 Used in Magnesium Foundries																									NO
E. Production of Halocarbons and SF_6	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO		NO	NO	NO	NO	NO	NO	NO	NO		NO
1. By-product Emissions	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO		NO	NO	NO	NO	NO	NO	NO	NO		NO
Production of HCFC-22	NO																								
Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO		NO	NO	NO	NO	NO	NO	NO	NO		NO
2. Fugitive Emissions	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO		NO	NO	NO	NO	NO	NO	NO	NO		NO
3. Other *(as specified in table 2(II).C,E)*	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO		NO	NO	NO	NO	NO	NO	NO	NO		NO
Other non-specified	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO		NO	NO	NO	NO	NO	NO	NO	NO		NO
F (a). Consumption of Halocarbons and SF_6 (actual emissions - Tier 2)	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	43.06		NO	NO	NO	NO	NO	NO	NO	NO		0.15
1. Refrigeration and Air Conditioning Equipment	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	34.06		NO	NO	NO	NO	NO	NO	NO	NO		NO
2. Foam Blowing	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	6.27		NO	NO	NO	NO	NO	NO	NO	NO		NO
3. Fire Extinguishers	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE		NO	NO	NO	NO	NO	NO	NO	NO		NO
4. Aerosols/Metered Dose Inhalers	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	2.74		NO	NO	NO	NO	NO	NO	NO	NO		NO
5. Solvents	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE		NO	NO	NO	NO	NO	NO	NO	NO		NO
6. Other applications using ODS(3) substitutes	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE		NO	NO	NO	NO	NO	NO	NO	NO		NO
7. Semiconductor Manufacture	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE		NO	NO	NO	NO	NO	NO	NO	NO		NO
8. Electrical Equipment	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NO	NO	NO	NO	NO	NO	NO	NO		0.04
9. Other *(as specified in table 2(II)F)*	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO		NO	NO	NO	NO	NO	NO	NO	NO		0.11
noise reduction windows	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO		NO	NO	NO	NO	NO	NO	NO	NO		0.11
G. Other *(please specify)*	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO		NO	NO	NO	NO	NO	NO	NO	NO		NO
Other non-specified	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO		NO	NO	NO	NO	NO	NO	NO	NO		NO

Note: All footnotes for this table are given at the end of the table on sheet 2.

Note: Gases with global warming potential (GWP) values not yet agreed upon by the Conference of the Parties should be reported in table 9(b).

TABLE 2(II) SECTORAL REPORT FOR INDUSTRIAL PROCESSES - EMISSIONS OF HFCs, PFCs AND SF_6
(Sheet 2 of 2)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	HFC-23	HFC-32	HFC-41	HFC-43-10mee	HFC-125	HFC-134	HFC-134a	HFC-152a	HFC-143	HFC-143a	HFC-227ea	HFC-236fa	HFC-245ca	Unspecified mix of listed HFCs (1)	Total HFCs	CF_4	C_2F_6	C_3F_8	C_4F_{10}	c-C_4F_8	C_5F_{12}	C_6F_{14}	Unspecified mix of listed PFCs (1)	Total PFCs	SF_6
	(t)(2)													CO_2 equivalent (Gg)	CO_2 equivalent (Gg)	(t)(2)							CO_2 equivalent (Gg)	CO_2 equivalent (Gg)	(t)(2)
F(p). Total Potential Emissions of Halocarbons (by chemical) and SF_6 (4)	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE		NO	NO	NO	NO	NO	NO	NO	NO		NE
Production(5)	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE		NO	NO	NO	NO	NO	NO	NO	NO		NE
Import:	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE		NO	NO	NO	NO	NO	NO	NO	NO		NE
In bulk	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE		NO	NO	NO	NO	NO	NO	NO	NO		NE
In products(6)	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE		NO	NO	NO	NO	NO	NO	NO	NO		NE
Export:	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE		NO	NO	NO	NO	NO	NO	NO	NO		NE
In bulk	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE		NO	NO	NO	NO	NO	NO	NO	NO		NE
In products(6)	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE		NO	NO	NO	NO	NO	NO	NO	NO		NE
Destroyed amount	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE		NO	NO	NO	NO	NO	NO	NO	NO		NE

GWP values used	**11700**	**650**	**150**	**1300**	**2800**	**1000**	**1300**	**140**	**300**	**3800**	**2900**	**6300**	**560**			**6500**	**9200**	**7000**	**7000**	**8700**	**7500**	**7400**			**23900**
Total Actual Emissions (7) (CO_2 equivalent (Gg))	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	43.06	43.06	NO	NO	NO	NO	NO	NO	NO	NO	NA,NO	3.52
C. Metal Production	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NO	NO	NO	NO	NO	NO	NO	NO	NO	NE,NO
E. Production of Halocarbons and SF_6	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
F(a). Consumption of Halocarbons and SF_6	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	43.06	43.06	NO	NO	NO	NO	NO	NO	NO	NO	NO	3.52
G. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO

Ratio of Potential/Actual Emissions from Consumption of Halocarbons and SF_6																									
Actual emissions - F(a) ($Gg CO_2$ eq.)	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	43.06	43.06	NO	NO	NO	NO	NO	NO	NO	NO	NO	3.52
Potential emissions - F(p)(8) ($Gg CO_2$ eq.)	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NO	NO	NO	NO	NO	NO	NO	NO	NO	NE
Potential/Actual emissions ratio	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NE	NE	NO	NO	NO	NO	NO	NO	NO	NO	NO	NE

(1) In accordance with the UNFCCC reporting guidelines, HFC and PFC emissions should be reported for each relevant chemical. However, if it is not possible to report values for each chemical (i.e. mixtures, confidential data, lack of disaggregation), these columns could be used for reporting aggregate figures for HFCs and PFCs, respectively. Note that the unit used for these columns is Gg instead of Gg.

(2) Note that the units used in this table differ from those used in the rest of the Sectoral report tables, i.e. instead of *Gg*.

(3) ODS: ozone-depleting substances

(4) Potential emissions of each chemical of halocarbons and SF_6 estimated using Tier 1a or Tier 1b of the IPCC Guidelines (Volume 3. Reference Manual, pp. 2.47-2.50). Where potential emission estimates are available in a disaggregated manner for the source categories F.1 to F.9, these should be reported in the NIR and a reference should be provided in the documentation box. Use table Summary 3 to indicate whether Tier 1a or Tier 1b was used.

(5) Production refers to production of new chemicals. Recycled substances could be included here, but avoid double counting of emissions. An indication as to whether recycled substances are included should be provided in the documentation box to this table.

(6) Relevant only for Tier 1b.

(7) Total actual emissions equal the sum of the actual emissions of each halocarbon and SF_6 from the source categories 2.C, 2.E, 2.F and 2.G as reported in sheet 1 of this table multiplied by the corresponding GWP values.

(8) Potential emissions of each halocarbon and SF_6 taken from row F(p) multiplied by the corresponding GWP values.

Note: As stated in the UNFCCC reporting guidelines, Parties should report actual emissions of HFCs, PFCs and SF_6 where data are available, providing disaggregated data by chemical and source category in units of mass and in CO_2 equivalent. Parties reporting actual emissions should also report potential emissions for the sources where the concept of potential emissions applies, for reasons of transparency and comparability. Gases with GWP values not yet agreed upon by the COP should be reported in Table 9 (b).

Documentation box:
• Parties should provide detailed explanations on the industrial processes sector in Chapter 4: Industrial processes (CRF sector 2) of the NIR. Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.
• If estimates are reported under "2.G Other", use this documentation box to provide information regarding activities covered under this category and to provide reference to the section in the NIR where background information can be found.
2.C.3 Aluminium Production:In Luxembourg the production of aluminium products is made out of aluminium scrap (i.e. aluminium products are made of recycled aluminium).
2.C.4.1 Aluminium Foundries:In Luxembourg the production of aluminium products is made out of aluminium scrap (i.e. aluminium products are made of recycled aluminium).
2.E Production of Halocarbons and SF6:Estimates of F-gases emissions are coming from a study realized end 1999 that for the first time tried to evaluate the actual consumption of F-gases in the country following a top-down approach. This study has not been updated since.
2.F Consumption of Halocarbons and SF6:Estimates of F-gases emissions are coming from a study realized end 1999 that for the first time tried to evaluate the actual consumption of F-gases in the country following a top-down approach. This study has not been updated since. From that study, F-gases have been distributed amongst 5 CRF categories: 2.F.1, 2.F.2, 2.F.4, 2.F.8 and 2.F.9. It has also been decided to use the 1990 F-gases estimates for the years 1990-1999 and the 2000 estimates for the subsequent years.
2.F.9 noise reduction windows;(1) The value recorded relate only to SF6 consumption and the GWP used is 23900. (2) Estimates of F-gases emissions are coming from a study realized end 1999 that for the first time tried to evaluate the actual consumption of F-gases in the country following a top-down approach. This study has not been updated since.
2.F.P1 Production:The study realized end 1999 that for the first time tried to evaluate the actual consumption of F-gases in the country (see note for 2.F) did not focus on potential emissions.
2.F.P2 Import:.The study realized end 1999 that for the first time tried to evaluate the actual consumption of F-gases in the country (see note for 2.F) did not focus on potential emissions.
2.F.P3 Export:.The study realized end 1999 that for the first time tried to evaluate the actual consumption of F-gases in the country (see note for 2.F) did not focus on potential emissions.
2.F.P4 Destroyed amount:The study realized end 1999 that for the first time tried to evaluate the actual consumption of F-gases in the country (see note for 2.F) did not focus on potential emissions.
2.G Other non-specified:This activity results only in NH3 emissions.

TABLE 2(II).C SECTORAL BACKGROUND DATA FOR INDUSTRIAL PROCESSES
Metal Production
(Sheet 1 of 1)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA		IMPLIED EMISSION FACTORS[2]			EMISSIONS					
			CF_4	C_2F_6	SF_6	CF_4		C_2F_6		SF_6	
						Emissions[3]	Recovery[4]	Emissions[3]	Recovery[4]	Emissions[3]	Recovery[4]
	Description[1]	(t)	(kg/t)			(t)					
C. PFCs and SF_6 from Metal Production						NO	NO	NO	NO	NE,NO	NO
PFCs from Aluminium Production	aluminium production from aluminium scrap	NE	NO	NO		NO	NO	NO	NO		
SF_6 used in Aluminium and Magnesium Foundries										NO	NO
Aluminium Foundries	aluminium production in foundries	NO			NO					NO	NO
Magnesium Foundries	magnesium production	NO			NO					NO	NO

(1) Specify the activity data used as shown in the examples in parentheses.

(2) The implied emission factors (IEFs) are estimated on the basis of gross emissions as follows: IEF = (emissions + amounts recovered, oxidized, destroyed or transformed) / activity data.

(3) Final emissions (after subtracting the amounts of emission recovery, oxidation, destruction or transformation).

(4) Amounts of emission recovery, oxidation, destruction or transformation.

Documentation box:

• Parties should provide detailed explanations on the industrial processes sector in Chapter 4: Industrial processes (CRF sector 2) of the NIR. Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

• Where only aggregate figures for activity data are provided, e.g. due to reasons of confidentiality (see footnote 1 to table 2(II)), a note indicating this should be provided in this documentation box.

• Where applying Tier 1b and country-specific methods, specify any other relevant activity data used in this documentation box, including a reference to the section of the NIR where more detailed information can be found.

• Use this documentation box for providing clarification on emission recovery, oxidation, destruction and/or transformation, and provide a reference to the section of the NIR where more detailed information can be found

2.C.3 Aluminium Production:In Luxembourg the production of aluminium products is made out of aluminium scrap (i.e. aluminium products are made of recycled aluminium).

2.C.4.1 Aluminium Foundries:In Luxembourg the production of aluminium products is made out of aluminium scrap (i.e. aluminium products are made of recycled aluminium).

TABLE 2(II).E SECTORAL BACKGROUND DATA FOR INDUSTRIAL PROCESSES
Production of Halocarbons and SF6
(Sheet 1 of 1)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA		IMPLIED EMISSION FACTORS (2)	EMISSIONS	
				Emissions(3)	Recovery(4)
	Description (1)	(t)	(kg/t)	(t)	
E. Production of Halocarbons and SF 6					
1. By-product Emissions					
Production of HCFC-22					
HFC-23	Production of HCFC-22	NO	NO	NO	NO
Other *(specify activity and chemical)*					
Other non-specified					
2. Fugitive Emissions *(specify activity and chemical)*					
HFCs				NO	
HFC-23				NO	
HFC-32				NO	
HFC-41				NO	
HFC-43-10-mee				NO	
HFC-125				NO	
HFC-134				NO	
HFC-134a				NO	
HFC-152a				NO	
HFC-143				NO	
HFC-143a				NO	
HFC-227ea				NO	
HFC-236fa				NO	
HFC-245ca				NO	
Unspecified mix of HFCs				NO	
PFCs				NO	
CF4				NO	
C2F6				NO	
C3F8				NO	
C4F10				NO	
c-C4F8				NO	
C5F12				NO	
C6F14				NO	
Unspecified mix of PFCs				NO	
SF6				NO	
Other non-specified					
HFCs				NO	
HFC-23				NO	
HFC-32				NO	
HFC-41				NO	
HFC-43-10-mee				NO	
HFC-125				NO	
HFC-134				NO	
HFC-134a				NO	
HFC-152a				NO	
HFC-143				NO	
HFC-143a				NO	
HFC-227ea				NO	
HFC-236fa				NO	
HFC-245ca				NO	
Unspecified mix of HFCs				NO	
PFCs				NO	
CF4				NO	
C2F6				NO	
C3F8				NO	
C4F10				NO	
c-C4F8				NO	
C5F12				NO	
C6F14				NO	
Unspecified mix of PFCs				NO	
SF6				NO	
3. Other *(specify activity and chemical)*					
HFCs				NO	
HFC-23				NO	
HFC-32				NO	
HFC-41				NO	
HFC-43-10-mee				NO	
HFC-125				NO	
HFC-134				NO	
HFC-134a				NO	
HFC-152a				NO	
HFC-143				NO	
HFC-143a				NO	
HFC-227ea				NO	
HFC-236fa				NO	
HFC-245ca				NO	
Unspecified mix of HFCs				NO	
PFCs				NO	
CF4				NO	
C2F6				NO	
C3F8				NO	
C4F10				NO	
c-C4F8				NO	
C5F12				NO	
C6F14				NO	
Unspecified mix of PFCs				NO	
SF6				NO	
Other non-specified					
HFCs				NO	
HFC-23				NO	
HFC-32				NO	
HFC-41				NO	
HFC-43-10-mee				NO	
HFC-125				NO	
HFC-134				NO	
HFC-134a				NO	
HFC-152a				NO	
HFC-143				NO	
HFC-143a				NO	
HFC-227ea				NO	
HFC-236fa				NO	
HFC-245ca				NO	
Unspecified mix of HFCs				NO	
PFCs				NO	
CF4				NO	
C2F6				NO	
C3F8				NO	
C4F10				NO	
c-C4F8				NO	
C5F12				NO	
C6F14				NO	
Unspecified mix of PFCs				NO	
SF6				NO	

(1) Specify the activity data used as shown in the examples within parentheses.
(2) The implied emission factors (IEFs) are estimated on the basis of gross emissions as follows: IEF = (emissions + amounts recovered, oxidized, destroyed or transformed) / activity data.
(3) Final emissions are to be reported (after subtracting the amounts of emission recovery, oxidation, destruction or transformation).
(4) Amounts of emission recovery, oxidation, destruction or transformation.

Documentation box:
• Parties should provide detailed explanations on the industrial processes sector in Chapter 4: Industrial processes (CRF sector 2) in the NIR. Use this documentation box to provide references to relevant sections in the NIR if any additional information above further details are needed to understand the content of this table
• Where only aggregate figures for activity data are provided, e.g. due to reasons of confidentiality (see footnote 1 to table 2(II)), a note indicating this should be provided in this documentation box.

• Where applying Tier 2 and country-specific methods, specify any other relevant activity data used in this documentation box, including a reference to the section of the NIR where more detailed information can be found.

• Use this documentation box for providing clarification on emission recovery, oxidation, destruction and/or transformation, and provide a reference to the section of the NIR where more detailed information can be found. .

2.E Production of Halocarbons and SF6:Estimates of F-gases emissions are coming from a study realized end 1999 that for the first time tried to evaluate the actual consumption of F-gases in the country following a top-down approach. This study has not been updated since.

TABLE 2(II).F SECTORAL BACKGROUND DATA FOR INDUSTRIAL PROCESSES
Consumption of Halocarbons and SF_6
(Sheet 1 of 2)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA *Amount of fluid*			IMPLIED EMISSION FACTORS			EMISSIONS		
	Filled into new manufactured products	In operating systems (average annual stocks)	Remaining in products at decommissioning	Product manufacturing factor	Product life factor	Disposal loss factor	From manufacturing	From stocks	From disposal
	(t)			(% per annum)			(t)		
1. Refrigeration[1]									
Air Conditioning Equipment									
Domestic Refrigeration *(please specify chemical)* [1]									
Commercial Refrigeration									
Transport Refrigeration									
Industrial Refrigeration									
Stationary Air-Conditioning									
Mobile Air-Conditioning									
2. Foam Blowing[1]									
Hard Foam									
Soft Foam									

[1] Under each of the listed source categories, specify the chemical consumed (*e.g. HFC-32)* as indicated under category Domestic Refrigeration; use one row per chemical.

Note: This table provides for reporting of the activity data and emission factors used to calculate actual emissions from consumption of halocarbons and SF_6 using the "bottom-up approach" (based on the total stock of equipment and estimated emission rates from this equipment). Some Parties may prefer to estimate actual emissions following the alternative "top-down approach" (based on annual sales of equipment and/or gas). Those Parties should indicate the activity data used and provide any other information needed to understand the content of the table in the documentation box at the end of sheet 2 to this table, including a reference to the section of the NIR where further details can be found. Those Parties should provide the following data in the NIR:

1. the amount of fluid used to fill new products,
2. the amount of fluid used to service existing products,
3. the amount of fluid originally used to fill retiring products (the total nameplate capacity of retiring products),
4. the product lifetime, and
5. the growth rate of product sales, if this has been used to calculate the amount of fluid originally used to fill retiring products.

In the NIR, Parties may provide alternative formats for reporting equivalent information with a similar level of detail.

TABLE 2(II).F SECTORAL BACKGROUND DATA FOR INDUSTRIAL PROCESSES
Consumption of Halocarbons and SF_6
(Sheet 2 of 2)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA *Amount of fluid*			IMPLIED EMISSION FACTORS			EMISSIONS		
	Filled into new manufactured products	In operating systems (average annual stocks)	Remaining in products at decommissioning	Product manufacturing factor	Product life factor	Disposal loss factor	From manufacturing	From stocks	From disposal
	(t)			(% per annum)			(t)		
3. Fire Extinguishers *(please specify chemical)* [1]									
4. Aerosols [1]									
Metered Dose Inhalers									
Other									
5. Solvents [1]									
6. Other applications using ODS[2] substitutes [1]									
7. Semiconductor Manufacture [1]									
8. Electrical Equipment[1]									
9. Other *(please specify)* [1]									
noise reduction windows									

[1] Under each of the listed source categories, specify the chemical consumed (e.g. HFC-32) as indicated under category Fire Extinguishers; use one row per chemical.

[2] ODS: ozone-depleting substances.

Documentation box:

• Parties should provide detailed explanations on the industrial processes sector in Chapter 4: Industrial processes (CRF sector 2) of the NIR. Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

• Where only aggregate figures for activity data are provided, e.g. due to reasons of confidentiality (see footnote 1 to table 2(II)), a note indicating this should be provided in this documentation box.

• With regard to data on the amounts of fluid that remained in retired products at decommissioning, use this documentation box to provide a reference to the section of the NIR where information on the amount of the chemical recovered (recovery efficiency) and other relevant information used in the emission estimation can be found.

• Parties that estimate their actual emissions following the alternative top-down approach might not be able to report emissions using this table. As indicated in the note to sheet 1 of this table, Parties should in these cases provide, in the NIR, alternative formats for reporting equivalent information wi

2.F.9 noise reduction windows:(1) The value recorded relate only to SF6 consumption and the GWP used is 23900. (2) Estimates of F-gases emissions are coming from a study realized end 1999 that for the first time tried to evaluate the actual consumption of F-gases in the country following a top-down approach. This study has not been updated since.

TABLE 3 SECTORAL REPORT FOR SOLVENT AND OTHER PRODUCT USE
(Sheet 1 of 1)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2	N_2O	NMVOC
	(Gg)		
Total Solvent and Other Product Use	9.22	NE,NO	3.05
A. Paint Application	4.28		1.37
B. Degreasing and Dry Cleaning	0.84	NE	0.27
C. Chemical Products, Manufacture and Processing	IE		0.09
D. Other	4.10	NE,NO	1.32
1. Use of N_2O for Anaesthesia		NE	
2. N_2O from Fire Extinguishers		NE	
3. N_2O from Aerosol Cans		NE	
4. Other Use of N_2O		NO	
5. Other *(as specified in table 3.A-D)*	4.10	NE	1.32
other use of solvent and related activities	4.10	NE	1.32

Note: The quantity of carbon released in the form of NMVOCs should be accounted for in both the NMVOC and the CO_2 columns. The quantites of NMVOCs should be converted into CO_2 equivalent emissions before being added to the CO_2 amounts in the CO_2 column.

Documentation box:

• Parties should provide detailed explanations about the Solvent and Other Product Use sector in Chapter 5: Solvent and Other Product Use (CRF sector 3) of the NIR. Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

• The IPCC Guidelines do not provide methodologies for the calculation of emissions of N_2O from Solvent and Other Product Use. If reporting such data, Parties should provide in the NIR additional information (activity data and emission factors) used to derive these estimates, and provide in this documentation box a reference to the section of the NIR where this information can be found.

3.B Degreasing and Dry Cleaning:N2O estimates: since there are no methodologies in the IPCC Guidelines for calculating the emissions of this gas and since we do not have a national methodology to do

so, we were not able to estimate N2O emissions for solvent and other product use.

3.C Chemical Products, Manufacture and Processing:Chemical products data are not yet recorded. However, we have an estimate of the NMVOC generated by the chemical activities.

3.D Other:N2O estimates: since there are no methodologies in the IPCC Guidelines for calculating the emissions of this gas and since we do not have a national methodology to do

so, we were not able to estimate N2O emissions for solvent and other product use.

3.D.1 Use of N2O for Anaesthesia:Activity data for anaesthesia is not known with enough precision but is expected to be very low (i.e.close to zero) in Luxembourg. NE could therefore be replaced by a zero value when showing data in Gg at two digits

level. However, since "0 is not an option", and NO would be somewhat misleading, we have kept the notation key NE.

3.D.2 Fire Extinguishers:Activity data for fire extinguishers is not known with enough precision but is expected to be very low (i.e.close to zero) in Luxembourg. NE could therefore be replaced by a zero value when showing data in Gg at two digits level. However, since "0 is not an option", and NO would be somewhat misleading, we have kept the notation key NE.

3.D.3 N2O from Aerosol Cans:Activity data for aerosol cans is not known with enough precision but is expected to be very low (i.e.close to zero) in Luxembourg. NE could therefore be replaced by a zero value when showing data in Gg at two digits level. However, since "0 is not an option", and NO would be somewhat misleading, we have kept the notation key NE.

3.D.5 other use of solvent and related activities:(1) CO2 emissions: these emissions relates to both the chemical activities (CRF category 3.C) and the other use of solvents and related activities (CRF category 3.D.5). (2) NMVOC emissions: these emissions relate only to the other use of solvents and related activities (CRF category 3.D.5). Those NMVOC emissions from chemical activities are recorded in table 3.C.

TABLE 3.A-D SECTORAL BACKGROUND DATA FOR SOLVENT AND OTHER PRODUCT USE
(Sheet 1 of 1)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA		IMPLIED EMISSION FACTORS [1]	
	Description	(kt)	CO_2 (t/t)	N_2O (t/t)
A. Paint Application	car repairing, construction & buildings, domestic use, coil caoting, boat buiding, other industrial and non-industrial paint application	4.65	0.92	
B. Degreasing and Dry Cleaning	metal degreasing, dry cleaning	0.29	2.90	NE
C. Chemical Products, Manufacture and Processing	polyvinyle chloride processing, rubber processing, paints manufacturing	NE	IE	
D. Other				
1. Use of N_2O for Anaesthesia	use of N2O for anaesthesia	NE		NE
2. N_2O from Fire Extinguishers	N2O from fire extinguishers	NE		NE
3. N_2O from Aerosol Cans	N2O from aerosol cans	NE		NE
4. Other Use of N_2O	other use of N2O	NO		NO
5. Other *(please specify)* [2]				
other use of solvent and related activities	printing, glues & adhesives applications, wood preservation, vehicles underseal treatment & conservation, domestic solvent use	NE	NE	NE

[1] The implied emission factors will not be calculated until the corresponding emission estimates are entered directly into table 3.

[2] Some probable sources to be reported under 3.D Other are listed in this table. Complement the list with other relevant sources, as appropriate.

Documentation box:
Parties should provide detailed explanations on the Solvent and Other Product Use sector in Chapter 5: Solvent and Other Product Use (CRF sector 3) of the NIR. Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

3.B Degreasing and Dry Cleaning:N2O estimates: since there are no methodologies in the IPCC Guidelines for calculating the emissions of this gas and since we do not have a national methodology to do so, we were not able to estimate N2O emissions for solvent and other product use.

3.C Chemical Products, Manufacture and Processing:Chemical products data are not yet recorded. However, we have an estimate of the NMVOC generated by the chemical activities.

3.D Other:N2O estimates: since there are no methodologies in the IPCC Guidelines for calculating the emissions of this gas and since we do not have a national methodology to do so, we were not able to estimate N2O emissions for solvent and other product use.

3.D.1 Use of N2O for Anaesthesia:Activity data for anaesthesia is not known with enough precision but is expected to be very low (i.e.close to zero) in Luxembourg. NE could therefore be replaced by a zero value when showing data in Gg at two digits level. However, since "0 is not an option", and NO would be somewhat misleading, we have kept the notation key NE.

3.D.2 Fire Extinguishers:Activity data for fire extinguishers is not known with enough precision but is expected to be very low (i.e.close to zero) in Luxembourg. NE could therefore be replaced by a zero value when showing data in Gg at two digits level. However, since "0 is not an option", and NO would be somewhat misleading, we have kept the notation key NE.

3.D.3 N2O from Aerosol Cans:Activity data for aerosol cans is not known with enough precision but is expected to be very low (i.e.close to zero) in Luxembourg. NE could therefore be replaced by a zero value when showing data in Gg at two digits level. However, since "0 is not an option", and NO would be somewhat misleading, we have kept the notation key NE.

3.D.5 other use of solvent and related activities:(1) CO2 emissions: these emissions relates to both the chemical activities (CRF category 3.C) and the other use of solvents and related activities (CRF category 3.D.5). (2) NMVOC emissions: these emissions relate only to the other use of solvents and related activities (CRF category 3.D.5). Those NMVOC emissions from chemical activities are recorded in table 3.C.

TABLE 4 SECTORAL REPORT FOR AGRICULTURE
(Sheet 1 of 2)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CH_4	N_2O	NO_x	CO	NMVOC
	(Gg)				
Total Agriculture	**11.12**	0.47	NA,NO	NA,NO	0.16
A. Enteric Fermentation	7.52				
1. Cattle [(1)]	7.24				
Option A:					
Dairy Cattle	IE				
Non-Dairy Cattle	IE				
Option B:					
Mature Dairy Cattle	4.86				
Mature Non-Dairy Cattle	2.09				
Young Cattle	0.29				
2. Buffalo	NO				
3. Sheep	0.08				
4. Goats	0.01				
5. Camels and Llamas	NO				
6. Horses	0.07				
7. Mules and Asses	NE				
8. Swine	0.13				
9. Poultry	0.01				
10. Other *(as specified in table 4.A)*	NO				
Other non-specified	NO				
B. Manure Management	3.59	NE,NO			NE,NO
1. Cattle [(1)]	1.18				
Option A:					
Dairy Cattle	IE				
Non-Dairy Cattle	IE				
Option B:					
Mature Dairy Cattle	0.84				
Mature Non-Dairy Cattle	0.29				
Young Cattle	0.04				
2. Buffalo	NO				
3. Sheep	0.00				
4. Goats	0.00				
5. Camels and Llamas	NO				
6. Horses	0.01				
7. Mules and Asses	NE				
8. Swine	2.28				
9. Poultry	0.13				
10. Other livestock *(as specified in table 4.B(a))*	NO				
Other non-specified	NO				

Note: All footnotes for this table are given at the end of the table on sheet 2.

TABLE 4 SECTORAL REPORT FOR AGRICULTURE
(Sheet 2 of 2)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CH_4	N_2O	NO_x	CO	NMVOC
	(Gg)				
B. Manure Management (continued)					
11. Anaerobic Lagoons		NE			NE
12. Liquid Systems		NE			NE
13. Solid Storage and Dry Lot		NE			NE
14. Other AWMS		NO			NO
C. Rice Cultivation	NO				**NO**
1. Irrigated	NO				NO
2. Rainfed	NO				NO
3. Deep Water	NO				NO
4. Other *(as specified in table 4.C)*	NO				NO
Other non-specified	NO				NO
D. Agricultural Soils[2]	NE	0.47			0.16
1. Direct Soil Emissions	NE	0.47			0.16
2. Pasture, Range and Paddock Manure [3]		NE			NE
3. Indirect Emissions	NE	NE			NE
4. Other *(as specified in table 4.D)*	NE	NE			NE
Other non-specified	NE	NE			NE
E. Prescribed Burning of Savannas	NO	NO	NO	NO	NO
F. Field Burning of Agricultural Residues	NO	NO	NO	NO	NO
1 . Cereals	NO	NO	NO	NO	NO
2. Pulses	NO	NO	NO	NO	NO
3 . Tubers and Roots	NO	NO	NO	NO	NO
4 . Sugar Cane	NO	NO	NO	NO	NO
5 . Other *(as specified in table 4.F)*	NO	NO	NO	NO	NO
Other crops	NO	NO	NO	NO	NO
G. Other *(please specify)*	**NO**	**NO**	**NO**	**NO**	**NO**
Other non-specified	NO	NO	NO	NO	NO

(1) The sum for cattle would be calculated on the basis of entries made under either option A (dairy and non-dairy cattle) or option B (mature dairy cattle, mature non-dairy cattle and young cattle).

(2) See footnote 4 to Summary 1.A of this common reporting format. Parties which choose to report CO_2 emissions and removals from agricultural soils under 4.D Agricultural Soils of the sector Agriculture should report the amount (in Gg) of these emissions or removals in table Summary 1.A of the CRF. References to additional information (activity data, emissions factors) reported in the NIR should be provided in the documentation box to table 4.D. In line with the corresponding table in the IPCC Guidelines (i.e. IPCC Sectoral Report for Agriculture), this table does not include provisions for reporting CO_2 estimates.

(3) Direct N_2O emissions from pasture, range and paddock manure are to be reported in the "4.D Agricultural Soils" category. All other N_2O emissions from animal manure are to be reported in the "4.B Manure Management" category. See also chapter 4.4 of the IPCC good practice guidance report.

Note: The IPCC Guidelines do not provide methodologies for the calculation of CH_4 emissions and CH_4 and N_2O removals from agricultural soils, or CO_2 emissions from prescribed burning of savannas and field burning of agricultural residues. Parties that have estimated such emissions should provide, in the NIR, additional information (activity data and emission factors) used to derive these estimates and include a reference to the section of the NIR in the documentation box of the corresponding Sectoral background data tables.

Documentation box:
• Parties should provide detailed explanations on the agriculture sector in Chapter 6: Agriculture (CRF sector 4) of the NIR. Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.
• If estimates are reported under "4.G Other", use this documentation box to provide information regarding activities covered under this category and to provide reference to the section in the NIR where background information can be found.
4.A Mature Non-Dairy Cattle:This category covers breast-feeding cattle, non-dairy female cattle and male cattle.
4.A Young Cattle:This category covers calves and growing heifers.
4.A Buffalo:No regular presence of buffalos in Luxembourg.
4.A Goats:The number of goats is recorded in agricultural statistics since 2000 only.
4.A Camels and Llamas:No regular presence of camels and llamas in Luxembourg.
4.A Mules and Asses:The number of mules and asses is not recorded in agricultural statistics.
4.B Manure Management:The nitrogen excretion per AWMS cannot be calculated since the nitogen excretion per head of animal is not yet estimated for Luxembourg. The default factors suggested for Western Europe in the IPCC Guidelines (table 4-20) have to be further investigated to decide whether or not they might be applied to Luxembourg's situation as regards manure management of animal
Additional information: the allocation of AWMS for dry lot is included in solid storage. The MCF are coming from table 4-8 of the IPCC Guidelines, Volume 3. Reference Manual.
4.B Mature Non-Dairy Cattle:This category covers breast-feeding cattle, non-dairy female cattle and male cattle.
4.B Young Cattle:This category covers calves and growing heifers.
4.B Buffalo:No regular presence of buffalos in Luxembourg.
4.B Goats:The number of goats is recorded in agricultural statistics since 2000 only.
4.B Camels and Llamas:No regular presence of camels and llamas in Luxembourg.
4.B Mules and Asses:The number of mules and asses is not recorded in agricultural statistics.
4.C Rice Cultivation:No rice cultivation in Luxembourg.
4.E Prescribed Burning of Savannas:No savannas in Luxembourg.
4.F Field Burning of Agricultural Residues:Field burning is not an usual practice in Luxembourg. It might only happen occasionally.
4.F.5 Other crops:Data relates to other crops such as colza, clovers, lucernes, beets and other fodder plants.

TABLE 4.A SECTORAL BACKGROUND DATA FOR AGRICULTURE
Enteric Fermentation
(Sheet 1 of 1)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA AND OTHER RELATED INFORMATION			IMPLIED EMISSION FACTORS [3]
	Population size [1] (1000s)	Average gross energy intake (GE) (MJ/head/day)	Average CH_4 conversion rate (Y_m) [2] (%)	CH_4 (kg CH_4/head/yr)
1. Cattle	186.73			38.77
Option A:				
Dairy Cattle [4]	IE	IE	IE	IE
Non-Dairy Cattle	IE	IE	IE	IE
Option B:				
Mature Dairy Cattle	39.88	309.50	6.00	121.82
Mature Non-Dairy Cattle	34.70	153.22	6.00	60.30
Young Cattle	112.14	6.51	6.00	2.57
2. Buffalo	NO	NA	NA	NO
3. Sheep	9.74	20.00	6.00	7.87
4. Goats	2.01	14.00	5.00	4.59
5. Camels and Llamas	NO	NA	NA	NO
6. Horses	3.69	110.00	2.50	18.04
7. Mules and Asses	NE	60.00	2.50	NE
8. Swine	84.61	38.00	0.60	1.50
9. Poultry	74.46	10.00	0.10	0.07
10. Other *(please specify)*				
Other non-specified	NO	NA	NA	NO

[1] Parties are encouraged to provide detailed livestock population data by animal type and region, if available, in the NIR, and provide in the documentation box below a reference to the relevant section. Parties should use the same animal population statistics to estimate CH4 emissions from enteric fermentation, CH4 and N2O from manure management, N2O direct emissions from soil and N2O emissions associated with manure production, as well as emissions from the use of manure as fuel, and sewage-related emissions reported in the Waste sector.

[2] Y_m refers to the fraction of gross energy in feed converted to methane and should be given in per cent in this table.

[3] The implied emission factors will not be calculated until the corresponding emission estimates are entered directly into Table 4.

[4] Including data on dairy heifers, if available.

Documentation box:

• Parties should provide detailed explanations on the Agriculture sector in Chapter 6: Agriculture (CRF sector 4) of the NIR. Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

• Indicate in this documentation box whether the activity data used are one-year estimates or a three-year averages.

• Provide a reference to the relevant section in the NIR, in particular with regard to:

(a) disaggregation of livestock population (e.g. according to the classification recommended in the IPCC good practice guidance), including information on whether these data are one-year estimates or three-year

(b) parameters relevant to the application of IPCC good practice guidance.

4.A Mature Non-Dairy Cattle:This category covers breast-feeding cattle, non-dairy female cattle and male cattle.

4.A Young Cattle:This category covers calves and growing heifers.

4.A Buffalo:No regular presence of buffalos in Luxembourg.

4.A Goats:The number of goats is recorded in agricultural statistics since 2000 only.

4.A Camels and Llamas:No regular presence of camels and llamas in Luxembourg.

4.A Mules and Asses:The number of mules and asses is not recorded in agricultural statistics.

Additional information (only for those livestock types for which Tier 2 was used) [a]

Disaggregated list of animals [b]		Dairy Cattle	Non-Dairy Cattle	Mature Dairy Cattle	Mature Non-Dairy Cattle	Young Cattle	Buffalo	Sheep	Goats	Camels and Llamas	Horses	Mules and Asses	Swine	Poultry	Other *(specify)*	Other non-specified
Indicators:																
Weight	(kg)	IE	IE	650.00	705.00	340.00	NA	45.00	40.00	NA	600.00	300.00	100.00	1.10		NA
Feeding situation [c]				stall/pasture	stall/pasture	stall/pasture	NA	stall/pasture	stall/pasture	NA	stall/pasture	stall/pasture	stall/pasture	stall/pasture		NA
Milk yield	(kg/day)	IE	IE	18.44	NA	NA	NA	NA	NE	NA	NA	NA	NA	NA		NA
Work	(h/day)	IE	IE	NO	NE	NE	NA	NA	NA	NA	NE	NE	NA	NA		NA
Pregnant	(%)	IE	IE	NE	NE	NE	NA	NE	NE	NA	NE	NE	NE	NE		NA
Digestibility of feed	(%)	IE	IE	66.00	NE	NE	NA	NE	NE	NA	NE	NE	NE	NE		NA

[a] See also Tables A-1 and A-2 of the IPCC Guidelines (Volume 3. Reference Manual, pp. 4.31-4.34). These data are relevant if Parties do not have data on average feed intake.

[b] Disaggregate to the split actually used. Add columns to the table if necessary.

[c] Specify feeding situation as pasture, stall fed, confined, open range, etc.

TABLE 4.B(a) SECTORAL BACKGROUND DATA FOR AGRICULTURE
CH_4 Emissions from Manure Management
(Sheet 1 of 2)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA AND OTHER RELATED INFORMATION							IMPLIED EMISSION FACTORS [4]
	Population size (1000s)	Allocation by climate region [1] (%)			Typical animal mass (average) (kg)	VS[2] daily excretion (average) (kg dm/head/day)	CH_4 producing potential (Bo)[2] (average) (m^3 CH_4/kg VS)	CH_4 (kg CH_4/head/yr)
		Cool	Temperate	Warm				
1. Cattle	186.73							6.30
Option A:								
Dairy Cattle [3]	IE	IE	IE	IE	IE	IE	IE	IE
Non-Dairy Cattle	IE	IE	IE	IE	IE	IE	IE	IE
Option B:								
Mature Dairy Cattle	39.88	100.00	0.00	0.00	650.00	5.20	0.20	21.15
Mature Non-Dairy Cattle	34.70	100.00	0.00	0.00	705.00	2.59	0.19	8.39
Young Cattle	112.14	100.00	0.00	0.00	340.00	0.10	0.20	0.37
2. Buffalo	NO	NA	NA	NA	NA	NA	NA	NO
3. Sheep	9.74	100.00	0.00	0.00	45.00	0.30	0.20	0.16
4. Goats	2.01	100.00	0.00	0.00	40.00	0.20	0.20	0.10
5. Camels and Llamas	NO	NA	NA	NA	NA	NA	NA	NO
6. Horses	3.69	100.00	0.00	0.00	600.00	1.90	0.30	1.57
7. Mules and Asses	NE	100.00	NE	NE	300.00	1.10	0.30	NE
8. Swine	84.61	100.00	0.00	0.00	100.00	0.70	0.50	26.92
9. Poultry	74.46	100.00	0.00	0.00	1.10	0.20	0.30	1.77
10. Other livestock *(please specify)*								
Other non-specified	NO	100.00	0.00	0.00	NA	NA	NA	NO

[1] Climate regions are defined in terms of annual average temperature as follows: Cool = less than 15°C; Temperate = 15 - 25°C inclusive; and Warm = greater than 25°C (see table 4.2 of the IPCC Guidelines (Volume 3, Reference Manual, p. 4.8)).

[2] VS = Volatile Solids; Bo = maximum methane producing capacity for manure IPCC Guidelines (Volume 3, Reference Manual, p.4.23 and p.4.15); dm = dry matter. Provide average values for VS and Bo where original calculations were made at a more disaggregated level of these livestock categories.

[3] Including data on dairy heifers, if available

[4] The implied emission factors will not be calculated until the corresponding emission estimates are entered directly into table 4

Documentation box:

• Parties should provide detailed explanations on the Agriculture sector in Chapter 6: Agriculture (CRF sector 4) of the NIR. Use this documentation box to provide references to relevant sections of the NIR if any additional information and further details are needed to understand the content of this table.

• Indicate in this documentation box whether the activity data used are one-year estimates or three-year averages.

• Provide a reference to the relevant section in the NIR, in particular with regard to:

(a) disaggregation of livestock population (e.g. according to the classification recommended in the IPCC good practice guidance), including information on whether these data are one-year estimates or three-year averages.
(b) parameters relevant to the application of IPCC good practice guidance;
(c) information on how the MCFs are derived, if relevant data could not be provided in the additional information box.

4.B Manure Management:The nitrogen excretion per AWMS cannot be calculated since the nitogen excretion per head of animal is not yet estimated for Luxembourg. The default factors suggested for Western Europe in the IPCC Guidelines (table 4-20) have to be further investigated to decide whether or not they might be applied to Luxembourg's situation as regards manure management of animal

Additional information: the allocation of AWMS for dry lot is included in solid storage. The MCF are coming from table 4-8 of the IPCC Guidelines, Volume 3. Reference Manual.

4.B Mature Non-Dairy Cattle:This category covers breast-feeding cattle, non-dairy female cattle and male cattle.

4.B Young Cattle:This category covers calves and growing heifers.

4.B Buffalo:No regular presence of buffalos in Luxembourg.

4.B Goats:The number of goats is recorded in agricultural statistics since 2000 only.

4.B Camels and Llamas:No regular presence of camels and llamas in Luxembourg.

4.B Mules and Asses:The number of mules and asses is not recorded in agricultural statistics.

TABLE 4.B(a) SECTORAL BACKGROUND DATA FOR AGRICULTURE
CH_4 Emissions from Manure Management
(Sheet 2 of 2)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

Additional information (for Tier 2)[a]

Animal category	Indicator	Climate region	Animal waste management system						
			Anaerobic lagoon	Liquid system	Daily spread	Solid storage	Dry lot	Pasture range paddock	Other
Dairy Cattle	Allocation (%)	Cool							
		Temperate							
		Warm							
	MCF[b]	Cool							
		Temperate							
		Warm							
Non-Dairy Cattle	Allocation (%)	Cool							
		Temperate							
		Warm							
	MCF[b]	Cool							
		Temperate							
		Warm							
Mature Dairy Cattle	Allocation (%)	Cool	5.00	14.25	0.00	35.75	IE	45.00	NO
		Temperate	NA	NA	NA	NA	NA	NA	NA
		Warm	NA	NA	NA	NA	NA	NA	NA
	MCF[b]	Cool	90.00	10.00	0.10	1.00	1.00	1.00	NO
		Temperate	NA	NA	NA	NA	NA	NA	NA
		Warm	NA	NA	NA	NA	NA	NA	NA
Mature Non-Dairy Cattle	Allocation (%)	Cool	5.00	17.50	0.00	27.50	IE	50.00	NO
		Temperate	NA	NA	NA	NA	NA	NA	NA
		Warm	NA	NA	NA	NA	NA	NA	NA
	MCF[b]	Cool	90.00	10.00	0.10	1.00	1.00	1.00	NO
		Temperate	NA	NA	NA	NA	NA	NA	NA
		Warm	NA	NA	NA	NA	NA	NA	NA
Young Cattle	Allocation (%)	Cool	5.00	17.50	0.00	27.50	IE	50.00	NO
		Temperate	NA	NA	NA	NA	NA	NA	NA
		Warm	NA	NA	NA	NA	NA	NA	NA
	MCF[b]	Cool	90.00	10.00	0.10	1.00	1.00	1.00	NO
		Temperate	NA	NA	NA	NA	NA	NA	NA
		Warm	NA	NA	NA	NA	NA	NA	NA
Buffalo	Allocation (%)	Cool	NA	NA	NA	NA	NA	NA	NA
		Temperate	NA	NA	NA	NA	NA	NA	NA
		Warm	NA	NA	NA	NA	NA	NA	NA
	MCF[b]	Cool	NA	NA	NA	NA	NA	NA	NA
		Temperate	NA	NA	NA	NA	NA	NA	NA
		Warm	NA	NA	NA	NA	NA	NA	NA
Sheep	Allocation (%)	Cool	0.00	0.00	0.00	40.00	IE	60.00	NO
		Temperate	NA	NA	NA	NA	NA	NA	NA
		Warm	NA	NA	NA	NA	NA	NA	NA
	MCF[b]	Cool	90.00	10.00	0.10	1.00	1.00	1.00	NO
		Temperate	NA	NA	NA	NA	NA	NA	NA
		Warm	NA	NA	NA	NA	NA	NA	NA
Goats	Allocation (%)	Cool	0.00	0.00	0.00	40.00	IE	60.00	NO
		Temperate	NA	NA	NA	NA	NA	NA	NA
		Warm	NA	NA	NA	NA	NA	NA	NA
	MCF[b]	Cool	90.00	10.00	0.10	1.00	1.00	1.00	NO
		Temperate	NA	NA	NA	NA	NA	NA	NA
		Warm	NA	NA	NA	NA	NA	NA	NA
Camels and Llamas	Allocation (%)	Cool	NA	NA	NA	NA	NA	NA	NA
		Temperate	NA	NA	NA	NA	NA	NA	NA
		Warm	NA	NA	NA	NA	NA	NA	NA
	MCF[b]	Cool	NA	NA	NA	NA	NA	NA	NA
		Temperate	NA	NA	NA	NA	NA	NA	NA
		Warm	NA	NA	NA	NA	NA	NA	NA
Horses	Allocation (%)	Cool	0.00	0.00	0.00	40.00	IE	60.00	NO
		Temperate	NA	NA	NA	NA	NA	NA	NA
		Warm	NA	NA	NA	NA	NA	NA	NA
	MCF[b]	Cool	90.00	10.00	0.10	1.00	1.00	1.00	NO
		Temperate	NA	NA	NA	NA	NA	NA	NA
		Warm	NA	NA	NA	NA	NA	NA	NA
Mules and Asses	Allocation (%)	Cool	0.00	0.00	0.00	40.00	IE	60.00	NO
		Temperate	NA	NA	NA	NA	NA	NA	NA
		Warm	NA	NA	NA	NA	NA	NA	NA
	MCF[b]	Cool	90.00	10.00	0.10	1.00	1.00	1.00	NO
		Temperate	NA	NA	NA	NA	NA	NA	NA
		Warm	NA	NA	NA	NA	NA	NA	NA
Swine	Allocation (%)	Cool	5.00	90.00	0.00	5.00	IE	0.00	NO
		Temperate	NA	NA	NA	NA	NA	NA	NA
		Warm	NA	NA	NA	NA	NA	NA	NA
	MCF[b]	Cool	90.00	10.00	0.10	1.00	1.00	1.00	NO
		Temperate	NA	NA	NA	NA	NA	NA	NA
		Warm	NA	NA	NA	NA	NA	NA	NA
Poultry	Allocation (%)	Cool	25.00	25.00	0.00	50.00	IE	0.00	NO
		Temperate	NA	NA	NA	NA	NA	NA	NA
		Warm	NA	NA	NA	NA	NA	NA	NA
	MCF[b]	Cool	90.00	10.00	0.10	1.00	1.00	1.00	NO
		Temperate	NA	NA	NA	NA	NA	NA	NA
		Warm	NA	NA	NA	NA	NA	NA	NA
Other livestock *(please specify)*	Allocation (%)	Cool							
		Temperate							
		Warm							
	MCF[b]	Cool							
		Temperate							
		Warm							

[a] The information required in this table may not be directly applicable to country-specific methods developed for MCF calculations. In such cases, information on MCF derivation should be described in the NIR and references to the relevant sections of the NIR should be provided in the documentation box.

[b] MCF = Methane Conversion Factor (IPCC Guidelines, (Volume 3. Reference Manual, p. 4.9)). If another climate region categorization is used, replace the entries in the cells with the climate regions for which the MCFs are specified.

TABLE 4.B(b) SECTORAL BACKGROUND DATA FOR AGRICULTURE
N_2O Emissions from Manure Management
(Sheet 1 of 1)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA AND OTHER RELATED INFORMATION								IMPLIED EMISSION FACTORS [1]	
	Population size	Nitrogen excretion	Nitrogen excretion per animal waste management system (AWMS) (kg N/yr)						Emission factor per animal waste management system	
	(1000s)	(kg N/head/yr)	Anaerobic lagoon	Liquid system	Daily spread	Solid storage and dry lot	Pasture range and paddock	Other	(kg N_2O-N/kg N)	
Cattle	186.73		IE,NE	IE,NE	IE,NE	IE,NE	IE,NE	IE,NO	Anaerobic lagoon	NE
Option A:									Liquid system	NE
Dairy Cattle	IE	IE	IE	IE	IE	IE	IE	IE	Solid storage and dry lot	NE
Non-Dairy Cattle	IE	IE	IE	IE	IE	IE	IE	IE	Other AWMS	NO
Option B:										
Mature Dairy Cattle	39.88	NE	NE	NE	NE	NE	NE	NO		
Mature Non-Dairy Cattle	34.70	NE	NE	NE	NE	NE	NE	NO		
Young Cattle	112.14	NE	NE	NE	NE	NE	NE	NO		
Sheep	9.74	NE	NE	NE	NE	NE	NE	NO		
Swine	84.61	NE	NE	NE	NE	NE	NE	NO		
Poultry	74.46	NE	NE	NE	NE	NE	NE	NO		
Buffalo	NO	NA	NO	NO	NO	NO	NO	NO		
Goats	2.01	NE	NE	NE	NE	NE	NE	NO		
Camels and Liamas	NO	NA	NO	NO	NO	NO	NO	NO		
Horses	3.69	NE	NE	NE	NE	NE	NE	NO		
Mules and Asses	NE	NE	NE	NE	NE	NE	NE	NO		
Other livestock *(please specify)*										
Other non-specified	NO	NA	NO	NO	NO	NO	NO	NO		
Total per AWMS			IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NO		

[1] The implied emission factor will not be calculated until the emissions are entered directly into table

Documentation box:

• Parties should provide detailed explanations on the Agriculture sector in Chapter 6: Agriculture (CRF sector 4) of the NIR. Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

• Indicate in this documentation box whether the activity data used are one-year estimates or three-year averages.

• Provide a reference to the relevant section in the NIR, in particular with regard to:

(a) disaggregation of livestock population (e.g. according to the classification recommended in the IPCC good practice guidance), including information on whether these data are one-year estimates or three-year averages.

(b) information on other AWMS, if reported.

4.B Manure Management:The nitrogen excretion per AWMS cannot be calculated since the nitogen excretion per head of animal is not yet estimated for Luxembourg. The default factors suggested for Western Europe in the IPCC G
Additional information: the allocation of AWMS for dry lot is included in solid storage. The MCF are coming from table 4-8 of the IPCC Guidelines, Volume 3. Reference Manual.
4.B Mature Non-Dairy Cattle:This category covers breast-feeding cattle, non-dairy female cattle and male cattle.
4.B Young Cattle:This category covers calves and growing heifers.

TABLE 4.C SECTORAL BACKGROUND DATA FOR AGRICULTURE
Rice Cultivation
(Sheet 1 of 1)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES		ACTIVITY DATA AND OTHER RELATED INFORMATION			IMPLIED EMISSION FACTOR [1]	EMISSIONS
		Harvested area [2]	Organic amendments added[3]		CH_4	CH_4
		(10^9 m^2/yr)	type	(t/ha)	(g/m^2)	(Gg)
1. Irrigated						NO
Continuously Flooded		NO	(specify type)	NO	NO	NO
Intermittently Flooded	Single Aeration	NO	(specify type)	NO	NO	NO
	Multiple Aeration	NO	(specify type)	NO	NO	NO
2. Rainfed						NO
Flood Prone		NO	(specify type)	NO	NO	NO
Drought Prone		NO	(specify type)	NO	NO	NO
3. Deep Water						NO
Water Depth 50-100 cm		NO	(specify type)	NO	NO	NO
Water Depth > 100 cm		NO	(specify type)	NO	NO	NO
4. Other *(please specify)*		NO				NO
Other non-specified		NO	(specify type)	NO	NO	NO

Upland Rice[4]	NO					
Total [4]	NO					

[1] The implied emission factor implicitly takes account of all relevant corrections for continuously flooded fields without organic amendment, the correction for the organic amendments and the effect of different soil characteristics, if considered in the calculation of methane emissions.

[2] Harvested area is the cultivated area multiplied by the number of cropping seasons per yea

[3] Specify dry weight or wet weight for organic amendments in the documentation bo

[4] These rows are included to allow comparison with international statistics. Methane emissions from upland rice are assumed to be zer

Documentation box:

• Parties should provide detailed explanations on the Agriculture sector in Chapter 6: Agriculture (CRF sector 4) of the NIR. Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

• When disaggregating by more than one region within a country, and/or by growing season, provide additional information on disaggregation and related data in the NIR and provide a reference to the relevant section in the NIR.

• Where available, provide activity data and scaling factors by soil type and rice cultivar in the NIR.

4.C Rice Cultivation:No rice cultivation in Luxembourg.

TABLE 4.D SECTORAL BACKGROUND DATA FOR AGRICULTURE

Inventory 2004

Agricultural Soils

Submission 2007 v1.1

(Sheet 1 of 2)

LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA AND OTHER RELATED INFORMATION		IMPLIED EMISSION FACTORS	EMISSIONS
	Description	Value kg N/yr	kg N_2O-N/kg N [2]	N_2O (Gg)
1. Direct Soil Emissions	**N input to soils**			0.47
1. Synthetic Fertilizers	Nitrogen input from application of synthetic fertilizers	NE	NE	0.47
2. Animal Manure Applied to Soils	Nitrogen input from manure applied to soils	NE	NE	NE
3. N-fixing Crops	Nitrogen fixed by N-fixing crops	NE	NE	NE
4. Crop Residue	Nitrogen in crop residues returned to soils	NE	NE	NE
5. Cultivation of Histosols [2]	Area of cultivated organic soils (ha/yr)	NE	NE	NE
6. Other direct emissions *(please specify)*				IE
Fallows	fallows	NE	IE	IE
2. Pasture, Range and Paddock Manure	**N excretion on pasture range and paddock**	NE	NE	NE
3. Indirect Emissions				NE
1. Atmospheric Deposition	Volatized N from fertilizers, animal manures and other	NE	NE	NE
2. Nitrogen Leaching and Run-off	N from fertilizers, animal manures and other that is lost through leaching and run-off	NE	NE	NE
4. Other *(please specify)*				NE
Other non-specified	other soil emissions n.i.e.	NE	NE	NE

[1] To convert from N_2O-N to N_2O emissions, multiply by 44/28. Note that for cultivation of Histosols the unit of the IEF is kg N_2O-N/ha.

Documentation box:

• Parties should provide detailed explanations on the Agriculture sector in Chapter 6: Agriculture (CRF sector 4) of the NIR. Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

• Provide a reference to the relevant section in the NIR, in particular with regard to:

(a) Background information on CH_4 emissions from agricultural soils, if accounted for under the Agriculture sector;

(b) Disaggregated values for $Frac_{GRAZ}$ according to animal type, and for $Frac_{BURN}$ according to crop types;

(c) Full list of assumptions and fractions used.

TABLE 4.D SECTORAL BACKGROUND DATA FOR AGRICULTURE

Agricultural Soils[(1)]

(Sheet 2 of 2)

Inventory 2004

Submission 2007 v1.1

LUXEMBOURG

Additional information

Fraction [(a)]	Description	Value
$Frac_{BURN}$	Fraction of crop residue burned	NE
$Frac_{FUEL}$	Fraction of livestock N excretion in excrements burned for fuel	NE
$Frac_{GASF}$	Fraction of synthetic fertilizer N applied to soils that volatilizes as NH_3 and NOx	NE
$Frac_{GASM}$	Fraction of livestock N excretion that volatilizes as NH_3 and NOx	NE
$Frac_{GRAZ}$	Fraction of livestock N excreted and deposited onto soil during grazing	NE
$Frac_{LEACH}$	Fraction of N input to soils that is lost through leaching and run-off	NE
$Frac_{NCRBF}$	Fraction of total above-ground biomass of N-fixing crop that is N	NE
$Frac_{NCRO}$	Fraction of residue dry biomass that is N	NE
$Frac_{R}$	Fraction of total above-ground crop biomass that is removed from the field as a crop product	NE
Other fractions *(please specify)*		NE

[(a)] Use the definitions for fractions as specified in the IPCC Guidelines (Volume 3. Reference Manual, pp. 4.92-4.113) as elaborated by the IPCC good practice guidance (pp. 4.54-4.74).

TABLE 4.E SECTORAL BACKGROUND DATA FOR AGRICULTURE
Prescribed Burning of Savannas
(Sheet 1 of 1)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA AND OTHER RELATED INFORMATION					IMPLIED EMISSION FACTORS		EMISSIONS	
	Area of savanna burned (k ha/yr)	Average above-ground biomass density (t dm/ha)	Fraction of savanna burned	Biomass burned (Gg dm)	Nitrogen fraction in biomass	CH_4 (kg/t dm)	N_2O (kg/t dm)	CH_4 (Gg)	N_2O (Gg)
(specify ecological zone)								NO	NO
Other non-specified	NO	NA	NO	NO	NA	NO	NO	NO	NO

Additional information

	Living Biomass	Dead Biomass
Fraction of above-ground biomass	NA	NA
Fraction oxidized	NA	NA
Carbon fraction	NA	NA

Documentation box:
Parties should provide detailed explanations on the Agriculture sector in Chapter 6: Agriculture (CRF sector 4) of the NIR. Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

4.E Prescribed Burning of Savannas:No savannas in Luxembourg.

TABLE 4.F SECTORAL BACKGROUND DATA FOR AGRICULTURE
Field Burning of Agricultural Residues
(Sheet 1 of 1)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA AND OTHER RELATED INFORMATION								IMPLIED EMISSION FACTORS		EMISSIONS	
	Crop production (t)	Residue/ Crop ratio	Dry matter (dm) fraction of residue	Fraction burned in fields	Fraction oxidized	Total biomass burned (Gg dm)	C fraction of residue	N-C ratio in biomass residues	CH_4 (kg/t dm)	N_2O (kg/t dm)	CH_4 (Gg)	N_2O (Gg)
1. Cereals											NO	NO
Wheat	79,978.00	NE	NE	NO	NO	NO	NE	NE	NO	NO	NO	NO
Barley	52,761.00	NE	NE	NO	NO	NO	NE	NE	NO	NO	NO	NO
Maize	187,975.00	NE	NE	NO	NO	NO	NE	NE	NO	NO	NO	NO
Oats	9,458.00	NE	NE	NO	NO	NO	NE	NE	NO	NO	NO	NO
Rye	7,921.00	NE	NE	NO	NO	NO	NE	NE	NO	NO	NO	NO
Rice	NO	NA	NA	NO	NO	NO	NA	NA	NO	NO	NO	NO
Other *(please specify)*											NO	NO
Triticale, secondary and mixed cereals not indicated elsewhere	25,243.00	NE	NE	NO	NO	NO	NE	NE	NO	NO	NO	NO
2. Pulses											NO	NO
Dry bean	NO	NA	NA	NO	NO	NO	NA	NA	NO	NO	NO	NO
Peas	30.00	NE	NE	NO	NO	NO	NE	NE	NO	NO	NO	NO
Soybeans	NO	NA	NA	NO	NO	NO	NA	NA	NO	NO	NO	NO
Other *(please specify)*											NO	NO
dry vegetables cropped for their grains	1,729.00	NE	NE	NO	NO	NO	NE	NE	NO	NO	NO	NO
3 Tubers and Roots											NO	NO
Potatoes	22,244.00	NE	NE	NO	NO	NO	NE	NE	NO	NO	NO	NO
Other *(please specify)*											NO	NO
carrots and leeks	395.00	NE	NE	NO	NO	NO	NE	NE	NO	NO	NO	NO
4 Sugar Cane	NO	NA	NA	NO	NO	NO	NA	NA	NO	NO	NO	NO
5 Other *(please specify)*											NO	NO
Other crops	167,497.00	NE	NE	NO	NO	NO	NE	NE	NO	NO	NO	NO

Documentation box:

Parties should provide detailed explanations on the Agriculture sector in Chapter 6: Agriculture (CRF sector 4) of the NIR. Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

4.F.2.2 Peas:The quantity is not the quantity produced but the quantity sold.

4.F.3.2 carrots and leeks:The quantity is not the quantity produced but the quantity sold.

4.F.5 Other crops:Data relates to other crops such as colza, clovers, lucernes, beets and other fodder plants.

TABLE 5 SECTORAL REPORT FOR LAND USE, LAND-USE CHANGE AND FORESTRY
(Sheet 1 of 1)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Net CO_2 emissions/removals[1, 2]	CH_4 [2]	N_2O [2]	NO_x	CO	NMVOC
	(Gg)					
Total Land-Use Categories	**-294.93**	**NA,NE**	**0.07**	**NA,NE**	**NA,NE**	**NA,NE**
A. Forest Land	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**
1. Forest Land remaining Forest Land	NE	NE	NE	NE	NE	NE
2. Land converted to Forest Land	NE	NE	NE	NE	NE	NE
B. Cropland	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**
1. Cropland remaining Cropland	NE	NE	NE	NE	NE	NE
2. Land converted to Cropland	NE	NE	NE	NE	NE	NE
C. Grassland	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**
1. Grassland remaining Grassland	NE	NE	NE	NE	NE	NE
2. Land converted to Grassland	NE	NE	NE	NE	NE	NE
D. Wetlands	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**
1. Wetlands remaining Wetlands[3]	NE	NE	NE	NE	NE	NE
2. Land converted to Wetlands	NE	NE	NE	NE	NE	NE
E. Settlements	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**
1. Settlements remaining Settlements[3]	NE	NE	NE	NE	NE	NE
2. Land converted to Settlements	NE	NE	NE	NE	NE	NE
F. Other Land	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**
1. Other Land remaining Other Land[4]						
2. Land converted to Other Land	NE	NE	NE	NE	NE	NE
G. Other *(please specify)* [5]	**-294.93**	**NA,NE**	**0.07**	**NA,NE**	**NA,NE**	**NA,NE**
Harvested Wood Products [6]	NE	NE	NE	NE	NE	NE
Carbon Intake by Temperate Forests	-294.93	NA	NA	NA	NA	NA
N2O Emissions of Broadleaf and Coniferous Forests	NA	NA	0.07	NA	NA	NA
Information items[7]						
Forest Land converted to other Land-Use Categories	NE	NE	NE	NE	NE	NE
Grassland converted to other Land-Use Categories	NE	NE	NE	NE	NE	NE

[1] According to the Revised 1996 IPCC Guidelines, for the purposes of reporting, the signs for removals are always negative (-) and for emissions positive (+).

[2] For each land-use category and sub-category, this table sums net CO_2 emissions and removals shown in tables 5.A to 5.F, and the CO_2, CH_4 and N_2O emissions showing in tables 5(I) to 5(V).

[3] Parties may decide not to prepare estimates for these categories contained in appendices 3a.3 and 3a.4 of the IPCC good practice guidance for LULUCF, although they may do so if they wish.

[4] This land-use category is to allow the total of identified land area to match the national area.

[5] The total for category 5.G Other includes items specified only under category 5.G in this table as well as sources and sinks specified in category 5.G in tables 5(I) to 5(V).

[6] Parties may decide not to prepare estimates for this category contained in appendix 3a.1 of the IPCC good practice guidance for LULUCF, although they may do so if they wish and report in this row.

[7] These items are listed for information only and will not be added to the totals, because they are already included in subcategories 5.A.2 to 5.F.2.

Documentation box:

• Parties should provide detailed explanations on the Land Use, Land-Use Change and Forestry sector in Chapter 7: Land Use, Land-Use Change and Forestry (CRF sector 5) of the NIR. Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

• If estimates are reported under 5.G Other, use this documentation box to provide information regarding activities covered under this category and to provide reference to the section in the NIR where background information can be found.

TABLE 5.A SECTORAL BACKGROUND DATA FOR LAND USE, LAND-USE CHANGE AND FORESTRY
Forest Land
(Sheet 1 of 1)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES		ACTIVITY DATA		IMPLIED CARBON-STOCK-CHANGE FACTORS						CHANGES IN CARBON STOCK						
Land-Use Category	Sub-division[1]	Area[2] (kha)	Area of organic soil[2] (kha)	Carbon stock change in living biomass per area [3] [4]			Net carbon stock change in dead organic matter per area[4]	Net carbon stock change in soils per area [4]		Carbon stock change in living biomass[3] [4]			Net carbon stock change in dead organic matter[4]	Net carbon stock change in soils [4] [6]		Net CO_2 emissions/ removals [8] [9]
				Gains	Losses	Net change		Mineral soils[5]	Organic soils	Gains	Losses	Net change		Mineral soils	Organic soils[7]	
				(Mg C/ha)						(Gg C)						(Gg)
A. Total Forest Land		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
1. Forest Land remaining Forest Land		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
2. Land converted to Forest Land[10]		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
2.1 Cropland converted to Forest Land		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
2.2 Grassland converted to Forest Land		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
2.3 Wetlands converted to Forest Land		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
2.4 Settlements converted to Forest Land		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
2.5 Other Land converted to Forest Land		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE

[1] Land categories may be further divided according to climate zone, management system, soil type, vegetation type, tree species, ecological zone or national land classification.

[2] The total area of the subcategories, in accordance with the sub-division used, should be entered here. For lands converted to Forest Land report the cumulative area remaining in the category in the reporting year.

[3] Carbon stock gains and losses should be listed separately except in cases where, due to the methods used, it is technically impossible to separate information on gains and losses.

[4] The signs for estimates of gains in carbon stocks are positive (+) and of losses in carbon stocks are negative (-).

[5] Implied carbon-stock-change factors for mineral soils are calculated by dividing the net C stock change estimate for mineral soil by the difference between the area and the area of organic soil.

[6] When Parties are estimating fluxes for organic soils but cannot separate these fluxes from mineral soils, these fluxes should be reported under mineral soils.

[7] The value reported for organic soils is estimated as a flux. For consistency with other entries in this column, these fluxes should be expressed in the unit required in this column, i.e. in Gg C.

[8] According to the Revised 1996 IPCC Guidelines, for the purposes of reporting, the signs for removals are always negative (-) and for emissions positive (+). Net changes in carbon stocks are converted to CO_2 by multiplying C by 44/12 and changing the sign for net CO2 removals to be negative (-) and for net CO_2 emissions to be positive (+). Note that carbon stock changes in a single pool are not necessarily equal to emissions or removals, because some carbon stock changes result from carbon transfers among pools rather than exchanges with the atmosphere.

[9] Where Parties directly estimate emissions and removals rather than carbon stock changes, they may report emissions/removals directly in this column and use notation keys in the stock change columns.

[10] A Party may report aggregate estimates for all conversions of land to forest land when data are not available to report them separately. A Party should specify in the documentation box which types of land conversion are included. Separate estimates for grassland conversion should be provided in table 5 as an information item.

Documentation box:
Parties should provide detailed explanations on the Land Use, Land-Use Change and Forestry sector in Chapter 7: Land Use, Land-Use Change and Forestry (CRF sector 5) of the NIR. Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

TABLE 5.B SECTORAL BACKGROUND DATA FOR LAND USE, LAND-USE CHANGE AND FORESTRY
Cropland
(Sheet 1 of 1)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES		ACTIVITY DATA		IMPLIED CARBON-STOCK-CHANGE FACTORS						CHANGES IN CARBON STOCK						
Land-Use Category	Sub-division [1]	Area[2] (kha)	Area of organic soil[2] (kha)	Carbon stock change in living biomass per area [3] [4]			Net carbon stock change in dead organic matter per area[4]	Net carbon stock change in soils per area [4]		Carbon stock change in living biomass[3], [4], [6]			Net carbon stock change in dead organic matter[4] [7]	Net carbon stock change in soils [4] [8]		Net CO_2 emissions/ removals [10] [11]
				Gains	Losses	Net change		Mineral soils[5]	Organic soils	Gains	Losses	Net change		Mineral soils	Organic soils[9]	
				(Mg C/ha)						(Gg C)						(Gg)
B. Total Cropland		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
1. Cropland remaining Cropland		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
2. Land converted to Cropland[12]		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
2.1 Forest Land converted to Cropland		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
2.2 Grassland converted to Cropland		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
2.3 Wetlands converted to Cropland		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
2.4 Settlements converted to Cropland		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
2.5 Other Land converted to Cropland		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE

[1] Land categories may be further divided according to climate zone, management system, soil type, vegetation type, tree species, ecological zone or national land classification.
[2] The total area of the subcategories, in accordance with the sub-division used, should be entered here. For lands converted to Cropland report the cumulative area remaining in the category in the reporting year.
[3] Carbon stock gains and losses should be listed separately except in cases where, due to the methods used, it is technically impossible to separate information on gains and losses.
[4] The signs for estimates of gains in carbon stocks are positive (+) and of losses in carbon stocks are negative (-)
[5] Implied carbon-stock-change factors for mineral soils are calculated by dividing the net C stock change estimate for mineral soil by the difference between the area and the area of organic s
[6] For category 5.B.1 Cropland remaining Cropland this column only includes changes in perennial woody biomas
[7] No reporting on dead organic matter pools is required for category 5.B.1. Cropland remaining Cropland
[8] When Parties are estimating fluxes for organic soils but cannot separate these fluxes from mineral soils, these fluxes should be reported under mineral so
[9] The value reported for organic soils is estimated as a flux. For consistency with other entries in this column, these fluxes should be expressed in the unit required in this column, i.e. in Gg
[10] According to the Revised 1996 IPCC Guidelines, for the purposes of reporting, the signs for removals are always negative (-) and for emissions positive (+). Net changes in carbon stocks are converted to t_2 by multiplying C by 44/12 and changing the sign for net CO_2 removals to be negative (-) and for net CO_2 emissions to be positive (+). Note that carbon stock changes in a single pool are not necessarily equal to emissions or removals, because some carbon stock changes result from carbon transfers among pools rather than exchanges with the atmosphere.
[11] Where Parties directly estimate emissions and removals rather than carbon stock changes, they may report emissions/removals directly in this column and use notation keys in the stock change colur
[12] A Party may report aggregate estimates for all land conversions to cropland, when data are not available to report them separately. A Party should specify in the documentation box which types of land conversion are included. Separate estimates for forest lan grassland conversion should be provided in table 5 as an information item.

Documentation box:
Parties should provide detailed explanations on the Land Use, Land-Use Change and Forestry sector in Chapter 7: Land Use, Land-Use Change and Forestry (CRF sector 5) of the NIR. Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

TABLE 5.C SECTORAL BACKGROUND DATA FOR LAND USE, LAND-USE CHANGE AND FORESTRY

Inventory 2004

Grassland

Submission 2007 v1.1

(Sheet 1 of 1)

LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES		ACTIVITY DATA		IMPLIED CARBON-STOCK-CHANGE FACTORS						CHANGES IN CARBON STOCK						
Land-Use Category	Sub-division [1]	Area[2] (kha)	Area of organic soil[2] (kha)	Carbon stock change in living biomass per area [3] [4]			Net carbon stock change in dead organic matter per area[4]	Net carbon stock change in soils per area [4]		Carbon stock change in living biomass[3], [4], [6]			Net carbon stock change in dead organic matter[4] [7]	Net carbon stock change in soils [4] [8]		Net CO_2 emissions/ removals [10] [11]
				Gains	Losses	Net change		Mineral soils[5]	Organic soils	Gains	Losses	Net change		Mineral soils	Organic soils[9]	
				(Mg C/ha)						(Gg C)						(Gg)
C. Total Grassland		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
1. Grassland remaining Grassland		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
2. Land converted to Grassland[12]		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
2.1 Forest Land converted to Grassland		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
2.2 Cropland converted to Grassland		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
2.3 Wetlands converted to Grassland		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
2.4 Settlements converted to Grassland		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
2.5 Other Land converted to Grassland		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE

[1] Land categories may be further divided according to climate zone, management system, soil type, vegetation type, tree species, ecological zone or national land classification.

[2] The total area of the subcategories, in accordance with the sub-division used, should be entered here. For lands converted to Grassland report the cumulative area remaining in the category in the reporting year.

[3] Carbon stock gains and losses should be listed separately except in cases where, due to the methods used, it is technically impossible to separate information on gains and losses.

[4] The signs for estimates of gains in carbon stocks are positive (+) and of losses in carbon stocks are negative (-)

[5] Implied carbon-stock-change factors for mineral soils are calculated by dividing the net C stock change estimate for mineral soil by the difference between the area and the area of organic s

[6] For category 5.C.1 Grassland remaining Grassland this column only includes changes in perennial woody biomas

[7] No reporting on dead organic matter pools is required for category 5.C.1 Grassland remaining Grassland

[8] When Parties are estimating fluxes for organic soils but cannot separate these fluxes from mineral soils, these fluxes should be reported under mineral soi

[9] The value reported for organic soils is estimated as a flux. For consistency with other entries in this column, these fluxes should be expressed in the unit required in this column, i.e. in Gg C.

[10] According to the Revised 1996 IPCC Guidelines, for the purposes of reporting, the signs for removals are always negative (-) and for emissions positive (+). Net changes in carbon stocks are converted to CO_2 by multiplying C by 44/12 and changing the sign for net CO_2 removals to be negative (-) and for net CO_2 emissions to be positive (+). Note that carbon stock changes in a single pool are not necessarily equal to emissions or removals, because some carbon stock changes result from carbon transfers among pools rather than exchanges with the atmosphere.

[11] Where Parties directly estimate emissions and removals rather than carbon stock changes, they may report emissions/removals directly in this column and use notation keys in the stock change colur

[12] A Party may report aggregate estimates for all land conversions to grassland, when data are not available to report them separately. A Party should specify in the documentation box which types of land conversion are included. Separate estimates for forest conversion should be provided in table 5 as an information item.

Documentation box:

Parties should provide detailed explanations on the Land Use, Land-Use Change and Forestry sector in Chapter 7: Land Use, Land-Use Change and Forestry (CRF sector 5) of the NIR. Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

TABLE 5.D SECTORAL BACKGROUND DATA FOR LAND USE, LAND-USE CHANGE AND FORESTRY
Wetlands
(Sheet 1 of 1)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES		ACTIVITY DATA	IMPLIED CARBON-STOCK-CHANGE FACTORS					CHANGES IN CARBON STOCK					
Land-Use Category	Sub-division [1]	Area[2] (kha)	Carbon stock change in living biomass per area[3] [4]			Net carbon stock change in dead organic matter per area[4]	Net carbon stock change in soils per area [4]	Carbon stock change in living biomass[3] [4]			Net carbon stock change in dead organic matter[4]	Net carbon stock change in soils [4]	Net CO_2 emissions/ removals [5] [6]
			Gains	Losses	Net change			Gains	Losses	Net change			
			(Mg C/ha)					(Gg C)					(Gg)
D. Total Wetlands		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
1. Wetlands remaining Wetlands [7]		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
2. Land converted to Wetlands [8]		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
2.1 Forest Land converted to Wetlands		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
2.2 Cropland converted to Wetlands		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
2.3 Grassland converted to Wetlands		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
2.4 Settlements converted to Wetlands		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
2.5 Other Land converted to Wetlands		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE

[1] Land categories may be further divided according to climate zone, management system, soil type, vegetation type, tree species, ecological zone or national land classification.
[2] The total area of the subcategories, in accordance with the sub-division used, should be entered here. For lands converted to Wetlands report the cumulative area remaining in the category in the reporting year.
[3] Carbon stock gains and losses should be listed separately except in cases where, due to the methods used, it is technically impossible to separate information on gains and losses.
[4] The signs for estimates of gains in carbon stocks are positive (+) and of losses in carbon stocks are negative (-).
[5] According to the Revised 1996 IPCC Guidelines, for the purposes of reporting, the signs for removals are always negative (-) and for emissions positive (+). Net changes in carbon stocks are converted to CO_2 by multiplying C by 44/12 and changing the sign for net CO_2 removals to be negative (-) and for net CO_2 emissions to be positive (+). Note that carbon stock changes in a single pool are not necessarily equal to emissions or removals, because some carbon stock changes result from carbon transfers among pools rather than exchanges with the atmosphere.
[6] Where Parties directly estimate emissions and removals rather than carbon stock changes, they may report emissions/removals directly in this column and use notation keys in the stock change columns.
[7] Parties may decide not to prepare estimates for this category contained in appendix 3a.3 of the IPCC good practice guidance for LULUCF, although they may do so if they wish.
[8] A Party may report aggregate estimates for all land conversions to wetlands, when data are not available to report them separately. A Party should specify in the documentation box which types of land conversion are included. Separate estimates for forest land and grassland conversion should be provided in table 5 as an information item.

Documentation box:

Parties should provide detailed explanations on the Land Use, Land-Use Change and Forestry in Chapter 7: Land Use, Land-Use Change and Forestry (CRF sector 5) of the NIR. Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

TABLE 5.E SECTORAL BACKGROUND DATA FOR LAND USE, LAND-USE CHANGE AND FORESTRY
Settlements
(Sheet 1 of 1)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES		ACTIVITY DATA	IMPLIED CARBON-STOCK-CHANGE FACTORS					CHANGES IN CARBON STOCK					
Land-Use Category	Sub-division [1]	Area[2] (kha)	Carbon stock change in living biomass per area[3] [4]			Net carbon stock change in dead organic matter per area[4]	Net carbon stock change in soils per area [4]	Carbon stock change in living biomass[3], [4], [5]			Net carbon stock change in dead organic matter[4]	Net carbon stock change in soils [4]	Net CO_2 emissions/ removals [6] [7]
			Gains	Losses	Net change			Gains	Losses	Net change			
			(Mg C/ha)					(Gg C)					(Gg)
E. Total Settlements		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
1. Settlements remaining Settlements [8]		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
2. Land converted to Settlements [9]		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
2.1 Forest Land converted to Settlements		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
2.2 Cropland converted to Settlements		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
2.3 Grassland converted to Settlements		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
2.4 Wetlands converted to Settlements		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
2.5 Other Land converted to Settlements		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE

[1] Land categories may be further divided according to climate zone, management system, soil type, vegetation type, tree species, ecological zone or national land classification.

[2] The total area of the subcategories, in accordance with the sub-division used, should be entered here. For lands converted to Settlements report the cumulative area remaining in the category in the reporting year.

[3] Carbon stock gains and losses should be listed separately except in cases where, due to the methods used, it is technically impossible to separate information on gains and losses.

[4] The signs for estimates of gains in carbon stocks are positive (+) and of losses in carbon stocks are negative (-).

[5] For category 5.E.1 Settlements remaining Settlements this column only includes changes in perennial woody biomass.

[6] According to the Revised 1996 IPCC Guidelines, for the purposes of reporting, the signs for removals are always negative (-) and for emissions positive (+). Net changes in carbon stocks are converted to CO_2 by multiplying C by 44/12 and changing the sign for net CO_2 removals to be negative (-) and for net CO_2 emissions to be positive (+). Note that carbon stock changes in a single pool are not necessarily equal to emissions or removals, because some carbon stock changes result from carbon transfers among pools rather than exchanges with the atmosphere.

[7] Where Parties directly estimate emissions and removals rather than carbon stock changes, they may report emissions/removals directly in this column and use notation keys in the stock change columns.

[8] Parties may decide not to prepare estimates for this category contained in appendix 3a.4 of the IPCC good practice guidance for LULUCF, although they may do so if they wish.

[9] A Party may report aggregate estimates for all land conversions to settlements, when data are not available to report them separately. A Party should specify in the documentation box which types of land conversion are included. Separate estimates for forest land and grassland conversion should be provided in table 5 as an information item.

Documentation box:
Parties should provide detailed explanations on the Land Use, Land-Use Change and Forestry sector in Chapter 7: Land Use, Land-Use Change and Forestry (CRF sector 5) of the NIR. Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

TABLE 5.F SECTORAL BACKGROUND DATA FOR LAND USE, LAND-USE CHANGE AND FORESTRY
Other land
(Sheet 1 of 1)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES		ACTIVITY DATA	IMPLIED CARBON-STOCK-CHANGE FACTORS					CHANGES IN CARBON STOCK					
Land-Use Category	Sub-division [1]	Area[2] (kha)	Carbon stock change in living biomass per area[3] [4]			Net carbon stock change in dead organic matter per area[4]	Net carbon stock change in soils per area [4]	Carbon stock change in living biomass[3] [4]			Net carbon stock change in dead organic matter[4]	Net carbon stock change in soils [4]	Net CO_2 emissions/ removals [5] [6]
			Gains	Losses	Net change			Gains	Losses	Net change			
			(Mg C/ha)					(Gg C)					(Gg)
F. Total Other Land		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
1. Other Land remaining Other Land [7]		NE											
2. Land converted to Other Land [8]		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
2.1 Forest Land converted to Other Land		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
2.2 Cropland converted to Other Land		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
2.3 Grassland converted to Other Land		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
2.4 Wetlands converted to Other Land		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
2.5 Settlements converted to Other Land		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE

[1] Land categories may be further divided according to climate zone, management system, soil type, vegetation type, tree species, ecological zone or national land classification.

[2] The total area of the subcategories, in accordance with the sub-division used, should be entered here. For lands converted to Other Land report the cumulative area remaining in the category in the reporting year.

[3] Carbon stock gains and losses should be listed separately except in cases where, due to the methods used, it is technically impossible to separate information on gains and losses.

[4] The signs for estimates of gains in carbon stocks are positive (+) and of losses in carbon stocks are negative (-).

[5] According to the Revised 1996 IPCC Guidelines, for the purposes of reporting, the signs for removals are always negative (-) and for emissions positive (+). Net changes in carbon stocks are converted to CO_2 by multiplying C by 44/12 and changing the sign for net CO_2 removals to be negative (-) and for net CO_2 emissions to be positive (+). Note that carbon stock changes in a single pool are not necessarily equal to emissions or removals, because some carbon stock changes result from carbon transfers among pools rather than exchanges with the atmosphere.

[6] Where Parties directly estimate emissions and removals rather than carbon stock changes, they may report emissions/removals directly in this column and use notation keys in the stock change columns.

[7] This land-use category is to allow the total of identified land area to match the national area.

[8] A Party may report aggregate estimates for all land conversions to other land, when data are not available to report them separately. A Party should specify in the documentation box which types of land conversion are included. Separate estimates for forest land and grassland conversion should be provided in table 5 as an information item.

Documentation box:

Parties should provide detailed explanations on the Land Use, Land-Use Change and Forestry sector in Chapter 7: Land Use, Land-Use Change and Forestry (CRF sector 5) of the NIR. Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

TABLE 5 (I) SECTORAL BACKGROUND DATA FOR LAND USE, LAND-USE CHANGE AND FORESTRY

Inventory 2004

Direct N_2O emissions from N fertilization[1] of Forest Land and Other

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(Sheet 1 of 1)

LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA	IMPLIED EMISSION FACTORS	EMISSIONS [4]
Land-Use Category [2]	Total amount of fertilizer applied (Gg N/yr)	N_2O-N emissions per unit of fertilizer (kg N_2O-N/kg N)[3]	N_2O (Gg)
Total for all Land Use Categories	**NA,NE**	**NA,NE**	**NA,NE**
A. Forest Land [5] [6]	**NE**	**NE**	**NE**
1. Forest Land remaining Forest Land	NE	NE	NE
2. Land converted to Forest Land	NE	NE	NE
G. Other *(please specify)*			
Carbon Intake by Temperate Forests	NA	NA	NA
N2O Emissions of Broadleaf and Coniferous Forests	NA	NA	NA

[1] Direct N_2O emissions from fertilization are estimated using equations 3.2.17 and 3.2.18 of the IPCC good practice guidance for LULUCF based on the amounts of fertilizers applied to forest land.

[2] N_2O emissions from N fertilization of cropland and grassland are reported in the Agriculture sector; therefore only Forest Land is included in this table.

[3] In the calculation of the implied emission factor, N_2O emissions are converted to N_2O-N by multiplying by 28/44.

[4] Emissions are reported with a positive sign.

[5] If a Party is not able to separate the fertilizer applied to forest land from that applied to agriculture, it may report all N_2O emissions from fertilization in the Agriculture sector. This should be explicitly indicated in the documentation box.

[6] A Party may report aggregate estimates for all N fertilization on forest land in the category Forest Land remaining Forest Land when data are not available to report Forest Land remaining Forest Land and Land converted to Forest Land separately.

Documentation box:

Parties should provide detailed explanations on the Land Use, Land-Use Change and Forestry sector in Chapter 7: Land Use, Land-Use Change and Forestry (CRF sector 5) of the NIR. Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

TABLE 5 (II) SECTORAL BACKGROUND DATA FOR LAND USE, LAND-USE CHANGE AND FORESTRY

Inventory 2004

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LUXEMBOURG

Non-CO_2 emissions from drainage of soils and wetlands[1]

(Sheet 1 of 1)

GREENHOUSE GAS SOURCE AND SINK CATEGORIES		ACTIVITY DATA	IMPLIED EMISSION FACTORS		EMISSIONS [5]	
Land-Use Category [2]	Sub-division [3]	Area (kha)	N_2O-N per area [4] (kg N_2O-N/ha)	CH_4 per area (kg CH_4/ha)	N_2O (Gg)	CH_4 (Gg)
Total all Land-Use Categories					**NA,NE**	**NA,NE**
A. Forest Land [6]			**NE**	**NE**	**NE**	**NE**
Organic Soil		NE	NE	NE	NE	NE
Mineral Soil		NE	NE	NE	NE	NE
D. Wetlands			**NE**	**NE**	**NE**	**NE**
Peatland [7]		NE	NE	NE	NE	NE
Flooded Lands [7]		NE	NE	NE	NE	NE
G. Other (please specify)					**NA**	**NA**
Carbon Intake by Temperate Forests		NA	NA	NA	NA	NA
Organic Soil		NA	NA	NA	NA	NA
Mineral Soil		NA	NA	NA	NA	NA
N2O Emissions of Broadleaf and Coniferous Forests		NA	NA	NA	NA	NA
Organic Soil		NA	NA	NA	NA	NA
Mineral Soil		NA	NA	NA	NA	NA

[1] Parties may decide not to prepare estimates for these categories contained in appendices 3a.2 and 3a.3 of the IPCC good practice guidance for LULUCF, although they may do so if they wish.

[2] N_2O emissions from drained cropland and grassland soils are covered in the Agriculture tables of the CRF under Cultivation of Histosols.

[3] A Party should report further disaggregations of drained soils corresponding to the methods used. Tier 1 disaggregates soils into "nutrient rich" and "nutrient poor" areas, whereas higher-tier methods can further disaggregate into different peatland types, soil

[4] In the calculation of the implied emission factor, N_2O emissions are converted to N_2O-N by multiplying by 28/44.

[5] Emissions are reported with a positive sign.

[6] In table 5, these emissions will be added to 5.A.1 Forest Land remaining Forest Land.

[7] In table 5, these emissions will be added to 5.D.2 Land converted to Wetlands.

Documentation box:

Parties should provide detailed explanations on the Land Use, Land-Use Change and Forestry sector in Chapter 7: Land Use, Land-Use Change and Forestry (CRF sector 5) of the NIR. Use this documentation box to provide references to relevant sections o the NIR if any additional information and/or further details are needed to understand the content of this table.

TABLE 5 (III) SECTORAL BACKGROUND DATA FOR LAND USE, LAND-USE CHANGE AND FORESTRY

Inventory 2004

N_2O emissions from disturbance associated with land-use conversion to cropland [1]

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(Sheet 1 of 1)

LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA	IMPLIED EMISSION FACTORS	EMISSIONS [4]
Land-Use Category [2]	Land area converted	N_2O-N emissions per area converted [3]	N_2O
	(kha)	(kg N_2O-N/ha)	(Gg)
Total all Land-Use Categories [5]	**NA,NE**	**NA,NE**	**NA,NE**
B. Cropland	**NE**	**NE**	**NE**
2. Lands converted to Cropland [6]	NE	NE	NE
Organic Soils	NE	NE	NE
Mineral Soils	NE	NE	NE
2.1 Forest Land converted to Cropland	NE	NE	NE
Organic Soils	NE	NE	NE
Mineral Soils	NE	NE	NE
2.2 Grassland converted to Cropland	NE	NE	NE
Organic Soils	NE	NE	NE
Mineral Soils	NE	NE	NE
2.3 Wetlands converted to Cropland [7]	NE	NE	NE
Organic Soils	NE	NE	NE
Mineral Soils	NE	NE	NE
2.5 Other Land converted to Cropland	NE	NE	NE
Organic Soils	NE	NE	NE
Mineral Soils	NE	NE	NE
G. Other *(please specify)*			
Carbon Intake by Temperate Forests	NA	NA	NA
Organic Soils	NA	NA	NA
Mineral Soils	NA	NA	NA
N2O Emissions of Broadleaf and Coniferous Forests	NA	NA	NA
Organic Soils	NA	NA	NA
Mineral Soils	NA	NA	NA

[1] Methodologies for N_2O emissions from disturbance associated with land-use conversion are based on equations 3.3.14 and 3.3.15 of the IPCC good practice guidance for LULUCF. N_2O emissions from fertilization in the preceding land use and new land use should not be reported.

[2] According to the IPCC good practice guidance for LULUCF, N_2O emissions from disturbance of soils are only relevant for land conversions to cropland. N_2O emissions from Cropland remaining Cropland are included in the Agriculture sector of the good practice guidance. The good practice guidance provides methodologies only for mineral soils.

[3] In the calculation of the implied emission factor, N_2O emissions are converted to N_2O-N by multiplying by 28/44.

[4] Emissions are reported with a positive sign.

[5] Parties can separate between organic and mineral soils, if they have data available.

[6] If activity data cannot be disaggregated to all initial land uses, Parties may report some initial land uses aggregated under Other Land converted to Cropland (indicate in the documentation box what this category includes).

[7] Parties should avoid double counting with N_2O emissions from drainage and from cultivation of organic soils reported in Agriculture under Cultivation of Histosols.

Documentation box:

Parties should provide detailed explanations on the Land Use, Land-Use Change and Forestry sector in Chapter 7: Land Use, Land-Use Change and Forestry (CRF Sector 5) of the NIR. Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

TABLE 5 (IV) SECTORAL BACKGROUND DATA FOR LAND USE, LAND-USE CHANGE AND FORESTRY

Inventory 2004

CO_2 emissions from agricultural lime application [1]

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GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA	IMPLIED EMISSION FACTORS	EMISSIONS [3]
Land-Use Category	**Total amount of lime applied (Mg/yr)**	**CO_2-C per unit of lime [2] (Mg CO_2-C /Mg)**	**CO_2 (Gg)**
Total all Land-Use Categories [4], [5], [6]	**NA,NE**	**NA,NE**	**NA,NE**
B. Cropland [6] [7]	**NE**	**NE**	**NE**
Limestone $CaCO_3$	NE	NE	NE
Dolomite $CaMg(CO_3)_2$	NE	NE	NE
C. Grassland [6] [8]	**NE**	**NE**	**NE**
Limestone $CaCO_3$	NE	NE	NE
Dolomite $CaMg(CO_3)_2$	NE	NE	NE
G. Other *(please specify)* [6] [9]			
Carbon Intake by Temperate Forests	NA	NA	NA
Limestone CaCO3	NA	NA	NA
Dolomite CaMg(CO3)2	NA	NA	NA
N2O Emissions of Broadleaf and Coniferous Forests	NA	NA	NA
Limestone CaCO3	NA	NA	NA
Dolomite CaMg(CO3)2	NA	NA	NA

[1] CO_2 emissions from agricultural lime application are addressed in equations 3.3.6 and 3.4.11 of the IPCC good practice guidance for LULUCF.

[2] The implied emission factor is expressed in unit of carbon to faciliate comparison with published emission factors.

[3] Emissions are reported with a positive sign.

[4] If Parties are not able to separate liming application for different land-use categories, they should include liming for all land-use categories in the category 5.G Other.

[5] Parties that are able to provide data for lime application to forest land should provide this information under 5.G Other and specify in the documentation box that forest land application is included in this category.

[6] A Party may report aggregate estimates for total lime applications when data are not available for limestone and dolomite.

[7] In table 5, these CO_2 emissions will be added to 5.B.1 Cropland remaining Cropland.

[8] In table 5, these CO_2 emissions will be added to 5.C.1 Grassland remaining Grassland.

[9] If a Party has data broken down to limestone and dolomite at national level, it can report these data under 5.G Other.

Documentation box:

Parties should provide detailed explanations on the Land Use, Land-Use Change and Forestry sector in Chapter 7: Land Use, Land-Use Change and Forestry (CRF sector 5) of the NIR. Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

TABLE 5 (V) SECTORAL BACKGROUND DATA FOR LAND USE, LAND-USE CHANGE AND FORESTRY

Biomass Burning [1]

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Inventory 2004

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LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA			IMPLIED EMISSION FACTOR			EMISSIONS [5]		
	Description [3]	Unit	Values	CO_2	CH_4	N_2O	CO_2 [4]	CH_4	N_2O
Land-Use Category [2]		(ha or kg dm)		(Mg/activity data unit)			(Gg)		
Total for Land-Use Categories	**Biomass burned**		**NA**	**NA,NE**	**NA,NE**	**NA,NE**	**NA,NE**	**NA,NE**	**NA,NE**
A. Forest Land	**Biomass burned**	**kg dm**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**
1. Forest land remaining Forest Land	Biomass burned	kg dm	NE	NE	NE	NE	NE	NE	NE
Controlled Burning	Biomass burned	kg dm	NE	NE	NE	NE	NE	NE	NE
Wildfires	Biomass burned	kg dm	NE	NE	NE	NE	NE	NE	NE
2. Land converted to Forest Land	Biomass burned	kg dm	NE	NE	NE	NE	NE	NE	NE
Controlled Burning	Biomass burned	kg dm	NE	NE	NE	NE	NE	NE	NE
Wildfires	Biomass burned	kg dm	NE	NE	NE	NE	NE	NE	NE
B. Cropland	**Biomass burned**	**kg dm**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**
1. Cropland remaining Cropland [6]	Biomass burned	kg dm	NE	NE	NE	NE	NE	NE	NE
Controlled Burning	Biomass burned	kg dm	NE	NE	NE	NE	NE	NE	NE
Wildfires	Biomass burned	kg dm	NE	NE	NE	NE	NE	NE	NE
2. Land converted to Cropland	Biomass burned	kg dm	NE	NE	NE	NE	NE	NE	NE
Controlled Burning	Biomass burned	kg dm	NE	NE	NE	NE	NE	NE	NE
Wildfires	Biomass burned	kg dm	NE	NE	NE	NE	NE	NE	NE
2.1. Forest Land converted to Cropland	Biomass burned	kg dm	NE	NE	NE	NE	NE	NE	NE
Controlled Burning	Biomass burned	kg dm	NE	NE	NE	NE	NE	NE	NE
Wildfires	Biomass burned	kg dm	NE	NE	NE	NE	NE	NE	NE
C. Grassland	**Biomass burned**	**kg dm**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**
1. Grassland remaining grassland [7]	Biomass burned	kg dm	NE	NE	NE	NE	NE	NE	NE
Controlled Burning	Biomass burned	kg dm	NE	NE	NE	NE	NE	NE	NE
Wildfires	Biomass burned	kg dm	NE	NE	NE	NE	NE	NE	NE
2. Land converted to Grassland	Biomass burned	kg dm	NE	NE	NE	NE	NE	NE	NE
Controlled Burning	Biomass burned	kg dm	NE	NE	NE	NE	NE	NE	NE
Wildfires	Biomass burned	kg dm	NE	NE	NE	NE	NE	NE	NE
2.1. Forest Land converted to Grassland	Biomass burned	kg dm	NE	NE	NE	NE	NE	NE	NE
Controlled Burning	Biomass burned	kg dm	NE	NE	NE	NE	NE	NE	NE
Wildfires	Biomass burned	kg dm	NE	NE	NE	NE	NE	NE	NE
D. Wetlands	**Biomass burned**	**kg dm**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**
1. Wetlands remaining Wetlands [8]	Biomass burned	kg dm	NE	NE	NE	NE	NE	NE	NE
Controlled Burning	Biomass burned	kg dm	NE	NE	NE	NE	NE	NE	NE
Wildfires	Biomass burned	kg dm	NE	NE	NE	NE	NE	NE	NE
2. Land converted to Wetlands	Biomass burned	kg dm	NE	NE	NE	NE	NE	NE	NE
Controlled Burning	Biomass burned	kg dm	NE	NE	NE	NE	NE	NE	NE
Wildfires	Biomass burned	kg dm	NE	NE	NE	NE	NE	NE	NE
2.1. Forest Land converted to Wetlands	Biomass burned	kg dm	NE	NE	NE	NE	NE	NE	NE
Controlled Burning	Biomass burned	kg dm	NE	NE	NE	NE	NE	NE	NE
Wildfires	Biomass burned	kg dm	NE	NE	NE	NE	NE	NE	NE
E. Settlements [8]	Biomass burned	kg dm	NE	**NE**	**NE**	**NE**	NE	NE	NE
F. Other Land [9]	Biomass burned	kg dm	NE	**NE**	**NE**	**NE**	NE	NE	NE
G. Other (please specify)									
Carbon Intake by Temperate Forests			NA	NA	NA	NA	NA	NA	NA
Controlled Burning			NA	NA	NA	NA	NA	NA	NA
Wildfires			NA	NA	NA	NA	NA	NA	NA
N2O Emissions of Broadleaf and Coniferous Forests			NA	NA	NA	NA	NA	NA	NA
Controlled Burning			NA	NA	NA	NA	NA	NA	NA
Wildfires			NA	NA	NA	NA	NA	NA	NA

[1] Methodological guidance on burning can be found in sections 3.2.1.4 and 3.4.1.3 of the IPCC good practice guidance for LULUCF.

[2] Parties should report both controlled/prescribed burning and wildfires emissions, where appropriate, in a separate manner.

[3] For each category activity data should be selected between area burned or biomass burned. Units for area will be ha and for biomass burned kg dm. The implied emission factor will refer to the selected activity data with an automatic change in the units.

[4] If CO_2 emissions from biomass burning are not already included in tables 5.A - 5.F, they should be reported here. This should be clearly documented in the documentation box and in the NIR. Double counting should be avoided. Parties that include all carbon stock changes in the carbon stock tables (5.A, 5.B, 5.C, 5.D, 5.E and 5.F), should report IE (included elsewhere) in this column.

[5] Emissions are reported with a positive sign.

[6] In-situ above-ground woody biomass burning is reported here. Agricultural residue burning is reported in the Agriculture sector.

[7] Includes only emissions from controlled biomass burning on grasslands outside the tropics (prescribed savanna burning is reported under the Agriculture sector).

[8] Parties may decide not to prepare estimates for these categories contained in appendices 3a.2, 3a.3 and 3a.4 of the IPCC good practice guidance for LULUCF, although they may do so if they wish.

[9] This land-use category is to allow the total of identified land area to match the national area.

Documentation box:

Parties should provide detailed explanations on the Land Use, Land-Use Change and Forestry sector in Chapter 7: Land Use, Land-Use Change and Forestry (CRF sector 5) of the NIR. Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

TABLE 6 SECTORAL REPORT FOR WASTE
(Sheet 1 of 1)

Inventory 2004
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LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2 [1]	CH_4	N_2O	NO_x	CO	NMVOC	SO_2
	(Gg)						
Total Waste	**10.00**	**1.14**	**NE,NO**	**NE,NO**	**NE,NO**	**NE,NO**	**NE,NO**
A. Solid Waste Disposal on Land	**NO**	**1.14**		**NE,NO**	**NE,NO**	**NE,NO**	
1. Managed Waste Disposal on Land	NO	1.14		NE	NE	NE	
2. Unmanaged Waste Disposal Sites	NO	NO		NO	NO	NO	
3. Other *(as specified in table 6.A)*	NO	NO		NO	NO	NO	
Other non-specified	NO	NO		NO	NO	NO	
B. Waste Water Handling		**NE,NO**	**NE,NO**	**NE,NO**	**NE,NO**	**NE,NO**	
1. Industrial Wastewater		NE	NE	NE	NE	NE	
2. Domestic and Commercial Waste Water		NE	NE	NE	NE	NE	
3. Other *(as specified in table 6.B)*		NO	NO	NO	NO	NO	
Other non-specified		NO	NO	NO	NO	NO	
C. Waste Incineration	**10.00**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**
D. Other *(please specify)*	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Other non-specified	NO	NO	NO	NO	NO	NO	NO

[1] CO_2 emissions from source categories Solid waste disposal on land and Waste incineration should only be included if they derive from non-biological or inorganic waste sources.

Documentation box:

• Parties should provide detailed explanations on the waste sector in Chapter 8: Waste (CRF sector 6) of the NIR. Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

• If estimates are reported under "6.D Other", use this documentation box to provide information regarding activities covered under this category and to provide reference to the section in the NIR where background information can be found.

6 Waste:In table 6.A, the relatively high figures for waste generation rate per capita is explained by the fact that, every working day, more than 100,000 commuters (i.e. around a quarter of the resident population) are crossing Luxembourg's borders to come to work. They, of course, generate important quantities of waste that are then divided by the resident population to obtain per capita figures.

6.A Solid Waste Disposal on Land:(1) The total population is the population estimated/calculated by the National Statistical Institute STATEC on the 31st of December of each year. It is difficult to estimate the 'urban population' in Luxembourg since the country is tiny and, in its southern part, which is also the most populated, villages and small cities are lying very close to each other. Hence, it is recommended, for this inventory, to work anyway on the basis of the total population.

(2) The waste generation rate per capita is calculated since 1995 (the first year for which sufficiently detailed figures coming from the municipalities on municipal waste are available). The fact that the data have to be transmitted to the central administration by each of the 118 municipalities of the country explains why the 2004 data are still not yet estimated (currently processed in fact).

(3) The time lag to consider for annual MSW at SWDS has not yet been estimated in Luxembourg. Indeed, during the period, some landfill sites have been closed down and others extended so to limit these sites to two now in Luxembourg. Methods on how to count the 'active years' of these sites have not yet been established.

TABLE 6.A SECTORAL BACKGROUND DATA FOR WASTE
Solid Waste Disposal
(Sheet 1 of 1)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA AND OTHER RELATED INFORMATION			IMPLIED EMISSION FACTOR		EMISSIONS		
	Annual MSW at the SWDS	MCF	DOC degraded	CH_4 [1]	CO_2	CH_4		CO_2 [4]
						Emissions [2]	Recovery [3]	
	(Gg)		%	(t /t MSW)		(Gg)		
1 Managed Waste Disposal on Land	67.86	1.00	NE	0.02	NO	1.14	0.33	NO
2 Unmanaged Waste Disposal Sites	NO	NA	NA	NO	NO	NO	NO	NO
a. Deep (>5 m)	NO	NA	NA	NO	NO	NO	NO	NO
b. Shallow (<5 m)	NO	NA	NA	NO	NO	NO	NO	NO
3 Other *(please specify)*						NO	NO	NO
Other non-specified	NO	NA	NA	NO	NO	NO	NO	NO

Additional information

Description	Value
Total population (1000s)[a]	**455.00**
Urban population (1000s)[a]	NE
Waste generation rate (kg/capita/day)	NE
Fraction of MSW disposed to SWDS	0.31
Fraction of DOC in MSW	NE
CH_4 oxidation factor [b]	NE
CH_4 fraction in landfill gas	NE
CH_4 generation rate constant (k) [c]	0.05
Time lag considered (yr) [c]	NE

Note: MSW - Municipal Solid Waste, SWDS - Solid Waste Disposal Site, MCF - Methane Correction Factor, DOC - Degradable Organic Carbon (IPCC Guidelines (Volume 3. Reference Manual, section 6.2.4)).
MSW includes household waste, yard/garden waste, commercial/market waste and organic industrial solid waste. MSW should not include inorganic industrial waste such as construction or demolition materials.

[1] The CH_4 implied emission factor (IEF) is calculated on the basis of gross CH_4 emissions, as follows: IEF = (CH_4 emissions + CH_4 recovered)/annual MSW at the SWDS.
[2] Actual emissions (after recovery).
[3] CH_4 recovered and flared or utilized.
[4] Under Solid Waste Disposal, CO_2 emissions should be reported only when the disposed waste is combusted at the disposal site as a management practice. CO_2 emissions from non-biogenic wastes are included in the total emissions, whereas the CO_2 emissions from biogenic wastes are not included in the total emissions.

[a] Specify whether total or urban population is used and the rationale for doing so.
[b] See IPCC Guidelines (Volume 3. Reference Manual, p. 6.9).
[c] Only for Parties using Tier 2 methods.

TABLE 6.C SECTORAL BACKGROUND DATA FOR WASTE
Waste Incineration
(Sheet 1 of 1)

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA	IMPLIED EMISSION FACTOR			EMISSIONS		
	Amount of incinerated wastes	CO_2	CH_4	N_2O	CO_2 [1]	CH_4	N_2O
	(Gg)	(kg/t waste)			(Gg)		
Waste Incineration	133.81				10.00	NE	NE
a. Biogenic [1]	NE	NE	NE	NE	NE	NE	NE
b. Other (non-biogenic - *please specify*) [1], [2]					10.00	NE	NE
Non-biomass Incineration	NE	NE	NE	NE	10.00	NE	NE

[1] Under Solid Waste Disposal, CO_2 emissions should be reported only when the disposed waste is combusted at the disposal site as a management practice. CO_2 emissions from non-biogenic wastes are included in the total emissions, while the CO_2 emissions from biogenic wastes are not included in the total emissions.
[2] Enter under this source category all types of non-biogenic wastes, such as plastics.

Note: Only emissions from waste incineration without energy recovery are to be reported in the Waste sector. Emissions from incineration with energy recovery are to be reported in the Energy sector, as Other Fuels (see IPCC good practice guidance, page 5.23).

Documentation box:
• Parties should provide detailed explanations on the waste sector in Chapter 8: Waste (CRF sector 6) of the NIR. Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details
• Parties that use country-specific models should provide a reference in the documentation box to the relevant section in the NIR where these models are described, and fill in only the relevant cells of tables 6.A and 6.C.
• Provide a reference to the relevant section in the NIR, in particular with regard to:
(a) A population size (total or urban population) used in the calculations and the rationale for doing so;
(b) The composition of landfilled waste;
(c) In relation to the amount of incinerated wastes (specify whether the reported data relate to wet or dry matter).

6.A Solid Waste Disposal on Land:(1) The total population is the population estimated/calculated by the National Statistical Institute STATEC on the 31st of December of each year. It is difficult to estimate the 'urban population' in Luxembourg since the country is tiny and, in its southern part, which is also the most populated, villages and small cities are lying very close to each other. Hence, it is recommended, for this inventory, to work anyway on the basis of the total population.

(2) The waste generation rate per capita is calculated since 1995 (the first year for which sufficiently detailed figures coming from the municipalities on municipal waste are available). The fact that the data have to be transmitted to the central administration by each of the 118 municipalities of the country explains why the 2004 data are still not yet estimated (currently processed in fact).

(3) The time lag to consider for annual MSW at SWDS has not yet been estimated in Luxembourg. Indeed, during the period, some landfill sites have been closed down and others extended so to limit these sites to two now in Luxembourg. Methods on how to count the 'active years' of these sites have not yet been established.

6.C.1 Biogenic:The emissions of the biogenic fraction that is burned in the sole incinerator of the country is not yet estimated.

6.C.2 Non-biomass Incineration:A value of 10 Gg of CO2 is reported every year though the quantities of refusals incinerated varies from year to year. The reason stems from the fact that the emissions are a first relatively rough estimation of the non-biogenic fraction that is burned in the sole incinerator of the country.

TABLE 6.B SECTORAL BACKGROUND DATA FOR WASTE

Waste Water Handling

(Sheet 1 of 2)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA AND RELATED INFORMATION[1]	IMPLIED EMISSION FACTOR		EMISSIONS		
	Total organic product	CH_4 [2]	N_2O[3]	CH_4 Emissions [4]	CH_4 Recovery [5]	N_2O [3]
	(Gg DC[1]/yr)	(kg/kg DC)		(Gg)		
1. Industrial Waste Water				NE	NE	NE
a. Waste Water	1.12	NE	NE	NE	NE	NE
b. Sludge	NE	NE	NE	NE	NE	NE
2. Domestic and Commercial Wastewater				NE	NE	NE
a. Waste Water	22.16	NE	NE	NE	NE	NE
b. Sludge	NE	NE	NE	NE	NE	NE
3. Other *(please specify)* [6]				NO	NO	NO
Other non-specified				NO	NO	NO
a. Waste Water	NO	NO	NO	NO	NO	NO
b. Sludge[6]	NO	NO	NO	NO	NO	NO

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA AND OTHER RELATED INFORMATION			IMPLIED EMISSION FACTOR	EMISSIONS
	Population (1000s)	Protein consumption (kg/person/yr)	N fraction (kg N/kg protein)	N_2O (kg N_2O-N/kg sewage N produced)	N_2O (Gg)
N_2O from human sewage [3]	455.00	NE	NE	NE	NE

[1] DC - degradable organic component. DC indicators are COD (Chemical Oxygen Demand) for industrial waste water and BOD (Biochemical Oxygen Demand) for Domestic/Commercial waste water/sludge (IPCC Guidelines (Volume 3. Reference Manual, pp. 6.14, 6.18)).

[2] The CH_4 implied emission factor (IEF) is calculated on the basis of gross CH_4 emissions, as follows: IEF = (CH_4 emissions + CH_4 recovered or flared) / total organic product.

[3] Parties using methods other than those from the IPCC for estimating N_2O emissions from human sewage or waste-water treatment should provide aggregate data in this table.

[4] Actual emissions (after recovery).

[5] CH_4 recovered and flared or utilized.

[6] Use the cells below to specify each activity covered under "6.B.3 Other". Note that under each reported activity, data for waste water and sludge are to be reported separately.

Documentation box:

• Parties should provide detailed explanations on the Waste sector in Chapter 8: Waste (CRF sector 6) of the NIR. Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

• Regarding the estimates for N_2O from human sewage, specify whether total or urban population is used in the calculations and the rationale for doing so. Provide explanation in the documentation box.

• Parties using methods other than those from the IPCC for estimating N_2O emissions from human sewage or waste-water treatment should provide, in the NIR, corresponding information on methods, activity data and emission factors used, and should provide a reference to the relevant section of the NIR in this documentation box.

6.B.1 Industrial Wastewater/2004:Data relates to organic chemicals only.

TABLE 6.B SECTORAL BACKGROUND DATA FOR WASTE

Waste Water Handling

(Sheet 2 of 2)

Inventory 2004

Submission 2007 v1.1

LUXEMBOURG

Additional information

	Domestic	Industrial
Total waste water (m^3):	30,000,000.00	695,000.00
Treated waste water (%):	97.68	2.32

Waste-water streams:	Waste-water output (m^3)	DC (kg COD/m^3)
Industrial waste water	695,000.00	1.61
Iron and steel	NE	NE
Non-ferrous	NE	NE
Fertilizers	NE	NE
Food and beverage	NE	NE
Paper and pulp	NE	NE
Organic chemicals	695,000.00	1.61
Other (please specify)	NO	NA
Textile		
Rubber		
Poultry		
Wood and wood production		
Wool Scouring		
Other agricultural		
Chemical		
Dairy Processing		
Electricity, steam, water production		
Leather industry		
Leather and Skins		
Iron and steel		
Meat industry		
Fuels		

SUMMARY 1.A SUMMARY REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES (IPCC TABLE 7A)
(Sheet 1 of 3)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES		Net CO_2 emissions/removals	CH_4	N_2O	HFCs[1]		PFCs[1]		SF_6		NO_x	CO	NMVOC	SO_2
					P	A	P	A	P	A				
		(Gg)			CO_2 equivalent (Gg)				(Gg)					
Total National Emissions and Removals		**11,683.08**	**16.62**	**1.41**	**NA,NE,NO**	**43.06**	**NA,NO**	**NA,NO**	**NA,NE,NO**	**0.00**	**8.47**	**13.11**	**6.14**	**2.71**
1. Energy		**11,210.98**	**4.36**	**0.87**							**8.03**	**8.69**	**2.16**	**2.50**
A. Fuel Combustion	Reference Approach [2]	10,906.55												
	Sectoral Approach [2]	11,210.98	1.45	0.87							8.03	8.69	1.47	2.50
1. Energy Industries		383.13	0.01	0.01							0.68	0.07	0.33	0.03
2. Manufacturing Industries and Construction		2,528.26	0.04	0.02							5.42	2.66	0.05	1.50
3. Transport		6,986.62	1.10	0.84							0.42	0.17	0.07	0.04
4. Other Sectors		1,312.97	0.30	NE							1.51	5.79	1.02	0.93
5. Other		IE,NO	IE,NO	IE,NO							IE	IE	IE	IE
B. Fugitive Emissions from Fuels		IE,NE,NO	2.91	NO							NE,NO	NE,NO	0.69	NE,NO
1. Solid Fuels		NO	NO	NO							NO	NO	NO	NO
2. Oil and Natural Gas		IE,NE,NO	2.91	NO							NE,NO	NE,NO	0.69	NE,NO
2. Industrial Processes		**747.81**	**NA,NE,NO**	**NE,NO**	**NA,NE,NO**	**43.06**	**NA,NO**	**NA,NO**	**NA,NE,NO**	**0.00**	**0.44**	**4.42**	**0.77**	**0.21**
A. Mineral Products		504.08	NO	NO							NE,NO	NE,NO	NE,NO	NE,NO
B. Chemical Industry		NO	NO	NO	NA	NA	NA	NA	NA	NA	NA,NO	NA,NO	NA,NO	NA,NO
C. Metal Production		240.31	NA,NE,NO	NE				NO		NE,NO	0.44	4.42	0.65	0.21
D. Other Production [3]		3.42									NE	NE	0.12	NE
E. Production of Halocarbons and SF_6						NO		NO		NO				
F. Consumption of Halocarbons and SF_6					NE	43.06	NO	NO	NE	0.00				
G. Other		NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO

Note: **A** = Actual emissions based on Tier 2 approach of the IPCC Guidelines.
P = Potential emissions based on Tier 1 approach of the IPCC Guidelines.

Note: All footnotes for this table are given at the end of the table on sheet 3.

SUMMARY 1.A SUMMARY REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES (IPCC TABLE 7A)
(Sheet 2 of 3)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Net CO_2 emissions/removals	CH_4	N_2O	HFCs [1]		PFCs[1]		SF_6		NO_x	CO	NMVOC	SO_2
				P	A	P	A	P	A				
	(Gg)			CO_2 equivalent (Gg)						(Gg)			
3. Solvent and Other Product Use	**9.22**		**NE,NO**							**NE**	**NE**	**3.05**	**NE**
4. Agriculture		**11.12**	**0.47**							**NA,NO**	**NA,NO**	**0.16**	**NO**
A. Enteric Fermentation		7.52											
B. Manure Management		3.59	NE,NO									NE,NO	
C. Rice Cultivation		NO										NO	
D. Agricultural Soils[4]		NE	0.47									0.16	
E. Prescribed Burning of Savannas		NO	NO							NO	NO	NO	
F. Field Burning of Agricultural Residues		NO	NO							NO	NO	NO	
G. Other		NO	NO							NO	NO	NO	NO
5. Land Use, Land-Use Change and Forestry	[5] **-294.93**	**NA,NE**	**0.07**							**NA,NE**	**NA,NE**	**NA,NE**	**NA,NE**
A. Forest Land	[5] NE	NE	NE							NE	NE	NE	
B. Cropland	[5] NE	NE	NE							NE	NE	NE	
C. Grassland	[5] NE	NE	NE							NE	NE	NE	
D. Wetlands	[5] NE	NE	NE							NE	NE	NE	
E. Settlements	[5] NE	NE	NE							NE	NE	NE	
F. Other Land	[5] NE	NE	NE							NE	NE	NE	
G. Other	[5] -294.93	NA,NE	0.07							NA,NE	NA,NE	NA,NE	NA,NE
6. Waste	**10.00**	**1.14**	**NE,NO**							**NE,NO**	**NE,NO**	**NE,NO**	**NE,NO**
A. Solid Waste Disposal on Land	[6] NO	1.14								NE,NO	NE,NO	NE,NO	
B. Waste-water Handling		NE,NO	NE,NO							NE,NO	NE,NO	NE,NO	
C. Waste Incineration	[6] 10.00	NE	NE							NE	NE	NE	NE
D. Other	NO	NO	NO							NO	NO	NO	NO
7. Other ***(please specify)*** [7]	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

Note: All footnotes for this table are given at the end of the table on sheet 3.

SUMMARY 1.A SUMMARY REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES (IPCC TABLE 7A)
(Sheet 3 of 3)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Net CO_2 emissions/removals	CH_4	N_2O	HFCs		PFCs		SF_6		NO_x	CO	NMVOC	SO_2
				P	A	P	A	P	A				
	(Gg)			CO_2 equivalent (Gg)				(Gg)					
Memo Items: (8)													
International Bunkers	**1,290.42**	**NE**	**NE**							**NE**	**NE**	**NE**	**NE**
Aviation	1,290.42	NE	NE							NE	NE	NE	NE
Marine	NE	NE	NE							NE	NE	NE	NE
Multilateral Operations	**IE**	**IE**	**IE**							**IE**	**IE**	**IE**	**IE**
CO_2 Emissions from Biomass	**43.80**												

(1) The emissions of HFCs and PFCs are to be expressed as CO_2 equivalent emissions. Data on disaggregated emissions of HFCs and PFCs are to be provided in Table 2(II) of this common reporting format.

(2) For verification purposes, countries are asked to report the results of their calculations using the Reference approach and to explain any differences with the Sectoral approach in the documentation box to Table 1.A.(c). For estimating national total emissions, the results from the Sectoral approach should be used, where possible.

(3) Other Production includes Pulp and Paper and Food and Drink Production.

(4) Parties which previously reported CO_2 from soils in the Agriculture sector should note this in the NIR.

(5) For the purposes of reporting, the signs for removals are always negative (-) and for emissions positive (+).

(6) CO_2 from source categories Solid Waste Disposal on Land and Waste Incineration should only be included if it stems from non-biogenic or inorganic waste streams. Only emissions from Waste Incineration Without Energy Recovery are to be reported in the Waste sector, whereas emissions from Incineration With Energy Recovery are to be reported in the Energy sector.

(7) If reporting any country-specific source category under sector "7. Other", detailed explanations should be provided in Chapter 9: Other (CRF sector 7) of the NIR

(8) Countries are asked to report emissions from international aviation and marine bunkers and multilateral operations, as well as CO_2 emissions from biomass, under Memo Items. These emissions should not be included in the national total emissions from the energy sector. Amounts of biomass used as fuel are included in the national energy consumption but the corresponding CO_2 emissions are not included in the national total as it is assumed that the biomass is produced in a sustainable manner. If the biomass is harvested at an unsustainable rate, net CO_2 emissions are accounted for as a loss of biomass stocks in the Land Use, Land-use Change and Forestry sector.

SUMMARY 1.B SHORT SUMMARY REPORT FOR NATIONAL GREENHOUSE GAS INVENTORIES (IPCC TABLE 7B)
(Sheet 1 of 1)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES		Net CO_2 emisions/removals	CH_4	N_2O	HFCs[1]		PFCs[1]		SF_6		NO_x	CO	NMVOC	SO_2
					P	A	P	A	P	A				
		(Gg)			CO_2 equivalent (Gg)				(Gg)					
Total National Emissions and Removals		**11,683.08**	**16.62**	**1.41**	**NA,NE,NO**	**43.06**	**NA,NO**	**NA,NO**	**NA,NE,NO**	**0.00**	**8.47**	**13.11**	**6.14**	**2.71**
1. Energy		**11,210.98**	**4.36**	**0.87**							**8.03**	**8.69**	**2.16**	**2.50**
A. Fuel Combustion	Reference Approach[2]	10,906.55												
	Sectoral Approach[2]	11,210.98	1.45	0.87							8.03	8.69	1.47	2.50
B. Fugitive Emissions from Fuels		IE,NE,NO	2.91	NO							NE,NO	NE,NO	0.69	NE,NO
2. Industrial Processes		**747.81**	**NA,NE,NO**	**NE,NO**	**NA,NE,NO**	**43.06**	**NA,NO**	**NA,NO**	**NA,NE,NO**	**0.00**	**0.44**	**4.42**	**0.77**	**0.21**
3. Solvent and Other Product Use		**9.22**		**NE,NO**							**NE**	**NE**	**3.05**	**NE**
4. Agriculture [3]			**11.12**	**0.47**							**NA,NO**	**NA,NO**	**0.16**	**NO**
5. Land Use, Land-Use Change and Forestry		[4] **-294.93**	**NA,NE**	**0.07**							**NA,NE**	**NA,NE**	**NA,NE**	**NA,NE**
6. Waste		**10.00**	**1.14**	**NE,NO**							**NE,NO**	**NE,NO**	**NE,NO**	**NE,NO**
7. Other		**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
Memo Items: [5]														
International Bunkers		**1,290.42**	**NE**	**NE**							**NE**	**NE**	**NE**	**NE**
Aviation		1,290.42	NE	NE							NE	NE	NE	NE
Marine		NE	NE	NE							NE	NE	NE	NE
Multilateral Operations		**IE**	**IE**	**IE**							**IE**	**IE**	**IE**	**IE**
CO_2 Emissions from Biomass		**43.80**												

Note: A = Actual emissions based on Tier 2 approach of the IPCC Guidelines.
P = Potential emissions based on Tier 1 approach of the IPCC Guidelines.

[1] The emissions of HFCs and PFCs are to be expressed as CO_2 equivalent emissions. Data on disaggregated emissions of HFCs and PFCs are to be provided in Table 2(II) of this common reporting format.

[2] For verification purposes, countries are asked to report the results of their calculations using the Reference approach and to explain any differences with the Sectoral approach in the documentation box to Table 1.A.(c). For estimating national total emissions, the result from the Sectoral approach should be used, where possible.

[3] Parties which previously reported CO_2 from soils in the Agriculture sector should note this in the NIR.

[4] For the purposes of reporting, the signs for removals are always negative (-) and for emissions positive (+).

[5] Countries are asked to report emissions from international aviation and marine bunkers and multilateral operations, as well as CO_2 emissions from biomass, under Memo Items. These emissions should not be included in the national total emissions from the energy sector. Amounts of biomass used as fuel are included in the national energy consumption but the corresponding CO_2 emissions are not included in the national total as it is assumed that the biomass is produced in a sustainable manner. If the biomass is harvested at an unsustainable rate, net CO_2 emissions are accounted for as a loss of biomass stocks in the Land Use, Land-use Change and Forestry sector.

SUMMARY 2 SUMMARY REPORT FOR CO_2 EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2 [1]	CH_4	N_2O	HFCs [2]	PFCs [2]	SF_6 [2]	Total
	CO_2 equivalent (Gg)						
Total (Net Emissions) [1]	**11,683.08**	**348.96**	**437.10**	**43.06**	**NA,NO**	**3.52**	**12,515.72**
1. Energy	**11,210.98**	**91.56**	**269.70**				**11,572.24**
A. Fuel Combustion (Sectoral Approach)	11,210.98	30.45	269.70				11,511.13
1. Energy Industries	383.13	0.21	3.10				386.44
2. Manufacturing Industries and Construction	2,528.26	0.84	6.20				2,535.30
3. Transport	6,986.62	23.10	260.40				7,270.12
4. Other Sectors	1,312.97	6.30	NE				1,319.27
5. Other	IE,NO	IE,NO	IE,NO				IE,NO
B. Fugitive Emissions from Fuels	IE,NE,NO	61.11	NO				61.11
1. Solid Fuels	NO	NO	NO				NO
2. Oil and Natural Gas	IE,NE,NO	61.11	NO				61.11
2. Industrial Processes	**747.81**	**NA,NE,NO**	**NE,NO**	**43.06**	**NA,NO**	**3.52**	**794.39**
A. Mineral Products	504.08	NO	NO				504.08
B. Chemical Industry	NO	NO	NO	NA	NA	NA	NA,NO
C. Metal Production	240.31	NA,NE,NO	NE	NA,NE	NO	NE,NO	240.31
D. Other Production	3.42						3.42
E. Production of Halocarbons and SF_6				NO	NO	NO	NO
F. Consumption of Halocarbons and SF_6 [2]				43.06	NO	3.52	46.58
G. Other	NO	NO	NO	NO	NO	NO	NO
3. Solvent and Other Product Use	**9.22**		**NE,NO**				**9.22**
4. Agriculture		**233.46**	**145.70**				**379.16**
A. Enteric Fermentation		158.00					158.00
B. Manure Management		75.46	NE,NO				75.46
C. Rice Cultivation		NO					NO
D. Agricultural Soils[3]		NE	145.70				145.70
E. Prescribed Burning of Savannas		NO	NO				NO
F. Field Burning of Agricultural Residues		NO	NO				NO
G. Other		NO	NO				NO
5. Land Use, Land-Use Change and Forestry [1]	**-294.93**	**NA,NE**	**21.70**				**-273.23**
A. Forest Land	NE	NE	NE				NE
B. Cropland	NE	NE	NE				NE
C. Grassland	NE	NE	NE				NE
D. Wetlands	NE	NE	NE				NE
E. Settlements	NE	NE	NE				NE
F. Other Land	NE	NE	NE				NE
G. Other	-294.93	NA,NE	21.70				-273.23
6. Waste	**10.00**	**23.94**	**NE,NO**				**33.94**
A. Solid Waste Disposal on Land	NO	23.94					23.94
B. Waste-water Handling		NE,NO	NE,NO				NE,NO
C. Waste Incineration	10.00	NE	NE				10.00
D. Other	NO	NO	NO				NO
7. Other *(as specified in Summary 1.A)*	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

Memo Items: [4]							
International Bunkers	1,290.42	NE	NE				1,290.42
Aviation	1,290.42	NE	NE				1,290.42
Marine	NE	NE	NE				NE
Multilateral Operations	**IE**	**IE**	**IE**				**IE**
CO_2 Emissions from Biomass	**43.80**						**43.80**

Total CO_2 Equivalent Emissions without Land Use, Land-Use Change and Forestry	12,788.95
Total CO_2 Equivalent Emissions with Land Use, Land-Use Change and Forestry	12,515.72

(1) For CO_2 from Land Use, Land-use Change and Forestry the net emissions/removals are to be reported. For the purposes of reporting, the signs for removals are always negative (-) and for emissions positive (+).

(2) Actual emissions should be included in the national totals. If no actual emissions were reported, potential emissions should be included.

(3) Parties which previously reported CO_2 from soils in the Agriculture sector should note this in the NIR.

(4) See footnote 8 to table Summary 1.A.

SUMMARY 3 SUMMARY REPORT FOR METHODS AND EMISSION FACTORS USED
(Sheet 1 of 2)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2		CH_4		N_2O		HFCs		PFCs		SF_6	
	Method applied	Emission factor	Method applied	Emission factor	Method applied	Emission factor	Method applied	Emission factor	Method applied	Emission factor	Method applied	Emission factor
1. Energy	**CR**	**CR,CS,PS**	**CR**	**CR,CS,PS**	**CR**	**CR,CS**						
A. Fuel Combustion	CR	CR,CS,PS	CR	CR,CS	CR	CR,CS						
1. Energy Industries	CR	CR,CS	CR	CS	CR	CS						
2. Manufacturing Industries and Construction	CR	CR,CS,PS	CR	CR,CS	CR	CR,CS						
3. Transport	CR	CR	CR	CR	CR	CR						
4. Other Sectors	CR	CR	CR	CR	NA	NA						
5. Other	NA	NA	NA	NA	NA	NA						
B. Fugitive Emissions from Fuels	NA	NA	CR	PS	NA	NA						
1. Solid Fuels	NA	NA	NA	NA	NA	NA						
2. Oil and Natural Gas	NA	NA	CR	PS	NA	NA						
2. Industrial Processes	**CR**	**CR,PS**	**NA**	**NA**	**NA**	**NA**	**CS**	**CS**	**NA**	**NA**	**CS**	**CS**
A. Mineral Products	CR	PS	NA	NA	NA	NA						
B. Chemical Industry	NA	NA	NA	NA	NA	NA					NA	NA
C. Metal Production	CR	PS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D. Other Production	CR	CR										
E. Production of Halocarbons and SF_6											NA	NA
F. Consumption of Halocarbons and SF_6							CS	CS			CS	CS
G. Other	NA	NA	NA	NA	NA	NA			NA	NA	NA	NA

Use the following notation keys to specify the method applied:

D (IPCC default) **T1a, T1b, T1c** (IPCC Tier 1a, Tier 1b and Tier 1c, respectively) **CR** (CORINAIR)
RA (Reference Approach) **T2** (IPCC Tier 2) **CS** (Country Specific)
T1 (IPCC Tier 1) **T3** (IPCC Tier 3) **OTH** (Other)

If using more than one method within one source category, list all the relevant methods. Explanations regarding country-specific methods, other methods or any modifications to the default IPCC methods, as well as informatio

Use the following notation keys to specify the emission factor used:

D (IPCC default) **CS** (Country Specific) **OTH** (Other)
CR (CORINAIR) **PS** (Plant Specific)

Where a mix of emission factors has been used, list all the methods in the relevant cells and give further explanations in the documentation box. Also use the documentation box to explain the use of notation OTH.

SUMMARY 3 SUMMARY REPORT FOR METHODS AND EMISSION FACTORS USED
(Sheet 2 of 2)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2		CH_4		N_2O		HFCs		PFCs		SF_6	
	Method applied	Emission factor	Method applied	Emission factor	Method applied	Emission factor	Method applied	Emission factor	Method applied	Emission factor	Method applied	Emission factor
3. Solvent and Other Product Use	**CR**	**CR**			**NA**	**NA**						
4. Agriculture			**T1,T2**	**CS**	**CR**	**CR**						
A. Enteric Fermentation			T1,T2	CS								
B. Manure Management			T2	CS	NA	NA						
C. Rice Cultivation			NA	NA								
D. Agricultural Soils			NA	NA	CR	CR						
E. Prescribed Burning of Savannas			NA	NA	NA	NA						
F. Field Burning of Agricultural Residues			NA	NA	NA	NA						
G. Other			NA	NA	NA	NA						
5. Land Use, Land-Use Change and Forestry	**CS**	**CS**	**NA**	**NA**	**CS**	**CS**						
A. Forest Land	NA	NA	NA	NA								
B. Cropland	NA	NA	NA	NA	NA	NA						
C. Grassland	NA	NA	NA	NA	NA	NA						
D. Wetlands	NA	NA	NA	NA	NA	NA						
E. Settlements	NA	NA	NA	NA	NA	NA						
F. Other Land	NA	NA	NA	NA	NA	NA						
G. Other			NA	NA	CS	CS						
6. Waste	**CS**	**CS**	**T2**	**D**	**NA**	**NA**						
A. Solid Waste Disposal on Land	NA	NA	T2	D								
B. Waste-water Handling			NA	NA	NA	NA						
C. Waste Incineration	CS	CS	NA	NA	NA	NA						
D. Other	NA	NA	NA	NA	NA	NA						
7. Other (as specified in Summary 1.A)	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

Use the following notation keys to specify the method applied:

D (IPCC default) **T1a, T1b, T1c** (IPCC Tier 1a, Tier 1b and Tier 1c, respectively) **CR** (CORINAIR)
RA (Reference Approach) **T2** (IPCC Tier 2) **CS** (Country Specific)
T1 (IPCC Tier 1) **T3** (IPCC Tier 3) **OTH** (Other)

If using more than one method within one source category, list all the relevant methods. Explanations regarding country-specific methods, other methods or any modifications to the default IPCC methods, as well as information regarding the use of different methods

Use the following notation keys to specify the emission factor used:

D (IPCC default) **CS** (Country Specific) **OTH** (Other)
CR (CORINAIR) **PS** (Plant Specific)

Where a mix of emission factors has been used, list all the methods in the relevant cells and give further explanations in the documentation box. Also use the documentation box to explain the use of notation OTH.

Documentation box:

• Parties should provide the full information on methodological issues, such as methods and emission factors used, in the relevant sections of Chapters 3 to 9 (see section 2.2 of each of Chapters 3 - 9) of the NIR. Use this documentation box to provide references to relevant sections of the NIR if any additional information and further details are needed to understand the content of this table.

• Where a mix of methods/emission factors has been used within one source category, use this documentation box to specify those methods/emission factors for the various sub-sources where they have been applied.

• Where the notation OTH (Other) has been entered in this table, use this documentation box to specify those other methods/emission factors.

TABLE 7 SUMMARY OVERVIEW FOR KEY CATEGORIES
(Sheet 1 of 1)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

KEY CATEGORIES OF EMISSIONS AND REMOVALS	Gas	Criteria used for key source identification			Key category excluding LULUCF [1]	Key category including LULUCF [1]	Comments [1]
		L	T	Q			
Specify key categories according to the national level of disaggregation used:							
1 A 1 a Public Electricity and Heat Production: Gaseous Fuels (CO2)	CO2	x	x		x		
1 A 1 a Public Electricity and Heat Production: Solid Fuels	CO2						NA
1 A 2 a Iron and Steel: Gaseous Fuels	CO2	x			x		
1 A 2 a Iron and Steel: Solid Fuels	CO2		x		x		
1 A 2 f Other: Gaseous Fuels	CO2	x	x		x		
1 A 2 f Other: Liquid Fuels	CO2	x	x		x		
1 A 2 f Other: Solid Fuels	CO2	x	x		x		
1 A 3 b Road Transportation: Diesel oil	CO2	x	x		x		
1 A 3 b Road Transportation: Diesel oil	N2O	x	x		x		
1 A 3 b Road Transportation: Gasoline	CO2	x	x		x		
1 A 3 b Road Transportation: Gasoline	N2O						NA
1 A 4 a Commercial/Institutional: Gaseous Fuels	CO2	x			x		

TABLE 8(a) RECALCULATION - RECALCULATED DATA
(Sheet 1 of 2)

Recalculated year: Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES		CO_2						CH_4						N_2O					
		Previous submission	Latest submission	Difference	Difference[1]	Impact of recalculation on total emissions excluding LULUCF [2]	Impact of recalculation on total emissions including LULUCF[3]	Previous submission	Latest submission	Difference	Difference[1]	Impact of recalculation on total emissions excluding LULUCF [2]	Impact of recalculation on total emissions including LULUCF[3]	Previous submission	Latest submission	Difference	Difference[1]	Impact of recalculation on total emissions excluding LULUCF [2]	Impact of recalculation on total emissions including LULUCF[3]
		CO_2 equivalent (Gg)			(%)			CO_2 equivalent (Gg)			(%)			CO_2 equivalent (Gg)			(%)		
Total National Emissions and Removals			**11,683.08**						348.96						437.10				
1. Energy			**11,210.98**						91.56						269.70				
1.A.	Fuel Combustion Activities		11,210.98						30.45						269.70				
1.A.1.	Energy Industries		383.13						0.21						3.10				
1.A.2.	Manufacturing Industries and Construction		2,528.26						0.84						6.20				
1.A.3.	Transport		6,986.62						23.10						260.40				
1.A.4.	Other Sectors		1,312.97						6.30						NE				
1.A.5.	Other		IE,NO						IE,NO						IE,NO				
1.B.	Fugitive Emissions from Fuels		IE,NE,NO						61.11						NO				
1.B.1.	Solid fuel		NO						NO						NO				
1.B.2.	Oil and Natural Gas		IE,NE,NO						61.11						NO				
2. Industrial Processes			**747.81**						**NA,NE,NO**						**NE,NO**				
2.A.	Mineral Products		504.08						NO						NO				
2.B.	Chemical Industry		NO						NO						NO				
2.C.	Metal Production		240.31						NA,NE,NO						NE				
2.D.	Other Production		3.42																
2.G.	Other		NO						NO						NO				
3. Solvent and Other Product Use			**9.22**												**NE,NO**				
4. Agriculture									**233.46**						**145.70**				
4.A.	Enteric Fermentation								158.00										
4.B.	Manure Management								75.46						NE,NO				
4.C.	Rice Cultivation								NO										
4.D.	Agricultural Soils[4]								NE						145.70				
4.E.	Prescribed Burning of Savannas								NO						NO				
4.F.	Field Burning of Agricultural Residues								NO						NO				
4.G.	Other								NO						NO				
5. Land Use, Land-Use Change and Forestry (net)[5]			**-294.93**						NA,NE						21.70				
5.A.	Forest Land		NE						NE						NE				
5.B.	Cropland		NE						NE						NE				
5.C.	Grassland		NE						NE						NE				
5.D.	Wetlands		NE						NE						NE				
5.E.	Settlements		NE						NE						NE				
5.F.	Other Land		NE						NE						NE				
5.G.	Other		-294.93						NA,NE						21.70				

Note: All footnotes for this table are given at the end of the table on sheet 2.

TABLE 8(a) RECALCULATION - RECALCULATED DATA
(Sheet 2 of 2)

Recalculated year: Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2						CH_4						N_2O					
	Previous submission	Latest submission	Difference	Difference[1]	Impact of recalculation on total emissions excluding LULUCF [2]	Impact of recalculation on total emissions including LULUCF[3]	Previous submission	Latest submission	Difference	Difference[1]	Impact of recalculation on total emissions excluding LULUCF [2]	Impact of recalculation on total emissions including LULUCF[3]	Previous submission	Latest submission	Difference	Difference[1]	Impact of recalculation on total emissions excluding LULUCF [2]	Impact of recalculation on total emissions including LULUCF[3]
	CO_2 equivalent (Gg)			(%)			CO_2 equivalent (Gg)			(%)			CO_2 equivalent (Gg)			(%)		
6. Waste		**10.00**						23.94						NE,NO				
6.A. Solid Waste Disposal on Land		NO						23.94										
6.B. Waste-water Handling								NE,NO						NE,NO				
6.C. Waste Incineration		10.00						NE						NE				
6.D. Other		NO						NO						NO				
7. Other ***(as specified in Summary 1.A)***		NA						NA						NA				
Memo Items:																		
International Bunkers		**1,290.42**						**NE**						**NE**				
Multilateral Operations		**IE**						**IE**						**IE**				
CO_2 Emissions from Biomass		**43.80**																

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	HFCs						PFCs						SF_6					
	Previous submission	Latest submission	Difference	Difference[1]	Impact of recalculation on total emissions excluding LULUCF [2]	Impact of recalculation on total emissions including LULUCF[3]	Previous submission	Latest submission	Difference	Difference[1]	Impact of recalculation on total emissions excluding LULUCF [2]	Impact of recalculation on total emissions including LULUCF[3]	Previous submission	Latest submission	Difference	Difference[1]	Impact of recalculation on total emissions excluding LULUCF [2]	Impact of recalculation on total emissions including LULUCF[3]
	CO_2 equivalent (Gg)			(%)			CO_2 equivalent (Gg)			(%)			CO_2 equivalent (Gg)			(%)		
Total Actual Emissions		**43.06**						**NA,NO**						**3.52**				
2.C.3. Aluminium Production								NO										
2.E. Production of Halocarbons and SF_6		NO						NO						NO				
2.F. Consumption of Halocarbons and SF_6		43.06						NO						3.52				
2.G. Other		NO						NO						NO				
Potential Emissions from Consumption of HFCs/PFCs and SF_6		**NE**						**NO**						**NE**				

	Previous submission	Latest submission	Difference	Difference[1]
	CO_2 equivalent (Gg)			(%)
Total CO_2 Equivalent Emissions with Land Use, Land-Use Change and Forestry		12,515.72		
Total CO_2 Equivalent Emissions without Land Use, Land-Use Change and Forestry		12,788.95		

[1] Estimate the percentage change due to recalculation with respect to the previous submission (percentage change = 100 x [(LS-PS)/PS], where LS = latest submission and PS = previous submission. All cases of recalculation of the estimate of the source/sink category should be addressed and explained in table 8(b).
[2] Total emissions refer to total aggregate GHG emissions expressed in terms of CO_2 equivalent, excluding GHGs from the LULUCF sector. The impact of the recalculation on the total emissions is calculated as follows: impact of recalculation (%) = 100 x [(source (LS) - source (PS))/total emissions (LS)], where LS = latest submission, PS = previous submission.
[3] Total emissions refer to total aggregate GHG emissions expressed in terms of CO_2 equivalent, including GHGs from the LULUCF sector. The impact of the recalculation on the total emissions is calculated as follows: impact of recalculation (%) = 100 x [(source (LS) - source (PS))/total emissions (LS)], where LS = latest submission, PS = previous submission.
[4] Parties which previously reported CO_2 from soils in the Agriculture sector should note this in the NIR.
[5] Net CO_2 emissions/removals to be reported.

Documentation box:

Parties should provide detailed information on recalculations in Chapter 10: Recalculations and Improvements, and in the relevant sections of Chapters 3 to 9 (see section 2.5 of each of Chapters 3 - 9) of the NIR. Use this documentation box to provide references to relevant sections of the NIR if any additional information and further details are needed to understand the content of this table.

TABLE 8(b) RECALCULATION - EXPLANATORY INFORMATION
(Sheet 1 of 1)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

Specify the sector and source/sink category[1] where changes in estimates have occurred:		GHG	RECALCULATION DUE TO				
			CHANGES IN:			Addition/removal/ reallocation of source/sink categories	Other changes in data (e.g. statistical or editorial changes, correction of errors)
			Methods [2]	Emission factors [2]	Activity data [2]		

[1] Enter the identification code of the source/sink category (e.g. 1.B.1) in the first column and the name of the category (e.g. Fugitive Emissions from Solid Fuels) in the second column of the table. Note that the source categories entered in this table should match those used in table 8(a).
[2] Explain changes in methods, emission factors and activity data that have resulted in recalculation of the estimate of the source/sink as indicated in table 8(a). Include changes in the assumptions and coefficients in the Methods column.

Documentation box:

Parties should provide the full information on recalculations in Chapter 10: Recalculations and Improvements, and in the relevant sections of Chapters 3 to 9 (see section 2.5 of each of Chapters 3 to 9) of the NIR. Use this documentation box to provide references to relevant sections of the NIR if any additional information and further details are needed to understand the content of this table. References should point particularly to the sections of the NIR in which justifications of the changes as to improvements in the accuracy, completeness and consistency of the inventory are reported.

TABLE 9(a) COMPLETENESS - INFORMATION ON NOTATION KEYS
(Sheet 1 of 1)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

THE TABLE BEING VERY LONG AND NOT READABLE WHEN PRINTED, SEE THE INVENTORY ON CD-ROM OR ON INTERNET (http://cdr.eionet.europa.eu/lu/eu/ghgmm/envrgjxpg)

TABLE 9(b) COMPLETENESS - INFORMATION ON ADDITIONAL GREENHOUSE GASES
(Sheet 1 of 1)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

Additional GHG emissions reported[1]						
GHG	**Source category**	**Emissions (Gg)**	**Estimated GWP value (100-year horizon)**	**Emissions CO_2 equivalent (Gg)**	**Reference to the source of GWP value**	**Explanation**

[1] Parties are encouraged to provide information on emissions of greenhouse gases whose GWP values have not yet been agreed upon by the COP. Include such gases in this table if they are considered in the submitted inventory. Provide additional information on the estimation methods used.

Documentation box:
Parties should provide detailed information regarding completeness of the inventory in the NIR (Chapter 1.8: General Assessment of the Completeness, and Annex 5). Use this documentation box to provide references to relevant sections of the NIR if any additional information and further details are needed to understand the content of this table.

TABLE 10 EMISSION TRENDS
CO_2
(Part 1 of 2)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Base year (1990)	1991	1992	1993	1994	1995	1996	1997	1998	1999
	(Gg)	(Gg)	(Gg)	(Gg)	(Gg)	(Gg)	(Gg)	(Gg)	(Gg)	(Gg)
1. Energy	**10,528.80**	**10,856.30**	**10,745.55**	**11,024.54**	**10,309.26**	**8,194.41**	**8,300.64**	**7,728.03**	**7,084.52**	**7,626.17**
A. Fuel Combustion (Sectoral Approach)	10,528.80	10,856.30	10,745.55	11,024.54	10,309.26	8,194.41	8,300.64	7,728.03	7,084.52	7,626.17
1. Energy Industries	1,267.76	1,210.81	1,106.79	1,197.08	996.32	785.47	682.75	402.34	68.61	103.17
2. Manufacturing Industries and Construction	5,290.61	4,762.09	4,543.90	4,636.83	4,314.67	2,618.77	2,609.29	2,080.48	1,501.53	1,708.82
3. Transport	2,724.47	3,317.22	3,574.99	3,633.52	3,665.55	3,452.55	3,532.57	3,802.12	3,984.09	4,343.90
4. Other Sectors	1,245.96	1,566.18	1,519.87	1,557.11	1,332.72	1,337.62	1,476.03	1,443.09	1,530.29	1,470.28
5. Other	IE,NO	IE,NO	IE,NO	IE,NO	IE,NO	IE,NO	IE,NO	IE,NO	IE,NO	IE,NO
B. Fugitive Emissions from Fuels	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO
1. Solid Fuels	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2. Oil and Natural Gas	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO
2. Industrial Processes	**1,556.59**	**1,507.48**	**1,407.50**	**1,475.13**	**1,294.38**	**943.86**	**896.78**	**821.87**	**638.36**	**670.58**
A. Mineral Products	590.62	590.62	572.47	572.47	539.58	485.78	480.03	494.82	497.12	519.83
B. Chemical Industry	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
C. Metal Production	961.78	913.44	829.76	898.44	750.64	454.23	413.26	324.10	137.49	146.68
D. Other Production	4.19	3.42	5.27	4.22	4.16	3.85	3.49	2.95	3.75	4.07
E. Production of Halocarbons and SF_6										
F. Consumption of Halocarbons and SF_6										
G. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
3. Solvent and Other Product Use	9.05	9.08	9.11	9.18	9.22	9.28	9.36	9.40	9.46	9.49
4. Agriculture										
A. Enteric Fermentation										
B. Manure Management										
C. Rice Cultivation										
D. Agricultural Soils										
E. Prescribed Burning of Savannas										
F. Field Burning of Agricultural Residues										
G. Other										
5. Land Use, Land-Use Change and Forestry[(2)]	**-294.93**	**-294.93**	**-294.93**	**-294.93**	**-294.93**	**-294.93**	**-294.93**	**-294.93**	**-294.93**	**-294.93**
A. Forest Land	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
B. Cropland	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
C. Grassland	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
D. Wetlands	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
E. Settlements	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
F. Other Land	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
G. Other	-294.93	-294.93	-294.93	-294.93	-294.93	-294.93	-294.93	-294.93	-294.93	-294.93
6. Waste	**10.00**	**10.00**	**10.00**	**10.00**	**10.00**	**10.00**	**10.00**	**10.00**	**10.00**	**10.00**
A. Solid Waste Disposal on Land	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
B. Waste-water Handling										
C. Waste Incineration	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
D. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
7. Other *(as specified in Summary 1.A)*	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
Total CO_2 emissions including net CO_2 from LULUCF	**11,809.51**	**12,087.93**	**11,877.23**	**12,223.92**	**11,327.93**	**8,862.62**	**8,921.85**	**8,274.37**	**7,447.41**	**8,021.31**
Total CO_2 emissions excluding net CO_2 from LULUCF	**12,104.44**	**12,382.86**	**12,172.16**	**12,518.85**	**11,622.86**	**9,157.55**	**9,216.78**	**8,569.30**	**7,742.34**	**8,316.24**
Memo Items:										
International Bunkers	**399.10**	**412.19**	**401.43**	**505.41**	**505.41**	**574.04**	**623.69**	**746.01**	**904.09**	**1,019.97**
Aviation	399.10	412.19	401.43	505.41	505.41	574.04	623.69	746.01	904.09	1,019.97
Marine	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Multilateral Operations	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE
CO_2 Emissions from Biomass	70.91	70.91	70.91	70.91	70.91	70.83	71.38	71.38	71.38	71.38

Note: All footnotes for this table are given at the end of the table on sheet 5.

TABLE 10 EMISSION TRENDS
CO_2
(Part 2 of 2)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	2000	2001	2002	2003	2004	Change from base to latest reported year
	(Gg)	(Gg)	(Gg)	(Gg)	(Gg)	%
1. Energy	**8,109.87**	**8,434.71**	**9,221.33**	**9,739.23**	**11,210.98**	**6.48**
A. Fuel Combustion (Sectoral Approach)	8,109.87	8,434.71	9,221.33	9,739.23	11,210.98	6.48
1. Energy Industries	254.87	266.14	266.14	266.14	383.13	-69.78
2. Manufacturing Industries and Construction	1,644.69	1,561.17	2,186.18	2,130.86	2,528.26	-52.21
3. Transport	4,977.76	5,222.59	5,419.96	6,018.90	6,986.62	156.44
4. Other Sectors	1,232.55	1,384.81	1,349.05	1,323.33	1,312.97	5.38
5. Other	IE,NO	IE,NO	IE,NO	IE,NO	IE,NO	0.00
B. Fugitive Emissions from Fuels	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	0.00
1. Solid Fuels	NO	NO	NO	NO	NO	0.00
2. Oil and Natural Gas	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	0.00
2. Industrial Processes	**698.54**	**642.24**	**790.14**	**727.84**	**747.81**	**-51.96**
A. Mineral Products	564.01	500.03	516.30	461.36	504.08	-14.65
B. Chemical Industry	NO	NO	NO	NO	NO	0.00
C. Metal Production	131.13	138.97	270.05	262.69	240.31	-75.01
D. Other Production	3.40	3.24	3.79	3.79	3.42	-18.38
E. Production of Halocarbons and SF_6						
F. Consumption of Halocarbons and SF_6						
G. Other	NO	NO	NO	NO	NO	0.00
3. Solvent and Other Product Use	9.35	9.16	9.21	9.21	9.22	1.88
4. Agriculture						
A. Enteric Fermentation						
B. Manure Management						
C. Rice Cultivation						
D. Agricultural Soils						
E. Prescribed Burning of Savannas						
F. Field Burning of Agricultural Residues						
G. Other						
5. Land Use, Land-Use Change and Forestry [2]	**-294.93**	**-294.93**	**-294.93**	**-294.93**	**-294.93**	**0.00**
A. Forest Land	NE	NE	NE	NE	NE	0.00
B. Cropland	NE	NE	NE	NE	NE	0.00
C. Grassland	NE	NE	NE	NE	NE	0.00
D. Wetlands	NE	NE	NE	NE	NE	0.00
E. Settlements	NE	NE	NE	NE	NE	0.00
F. Other Land	NE	NE	NE	NE	NE	0.00
G. Other	-294.93	-294.93	-294.93	-294.93	-294.93	0.00
6. Waste	**10.00**	**10.00**	**10.00**	**10.00**	**10.00**	**0.00**
A. Solid Waste Disposal on Land	NO	NO	NO	NO	NO	0.00
B. Waste-water Handling						
C. Waste Incineration	10.00	10.00	10.00	10.00	10.00	0.00
D. Other	NO	NO	NO	NO	NO	0.00
7. Other *(as specified in Summary 1.A)*	**NA**	**NA**	**NA**	**NA**	**NA**	**0.00**
Total CO_2 emissions including net CO_2 from LULUCF	**8,532.83**	**8,801.18**	**9,735.75**	**10,191.35**	**11,683.08**	**-1.07**
Total CO_2 emissions excluding net CO_2 from LULUCF	**8,827.76**	**9,096.11**	**10,030.68**	**10,486.28**	**11,978.01**	**-1.04**
Memo Items:						
International Bunkers	**972.17**	**1,051.30**	**1,139.03**	**1,186.60**	**1,290.42**	**223.33**
Aviation	972.17	1,051.30	1,139.03	1,186.60	1,290.42	223.33
Marine	NE	NE	NE	NE	NE	0.00
Multilateral Operations	IE	IE	IE	IE	IE	0.00
CO_2 Emissions from Biomass	71.38	71.38	43.80	43.80	43.80	-38.23

Note: All footnotes for this table are given at the end of the table on sheet 5.

TABLE 10 EMISSION TRENDS Inventory 2004
CH_4 Submission 2007 v1.1
(Part 1 of 2) LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Base year (1990)	1991	1992	1993	1994	1995	1996	1997	1998	1999
	(Gg)	(Gg)	(Gg)	(Gg)	(Gg)	(Gg)	(Gg)	(Gg)	(Gg)	(Gg)
1. Energy	2.75	3.11	3.33	3.50	3.29	3.44	3.68	3.72	3.68	3.67
A. Fuel Combustion (Sectoral Approach)	1.44	1.71	1.87	1.98	1.80	1.69	1.81	1.81	1.75	1.61
1. Energy Industries	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO
2. Manufacturing Industries and Construction	0.03	0.03	0.03	0.03	0.05	0.03	0.05	0.03	0.03	0.05
3. Transport	0.87	0.94	1.16	1.17	1.25	1.20	1.24	1.28	1.26	1.10
4. Other Sectors	0.54	0.74	0.68	0.78	0.50	0.46	0.52	0.50	0.46	0.46
5. Other	IE,NO	IE,NO	IE,NO	IE,NO	IE,NO	IE,NO	IE,NO	IE,NO	IE,NO	IE,NO
B. Fugitive Emissions from Fuels	1.31	1.40	1.46	1.52	1.49	1.75	1.87	1.91	1.93	2.06
1. Solid Fuels	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2. Oil and Natural Gas	1.31	1.40	1.46	1.52	1.49	1.75	1.87	1.91	1.93	2.06
2. Industrial Processes	**IE,NE,NO**	**IE,NE,NO**	**IE,NE,NO**	**IE,NE,NO**	**IE,NE,NO**	**IE,NE,NO**	**IE,NE,NO**	**IE,NE,NO**	**NA,NE,NO**	**NA,NE,NO**
A. Mineral Products	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
B. Chemical Industry	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
C. Metal Production	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	NA,NE,NO	NA,NE,NO
D. Other Production										
E. Production of Halocarbons and SF_6										
F. Consumption of Halocarbons and SF_6										
G. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
3. Solvent and Other Product Use										
4. Agriculture	**13.04**	**12.57**	**11.90**	**12.00**	**11.83**	**12.05**	**12.07**	**11.92**	**11.96**	**12.02**
A. Enteric Fermentation	9.37	9.18	8.59	8.57	8.50	8.62	8.63	8.39	8.33	8.29
B. Manure Management	3.67	3.39	3.32	3.42	3.32	3.43	3.44	3.53	3.63	3.73
C. Rice Cultivation	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
D. Agricultural Soils	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
E. Prescribed Burning of Savannas	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
F. Field Burning of Agricultural Residues	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
G. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
5. Land Use, Land-Use Change and Forestry	**NA,NE**	**NA,NE**	**NA,NE**	**NA,NE**	**NA,NE**	**NA,NE**	**NA,NE**	**NA,NE**	**NA,NE**	**NA,NE**
A. Forest Land	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
B. Cropland	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
C. Grassland	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
D. Wetlands	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
E. Settlements	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
F. Other Land	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
G. Other	NA,NE	NA,NE	NA,NE	NA,NE	NA,NE	NA,NE	NA,NE	NA,NE	NA,NE	NA,NE
6. Waste	**1.55**	**1.32**	**1.31**	**1.29**	**1.30**	**1.31**	**1.37**	**1.39**	**1.41**	**1.41**
A. Solid Waste Disposal on Land	1.55	1.32	1.31	1.29	1.30	1.31	1.37	1.39	1.41	1.41
B. Waste-water Handling	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO
C. Waste Incineration	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
D. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
7. Other *(as specified in Summary 1.A)*	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
Total CH_4 emissions including CH_4 from LULUCF	**17.34**	**17.00**	**16.54**	**16.79**	**16.42**	**16.80**	**17.12**	**17.03**	**17.05**	**17.10**
Total CH_4 emissions excluding CH_4 from LULUCF	**17.34**	**17.00**	**16.54**	**16.79**	**16.42**	**16.80**	**17.12**	**17.03**	**17.05**	**17.10**
Memo Items:										
International Bunkers	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Aviation	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Marine	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Multilateral Operations	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE
CO_2 Emissions from Biomass										

Note: All footnotes for this table are given at the end of the table on sheet 5

TABLE 10 EMISSION TRENDS
CH_4
(Part 2 of 2)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	2000	2001	2002	2003	2004	Change from base to latest reported year
	(Gg)	(Gg)	(Gg)	(Gg)	(Gg)	%
1. Energy	3.83	3.91	4.33	4.37	4.36	58.55
A. Fuel Combustion (Sectoral Approach)	1.72	1.73	1.56	1.58	1.45	0.69
1. Energy Industries	0.01	0.01	0.01	0.01	0.01	100.00
2. Manufacturing Industries and Construction	0.03	0.03	0.01	0.01	0.04	33.33
3. Transport	1.28	1.27	1.22	1.24	1.10	26.44
4. Other Sectors	0.40	0.42	0.32	0.32	0.30	-44.44
5. Other	IE,NO	IE,NO	IE,NO	IE,NO	IE,NO	0.00
B. Fugitive Emissions from Fuels	2.11	2.18	2.77	2.79	2.91	122.14
1. Solid Fuels	NO	NO	NO	NO	NO	0.00
2. Oil and Natural Gas	2.11	2.18	2.77	2.79	2.91	122.14
2. Industrial Processes	**NA,NE,NO**	**NA,NE,NO**	**NA,NE,NO**	**NA,NE,NO**	**NA,NE,NO**	**0.00**
A. Mineral Products	NO	NO	NO	NO	NO	0.00
B. Chemical Industry	NO	NO	NO	NO	NO	0.00
C. Metal Production	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	0.00
D. Other Production						
E. Production of Halocarbons and SF_6						
F. Consumption of Halocarbons and SF_6						
G. Other	NO	NO	NO	NO	NO	0.00
3. Solvent and Other Product Use						
4. Agriculture	**11.66**	**11.63**	**11.45**	**11.26**	**11.12**	**-14.77**
A. Enteric Fermentation	8.09	8.09	7.92	7.65	7.52	-19.72
B. Manure Management	3.57	3.54	3.53	3.61	3.59	-2.15
C. Rice Cultivation	NO	NO	NO	NO	NO	0.00
D. Agricultural Soils	NE	NE	NE	NE	NE	0.00
E. Prescribed Burning of Savannas	NO	NO	NO	NO	NO	0.00
F. Field Burning of Agricultural Residues	NO	NO	NO	NO	NO	0.00
G. Other	NO	NO	NO	NO	NO	0.00
5. Land Use, Land-Use Change and Forestry	**NA,NE**	**NA,NE**	**NA,NE**	**NA,NE**	**NA,NE**	**0.00**
A. Forest Land	NE	NE	NE	NE	NE	0.00
B. Cropland	NE	NE	NE	NE	NE	0.00
C. Grassland	NE	NE	NE	NE	NE	0.00
D. Wetlands	NE	NE	NE	NE	NE	0.00
E. Settlements	NE	NE	NE	NE	NE	0.00
F. Other Land	NE	NE	NE	NE	NE	0.00
G. Other	NA,NE	NA,NE	NA,NE	NA,NE	NA,NE	0.00
6. Waste	**1.40**	**1.23**	**1.06**	**1.12**	**1.14**	**-26.45**
A. Solid Waste Disposal on Land	1.40	1.23	1.06	1.12	1.14	-26.45
B. Waste-water Handling	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	0.00
C. Waste Incineration	NE	NE	NE	NE	NE	0.00
D. Other	NO	NO	NO	NO	NO	0.00
7. Other *(as specified in Summary 1.A)*	**NA**	**NA**	**NA**	**NA**	**NA**	**0.00**
Total CH_4 emissions including CH_4 from LULUCF	**16.89**	**16.77**	**16.84**	**16.75**	**16.62**	**-4.19**
Total CH_4 emissions excluding CH_4 from LULUCF	**16.89**	**16.77**	**16.84**	**16.75**	**16.62**	**-4.19**
Memo Items:						
International Bunkers	NE	NE	NE	NE	NE	0.00
Aviation	NE	NE	NE	NE	NE	0.00
Marine	NE	NE	NE	NE	NE	0.00
Multilateral Operations	IE	IE	IE	IE	IE	0.00
CO_2 Emissions from Biomass						

Note: All footnotes for this table are given at the end of the table on sheet 5.

TABLE 10 EMISSION TRENDS
N_2O
(Part 1 of 2)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Base year (1990)	1991	1992	1993	1994	1995	1996	1997	1998	1999
	(Gg)	(Gg)	(Gg)	(Gg)	(Gg)	(Gg)	(Gg)	(Gg)	(Gg)	(Gg)
1. Energy	**0.18**	**0.22**	**0.32**	**0.32**	**0.35**	**0.33**	**0.36**	**0.42**	**0.46**	**0.53**
A. Fuel Combustion (Sectoral Approach)	0.18	0.22	0.32	0.32	0.35	0.33	0.36	0.42	0.46	0.53
1. Energy Industries	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO
2. Manufacturing Industries and Construction	0.03	0.02	0.02	0.02	0.02	0.01	0.01	0.02	0.02	0.03
3. Transport	0.15	0.18	0.28	0.28	0.31	0.30	0.33	0.38	0.42	0.48
4. Other Sectors	NE	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
5. Other	IE,NO	IE,NO	IE,NO	IE,NO	IE,NO	IE,NO	IE,NO	IE,NO	IE,NO	IE,NO
B. Fugitive Emissions from Fuels	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
1. Solid Fuels	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2. Oil and Natural Gas	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2. Industrial Processes	**NE,NO**	**NE,NO**	**NE,NO**	**NE,NO**	**NE,NO**	**NE,NO**	**NE,NO**	**NE,NO**	**NE,NO**	**NE,NO**
A. Mineral Products	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
B. Chemical Industry	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
C. Metal Production	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
D. Other Production										
E. Production of Halocarbons and SF_6										
F. Consumption of Halocarbons and SF_6										
G. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
3. Solvent and Other Product Use	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO
4. Agriculture	**0.47**	**0.47**	**0.47**	**0.47**	**0.47**	**0.47**	**0.47**	**0.47**	**0.47**	**0.47**
A. Enteric Fermentation										
B. Manure Management	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO
C. Rice Cultivation										
D. Agricultural Soils	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47
E. Prescribed Burning of Savannas	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
F. Field Burning of Agricultural Residues	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
G. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
5. Land Use, Land-Use Change and Forestry	**0.07**	**0.07**	**0.07**	**0.07**	**0.07**	**0.07**	**0.07**	**0.07**	**0.07**	**0.07**
A. Forest Land	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
B. Cropland	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
C. Grassland	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
D. Wetlands	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
E. Settlements	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
F. Other Land	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
G. Other	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
6. Waste	**NE,NO**	**NE,NO**	**NE,NO**	**NE,NO**	**NE,NO**	**NE,NO**	**NE,NO**	**NE,NO**	**NE,NO**	**NE,NO**
A. Solid Waste Disposal on Land										
B. Waste-water Handling	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO
C. Waste Incineration	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
D. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
7. Other *(as specified in Summary 1.A)*	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
Total N_2O emissions including N_2O from LULUCF	**0.72**	**0.76**	**0.86**	**0.86**	**0.89**	**0.87**	**0.90**	**0.96**	**1.00**	**1.07**
Total N_2O emissions excluding N_2O from LULUCF	**0.65**	**0.69**	**0.79**	**0.79**	**0.82**	**0.80**	**0.83**	**0.89**	**0.93**	**1.00**
Memo Items:										
International Bunkers	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**
Aviation	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Marine	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Multilateral Operations	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE
CO_2 Emissions from Biomass										

Note: All footnotes for this table are given at the end of the table on sheet 5.

TABLE 10 EMISSION TRENDS
N_2O
(Part 2 of 2)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	2000	2001	2002	2003	2004	Change from base to latest reported year
	(Gg)	(Gg)	(Gg)	(Gg)	(Gg)	%
1. Energy	**0.56**	**0.61**	**0.65**	**0.70**	**0.87**	**383.33**
A. Fuel Combustion (Sectoral Approach)	0.56	0.61	0.65	0.70	0.87	383.33
1. Energy Industries	IE,NE,NO	IE,NE,NO	IE,NE,NO	IE,NE,NO	0.01	100.00
2. Manufacturing Industries and Construction	0.02	0.01	0.01	0.01	0.02	-33.33
3. Transport	0.54	0.58	0.62	0.69	0.84	460.00
4. Other Sectors	NE	0.02	0.02	NE	NE	0.00
5. Other	IE,NO	IE,NO	IE,NO	IE,NO	IE,NO	0.00
B. Fugitive Emissions from Fuels	NO	NO	NO	NO	NO	0.00
1. Solid Fuels	NO	NO	NO	NO	NO	0.00
2. Oil and Natural Gas	NO	NO	NO	NO	NO	0.00
2. Industrial Processes	**NE,NO**	**NE,NO**	**NE,NO**	**NE,NO**	**NE,NO**	**0.00**
A. Mineral Products	NO	NO	NO	NO	NO	0.00
B. Chemical Industry	NO	NO	NO	NO	NO	0.00
C. Metal Production	NE	NE	NE	NE	NE	0.00
D. Other Production						
E. Production of Halocarbons and SF_6						
F. Consumption of Halocarbons and SF_6						
G. Other	NO	NO	NO	NO	NO	0.00
3. Solvent and Other Product Use	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	0.00
4. Agriculture	**0.47**	**0.47**	**0.47**	**0.47**	**0.47**	**0.00**
A. Enteric Fermentation						
B. Manure Management	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	0.00
C. Rice Cultivation						
D. Agricultural Soils	0.47	0.47	0.47	0.47	0.47	0.00
E. Prescribed Burning of Savannas	NO	NO	NO	NO	NO	0.00
F. Field Burning of Agricultural Residues	NO	NO	NO	NO	NO	0.00
G. Other	NO	NO	NO	NO	NO	0.00
5. Land Use, Land-Use Change and Forestry	**0.07**	**0.07**	**0.07**	**0.07**	**0.07**	**0.00**
A. Forest Land	NE	NE	NE	NE	NE	0.00
B. Cropland	NE	NE	NE	NE	NE	0.00
C. Grassland	NE	NE	NE	NE	NE	0.00
D. Wetlands	NE	NE	NE	NE	NE	0.00
E. Settlements	NE	NE	NE	NE	NE	0.00
F. Other Land	NE	NE	NE	NE	NE	0.00
G. Other	0.07	0.07	0.07	0.07	0.07	0.00
6. Waste	**NE,NO**	**NE,NO**	**NE,NO**	**NE,NO**	**NE,NO**	**0.00**
A. Solid Waste Disposal on Land						
B. Waste-water Handling	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	0.00
C. Waste Incineration	NE	NE	NE	NE	NE	0.00
D. Other	NO	NO	NO	NO	NO	0.00
7. Other *(as specified in Summary 1.A)*	**NA**	**NA**	**NA**	**NA**	**NA**	**0.00**
Total N_2O emissions including N_2O from LULUCF	**1.10**	**1.15**	**1.19**	**1.24**	**1.41**	**95.83**
Total N_2O emissions excluding N_2O from LULUCF	**1.03**	**1.08**	**1.12**	**1.17**	**1.34**	**106.15**
Memo Items:						
International Bunkers	**NE**	**NE**	**NE**	**NE**	**NE**	**0.00**
Aviation	NE	NE	NE	NE	NE	0.00
Marine	NE	NE	NE	NE	NE	0.00
Multilateral Operations	IE	IE	IE	IE	IE	0.00
CO_2 Emissions from Biomass						

Note: All footnotes for this table are given at the end of the table on sheet 5.

TABLE 10 EMISSION TRENDS
HFCs, PFCs and SF_6
(Part 1 of 2)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Base year (1990) (Gg)	1991 (Gg)	1992 (Gg)	1993 (Gg)	1994 (Gg)	1995 (Gg)	1996 (Gg)	1997 (Gg)	1998 (Gg)	1999 (Gg)
Emissions of HFCs[3] - (Gg CO_2 equivalent)	**13.62**	**13.62**	**13.62**	**13.62**	**13.62**	**13.62**	**13.62**	**13.62**	**13.62**	**13.62**
HFC-23	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO
HFC-32	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO
HFC-41	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO
HFC-43-10mee	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO
HFC-125	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO
HFC-134	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO
HFC-134a	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO
HFC-152a	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO
HFC-143	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO
HFC-143a	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO
HFC-227ea	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO
HFC-236fa	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO
HFC-245ca	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO
Unspecified mix of listed HFCs[4] - (Gg CO_2 equivalent)	13.62	13.62	13.62	13.62	13.62	13.62	13.62	13.62	13.62	13.62
Emissions of PFCs[3] - (Gg CO_2 equivalent)	**NA,NO**	**NA,NO**	**NA,NO**	**NA,NO**	**NA,NO**	**NA,NO**	**NA,NO**	**NA,NO**	**NA,NO**	**NA,NO**
CF_4	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
C_2F_6	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
C_3F_8	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
C_4F_{10}	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
c-C_4F_8	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
C_5F_{12}	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
C_6F_{14}	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Unspecified mix of listed PFCs[4] - (Gg CO_2 equivalent)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Emissions of SF_6[3] - (Gg CO_2 equivalent)	**2.91**	**2.91**	**2.91**	**2.91**	**2.91**	**2.91**	**2.91**	**2.91**	**2.91**	**2.91**
SF_6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: All footnotes for this table are given at the end of the table on sheet 5.

TABLE 10 EMISSION TRENDS
HFCs, PFCs and SF_6
(Part 2 of 2)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	2000	2001	2002	2003	2004	Change from base to latest reported year
	(Gg)	(Gg)	(Gg)	(Gg)	(Gg)	%
Emissions of HFCs[3] - (Gg CO_2 equivalent)	**43.06**	**43.06**	**43.06**	**43.06**	**43.06**	**216.21**
HFC-23	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	0.00
HFC-32	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	0.00
HFC-41	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	0.00
HFC-43-10mee	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	0.00
HFC-125	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	0.00
HFC-134	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	0.00
HFC-134a	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	0.00
HFC-152a	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	0.00
HFC-143	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	0.00
HFC-143a	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	0.00
HFC-227ea	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	0.00
HFC-236fa	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	0.00
HFC-245ca	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	0.00
Unspecified mix of listed HFCs[4] - (Gg CO_2 equivalent)	43.06	43.06	43.06	43.06	43.06	216.21
Emissions of PFCs[3] - (Gg CO_2 equivalent)	**NA,NO**	**NA,NO**	**NA,NO**	**NA,NO**	**NA,NO**	**0.00**
CF_4	NO	NO	NO	NO	NO	0.00
C_2F_6	NO	NO	NO	NO	NO	0.00
C_3F_8	NO	NO	NO	NO	NO	0.00
C_4F_{10}	NO	NO	NO	NO	NO	0.00
c-C_4F_8	NO	NO	NO	NO	NO	0.00
C_5F_{12}	NO	NO	NO	NO	NO	0.00
C_6F_{14}	NO	NO	NO	NO	NO	0.00
Unspecified mix of listed PFCs[4] - (Gg CO_2 equivalent)	NO	NO	NO	NO	NO	0.00
Emissions of SF6[3] - (Gg CO_2 equivalent)	**3.52**	**3.52**	**3.52**	**3.52**	**3.52**	**21.08**
SF_6	0.00	0.00	0.00	0.00	0.00	21.08

Note: All footnotes for this table are given at the end of the table on sheet 5.

TABLE 10 EMISSION TRENDS SUMMARY (Part 1 of 2)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS EMISSIONS	Base year (1990)	1991	1992
	CO_2 equivalent (Gg)	CO_2 equivalent (Gg)	CO_2 equivalent (Gg)
CO_2 emissions including net CO_2 from LULUCF	11,809.51	12,087.93	11,877.23
CO_2 emissions excluding net CO_2 from LULUCF	12,104.44	12,382.86	12,172.16
CH_4 emissions including CH_4 from LULUCF	364.22	356.95	347.42
CH_4 emissions excluding CH_4 from LULUCF	364.22	356.95	347.42
N_2O emissions including N_2O from LULUCF	223.20	235.60	266.60
N_2O emissions excluding N_2O from LULUCF	201.50	213.90	244.90
HFCs	13.62	13.62	13.62
PFCs	NA,NO	NA,NO	NA,NO
SF_6	2.91	2.91	2.91
Total (including LULUCF)	**12,413.46**	**12,697.01**	**12,507.77**
Total (excluding LULUCF)	**12,686.69**	**12,970.24**	**12,781.00**

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Base year (1990)	1991	1992
	CO_2 equivalent (Gg)	CO_2 equivalent (Gg)	CO_2 equivalent (Gg)
1. Energy	10,642.35	10,989.81	10,914.68
2. Industrial Processes	1,573.12	1,524.01	1,424.03
3. Solvent and Other Product Use	9.05	9.08	9.11
4. Agriculture	419.62	409.62	395.68
5. Land Use, Land-Use Change and Forestry[5]	-273.23	-273.23	-273.23
6. Waste	42.55	37.72	37.51
7. Other	NA	NA	NA
Total (including LULUCF)[5]	**12,413.46**	**12,697.01**	**12,507.77**

[1] The column "Base year" should be filled in only by those Parties with economies in transition that use a base year different from 1990 in accordance with the relevant decisions of the COP. For these Parties, this different base year is used to calculate the percentage change in the final column of this table.

[2] Fill in net emissions/removals as reported in table Summary 1.A. For the purposes of reporting, the signs for removals are always negative (-) and for emissions positive (+).

[3] Enter actual emissions estimates. If only potential emissions estimates are available, these should be reported in this table and an indication for this be provided in the documentation box. Only in these rows are the emissions expressed as CO_2 equivalent emissions.

[4] In accordance with the UNFCCC reporting guidelines, HFC and PFC emissions should be reported for each relevant chemical. However, if it is not possible to report values for each chemical (i.e. mixtures, confidential data, lack of disaggregation), this row could be used for reporting aggregate figures for HFCs and PFCs, respectively. Note that the unit used for this row is Gg of CO_2 equivalent and that appropriate notation keys should be entered in the cells for the individual chemicals.

[5] Includes net CO_2, CH_4 and N_2O from LULUCF.

TABLE 10 EMISSION TRENDS SUMMARY (Part 2 of 2)

Inventory 2004
Submission 2007 v1.1
LUXEMBOURG

GREENHOUSE GAS EMISSIONS	2000	2001	2002
	CO_2 equivalent (Gg)	CO_2 equivalent (Gg)	CO_2 equivalent (Gg)
CO_2 emissions including net CO_2 from LULUCF	8,532.83	8,801.18	9,735.75
CO_2 emissions excluding net CO_2 from LULUCF	8,827.76	9,096.11	10,030.68
CH_4 emissions including CH_4 from LULUCF	354.67	352.26	353.61
CH_4 emissions excluding CH_4 from LULUCF	354.67	352.26	353.61
N_2O emissions including N_2O from LULUCF	341.00	356.50	368.90
N_2O emissions excluding N_2O from LULUCF	319.30	334.80	347.20
HFCs	43.06	43.06	43.06
PFCs	NA,NO	NA,NO	NA,NO
SF_6	3.52	3.52	3.52
Total (including LULUCF)	**9,275.08**	**9,556.53**	**10,504.85**
Total (excluding LULUCF)	**9,548.31**	**9,829.76**	**10,778.08**

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	2000	2001	2002
	CO_2 equivalent (Gg)	CO_2 equivalent (Gg)	CO_2 equivalent (Gg)
1. Energy	8,363.90	8,705.92	9,513.76
2. Industrial Processes	745.12	688.82	836.72
3. Solvent and Other Product Use	9.35	9.16	9.21
4. Agriculture	390.54	390.02	386.12
5. Land Use, Land-Use Change and Forestry[5]	-273.23	-273.23	-273.23
6. Waste	39.40	35.83	32.26
7. Other	NA	NA	NA
Total (including LULUCF)[5]	**9,275.08**	**9,556.53**	**10,504.85**

[1] The column "Base year" should be filled in only by those Parties with economies in transition that use a base year different from 1990 in accordance with the relevant decisions of the COP. For these Parties, this different base year is used to calculate the percentage change in the final column of this table.

[2] Fill in net emissions/removals as reported in table Summary 1.A. For the purposes of reporting, the signs for removals are always negative (-) and for emissions positive (+).

[3] Enter actual emissions estimates. If only potential emissions estimates are available, these should be reported in this table and an indication for this be provided in the documentation box. Only in these rows are the emissions expressed as CO_2 equivalent emissions.

[4] In accordance with the UNFCCC reporting guidelines, HFC and PFC emissions should be reported for each relevant chemical. However, if it is not possible to report values for each chemical (i.e. mixtures, confidential data, lack of disaggregation), this row could be used for reporting aggregate figures for HFCs and PFCs, respectively. Note that the unit used for this row is Gg of CO_2 equivalent and that appropriate notation keys should be entered in the cells for the individual chemicals.

[5] Includes net CO_2, CH_4 and N_2O from LULUCF.

Documentation box:
• Parties should provide detailed explanations on emissions trends in Chapter 2: Trends in Greenhouse Gas Emissions and, as appropriate, in the corresponding Chapters 3 - 9 of the NIR. Use this documentation box to provide references to relevant sections of the NIR if any additional information and further details are needed to understand the content of this table.
• Use the documentation box to provide explanations if potential emissions are reported.

Annex II – CRF Table 8(a) Recalculation 1990 – 2004

This Annex includes the CRF-Table 8(a): Recalculation for the time series 1990 - 2004.

TABLE 8(a) RECALCULATION - RECALCULATED DATA

Recalculated year: 2003

Inventory 2004
Submission 2007 v1.1
Luxembourg

GREENHOUSE GAS SOURCE AND SINK CATEGORIES		CO_2					CH_4					N_2O				
		Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)
		CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)
Total National Emissions and Removals		**10 396.93**	**10 191.35**	**-205.58**	**-1.98**	**-1.83**	**470.82**	**353.01**	**-117.81**	**-25.02**	**-1.05**	**89.90**	**384.40**	**294.50**	**327.59**	**2.62**
1. Energy		**9 954.81**	**9 739.23**	**-215.58**	**-2.17**	**-1.92**	**74.76**	**91.77**	**17.01**	**22.75**	**0.15**	**58.90**	**217.00**	**158.10**	**268.42**	**1.41**
1.A.	Fuel Combustion Activities	9 954.81	9 739.23	-215.58	-2.17	-1.92	16.17	33.18	17.01	105.19	0.15	58.90	217.00	158.10	268.42	1.41
1.A.1.	Energy Industries	266.14	266.14	0.00	0.00	0.00	0.21	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.A.2.	Manufacturing Industries and Construction	2 301.27	2 130.86	-170.41	-7.41	-1.51	0.21	0.21	0.00	0.00	0.00	3.10	3.10	0.00	0.00	0.00
1.A.3.	Transport	6 018.97	6 018.90	-0.07	0.00	0.00	9.03	26.04	17.01	188.37	0.15	55.80	213.90	158.10	283.33	1.41
1.A.4.	Other Sectors	1 368.43	1 323.33	-45.10	-3.30	-0.40	6.72	6.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.A.5.	Other	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
1.B.	Fugitive Emissions from Fuels	0.00	0.00	0.00	0.00	0.00	58.59	58.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.B.1.	Solid fuel	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
1.B.2.	Oil and Natural Gas	0.00	0.00	0.00	0.00	0.00	58.59	58.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2. Industrial Processes		**727.84**	**727.84**	**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**
2.A.	Mineral Products	461.36	461.36	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
2.B.	Chemical Industry	0.00	NO	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
2.C.	Metal Production	262.69	262.69	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
2.D.	Other Production	3.79	3.79	0.00	0.00	0.00										
2.G.	Other	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
3. Solvent and Other Product Use		**9.21**	**9.21**	**0.00**	**0.00**	**0.00**						**0.00**	**0.00**	**0.00**	**0.00**	0.00
4. Agriculture							**338.73**	**237.72**	**-101.01**	**-29.82**	**-0.90**	**0.00**	**145.70**	**145.70**	**100.00**	**1.30**
4.A.	Enteric Fermentation						316.68	161.70	-154.98	-48.94	-1.38					
4.B.	Manure Management						22.05	76.02	53.97	244.76	0.48	0.00	0.00	0.00	0.00	0.00
4.C.	Rice Cultivation						0.00	0.00	0.00	0.00	0.00					
4.D.	Agricultural Soils [2]						0.00	0.00	0.00	0.00	0.00	0.00	145.70	145.70	100.00	1.30
4.E.	Prescribed Burning of Savannas						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.F.	Field Burning of Agricultural Residues						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.G.	Other						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Land-Use, Land-Use Change and Forestry		**-294.93**	**-294.93**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**21.70**	**21.70**	**0.00**	**0.00**	**0.00**
5.A.	Forest Land		-294.93	-294.93				0.00	0.00				0.00	0.00		
5.B.	Cropland		-	0.00				0.00	0.00				21.70	21.70		
5.C.	Grassland		-	0.00				0.00	0.00				0.00	0.00		
5.D.	Wetlands		-	0.00				0.00	0.00				0.00	0.00		
5.E.	Settlements		-	0.00				0.00	0.00				0.00	0.00		
5.F.	Other Land		-	0.00				0.00	0.00				0.00	0.00		
5.G.	Other		-	0.00				0.00	0.00				0.00			
6. Waste		**0.00**	**10.00**	**10.00**	**100.00**	**0.09**	**57.33**	**23.52**	**-33.81**	**-58.97**	**-0.30**	**9.30**	**0.00**	**-9.30**	**-100.00**	**-0.08**
6.A.	Solid Waste Disposal on Land	0.00	0.00	0.00	0.00	0.00	48.51	23.52	-24.99	-51.52	-0.22					
6.B.	Wastewater Handling						4.62	0.00	-4.62	-100.00	-0.04	6.20	0.00	-6.20	-100.00	-0.06
6.C.	Waste Incineration	0.00	10.00	10.00	100.00	0.09	0.21	0.00	-0.21	-100.00	0.00	3.10	0.00	-3.10	-100.00	-0.03
6.D.	Other	0.00	0.00	0.00	0.00	0.00	3.99	0.00	-3.99	-100.00	-0.04	0.00	0.00	0.00	0.00	0.00
7. Other *(please specify)*		**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**
Memo Items:																
International Bunkers		**1 185.70**	**1 186.60**	**0.90**	**0.08**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Multilateral Operations		**0.00**	**NE**	**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**
CO_2 Emissions from Biomass		**43.80**	**43.80**	**0.00**	**0.00**	**0.00**										

GREENHOUSE GAS SOURCE AND SINK CATEGORIES		HFCs					PFCs					SF_6				
		Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)
		CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)
Total Actual Emissions		**43.06**	**43.07**	**0.01**	**0.02**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**3.52**	**3.53**	**0.01**	**0.28**	**0.00**
2.C.3.	Aluminium Production					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.E.	Production of Halocarbons and SF_6	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
2.F.	Consumption of Halocarbons and SF_6	43.06	43.07	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00	3.52	3.53	0.01	0.28	0.00
	Other	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
Potential Emissions from Consumption of HFCs/PFCs and SF_6		**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

	Previous submission	Latest submission	Difference	Difference[1]
	CO_2 equivalent (Gg)			(%)
Total CO_2 Equivalent Emissions with Land-Use Change and Forestry [3]	11 004.23	10 975.36	-28.87	-0.26
Total CO_2 Equivalent Emissions without Land-Use Change and Forestry [3]	11 277.46	11 248.59	-28.87	-0.26

TABLE 8(a) RECALCULATION - RECALCULATED DATA

Recalculated year: 2002

Inventory 2004
Submission 2007 v1.1
Luxembourg

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2					CH_4					N_2O				
	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)
	CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)
Total National Emissions and Removals	**9 923.40**	**9 735.75**	**-187.65**	**-1.89**	**-1.74**	**470.74**	**354.27**	**-116.47**	**-24.74**	**-1.08**	**96.87**	**368.90**	**272.03**	**280.83**	**2.52**
1. Energy	**9 418.96**	**9 221.33**	**-197.63**	**-2.10**	**-1.83**	**74.58**	**90.93**	**16.35**	**21.93**	**0.15**	**67.65**	**201.50**	**133.85**	**197.86**	**1.24**
1.A. Fuel Combustion Activities	9 418.96	9 221.33	-197.63	-2.10	-1.83	16.45	32.76	16.31	99.11	0.15	67.65	201.50	133.85	197.86	1.24
1.A.1. Energy Industries	266.14	266.14	0.00	0.00	0.00	0.12	0.21	0.09	78.79	0.00	1.46	0.00	-1.46	-100.00	-0.01
1.A.2. Manufacturing Industries and Construction	2 340.81	2 186.18	-154.63	-6.61	-1.43	0.48	0.21	-0.27	-56.03	0.00	4.80	3.10	-1.70	-35.35	-0.02
1.A.3. Transport	5 422.26	5 419.96	-2.30	-0.04	-0.02	9.13	25.62	16.49	180.63	0.15	55.27	192.20	136.93	247.78	1.27
1.A.4. Other Sectors	1 389.75	1 349.05	-40.70	-2.93	-0.38	6.73	6.72	-0.01	-0.13	0.00	6.13	6.20	0.07	1.21	0.00
1.A.5. Other	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
1.B. Fugitive Emissions from Fuels	0.00	0.00	0.00	0.00	0.00	58.12	58.17	0.05	0.08	0.00	0.00	0.00	0.00	0.00	0.00
1.B.1. Solid fuel	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
1.B.2. Oil and Natural Gas	0.00	0.00	0.00	0.00	0.00	58.12	58.17	0.05	0.08	0.00	0.00	0.00	0.00	0.00	0.00
2. Industrial Processes	**790.14**	**790.14**	**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**
2.A. Mineral Products	516.30	516.30	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
2.B. Chemical Industry	0.00	NO	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
2.C. Metal Production	270.05	270.05	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
2.D. Other Production	3.79	3.79	0.00	0.03	0.00										
2.G. Other	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
3. Solvent and Other Product Use	**9.22**	**9.21**	**-0.01**	**-0.11**	**0.00**						**0.00**	**0.00**	**0.00**	**0.00**	0.00
4. Agriculture						**338.79**	**241.08**	**-97.71**	**-28.84**	**-0.91**	**0.00**	**145.70**	**145.70**	**100.00**	**1.35**
4.A. Enteric Fermentation						316.64	166.74	-149.90	-47.34	-1.39					
4.B. Manure Management						22.15	74.34	52.19	235.62	0.48	0.00	0.00	0.00	0.00	0.00
4.C. Rice Cultivation						0.00	0.00	0.00	0.00	0.00					
4.D. Agricultural Soils [2]						0.00	0.00	0.00	0.00	0.00	0.00	145.70	145.70	100.00	1.35
4.E. Prescribed Burning of Savannas						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.F. Field Burning of Agricultural Residues						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.G. Other						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Land-Use, Land-Use Change and Forestry	**-294.93**	**-294.93**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**21.70**	**21.70**	**0.00**	**0.00**	**0.00**
5.A. Forest Land		-294.93	-294.93				0.00	0.00				0.00	0.00		
5.B. Cropland		-	0.00				0.00	0.00				21.70	21.70		
5.C. Grassland		-	0.00				0.00	0.00				0.00	0.00		
5.D. Wetlands		-	0.00				0.00	0.00				0.00	0.00		
5.E. Settlements		-	0.00				0.00	0.00				0.00	0.00		
5.F. Other Land		-	0.00				0.00	0.00				0.00	0.00		
5.G. Other		-	0.00				0.00	0.00				0.00	0.00		
6. Waste	**0.00**	**10.00**	**10.00**	**100.00**	**0.09**	**57.37**	**22.26**	**-35.11**	**-61.20**	**-0.33**	**7.52**	**0.00**	**-7.52**	**-100.00**	**-0.07**
6.A. Solid Waste Disposal on Land	0.00	0.00	0.00	0.00	0.00	48.47	22.26	-26.21	-54.08	-0.24					
6.B. Wastewater Handling						4.71	0.00	-4.71	-100.00	-0.04	5.56	0.00	-5.56	-100.00	-0.05
6.C. Waste Incineration	0.00	10.00	10.00	100.00	0.09	0.20	0.00	-0.20	-100.00	0.00	1.96	0.00	-1.96	-100.00	-0.02
6.D. Other	0.00	0.00	0.00	0.00	0.00	3.99	0.00	-3.99	-100.00	-0.04	0.00	0.00	0.00	0.00	0.00
7. Other *(please specify)*	**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								
Memo Items:															
International Bunkers	**1 138.18**	**1 139.03**	**0.85**	**0.07**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Multilateral Operations	**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**
CO_2 Emissions from Biomass	**43.81**	**43.80**	**-0.01**	**-0.01**	**0.00**										

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	HFCs					PFCs					SF_6				
	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)
	CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)
Total Actual Emissions	**43.06**	**43.07**	**0.01**	**0.02**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**3.52**	**3.52**	**0.00**	**0.00**	**0.00**
2.C.3. Aluminium Production					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.E. Production of Halocarbons and SF_6	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
2.F. Consumption of Halocarbons and SF_6	43.06	43.07	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00	3.52	3.52	0.00	0.00	0.00
Other	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
Potential Emissions from Consumption of HFCs/PFCs and SF_6	**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

	Previous submission	Latest submission	Difference	Difference[1]
	CO_2 equivalent (Gg)			(%)
Total CO_2 Equivalent Emissions with Land-Use Change and Forestry [3]	10 537.59	10 505.51	-32.08	-0.30
Total CO_2 Equivalent Emissions without Land-Use Change and Forestry [3]	10 810.82	10 778.74	-32.08	-0.30

TABLE 8(a) RECALCULATION - RECALCULATED DATA

Recalculated year: 2001

Inventory 2004
Submission 2007 v1.1
Luxembourg

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2					CH_4					N_2O				
	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)
	CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)
Total National Emissions and Removals	**8 905.98**	**8 801.18**	**-104.80**	**-1.18**	**-1.07**	**472.84**	**353.01**	**-119.83**	**-25.34**	**-1.22**	**96.96**	**356.50**	**259.54**	**267.67**	**2.64**
1. Energy	**8 565.87**	**8 434.71**	**-131.16**	**-1.53**	**-1.33**	**65.66**	**82.11**	**16.45**	**25.06**	**0.17**	**67.83**	**189.10**	**121.27**	**178.80**	**1.23**
1.A. Fuel Combustion Activities	8 565.87	8 434.71	-131.16	-1.53	-1.33	19.84	36.33	16.49	83.09	0.17	67.83	189.10	121.27	178.80	1.23
1.A.1. Energy Industries	266.14	266.14	0.00	0.00	0.00	0.12	0.21	0.09	78.79	0.00	1.46	0.00	-1.46	-100.00	-0.01
1.A.2. Manufacturing Industries and Construction	1 651.00	1 561.17	-89.83	-5.44	-0.91	0.81	0.63	-0.18	-21.98	0.00	7.17	3.10	-4.07	-56.75	-0.04
1.A.3. Transport	5 223.21	5 222.59	-0.62	-0.01	-0.01	9.65	26.67	17.02	176.33	0.17	52.72	179.80	127.08	241.03	1.29
1.A.4. Other Sectors	1 425.51	1 384.81	-40.70	-2.86	-0.41	9.27	8.82	-0.45	-4.82	0.00	6.47	6.20	-0.27	-4.21	0.00
1.A.5. Other	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
1.B. Fugitive Emissions from Fuels	0.00	0.00	0.00	0.00	0.00	45.81	45.78	-0.03	-0.08	0.00	0.00	0.00	0.00	0.00	0.00
1.B.1. Solid fuel	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
1.B.2. Oil and Natural Gas	0.00	0.00	0.00	0.00	0.00	45.81	45.78	-0.03	-0.08	0.00	0.00	0.00	0.00	0.00	0.00
2. Industrial Processes	**625.45**	**642.24**	**16.79**	**2.68**	**0.17**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
2.A. Mineral Products	483.23	500.03	16.80	3.48	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.B. Chemical Industry	0.00	NO	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
2.C. Metal Production	138.98	138.97	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
2.D. Other Production	3.24	3.24	0.00	-0.14	0.00										
2.G. Other	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
3. Solvent and Other Product Use	**9.58**	**9.16**	**-0.42**	**-4.42**	**0.00**						**0.00**	**0.00**	**0.00**	**0.00**	0.00
4. Agriculture						**350.47**	**245.07**	**-105.40**	**-30.07**	**-1.07**	**0.00**	**145.70**	**145.70**	**100.00**	**1.48**
4.A. Enteric Fermentation						327.70	170.31	-157.39	-48.03	-1.60					
4.B. Manure Management						22.77	74.76	51.99	228.33	0.53	0.00	0.00	0.00	0.00	0.00
4.C. Rice Cultivation						0.00	0.00	0.00	0.00	0.00					
4.D. Agricultural Soils [2]						0.00	0.00	0.00	0.00	0.00	0.00	145.70	145.70	100.00	1.48
4.E. Prescribed Burning of Savannas						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.F. Field Burning of Agricultural Residues						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.G. Other						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Land-Use, Land-Use Change and Forestry	**-294.93**	**-294.93**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**21.70**	**21.70**	**0.00**	**0.00**	**0.00**
5.A. Forest Land		-294.93	-294.93				0.00	0.00				0.00	0.00		
5.B. Cropland		-	0.00				0.00	0.00				21.70	21.70		
5.C. Grassland		-	0.00				0.00	0.00				0.00	0.00		
5.D. Wetlands		-	0.00				0.00	0.00				0.00	0.00		
5.E. Settlements		-	0.00				0.00	0.00				0.00	0.00		
5.F. Other Land		-	0.00				0.00	0.00				0.00	0.00		
5.G. Other		-	0.00				0.00	0.00				0.00	0.00		
6. Waste	**0.00**	**10.00**	**10.00**	**100.00**	**0.10**	**56.71**	**25.83**	**-30.88**	**-54.45**	**-0.31**	**7.44**	**0.00**	**-7.44**	**-100.00**	**-0.08**
6.A. Solid Waste Disposal on Land	0.00	0.00	0.00	0.00	0.00	47.86	25.83	-22.03	-46.03	-0.22					
6.B. Wastewater Handling						4.66	0.00	-4.66	-100.00	-0.05	5.51	0.00	-5.51	-100.00	-0.06
6.C. Waste Incineration	0.00	10.00	10.00	100.00	0.10	0.20	0.00	-0.20	-100.00	0.00	1.93	0.00	-1.93	-100.00	-0.02
6.D. Other	0.00	0.00	0.00	0.00	0.00	3.99	0.00	-3.99	-100.00	-0.04	0.00	0.00	0.00	0.00	0.00
7. Other *(please specify)*	**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**
Memo Items:															
International Bunkers	**1 051.00**	**1 051.30**	**0.30**	**0.03**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Multilateral Operations	**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**
CO_2 Emissions from Biomass	**71.37**	**71.38**	**0.01**	**0.01**	**0.00**										

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	HFCs					PFCs					SF_6				
	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)
	CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)
Total Actual Emissions	**43.06**	**43.07**	**0.01**	**0.02**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**3.51**	**3.53**	**0.02**	**0.48**	**0.00**
2.C.3. Aluminium Production					0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.E. Production of Halocarbons and SF_6	-	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
2.F. Consumption of Halocarbons and SF_6	43.06	43.07	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00	3.51	3.53	0.02	0.48	0.00
Other	-	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
Potential Emissions from Consumption of HFCs/PFCs and SF_6	**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

	Previous submission	Latest submission	Difference	Difference[1]
	CO_2 equivalent (Gg)			(%)
Total CO_2 Equivalent Emissions with Land-Use Change and Forestry [3]	9 522.35	9 557.29	34.94	0.37
Total CO_2 Equivalent Emissions without Land-Use Change and Forestry [3]	9 795.58	9 830.52	34.94	0.36

TABLE 8(a) RECALCULATION - RECALCULATED DATA

Recalculated year: 2000

Inventory 2004
Submission 2007 v1.1
Luxembourg

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2					CH_4					N_2O				
	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)
	CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)
Total National Emissions and Removals	**8 628.19**	**8 532.83**	**-95.36**	**-1.11**	**-1.00**	**478.01**	**314.58**	**-163.43**	**-34.19**	**-1.72**	**94.48**	**341.00**	**246.52**	**260.93**	**2.59**
1. Energy	**8 231.81**	**8 109.87**	**-121.94**	**-1.48**	**-1.28**	**63.22**	**80.43**	**17.21**	**27.21**	**0.18**	**65.30**	**173.60**	**108.30**	**165.87**	**1.14**
1.A. Fuel Combustion Activities	8 231.81	8 109.87	-121.94	-1.48	-1.28	19.00	36.12	17.12	90.12	0.18	65.30	173.60	108.30	165.87	1.14
1.A.1. Energy Industries	254.87	254.87	0.00	0.00	0.00	0.11	0.21	0.10	86.71	0.00	1.40	0.00	-1.40	-100.00	-0.01
1.A.2. Manufacturing Industries and Construction	1 734.08	1 644.69	-89.39	-5.16	-0.94	0.79	0.63	-0.16	-19.89	0.00	7.13	6.20	-0.93	-13.06	-0.01
1.A.3. Transport	4 975.17	4 977.76	2.59	0.05	0.03	9.27	26.88	17.61	190.05	0.19	51.00	167.40	116.40	228.25	1.22
1.A.4. Other Sectors	1 267.68	1 232.55	-35.13	-2.77	-0.37	8.83	8.40	-0.43	-4.89	0.00	5.77	0.00	-5.77	-100.00	-0.06
1.A.5. Other	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
1.B. Fugitive Emissions from Fuels	0.00	0.00	0.00	0.00	0.00	44.23	44.31	0.08	0.19	0.00	0.00	0.00	0.00	0.00	0.00
1.B.1. Solid fuel	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
1.B.2. Oil and Natural Gas	0.00	0.00	0.00	0.00	0.00	44.23	44.31	0.08	0.19	0.00	0.00	0.00	0.00	0.00	0.00
2. Industrial Processes	**681.74**	**698.54**	**16.80**	**2.46**	**0.18**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
2.A. Mineral Products	547.21	564.01	16.80	3.07	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.B. Chemical Industry	0.00	NO	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
2.C. Metal Production	131.13	131.13	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
2.D. Other Production	3.40	3.40	0.00	-0.07	0.00						0.00				
2.G. Other	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
3. Solvent and Other Product Use	**9.57**	**9.35**	**-0.22**	**-2.34**	**0.00**						**0.00**	**0.00**	**0.00**	**0.00**	0.00
4. Agriculture						**350.18**	**204.75**	**-145.43**	**-41.53**	**-1.53**	**0.00**	**145.70**	**145.70**	**100.00**	**1.53**
4.A. Enteric Fermentation						327.47	170.31	-157.16	-47.99	-1.65					
4.B. Manure Management						22.72	34.44	11.72	51.62	0.12	0.00	0.00	0.00	0.00	0.00
4.C. Rice Cultivation						0.00	0.00	0.00	0.00	0.00					
4.D. Agricultural Soils [2]						0.00	0.00	0.00	0.00	0.00	0.00	145.70	145.70	100.00	1.53
4.E. Prescribed Burning of Savannas						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.F. Field Burning of Agricultural Residues						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.G. Other						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Land-Use, Land-Use Change and Forestry	**-294.93**	**-294.93**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**21.70**	**21.70**	**0.00**	**0.00**	**0.00**
5.A. Forest Land		-294.93	-294.93				0.00	0.00				0.00	0.00		
5.B. Cropland		-	0.00				0.00	0.00				21.70	21.70		
5.C. Grassland		-	0.00				0.00	0.00				0.00	0.00		
5.D. Wetlands		-	0.00				0.00	0.00				0.00	0.00		
5.E. Settlements		-	0.00				0.00	0.00				0.00	0.00		
5.F. Other Land		-	0.00				0.00	0.00				0.00	0.00		
5.G. Other		-	0.00				0.00	0.00				0.00	0.00		
6. Waste	**0.00**	**10.00**	**10.00**	**100.00**	**0.11**	**64.60**	**29.40**	**-35.20**	**-54.49**	**-0.37**	**7.48**	**0.00**	**-7.48**	**-100.00**	**-0.08**
6.A. Solid Waste Disposal on Land	0.00	0.00	0.00	0.00	0.00	55.77	29.40	-26.37	-47.29	-0.28					
6.B. Wastewater Handling	0.00					4.63	0.00	-4.63	-100.00	-0.05	5.47	0.00	-5.47	-100.00	-0.06
6.C. Waste Incineration	0.00	10.00	10.00	100.00	0.11	0.20	0.00	-0.20	-100.00	0.00	2.01	0.00	-2.01	-100.00	-0.02
6.D. Other	0.00	0.00	0.00	0.00	0.00	3.99	0.00	-3.99	-100.00	-0.04	0.00	0.00	0.00	0.00	0.00
7. Other *(please specify)*	**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**
Memo Items:															
International Bunkers	**971.26**	**972.17**	**0.91**	**0.09**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Multilateral Operations	**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**
CO_2 Emissions from Biomass	**71.37**	**71.38**	**0.01**	**0.01**	**0.00**										

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	HFCs					PFCs					SF_6				
	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)
	CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)
Total Actual Emissions	**43.06**	**43.07**	**0.01**	**0.02**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**3.52**	**3.53**	**0.01**	**0.28**	**0.00**
2.C.3. Aluminium Production					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.E. Production of Halocarbons and SF_6	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
2.F. Consumption of Halocarbons and SF_6	43.06	43.07	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00	3.52	3.53	0.01	0.28	0.00
Other	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
Potential Emissions from Consumption of HFCs/PFCs and SF_6	**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

	Previous submission	Latest submission	Difference	Difference[1]
	CO_2 equivalent (Gg)			(%)
Total CO_2 Equivalent Emissions with Land-Use Change and Forestry [3]	9 247.26	9 235.01	-12.25	-0.13
Total CO_2 Equivalent Emissions without Land-Use Change and Forestry [3]	9 520.49	9 508.24	-12.25	-0.13

TABLE 8(a) RECALCULATION - RECALCULATED DATA

Recalculated year: 1999

Inventory 2004
Submission 2007 v1.1
Luxembourg

GREENHOUSE GAS SOURCE AND SINK CATEGORIES		CO_2					CH_4					N_2O				
		Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)
		CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)
Total National Emissions and Removals		**8 144.77**	**8 021.31**	**-123.46**	**-1.52**	**-1.37**	**482.58**	**358.89**	**-123.69**	**-25.63**	**-1.37**	**89.90**	**331.70**	**241.80**	**268.97**	**2.69**
1. Energy		**7 748.29**	**7 626.17**	**-122.12**	**-1.58**	**-1.36**	**62.79**	**77.07**	**14.28**	**22.74**	**0.16**	**58.90**	**164.30**	**105.40**	**178.95**	**1.17**
1.A.	Fuel Combustion Activities	7 748.29	7 626.17	-122.12	-1.58	-1.36	19.53	33.81	14.28	73.12	0.16	58.90	164.30	105.40	178.95	1.17
1.A.1.	Energy Industries	103.17	103.17	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
1.A.2.	Manufacturing Industries and Construction	1 785.08	1 708.82	-76.26	-4.27	-0.85	1.05	1.05	0.00	0.00	0.00	9.30	9.30	0.00	0.00	0.00
1.A.3.	Transport	4 344.84	4 343.90	-0.94	-0.02	-0.01	8.82	23.10	14.28	161.90	0.16	43.40	148.80	105.40	242.86	1.17
1.A.4.	Other Sectors	1 515.20	1 470.28	-44.92	-2.96	-0.50	9.66	9.66	0.00	0.00	0.00	6.20	6.20	0.00	0.00	0.00
1.A.5.	Other	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
1.B.	Fugitive Emissions from Fuels	0.00	0.00	0.00	0.00	0.00	43.26	43.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.B.1.	Solid fuel	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
1.B.2.	Oil and Natural Gas	0.00	0.00	0.00	0.00	0.00	43.26	43.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2. Industrial Processes		**670.58**	**670.58**	**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**
2.A.	Mineral Products	519.83	519.83	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
2.B.	Chemical Industry	0.00	NO	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
2.C.	Metal Production	146.68	146.68	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
2.D.	Other Production	4.07	4.07	0.00	0.00	0.00										
2.G.	Other	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
3. Solvent and Other Product Use		**5.20**	**9.49**	**4.29**	**82.50**	**0.05**						**0.00**	**0.00**	**0.00**	**0.00**	0.00
4. Agriculture							**355.11**	**252.21**	**-102.90**	**-28.98**	**-1.14**	**0.00**	**145.70**	**145.70**	**100.00**	**1.62**
4.A.	Enteric Fermentation						332.01	174.30	-157.71	-47.50	-1.75					
4.B.	Manure Management						23.10	77.91	54.81	237.27	0.61	0.00	0.00	0.00	0.00	0.00
4.C.	Rice Cultivation						0.00	0.00	0.00	0.00	0.00					
4.D.	Agricultural Soils [2]						0.00	0.00	0.00	0.00	0.00	0.00	145.70	145.70	100.00	1.62
4.E.	Prescribed Burning of Savannas						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.F.	Field Burning of Agricultural Residues						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.G.	Other						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Land-Use, Land-Use Change and Forestry		**-294.93**	**-294.93**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**21.70**	**21.70**	**0.00**	**0.00**	**0.00**
5.A.	Forest Land		-294.93	-294.93				0.00	0.00				0.00	0.00		
5.B.	Cropland		-	0.00				0.00	0.00				21.70	21.70		
5.C.	Grassland		-	0.00				0.00	0.00				0.00	0.00		
5.D.	Wetlands		-	0.00				0.00	0.00				0.00	0.00		
5.E.	Settlements		-	0.00				0.00	0.00				0.00	0.00		
5.F.	Other Land		-	0.00				0.00	0.00				0.00	0.00		
5.G.	Other		-	0.00				0.00	0.00				0.00	0.00		
6. Waste		**15.63**	**10.00**	**-5.63**	**-36.02**	**-0.06**	**64.68**	**29.61**	**-35.07**	**-54.22**	**-0.39**	**9.30**	**0.00**	**-9.30**	**-100.00**	**-0.10**
6.A.	Solid Waste Disposal on Land	0.00	0.00	0.00	0.00	0.00	55.86	29.61	-26.25	-46.99	-0.29					
6.B.	Wastewater Handling						4.62	0.00	-4.62	-100.00	-0.05	6.20	0.00	-6.20	-100.00	-0.07
6.C.	Waste Incineration	15.63	10.00	-5.63	-36.02	-0.06	0.21	0.00	-0.21	-100.00	0.00	3.10	0.00	-3.10	-100.00	-0.03
6.D.	Other	0.00	0.00	0.00	0.00	0.00	3.99	0.00	-3.99	-100.00	-0.04	0.00	0.00	0.00	0.00	0.00
7. Other *(please specify)*		**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**
Memo Items:																
International Bunkers		**1 019.12**	**1 019.97**	**0.85**	**0.08**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Multilateral Operations		**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**
CO_2 Emissions from Biomass		**71.38**	**71.38**	**0.00**	**0.00**	**0.00**										

GREENHOUSE GAS SOURCE AND SINK CATEGORIES		HFCs					PFCs					SF_6				
		Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)
		CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)
Total Actual Emissions		**43.06**	**13.62**	**-29.44**	**-68.37**	**-0.33**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**3.52**	**2.91**	**-0.61**	**-17.33**	**-0.01**
2.C.3.	Aluminium Production					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.E.	Production of Halocarbons and SF_6	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
2.F.	Consumption of Halocarbons and SF_6	43.06	13.62	-29.44	-68.37	-0.33	0.00	0.00	0.00	0.00	0.00	3.52	2.91	-0.61	-17.33	-0.01
	Other	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
Potential Emissions from Consumption of HFCs/PFCs and SF_6		**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

	Previous submission	Latest submission	Difference	Difference[1]
	CO_2 equivalent (Gg)			(%)
Total CO_2 Equivalent Emissions with Land-Use Change and Forestry [3]	8 763.83	8 728.43	-35.40	-0.40
Total CO_2 Equivalent Emissions without Land-Use Change and Forestry [3]	9 037.06	9 001.66	-35.40	-0.39

TABLE 8(a) RECALCULATION - RECALCULATED DATA

Recalculated year: 1998

Inventory 2004
Submission 2007 v1.1
Luxembourg

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2					CH_4					N_2O				
	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)
	CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)
Total National Emissions and Removals	**7 400.85**	**7 447.41**	**46.56**	**0.63**	**0.55**	**481.36**	**357.84**	**-123.52**	**-25.66**	**-1.47**	**87.63**	**310.00**	**222.37**	**253.76**	**2.65**
1. Energy	**7 047.96**	**7 084.52**	**36.56**	**0.52**	**0.43**	**61.98**	**77.28**	**15.30**	**24.68**	**0.18**	**56.63**	**142.60**	**85.97**	**151.82**	**1.02**
1.A. Fuel Combustion Activities	7 047.96	7 084.52	36.56	0.52	0.43	21.45	36.75	15.30	71.30	0.18	56.63	142.60	85.97	151.82	1.02
1.A.1. Energy Industries	68.61	68.61	0.00	0.00	0.00	0.03	0.00	-0.03	-100.00	0.00	0.38	0.00	-0.38	-100.00	0.00
1.A.2. Manufacturing Industries and Construction	1 416.96	1 501.53	84.57	5.97	1.01	0.64	0.63	-0.01	-1.70	0.00	6.70	6.20	-0.50	-7.39	-0.01
1.A.3. Transport	3 984.81	3 984.09	-0.72	-0.02	-0.01	10.88	26.46	15.58	143.27	0.19	42.40	130.20	87.80	207.11	1.04
1.A.4. Other Sectors	1 577.58	1 530.29	-47.29	-3.00	-0.56	9.91	9.66	-0.25	-2.49	0.00	7.16	6.20	-0.96	-13.42	-0.01
1.A.5. Other	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
1.B. Fugitive Emissions from Fuels	0.00	0.00	0.00	0.00	0.00	40.53	40.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.B.1. Solid fuel	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
1.B.2. Oil and Natural Gas	0.00	0.00	0.00	0.00	0.00	40.53	40.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2. Industrial Processes	**638.36**	**638.36**	**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**
2.A. Mineral Products	497.12	497.12	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
2.B. Chemical Industry	0.00	NO	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
2.C. Metal Production	137.49	137.49	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
2.D. Other Production	3.75	3.75	0.00	0.00	0.00										
2.G. Other	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
3. Solvent and Other Product Use	**9.46**	**9.46**	**0.00**	**-0.04**	**0.00**						**0.00**	**0.00**	**0.00**	**0.00**	0.00
4. Agriculture						**355.12**	**250.95**	**-104.17**	**-29.33**	**-1.24**	**0.00**	**145.70**	**145.70**	**100.00**	**1.73**
4.A. Enteric Fermentation						332.23	174.93	-157.30	-47.35	-1.87					
4.B. Manure Management						22.89	76.02	53.13	232.12	0.63	0.00	0.00	0.00	0.00	0.00
4.C. Rice Cultivation						0.00	0.00	0.00	0.00	0.00					
4.D. Agricultural Soils [2]						0.00	0.00	0.00	0.00	0.00	0.00	145.70	145.70	100.00	1.73
4.E. Prescribed Burning of Savannas						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.F. Field Burning of Agricultural Residues						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.G. Other						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Land-Use, Land-Use Change and Forestry	**-294.93**	**-294.93**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**21.70**	**21.70**	**0.00**	**0.00**	**0.00**
5.A. Forest Land		-294.93	-294.93				0.00	0.00				0.00	0.00		
5.B. Cropland		-	0.00				0.00	0.00				21.70	21.70		
5.C. Grassland		-	0.00				0.00	0.00				0.00	0.00		
5.D. Wetlands		-	0.00				0.00	0.00				0.00	0.00		
5.E. Settlements		-	0.00				0.00	0.00				0.00	0.00		
5.F. Other Land		-	0.00				0.00	0.00				0.00	0.00		
5.G. Other		-	0.00				0.00	0.00				0.00	0.00		
6. Waste	**0.00**	**10.00**	**10.00**	**100.00**	**0.12**	**64.26**	**29.61**	**-34.65**	**-53.92**	**-0.41**	**9.30**	**0.00**	**-9.30**	**-100.00**	**-0.11**
6.A. Solid Waste Disposal on Land	0.00	0.00	0.00	0.00	0.00	55.65	29.61	-26.04	-46.79	-0.31					
6.B. Wastewater Handling						4.41	0.00	-4.41	-100.00	-0.05	6.20	0.00	-6.20	-100.00	-0.07
6.C. Waste Incineration	0.00	10.00	10.00	100.00	0.12	0.21	0.00	-0.21	-100.00	0.00	3.10	0.00	-3.10	-100.00	-0.04
6.D. Other	0.00	0.00	0.00	0.00	0.00	3.99	0.00	-3.99	-100.00	-0.05	0.00	0.00	0.00	0.00	0.00
7. Other *(please specify)*	**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**
Memo Items:															
International Bunkers	**903.21**	**904.09**	**0.88**	**0.10**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Multilateral Operations	**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**
CO_2 Emissions from Biomass	**0.00**	**71.38**	**71.38**	**100.00**	**0.85**										

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	HFCs					PFCs					SF_6				
	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)
	CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)
Total Actual Emissions	**43.06**	**13.62**	**-29.44**	**-68.37**	**-0.35**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**3.52**	**2.91**	**-0.61**	**-17.33**	**-0.01**
2.C.3. Aluminium Production					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.E. Production of Halocarbons and SF_6	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
2.F. Consumption of Halocarbons and SF_6	43.06	13.62	-29.44	-68.37	-0.35	0.00	0.00	0.00	0.00	0.00	3.52	2.91	-0.61	-17.33	-0.01
Other	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
Potential Emissions from Consumption of HFCs/PFCs and SF_6	**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

	Previous submission	Latest submission	Difference	Difference[1]
	CO_2 equivalent (Gg)			(%)
Total CO_2 Equivalent Emissions with Land-Use Change and Forestry [3]	8 016.43	8 131.78	115.35	1.44
Total CO_2 Equivalent Emissions without Land-Use Change and Forestry [3]	8 289.66	8 405.01	115.35	1.39

TABLE 8(a) RECALCULATION - RECALCULATED DATA

Recalculated year: 1997

Inventory 2004
Submission 2007 v1.1
Luxembourg

GREENHOUSE GAS SOURCE AND SINK CATEGORIES		CO_2					CH_4					N_2O				
		Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)
		CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)
Total National Emissions and Removals		**8 344.30**	**8 274.37**	**-69.93**	**-0.84**	**-0.76**	**507.36**	**357.84**	**-149.52**	**-29.47**	**-1.62**	**232.50**	**297.60**	**65.10**	**28.00**	**0.71**
1. Energy		**7 977.34**	**7 728.03**	**-249.31**	**-3.13**	**-2.70**	**59.85**	**78.12**	**18.27**	**30.53**	**0.20**	**55.80**	**130.20**	**74.40**	**133.33**	**0.81**
1.A.	Fuel Combustion Activities	7 977.34	7 728.03	-249.31	-3.13	-2.70	19.74	38.01	18.27	92.55	0.20	55.80	130.20	74.40	133.33	0.81
1.A.1.	Energy Industries	403.16	402.34	-0.82	-0.20	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.A.2.	Manufacturing Industries and Construction	2 374.60	2 080.48	-294.12	-12.39	-3.19	0.63	0.63	0.00	0.00	0.00	6.20	6.20	0.00	0.00	0.00
1.A.3.	Transport	3 785.61	3 802.12	16.51	0.44	0.18	9.03	26.88	17.85	197.67	0.19	40.30	117.80	77.50	192.31	0.84
1.A.4.	Other Sectors	1 413.97	1 443.09	29.12	2.06	0.32	10.08	10.50	0.42	4.17	0.00	6.20	6.20	0.00	0.00	0.00
1.A.5.	Other	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
1.B.	Fugitive Emissions from Fuels	0.00	0.00	0.00	0.00	0.00	40.11	40.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.B.1.	Solid fuel	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
1.B.2.	Oil and Natural Gas	0.00	0.00	0.00	0.00	0.00	40.11	40.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2. Industrial Processes		**634.19**	**821.87**	**187.68**	**29.59**	**2.04**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
2.A.	Mineral Products	363.83	494.82	130.99	36.00	1.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.B.	Chemical Industry	0.00	NO	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
2.C.	Metal Production	265.74	324.10	58.36	21.96	0.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.D.	Other Production	4.61	2.95	-1.66	-36.01	-0.02										
2.G.	Other	5.00	0.00	-5.00	-100.00	-0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Solvent and Other Product Use		**11.47**	**9.40**	**-2.07**	**-18.05**	**-0.02**						**0.00**	**0.00**	**0.00**	**0.00**	0.00
4. Agriculture							**369.81**	**250.53**	**-119.28**	**-32.25**	**-1.29**	**148.18**	**145.70**	**-2.48**	**-1.67**	**-0.03**
4.A.	Enteric Fermentation						346.08	176.40	-169.68	-49.03	-1.84					
4.B.	Manure Management						23.73	74.13	50.40	212.39	0.55	0.00	0.00	0.00	0.00	0.00
4.C.	Rice Cultivation						0.00	0.00	0.00	0.00	0.00					
4.D.	Agricultural Soils [2]						0.00	0.00	0.00	0.00	0.00	148.18	145.70	-2.48	-1.67	-0.03
4.E.	Prescribed Burning of Savannas						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.F.	Field Burning of Agricultural Residues						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.G.	Other						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Land-Use, Land-Use Change and Forestry		**-294.93**	**-294.93**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**21.70**	**21.70**	**0.00**	**0.00**	**0.00**
5.A.	Forest Land		-294.93	-294.93				0.00	0.00				0.00	0.00		
5.B.	Cropland		-	0.00				0.00	0.00				21.70	21.70		
5.C.	Grassland		-	0.00				0.00	0.00				0.00	0.00		
5.D.	Wetlands		-	0.00				0.00	0.00				0.00	0.00		
5.E.	Settlements		-	0.00				0.00	0.00				0.00	0.00		
5.F.	Other Land		-	0.00				0.00	0.00				0.00	0.00		
5.G.	Other		-	0.00				0.00	0.00				0.00	0.00		
6. Waste		**16.23**	**10.00**	**-6.23**	**-38.39**	**-0.07**	**77.72**	**29.19**	**-48.53**	**-62.44**	**-0.53**	**6.82**	**0.00**	**-6.82**	**-100.00**	**-0.07**
6.A.	Solid Waste Disposal on Land	0.00	0.00	0.00	0.00	0.00	69.13	29.19	-39.94	-57.78	-0.43					
6.B.	Wastewater Handling						4.45	0.00	-4.45	-100.00	-0.05	5.27	0.00	-5.27	-100.00	-0.06
6.C.	Waste Incineration	16.23	10.00	-6.23	-38.39	-0.07	0.15	0.00	-0.15	-100.00	0.00	1.55	0.00	-1.55	-100.00	-0.02
6.D.	Other	0.00	0.00	0.00	0.00	0.00	3.99	0.00	-3.99	-100.00	-0.04	0.00	0.00	0.00	0.00	0.00
7. Other *(please specify)*		**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**
Memo Items:																
International Bunkers		**721.90**	**746.01**	**24.11**	**3.34**	**0.26**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**6.20**	**0.00**	**-6.20**	**-100.00**	**-0.07**
Multilateral Operations		-	**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**
CO_2 Emissions from Biomass		**61.10**	**71.38**	**10.28**	**16.82**	**0.11**										

GREENHOUSE GAS SOURCE AND SINK CATEGORIES		HFCs					PFCs					SF_6				
		Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)
		CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)
Total Actual Emissions		**43.06**	**13.62**	**-29.44**	**-68.37**	**-0.32**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**3.52**	**2.91**	**-0.61**	**-17.33**	**-0.01**
2.C.3.	Aluminium Production					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.E.	Production of Halocarbons and SF_6	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
2.F.	Consumption of Halocarbons and SF_6	43.06	13.62	-29.44	-68.37	-0.32	0.00	0.00	0.00	0.00	0.00	3.52	2.91	-0.61	-17.33	-0.01
	Other	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
Potential Emissions from Consumption of HFCs/PFCs and SF_6		**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

	Previous submission	Latest submission	Difference	Difference[1]
	CO_2 equivalent (Gg)			(%)
Total CO_2 Equivalent Emissions with Land-Use Change and Forestry [3]	9 130.74	8 946.34	-184.40	-2.02
Total CO_2 Equivalent Emissions without Land-Use Change and Forestry [3]	9 403.97	9 219.57	-184.40	-1.96

TABLE 8(a) RECALCULATION - RECALCULATED DATA

Recalculated year: 1996

Inventory 2004
Submission 2007 v1.1
Luxembourg

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2					CH_4					N_2O				
	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)
	CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)
Total National Emissions and Removals	**9 116.00**	**8 921.85**	**-194.15**	**-2.13**	**-1.97**	**501.54**	**359.31**	**-142.23**	**-28.36**	**-1.44**	**216.07**	**279.00**	**62.93**	**29.12**	**0.64**
1. Energy	**9 150.00**	**8 300.64**	**-849.36**	**-9.28**	**-8.62**	**54.52**	**77.28**	**22.76**	**41.76**	**0.23**	**50.53**	**111.60**	**61.07**	**120.86**	**0.62**
1.A. Fuel Combustion Activities	9 150.00	8 300.64	-849.36	-9.28	-8.62	15.33	38.01	22.68	147.95	0.23	50.53	111.60	61.07	120.86	0.62
1.A.1. Energy Industries	737.00	682.75	-54.25	-7.36	-0.55	0.04	0.00	-0.04	-100.00	0.00	0.93	0.00	-0.93	-100.00	-0.01
1.A.2. Manufacturing Industries and Construction	3 409.00	2 609.29	-799.71	-23.46	-8.12	0.86	1.05	0.19	21.95	0.00	8.68	3.10	-5.58	-64.29	-0.06
1.A.3. Transport	3 554.00	3 532.57	-21.43	-0.60	-0.22	3.80	26.04	22.24	585.08	0.23	34.10	102.30	68.20	200.00	0.69
1.A.4. Other Sectors	1 375.00	1 476.03	101.03	7.35	1.03	10.16	10.92	0.76	7.44	0.01	6.82	6.20	-0.62	-9.09	-0.01
1.A.5. Other	75.00	0.00	-75.00	-100.00	-0.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.B. Fugitive Emissions from Fuels	0.00	0.00	0.00	0.00	0.00	39.19	39.27	0.08	0.21	0.00	0.00	0.00	0.00	0.00	0.00
1.B.1. Solid fuel	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
1.B.2. Oil and Natural Gas	0.00	0.00	0.00	0.00	0.00	39.19	39.27	0.08	0.21	0.00	0.00	0.00	0.00	0.00	0.00
2. Industrial Processes	**236.00**	**896.78**	**660.78**	**279.99**	**6.71**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
2.A. Mineral Products	-	480.03	480.03	100.00	4.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.B. Chemical Industry	0.00	NO	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
2.C. Metal Production	231.00	413.26	182.26	78.90	1.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.D. Other Production	0.00	3.49	3.49	100.00	0.04										
2.G. Other	5.00	0.00	-5.00	-100.00	-0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Solvent and Other Product Use	**11.00**	**9.36**	**-1.64**	**-14.91**	**-0.02**						**0.00**	**0.00**	**0.00**	**0.00**	0.00
4. Agriculture						**369.77**	**253.26**	**-116.51**	**-31.51**	**-1.18**	**148.18**	**145.70**	**-2.48**	**-1.67**	**-0.03**
4.A. Enteric Fermentation						346.06	181.23	-164.83	-47.63	-1.67					
4.B. Manure Management						23.71	72.03	48.32	203.81	0.49	0.00	0.00	0.00	0.00	0.00
4.C. Rice Cultivation						0.00	0.00	0.00	0.00	0.00					
4.D. Agricultural Soils [2]						0.00	0.00	0.00	0.00	0.00	148.18	145.70	-2.48	-1.67	-0.03
4.E. Prescribed Burning of Savannas						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.F. Field Burning of Agricultural Residues						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.G. Other						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Land-Use, Land-Use Change and Forestry	**-295.00**	**-294.93**	**0.07**	**-0.02**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**10.54**	**21.70**	**11.16**	**105.88**	**0.11**
5.A. Forest Land		-294.93	-294.93				0.00	0.00				0.00	0.00		
5.B. Cropland		-	0.00				0.00	0.00				21.70	21.70		
5.C. Grassland		-	0.00				0.00	0.00				0.00	0.00		
5.D. Wetlands		-	0.00				0.00	0.00				0.00	0.00		
5.E. Settlements		-	0.00				0.00	0.00				0.00	0.00		
5.F. Other Land		-	0.00				0.00	0.00				0.00	0.00		
5.G. Other		-	0.00				0.00	0.00				0.00	0.00		
6. Waste	**14.00**	**10.00**	**-4.00**	**-28.57**	**-0.04**	**77.26**	**28.77**	**-48.49**	**-62.76**	**-0.49**	**6.82**	**0.00**	**-6.82**	**-100.00**	**-0.07**
6.A. Solid Waste Disposal on Land	1.00	0.00	-1.00	-100.00	-0.01	69.13	28.77	-40.36	-58.38	-0.41					
6.B. Wastewater Handling						4.39	0.00	-4.39	-100.00	-0.04	5.27	0.00	-5.27	-100.00	-0.05
6.C. Waste Incineration	13.00	10.00	-3.00	-23.08	-0.03	0.15	0.00	-0.15	-100.00	0.00	1.55	0.00	-1.55	-100.00	-0.02
6.D. Other	0.00	0.00	0.00	0.00	0.00	3.59	0.00	-3.59	-100.00	-0.04	0.00	0.00	0.00	0.00	0.00
7. Other *(please specify)*	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**10.54**	**0.00**	**-10.54**	**-100.00**	**-0.11**
Memo Items:															
International Bunkers	**194.00**	**623.69**	**429.69**	**221.49**	**4.36**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Multilateral Operations	**-**	**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**
CO_2 Emissions from Biomass	**-**	**71.38**	**71.38**	**100.00**	**0.72**										

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	HFCs					PFCs					SF_6				
	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)
	CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)
Total Actual Emissions	**43.06**	**13.62**	**-29.44**	**-68.37**	**-0.30**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**3.52**	**2.91**	**-0.61**	**-17.33**	**-0.01**
2.C.3. Aluminium Production					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.E. Production of Halocarbons and SF_6	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
2.F. Consumption of Halocarbons and SF_6	43.06	13.62	-29.44	-68.37	-0.30	0.00	0.00	0.00	0.00	0.00	3.52	2.91	-0.61	-17.33	-0.01
Other	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
Potential Emissions from Consumption of HFCs/PFCs and SF_6	**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

	Previous submission	Latest submission	Difference	Difference[(1)]
	CO_2 equivalent (Gg)			(%)
Total CO_2 Equivalent Emissions with Land-Use Change and Forestry [3]	9 880.19	9 576.69	-303.50	-3.07
Total CO_2 Equivalent Emissions without Land-Use Change and Forestry [3]	10 164.65	9 849.92	-314.73	-3.10

TABLE 8(a) RECALCULATION - RECALCULATED DATA

Recalculated year: 1995

Inventory 2004
Submission 2007 v1.1
Luxembourg

GREENHOUSE GAS SOURCE AND SINK CATEGORIES		CO_2					CH_4					N_2O				
		Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)
		CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)
Total National Emissions and Removals		**9 319.09**	**8 862.62**	**-456.46**	**-4.90**	**-4.67**	**464.31**	**353.01**	**-111.30**	**-23.97**	**-1.14**	**213.28**	**269.70**	**56.42**	**26.45**	**0.58**
1. Energy		**9 031.09**	**8 194.41**	**-836.67**	**-9.26**	**-8.56**	**51.14**	**72.24**	**21.11**	**41.27**	**0.22**	**48.36**	**102.30**	**53.94**	**111.54**	**0.55**
1.A.	Fuel Combustion Activities	9 031.09	8 194.41	-836.67	-9.26	-8.56	14.41	35.49	21.08	146.36	0.22	48.36	102.30	53.94	111.54	0.55
1.A.1.	Energy Industries	820.00	785.47	-34.53	-4.21	-0.35	0.04	0.00	-0.04	-100.00	0.00	0.93	0.00	-0.93	-100.00	-0.01
1.A.2.	Manufacturing Industries and Construction	3 474.00	2 618.77	-855.23	-24.62	-8.75	0.71	0.63	-0.08	-11.76	0.00	8.06	3.10	-4.96	-61.54	-0.05
1.A.3.	Transport	3 423.09	3 452.55	29.46	0.86	0.30	3.74	25.20	21.46	574.16	0.22	33.17	93.00	59.83	180.37	0.61
1.A.4.	Other Sectors	1 236.00	1 337.62	101.62	8.22	1.04	9.89	9.66	-0.23	-2.34	0.00	5.89	6.20	0.31	5.26	0.00
1.A.5.	Other	78.00	0.00	-78.00	-100.00	-0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.B.	Fugitive Emissions from Fuels	0.00	0.00	0.00	0.00	0.00	36.75	36.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.B.1.	Solid fuel	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
1.B.2.	Oil and Natural Gas	0.00	0.00	0.00	0.00	0.00	36.75	36.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2. Industrial Processes		**271.00**	**943.86**	**672.86**	**248.29**	**6.88**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
2.A.	Mineral Products	-	485.78	485.78	100.00	4.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.B.	Chemical Industry	0.00	NO	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
2.C.	Metal Production	266.00	454.23	188.23	70.76	1.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.D.	Other Production	0.00	3.85	3.85	100.00	0.04										
2.G.	Other	5.00	0.00	-5.00	-100.00	-0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Solvent and Other Product Use		**11.00**	**9.28**	**-1.72**	**-15.64**	**-0.02**						**0.00**	**0.00**	**0.00**	**0.00**	0.00
4. Agriculture							**355.55**	**253.26**	**-102.29**	**-28.77**	**-1.05**	**147.25**	**145.70**	**-1.55**	**-1.05**	**-0.02**
4.A.	Enteric Fermentation						332.70	181.02	-151.68	-45.59	-1.55					
4.B.	Manure Management						22.85	72.24	49.39	216.18	0.51	0.00	0.00	0.00	0.00	0.00
4.C.	Rice Cultivation						0.00	0.00	0.00	0.00	0.00					
4.D.	Agricultural Soils [2]						0.00	0.00	0.00	0.00	0.00	147.25	145.70	-1.55	-1.05	-0.02
4.E.	Prescribed Burning of Savannas						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.F.	Field Burning of Agricultural Residues						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.G.	Other						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Land-Use, Land-Use Change and Forestry		**0.00**	**-294.93**	**-294.93**	**100.00**	**-3.02**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**10.54**	**21.70**	**11.16**	**105.88**	**0.11**
5.A.	Forest Land		-294.93	-294.93				0.00	0.00				0.00	0.00		
5.B.	Cropland		-	0.00				0.00	0.00				21.70	21.70		
5.C.	Grassland		-	0.00				0.00	0.00				0.00	0.00		
5.D.	Wetlands		-	0.00				0.00	0.00				0.00	0.00		
5.E.	Settlements		-	0.00				0.00	0.00				0.00	0.00		
5.F.	Other Land		-	0.00				0.00	0.00				0.00	0.00		
5.G.	Other		-	0.00				0.00	0.00				0.00	0.00		
6. Waste		**6.00**	**10.00**	**4.00**	**66.67**	**0.04**	**57.60**	**27.51**	**-30.09**	**-52.24**	**-0.31**	**7.13**	**0.00**	**-7.13**	**-100.00**	**-0.07**
6.A.	Solid Waste Disposal on Land	4.00	0.00	-4.00	-100.00	-0.04	47.10	27.51	-19.59	-41.60	-0.20					
6.B.	Wastewater Handling						4.33	0.00	-4.33	-100.00	-0.04	5.27	0.00	-5.27	-100.00	-0.05
6.C.	Waste Incineration	0.00	10.00	10.00	100.00	0.10	0.19	0.00	-0.19	-100.00	0.00	1.86	0.00	-1.86	-100.00	-0.02
6.D.	Other	2.00	0.00	-2.00	-100.00	-0.02	5.99	0.00	-5.99	-100.00	-0.06	0.00	0.00	0.00	0.00	0.00
7. Other *(please specify)*		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**10.54**	**0.00**	**-10.54**	**-100.00**	**-0.11**
Memo Items:																
International Bunkers		**194.00**	**574.04**	**380.04**	**195.90**	**3.89**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Multilateral Operations		**-**	**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**
CO_2 Emissions from Biomass		**-**	**70.83**	**70.83**	**100.00**	**0.72**										

GREENHOUSE GAS SOURCE AND SINK CATEGORIES		HFCs					PFCs					SF_6				
		Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)
		CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)
Total Actual Emissions		**43.06**	**13.62**	**-29.44**	**-68.37**	**-0.30**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**3.52**	**2.91**	**-0.61**	**-17.33**	**-0.01**
2.C.3.	Aluminium Production					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.E.	Production of Halocarbons and SF_6	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
2.F.	Consumption of Halocarbons and SF_6	43.06	13.62	-29.44	-68.37	-0.30	0.00	0.00	0.00	0.00	0.00	3.52	2.91	-0.61	-17.33	-0.01
	Other	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
Potential Emissions from Consumption of HFCs/PFCs and SF_6		**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

	Previous submission	Latest submission	Difference	Difference[1]
	CO_2 equivalent (Gg)			(%)
Total CO_2 Equivalent Emissions with Land-Use Change and Forestry [3]	10 043.26	9 501.86	-541.39	-5.39
Total CO_2 Equivalent Emissions without Land-Use Change and Forestry [3]	10 032.72	9 775.09	-257.62	-2.57

TABLE 8(a) RECALCULATION - RECALCULATED DATA **Recalculated year: 1994**

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2					CH_4					N_2O				
	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)
	CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)
Total National Emissions and Removals	**11 998.09**	**11 327.93**	**-670.16**	**-5.59**	**-5.48**	**460.09**	**344.61**	**-115.48**	**-25.10**	**-0.94**	**213.59**	**275.90**	**62.31**	**29.17**	**0.51**
1. Energy	**11 520.09**	**10 309.26**	**-1 210.83**	**-10.51**	**-9.89**	**48.15**	**69.09**	**20.94**	**43.48**	**0.17**	**48.67**	**108.50**	**59.83**	**122.93**	**0.49**
1.A. Fuel Combustion Activities	11 520.09	10 309.26	-1 210.83	-10.51	-9.89	15.94	37.80	21.86	137.15	0.18	48.67	108.50	59.83	122.93	0.49
1.A.1. Energy Industries	1 064.00	996.32	-67.68	-6.36	-0.55	0.04	0.00	-0.04	-100.00	0.00	1.24	0.00	-1.24	-100.00	-0.01
1.A.2. Manufacturing Industries and Construction	5 475.00	4 314.67	-1 160.33	-21.19	-9.48	1.24	1.05	-0.19	-15.25	0.00	11.47	6.20	-5.27	-45.95	-0.04
1.A.3. Transport	3 685.09	3 665.55	-19.54	-0.53	-0.16	3.89	26.25	22.37	575.68	0.18	30.07	96.10	66.03	219.59	0.54
1.A.4. Other Sectors	1 296.00	1 332.72	36.72	2.83	0.30	10.79	10.50	-0.29	-2.72	0.00	5.89	6.20	0.31	5.26	0.00
1.A.5. Other	-	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
1.B. Fugitive Emissions from Fuels	0.00	0.00	0.00	0.00	0.00	32.21	31.29	-0.92	-2.87	-0.01	0.00	0.00	0.00	0.00	0.00
1.B.1. Solid fuel	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
1.B.2. Oil and Natural Gas	0.00	0.00	0.00	0.00	0.00	32.21	31.29	-0.92	-2.87	-0.01	0.00	0.00	0.00	0.00	0.00
2. Industrial Processes	**447.00**	**1 294.38**	**847.38**	**189.57**	**6.92**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
2.A. Mineral Products	IE	539.58	539.58	100.00	4.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.B. Chemical Industry	IE	NO	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
2.C. Metal Production	IE	750.64	750.64	100.00	6.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.D. Other Production	IE	4.16	4.16	100.00	0.03										
2.G. Other	447.00	0.00	-447.00	-100.00	-3.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Solvent and Other Product Use	**12.00**	**9.22**	**-2.78**	**-23.17**	**-0.02**						**0.00**	**0.00**	**0.00**	**0.00**	0.00
4. Agriculture						**355.57**	**248.22**	**-107.35**	**-30.19**	**-0.88**	**147.25**	**145.70**	**-1.55**	**-1.05**	**-0.01**
4.A. Enteric Fermentation						332.70	178.50	-154.20	-46.35	-1.26					
4.B. Manure Management						22.89	69.72	46.83	204.59	0.38	0.00	0.00	0.00	0.00	0.00
4.C. Rice Cultivation						0.00	0.00	0.00	0.00	0.00					
4.D. Agricultural Soils [2]						0.00	0.00	0.00	0.00	0.00	147.25	145.70	-1.55	-1.05	-0.01
4.E. Prescribed Burning of Savannas						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.F. Field Burning of Agricultural Residues						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.G. Other						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Land-Use, Land-Use Change and Forestry	**0.00**	**-294.93**	**-294.93**	**100.00**	**-2.41**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**10.54**	**21.70**	**11.16**	**105.88**	**0.09**
5.A. Forest Land		-294.93	-294.93				0.00	0.00				0.00	0.00		
5.B. Cropland		-	0.00				0.00	0.00				21.70	21.70		
5.C. Grassland		-	0.00				0.00	0.00				0.00	0.00		
5.D. Wetlands		-	0.00				0.00	0.00				0.00	0.00		
5.E. Settlements		-	0.00				0.00	0.00				0.00	0.00		
5.F. Other Land		-	0.00				0.00	0.00				0.00	0.00		
5.G. Other		-	0.00				0.00	0.00				0.00	0.00		
6. Waste	**19.00**	**10.00**	**-9.00**	**-47.37**	**-0.07**	**56.36**	**27.30**	**-29.06**	**-51.56**	**-0.24**	**7.13**	**0.00**	**-7.13**	**-100.00**	**-0.06**
6.A. Solid Waste Disposal on Land	1.00	0.00	-1.00	-100.00	-0.01	47.10	27.30	-19.80	-42.04	-0.16					
6.B. Wastewater Handling						4.26	0.00	-4.26	-100.00	-0.03	4.96	0.00	-4.96	-100.00	-0.04
6.C. Waste Incineration	18.00	10.00	-8.00	-44.44	-0.07	0.21	0.00	-0.21	-100.00	0.00	2.17	0.00	-2.17	-100.00	-0.02
6.D. Other	0.00	0.00	0.00	0.00	0.00	4.79	0.00	-4.79	-100.00	-0.04	0.00	0.00	0.00	0.00	0.00
7. Other *(please specify)*	**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**
Memo Items:															
International Bunkers	**194.00**	**505.41**	**311.41**	**160.52**	**2.54**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Multilateral Operations	**-**	**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**
CO_2 Emissions from Biomass	**-**	**70.91**	**70.91**	**100.00**	**0.58**										

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	HFCs					PFCs					SF_6				
	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)
	CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)
Total Actual Emissions	**43.06**	**13.62**	**-29.44**	**-68.37**	**-0.24**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**3.52**	**2.91**	**-0.61**	**-17.33**	**0.00**
2.C.3. Aluminium Production					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.E. Production of Halocarbons and SF_6	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
2.F. Consumption of Halocarbons and SF_6	43.06	13.62	-29.44	-68.37	-0.24	0.00	0.00	0.00	0.00	0.00	3.52	2.91	-0.61	-17.33	0.00
Other	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
Potential Emissions from Consumption of HFCs/PFCs and SF_6	**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

	Previous submission	Latest submission	Difference	Difference[1]
	CO_2 equivalent (Gg)			(%)
Total CO_2 Equivalent Emissions with Land-Use Change and Forestry [3]	12 718.34	11 964.97	-753.37	-5.92
Total CO_2 Equivalent Emissions without Land-Use Change and Forestry [3]	12 707.80	12 238.20	-469.60	-3.70

TABLE 8(a) RECALCULATION - RECALCULATED DATA

Recalculated year: 1993

Inventory 2004
Submission 2007 v1.1
Luxembourg

GREENHOUSE GAS SOURCE AND SINK CATEGORIES		CO_2					CH_4					N_2O				
		Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)
		CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)
Total National Emissions and Removals		**12 008.33**	**12 223.92**	**215.59**	**1.80**	**1.64**	**498.12**	**352.17**	**-145.95**	**-29.30**	**-1.11**	**207.70**	**266.60**	**58.90**	**28.36**	**0.45**
1. Energy		**10 944.32**	**11 024.54**	**80.22**	**0.73**	**0.61**	**46.83**	**73.50**	**26.67**	**56.95**	**0.20**	**31.00**	**99.20**	**68.20**	**220.00**	**0.52**
1.A.	Fuel Combustion Activities	10 944.32	11 024.54	80.22	0.73	0.61	19.32	41.58	22.26	115.22	0.17	31.00	99.20	68.20	220.00	0.52
1.A.1.	Energy Industries	1 251.22	1 197.08	-54.14	-4.33	-0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.A.2.	Manufacturing Industries and Construction	5 150.13	4 636.83	-513.30	-9.97	-3.91	0.63	0.63	0.00	0.00	0.00	9.30	6.20	-3.10	-33.33	-0.02
1.A.3.	Transport	3 291.61	3 633.52	341.91	10.39	2.60	6.72	24.57	17.85	265.63	0.14	12.40	86.80	74.40	600.00	0.57
1.A.4.	Other Sectors	1 251.36	1 557.11	305.75	24.43	2.33	11.97	16.38	4.41	36.84	0.03	6.20	6.20	0.00	0.00	0.00
1.A.5.	Other	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
1.B.	Fugitive Emissions from Fuels	0.00	0.00	0.00	0.00	0.00	27.51	31.92	4.41	16.03	0.03	0.00	0.00	0.00	0.00	0.00
1.B.1.	Solid fuel	-	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
1.B.2.	Oil and Natural Gas	-	0.00	0.00	0.00	0.00	27.51	31.92	4.41	16.03	0.03	0.00	0.00	0.00	0.00	0.00
2. Industrial Processes		**1 330.84**	**1 475.13**	**144.29**	**10.84**	**1.10**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
2.A.	Mineral Products	540.82	572.47	31.65	5.85	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.B.	Chemical Industry	0.00	NO	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
2.C.	Metal Production	786.15	898.44	112.29	14.28	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.D.	Other Production	3.87	4.22	0.35	8.94	0.00										
2.G.	Other	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
3. Solvent and Other Product Use		**10.74**	**9.18**	**-1.56**	**-14.55**	**-0.01**						**0.00**	**0.00**	**0.00**	**0.00**	0.00
4. Agriculture							**370.65**	**251.58**	**-119.07**	**-32.12**	**-0.91**	**145.70**	**145.70**	**0.00**	**0.00**	**0.00**
4.A.	Enteric Fermentation						346.29	179.97	-166.32	-48.03	-1.27					
4.B.	Manure Management						24.36	71.61	47.25	193.97	0.36	0.00	0.00	0.00	0.00	0.00
4.C.	Rice Cultivation						0.00	0.00	0.00	0.00	0.00					
4.D.	Agricultural Soils [2]						0.00	0.00	0.00	0.00	0.00	145.70	145.70	0.00	0.00	0.00
4.E.	Prescribed Burning of Savannas						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.F.	Field Burning of Agricultural Residues						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.G.	Other						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Land-Use, Land-Use Change and Forestry		**-294.93**	**-294.93**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**21.70**	**21.70**	**0.00**	**0.00**	**0.00**
5.A.	Forest Land		-294.93	-294.93				0.00	0.00				0.00	0.00		
5.B.	Cropland		-	0.00				0.00	0.00				21.70	21.70		
5.C.	Grassland		-	0.00				0.00	0.00				0.00	0.00		
5.D.	Wetlands		-	0.00				0.00	0.00				0.00	0.00		
5.E.	Settlements		-	0.00				0.00	0.00				0.00	0.00		
5.F.	Other Land		-	0.00				0.00	0.00				0.00	0.00		
5.G.	Other		-	0.00				0.00	0.00				0.00	0.00		
6. Waste		**17.35**	**10.00**	**-7.35**	**-42.38**	**-0.06**	**80.64**	**27.09**	**-53.55**	**-66.41**	**-0.41**	**6.20**	**0.00**	**-6.20**	**-100.00**	**-0.05**
6.A.	Solid Waste Disposal on Land	0.00	0.00	0.00	0.00	0.00	64.47	27.09	-37.38	-57.98	-0.28					
6.B.	Wastewater Handling						3.99	0.00	-3.99	-100.00	-0.03	6.20	0.00	-6.20	-100.00	-0.05
6.C.	Waste Incineration	17.35	10.00	-7.35	-42.38	-0.06	0.21	0.00	-0.21	-100.00	0.00	3.10	0.00	-3.10	-100.00	-0.02
6.D.	Other	0.00	0.00	0.00	0.00	0.00	11.97	0.00	-11.97	-100.00	-0.09	0.00	0.00	0.00	0.00	0.00
7. Other *(please specify)*		**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**
Memo Items:																
International Bunkers		**369.26**	**505.41**	**136.15**	**36.87**	**1.04**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Multilateral Operations		**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**
CO_2 Emissions from Biomass		**53.96**	**70.91**	**16.95**	**31.42**	**0.13**										

GREENHOUSE GAS SOURCE AND SINK CATEGORIES		HFCs					PFCs					SF_6				
		Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)
		CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)
Total Actual Emissions		**43.06**	**13.62**	**-29.44**	**-68.37**	**-0.22**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**3.52**	**2.91**	**-0.61**	**-17.33**	**0.00**
2.C.3.	Aluminium Production					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.E.	Production of Halocarbons and SF_6	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
2.F.	Consumption of Halocarbons and SF_6	43.06	13.62	-29.44	-68.37	-0.22	0.00	0.00	0.00	0.00	0.00	3.52	2.91	-0.61	-17.33	0.00
	Other	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
Potential Emissions from Consumption of HFCs/PFCs and SF_6		**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

	Previous submission	Latest submission	Difference	Difference[1]
	CO_2 equivalent (Gg)			(%)
Total CO_2 Equivalent Emissions with Land-Use Change and Forestry [3]	12 760.73	12 859.22	98.49	0.77
Total CO_2 Equivalent Emissions without Land-Use Change and Forestry [3]	13 033.96	13 132.45	98.49	0.76

TABLE 8(a) RECALCULATION - RECALCULATED DATA

Recalculated year: 1992

Inventory 2004
Submission 2007 v1.1
Luxembourg

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2					CH_4					N_2O				
	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)
	CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)
Total National Emissions and Removals	**11 657.80**	**11 877.23**	**219.43**	**1.88**	**1.72**	**498.12**	**347.13**	**-150.99**	**-30.31**	**-1.18**	**207.70**	**266.60**	**58.90**	**28.36**	**0.46**
1. Energy	**10 615.33**	**10 745.55**	**130.22**	**1.23**	**1.02**	**46.83**	**69.93**	**23.10**	**49.33**	**0.18**	**31.00**	**99.20**	**68.20**	**220.00**	**0.53**
1.A. Fuel Combustion Activities	10 615.33	10 745.55	130.22	1.23	1.02	19.32	39.27	19.95	103.26	0.16	31.00	99.20	68.20	220.00	0.53
1.A.1. Energy Industries	1 211.43	1 106.79	-104.64	-8.64	-0.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.A.2. Manufacturing Industries and Construction	4 986.36	4 543.90	-442.46	-8.87	-3.46	0.63	0.63	0.00	0.00	0.00	9.30	6.20	-3.10	-33.33	-0.02
1.A.3. Transport	3 205.98	3 574.99	369.01	11.51	2.89	6.72	24.36	17.64	262.50	0.14	12.40	86.80	74.40	600.00	0.58
1.A.4. Other Sectors	1 211.57	1 519.87	308.30	25.45	2.41	11.97	14.28	2.31	19.30	0.02	6.20	6.20	0.00	0.00	0.00
1.A.5. Other	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
1.B. Fugitive Emissions from Fuels	0.00	0.00	0.00	0.00	0.00	27.51	30.66	3.15	11.45	0.02	0.00	0.00	0.00	0.00	0.00
1.B.1. Solid fuel	-	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
1.B.2. Oil and Natural Gas	-	0.00	0.00	0.00	0.00	27.51	30.66	3.15	11.45	0.02	0.00	0.00	0.00	0.00	0.00
2. Industrial Processes	**1 309.75**	**1 407.50**	**97.75**	**7.46**	**0.76**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
2.A. Mineral Products	532.25	572.47	40.22	7.56	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.B. Chemical Industry	0.00	NO	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
2.C. Metal Production	773.70	829.76	56.06	7.25	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.D. Other Production	3.81	5.27	1.46	38.23	0.01										
2.G. Other	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
3. Solvent and Other Product Use	**10.57**	**9.11**	**-1.46**	**-13.84**	**-0.01**						**0.00**	**0.00**	**0.00**	**0.00**	0.00
4. Agriculture						**370.65**	**249.69**	**-120.96**	**-32.63**	**-0.95**	**145.70**	**145.70**	**0.00**	**0.00**	**0.00**
4.A. Enteric Fermentation						346.29	179.97	-166.32	-48.03	-1.30					
4.B. Manure Management						24.36	69.72	45.36	186.21	0.35	0.00	0.00	0.00	0.00	0.00
4.C. Rice Cultivation						0.00	0.00	0.00	0.00	0.00					
4.D. Agricultural Soils [2]						0.00	0.00	0.00	0.00	0.00	145.70	145.70	0.00	0.00	0.00
4.E. Prescribed Burning of Savannas						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.F. Field Burning of Agricultural Residues						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.G. Other						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Land-Use, Land-Use Change and Forestry	**-294.93**	**-294.93**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**21.70**	**21.70**	**0.00**	**0.00**	**0.00**
5.A. Forest Land		-294.93	-294.93				0.00	0.00				0.00	0.00		
5.B. Cropland		-	0.00				0.00	0.00				21.70	21.70		
5.C. Grassland		-	0.00				0.00	0.00				0.00	0.00		
5.D. Wetlands		-	0.00				0.00	0.00				0.00	0.00		
5.E. Settlements		-	0.00				0.00	0.00				0.00	0.00		
5.F. Other Land		-	0.00				0.00	0.00				0.00	0.00		
5.G. Other		-	0.00				0.00	0.00				0.00	0.00		
6. Waste	**17.08**	**10.00**	**-7.08**	**-41.45**	**-0.06**	**80.64**	**27.51**	**-53.13**	**-65.89**	**-0.42**	**6.20**	**0.00**	**-6.20**	**-100.00**	**-0.05**
6.A. Solid Waste Disposal on Land	0.00	0.00	0.00	0.00	0.00	64.47	27.51	-36.96	-57.33	-0.25					
6.B. Wastewater Handling						3.99	0.00	-3.99	-100.00	-0.03	6.20	0.00	-6.20	-100.00	-0.05
6.C. Waste Incineration	17.08	10.00	-7.08	-41.45	-0.06	0.21	0.00	-0.21	-100.00	0.00	3.10	0.00	-3.10	-100.00	-0.02
6.D. Other	0.00	0.00	0.00	0.00	0.00	11.97	0.00	-11.97	-100.00	-0.09	0.00	0.00	0.00	0.00	0.00
7. Other *(please specify)*	**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**
Memo Items:															
International Bunkers	**363.41**	**401.43**	**38.02**	**10.46**	**0.30**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Multilateral Operations	**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**
CO_2 Emissions from Biomass	**53.10**	**70.91**	**17.81**	**33.54**	**0.14**										

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	HFCs					PFCs					SF_6				
	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)
	CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)
Total Actual Emissions	**43.06**	**13.62**	**-29.44**	**-68.37**	**-0.23**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**3.52**	**2.91**	**-0.61**	**-17.33**	**0.00**
2.C.3. Aluminium Production					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.E. Production of Halocarbons and SF_6	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
2.F. Consumption of Halocarbons and SF_6	43.06	13.62	-29.44	-68.37	-0.23	0.00	0.00	0.00	0.00	0.00	3.52	2.91	-0.61	-17.33	0.00
Other	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
Potential Emissions from Consumption of HFCs/PFCs and SF_6	**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

	Previous submission	Latest submission	Difference	Difference[1]
	CO_2 equivalent (Gg)			(%)
Total CO_2 Equivalent Emissions with Land-Use Change and Forestry [3]	12 410.20	12 507.49	97.29	0.78
Total CO_2 Equivalent Emissions without Land-Use Change and Forestry [3]	12 683.43	12 780.72	97.29	0.77

TABLE 8(a) RECALCULATION - RECALCULATED DATA

Recalculated year: 1991

Inventory 2004
Submission 2007 v1.1
Luxembourg

GREENHOUSE GAS SOURCE AND SINK CATEGORIES		CO_2					CH_4					N_2O				
		Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)
		CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)
Total National Emissions and Removals		**11 865.28**	**12 087.93**	**222.65**	**1.88**	**1.72**	**498.12**	**356.58**	**-141.54**	**-28.41**	**-1.09**	**207.70**	**235.60**	**27.90**	**13.43**	**0.22**
1. Energy		**10 823.87**	**10 856.30**	**32.43**	**0.30**	**0.25**	**46.83**	**65.31**	**18.48**	**39.46**	**0.14**	**31.00**	**68.20**	**37.20**	**120.00**	**0.29**
1.A.	Fuel Combustion Activities	10 823.87	10 856.30	32.43	0.30	0.25	19.32	35.91	16.59	85.87	0.13	31.00	68.20	37.20	120.00	0.29
1.A.1.	Energy Industries	1 233.94	1 210.81	-23.13	-1.87	-0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.A.2.	Manufacturing Industries and Construction	5 079.04	4 762.09	-316.95	-6.24	-2.44	0.63	0.63	0.00	0.00	0.00	9.30	6.20	-3.10	-33.33	-0.02
1.A.3.	Transport	3 276.80	3 317.22	40.42	1.23	0.31	6.72	19.74	13.02	193.75	0.10	12.40	55.80	43.40	350.00	0.33
1.A.4.	Other Sectors	1 234.09	1 566.18	332.09	26.91	2.56	11.97	15.54	3.57	29.82	0.03	6.20	6.20	0.00	0.00	0.00
1.A.5.	Other	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
1.B.	Fugitive Emissions from Fuels	0.00	0.00	0.00	0.00	0.00	27.51	29.40	1.89	6.87	0.01	0.00	0.00	0.00	0.00	0.00
1.B.1.	Solid fuel	-	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
1.B.2.	Oil and Natural Gas	-	0.00	0.00	0.00	0.00	27.51	29.40	1.89	6.87	0.01	0.00	0.00	0.00	0.00	0.00
2. Industrial Processes		**1 308.71**	**1 507.48**	**198.77**	**15.19**	**1.53**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
2.A.	Mineral Products	531.83	590.62	58.79	11.05	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.B.	Chemical Industry	0.00	NO	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
2.C.	Metal Production	773.08	913.44	140.36	18.16	1.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.D.	Other Production	3.81	3.42	-0.39	-10.22	0.00										
2.G.	Other	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
3. Solvent and Other Product Use		**10.56**	**9.08**	**-1.48**	**-14.05**	**-0.01**						**0.00**	**0.00**	**0.00**	**0.00**	0.00
4. Agriculture							**370.65**	**263.55**	**-107.10**	**-28.90**	**-0.83**	**145.70**	**145.70**	**0.00**	**0.00**	**0.00**
4.A.	Enteric Fermentation						346.29	192.57	-153.72	-44.39	-1.15					
4.B.	Manure Management						24.36	70.98	46.62	191.38	0.36	0.00	0.00	0.00	0.00	0.00
4.C.	Rice Cultivation						0.00	0.00	0.00	0.00	0.00					
4.D.	Agricultural Soils [2]						0.00	0.00	0.00	0.00	0.00	145.70	145.70	0.00	0.00	0.00
4.E.	Prescribed Burning of Savannas						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.F.	Field Burning of Agricultural Residues						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.G.	Other						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Land-Use, Land-Use Change and Forestry		**-294.93**	**-294.93**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**21.70**	**21.70**	**0.00**	**0.00**	**0.00**
5.A.	Forest Land		-294.93	-294.93				0.00	0.00				0.00	0.00		
5.B.	Cropland		-	0.00				0.00	0.00				21.70	21.70		
5.C.	Grassland		-	0.00				0.00	0.00				0.00	0.00		
5.D.	Wetlands		-	0.00				0.00	0.00				0.00	0.00		
5.E.	Settlements		-	0.00				0.00	0.00				0.00	0.00		
5.F.	Other Land		-	0.00				0.00	0.00				0.00	0.00		
5.G.	Other		-	0.00				0.00	0.00				0.00	0.00		
6. Waste		**17.07**	**10.00**	**-7.07**	**-41.40**	**-0.05**	**80.64**	**27.72**	**-52.92**	**-65.63**	**-0.41**	**6.20**	**0.00**	**-6.20**	**-100.00**	**-0.05**
6.A.	Solid Waste Disposal on Land	0.00	0.00	0.00	0.00	0.00	64.47	27.72	-36.75	-57.00	-0.28					
6.B.	Wastewater Handling						3.99	0.00	-3.99	-100.00	-0.03	6.20	0.00	-6.20	-100.00	-0.05
6.C.	Waste Incineration	17.07	10.00	-7.07	-41.40	-0.05	0.21	0.00	-0.21	-100.00	0.00	3.10	0.00	-3.10	-100.00	-0.02
6.D.	Other	0.00	0.00	0.00	0.00	0.00	11.97	0.00	-11.97	-100.00	-0.09	0.00	0.00	0.00	0.00	0.00
7. Other *(please specify)*		**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**
Memo Items:																
International Bunkers		**363.12**	**412.19**	**49.07**	**13.51**	**0.38**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Multilateral Operations		**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**
CO_2 Emissions from Biomass		**53.06**	**70.91**	**17.85**	**33.64**	**0.14**										

GREENHOUSE GAS SOURCE AND SINK CATEGORIES		HFCs					PFCs					SF_6				
		Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)
		CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)
Total Actual Emissions		**43.06**	**13.62**	**-29.44**	**-68.37**	**-0.23**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**3.52**	**2.91**	**-0.61**	**-17.33**	**0.00**
2.C.3.	Aluminium Production					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.E.	Production of Halocarbons and SF_6	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
2.F.	Consumption of Halocarbons and SF_6	43.06	13.62	-29.44	-68.37	-0.23	0.00	0.00	0.00	0.00	0.00	3.52	2.91	-0.61	-17.33	0.00
	Other	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
Potential Emissions from Consumption of HFCs/PFCs and SF_6		**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

	Previous submission	Latest submission	Difference	Difference[1]
	CO_2 equivalent (Gg)			(%)
Total CO_2 Equivalent Emissions with Land-Use Change and Forestry [3]	12 617.68	12 696.64	78.96	0.63
Total CO_2 Equivalent Emissions without Land-Use Change and Forestry [3]	12 890.91	12 969.87	78.96	0.61

TABLE 8(a) RECALCULATION - RECALCULATED DATA

Recalculated year: 1990

Inventory 2004
Submission 2007 v1.1
Luxembourg

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2					CH_4					N_2O				
	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)
	CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)
Total National Emissions and Removals	**11 711.77**	**11 809.51**	**97.74**	**0.83**	**0.77**	**498.12**	**364.14**	**-133.98**	**-26.90**	**-1.06**	**207.70**	**223.20**	**15.50**	**7.46**	**0.12**
1. Energy	**10 536.85**	**10 528.80**	**-8.05**	**-0.08**	**-0.06**	**46.83**	**57.75**	**10.92**	**23.32**	**0.09**	**31.00**	**55.80**	**24.80**	**80.00**	**0.20**
1.A. Fuel Combustion Activities	10 536.85	10 528.80	-8.05	-0.08	-0.06	19.32	30.24	10.92	56.52	0.09	31.00	55.80	24.80	80.00	0.20
1.A.1. Energy Industries	1 277.32	1 267.76	-9.56	-0.75	-0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.A.2. Manufacturing Industries and Construction	5 257.58	5 290.61	33.03	0.63	0.26	0.63	0.63	0.00	0.00	0.00	9.30	9.30	0.00	0.00	0.00
1.A.3. Transport	2 724.48	2 724.47	-0.01	0.00	0.00	6.72	18.27	11.55	171.88	0.09	12.40	46.50	34.10	275.00	0.27
1.A.4. Other Sectors	1 277.47	1 245.96	-31.51	-2.47	-0.25	11.97	11.34	-0.63	-5.26	0.00	6.20	0.00	-6.20	-100.00	-0.05
1.A.5. Other	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
1.B. Fugitive Emissions from Fuels	0.00	0.00	0.00	0.00	0.00	27.51	27.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.B.1. Solid fuel	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
1.B.2. Oil and Natural Gas	0.00	0.00	0.00	0.00	0.00	27.51	27.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2. Industrial Processes	**1 439.46**	**1 556.59**	**117.13**	**8.14**	**0.92**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
2.A. Mineral Products	584.96	590.62	5.66	0.97	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.B. Chemical Industry	0.00	NO	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
2.C. Metal Production	850.32	961.78	111.46	13.11	0.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.D. Other Production	4.19	4.19	0.00	0.00	0.00										
2.G. Other	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
3. Solvent and Other Product Use	**11.62**	**9.05**	**-2.57**	**-22.12**	**-0.02**						**0.00**	**0.00**	**0.00**	**0.00**	0.00
4. Agriculture						**370.65**	**273.84**	**-96.81**	**-26.12**	**-0.76**	**145.70**	**145.70**	**0.00**	**0.00**	**0.00**
4.A. Enteric Fermentation						346.29	196.98	-149.31	-43.12	-1.18					
4.B. Manure Management						24.36	76.86	52.50	215.52	0.41	0.00	0.00	0.00	0.00	0.00
4.C. Rice Cultivation						0.00	0.00	0.00	0.00	0.00					
4.D. Agricultural Soils (2)						0.00	0.00	0.00	0.00	0.00	145.70	145.70	0.00	0.00	0.00
4.E. Prescribed Burning of Savannas						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.F. Field Burning of Agricultural Residues						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.G. Other						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Land-Use, Land-Use Change and Forestry	**-294.93**	**-294.93**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**21.70**	**21.70**	**0.00**	**0.00**	**0.00**
5.A. Forest Land		-294.93	-294.93				0.00	0.00				0.00	0.00		
5.B. Cropland		-	0.00				0.00	0.00				21.70	21.70		
5.C. Grassland		-	0.00				0.00	0.00				0.00	0.00		
5.D. Wetlands		-	0.00				0.00	0.00				0.00	0.00		
5.E. Settlements		-	0.00				0.00	0.00				0.00	0.00		
5.F. Other Land		-	0.00				0.00	0.00				0.00	0.00		
5.G. Other		-	0.00				0.00	0.00				0.00	0.00		
6. Waste	**18.77**	**10.00**	**-8.77**	**-46.72**	**-0.07**	**80.64**	**32.55**	**-48.09**	**-59.64**	**-0.38**	**6.20**	**0.00**	**-6.20**	**-100.00**	**-0.05**
6.A. Solid Waste Disposal on Land	0.00	0.00	0.00	0.00	0.00	64.47	32.55	-31.92	-49.51	-0.25					
6.B. Wastewater Handling						3.99	0.00	-3.99	-100.00	-0.03	6.20	0.00	-6.20	-100.00	-0.05
6.C. Waste Incineration	18.77	10.00	-8.77	-46.72	-0.07	0.21	0.00	-0.21	-100.00	0.00	3.10	0.00	-3.10	-100.00	-0.02
6.D. Other	0.00	0.00	0.00	0.00	0.00	11.97	0.00	-11.97	-100.00	-0.09	0.00	0.00	0.00	0.00	0.00
7. Other *(please specify)*	**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**
Memo Items:															
International Bunkers	**399.40**	**399.10**	**-0.30**	**-0.08**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Multilateral Operations	**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**
CO_2 Emissions from Biomass	**58.36**	**70.91**	**12.55**	**21.50**	**0.10**										

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	HFCs					PFCs					SF_6				
	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)	Previous submission	Latest submission	Difference	Difference(1)	Impact of recalculation on total emissions (2)
	CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)	CO_2 equivalent (Gg)			(%)	(%)
Total Actual Emissions	**43.06**	**13.62**	**-29.44**	**-68.37**	**-0.23**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**3.52**	**2.91**	**-0.61**	**-17.33**	**0.00**
2.C.3. Aluminium Production					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.E. Production of Halocarbons and SF_6	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
2.F. Consumption of Halocarbons and SF_6	43.06	13.62	-29.44	-68.37	-0.23	0.00	0.00	0.00	0.00	0.00	3.52	2.91	-0.61	-17.33	0.00
Other	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
Potential Emissions from Consumption of HFCs/PFCs and SF_6	**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

	Previous submission	Latest submission	Difference	Difference(1)
	CO_2 equivalent (Gg)			(%)
Total CO_2 Equivalent Emissions with Land-Use Change and Forestry (3)	12 464.17	12 413.38	-50.79	-0.41
Total CO_2 Equivalent Emissions without Land-Use Change and Forestry (3)	12 737.40	12 686.61	-50.79	-0.40

Annex III – Problems encountered using CRF Reporter v3.1.11

This Annex reproduces a document sent to the UNFCCC Secretariat on 27 March 2007 recording the problems and issues encountered while transferring inventories' data into CRF Reporter version 3.1.11.

LE GOUVERNEMENT
DU GRAND-DUCHÉ DE LUXEMBOURG
Ministère de l'Environnement

Tuesday, March 27, 2007

Inconsistencies and other issues encountered with CRF Reporter version 3.1.11

The table below indicates the inconsistencies or problems encountered when working in CRF Reporter and generating the CRF tables from within the application.

CRF source and sink categories	Information type	Description of the problem
—	—	if you choose the function "fill empty cells with notation keys", CRF Reporter automatically fills all the blank cells of a table with the NK chosen and selects, if necessary, the correct NK for some lines (NA for "methods", e.g., if NE or NO has been propagated for actual emissions in Gg). However, if you want to perform that only on a selection of cells in a table (highlighted cells), it does not work and the propagation goes all along the way to the end of the table. Though you can still edit manually the NK (delete cell range, copy cell range, …), it would be nice to be able to "limit" in a way the propagation because you might need to enter, for instance, both NE or NO in a same table.
—	—	sometimes when CRF Reporter generates the CRF tables, the documentation boxes cut the text by including a bold line in awkward places (see, e.g., CRF Table 3.A-D) or the documentation box is not formatted (see e.g. CRF Tables 1.A(c) or 1.C).
—	—	sometimes when CRF Reporter generates the CRF tables, it fills cells that should not be filled (see, e.g., CRF Tables 2(I)s1 or Summary3s1).
—	—	sometimes when CRF Reporter generates the CRF tables, it seems that it forgets to fill some cells (see, e.g., CRF Table Summary3s1 and 2). This is probably linked to the not filled "method" and "EF used" cells within CRF Reporter itself (see below).
Sectors/Totals	HFCs Actual emissions	the "method" and "EF used" cells are not filled by NA when all the HFCs sub-categories are NA, NE or NO. They cannot be filled in manually since they only accept notation keys for method and EF used.
1.AA.3	Liquid fuels summary	the CH4 and N2O entries are wrong: they do not take into account the values of the cells for liquid fuels for road transportation that have been entered manually after having used the "disable aggregation for cell data" function.

1.AD.1 to 10	Additional information/Associated CO2 emissions	if the associated CO2 emissions cell contains NE and you indicate NE too for the "allocated under" line, then, if you add a cell comment to explain the notation key NE, CRF Reporter changes the "allocated under" line to zero (0.00) while adding the comment. When you retype NE and add again the comment, then it remains.
1.AD, 1.C	—	when CRF Reporter generates Table 1.AD or Table 1.C, it does not seem to copy the documentation box input.
2.B	HFCs Emissions PFCs Emissions	the "method" and "EF used" cells are not filled by NA when all the HFCs or PFCs are showing NO in sub-categories 2.B.1 to 2.B.5. They cannot be filled in manually and the "disable aggregation for cell data" function is not available.
2.B	HFCs , PFCs,SF6 NOx, CO, NMVOC, SO2	the "actual" or "potential emissions" cells are automatically filled by CRF Reporter but indicate NA or NA,NO when it should be NO only (all the sub categories 2.B.1 to 2.B.5 are filled with NO). They cannot be filled in manually and the "disable aggregation for cell data" function is not available.
2.B.5	HFCs, PFCs,SF6 NOx, CO, NMVOC, SO2	the "actual" or "potential emissions" cells are automatically filled by CRF Reporter but indicate NA when it should be NO (all the sub categories 2.B.5.1 to 2.B.5.5 are filled with NO). They cannot be filled in manually and the "disable aggregation for cell data" function is not available.
2.C.3	PFCs Emissions	the "method" and "EF used" cells are not filled by NA when all the PFCs sub-categories are NO. They cannot be filled in manually since they only accept notation keys for method and EF used.
2.C, 2.C.5	HFCs Emissions (2.C & 2.C.5) PFCs Emissions (2.C.5)	the "actual emissions" cells are automatically filled by CRF Reporter but indicate NA,NE or NA,NO when it should be NE or NO only. They cannot be filled in manually and the "disable aggregation for cell data" function is not available.
2.E, 2.E.1, 2.G	HFCs Actual emissions	the "method" and "EF used" cells are not filled by NA when all the HFCs sub-categories are NO. They cannot be filled in manually and the "disable aggregation for cell data" function is not available.
2.E.1.2, 2.E.2, 2.E.3, 2.G (manually added categories)	HFCs Actual emissions (all) PFCs Actual emissions (2.G only)	the "method" and "EF used" cells are not filled by NA when all the HFCs or PFCs sub-categories are NO. They cannot be filled in manually since they only accept notation keys for method and EF used.
2.F	PFCs Actual emissions	the "method" and "EF used" cells are not filled by NA when all the PFCs sub-categories are NO. They cannot be filled in manually and the "disable aggregation for cell data" function is not available.
2.F.1 to 2.F.8, 2.F.9 (manually added categories)	PFCs Actual emissions	the "method" and "EF used" cells are not filled by NA when all the PFCs sub-categories are NO. They cannot be filled in manually since they only accept notation keys for method and EF used.

2.F.3, 2.F.5 to 2.F.8, 2.F.9 (manually added categories)	HFCs Actual emissions	the "method" and "EF used" cells are not filled by NA when all the HFCs sub-categories are NA, NE or NO. They cannot be filled in manually since they only accept notation keys for method and EF used.
2.IIA.F.1.1 to 6, 2.IIA.F.2.1 to 2, 2.IIA.F.4.1 to 2	—	tables only indicate "Year specific documentation" and nothing else. Is that right? If yes, what should go there and why no entries for activity data, EF, emissions, etc.?
2.F.P1, 2.F.P2.1, 2.F.P2.2, 2.F.P3.1, 2.F.P3.2, 2.F.P4	HFCs Actual emissions PFCs Actual emissions	the "method" and "EF used" cells are not filled by NA when all the HFCs or PFCs sub-categories are NE or NO. They cannot be filled in manually since they only accept notation keys for method and EF used.
2.F.P2, 2.F.P3	HFCs Actual emissions PFCs Actual emissions	the "method" and "EF used" cells are not filled by NA when all the HFCs or PFCs sub-categories are NE or NO. They cannot be filled in manually and the "disable aggregation for cell data" function is not available.
4.B	—	when CRF Reporter generates Table 4.B(b), it copies in the documentation box some of the inputs of Table 4.B(a)s1 but not all of them. Why?
4.B – Cattle – Option B	Nitrogen excretion per AWMS	each of the entries of that information type are automatically filled by CRF Reporter but indicate IE,NE or IE,NO when it should be NE or NO only (all the sub are filled with NE or NO). This bug has been indicated to the UNFCCC Secretariat and confirmed by them on 16 March 2007. It might come from the Option A or B choice.
4.B – nitrogen excretion par AWMS breakdown	Nitrogen excretion per AWMS	for each nitrogen excretion per AWMS category, the values of this excretion are automatically filled by CRF Reporter but indicate IE,NE,NO or IE,NO when it should be NE,NO or NO only (all the sub are filled with NE or NO). This bug has been indicated to the UNFCCC Secretariat and confirmed by them on 16 March 2007. It might come from the Option A or B choice.
4.D.1.6	N2O IEF	IE is recorded as IEF for the manually added category under 4.D.1.6. However, at 4.D.1.6 level itself, the IEF line remains blank. The notation keys typed in manually disappear once you click on another node. According to the UNFCCC Secretariat and confirmed by them on 16 March 2007, this line IEF should not be included in this table.
5.A, 5.A/5(II), 5.A.1	N2O	the "method" and "EF used" cells are not filled by NA when all the sub-categories are NE. They cannot be filled in manually and the "disable aggregation for cell data" function is not available.
5.B.2/5(III)/5.B2.1 to 5	N2O	the "method" and "EF used" cells are not filled by NA when N2O emissions are NE. They cannot be filled in manually since they only accept notation keys for method and EF used.
5.F.1	—	this category shows no table and ask to specify the request by selecting a child category for this node. I guess that's OK. However, the only sub-category (carbon stock change) only ask to fill in the area.

6.B	CH4	the "method" and "EF used" cells are not filled by NA when all the sub-categories are NE. They cannot be filled in manually and the "disable aggregation for cell data" function is not available.
Cross-cutting information – Key categories	—	the propagation of the notation keys does not work as well as the copy-paste cell range, hence you have to enter manually often the same information cell by cell.

The case indicated in the table above for category 6.B for CH4 is, according to the UNFCCC Secretariat, the result of a refreshing issue within CRF Reporter leading to missing NA notation keys for "methods" and "EF used" in aggregated nodes (i.e. nodes containing or made of green cells). It might be the case that other issues indicated in this table have the same origin and it seems that the problem is limited to situations where notation keys such as NA, NE or NO have been used for the disaggregated levels of a node, i.e. **not** when actual data and effective methods and emission factors notation keys (CR, PS, T1, …) have been filled in. In this latter case, the correct notation keys are reported at the aggregated level. However, the "trick" suggested by the Secretariat to cope with that refreshing problem did not seem to work on those other similar cases mentioned in the table. Here is the "trick": if a node containing green cells (i.e. cells that are automatically calculated/filled by CRF Reporter) has some of them left empty for "methods" and "EF used" and that they cannot be edited manually by using the "disable aggregation for cell data" function, then:

a) go down one or two levels to a node with white cells that can be edited;
b) for the entry line corresponding to the aggregated (i.e. green) one that has empty cells, replace the notation keys NA, NE or NO by any values and choose any of the suggested notation key for "methods" and "EF used" (it is enough to change only one year actually);
c) go back to the aggregated level by double-clicking on it: for the year(s) changed you will now see a replica of the notation keys you indicated in step b) for "methods" and "EF used";
d) go down again where you have entered the value(s) and type back the adequate notation key: "method" and "EF used" return to NA;
e) double-click again on the aggregated node: now the empty cells for "methods" and "EF used" should be filled with NA as expected.

Another annoying issue is the "zero is not an option" approach for CRF tables. Though this is a respectable option taken by the designers of GHG inventories, it leads to some difficulties, especially for small countries. Indeed, in some case we do not have an estimate of either the activity data and/or the gas emissions associated to it. However, it is believed that the activity and/or the associated emissions are close to zero. Hence, often these emissions are not estimated due to the burden of inventories on small countries having very limited resources (both human and/or material). But, with the "zero is not an option" approach, introducing "0 Gg" in a table is not possible. Indicating NO would be somewhat misleading since there might be some very limited emissions. Typing in anything such as 0.0049 or 0.00000001 e.g. that are rounded to "0.00 Gg" is a bit of a stupid solution. Hence, Luxembourg has used the notation key NE with a cell comment saying "*emissions for this category is not known with enough precision but is expected to be very low (i.e.close to zero) in Luxembourg. NE could therefore be replaced by a zero value when showing data in Gg at two digits level. However, since "0 is not an option", and NO would be somewhat misleading, we have kept the notation key NE*". For the activity, in the documentation box, we have written "*though this activity is not estimated yet*

with precision, it is expected to be very low in Luxembourg. Hence, the emissions are estimated being equal or very close to zero". One has to admit that this is not a very elegant way of proceeding; a way which can also cause some confusion.

Finally, when you prepare the official submission, CRF Reporter performs some completeness checks (for NE and IE notation keys) without letting you correct the possible missing items. Consequently, we might suppose that these checks are intended to indicate, in the XML file that will be generated by the "Prepare official submission" command, where is the missing information. However, during this submission process, CRF Reporter also generates the CRF tables. Here it could be nice if the user has the choice whether or not she or he wants to generate the Excel tables which is processor intensive and is taking a lot of time (for Luxembourg on a PC running Windows XP SP2 with a Pentium 4 processor running at 2.80 MHz, 1 Gb of RAM and the virtual memory set to 2048 MB, the generation of 15 Excel files (1990 to 2004) took 4 hours). In fact, it might be that the CRF Excel tables have already been generated just before the preparation of the official submission (for a "visual" checking, for instance) and are considered to be complete and correct. In this case, it would not be necessary to generate again these tables.

Eric DE BRABANTER

Annex IV – Inventory 1990-2004 transmission of 27 March 2007

This Annex reproduces the e-mail to the UNFCCC Secretariat of 27 March 2007 indicating the official submission of Luxembourg's GHG inventories 1990-2004 from CRF Reporter v3.1.11.

Dear colleagues,

This morning I have uploaded on the Central Data Repository (CDR) of the ReportNet of the EIONET network our GHG inventories for the years 1990 to 2004:
see http://cdr.eionet.europa.eu/lu/eu/ghgmm/envrgjxpg.

These inventories (CRF Excel tables) have been generated directly from within CRF Reporter version 3.1.11. The XML file produced by CRF Reporter is also uploaded on the CDR. The tables are completed (completeness checks passed in CRF Reporter) but one set of tables is lacking: Tables 8 - recalculation. Why?
a) since we have used a blank version of CRF Reporter and since we use it for the first time, we did not have a recalculation table available;
b) with the work produced recently on the inventories, recalculation seems not to make too much sense. However, recalculation will be annexed to the forthcoming NIR, at least for the base year 1990.

Another point is that I did not edit the Excel tables generated by CRF Reporter. Hence, they contain the "transfer" flaws from the software to Excel (such as blank cells, greyed cells that are filled by (usually wrong) notation keys, documentation box not formatted, ...). Note however that these flaws are not numerous. This is why, on top of the Excel and XML files, CDR also contain 3 Temporary Items:
a) a PDF file recording all the inconsistencies and issues I have faced while working with CRF Reporter;
b) the CRF Reporter log file from its first installation up to this morning when it started to act strangely: after having clicked OK in the dialog box "Official Submission Successful" and produced the suggested backup (see c) below) it apparently started to generate new Excel tables (version 1.2) and when I stopped CRF Reporter (Ctrl-Alt-Del) it had already produced Excel tables for 2004 and 2003;
c) the backup database generated after the official submission.

I hope that these files, combined with non-edited Excel generated tables, will help the Secretariat in its work to improve the Reporter which is a tool both relatively easy to use and very helpful.