UNECE Air Pollution Questionnaire:

Full responses to NOx Protocol questions from 2008 questionnaire

5/4/10 This document contains all the responses to Q2-6 in the 2008 questionnaire. These questions relate specifically to the 1988 NOx Protocol. Author Clare Howard.

Contents

Introduction

This document contains all the responses to Q2-6 from the 2008 UNECE Air Pollution Questionnaire. These questions relate to the 1988 NOx Protocol. The countries which responded to the questions can be seen in Table 1.

Table 1: Countries which responded to the NOx Protocol questions from the 2008 questionnaire

A: Response to all questions related to the Protocol received by 1/4/08
B: Response to all questions related to the Protocol received, but not by 1/4/08
C (no….): Response to all questions related to the Protocol received, except those specified
None: No response to any question regarding the Protocol
Not applicable (not Party to the Protocol)
R: Reply by a non-Party to the Protocol

Party	Response	Party	Response
Austria	A	Liechtenstein	None
Belarus	B	Lithuania	A
Belgium	A	Luxembourg	None
Bulgaria	B	Monaco	
Canada	A	Netherlands	A
Croatia	B	Norway	A
Cyprus	A	Portugal	
Czech Republic	A	Republic of Moldova	
Denmark	B	Romania	
Estonia	A	Russian Federation	None
Finland	A	Slovakia	A
France	B	Slovenia	A
Germany	B	Spain	A
Greece	None	Sweden	A
Hungary	A	Switzerland	A
Iceland		Ukraine	A
Ireland	B	United Kingdom	A
Italy	A	United States	A
Latvia		European Community	None

Question 2 *With reference to article 7, please provide up-to-date information on the national programmes, policies and strategies your country has developed to implement the obligations under the Protocol that serve as a means of controlling and reducing emissions of nitrogen oxides (NOx) or their transboundary fluxes. If your country is a Party to the Gothenburg Protocol, you may cross-refer to question 39.*

Bulgaria

The national strategies and programs, listed in Q1, approved by country's Government and Parliament, have been developed in pursuance of country's obligations and for controlling and reducing emissions of nitrogen oxides and their transboundary fluxes under the NOx Protocol. These strategies and programs are in compliance with country's commitments under the Art.7 of the Protocol.

Canada

In June 2000, the federal and provincial Ministers of the Environment endorsed Canada-wide Standards (CWS) for particulate matter (PM) and Ozone. These standards set new ambient targets for these two pollutants to be achieved by the year 2010. Achieving the CWS for PM will require reductions in emissions of its gaseous precursors, which include nitrogen oxides (NOX). For its part, the Government of Canada released its Interim Plan 2001 on Particulate Matter and Ozone which identifies strategies proposed by the federal government to meet its commitments under the CWS process (2001). Canada released the 2003 Progress Report on Particulate Matter and Ozone that highlights actions by the federal government and progress made on our commitments in the Interim Plan 2001. Recent regulatory initiatives for emissions of NOX from vehicles, engines and fuels include: On-road Vehicle and Engine Emission Regulations (2003), Off-Road Small Spark-Ignition Engine Emission Regulations (2003) and Off-Road Compression-Ignition Engine Emission Regulations. These initiatives align Canada's smog-forming emission standards with those of the U.S. Environmental Protection Agency. In 2004, New Source Emission Guidelines for Thermal Electricity Generation were published in the Canada Gazette, Part 1. These contain emission limits for NOX as well as SO2 and PM, based on the performance of the best available economically feasible technologies. In 2005, Nova Scotia, Quebec and Ontario promulgated regulations that include emissions standards and caps for specific sectors or a range of sectors and monitoring measures to prevent, eliminate or reduce the release of NOX and other contaminants into the atmosphere. In addition to particulate matter less than or equal to 10 microns (PM10) being on the List of Toxic Substances in Schedule 1 of the Canadian Environmental Protection Act (2001), PM10 precursors and ground level ozone and its precursors were added to the list in 2003. Nitrogen oxides were specifically included as precursors to both PM10 and ozone. Future risk management strategies aimed at reducing PM10 and ozone are expected to focus primarily on reductions in emissions of the precursors, which include NOX. Canada and the U.S. signed the Ozone Annex (2000) to the Canada-United States Air Quality Agreement. The measures committed in the Annex are estimated to reduce annual NOx emissions in the region of Canada defined in the Annex as the Pollutant Emission Management Area from 1990 levels by 39% by 2010. The measures committed in the Annex to reduce NOX emissions in Canada reflect the programs being developed and in place to achieve the Canada-wide Standard for Ozone of 65 parts per billion by 2010. As part of The Canada-Wide Acid Rain Strategy for Post-2000, Canada recently developed critical loads for nitrogen aimed at protecting forest soils and which will be used to guide the development of further measures to limit and reduce national NOX emissions or their

transboundary fluxes.

Cyprus

Cyprus acceded to the 1988 NOx Protocol since 2/9/2004. The national total NOx emissions for the year 2006 amount to 17,56 Gg. The main source of NOx emissions in Cyprus is public electricity (40% of national total in 2006). Other major sectors that contribute to NOx emissions are the road transportation (39% of national total in 2006) and the cement production (13% of national total in 2006). Several measures are promoted in order to reduce NOx emissions from transport sector. These include enforcement of speed limits and efficient traffic management. Furthermore, since May 2004 all imported vehicles using petrol are equipped with catalytic converters. The use of three – way catalyst will lead to a reduction of NOx emissions from this sector. For all new large combustion installations for electricity production, the NOx limit values specified in the LCP Directive (2001/80/EC) are specified in the relevant Air Emission Permit, thus encouraging the use of low NOx burners. As far as the public electricity sector is concerned, the national efforts are focusing in securing the supply of Liquefied Natural Gas (LNG) for use in the energy sector by 2012. The successful outcome of this process will contribute significantly to the reduction of NOx emissions to the atmosphere. In addition to this, systematic measures are also taken to develop a sound energy efficiency policy aiming at reduction of NOx emissions. Main instruments of this policy are the energy pricing, the formulation and implementation of energy efficiency programmes for various sectors of the economy and the promotion of renewable energy sources, mainly wind and solar. The main objective is to increase the contribution of renewable energy to the energy balance of the island up to 12% by the year 2010. The impact of national programmes, policies and strategies has been already seen, as the NOx emissions from 21,65 Gg in 2000 have been reduced to 17,56 Gg in 2006. Cyprus has promoted cooperation with specialized European organization for the calculation and mapping of critical loads of nutrient nitrogen and developed programmes for the reductions in national annual emissions of nitrogen oxides or transboundary fluxes.

Czech Republic

See Q. 39.

Denmark

The reduction of nitrogen oxides is a major goal of energy policy (through saving energy consumption and more efficient production stationary sources). For mobile sources, catalytic converters on cars and emission standards (according to the EU directives for both road vehicles and non road vehicles) are implemented. Regulation of large combustion plants comply with the EU-LCP Directive. NOx emissions from other combustion plants are regulated by national guidelines. A Statutory order of June 2005 regulates NOx-emissions from engines and turbines bigger than 120 kW Thermal. We also cross-refer to answer to question 39

Estonia

The largest proportion of NOx is emitted from mobile pollution sources (in 2003, the relevant percentage in all of Estonia was 48.5%) and combustion facilities (51%). During the period 1990–2003, the emission of NOx reduced by 48.2%, within the same period, emissions from

the energy sector have decreased 40% and more than twice from the transport sector. Estonian objective is to guarantee that as of 2010, the total emission of nitrogen oxides from stationary and mobile pollution sources in Estonia would not exceed 60, 000 tonnes a year. Estonia has adopted following strategies and programs which will lead to the emission reduction of several pollutants (e.g. nitrogen oxides): Environmental strategy until 2030 (http://www.envir.ee/2959), Environmental action plan until 2013 (http://www.envir.ee/2851), National emission reduction program for mobile and stationary sources (incl. LCP, NEC measures) 2006-2015 (http://ec.europa.eu/environment/air/nationalprogr_dir200181.htm), Greenhouse gases emissions reduction program 2003-2012

Finland

Finland has prepared national strategies and policies in ad hoc committees. Since 1991, three way catalytic converters have been required for new passenger cars by national regulations. EU exhaust standards replaced domestic regulations in 1996. However, only about 60% of total car mileage was driven by cars with catalytic converters in 2003 and still about one third of the total milage. Emission standards for major power stations were set in 1991, but have been updated since that. Stationary source emissions have fallen by 30% since 1980. See also answer to question 39.

Germany

NOx emissions in Germany had decreased from 3350 kt in 1987 to 2055 kt in 1994 the target year of the protocol, which is more than the required 30%, and have continued to decrease to 1584 kt in 2000 and to 1395 kt in 2006. See also question 39.

Hungary

Basic target of the Protocol – not to exceed the national NOx emission of the year 1987 until 1994 – was fulfilled. Ministerial Decree 22/1998.(VI.26.) KTM came into force in 1998. A new Ministerial Decree 10/2003.(VII.11.) KvVM was issued in 2003 in compliance with Directive 2001/80/EC. These pieces of legislation reflect the national policies and stipulate the ELVs for large combustion plants. Nitrogen oxides emission is generated mainly by the traffic, ELVs were introduced in accordance with EU legislation (E-II, E-III, E-IV) and ELVs for off-road machines were applied complying with relevant EU Directives since 2000.

Ireland

The main overarching legislative instrument to address NOx emissions is the European Communities (National Emissions Ceilings) Regulations 2004 which transposed the National Emissions Ceilings Directive 2001/81/EC for certain atmospheric pollutants. The directive sets a national emission ceilings for, inter alia, oxides of nitrogen (NOx). The emission ceiling to be achieved by Ireland by 2010 is 65kt for NOx (42% reduction). Total NOx emissions for Ireland in 2006 were 113.3 kt in compliance with the Sofia Protocol objective of maintaining emissions below 116.4 kt, the 1987 base year total. The 2003 Discussion Paper: Strategy to Reduce Emissions of Transboundary Air Pollution by 2010 set out the main national challenged to address transboundary emissions. Following public consultation, a National Programme to address transboundary pollutants was issued in 2005 and this was updated in July 2007 to reflect additional sectoral measures which have been adopted and/or

implemented by the Irish Government since the Programme was finalised in 2005. Identification of further additional measures which are viable and cost-effective in reducing transboundary pollutants, particularly all sources of NOx, is ongoing. Click this link to access the National Programme and 2007 Update. Emissions of NOx in Ireland are affected by 'fuel tourism' where fuel is sold in Ireland but consumed outside the state. The factors that drive fuel tourism, have meant that for the Sofia Protocol base year of 1987, there was a net inflow of fuel from the state, thus depressing actual base year emission but in recent years the situation has reversed and there has been a net outflow of fuel from the state which inflates national emissions. The NOx emissions inventory is compiled using two methodologies, (i) based on fuel sold and (ii) an adjusted estimate to correct for fuel tourism. For the 2008 submission estimates for the base year have been improved to ensure consistency with the 1990 – 2006 time series. Adjusted NOx emissions were 116.4 kt in 1987 and rose to a high of 138.9 kt in 1992 and have since fallen to 113.3 kt in 2006.

Italy

Italy's policy to control and reduce nitrogen oxides emissions is inspired by the polluter pays and user pays principles, applied through a mix of command and control measures based on a regulation framework, e.g. air quality limit and target values, and economic instruments, e.g. a tax to the large combustion plants producing NOx emissions (Presidential Decree n. 416 on October the 26th 2001). Furthermore specific measures have been developed to promote sustainable mobility and several measures on energy sector (e.g. green certificates, energy efficiency) have been adopted in December 2002 by a decision of the Interministerial Committee for Economic Planning (CIPE) in order to fulfil the Kyoto commitments. The Legislative Decree n. 171 on May the 21st 2004 , which implements the directive 2001/81/CE, on National Emission Ceilings considers further actions to meet the NOx ELV in 2010.

Liechtenstein

Response by Party: The minimum target for Liechtenstein is a 30 % reduction of nitrogen oxides emissions until 1998 on a base year between 1980 – 1986, and a steadily further reduction of the emissions in the following years. The 2008 Environmental Protection Act [1] and the 1987 Ordinance on Air Pollution, amended 1988, 1992, 1999 and 2008 [2], regulate emissions from stationary sources. The Ordinance contains emission standards for organic and inorganic pollutants, including nitrogen oxides, as well as fuel and petrol requirements. Further, the Energy Efficiency Act [4] provides an incentive by subsidies for the use of renewable energy as solar energy, wood and biomass. Emission standards for motor vehicles are laid down in the Road Traffic Act [5] and implementing Ordinances [6,7,8,9]. Incentive measures for public traffic systems are based on the 1992 Act for supporting public traffic [10]. The measures taken lead to a reduction of nitrogen oxide emissions since 1985 of almost 25 per cent. 1985: 841 tonnes, 1990: 711 tonnes, 1995: 632 tonnes, 2000: 660 tonnes, 2007: 629 tonnes.

Lithuania

See the question 39.

Monaco

Netherlands

The Netherlands is a Party to the Nitrogen Oxides Protocol and the Gothenburg Protocol. The general on policy on nitrogen oxides is given in the answer to question 39.

Norway

The Pollution Control Act of 1981 constitutes the basic element in Norway's policy to control and reduce pollution, including emissions of NOx. The Pollution Control Act is a typical enabling act, meaning that the details (ELVs and other specific requirements) are outlined in individual discharge permits or regulations issued by the pollution control authorities. The main rule of the act is that pollution is forbidden, unless it is specifically permitted by law, regulations or individual permits. Regulations pursuant to the Pollution Control Act are laid down by the Regulations relating to Pollution Control (the Pollution Regulation) of 2004. Emissions of NOx from vehicles and ships are regulated by special laws and regulations. Norway also makes use of economic incentives in order to reduce emissions of NOx. As a party to the Agreement on The European Economic Area (EEA) between the European Community, the EU member states and three EFTA member states, Norway has implemented in national legislation the provisions of all EU legislative acts regulating emissions from specific sources and products that are relevant to the implementation of the obligations under the Protocol. Emissions from large stationary sources are controlled through permits pursuant to the Pollution Control Act. For existing stationary sources, permits are revised to ensure the use of Best Available Techniques (BAT) in accordance with Council Directive 96/61/EC on integrated pollution prevention and control (the IPPC Directive). The IPPC Directive is implemented in national legislation. The application of BAT is required for new stationary sources and for upgrading and extension of existing sources. Emission limit values for new and for upgrading and extension of existing large stationary sources are given within the range of 5-25 ppm NOx. Norway has implemented the Council Directive; 88/609/EEC (Large Combustion Plants (LCP) Directive - see Q.13.) and Council Directive 85/203/EEC on air quality standards for nitrogen dioxide (in 1997). Council Directive 96/62/EC on ambient air quality assessment and management, and its two first daughter directives; 1999/30/EC on limit values for sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead in ambient air and 2000/69/EC on limit values for benzene and carbon monoxide in ambient air, were implemented in October 2002. A new tax on emissions of NOx from energy production delivery from defines sources such as propulsion machinery, motors, boilers and turbines exceeding given capacity was put into effect from 1 January 2007. And from January 2008 a negotiated agreement between the government and several sectors (including many of the said sources) on NOx-reductions have been settled. A tax on emissions of NOx from energy production delivery from defined sources such as propulsion machinery, motors, boilers and turbines exceeding given capacity was put into effect from 1 January 2007. Tax exemption is granted in the case of emission sources that are encompassed by n environmental agreement with the State on the performance of measures to achieve specific reductions in emissions of NOx within defined time frames. In January 2008 the Norwegian government and 14 business organizations agreed on the principal contents of such an agreement With respect to mobile sources, vehicles must meet emission standards set pursuant to the Road Traffic Act incorporating relevant EU directives, see response to Q.5. Norway has introduced fiscal taxes on petrol and diesel. A differentiation in the annual tax for heavy road vehicles according to the emission levels (including NOx) was introduced in 2000. Emissions from coastal traffic and fishing vessels constitute about 34% of national NOx emissions in 2006. Norway has ratified Annex VI on air pollution from ships to the

Maritime Pollution (MARPOL) Convention of the UN Maritime Organisation IMO. These have also been implemented in the Norwegian Ship Safety and Security Act. In the offshore petroleum sector, low-NOx technology is installed in new gas turbines. Emission limit values for older turbines will be set as part of the revision of emission permits. The revision process is scheduled to be finalised in 2008.

Slovakia

See reply to question 39.

Slovenia

Please see A. 39.

Spain

Please, see Q. 39. For NOx, the potential emissions abatement foreseen in the second National Programme for Reduction on Emissions (NEC Directive) with all the measures is given in the first figure in Annex 1.2, which depicts the effect of the measures included in the base scenario. The projected reductions in 2010 will be 41,3%, in relation with the BAU scenario. Also, the National Plan on Emissions Reductions in existing Large Combustion Plants foresees a reduction of 15% in NOx emissions in 2015 with respect to those of 2001.

Sweden

Swe response Comment: Go to Q39!

Switzerland

Please refer to answer 39.

United Kingdom

The revised Air Quality Strategy for England, Scotland, Wales and Northern Ireland was published in July 2007. The Strategy, which was previously reviewed in 2000 and 2003, sets objectives for cutting air pollutants to protect public health, vegetation and ecosystems. Performance against these objectives is monitored in populated or problem areas: urban conurbations, industrial sites and motorways. Nitrogen dioxide is one of the pollutants covered by the Strategy. The Pollution Prevention and Control (England and Wales) Regulations came into force on 1 August 2000 transposing the EC Directive on Integrated Pollution Prevention and Control (IPPC). These were made under the Pollution Prevention and Control Act 1999 and similar arrangements have also been made in Scotland and Northern Ireland. IPPC applies an integrated environmental approach to the regulation of industrial activities and extends to cover previously unregulated sources of emissions of pollutants to air, land, water and waste. IPPC covers around 4,300 installations in England and Wales, and some 450 installations in Scotland. These include oil refineries, power stations and chemical plants. As of January 2008, local authorities in England will report on emissions of NOx (and PM10) from their estates and operations, working towards reducing emissions of these pollutants as one of the new set of 198 national performance indicators for local authorities. Local authorities will also continue to take action to reduce concentrations of nitrogen dioxide in hotspots that they designate as air quality management areas under Part

IV of the Environment Act 1995.

United States

Environmental legislation, most importantly the Clean Air Act (CAA) and regulatory programs authorized by that legislation, include national strategies and programs in the United States to control and reduce nitrogen oxides (NOx) emissions. State and local governments must implement NOx emission control programs by specific deadlines and submit plans that demonstrate how the cities within their State will attain the national ambient air quality standard (NAAQS) for ozone. Specific programs are implemented which achieve emission reductions from mobile sources and fuels, and require the installation of best available control technologies on new and existing major stationary sources of NOx. The Environmental Protection Agency finalized a rule in 1998 that, upon implementation, will reduce summertime NOx emissions by approximately 23 percent (900,000 tons) in the eastern U.S. -- the main portion of the country that affects air quality in Canada. These reductions began in 2004 and are calculated from 1996 emission levels. We are now seeing improved air quality in the eastern United States that can be attributed to this rule. States are required under this rule to adopt and implement NOx control measures to ensure that seasonal NOx emissions do not exceed specified levels. All of the States required to implement this rule have adopted a NOx cap-and-trade program for large electric generating units and large industrial boilers and turbines as the major control strategy. In addition, the performance objective for the Acid Rain Program's NOx component has been to achieve and maintain a 2 million ton reduction from affected coal-fired electric utility units relative to the NOx emission levels projected to occur in 2000 absent the Acid Rain Program. The goal was achieved in 2000: total NOx mass emissions for coal-fired electric utility units affected by the NOx program component had been reduced to 4.5 million tons (a reduction of 2.9 million tons below program projections). In 2002, the reduction fell to 4 million tons. Total NOx mass emissions for all Acid Rain Program affected units in 2002 were 2.2 million tons (or 33%) below 1990 emission levels. In March 2005, EPA finalized a rule, known as the Clean Air Interstate Rule (CAIR), which requires the District of Columbia and 28 States in the eastern half of the U.S. to reduce emissions of NOx and sulfur dioxide (SO2) to specified levels. EPA estimates that the rule will reduce annual NOx emissions by 1.2 million tons in 2009 and by 1.5 million tons in 2015; and will reduce annual SO2 emissions by 3.6 million tons in 2010 and by 3.9 million tons in 2015. When fully implemented, CAIR will reduce SO2 emissions in these States by over 70 percent and NOx emissions by over 60 percent from 2003 levels. In March 2006, EPA adopted Federal NOx and SO2 cap and trade programs as a backstop to implement the CAIR reductions until States have their State rules in place to achieve the reductions. All States are choosing to meet the CAIR requirements by having their electric utilities participate in 2-phased cap and trade programs by either adopting State rules or leaving the Federal program in place. In 1999, EPA issued a national rule that also reduced the sulfur, NOx and other sources of fine particles that cause regional haze problems across the country (Regional Haze Regulations, 40 CFR Part 51; FR Vol. 64, No. 126, p. 35714). State Implementation Plans (SIPs) demonstrating how reductions of these pollutants will be achieved were due on December 17th, 2007. The SIPs require Best Available Retrofit Technology (BART) evaluations for sulfur, NOx, and particulate matter on 26 major source categories including power plants, pulp and paper mills, cement facilities, and refineries. BART must be implemented by 2013. The rule also requires states to meet interim emission reduction milestones to demonstrate reasonable progress towards meeting the goal of improving visibility in designated areas in the United States; the ultimately goal of the program is to return visibility to natural background conditions by 2064.

Question 3 **The question refers only to Parties in those areas in which national or international tropospheric ozone standards are exceeded or where transboundary fluxes originate or are expected to originate.With reference to article 2, paragraph 2 (a), please specify the national NOx emission standards applied to major stationary sources and/or major source categories in your country, taking into consideration the technical annex to the Protocol. For the purpose of this question, "major stationary source" means any stationary source, the construction or substantial modification of which commenced after 14 February 1993 and which has a thermal input of at least 50 MWth. Please complete the table below.*

Bulgaria

No national or international tropospheric ozone standards are exceeded and there are no transboundary fluxes originate or expected to originate from Bulgaria. The national NOx emission standards applied to major stationary sources are specified in: • Regulation No.1/2005 for emission limit values (ELV) of hazardous substances (pollutants) emitted in the atmosphere from stationary sources (SG 64/2005); • Regulation for treatment of used oils and waste oil products approved by the Government with Decision No. 131/2000 (SG 59/2000); • Regulation No. 10 / 2003 on the emission limit values (concentrations in waste gasses) of sulphur dioxide, nitrogen oxides and total dust, discharged to the atmosphere from large combustion plants transposing Directive 2001/80/EC (SG 93/2003); • Regulation No. 6/2004 on the conditions and the requirements for construction and operation of installations for incineration and installations for co-incineration of waste transposing Directive 2000/76/EC (SG 78/2004); Permits with corresponding ELV listed in a Table 1: Question 3 were issued for all new / substantially modified stationary sources, referring to these regulations, as to the Regulation on the conditions and procedure for issuing of permits for Integrated Pollution Prevention and Control for the construction of new and the operation of existing industrial installations and equipment, approved with Government Decision No. 62/2003 (SG 26/2003).

Major stationary sources or major source category2/ for NOx	National emission standards1/	National legislation and comments (e.g. BAT applied)
1. Public power, cogeneration and district heating plants:1.Large Combustion Plants (including public power and district heating plants excluding gas turbines)*	...	After 21st of October 2003:
(a) Commercial boilers	...	...
(b) Domestic heaters	...	...
3. Industrial combustion plants and processes with combustion	...	...
(a) Boilers and process heaters (no direct contact between flue gas and products)	...	...
(b) Processes (direct contact); (e.g. calcinations processes in rotary kilns; production of cement, lime, etc.; glass production; metallurgical operation; pulp production)	...	...
4. Non-combustion processes, e.g. nitric acid production	...	...
5. Extraction, processing and distribution of fossil fuels	...	...
6. Waste treatment and disposal, e.g. incineration of	...	...

municipal and industrial waste		

Canada

Major stationary sources or major source category2/ for NOx	National emission standards1/	National legislation and comments (e.g. BAT applied)
1. Public power, cogeneration and district heating plants:	...	...
(a) Boilers	New sources > 73 MWth commencing after to April 1 2003: • 0.69 kg NOx (as NO2) per MWH of electricity output for all fossil fuels (determined over successive 720 hour rolling average periods). For standards prior to 2003 see additional submission.	Guidelines under CEPA 1999
(b) Stationary combustion turbines and internal combustion engines	combustion turbines (g/Gj) power output; < 3 MW capacity natural gas: 500 liquid fuel: 1250; 3–20 MW capacity natural gas: 240 liquid fuel: 460; > 20 MW capacity natural gas: 140 liquid fuel : 380	Guidelines under Canadian Council of Ministers of the Environment
2. Commercial, institutional and residential combustion plants:	...	Guidelines under Canadian Council of Ministers of the Environment
(a) Commercial boilers/Industrial boilers and Process Heaters (g/Gj heat input) (new)	10.5–105 GJ/hr cap: Gaseous fuel: 26, Distillate fuel: 40, Residual oil (<0.35% nitrogen): 90, Residual oil (= or > 0.35% N): 110; >105 GJ/hr cap: Gaseous fuel: 40, Distillate oil: 50, Residual oil (<0.35% N): 90, Residual oil (= or > 0.35% N): 125	...
(b) Domestic heaters	Domestic heaters would be subject to the same guidelines as the commercial, institutional and industrial combustion plants whose guidelines are listed above.	...
3. Industrial combustion plants and processes with combustion	...	...

(a) Boilers and process heaters (no direct contact between flue gas and products)	10.5–105 GJ/hr cap: Gaseous fuel: 26, Distillate fuel: 40, Residual oil (<0.35% nitrogen): 90, Residual oil (= or > 0.35% N): 110; >105 GJ/hr cap: Gaseous fuel: 40, Distillate oil: 50, Residual oil (<0.35% N): 90, Residual oil (= or > 0.35% N): 125	Guidelines under Canadian Council of Ministers of the Environment
(b) Processes (direct contact); (e.g. calcinations processes in rotary kilns; production of cement, lime, etc.; glass production; metallurgical operation; pulp production)	New cement kilns:2.3 kg NOx/tonne of clinker production	There are no federal/national requirements specifically targeting most new source types listed in category c)(ii). Such facilities are under provincial jurisdiction and are subject to provincial regulations.
4. Non-combustion processes, e.g. nitric acid production	...	Information to follow
5. Extraction, processing and distribution of fossil fuels	...	Currently there are no federal/national requirements specifically targeting most new source types listed. Such facilities are under provincial jurisdiction and are subject to provincial regulations.
6. Waste treatment and disposal, e.g. incineration of municipal and industrial waste	400 mg/Rm3	There are federal guidelines under the Canadian Council of Ministers of the Environment Operating and Emissions Guidelines for Municipal Solid Waste Incinerators. There are also provincial guidelines.

Cyprus

Major stationary sources or major source category2/ for NOx	National emission standards1/	National legislation and comments (e.g. BAT applied)
1. Public power, cogeneration and district heating plants:	...	...
(a) Boilers	Vasilikos Power Station Unit 1 and 2 Year of Operation 2000: 450 mg/Nm3 and Vasilikos Power Station Unit 3 Year of Operation 2005: 200 mg/Nm3	Regulations P.I.195/2004 which harmonise Cypriot legislation with the provisions of Directive 2001/80/EC

(b) Stationary combustion turbines and internal combustion engines	...	...
2. Commercial, institutional and residential combustion plants:	...	...
(a) Commercial boilers	...	...
(b) Domestic heaters	...	...
3. Industrial combustion plants and processes with combustion	...	...
(a) Boilers and process heaters (no direct contact between flue gas and products)	...	...
(b) Processes (direct contact); (e.g. calcinations processes in rotary kilns; production of cement, lime, etc.; glass production; metallurgical operation; pulp production)	...	...
4. Non-combustion processes, e.g. nitric acid production	...	...
5. Extraction, processing and distribution of fossil fuels	...	...
6. Waste treatment and disposal, e.g. incineration of municipal and industrial waste	...	...

Czech Republic

(a)Boilers Combustion Plants Very large combust. Plant=LCP by the EU directive 2001/80/EC Reference conditions and Statistical treatment: The values of the mass flux and mass concentration of nitrogen oxides shall be expressed as nitrogen dioxide. (A) refers to the concentration of the pertinent substance in dry gas under normal conditions (101, 32 kPa, 00 C), which may be accompanied by the reference content of some substance(s) in the carrier gas (usually oxygen) (B) refers to the concentration of the pertinent substance in wet gas under normal conditions (101, 32 kPa, 00 C), which may be accompanied by the reference content of some substance(s) in the carrier gas (usually oxygen) (C) refers to the concentration of the pertinent substance in damp gas under normal operational conditions. (1) For continuous measurement of the values for compliance with the emission limits, the following conditions must be fulfilled: a) the annual average of the daily mean values is less than the value of the emission limit, b) 95% of all the thirty-minute mean values is less than 120% of the emission limit, c) all the thirty-minute mean values are less than twice the emission limit, and d) none of the calendar month mean values exceeds the emission limit and 95% of all the 48 h mean values are less than 110% of the emission limit. The statistical treatment is in accordance with the requirements of Directive 2001/80/EC. (2) The statistical treatment is in accordance with the requirements of Council directive 2000/76/EC on the incineration of waste (Article 11 and Annex V).

Major stationary sources or major source category2/ for NOx	National emission standards1/	National legislation and comments (e.g. BAT applied)
a) Boilers gaseous fuels natural gas **> 300 MWt	100 mg/m3, 3 % O2 (A) (1)	** Constr. Permit since 1.1.2003
(b) internal combustion engines	See emission standards for Public power, cogeneration and district heating plants	Combustion modification
(b)Stationary combustion turbines and internal combustion enginesGas turbines **Natural gas > 50 MWt	50 mg/m3, 15 % O2 (A) (1)	** Constr. Permit since 1.1.2003
a) Boilers solid fuels *> 500 MWt	500 mg/m3 , 200 mg/m3 from 2016, 6 % O2,(A) (1)	Primary measures, FBC,SNCR, SCR
a) Boilers liquid fuels > *50 - 500 MWt	450 mg/m3, 3 % O2 (A) (1)	Primary measures,* Construct. Permit since 1.7.1987
a) Boilers gaseous fuels *50 až 500 MWt	200 mg/m3, 3 % O2 (A) (1)	Primary measures,* Construct. Permit since 1.7.1987
a) Boilers gaseous fuels natural gas ** 50 - 300 MWt	150 mg/m3, 3 % O2 (A) (1)	** Constr. Permit since 1.1.2003
a) Boilers liquid fuels**50 - 100 MWt	400 mg/m3 , 3 % O2 (A) (1)	Primary measures,SNCR, SCR,** Constr. Permit since 1.1.2003
a) Boilers liquid fuels	200 mg/m3, 3 % O2 (A) (1)	Primary measures,SNCR, SCR,** Constr. Permit since 1.1.2003
(b) Processes (direct contact); (e.g. calcinations processes in rotary kilns; production of cement, lime, etc.; glass production; metallurgical operation; pulp production)	Lime production- rotation furnaces 1800 mg/m3 (C), - other furnaces 1500 mg/m3 (C)	Government Order No 615/2006 Coll.
(b) Processes (direct contact); (e.g. calcinations processes in rotary kilns; production of cement, lime, etc.; glass production; metallurgical operation; pulp production)	Glass production fusion aggregates :- regen. continuous - 2 500 mg/m3 (A) 13% O2; - discontinuous - 1 100 mg/m3 (A) (17%) O2;- recuper. continuous - 1 600 mg/m3 (A) 13% O2	Government Order No 615/2006 Coll., increase of input energy efficiency,modernization of fusion aggregates
(b) Processes (direct contact); (e.g. calcinations processes in	Production of iron and steel - 400 mg/m3 (C)	Government Order No 615/2006 Coll

rotary kilns; production of cement, lime, etc.; glass production; metallurgical operation; pulp production)		
(b) Processes (direct contact); (e.g. calcinations processes in rotary kilns; production of cement, lime, etc.; glass production; metallurgical operation; pulp production)	Coke production 500 mg/m3,, (B) 5% O2	Government Order No 615/2006 Coll.
(b) Processes (direct contact); (e.g. calcinations processes in rotary kilns; production of cement, lime, etc.; glass production; metallurgical operation; pulp production)	Grey iron foundries 400 mg/m3 (C)	Government Order No 615/2006 Coll.
(b) Processes (direct contact); (e.g. calcinations processes in rotary kilns; production of cement, lime, etc.; glass production; metallurgical operation; pulp production)	Sinter plants 400 mg/m3 , (A) 19 % O2	Government Order No 615/2006 Coll.
a) Boilers liquid fuels > *500 MWt	400 mg/m3, 3 % O2 (A) (1)	Primary measures,* Construct. Permit since 1.7.1987
a) Boilers gaseous fuels other > 50 MWt	200 mg/m3, 3 % O2 (A) (1)	...
a) Boilers solid fuels **50 - 100 MWt	400 mg/m3, 6 % O2 (A) (1)	Primary measures, FBC, SNCR, SCR;** Constr. Permit since 1.1.2003
(a) Boilers solid fuels **100 - 300 MWt	200 mg/m3, 6 % O2 (A) (1)	Primary measures, FBC, SNCR, SCR;** Constr. Permit since 1.1.2003
(a) Boilers solid fuels ** biomass	300 mg/m3, 6 % O2 (A) (1)	Primary measures, FBC, SNCR, SCR;** Constr. Permit since 1.1.2003
(a) Boilers solid fuels> **300 MWt	200 mg/m3, 6 % O2(A) (1)	Primary measures, FBC, SNCR, SCR;** Constr. Permit since 1.1.2003
a) Boilers gaseous fuels	300 mg/m3, 3 % O2 (A)	Primary measures,* Construct.

> *500 MWt	(1)	Permit since 1.7.1987
(b)Stationary combustion turbines and internal combustion engines Gas turbines Other > 50 MWt	120 mg/m3, 15 % O2 (A) (1)	...
6. Waste treatment and disposal, e.g. incineration of municipal and industrial waste	Hazardous waste incineration; x 400 mg/m3 (A) 11% O2;xx 200 mg/m3 (A) 11% O2, incin. of waste oil 3 % O2 (2)	Waste gas treatment (SCR, SNCR), x Permit before 28.12.2002; xx Permit after 28.12.2002; (Implementation of Council Directive 2000/76/EC on the incineration of waste)
(a) Boilers solid fuels * 50-500 MW	600 mg/m3, 6 % O2	Primary measures (e.g. LEA, BBF, LNB, FGR, IFNR),FBC; * Construct. Permit since 1.7.1987
(b) Stationary combustion turbines and internal combustion engines Gas turbines volume flow rate * > 60 000 m3/h	300 mg/m3, 15 % O2 (A) (1)	*Construct. Permit since 1.7.1987
2. Commercial, institutional and residential combustion plants:	...	...
(a) Commercial boilers	See emission standards for Public power, cogeneration and district heating plants	Combustion modification
(b) Domestic heaters	See emission standards for Public power, cogeneration and district heating plants	Combustion modification
3. Industrial combustion plants and processes with combustion	...	...
(a) Boilers and process heaters (no direct contact between flue gas and products)	...	...
(b) Processes (direct contact); (e.g. calcinations processes in rotary kilns; production of cement, lime, etc.; glass production;	Cement plants with rotation kilns permitted before 14.8.2002 - 1800 mg/m3 (C) 10% O2;permitted after 14.8.2002 - 1200 mg/m3	Government Order No 615/2006 Coll., precalcination step, introduction, optimizing of firing technology

metallurgical operation; pulp production)	(A) 10%O2	
4. Non-combustion processes, e.g. nitric acid production	350 mg/m3	Government Order No 615/2006 Coll
5. Extraction, processing and distribution of fossil fuels	...	...
6. Waste treatment and disposal, e.g. incineration of municipal and industrial waste	Municipal waste incineration, until 28.12.2005 x 350 mg/m3 (A) 11% O2,since 28.12.2005 x200 mg/m3, (A) 11% O2, xx 200 mg/m3 (A) 11% O2 (2)	Waste gas treatment (SCR, SNCR), x Permit before 28.12.2002; xx Permit after 28.12.2002; (Implementation of Council Directive 2000/76/EC on the incineration of waste)

Denmark

Major stationary sources or major source category2/ for NOx	National emission standards1/	National legislation and comments (e.g. BAT applied)
(a) Boilers, Biomass, 100 - 300 MW 6 % O2,	300 mg NO2/Nm3	Statutory Order no. 808 of 25 September 2003
(a) Boilers, biomass, above 300 MW, 6% O2	200 mg NO2/Nm3	Statutory Order no. 808 of 25 September 2003
(a) Boilers, other solid, 50 - 100 MW 6% O2	400 mg NO2/Nm3	Statutory Order no. 808 of 25 September 2003
(a) Boilers, liquid fuels, 50 - 100 MW, 3% O2	400 mg NO2/Nm3	Statutory Order no. 808 of 25 September 2003
(a) Boilers, liquid fuels, above 100 MW, 3 % O2	200 mg NO2/Nm3	Statutory Order no. 808 of 25 September 2003
(a) Boilers, other gases, above 50 MW, 3 % O2	200 mg NO2/Nm3	Statutory Order no. 808 of 25 September 2003
(b) Stationary combustion turbines, liquid fuelks, above 50 MW, 15 % O2	120 mg NO2/Nm3	Statutory Order no. 808 of 25 September 2003
(a) Boilers, other solid, 100 - 300 MW, 6 % O2	200 mg NO2/Nm3	Statutory Order no. 808 of 25 Sepetmber 2003
(a) Boilers, other solid, above 300 MW, 6 % O2	200 mg NO2/Nm3	Statutory Order no. 808 of 25 September 2003
(a) Boilers, natural gas, 50 - 300 MW, 3 % O2	150 mg NO2/Nm3	Statutory Order no. 808 of 25 September 2003
(a) Boilers, Natural Gas, above 300 MW, 3% O2	100 mg NO2/Nm3	Statutory Order no. 808 of 25 September 2003
(b) Stationary combustion turbines, above 50 MW, other gases, 15 % O2	120 mg NO2/Nm3	Statutory Order no 808 of 25 September 2003
1. Public power, cogeneration and district	...	...

heating plants:		
(a) Boilers, 50 - 100 MW, biomass, 6% O2	400 mg NO2/Nm3	Statutory Order no. 808 of 25 September 2003
(b) Stationary combustion turbines, natural gas , above 50 MW,15 % O2	50 mg NO2/Nm3	Statutory Order no. 808 of 25 September 2003
2. Commercial, institutional and residential combustion plants:	...	...
(a) Commercial boilers	As boilers 50 - 100 MW	Statutory Order no 808 of 25 September 2003
(b) Domestic heaters	As boilers 50 - 100 MW	Statutory Order no. 808 of 25 Septermber 2003
3. Industrial combustion plants and processes with combustion	As boilers 50 - 100 MW	Statutory Order no. 808 of 25 Septermber 2003
(a) Boilers and process heaters (no direct contact between flue gas and products)	As boilers 50 - 100 MW	Statutory Order no. 808 of 25 September 2003
(b) Processes Cement production cemnet kilns coincinerating waste, 10 % O2	400 mg NO2/Nm3	Statutory Order no. 162 of 11 March 2003
4. Non-combustion processes, e.g. nitric acid production	NO	...
5. Extraction, processing and distribution of fossil fuels	NA	...
6. Waste treatment and disposal, e.g. incineration of municipal and industrial waste	24 hour value: 400 mg/Nm3	Statutory Order 162 of 11 March 2003

Estonia

See table below

Major stationary sources or major source category2/ for NOx	National emission standards1/	National legislation and comments (e.g. BAT applied)
(a) Boilers	Emission limit values are adopted from the LCP (2001/80/EC) directive	Decree no 112 https://www.riigiteataja.ee/ert/act.jsp?id=797559, using BAT
(b) Stationary combustion turbines and internal combustion engines	Emission limit values are adopted from the LCP (2001/80/EC) directive	Decree no 112 https://www.riigiteataja.ee/ert/act.jsp?id=797559, using BAT
2. Commercial, institutional and residential combustion	...	...

plants:		
(a) Commercial boilers	Emission limit values are adopted from the LCP (2001/80/EC) directive	Decree no 112 https://www.riigiteataja.ee/ert/act.jsp?id=797559, using BAT
(b) Domestic heaters	Emission limit values are adopted from the LCP (2001/80/EC) directive	Decree no 112 https://www.riigiteataja.ee/ert/act.jsp?id=797559, using BAT
3. Industrial combustion plants and processes with combustion	...	...
(a) Boilers and process heaters (no direct contact between flue gas and products)	Emission limit values are adopted from the LCP (2001/80/EC) directive	Decree no 112 https://www.riigiteataja.ee/ert/act.jsp?id=797559, using BAT
(b) Processes (direct contact); (e.g. calcinations processes in rotary kilns; production of cement, lime, etc.; glass production; metallurgical operation; pulp production)	IPPC or environmental permit required. BAT based limit values applied	Decree no 112 https://www.riigiteataja.ee/ert/act.jsp?id=797559 and National IPPC regulation https://www.riigiteataja.ee/ert/act.jsp?id=12889999
4. Non-combustion processes, e.g. nitric acid production	IPPC or environmental permit required. BAT based limit values applied	Decree no 112 https://www.riigiteataja.ee/ert/act.jsp?id=797559 and National IPPC regulation https://www.riigiteataja.ee/ert/act.jsp?id=12889999
5. Extraction, processing and distribution of fossil fuels	IPPC or environmental permit required. BAT based limit values applied	Decree no 112 https://www.riigiteataja.ee/ert/act.jsp?id=797559 and National IPPC regulation https://www.riigiteataja.ee/ert/act.jsp?id=12889999
6. Waste treatment and	24 h limit value - waste incineration	Decree no 66 https://www.riigiteataja.ee/ert/act.jsp?id=1014392

disposal, e.g. incineration of municipal and industrial waste	6 t/per hour or more 200 mg/m3, waste incineration 6 t/per hour or less 400 mg/m330 min limit value - waste incineration 6 t/per hour or more 200 mg/m3 to 400 mg/m3	

Finland

Please see also answers to questions 44 and 45 and tables 22 and 23 respectively.

Major stationary sources or major source category2/ for NOx	National emission standards1/	National legislation and comments (e.g. BAT applied)
1. Public power, cogeneration and district heating plants:	2) for sources using gaseous fuel 200mg (natural gas 150 mg)	Government Decree 1017/2002
1. Public power, cogeneration and district heating plants:	3) for fuels used in combustion turbines applies following limit values (15% O2): a) 50 mg for natural gas, b) 120 mg liquid fuels and c) 120 mg gaseous fuels	...
1. Public power, cogeneration and district heating plants:	1) For sources using solid fuel 400 mg NO2/m3(n), 3% O2	Government Decree 1017/2002
(a) Boilers	For sources using solid fuel 600 mg (6% O2), for fluid or gaseous fuels 450 mg (3% O2)	...
(b) Stationary combustion turbines and internal combustion engines	For sources with permit issued before 1.4.1991: fluid fuel 200 mg (15% O2), gaseous fuel 150 mg and permit issued after 1.4.1991: 100mg	...
2. Commercial, institutional and residential combustion plants:	For sources using solid fuel 600 mg (6% O2), for fluid or gaseous fuels 450 mg (3% O2)	Government Decree 1017/2002
(a) Commercial boilers	For sources using solid fuel 600 mg (6% O2), for fluid or gaseous fuels 450 mg (3% O2)	...
(b) Domestic heaters	For sources using solid fuel 600 mg (6% O2), for fluid or gaseous fuels 450 mg (3% O2)	...
3. Industrial combustion plants and processes with combustion	For sources using solid fuel 600 mg (6% O2), for fluid or gaseous fuels 450 mg (3% O2)	Government Decree 1017/2002
(a) Boilers and process heaters	For sources using solid fuel 600	...

(no direct contact between flue gas and products)	mg (6% O2), for fluid or gaseous fuels 450 mg (3% O2)	
(b) Processes (direct contact); (e.g. calcinations processes in rotary kilns; production of cement, lime, etc.; glass production; metallurgical operation; pulp production)	Environmental permit required. BAT based limit values applied	Environmental Protection Act (86/2000) and Environmental Protection Decree (169/2000)
4. Non-combustion processes, e.g. nitric acid production	Environmental permit required. BAT based limit values applied.	Environmental Protection Act (86/2000) and Environmental Protection Decree (169/2000)
5. Extraction, processing and distribution of fossil fuels	Not a major source in Finland	...
6. Waste treatment and disposal, e.g. incineration of municipal and industrial waste	From 800 mg down to 150 mg (6% O2) depending on the the incineration capacity and incineration source	Government Decree 362/2003

Hungary

For the main stationary source categories ELVs have been developed partly complying with relevant EU Directives (for large combustion plants: 2001/80/EC, for waste incineration: 2000/76/EC) and partly by joint Ministerial Decree 14/2001.(V.9.) KöM-EüM-FVM for all other stationary sources. A Ministerial Decree 17/2001.(VIII.3.) KöM was issued on control and evaluation of measurements concerning stationary air polluting sources. Due to its complexity the Table 1 is sent only in word format to the Secretariat.

Major stationary sources or major source category2/ for NOx	National emission standards1/	National legislation and comments (e.g. BAT applied)
1. Public power, cogeneration and district heating plants:	...	...
(a) Boilers	...	22/1998.(VI.26.) KTM, 10/2003.(VII.11.) KvVM, Harmonized with 2001/80/EC
(b) Stationary combustion turbines and internal combustion engines	...	22/1998.(VI.26.) KTM, 10/2003.(VII.11.) KvVM Annex 4., Harmonized with 2001/80/EC; 32/1993.(XII.23.) KTM
2. Commercial, institutional and residential combustion plants:	...	22/1998.(VI.26.) KTM, 10/2003.(VII.11.) KvVM, Harmonized with 2001/80/EC
(a) Commercial boilers	...	...
(b) Domestic heaters	...	...
3. Industrial combustion plants and	...	...

processes with combustion		
(a) Boilers and process heaters (no direct contact between flue gas and products)	...	14/2001.(V.9.) KöM-EüM-FVM
(b) Processes (direct contact); (e.g. calcinations processes in rotary kilns; production of cement, lime, etc.; glass production; metallurgical operation; pulp production)	...	14/2001.(V.9.) KöM-EüM-FVM
4. Non-combustion processes, e.g. nitric acid production	...	14/2001.(V.9.) KöM-EüM-FVM
5. Extraction, processing and distribution of fossil fuels	...	...
6. Waste treatment and disposal, e.g. incineration of municipal and industrial waste	...	3/2002.(II.22.) KöM, Harmonized with 2000/76/EC

Ireland

NOx emission from major stationary sources in Ireland are regulated by the EU Large Combustion Plant directive (2001/80/EC) transposed into law in Ireland by the Large Combustion Plant Regulations (SI No 644 of 2003) and the EPA Licensing Regulations, as amended (S.I. No 85 1994). There are implemented through the Integrated Pollution Prevention and Control (IPPC) regime which applies the principle of BAT. The ELVs set out in Table 1 apply from 27 November 2002, for plant granted permissions before that date, the ELVs in Table 4 apply. Statistical treatment is prescribed in the relevant legislation. 1/ Specify the units and statistical treatment. 2/ For the definition of major source category see article 1, paragraph 10.

Major stationary sources or major source category2/ for NOx	National emission standards1/	National legislation and comments (e.g. BAT applied)
1. Public power, cogeneration and district heating plants:	Directive 2001/80/ECELVs (mg/Nm3)	Large Combustion Plant Regulations (SI No 644 of 2003)
(a) Boilers	...	...
(b) Stationary combustion turbines and internal combustion engines	...	...
2. Commercial, institutional and residential combustion plants:	...	...
(a) Commercial boilers	Directive 2001/80/ECELVs (mg/Nm3)	Large Combustion Plant Regulations (SI No 644 of 2003)
(b) Domestic heaters	Oil Firing Technical Association standard OFS A100 (ppm)	Not enshrined in law
3. Industrial combustion plants and processes with combustion	...	...

(a) Boilers and process heaters (no direct contact between flue gas and products)	Directive 2001/80/ECELVs (mg/Nm3)	Large Combustion Plant Regulations (SI No 644 of 2003)
(b) Processes (direct contact); (e.g. calcinations processes in rotary kilns; production of cement, lime, etc.; glass production; metallurgical operation; pulp production)	...	...
4. Non-combustion processes, e.g. nitric acid production	...	...
5. Extraction, processing and distribution of fossil fuels	Directive 2001/80/EC	Large Combustion Plant Regulations (SI No 644 of 2003)
6. Waste treatment and disposal, e.g. incineration of municipal and industrial waste	Waste Incineration Directive (2000/76/EC)	...

Italy

In Italy it is in force the Legislative Decree on April the 3th 2006, n. 152 (articles 273 and 274, and Annex II to part V of the Decree) that implements the EC Directive 2001/80, concerning the limits set up for the large combustion plants. However national (above 300 MWth) and regional (under 300 MWth) competent authorities can establish more stringent limits, in considering the principles established by Legislative Decree 152/2006 and Legislative Decree n. 59 on February the 18th 2005 (transposing the EC Directive 96/61). According decree 152/2006 all plants must have a permit to produce atmospheric emission with specific emission limit values (ELV) set down by competent authorities taking into account BAT. For emissions from incineration plants in Italy are applied stricter value for NOx, in implementing the 2000/76/EEC Directive by the Legislative Decree n. 133 on April the 29th 2005.

Major stationary sources or major source category2/ for NOx	National emission standards1/	National legislation and comments (e.g. BAT applied)
boilers (built before 2006) solid fuel	600 mg/Nmc (50< or = thermal input < 500) - 200 mg/Nmc (thermal input > or = 500)	...
boilers (built before 2006) liquid fuel	450 mg/Nmc (50< or = thermal input < 500) - 200 mg/Nmc (thermal input > or = 500)	...
new boilers - solid fuel	400 mg/Nmc (50< or = thermal input < 100) - 200 mg/Nmc (thermal input > or = 100)	...
gas turbines	50 mg/Nmc (natural gas) - 120 mg/Nmc (other gasses and liquid fuels)	generally competent authorities give stricter emission limit values (20-30-40 mg/Nmc)
boilers (built before 2006) gasseous fuel	300 mg/Nmc (50< or = thermal input < 500) - 200 mg/Nmc	...

	(thermal input > or = 500)	
new boilers - liquid fuel	400 mg/Nmc (50< or = thermal input < 100) - 200 mg/Nmc (thermal input > or = 100)	...
new boilers - gasseous fuel	150 mg/Nmc (50< or = thermal input < 300) - 100 mg/Nmc (thermal input > or = 300)	...
(a) Commercial boilers	same values as boilers if thermal input greater than 3 MW	...
(b) Domestic heaters	same values as boilers if thermal input greater than 3 MW	...
(b) Processes (direct contact); (e.g. calcinations processes in rotary kilns; production of cement, lime, etc.; glass production; metallurgical operation; pulp production)	...	according to decree 152/2006 and 59/2005 competent authorities have to give permit with specific ELV taking into account BAT
4. Non-combustion processes, e.g. nitric acid production	...	according to decree 152/2006 and 59/2005 competent authorities have to give permit with specific ELV taking into account BAT
5. Extraction, processing and distribution of fossil fuels	...	according to decree 152/2006 and 59/2005 competent authorities have to give permit with specific ELV taking into account BAT
6. Waste treatment and disposal, e.g. incineration of municipal and industrial waste	200 mg/Nm3 (daily mean value), 400 mg/Nm3 (half-hourly mean value), 200 mg/Nm3 (half-hourly mean value for 97% of measurements per year) for Incineration plants	...

Liechtenstein

Response by Party: The major stationary source category according to the definitions of the protocol are non-industrial combustion plants, followed by combustion in manufacturing industry and residential combustion. Neither combustion plants with a heat input of more than 50 MW nor waste incineration plants exist in Liechtenstein. The Ordinance on Air Pollution (OAP) amended in 2008 [2] lays down emission limit values, i.e. maximum values not to be exceeded without prescribing the techniques to be applied. However the emission standards are based on the state of the art.

Major stationary sources or major source category2/ for NOx	National emission standards1/	National legislation and comments (e.g. BAT applied)

1. Public power, cogeneration and district heating plants:	...	...
(a) Boilers	150 mg/m3 with liquid fuels and 110 mg/m3 for gaseous fuels and 150 mg/m3 for wood burning	[2]
(b) Stationary combustion turbines and internal combustion engines	50 mg/m3 with natural gas fuels. 120 mg/m3 with other fuels for stationary combustion turbines.400 mg/m3 with natural gas fuels and 250 mg/m3 with other fuels for internal combustion engines.	[2]
2. Commercial, institutional and residential combustion plants:	...	...
(a) Commercial boilers	120 mg/m3 "extra light" fuel oil.80 mg/m3 for gas; 250 mg/m3 for wood burning.	[2] with respect to temperature of heat carrier or massflow (wood).
(b) Domestic heaters	see above	[2]
3. Industrial combustion plants and processes with combustion	...	...
(a) Boilers and process heaters (no direct contact between flue gas and products)	120 mg/m3 with liquid fuels. 80 mg/m3 for gas and 250 mg/m3 for wood burning.	[2] with ref. value 3% O2 and ref. value 11% O2 for wood over 10 MW
(b) Processes (direct contact); (e.g. calcinations processes in rotary kilns; production of cement, lime, etc.; glass production; metallurgical operation; pulp production)	<800 mg/m3 for cement production.	Not applicable in LIE
4. Non-combustion processes, e.g. nitric acid production	250 mg/m3	[2] with massflow >2500 g/h
5. Extraction, processing and distribution of fossil fuels	<300 mg/m3 for refinieries	Not applicable in LIE
6. Waste treatment and disposal, e.g. incineration of municipal and industrial waste	80 mg/m3	[2] with massflow >2500g/h and ref. value 3% O2

Lithuania

See the table.

Major stationary sources or major source category2/ for NOx	National emission standards1/	National legislation and comments (e.g. BAT applied)
...	2) Emission limit values for waste incineration plants: 200 mg/m3 (for existing	"Environmental Protection Requirement for Incineration of Waste" (31-12-2002 Order No 699

	plants with a nominal capacity >6 t/h or new plants), 400 mg/m3 (for existing plants with a nominal capacity <= 6 t/h).	of the Minister of Environment)
...	3) For existing waste incineration plants (6-16 t/h) 400 mg/m3 ELV may be applied by 01-01-2010.	...
1. Public power, cogeneration and district heating plants:	From 30-10-2007 emission limit values for IPPC installations (>50 MW) are based on BAT. Considering economic conditions of entities, transitional period for achieving these limit values may be established in the IPPC permit.	"Rules on Issuing, Reconsideration and Cancelling of Integrated Pollution Prevention and Control (IPPC) Permits (27-02-2002 Order No 80 of the Minister of Environment). Some BAT are applied:other types of fuel (gas), new modern burners installed.
(a) Boilers	During transitional period limit values indicated in the question 45 are applied.	-"-
(b) Stationary combustion turbines and internal combustion engines	-"-	-"-
2. Commercial, institutional and residential combustion plants:	-"-	-"-
(a) Commercial boilers	-"-	-"-
(b) Domestic heaters	-"-	-"-
3. Industrial combustion plants and processes with combustion	From 30-10-2007 emission limit values for IPPC installations (>50 MW) are based on BAT.	"Rules on Issuing, Reconsideration and Cancelling of Integrated Pollution Prevention and Control (IPPC) Permits (27-02-2002 Order No 80 of the Minister of Environment).
(a) Boilers and process heaters (no direct contact between flue gas and products)	-"-	-"-
(b) Processes (direct contact); (e.g. calcinations processes in rotary kilns; production of cement, lime, etc.;	-"-	-"-

glass production; metallurgical operation; pulp production)		
4. Non-combustion processes, e.g. nitric acid production	From 30-10-2007 emission limit values for IPPC installations (>50 MW) are based on BAT.	"Rules on Issuing, Reconsideration and Cancelling of Integrated Pollution Prevention and Control (IPPC) Permits (27-02-2002 Order No 80 of the Minister of Environment).
5. Extraction, processing and distribution of fossil fuels	From 30-10-2007 emission limit values for IPPC installations (>50 MW) (industrial process) are based on BAT. Limit values for boilers are indicated in the question 45.	Orders of the Minister of Environment: "Rules on Issuing, Reconsideration and Cancelling of Integrated Pollution Prevention and Control (IPPC) Permits (27-02-2002 No 80); "Emission Standards from Large Combustion Installations" (24-12-2003 No 712)
6. Waste treatment and disposal, e.g. incineration of municipal and industrial waste	1) Emission limit values for combustion plants co-incinerating waste (solid and liquid fuel): 400 (50-100 MWth), 300 (100-300 MWth), 200 (>300 MWth)	"Environmental Protection Requirement for Incineration of Waste" (31-12-2002 Order No 699 of the Minister of Environment)

Monaco

Sans objet. La puissance actuelle de l'usine d'incinération dees ordures ménagères de Monaco est d'environ 25 MWth. La réglementation n'a pas été modifiée depuis le 14 février 1993, hormis en 2003 (l'utilisation du fioul a été interdite dans les constructions neuves). Fin 2006, l'usine d'incinération des ordures ménagères a été mise aux normes européennes en vigueur. Ainsi une tour de lavage des fumées supplémentaire a été installée ce qui a induit une forte baisse des émissions de NOx dans les effluents gazeux.

Major stationary sources or major source category2/ for NOx	National emission standards1/	National legislation and comments (e.g. BAT applied)
1. Public power, cogeneration and district heating plants:	...	...
(a) Boilers	...	...
(b) Stationary combustion turbines and internal combustion engines	...	...
2. Commercial, institutional and residential combustion plants:	...	...
(a) Commercial boilers	...	...
(b) Domestic heaters	...	...
3. Industrial combustion plants and processes with combustion	...	...
(a) Boilers and process heaters (no direct contact between flue gas and products)	...	...

(b) Processes (direct contact); (e.g. calcinations processes in rotary kilns; production of cement, lime, etc.; glass production; metallurgical operation; pulp production)	...	...
4. Non-combustion processes, e.g. nitric acid production	...	...
5. Extraction, processing and distribution of fossil fuels	...	...
6. Waste treatment and disposal, e.g. incineration of municipal and industrial waste	...	...

Netherlands

The Netherlands uses standards since 1987. Table Q3 gives an overview of standards and legislation in force. Notes to table q3: - All values are given at 6% O2 for solid fuels (and 3% for others), unless otherwise indicated. All standards are in effect and laid down in decrees (except for glass, which is BAT in license). For installations covered by the IPPC directive the emission limit values in the table are maxima. Based on individual BAT considerations more stringent emission limits are set in the permits; - The indicated pollution control measures are widely implemented. When for combustion plants continuous measurements are not required, the emissions are in compliance with the emission limit values when all results of the periodic measurements are below the emission limit values. For combustion plants permitted before November 2002 continuous measurements are required when the thermal capacity exceeds 300 MW. For combustion plants permitted after this date continuous measurements are prescribed above 100 MW. In the latter situation compliance with the emission limit value (ELV) is proved when: • Every daily average is below the emission limit value, and; • 95% of the hourly averages in year are below 200% of the emission limit value.

Major stationary sources or major source category2/ for NOx	National emission standards1/	National legislation and comments (e.g. BAT applied)
Boilers (liquid) (> May 1998) > 300 MWth	120 mg NOx/m3 & 95% of 48h average below 110% ELV	Max emission limit value from Bees A; in individual permits more stringent limit values set at BAT-level
Boilers (liquid) (> May 1998): 50-300 MWth	120 mg NOx/m3 & 95% of 48h average below 110% ELV	Max emission limit value from Bees A; in individual permits more stringent limit values set at BAT-level
(b) Stationary combustion turbines and internal combustion engines	...	...
2. Commercial, institutional and residential combustion plants:	...	...
(a) Commercial boilers	See 1a	See 1a
(b) Domestic heaters	See 1a and 1b	See 1a and 1b
3. Industrial combustion plants and processes with combustion:	...	...
(b) Processes (direct contact); (e.g. calcinations processes in rotary kilns; production of	...	...

cement; lime, etc.; glass production; metallurgical operation; pulp production)		
Glass ('95-2003)	1600-2200 mg NOx/m3 (8% O2)	Max emission limit value from Bees A; in individual permits more stringent limit values set at BAT-level
Glass (> 2003)	1 kg NOx/ton glass	Max emission limit value from Bees A; in individual permits more stringent limit values set at BAT-level
6. Waste treatment and disposal, e.g. incineration of municipal and industrial waste:	...	...
Waste incineration plants	70 mg/m3 (11% O2) & monthly average	Max emission limit value from Bva; in individual permits more stringent limit values set at BAT-level
CHP Combustion turbines (natural gas) (> Nov 2002) >= 50 MWth	45 g/GJ NOx (53 mg NOx/m3; 15 vol % O2) & 100% of daily average below 100% ELV	Max emission limit value from Bees A; in individual permits more stringent limit values set at BAT-level
CHP Combustion turbines	65 g/GJ NOx (77 mg NOx/m3; 15 vol% O2)& 95% of 48h average below 110% ELV or >Nov 2002 100% of daily average below 100% ELV	Max emission limit value from Bees A; in individual permits more stringent limit values set at BAT-level
(a) Boilers and process heaters (no direct contact between flue gas and products)	...	...
Mineral oil refineries (liquid fuel > 1998)	120 mg NOx/m3 & 95% of 48h average below 110% ELV	Max emission limit value from Bees A; in individual permits more stringent limit values set at BAT-level
Mineral oil refineries (gas > 1998)	70-140 mg NOx/m3 & defined in permits	Max emission limit value from Bees A; in individual permits more stringent limit values set at BAT-level
Furnaces (liquid fuel > 1998)	120 mg NOx/m3 & 95% of 48h average below 110% ELV	Max emission limit value from Bees A; in individual permits more stringent limit values set at BAT-level
Furnaces (gas > 1998)	70-140 mg NOx/m3 & defined in permits	Max emission limit value from Bees A; in individual permits more stringent limit

		values set at BAT-level
4. Non-combustion processes, e.g. nitric acid production:	...	...
Nitric acid production (> 1987)	220 ppm & hourly average	General binding rule; in individual permits more stringent limit values set at BAT-level
5. Extraction, processing and distribution of fossil fuels:	...	...
Combustion turbines for natural gas compression (Natural gas) (> Nov 2002) >= 50 MWth	45 g /GJ NOx (53 mg Nox/m3; 15 vol% O2) & 100% of daily average below 100% ELV	Max emission limit value from Bees A; in individual permits more stringent limit values set at BAT-level
Stationary engines > 1 MW (fuel > 50% gas) (>1994)	140 g/GJ NOx (442 mg NOx/m3; 5 vol% O2) & highest of 3 half h. averages, every 3 years	Emission limit in Bees A and Bees B; stringent emission limit value for new engines of 30 g/GJ under discussion and probably in force from 2009
Stationary engines > 1 MW (fuel < 50% gas) (>1990)	400-500 g/GJ NOx (1270-1590 mg NOx/m3; 5 vol% O2) & highest of 3 half h. averages, every 3 years	Emission limit in Bees A and Bees B; stringent emission limit value for new engines of 130 g/GJ under discussion and probably in force from 2009
1. Public power, cogeneration and disctrict heating plants:	...	...
(a) boilers	...	...
Boilers (solid fuel) (>1990): > 300 MWth	200 mg NOx/m3 & 95% of 48h average below 110% Emission Limit Values (ELVs)	Max emission limit value from Bees A; in individual permits more stringent limit values set at BAT-level
Boilers (solid fuel) (>1994): 50-300 MWth	100 mg NOx/m3 & 95% of 48h average below 110% ELV	Max emission limit value from Bees A; in individual permits more stringent limit values set at BAT-level
Boilers (natural gas) (> May 1998) >= 50 MWth	70 mg NOx/m3 & 95% of 48h average below 110% ELV	Max emission limit value from Bees A; in individual permits more stringent limit values set at BAT-level
Boilers (all other gases) (> May 1998)	70-140 mg NOx/m3 & 95% of 48h average below 110% ELV	Max emission limit value from Bees A; in individual permits more stringent limit values set at BAT-level

Norway

The major stationary source categories in Norway are combustion installations in the petroleum sector offshore, oil and gas refineries, pulp and paper industry and the production of ferroalloys, cement and fertilizer. Emissions from the petroleum sector offshore, oil and gas refineries, pulp and paper and cement production are related to energy production, whereas emissions from metal production and fertilizer are mainly process-related. All plants must have an emission permit issued by the Pollution Control Authority. These are issued on a plant-by-plant basis pursuant to the Pollution Control Act of 1981 and in compliance with the LCP and IPPC directives. The use of Best Available Techniques (BAT) is required for new and existing plants. BAT may be defined at the national level or within an international framework (EU and OSPARCOM). The installation of low-NOx burners at new stationary sources is a minimum requirement. Emission limit values for new gas power plants are stipulated at 5 ppm (yearly average), requiring both low-nox-turbines and SCR-technology (or equally efficient technology). For new offshore installations (gas turbines/dual fuel turbines), emission limit values are stipulated in the range 30-40 ppm. Permits issued for offshore installations before 2002, have no emission limit values for NOx in the permit, but the Pollution Control Authority plans to introduce this during 2008 on a plant-to-plant-basis. The table below gives the standards in the individual permits, please see table.

Major stationary sources or major source category2/ for NOx	National emission standards1/	National legislation and comments (e.g. BAT applied)
Dual fuel turbines	200 mg/Nm3	(example. Volve)
Snøhvit	5 ppm (yearly average)	In operation from 2007. Emission limit value stipulated in the permit.
Gas power plant	5 ppm (yearly average)	First plant in operation in 2007. Next plantin 2009. Emission limit value (ELV) stipulated in the permits (2 plants). ELVs based on low-NOx-gas turbines and SCR
Pulp and paper, bio fuel boilers	350 mg/Nm3	12 hour average
Refinery	Total load/year	Existing plant. ELVstipulated in the permit. ELV based on installation of application SNCR (or equally efficient measures) by 2009and SCR (or equally efficient measures) by 2014
Offshore energy production.Gas turbines	76 mg/Nm3	(example)

Slovakia

Slovakia has applied the emission limit values for NOx emissions to major new stationary sources according to the Ministerial Decree No. 706/2002. This Decree establishes emission limits, technical requirements for and general conditions of operation of air pollution stationary sources, periods and terms of their validity, new sources and existing sources of air pollution and their facilities, list of pollutants, for which the emission limits, emission quotas and general operating conditions are established, categorisation of large and medium sources and requirements for securing the dispersion of pollutant emissions. This Decree transposed

the Directives 92/112/EEC, 2000/76/EC and 2001/80/EC.

Major stationary sources or major source category2/ for NOx	National emission standards1/	National legislation and comments (e.g. BAT applied)
3 (b) Processes (direct contact); (e.g. calcinations processes in rotary kilns; production of cement, lime, etc.; glass production; metallurgical operation; pulp production)	GLASS PRODUCTION: 1600 mg/m3 (for recuperative continuous smelting aggregates), 2500 mg/m3 (for regeneration continuous smelting aggregates) and 1100 mg/m3 (for discontinuous smelting aggregates)	the Ministerial Decree No. 706/2002
(b) Processes (direct contact); (e.g. calcinations processes in rotary kilns; production of cement, lime, etc.; glass production; metallurgical operation; pulp production)	METALLURGICAL OPERATION: 400 mg/m3 (iron ore production), 400 mg/m3 (steel production), 1300 mg/m3 (aluminium production with utilising flue heat) and 1800 mg/m3 (aluminium production without utilising flue heat)	the Ministerial Decree No. 706/2002
3 (b) Processes (direct contact); (e.g. calcinations processes in rotary kilns; production of cement, lime, etc.; glass production; metallurgical operation; pulp production)	PULP PRODUCTION: 400 mg/m3 (bisulphite procedure and bisulphite-neutral procedure of production), 300 mg/m3 (sulphide production procedure) and 300 mg/m3 (sodium-anthraquinone procedure of production)	the Ministerial Decree No. 706/2002
1. Public power, cogeneration and district heating plants:	...	...
(a) Boilers	650 mg/m3 for solid fuels, 450 mg/m3 for liquid fuels, 200 mg/m3 for gas fuels	the Ministerial Decree No. 706/2002
(b) Stationary combustion turbines and internal combustion engines	300 mg/m3 for sources which are put into operation before 27 November 2003; 50 mg/m3 (natural gas) and 120 mg/m3 (liquid fuels) for sources which are put into operation from 27 November 2003	the Ministerial Decree No. 706/2002
2. Commercial, institutional and residential combustion plants:	...	...
(a) Commercial boilers	see letter 1 a) and b) in the table	...
(b) Domestic heaters	see letter 1 a) and b) in the table	...
3. Industrial combustion plants and processes with combustion	...	...
(a) Boilers and process heaters (no direct contact between flue gas and products)	see letter 1 a) and b) in the table	...

(b) Processes (direct contact); (e.g. calcinations processes in rotary kilns; production of cement, lime, etc.; glass production; metallurgical operation; pulp production)	CALCINATIONS PROCESSES IN ROTARY KILNS: 1300mg/m3; PRODUCTION OF CEMENT: 1300 mg/m3; PRODUCTION OF LIME: 1500 mg/m3	the Ministerial Decree No. 706/2002
4. Non-combustion processes, e.g. nitric acid production	Nitric acid production: 300 mg/m3	the Ministerial Decree No. 706/2002
5. Extraction, processing and distribution of fossil fuels	700 mg/m3 (oil refineries, petrochemical oil processing) and 500 mg/m3 (coke production)	the Ministerial Decree No. 706/2002
6. Waste treatment and disposal, e.g. incineration of municipal and industrial waste	200 mg/m3 as daily averages, 400 mg/m3 as half-hour averages (no half-hour average value in a year may exceed the specified value) and 200 mg/m3 as half-hour averages (97 % of half-hour averages in a year may not exceed the specified value)	the Ministerial Decree No. 706/2002

Slovenia

According to the Environmental Protection Act (OJ RS, No. 2/2006) and Decree on activities and installations causing large-scale environmental pollution (OJ RS, No. 97/2004, 71/2007, 122/2007) all stationary sources (i.e. industrial installations) listed in Technical Annex of the Protocol have to obtain for their operation an environmental permit. Slovenian competent authority for issuing environmental permits is the Environmental Agency (EARS). Basic requirements for prevention and control of emissions in permits are: required application of best available technique (as defined in the BREF documents of the European IPPC Bureau in Sevilla), regulated emission limit values (from the national legislation) and regulated control measures (from the national legislation). This applies to both existing and new installations. National legislation on NOx emission limit values for stationary sources listed in Technical Annex of the Protocol: - Decree on the emission of substances into the atmosphere from stationary sources of pollution (OJ RS, No. 31/2007), - Decree on emission limit values discharged into the atmosphere from large combustion plants (OJ RS, No. 73/2005, 92/2007), - Decree on the emission of substances into the atmosphere from stationary gas turbines with thermal input power under 50 MW and from stationary internal combustion engines (OJ RS, No. 34/2007, 81/2007), - Decree on the emission of substances into the atmosphere from installations for the production of cement (OJ RS, No. 34/2007), - Decree on the emission of substances into the atmosphere from installations for the production of light alloy, ferrous alloy and steel (OJ RS, No. 34/2007), - Decree on the emission of substances into the atmosphere from waste incineration and co-incineration plants (OJ RS, No. 50/2001, 56/2002, 84/2002). NOx emission limit values for new stationary sources are given in Table 1. NOx emission limit values for new stationary sources are also given in Table 21 under A. 44.

Major stationary sources or major source category2/ for NOx	National emission standards1/	National legislation and comments (e.g. BAT applied)

1. Public power, cogeneration and district heating plants:	...	...
(a) Boilers	From 200-400 mg/Nm3 (6% O2) for solid fuels, from 200-400 mg/Nm3 (3%O2) for liquid fuels, 200 mg/Nm3 (3% O2) for gaseous fuels, 100-150 (3% O2) for natural gas	Decree on emission limit values discharged into the atmosphere from large combustion plants (OJ RS, No. 73/2005, 92/2007)
(b) Stationary combustion turbines and internal combustion engines	Natural gas: 50 mg/Nm3, O2 content 15%. Other gaseous fuels: 120 mg/Nm3, O2 content 15%. Liquid fuels: 120 mg/Nm3, O2 content 15%.	Decree on the emission of substances into the atmosphere from stationary gas turbines with thermal input power under 50 MW and from stationary internal combustion engines (OJ RS, No. 34/2007, 81/2007)
2. Commercial, institutional and residential combustion plants:	Not a major source in Slovenia.	...
(a) Commercial boilers	...	...
(b) Domestic heaters	...	...
3. Industrial combustion plants and processes with combustion	...	...
(a) Boilers and process heaters (no direct contact between flue gas and products)	depend upon thermal input: 200-400 mg/m3 (solid fuels, 6% O2), 200-400 mg/m3 (liquid fuels, 3%), 100-150 mg/m3 (natural, 3% O2). Please see Table 21 under A.44	Decree on emission limit values discharged into the atmosphere from large combustion plants (OJ RS, No. 73/2005, 92/2007)
(b) Processes (direct contact); (e.g. calcinations processes in rotary kilns; production of cement, lime, etc.; glass production; metallurgical operation; pulp production)	Glass: 500-800 mg/m3 (depending on the type of the kiln), O2 content from 8-13%. Lime: 500-1500 mg/m3 (depending on the type of the kiln), O2 content 10%. Please see also Table 21.	Decree on the emission of substances into the atmosphere from stationary sources of pollution (OJ RS, No. 31/2007)
4. Non-combustion	200 mg/m3	Decree on the emission of substances

processes, e.g. nitric acid production		into the atmosphere from stationary sources of pollution (OJ RS, No. 31/2007)
5. Extraction, processing and distribution of fossil fuels	Not a major source in Slovenia.	...
6. Waste treatment and disposal, e.g. incineration of municipal and industrial waste	From 200-400 mg/Nm3 (6% O2) depending on the incineration capacity and incineration source.	Decree on the emission of substances into the atmosphere from waste incineration and co-incineration plants (OJ RS, No. 50/2001,056/2002,084/2002)

Spain

For points 1 to 3 in the table below, please go to Q. 40 and 41, where you can see the limit values in Royal Decree 430/2004, that put into Spanish legislation the Directive 2001/80/EC of European Parliament and of the Council, of 23 October 2001, on the limitation of emissions of certain pollutants into air from large combustion plants. For points 4 and 5, competent authorities have to give permit with specific ELV taking into account BAT (Law 16/2002, which put into Spanish legislation Directive 96/61/EC)

Major stationary sources or major source category2/ for NOx	National emission standards1/	National legislation and comments (e.g. BAT applied)
1. Public power, cogeneration and district heating plants:	...	RD 430/2004
(a) Boilers	...	...
(b) Stationary combustion turbines and internal combustion engines	...	...
2. Commercial, institutional and residential combustion plants:	...	RD 430/2004
(a) Commercial boilers	...	...
(b) Domestic heaters	...	...
3. Industrial combustion plants and processes with combustion	...	RD 430/2004
(a) Boilers and process heaters (no direct contact between flue gas and products)	...	...
(b) Processes (direct contact); (e.g. calcinations processes in rotary kilns; production of cement, lime, etc.; glass production; metallurgical operation; pulp production)	...	...
4. Non-combustion processes, e.g. nitric acid production	...	Law 16/2002
5. Extraction, processing and distribution of fossil fuels	...	Law 16/2002
6. Waste treatment and disposal, e.g.	800 mg/m3	Annex II in RD

incineration of municipal and industrial waste	(existing) 500 mg/m3 (new) Daily mean values	653/2003 (Directive 2000/76/EC)

Sweden

Swe response: Public power, cogeneration and district heating. Emission standards combustion plants >50 MWth according to EU Directive 2001/80/EC (OJ L309, 27.11.2001, p. 1). All plants larger than approx 5 MWth are covered by the NOx-charge system. (Resulting in average NOx emissions from every plant <200 mg/m3). Individual permitting subject to requirements in Environmental Code (a Swedish parliamentary law, Swedish Statute Code 1998:808 and Ordinance 1998:899) normally results in more strict requirements than the EC-Directive. Table 1 not used.

Major stationary sources or major source category2/ for NOx	National emission standards1/	National legislation and comments (e.g. BAT applied)
1. Public power, cogeneration and district heating plants:	...	...
(a) Boilers	...	...
(b) Stationary combustion turbines and internal combustion engines	...	...
2. Commercial, institutional and residential combustion plants:	...	...
(a) Commercial boilers	...	...
(b) Domestic heaters	...	...
3. Industrial combustion plants and processes with combustion	...	...
(a) Boilers and process heaters (no direct contact between flue gas and products)	...	...
(b) Processes (direct contact); (e.g. calcinations processes in rotary kilns; production of cement, lime, etc.; glass production; metallurgical operation; pulp production)	...	...
4. Non-combustion processes, e.g. nitric acid production	...	...
5. Extraction, processing and distribution of fossil fuels	...	...
6. Waste treatment and disposal, e.g. incineration of municipal and industrial waste	...	...

Switzerland

Please see emission limit values in the enclosed table.

Major stationary sources or major source category2/ for NOx	National emission standards1/	National legislation and comments (e.g. BAT applied)
1. Public power, cogeneration and district heating plants:	ELVs based on SCR application	Ordinance on Air Pollution Control (OAPC)
(a) Boilers	150 mg/m3 with liquid fuels; 110 for gas;	OAPC, Annex 3, ref. value 3% O2
(b) Stationary combustion turbines	50 mg/m3 with natural gas	OAPC Annex 2, 15% O2

and internal combustion engines	fuels and 120 with other fuels for turbines. 400 with gas and 250 with other fuels for engines	for turbines and 5% for engines
2. Commercial, institutional and residential combustion plants:	ELVs	OAPC, Annex 3
(a) Commercial boilers	120 mg/m3 with extra light fuel oil and 80 for gas and 250 for wood	with heat carrier fluid <110°C and ref. value 3% O2 and Annex 1 with 11%O2 with wood (for a mass flow >2.5 kg/h)
(b) Domestic heaters	120 mg/m3 with extra light fuel oil and 80 for gas and 250 for wood	with heat carrier fluid <110°C and ref. value 3% O2 and Annex 1 with 11%O2 with wood (for a mass flow >2.5 kg/h)
3. Industrial combustion plants and processes with combustion	ELVs	based on SCR application
(a) Boilers and process heaters (no direct contact between flue gas and products)	120 mg/m3 with extra light fuel oil and 80 for gas and 250 for wood	OAPC, Annex 3, Ref. value 3% O2 and Annex 1 and 11% for wood (>10 MW)
(b) Processes (direct contact); (e.g. calcinations processes in rotary kilns; production of cement, lime, etc.; glass production; metallurgical operation; pulp production)	<<800 mg/m3 for cement production	OAPC, Annex 2
4. Non-combustion processes, e.g. nitric acid production	250 mg/m3	OAPC, Annex 1 with mass flow > 2.5 gk/h
5. Extraction, processing and distribution of fossil fuels	<300 mg/m3 for refineries	OAPC, Annex 2 ref. value 3% O2
6. Waste treatment and disposal, e.g. incineration of municipal and industrial waste	80 mg/m3	OAPC, Annex 2 with mas flow >2,5 kg/h and ref. value 3% O2

United Kingdom

The UK considers power plants to be the major stationary source category for emissions of NOx. The UK has transposed the revised EU Large Combustion Plant Directive (LCPD, 2001/80/EC) which sets more stringent emission standards for new plants as well as extending the standards under the earlier Directive 88/609/EC. The emission limits applicable to large combustion plants after 14 February 1993 are detailed in the table below. The UK has adopted a National Emission Reduction Plan for selected existing (pre 1987) combustion facilities, the remaining plants will be required to achieve the emission limit values in the LCPD (some plants have opted out of LCPD emission limits by declaring that they intend to cease operation within a defined period). The Large Combustion Plant (National Emission

Reduction Plan) Regulations 2007 sets out the emission reduction targets. The Directive 1996/61/EC concerning integrated pollution prevention and control (IPPC), recently codified as 2008/1/EC, applies to industrial activities (including power plants) and requires application of Best Available Techniques (BAT) to minimise impact on the environment. Implementation of the IPPC and LCPD and national controls on other (non-residential) stationary sources is currently implemented through the Pollution Prevention and Control Regulations but note that these will be superseded (from 6 April 2008) by the Environmental Permitting Regulations 2007 in England and Wales. In general, the emission standards represent achievable emission levels associated with application of BAT – actual emission limits will be site-specific. Other figures (some industrial activity limits and limit values for industrial boilers) represent emission limit values consistent with BAT.

Major stationary sources or major source category2/ for NOx	National emission standards1/	National legislation and comments (e.g. BAT applied)
1. Public power, cogeneration and district heating plants:	...	...
(a) Boilers	100-1400mg/nm3	Standards vary depending on boiler type and age. Higher figures in range are for opt out plants under Large Combustion Plant Directive
(b) Stationary combustion turbines and internal combustion engines	20-500mg/nm3	Standards vary depending on type and age of turbine or engine.
2. Commercial, institutional and residential combustion plants:	...	...
(a) Commercial boilers	No NOx limit applied	...
(b) Domestic heaters	No NOx limit applied	...
3. Industrial combustion plants and processes with combustion	...	...
(a) Boilers and process heaters (no direct contact between flue gas and products)	140-650 mg/nm3	Standards vary according to fuel type and age
(b) Processes (direct contact); (e.g. calcinations processes in rotary kilns; production of cement, lime, etc.; glass production; metallurgical operation; pulp production)	50-1300 mg/nm3	Large variation in standards according to type of process.
4. Non-combustion processes, e.g. nitric acid production	50-200 mg/nm3	...
5. Extraction, processing and distribution of fossil fuels	10-1400 mg/nm3	Large variation in standards depending on fuel and processing involved
6. Waste treatment and disposal, e.g. incineration of municipal and industrial waste	400 (200) mg/nm3	Figure in brackets is daily average

United States

The U.S. has new source performance standards (NSPS) or emission limit standards for major industrial sources of several pollutants including CO, Pb, NOx, VOCs, PM10, and SO2. The NSPS are technology-based emission standards based on best demonstrated technology for a particular source category or process that is economically feasible. The NSPS have been established for over 60 categories of major sources. The CAA also requires EPA to periodically update and revise these emissions standards as new technologies are developed. For example, EPA issued new source performance standards for NOx emissions from utility boilers and stationary combustion turbines in 1979 and industrial boilers in 1986. In September 1998, EPA revised and substantially tightened the utility and industrial boiler standards. The new NOx emissions limits were approximately 42 percent lower than the original limits. In subsequent years, as more new boilers are built and become subject to the NSPS, the emission reductions in terms of tons/year will be greater. These reductions do not include reductions from existing boilers that become subject to this NSPS. A boiler becomes subject to the NSPS if it is new or is an existing boiler that is modified or reconstructed after the effective date of this NSPS (11/16/98). In 2006, EPA revised and tightened both the utility and stationary combustion turbine standards. The NOx standards are 40% and 80% lower than the previous standards. In addition, in 2005, EPA proposed NOx standards for new stationary diesel engines. The regulations will require, for non-emergency engines, the maximum level of control that can be achieved by using aftertreatment technologies to reduce NOx. For emergency engines, the standards will reduce emissions to the minimum levels possible without the use of exhaust aftertreatment. These standards will force emissions from stationary diesel engines to the same levels achieved by non-road diesel engines under EPA regulations for mobile sources.

Question 4 *Article 2, paragraph 2 (c)please provide details of the pollution control measures for NOx emissions introduced in your country for major stationary sources with a thermal input of at least 100 MWth, the construction of which commenced on or before 14 February 1993, taking into consideration the technical annex to the Protocol. Please complete the table below.*

Bulgaria

The pollution control measures for NOx emissions for major stationary sources with a thermal input of at least 100 MWth are established in the regulations listed below: • Regulation No.1/2005 for emission limit values (ELV) of hazardous substances (pollutants) emitted in the atmosphere from stationary sources (SG 64/2005); • Regulation No. 10/2003 on the emission limit values (concentrations in waste gasses) of sulphur dioxide, nitrogen oxides and total dust, discharged to the atmosphere from large combustion plants transposing Directive 2001/80/EC (SG 93/2003); • Regulation No. 6/2004 on the conditions and the requirements for construction and operation of installations for incineration and installations for co-incineration of waste which transposes Directive 2000/76/EC (SG 78/2004).

Major stationary sources	Pollution control measures applied	Comments (national legislation, relevant plant characteristics e.g. age, utilization rate)
1. Public power, cogeneration and district heating plants:	...	...
(a) Boilers	solid fuel: 100-500 MWth - 600 mg/m3; >500 MWth - 500 mg/m3 since 1st of January 2008 (200 mg/m3 since 1st of January 2016)	Regulation No.10
(b) Stationary combustion turbines and internal combustion engines	natural gas - 50 or 75 mg/m3; liquid and gaseous fuels - 120 mg/m3	same
2. Commercial, institutional and residential combustion plants:	...	commercial institutional and residential combustion plants with thermal power at least 100 MWth are not available in Bulgaria
(a) Commercial boilers	...	...
(b) Domestic heaters	...	...
3. Industrial combustion plants and processes with combustion	...	...
(a) Boilers and process heaters (no direct contact between flue gas and products)	the same ELV as for boilers for public power, cogeneration and district heating plants [see p.1(a) above]	Regulation No.10
(b) Processes (direct contact); (e.g. calcinations processes in rotary kilns; production of	500 mg/m3 - for calcination processes, production of cement, lime etc.; 500 mg/m3 - for glass	Regulation No.1

cement, lime, etc.; glass production; metallurgical operation; pulp production)	production; 400 mg/m3 - for metallurgical operations; 400 mg/m3 - for pulp production	
4. Non-combustion processes, e.g. nitric acid production	nitric acid production - 500 mg/m3 until 31st of December 2009; 400 mg/m3 since 1st of January 2010	same
5. Extraction, processing and distribution of fossil fuels	...	...
6. Waste treatment and disposal, e.g. incineration of municipal and industrial waste	200 mg/m3 - for plants with capacity >3 t/h and 400 mg/m3 - for plants with capacity < 3 t/h	Regulation No. 6

Canada

Major stationary sources	Pollution control measures applied	Comments (national legislation, relevant plant characteristics e.g. age, utilization rate)
1. Public power, cogeneration and district heating plants:	...	...
(a) Boilers	Selective catalytic reduction units have been retrofitted on 4 coal-fired units: 6 gas-fired units.Low NOx burners have been retroffited on many coal-fired units.1 circulating fluidized bed unit.	Coal-fired units: approx 500 MWe, 30-40yr; gas-fired units: 150MW, 30-50yr; coal-fired units: 150-500MWe, 40 yr; bed unit: 165MWe, 14 yr
(b) Stationary combustion turbines and internal combustion engines	Many systems use combined cycle or cogeneration configurations	...
2. Commercial, institutional and residential combustion plants:	...	...
(a) Commercial boilers	A number of units have been retrofitted with low NOx burners	...
(b) Domestic heaters	Domestic heaters would be subject to the same guidelines as the commercial, institutional and industrial combustion plants whose guidelines are listed above.	...
3. Industrial combustion plants and processes with combustion	...	...

(a) Boilers and process heaters (no direct contact between flue gas and products)	A number of units have been retrofitted with low NOx burners	...
(b) Processes (direct contact); (e.g. calcinations processes in rotary kilns; production of cement, lime, etc.; glass production; metallurgical operation; pulp production)	...	Currently there are no federal/national requirements specifically targeting most new source types listed. Such facilities are under provincial jurisdiction and are subject to provincial regulations.
4. Non-combustion processes, e.g. nitric acid production	...	Information to follow
5. Extraction, processing and distribution of fossil fuels	...	Currently there are no federal/national requirements specifically targeting most new source types listed. Such facilities are under provincial jurisdiction and are subject to provincial regulations.
6. Waste treatment and disposal, e.g. incineration of municipal and industrial waste	400 mg/Rm3	There are federal guidelines under the Canadian Council of Ministers of the Environment Operating and Emissions Guidelines for Municipal Solid Waste Incinerators. There are also provincial guidelines.

Cyprus

Major stationary sources	Pollution control measures applied	Comments (national legislation, relevant plant characteristics e.g. age, utilization rate)
1. Public power, cogeneration and district heating plants:	...	...
(a) Boilers	Dhekelia Power Station, Unit 5 and 6, Year of Operation 1993: Low NOx Burners	Regulations P.I.195/2004 which harmonise Cypriot legislation with the provisions of Directive 2001/80/EC
(b) Stationary combustion turbines and internal combustion engines	...	...
2. Commercial, institutional and residential combustion plants:	...	...
(a) Commercial boilers	...	...

(b) Domestic heaters	...	...
3. Industrial combustion plants and processes with combustion	...	...
(a) Boilers and process heaters (no direct contact between flue gas and products)	...	...
(b) Processes (direct contact); (e.g. calcinations processes in rotary kilns; production of cement, lime, etc.; glass production; metallurgical operation; pulp production)	Vasilikos Cement Plant: Low NOx Burners	Law 56(I)/2003 which harmonise Cypriot legislation with the provisions of Directive 96/61/EC
4. Non-combustion processes, e.g. nitric acid production	...	...
5. Extraction, processing and distribution of fossil fuels	...	...
6. Waste treatment and disposal, e.g. incineration of municipal and industrial waste	...	...

Czech Republic

The sources with building approvals issued before 1.7. 1987 alternatively fulfill the emission reduction plan legislatively set in the Government Order No. 372/2007 Coll. The emission ceiling for nitrogen oxides is set for the sources on the basis of real annual emissions of nitrogen oxides for 5 years of the operation of the source including the year 2000. The real achieved values of NOx concentrations in the waste gas are recalculated to the values of emission limits set for the sources with building approval issued after 1.7. 1987 and before 1.1.2003.

Major stationary sources	Pollution control measures applied	Comments (national legislation, relevant plant characteristics e.g. age, utilization rate)
1. Public power, cogeneration and district heating plants:	...	...
(a) Boilers	Solid fuels - Primary measures (e.g. LEA, BBF, LNB, FGR, OFA, IFNR),FBC; since 1.1.2016 > 500 MWt (200 mg/m3) - Primary measures, FBC, SNCR, SCR; liquid and gaseous fuels – primary measures	*
(b) Stationary combustion turbines and internal combustion engines	Primary measures	...
2. Commercial, institutional and residential combustion plants:	Primary measures	...
(a) Commercial boilers	Primary measures	...

(b) Domestic heaters	Primary measures	...
3. Industrial combustion plants and processes with combustion	...	...
(a) Boilers and process heaters (no direct contact between flue gas and products)	...	...
(b) Processes (direct contact); (e.g. calcinations processes in rotary kilns; production of cement, lime, etc.; glass production; metallurgical operation; pulp production)	Cement plants with rotation kilns and lime production- precalcination step introduction, optimizing of firing technology; glass production fusion aggregates, increase of input energy efficiency, modernization of fusion aggregates	...
4. Non-combustion processes, e.g. nitric acid production	SCR	...
5. Extraction, processing and distribution of fossil fuels	...	...
6. Waste treatment and disposal, e.g. incineration of municipal and industrial waste	waste gas treatment, (SCR, SNCR)	Government order No.354/2002 Coll. (transposition of Directive 2000/76/EC)

Estonia

See previous tabel (question 3)

Major stationary sources	Pollution control measures applied	Comments (national legislation, relevant plant characteristics e.g. age, utilization rate)
1. Public power, cogeneration and district heating plants:	...	...
(a) Boilers	...	...
(b) Stationary combustion turbines and internal combustion engines	...	...
2. Commercial, institutional and residential combustion plants:	...	...
(a) Commercial boilers	...	...
(b) Domestic heaters	...	...
3. Industrial combustion plants and processes with combustion	...	...
(a) Boilers and process heaters (no direct contact between flue gas and products)	...	...
(b) Processes (direct contact); (e.g. calcinations	...	...

processes in rotary kilns; production of cement, lime, etc.; glass production; metallurgical operation; pulp production)		
4. Non-combustion processes, e.g. nitric acid production	...	...
5. Extraction, processing and distribution of fossil fuels	...	...
6. Waste treatment and disposal, e.g. incineration of municipal and industrial waste	...	...

Finland

In 2005 the Finnish Government adopted a decision on a national plan to reduce sulphur dioxide, nitrogen oxides and dust emissions from the major existing stationary sources with an environmental permit issued before July 1, 1987. The emission limit values introduced in the plan entered into force by 1.1.2008 and replaced the guide values for NOx emissions adopted in 1991. The plan sets for the sources limit values equivalent to those introduced in the LCP Directive for sources falling under its scope. For applicable limit values see the answer to question 45.

Major stationary sources	Pollution control measures applied	Comments (national legislation, relevant plant characteristics e.g. age, utilization rate)
1. Public power, cogeneration and district heating plants:	...	...
(a) Boilers	...	...
(b) Stationary combustion turbines and internal combustion engines	...	...
2. Commercial, institutional and residential combustion plants:	...	...
(a) Commercial boilers	...	...
(b) Domestic heaters	...	...
3. Industrial combustion plants and processes with combustion	...	...
(a) Boilers and process heaters (no direct contact between flue gas and products)	...	...
(b) Processes (direct contact); (e.g. calcinations processes in rotary kilns; production of cement, lime, etc.; glass production; metallurgical operation; pulp production)	...	...
4. Non-combustion processes, e.g. nitric acid production	...	...
5. Extraction, processing and distribution of fossil fuels	...	...
6. Waste treatment and disposal, e.g. incineration of municipal and industrial waste	...	...

Hungary

Hungary lists ELVs of NOx which may not be exceeded after 01.07.2001. (the authorities can permit longer deadline for existing stationary sources up to 31.10.2007). For a number of industries as the glass industry, the cement industry, the burning of lime-stone, bauxite in rotary kiln, in other kiln, the production of lime, stationary diesel engines, different chemical processes etc… ELVs have been specified in the line with annexes of the protocol, and international practice. The source categories in Hungary are the same like of the current CORINAIR categories. Requirements concerning data reporting and the measures taken have been in compliance with CORINAIR procedures. vehicle types. Vehicles can be put onto operation if they meet these requirements.

Major stationary sources	Pollution control measures applied	Comments (national legislation, relevant plant characteristics e.g. age, utilization rate)
1. Public power, cogeneration and district heating plants:	...	...
(a) Boilers	Continuous measurement of SO2, NOx, PM	10/2003.(VII.11.) KvVM, Harmonized with 2001/80/EC
(b) Stationary combustion turbines and internal combustion engines	Stationary combustion turbines: Continuous measurement of NOx; Internal combustion engines: emission control of NOx yearly	10/2003.(VII.11.) KvVM, Harmonized with 2001/80/EC; 32/1993.(XII.23.) KTM
2. Commercial, institutional and residential combustion plants:	...	...
(a) Commercial boilers	Continuous measurement of SO2, NOx, PM	10/2003.(VII.11.) KvVM, Harmonized with 2001/80/EC
(b) Domestic heaters	Continuous measurement of SO2, NOx, PM	10/2003.(VII.11.) KvVM, Harmonized with 2001/80/EC
3. Industrial combustion plants and processes with combustion	...	...
(a) Boilers and process heaters (no direct contact between flue gas and products)	Emission control of NOx yearly	17/2001.(VIII.3.) KöM
(b) Processes (direct contact); (e.g. calcinations processes in rotary kilns; production of cement, lime, etc.; glass production; metallurgical operation; pulp production)	Emission control of NOx two yearly	17/2001.(VIII.3.) KöM
4. Non-combustion processes, e.g. nitric acid production	Emission control of NOx two yearly	17/2001.(VIII.3.) KöM
5. Extraction, processing and distribution of fossil fuels	...	...

6. Waste treatment and disposal, e.g. incineration of municipal and industrial waste	Waste incineration: continuous measurement of NOx, CO, PM, SO2, TOC	3/2002.(II.22.) KöM, Harmonized with 2000/76/EC

Ireland

NOx emission from major stationary sources in Ireland are regulated by the EU Large Combustion Plant directive (2001/80/EC) transposed into law in Ireland by the Large Combustion Plant Regulations (SI No 644 of 2003) and the EPA Licensing Regulations, as amended (S.I. No 85 1994). There are implemented through the Integrated Pollution Prevention and Control (IPPC) regime which applies the principle of BAT. The ELVs set out in Table 2 apply before 27 November 2002. Statistical treatment is prescribed in the relevant legislation.

Major stationary sources	Pollution control measures applied	Comments (national legislation, relevant plant characteristics e.g. age, utilization rate)
1. Public power, cogeneration and district heating plants:	...	...
(a) Boilers	Directive 2001/80/ECELVs (mg/Nm3)	Large Combustion Plant Regulations (SI No 644 of 2003)
(b) Stationary combustion turbines and internal combustion engines	Directive 2001/80/ECELVs (mg/Nm3)	Large Combustion Plant Regulations (SI No 644 of 2003)
2. Commercial, institutional and residential combustion plants:	...	...
(a) Commercial boilers	Oil Firing Technical Association standard OFS A100 (ppm)	Not enshrined in law
(b) Domestic heaters	Oil Firing Technical Association standard OFS A100 (ppm)	Not enshrined in law
3. Industrial combustion plants and processes with combustion	...	...
(a) Boilers and process heaters (no direct contact between flue gas and products)	...	...
(b) Processes (direct contact); (e.g. calcinations processes in rotary kilns; production of cement, lime, etc.; glass production; metallurgical operation; pulp production)	IPPC directive 96/61/ECBAT (mg/Nm3)	EPA Licensing Regulations, as amended (S.I. No 85 1994).
4. Non-combustion processes, e.g. nitric acid production	IPPC directive 96/61/ECBAT (mg/Nm3)	EPA Licensing Regulations, as amended (S.I. No 85 1994).
5. Extraction, processing and distribution of fossil fuels	Directive 2001/80/EC	Large Combustion Plant Regulations (SI

		No 644 of 2003)
6. Waste treatment and disposal, e.g. incineration of municipal and industrial waste	Waste Incineration Directive (2000/76/EC)	...

Italy

see answer to question 3

Major stationary sources	Pollution control measures applied	Comments (national legislation, relevant plant characteristics e.g. age, utilization rate)
1. Public power, cogeneration and district heating plants:	...	...
(a) Boilers	...	...
(b) Stationary combustion turbines and internal combustion engines	...	...
2. Commercial, institutional and residential combustion plants:	...	...
(a) Commercial boilers	...	...
(b) Domestic heaters	...	...
3. Industrial combustion plants and processes with combustion	...	...
(a) Boilers and process heaters (no direct contact between flue gas and products)	...	...
(b) Processes (direct contact); (e.g. calcinations processes in rotary kilns; production of cement, lime, etc.; glass production; metallurgical operation; pulp production)	...	...
4. Non-combustion processes, e.g. nitric acid production	...	...
5. Extraction, processing and distribution of fossil fuels	...	...
6. Waste treatment and disposal, e.g. incineration of municipal and industrial waste	...	...

Liechtenstein

Response by Party: No stationary sources of NOx with an thermal input > 100 MW exist. For smaller installations, the emission standards apply not only to new plants, but also to existing plants. These have to be retrofitted within a time period as laid down in the Ordinance of Air Pollution [2] after entry into force of emission limitations.

Major stationary sources	Pollution control measures applied	Comments (national legislation, relevant plant characteristics e.g. age, utilization rate)
1. Public power, cogeneration and district heating plants:	...	...

(a) Boilers	150 mg/m3 with liquid fuels and 110 mg/m3 for gas and 150 mg/m3 for wood burning.	[2] with ref. value 3% O2 and ref. value 11% O2 for wood. Not relevant/Not applicable in LIE.
(b) Stationary combustion turbines and internal combustion engines	50 mg/m3 with natural gas fuels; 120 mg/m3 with other fuels for comb. turbines. 400 mg/m3 with natural gas fuels and 250 mg/m3 with other fuels for internal comb.engines.	[2] with ref. value 15% O2 for combust. turbines. Ref. value 5% for internal comb. engines. Not relevant/Not applicable in LIE.
2. Commercial, institutional and residential combustion plants:	...	...
(a) Commercial boilers	120 mg/m3 "extra light" fuel oil. 80 mg/m3 for gas and 250 mg/m3 for wood burning	[2] with temp. of heat carrier <110°C and ref. value 3% O2. And with massflow >2500g/h and ref. value 11% O2 for wood. Not relevant/Not applicable in LIE.
(b) Domestic heaters	120 mg/m3 "extra light" fuel oil. 80 mg/m3 for gas and 250 mg/m3 for wood burning	[2] with temp. of heat carrier <110°C and ref. value 3% O2. And with massflow >2500g/h and ref. value 11% O2 for wood.Not relevant/Not applicable in LIE.
3. Industrial combustion plants and processes with combustion	...	...
(a) Boilers and process heaters (no direct contact between flue gas and products)	120 mg/m3 "extra light" fuel oil. 80 mg/m3 for gas and 250 mg/m3 for wood burning	[2] with ref. value 3% O2 and ref. value 11% O2 for wood over 10 MW. Not relevant/Not applicable in LIE.
(b) Processes (direct contact); (e.g. calcinations processes in rotary kilns; production of cement, lime, etc.; glass production; metallurgical operation; pulp production)	<800 mg/m3 for cement produktion	[2] Not relevant/Not applicable in LIE.
4. Non-combustion processes, e.g. nitric acid production	250 mg/m3	[2] with massflow >2500g/h and ref. value 3% O2. Not relevant/Not applicable in LIE.
5. Extraction, processing and	<300 mg/m3 for refineries	[2] Not relevant/Not

distribution of fossil fuels		applicable in LIE.
6. Waste treatment and disposal, e.g. incineration of municipal and industrial waste	80 mg/m3	[2] with massflow >2500g/h and ref. value 3% O2. Not relevant/Not applicable in LIE.

Lithuania

See the table.

Major stationary sources	Pollution control measures applied	Comments (national legislation, relevant plant characteristics e.g. age, utilization rate)
1. Public power, cogeneration and district heating plants:	IPPC permits; requirements for monitoring of emissions and of the environment (on line measurements of emissions are obligatory from 01-01-2008 for existing combustion plants with termal input more than 100 MW)	Orders of the Minister of Environment: "Rules on Issuing, Reconsideration and Cancelling of Integrated Pollution Prevention and Control (IPPC) Permits (27-02-2002 No 80); "Emission Standards from Large Combustion Installations" (24-12-2003 No 712)
(a) Boilers	-"-	-"-
(b) Stationary combustion turbines and internal combustion engines	-"-	-"-
2. Commercial, institutional and residential combustion plants:	-"-	-"-
(a) Commercial boilers	-"-	-"-
(b) Domestic heaters	-"-	-"-
3. Industrial combustion plants and processes with combustion	IPPC permits; requirements for monitoring of emissions and of the environment	"Rules on Issuing, Reconsideration and Cancelling of Integrated Pollution Prevention and Control (IPPC) Permits (27-02-2002 Order No 80 of the Minister of Environment).
(a) Boilers and process heaters (no direct contact between flue gas and products)	-"-	-"-
(b) Processes (direct contact); (e.g. calcinations processes in rotary kilns; production of cement, lime, etc.; glass production;	-"-	-"-

metallurgical operation; pulp production)		
4. Non-combustion processes, e.g. nitric acid production	IPPC permits; requirements for monitoring of emissions and of the environment	"Rules on Issuing, Reconsideration and Cancelling of Integrated Pollution Prevention and Control (IPPC) Permits (27-02-2002 Order No 80 of the Minister of Environment).
5. Extraction, processing and distribution of fossil fuels	IPPC permits; requirements for monitoring of emissions and of the environment (on line measurements of emissions are obligatory from 01-01-2008 for existing combustion plants with termal input more than 100 MW)	Orders of the Minister of Environment: "Rules on Issuing, Reconsideration and Cancelling of Integrated Pollution Prevention and Control (IPPC) Permits (27-02-2002 No 80); "Emission Standards from Large Combustion Installations" (24-12-2003 No 712)
6. Waste treatment and disposal, e.g. incineration of municipal and industrial waste	IPPC permits; requirements for monitoring of emissions and of the environment (on line monitoring of emissions is required for waste incinerating plants and waste co-incinerating combustion plants)	Orders of the Minister of Environment: "Rules on Issuing, Reconsideration and Cancelling of Integrated Pollution Prevention and Control (IPPC) Permits (27-02-2002 No 80); "Environmental Protection Requirement for Incineration of Waste" (31-12-2002 No 699)

Netherlands

Table Q4 gives an overview of present emission limit ranges for existing plants. The higher emission limits are the limits for installations before 1988. The emission limit values have been legally set in general binding rules for combustion plants, nitric acid plants, and MSWI installations. These emission limit values were already in compliance with or more strict than the Large Combustion Plants (LCP) Directive (2001/80/EC) and Directive 2000/76/EC on waste incineration (see Q2). Although the limits are already in compliance with the protocol, stricter emission limits can be set in licenses for installations covered by the IPPC directive, because for those installations BAT based emission limits shall be prescribed. Table Q4 indicates whether the standard is laid down in a decree (GBR, general binding rule) or in individual environmental licenses (using BAT). Further reduction will be stimulated via the NOx emission rights trading system. Notes to table q.4: (a) 1300 mg/Nm3 is a 24-hour value. Range of the daily average is 600-800 mg/Nm3; (b) Exact Emission Limit Values (ELVs) depends of (a) year of permit and (b) thermal input (MWth).

Major stationary sources	Pollution control measures applied	Comments (national legislation, relevant plant characteristics e.g. age, utilization rate)
...	...	...
...	Primary	ELV 1300 mg NOx/m3 & daily average (a)
...	Emission Optimized Sintering	ELV 450 mg NOx/m3 (12%02) &

	(EOS) system (primary), results in lower loads of NOx, though concentrations rise. Subsequently end-of-pipe techniques become more attractive	daily average (b
...	...	...
...	SCR/Selective non-catalytic reduction (SNCR)	Residual burnt gases (GBR): ELV 200-600 ppm & hour average (a)
...	...	...
...	SCR/SNCR	Bva: 70 mg/m3 (11% O2) & monthly average
...	Primary/dry low NOx (DLN)	Bees A: ELV 70-350 mg NOx/m3 & highest of 3 half hour averages every 3 year, or 95% of 48h average continuous measurement below 110% (a)
...	...	...
...	Primary	Bees A: ELV 140-800 & highest of 3 half hour averages every 3 year, or 95% of 48h average continuous measurement below 110% (a)
...	Primary	Bees A: ELV 400-1200 g/GJ NOx & highest of 3 half hour averages every 3 year, or 95% of 48h average continuous measurements
...	Primary/steam injection	Bees A: ELV 65 g/GJ NOx & highest of 3 half hour averages every 3 year, or 95% of 48h average continuous measurement below 110% (a)
...	Fuel switch + Selective Catalytic Reduction (SCR)	Bees A: ELV 100-650 mg NOx/m3 & highest of 3 half hour averages every 3 year, or 95% of 48h average continuous measurement below 110% (a)
...	Primary/fuel switch +SCR	Bees A: ELV 120-450 mg NOx/m3 & highest of 3 half hour averages every 3 year, or 95% of 48h average continuous measurement below 110% (a)
...	...	...
...	see 1a	see 1a
...	see 1a and 1b	see 1a and 1b
...	...	...

...	...	...
...	Primary/Low NOx burners /SCR	Bees A: ELV 120 –450 resp. 70-350 mg NOx/m3 & 95% of 48h average below 110% (a)
...	Primary/Low NOx burners /SCR	Bees A: ELV 120 –450 resp. 70-350 mg NOx/m3 & 95% of 48h average below 110% (a)
...	...	...
...	Primary/fuel switch, Oxy-burning	ELV 300-2200 mg NOx/m3 (8% O2) & regulated in permits (a)
1. Public power, cogeneration and district heating plants:	...	...
...	Primary	Bees A: 200 g/GJ NOx (235 mg Nox/m3; 15 vol% O2) & highest of 3 half hour averages every 3 year, or 95% of 48h average continuous measurement below 110% (a)
...	...	...

Norway

The existing majory sources with a termal input > 100 MW which commenced before 14 February 1993 are industrial combustion plants and industrial processes. Industrial plants are regulated by individual permits pursuant to the Pollution Control Act of 1981. Individual emission limit values are in most cases laid down as permit conditions. In those cases where emission limit values for NOx have not been stipulated in the permit, the operator shall report the emissions on a yearly basis. The EU-directive on Large Combustion Plant and the EU IPPC-directive is implemented in Norway. The permits have been reviewed and updated during the last years in order to ensure that permit conditions are based on Best Available Technology of today and emission limit values have been introduced, either as concentration (ppm) or as total mass /year. The EU-directive on Large Combustion Plants and EU - reference documents on BAT (BREFs) have been taken into account when deciding on control measures/emission limit values. In parallel with reviewing and updating individual permits for existing industrial plants, several studies on potential NOx-reduction measures across sectors in order to achieve cost-effective national reduction targets have been undertaken. As a result, a new tax on emissions of NOx from energy production was put into effect from 1 January 2007, and from January 2008, a negotiated agreement between the government and several sectors (including industrial sector) on NOx-reductions have been settled.

Major stationary sources	Pollution control measures applied	Comments (national legislation, relevant plant characteristics e.g. age, utilization rate)
...	Processes (metallurgic, cement): Different measures,	Regulated by individual permits. Compliance with IPPC directive

	BAT for the sector	
...	For offshore turbines: Low-Nox-burners	Permits for offshore fields issued before 2002 do not comprise specific NOx-regulations. These permits will be reviewed in 2008 aiming at introducing control measures (regulations) for NOx-emissions
(a) Boilers	Retrofit to low-nox-burners when possible	Regulated by individual permits ensuring compliance with (EU) LCP-directive and IPPC-directive (BAT)
5. Extraction, processing and distribution of fossil fuels	...	...
6. Waste treatment and disposal, e.g. incineration of municipal and industrial waste	...	...

Slovakia

Slovak legislation does not prescribe specific measures for reducing NOx emissions. However, the Act No. 478/2002 on air protection and the Act No. 401/1998 on fees for air pollution have introduced categories for basic pollutants. This is intended to be an economic incentive for operators to plan investment and cut emissions. Through the Act No. 478/2002 on air protection (article 18, paragraph 3) and the Act No. 245/2003 on integrated pollution prevention and control (IPPC), new installations must apply best available techniques (BAT). Slovakia has applied the emission limit values for NOx emissions (see reply and table to question 3).

Major stationary sources	Pollution control measures applied	Comments (national legislation, relevant plant characteristics e.g. age, utilization rate)
1. Public power, cogeneration and district heating plants:	...	...
(a) Boilers	...	...
(b) Stationary combustion turbines and internal combustion engines	...	...
2. Commercial, institutional and residential combustion plants:	...	...
(a) Commercial boilers	...	...
(b) Domestic heaters	...	...
3. Industrial combustion plants and processes with combustion	...	...
(a) Boilers and process heaters (no direct contact between flue gas and products)	...	...

(b) Processes (direct contact); (e.g. calcinations processes in rotary kilns; production of cement, lime, etc.; glass production; metallurgical operation; pulp production)	...	...
4. Non-combustion processes, e.g. nitric acid production	...	...
5. Extraction, processing and distribution of fossil fuels	...	...
6. Waste treatment and disposal, e.g. incineration of municipal and industrial waste	...	...

Slovenia

For the national legislation on NOx emission limit values and their application in environmental permits please see text in A. 3. In addition to the (new) Decree on the emission of substances into the atmosphere from stationary sources of pollution (OJ RS, No. 31/2007), the (old) Decree (OJ RS, No. 73/94, 68/96, 109/01) applies for emission limit values of some existing stationary sources. NOx emission limit value is the measure for pollution control applied for existing stationary sources and is given in Table 2. Please see Table 22 (emission limit values) and text under answer 45.

Major stationary sources	Pollution control measures applied	Comments (national legislation, relevant plant characteristics e.g. age, utilization rate)
1. Public power, cogeneration and district heating plants:	...	...
(a) Boilers	depend upon thermal input: 200-600mg/Nm3 (solid fuels, 6% O2), 400-450 mg/m3 (liquid fuels, 3% O2), 200-300 mg/m3 (natural/other gases, 3% O2)	Decree on emission limit values discharged into the atmosphere from large combustion plants (OJ RS, No. 73/2005, 92/2007)
(b) Stationary combustion turbines and internal combustion engines	400 mg/m3 (liquid fuels, 15% O2), 300 mg/m3 (natural 15% O2)	Decree on the emission of substances into the atmosphere from stationary gas turbines with thermal input power under 50 MW and from stationary internal combustion engines (OJ RS, No. 34/2007, 81/2007)
2. Commercial, institutional and residential combustion plants:	...	...
(a) Commercial boilers	...	...
(b) Domestic heaters	...	...
3. Industrial combustion plants and processes with combustion	...	...
(a) Boilers and process	depend upon thermal input:	Decree on emission limit values

heaters (no direct contact between flue gas and products)	200-600 mg/m3 (solid fuels, 6 % O2), 400-450 mg/m3 (liquid fuels, 3 % O2), 200-300 mg/m3 (natural/others gases, 3 % O2)	discharged into the atmosphere from large combustion plants (OJ RS, No. 73/2005, 92/2007)
(b) Processes (direct contact); (e.g. calcinations processes in rotary kilns; production of cement, lime, etc.; glass production; metallurgical operation; pulp production)	Lime: 1500-1800 mg/Nm3, glass: 1200-3500 mg/Nm3 (8/13% O2). Please see also Table 22.	(old) Decree (OJ RS, No., 73/94, 68/96, 109/01)
4. Non-combustion processes, e.g. nitric acid production	450 mg/Nm3	(old) Decree (OJ RS, No. 73/94, 68/96, 109/01)
5. Extraction, processing and distribution of fossil fuels	Not a major source in Slovenia.	...
6. Waste treatment and disposal, e.g. incineration of municipal and industrial waste	From 200-400 mg/Nm3 (6% O2) depending on the incineration capacity and incineration source.	Decree on the emission of substances into the atmosphere from waste incineration and co-incineration plants

Spain

Please see Q. 45 and 3

Major stationary sources	Pollution control measures applied	Comments (national legislation, relevant plant characteristics e.g. age, utilization rate)
1. Public power, cogeneration and district heating plants:	...	...
(a) Boilers	...	...
(b) Stationary combustion turbines and internal combustion engines	...	...
2. Commercial, institutional and residential combustion plants:	...	...
(a) Commercial boilers	...	...
(b) Domestic heaters	...	...
3. Industrial combustion plants and processes with combustion	...	...
(a) Boilers and process heaters (no direct contact between flue gas and products)	...	...
(b) Processes (direct contact); (e.g. calcinations processes in rotary kilns; production of cement, lime, etc.; glass production; metallurgical operation; pulp	...	...

production)		
4. Non-combustion processes, e.g. nitric acid production	...	...
5. Extraction, processing and distribution of fossil fuels	...	...
6. Waste treatment and disposal, e.g. incineration of municipal and industrial waste	...	...

Sweden

Swe response: Public power, cogeneration and district heating. All plants larger than approx. 5 MWth covered by the NOx-charge system (Resulting in emissions <200 mg/m3 on average from the plants.) Measures: Primary measures/ SNCR/SCR. SCR applied at coal fired power plants. (There is just a few coal fired plants in Sweden today.). Most plants are biomass fired. A few SCR are installed, but mostly SNCR are used. Oil fired plants mostly as stand by. One such big oil fired plant uses SCR. Smaller plants manage low emissions by using gas oil. Table 2 not used.

Major stationary sources	Pollution control measures applied	Comments (national legislation, relevant plant characteristics e.g. age, utilization rate)
1. Public power, cogeneration and district heating plants:	...	...
(a) Boilers	...	...
(b) Stationary combustion turbines and internal combustion engines	...	...
2. Commercial, institutional and residential combustion plants:	...	...
(a) Commercial boilers	...	...
(b) Domestic heaters	...	...
3. Industrial combustion plants and processes with combustion	...	...
(a) Boilers and process heaters (no direct contact between flue gas and products)	...	...
(b) Processes (direct contact); (e.g. calcinations processes in rotary kilns; production of cement, lime, etc.; glass production; metallurgical operation; pulp production)	...	...
4. Non-combustion processes, e.g. nitric acid production	...	...
5. Extraction, processing and distribution of fossil fuels	...	...
6. Waste treatment and disposal, e.g. incineration of municipal and industrial waste	...	...

Switzerland

The same limit values are applied as for the installations mentionned in response to question

3.

Major stationary sources	Pollution control measures applied	Comments (national legislation, relevant plant characteristics e.g. age, utilization rate)
1. Public power, cogeneration and district heating plants:	ELVS as mentionned in table 2008Q3	OAPC as mentionned in table 2008Q3 ba<sed on SCR application
(a) Boilers	...	...
(b) Stationary combustion turbines and internal combustion engines	...	...
2. Commercial, institutional and residential combustion plants:	...	...
(a) Commercial boilers	...	...
(b) Domestic heaters	...	...
3. Industrial combustion plants and processes with combustion	...	...
(a) Boilers and process heaters (no direct contact between flue gas and products)	...	...
(b) Processes (direct contact); (e.g. calcinations processes in rotary kilns; production of cement, lime, etc.; glass production; metallurgical operation; pulp production)	...	...
4. Non-combustion processes, e.g. nitric acid production	...	...
5. Extraction, processing and distribution of fossil fuels	...	...
6. Waste treatment and disposal, e.g. incineration of municipal and industrial waste	...	...

United Kingdom

Power plants constitute the only major source category under the Protocol. Under the EC Large Combustion Plant Directive (88/609/EC) the UK was committed to reducing NOx emissions from existing large combustion plants (those licensed before I July 1987 and > 50MWth) by 30% from 1980 levels by 1998. In order to achieve these reductions, operators of combustion plants were set limits for NOx emissions each year and a timetable for installing the new equipment required to meet the emission levels set for future years. The UK reported to the Commission in 2001 that NOx emissions from plants covered by the Directive had reduced by 69% compared with the 1980 baseline. The UK has completed transposition of the revised Large Combustion Plant Directive (2001/80/EC) and the National Emissions Ceilings Directive (2001/81/EC). Implementation of these Directives by the required dates of 2008 and 2010 will further reduce NOx emissions from power plants. NOx emissions are also controlled under the Pollution Prevention and Control Act which (for installations >50 MWth) requires operators to employ Best Available Techniques (BAT) to minimise impacts on the environment. The Pollution Prevention and Control Act implements the EC Integrated Pollution Prevention and Control Directive (1996/61/EC). The PPC regulations will be superseded (from 6 April 2008) by the Environmental Permitting

Regulations 2007 in England and Wales.

Major stationary sources	Pollution control measures applied	Comments (national legislation, relevant plant characteristics e.g. age, utilization rate)
1. Public power, cogeneration and district heating plants:	...	...
(a) Boilers	Low NOx Burners	Application of low NOx burners on selected coal-fired facilities to achieve emissions reductions under Large Combustion Plant Directive
(b) Stationary combustion turbines and internal combustion engines	None	More recent gas turbines are all fitted with dry low NOx combustion systems
2. Commercial, institutional and residential combustion plants:	...	...
(a) Commercial boilers	None	...
(b) Domestic heaters	None	...
3. Industrial combustion plants and processes with combustion	...	...
(a) Boilers and process heaters (no direct contact between flue gas and products)	Low NOx Burners	Application of low-NOx burners or move to gaseous fuels on some industrial facilities.
(b) Processes (direct contact); (e.g. calcinations processes in rotary kilns; production of cement, lime, etc.; glass production; metallurgical operation; pulp production)	Low NOx Burners	Application of low-NOx burners and other combustion modifications on some facilities. Use of substitute fuels has also reduced NOx from cement plants.
4. Non-combustion processes, e.g. nitric acid production	SCR/NSCR	Application of high pressure absorption and selective and non-selective catalytic reduction on nitric acid manufacture.
5. Extraction, processing and distribution of fossil fuels	Low NOx Burners	Application of low-NOx burners on some refinery facilities and also greater use of refinery gas fuel.
6. Waste treatment and disposal, e.g. incineration of municipal and industrial waste	NSCR	Many older facilities closed with introduction of Directives to control waste incineration emissions. Achieving NOx limits for Directive 2000/76/EC generally requires urea or ammonia injection

United States

For existing stationary sources, the U.S. program is based on achieving the mandatory NAAQS for ozone. Great success has been achieved in the United States in balancing economic growth and environmental protection by allowing States and cities to choose the most cost-effective strategies to address the existing sources and by not mandating the same level of control on major existing sources as for new sources. This approach has been

extremely successful in significantly reducing the costs of achieving U.S. environmental goals. Under the Clean Air Act, EPA requires stringent levels of control for newly-built or modified industrial sources of SO2, NOx, VOCs and other pollutants. EPA has also implemented a variety of programs that are significantly reducing emissions of SO2 and NOx from existing industrial sources, including fossil fuel-fired power plants. Among these efforts are the acid rain program, which required a ten million ton reduction of SO2 emissions from 1980 levels and a significant reduction of NOx from power plants nationwide. In 1998, EPA also promulgated a rule reducing and capping NOx emissions from industrial sources, including power generation sources, in 19 Eastern states and the District of Columbia. In 2005, EPA issued rules requiring additional reductions of NOx and SO2 from sources in 28 Eastern states and the District of Columbia (Clean Air Interstate Rule, 40 CFR Parts 41, 72, 73, 74, 77, 78 and 96; FR Vol. 70 No. 1, p. 25162) and recommended that these states focus the reductions on power plants. EPA is also working with these states to reduce nitrogen eutrophication problems in the Chesapeake Bay and other ecosystems. In 1999, EPA issued a national rule that further reduced the sulfur, NOx and other sources of fine particles that cause regional haze problems across the country (Regional Haze Regulations, 40 CFR Part 51; FR Vol. 64, No. 126, p. 35714).

Major stationary sources	Pollution control measures applied	Comments (national legislation, relevant plant characteristics e.g. age, utilization rate)
1. Public power, cogeneration and district heating plants:	...	...
(a) Boilers	...	...
(b) Stationary combustion turbines and internal combustion engines	...	...
2. Commercial, institutional and residential combustion plants:	...	...
(a) Commercial boilers	...	...
(b) Domestic heaters	...	...
3. Industrial combustion plants and processes with combustion	...	...
(a) Boilers and process heaters (no direct contact between flue gas and products)	...	...
(b) Processes (direct contact); (e.g. calcinations processes in rotary kilns; production of cement, lime, etc.; glass production; metallurgical operation; pulp production)	...	...
4. Non-combustion processes, e.g. nitric acid production	...	...
5. Extraction, processing and distribution of fossil fuels	...	...
6. Waste treatment and disposal, e.g. incineration of municipal and industrial waste	...	...

Question 5 *With reference to article 2, paragraph 2(b) please specify the national NOx emission standards applied to newly registered mobile sources in all major source categories, taking into consideration the technical annex to the Protocol and the relevant decisions taken within the framework of the Inland Transport Committee of UNECE. If your country is a Party to the Gothenburg Protocol, you may cross-refer to questions 51-56. Please complete the table below.*

Bulgaria

The national NOx emission standards applied to newly registered mobile sources in all major source categories are given in the attached Table 2008Q5.

Mobile source category	NOx emission standards (unit: g/km or g/kWh)	Date	National legislation
1. Road vehicles	...	...	...
(a) Passenger cars:	petrol: 0.08 g/km; diesel: 0.25 g/km	2006	Regulation No.73 (SG 51/2006)
(b) Light commercial vehicles	...	...	...
Class I	petrol: 0.08 g/km; diesel: 0.25 g/km	same	same
Class II	petrol: 0.18 g/km; diesel: 0.33g/km	same	same
Class III	petrol: 0.21 g/km; diesel: 0.39 g/km	same	same
(c) Heavy-duty vehicles (HDV)	diesel: 3.5 g/kWh	2006	Regulation No.78 (SG 78/2006)
(d) Motorcycles and mopeds	petrol: 1. motorcycles: 0.15-0.22 g/km; 2. mopeds: 1.2 g/km (HC+NOx) for mopeds	for motorcycles - from 2006; for mopeds - from 2002	Regulation No.130 (SG 76/2005)
(e) Tractors (agricultural and forestry)	diesel: HC+NOx - 4.0-7.5 g/kWh	2005	Regulation No.10 (SG 28/2004)
2. Non-road engine applications: agricultural, mobile industrial and construction machinery	...	...	...
< 18 kW	...	...	...
19 < kW < 37	7.5	31.12.2005	Regulation No.10 (SG 28/2004)
37 < kW < 75	4.7	31.12.2005	same
75 < kW < 130	4.0	31.12.2005	same

130 < kW < 560	4.0	30.06.2005	same
3. Other mobile sources	...	...	...
(a) Rail transport	...	...	...
Self-propelled rail cars	4.0	2006	same
Locomotives	...	...	...
130 < kW < 560	4.0	2006	same
> 560 kW	6.0	2007	same
> 2000 kW and > 5 litres/cylinder	7.4	2007	same
(b) Ships and other marine craft	...	...	...
Recreational craft	7.2-8.7	31.12.2006	same
Inland shipping	7.2-8.7	31.12.2006	same
(c) Aircraft	...	...	...

Canada

Mobile source category	NOx emission standards (unit: g/km or g/kWh)	Date	National legislation
...	...	...	...
1. Road vehicles	...	...	...
(a) Passenger cars:	0.2 g/mile, 0.07 g/mile (On-road heavy light-duty trucks and medium duty passenger vehicles)	Standards represent the average vehicle under a fleet-average standard and are progressively more stringent from 2004 to 2007 (0.20 g/mile) and then from 2008 to 2009 (0.07 g/mile).	On-Road Heavy Light-Duty Trucks (GVWR 6001-8500 lb.) and Medium-Duty Passenger Vehicles
(b) Light commercial vehicles	0.07 g/mile (On-road light duty and light light-duty trucks)	Standard represents the average vehicle under a fleet-average standard and is progressively more stringent from 2004 to 2007.	On-Road Light-Duty Vehicles and Light Light-Duty Trucks (gross vehicle weight rating or "GVWR" up to 6000 lb.)
Class I	...	...	...
Class II	...	...	...
Class III	...	...	...
(c) Heavy-duty vehicles (HDV)	Petrol: 1.0g/bhb-hr(a) 0.2g/bhp-hr(b); DIesel: 2.4g/bhp-hr(a), 0.2g/bhp-hr(b) (On-	(a)Standard is a combined NOx+NMHC and is phased in beginning	On-Road Heavy-duty Vehicles/Engines

	road heavy-duty vehicles/engines)	in 2005. (b)Standard is phased in beginning in 2008. (c)Standard is a combined NOx+NMHC and is phased in beginning in 2004. (d)Standard is phased in beginning in 2007.	
(d) Motorcycles and mopeds	1.4g/km (On-road<=279cc); 1.4g/km. 0.8g/km (>279cc)	Standard is an optional combined NOx+HC standard and represents the average motorcycle under a fleet-average standard for 2006. For 2006-2009 model years (1.4 g/km) and 2010 and subsequent model years (0.8 g/km).	On-Road Motorcycles(<= 279cc); On-road motorcycles (>279cc)
(e) Tractors (agricultural and forestry)	...	...	...
2. Non-road engine applications: agricultural, mobile industrial and construction machinery	...	...	...
< 18 kW	50-119g/kW-hr	Standard is a combined NOx+HC standard and applies to 2005 and later model years based on engine displacement.	Handheld Off-Road Small Spark-Ignition Engines (= 19 kW)
19 < kW < 37	7.5g/kW-hr (diesel)	Standard is a combined NOx+NMHC standard and applies to 2006 and later model years.	Off-Road Compression-Ignition Engines (< 37 kW)
37 < kW < 75	7.5g/kW-hr(a), 4.7g/kW-hr (b) (diesel)	Standards are for combined NOx+NMHC: (a)applies to 2006-07	Off-Road Compression-Ignition Engines (= 37 kW and < 75 kW)

		model years, (b)applies to 2008 and later model years	
75 < kW < 130	6.6g/kW-hr(a), 4.0g/kW-hr(b) (diesel)	Standards are for combined NOx+NMHC: (a)applies to 2006 model year, (b)applies to 2007 and later model years	Off-Road Compression-Ignition Engines (= 75 kW and < 130 kW)
130 < kW < 560	4.0g/kW-hr	Standard is a combined NOx+NMHC standard and applies to 2006 and later model years.	Off-Road Compression-Ignition Engines (= 130 kW and = 560 kW)
3. Other mobile sources	...	...	...
(a) Rail transport	115 kilotonnes Cap (Memorandum of Understanding MOU)	2005	A MOU between the Govt of Canada and the Railway Association of Canada (RAC) addresses emissions of NOx. Following the expiry of the MOU in 2010, Canada will develop and implement smog-forming and GHG emissions regulations.
Self-propelled rail cars	...	...	...
Locomotives	...	...	...
130 < kW < 560	...	...	...
> 560 kW	...	...	...
> 2000 kW and > 5 litres/cylinder	...	...	...
(b) Ships and other marine craft	Canada has adopted the International Maritime Organization NOx standards for vessels and fuel sulphur limits.	...	Canada Shipping Act
Recreational craft	...	...	...
Inland shipping	...	...	...

(c) Aircraft	AVIATION FUELS: Prescribe standards for smoke, unburned HC, CO and NOx. Applicable to all turbo-jet and turbofan engines intended for propulsion at subsonic or supersonic speeds, as applicable.	...	Aeronautics Act

Cyprus

See reply to questions 51-56.

Mobile source category	NOx emission standards (unit: g/km or g/kWh)	Date	National legislation
1. Road vehicles	...	...	...
(a) Passenger cars:	...	...	...
(b) Light commercial vehicles	...	...	...
Class I	...	...	...
Class II	...	...	...
Class III	...	...	...
(c) Heavy-duty vehicles (HDV)	...	...	...
(d) Motorcycles and mopeds	...	...	...
(e) Tractors (agricultural and forestry)	...	...	...
2. Non-road engine applications: agricultural, mobile industrial and construction machinery	...	...	...
< 18 kW	...	...	...
19 < kW < 37	...	...	...
37 < kW < 75	...	...	...
75 < kW < 130	...	...	...
130 < kW < 560	...	...	...
3. Other mobile sources	...	...	...
(a) Rail transport	...	...	...
Self-propelled rail cars	...	...	...
Locomotives	...	...	...
130 < kW < 560	...	...	...
> 560 kW	...	...	...
> 2000 kW and > 5 litres/cylinder	...	...	...
(b) Ships and other marine craft	...	...	...
Recreational craft	...	...	...
Inland shipping	...	...	...

(c) Aircraft	...	...	...

Czech Republic

See Q. 51. – 56.

Mobile source category	NOx emission standards (unit: g/km or g/kWh)	Date	National legislation
1. Road vehicles	...	...	...
(a) Passenger cars:	...	...	...
(b) Light commercial vehicles	...	...	...
Class I	...	...	...
Class II	...	...	...
Class III	...	...	...
(c) Heavy-duty vehicles (HDV)	...	...	...
(d) Motorcycles and mopeds	...	...	...
(e) Tractors (agricultural and forestry)	...	...	...
2. Non-road engine applications: agricultural, mobile industrial and construction machinery	...	...	...
< 18 kW	...	...	...
19 < kW < 37	...	...	...
37 < kW < 75	...	...	...
75 < kW < 130	...	...	...
130 < kW < 560	...	...	...
3. Other mobile sources	...	...	...
(a) Rail transport	...	...	...
Self-propelled rail cars	...	...	...
Locomotives	...	...	...
130 < kW < 560	...	...	...
> 560 kW	...	...	...
> 2000 kW and > 5 litres/cylinder	...	...	...
(b) Ships and other marine craft	...	...	...
Recreational craft	...	...	...
Inland shipping	...	...	...
(c) Aircraft	...	...	...

Denmark

We are cross referring to qustions 51 - 56

Mobile source category	NOx emission standards (unit: g/km or g/kWh)	Date	National legislation
1. Road vehicles	...	...	...

(a) Passenger cars:	...	...	...
(b) Light commercial vehicles	...	...	...
Class I	...	...	...
Class II	...	...	...
Class III	...	...	...
(c) Heavy-duty vehicles (HDV)	...	...	...
(d) Motorcycles and mopeds	...	...	...
(e) Tractors (agricultural and forestry)	...	...	...
2. Non-road engine applications: agricultural, mobile industrial and construction machinery	...	...	...
< 18 kW	...	...	...
19 < kW < 37	...	...	...
37 < kW < 75	...	...	...
75 < kW < 130	...	...	...
130 < kW < 560	...	...	...
3. Other mobile sources	...	...	...
(a) Rail transport	...	...	...
Self-propelled rail cars	...	...	...
Locomotives	...	...	...
130 < kW < 560	...	...	...
> 560 kW	...	...	...
> 2000 kW and > 5 litres/cylinder	...	...	...
(b) Ships and other marine craft	...	...	...
Recreational craft	...	...	...
Inland shipping	...	...	...
(c) Aircraft	...	...	...

Estonia

The emission standards applied to the mobile source categories identified are those of EU (EURO III, IV and V). Estonia has implemented EU Directive 97/68/EC.

Mobile source category	NOx emission standards (unit: g/km or g/kWh)	Date	National legislation
1. Road vehicles	...	...	...
(a) Passenger cars:	0,08 g/km (petrol), 0,25 g/km (diesel)	01.01.06	Decree no 122: https://www.riigiteataja.ee/ert/act.jsp?id=803291
(b) Light commercial	...	...	...

vehicles			
Class I	0,08 g/km (petrol), 0,25 g/km (diesel)	01.01.06	Decree no 122: https://www.riigiteataja.ee/ert/act.jsp?id=803291
Class II	0,1 g/km (petrol), 0,33 g/km (diesel)	01.01.07	Decree no 122: https://www.riigiteataja.ee/ert/act.jsp?id=803291
Class III	0,11 g/km (petrol), 0,39 g/km (diesel)	01.01.07	Decree no 122: https://www.riigiteataja.ee/ert/act.jsp?id=803291
(c) Heavy-duty vehicles (HDV)	3,5 g/km (diesel)	01.10.06	Decree no 122: https://www.riigiteataja.ee/ert/act.jsp?id=803291
(d) Motorcycles and mopeds	0,1 g/km (2-stroke), 0,3 g/km (4-stroke)	01.10.06	Decree no 122: https://www.riigiteataja.ee/ert/act.jsp?id=803291
(e) Tractors (agricultural and forestry)	same as non-road	...	Decree no 55: https://www.riigiteataja.ee/ert/act.jsp?id=921174
2. Non-road engine applications: agricultural, mobile industrial and construction machinery	...	...	...
< 18 kW	...	...	...
19 < kW < 37	7,5 g/kWh	31.12.06	Decree no 55: https://www.riigiteataja.ee/ert/act.jsp?id=921174
37 < kW < 75	4,7 g/kWh	31.12.07	Decree no 55: https://www.riigiteataja.ee/ert/act.jsp?id=921174
75 < kW < 130	4 g/kWh	31.12.06	Decree no 55: https://www.riigiteataja.ee/ert/act.jsp?id=921174
130 < kW < 560	4 g/kWh	31.12.05	Decree no 55: https://www.riigiteataja.ee/ert/act.jsp?id=921174
3. Other mobile sources	...	...	...
(a) Rail transport	...	...	...
Self-propelled rail cars	4 g/kWh	31.12.05	Decree no 55: https://www.riigiteataja.ee/ert/act.jsp?id=921174
Locomotives	...	...	...
130 < kW <	4 g/kWh	31.12.06	Decree no 55:

560			https://www.riigiteataja.ee/ert/act.jsp?id=921174
> 560 kW	6 g/kWh	31.12.08	Decree no 55: https://www.riigiteataja.ee/ert/act.jsp?id=921174
> 2000 kW and > 5 litres/cylinder	7,4 g/kWh	31.12.08	Decree no 55: https://www.riigiteataja.ee/ert/act.jsp?id=921174
(b) Ships and other marine craft	Marpol (annex VI, regulation 13)	...	...
Recreational craft	...	...	...
Inland shipping	7,5-11(HC+NOx) g/kWh	...	Decree no 55: https://www.riigiteataja.ee/ert/act.jsp?id=921174
(c) Aircraft	...	...	...

Finland

The emission standards applied to the mobile source categories in Finland are those adopted in the EU regime (EURO III, IV and V). See also questions 51-55 and the respective tables therein.

Mobile source category	NOx emission standards (unit: g/km or g/kWh)	Date	National legislation
1. Road vehicles	...	...	...
(a) Passenger cars:	0,08 petrol / 0,25 Diesel	September 4, 2004	Decree of the Ministry of Transport and Communication 334/2004
(b) Light commercial vehicles	...	August 1, 2006	Decree of the Ministry of Transport and Communication 622/2006
Class I	0,08 petrol / 0,25 Diesel	...	...
Class II	0,10 petrol / 0,33 Diesel	...	...
Class III	0,11 petrol / 0,39 Diesel	...	...
(c) Heavy-duty vehicles (HDV)	2,0	August 1, 2006	Decree of the Ministry of Transport and Communication 622/2006
(d) Motorcycles and mopeds	0,1 for 2-stroke and 0,3 for 4-stroke engines	Januray 1, 2003	Decree of the Ministry of Transport and Communication 1250/2002
(e) Tractors (agricultural and forestry)	...	...	Provisions of EU Directives 2005/13 and 2000/25 implemented to national

			legislation by Government and Ministry level decrees and decisions
2. Non-road engine applications: agricultural, mobile industrial and construction machinery	...	...	Government Decrees 844/2004 and 398/2005
< 18 kW	...	...	...
19 < kW < 37	8,0 g/kWh	...	...
37 < kW < 75	7,0 g/kWh	...	...
75 < kW < 130	6,0 g/kWh	...	...
130 < kW < 560	6,0 g/kWh	...	...
3. Other mobile sources	...	...	...
(a) Rail transport	...	...	Government Decree 398/2005
Self-propelled rail cars	...	...	...
Locomotives	...	...	...
130 < kW < 560	HC + NOx 4g/kWh	January 1, 2005	...
> 560 kW	HC + NOx 6g/kWh	January 1, 2008	...
> 2000 kW and > 5 litres/cylinder	HC + NOx 7,4g/kWh	January 1, 2008	...
(b) Ships and other marine craft	...	...	...
Recreational craft	10 g/kwh for 2-stroke and 15 g for 4-stroke petrol engine and 9,8 g for diesel engine	...	Government Decree 621/2005
Inland shipping	7,2 - 11 g/kWh depending on displacement and power output of the engine	Limit values applied currently have entered into force between 1.7.2005 and 1.1.2008	Government Decree 398/2005
(c) Aircraft	...	...	...

Germany

See questions 51-56.

Mobile source category	NOx emission standards	Date	National

	(unit: g/km or g/kWh)		legislation
1. Road vehicles	...	...	...
(a) Passenger cars:	...	...	...
(b) Light commercial vehicles	...	...	...
Class I	...	...	...
Class II	...	...	...
Class III	...	...	...
(c) Heavy-duty vehicles (HDV)	...	...	...
(d) Motorcycles and mopeds	...	...	...
(e) Tractors (agricultural and forestry)	...	...	...
2. Non-road engine applications: agricultural, mobile industrial and construction machinery	...	...	...
< 18 kW	...	...	...
19 < kW < 37	...	...	...
37 < kW < 75	...	...	...
75 < kW < 130	...	...	...
130 < kW < 560	...	...	...
3. Other mobile sources	...	...	...
(a) Rail transport	...	...	...
Self-propelled rail cars	...	...	...
Locomotives	...	...	...
130 < kW < 560	...	...	...
> 560 kW	...	...	...
> 2000 kW and > 5 litres/cylinder	...	...	...
(b) Ships and other marine craft	...	...	...
Recreational craft	...	...	...
Inland shipping	...	...	...
(c) Aircraft	...	...	...

Hungary

The licensing procedure and emission standards applied to new mobile sources (road vehicles) are in full compliance with UN/ECE regulations. There are approval requirements for different mobile sources (road vehicles, off-road vehicles). The ELVs of petrol and Diesel engine driven vehicles are identical to requirements stipulated in decisions taken within the framework of the Inland Transport Committee of the Commission. See Q 51-56.

Mobile source category	NOx emission standards (unit: g/km or g/kWh)	Date	National legislation
1. Road vehicles	...	...	6/1990.(IV.12.) KÖHÉM and its amendments [the latest 106/2007.(XII.23.) GKM], harmonized with 70/220/EEC and

			its amendments
(a) Passenger cars:	...	...	...
(b) Light commercial vehicles	...	...	...
Class I	...	...	...
Class II	...	...	...
Class III	...	...	...
(c) Heavy-duty vehicles (HDV)	...	...	...
(d) Motorcycles and mopeds	...	...	...
(e) Tractors (agricultural and forestry)	...	...	...
2. Non-road engine applications: agricultural, mobile industrial and construction machinery	...	...	75/2005.(IX.29.) GKM-KvVM, harmonized with 97/68/EC and its amendments: 2001/63/EC, 2002/88/EC, 2004/26/EC
< 18 kW	...	...	...
19 < kW < 37	...	...	...
37 < kW < 75	...	...	...
75 < kW < 130	...	...	...
130 < kW < 560	...	...	...
3. Other mobile sources	...	...	75/2005.(IX.29.) GKM-KvVM, harmonized with 97/68/EC and its amendments: 2001/63/EC, 2002/88/EC, 2004/26/EC
(a) Rail transport	...	...	...
Self-propelled rail cars	...	...	...
Locomotives	...	...	...
130 < kW < 560	...	...	...
> 560 kW	...	...	...
> 2000 kW and > 5 litres/cylinder	...	...	...
(b) Ships and other marine craft	...	...	...
Recreational craft	...	...	...
Inland shipping	...	...	...
(c) Aircraft	...	...	...

Ireland

The emission standards for NOx from road vehicles are set out in a series of EU directives and regulations known as Euro Standards . Since 1993, robust emission standards have been

progressively introduced for vehicles. These standards have substantially reduced, inter alia, NOx from passenger cars and heavy goods vehicles. The relevant directives and regulations have been transposed as necessary into Irish Law by national regulation. Relevant values for table can be found in the Directives and Regulations listed in the footnote below. NOx emissions from non-road mobile machinery are regulated under Directives 1997/68/EC as amended by Directives 2001/63/EC, 2002/88/EC and 2004/26/EC. The Directives are transposed into Irish law by the European Communities (Control of Emissions of Gaseous and Particulate Pollutants from Non- Road Mobile Machinery) Regulations (SI No 147). Relevant values for the section of the table relating to non-road mobile machinery can be found in the Directives listed above.

Mobile source category	NOx emission standards (unit: g/km or g/kWh)	Date	National legislation
1. Road vehicles	...	...	...
(a) Passenger cars:	...	...	...
(b) Light commercial vehicles	...	...	...
Class I	...	...	...
Class II	...	...	...
Class III	...	...	...
(c) Heavy-duty vehicles (HDV)	...	...	...
(d) Motorcycles and mopeds	...	...	...
(e) Tractors (agricultural and forestry)	...	...	...
2. Non-road engine applications: agricultural, mobile industrial and construction machinery	...	...	...
< 18 kW	...	...	...
19 < kW < 37	...	...	...
37 < kW < 75	...	...	...
75 < kW < 130	...	...	...
130 < kW < 560	...	...	...
3. Other mobile sources	...	...	...
(a) Rail transport	...	...	...
Self-propelled rail cars	...	...	...
Locomotives	...	...	...
130 < kW < 560	...	...	...
> 560 kW	...	...	...
> 2000 kW and > 5 litres/cylinder	...	...	...
(b) Ships and other marine craft	...	...	...
Recreational craft	...	...	...
Inland shipping	...	...	...
(c) Aircraft	...	...	...

Italy

New vehicles have to meet emission standards set up in the EC Directives. Any motor vehicles must satisfy requirements for type-approval and conformity of production for registration, sale and entry into service. The Ministerial Decree on December the 21st 1999, which implements the EC Directive 98/69, establishes emission standard for car passengers and light-duty vehicles. The Ministerial Decree on May the 25th 2001, which implements the EC Directive 99/96, establishes emission standard for heavy-duty vehicles. The Ministerial Decree on March the 23rd 2001, which implements the directive 97/24/CE, establishes emission standard for mopeds. The Ministerial Decree on February the 20th 2003 implementing the Directive 2002/51/EC is applied for motorcycles, tricycles and quadricycles. The Ministerial Decree on December the 20th 1999 as modified by the Ministerial Decree on June the 1st 2001 which implements the EC Directive 97/68, establishes emission standard for off-road vehicles (compression ignition engines that is operated under intermitted speed). For spark ignition engines and for compression ignition engines that is operated under constant speed (like gas compressors, water pumps, turf care, etc.), the provisions of the 2002/88/EC Directive are applied. These standards are not applied to watercrafts, aircrafts, recreational crafts.

Mobile source category	NOx emission standards (unit: g/km or g/kWh)	Date	National legislation
...	1.20 g/Km (referred to HC+NOx)	mopeds (<50cc)	...
...	0.15 g/Km	motorcycle	...
...	50 g/Kwh . referred to HC+NOx	non road non hand-held spark ignition engines (<66cc)	...
...	0.40 g/km(petrol)-0.65g/km (diesel)	tricycles and quadricycles	...
...	40 g/Kwh. referred to HC+NOx	non road non hand-held spark ignit. engines (cc>66) (cc<100)	...
...	16.1 g/kwh .referred toHC+NOx	non road non hand-held spark ignition engines (cc>100)(cc<225)	...
...	13.4 g/Kwh. referred to HC+NOx	non road non hand held spark ignition engines (cc>225)	...
1. Road vehicles	...	...	...
(a) Passenger cars:	0.08 g/Km (petrol)- 0.25 g/Km (diesel)	...	...
(b) Light commercial vehicles	...	...	...
Class I	0.08g/Km (petrol)-0.25 g/Km (diesel)	...	euro 4
Class II	0.10 g/Km (petrol)-0.33 (diesel)	...	euro 4

Class III	0.11 g/Km (petrol)-0.39g/Km (diesel)	...	euro 4
(c) Heavy-duty vehicles (HDV)	3.5 g/KWh (diesel). Limit is referred also to LPG and NG vehicles	...	...
2. Non-road engine applications: agricultural, mobile industrial and construction machinery	...	...	...
19 < kW < 37	8 g/KWh (diesel)	...	...
37 < kW < 75	7g/KWh(diesel)	...	...
75 < kW < 130	6g/kWh (diesel)	...	...
130 < kW < 560	6g/kWh (diesel)	...	...
3. Other mobile sources	...	...	...

Liechtenstein

Response by Party: The major mobile source category according to the definitions of the protocol is road transport (almost 60 % of the total NOx emissions), followed by other mobile sources and machinery. Emission standards for motor vehicles are laid down in the Road Traffic Act [5] and implementing Ordinances [6,7,8,9], reflecting the EC standards based on Directives 70/220/EEC, 98/69/EC and 1999/102/EC. Currently EURO 4 norm for light-duty vehicles is implemented since 2005. Directive 715/2007/EC will come into force as of 2. January 2013.

Mobile source category	NOx emission standards (unit: g/km or g/kWh)	Date	National legislation
1. Road vehicles	0,08 g/km (Petrol) and 0,25 g/km (Diesel)	...	Applicable according to EEA Agreement
(a) Passenger cars:	see above	...	...
(b) Light commercial vehicles	see above	...	...
Class I	0,08 g/km (Petrol) and 0,25 g/km (Diesel)	...	...
Class II	0,10 g/km (Petrol) and 0,33 g/km (Diesel)	...	...
Class III	0,11 g/km (Petrol) and 0,39 g/km (Diesel)	...	...
(c) Heavy-duty vehicles (HDV)	3,5 g/km (Diesel)	...	...
(d) Motorcycles and mopeds	0,15 g/km (Petrol) for Motorcycles and 1,2 g/km (Petrol) for Mopeds. NOX emissions =NOX+HC	...	...
(e) Tractors (agricultural and forestry)	8,0-8,6 g/kWh (Diesel)	...	...
2. Non-road engine applications:	...	...	...

agricultural, mobile industrial and construction machinery			
< 18 kW	10,0 g/kWh (Petrol)	...	...
19 < kW < 37	7,5 g/kWh (Diesel).	...	...
37 < kW < 75	4,7 g/kWh (Diesel).	...	...
75 < kW < 130	4,0 g/kWh (Diesel).	...	...
130 < kW < 560	4,0 g/kWh (Diesel).	...	...
3. Other mobile sources	...	...	...
(a) Rail transport	...	...	...
Self-propelled rail cars	4,0 g/kWh.	...	...
Locomotives	...	...	...
130 < kW < 560	4,0 g/kWh	...	...
> 560 kW	6,0 g/kWh	...	...
> 2000 kW and > 5 litres/cylinder	7,4 g/kWh	...	...
(b) Ships and other marine craft	9,8-15 g/kWh	...	...
Recreational craft	see above	...	...
Inland shipping	7,5-11,0 g/kWh	...	...
(c) Aircraft	...	...	...

Lithuania

See the questions 51-56.

Mobile source category	NOx emission standards (unit: g/km or g/kWh)	Date	National legislation
1. Road vehicles	...	...	...
(a) Passenger cars:	...	...	...
(b) Light commercial vehicles	...	...	...
Class I	...	...	...
Class II	...	...	...
Class III	...	...	...
(c) Heavy-duty vehicles (HDV)	...	...	...
(d) Motorcycles and mopeds	...	...	...
(e) Tractors (agricultural and forestry)	...	...	...
2. Non-road engine applications: agricultural, mobile industrial and construction machinery	...	...	...
< 18 kW	...	...	...
19 < kW < 37	...	...	...
37 < kW < 75	...	...	...
75 < kW < 130	...	...	...

130 < kW < 560	...	...	...
3. Other mobile sources	...	...	...
(a) Rail transport	...	...	...
Self-propelled rail cars	...	...	...
Locomotives	...	...	...
130 < kW < 560	...	...	...
> 560 kW	...	...	...
> 2000 kW and > 5 litres/cylinder	...	...	...
(b) Ships and other marine craft	...	...	...
Recreational craft	...	...	...
Inland shipping	...	...	...
(c) Aircraft	...	...	...

Monaco

Les véhicules vendus sur le territoire monégasque proviennent quasiment tous de constructeurs implantés dans des pays européens et sont donc conformes aux normes fixées par l'Union Européenne. Les normes d'émissions à Monaco ne concernent que le CO et les poussières dans les gaz d'échappement.

Mobile source category	NOx emission standards (unit: g/km or g/kWh)	Date	National legislation
1. Road vehicles	...	...	...
(a) Passenger cars:	...	...	...
(b) Light commercial vehicles	...	...	...
Class I	...	...	...
Class II	...	...	...
Class III	...	...	...
(c) Heavy-duty vehicles (HDV)	...	...	...
(d) Motorcycles and mopeds	...	...	...
(e) Tractors (agricultural and forestry)	...	...	...
2. Non-road engine applications: agricultural, mobile industrial and construction machinery	...	...	...
< 18 kW	...	...	...
19 < kW < 37	...	...	...
37 < kW < 75	...	...	...
75 < kW < 130	...	...	...
130 < kW < 560	...	...	...
3. Other mobile sources	...	...	...
(a) Rail transport	...	...	...
Self-propelled rail cars	...	...	...

Locomotives	...	...	...
130 < kW < 560	...	...	...
> 560 kW	...	...	...
> 2000 kW and > 5 litres/cylinder	...	...	...
(b) Ships and other marine craft	...	...	...
Recreational craft	...	...	...
Inland shipping	...	...	...
(c) Aircraft	...	...	...

Netherlands

The Netherlands is a Party to the Gothenburg Protocol. Therefore cross-reference to questions 51-56 takes place.

Mobile source category	NOx emission standards (unit: g/km or g/kWh)	Date	National legislation
1. Road vehicles	...	...	...
(a) Passenger cars:	...	...	...
(b) Light commercial vehicles	...	...	...
Class I	...	...	...
Class II	...	...	...
Class III	...	...	...
(c) Heavy-duty vehicles (HDV)	...	...	...
(d) Motorcycles and mopeds	...	...	...
(e) Tractors (agricultural and forestry)	...	...	...
2. Non-road engine applications: agricultural, mobile industrial and construction machinery	...	...	...
< 18 kW	...	...	...
19 < kW < 37	...	...	...
37 < kW < 75	...	...	...
75 < kW < 130	...	...	...
130 < kW < 560	...	...	...
3. Other mobile sources	...	...	...
(a) Rail transport	...	...	...
Self-propelled rail cars	...	...	...
Locomotives	...	...	...
130 < kW < 560	...	...	...
> 560 kW	...	...	...
> 2000 kW and > 5 litres/cylinder	...	...	...
(b) Ships and other marine craft	...	...	...
Recreational craft	...	...	...

Inland shipping	...	...	...
(c) Aircraft	...	...	...

Norway

The largest mobile source category in Norway regarding NOx-emissions is ship and boat traffic, including fishing vessels, with coastal traffic as the major contributor. Emissions from coastal traffic and fishing vessels constitute about 34% of national NOx emissions in 2006. Norway has ratified Annex VI on air pollution from ships to the Maritime Pollution (MARPOL) Convention of the UN Maritime Organisation IMO. These have also been implemented in national legislation, in the Norwegian Ship Safety and Security Act. Emissions from road traffic are attributed to diesel and petrol driven vehicles. On-road vehicles must fulfil the emission standards set by the Ministry of Transport pursuant to the Road Traffic Act. From January 1989, US-83 vehicle emission standards were made compulsory for petrol fuelled passenger cars. This resulted in the introduction of three-way-catalyst equipped cars. In 2003, about 75 per cent of all petrol-fuelled cars were equipped with three-way-catalysts. Since 1993, regulations on vehicles have been set complying with Council Directives 70/220/EEC on air pollution by gases from motor vehicles and Council Directive 88/77/EEC on emission of gaseous pollutants from diesel engines for use in vehicles, including their amending directives. Norway has also implemented the provisions of the EU directives 97/24/EC, 97/68/EC, 2000/25/EC and 2004/26/EU on emissions from non-road mobile machinery, two or three-wheel motor vehicles and agricultural or forestry tractors, respectively. In 1998, a new vehicle control system was introduced according to provisions of Council Directive 96/96/EC on roadworthiness tests for motor vehicles and their trailers. EU Directive 1999/96/EC amending Council Directive 88/77/EEC introduces new emission standards (EURO V), that will apply for both light and heavy duty vehicles by 2005. The new standards have been implemented in Norwegian legislation. For more details about emission levels, see Questions 51-56.

Mobile source category	NOx emission standards (unit: g/km or g/kWh)	Date	National legislation
1. Road vehicles	...	...	...
(a) Passenger cars:	...	...	...
(b) Light commercial vehicles	...	...	...
Class I	...	...	...
Class II	...	...	...
Class III	...	...	...
(c) Heavy-duty vehicles (HDV)	...	...	...
(d) Motorcycles and mopeds	...	...	...
(e) Tractors (agricultural and forestry)	...	...	...
2. Non-road engine applications: agricultural, mobile industrial and construction machinery	...	...	...
< 18 kW	...	...	...
19 < kW < 37	...	...	...
37 < kW < 75	...	...	...
75 < kW < 130	...	...	...

130 < kW < 560	...	...	...
3. Other mobile sources	...	...	...
(a) Rail transport	...	...	...
Self-propelled rail cars	...	...	...
Locomotives	...	...	...
130 < kW < 560	...	...	...
> 560 kW	...	...	...
> 2000 kW and > 5 litres/cylinder	...	...	...
(b) Ships and other marine craft	...	...	...
Recreational craft	...	...	...
Inland shipping	...	...	...
(c) Aircraft	...	...	...

Slovakia

See replies to questions 51 – 56.

Mobile source category	NOx emission standards (unit: g/km or g/kWh)	Date	National legislation
1. Road vehicles	...	...	...
(a) Passenger cars:	...	...	...
(b) Light commercial vehicles	...	...	...
Class I	...	...	...
Class II	...	...	...
Class III	...	...	...
(c) Heavy-duty vehicles (HDV)	...	...	...
(d) Motorcycles and mopeds	...	...	...
(e) Tractors (agricultural and forestry)	...	...	...
2. Non-road engine applications: agricultural, mobile industrial and construction machinery	...	...	...
< 18 kW	...	...	...
19 < kW < 37	...	...	...
37 < kW < 75	...	...	...
75 < kW < 130	...	...	...
130 < kW < 560	...	...	...
3. Other mobile sources	...	...	...
(a) Rail transport	...	...	...
Self-propelled rail cars	...	...	...
Locomotives	...	...	...
130 < kW < 560	...	...	...

> 560 kW	...	...	...
> 2000 kW and > 5 litres/cylinder	...	...	...
(b) Ships and other marine craft	...	...	...
Recreational craft	...	...	...
Inland shipping	...	...	...
(c) Aircraft	...	...	...

Slovenia

Please see A. 51 – 56 and tables 26, 27, 28, 29 and 30.

Mobile source category	NOx emission standards (unit: g/km or g/kWh)	Date	National legislation
1. Road vehicles	...	...	Technical specifications for motor vehicles and trailer vehicles (OJ RS, No. 33/2003, 61/2004, 142/2004, 75/2005)
(a) Passenger cars:	0.08 (Petrol), 0.25 (Diesel)	2006.01	See above.
(b) Light commercial vehicles	...	...	See above.
Class I	0.08 (Petrol), 0.25 (Diesel)	2006.01	See above.
Class II	0.1 (Petrol), 0.33 (Diesel)	2007.01	See above.
Class III	0.11 (Petrol), 0.39 (Diesel)	2007.01	See above.
(c) Heavy-duty vehicles (HDV)	3.5 (Petrol)	2006.10	See above.
(d) Motorcycles and mopeds	0.1 for two stroke and 0.3 for four stroke engines	1999.06.17	See above.
(e) Tractors (agricultural and forestry)	...	...	...
2. Non-road engine applications: agricultural, mobile industrial and construction machinery	...	...	Rules on the emission of gaseous and particulate pollutants from internal combustion engines installed in non-road mobile machinery (OJ RS, No. 85/2003, 22/2005, 92/2005, 95/2007)
< 18 kW	...	...	...
19 < kW < 37	8.0 (Petrol), 8.0 (Diesel)	2001.01	See above.
37 < kW < 75	7.0 (Petrol), 7.0	2004.01	See above.

	(Diesel)		
75 < kW < 130	6.0 (Petrol), 6.0 (Diesel)	2003.01	See above.
130 < kW < 560	6.0 (Petrol), 6.0 (Diesel)	2002.01	See above.
3. Other mobile sources	...	...	Rules on the emission of gaseous and particulate pollutants from internal combustion engines installed in non-road mobile machinery (OJ RS, No. 85/2003, 22/2005, 92/2005, 95/2007)
(a) Rail transport	...	...	See above.
Self-propelled rail cars	...	...	...
Locomotives	...	...	...
130 < kW < 560	4.0 (HC+NOx)	...	See above.
> 560 kW	6.0 (NOx)	...	See above.
> 2000 kW and > 5 litres/cylinder	7.4 (NOx)	...	See above.
(b) Ships and other marine craft	...	...	...
Recreational craft	...	...	...
Inland shipping	7.2-11 g/kWh depending on displacement and power output of the engine	...	See above.
(c) Aircraft	...	...	...

Spain

For points 1 (a) and (b) in the table below, please go to Q. 51; for point 1 (c), go to Q. 52 and 53; for point 1 (d), Q. 55 and 56; for point 2, Q. 54. For all other points, limit values are those in the table.

Mobile source category	NOx emission standards (unit: g/km or g/kWh)	Date	National legislation
1. Road vehicles	...	...	...
(a) Passenger cars:	...	...	...
(b) Light commercial vehicles	...	...	...
Class I	...	...	...
Class II	...	...	...
Class III	...	...	...
(c) Heavy-duty vehicles (HDV)	...	...	...

(d) Motorcycles and mopeds	...	...	...
(e) Tractors (agricultural and forestry)	14.4 to 7	January 2006	Directive 2005/13/EC Stage III a
2. Non-road engine applications: agricultural, mobile industrial and construction machinery	...	...	...
< 18 kW	...	...	...
19 < kW < 37	...	...	...
37 < kW < 75	...	...	...
75 < kW < 130	...	...	...
130 < kW < 560	...	...	...
3. Other mobile sources	...	...	Directive 97/68/EC
(a) Rail transport	...	...	...
Self-propelled rail cars	4	...	...
Locomotives	...	...	...
130 < kW < 560	4 (HC + NOx)	January 2006	...
> 560 kW	6	January 2007	...
> 2000 kW and > 5 litres/cylinder	7.4	January 2007	...
(b) Ships and other marine craft	...	...	...
Recreational craft	7.2 to 11 (HC + NOx)	July 2007	...
Inland shipping	...	...	...
(c) Aircraft	...	...	...

Sweden

Swe response: Please find data below, Table 3 not filled in. See also Tables 26-31. Mobile source category Emission limit values (unit: g/km* or g/kWh?#) Date National legislation Petrol (Positive Ignition) Diesel (Compr. Ignition) Intro from (Swedish Statute Code No. L=Law, O=Ordinance, SJÖFS=Agency Regulation) NOx VOC VOC+NOx NOx VOC VOC+NOx 1. Road vehicles - - L:2001:1080. O:2001:1085. (a) Passenger cars* 0.08 0.1 - 0.25 - 0.30 1.01.2006 implementing EU-Dir 70/220/EEC. (b) Light commercial vehicles* N1 Class I 0.08 0.1 - 0.25 - 0.30 1.01.2007 N1 Class II 0.10 0.13 - 0.33 - 0.39 1.01.2007 N1 Class III 0.11 0.16 - 0.39 - 0.46 1.01.2007 (c) Heavy-duty vehicles# (VOC as NMHC) (ETC test cycle) - - - 3.5 0.55 - 1.10.2006 impl. EU-Dir 2005/55/EC, OJ L275, 20.10.2005, p.1. (d) Motorcycles (g/km) impl. EU-Dir 97/24/EC, am. 2002/51/EC, OJ L252, 20.9.2002, p. 20. <150 cm3 0.15 0.8 - 0.15 0.8 - 1.01.2007 ≥150 cm3 0.15 0.3 - 0.15 0.3 - 1.01.2007 3- and 4-wheelers 0.4 1.5 - 0.65 l.0 - 1.07.2004 (e) Mopeds (g/km) Dir 97/24/EC, OJ L 226, 18.8.1997, p. 1. 2-wheelers - - 1.2 - - 1.2 17.06.2002 3- and 4-wheelers - - 2.4 - - 2.4 17.06.2002 (f) Tractors (agricultural and forestry) (engines) See 2. EU-Dir 2000/25/EC 2.

Non-road engine appl.:s: agricultural, mobile industrial and construction machinery L: 1998:1707. O:1998:1709. <18 kW: SH; <20/20-50/>50# - - 50/50/72-- 2008/2008/2009 EU-Dir 97/68/EC, am. EU-Dir 2002/88/EC, OJ L 35, 11.2.2002, p.28. <18 kW: SN; <66/66-100/100-225/>225 ml cyl vol # - - 50/40/16.1/12.1 - - 2005/2005/ 2008/2007 19< kW <37# - - - 7.5 31.12.2006 EU-Dir 97/68/EC, am. EU-Dir 2004/26/EC, OJ L 225, 25.6.2004, p.3. 37< kW <75# - - - 4.7 31.12.2007 75< kW <130# - - - 4.0 31.12.2006 130< kW <560# - - - 4.0 31.12.2005 3. Other mobile sources L: 1998:1707. O:1998:1709. impl. EU-Dir 97/68/EC, am. Dir 2004/26/EC, OJ L 225, 25.6.2004, p.3. (a) Rail transport Self-propelled rail cars# - - - 4.0 31.12.2005 Locomotives 130< kW <560 - - - 4.0 31.12.2006 >560 kW - - 6.0 0.5 - 31.12.2008 >2000 kW and >5 l/cyl - - 7.4 0.4 - 31.12.2008 (b) Ships & other marine craft Recreational craft (VOC=A+B/Pn) SJÖFS 2005:4, EU-Dir 94/25/EC 2 stroke# 10 A=30, B=100, n=0.75 9.8 A=1.5, B=2, n=0.5/-/ 1.01.2005 4 stroke# 15 A=6, B=50, n=0.75 - 1.01.2005 Inland shipping - - - - - [No inland waterways in SE.] (c) Aircraft - - - - - -

Mobile source category	NOx emission standards (unit: g/km or g/kWh)	Date	National legislation
1. Road vehicles	...	...	...
(a) Passenger cars:	...	...	...
(b) Light commercial vehicles	...	...	...
Class I	...	...	...
Class II	...	...	...
Class III	...	...	...
(c) Heavy-duty vehicles (HDV)	...	...	...
(d) Motorcycles and mopeds	...	...	...
(e) Tractors (agricultural and forestry)	...	...	...
2. Non-road engine applications: agricultural, mobile industrial and construction machinery	...	...	...
< 18 kW	...	...	...
19 < kW < 37	...	...	...
37 < kW < 75	...	...	...
75 < kW < 130	...	...	...
130 < kW < 560	...	...	...
3. Other mobile sources	...	...	...
(a) Rail transport	...	...	...
Self-propelled rail cars	...	...	...
Locomotives	...	...	...
130 < kW < 560	...	...	...
> 560 kW	...	...	...
> 2000 kW and > 5 litres/cylinder	...	...	...
(b) Ships and other marine craft	...	...	...
Recreational craft	...	...	...
Inland shipping	...	...	...
(c) Aircraft	...	...	...

Switzerland

See answer to questions 51 - 56.

Mobile source category	NOx emission standards (unit: g/km or g/kWh)	Date	National legislation
1. Road vehicles	...	...	...
(a) Passenger cars:	...	...	...
(b) Light commercial vehicles	...	...	...
Class I	...	...	...
Class II	...	...	...
Class III	...	...	...
(c) Heavy-duty vehicles (HDV)	...	...	...
(d) Motorcycles and mopeds	...	...	...
(e) Tractors (agricultural and forestry)	...	...	...
2. Non-road engine applications: agricultural, mobile industrial and construction machinery	...	...	...
< 18 kW	...	...	...
19 < kW < 37	...	...	...
37 < kW < 75	...	...	...
75 < kW < 130	...	...	...
130 < kW < 560	...	...	...
3. Other mobile sources	...	...	...
(a) Rail transport	...	...	...
Self-propelled rail cars	...	...	...
Locomotives	...	...	...
130 < kW < 560	...	...	...
> 560 kW	...	...	...
> 2000 kW and > 5 litres/cylinder	...	...	...
(b) Ships and other marine craft	...	...	...
Recreational craft	...	...	...
Inland shipping	...	...	...
(c) Aircraft	...	...	...

United Kingdom

Mobile source category	NOx emission standards (unit: g/km or g/kWh)	Date	National legislation
1. Road vehicles	...	...	...

(a) Passenger cars:	0.08 g/km (petrol), 0.25 g/km (diesel)	01/01/06	Directive 98/69/EC
(b) Light commercial vehicles	...	...	...
Class I	0.08 g/km (petrol), 0.25 g/km (diesel)	01/01/06	Directive 98/69/EC
Class II	0.10 g/km (petrol), 0.33 g/km (diesel)	01/01/07	Directive 98/69/EC
Class III	0.11 g/km (petrol), 0.39 g/km (diesel)	01/01/07	Directive 98/69/EC
(c) Heavy-duty vehicles (HDV)	Euro IV: 3.5 g/kWh (diesel), Euro V: 2.0 g/kWh (diesel)	Euro IV: 01/10/06, Euro V: 01/10/08	Directive 05/55/EC
(d) Motorcycles and mopeds	0.15 g/km (petrol)	01/01/07	Directive 02/51/EC
(e) Tractors (agricultural and forestry)	...	...	Directive 05/13/EC – same emissions limits as for non-road engines (Directive 2004/26/EC) – please see 2. below
2. Non-road engine applications: agricultural, mobile industrial and construction machinery	...	...	...
< 18 kW	10g/kWh (petrol)	01/08/04–01/08/07	Directive 02/88/EC (implementation dates varies depending on engine size)
19 < kW < 37	7.5 g/kWh (diesel)	01/01/07	Directive 04/26/EC. Note the emissions standard is for NOx + HC
37 < kW < 75	4.7 g/kWh (diesel)	01/01/08	Directive 04/26/EC. Note that the emissions standard is for NOx + HC
75 < kW < 130	4.0 g/kWh (diesel)	01/01/07	Directive 04/26/EC. Note that the emissions standard is for NOx + HC
130 < kW < 560	4.0 g/kWh (diesel)	01/01/06	Directive 04/26/EC. Note that the emissions standard is for NOx + HC
3. Other mobile sources	...	...	...

(a) Rail transport	...	...	...
Self-propelled rail cars	4.0 g/kWh (diesel)	01/01/06	Directive 04/26/EC. Note that the emissions standard is for NOx + HC
Locomotives	...	...	...
130 < kW < 560	4.0 g/kWh (diesel)	01/01/07	Directive 04/26/EC. Note that the emissions standard is for NOx + HC
> 560 kW	6.0 g/kWh (diesel)	01/01/09	Directive 04/26/EC
> 2000 kW and > 5 litres/cylinder	7.4 g/kWh (diesel)	01/01/09	Directive 04/26/EC
(b) Ships and other marine craft	...	...	Emissions limits varies with engine size – please refer to stage III A standard in Directive 04/26/EC
Recreational craft	...	...	...
Inland shipping	...	...	...
(c) Aircraft	...	...	...

United States

In December 1999, new tailpipe emissions and low-sulfur fuel standards for light duty vehicles (Tier 2) were finalized. These standards took effect in 2004, and include new requirements for sport utility vehicles. These new standards require passenger vehicles to be 77 to 95 percent cleaner than those on the road today and reduce the sulfur content of gasoline up to 90 percent. http://www.epa.gov/otaq/regs/ld-hwy/tier-2/index.htm. In December 2000, EPA finalized a comprehensive program which regulates the highway heavy-duty engine and its fuel as a single system. New emission standards took effect in 2004, and increase in stringency in 2007. The program will reduce emissions of NOx and non-methane hydrocarbons (NMHC) by 2.6 million and 115,000 tons per year in 2030, respectively (95% below current levels). http://www.epa.gov/otaq/diesel.htm. With stringent controls in place for highway sources, nonroad engines powering farm and construction equipment contribute a higher fraction of the remaining inventory of pollutants. Since 1996, EPA has published a number of rules applying standards to engines in many nonroad categories (http://www.epa.gov/otaq/nonroad.htm). The Tier 3 nonroad standards were published in 1998 and took effect between 2006 and 2008 depending upon engine size. The EPA published a proposal (May 2003) for more stringent non-road standards that would begin implementation in 2008 and phase in until 2014 (http://www.epa.gov/nonroad/). The EPA published regulations for recreational vehicles in November 2002. The regulation covers snow mobiles, all-terrain vehicles, and off-highway motorcycles. Phase-in of the emission reductions begans in 2006 with full emissions reductions by 2010 (http://www.epa.gov/otaq/recveh.htm). For the U.S., see attached Table 3.

Mobile source category	NOx emission standards (unit: g/km or g/kWh)	Date	National legislation
1. Road vehicles	...	...	...

(a) Passenger cars:	...	...	...
(b) Light commercial vehicles	...	...	...
Class I	...	...	...
Class II	...	...	...
Class III	...	...	...
(c) Heavy-duty vehicles (HDV)	...	...	...
(d) Motorcycles and mopeds	...	...	...
(e) Tractors (agricultural and forestry)	...	...	...
2. Non-road engine applications: agricultural, mobile industrial and construction machinery	...	...	...
< 18 kW	...	...	...
19 < kW < 37	...	...	...
37 < kW < 75	...	...	...
75 < kW < 130	...	...	...
130 < kW < 560	...	...	...
3. Other mobile sources	...	...	...
(a) Rail transport	...	...	...
Self-propelled rail cars	...	...	...
Locomotives	...	...	...
130 < kW < 560	...	...	...
> 560 kW	...	...	...
> 2000 kW and > 5 litres/cylinder	...	...	...
(b) Ships and other marine craft	...	...	...
Recreational craft	...	...	...
Inland shipping	...	...	...
(c) Aircraft	...	...	...

Question 6 *Article 4 has your country made unleaded fuel sufficiently available, in particular cases as a minimum along main international transit routes, to facilitate the circulation of vehicles equipped with catalytic converters? Yes ☐ No ☐ You may provide further details. However, if your country is a Party to the Heavy Metals Protocol, you should provide further details under question 37.*

Bulgaria

Yes X

Canada

Yes Since December 1, 1990, pursuant to the federal Gasoline Regulations, Canada generally limits the maximum concentration of lead that is produced, imported, sold or offered for sale in Canada to 5mg/L. For engines designed to use leaded gasoline such as farm machinery, boats and large trucks, the leaded gasoline that is produced in Canada and sold or offered for sale in Canada shall not exceed 30 mg/L and the leaded gasoline that is imported into Canada and sold or offered for sale in Canada shall not exceed 26mg/L. The Gasoline Regulations also stipulates the submission to the Minister of quarterly reports on lead concentration in gasoline that is produced in and imported into Canada for use or sale in Canada, and annual reports on leaded gasoline produced and imported for use in competition vehicles. Gasoline for use in aircrafts is exempt from the Gasoline Regulations and, until January 1, 2008, leaded gasoline for use in competition vehicles was not subject to the lead concentration restrictions imposed by the Regulations. On December 22, 2007, the Government of Canada proposed amending regulations that would extend the exemption for competition vehicles until January 1, 2009 and would remove the regulatory provisions which allow the production, import and sale of leaded gasoline for use in farm machinery, boats, and large trucks. These amendments are planned to be finalized in early 2008.

Cyprus

Yes. Leaded petrol was completely replaced in Cyprus market with unleaded petrol since May 2004. After that date all imported vehicles using petrol are equipped with catalytic converters. Old vehicles, not equipped with catalytic converters, are also using unleaded petrol.

Czech Republic

Yes X No ☐ The sale of leaded petrol was finished on 1 January 2001 pursuant to the Decree of the Ministry of Transport and Communications No. 244/1999 Coll. The Decree of the Ministry of Industry and Trade No. 229/2004 Coll. set the maximum permitted amount of lead in all types of automobile petrol to 5 mg/l.

Denmark

Unleaded fuel is available in the whole country

Estonia
Yes. Leaded petrol is prohibited since 01.01.2000

Finland
Distribution and use of leaded petrol has been banned in Finland.

Germany
Yes You may provide further details. However, if your country is a Party to the Heavy Metals Protocol, you should provide further details under question 37. Leaded petrol has been phased out in Germany and only unleaded fuel is available at all fuel stations.

Hungary
Yes. Ministerial Decree 12/1998.(XI.23.)GM banned leaded petrol in Hungary since 1 April 1999.

Ireland
Yes X□ No □ Leaded fuel has been banned in Ireland since 1st January 2000 under EU fuel quality directive 98/70/EC and transposed into law in Ireland through the Air Pollution Act (Environmental Specifications for Petrol and Diesel Fuels) Regulations (SI No 407 of 1999 and SI No 72 of 2000). You may provide further details. However, if your country is a Party to the Heavy Metals Protocol, you should provide further details under question 37.

Italy
In Italy leaded petrol has been banned since January the 1st 2002.

Liechtenstein
Response by Party: Yes X No □ You may provide further details. However, if your country is a Party to the Heavy Metals Protocol, you should provide further details under question 37.
Response by Party: See answer to question 37

Lithuania
Yes. Unleaded fuel (Pb<0.005 g/l) is marketed in the whole country.Petrol with lead content above 0.005 g/l (not more than 0.15 g/l) can be marketed (up to 0.5% total petrol sales)after agreement with the Ministry of Economy, the Ministry of Environment and the Ministry of Transport.

Monaco
Oui, l'essence avec plomb a été abandonnée en Principauté de Monaco et substituée par de l'esssence sans plomb depuis le 1er janvier 2000

Netherlands
The Netherlands is a Party to the Heavy Metals Protocol, further details are given under

question 37.

Norway

Yes, Norway has phased out the use of leaded petrol. In 1986 a new tax on leaded petrol was introduced. The extra tax has proved to be a very effective policy instrument in order to phase out the use of leaded petrol. According to "Regulations relating to the quality of petrol and auto diesel to be used by on-road vehicles (Directive 98/70/EC)", Norway regulated the lead content of marketed petrol intended for on-road vehicles. In March 2000, this should not exceed 0,005 g/l. Since 1997 the lead content in petrol was in practical terms “zero”. So called leaded petrol in Norway has an additive based on potassium solution. As a consequence of the implementation of Directive 98/70/EC the extra tax on leaded petrol has been abolished.

Slovakia

Yes. See reply to question 37.

Slovenia

Yes. In 1988 unleaded fuel was made available in Slovenia by motor fuel distributors. In the year 1993, already 28% of gasoline sold was unleaded. In 2001 leaded fuel was phased out and its sale in Slovenia ended (Regulation of quality of liquid fuels, OJ RS, No. 78/2000). Please also see A. 37.

Spain

Yes. Sales of leaded petrol are banned from 1 January 2002, in accordance with the Royal Decree 403/2000.

Sweden

Swe response: Yes ⎫

Switzerland

Switzerland made unleaded fuel available in all petrol stations since 1987. See also answer to question 37.

United Kingdom

Yes. In the UK, all new petrol-engined cars have been fitted with catalytic convertors and have had to use unleaded petrol since January 1993. The general marketing of leaded petrol in the UK has been banned since 1 January 2000 under EU Directive 98/70/EC. Both unleaded and lead replacement petrol is widely available in the UK.