

UNECE AIR POLLUTION QUESTIONNAIRE:

Selected responses to NOx Protocol questions from 2008 questionnaire

5/4/10 This document contains a selection of responses to Q2-6 in the 2008 questionnaire. These questions relate specifically to the 1988 NOx Protocol, the countries were selected at random.
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Introduction

This document contains responses to Q2-6 from the 2008 UNECE Air Pollution Questionnaire, for five countries, selected at random. This has been done to provide a smaller more manageable background document, which gives a flavour of the measures which countries have taken regarding NOx. A full set of responses can be downloaded as a separate document on the TFRN website.

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.

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.

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.

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.

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 category ² for NOx	National emission standards ¹ /	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

Finland

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

Major stationary sources or major source category ^{2/} for NOx	National emission standards ^{1/}	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% O ₂): 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 NO ₂ /m ³ (n), 3% O ₂	Government Decree 1017/2002
(a) Boilers	For sources using solid fuel 600 mg (6% O ₂), for fluid or gaseous fuels 450 mg (3% O ₂)	...
(b) Stationary combustion turbines and internal combustion engines	For sources with permit issued before 1.4.1991: fluid fuel 200 mg (15% O ₂), 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% O ₂), for fluid or gaseous fuels 450 mg (3% O ₂)	Government Decree 1017/2002
(a) Commercial boilers	For sources using solid fuel 600 mg (6% O ₂), for fluid or gaseous fuels 450 mg (3% O ₂)	...
(b) Domestic heaters	For sources using solid fuel 600 mg (6% O ₂), for fluid or gaseous fuels 450 mg (3% O ₂)	...
3. Industrial combustion plants and processes with combustion	For sources using solid fuel 600 mg (6% O ₂), for fluid or gaseous fuels 450 mg (3% O ₂)	Government Decree 1017/2002
(a) Boilers and process heaters (no direct contact between flue gas and products)	For sources using solid fuel 600 mg (6% O ₂), for fluid or gaseous fuels 450 mg (3% O ₂)	...

Finland

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

Major stationary sources or major source category ^{2/} for NOx	National emission standards ^{1/}	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% O ₂): 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 NO ₂ /m ³ (n), 3% O ₂	Government Decree 1017/2002
(a) Boilers	For sources using solid fuel 600 mg (6% O ₂), for fluid or gaseous fuels 450 mg (3% O ₂)	...
(b) Stationary combustion turbines and internal combustion engines	For sources with permit issued before 1.4.1991: fluid fuel 200 mg (15% O ₂), 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% O ₂), for fluid or gaseous fuels 450 mg (3% O ₂)	Government Decree 1017/2002
(a) Commercial boilers	For sources using solid fuel 600 mg (6% O ₂), for fluid or gaseous fuels 450 mg (3% O ₂)	...
(b) Domestic heaters	For sources using solid fuel 600 mg (6% O ₂), for fluid or gaseous fuels 450 mg (3% O ₂)	...
3. Industrial combustion plants and processes with combustion	For sources using solid fuel 600 mg (6% O ₂), for fluid or gaseous fuels 450 mg (3% O ₂)	Government Decree 1017/2002
(a) Boilers and process heaters (no direct contact between flue gas and products)	For sources using solid fuel 600 mg (6% O ₂), for fluid or gaseous fuels 450 mg (3% O ₂)	...
(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	From 800 mg down to 150 mg	Government Decree

disposal, e.g. incineration of municipal and industrial waste	(6% O ₂) depending on the the incineration capacity and incineration source	362/2003
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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 category ^{2/} for NOx	National emission standards ^{1/}	National legislation and comments (e.g. BAT applied)
Boilers (liquid) (> May 1998) > 300 MWth	120 mg NOx/m ³ & 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/m ³ & 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/m ³ (8% O ₂)	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/m ³ (11% O ₂) & 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/m ³ ; 15 vol % O ₂) & 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/m ³ ; 15 vol% O ₂)& 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/m ³ & 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/m ³ & 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/m ³ & 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/m ³ & 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 district 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 category ² / for NOx	National emission standards ^{1/}	National legislation and comments (e.g. BAT applied)
Dual fuel turbines	200 mg/Nm ³	(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 plant in 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/Nm ³	12 hour average
Refinery	Total load/year	Existing plant. ELV stipulated in the permit. ELV based on installation of application SNCR (or equally efficient measures) by 2009 and SCR (or equally efficient measures) by 2014
Offshore energy production.Gas turbines	76 mg/Nm ³	(example)

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 category ² / for NOx	National emission standards ^{1/}	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. incineration of municipal and industrial waste	800 mg/m ³ (existing) 500 mg/m ³ (new) Daily mean values	Annex II in RD 653/2003 (Directive 2000/76/EC)

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/m ³ ; >500 MWth - 500 mg/m ³ since 1st of January 2008 (200 mg/m ³ since 1st of January 2016)	Regulation No.10
(b) Stationary combustion turbines and internal combustion engines	natural gas - 50 or 75 mg/m ³ ; liquid and gaseous fuels - 120 mg/m ³	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 cement, lime, etc.; glass	500 mg/m ³ - for calcination processes, production of cement, lime etc.; 500 mg/m ³ - for glass production; 400 mg/m ³ - for	Regulation No.1

production; metallurgical operation; pulp production)	metallurgical operations; 400 mg/m ³ - for pulp production	
4. Non-combustion processes, e.g. nitric acid production	nitric acid production - 500 mg/m ³ until 31st of December 2009; 400 mg/m ³ 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/m ³ - for plants with capacity >3 t/h and 400 mg/m ³ - for plants with capacity < 3 t/h	Regulation No. 6

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

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/m ³ & daily average (a)
...	Emission Optimized Sintering (EOS) system (primary), results in lower loads of NOx, though concentrations rise. Subsequently end-of-pipe techniques become more attractive	ELV 450 mg NOx/m ³ (12% O ₂) & 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/m ³ (11% O ₂) & monthly average
...	Primary/dry low NOx (DLN)	Bees A: ELV 70-350 mg NOx/m ³ & 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 major sources with a thermal 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, BAT for the sector	Regulated by individual permits. Compliance with IPPC directive
...	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	...	...

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

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	...	...	...

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	...	...	...

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
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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

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	...	...	...

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

Finland

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

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.

Spain

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