UNECE Air pollution questionnaire:


5/4/10 This appendix contains all of the responses to Q39 & 59-66 of the 2008 questionnaire. Author Clare Howard.
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**Question 39** With reference to article 6, paragraph 1(a), please provide details of the supporting strategies, policies and programmes your country has adopted to facilitate the implementation of its obligations under article 3 of the Protocol. Where pollutant specific policies, strategies or programmes are used, please make a clear distinction between (a) sulphur; (b) NOx; (c) VOCs and (d) ammonia.

Note the responses to Q39 were not synthesised in the main report, however the question does make reference to policies, strategies etc which relate to ammonia. Therefore the raw data is provided here for further information.

**Bulgaria**
- There are no particular programs adopted for the pollutants listed. All the pollutants are subject of the new National Program for Reduction of the Total Annual Emissions in the Ambient Air of SOx, NOx, VOC and NH3 (Government Decision No.261/2007).
- See also the answer of Q1.

**Canada**
Canada is not a Party to this Protocol; responses are given on a voluntary basis and should not be used to assess Canada’s compliance with the Protocol.

**Cyprus**
A national programme for the reduction of emissions has been prepared in Cyprus. This programme includes measures that have been established taking into consideration mainly the provisions of Directive 1996/61/EC in relation to emission limit values and the use of Best Available Techniques that can be applied in Cyprus. Furthermore, the provisions of other relevant Directives for emissions control (2001/80/EC, 1999/13/EC, 1994/63/EC, etc), were also taken into consideration.  

a) Sulphur: The national efforts for the protection of the environment in the energy sector focus on securing the supply of Liquefied Natural Gas (LNG) for use by 2012 at Vasilikos Power Station and subsequently at the other stations. The successful outcome of this process will contribute significantly to the drastic reduction of emissions of the main pollutants to the atmosphere, especially of the SO2 emissions. In the meantime systematic measures are also taken to develop a sound energy efficiency policy aiming at reducing of the emissions. Main instruments of this policy are the energy pricing, the formulation and implementation of energy efficiency programmes for the various sectors of the economy and the promotion of renewable energy sources. The main objectives of the government policy in this field are to increase the share of energy from renewable sources in the provision of total energy produced from 0% in 2000 to 9% in 2010, to increase the electricity generated from renewable sources, from the present zero level, to 6% by 2010 and achieve the target prescribed in the relevant harmonized EU legislation. The Cyprus Institute of Energy operates since 2000 a grants scheme which provides financial support in the form of governmental subsidies for investments in the field of energy conservation and replacement of electricity and conventional fuels with renewable energy sources. Special emphasis is given to solar energy and wind energy. The scheme is designed to encourage the enterprises of the energy, industrial, hotel and agricultural sectors to use renewable energy. The burning of liquid fuels is the main contributor to SO2 emissions in the industrial sector. The Sulphur Content of Liquid Fuels Directive (1999/32/EC) sets a
series of sulphur limits in heavy fuel oils aiming to reduce SO\textsubscript{2} emissions. Since 2004, the sulphur content of gas oil has been restricted to 0.2 \% by mass according to the provisions of the Regulation 316/2004 which harmonises the Cyprus legislation with EU Directive 1999/32/EC. This level will be reduced further in the near future according to the plans of the Ministry of Commerce, Industry and Tourism. It is noted that before 2004, the sulphur content of gas oil used by the industrial sector in Cyprus was 1\% by mass. This reduction of the sulphur content in gas oil will contribute to the reduction of SO\textsubscript{2} emissions from the industrial sector. The air emissions from the transport sector in Cyprus are regulated in full accordance with current EU legislation. Concerning the quality of fuels it should be noted that the sulphur content of the diesel fuel was reduced in 2004 from 1\% to 0.035\%. In 2005, the sulphur content was further reduced to 0.005\% and in 2009 will be pushed down to 0.001\%. As far as the quality of petrol is concerned it should be noted that the sulphur content was reduced in 2004 from 1\% to 0.015\%. In 2005, the sulphur content of petrol was further reduced to 0.005\% and will reach in 2009 the amount of 0.001\%. b) NO\textsubscript{x}: Although nitrogen oxides (NO\textsubscript{x}) emissions from industrial activities are already very low compared to the national total NO\textsubscript{x} emissions, it is envisaged that the application of BATs in existing IPPC industrial units, such as cement plants, will further reduce NO\textsubscript{x} emissions level. The main BAT considered is the use of low NO\textsubscript{x} burners. Several measures are promoted in order to reduce NO\textsubscript{x} emissions from road transport sector. These include enforcement of speed limits and efficient traffic management. Furthermore, leaded petrol has been completely replaced by unleaded petrol since May 2004. After that date all imported vehicles using petrol are equipped with catalytic converters. The use of three-way catalysts will lead to a large reduction of NO\textsubscript{x} emissions from this sector. c) VOCs: Organic Solvents are used in various industrial processes in Cyprus and are emitted either directly or indirectly into the air. In the industrial sector the main regulatory tool to reduce VOC emissions is Directive 1999/13/EC on the limitation of emissions of volatile organic compounds due to the use of organic solvents in certain activities and installations (known as the VOC Solvents Directive). In Cyprus a number of existing installations fall within the scope of the VOC Solvents Directive and are obliged to meet the emission limit values set in the Directive. In the licenses (Air Emission Permits) issued by the Minister of Labour and Social Insurance according to the provisions of the Air Pollution Control Law of 2002 (Law 187(I)/2002), the emission limit values and the total emission values included in the Directive (Annex IIA) are set as conditions. Already the owners of some installations, in order to meet specified emission limit values, have proceeded with the installation and operation of suitable abatement techniques such as afterburners. The second relevant Directive to be applied in Cyprus, the VOC Paints Directive (2004/42/EC), was transposed to National Law in March 2006. The products covered by the Directive are paints and varnishes for use on buildings, and products for vehicle refinishing. According to this legislation, products placed on the market should meet specified VOC limit values indicate din Annex II of the Directive. The implementation and enforcement of the provisions of the above two Directives (1999/13/EC and 2004/42/EC) ensures the reduction of VOC emissions from the industrial sector to the atmosphere of Cyprus. The VOC emissions from the storage and distribution of petrol, according to the Directive 1994/63/EC, have been controlled in Cyprus through Regulations No. 319/2002 and No. 76/2003. The main provisions of these Regulations are: 1. The installation of the necessary equipment of petrol stations to facilitate the collection of vapours displaced when the storage tanks are filled from road tankers. 2. The modification of road tankers so that they can receive and maintain the petrol vapours from the above operation until they are re-filled with petrol at the terminals. 3. The collection of vapours from road tankers and storage tanks at terminals and their recovery in Vapour Recovery Units (VRU). In Cyprus four companies deal with the storage and distribution of oil
products and they are served by three main fuel terminals. In promoting the effective implementation of the above legislation, and in the framework of the national strategy to reduce VOC emissions, two VRU’s have been installed to serve the needs of the three terminals. Two of the terminals share a single VRU. All road tankers have been modified as required and 245 out of the 250 petrol stations in Cyprus have already installed the necessary equipment for Vapour collection. Five petrol stations have been excluded until 2008 because of their low throughput and because they are situated in remote locations. As far as vapour balancing during vehicle refuelling of petrol service stations (Stage II) is concerned, Cyprus started taking measures for future implementation. All new stations must install the underground pipes required for this purpose. So far about 30% of the service stations have complied with this requirement. To implement vapour balancing (Stage II), service stations will need in addition the necessary equipment at the delivery pumps. Implementation of this system started in March 2008 at four petrol stations in Cyprus on a pilot basis. Several measures are promoted in road transport sector in order to reduce VOC emissions from this sector. These include enforcement of speed limits and efficient traffic management. Furthermore, leaded petrol has been completely replaced by unleaded petrol since May 2004. After that date all imported vehicles using petrol are equipped with catalytic converters. The use of three-way catalysts will lead to a large reduction of VOC emissions from this sector. d) Ammonia: The main pollutant emitted from the agricultural sector is ammonia. In general, measures applied to cut ammonia emissions are alternative livestock feeding strategies, low – emission slurry and manure spreading and storage, low – emission animal housing systems and measures connected to the use of mineral fertilizers, including their restriction. Intensive rearing of poultry or pigs and in general agriculture is by far the largest source of ammonia emissions in Cyprus. Specifically it accounts for 94% of total ammonia emissions in Cyprus while the rest 6% comes from the use of fertilizers. The application by October 2007 of the Best Available Techniques in existing IPPC pig and poultry farms will significantly minimize ammonia emissions to the atmosphere of Cyprus. Furthermore the Department of Labour Inspection together with all other Departments and Associations involved, have developed a National Best Available Technique Document for pig farms based on the information included in the relevant BREF Document issued by the European IPPC Bureau in Seville, Spain. A similar National BREF Document has also been prepared for IPPC poultry farms. In particular, the above two Documents refer to feeding methods, housing of animals, storage of manure and slurry as well as ways of spreading them on land.

Czech Republic

In the Czech Republic the National program on emission reduction adopted by the Government Regulation No. 630 of 11. 6. 2007 is applied for all categories of sources. Since 2008 the alternative strategy for a certain part of stationary combustion sources has been applied in the Czech Republic (building permission issued before 1. 7. 1987); these sources are included in the National program on reduction of emissions from the existing extra large combustion sources of air pollution. The Program is applied to stationary combustion sources with the energy input from 50 MW and it limits sulphur and NOx emissions produced by these sources. To achieve its goals the Program is supported mainly by the Act No. 86/2002 Coll. on clean air protection and its implementary regulations and other legislative documents. As the legislative tool regulating the amount of VOC in the ambient air is regarded the Clean Air Act and its implementary document, and namely the Decree No. 355/2002 Coll. amended by Decree No. 509/2005 Coll. Both these documents transpose the European Directives 1999/13/EC and 2004/42/EC, which control these substances on a
European level. Currently, a complex amendment of the above Decree is under preparation which will solve also the drawbacks ensuing from the previous reporting period to the CRLTAP Protocol. On 13 July 2005 the Government Resolution No. 882 approved the Transport policy for the years 2005–2013. Its priorities and goals are in compliance with the goals aimed at VOC emissions abatement. A number of measures have been taken, e.g. support of alternative fuels and creating the prerequisites for the change of interdepartmental division of transportation towards better environmentally sound transportation.

**Denmark**

Being a Member State of the European Union since 1973 Denmark has implemented all EU-legislation and will not be repeated here. Therefore, in the following only reference is made to specific national legislation regulating the emissions of sulphur dioxide, nitrogen oxides, volatile organic compounds and ammonia: Sulphur dioxide, nitrogen oxide and VOC’s: The latest version of the national guidelines for air emission regulation was published in 2002, and contains guidelines for the municipal authorities for environmental approval of new and enlarged industrial and energy installations. The guideline contains emission limit values for SO2, NOx and VOC. Sulphur dioxide and nitrogen oxide: The emissions of SO2 and NOx from primary electricity-generating plants (> 25 MWel) are regulated through Statutory Order no. 885 of 18 December 1991 on the limitation of from power stations. On the basis of annual reports from the plants, annual quotas are set for emissions from individual plants of SO2 and NOx Sulphur dioxide: The emission of sulphur dioxide is also regulated by consolidated Act no. 78 of 3 August 2006 on a tax on sulphur. Tax must be paid on the basis of the sulphur content in the fuel, although the tax does not apply to products with a sulphur content of less than 0.05 %. The tax is DKK 20 (app. EUR 2.6) per kg sulphur in each type of fuel. Alternatively, installations with automatic measuring equipment for SO2 can pay DKK 10 (app. EUR 1.3) per kg SO2 actually emitted into the atmosphere, i.e. the plants do not pay tax on sulphur collected in cleaning equipment. Nitrogen oxide: Statutory Order no. 622 of 23 June 2005 amending the Statutory Order on approval of listed activities stipulates requirements on the organisation and operation of power-generating plants, heat-generating plants, gas-turbine plants and gas-motor plants with a total input effect of between 1 MW and 50 MW. The same Statutory Order also lays down emission limits for NOx from boiler plants, and there are specific Danish regulations in Statutory Order no. 621 of 23 June 2005, which limit emissions of NOx from stationary motor and gas-turbine installations with an input effect of more than 120 kW per motor or turbine. All the emission limits in these statutory orders have been set dependent upon the type of fuel. VOC’s: The Danish Parliament has passed statutory order for wood-burning stoves and boilers. The statutory order contains provisions on the emissions of particles from stoves and boilers, and it is expected to affect emissions of VOC. The requirements in the statutory order apply when the equipment is installed and therefore they will aim at new stoves and boilers as well as used boilers and stoves which are reinstalled. Ammonia: Denmark has launched a number of action plans and initiatives with the purpose of reducing agriculture's nutrient impact on the environment. These action plans have defined the overall targets and have been realized in specific regulations. The first action plan for the aquatic environment was published in 1987 with the objective of halving nitrogen losses within a three-year period. It was followed up in 1991 by an action plan for sustainable development in agriculture. In 1998 another action plan for the aquatic environment was launched, and in 2001 an action plan for the reduction of ammonia emissions from agriculture was introduced aiming specifically at initiatives to reduce ammonia emissions from the agricultural sector which accounts for one third of total nitrogen losses from agriculture. The ammonia action plan introduced 1. Optimization of
manure management, 2. covers on stores of solid organic manure that are not in daily use, 3. Covers on liquid manure storage tanks or establishment of floating layer, 4. Ban on surface spreading and reduction of the time to 6 hours from field application of manure to incorporation in soil, and 5. ban on ammonia treatment of straw. An act on environmental authorization of livestock farms, went into force 1 January 2007 and expands the number of livestock farms subject by setting a limit to authorization on 75 animal units. From 1 January 2007, ammonia emissions from new or expanded livestock housing installations (including rebuild installations) for livestock farms of more than 75 animal units should be 15 % less compared to emissions from the modern housing system with the least ammonia emissions in 2005/2006. The requirement for a 15 % reduction will be changed in 2008 to a requirement for a 20 % reduction, and in 2009 to a requirement for a 25 % reduction.

**Finland**

The Finnish National Programme for air pollution control (Air Pollution Control Programme 2010) was approved by the Finnish Government on September 2002. The programme constitutes framework for Finland's national implementation of EC Directive 2001/81 (emission ceiling directive) setting for each Member State national emission ceiling for specific atmospheric pollutants. To cope with the obligations set forth by the emission ceiling directive Finland is not bound to take any additional measures to those already taken to meet the existing obligations deriving from the EC legislation and prior national policies, strategies and programmes. The same applies to the obligations under the Gothenburg Protocol as the targets of the emission ceiling directive are at the same or higher level as of the Gothenburg Protocol. It is noteworthy to mention that the approach of air pollution control in Finland is based on measures to reduce overall emissions from the major sources of emissions, like for instance of those deriving from energy generation, transport, or agriculture, rather than on preparation of pollutant specific strategies, policies and programmes. The national policies, strategies and programmes aiming directly or indirectly to the abatement of acidification, eutrophication and formation of ground-level ozone also have affects to the emissions of the specific pollutants covered in the Gothenburg Protocol.

**Germany**

Air pollution control activity in Germany is ruled by the 1974 Act of Federal Immission Control (Bundes-Immissionsschutzgesetz - BImSchG), last update October 2007. A basic feature of this act is the precautionary principle, which means in practical terms that all sources (new and existing) must prevent and control emissions according to the state of the art. Since the mid-1970s, a system of ordinances and technical instructions on emission prevention and control has come into effect. For major specific regulations on emission reduction requirements see (a) - (d) below. The establishment and operation of installations particularly liable to cause harmful effects on the environment are subject to licensing. These plants are listed in the 4th ordinance under the BImSchG (4. BImSchV). Detailed provisions relating to the licensing procedure are laid down in the 9th ordinance (9. BImSchV). The basic provisions on road traffic are regulated in the Road Traffic Act (Straßenverkehrsgesetz) and the Ordinance Authorising the Use of Motor Vehicles for Road Traffic (StVZO) defines technical requirements for motor vehicles, see (b) and (c) below. National emission ceilings for SO2, NOx, NMVOC and NH3 as well as the National Programme with concrete measures to achieve the national emission ceilings in 2010 are regulated in the 33. BImSchV. The National Programme is available under http://www.umweltdaten.de/publikationen/fpdf-l/3306.pdf. For a full documentation of all
relevant laws and regulations see the attachment to this questionnaire “German regulations that have an impact on emission reduction”. (a) Sulphur 1. BImSchV, 3. BImSchV, 13. BImSchV, 17. BImSchV and Technical Instructions on Air Quality Control (TA Luft) (b) NOx 1. BImSchV, 13. BImSchV, 17. BImSchV and Technical Instructions on Air Quality Control (TA Luft) The StVZO transposes the EC directives on emission reduction from motor-vehicles into German law, such as Directives 91/441/EEC, 96/69/EC, 97/24/EC, 93/12/EEC and 98/70/EC. (c) VOCs 2. BImSchV, 17. BImSchV, 31. BImSchV and Technical Instructions on Air Quality Control (TA Luft) Ordinance on Solvent-Containing Paints and Varnishes (Lösemittelhaltige Farben- und Lack-Verordnung – ChemVOCFarbV, see questions 8 and 11) The StVZO transposes the EC directives on emission reduction from motor-vehicles into German law, such as Directives 91/441/EEC, 91/542/EEC, 94/12/EEC, 96/69/EC, 97/24/EC, 93/12/EEC and 98/70/EC. (d) Ammonia Emissions from stables and storage & handling of animal manure (liquid and solid) are regulated by TA Luft. Land spreading is regulated in the Ordinance on principles of good professional practice in the use of fertilisers (Use of Fertilisers Ordinance).

Hungary
The Governmental Decree 21/2001.(II.14.) Korm. required the designation of agglomerations and zones of the territory of the country in compliance with relevant EU Directives. The Ministerial Decree 4/2002.(X.7.) KvVM comprised these agglomerations and zones on the basis of air quality assessments carried out by the 12 competent environmental authorities. The main emitting sources in each of these territorial units were determined and the necessary emission reduction measures were identified to obtain or ensure the required level of ambient air quality. The national strategy formulated in 2004 on air quality was comprised on this basis addressing emissions of stationery sources, transport and the residential sector. The target pollutants of the Gothenburg Protocol (SO2, NOx, VOCs and NH3) were dealt with separately.

Liechtenstein

Lithuania
The National Sustainable Development Strategy (approved by the Government in 2003) is one of the key instruments governing sustainable development of Lithuania's economy, environmental protection and social policy. Minimization of the impact from the main sectors (transport, industry, energy, agriculture, housing and tourism) on the environment is one of the priorities of the Strategy. The objectives of the Strategy in the air sector are to improve air quality management system, in order to ensure air quality corresponding to EU requirements in the whole territory of the country and to achieve twice as slow increase of amounts of pollutant and greenhouse gas emissions into the air than increase in production and services (until 2020). Different measures concerning fuel production and quality, and its control system improvement, the promotion of alternative and ecological fuel consumption, stricter regulations for pollution norms, strengthening of transport technical maintenance, optimizing the traffic in cities, and improvement of roads are in conformity with the goals of reducing transport impact on the environment. Long-term objectives in the industry sector are to direct the development of industrial sector to advanced and environment friendly technologies, to increase not only economic but also ecological efficiency of enterprises, to save resources and minimise negative impact on the
environment, as well as their implementation measures are also laid in the National Sustainable Development Strategy. Measures and activities for the reduction of air pollution are projected in national programs, the strategies of certain economy branches. The new National Energy Strategy (approved 18-01-2007 by the Resolution No X-1046 of the Parliament) defines the main targets set by the State and directions for their implementation until 2025 by fully adjusting these targets and directions to growing state needs and the most recent international requirements, having regard to the aspects of efficiency, energy security, environmental and management improvement. The National Energy Efficiency Programme for 2006-2010 (approved 11-05-2006 by the Resolution No 443 of the Government) formulates basic strategic goals and measures which are directly connected with saving of energy, its more effective use, and expansion and promotion of alternative energy consumption in the following sectors: buildings and their engineering systems, cogeneration, district heating, equipment in enterprises, establishments and households, transport, as well as indigenous, renewable and waste energy resources. Measures for reduction of pollution of environment from transport sector is regulated the Long Term Development Strategy of the State (approved 12-11-2002 by the Resolution No IX-1187 of the Parliament), the General Plan of the Territory of the Republic of Lithuania (approved 29-10-2002 by the Resolution No IX-1154 of the Parliament; amended 12-10-2006), the Long-Term Economic Development Strategy of Lithuania until 2015 (approved 12-06-2002 by the Regulation No 853 of the Government). The National Emission Management (Reduction) Programme till 2010 (approved 31-01-2008 by the Order No D1-89 of the Minister of Environment) sets measures to ensure that emissions of pollutants (SO2, NOx, VOC and NH3) in 2010 would meet the limits set in the national and international (Gothenburg Protocol, EU directives) legislation.

**Monaco**

**Netherlands**

The Dutch acidification abatement policy dates back to the 60s. Up to 1979 the focus was on legislation on S-content in fuels and measures in licenses of industrial plants. In 1979 a comprehensive strategy was adopted with national emission ceilings for SO2, NOx, VOCs and Ammonia. As early as 1984 the Netherlands applied as a strategy the ‘two track approach’, with both an effects based (deposition loads) overall target and mission ceilings. This strategy was followed by air quality standards (1986), legislation for combustion plants (Decrees on emission standards for combustion plants (BEES A and B), 1987) and critical deposition loads (after using preliminary ones since ’83; these were introduced in 1989/90 in the first National Environmental Policy Plan (1989) & the Acidification Abatement Plan). In these plans national ceilings are established as well as the contribution of the individual target groups to these ceilings. Policies were further intensified in following National Environmental Policy plans (NMPs 1993, 1998 and 2001). International and European targets for 2010 were set in respectively the Gothenburg Protocol and the National Emission Ceiling Directive (NEC, 2001/81/EC). The Netherlands set more stringent targets for 2010 in NMP4 (2001). With the implementation Memorandum ‘emission ceilings acidification and continental air pollution 2003’ (Erop of Eronder, 2003) the Government has actualised the national emissions targets for SO2, NOx, NH3 and NMVOC for meeting the targets of the Gothenburg Protocol and the NEC Directive. In this Memorandum the Government newly divided the emissions ceilings into separate targets for each sector: Refineries, Energy, Basic Metal and other industry, Chemical industry and Other. If a sector target
appears not to be met, additional measures for that sector would be necessary or if that would not be possible the target of another sector could be adjusted. An overview of the emission ceilings for 2010 as set in respectively the Gothenburg Protocol and the NEC is given in Annex 39a to this question. A sectoral overview of the emission ceilings for 2010 as set in ‘Erop of Eronder’ is given in Annex 39b to this question. SO2 emissions dropped 65% over 1980-1993 (and further decreased afterwards), mainly achieved by licensing and legislation gradually strengthened over time. In environmental policies up to 1993 health issues more or less had been tackled, but critical loads for acidification were still not within reach. Due to further intensifications in the National Environmental Policy plans (NMPs 1993, 1998 and 2001) emissions in 2000 dropped further to about 80% reduction compared to 1980. Specific strategies to meet the targets of the Gothenburg Protocol and the NEC Directive are agreements negotiated with the major emitters of SO2 (i.e. the refineries and the energy power plants, especially the coal fired plants) to reduce the emissions of SO2 to an agreed maximum. These agreements are made with the industrial sectors and are not used for licensing the individual installations. NOx NOx policy is mainly driven by national environmental policy, EU legislation and to some extent by traffic & transport plans. Implemented measures aimed at fuel switch, low NOx technologies, increased energy efficiency, renewable energy use (f.e. by covenants, fiscal incentives and subsidies), etc. As result of the environmental policy a NOx emission reduction of more than 35% has been realized over the period from 1980 to 2004. Measures are e.g. general binding rules for combustion plants and nitric acid plants (both since 1987), mobile sources (since 1973) and waste incineration plants (since 1993). Permits for stationary sources may include additional measures. This is especially the case when an installation is covered by the IPPC directive, because BAT based emission limit values shall be prescribed. Energy policy and traffic control measures, also add to the gradual reduction of NOx. Another measure for additional reduction in industry and power sector is the NOx emission trading system which started in July 2005. This trading system is based on performance standard rates (PSRs). For combustion processes the performance standard rate will be reduced from 68 g/GJ in 2005 to 40 g/GJ in 2010. For certain specified processes PSRs are defined per sector (in g/tonne product) and decreasing annually until 2010. VOCs The national policy in respect of reduction of emissions of volatile organic compounds (VOCs) has been defined by the Covenant on Hydrocarbon (KWS 2000) in the period 1988-2000. This project played a key role in the granting of permits. KWS 2000 ended in 2000, achieving 50% reduction in stationary sources as compared to 1981. To follow up KWS 2000, businesses and government developed a National VOC Reduction Plan (NRP-VOC). This plan is part of the Implementation Memorandum emission ceilings acidification and continental air pollution (Erop of eronder, 2003). For the sector Traffic there is a separate plan (The Traffic Emission Policy Document, 2004). In April 2005 the NRP-VOC was formally adopted. Furthermore a project group was established. The main task of this project group is to guard the progress of the implementation of the measures of the National VOC Reduction Plan. With the NRP-VOC a reduction of 30% according to the emission in 2000 is targeted in 2010. NH3 In 1997 the agricultural sector emitted 176 kton (94 % of the total ammonia emission). To meet the national emission ceiling target for ammonia in 2010 the Netherlands focuses on the agricultural sector. The Regulation on Ammonia and Animal Husbandry (Besluit ammoniakemissie huisvesting veehouderijen, Bahv) prescribes emission limit values. Only housing systems with an emission value ≤ ELV as set in the Regulation may be used. This Regulation did not yet enter into force. Till this happens the competent authority must decide on compliance with the ALARA principle of the Environmental Protection Act. Furthermore, in cooperation with VROM, the Dutch Ministry of Agriculture, Nature and Food Quality (LNV) carries out the Programme Combined Air Cleaning System (PGL),
which aims at the reduction of ammonia, particulate matter and odour emissions from intensive livestock farming. PGL stimulates the introduction and development of combined air cleaning systems by means of research, workshops and investment measures. Combined air cleaning systems are important to the intensive livestock farming for reaching European standards for fine particulates, the national emission ceilings for ammonia (National Emission Ceiling-NEC) and the reduction of odour emissions in rural areas. Ammonia emission is an important aspect for granting an environmental permit to an animal husbandry. The Dutch Decree on Ammonia and Livestock Breeding (Regeling Ammoniak en Veehouderij, Rav) provides emission factors needed for the calculation of ammonia emitted from animal housing systems belonging to animal husbandries. Per animal category the Rav contains a list of specific animal housings systems with corresponding emission factors. This year VROM will evaluate the extent to which the dairy farming sector has lowered ammonia emissions from farms using voluntary measures. Depending on the results of this evaluation, the Dutch government will assess the need to extend the working of the Dutch Animal Housing regulations so that measures to reduce ammonia emissions become compulsory for dairy farms. Annex 39c, gives an overview of the Programme BO-05-005 Gaseous Emissions related research activities.

Norway

The Pollution Control Act of 1981 and the Product Control Act of 1976 constitute the basic elements in Norway’s policy to control and reduce pollution, including pollutant emissions to air. 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 relevant to the implementation of the obligations under the Protocol are laid down by the Regulations relating to Pollution Control (the Pollution Regulation) of 2004. Regulations pursuant to the Product Control Act relevant to the implementation of the obligations under the Protocol are laid down by the Regulations relating to restrictions on the manufacture, import, export, sale and use of chemicals and other products hazardous to health and the environment (Product Regulations) of 2007. Emissions of NOx and VOC from vehicles and ships as well as emissions of ammonia from agriculture are regulated by special laws and regulations. Norway also makes use of economic incentives in order to reduce pollutant emissions to air. 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. Agriculture generates nearly 90 per cent of Norway’s emissions of ammonia. The main sources of ammonia emissions are livestock manure, the use of commercial fertilizer and treatment of straw with ammonia. Protocol obligations related to emissions of ammonia from agriculture are mainly implemented through relevant provisions of the Regulation regarding fertilizers etc of organic origin of 2003, the Regulation on trade of fertilizers and lime products of 2003 and the Act for regulation of pig-, egg- and poultry production of 2004. For more detailed information on Norway’s national programmes, policies and strategies to implement the obligations under the Protocol please see answers to questions 2 (NOx) 7 (VOC) and 13 (sulphur).
Portugal

The Decree-Law n°193/2003, 22nd August, that transposes to national law Directive 2001/81/EC on national emission ceilings (NEC Directive) establishes the need of developing a National Programme to reduce the emissions of SO2, NOx, VOCNM and NH3. The National Emission Ceiling Programme (Plano Tectos Nacionais de Emissão – PTEN) defines the national strategy for compliance with the national emission ceilings (NEC) for SO2, NOx, NMVOC and NH3 for 2010 as established by the NEC Directive. These NEC are: 160 kt for SO2; 250 kt for NOx; 180 kt for NMVOC and 90 kt for NH3. PTEN was updated during 2006 and the current version replaced the version of May 2004. This update was necessary due to the on-going revision of the NEC directive, and mainly due to the update in national projections for 2010 regarding economic growth, energy demand, waste management and agricultural activities. These updated activity rates were considered in the most recent version of the National Climate Change Programme (PNAC 2006). PTEN and PNAC use the same activity rates to the extent possible to ensure national coherence. Some methodological changes were also made. In particular, the approach to estimate SO2 emissions was changed from mass/GJ emission factors to % of sulphur content to guarantee better harmonization with the National Emission Inventories estimates. It is foreseen that the NEC will be complied for SO2 (133 kt SO2 in 2010 i.e. 27 kt below the ceiling); NOx (242 kt NOx in 2010 i.e 8 kt below the ceiling), and NH3 (69 kt NH3 i.e. 21 kt below the ceiling). It is expected that in 2010 the VOC will be of 194 kt (14 kt, i.e. 8% above the ceiling). The existing policies and measures (P&M) will significantly contribute for the compliance with NEC. In 2010 it is expected a reduction of 189 kt SO2 (mainly due to the reduction in S content in fuel), 5 kt NOx (due to the Large Combustion Plants Directive), 0.1 kt NH3 (due to the Biofuels Directive), and 49 kt VOC (due to the implementation of a series of P&M in almost all economic sectors). Once the emission ceilings established under NEC Directive for Portugal are more stringent than those in Gothenburg Protocol, this studies allows also the evaluation of the compliance under this Protocol ratified by Portugal in 2005 and according with the projections of emissions for 2010 the ceilings will be met. In what concerns the strategies and policies adopted in Portugal regarding the obligations under article 3 of the Protocol it is important to mentioned, all the work developed regarding the: a)Review of the national atmospheric emission legislation, with a larger scope and that establishes the rules concerning the application of emission limit values (ELV), the obligation of monitoring emissions by operators and stack constructive aspects; b)The implementation of Directive 1999/13/EC on VOC (transposed by Decree-Law n.° 242/2001, from 31st August) that foresees the possibility of reduction plans for units using solvents to achieve the same results as if ELVs were applied to that units; c)The implementation of Directive 2001/80/CE on the emissions of Large Combustion Plants modifying Directive 88/609/CEE and transposed to national law by Decree-law 178/2003, August 5th. In this aim a National Emission Reduction Plan was developed for the existing installations. The goal of this Plan is to achieve the same level of emission reduction of SO2, NOx and particles as if the emission limit values set by the Directive were applied to the same installations. The Plan goes into effect in 1st January 2008 and it embraces 8 industrial units of the electric production, petroleum refining, pulp and paper and petrochemical sector which will be forced to reduce its emissions of the referred pollutants. It is also relevant to mention the Directive 96/61/EC (IPPC Directive) transposed to the national law by DL n° 194/2000, which obliged most of the important industrial units to obtain their environmental permit. In this permit these units have to give evidence of the compliance of all environmental national legislation, and the implementation of the best available techniques, in order to fulfil the EAV defined in the reference documents (BREF documents), which in most cases are much more restrict then national
law. In this context, it is expected that these particular group of units will have a better performance, in what concerns atmospheric emissions, then would result from the full compliance of the national law.

**Romania**

Official Journal no. 15/2007); — Joint Ministerial Order nr.241/196/2005 for the approval of the list containing the localities by counties where there are sources of nitrates from agricultural activities and of the list containing the localities from the basin/hydrographical spaces where there are sources of nitrates from the agricultural activities; — Ministerial Order nr.1072/2003 regarding the monitoring system of the surface water and groundwater from the agricultural sources (Romanian Official Journal no.71/2004); — Government Decision no. 689/2004 on establishing of the requirements for marketing of petrol and diesel fuels(Romanian Official Journal no. 442/ 2004), with further amendments (GD no. 15/2006) (Romanian Official Journal no. 34/2006); — Government Decision no. 332/2007 relating to measures against the emission of gaseous and particulate pollutants from internal combustion engines to be installed in non-road mobile machinery ( Romanian Official Journal no 472/2007).

Slovakia
Ministry of the Environment of Slovakia worked out the National Environment Policy in 1993. The National Environment Policy sets short-term, medium-term and long-term objectives for environment policy of Slovakia. There are set as well requirements for air protection – reduction of emissions of air pollutants (SO2, NOx, CO, PM), volatile organic compounds, persistent organic pollutants, heavy metals, CO2. The requirements for achievement of objectives are introduced in the first National environment action plan (NEAP I) and in the second National environment action plan (NEAP II). The objectives of the National Environment Policy are reached through several pieces of Slovak legislation: The Ministerial Decree No. 706/2002 sets emission limit values for sulphur emissions and NOx emissions. The Ministerial Decree No. 409/2003 sets emission limit values for VOCs emissions. The Ministerial Decree No. 704/2002 establishes technical requirements for and general operating conditions of installations used for storage, loading and transport of petrol. The Ministerial Decree No. 53/2004 sets the emission limit values for sulphur content of gas oil. The Ministerial Decree No. 133/2006 establishes requirements to reduce VOC emissions from using organic solvents in the controlled products (e.g. labelling of products specifying their VOC content).

Slovenia
National Environmental Action Plan (NEAP) 2005-2012 (OJ RS, No. 2/2006) was adopted by the National Assembly at the end of 2005. It is a continuation of the environmental policy focused on the implementation of legislation. Policy general principles and strategic orientation comprise: support of effective implementation of the adopted legislation, integration of environmental issues in spatial planning and in sectoral policies, promotion of environmental technologies and sustainable production, consumption and use of natural resources, promotion of environmental economic policy (including green public finances), rehabilitation of degraded areas and others. Air quality issues are addressed under NEAP priority quality of life. The programme’s first priority is to reduce greenhouse gas emissions, which will, by reducing use of fossil fuels, indirectly contribute to significant emission reductions of air pollutants. NEAP envisages finances from the national budget for modernization of ambient air quality monitoring and for action programmes for improving air quality, while emission reductions from stationary sources are carried out by plants owners and operators (most of large combustion plants are operated by state owned companies). NEAP also envisages specific action plans and measures. The following are relevant for air quality management: (i) Action programmes for improving air quality to achieve ambient air
quality limit values; address SO2 and PM10/2.5 in polluted areas (in preparation); (ii) Operational programme for complying with national emission ceilings for atmospheric pollutants - Revision on Operational programme for complying with national emission ceilings for pollutants from 2005 (adopted by the Government in January 2007); includes policy and measures for reducing emissions of SO2, NOx, VOCs, NH3, and PM10/2.5 – related to Directive 2001/81/EC on national emission ceilings for certain atmospheric pollutants and the 1999 Gothenburg protocol; (iii) Operational programme for reducing atmospheric emissions from large combustion plants (adopted by the Government in February 2006); includes measures for the Slovenian large combustion plants (over 50 MW) to achieve emission limitations of SO2, NOx, CO and PM for the period 2004-2020.

Spain

The most important step taken by Spain in the last times is the approval of the new Act of Air Quality and Atmospheric Protection (Law 34/2007, Official Gazette 16/11/2007), which is a new basic act, adapted to the actual legislative and administrative organization in Spain (the old Act dated of 1972) and which is inspired by the principles, approaches and guidelines of the European environmental and atmospheric politics. In the near future, this new act will be developed via some new Royal Decrees, one of them regulating the emission values of some pollutants (among which, the four in the Gothenburg Protocol) from all potentially pollutant installations. Besides, Spanish Strategy of Air Quality, approved by the Council of Ministers, 16 February 2007, proposes some measures to reduce emissions of the Gothenburg Protocol pollutants, such as the updating of the legislative framework; the strengthening of the management instruments; the implementation of Plans and Programmes; the implementation and strengthening of the cooperation instruments; and the promotion of research. As regards policies already into force, according to the Directive 2001/81/EC (NEC Directive), the second National Programme for Reduction on Emissions was approved by the Spanish Council of Ministers on 7 December 2007 (Official Gazette 29/01/2008). It contains some measures derived from international and EU initiatives and other ones developed by the national, regional or local administration. The complete list of policies and measures can be seen in Annex 1.1, and they are divided into “International and European Union legislation, other measures derived from this legislation”, “National policies and legislative measurements” and “Politics pending of quantification”. For the two first categories, a distinction of their possible effects on every pollutant (SO2, NOx, VOC and NH3) is included. These listed measures are the most relevant in the national level and other are targeted to specific sectors, such as the Strategy for Energetic Saving and Efficiency in Spain 2004-2012 (E4) or the Renewable Energies Plan 2005-2010 (see, for the two latter, the Questionnaire 2006). Other actions are taken by regional and local authorities in sectors such as public transportation, housing and energy (saving and efficiency and renewables). The effects of this second National Programme for Reduction on Emissions on NOx, VOC and SO2 can be seen in questions 2, 7 and 13, respectively. With respect to NH3, it predicts, for the measures included in the base scenario, the effects depicted in the fourth figure in Annex 1.2. Also, to comply with the commitments under the Directive 2001/80/EC (LCP Directive), put into Spanish legislation by Royal Decree 430/2004 (Official Gazette 20/03/2004), the Spanish Council of Ministers sanctioned the National Plan on Emissions Reductions in existing Large Combustion Plants (Official Gazette 28/01/2008). It foresees a reduction of 15% in NOx emissions in 2015 with respect to those of 2001; and a reduction of 81% in SO2 emissions in 2015 with respect to those of 2001. Finally, the Spanish Strategy for Climatic Change and Clean Energy was approved by the Council of Ministers in 20 July 2007, with 198 measures and 75 indicators to follow their
impact. The Strategy is accompanied by an Urgent Measures Plan, with the following actions: The Action Plan of the Strategy for Energetic Saving and Efficiency in Spain (2008-2012), focused in seven sectors: industry, transportation, building construction, public services, residential and office equipment, agriculture and energy transformation. Measures for the sector of transportation, with an increase in the use of biofuels. Measures in the residential sector, such as the Programme for Energetic Saving and Efficiency in buildings of the National General Administration. Measures in the sector of energy, such as the increase of the wind energy production. Measures in other sectors: for instance, agriculture with slurries biodigestion or reduction in the use of nitrogenated fertilizers.

**Sweden**

Swedish response The National emission abatement strategy for air pollutant emissions is a part of the general environment policy. It goes under several of the 16 Environmental Objectives, primarily these: Clean air, Natural acidification only, Zero eutrophication. Complementing the ceiling values in the protocols, there are additional targets for the national emission control activities. For example, for acidifications, a percentages of lakes which have to be saved. There are targets for particulates, nitrogen to air, etc. For reaching these goals measures in transport, industry, energy and agriculture sectors are requested. In addition to all internationally agreed emission limits on products and installations, fiscal, taxation and charging systems are in operation. Emission performance is summoned and assessed yearly. A recent review of the Environmental Objectives (done on a 4-year schedule) forecast attainment of the 2010 ceilings. In the current phase a review is taking place as preparations for a planned renewal of the environmental policy, with the 2020 framework. The strategy: a. The S-ceiling for 2010 is reached. Policy to reduce use of fossil fuels, and/or to reduce the content of sulphur in fuel. Among instruments in use: tax incentives on S-free motor fuels and S-tax on coal, peat and oil. b. The NOx-ceiling for 2010 is not yet attained. A NOx-charge on combustion plants was introduced in 1992. It has been changed a few times to include a larger share of the plants. Specific emissions from plants in the system reduced by more than 50%. The charged was recently raised (1 January 2008) in order to facilitate further NOx-control. By implementing the environmental law, strict emission standards are required for individual permits. As an EU-MS, Sweden apply all EU-regulations and directives on emissions from different sorts of motor vehicles mobile machinery, pleasure boats, ships and locomotives. c. The VOC-ceiling for 2010 is going to be reached. As an EU-MS, Sweden apply all EU-regulations and directives, for VOC there is a separate one (1999/13/EC), and all relevant in motor vehicles and engines. Nationally, rules apply on small scale heating and wood burning, together with regulations on VOC emissions from petrol depots, distribution and dispensing. d. NH3-Goal: -15% in 2010 from 1995. The NH3-ceiling for 2010 (-7%) is going to be reached. Ammonia control measures apply mainly in agriculture (85% of emissions), to handle eutrophication. e. POP. For the compounds in ANNEX I and II to the protocol, Sweden has a strategy for phasing out POPs; they should not be produced, treated, placed on the market, used or reused. Export and import will be prohibited. The EU-Reg. 2455/92/EEC on export and import of certain dangerous chemicals apply in Sweden as well as EU-Reg. 850/2004/EC on POPs. For PAHs and dioxins/furans (ANNEX III), Sweden has a BAT-strategy which says that emissions should be reduced as much as is technical possible. Particulate emissions are bound to go down from mobile sources when new stringent limits are being phased-in coming decade. Stockpiles of POPs have to be dealt with in an environmental safe manner. f. HM. Sweden is implementing an environmental legislation which is based on the application of best available technology (BAT) for new and existing stationary sources e.g., iron and steal
production, sinter plants, non ferrous smelters, utility and industrial boilers and waste incineration plants. This means also implementation of the EU IPPC directive. Sweden has implemented a chemicals act (parliamentary law) which inter alia, for phasing out of Cd, Hg and Pb. g. References. Swedish Environmental Policy, bill 2004/05:150. (In English.) Environmental Objective Reviews 2007. (With summaries in English.)

Switzerland
In 1986, the Swiss Government adopted its air pollution control strategy concerning SO2, NOx and NMVOC. In 1989, a strategy was adopted to abate ozone excessive concentrations with target to reduce precursors emissions (NOx and NMVOC) by 70 to 80% versus their maximal levels. The 1983 Federal Law relating to the Protection of the Environment and its implementing ordinances, in particular the 1986 Ordinance on the Air Pollution Control (OAPC) with amendments in 1992, 1998, 2005 and 2007 established the regulation for stationary sources based on emission limit values, as well as fuel quality regulation. As regards pollution caused by motor vehicles, emission standards (similar to EURO norms) are laid down in the Ordinances relating to the Laws on Road Transport, Navigation and Aviation. a) Concerning SO2: the target is to bring the emissions to 1950 levels (i.e. a 60% reduction compared to 1980 levels, its maximum achieved level). The Ordinance of 1997 on the Incentive Tax on “Extra Light” Heating Oil provide also a legal framework to implement this strategy. b) Concerning NOx: the minimum target is to reduce emissions to 1960 levels (i.e. a reduction of 64% compared to 1985, its maximum achieved level); c) Concerning VOC: the minimum target is to bring VOC emissions down to 1960 levels (i.e. a 55% reduction compared to 1985 levels, its maximum achieved level). The incentive tax on VOC emissions from solvent use which has been levied since January 2000 provide an important contribution on legal framework to implement this strategy. d) Concerning NH3: in 1999 the Government has set an emission reduction goal for ammonia, i.e. to reduce emissions by 40 – 50% compared with the emission level achieved in 1995 (report 99.077 to the Swiss Parliament)

United Kingdom
Please cross refer to Question 2 for Sulphur, Question 7 for NOx and Question 13 for VOCs. Current controls on ammonia are primarily through IPPC which, through a permitting process, controls emission to air, water and land from a range of industrial sources, including fertiliser production, intensive indoor rearing of pigs and poultry (although these cover only a small proportion of total ammonia emissions). Permit conditions require the use of BAT in relation to all significant emissions (which, for intensive livestock rearing, includes ammonia). There is also a number of current, and forthcoming, policy levers and controls which will and do have impacts on ammonia losses in the UK. Of most significance are: Common Agricultural Policy reform, where production is now decoupled from subsidies; the review and likely tightening of the action programme under the EC Nitrates Directive; and the Catchment Sensitive Farming programme, which is driven by EC Water Framework Directive objectives. The UK has commissioned work to try and assess the effects of these levers and controls on ammonia projections.

United States
The Unites States has a very strong, structured, and rigorous regulatory program under the Clean Air Act to significantly reduce emissions of NOx, sulfur, VOCs and other pollutants.
The EPA has established national ambient air quality standards for several pollutants, including SO2, NO2, particulate matter and ozone. In 1997, EPA revised and further strengthened the standards for ozone and particulate matter and most recently, in March of 2008, EPA reviewed and further strengthened the 8-hour ozone standard. Under the Clean Air Act, state and local governments must implement programs to reduce these pollutants by specific deadlines. Failure to take steps to do so can result in sanctions and, potentially, imposition of federal controls to achieve the required emission reductions. To help achieve these air quality standards, EPA has issued a series of national regulations over the past 20 years that have resulted in significantly lower emissions of VOCs and NOx from light-duty vehicles, and NOx from heavy-duty vehicles. In addition, EPA has begun phasing-in control programs to reduce these emissions from non-road engines. It has also reduced sulfur in diesel fuels, and required cleaner gasoline, low in VOCs, in most urban areas in the country (Control of Air Pollution From New Motor Vehicles: Tier 2 Motor Vehicle Emissions Standards and Gasoline Sulfur Control Requirements, 40 CFR Parts 80, 85, 86; FR Vol. 65, No. 28, p. 6698). Several additional programs and regulations have been initiated or are currently being phased in to further reduce emissions of NOx, sulfur and VOCs from vehicles, locomotives, airplanes, recreational vehicles, and/or fuels (see http://epa.gov/nonroad/). 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. SO2 emissions are capped at a level that cannot be exceeded. 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). See Question 2 for more specific details on NOx. The table under Question 3 has more specific information on NOx controls for stationary source categories, Tables 2 and 3 attached at the end of this report have more specific information on controls for VOC and mobile sources and fuels, and Table 4 attached at the end of this report has information on Sulphur controls. The programs in place to control NOx have reduced NOx emissions 29% from 25 million tons in 1990 to 17.75 million tons in 2006; the trend will continue downward as additional programs are implemented such as CAIR and new mobile source regulations. In 2010, NOx emission reductions of 51% from 1990 levels are expected to result from the PEMA agreement between the U.S. and Canada to control transboundary emissions of NOx. The programs in place to control SO2 have reduced SO2 emissions 38% from 23 million tons in 1990 to 14.265 million tons in 2006; the trend will continue downward as additional programs are implemented such as CAIR and new mobile source regulations to control the sulphur content in fuels. In 2010, VOC emission reductions of 49% from 1990 levels are expected to result from the PEMA agreement between the U.S. and Canada to control transboundary emissions of VOCs. Provisions to control ammonia are not applicable in the U.S.
Question 59 With reference to article 3, paragraph 8 (a) and annex IX, paragraph 3, have you established, published and disseminated an advisory code on good agricultural practice to control ammonia emissions? If so, please provide details of its provisions, relevant to: (a) Nitrogen management, taking account of the whole nitrogen cycle; (b) Livestock feeding strategies; (c) Low-emission manure spreading techniques; (d) Low-emission manure storage systems; (e) Low-emission animal housing systems; (f) Possibilities for limiting ammonia emissions from the use of mineral fertilizers.

Bulgaria
"The Rules for good agricultural practice" are approved by the Ministry of Agriculture and Food Supply (MAFS) (Order No. RD-09-431/2005). "The Rules" are published and could be found on the MAFS’ web site. The rules establish multiple requirements intended to limit ammonia emissions into the water and into the air. The rules are mandatory for some regions and with a different level of binding force for others, depending mainly on the territory’s status regarding underground water. "The Rules for good agricultural practice" include general rules for fertilizing with nitrogen (N) containing fertilizers. They envisage, among others: - importing of fertilizers in parts, in order avoid emissions in the air and water; - special requirements for the soil’s condition for importing N fertilizers and manure in a soil; - prohibition against using N fertilizers on carbonate soils; - N fertilizers application in a soil is prohibited from 1st of November to 31st of January; - it is recommended not to import fertilizers on frozen soils, and at thickness of the snow cover above 6 cm; - after importing the ammonium fertilizers in a soil, the latter should be immediately dug up via different operations - cultivation, tilling, etc.; - prohibition for importing N fertilizers at high temperatures (above +8°C); - limitation on the maximum quantity of the fertilizer applied per decare; - application of the fertilizers in parts, etc. The measures listed help to evade emissions into the water (including by dissolving at melting), and in the air, as well. “The Rules for good agricultural practice” approved by the Ministry of agriculture and forestry include provisions on the issues listed in p. a to f above.

Canada
Canada is not a Party to this Protocol; responses are given on a voluntary basis and should not be used to assess Canada’s compliance with the Protocol.

Cyprus
Air Emission Permits have been issued to all IPPC pigeries and poultry farms. The permits include conditions on the promotion of nitrogen management taking account of the whole nitrogen cycle, alternative livestock feeding strategies, low emission manure spreading and storage as well as low emission animal housing systems. Furthermore the Department of Labour Inspection together with all other Departments and Associations involved, have developed a National Best Available Technique Document for pig farms based on the information included in the relevant BREF Document issued by the European IPPC Bureau in Seville, Spain. A similar National BREF Document has also been prepared for IPPC poultry farms. In particular, the above two Documents refer to feeding methods, housing of animals, storage of manure and slurry as well as ways of spreading them on land.
**Czech Republic**

The Czech Code of Good Agricultural Practice, which is applied in the elaboration of the Plans of guidelines of good agricultural practice, covers the following topics: 1) nitrogen management, taking into account the whole nitrogen cycle 2) feeding strategy of farm animals 3) low-emission systems of farm fertilizers incorporation 4) low-emission systems of farm fertilizers storage 5) low-emission systems of housing farm animals 6) decreasing ammonia emissions from mineral fertilizers. The Code refers to the Czech translation of the Reference document on best available techniques for intensive rearing of poultry and pigs (BREF ILF) as a source of information. In order to avoid possible difficulties with meeting the requirements of the Gothenburg Protocol, with reference to Article 3.8 a) and Annex IX, para 3., a new publication will appear in the first half of 2008 based on the translation of “GUIDANCE DOCUMENT ON CONTROL TECHNIQUES FOR PREVENTING AND ABATING EMISSIONS OF AMMONIA“ (ECE/EB.AIR/WG.5/2007/13), which already refers to BREF (under point 7).

**Denmark**

In 2001 the Ministry of Agriculture and the Ministry of Environment published the Action Plan for Reducing Ammonia Volatilization from Agriculture. The action plan, which can be found at this web site [http://www.skovognatur.dk/Emne/Landbrug/Miljoe/](http://www.skovognatur.dk/Emne/Landbrug/Miljoe/), comprises the following elements: 1) Optimization of manure handling in cattle, pig and poultry housing, 2) Optimization of manure handling in housing for fur animals, 3) Covers on stores of solid manure that are not in daily use, 4) Covers on slurry containers on livestock holdings, 5) A ban on surface spreading and a reduction in the time that applied manure is allowed to remain on the ground surface, 6) A ban on ammonia treatment of straw, and 7) Limiting local ammonia volatilization from livestock holding in the vicinity of vulnerable natural habitat types. The action Plan will reduce the emissions of ammonia by approx. 9,500 tons per year.

**Finland**

The code of good agricultural production (Ministry of Agriculture and Forestry 1993) includes ammonia abatement measures (see the measures below). In Finland, the Nitrates Directive (91/676/EEC 1991) is transposed to national legislation through the Environmental Protection Act (4th February 2000/86) and Government Decree No 931/2000 (9 November 2000) on reducing the release of nitrates from agricultural sources into water bodies. The provisions of the Government Decree apply to the whole national territory of Finland without regional or local differentiation. The Decree contains provisions and recommendations on good agricultural practices, storage of manure, spreading and allowable quantities of fertilizers and silage liquor and analysis and recording of nitrogen in fertilizers. Two of the provisions of the Government Decree No 931/2000 link directly on ammonia emission abatement: (1) manure or other organic fertilizer spread in autumn must be incorporated immediately or within 24 hours after spreading, and (2) manure stored in heaps on the fields must be covered with e.g. a tight cover or a with 10 cm of peat. In addition to the obligatory measures, the Decree includes voluntary measures on ammonia abatement which are in line with the code of good agricultural production including covering the manure storages, incorporating manure within 4 hours after spreading, favoring injection technique for slurry and urine when spread, or when not possible, using band spreader. Furthermore, manure application on warm, sunny and windy weather should be avoided, and
the local circumstances and timing should be taken into account when manure application is planned and realized to minimize the harmful effects in neighbourhood. (Government Decree No 931/2000, Ministry of Agriculture and Forestry 1993)

Germany

Storage and handling of liquid fertilizer is regulated by TA Luft 5.4.7.1 which refers to DIN 11622 and DIN 1045 for further specifications. Land spreading of fertilizers including animal manure is regulated by the Ordinance on principles of good professional practice in the use of fertilisers (Use of Fertilisers Ordinance – Düngeverordnung. Latest amendment 2007). One outcome of the demands in annex IX is the publication “Code of good practice to reduce ammonia emissions from agriculture” (aid-Heft 1454/2003, ISBN 978-3-8308-0341-6). In this publication different measures are described to reduce the ammonia emissions from the different emission sources (feed, manure management, animal housing systems and mineral fertilizers). (a) Nitrogen management, taking account of the whole nitrogen cycle: These are included in aid-Heft 1454/2003. The nitrogen cycle on the farm is discussed, describing the principles for increasing nitrogen efficiency of the farm. These principles include measures to minimize nitrogen (nitrate and ammonia) losses by assessing the nutrient demand in order to derive the application rate (paying special attention to grassland). The Ordinance on good agricultural practice in fertilizing (Düngeverordnung), which regulates the application of fertilizers including spreading of liquid and solid animal manure requires to establish whole farm nutrient balances (only surface balances, i.e. ammonia emissions into the air are neglected). The tolerable balance surplus thus calculated (i.e. excluding ammonia) has to be gradually lowered to 60 kg/ha by 2010. (b) Livestock feeding strategies: These are included in aid-Heft 1454/2003, covering principles of feeding, feed storage and preservation, dependence of nitrogen excretion on feeding and on the animals’ performance, and formulation of a feed which is balanced and whose nutritional composition matches the animals’ nutrient demand. (c) Low-emission manure spreading techniques: Chapter “Management of Manure” of aid-Heft 1454/2003 demonstrates principles for the low-emission spreading of manure. These include factors related to the timing of operations (selection of the time of spreading based on stage of growth and time of year; time of day for spreading; soil conditions; taking into account weather forecasts) as well as the specification of potential emission reductions by employing various spreading techniques and by immediately incorporating solid manure, respectively. With the latest amendment (2007) of the Ordinance on good agricultural practice in fertilizing (Düngeverordnung) more old-fashioned and environmentally unfavourable devices for land spreading of animal manure have been banned to reduce ammonia emissions. A phasing out period for existing equipment until 2015 was granted (transition period). Within the agri-environmental schemes (“Second pillar” of the common agricultural policy of the EU) the Federation and the Federal States give financial assistance for farmers purchasing or renting low emission fertilizing devices. (d) Low-emission manure storage systems: Chapter “Management of Manure” of aid-Heft 1454/2003 also informs on low-emission manure storage systems (specifying the potential for emission reductions of various alternatives for covering stores). (e) Low-emission animal housing systems: aid-Heft 1454/2003 describes general abatement measures for ammonia emissions from housing systems: cleanliness, residence time of excreta in the housing, housing climate and control of ventilation systems, functional areas). In addition, specific abatement measures are described and discussed for individual species: cattle (e.g. exercise yards), pigs (e.g. housing with outdoor climate), poultry (e.g. frequency of removal of the manure). In 2006, the “National Evaluation Framework for Livestock Farming Systems” (Nationaler Bewertungsrahmen
Tierhaltungsverfahren. KTBL 2006 ed.) has been published, basically by the same institutions. This very comprehensive publication (about 800 pp) evaluates 139 systems for the intensive rearing of cattle, pigs, poultry and horses in detail both from environmental point of view as well as under animal welfare aspects. Among others many possible measures to improve the environmental performance of intensive livestock farming including ammonia abatement are identified. The “National Evaluation Framework...” is regarded as a basic source of information for the competent bodies applying the IPPC-Guideline and the according national legislation on animal housing systems in Germany. (f) Possibilities for limiting ammonia emissions from the use of mineral fertilizers: aid-Heft 1454/2003 describes good agricultural practice for the use of mineral fertilizers in order to reduce emissions from this activity (bare soil: immediate incorporation of the fertilizer; arable land during the growing season: application under cool humid conditions; use of urease inhibitors).

Hungary

Governmental Decree 27/2006.(II.7.) Korm. on protection of waters against pollution caused by nitrates from agricultural sources is harmonized with the EU legislation 91/676/EEC Council Directive (Nitrates Directive). The Governmental Decree 27/2006.(II.7.) Korm. contains the main rules of the good agricultural practice - first of all the rules of fertilizing - and also contains the list of vulnerable zones for nitrates in which the farmers shall meet the requirements of the good agricultural practice during their agricultural activities. Agricultural support system is also based on the application of good agricultural practice.

Lithuania

Advisory Code of good agricultural practise was published in 2000 by the Ministry of Agriculture and the Ministry of Environment (second edition published in 2007 by the Ministry of Agriculture). The Code includes detailed provisions on nitrogen management (taking into account the whole nitrogen cycle), livestock feeding strategies, low-emission manure spreading techniques and systems, low-emission animal housing systems and possibilities for limiting ammonia emissions from the use of mineral fertilizers. Some of the provisions of Code of good agricultural practise are: - Livestock density corresponding to manure application - maximally 170 kg of nitrogen per year per hectare of utilised agricultural area; - Regulated use of organic fertilisers (manure, sewage sludge, compost, etc.). Organic fertilisers must not be spread from 1 December to 1 April on soil that are frozen, water saturated or are covered with snow; - Solid and liquid manure shall be incorporated into the soil within 12 hours after application; - Unevenness of spreading of manure and slurry cannot be more than 15 %; - Unevenness of spreading of mineral fertilisers cannot exceed ± 10 % of the established rate; - Animal density in a farm should not exceed 1.7 animal units per hectare of utilised agricultural land; - Place of construction of livestock-farm is selected according to sanitary, zooveterinarian, environmental and fire-prevention norm requirements; - The chosen animal keeping system has to ensure good animal health and high productivity, low expenditure of fodders, labour, low monetary costs, qualitative production and to protect environment from pollution with production wastes; - Animals should be fed only with valuable feed at officially determined feeding norms based on animals need; - In the farms having more than 10 animal units there shall be manure storage of sufficient capacity in order to reduce nutrient losses and preserve environmental; - Manure stores (on-ground, reservoir or lagoon type) shall have such capacity that would contain pig and poultry manure accumulated during 8 months, and the manure of cattle,
horses, sheep and other animals accumulated during 6 months; - Urine and slurry stores shall be covered or handled by a method that efficiently reduces ammonia emissions.

Monaco
Non. Sans objet, il n'existe pas d'exploitations agricoles sur le territoire monégasque.

Netherlands
There is a good agricultural practice code (Goede Landbouw Praktijk, GLP), last updated per 1-1-2006, approved by the EC, as part of the Dutch Rural Development Programme 2000 -2006. There are nine parts. The first is to comply with the Nitrate Decree, the second includes pesticides. Part 1-4 apply to agricultural producers and are part of the control of the GLP as part of the Rural Development Programme. The “Rules for good agricultural practice“ include provisions on: (a). Nitrogen management, taking account of the whole nitrogen cycle: This is regulated in the Good Farming Practice GFP (Beleidsregel normenkader randvoorwaarden Gemeenschappelijk Landbouwbeleid (GLB), Staatsblad 2006 No 148) approved by the EC, as part of the Dutch Country Development Programme 2000-2006 and in the decrees mentioned in the answer to question 60; (b). Livestock feeding strategies: For intensive poultry and pig rearing this is regulated in the BREF (Reference Documents on Best Available Techniques for Intensive Rearing of Pigs and Poultry, July 2003 (Pb EU 2003, C170). For cattle this is regulated in an arrangement with the cattle breeding industry, Letter on Fertilizer and Ammonia Policy (Brief mest- en ammoniakbeleid, Tweede Kamer, vergaderjaar 2002–2003, 24 445, No 65); (c). Low-emission manure spreading techniques: This is regulated as for provision (a); (d). Low-emission manure storage systems; This is regulated in: Decree on Environmental control of Manure Basins (Besluit mestbassins Milieubeheer), Staatsblad 1990 No 618, (last amended in 2006, Staatsblad 2006 No 661); (e). Low-emission animal housing systems: This is regulated in the Decree on Ammonia and Livestock Breeding (Regeling Ammoniak en Veehouderij), Staatsblad 2002, No 82, (last updated in 2007, Staatsblad 2007, No 92); (f). Possibilities for limiting ammonia emissions from the use of mineral fertilizers: See the answer to question 60.

Norway
After considering different options for implementing the provisions of annex IX, paragraph 3, Norwegian authorities have for the present concluded that the most effective way to publish and disseminate advice on good agricultural practice to control ammonia emissions, is to make use of general and well-established information channels. Relevant information on good agricultural practice regarding nitrogen management including storage and spreading techniques (cf. items a, c, d, e and f), taking into account specific national conditions, has been issued by research institutions and is brought to farmers through the Norwegian Agricultural Extension Service and the local and regional agricultural administration offices. Relevant livestock feeding strategies (cf. item b) are regarded implemented in Norwegian agriculture, and new knowledge is put into practice through a well established information system within the private advisory sector.

Romania
In order to ensure environmental protection and to control ammonia emissions were
elaborated and published the Ministerial Order no.1182/1271//2005 for the approval of the new Code for Good Agriculture Practices (Romanian Official Journal no. 1182/2006) and the Ministerial Order no. 1234/14.11.2006 (Romanian Official Journal no. 15/2007) for the approval of the Code for Good Practices in Farms, which include the provisions referring to correct use of the manure.

Slovakia
Paragraph 10 does not apply to Slovakia. In spite of this Slovakia has applied the code of good agriculture practice according to the Act No. 184/2002 on water protection. The code is published by the Ministry of Agriculture.

Slovenia
The first Slovenian Advisory Code on good agricultural practice was published and disseminated in 65000 copies in connection with the Rules concerning good agricultural practice and manuring (OJ RS, No. 130/2004). The Code was upgraded by the end of 2006; it includes all the provisions on ammonia control emissions as listed under (a)-(f) in question 59. Internet link to the latest Slovenian Advisory Code (in Slovenian language): http://www.kis.si/datoteke/File/kis/SLO/Publikacije/drugo/Kodeks_DKP.pdf Slovenia also developed Operationale programme for environmental protection with nitrates from agriculture use for years 2004-2008. Its basic goal is improvement of the water environment, by reducing emissions from dispersed sources (e.g. intensive agriculture, disperse settlement, with no sewage sludge pretreatment). Operational programme is focused on nitrate pollution input into the water from agriculture sources. The priority is effective agricultural practice, which provides special founded fertilization, sufficient capacities of storage of livestock manure, etc. National legislation also related to good agricultural practice to control ammonia emissions: Decree on the input of dangerous substances and plant nutrients into the soil (OJ RS, No. 68/1996, 35/2001, 2/2004, 29/2004, 41/2004); Decree on limit values, alert thresholds and critical levels of dangerous substances into the soil (OJ RS, No. 68/1996, 41/2004) and Regulation about cross compliance (OJ RS, No. 34/2007, 66/2007).

Spain
The General Direction of Livestock Breeding, in the Ministry of Agriculture, Fishing and Food (MAPA) has developed a Technological Development Programme on the assessment of technologies to reduce emissions from intensive livestock farming. As a result, three Guides on BATs have been published, one for the intensive rearing of pigs, another for laying hens and the last one for laying aviculture, as well as three brief advisory documents aimed to livestock owners and technicians. These guides can be found in the MAPA Web page (http://www.mapa.es/es/ganaderia/pags/IPPC/IPPC.htm#art2) and the Environmental Ministry Web page (http://www.eper-es.es/ver.asp?id=1044&Doc=1216&index=4). Besides, every Autonomous Region has its own Codes on Good Agricultural Practice for each agroclimatic area. For the specific points: a) In the Guides on BATs for the livestock farming, in Chapter I, point 1.5, environmental factors for the intensive livestock farming are included; and in Chapter II, processes and techniques related to the nitrogen cycle. b) BATs on livestock feeding techniques for pigs and poultry are included in Chapter IV, point 4.6.2 in the Guides on BATs. c) Manure spreading techniques are included in Chapter IV, point 4.6.6 in the Guides on BATs for the livestock farming. d) In Chapter IV, point 4.6.4 in the
Guides on BATs, experimental values of emissions in the storage of solid dung and slurry for different climatic conditions can be found. e) In Chapter IV, point 4.6.3 in the Guides on BATs, the effects that the design of animal housing and slurry management have on emissions can be found. f) In the Urgent Measures Plan of the Spanish Strategy for Climatic Change and Clean Energy (see Q. 39), the measure “Reduction in the use of nitrogenous fertilisers” is included; this measure has 4 actions: 1. Promotion of fertilizers for organic irrigation. This technique implies a more efficient use of fertilizers. 2. Training and information on teaming-up of fertilization. This year a guide on fertilization for most of the Spanish crops will be published and widely distributed. 3. Monitoring and regulation Programmes for the mechanical fertilizer distributors. 4. Help in the purchase of fertilizer distributors as a part of the Renove Plan for agricultural machinery (Royal Decree 228/2008, 15 February).

Sweden
Swe response: Applicable national regulations are an ordinance on environmental adaptation of agriculture (1998:915) together with authority regulations (SJVFS 1999:119 and 2006:66). An advisory code on good agricultural practice to control ammonia emissions has been published by the Swedish Board of Agriculture (“Good agricultural practice for limiting ammonia leakage”) - Jordbruksinformation 13 –2006). The publication is also available on the Board’s website www.sjv.se (in Swedish).

Switzerland
A Swiss code of good agricultural practice is currently under preparation according to the specifications of the international framework code. Meanwhile this framework code was translated into German language and the French and German versions were distributed to the Cantons being responsible for the implementation. Several guidance documents covering single elements of the code were already published to support the implementation by the local authorities. These recommendations cover low-emission manure storage systems and spreading techniques.

United Kingdom
There is currently no advisory code aimed specifically at controlling ammonia emissions. However, a public consultation process has been carried out on a revised Code of Good Agricultural Practice (CoGAP) and this will be published in 2008. The new Code will be widely available to farmer and land managers, both electronically and in print, and the ownership of a copy is compulsory for the participation in many industry assurance schemes. The Code also provides a basis for many Government initiatives, for which farmers are required to comply with the advice within. At present, there are 3 Code of Good Agricultural Practice (CoGAP), one is aimed at the protection of Air. These codes were produced by the Ministry of Agriculture, Fisheries and Food and the Welsh Office Agriculture Department and were last revised in 1998. They provide advice on best practice to minimise ammonia emissions from agriculture. These codes are currently being revised as described above, being combined into a single integrated Code, aimed at protecting air, soil and water resources. (a) Nitrogen management, taking account of the whole nitrogen cycle; The key recommendations with respect to Nitrogen management, taking account of the whole nitrogen cycle, are to: • Manage nitrogen efficiently by using the correct quantity required for plant nutrition. This will reduce losses, increase profitability fro the farmer and
protect the environment. • Pay particular attention to how manufactured nitrogen fertiliser and organic manure are applied and ensure that it is used at a time when it will be of maximum benefit to the crop. • Maintain green cover on the land for as much of the year as possible. • Match the nitrogen content of livestock feed to the particular requirements of the stock. To reduce the risk of both run-off and ammonia loss, when applying livestock manures to bare land or stubble: • farmers should incorporate slurry that has been broadcast (spread by splash plate) into the soil, if possible, immediately and at the latest within 6 hours. • farmers should incorporate solid manures into the soil as soon as possible and, at the latest, within 24 hours. In addition, the proposed Nitrates Directive Action Programme, which will apply across UK designated NVZs will include: • Organic manures with low available N (e.g. FYM) applied to bare soils or stubbles prior to crop planting or drilling must be incorporated into the soil as soon as possible and within 24 hours at the latest on all sloping land that is located within 50m of a surface water and which could receive run-off from that land. • Organic manures with high available N (e.g. poultry manure) applied to bare soils or stubbles by broadcast methods prior to crop planting or drilling, must be incorporated into the soil as soon as possible and within 24 hours at the latest. (b) Livestock feeding strategies; Some general advice on livestock feeding strategies is provided by the CoGAP: • 'You should match the nitrogen content of diets to the expected level of production and the particular growth stage of the stock. This will save you money and, by reducing the amount of nitrogen excreted, reduce the amount of ammonia being released. It may also make it easier for you to meet any restrictions on the quantity of manure that you can apply to your land.' (c) Low-emission manure spreading techniques; Advice in CoGAP is that 'If possible, to reduce odour and ammonia loss: • use a band spreader or injector to apply slurry. • otherwise, use broadcast equipment with a low trajectory and large droplets. • After cutting grass for silage, you should allow for some grass re-growth before applying slurry by band spreader as this will reduce ammonia and odour emissions. • On bare land and stubble, to reduce odour, ammonia loss and run-off risk: • if you broadcast slurry (by splash plate), you should incorporate it immediately, and at the latest within 6 hours. • if you apply solid manure, you should incorporate it as soon as possible, and at the latest within 24 hours.' (d) Low-emission manure storage systems; The advice given in CoGAP is to: • 'Consider using floating covers or roofs on slurry stores to reduce odour and ammonia emissions, as well as keeping direct rainfall out. Natural surface crusts on stored slurry will reduce odour and ammonia emissions.' • 'You should consider providing a roof to keep rainfall off the manure and minimise the volume of liquids produced. You can reduce odour and ammonia emissions from poultry manure by keeping it as dry as possible.' • 'Using narrow densely packed A-shaped heaps for poultry manure will shed rainwater more easily and prevent manure from becoming very wet. This will reduce odour and ammonia emissions. (e) Low-emission animal housing systems; No specific advice is given on Low-emission animal housing systems. However, more general advice is given: • 'Good management and a high standard of hygiene and cleanliness will reduce emissions of odour and ammonia from livestock buildings and from fouled open concrete yards.' • 'For bedded systems – use sufficient clean, dry bedding to keep animals clean. Dirty livestock increase emissions of odour and ammonia.' • 'Keep areas of open concrete used by livestock to the minimum, as these areas will be fouled by manure. Pipe or channel foul run-off rather than letting it flow across clean concrete. Keep soiled concrete areas free from any build-up of slurry or manure.' • 'Cattle buildings: • Scrape cubicle passages and other heavily soiled areas regularly, typically twice daily. • Dairy and parlour buildings need to be washed and cleaned frequently.' • 'Pig Buildings • Emissions are minimised if pens are kept clean. Dirty pens can result from poor management, poor ventilation and inadequate floor surfaces, as well as incorrect pen design and construction, and badly sited feeding and watering facilities.
Whenever possible you should clean non-bedded, concreted dunging areas every day.’ • ’You should maintain ventilation fans and check they are running at the correct airflow for the number and weight of animals or birds present. Poor ventilation can result in humid conditions that give rise to unpleasant odours, high concentrations of ammonia and poor conditions for animal health and welfare.’ • The advice highlights the need to follow Integrated Pollution Prevention and Control (IPPC) requirements: ♣ For pigs, in relation to IPPC ‘Larger pig units must comply with permit conditions set by the Environment Agency. These conditions are based on the Best Available Techniques (BAT) for avoiding or minimising all types of emissions, including from pig buildings.’ ♣ For poultry: ’You can reduce emissions from housing by keeping poultry manure in a dry condition.’ And the same statement is made with respect to IPPC and BAT as for pigs. ♣ Caged laying birds: Remove manure frequently from poultry houses with manure belt systems. Consider rapid air-drying of manure on the belts by using the warm air from the house ventilation system. For deep pit systems – consider rapid air-drying of manure below the cages. Keeping manure as dry as possible will reduce ammonia emissions. Prevent drinkers leaking and spilling water onto manure belts or into manure stores.’ (f) Possibilities for limiting ammonia emissions from the use of mineral fertilizers. Farmers are advised that: • 'ammonia can be lost from manufactured nitrogen fertilisers, especially when no rain falls soon after spreading any that contain urea. Up to 20% of the nitrogen content of urea may be lost to air. Such losses are more closely related to soil moisture and weather conditions than to soil type, and may be minimised if urea is applied shortly before rain is expected.'
**Question 60** With reference to article 3, paragraph 8 (a), and annex IX, paragraph 4, please provide details of the steps taken in your country to limit ammonia emissions from the use of solid fertilizers based on urea.

**Bulgaria**
The urea based fertilizers are used in Bulgarian agriculture. The general prescriptions for N fertilizers given by "The Rules for good agricultural practice" are applicable for them, too. The most important specific measures envisaged to limit ammonia emissions when using solid urea based fertilizers are:
- avoiding fertilizer’s application at temperatures, exceeding +8° C;
- avoiding application of urea based fertilizers on carbonate soils.

**Canada**
Canada is not a Party to this Protocol; responses are given on a voluntary basis and should not be used to assess Canada’s compliance with the Protocol.

**Cyprus**
To limit ammonia emissions from the use of solid fertilizers based on urea, several methods of fertilizer application are followed in Cyprus. These methods refer to combined irrigation/fertilization (fertigation), solid incorporation, surface application where necessary and leaf application.

**Czech Republic**
The amended Act No. 156/1998 Coll. on fertilizers, auxiliary soil agents, auxiliary plant preparations and substrata, and on agrochemical testing of agricultural lands (fertilizers act) proposes that all solid urea based fertilizers must be incorporated into the soil within 24 hours after the application to the surface of arable land, with effect from 1.1.2009.

**Denmark**
There is in Denmark no direct initiative taken to reduce the use of urea in solid fertilizer. However, the active environmental policy to reduce the ammonia emission has introduced a maximum nitrogen application rate to agricultural crops, requirements of fertilization budgets and minimum demands for utilization of nitrogen in manure – all measures which has forced the farmers to improve the nitrogen use in general. The use of urea has been reduced from 6.6 M kg N in 1985 to 0.6 M kg N in 2006, which in 2006 correspond to less than 1% of the total N in fertilizer.

**Finland**
According to the Finnish Food Safety Authority and the main supplier of the mineral fertilizers in Finland (Yara Ltd) the use of solid fertilizers based on urea is very rare in Finland and are mainly used in forestry. No special measures are applied to limit ammonia emissions from the urea-based fertilizers.

**Germany**
To reduce emission from solid fertilizers based on urea the following measures are described in the publication “aid-Heft 1454/2003” (see question 59): - Arable farmland: direct incorporation - Grassland: spread when the weather is cold and wet - Use of urease inhibitors

**Hungary**
The quality requirements of the fertilizers are regulated according to Ministerial Decree 36/2006. (V. 18.) FVM. This decree contains the rules of licensing, storing, distributing and application of the fertilizers. The distributing and application of the fertilizers can be accomplished only with the permission of the Plant and Soil Protection Service (national authority). No special measures are applied to limit ammonia emissions from the urea-based fertilizers.

**Lithuania**
Solid fertilizers based on urea are used according to fertilization programmes. These programmes have to be prepared in accordance with the provisions of the Environmental Protection Requirements for Management of Manure (14-07-2005 by the Order No D1-367/3D-342 of the Minister of Environment and the Minister of Agriculture).

**Monaco**
Il n'existe pas de réglementation spécifique en Principauté. Néanmoins, les produits utilisés provenant de l'Union Européenne, leurs caractériqtiques techniques en respectent la réglementation.

**Netherlands**
This is regulated in the Fertilizer Act (Meststoffenwet), Staatsblad 1986, No 620 (last amended in 2006, Staatsblad 2006 No 64) and the following decrees: • Quality and Use of Other Organic Fertilisers Decree (Besluit kwaliteit en gebruik overige organische meststoffen), Staatsblad 1998 No 86 (last amended in 2007, Staatsblad 2007 No 519); • Use of Fertilisers Decree (Besluit gebruik meststoffen, Wet bodembescherming), Staatsblad 1998 No 2 (last amended in 2007, Staatsblad 2007 No 519). Dutch farmers have to comply with maximum application standards for different types of fertiliser. There are three application standards: - for the total amount of animal manure; - total nitrogen application; - total phosphate application. The application standards include the use of solid fertilizers based on urea. There are no specific measures concerning solid fertilizers based on urea. However, this type of fertilizer is hardly used in the Netherlands.

**Norway**
Very small amounts solid fertilizer based on urea is used in Norway. The sales data are being followed closely, but at the moment there is no need for any special steps.

**Romania**
In order to limit ammonia emissions from the use of solid fertilizers based on urea, the scope
and manner of the use of fertilizers were specified in the: - Governmental Decision no.1261/2007 (Romanian Official Journal no. 733/30/10/2007) on establishing some measures for application of the (EC) Regulation no. 2.003/2003 on fertilizers; - Ministerial Order no 648/2006 on the licensing of the laboratory for the laboratory analysis for fertilizers marked and the licensing of the inspectors for activities control (Romanian Official Journal no. 842/2006); - Ministerial Order no. 6/22/2004 for the approval of the Regulation of the Interministerial Commission for licensing of the fertilizers in order to entry its in the licensing fertilizers list for the use and market it in Romania, with further amendments (Romanian Official Journal no. 662/2007).

**Slovakia**

Paragraph 10 does not apply to Slovakia. Liquid manure in a rather stiff form is not applied into soil as manure in Slovakia. There is a possibility to appear manure with a small additive of liquid manure in compound manure NPK.

**Slovenia**

The use of urea in Slovenia is very limited, comprising 15% of total N in mineral fertilizers. It is used mainly for fertilizing the maize during vegetation. It was estimated that in this particular and specific case its replacement would technically and economically not be feasible. For this reason, no further steps are foreseen to further limit its use.

**Spain**

Solid fertilizers based on urea must be in compliance with Regulation (EC) No 2003/2003 of the European Parliament and of the Council of 13 October 2003 relating to fertilisers. In its third adaptation to the Technical Progress, Annex I will include a urease inhibitor. Though there is no plan specific for these fertilizes, as they are nitrogenous fertilisers, they are included in the measure described in Q.59, point f).

**Sweden**

Swe response: Rules on precautions for the use of urea based fertilizers in order to reduce ammonia emissions is incorporated in regulations from the Swedish Board of Agriculture (SJVFS 2004:62).

**Switzerland**

The principal fertilizers used in Switzerland are based on farm manure and urea is used in restricted amount. In certain specific cases like for vegetables production, mineral fertilizers are applied.

**United Kingdom**

Advice in provided through COGAP: • 'Use of urea fertiliser: Ammonia can be lost from manufactured nitrogen fertilisers, especially when no rain falls soon after spreading any that contain urea. Up to 20% of the nitrogen content of urea may be lost to air. Such losses are more closely related to soil moisture and weather conditions than to soil type, and may be minimised if urea is applied shortly before rain is expected.’ In addition, as part of the England Catchment Sensitive Farming Delivery Initiative (ECSFDI), a supportive approach
is utilised to enable the agriculture industry to work in partnership with Government to deliver policy outcomes by changing farming practices to reduce diffuse water pollution from agriculture. The scheme operates in forty priority catchments covering about 40% of the agricultural area of England. As part of this scheme, farmers are encouraged to manage input of nutrients to land more effectively and efficiently to reduce losses to the environment. UK Government has also supported research and development which has shown that ammonium nitrate is the most suitable fertiliser for use under UK conditions. The outputs have been published and disseminated to the farming industry. According to the 2006 British Survey of Fertiliser Practice (BSFP), 5% of all fertilisers are applied in the form of urea. About 10% of straight nitrogen fertilisers are applied as urea. Ninety per cent of urea is applied between February and May. Only 9.4% is applied in June and July. It is likely that this late urea is applied as a foliar spray to boost grain N content in milling quality wheat’s, rates of N applied in this way are low, but potential for NH3 loss must be high.

United States
Not applicable to the United States.
**Question 61** With reference to article 3, paragraph 8 (a), and annex IX, paragraph 5, please indicate whether the use of ammonium carbonate fertilizers is prohibited in your country and specify the relevant legislation.

**Bulgaria**
The ammonium carbonate fertilizers are not listed in the Regulation for the content, packaging, labeling, sampling and analysis of fertilizers (Decree of CM No. 5/2003, SG 10/2003). This decree sets, among the other, the fertilizers content. The absence of the ammonium carbonate fertilizers in the list means that they are prohibited for use in Bulgaria.

**Canada**
Canada is not a Party to this Protocol; responses are given on a voluntary basis and should not be used to assess Canada’s compliance with the Protocol.

**Cyprus**
The use of ammonium carbonate fertilizers is prohibited in Cyprus according to the provisions of the EU Directive 2003/2003/EC.

**Czech Republic**
The Central Institute for Supervising and Testing in Agriculture (ÚKZÚZ), established by the Government of the Czech Republic, approves the use of any fertilizers for the application on arable land in the Czech Republic. This organization meets the requirements of the Gothenburg Protocol, concerning the ban of using the fertilizers based on ammonium carbonate, and therefore the permit for the application of these fertilizers cannot be issued. Only fertilizers registered and approved by ÚKZÚZ may be applied in the Czech Republic, any others are banned. The records of ÚKZÚZ say there was not a single requirement to approve (register) the fertilizer based on ammonium carbonate, as they are not used in the Czech Republic.

**Denmark**
Use of ammonium carbonate fertilizers is not directly prohibited in Denmark. Based on sales estimates from The Danish Plant Directory ammonium carbonate is not used as fertilizer in Denmark. The Danish farmers prefer ammonium nitrate fertilizer.

**Finland**
According to the Finnish Food Safety Authority ammonium carbonate fertilizers are neither used or produced in Finland. The use of ammonium carbonate fertilizers is not explicitly prohibited by legislation in Finland. The approach works the opposite way, i.e. for a fertilizer to be allowed for use must be authorised by the Finnish Food Safety Authority and to be enlisted into the register on the approved fertilizers kept by the Food Safety Authority. Only those fertilizers which are included in the national list kept by Food Safety Authority or fertilizers included in the list published under the EC Fertilizer Regulation (2003/2003) are eligible for importing, marketing or producing for markets.
Germany
Use of ammonium carbonate fertilizers is prohibited in Germany (Düngemittelverordnung – Ordinance on Fertilizers).

Hungary
The quality requirements of the fertilizers are regulated according to Ministerial Decree 36/2006. (V. 18.) FVM. This decree contains the rules of licensing, storing, distributing and application of the fertilizers. The distributing and application of the fertilizers can be accomplished only with the permission of the Plant and Soil Protection Service (national authority). The use of ammonium carbonate fertilizers is not prohibited by legislation in Hungary.

Lithuania
There are no legislation prohibiting the use of ammonium carbonate fertilizers.

Monaco
Il n'existe pas de réglementation spécifique, ni d'exploitations agricoles, en Principauté de Monaco. Néanmoins, les produits utilisés dans le cadre de l'entretien de jardins d'agrément proviennent de l'Union Européenne, leurs caractériqtiques techniques en respectent la réglementation.

Netherlands
Ammonium carbonate is not listed in appendix I from the Fertilisers Decree 1977 (Meststoffen beschikking) and use is therefore prohibited.

Norway
In accordance with section 10 c of the Regulation on trade of fertilizers and lime products of 2003 the use of ammonia carbonate is prohibited in Norway.

Romania
In Annex I of the Ministerial Order no. 6/22/2004 for the approval of the Regulation of the Interministerial Commission for licensing of the fertilizers in order to entry its in the licensing fertilizers list for the use and market it in Romania, with further amendments (Romanian Official Journal no. 662/2007) ammonium carbonate is not listed, in this case the fertilizers base on ammonium carbonate are not licentiate in Romania.

Slovakia
Paragraph 10 does not apply to Slovakia. Carbonate of ammonium does not occur as manure in Slovakia.

Slovenia
The use of ammonium carbonate is prohibited, according to the Mineral Fertilizers Act (OJ
Spain
The Royal Decree 824/2005, of 8 July 2005 (Official Gazette 171, of 19 July 2005), on fertilizing products states in article 5 that only those fertilizers included in Annex I of the Regulation (EC) No 2003/2003 or in Annex I of the Royal Decree 824/2005 can be used as manure or soil conditioner in agriculture and gardening. None of the Annexes includes ammonium carbonate fertilizers.

Sweden
Swe response: There is today no prohibition on the use of these fertilizers. There is a work going on to introduce a prohibition in the Swedish legislation. However, these fertilizers are not in use in Sweden today.

Switzerland
Ammonium carbonate is not used as fertilizer in Switzerland.

United Kingdom
There is no specific UK legislation banning the use of ammonium carbonate, however its use in the UK for agriculture is negligible. According to the 2006 British Survey of Fertiliser Practice, in Great Britain, 35% of fertiliser was applied in the form of ammonium nitrate, 0.4% of fertiliser was applied in the form of calcium ammonium nitrate, but there was no record of ammonium carbonate being used.

United States
Not applicable to the United States.
**Question 62** With reference to article 3, paragraph 8 (a), and annex IX, paragraph 6, please explain how your country ensures the use of the low-emission slurry application techniques listed in guidance document V (ECE/EB.AIR/WG.5/2007/13), taking into account local soil and geomorphological conditions, slurry type and farm structure.

**Bulgaria**
"The Rules for good agricultural practice" give detail prescriptions on the way of storage and application of fertilizers (including slurry) in order to avoid water and air pollution. A special chapter in “The Rules” is dedicated to the requirements which have to be respected with regard to N fertilizers. The prescriptions take into account many factors, including geomorphological conditions, slurry and farm type, as it might be seen in some of the answers to Q59.

**Canada**
Canada is not a Party to this Protocol; responses are given on a voluntary basis and should not be used to assess Canada’s compliance with the Protocol.

**Cyprus**
According to Air Emission Permits issued for IPPC piggeries and poultry farms, farmers are obliged to use low-emissions slurry application techniques such as band spreading or injection.

**Czech Republic**
In comparison with the previous evaluation the share of slurry application to arable land using low-emission systems has markedly increased in the Czech Republic. Mainly trailing hoses are used. In case of conventional broadcast application the slurry must be, pursuant to the request set by the Act on fertilizers, incorporated into the soil within 24 hours depending on local circumstances.

**Denmark**
During the last 20 years a number of measures have been implemented in manure handling to reduce the ammonia emission. The following actions can be mentioned in relation to manure application: - From 1986 - prohibition on spreading of manure from harvest until 1st February and spreading on frozen ground. - from 2003 - prohibition on broad spreading of manure - from 2002 - manure spread on bare soil must be ploughed down within 6 hours(1987: 12 hours) The consequences of these measures are a greater part of the slurry is incorporated directly in the soil. In 2006 approximately 30% of slurry is incorporated in soil. Furthermore, a requirement from 1 January 2007 has introduced regarding a maximum limit for additional emissions in vulnerable nature areas. From 2011, there will be a general requirement to inject liquid manure that is applied to bare-soiled farmland and grass fields. Until 2011, it is suggested that liquid manure should be injected when applied in particularly vulnerable areas.
Finland

Using of low-emission slurry application techniques is ensured in Finland by transposing the Nitrates Directive (91/676/EEC) to national legislation through the Environmental Act (2000/86) and Government Decree 931/2000, and the Sewage Sludge Directive (86/278/EEC) through the Government Decree 282/1994. These directives and the national implementing acts contain also provisions on low-emission slurry application techniques corresponding with those enlisted in the guidance document V. Moreover, low-emission slurry application techniques are part of cross-compliance in Finland which consists of statutory management requirements and requirements of good agricultural and environmental conditions. Statutory management requirements are pre-condition for farmers to receive direct support scheme under the Common Agriculture Policy.

Germany

According to § 3 Abs. 10 of the Ordinance on good agricultural practice in Fertilizing (Düngeverordnung) Slurry application techniques must be in accordance with the generally accepted rules of technique (allgemein anerkannte Regeln der Technik). Appendix 1 of this Ordinance lists techniques which are no longer allowed (transition periods for existing device is granted). This list (appendix) is extended in each amendment of the ordinance, thus gradually increasing the technological level in fertilizer application.

Hungary

Governmental Decree 50/2001. (IV. 3.) Korm. regulates the rules of using and treating of sewage and sewage sludge in agriculture. This degree is harmonized with the EU legislation (86/278/EEC Council directive), however it has stricter requirements in some points than the EU legislation. Sewage and sewage sludge can be used in the agriculture only with the permission of the national soil protection authority which regulates the quality and quantity of the sewage and sewage sludge spread to an area unit [acre]. Storing of the sewage sludge on the land is prohibited. Using of low-emission slurry application techniques is ensured also by Governmental Decree 27/2006.(II.7.) Korm. on protection of waters against pollution caused by nitrates from agricultural sources (harmonized with the EU legislation 91/676/EEC Council Directive).

Lithuania


Monaco

sans objet, il n'existe pas d'exploitations porcines sur le territoire monégasque.

Netherlands

The Use of Fertilizers Decree, 1997, prescribes the methods for use of slurry with low ammonia emissions according to the guidance document V: - low emission use of animal
manure on grassland: manure slurry is to be applied in or on the soil immediately, with the use of devices that lift or push away the grass just before application; - low emission use of animal manure on arable land: manure slurry is to be injected in slits in the soil and thereafter mixed with or ploughed in the soil in such a way that no manure visibly laying on the surface. Developments since January 1st 2008: in a single working process manure or slurry are being spread over the soil and ploughed under by one machine with the result that the used manure or slurry are either intensively mixed with the soil or entirely brought under the soil. Manure or slurry may not be visibly laying on the surface (Stb 2007, 519).

Norway
Due to the small scale of Norwegian agriculture and because of Norway’s hilly geography, the focus has been on putting water into the slurry before spreading and to incorporate the slurry into the ground where suitable. There has also been informed of the importance of timing in relation to weather conditions. Surface broadcast application is still the most used method. Taking into account local soil and geomorphological conditions, slurry type and farm structure, Norwegian authorities for the present consider that the measures taken fulfil the provisions of annex IX, paragraph 6. However, in 2008 a pilot project will be launched to carry out more environmentally friendly spreading techniques in 3 different live-stock districts in Norway. The aim of this project is to stimulate farmers to switch to low-emission slurry application techniques, like DGI (direct ground injection) and band-spreading/shallow injection methods. The farmers will also benefit economically if the slurry is immediately incorporated after spreading (meaning within 2 hours). If successful, the aim is to turn this project into a subsidy program to promote more environmentally friendly spreading techniques nationwide.

Romania
The Code for Good Agriculture Practices approved by Ministerial Order no.1182/1271//2005 (Romanian Official Journal no. 1182/2006) and the Code for Good Practices in Farms approved by Ministerial Order no. 1234/14.11.2006 (Romanian Official Journal no. 15/2007) include some provisions referring to slurry application techniques regarding the period and the application requirements which must be respected.

Slovakia
Paragraph 10 does not apply to Slovakia. Utilization of low-emission slurry application techniques has not been required yet, as it is applied on soil surface by dispersion with following ploughing into soil in 24 hours. In appropriate conditions of canalization the risk of ammoniac elusion is heavily reduced, for example within application on cut straw or silage.

Slovenia
Low-emission slurry application techniques that are listed in Guidance are recommended by the Slovenian Advisory Code of good agricultural practice. The Code has an advisory status, allowing farmers to take any measure into account as far as they consider it applicable. Generally, Category 1 techniques are not applicable. The exception is incorporating the slurry by the means of ploughing. The major limiting factors for other techniques (band spreading and injection) are the following: (i) farm size (6.5 ha and 5.9 livestock units per
farm on average), (ii) land fragmentation (only 12% of farmers have their land in one piece and more than 20% of farmers have their land in more than 10 pieces) and (iii) topography (shallow and stony soils; 72% of agricultural land lies in less favored areas). Special equipment is too expensive for small farmers and due to land fragmentation it is also not possible to organize a special service for slurry application. The most common technique for ammonia emissions control is Category 2, i.e. spreading in cool, humid conditions. This technique is used traditionally, passing from generation to generation.

Spain
The Codes on Good Agricultural Practice and the regulations in the different Autonomous Regions include techniques for reducing emissions and odours. In the national level, and as a basic regulation, the General Direction of Livestock Breeding (MAPA) is making a Royal Decree for the promotion of new technologies in the environmental improvements of pig farming and for projects of pig slurries management. The use of slurry application equipment that reduces the ammonia emissions will be promoted. Besides, as a part of the Urgent Measures Plan (see Q. 59), there will be a Plan on Slurries Biodigestion, which will promote technologies for the anaerobic fermentation of slurry and combustion of resulting biogas to reduce methane emissions in the slurry treatment. In highly livestock density areas nitrogen in the slurries will be reduced by nitrification-denitrification processes or by ammonia stripping technologies.

Sweden
Swe response: Rules on precautions for manure application is incorporated in the regulation (SJVFS 2004:62) concerning environmental precaution in agriculture issued by the Swedish Board of Agriculture. The measures prescribed in the regulation are in accordance with the techniques mentioned as suitable to limit ammonia emissions in the Gothenburg Protocol. Regulation SJVFS 2004:62 (revised in SJVFS 2006:66), requires that solid manure applied to land to be ploughed is incorporated within at least 24 hours of spreading: “...the same day it was spread...” (22 §) and for artificially produced fertilisers (urea) it shall be ploughed down within “...4 hours...” (23 §).

Switzerland
The low-emission slurry application techniques in Switzerland are subject to some financial incentives under a so-called “Ressourceprogramm” as a part of the newly adopted Agriculture Policy 2007-2011. Currently pilot-project are under preparation and since end of 2008 a few concrete projects will be full implemented.

United Kingdom
The proposed Nitrates Directive Action programme rules will ban high pressure, high trajectory application techniques which cause atomisation and drift. Integrated Pollution Prevention and Control (IPPC) applies to intensive pig and poultry farms since 2007. It requires each installation to have a permit containing emission limit values and other conditions based on the application of best available technique (BAT) and set to minimise emissions of pollutants likely to be emitted in significant quantities to air, water or land. Under IPPC regulations, slurry should be applied to land on IPPC installations using only the following methods: • An injector or band-spreader. • Any type of equipment with splash
plates, provided slurry is incorporated into the soil within 6 hours of application and provided such equipment is operated to avoid slurry atomisation and drift i.e. operated at low pressure to create large droplets. • Irrigation – where this method is used the slurry should be applied to a growing crop. The equipment should be operated to provide a low spreading trajectory (operated at low pressure to create large droplets). • Where dilute pig slurry (less than 2% dry matter) is applied using irrigation then the requirement for this to be to a growing crop does not apply. This is based on Defra funded research (WA0715) which indicates that ammonia emissions from dilute pig slurry (1.7% dry matter) are not significant. • Incorporation is unnecessary for wash water with less than 1% dry matter. There is also a range of publications available to the industry on spreading equipment e.g. Managing Livestock Manures and Slurry booklets http://www.defra.gov.uk/farm/environment/land-manage/nutrient/manure/livemanure3pt1.pdf As part of the England Catchment Sensitive Farming Delivery Initiative (ECSFDI), farmers are encouraged to manage input of nutrients to land more effectively and efficiently to reduce losses to the environment. Data for 2006 indicate that 1.0% of cattle slurry and 11% of pig slurry were applied by injection with 2.7% of cattle slurry applied by band spreader and 13.0% of pig slurry applied by trailing hose. The estimates for 1999 were 1.0, 11, 1.6 and 0% respectively, while the equivalent estimates for 1990 were all zero.

**United States**
Not applicable to the United States.
**Question 63** With reference to article 3, paragraph 8 (a), and annex IX, paragraph 7, please provide details of the measures taken in your country to limit ammonia emissions from solid manure application, and in particular whether there is a requirement that solid manure applied to land to be ploughed is incorporated within at least 24 hours of spreading.

**Bulgaria**
"The Rules for good agricultural practice" include rules for manure application. They envisage many specific measures for reducing emissions in the air and in the water as a result of manure's application. Amongst the other:
- manure application in a soil is prohibited from 1st of November to 31st of January;
- it is recommended not to do manure application on frozen soils and when the thickness of the snow cover is higher than 6 cm;
- special requirements should be observed for storage of solid and liquid manure – it should be kept in a special storages, it should stay at least 6-8 months before application etc.
- there are special requirements for quality of manure, too;
- the requirements for importing manure in the soil are to those for inorganic N fertilizers. According to “The Rules for good agricultural practice” the solid manure applied to land should be incorporated WITHOUT FURTHER DELAY to the ground using appropriate equipment.

**Canada**
Canada is not a Party to this Protocol; responses are given on a voluntary basis and should not be used to assess Canada’s compliance with the Protocol.

**Cyprus**
According to Air Emission Permits issued for IPPC piggeries and poultry farms, farmers are obliged to incorporate solid manure within at least 12 hours of spreading.

**Czech Republic**
Due to the size of farms run in the Czech Republic the Act on fertilizers requests ploughing or other incorporation of solid manure (manure, bedding) within 48 hours after the application on the soil at the latest. In vulnerable areas, which represent approx. 50 % of arable land, the solid manure must be incorporated within 24 hours after its application.

**Denmark**
See answer to question 62

**Finland**
The code of good agricultural production (Ministry of Agriculture and Forestry 1993) includes measures of ammonia abatement. In Finland, the Nitrates Directive (91/676/EEC 1991) is transposed to national legislation through the Environmental Protection Act (4th February 2000/86) and Government Decree No 931/2000 (9 November 2000) on reducing the release of nitrates from agricultural sources into water bodies. The provisions of the Government Decree apply to the whole national territory of Finland without regional or local differentiation. The Decree contains provisions and recommendations on good agricultural practices, storage of manure, spreading and allowable quantities of fertilizers and silage.
liquor and analysis and recording of nitrogen in fertilizers. Two of the provisions of the Government Decree No 931/2000 link directly on ammonia emission abatement: (1) manure or other organic fertilizer spread in autumn must be incorporated immediately or within 24 hours after spreading, and (2) manure stored in heaps on the fields must be covered for example with a tight cover or with a 10 cm of peat. In addition to the obligatory measures, the Decree includes voluntary measures on ammonia abatement which are in line with the code of good agricultural production including covering the manure storages, incorporating manure within 4 hours after spreading, favourable injection technique for slurry and urine when spread, or when not possible, using band spreader. Furthermore, manure application on warm, sunny and windy weather should be avoided, and the local circumstances and timing should be taken into account when manure application is planned and realized to minimize the harmful effects in neighbourhood. (Government Decree No 931/2000, Ministry of Agriculture and Forestry 1993)

Germany
The publication “aid-Heft 1454/2003” (see question 59) describes ploughing within 24 hours as measure for reducing ammonia emission from solid manure application. The Ordinance of good agricultural practice in Fertilizing (Düngeverordnung) obliges farmers to incorporate liquid manure and poultry excrements on fallow arable land “immediately”, i. e. during the same day. For solid manure immediate incorporation is not compulsory, but recommended.

Hungary
According to Governmental Decree 50/2001. (IV. 3.) Korm. the sewage sludge is to be injected under the surface of the soil or mixed with or ploughed in the soil within 24 hours of spreading.

Lithuania
Environmental Protection Requirements for Management of Manure ((14-07-2005 Order No D1-367/3D-342 of the Minister of Environment and the Minister of Agriculture) determines that solid manure applied to land to be ploughed shall be incorporated into the soil within 12 hours after application. No violations have been detected and no fines fines have been imposed during 2006-2007.

Monaco
Sans objet, il n'existe pas d'exploitations agricoles sur le territoire monégasque.

Netherlands
The measures to limit ammonia emissions from manure application are covered by the use of fertilisers Decree (Besluit gebruik meststoffen, see question 60). The Decree prohibits the appliance of manure on soils which are frozen, covered with snow or saturated with water. In the winter period (1 September – 31 January) there is a full ban on spreading manure (article 3 and 4). Furthermore the Decree includes the obligation that manure is spread with low emission techniques (article 5 and appendix II). There is a requirement that solid manure applied to land to be ploughed must be adsorbed within at least 24 hours of spreading. This is regulated in the Fertilizer Act (Meststoffenwet), Staatsblad 1986, No 620 (last amended in 2006, Staatsblad 2006 nr. 64) and decree Use of Fertilisers Decree (Besluit gebruik
meststoffen Wet bodembescherming), Staatsblad 1998 nr. 2 (last amended in 2007, Staatsblad 2007 No 519). Developments since January 1st 2008: in a single working process manure or slurry is spread over the soil and ploughed under by one machine with the result that the used manure or slurry are either intensively mixed with the soil or entirely brought u

**Norway**

This requirement is incorporated into the Regulation regarding fertilizers etc of organic origin of 2003. According to section 24 of the regulation all manure applied on land to be ploughed shall be incorporated as soon as possible and within 18 hours.

**Slovakia**

Paragraph 10 does not apply to Slovakia. Regardful manures application is regulated according to the Ministerial Decree No. 392/20004 of the Ministry of the Agriculture on farming in woundable areas for hydrosphere protection. According to this Decree stiff manures must be plough into soil in 48 hour and liquid manures in 24 hours. The 24 hours period is recommended also for stiff manures in certain soil and production conditions.

**Slovenia**

Ploughing in of solid manure within at least 24 hours of spreading is recommended in the Slovenian Advisory Code of good agricultural practice. However, the Code has an advisory and not the legal status, allowing farmers to take any measure into account as far as they con-sider it applicable. Due to specific Slovenian conditions, i.e. the farm structure (small farms with mostly part-time farmers), this particular measure cannot be prescribed, although in practice many farmers apply it.

**Spain**

The Codes on Good Agricultural Practice and the regulations in the different Autonomous Regions include techniques for reducing emissions and odours. The studies carried out by MAPA have proved reductions in ammonia emissions: 40%, in slurry digging by 12 hours; and 16%, in slurry digging by 24 hours. The Plan on Slurries Biodigestion (see Q. 62) considers codigestion of pig slurry mixing it with other kinds of slurry, with an indirect impact on the agricultural management of slurries.

**Sweden**

Swe response: Rules on precautions for manure application is incorporated in the regulation (SJVFS 2004:62) concerning environmental precaution in agriculture issued by the Swedish Board of Agriculture. The measures prescribed in the regulation is in accordance with the techniques mentioned as suitable to limit ammonia emissions in the Gothenburg Protocol. Regulation SJFS 2004:62 (revised in SJVFS 2006:66), requires that solid manure applied to land to be ploughed is incorporated within at least 24 hours of spreading: “...the same day it was spread...” (22 §) and for artificially produced fertilisers (urea) it shall be ploughed down within “...4 hours...” (23 §). In some counties in the south of Sweden manure (slurry and solid manure) that is spread on bare soil shall be incorporated into the soil within four hours of the spreading.
Switzerland
A guidance document exists on how to minimize the risk of ammonia emissions by incorporating solid manure immediately or at least within 24 hours after spreading.

United Kingdom
The proposed Nitrates Directive Action Programme, which will apply across UK designated NVZs will include: • Organic manures with low available N (e.g. FYM) applied to bare soils or stubbles prior to crop planting or drilling must be incorporated into the soil as soon as possible and within 24 hours at the latest on all sloping land that is located within 50m of a surface water and which could receive run-off from that land. • Organic manures with high available N (e.g. poultry manure) applied to bare soils or stubbles by broadcast methods prior to crop planting or drilling, must be incorporated into the soil as soon as possible and within 24 hours at the latest. More targeted, under IPPC regulations, applications of solid manure to uncropped land or bare soil on IPPC installations should be incorporated within 24 hours, unless such applications are used to control wind erosion on susceptible soils: • Incorporation should be achieved by ploughing, discing or using a rotary cultivator. • Solid manure does not need to be incorporated if it is applied to grassland or other established crops. There is also a range of publications available to the industry on spreading equipment e.g. Managing Livestock Manures and Slurry booklets http://www.defra.gov.uk/farm/environment/land-manage/nutrient/manure/livemanure3pt1.pdf As part of the ECSFDI, farmers are encouraged to manage input of nutrients to land more effectively and efficiently to reduce losses to the environment. Data available indicate that 2.6% of pig FYM and 8.3% of poultry manure are incorporated within 4h of application, while a further 17.5% of pig FYM and 45.8% of poultry manure is incorporated within 24h.
Question 64 With reference to article 3, paragraph 8 (a), and annex IX, paragraph 8, please provide details on the use in your country of the low-emission storage systems for new slurry stores (construction commenced after 17 May 2006) on large pig and poultry farms (2,000 fattening pigs, or 750 sows or 40,000 poultry) or techniques that have been shown to reduce emissions by 40 per cent or more compared to the reference listed in guidance document V (ECE/EB.AIR/WG.5/2007/13).

Bulgaria
All storage systems for new slurry stores on large pig and poultry farms (for 2,000 fattening pigs, or 750 sows or 40,000 poultry) comes under 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 (SG 26/2003), approved by the Government with Decree No. 62 dated 12th of March 2003. This regulation is harmonized with Directive 1996/61/EC and demands applying of BAT to the installations under its scope. According to the directive, all installations listed in Annex I, should be bring into compliance by 31st of October 2007, including large pig and poultry farms.

Canada
Canada is not a Party to this Protocol; responses are given on a voluntary basis and should not be used to assess Canada’s compliance with the Protocol.

Cyprus
Air Emission Permits have been issued to all IPPC piggeries and poultry farms. The permits include conditions so that slurry is stored in concrete tanks with suitable cover.

Czech Republic
Detail information on newly built storing facilities is not available. There are records of activities aimed at the renovation of a pig farm (more than 2,000 fattening pigs) intending to cover the slurry tank with a tent construction.

Denmark
By Danish law all slurry tanks have to be covered either by floating layer or solid cover and solid cover can reduce the ammonia emission up to 90% compared with uncovered slurry. Municipal supervision of liquid manure storage tanks will be intensified significantly and there will be a requirement for permanent covers on tanks established after 2007.

Finland
The need for slurry storage covering on new large pig and poultry installations is assessed case by case under the consideration of the environmental permit and using the BAT Reference Document (EC 2003) and the national BAT reports (Mikkola et al. 2002, Puumala and Grönroos 2004) as sources of BAT information. Slurry stores must be covered with a solid lids or floating covers if it is obvious that a new or enlarged installation causes local disturbance in the form of odour emissions. In all cases slurry stores must be filled from underneath. In new large pig installations in Finland the floors are in most cases partly
slatted.

**Germany**

TA Luft 5.4.7.1 requires: Storages of liquid manure outside of housing systems need closed tanks or equivalent measures to reduce emission. The cover should reduce the emission minimum 80% in comparison to storage without cover. Poultry systems: Drying and ventilation of the manure belt is required (drying rate at least 60%). Dried poultry droppings shall be stored in a way that there is no re-humidification (e.g. by rainwater) in the area of the installation. Further requirements: – providing sufficient storage capacity – reduction of surface

**Hungary**

The deadlines of building manure storage systems are stipulated in Governmental Decree 27/2006.(II.7.) Korm. on protection of waters against pollution caused by nitrates from agricultural sources. On all (new and existing) large pig and poultry farms (regulated by the IPPC Directive) insulated storage system is compulsory from 1 November 2007.

**Lithuania**

Requirements of new slurry storage systems for new slurry stores and large farms are set in the Environmental Protection Requirements for Management of Manure (14-07-2005 Order No D1-367/3D-342 of the Minister of Environment and the Minister of Agriculture) and the Requirements for Good Agricultural practice (16-07-2004 Order No 3D-431 of the Minister of Agriculture). Existing farms with more than 300 animal units, that do not meet the requirements, shall install such systems till 1 January 2008, farms with 10-300 animal units till 1 January 2012. These farms are also regulated through the IPPC permits (EU Directive 96/61/EC). BAT listed in "European Commission Reference Document on Best Available Technique for intensive Rearing of Poultry and Pigs" (July 2003) are gradually installed at existing and especially new installations (floating covers for storages of slurry, storage bags).

**Monaco**

Sans objet. Il n'existe pas d'exploitations agricoles, en particulier porcines et avicoles, sur le territoire monégasque.

**Netherlands**

This is regulated in: Decree on Environmental control of Manure Basins (Besluit mestbassins Milieubeheer), Staatsblad 1990 No 618, (last amended in 2006 Staatsblad 2006 nr. 661). This Decree regulates (Annex 1, prescription 1.4) compulsory covering of basins for slurry manure, since 1 January 1992. With coverages according to the regulations from the Building Technology Guidelines Manure Basins 1992 (Bouwtechnische richtlijnen mestbassins 1992), a roof or sheet coverage, an emission reduction of more than 40% can be realised.

**Norway**

According to section 19 of the Regulation regarding fertilizers etc. of organic origin of 2003,
pig and poultry farms of 2,000 fattening pigs or 750 sows or 40,000 poultry equipped with slurry stores shall use storage systems or techniques that have been shown to reduce emissions of ammonia by 40% or more compared to uncovered outdoor slurry stores. According to the Act for regulation of pig and poultry production, and the accompanying regulations, a licence issued by the Ministry of Agriculture and Food is required before establishing large pig and poultry farms as defined by annex IX. No such licences have been issued after 17 May 2006.

Romania
According to the provision of the Code of the good practices in agriculture, approved by Joint Ministerial Order no. 1182/1270/2005, for storage of manure is necessary to apply the measures in order to protect the water quality and to prevent the environment against pollution. In the building process of the manure landfills shall take into consideration the necessity to assure the impermeability and the system for collection of the rain water. Also, it is necessary a sufficient capacity of the platforms for disposal of the manure and special ways for access. It is not allow to built the platforms near to rivers or in areas where the ground water are at small dippy. The residential areas and sources for drinking water must be located at long distance, more than 50 m. In the platforms the waste is kipped compacted and covered with a 15-20 cm of soil layer. In order to improve the composition of the manure and to limite the releases of the nitrogen it is recommended that the manure must be covered with fertilizers (1-2% from the waste mass) when it is laid down into the platform.

Slovakia
Paragraph 10 does not apply to Slovakia. Emission reduction of 40% from manures storages within whole breeding is achieved by using of additives and changing of storage technologies from stables to containers with possibility of control of storage technologies failure in Slovakia. Alternative solution may be litter breeding with consequent manure storage with using of additives and technologies of manure treatment.

Slovenia
Low-emission storage systems for the slurry stores, as described in the Guidance Documents on Control Techniques and Economic Instruments to the Gothenburg Protocol (EB.AIR/1999/2), Chapter V. (C) – p. 103-105, are obliged to be used on large pig and poultry farms in Slovenia. According to the Slovenian legislation, large farms (new and existing farms) need to have environmental integrated permit (IPPC) for their operation. For issuing such permit, a farm has to meet requirements of the best available technique (BAT) as in the European BREF reference documents. Major BAT requirements for the farms are covered by the BREF ILF (IPPC Reference Document on Best Available Techniques for Intensive Rearing of Poultry and Pigs, BREF ILF, issued July 2003; http://eippcb.jrc.es/pages/FActivities.htm). BREF ILF includes, among others, all technical provisions on emissions of ammonia from agriculture from the Gothenburg Protocol Guidance Document (Chapter V). The following BAT techniques to cover slurry stores are required in Slovenia: (i) for slurry tanks: a rigid lid, roof or tent structure, or a floating cover (such as chopped straw, natural crust, canvas, foil peat, light expanded clay aggregate or expanded polystyrene), (ii) for slurry storage lagoons: a plastic cover or a floating cover (such as chopped straw, light expanded clay aggregate or natural crust). The decision on what type of cover is performed can only be taken on a case by case basis.
Spain
For those installations included in the IPPC, permit by competent authorities requires a correct system for the storage of slurry. Besides, the Plan on Slurries Biodigestion (see Q. 62) promotes, in every farm, the anaerobic treatment of slurry by anaerobic digesters built in the slurry floats of storage.

Sweden
Swe response: Sweden has introduced a general regulation for covering of slurry stores even for smaller farms than what the protocol prescribes, but these rules do not apply to the northern part of the country. For installations requiring a permit (IPPC directive 96/61/EEC) BAT should be used, which apply to the whole country.

Switzerland
For new slurry stores, low-emission storage systems have to be applied independently of the size of the farm.

United Kingdom
Under IPPC regulations, new and substantially reconstructed or enlarged slurry stores will need to be covered. Slurry storage covers should comprise a rigid cover to a steel or concrete tank. Such rigid covers would be expected to ensure ammonia emissions are reduced by at least 80%. New earth banked lagoons should not be constructed unless an effective covering method can be demonstrated. Assuming a store lifetime of 20 years, 5% will be replaced in any year and for farms under IPPC it is assumed that the replacements will include a store cover. IPPC for pigs came into force in 2007, hence current estimates would be that there are very few stores with covers. As part of the ECSFDI, grants to cover 50 % of costs are offered to farmers for purchasing of manure storage lids.

United States
Not applicable to the United States.
**Question 65** With reference to article 3, paragraph 8 (a) and annex IX, paragraph 9, please provide details of whether emission reductions of 40 per cent have been achieved in your country for existing slurry stores (construction commenced on or before 17 May 2006) on large pig and poultry farms (2,000 fattening pigs, or 750 sows or 40,000 poultry).

**Bulgaria**
For the time being there is no reliable information about the emission reductions achieved for existing slurry stores. This type of information is not collected nor calculated though it is expected that there is some reduction achieved as a result of BAT application - this type of large pig and poultry farms (for 2 000 fattening pigs, or 750 sows or 40 000 poultry) comes under the IPPC Regulation (SG 26/2003) and therefore they are obliged to apply BAT.

**Canada**
Canada is not a Party to this Protocol; responses are given on a voluntary basis and should not be used to assess Canada’s compliance with the Protocol.

**Cyprus**
Air Emission Permits have been issued to all IPPC piggeries and poultry farms. The permits include conditions so that slurry is stored in concrete tanks with suitable cover.

**Czech Republic**
The state authorities strongly demand that the existing slurry stores use the low-emission storing systems with the abatement efficiency at least 40 %. Mostly, however, these are category 2 techniques – creation of natural crust or application of biotechnological manure additives to the stored slurry. Category 1 techniques (roof structure) are applied with difficulties due to big investments and technical problems. Big plastic lagoons are equipped with floating foil.

**Denmark**
See answer to question 64.

**Finland**
In Finland, the most intensive pig and poultry farming locates in the Southwest part of the country. Within the territory of Southwest Finland Regional Environment Centre, 38% of slurry stores on large pig farms constructed before 17 May 2006 are equipped with floating cover and 18% with solid cover. 44% of slurry stores are uncovered. Compared to uncovered case, solid cover and floating cover reduce ammonia evaporation approximately 80-90% and 60-70%, respectively. If all slurry stores on large pig farms were uncovered, ammonia emissions were approximately 40% higher than now. In poultry farms only solid manure systems are used.

**Germany**
Requirements according to question 64 also apply to existing slurry stores. Measurements
performed in Germany sponsored by FEA have shown that in open pig slurry stores a floating cover with a 10 cm layer of chopped straw (inducing the formation of a crust) meets the requirements mentioned in the question.

**Hungary**
The deadlines of building manure storage systems are stipulated in Governmental Decree 27/2006.(II.7.) Korm. on protection of waters against pollution caused by nitrates from agricultural sources. On all (new and existing) large pig and poultry farms (regulated by the IPPC Directive) insulated storage system is compulsory from 1 November 2007.

**Lithuania**
Requirements of slurry storage systems for slurry stores and large farms are set in the Environmental Protection Requirements for Management of Manure (14-07-2005 Order No. D1-367/3D-342 of the Minister of Environment and the Minister of Agriculture) and the Requirements for Good Agricultural practice (16-07-2004 Order No 3D-431 of the Minister of Agriculture). Requirements for existing farms with more than 300 animal units are applied from 1 January 2008. Existing farms with 10-300 animal units have to meet the requirements from 1 January 2012. These farms are also regulated through the IPPC permits (EU Directive 96/61/EC. BAT listed in "European Commission Reference Document on Best Available Technique for intensive Rearing of Poultry and Pigs" (July 2003) are gradually installed at existing installations. For example, several pig raring companies (CSC "Saarimner", CSC "Šešupė" and CSC "Smilgiai) developed close type slurry storage. Such BAT models are under construction at several other farms.

**Monaco**
Sans objet. Il n'existe pas d'exploitations agricoles, en particulier porcines et avicoles, sur le territoire monégasque.

**Netherlands**
This is also regulated in: Decree on Environmental control of Manure Basins (Besluit mestbassins Milieubeheer), Staatsblad 1990 nr. 618, (last amended in 2006 Staatsblad 2006 nr. 661). This Decree regulates (Annex 1, prescription 1.4) compulsory covering of basins for slurry manure, since 1 January 1992. With coverages according to the regulations from the Building Technology Guidelines Manure Basins 1992 (Bouwtechnische richtlijnen mestbassins 1992), a roof or sheet coverage, an emission reduction of more than 40% can be realised.

**Norway**
According to section 19 of the Regulation regarding fertilizers etc. of organic origin of 2003, pig and poultry farms of 2,000 fattening pigs or 750 sows or 40,000 poultry equipped with slurry stores, shall use storage systems or techniques that have been shown to reduce emissions of ammonia by 40% or more compared to uncovered outdoor slurry stores. However, only a few Norwegian farms exceed the limits listed as “large pig and poultry farms”. In 2007 there were about 16 farms with housing systems for more than 40,000 poultry, and these farms do not have a slurry-based system. There are no farms in Norway with more than 2,000 fattening pigs or 750 sows. Consequently, the provisions of annex IX,
Romania
In Romania, the environmental permitting process of the activities/installations for the intensive rearing of poultry or pigs with a capacity greater than: (a) 40 000 places for poultry; (b) 2 000 places for production pigs (over 30 kg); or (c) 750 places for sows are taken into consideration in the following laws: - Emergency Ordinance no. 152/2005 concerning the integrated pollution prevention and control, approved with amendments by Law no. 84/2006; - Guvernamental Decision no. 964/2000 for approving of the action plan for water protection against pollutions nitrates from agriculture sources; - Joint Ministerial Order of minister of environment and minister of agriculture no. 1182/1270/2005 for approving the Cod of good practices in agriculture; - Ministerial Order no. 169/2004 for approving the recommendations of the reference documents concerning the best available techniques (BREF) on intensive rearing of poultry or pigs; For new landfills (built after 17 May 2006) the following techniques for disposal will be used in order to reduce with 40% of the ammonium emissions: a) the solid waste from the poultries farms will be removed from lair by specific equipment; b) the manure from pigs farms will be disposal into concrete basin impermeable an anticorrosive protection.

Slovakia
Paragraph 10 does not apply to Slovakia. Emission reduction of 40% from manures storages within whole breeding is achieved by using of additives and changing of storage technologies from stables to containers with possibility of control of storage technologies failure in Slovakia. Alternative solution may be litter breeding with consequent manure storage with using of additives and technologies of manure treatment.

Slovenia
The same BAT requirements apply to new and existing farms. Please see A. 64.

Spain
Please, see Q. 64 For those installations included in the IPPC, competent authorities are reviewing permits and now they require a correct system for the storage of slurry.

Sweden
Swe response: Sweden has introduced a general regulation for covering of slurry stores even for smaller farms than what the protocol prescribes, but these rules do not apply to the northern part of the country. For installations requiring a permit (IPPC directive 96/61/EEC) BAT should be used, which apply to the whole country.

Switzerland
Existing slurry stores on large pig and poultry farms should as far as possible retrofit their installation and apply roof or tent structure or plastic sheets for manure storage like the new installation. Decision for retrofitting are taken after a case by case assessment. Only few installations with such size are operated in Switzerland as they required derogation to the highest size farm installation.
**United Kingdom**

Emission reductions of 40 per cent have not been achieved for existing slurry stores (construction commenced on or before 17 May 2006) on large pig and poultry farms. However, to aid in reduction of emissions from stores, as part of the ECSFDI, grants to cover 50% of costs are offered to farmers for purchasing of manure storage lids. In addition COGAP provides advice, as detailed above, on reducing emissions. In the Farm Practices Survey for England, 2006, only a total of 2 farms indicated that, in the previous two years, a cover or roof had been fitted to an existing store (i.e. representing only 0.3% of farms responding). On dairy farms, it is estimated that a high proportion of slurry stores (c. 80%) are managed in a way that encourages the formation of a natural crust; an effective crust has been shown to reduce ammonia emissions by >50%. However, this is not the case with pig slurry, since this slurry does not normally crust over.

**United States**

Not applicable to the United States.
**Question 66** *With reference to article 3, paragraph 8 (a) and annex IX, paragraph 10, please provide details of the use in your country of housing systems for new animal housing on large pig and poultry farms which have been shown to reduce emissions by 20 per cent or more compared to the reference listed in guidance document V.*

**Bulgaria**
The large pig and poultry farms (for 2 000 fattening pigs, or 750 sows or 40 000 poultry) comes under the IPPC Regulation (SG 26/2003), approved by the Government with Decree No. 62. The regulation demands applying of BAT regarding the installations listed in Annex I. Applying housing system is BAT. According to Guidance document V (EB decision 1991/1), many of the options for reducing emissions from housing are more expensive than manure application and storage options. And these options can be implemented only for newly built houses. Though there is no collected information which types of housing systems are in use at present, the new large pig and poultry farms, should be bring into compliance by 31st of October 2007 and therefore they are obliged to choose a housing system from the options listed in the BAT reference document.

**Canada**
Canada is not a Party to this Protocol; responses are given on a voluntary basis and should not be used to assess Canada’s compliance with the Protocol.

**Cyprus**
For new pig farms, fully or partly slatted floors with vacuum systems underneath are mainly used. For laying hens, two housing systems are used. The first system is the traditional deep-pit house where the manure falls from the tiers into a pit beneath the surface of the house and it’s stored for a year or more. The second system involves the collection of manure using manure belts which are placed under the tiers. The housing system for broilers involves a solid fully littered floor which is kept as dry as possible. For this reason a suitable drinking-water system is used to reduce the spillage of water. Furthermore the housing system is well insulated.

**Czech Republic**
New animal housing on large pig and poultry farms can use only housing techniques approved in the Reference document on best available techniques for intensive rearing of poultry and pigs (BREF ILF) or techniques listed in (ECE/EB.AIR/WG.5/2007/13).

**Denmark**
Approximately 50% of the total ammonia emission from livestock origins from the swine production. In order to increase the use of housing with partially slatted floor for pigs, which has an emission of 20-50% below other systems and to increase the use of new technology for all animal categories, which can reduce the emission further, a new act regarding the approval of livestock production has in 2007 been passed in Denmark. According to this act every farm, which apply for a new approval and have a production above 75 animal units (7500 kg N ab storage), has to reduce the ammonia emission. The emission shall be reduced by 15 % I 2007, 20 % in 2008 and at least 25 % from 2009 in new
stables compared to the reference system. Systems based on deep litter shall also with some exceptions reduce the emission in new stables with 15-25% compared to systems with 100% deep litter. Near some areas with sensitive nature due to nitrogen deposition, there are also limits for how much the livestock production can increase the ammonia deposition on these areas. This will results in further requirements for new stables and developing of ammonia reducing measures.

**Finland**

The need for low emission housing systems on new large pig and poultry installations is assessed case by case under the consideration of the environmental permit and using the BAT Reference Document (EC 2003) and the national BAT reports (Mikkola et al. 2002, Puumala and Grönroos 2004) as sources of BAT information. If it is obvious that a new or enlarged installation for pig rearing causes local disturbance in the form of odour emissions the slurry channels must be equipped with manure cooling systems. In many cases new large pig houses are also equipped with climate control systems that reduce the ventilation rates. For poultry systems typically no ammonia abatement measures are used.

**Germany**

In December 2006, the German Federal Environment Agency (UBA) together with the German Federal Ministry of Food, Agriculture and Consumer Protection (BMELV) completed a joint research project which investigates into the housing systems currently used in Germany for rearing pigs, poultry, cattle and horses. The research report compiled in this project, “Nationaler Bewertungsrahmen Tierhaltung” (National Framework for the Evaluation of Livestock Farming, KTBL-Schrift 446, ISBN 3-939371-13-0), evaluates the impact of these housing systems on the environment and on the animal welfare, based on a system of indicators. Housing systems which in this report have been shown to reduce emissions by 20% or more compared to the reference (and which are also listed in guidance document V) include: - Pig housing: o Housing on a partly-slatted floor (50% perforated), at optimized ventilation (DIN 18910-1). o Vacuum system. - Poultry (laying hens): o Cage housing with forced drying and frequent removal (twice a week) of manure, and manure storage outside the house. o Aviary systems with manure belt and forced drying. - Poultry (broilers): o Reference system (fully littered floor), a 20% reduction of emissions is achieved by nitrogen adapted feed (multiphase feeding, according to nutritional requirements as function of the increasing live weight of the bird). In summary, the most important factors to reduce emissions from the housing systems are to keep the housing systems clean and dry, to minimize the emitting surface, to optimize the flow pattern of the air in the housing and (in pig stables) to have enough room per animal available to allow the animals to create separate functional areas (for lying and excretion).

**Hungary**

Housing systems for new animal housing on large pig and poultry farms are regulated by the IPPC Directive and IPPC Guideline on intensive livestock farming. Governmental Decree 314/2005.(XII.25.) Korm harmonized with the IPPC Directive contains the rules of an integrated licensing procedure and the basic obligations of the operators. Governmental Decree 21/2001.(II.14.) Korm on certain rules for the protection of air quality also prescribes the application of the best available techniques. BAT Reference Guidance for pig farms was adopted and published in Hungarian for the purpose of distribution to stakeholders.
**Lithuania**
Requirements of animal housing systems for new animal housing on large pig and poultry farms are set in the Environmental Protection Requirements for Management of Manure (approved in 2005 by the Order of the Minister of Environment and the Minister of Agriculture) and the Requirements for Good Agricultural practice (16-07-2004 Order No 3D-431 of the Minister of Agriculture). Existing farms with more than 300 animal units, that do not meet the requirements, shall install such systems till 1 January 2008, farms with 10-300 animal units till 1 January 2012. Farms are also regulated through the Integrated Pollution Prevention and Control permits (EU Directive 96/61/EC). Due to climate conditions farms of closed type are used in Lithuania. Adsorption of urine by straw or peat and rapid removal of urine, rapid separation of urine-slurry-manure mixture are used to decrease emissions from houses for animals and poultry.

**Monaco**
Sans objet. Il n'existe pas d'exploitations agricoles, en particulier porcines et avicoles, sur le territoire monégasque.

**Netherlands**
This is regulated in the Environmental Management Act (Wet milieubeheer) article 22.1a. It regulates the application of the IPPC guidelines for large pig and poultry farms. All new built housing systems have maximum emission factors per animal place, which will result in an emission reduction of 40-90% (varies per animal species) compared to traditional animal housing. With regard to ammonia emissions from animal husbandries, article 2.8. of the Environmental Agriculture Decree (Besluit Landbouw Milieubeheer, Blm) states that for live stock from a category to which according to the Regulation on Ammonia and Animal Husbandry (Besluit ammoniakemissie huisvesting veehouderijen, Bahv) a maximal emission value applies, housing systems meeting the criteria of the Bahv must be used. With this the Bahv does also apply to those organisations to which the Blm applies. Article 2.8. enters into force when the Bahv enters into force. When this will happen is still under discussion.

**Norway**
According to section 19 of the Regulation regarding fertilizers etc. of organic origin of 2003, new pig and poultry farms of 2,000 fattening pigs or 750 sows or 40,000 poultry equipped with slurry stores shall use housing systems which have been shown to reduce emissions of ammonia by 20% or more compared to the reference. Reference techniques are defined in accordance with the guidance document referred to in annex IX, paragraph 6. The Norwegian poultry production is generally performed with modern productions systems, with advanced technology like the systems described in guidance document V. The 16 Norwegian production facilities (cf. the answer to question 65) that fall within the regulation of this question is therefore expected to have the technical standard as required, since this is regarded as the general standard in Norway.

**Romania**
In Romania, the new installations for the intensive rearing of poultry or pigs use the recommendations of the reference documents concerning the best available techniques (BREF) on intensive rearing of poultry or pigs and the provisions of the Cod of the Good Practice in Agriculture approved by Joint Ministerial Order of the minister of environment and the minister of agriculture no. 1182/1270/2005 and the provisions of the sanitary-veterinary legislation specific for this field.

Slovakia
Paragraph 10 does not apply to Slovakia. In cattle breeding systems of stabling with litter are currently used while in pigs breeding only 40 – 50% of animals are stabling with litter. Organic bulk of litter ties ammonium what effects in emission decreasing.

Slovenia
The following low-emission housing system (also listed in the Guidance Document, Chapter V. (D) is used in the existing large farms in Slovenia: (i) for the large pig farms: partly slatted floor; (ii) for laying hens: solid fully littered floor; (iii) for broilers: solid fully littered floor (in the well insulated fan/naturally ventilated house and equipped with non-leaking drinking system). Obligations for the new and existing farms on the use of BAT and control techniques for preventing/abating emissions are described in A.64.

Spain
According to the studies by the General Direction of Livestock Breeding, in pig farms, “Partially slatted floor” is implemented in 79% of stalls of pregnancy pigs, 23% of stalls of transition pigs and 60% of stalls of feeding for fattening. This BAT, under Spanish conditions, reduces ammonia emissions between 20% and 50%. Besides, this technique is in line with the Directive 98/58/EC on animal welfare, which makes think of an increment of its use in the next years. In poultry farms, the BAT “Frequent removal of poultry droppings” is implemented in every stall in the installations under Directive IPPC. This BAT reduces ammonia emissions in Spain above 50%.

Sweden
Swe response: Regulation on housing systems is included in the processing of permit applications according to the animal protection act and the Swedish Environmental Code. Ammonia emissions is accounted for in this process. Regulation (DFS 2007:5) prescribes even floor surface, separate laying area, etc.

Switzerland
The new installations for large pig and poultry farms are requested to apply measures according to the guidance document V. Only very few installations at a size corresponding to para. 10 are operated in Switzerland as they required derogation to the highest size farm installation.

United Kingdom
Under IPPC regulations, new and substantially reconstructed or enlarged housing systems for new animal housing on large pigs and poultry farms will need to comply with BAT.
**United States**

Not applicable to the United States.