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Review of strategies and policies of Parties and Signatories to the Convention for the abatement of air pollution

Draft 2010 review of strategies and policies for air pollution abatement*

Note by the secretariat

Implementation of protocols and strategies and policies for controlling long-range transboundary air pollution

Contents

* This document was submitted late owing to resource constraints.

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I. Implementation of protocols and progress in national strategies and policies

1. This document presents the third part of the draft 2010 review on strategies and policies for air pollution abatement (the first and second parts of the review are contained in ECE/EB.AIR/2010/8 and Add.1.), prepared by the secretariat with the assistance of a consultant as mandated by the Executive Body at its twenty-seventh session in December 2009 (ECE/EB.AIR/99, para. 85 (e)). Based on the replies to the 2010 questionnaire on strategies and policies (ECE/EB.AIR/2009/12 and ECE/EB.AIR/2009/13), it summarizes progress in the implementation of the earlier protocols to the Convention on Long-range Transboundary Air Pollution and presents an overview of the national institutional and regulatory frameworks for transboundary air pollution abatement, as well as policy measures and economic instruments for addressing emissions from the main economic sectors.

A. 1991 Geneva Protocol concerning the Control of Emissions of Volatile Organic Compounds or their Transboundary Fluxes[1]

1. Overview and main obligations

2. The Protocol concerning the Control of Emissions of Volatile Organic Compounds or their Transboundary Fluxes entered into force in 1997 and has been ratified by 24 Parties.[2] The Protocol requires Parties to control and reduce their emissions of volatile organic compounds (VOCs) in order to reduce their transboundary fluxes and the fluxes of the resulting secondary photochemical oxidant products so as to protect human health and the environment. Parties must opt for one of the following three options for emission-reduction targets set out in the Protocol:

(a) A 30% reduction in VOC emissions by 1999 using a year between 1984 and 1990 as a basis. (This option was chosen by Austria, Belgium, Estonia, Finland, France, Germany, the Netherlands, Portugal, Spain, Sweden and the United Kingdom with 1988 as a base year; by Denmark with 1985; by Liechtenstein, Switzerland and the United States with 1984 as a base; and by the Czech Republic, Italy, Luxembourg, Monaco and Slovakia with 1990 as a base year);

(b) The same reduction as above within a Tropospheric Ozone Management Area (TOMA) specified in annex I to the Protocol and ensuring that by 1999 total national emissions do not exceed 1988 levels. Annex I specifies TOMAs in Norway (base year 1989) and Canada (base year 1988);

(c) For countries where VOC emissions in 1988 did not exceed certain specified levels, Parties could opt for a stabilization at that level of emission by 1999 (this option was chosen by Bulgaria, Greece and Hungary).

[1] http://www.unece.org/env/lrtap/vola_h1.htm.

[2] Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Italy, Liechtenstein, Lithuania, Luxembourg, Monaco, Netherlands, Norway, Slovakia, Spain, Sweden, Switzerland, the former Yugoslav Republic of Macedonia and the United Kingdom of Great Britain and Northern Ireland. The updated status of ratifications is available at http://www.unece.org/env/lrtap/status/lrtap_s.htm.

2. National programmes, policies and strategies

3. This section summarizes measures taken by Austria, Estonia, Italy and Liechtenstein and Canada[3] to implement the VOCs Protocol. (Measures by Parties to the 1999 Gothenburg Protocol to Abate Acidification, Eutrophication and Ground-level Ozone (Gothenburg Protocol) are reported under the section on the Gothenburg Protocol in document ECE/EB.AIR/2010/8/Add.1.)

4. Austria reported that its VOC emissions had dropped by over 50% between 1988 and 2008. It referred notably to domestic regulations in the industrial sector, including its Industrial Code, the Clean Air Act for Steam-boilers and its Solvent Ordinance for operations relating to paints and lacquers. Canada outlined its programmes under the solvents, petroleum, organics, chemical, food, iron and steel industries, as well as those for its small-scale combustion sources, waste and agriculture.

5. Estonia, where VOC emissions had halved between 1990 and 2008, reported on its efforts in the transport sector to increase the share of public transportation and to prioritize electricity-based and railway transport. Italy reported that its measures in the transport sector included urban traffic plans and incentives to renew the existing fleet of cars and motorcycles. Measures taken in Liechtenstein had led to a 58% reduction in VOC emissions between 1985 and 2008. It reported in particular that its Energy Efficiency Act provided subsidies for the use of renewable energy such as solar energy, wood and biomass.

Stationary sources

6. Most Parties found it difficult to respond to the question related to the national or international emission standards applied to control and reduce VOC emissions from stationary sources. In many cases countries noted that it was site-specific, subsector-specific or based on best available techniques (BAT), but that no set figure could be applied across an entire sector such as the food industry. The Parties also referred to standards set in European Union (EU) Directives 1999/13/EC, 1994/63/EC, 2004/42/EC and EU BAT reference (BREF) documents.

7. Austria reported that it applied stricter standards than those in the Protocol for the production of iron and steel and of non-ferrous metals, as well as for foundries and some categories of steam-boilers. It also reported that local/regional air quality concerns could lead to more stringent limit values being applied in the issuing of licences. In Italy, new stationary plants required a permit issued by a competent authority that specified limits at least as stringent as those for existing plants. Subsidies for renewable energy were mentioned by Liechtenstein.

Mobile sources

8. Both Estonia and Italy reported on the application of relevant EU directives for passenger cars, light duty and heavy-duty vehicles (EURO standards).

[3] Not a Party to the VOCs Protocol.

B. 1998 Sofia Protocol concerning the Control of Emissions of Nitrogen Oxides or their Transboundary Fluxes[4]

1. Overview and main obligations

9. The Protocol concerning the Control of Emissions of Nitrogen Oxides or their Transboundary Fluxes entered into force in 1991 and has been ratified by 34 Parties.[5] The Protocol requires that Parties take effective measures to control and/or reduce their annual emissions of nitrogen oxides (NO_x) or their transboundary fluxes so that by 31 December 1994 (at the latest) they do not exceed 1987 emissions (1978 for the United States). Parties to the Protocol are also required within two years of entry into force of the Protocol to apply national emissions standards to major new or modified stationary sources and/or source categories and to new mobile sources based on BAT and to introduce pollution control measures for major existing stationary sources.

2. National programmes, policies and strategies

10. This section reflects replies from Austria, Belarus, Canada, Estonia, Italy, Liechtenstein, the Russian Federation and Ukraine. Information on measures to reduce NO_x by Parties to the Gothenburg Protocol is included in the section on the Gothenburg Protocol.

11. In Belarus, between 1987 and 1994, NO_x emissions decreased by 22.8% and, by 2000, by 49%. Emission-reduction measures in Belarus included the promotion of new technologies for fuel combustion with minimal emissions (exhaust gas recirculation, multistage combustion, control of combustion using a gas analyser, conducting local monitoring) and environmental certification of vehicles. In the Russian Federation, while total emissions of NO_x increased by 2.4% between 1987 and 2008, total emissions from stationary sources during the same period dropped by 53% (an increase of 64.4% from mobile sources was responsible for offsetting this drop). Reduction strategies highlighted by the Russian Federation focused on mobile sources, including a 2001 federal programme to reduce emissions from vehicles, and on energy, including the 2003 Energy Strategy, which emphasized energy efficiency and new technologies. Ukraine's energy strategy covered the period up until 2030, and aimed at providing cleaner fuel and energy in order to reduce NO_x emissions, through measures such as improving energy efficiency, fuel switching, new combustion technologies, modification of combustion processes and flue gas treatment.

12. Austria managed its NO_x emissions from stationary sources through licences containing emission limit values and measures, including on BAT. Its emissions from stationary sources and from residential combustion had dropped by slightly less than one third between 1987 and 2008. Estonia reduced its NO_x emissions between 1990 and 2008 by 53.3% (50.31% reduction in stationary fuel combustion and 56.5% from mobile sources). Italy implemented a series of command and control measures to reduce NO_x emissions, such as taxing large combustion plants and setting ceilings. It also promoted energy efficiency (for example issuing green certificates) and sustainable mobility. The

[4] http://www.unece.org/env/lrtap/nitr_h1.htm.

[5] Albania, Austria, Belarus, Belgium, Bulgaria, Canada, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Liechtenstein, Lithuania, Luxembourg, Netherlands, Norway, Russian Federation, Slovakia, Slovenia, Spain, Sweden, Switzerland, the former Yugoslav Republic of Macedonia, Ukraine, United Kingdom of Great Britain and Northern Ireland, United States of America and European Union. Updated status of ratifications is available at http://www.unece.org/env/lrtap/status/lrtap_s.htm.

measures taken to date had enabled Liechtenstein to reduce its NO_x emissions since 1985 by 24% by 2008. The country provided incentives in the form of subsidies for the use of renewable energy, including solar energy, wood and biomass.

13. For Canada, measures cited to reduce nitrogen included caps and emission standards for particulate matter (PM) and ozone, since reductions in these would also reduce NO_x emissions. The Government was also working with stakeholders to develop a regulatory approach for managing emissions of NO_x and other air pollutants from industry and other key sectors. Measures taken in Canada were anticipated to reduce annual NO_x emissions by 39% by 2010 from 1990 levels in the region of Canada defined in the annex to the Protocol as the Pollutant Emission Management Area.

3. Stationary sources

14. For the responding Parties, emission limit values reported for major stationary sources varied from 35–80 milligrams per cubic metre (mg/Nm^3) for combustion turbines with natural gas, to 500–1500 mg/Nm^3 for the production of glass in Austria; 150 mg/m^3 for boiler plants > 100 MW and boiler plants of 50–100 MW with natural gas, to 600 mg/Nm^3 for boilers with solid fuel in Belarus; 50 mg/Nm^3 for gas turbines operating with natural gas to 600 mg/Nm^3 for boilers with solid fuel built before 2006 in Italy; 50 mg/m^3 for gas turbines operating with natural gas to 800 mg/Nm^3 for kilns in cement production in Liechtenstein and Ukraine; and 125mg/m^3 for gas-powered boilers of 80–299 MW to 300 mg/Nm^3 for coal stations of over 300 MW in the Russian Federation.

15. Some of the reported measures to control NO_x emissions from major stationary sources with a thermal input of at least 100 megawatt thermal (MWth) included retrofitting low NO_x burners (most frequently cited measure), retrofitting selective catalytic reduction units, using combined cycle or cogeneration configurations, modernization of fusion aggregates and introducing Emission Optimized Sintering (EOS) systems.

4. Mobile sources

16. The reported national NO_x emission standards for newly registered mobile sources included: 0.08 g/km for passenger cars (petrol) in Austria, Belarus, Estonia, Italy and Liechtenstein, and 0.5 g/km for passenger vehicles in Ukraine; 7 g/kWh for heavy duty vehicles in Ukraine; and 7.5–11 (hydrocarbons (HC)+NO_x) g/kWh for shipping in Liechtenstein and Estonia.

17. All Parties had made unleaded fuel sufficiently available. Furthermore, Estonia and Italy had completely banned leaded fuel for on road vehicles. Others such as Canada reported that for vehicles designed for leaded petrol, such as farm machinery, leaded gasoline was limited to 30 mg/l (and 26 mg/l for imported leaded gasoline).

C. 1985 Helsinki Protocol on the Reduction of Sulphur Emissions or their Transboundary Fluxes by at least 30 per cent[6]

1. Overview and main obligations

18. The Protocol on the Reduction of Sulphur Emissions or their Transboundary Fluxes by at least 30 per cent was adopted in Helsinki in 1985 and entered into force two years later. It has been ratified by 25 Parties.[7] This first pollutant-related Protocol to the

[6] http://www.unece.org/env/lrtap/sulf_h1.htm.

[7] Albania, Austria, Belarus, Belgium, Bulgaria, Canada, Czech Republic, Denmark, Estonia, Finland,

Convention requires Parties to reduce their national annual SO_2 emissions or their transboundary fluxes by at least 30% from 1980 levels, by no later than 1993. This Protocol was complemented and in many ways superseded by the 1994 Oslo Protocol on Further Reduction of Sulphur Emissions. However, some of its Parties (Albania, Belarus, Estonia, the Russian Federation and Ukraine) have not ratified the later Protocol.

2. National programmes, policies and strategies

19. This section summarizes replies from Canada, Estonia, Liechtenstein and the Russian Federation. (The sulphur reduction measures by Parties to the 1994 Sulphur Protocol and to the Gothenburg Protocol are reported under the sections on these Protocols in document ECE/EB.AIR/2010/8/Add.1.)

20. The 1985 Sulphur Protocol has led to significant reductions in SO_2 emissions across Europe, with its 21 Parties surpassing the 30% reduction target. All Parties to the Protocol have achieved reductions in sulphur emissions of over 50% and 11 Parties have achieved reductions of at least 60%. Estonia reported a reduction of 74% between 1990–2008, while Liechtenstein reported a drop of over 63% between 1985 and 2008. The European territory of the Russian Federation saw a drop in SO_2 emissions of 80.4% between 1980 and 2008. In Belarus, SO_2 emissions decreased by 48.4% between 1980 and 1993 (and by 89% by 2008).

21. The most frequently cited measures to reduce SO_2 emissions related to limits and caps, and economic measures. Another frequently cited measure related to technological improvements such as pollution control equipment in Canada. The Russian Federation reported on a federal law passed in 1991 which promoted the use of BAT in the field of air protection and on a more recent (2008) decree to control emissions from cars, airplanes and various fuels.

II. Strategies and policies for controlling long-range transboundary air pollution

22. This section describes national strategies and policies for controlling long-range transboundary air pollution in the United Nations Economic Commission for Europe (UNECE) region, highlighting institutional, regulatory and strategic frameworks in place and the application of non-technical measures and economic instruments by industry and by the transport, energy and agricultural sectors for air pollution abatement. It also summarizes information on research, development, monitoring, exchange of technology and public awareness related to air pollution. The information is based on replies by Parties to the general policy questions of the 2010 questionnaire on strategies and policies (ECE/EB.AIR/2009/13).

France, Germany, Hungary, Italy, Liechtenstein, Lithuania, Luxembourg, Netherlands, Norway, Russian Federation, Slovakia, Sweden, Switzerland, The FYR of Macedonia and Ukraine. Updated status of ratifications is available at http://www.unece.org/env/lrtap/status/lrtap_s.htm.

A. National institutional, regulatory and strategic framework for air pollution abatement

1. Division of responsibility for measures to combat air pollution

23. For most Parties, the Ministry of the Environment was the lead authority in matters of air pollution. However, in many cases Parties also reported on close collaboration with other ministries, such as those of transport or energy. In Belarus, the remit for air protection was essentially shared between the Ministry of the Environment and the Ministry of Health.

24. In terms of hierarchical division of responsibility, most Parties noted the significant role of national authorities in policymaking and in monitoring, while local and municipal authorities were responsible for implementation and for informing the public. The Russian Federation reported on the distinction between the three levels of decision-making: federal, state and local. While the federal level was notably responsible for setting a unified air pollution policy and regulatory approach and establishing procedures, the state authorities were responsible for the adoption of laws and the development of regional programmes and interventions, among others. This Party also reported on the existence of specific federal bodies operating in fields of relevance to air protection that were responsible for issuing permits for emissions and in assessing emissions from different sources or for monitoring of air pollution.

25. Recent changes in Croatia had led to the creation of four new directorates, one of which was in charge of "atmosphere and waste management" with responsibilities for, notably: drafting regulations on pollutant limit values in ambient air; monitoring and analysis of the status of air quality at the national, regional and local levels; preparing background documents with regard to air pollution assessment; classification of the state territory into zones and agglomerations according to air pollution levels; and adopting and monitoring implementation of measures for air pollution reduction in zones and agglomerations in which limit and tolerance levels were exceeded. The Croatian Environment Agency, on the other hand, maintained information related to air quality.

26. The EU member States reported on a number of policies on air pollution, including directives and decisions (for example Directives 2008/50/EC and 2004/107/EC on air quality standards) which member States had to transpose into their legislation, as well as regulations which applied directly to them.

2. Ambient air quality and deposition standards

27. Many Parties noted that they applied the limits in the EU Directive for ambient air quality (2008/50/EC), which contained limits for SO_2, NO_x, PM (PM_{10}/$PM_{2.5}$) and lead. They referred, for example, to the limit of 350 micrograms per cubic metre ($\mu g/m^{3)}$ for SO_2, not to be exceeded more than 24 times a calendar year for on hour, and a limit for lead set at 0.5 $\mu g/m^3$ per calendar year. All but one responding Party also implemented the limit set for arsenic (6 ng/m^3/calendar year).

3. Multi-pollutant management approach

28. Several Parties reported that they applied a multi-pollutant approach, in line with the relevant EU regulations. Such an approach was applied to energy saving in particular in Hungary, and in livestock farming and traffic in the Netherlands. Reference was made to the EU National Emission Ceilings Directive (NEC Directive 2001/81/EC) that set ceilings for SO_2, NO_x, VOCs and ammonia (NH_3).

4. Integrating climate change and air pollution policies

29. Many Parties highlighted the benefits of measures to combat air pollution for achieving climate change targets and vice versa. Yet, in many cases they also identified the need for closer integration between the two areas. For example, in Cyprus, air pollution and climate change were addressed by two separate ministries. Denmark also reported that to date policies on climate change and air pollution had been approached independently from each other and that different air pollutants tended to be targeted separately. The Netherlands noted that efforts to tackle climate change and air pollution in an integrated manner should be further improved, although it also reported on progress made in this direction, including by means of a research programme called the "Dutch Policy Research Programme on Air and Climate". The Russian Federation highlighted that, while there was some integration between both areas, it remained weak. Spain noted that air pollution and climate change policies were integrated only in certain sectors, such as transport and energy. Equally, Sweden's environment policy had separate goals for climate change and air pollution, although implementation mechanisms sought synergies.

30. On the other hand, some Parties reported on increased cross-fertilization between the policies targeting air pollution and climate change. For example, Belarus reported on regulations that since 2008 covered both air pollutants and carbon dioxide (CO_2) (from fossil fuel combustion). The Czech Republic was combining its efforts on air pollution and climate change mitigation under its National Programme to Abate Climate Change Impacts, due to be adopted in the middle of 2010. Poland's efforts to promote renewable energy contributed to both climate change and air pollution reduction objectives. A number of measures in Slovenia, such as taxes on fossil fuels and the policy on waste management, achieved both air pollution and climate change objectives. The United Kingdom noted that its document "Air Pollution: Action in a Changing Climate", identified specific examples and opportunities to carry out synergistic improvements in air quality and reductions in climate change.

31. Promotion of synergies between climate change and air pollution measures was also a priority in the EU. An assessment of the EU Climate Action and Renewable Energy package showed the potential of reducing the cost of air pollution control by €8–€11 billion, and reduced SO_2 and NO_2 emissions by 10%–14%.

B. Sector-specific policies and measures for addressing air pollution

32. A number of Parties mentioned that they applied EU Directive 2008/1/EC concerning integrated pollution prevention and control (IPPC Directive) which promotes an integrated approach to pollution prevention. In Denmark, the "Eco-innovation 2010–2011" Action Plan promoted an integrated approach to environmental challenges, including air pollution, water and waste. The majority of responding Parties noted that air quality issues were integrated within broader environmental protection plans. Germany, Hungary, Romania and the United Kingdom stressed that air pollution concerns were taken into account in the activities of the various economic sectors, including industry, energy, transport, agriculture and in land use planning. The Czech Republic noted that its policies on air pollution took into consideration the wider ecosystems, as well as human health. Its State Environmental Policy (2004–2010) provided a framework for strengthening and improving cooperation with other sectors within the context of sustainable development.

33. A number of Parties mentioned environmental impact assessments as being an important basis for issuing permits, and for setting plans and programmes. In Norway, permits that were issued to facilities also regulated waste management more broadly. Consequently, they played a role not only in minimizing emissions into the air but also in

reducing contamination of soil and water. Equally, Croatia's new Environmental Protection Act required companies to obtain an integrated environmental protection permit prior to starting construction and operations (as well as prior to any significant change in operation or reconstruction of the installation). Portugal reported on its Polis Programme, created in 2000 to improve the overall quality of life in cities, which actively considers measures to improve urban air quality.

1. Industry

34. Parties reported on measures such as taxes, grants, licensing and voluntary schemes to control and reduce emissions from industry. The Belarusian National Action Plan on Rational Use of Natural Resources and Environment for 2006–2010 included the introduction of automatic monitoring systems for pollutants and emission sources on the edge of buffer zones and the implementation of environmental management systems. Belarus also reported using basic economic mechanisms including licensing and taxes. A 10% tax relief was granted to companies with certified environmental management systems. In the Czech Republic, a system of charges applied to polluters, according to the operator's size, and the revenue generated entered the State environmental fund for use in environmental projects. Norway had established a grant scheme totalling NOK 1.8 billion (approximately €227 million) per year for research and development (R&D) and innovation in environmental technologies (notably renewable energy, energy efficiency and carbon capture and storage).

35. Cyprus reported on the use of incentives such as cash grants to reduce industrial pollution and to promote renewable energy, while Slovenia's public Environmental Fund provided soft loans to companies for activities related to environmental protection, including air pollution prevention and control. Slovenia also provided subsidies for measures to improve energy efficiency and to support the use of renewable energy. Denmark noted that the licences granted to operators in the industrial sector outlined their obligations and guidelines related to efficient use of energy and raw material, optimizing the production processes, avoiding waste and promoting recycling, etc. It also reported that it ran a "help desk" for companies under its Eco-Innovations scheme to provide advice and support to businesses wishing to apply eco-efficient technologies. Further efforts in R&D were reported by the Netherlands, which promoted research and innovation in small businesses through a grants scheme called "Small Businesses Innovation Research", with a total budget of €2.45 million. Poland reported that its main priority was the restructuring of many industries, notably mining, cement and chemical industries, and the promotion of energy efficiency, innovation and BAT. Romania noted efforts to manage energy demand by monitoring energy consumption while raising awareness among industry operators about available options to reduce energy consumption.

36. The Russian Federation reported on specific subsectors such as the chemical and petrochemical industry, where the strategy included applying charges for negative environmental impacts, setting emission limits and promoting incentives to introduce BAT. A number of Parties mentioned the EU Emissions Trading Scheme for CO_2 emissions, which as been operational since 2005. The scheme covers over 11,500 energy-intensive installations, including combustion plants, oil refineries, coke ovens, iron and steel plants, and factories making cement, glass, lime, brick, ceramics, pulp and paper across the EU, accounting for about half of Europe's CO_2 emissions.

2. Transport

37. Measures by Parties to reduce emissions from the transport sector included reducing the use of cars through promotion of cycling and public transportation, elimination of old polluting cars, promotion of cleaner cars, improved fuels and R&D. For

example, cycling was promoted in Germany (under its 2002 National Cycling Plan) and in Italy and Poland (notably through public campaigns). Furthermore, Italy had set up a Fund for Sustainable Mobility (of €90 million/year for the period 2007–2009) to reduce emissions by promoting better public transportation, notably through underground railways, trams and trains. Croatia reported on the creation of bicycle lanes, improvements in the quality of public transport and intelligent traffic regulation.

38. Poland was promoting public transport through, among others, integrated train, bus and tram tickets and expanding parking areas near train stations. Portugal was also prioritizing improvements to the public transport system, notably by expanding the Lisbon and Oporto subway network, improving the national railway service and enlarging the fleet of vehicles powered by natural gas in public transport in Lisbon and Oporto. Romania was modernizing its rolling stock fleet to promote rail transport. The Russian Federation reported on its efforts to modernize the national transport system. Slovenia mentioned the existence of "Park and Ride" systems to encourage drivers to minimize the distance driven in their cars and to switch to public transport. Sweden reported that in some local municipalities buses were free of charge for either all citizens or certain groups, and either for all connections or just during certain hours.

39. Nearly all responding Parties reported on financial support schemes to promote the renewal of the car fleet (for cars older than 15 years generally). For example, in the Netherlands, owners of old cars received between €750 and €1,000 for trading them in for newer, more eco-friendly cars. As a result, around 80,000 old, polluting cars and delivery vans were expected to be traded in for newer and less polluting vehicles. Belarus succeeded in switching more than 4,000 vehicles to compressed and liquefied gas and renewed its bus stock. It also introduced higher import taxes for vehicles older than 14 years, with a resulting rise in the importation of newer and cleaner vehicles. In contrast many Parties imposed extra taxes on cars that either had more polluting engines (larger engines) or diesel cars without a filter.

40. In parallel, many Parties reported on incentives and subsidies to promote hybrid or electric cars. For example, in Cyprus grants worth a total of €2.3 million had been awarded for the purchase of hybrid, electric and dual propulsion vehicles. In the Czech Republic, these cars were dispensed from paying the road-traffic tax. Fiscal measures helped to increase the number of hybrid cars sold in the Netherlands, practically doubling their number from 3,700 vehicles in 2007 to 6,000 vehicles by the first half of 2008. The Portuguese Government provided a subsidy of €5,000 to the first 5,000 individuals that acquired an electric vehicle.

41. Various Parties reported on emission-reduction measures targeting fuels, including incentives to promote cleaner fuels (such as biofuels or compressed natural gas). In Slovakia, part of the bus fleet was being replaced with vehicles powered by natural gas. Similarly, Slovenia had included in Ljubljana's bus fleet 20 buses (out of 200) operating on pure biodiesel. In Sweden, all large petrol stations were required to have a biofuel pump and the installation was supported financially by the State.

42. Both Sweden and the United Kingdom reported on a congestion charge applied in their respective capital cities. In central Stockholm the scheme, in place since 2007, had brought down traffic by approximately 20%. In London the congestion charge came into effect in 2003 and the average volume of traffic entering the centre of the city had subsequently fallen by 21%.

43. Some Parties reported ongoing efforts in R&D to improve the transport sector's environmental impact. The Netherlands published several tenders for innovative developments, notably one to reduce the amount of kilometres necessary for transporting agricultural products, such as food and flowers/plants. One approach trialled in the United

Kingdom by the Highways Agency was to look at the effectiveness of a barrier coated with titanium dioxide designed to remove NO_x from the air.

44. The Russian Federation reported also on its air and maritime transport policies. In the field of air transport, it implemented improved environmental standards for aircraft engines (in line with those of the International Civil Aviation Organization) and was seeking to set high standards in civil shipbuilding in order for its industry to become more competitive globally. It also set specific measures for ships to reduce their emissions of SO_2, NO_2 and VOCs. With respect to on-road vehicles, the Russian Federation reported on the application of vehicle taxes.

3. Energy

Energy efficiency

45. Parties placed much emphasis on promoting energy efficiency, which not only contributed to reducing air pollution but also reduced anthropogenic sources of greenhouse gases responsible for climate change.

46. In its 2006–2010 energy policy, Belarus, among others, promoted the use of alternative and renewable energy, the implementation of combined schemes of power generation, the use of technological measures to suppress the formation of NO_x, the modernization of boilers, the development of small power stations and emission controls. Canada promoted energy efficiency through regulations, incentives and non-financial assistance for voluntary action, information and outreach activities. Measures under Croatia's Energy Efficiency Master Plan (2008–2016) included the use of biodegradable municipal wastes to fuel district heating plants, credits for renewable energy projects, and the promotion of energy efficiency in buildings. Cyprus's energy policy focused on energy pricing, sector-specific energy-efficiency programmes and renewable energy. Combined heat and electricity generation was promoted in the Czech Republic, Finland and Germany.

47. Italy was using "green" and "white" certificates to promote energy savings and renewable energy respectively. In Slovakia, measures to increase energy efficiency included regular inspections of boilers, heating systems and air-conditioning systems and the labelling of appliances according to their level of energy consumption. In Slovenia, the most important energy efficiency measures were: (i) fiscal measures, such as favourable taxation for biofuels for transport; (ii) market measures, such as the use of certification for energy in buildings and for identifying the origin of electricity; (iii) standard-setting, particularly in the building industry; (iv) financial support, such as subsidies for the domestic and professional use of renewable energy; and (v) information, promotion and demonstration activities.

48. Several Parties reported on the application of a mandatory energy-efficiency labelling scheme for appliances such as electric refrigerators, freezers, washing machines, electric tumble driers, dishwashers, household light bulbs, etc., in line with EC Directive 2005/32/EC.

49. Most responding Parties reported on measures to improve energy efficiency in buildings, labelled and classified according to their estimated consumption in primary energy (in line with EU Directive 2002/91/EC). For example, Austria reported on the use of subsidies to promote energy efficiency in buildings and the use of renewable energy. In the Netherlands, as of 2017, new non-residential buildings would have to be 50% more energy efficient compared with 2005. Italy supported energy-efficient buildings through fiscal deductions of up to 55% and municipalities could reduce ownership tax to below 4% if renewable energy systems were installed. Equally, in the Netherlands, since 1 July 2009

improvements in the energy efficiency of buildings were eligible for tax deductions and several subsidies existed to support energy improvements to private buildings. Liechtenstein promoted energy efficiency in buildings through its Building Act, which notably subsidized installations using renewable energy such as solar energy, wood and biomass. The United Kingdom was funding demonstration projects in low-carbon buildings through a £131 million (approximately €157 million) "Low Carbon Buildings Programme".

50. Innovative schemes were reported by a handful of Parties. These included, for example, Portugal's InovGrid Programme, which used cutting edge technology and expertise to support the installation of smart systems for energy metering in about 10% of households, or Sweden's "Get energy-smart" campaign to promote different ways to save and recycle energy via a touring demonstration house.

Renewable energy

51. Renewable energy sources were a major feature of all responding Parties' approaches to reduce emissions from the energy sector and were generally supported by grants or subsidies. For example, in Bulgaria, renewable energy represented 8.67% of total energy consumption in 2004, and 11.49% one year later. Croatia aimed for its share of electricity from renewable sources to reach 5.8% of total electricity consumption in 2010 compared to 0.8% in 2004. A major objective of Cyprus's policy to reduce emissions was to increase the contribution of renewable energy to the energy balance of the island up to 12% by the end of 2010. In the Czech Republic, renewable energy contributed 4.8% of the domestic energy consumption in 2008, essentially hydropower, but also biomass, biogas and solar energy (which had increased significantly (from 0.54 GWh in 2006 to 12.9 GWh in 2008). Furthermore, the Czech Republic reported that the Government subsidized up to 85% of the total eligible expenditures of a renewable energy project. Denmark's energy strategy aimed at increasing the share of renewable energy to 20% by 2011. To reach this target the Government subsidised onshore and offshore wind power and set up a special fund of DKK 25 million (approximately €3.3 million) per year over four years to promote the installation of solar photovoltaic cells, wave power, fuel cells running on renewable fuels and other renewable energy sources.

52. In Finland, about 30 % of electricity produced was from renewable sources, mainly hydropower and biomass. Hungary increased its use of renewable energy sources, particularly that of biomass. Poland's "Strategy for the development of renewable energy", adopted in 2001, aimed to increase the share of renewable sources of energy (particularly hydropower and biofuels) to at least 15% by 2020 through low interest loans and subsidies. Portugal was committed to securing 31% of its share of energy from renewable sources by 2020, with individual sources (such as wind and biomass) each having a specific target. To support these efforts it created an "Innovation Support Fund" in 2008 with a total of €76.8 million.

53. Romania reported on the use of a trading scheme whereby mandatory quotas of green certificates from renewable energy sources were allocated and could be traded. In Slovenia, the use of biofuels and other renewable fuels were promoted for motor vehicles, with the aim for them to reach 5% of all transport fuels by 2010 and 7.5% by 2015. More ambitiously, Slovenia's National Energy Programme expected that by 2010 the share of renewable energy would increase up to 12% of total primary energy supply, and the share of electricity based on renewable energy was expected to reach 33.6% of final electricity consumption.

54. Spain's 1999 Renewable Energy Promotion Plan committed to achieving 12% of primary energy use from renewables by 2010. Its Renewable Energy Plan for 2005–2010 foresaw that by 2010, 30% of electric production would come from renewable energy and

approximately 6% of transport fuels would be biofuels. Switzerland's programme SwissEnergy was launched in 2000 with the objective of improving energy efficiency and the use of renewable energy (mainly biomass, wind generation and passive solar systems) to help meet the target set out in the Kyoto Protocol to the United Nations Framework Convention on Climate Change. The United Kingdom reported on its "Renewables Obligation" which required licensed electricity suppliers to source a specified and increasing proportion of their electricity from renewable sources or pay a penalty. As a result, the proportion of electricity from renewable sources rose from 1.8% in 2002 to 5.4% in 2008. The United Kingdom also reported on the anticipated economic impact of its investment in offshore wind energy, which it estimated as being worth up to £75 billion (approximately €90 billion) by 2020, and providing up to 70,000 jobs.

4. Agriculture

55. Measures reported by Parties to address emissions from agriculture included alternative livestock feeding strategies, improved practices for manure storage and spreading, low-emission animal housing systems and the use of mineral fertilizers.

56. For several Parties, biogas presented an opportunity to reduce emissions from agricultural waste while at the same time improving energy efficiency. Cyprus reported that it already had eight biogas plants with a total capacity of 4.4 MW (out of a total estimated national potential of 12 MW). The Czech Republic and Norway reported on similar schemes. In Denmark, the biogas scheme, under the Rural Development Programme, was expected to be awarded DKK 100 million (approximately €13 million) annually from 2010–2012. The United Kingdom reported on a £10 million (approximately €12 million) project, called the Anaerobic Digestion Demonstration Programme, which supported demonstration projects on anaerobic digestion (using agricultural waste).

57. Various economic instruments were used by Parties in the agriculture sector, such as subsidies, tax incentives, fees, low interest loans etc. For example, tax benefits were granted in the Netherlands for farms that used techniques leading to low emissions of ammonia and greenhouse gases; Norway imposed fees on pesticides; and both Romania and Spain provided incentives to renew agricultural machinery.

58. Many Parties promoted organic farming through various financial schemes. In Cyprus, under the Rural Development Programme 2007–2013, cash grants were provided for organic farming. The Czech Republic and Denmark reported using subsidies to promote organic farming. A sharp rise in the proportion of organic farming was seen in Slovenia thanks to financial support from the State, with the share of organic farming to total farming area increasing from 0.5 % in 1999 to 6.1% in 2008. Switzerland provided direct payments for organic farming. Some Parties reported on activities related to awareness-raising and information dissemination on organic food in order to stimulate demand. The United Kingdom reported on a scheme called the Organic Conversion Information Service, which targeted farmers and provided them with free advice on the process and implications of switching to organic farming. The EU had an EU-wide organic agriculture policy[8] which contributed to the protection of natural resources, biodiversity and animal welfare, as well as to rural development.

[8] http://ec.europa.eu/agriculture/organic/eu-policy_en.

C. Research, development and monitoring

59. Many Parties mentioned that their research activities were linked to those of the of the Convention's Cooperative Programme on Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP) and its task forces. The Czech Republic reported that in 2010 it would participate in a case study on heavy metals which would analyse factors affecting the quality of the assessment of heavy metal pollution levels.

60. Slovakia reported on its Enviroportal, an environmental information system accessible online which provided verified information on the environment and served as an important decision-support tool. The Netherlands reported on a number of research programmes related to air pollution, notably a policy research programme on fine PM to deal with uncertainties concerning this pollutant and the European Platform on Mobility Management. This Party also noted that over 90% of its research related to air pollution was of an international nature. Switzerland reported that it had various institutes undertaking research related to air pollution (including the Swiss Federal Institute for Forest, Snow and Landscape Research; the Institute for Applied Plant Biology; the Agricultural Research Station; and the Research Group for Environmental Monitoring).

61. A number of Parties highlighted the importance of their air quality monitoring stations. For example, Hungary had 59 air quality monitoring stations across the country which measured levels of SO_2, NO_x, carbon monoxide (CO), PM, non-methane VOCs (NMVOCs) and ozone (at some stations). Similarly, Romania reported that its National Air Quality Monitoring Network had 142 automatic measuring stations across the country which measured air concentrations of SO_2, NO_2, CO, benzene and ozone, and PM. The Russian Federation reported that it had monitored air quality through 699 stations in 248 cities in 2008. Switzerland also reported that it had 96 stations to monitor air pollution across the country, 16 at the national level and 80 at the cantonal level.

62. The EU had a number of innovative programmes, such as the Competitiveness and Innovation Framework Programme's Entrepreneurship and Innovation Programme (CIP EIP),[9] which provided direct financial support for new and innovative technologies.

D. Exchange of technology and public awareness

63. Exchange of technology was reported by a number of Parties both at the national and international levels. For example, nationally, conferences, working groups and workshops were organized in Croatia, the Czech Republic, Hungary and Slovakia. International cooperation and sharing of experts were reported by Germany, Italy, Poland, Romania, Slovenia and Sweden. In the EU, regular workshops were organized (by the European Commission) to facilitate exchange of information on the development and implementation of air quality programmes. The EU candidate countries were invited to participate in assistance and support programmes which helped them to comply with EU legislation. Several Parties referred to their participation in the information exchange process set up by the European Commission under the IPPC Directive.

[9] See http://www.ec.europa.eu/cip/eip/index_en.htm.

64. With respect to air pollution legislation and policies, all responding Parties reported that they conducted public consultations prior to passing new laws or amending existing ones. In Cyprus and Romania the public was invited to participate in the preparation or revision of plans related to air pollution through open public hearings. Germany sent drafts of legislation specifically to selected experts and published them on the Internet. In Poland and the United Kingdom the public was invited to comment on any new Government proposal within a period varying from 21 days to 12 weeks. National and regional authorities, private entities and non-governmental organizations held workshops, seminars or conferences to raise public awareness about new policies and/or to improve the application of existing ones in Portugal. In the Russian Federation the authorities had to review the results of environmental monitoring reports undertaken by non-governmental organizations and public associations.

65. The Czech Republic, the Netherlands, Portugal and Spain reported that they applied the UNECE Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters, which establishes the right for the public to participate in decisions related to the environment. Furthermore, in the Netherlands, the Environmental Information Act contained new obligations for private enterprises to supply citizens with information about factors relating to their operations that might have an effect on the environment.

66. In most countries, information about air quality and pollution was communicated to the public via websites. In serious cases, some Parties (e.g., Cyprus, Italy and the Netherlands) reported that the public were further informed via the press and media. The Russian Federation reported on the use of interviews with leading experts to keep the public informed.

Annex

Proposed list of figures for inclusion in the final 2010 Review of Strategies and Policies for Air Pollution Abatement[10]

[10] Subject to the approval for publication of the 2010 review by the Executive Body at its twenty-eighth session in December 2010. Figures on the 2010 data would be included depending on the time of publishing, subject to their availability.