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Working Group on Strategies and Review

Fifty-second session

Geneva, 30 June–3 July 2014

Report of the Working Group on Strategies and Review on its fifty-second session

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I. Introduction

1. The fifty-second session of the Working Group on Strategies and Review was held in Geneva, Switzerland, from 30 June to 3 July 2014.

A. Attendance

2. The session was attended by representatives of the following Parties to the Convention on Long-range Transboundary Air Pollution: Albania, Armenia, Austria, Azerbaijan, Belarus, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, European Union (EU), Finland, France, Georgia, Germany, Greece, Hungary, Ireland, Italy, Kazakhstan, Kyrgyzstan, Lithuania, Netherlands, Norway, Poland, Republic of Moldova, Serbia, Slovakia, Spain, Sweden, Switzerland, the former Yugoslav Republic of Macedonia, Ukraine, United Kingdom of Great Britain and Northern Ireland and United States of America. Tajikistan and Uzbekistan were also represented.

3. Representatives of the European Environmental Bureau and the German Association of the Automotive Industry were present. A representative of the World Health Organization (WHO) attended via videoconference.

B. Organizational matters

4. The meeting was chaired by Mr. W. Harnett (United States).

5. The Working Group adopted the agenda for the meeting as set out in document ECE/EB.AIR/WG.5/111.

II. Adoption of the report of the fifty-first session

6. The Working Group adopted the report of its fifty-first session as set out in document ECE/EB.AIR/WG.5/110.

7. The representative of Greece on behalf of the EU noted that, in accordance with the rules of procedure, the draft report of each session should be distributed within six weeks after the session (ECE/EB.AIR/106/Add.1, decision 2010/19, annex, rule 10, para. 3).

III. Progress in the implementation of the 2014–2015 workplan

8. The Working Group took note of the reports by the co-Chairs of the Task Force on Reactive Nitrogen and the Expert Group on Techno-economic Issues and the Chair of the Task Force on Heavy Metals on their progress in the implementation of the 2014–2015 workplan for the implementation of the Convention (ECE/EB.AIR/122/Add.2). The co-Chair of the Task Force on Integrated Assessment Modelling presented the outcomes of the forty-third meeting of the Task Force, held in Helsinki on 6 and 7 May 2014.

9. On the basis of a presentation by the co-Chair of the Task Force on Integrated Assessment Modelling under the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP), the Working Group exchanged ideas on the scope, timeline and resources required for the preparation of the Assessment Report of the Convention on Long-range Transboundary Air Pollution to be published in 2016, highlighting, inter alia: (a) the need to include heavy metals and

persistent organic pollutants (POPs) in the scope of the report; (b) the requirement to specifically cover the needs and priorities of countries in Eastern Europe, the Caucasus and Central Asia in line with the Convention's long-term strategy (ECE/EB.AIR/106/Add.1, decision 2010/18, annex); and (c) that the report should be of a more forward-looking nature with regard to challenges related to air quality. It agreed that an updated outline of the Assessment Report should be submitted to the thirty-third session of the Executive Body for the Convention (Geneva, 8–12 December 2014) for its consideration.

10. The Working Group further welcomed the progress in the preparation of the revised United Nations Economic Commission for Europe (ECE) Framework Code for Good Agricultural Practice for Reducing Ammonia Emissions by the Task Force on Reactive Nitrogen, and invited all Parties to contribute to the preparation of the document by submitting technical comments to the co-Chairs of the Task Force by 30 August 2014. The Working Group requested the Task Force to submit the final draft to the Executive Body at its thirty-third session for adoption.

11. The Working Group also discussed and provided specific comments to the draft mandate of the proposed Task Force on Techno-economic Issues presented by the co-Chair of the Expert Group on Techno-economic Issues. It agreed to submit the draft mandate of the new Task Force, as modified at the session (annex I), to the Executive Body for its consideration and adoption at its thirty-third session.

IV. Information sharing by Parties on the implementation of the Convention

12. On the basis of presentations by representatives of Parties, the Working Group shared information on the implementation of the Convention throughout the ECE region, considering progress and challenges in Eastern Europe, the Caucasus and Central Asia, as well as emerging policy issues and scientific findings.

13. The following Parties shared information either by making a presentation and/or by submitting a completed template with examples and good practices of air pollution-related policies, strategies and measures: Armenia, Austria, Azerbaijan, Belarus, Belgium, Croatia, Czech Republic, EU, France, Georgia, Hungary, Italy, Kazakhstan, Kyrgyzstan, Norway, Poland, Republic of Moldova, Serbia, Spain, Switzerland, the former Yugoslav Republic of Macedonia, Ukraine, United Kingdom and United States. Tajikistan and Uzbekistan also shared their experiences.

A. Good practices to strengthen the implementation of air pollution-related policies, strategies and measures

14. The Working Group exchanged information, experiences and good practices on air pollution-related policies, legislation, strategies and measures, and requested the Chair to produce a summary of the discussions on the matter (annex II). In line with Executive Body decision 2013/2 (see ECE/EB.AIR/122/Add.1), the Working Group discussed ways and means to improve the organization of the exchange of experiences, noting inter alia, that:

(a) Specific themes related to air pollution abatement could be selected for each of the annual sessions on information sharing on the implementation of the Convention;

(b) The number of presentations at such sessions should be limited in order to facilitate more interactive discussions;

(c) Completed templates with examples and good practices and presentations should be provided to the secretariat within the requested time frame;

(d) The Chair would work with the Bureau of the Working Group in identifying appropriate themes and in the organization of the information-sharing sessions.

15. Some delegates suggested structuring all the discussions on the sharing of experiences in the implementation of the Convention under one common thematic area for future sessions of the Working Group.

B. Challenges faced and progress made by countries in Eastern and South-Eastern Europe, the Caucasus and Central Asia with regard to accession and implementation

16. The Working Group exchanged information on the progress made and obstacles remaining in countries of Eastern Europe, the Caucasus and Central Asia with regard to accession to and implementation of the Convention and its three most recent protocols. The countries shared information on the development and introduction of new measures, policies and legislation, implementation of capacity-building projects, plans for ratification and challenges. This part of the session was chaired by Mr. A. Pilipchuk (Belarus), Vice-Chair of the Working Group.

17. Representatives of Georgia, Armenia, and the Republic of Moldova informed the Working Group about the progress made as a result of the EU Air Quality Governance project implementation. The representative of Georgia detailed the country's plans to harmonize the national legislation with EU standards, the development of an air quality monitoring system and Georgia's intention to ratify the Convention's three latest protocols by the end of 2019. Armenia reported on its recent ratification of the Protocol on Long-term Financing of EMEP (EMEP Protocol), the ongoing development of emission levels associated with best available techniques (BATs) and the revision of the regulatory framework for the cement industry and the non-ferrous metallurgy and energy sectors. The delegation of the Republic of Moldova announced the country's intention to ratify the EMEP Protocol by the end of 2014 and the Protocol to Abate Acidification, Eutrophication and Ground-level Ozone (Gothenburg Protocol) by the end of 2019, and described the current work to revise the legislative framework and to improve emission inventories.

18. The representative of Ukraine gave an overview of the national regulatory framework for emissions from both stationary and mobile sources. The delegation of Kazakhstan reported on measures undertaken to improve air quality in the country, while noting the obstacles hindering further progress in ratifying and implementing the protocols to the Convention, such as the lack of understanding of their provisions and institutional barriers. Among the difficulties listed by the delegation of Kyrgyzstan in ratifying and implementing the protocols were the high emissions from mobile sources, mostly from old cars, outdated technologies and equipment in the energy sector and the underdeveloped monitoring network. A representative of Uzbekistan informed the Working Group about the progress in reducing emissions from the transport sector, and highlighted the country's political will to work in the framework of the Convention. The delegation of Tajikistan noted that, along with some progress made in improving of air quality, a number of challenges remained, including the lack of institutional capacity and emission inventories and the outdated monitoring network.

19. The Working Group stressed the need to encourage decision makers in the region to ratify and implement the three most recent protocols, by raising awareness about the adverse effects of air pollution on health and ecosystems and the benefits of joining the protocols, including through developing factsheets containing brief and clear information

on the requirements under the protocols and success stories. The Working Group underscored the importance of the support provided by other Parties in building capacity in countries in Eastern Europe, the Caucasus and Central Asia and the need to continue the ongoing work. It also noted information from Belarus on the benefits of the assessment by international experts of the conformity of the country's national programmes and plans with the requirements of the protocols in assisting ratification and implementation.

20. The delegation of the EU noted its plans to continue supporting the countries in Eastern Europe, the Caucasus and Central Asia. In particular, it mentioned a project to be launched in Belarus to support the country in ratifying the Gothenburg Protocol. Details of further activities would be specified at a later stage upon completion of the Air Quality Governance project.

C. Emerging policy issues and scientific findings

21. The Working Group took note of the recent evidence related to air pollution and health presented by the representative of WHO, the Chair of the Joint Task Force on the Health Aspects of Air Pollution, and of current activities of the Task Force. That included an update on the progress in research on the health impacts of particulate matter and ozone, the WHO Indoor Air Quality Guidelines for Household Fuel Combustion to be launched in 2014 and the Task Force paper on residential heating, as well as the relevant meetings and capacity-building activities organized by WHO. The Working Group also took note of the presentation by the representative of the Centre for Ecology and Hydrology of the United Kingdom, who introduced an innovative tool to monitor damage to vegetation caused by ground-level ozone using a smart phone application.¹ The tool had been developed by the International Cooperative Programme on Effects of Air Pollution on Natural Vegetation and Crops.

D. Current policy issues: transport and air pollution

22. The Working Group exchanged information on transport and air pollution within a special session organized in cooperation with the ECE Transport Division and with input provided by the ECE Housing and Land Management Unit. The Working Group requested the Chair to produce a summary of the discussions (annex III). It recognized the efforts of the ECE Transport Division, in particular its work carried out under the World Forum for Harmonization of Vehicle Regulations and the Working Party on Transport Trends and Economics, aimed at reducing the emissions of air pollutants, in particular nitrogen oxides and particulate matter, as well as the efforts of the Transport, Health and Environment Pan-European Programme (THE PEP) — for which the ECE Environment and Transport Divisions, as well as the WHO Regional Office for Europe jointly provide the secretariat.

V. Election of officers

23. The Working Group elected Mr. P. Almodovar (United States) and Mr. M. Gudas (Lithuania) and re-elected Mr. I. Angelov (Bulgaria) and Mr. A. Pilipchuk (Belarus) as its Vice-Chairs for the period 2015–2016.

¹ The application can be downloaded by following instructions at <http://icpvegetation.ceh.ac.uk/record/index>.

VI. Adoption of the conclusions and recommendations of the Working Group

24. On 3 July 2014, the Working Group on Strategies and Review adopted the decisions taken at its fifty-second session.

Annex I

Draft decision 2014/1 on the establishment of the Task Force on Techno-economic Issues

The Executive Body,

Taking into account the strategic priorities set out in the Long-term Strategy for the Convention on Long-range Transboundary Air Pollution (ECE/EB.AIR/106/Add.1, decision 2010/18, annex),

[*Recalling* its request to the Working Group on Strategies and Review in paragraph 1 of its decision 2013/22 to propose an update to the mandate of the Expert Group on Techno-economic Issues to establish a task force to address emission abatement technologies for stationary and mobile sources in relation to atmospheric emissions of nitrogen oxides (NO_x), sulphur dioxide (SO₂), volatile organic compounds (VOCs) and particulate matter (PM), including black carbon, heavy metals and persistent organic pollutants (POPs),

[*Also recalling*] [*Recalling*] its decision in paragraph 3 of decision 2013/22 to discontinue the Task Force on Persistent Organic Pollutants, while recognizing that any further work should be organized under ad hoc groups when the need arises or under the new Task Force on Techno-economic Issues,

[*Further recalling*] [*Also recalling*] its decision in paragraph 4 of its decision 2013/22 concerning future work on heavy metals, and in particular the recommendation of the Working Group on Strategies and Review that future work as of 2015 on abatement technologies for reducing emissions of heavy metals be addressed under the new Task Force on Techno-economic Issues,]

Acknowledging that the two lead countries, France and Italy, will continue to provide the co-chairs for the work on techno-economic issues and to support the technical secretariat functions carried out by the Interprofessional Technical Centre for Studies on Air Pollution and the French-German Institute for Environmental Research,

Decides to upgrade the Expert Group on Techno-economic Issues to the Task Force on Techno-economic Issues with the mandate as set out in the annex to this decision.

Annex

Mandate for the Task Force on Techno-economic Issues

The new Task Force on Techno-economic Issues, drawing on the expertise of the former Expert Group on Techno-economic Issues and other expertise as appropriate, shall perform the following tasks in addressing emission abatement technologies for stationary and mobile sources and other tasks requested by the Executive Body for the Convention on Long-range Transboundary Air Pollution or by the Working Group on Strategies and Review, assuming that adequate financial and human resources are available:

(a) Update and assess on a regular basis the information on emission abatement technologies for the reduction of the atmospheric emissions of SO₂, NO_x, VOCs, dust,^a

^a For Parties other than Canada and the United States of America, "dust" means the mass of particles, of any shape, structure or density, dispersed in the gas phase at the sampling point conditions which may be collected by filtration under specified conditions after representative sampling of the gas to be

black carbon, heavy metals and POPs from stationary and mobile sources, including on the costs of these technologies;

(b) Create and maintain a regional clearing house of control technology information for emissions of SO₂, NO_x, VOCs, dust, black carbon, heavy metals and POPs with the aim of being a reference place for dissemination of information to the experts of the Parties;

(c) Cooperate with the other technical bodies of the Convention — in particular the Task Force on Emission Inventories and Projections and the Task Force on Integrated Assessment Modelling — to create synergies, maximize results and optimize resources when performing its tasks;

(d) Cooperate with technical bodies outside the Convention as needed;

(e) Cooperate with the Coordinating Group on the promotion of actions towards implementation of the Convention in Eastern Europe, the Caucasus and Central Asia with the purpose of providing techno-scientific assistance to those countries;

(f) Organize seminars and workshops for the dissemination and promotion of information on abatement technologies, like the guidance documents on best available techniques and technical annexes to the protocols to the Convention;

(g) Provide assistance to the Implementation Committee if it so requests;

(h) Report on the progress in its work to the Working Group on Strategies and Review.

analysed, and which remain upstream of the filter and on the filter after drying under specified conditions.

Annex II

Chair's Summary of information sharing on good practices to strengthen the implementation of air pollution-related policies, strategies and measures

A. Introduction

1. The session on information sharing within the fifty-second session of the Working Group on Strategies and Review was organized based on decision 2013/2 adopted by the Executive Body at its thirty-second session (Geneva, 9–13 December 2013) to facilitate reporting by Parties on strategies, policies and measures employed to implement obligations under any of the Convention's protocols, to replace the questionnaire that was used for this purpose before.
2. To facilitate submission of examples and good practices of air pollution-related policies, strategies and measures, the secretariat of the Convention circulated a template for completion by Parties prior to the fifty-second session of the Working Group.
3. At the fifty-first session of the Working Group on Strategies and Review (Geneva, 30 April–3 May 2013), eight Parties reported on their policies, strategies and measures in the context of a similar session: Belgium, Denmark, EU, Germany, Ireland, Norway, Switzerland and United States. At the present session, 11 Parties shared information on policies and measures: Austria, Belgium, Czech Republic, EU, Hungary, Poland, Serbia, Spain, the former Yugoslav Republic of Macedonia, United Kingdom and United States. The Chair's summary is based on the presentations delivered by these Parties.

B. Policies, strategies and measures to abate air pollution

4. A number of key arguments for policymakers to implement policies, strategies and measures with the objective of abating air pollution were highlighted during the session, including examples of some of the actions being taken to address them:
 - (a) *Public health considerations:*
 - (i) The United States is in the process of reviewing the science upon which its National Ambient Air Quality Standards for ground-level ozone is based as well as the standards themselves, with a view of revising them, if appropriate;
 - (ii) The EU Clean Air Package launched in December 2013 sets public health objectives for 2030 with the goal of reducing mortality due to exposure to fine particulate matter (PM_{2.5}) and ground-level ozone by 52 per cent and 34 per cent, respectively, compared with 2005 levels;
 - (iii) Spain introduced voluntary measures to reduce mercury (Hg) emissions in industry to protect human health and environment;
 - (b) *Protecting the environment:*
 - (i) In the EU, the Clean Air Package was projected to save 123,000 square kilometres (km²) of ecosystems from eutrophication (a 35 per cent reduction in the area under eutrophication) and 19,000 km² of forest area from acidification (an 86 per cent reduction in forest ecosystems under acidification);
 - (ii) Hungary succeeded in substantially reducing its sulphur dioxide (SO₂) emissions to the benefit of the environment;

- (c) *Mitigating climate change:*
- (i) In the United States, the Clean Power Plan proposed in June 2014 and aimed at reducing carbon pollution from existing fossil fuel-fired power plants, would help reduce carbon dioxide (CO₂) emissions from the power sector by approximately 30 per cent from 2005 levels and would also produce co-benefits through the reduction of PM_{2.5}, SO₂ and nitrogen dioxide (NO₂) emissions by over 25 per cent by 2030;
 - (ii) In the Czech Republic, incentives to replace old solid fuel boilers were supported by programmes encouraging switching to biomass burning for domestic heating purposes;
 - (iii) In the former Yugoslav Republic of Macedonia measures to curb emissions of nitrogen oxides (NO_x) included the promotion of renewable energy development, such as solar power and hydropower installations;
- (d) *Market and industrial competitiveness:*
- (i) Serbia modernized its oil refinery sector to meet the latest EU fuel quality standards, which led to improved air quality and the increased competitiveness of Serbian products in the Balkans;
 - (ii) In the United Kingdom, the use of feeds supplemented by synthetic amino acids by the pig and poultry sector showed potential for reducing ammonia emissions while also saving money for producers;
- (e) *Compliance with emission ceilings under different Protocols:*
- (i) Compliance with emission reduction ceilings, such as the ones set out in the Protocol concerning the Control of Nitrogen Oxides or their Transboundary Fluxes and the Gothenburg Protocol, was one of the main drivers in implementing measures to reduce NO_x emissions in Poland and in the former Yugoslav Republic of Macedonia;
 - (ii) Belgium introduced advanced methods of detecting volatile organic compounds (VOCs) emissions at industrial sites in the light of its obligations under the Gothenburg Protocol.

C. Different types of instruments to promote air pollution abatement, including economic, voluntary and educational measures

5. Different types of regulatory measures were implemented by Parties to reduce air emissions:
- (a) Poland set requirements on the use of best available techniques (BAT) to control different pollutants under its National Environmental Policy;
 - (b) In 2011, Serbia banned the use of leaded fuel and introduced stricter requirements for fuel quality. Serbia subsequently joined the Protocol on Heavy Metals;
 - (c) In Hungary and Poland, a system of environmental charges and fines was introduced as well as an energy tax to control emissions of different pollutants;
 - (d) Belgium set mandatory emission limit values (ELVs) for stationary sources of VOCs pollution.
6. In addition to legislative and regulative approaches, measures beneficial to air pollution abatement can include economic, voluntary and educational measures. Such measures can have additional benefits, including awareness-raising, increased cooperation

and information exchange. For example, in Spain, voluntary agreements in the chlor-alkali sector involving stakeholders from industry and local and national governments resulted in a decrease in Hg emissions of 48 per cent and 43 per cent, respectively, during the 2000–2006 and 2007–2012 implementation phases.

7. Economic instruments include incentives and disincentives, like subsidies or taxes:
 - (a) In the Czech Republic, local and central governments provide subsidies for citizens to replace their old solid fuel boilers ranging from 560 to 2,200 euros per boiler;
 - (b) Within the proposed Clean Power Plan, the United States Environmental Protection Agency has established specific goals (state-wide number for the future carbon intensity of covered existing fossil fuel-fired power plants) for each state and introduced a variety of implementation measures for meeting those goals, including market-based trading programmes, switching of fuel to natural gas, retrofitting units with carbon capture and storage, low emission facilities, demand-side energy efficiency programmes and others.
8. Educational measures such as information campaigns can also be important tools of the overall policy and instrument mix. Examples are:
 - (a) An information campaign in Austria, with recommendations on the correct operation of wood-fuelled stoves and the proper types of fuel wood and information on the health effects of pollution, to reduce air pollution from domestic heating. Information was distributed through leaflets and published on the Internet;
 - (b) Public awareness was considered as one of the key components of national programmes to reduce air pollution in Poland and in the former Yugoslav Republic of Macedonia.
9. Educational campaigns can be implemented with limited funds but have the potential to produce substantial benefits. For instance, the awareness-raising programme in Austria only cost about 10,000 euros per year.

D. Designing and implementing targeted measures to abate air pollution

10. Policymakers usually have a wide range of measures to choose from, thus requiring an analysis to select the best option and proper design of the measure. Cost-benefit analysis is one of the determining steps in this process. Many examples show that benefits of abating air pollution outweigh by far the costs involved:
 - (a) It was estimated that implementation of the Clean Air Package in the EU would reduce health-related external costs by some 38 to 138 billion euros per annum, or around 12 to 40 times the projected implementation costs of 3.3 billion euros per year;
 - (b) In a similar manner, the proposed Clean Power Plan in the United States was expected to produce public health and climate benefits in the order of 55 to 93 billion United States dollars, which far outweighed the estimated costs of 7.3 to 8.8 billion United States dollars annually by 2030.
11. Choosing and designing appropriate measures needs to be based on national, regional and local circumstances and involve various stakeholders:
 - (a) In the Czech Republic, the subsidy programme for the replacement of old solid fuel boilers takes into account traditional fuels used in different parts of the country and relies strongly on cooperation between national and local authorities;
 - (b) In Spain, the successful implementation of the voluntary agreement for reduction of Hg emissions was achieved through the active involvement of the industry

players, regional governments and the Ministry of Environment. Annual meetings to overview the progress and the provision of training for staff of industrial facilities were key elements for the successful implementation of the programme;

(c) In Austria, chimney sweepers' and medical associations were closely involved in the elaboration of public awareness materials on the proper operation of residential wood stoves.

12. Innovative solutions to finance measures to reduce emissions of air pollutants were employed by a number of Parties. In Poland, a "debt for environment" swap programme was supported by six donor countries to reduce the Polish foreign debt by the amount of investments put into the protection of environment.

E. Conclusions

13. Delegates noted the usefulness of the new format for sharing information on policies, strategies and measures to abate air pollution, which provided a venue to learn about a range of instruments, designs and innovative approaches applied by Parties in a more interactive manner.

14. Parties were invited to participate actively in future sessions on exchanges of experience, and in particular Parties that had not yet shared such information at the previous sessions of the Working Group. The importance of the timely submission of templates and presentations to the secretariat was underscored in this regard.

15. It was further noted that future sessions on exchange of experiences could be dedicated to one of the Convention's protocols or one of the air pollutants to facilitate a more focused discussion.

Annex III

Chair's summary of information sharing during the special session on current policy issues: transport and air pollution

A. Introduction

1. In order to focus the exchange of experiences on policies, strategies and measures taken to reduce air pollution in one of the sectors that is a major source of air pollution, and to offer a platform for informed cross-sectoral dialogue, a special session on air pollution from the transport sector was held as part of the fifty-second session of the Working Group on Strategies and Review under the Convention on Long-range Transboundary Air Pollution and in the broader context of the United Nations Economic Commission for Europe (ECE) engagement in the transition towards a green economy.
2. The special session was organized by the secretariat of the Convention in cooperation with the ECE Transport Division, particularly the secretariat servicing the World Forum for Harmonization of Vehicle Regulation and the Working Party on Transport Trends and Economics.
3. Contributions to the session were furthermore provided by the ECE Housing and Land Management Unit as well as THE PEP, for which the ECE Environment and Transport Divisions, as well as the WHO Regional Office for Europe (WHO/Europe), jointly provide the secretariat.

B. Setting the Scene: Linkages between transport and air pollution

1. Air pollution — the world's single largest environmental health risk

4. It was noted that transport-related pollution was one of the major sources of air pollution, in particular of nitrogen oxides (NO_x) and particulate matter (PM). According to recent findings of WHO, air pollution in general, and PM specifically, had been found to be carcinogenic to humans and was now classified as the world's single largest environmental health risk, causing cardiovascular and respiratory diseases and leading to premature death. WHO air quality standards were being exceeded in most urban areas for fine particulate matter (PM_{2.5}) concentrations and the exposure to air pollution had not shown a downward trend in all places as emission data would suggest.

2. Road transport-related emissions — what we emit is not what we breathe in

5. In 2012, 15 per cent of total EU emissions were attributable to the road transport sector, making it the second largest emission source for PM_{2.5} and the third largest for coarse particulate matter (PM₁₀) emissions (13 per cent). With a 39 per cent share, it was also the biggest emitting economic sector for NO_x. Several Parties had failed to meet their emission reduction targets for 2010 under the Gothenburg Protocol. One of the main reasons identified for that failure was the gap between expected and real-world emissions, for NO_x in particular.

6. It was highlighted that reduction measures had to be aimed at primary PM emissions at different scales (street, urban, national and international), and at NO_x emissions that contributed to secondary PM concentrations, in order to reduce the human exposure to air pollution.

3. ECE Transport Division working towards sustainable development

7. An overview was given of the many facets of the work undertaken by the ECE Transport Division concerning the reduction of air pollution from transport, especially through its regulatory work on vehicle regulations under the World Forum for Harmonization of Vehicle Regulations and specifically the Working Party on Pollution and Energy, as well as the compilation of a number of publications such as “Transport for Sustainable Development”. The importance of high market fuel quality for the dissemination of modern vehicle technology, the replacement of the old vehicle fleet with newer vehicles and the availability of sustainable electricity, including smart grids, by 2040 were underlined as essential steps towards future sustainable transport.

4. The Transport, Health and Environment Pan-European Programme

8. The work under THE PEP was presented as a jewel of regional cooperation that brought together representatives of ministries of transport, health and environment from 56 ECE and WHO member States in a tripartite policy framework. It supported integrated policy approaches to sustainable and healthy transport and mobility in order to address major challenges, including transport-related environmental and health costs, the increase in freight and passenger transport, the increasing number of cars and the related rise in car trips with single occupancy and short distances. As part of THE PEP Paris Declaration^b five main goals had been agreed: (a) the stimulation of investments in green and healthy transport; (b) the improvement of mobility management and an increase in the efficiency of transport systems; (c) the reduction of transport-related greenhouse gases (GHGs), air pollution and noise; (d) the promotion of green, safe and healthy active mobility; and (e) the integration of transport, health and environmental objectives into urban and spatial planning policies. THE PEP was implemented through regional workshops, especially in countries of Eastern Europe, the Caucasus and Central Asia, through THE PEP partnerships, national action plans and recently THE PEP Academy. The speaker underscored the importance and potential of the further active involvement of environment ministries of member States in THE PEP process, as well as future cooperation on transport and health-related issues of air pollution between THE PEP and the Convention.

C. Road transport: Making vehicles emit less — achievements and remaining challenges

1. Transport sector: highly regulated, but real-world problems persist

9. Much more stringent emission limits for air pollutants from road transport had been introduced over the past few decades — with some limits reduced by up to 98 per cent — while at the same time technical innovations and associated improvements in the fuel-efficiency of vehicles had been encouraged.

10. In spite of those positive changes, however, a number of factors— including the increasing demand for road transport; delays in the expected time frames for vehicle fleet renewal; the availability of cleaner fuels and measures to shift to other cleaner forms of transport; and the gap between set emission limits and real-world emissions from vehicles — made it necessary to further improve the environmental performance of the transport sector in an active, well-targeted way.

11. While NO_x diesel standards had become more stringent over time, real world emissions showed that the Euro 5 standard was exceeded by a factor of four for diesel cars.

^b Available at: http://www.developpement-durable.gouv.fr/IMG/pdf/Declaration_de_Paris_EN-2.pdf.

The New European Driving Cycle as the basis for the emission determination, introduced in 2008, had been identified as being the underlying cause for the gap between set standards and real-world emissions. The European Commission was working on a Real Driving Emissions project to be used as of 2017 as part of the Euro 6 type approval.

2. Development of the new Worldwide harmonized Light vehicle Test Procedure

12. Furthermore, some of the current and potential future efforts towards reducing harmful air pollutants undertaken as part of the ECE Inland Transport Committee work, and in particular the recent development by the World Forum for Harmonization of Vehicle Regulation and the Working Party on Pollution and Energy of a new emission test cycle for light vehicles (i.e., the Worldwide harmonized Light vehicle Test Procedure (WLTP)), were outlined. It was shown that the transport sector was one of the most regulated sectors which had, over the past few decades, resulted in large decreases in PM and other emissions, but improvements in environmental performance had to continue in a well-targeted way.

13. The newly developed WLTP was expected to better represent real driving conditions globally, and thus to improve future projections of air pollution levels and enable the development of more effective measures to address them. It had been developed based on the collection of “in use data” and used Low (<60 kilometres an hour (km/h)), Medium (<80 km/h), High (<110 km/h) and extra High (>110 km/h) speed phases instead of the previous concept, which used the differentiation of urban, rural and motorway. The latter had been shown as not being representative of driving conditions worldwide. The new cycle further allowed use for different vehicle power classes, and worked with a higher vehicle test mass, a longer test cycle and longer distance as well as more dynamic acceleration.

3. Principles for better regulation

14. A representative of the German car industry highlighted the importance of already existing in-service conformity testing requirements after type approval in order to monitor real-world emissions. He outlined several principles for better regulation, including technology-neutral but performance-based test requirements to achieve clean mobility using a broad variety of technical solutions; cost-benefit and impact assessments as the basis for decision-making; clear and long-term target setting, taking into account the development process and the life cycle of vehicles; stakeholder participation; and worldwide harmonization of vehicle regulations.

15. In addition, phased approaches could achieve early as well as long-term reductions, as was outlined by a representative of the United States. Furthermore, the importance of a robust compliance regime to achieve real-world benefits was stressed. Moreover, the positive effect of regulatory flexibilities and voluntary partnerships (coupled with incentive programmes) was mentioned in order to be able to equally reward technology leaders and technology adopters.

D. Addressing high levels of air pollution from transport in the urban context

1. Short-term measures

16. A representative of France demonstrated how to address exceptionally high concentrations of PM and NO_x in an urgent and short-term manner, sharing experiences related to the Paris high pollution episode in March 2014, which had been an exceptional event due to the geographical coverage, its duration and intensity. It was also noted that the transboundary contribution to air pollution was quite large, with air mass fluxes from the

Eastern part of Europe having influenced the PM concentrations in France. The chemical characterization showed that the PM concentrations during the episode contained a high percentage of ammonium nitrates.

17. Emergency control measures adopted for the transport sector in response to the event had included the reinforcement of speed limits and controls, the banning of heavy duty vehicles from accessing the city and the provision of free access to public transport in several municipalities. As a result, NO_x emissions had been reduced by 20 per cent inside Paris and PM₁₀ emissions had been reduced by 15 per cent.

2. Long-term measures

18. A representative of the Madrid City Council reported a 40 per cent reduction in the average concentration of PM₁₀, a 50 per cent reduction of PM_{2.5} emissions and a 40 per cent reduction in NO_x emissions in Madrid over the past decade. Those achievements were the result of Madrid's Local Air Quality Strategy (2006–2010) and, more recently, the implementation of the Madrid's Air Quality Plan 2011–2015. The latter entailed an ambitious package of actions, including clean technology investments in the public bus fleet, which had reduced its emissions from 23 per cent of the total traffic emissions in the city to 16 per cent in 2013. However, nitrogen dioxide (NO₂) emissions had not been reduced as much as NO_x emissions, with a 25 per cent reduction of the NO₂ average concentration as opposed to 40 per cent NO_x reduction from 2004 to 2013. That was due to the “diesel effect”, which was reportedly caused by Euro 4 and Euro 5 vehicles as they had proven to have a higher NO₂/NO_x ratio than Euro 3 vehicles, with the resulting negative impact on air quality. In fact, Madrid's Vehicle Fleet Characterization Study (2013) showed that diesel passenger cars contributed 86.46 per cent of the total NO_x emissions from passenger cars.

19. A representative of Kazakhstan reported that Almaty was the most polluted city in Kazakhstan, that 80 per cent of that pollution came from road transport and that only 25 per cent of all trips in the city were undertaken by public transport. Consequently the Almaty mayor's office had initiated the development of the sustainable transport strategy, which was supported by a United Nations Development Programme (UNDP)/Global Environment Facility (GEF) project with major financial support from the European Bank for Reconstruction and Development. The overall objective of the project was to increase the share of public transport use by 20 per cent through improving public transport management and increasing the awareness of sustainable transport options. Many actions had already been taken during the past year, which had been declared the year of public transport in Almaty. The long-term plans up to 2023 included the further phasing out of old buses and cars, the development of a high-speed light rail system, improved parking management, etc.

3. Compact and smart cities

20. A representative of the ECE Housing and Land Management Unit further outlined the potential of emission reductions through urban planning and highlighted the high potential of further regulation in that area, especially in countries in transition that had a particularly high urbanization rate. The planning concept of compact cities, with dense and proximate development patterns that reduced travel distances and promoted the use of alternative means of transport, was outlined in that regard. In that connection, the ECE smart city programme strove to increase energy efficiency and reduce pollution by addressing various sectors, including transport and mobility.

4. A developed country is not a place where the poor have cars, it is where the rich use public transport

21. A representative of the Working Party on Transport Trends and Economics presented the findings of a forthcoming publication on public transport in the ECE region according to which Land use and transportation funding policies heavily influenced travel behaviour and travel choices. Therefore, if funding policies focused on pedestrian and biking facilities combined with public transport investments the result would be fewer car trips and consequently fewer emissions. In contrast, if funding policies focused on road capacity expansion, parking facilities and public transport, that would result in a higher number of trips undertaken by car and consequently higher emissions. Furthermore, the access of the urban population, including the urban poor, to the most efficient means of transport to reach employment opportunities, health and education facilities should be the main objective of transportation policies, thereby reducing congestion and its negative effects. Sustainable public transport financing should focus therefore on improving the integration of different modes of transport across urban services, as well as on increasing public transport capacity.

E. Achieving sustainable mobility through integrated policymaking and by facilitating modal shift

1. Internalizing the external costs of freight transport in Switzerland

22. A representative of Switzerland shared the Swiss experience regarding the challenges the country faced in shifting the transalpine freight traffic from road to rail to reduce the impacts of air pollutant emissions in the sensitive alpine environment. As part of its efforts, Switzerland had, for the first time in Europe, internalized the external costs of freight transport (estimated to amount to 1.746 billion Swiss francs in 2007) by establishing a distance-related heavy vehicle fee that encouraged the shift from road to rail and favoured cleaner vehicles. From 2001 onwards the number of vehicles transporting goods through the Swiss Alps had diminished. The modal split in 2012 showed that 63 per cent of goods had been transported by rail and 37 per cent by road. All monitoring stations showed a downward trend for NO_x and PM₁₀ emissions since 2003.

2. National programme for environmentally friendly mobility — the Austrian klima:aktiv mobil programme

23. A representative of Austria showcased Austria's klima:aktiv mobil programme, a federal programme to motivate and support cities, regions, companies, fleet operators, tourism operators, schools and others to implement environmentally friendly mobility projects through technical assistance, funding of investments, partnerships and awareness-raising measures. The programme, started in 2007 and now extended until 2020, aims at the improvement of mobility management, the increased uptake of alternative vehicles (such as electric and hybrid cars), the improvement of the cycling and walking infrastructure, innovative flexible public transport, etc.

24. During the first programme period, 2007–2013, the more than 4,900 projects had reduced CO₂ emissions in Austria by around 570,000 tons per year. The klima:aktiv mobil funding programme had supported eco-mobility projects of cities and companies with around €66.6 million in funding, prompting investments of about €495 million. Around 10,000 electric vehicles for fleets of companies and municipalities had been financially supported and 130 investment projects in cycling infrastructure had been co-funded. One of the concepts promoted as part of the programme was known as eco-driving, which was a fuel-saving way of driving that ultimately reduced emissions. That concept had been

implemented in over 300 companies with more than 20,000 participating drivers and would now also be part of the driving licence exams for 90,000 novice drivers as well as implemented for drivers of construction machinery. In order to receive funding for the envisioned measures, a certain reduction in CO₂ emissions had to be demonstrated. Originally planned as a programme aimed at climate change mitigation, additional incentives to reduce harmful air pollutants, such as NO_x and PM will now also be available as part of the programme.^c

F. Conclusions

25. Overall, it was noted that many different policies, strategies and measures already existed to reduce human and environmental exposure to air pollution from road transport. Those could include regulatory, economic, voluntary and informational measures which were aimed at the shifting from individual car use to public transport and active mobility (walking and cycling). For the latter, however, more compact urban development, as well as the construction of cycling lanes and sidewalks, was necessary. It was also important to shift freight from roads to other more environmentally friendly modes, such as railways and inland water transport. A major action to be taken was to ensure the availability of cleaner fuels to facilitate the penetration of cleaner vehicles, equipped with modern emission control devices, onto the market.

^c Further information on the klimaaktiv mobil programme is available at <http://www.klimaaktiv.at/>.