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Working Group on Strategies and Review

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Item 3 of the provisional agenda

Progress in the implementation of the 2014-2015 workplan

Report by the Expert Group on Techno-Economic Issues*

Summary

The enclosed report by the Expert-Group on Techno-Economic Issues contains the information on the outcome and discussions at the Expert Group plenary meeting in 2013, the implementation of the workplan in 2014 and forthcoming activities. It further contains a draft mandate for a Task Force on Techno-Economic Issues for consideration by the Working Group (see Annex).

* The present document is being submitted without formal editing.

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I. Introduction

1. The present document contains information on the plenary session of the Expert Group on Techno-economic Issues held on 18 October 2013 in Nice, France and addresses the implementation of the workplan as of 2014.

A. Attendance

2. Twenty-three experts participated in the Expert Group plenary meeting including experts from 11 Parties to the Convention: Croatia, Finland, France, Germany, Italy, the Netherlands, Russian Federation, Sweden, Switzerland, the former Yugoslav Republic of Macedonia and Ukraine. Representatives from the European Association of Internal Combustion Engine Manufacturers (EUROMOT), the European Chemical Industry Council (CEFIC), the oil companies' European association (CONCAWE), the French-German Institute for Environmental Research (KIT-DFIU), the Inter-professional Technical Centre for Studies on Atmospheric Pollution (CITEPA) and the French Agency of Environment and Energy Management (ADEME) took part in the meeting. Representatives of the private sector also attended. Simultaneous English-Russian interpretation was provided by the technical secretariat of the Expert-Group on Techno-Economic Issues to facilitate the active participation of the Russian-speaking experts. The participation of one expert from Ukraine was financially supported by France.

B. Organization of work

3. Mr. Tiziano Pignatelli (Italy) and Mr. Jean-Guy Bartaire (France) chaired the meeting. All presentations delivered at the meeting are available on internet at: http://www.citepa.org/old/forums/egtei/egtei_meetings.htm.

II. Summary of presentations and main discussion points

4. The technical secretariat of the Expert Group presented the results of the work of the sub-group for the revision of the methodology to estimate costs of reduction of sulphur dioxide (SO₂), nitrogen oxides (NO_x) and particulate matter (PM) emissions from large combustion plants. An excel spreadsheet tool had been developed to allow for the calculation of the investment and operating costs for de-NO_x, de-SO_x and de-duster abatement techniques.

5. The representative of the Russian Federation informed the Expert Group about the development of the national legal framework in the Russian Federation and the introduction of environmental regulations based on best available techniques (BAT) and related economic incentives. He highlighted the weaknesses of regulation on atmospheric pollution at the national level. Fees for polluters existed but they were not dissuasive and therefore, not stimulating entities to introduce "greener" technologies. For the future, the introduction of integrated environmental permits and BAT based regulations was foreseen. Rules would be differentiated according to the pollution level of installations. The BAT based regulations and integrated permits would be implemented for the largest polluters in addition to prescriptions on monitoring. National documents for BAT were planned to be established following the model of European Best Available Reference Documents (BREFs) and adapted to the Russian situation. Fees would be increased to higher levels to stimulate the application of BAT. A factor 2.5 for environmental fees was planned to be

introduced starting from 2017, and an additional factor 2.1 would be introduced in 2021. Environmental fees, comprising 0.21 per cent of the profits in 2009 would be increased up to 1.77 per cent in 2021. National documents for BAT would be published in 2017. They would be based on EU BREFS, with some adaptations. As of 2018, the introduction of integrated environmental permits for all potential polluters would facilitate the introduction of BAT. The installation of new industrial units not in line with BAT would then be forbidden.

6. The representative of Ukraine informed the Expert Group about current national legislation and policies on air pollution in Ukraine and major issues regarding the implementation of protocols to the Convention on Long-range Transboundary Air Pollution. She reported that in December 2010, *the Law on Ratification of the Protocol on Ukraine's accession to the Treaty establishing the Energy Community* was adopted. In 2010, key provisions of the “*State Environmental Strategy until 2020*” had been approved. The National Environmental Action Plan, covering 2011–2015 was the main implementation mechanism. Emission limit values (ELVs) were established taking into account both the state of the environment and the progress in the development of abatement techniques. She also highlighted several challenges faced by Ukraine with regard to the ratification of the protocols to the Convention on Long-range Transboundary Air Pollution, as follows:

- (a) The implementation of BAT on old installations required time and financial resources;
- (b) Not all the activities covered by the technical annexes to the protocols were analysed in terms of emission reduction potential;
- (c) The lack of modern measurement techniques;
- (d) The monitoring techniques applied in Ukraine, were not comparable with the standards in the European Union (EU) legislation;
- (e) The regulation on volatile organic compounds (VOCs) emissions was different from the provisions of the Protocol to Abate Acidification, Eutrophication and Ground-level Ozone (Gothenburg Protocol);
- (f) The VOCs content in products was difficult to be established;
- (g) Black carbon was not considered at all in the Ukrainian regulations.

7. Concerning mobile sources, Ukraine had adopted Euro 4 standards from 1 January 2014 onwards. Euro 5 was planned to be introduced by 2016 for cars and vans and EURO 6 by 2018. With regard to persistent organic pollutants, emission inventories were not yet developed and monitoring activities in the environment were not planned. Ukraine provided emission inventories to the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP) but encountered difficulties with regard to the methodologies to be applied and regarding the required format for reporting. The EMEP guidance for inventories was considered to be insufficient. Nevertheless, the achievement of consistency of inventories and reporting format was still an objective for Ukraine.

8. The representative of CEFIC presented on combustion plants between 50 and 150 megawatt thermal (MWth) capacity using special (liquid) fuels in chemical industry. He highlighted that in the chemical industry most plants had thermal capacity ranging between 50 and 250 MW, mainly for steam production. Such plants often used non-commercial fuel as a by-product of the process and were multi-fuel firing plants. Moreover, such plants operated at different load levels and fuels may be different day to day according to their availability. For the above reasons, the characteristics of such plants would not allow the

use of some reduction techniques. The characteristics of non-commercial fuels and multi-fuel firing operations would lead to higher values of BAT associate emission levels (AEL) for daily average and annual average.

9. The Swedish representative highlighted that in Sweden more than 90 per cent of electricity was provided by nuclear and hydroelectric power plants. Most of the combustion installations for district heating used biomass. There were nearly 400 district heating networks with about 70 Combined Heat and Power (CHP) plants. Of the total of 70 terawatt-hours (TWh) thermal input for heat and CHP, 40 per cent were produced by biomass and 25 per cent by waste combustion. 15 TWh were also produced by biomass in the industrial sector (in the pulp and paper sector, excluding recovery boilers). The oldest boilers in use in Sweden were often converted to biomass fuel. The newer boilers were often built for co-incineration. Typically, boilers were equipped with Selective Non-Catalytic Reduction (SNCR) and primary measures to abate NO_x. A heating water accumulator was used to maximize the operating hours of the base load boilers, thus, avoiding the use of the older boilers burning more expensive fuels. Less NO_x and other pollutants were emitted since the abatement was lower than the base load operation. Emissions reduction was enhanced by an economic measure, in particular a tax of 6 Euros per kilogram. Investment costs for a 75 MWth boiler were around 5 million Euros for Selective Catalytic Reduction (SCR) and 1 million Euros for SNCR.

10. The representative of the Energy research Centre of the Netherlands (ECN) highlighted the introduction in 2010 of a regulation to reduce emissions from plants with a thermal power lower than 50 MW. An evaluation of this decree was conducted recently with a special attention to potential further constraints in emissions, as follows:

(a) NO_x emission limit value (ELV) for natural gas and biogas engines (< 1 megawatt electric) MWe/2,5 MWth) at 100 mg/normal cubic meter (Nm³) at 3 per cent oxygen (O₂)(currently: 340)

(b) Hydrocarbons (C_xH_y) ELV for natural gas engines (≥ 1 MWe/2,5 MWth) at 1200 mg/Nm³ at 3 per cent O₂ (currently: 1500)

(c) Particulate matter (PM) ELV for diesel engines at 15 mg/Nm³ at 3 per cent O₂ (currently: 50)

(d) NO_x ELV for diesel engines at 140 mg/Nm³ at 3 per cent O₂ (currently: 450)

11. For natural gas engines, the limit of 100 mg/Nm³ at 3 per cent O₂ was considered too difficult to achieve by a three way catalyst. The ELV 140 mg/Nm³ at 3 per cent O₂, was advised by the evaluation study of ECN. A similar ELV was considered for biogas. VOCs emissions from gas engines could not be reduced without loss in energy efficiency. A limit of 1200 mg/Nm³ was considered as a compromise by ECN. This limit could be achieved by some manufacturers for existing engines with additional treatment. ELVs for new engines and a transitional arrangement period for existing engines were proposed by ECN. For diesel engines, filters could be used to reduce PM. The ELV of 15 mg/Nm³ was proposed by ECN. This ELV value was similar to the one proposed in Germany and corresponded to the limit already applied in the United States of America. For NO_x emissions from diesel engines, SCR was commercially available. Large engines operated at low revolution per minute (rpm) and high cylinder volumes thus causing an increase in NO_x emissions. The limit of 250 mg/Nm³ is advised by ECN. However, for diesel engines the implementation of stricter ELV values was still pending.

12. The German representative and Chair of the Task Force on Heavy Metals presented the status of the Protocol on Heavy Metals, amended in December 2012 by decision 2012/5 and decision 2012/16. She drew attention to the entry into force on 9 January 2014 of the amendments to annex III and to the adoption of the Guidance document on best available

techniques for controlling emissions of heavy metals and their compounds from the source categories listed in annex II (ECE/EB.AIR/116), adopted by decision 2012/7. The main focus of the amended Protocol on Heavy Metals was to increase the number of ratifications by the introduction of flexibility mechanisms. As in the Gothenburg Protocol, emission reductions compared to a reference year were required. No new ELVs for heavy metals had been agreed by Parties but ELVs for PM had been adjusted. The Protocol on Heavy Metals was coherent with the Gothenburg Protocol with regard to PM. Forty-six Parties had recently reported their heavy metals' emissions. In the EMEP region, lead, mercury and cadmium emissions decreased by more than 50 per cent from 1990 to 2010. The impacts of emissions were still present since critical load exceedances could be observed in central Europe and also other parts of the EMEP region.

13. The Italian co-Chair presented the results achieved in the application of the Greenhouse Gas and Air Pollution Interactions and Synergies (GAINS)-Model methodology to estimate the potential technological upgrade and its related costs needed for the compliance with the ELVs stipulated in the annexes to the Gothenburg Protocol for the Russian Federation and Ukraine. The GAINS methodology to estimate the potential technological upgrade and costs has been applied to the official scenarios for the Gothenburg Protocol review, as developed by the Centre for Integrated Assessment Modelling for Belarus, Republic of Moldova, Russian Federation and Ukraine using the old version of the GAINS Europe Model. The methodology revealed suitable results for the analysis for several sectors and pollutants. The results presented for the Russian Federation and Ukraine showed that potential existed for significant emission reductions as a consequence of the implementation of technologies consistent with the ELVs in the annexes of the revised Gothenburg Protocol. The estimation of deriving additional costs of abatement was also an output of the GAINS model, although not all the experts agree on the GAINS cost parameters. The technical report will be delivered in 2014 for consideration of the Working Group on Strategies and Review. The analysis was expected to be continued in 2014 and extended to other sectors and, to extent possible the new GAINS model structure, as well as to other countries in Eastern Europe, the Caucasus and Central Asia, if and when new scenarios would be available.

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

14. It was noted that while most of the tasks for the Expert Group in the 2014–2015 workplan for the implementation of the Convention had financial coverage due to contributions provided by France and Italy, some tasks may require additional funds, especially those activities concerning support to the experts from Eastern Europe, the Caucasus and Central Asia for travel expenses and translation of documents into Russian.

15. In accordance with item 2.2.4 of the workplan, the co-Chairs of the Expert Group developed draft Terms of reference for the Task Force on Techno-Economic Issues for consideration by the Working Group on Strategies and Review, presented in the Annex below.

Annex

Terms of reference of the task force on techno-economic issues

Draft prepared by the Expert Group on Techno-Economic Issue for the consideration of the Working Group on Strategies and Review

I. Background

Taking into account the Long Term Strategy of the Convention (ECE/EB.AIR/106/Add.1),

Having seen the work carried out by the Expert Group on Techno-Economic Issue in revising the Annexes to the Gothenburg Protocol, during the long process of revision of the Gothenburg Protocol,

Considering the discontinued Task Force on Persistent Organic Pollutants and the expected decision of the Executive Body at its thirty-third session in December 2014, which will discontinue the Task Force on Heavy Metals starting from 2015,

Building on the expertise from experts from Parties authorities, science and industry,

Securing the important role of the technical secretariat to the Expert Group on Techno-economic Issues financed by France and carried out by Inter-professional Technical Centre for Studies on Atmospheric Pollution (CITEPA) and French-German Institute for Environmental Research (KIT/DFIU),

Acknowledging that the two lead countries Italy and France will continue to provide the co-chairs and support the technical secretariat,

Proposes to the attention of the Executive Body at its thirty-third session in December 2014 the upgrade of the Expert Group on Techno-Economic Issue to Task Force on Techno-Economic Issues.

II. Tasks of the New Task Force

The new Task Force, which will include the experts of the discontinued Task Force on POPs and Task Force on Heavy Metals, experts from stationary and mobile sources, will perform the following institutional tasks if adequate financial and human resources are available:

(a) Update continuously the database of the abatement technologies for SO₂, NO_x, VOCs, dust including black carbon, heavy metals and POPs concerned in the Convention on Long-Range Transboundary Air Pollution. The updated information will include all technical parameters characterizing the abatement technologies, taking into account the Best Available Techniques (BAT);

(b) Update continuously the cost parameters of the abatement technologies for SO₂, NO_x, VOCs, dust including black carbon, heavy metals and POPs concerned in the Convention, for stationary [and mobile] sources, in the concerned sectors. Create and maintain the Clearinghouse of the Abatement Technologies for SO₂, NO_x, VOCs, dust

including black carbon, heavy metals and POPs with the aim of being a reference place of dissemination of information for 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 in order to create synergies, maximize the results and optimize the resources while performing its institutional tasks;

(d) Cooperate with the technical bodies of the European Commission (such as the Joint Research Centres) in drafting technical documents;

(e) Cooperate with the Coordinating Group for Eastern Europe, the Caucasus and Central Asia with the purpose of providing techno-scientific assistance to those countries, assuming that appropriate financial support would be available;

(f) Organize seminars and workshops for the dissemination of the information on the Abatement Technologies and / or the Guidance Documents of the Annexes to the Protocols of the Conventions, assumed that appropriate financial support will be provided;

(g) The Co-Chairs of the Task Force will report on the progress in the work of the Task Force to the Working Group on Strategy and Reviews, at its regular meeting.
