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Item 4 of the Provisional Agenda

Best practices in selected economic sectors to improve energy efficiency

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Background paper on exchange of know-how and best practices in industry to significantly improve energy efficiency in the ECE region ¹

Note by the Secretariat

I. Introduction

1. In many of the member States of the United Nations Economic Commission for Europe (ECE), industry is one of the largest energy consumers and source of the greenhouse gas (GHG) emissions. Achieving the ambitious targets of the Sustainable Development Goals (SDGs), including specifically on energy efficiency, and objectives of the Paris Agreement to limit global warming to well below 2 degrees by 2050, would be impossible without significant changes in the industrial sector as a whole and its segments. In order to be able to meet the targets, global emissions need to peak as soon as possible. Actions to reduce emission need to be implemented much faster and more effectively than has been the case to date. Industry is a sector that will continue to grow rapidly in order to contribute to the 88% forecast growth in the global economy by 2050. As a result, the challenge today is to develop policies and programmes that will improve energy efficiency and reduce energy consumption in industry and the sector's energy-related GHG emissions considerably quicker than the rate of economic growth.

¹ This background paper has been prepared by the ECE secretariat based on documentation provided by Mr. Zlatko Pavicic, Vice-Chair of the Group of Experts on Energy Efficiency, and Mr. Hannes Mac Nulty, member of the Group of Experts on Energy Efficiency.

2. The Group of Experts has developed a structured framework of energy efficiency policies and measures, which included actions that have been successfully implemented in the industrial sector.

II. Status of energy efficiency implementation by industry

3. Many companies are already implementing energy efficiency improvements to various degrees across the global industry sector, particularly those in energy intensive industries. However, common priority actions from industry to reduce GHG emissions in line with their sustainability targets have often been the purchase of green electricity and on-site production of renewable energy rather than more extensive or systematic energy efficiency improvements.

4. Implementing energy efficiency measures in the industrial sector and the array of multiple benefits on offer are not possible through energy source changes alone. In addition, energy efficiency improvements in industry is often most easily achieved through systematic energy management, and this in turn will deliver a range of multiple benefits, including reduced maintenance costs and improved product quality. The International Energy Agency estimates that the multiple benefits of energy efficiency can be as high as 2.5 times the value of the actual energy savings alone. For example, the development of new energy efficient technologies, industrial standards and new innovative products for industrial application could provide new long-term employment opportunities and economic growth at the same time.

5. When considering the impact of industry on energy consumption and its contribution to GHG emissions, potential interventions could prioritize the most intensive industrial segments. The European Commission has identified and assessed eight energy-intensive industrial segments, where the impact from energy saving and consumption reduction could be the most significant. In the industrial sector, special attention could focus on primary production and extraction of natural resources, as well as to processing of basic raw materials.

6. In the European Union, the following three industrial segments consume around 54% of energy: iron, steel and aluminium; chemicals and pharmaceuticals; and oil refineries. Estimates show that by 2050 energy consumption in the chemicals industry will significantly increase. Increase in energy consumption in the iron and steel segment will be more moderate. Other industries, especially the secondary sector, are expected to have a decrease in energy consumption compared to 2015. A large proportion of energy is used in technological processes of heating to high temperatures, especially in the iron, steel and aluminium production and processing of non-metal minerals, as well as in the oil refineries.

7. To achieve a significant increase in energy efficiency improvements in the industrial sectors and in particular the energy intensive industries, a combination of measures is necessary. Such measures include policy, regulatory, and institutional reforms; technological advances; and financial and economic incentives. The ECE Group of Experts on Energy Efficiency can support and promote energy efficiency improvements in industry throughout the ECE region by focusing on the following aspects:

- (a) Regulatory policies that support industrial energy efficiency;
- (b) Overcoming barriers to energy efficiency improvements in industry;
- (c) Highlighting best practice examples of industrial energy efficiency policies, programmes and other measures in ECE member States.

III. Regulatory policy in industrial energy efficiency

8. Based on the previous accomplishments in developing a structured framework of energy efficiency policies and measures, the ECE Group of Experts on Energy Efficiency may develop implementation guidelines for these best practices. For example, these guidelines could include examples of regulatory policies such as minimum energy performance standards that have been introduced and successfully applied in countries or groups of countries, such as the European Union and its Member States.

9. Providing incentives for implementation of processes and technologies can often help to increase energy efficiency improvement in major industries. Regulatory policies should encourage those measures that contribute the most to the fundamental change in energy consumption and energy management in the long term based on sustainable processes and systems as a whole.

10. The 2012 European Union Energy Efficiency Directive provides principles and legislative solutions that are transposed into the national legislation by the European Union (EU) Member States. A number of non-EU countries also apply the Directive or its parts, trying to harmonize legislation with that of the EU countries. Such application of regulatory framework on a broader scale and unification of legislation is a very good example of sharing best practice policies and guidelines.

11. The ECE Group of Experts could provide a platform for sharing solutions both for the improvement of the business climate for energy savings and for changes in production processes. It is crucial that new regulatory developments focus on raising general awareness within industry about the benefits of energy efficiency and the need to make changes in relation to the availability of resources and raw materials. Integrity of the production process design, the production itself, its cost-effectiveness and efficiency and, in the final stage, disposal and processing of used products should be the guiding principles of a policy framework for an energy-efficient industry and setting up of a circular economy. The complete cycle of a well-regulated and energy efficient industry can then become a basis for the development of a low-carbon economy.

12. The National Energy Efficiency Action Plans (NEEAP) developed and implemented by the EU Member States and countries that are contracting parties of the Energy Community have considerable potential for achieving significant energy efficiency improvements at the national level. The experience and potential of NEEAP could be used to develop guidelines and proposals for regulatory solutions to promote energy efficient industries.

IV. Barriers to energy efficiency in industry

13. Energy efficiency has the potential to deliver up to 40% of the global emission reductions while reducing industrial energy use by over 25%. However, even specifically designed policies and programmes have not overcome multiple barriers that continue to restrict widespread uptake of solutions that are financially viable. To achieve the full potential that energy efficiency offers, it is necessary to consider first the barriers that continue to impede the implementation of national action plans in the EU Member States and in the countries that have adopted energy efficiency policies in their national legislation.

14. The Group of Experts is therefore to consider barriers that impede adoption of energy efficiency measures in the industrial sector or in specific industrial segments. The types of barriers to be considered include:

- Policy barriers
- Economic barriers
- Financial barriers
- Development and technical barriers
- Institutional and organizational barriers

15. The ECE Group of Experts can provide significant value to the ECE member States by exploring these specific aspects of industrial energy efficiency. This will be an important contribution to the achievement of SDGs, in particular SDG 7 “Ensure access to affordable, reliable, sustainable and modern energy for all”, and the Paris Agreement.

V. Overcoming barriers and providing examples of best practices in industrial energy efficiency in ECE member States

16. The Group of Experts (or a task force established by the Group of Experts) will collect the industrial energy efficiency best practices, including national policies and programmes of ECE member States. The focus will be on examples that are already being implemented to ensure that sufficient evidence of their success is available. A special focus will also be made on those industries that would contribute the most significant savings on a global scale, particularly mining and raw materials processing, oil refineries, power generation, and chemicals.

17. An important practical step in identifying barriers and finding ways to overcome them will be a series of workshops that aim to reconsider how to develop industrial energy efficiency policies through a bottom-up approach. This workshop series will bring together two very different sets of stakeholders: a) key national policy makers with experience of energy efficiency policy and programmes and b) industry representatives who have direct experience of implementing engineering solutions to improve energy efficiency. The overall objective is that policy makers hear from those who are directly involved on the ground and who have to face the everyday corporate, financial and basic engineering barriers related to implementing widespread energy efficiency measures within a manufacturing site.

18. The introduction to the workshop series is taking place at the third session of the ECE Group of Experts on Energy Efficiency on 18–19 October 2016 in Baku, Azerbaijan. It will define the workshop series objectives and provide an opportunity for feedback from participants to create the basis for the consequent workshops in Geneva tentatively scheduled back-to-back with a session of the ECE Committee on Sustainable Energy to be held on 19 January 2017 and in Astana in the framework of the Eighth International Forum on Energy for Sustainable Development on 11–14 June 2017.
