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Best practices in selected economic sectors to improve energy efficiency**Best practices in selected economic sectors to improve energy efficiency****Background paper on outcomes of workshops to promote energy efficiency in industry¹****Note by the secretariat****I. Background information**

1. Today industry is responsible for one-third of the global primary energy consumption and CO₂ emissions. This is a sector that will continue to grow rapidly in order to contribute to the expected 88 percent global economy growth by 2050. As such, the challenge will be not only to avoid an increase of CO₂ emissions during this growth but also to manage an overall reduction of emissions. While changing the energy mix will remain an important approach to address the emission reduction challenge, a key role will be played through the reduction of energy consumption. Economically viable energy efficiency actions, based on existing technology solutions, have the potential to deliver already up to 30 percent of energy consumption reductions within industry. However, to date even specifically designed policies have not managed to overcome all the everyday barriers that continue to restrict widespread uptake of this more often than not financially feasible solution.

¹ This background paper has been prepared by the ECE secretariat based on the outcomes of two workshops organized by ECE. Organization of the workshops was approved by the third session of the Group of Experts on Energy Efficiency on 18-19 October 2016. The development of the workshops was initiated and supported by Mr. Hannes Mac Nulty, BG Consulting Engineers, Vice Chair of the Group of Experts.

2. One of the main reasons is that energy efficiency, and sustainable energy solutions in general, are in most cases treated separately from a company's day-to-day core operations. Another common challenge facing widespread uptake of industrial energy efficiency is the communication gap between the people who develop energy efficiency policies and the engineers who have to implement projects driven by these same policies. As a result, there often exists a situation where, despite the best intentions, even targeted and financially well supported policies are unable to deliver on the full potential offered by industrial energy efficiency.

3. Two workshops organized by the United Nations Economic Commission for Europe (ECE), Policy Maker Meets the Engineer (Geneva, 19 January 2017) and Creating the Business Case for Energy Efficiency: Engaging Governments with Industry (Astana, 13 June 2017) looked at these challenges. The first one considered a new approach to how policy could be better and more efficiently developed by overcoming the communication gap between policy makers and policy end users. Specifically, the underlying principle is how to develop effective government policies and corporate strategies by engaging with a policy's end user - the engineer - from the beginning of the process. The second workshop looked at energy solutions as a potential driver of many different types of productivity improvements within a company. For instance, energy specific solutions can be shown to have a positive impact on many types of operation-related activities, such as quality, safety, reliability and maintenance. Its objective was to promote and demonstrate how the joint efforts of policy makers and industry stakeholders are key to developing, in the first instance, awareness of the business case for energy driven operation efficiency improvements and then also providing the means by which a viable business case can be created.

II. Main findings and conclusions of the workshop Policy Maker Meets the Engineer

4. Plenary sessions of the workshop involved a wide range of presentations by business representatives, policy makers and representatives of international organizations on the attitude towards energy efficiency within industry followed by discussions. Most of the points raised by different parties were based on the principle that energy efficiency had a role to play within industry but that there was not yet sufficient understanding or support to ensure that the topic was treated with the level of importance that its true impact could warrant. Examples of the points raised are:

(a) Lack of good methodology to measure accurately energy savings achieved through energy efficiency projects;

(b) Capital expenditure (CAPEX) budgets being mostly assigned to core business projects and not to energy efficiency specific projects;

(c) Energy efficiency is not considered part of the core business even though it can have positive impact on many different operational activities;

(d) Lack of a comprehensive method to consider the carbon footprint, and thereby the related carbon price, over the full lifecycle of a product;

(e) The length of time required to assess the success of implemented energy efficiency policy and the lack of relevant knowledge by policy makers;

(f) Using specific energy consumption as a performance indicator can distort the real performance of an implemented project.

5. Another key message conveyed by the companies was the need to often consider energy sources (such as waste-to-energy and renewable energy), energy saving, and CO₂ emission reductions as separate topics depending on a particular industrial activity.

6. The subsequent group break-out sessions had the objective to see how well the engineers and policy makers, as well as other stakeholders, could engage with each other to produce specific and jointly agreed recommendations on how to improve energy efficiency policy. The following three sets of obstacles were identified as main ones, based upon which the possible solutions were proposed:

(a) Knowledge obstacles: lack of ability to identify and assess energy efficiency projects, which is linked to a lack of training and awareness of energy efficiency technologies, as well as ways to measure energy savings and the multiple benefits energy efficiency can provide. Examples of solutions proposed for this obstacle:

- (i) Targeted education of policy makers;
- (ii) Creation of specific networks on energy efficiency (Business to Business, Business to Government and Business to Consumer) to incentivize transparency, information sharing, databases, etc.;
- (iii) Standardized measurement methods for energy and resource savings and multiple benefits.

(b) Energy pricing and market obstacles: importance was attributed to the issue of energy pricing and a functioning energy market. Without the correct price signals, designing and implementing energy efficiency measures in companies is difficult. Examples of solutions proposed for this obstacle:

- (i) Carbon pricing;
- (ii) Target improvement of energy inefficient plants through specific taxation measures;
- (iii) Effective enforcement mechanisms;
- (iv) Use of sustainability pricing mechanisms rather than direct subsidies to incentivize sustainable energy sources.

(c) Policy obstacles: inadequate policies that lack drivers, incentives, predictability, and consistency. This obstacle is closely linked to obstacle (a) and results from insufficient communication between policy makers and the project implementers within industrial companies. Due to the linkages between obstacles (a) and (c), the proposed solutions are in some cases also similar for both obstacles. Examples of solutions proposed for this obstacle:

- (i) Long-term legislative and policy framework based on consensus;
- (ii) Target setting on CO₂ reduction/energy efficiency;
- (iii) Education of policy makers;
- (iv) Strong and skilled government agencies;
- (v) Industry network.

7. The direct engagement format of the workshop resulted not only in an agreement on the most significant obstacles but also in the collaborative development of solutions by a group that included all relevant stakeholders. One of the key conclusions is that the underlying principle of promoting and facilitating pragmatic and constructive engagement between policy makers and policy end users - the engineers - is a worthwhile and important way to drive actions that will improve industrial energy efficiency uptake.

8. A number of follow-up initiatives (below) have been proposed using the Group of Experts on Energy Efficiency as a platform for such activities. United Nations Industrial Development Organization (UNIDO), Copenhagen Centre on Energy Efficiency, and ECE have voiced their readiness to cooperate in providing support to implement them at the international level:

(a) The second international workshop on industrial energy efficiency in the framework of the Eighth International Forum on Energy for Sustainable Development in Astana, Kazakhstan in June 2017;

(b) Similar workshops at the national level in selected countries. Belarus, Kazakhstan, the former Yugoslav Republic of Macedonia, and Ukraine were mentioned as potential pilot countries. These workshops will aim to develop policy recommendations directly for the particular country through an engagement process involving the respective national governments and companies operating in these countries;

(c) International workshop on benchmarking to be held by UNIDO;

(d) Establishment of a UNIDO-led international industry oriented working group on energy efficiency. The purpose of this working group would be to work directly with companies on cross-sectoral energy efficiency and related energy topics.

III. Main findings and conclusions of the workshop Creating the Business Case for Energy Efficiency: Engaging Governments with Industry

9. This workshop was based on the outcomes and recommendations of the workshop Policy Maker Meets the Engineer. The four sessions of the workshop were a combination of presentations and panel discussions. The speakers and panellists at the sessions presented perspectives on why the business case matters and why it still remains a challenge; discussed the business case successes and challenges encountered by the different types of industry stakeholders; discussed how governments typically apply best practice policy and in what ways such policy can be improved further to align with every day business reality; and presented existing and proven solutions that support the effective and viable implementation of energy efficiency measures and assist with the development of comprehensive and clear business case.

10. The general outcome of the workshop outlined the simple fact that industrial energy efficiency has become a much spoken about topic, yet it still remains unclear to the many different types of stakeholders how to actually achieve the identified potential. In addition, while energy efficiency has been shown to be largely cost effective and in line with typical industry investment criteria, it is still over-reliant on the climate change topic rather than on the business case as an implementation driver.

11. It has been reiterated during the workshop that a new and innovative policy approach that moves beyond the more classic mix of incentives and obligations is required to bring about a more acceptable common understanding of the energy efficiency topic, which would improve considerably the ability to achieve tangible results on the ground. Rather than just compel or entice industry to implement energy efficiency, there is a need to convince them of the beneficial role energy efficiency can play within their overall business model. Industry is first and foremost about business. Energy efficiency makes financial sense and leads to increased industrial productivity, regardless of its importance to climate change. Convincing industry of this fact is crucial, as is convincing policy makers and supporting organizations to take this fact into account when designing and enforcing energy efficiency policies.

12. An important first step towards achieving the current and future potential of energy efficiency is related primarily to awareness building. A two-prong approach includes helping policy makers understand how industry operates from a business perspective and helping industry appreciate the financial and productivity benefits of energy efficiency. At the same time, these levels of awareness need to be applied also to both financing and supporting organizations.

13. The following actions are a summary of the main outcomes from the presentations and discussions at the workshop:

(a) Developing a cohesive industry engagement strategy that focuses on helping companies develop a proper understanding of energy efficiency internally within their own organization (from "shop floor to boardroom") and an exchange of experience and best practices between companies;

(b) Working with policy makers to orientate the driver of energy efficiency more towards business improvements rather than just focusing primarily on climate change mitigation;

(c) Developing a clear policy development approach that places the policy end user (the energy using company and the engineers on the ground) within the policy design cycle as a key input of information. The policy design cycle should also equally consider how government, industry, financial institutions and supporting organizations can share a common language on energy efficiency so that each can contribute in the most effective manner.

IV. Overall conclusions

14. The outcomes of both workshops highlight a very important point in relation to the reason why realizing the existing potential of energy efficiency remains a challenge. Significant political commitments have been taken by national governments worldwide to mitigate climate change and combat global warming. However, converting this discourse into tangible action can only be achieved if the right people are involved in the discussion from the beginning who can ensure that an implementable action plan is developed.

15. These are the people who will carry out concrete actions to deliver on the political commitments; they are in effect the policy end users. In the case of industry, it is the engineers who need to be given a strong voice at all stages of energy efficiency policy development. Policy makers will benefit from more extensive engagement with engineers to understand better how energy efficiency can be implemented most effectively and efficiently within industry's current business model. At the same time, participation of engineers in policy development will give them, as well as company management, more responsibility for their role in reducing the impact of climate change through their energy efficiency actions.
