Framework Convention on
Climate Change

TEC/2017/15/10

Technology Executive Committee

29 August 2017

Fifteenth meeting

Bonn, Germany, 12–15 September 2017

Draft executive summaries to target groups on industrial energy efficiency and material substitution in carbon-intensive sectors

Cover note

A. Background

1. In response to decision 1/CP.21 paragraph 109(c) and as per activity 6 of its workplan for 2016–2018, the TEC is to take forward the outcomes of the technical examination process, taking into account the policy options, and identify gaps and replicable best practices or enabling policy conditions. At TEC 13, the TEC agreed to continue its work in the areas of identified gaps, namely industrial energy efficiency and material substitution in carbon-intensive sectors.

2. As part of TEC 14, the TEC held a thematic dialogue on industrial energy efficiency and material substitution in carbon-intensive sectors.[1] The TEC considered key findings from the thematic dialogue and requested its task force on mitigation to produce a TEC Brief on the basis of those finding. In addition, The TEC agreed that the key findings will be extracted for inclusion in potential executive summaries to convey selected messages to tailored target groups.

B. Scope of the note

3. The annex to this note contains the draft executive summaries to target groups, namely domestic policy makers, industry actors, financial institutions and international organizations, prepared by the TEC task force on mitigation.

C. III. Expected action by the Technology Executive Committee

4. The TEC will be invited to provide comments on the draft executive summaries, with a view to finalizing them after TEC15.

[1] http://unfccc.int/ttclear/events/2017_event1.

Annex 1

Executive Summary for Domestic Policy Makers

Industrial Energy Efficiency and Material Substitution in Carbon Intensive Sectors

With over one third of global final energy consumption, the industrial sector spends more energy than any other end-use sector. Different energy and material efficiency measures can reduce energy consumption and related carbon emissions significantly, thereby also offering a great cost saving potential and a number of social co-benefits like improved working conditions. Despite the high potential of industrial energy efficiency, a number of challenges and unaddressed needs remain, among which the lack of awareness of energy efficiency potential, limited access to financing, and the need for capacity building are the prime ones.

ROLE OF DOMESTIC POLICY MAKERS

Policy makers have a critical role in setting the legal, regulatory and policy framework, addressing barriers that restrict energy efficiency in industry with different approaches and incentivizing various actors. Approaches range from economic and fiscal instruments, over regulatory measures, to information, education and deployment-related approaches. The following table lists main barriers and approaches that domestic policy makers can use to address them.

Barriers	Possible Approaches of Domestic Policy Makers
Lack of Financial Resources	Financial Incentives, direct investment, market-based instruments, e.g. carbon trading
Lack of Awareness	Information campaigns, performance labels, demonstration projects
Lack of Technical Know-How	Improvement of training landscape, aid in implementation
Lack of Motivation, Low Priority	Auditing, codes & standards, monitoring, obligation schemes, demonstration projects
Energy Price Subsidies	Fiscal instruments, i.e. carbon pricing, fading out of subsidies
Structural Barriers	Institutional creation, long-term strategic planning (incl. setting of targets)
Access to Technology	Market-based instruments (incl. technology transfer & development), R&D programs
Equipment Downtimes, Technology Lock-In	Financial incentives, codes & standards

POSSIBLE OPTIONS FOR ACTION

In order to promote industrial energy efficiency (EE) an **adequate policy framework** is crucial. Policy makers can improve the framework for example by anchoring industrial EE in national energy policy, considering EE in relevant decisions, establishing a dedicated authority, and taking into account national and regional conditions.

To **stimulate demand and encourage investments** in energy efficiency, it is important that clear and long-term investment signals are set. Simplifying public support programs and the processes of achieving funding, also plays an important role in this context. Especially in developing countries, which have great potential for reducing the energy intensity, there is need for providing new tailored support programs to start-ups that develop energy-saving technologies. This way knowledge-based employment can be created, which is crucial for the sustainable development of the country. Another option is to provide incentives, such as tax exemptions for specific voluntary actions of industry actors (e.g. for reaching certain energy reduction targets or for implementing an energy management system).

Energy management systems rank among the most important instruments to increase industrial EE. It is therefore recommendable to incentivize the broad application of the ISO 50001 standard, for instance through voluntary programs, subsidies, or the integration into the regulatory framework. In order to support knowledge exchange and education of industrial actors, the establishment of industrial **energy efficiency networks** proved to be an effective approach.

To **ensure policy compliance**, approaches range from setting incentives, providing information on potentials, costs and benefits, and offering training measures. Awareness campaigns can be targeted at industry actors or financial institutions. Actions might focus on a better accessibility of data and knowledge, e.g. through the creation of databases or platforms. If necessary, also enforcement mechanisms (e.g. sanctioning) can be considered, where compliance can be monitored e.g. through minimum energy performance standards or EE performance labelling.

Annex 2

Executive Summary for Industry Actors

Industrial Energy Efficiency and Material Substitution in Carbon Intensive Sectors

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POTENTIAL FOR INDUSTRY ACTORS

For enterprises there are a number of good reasons to invest in energy efficiency. Through the reduction of energy demand, companies become more independent from non-renewable fossil fuels. This increases their energy supply security on the one hand and makes them less exposed to risks related to volatile fuel prices on the other hand. Higher energy and material efficiency can furthermore result in a more cost-efficient production, an increased productivity, fewer material losses and a higher product quality. In addition to that, eco-friendly operation and production processes improve companies' environmental compliance and can also lead to a better reputation. Particularly small and medium-sized enterprises (SMEs) play a crucial role in improving energy efficiency in industry. They account for a high share of (energy-intensive) industry worldwide, especially in developing countries. Even if the amount of their individual energy consumption is low, the total energy use is therefore considerably high. However, the energy consumption in SMEs could be reduced significantly with the introduction of simple measures (see figure below). For SMEs, the benefits of energy efficiency are of particular relevance, since they can significantly enhance their competitiveness and build technological competence and innovation capability.

Energy Efficiency Measures			Material Efficiency Measures		
Measures for cross-cutting technologies, e.g. steam, motor drives, pumping systems, compressed air systems, heating, cooling	**Measures for energy-intensive sectors**, e.g. chemicals, iron & steel, cement, pulp & paper, non-ferrous metals, food	**Energy Management Systems:** organizational (ISO 50001) & technical energy management	**Fuel substitution:** fuel switch, waste heat recovery, less fuel demand	**Material substitution:** substitution of input material, reduction of material losses, re-design (less input material, light-weight, longer-life products)	**Material recovery:** recycling, reuse

POSSIBLE OPTIONS FOR ACTION

In order to share experiences with other enterprises and acquire knowledge about good practices, it is recommendable for companies to engage in **networks or clusters** dedicated to energy efficiency. In Germany for instance, an Energy Efficiency Network Initiative was founded by the Government and industry associations, targeted at conducting energy audits for the members and setting a common goal for each network. Also in Sweden, industry-related sector networks for energy efficiency were established, benefitting from public funding. Furthermore, taking part in cooperation projects with international companies offers the opportunity to obtain specific know-how and new energy-efficient technologies.

In general, fostering **capacity building** inside a company, e.g. sending employees to trainings for energy managers or auditors, is important to being able to identify energy efficiency opportunities and to implement measures in a sustainable way. Many ISO 50001 trainings for instance are offered around the globe. Moreover, it is important to also empower the trained staff and provide them with necessary resources for the application of their knowledge.

Companies can further take up energy improvement as an **additional business field.** After having implemented energy efficiency measures inside their own enterprise, the acquired knowledge can for example be used to provide energy efficiency services externally (e.g. in the form of consulting, providing solutions, conducting audits, etc.).

Besides fulfilling regulatory requirements, companies can further exploit the economic benefits of energy efficiency through the adoption of **voluntary measures**. A company (network) could take on unilateral commitments, for example setting own energy or CO_2 reduction targets. Industrial associations could further negotiate agreements with the government, as for example in the UK, where in the framework of Climate Change Agreements, 65% discount from the climate change levy is given to companies for meeting certain carbon-saving targets.

Annex 3

Executive Summary for Financial Institutions

Industrial Energy Efficiency and Material Substitution in Carbon Intensive Sectors

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ROLE OF FINANCIAL INSTITUTIONS

Financial institutions (FIs) are of great importance to increase energy efficiency in industry as they play a major role in addressing all of the three main barriers listed above. First of all, they can help to raise awareness for energy efficiency among their clients through information campaigns and demonstration projects. Moreover, to channel activities of FIs towards energy efficiency, awareness should also be raised inside their own institutions and for the information of other financial institutions. Multilateral development banks can sensitize national FIs in the context of international project work and also contribute to capacity building of national FIs. Furthermore, by providing financial support programs for energy efficiency measures, FIs address the lack of financial resources.

POSSIBLE OPTIONS FOR ACTION

In general:
Public & Private FIs

In order to increase investments in energy efficiency projects in industry, it is important that financial Institutions in general **consider energy efficiency** when making investment decisions and guide their clients towards energy efficiency oriented financing decisions. In addition to that, public as well as private FIs can take over an active role in developing and testing **new financing instruments** and insurance and risk mitigation products that address energy efficiency in particular.

To further enhance the quality of their financing products, it is recommended that FIs assess the possibility to further improve the **monitoring and reporting** of their energy efficiency financing activities.

International and national, public and private FIs can benefit from participating in a structured **knowledge exchange**. This way they have the possibility to share and get inspired by best practices, innovative financing mechanisms, eligibility criteria to ensure energy efficiency performance standards in different countries and subsectors, etc.

The limited access to financing is particularly a challenge for small and medium-sized enterprises (SMEs) and start-ups in developing countries that are often not able to meet the requirements of financial products. It is therefore highly recommended that FIs consider providing **tailored financing programs for SMEs and start-ups** that are active in the development of new EE technologies.

In particular:
International FIs & Donor Community

International FIs and the donor community can **support local banks** with the implementation of energy efficiency financing instruments, such as grant schemes, loans, guarantees, performance-based instruments and risk capital. They are well positioned to give guidance for developing tailored financing programs for different target groups, particularly for SMEs, to increase the access to finance. It is important that financing measures are adapted to the context of the respective country to ensure their successful implementation.

In order to raise awareness and to support technology development, the donor community can further provide direct funding for **pilot projects** and technology demonstration projects.

To make energy efficiency investment programs more visible, it is also recommended to expand **distribution activities** via local partner banks and other channels.

Technical assistance is a crucial instrument to build capacities of local partner banks and to enable them to evaluate and select profitable energy efficiency projects. International FIs and the donor community can support this by increasing the availability and accessibility of technical assistance for local banks and documenting the outcomes in order to draw conclusions for future projects.

Annex 4

Executive Summary for International Organizations

Industrial Energy Efficiency and Material Substitution in Carbon Intensive Sectors

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ROLE OF INTERNATIONAL ORGANIZATIONS

Many international organizations that are active in the field of energy have highlighted the importance of industrial energy efficiency and have established dedicated networks and initiatives. International organizations play a crucial role in fostering energy efficiency in industry as they work across borders. They can therefore contribute significantly to worldwide exchange of knowledge and best practices, e.g. the ISO 50001 standard for energy management, addressing the lack of awareness and the need for capacity building. Through the initiation and support of international collaboration projects, moreover, international organizations and initiatives can facilitate technology transfer and development, thereby facilitating access to energy-efficient technologies for developing countries.

Barriers	Possible Actions by International Organizations	
Lack of Awareness/ Motivation	Information & Demonstration	• Sharing of best practices • Demonstration Projects
Lack of Technical Know-How	Capacity Building	• Professional Training • Aid in Implementation
Structural Barriers	Policy Support	• Institutional Creation • Strategic Planning
Limited Access to Technology	Research & Development	• Research Programs • Pilot Projects • Technology Transfer

POSSIBLE OPTIONS FOR ACTION

There are multiple models for international organizations to contribute to **awareness-raising** among industry actors, policy makers, and financing institutions worldwide. Through the creation of online platforms or policy databases they can share best practices to inform about feasibility and benefits of energy efficiency projects in industry. They may for example encourage the uptake of ISO 50001 as an international best practice in energy management.

Many organizations already foster the introduction of energy management systems and the provision of accompanying **capacity building** options to drive technology innovations and competitiveness of companies. Capacity building can be offered in the form of technical training, workshops, study tours, technology demonstration projects, or as accompanying technical assistance for other programs.

Another area in which international organizations' actions can make a high impact is in providing **policy support**. They can assist in designing and implementing energy efficiency policies for industry. This may include the definition of common targets and strategies, regulatory standards, certification schemes, and the provision of policy assistance through online trainings etc. An example is the Clean Energy Solutions Center, an initiative implemented under the Clean Energy Ministerial to support governments in designing and adopting energy efficiency policies. Through the provision of policy support, a sustainable effect on the policy framework and thus the progress of industrial energy efficiency can be attained.

Engaging in **research and development programs**, international organizations can contribute to implementing pilot projects and testing new business models, and to develop and promote innovative solutions to enhance energy efficiency.

Although international organizations are well positioned to facilitate **technology transfer**, this plays a minor role in the activities of international organizations so far. Further action is needed to initiate transnational cooperation and strengthen cooperative action on technology transfer and development.