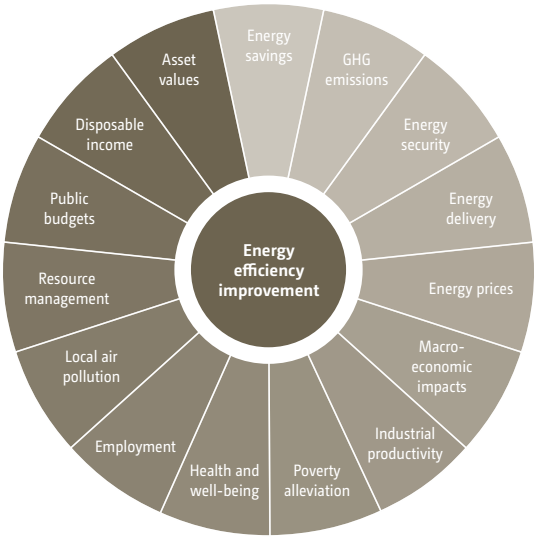
United Nations
Framework Convention on
Climate Change

Technology Executive Committee

EXECUTIVE SUMMARY FOR
INDUSTRY ACTORS

Industrial Energy and Material Efficiency in Emission- Intensive Sectors

Accounting for over one third of global final energy consumption, the worldwide industrial sector consumes more energy than any other end-use sector. Various energy and material efficiency measures can reduce energy consumption and related greenhouse gas emissions significantly, thereby also offering great cost saving potential and a number of environmental and social co-benefits, such as reduced air pollution and improved working conditions. Despite the high potential for industrial energy efficiency, a number of challenges and unaddressed needs remain, among which lack of awareness of energy efficiency potential, limited access to financing and the need for capacity-building are the prime ones.



Multiple benefits of energy efficiency
Source: OECD/IEA 2014

POTENTIAL AND BENEFITS 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 less reliable on non-renewable fossil fuels. This increases their energy security on the one hand and makes them less exposed to risks related to volatile fuel prices on the other. Higher energy and material efficiency can furthermore result in more cost-efficient production, increased productivity, reduced material losses and higher product quality. In addition, eco-friendly operation and production processes can improve companies' environmental compliance and also earn them 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 combined energy use in industries worldwide is considerably high. But the energy consumption of SMEs could be reduced significantly with the introduction of simple measures (see the figure below). For SMEs, the benefits of energy efficiency are of particular relevance, since they can significantly enhance their competitiveness and build their 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, redesign (less input material, light-weight, longer-life products)	**Material recovery:** recycling, reuse

POSSIBLE OPTIONS FOR ACTION

In order to share experience with other enterprises and acquire knowledge on good practices, companies are recommended to engage in **networks or clusters** dedicated to energy efficiency. In Germany, for instance, the Energy Efficiency Networks initiative was founded by the Government and industry associations, targeted at conducting energy audits for members and setting a common goal for each network. Also, in Sweden, industry-related sectoral networks for energy efficiency were established, benefiting 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** within a company, for example sending employees to training for energy managers or auditors, is important for enabling the identification of energy efficiency opportunities and the implementation of measures in a sustainable way. Training on the ISO 50001 standard, for instance, is offered around the globe. Moreover, it is important to empower the trained staff and to provide them with the necessary resources for the application of their knowledge.

Further, companies can take up energy efficiency improvement as an **additional business field**. After energy efficiency measures have been implemented within an 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 its own energy or CO_2 reduction targets. While industrial associations could negotiate agreements with the government, as for example in the United Kingdom, where, within the framework of climate change agreements, a 65 per cent discount on the climate change levy is given to companies for meeting certain emission-saving targets.

For more information, please read the TEC Brief on energy and material efficiency in emission-intensive sectors

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