

A REVIEW OF ENERGY EFFICIENCY POLICIES FOR MANUFACTURING SMALL AND MEDIUM-SIZED ENTERPRISES FROM AROUND THE WORLD

Reference

Published in proceedings of 2019 ACEEE Summer Study on Energy Efficiency in Industry, Portland, August 12-14, 2019, s. 3-135-3-150.

Published by:

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References to articles as well as information about projects can be found at the [IETS website](#).

Introduction

In most countries, manufacturing (industrial) small and medium-sized enterprises (SMEs) represent more than 99% of the number of companies and 60% of the employment. Thus, the sector is - apart from using energy - a major driver in the economy with regard to innovations, GDP, investments and export. Despite the importance of SMEs in the economy, they have not received much attention in most countries' energy policy activities.

Energy management in its various forms is regarded as one of the key drivers of industrial energy efficiency. Whereas the term “energy

management” is often associated with the standardized ISO 50001 standard, there is a broad variety of different programs and schemes in place, which do not strictly abide to the framework of the standard. Especially for SMEs, the standardized protocols of ISO 50001 are often too complex for a cost-efficient implementation.

This topic sheet, based on the result from Annex XVI, provides an international overview of some existing energy efficiency policies with a focus on energy management practices in selected EU member states as well as Norway and Japan.

EU member states

For the EU countries a common energy policy framework applies, which the different policy instruments set. For industry, three major instruments have a direct relation to industry:

The EU Emission Trading Scheme (EU ETS)

The EU ETS operates in the 28 EU countries including also Iceland, Liechtenstein and Norway covering around 45 % of the EU's greenhouse gas emissions. It is a highly relevant instrument for industry, as the whole electricity sector as well as industrial installations above 20 MW installed power are included in the scheme. Despite some setbacks due to the economic crisis in the late 2000's, the market is - also due to EU interventions - now recovering and carbon prices are rising again (> €20/t CO₂) from previous lower levels.

Energy Audit Obligation for Large Companies (Art. 8 EED)

The Energy Efficiency Directive (EU 2012/27/EU) is the EU's major piece of legislation specifically targeting energy efficiency. It covers a broad variety of instruments to foster energy efficiency in the EU member states. Several of these instruments are targeting industry. Most prominent among them is the obligation for non-SME organizations to conduct regular energy audits. Non-SMEs are companies, which are not SME in the definition of the EU (> 250 employees; > €50 million turnover; > €43 million balance sheet total). The energy audit has to comply with several minimum criteria set out in the directive. Enterprises, which have implemented or commit to introduce an energy management system, e.g. ISO 50001, are exempt from the obligation.

The implementation of the audit obligation is subject to national legislation of the member states. This leads to a certain variety in the implementation, especially regarding the reporting and verification of the audits. The directive does not require the implementation of measures or a reporting on the implementation. The policy is too new to have been scientifically evaluated, wherefore no data exists on its effectiveness.

The Minimum Energy Performance Standards of the Ecodesign directive

For a large variety of products, the EU has established minimum energy performance standards (MEPS) in the context of the Ecodesign Directive. These MEPS use a least life cycle cost approach and are in place for most crosscutting technologies in industry. The major product groups covered include the variety of motors and motor driven systems as well as lighting, boilers and ovens. These standards apply for all products put on the EU internal market (including the EFTA countries).

Other energy efficiency policies

Energy taxes on fuels and electricity

Energy and environmental taxes are one key part of the policy mix in many countries: The most important being a basic tax for electricity and CO₂-taxes for other energy carriers.

Investment subsidies and funds

For industry, a broad variety of funding schemes exist in most countries. Examples of these are investment subsidies for cross-cutting technologies, process technologies and waste heat technologies as well as sector specific programs. Other subsidies are for energy audits, energy management systems, support for design of technical installation and training.

Demonstration of new energy and climate technology

The aim of this kind of policy is to contribute to more new technologies that can yield reduced greenhouse gas emissions, reduced peak demand, improved energy efficiency or increased production of energy from renewable sources, being demonstrated under real operating conditions and qualified for the market. The policy provides the opportunity for demonstration under real operating conditions to lower technological, financial and commercial risk associated with utilizing new technology. An example in Norway is technology-neutral and is open to projects in all sectors.

Energy efficiency networks programs for SMEs

In national energy network programs for SMEs companies are divided in unique networks where groups of about 10 companies work with the support of a network coordinator and an energy expert. Those implementation-oriented networks usually include energy audits, a common target setting and a monitoring process. Networks are initiated and implemented by different actors such

as national or local energy agencies, chambers of commerce, utilities and consultants.

Energy Efficiency Obligation Scheme: White Certificates

In Italy a mechanism to support energy efficiency for industry is the “White Certificates Mechanism”. The system rests on the obligation for electricity and gas distributors with more than 50,000 end-users to generate each year a certain amount of savings or, alternatively, to purchase an equivalent amount of certificates. White certificates are used to certify the achievement of energy saving in the final use of energy, through energy efficiency measures and projects. The economic value of the certificates varies depending on the cost of energy and is a function of market trends

Environmental code

The Swedish Environmental Code addresses, among other things, energy efficiency as a key aspect. According to the Code, the best available technology (BAT) should be implemented. This is due to the fact that the European Industrial Emissions Directive (IED) sets requirements for BAT. In the previous European regulations, the Industrial Pollution and Prevention Control (IPPC) was in force where more than 20 best reference documents for a number of industries exists. Under the new directive, the IED, new documents are designed for different industries.

Voluntary Action Plans (VAPs) by industry

VAPs are implemented in some countries. In Japan, voluntary agreements between the government and the industry have a long history. Among voluntary action programs for energy efficiency and climate change mitigation by the

industry, the biggest ones are the VAPs by various industry associations. They covered approximately 80 percent of greenhouse gas emissions from the industrial and energy conversion sectors of Japan. In VAPs, each industry association established either CO₂ emission reduction or energy conservation target, whose content is communicated with and outcome is evaluated by the government.

Energy Conservation Law

The Energy Conservation Law in Japan regulates all companies using more than approximately 16 GWh energy per year. The energy use of the regulated companies covers more than 80% of the industrial energy use in the country. The law basically requires firms to establish an energy management system on their own and to decrease energy intensity by 1% annually.

Conclusions

This topic sheet, based on the work in Annex XVI, provides an international overview of existing energy efficiency policies with a focus on energy management practices in selected EU member states as well as Norway and Japan. The diverse policy initiatives for the regarded countries differs but have similarities. All studied countries apply some form of investment subsidy to promote uptake of industrial energy efficiency measures that forms a backbone of industrial energy policy. One studied country, Italy also relies upon a white certificate scheme and Japan relies upon both the Energy Conservation Law as well as the Voluntary Action Plans. All countries apply stand-alone energy audit policy schemes for industrial SMEs and three countries, Germany, Norway and Sweden, also apply energy efficiency implementation networks as key policy programs for the sector.

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About IETS

The IEA TCP on Industrial Energy-Related Technologies and Systems (IETS), founded in 2005, is dealing with new industrial energy technologies and systems.

The mission of IETS is to foster international cooperation among OECD and non-OECD countries for accelerated research and technology development of industrial energy-related technologies and systems. In doing so, IETS seeks to enhance knowledge and facilitate deployment of cost-effective new industrial technologies and system layouts that enable increased productivity and better product quality while improving energy efficiency and sustainability.

Through its activities, IETS will increase awareness of technology and energy efficiency opportunities in industry, contribute to synergy between different systems and technologies, and enhance international cooperation related to sustainable development.

Disclaimer

The IETS TCP was established as part of the IEA Technology Collaboration Programme. The IEA created the Technology Collaboration Programmes as a network of independent collaborations that enable governments and industries from around the world to lead programmes and projects on a wide range of energy technologies and related issues.

