

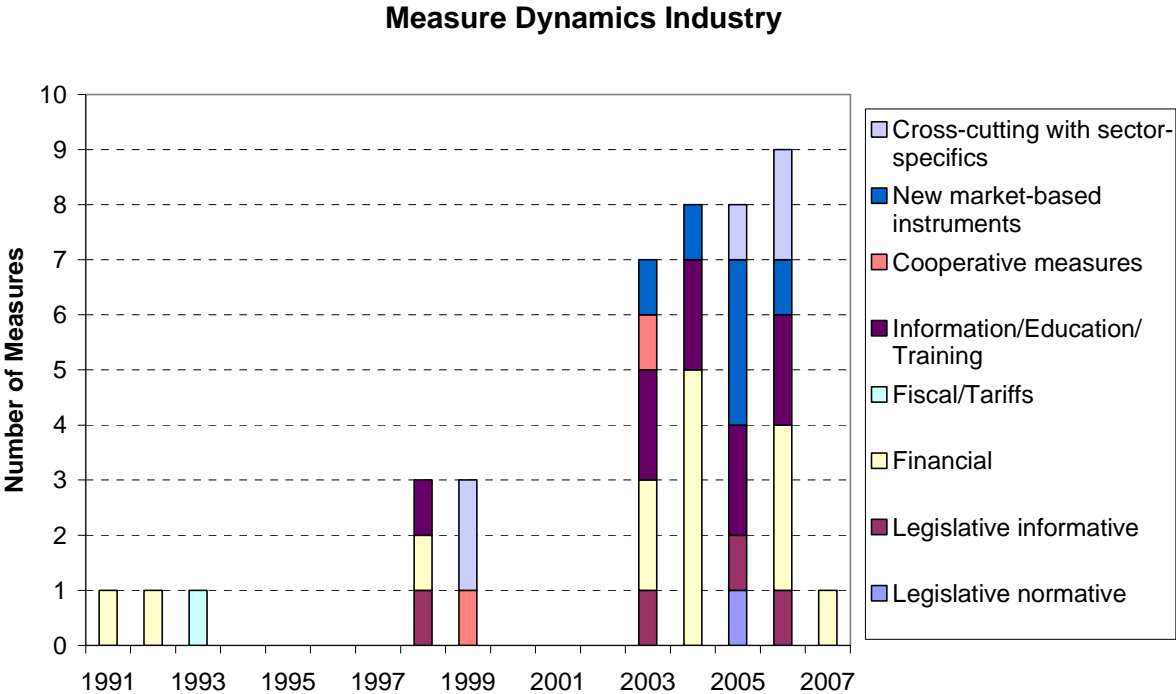
7. Energy Efficiency Policies in the Industry Sector

7.1. Measure dynamics in the industrial sector

Classical measures for energy efficiency such as subsidies are important but new measure types such as market-based instruments are also penetrating

Figure 7-1 shows the dynamics of the introduction of different types of measures over time. Given the fact that many measures have only been introduced very recently in the NMCs, it is difficult to distinguish really clear features in the development of energy efficiency measures. Nevertheless, a few developments can be pointed out.

Figure 7-1: Dynamics of measure types in the industry sector (NMCs)



Energy efficiency in the NMC industries has mostly been promoted through financial support (e. g. for industrial energy efficiency audits and investments) or legislative-informative measures (mandatory introduction of energy audits for example in Bulgaria, or mandatory energy managers in Slovakia). Information/education/training measures are also quite common. Measures based on new market instruments, such as the EU ETS, have been introduced more recently following the same trend as in the EU as a whole. Interesting is the fact that two countries (Estonia and Slovenia) have introduced sector-specific crosscutting measures based on environmental taxes with a CO₂-component. This type of measures will be discussed more in detail in the following sections.

7.2. High impact energy efficiency measures

High impact measures in the industrial sector are of mixed nature but cooperative measures are largely absent from the mix⁶⁶

About 21 % of all measures introduced in the industry sector in the NMCs are considered to be high impact measures. This share is rather similar to the EU-15. **Table 7-1** shows a list of these measures. There is rather a broad mix of measure types among the high impact measures but with the notable absence of cooperative measures such as negotiated or voluntary agreements. They are largely absent from the NMCs, either due to their historic development in planned economies but also because – to a certain degree – cooperative measures have shown their limitations to deliver in both the industrial and the transport sector in the absence of a strong public counterpart.

Table 7-1: High impact measures in the NMCs industry sector

Country	Measure title	Measure type
Bulgaria	Energy Efficiency Act (EEA) – Mandatory Industrial Audits for Energy Efficiency	Legislative-Informative
	Grants for energy audits in SME	Subsidies
Cyprus	Governmental grants/subsidies scheme for the promotion and encouragement of RES, energy saving and the creation of a special fund for financing or subsidising of these investments	Subsidies
	Information Campaign for Energy Efficiency, RES, RUE	IET
Czech Republic	Emission trading scheme and National Allocation Plan of the Czech Republic	New MBI
Latvia	Law on Electricity Market	Legislative-Normative
	Law on energy	Legislative-Normative
Slovakia	Income Tax Exemption for renewable energy and CHP	Fiscal

IET=information/education/training; New MBI=New market-based instruments

This fact makes this type of instrument less attractive in order to achieve results. This is why in some countries such as Bulgaria and the Czech Republic⁶⁷ mandatory audits up to the introduction of mandatory standards (especially for industrial cross-cutting technologies such as electric motors, compressed air systems etc.) has been introduced. The introduction of mandatory standards for industrial processes is also in progress in Bulgaria but this field is rather complex due to the heterogeneous nature of industrial

⁶⁶ High impact measures are measures with energy savings >0.5% of the total consumption in the sector.

⁶⁷ Romania was not investigated in this project but one seminar organised in Bucharest by the Energy Charter Secretariat has shown that this country also has introduced such an instrument.

processes. Some countries are not present in the list, either because none of the measures is considered as high impact, or because the impact could not be classified so far, even in semi-quantitative categories.

Information/education/training measures are less likely to be regarded as having a high impact. The same is true for new market-based instruments such as the EU ETS, which so far has not managed to make a significant impact on CO₂-emissions and, indirectly, on energy efficiency. However, this is a completely new instrument, which needs time to properly develop (see the discussion below).

7.3. Innovative energy efficiency measures

For most of the innovative measures described here it is too early to judge whether they may or may not have a major impact on future industrial energy efficiency, but they do have the potential to be high impact measures.

Examples of particularly innovative measures in the industry sector include:

- *New market-based instruments, in particular the EU ETS:* the EU ETS is by far the most important innovation of recent years concerning industrial energy efficiency measures, even though its main target is actually to reduce emissions of CO₂. Its medium- to long-term impact on improving energy efficiency may be quite large (**Box 7-1**).
- *EU Structural Funds for Environment and Infrastructure Operative Programme* (**Box 7-2**).
- *Inclusion of energy efficiency criteria in environmental permits:* incorporating energy efficiency criteria into environmental permits is one of the few regulative measures in the industrial sector. An example of such type of measures is the Environment Charges Act in Estonia (**Box 7-3**).
- *Mandatory audits and mandatory standards in the industrial sector:* such types of measures are more widely spread now in NMCs than in the EU-15. Examples are Bulgaria (**Box 7-4**), Czech Republic or Romania.
- *Energy Service Companies (ESCOs) in Hungary*⁶⁸

⁶⁸ For a detailed description of the Hungarian ESCO market see http://www.econolerint.com/en/PDF/HUNGARY_ESCO_final.pdf

Box 7-1: New market-based instruments

January 2005 saw the launch of the European Union Greenhouse Gas Emission Trading Scheme (EU ETS), the largest multi-country, multi-sector greenhouse gas emission trading scheme world-wide. The scheme is based on Directive 2003/87/EC which was implemented on 25 October 2003. The emission trading scheme which is relevant for larger industrial energy consumers and energy producers and transformers, has also been introduced in the NMCs. From the perspective of energy efficiency, it is particularly interesting whether the ETS will influence companies to undertake investments in energy efficiency. The following conclusions can be drawn so far on the functioning of the system which also hold for the NMCs (Source: MURE database, EU measure on the ETS):

- (1) The ETS is functioning as a market and triggers energy efficiency through higher prices.
- (2) Long-term investment decisions and the development of technical innovations are clearly influenced by the EU ETS.
- (3) No significant emission reductions occurred in the first phase of the EU ETS which lasts from 2005-2007; in particular no industrial energy efficiency measures have been triggered by the EU ETS.
- (4) The recent decisions on the cap for the second ETS period 2008-2012 and hence the shortening of the national allocations in the 2nd National Allocation Plans (NAP II) have contributed to send signals that the ETS may contribute to enhancing energy efficiency in the second period, although countries which will have to cut their emissions in the future compared to 2005 emissions are still rare. The pressure might, however, increase if stronger economic growth requires greater efforts to reduce CO₂ emissions and hence improve energy efficiency.

Box 7-2: EU Structural Funds for Environment and Infrastructure Operative Programme

Making use of structural funds of the EU, from which the NMCs benefit widely, to steer energy efficiency investments is an interesting option experimented in Hungary. There are components of the Environment and Infrastructure Operative Programme (KIOP-2004-1.7) aiming at (1) the increase of energy efficiency; (2) the promotion of renewable energy source utilisations. The objectives are to increase the utilisations of renewable energy sources, to increase energy efficiency, to reduce CO₂ emissions and to facilitate regional development. Organisations eligible for the grant are (1) in target group 1: central budget and organisations; municipalities and organisations; non-profit organisations; business organisations of major municipal ownership; foundations and associations; churches, public bodies; associations and non-profit consortiums established by these associations, (2) in target group 2: small and medium sized enterprises. The maximum amount of the grant is HUF 300 million (1.2 million Euro). There is no maximum limit of the investment cost.

Box 7-3: Estonia - The Environment Charges Act (State Gazette I 2005, 67, 512)

The Environment Charges Act (enforced on 1 January 2006) provides an obligation for owners of combustion equipment to pay pollution charges for several pollutants emitted into air (e.g. sulphur dioxide, nitrogen oxides, etc.). The pollution charge for release of carbon dioxide into ambient air was introduced on 1 January 2000, stipulated initially by the Pollution Charges Act, which was repealed since 31 December 2005.

Table 7-2: Pollution charge on carbon dioxide emission since 2006 (EUR/t CO₂)

2006 – 2007	2008	2009
1.00	1.50	2.00

In case of emission of CO₂ in larger quantities than permitted higher charge rates shall be used: in 2006 and 2007: 40 EUR/t and since 1 January 2008 – 100 EUR/t. The pollution charge in case of emissions into ambient air has to be paid by all enterprises that must have the air pollution permit. According to the regulation of the Minister of Environment no. 101 (02.08.2004) the air pollution permit is obligatory for all enterprises which own and operate combustion equipment (utilizing solid fuel, liquid fuel or gas fuel) with rated capacity equal to or higher than 0.3 MW in one location. At present, the CO₂ charge has to be paid by all enterprises producing electricity or/and heat, excluding the ones firing biomass or peat. Since 1 January 2009 it is planned to replace the CO₂ charge for electricity producers with an excise tax on electricity.

The Environmental Charges Act replaced the Pollution Charges Act which was repealed since 31 December 2005. The charges in the first period were as specified in the following table.

Table 7-3: Pollution charge on carbon dioxide emission since 2000-2005 (EUR/t CO₂)

2000	2001 – 2004	2005
0.32	0.48	0.72

The Environment Charges Act (enforced on 1 January 2006) provides a possibility for substituting the pollution charge (incl. CO₂ charge) with financing activities. The financing of activities shall substitute for the pollution charge if the polluter implements, at its expense, environmental protection measures which ensure the reduction of pollutants or waste over the course of three years by not less than 15 per cent in comparison with the last accounting year of the period prior to the implementation of such measures. The substitution of the pollution charge must be based on a contract entered into between the polluter and the Minister of the Environment. The contract contains sanctions which may be imposed on the polluter to whom substitution of the pollution charge is granted if the person fails to comply with the substitution conditions.

The impact of the measure is nevertheless estimated as low.

Box 7-4: Mandatory audits and standards in the industrial sector in Bulgaria

Energy Auditing requirements of Industrial Facilities in Bulgaria are based on the Energy Efficiency Act (Art. 17, EEAct, March 2004) and four regulations, namely 21/12.11.2004 (investigation for energy efficiency) and 18/12.11.2004 (energy performance of facilities).

The Energy Efficiency Act stipulates that "subject to investigation for energy efficiency shall be the sites referred to in Art. 16-2 [buildings] as well as every energy user whose annual energy consumption exceeds the limits determined by the ordinance. According to the secondary Regulation N°21, every energy consumer could be audited for energy efficiency. The Regulation stipulates obligatory auditing of all producers of goods and services with an overall annual energy consumption over 3 000 MWh. They are subject to energy auditing every 3 years, contracting & applying energy audits – either simplified audits (accuracy $\pm 15\%$), detailed audits (accuracy $\pm 5\%$) and/or control audits (control audits could be simplified or detailed). Regulation N°18 fixes the grounds for energy efficiency indicators and benchmarks to be used for industrial entities and large buildings. It stipulates in particular that "reference values of energy characteristics of industrial systems shall be presented in the form of Company Standards for Energy Efficiency (CSEE)", and that "company standards for energy efficiency shall be developed after a detailed survey for energy efficiency is being carried [out] pursuant to the ordinance for energy efficiency [audits]". In 2006 the first companies licensed for auditing of industrial systems have started to operate in the energy services market. As part of the general procedure, eight sites were audited - seven in the industry sector and one in the agriculture sector. The results of audits performed are shown in Table 7-4: more than one third of the energy can be saved at a payback time below 2.5 years.

Table 7-4: Results of obligatory audits performed in companies with annual energy consumption exceeding 3000 MWh (to the end of 2006)

Sector/branch	Number of audited companies	Total annual energy consumption	Expected annual energy savings	Expected annual financial savings	Necessary investment
		GWh/year	GWh/year	million BGL/year	million BGL
Agriculture	1	1.24	0.51	0.05	0.28
Industry/Food	1	11.01	2.78	0.17	0.67
Industry/Textile	1	7.58	1.93	0.48	0.79
Industry/Metal articles	5	53.92	21.31	1.46	3.79
Total	8	93.96	33.45	2.30	5.68

Note: 1BGL (Bulgarian Lev) = 0.507 Euro (as of 27 August 2007)

Based on these observations the Bulgarian Energy Agency AEE estimated ex-ante savings from the measure of 2.1 PJ in 2010 and 5.6 PJ in 2016 (1.4 % and 3.8% respectively of the energy consumption of the Bulgarian manufacturing industry in 2004). The audit scheme for industrial entities and large buildings has the aim to audit in the coming years 357 industrial entities above 3,000 MWh/year and 5,476 buildings above 1,000 sqm gross floor area (of which 65.9 % municipal and 34.1 % state-owned).

7.4. Conclusions

The main conclusions for the industrial sector are:

- There are large variations in industrial measure types by country in the New Member States but cooperative measures are largely absent (due to both differences in the approach to energy in the former centrally planned economies and due to fact that cooperative instruments have shown their limits in a variety of configurations). In addition, new measures such as the emission trading scheme have further weakened the importance of cooperative measures.
- New market-based instruments such as emission trading are increasingly also complementing the measure "tool box" in NMCs like in the EU-15 countries. They constitute the strongest link between national measures and EU-policy for energy efficiency in the industrial sector, although the impact on energy efficiency was limited in the first phase of the emission trading scheme.
- This is why in some NMCs mandatory audits up to the introduction of mandatory standards (especially for industrial cross-cutting technologies such as electric motors, compressed air systems etc.) are investigated.
- Other innovative measures next to mandatory audits and the emission trading scheme are the inclusion of energy efficiency criteria in environmental permits, the use of EU Structural Funds to steer environmental and energy-related issues, energy efficiency funds and Energy Service Companies ESCOs.