

# Introduction to Panel 3

## Matching policies and drivers: Policies and directives to drive industrial efficiency

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### Introduction

Implementing effectively the Energy Efficiency Directives represents a unique opportunity for industry and for society as a whole, but it is also a huge challenge. Indeed, as many national or local energy efficiency programs do not perform as much as expected at European level, an immense effort will be needed. Therefore, this panel looks at the impact of different factors (obstacles, drivers, characteristics of the industrial sector, etc.) on energy efficiency policies and programs in the industrial sector. Some relevant questions are raised, and seek an answer:

- Which suggestions can industry provide to policy-makers? How may industry influence the development of energy efficiency policy?
- Moreover, if synergies among different programs (e.g. Lead Market Initiative, SET Plan) exist, and if they provide evidence of huge benefits to portions of the industrial sector, how can such benefits be transferred at largest scale?

### Sectorial trends

This panel offers evidence of trends of national policies and programmes in different countries, within and outside Europe.

Fleiter et al. (3-042-14) discuss long-term improvements for selected energy intensive industries in Germany, in the second half of the 20<sup>th</sup> century. The results will indicate that in order to achieve substantial energy savings in the long term, radically new process innovations or shifts between processes are required. Policies aiming at the development and market introduction of new processes as well as R&D can support these changes. Furthermore, energy efficiency goals should not be formulated for and individual process but for a whole industry.

Hasanbeigi et al. (3-008-14) present several scenarios in which they have analysed the trend of energy consumption in China, showing that, although total annual crude steel production of key Chinese steel enterprises (and most likely entire Chinese steel industry) is assumed to peak in 2030 under all scenarios, total final energy use of the key Chinese steel enterprises (and most likely the entire Chinese steel industry) may peak earlier (even in 2015). The authors also link their evidence to the Chinese policies and incentives to reduce the energy intensity of the steel industry in China.

Bordigoni et al. (3-013-14) analyse the crucial energy issue for the paper industry competitiveness. This study analyses the effect of national differences in energy costs on the international trade of paper products. A gravity model is performed on a dataset of 32 countries for the 1995–2006 period. Energy costs, not only prices, are used.

Mazauric et al. (3-055-14) discuss the arbitrage between Energy Efficiency and Carbon Management. Their study relies on the TIAM-FR model, which is a 15-region world version of the MARKAL/TIMES model family, where an Energy Efficiency-dedicated module was implemented. A focus is given on Europe, United States and China; and only the implementation of the Energy Efficiency solutions in the industrial sector is considered.

### Discussions on policy instruments

This panel offers an interesting insight on how countries have dealt or should deal with policies to support industrial energy efficiency in different contexts.

Chittum (3-102-14), using examples from Aalborg, Denmark, as a representative Danish city, identifies the role industrial waste

heat has played and could play in the future of Danish district heating. This paper examines the policy construct that supports the leveraging of industrial waste heat resources in Denmark, and discusses whether such a construct might be applicable to other countries with industrial waste heat resources.

Väänänen et al. (3-099-14) aim to clarify upcoming energy efficiency related development in the next 15 years, mainly on a general level but also help end users understand the development and changes in energy intensive industry.

Friedrichsen & Aydemir (3-026-14) investigate the electricity price differences resulting from several political instruments for sample companies from three energy-intensive sectors: paper, steel, and aluminium production. In fact, member states have introduced different instruments to trigger the necessary changes in the generation and use of energy. Often these instruments lead to price increases for consumers, but include preferential treatment for industrial electricity consumption.

Aydemir & Friedrichsen (3-024-14), through a stylized case study in a paper mill, show that policy-driven burdens for industrial electricity consumption have a deviating impact on benchmarking the profitability of energy investment opportunities among different states (Germany, France, the Netherlands and the UK), as electricity prices include politically driven levies that vary within the EU.

Harmelink & Bosselaar (3-016-14) argue that clear arguments for the choice of a specific emission factor for attributing CO<sub>2</sub> emissions to heat and electricity are currently lacking. One of the reasons for these varying emission factors are the different methods applied for attributing CO<sub>2</sub> emissions to heat and electricity produced by CHP installations. As a consequence, basic information on how the factors were determined is missing and factors are not regularly updated. Starting from this evidence in the Netherlands, the authors suggest starting a discussion on harmonisation of methods around Europe and address issues like: growing share of renewables and how this affects calculated impact of energy savings and how to value electricity from CHP units.

Braungardt et al. (3-039-14) dig into the core of EU directives by discussing The Ecodesign and Energy Labelling directives which are key policy measures to increase energy efficiency in Europe. European industry has a crucial role during all phases of the legislative process: industry stakeholders are involved in defining the levels the measures are set at in the policy making process. Industry is required to improve their product portfolio to comply with the regulations, and is directly influenced by the Ecodesign regulations for key technologies such as electric motors.

Tóth et al. (3-098-14) study the Ecodesign and Energy Labelling directives as insiders, working at the commission. They

analyse the experience gathered so far with respect to products such as motors, transformers and lighting, in an attempt to describe the practice and the challenges in the application of the two framework Directives to industrial products.

Brunner et al. (3-021-14) look into motor systems that are responsible for more than 70 % of industrial electricity consumption. Policy can support industry in improving the energy efficiency of their electric motor systems and realize high savings. How should policies be designed and what mix of policy instruments should be applied? The Electric Motor Systems Annex (EMSA) of the International Energy Agency's 4E Implementing Agreement.

Sojdei et al. (3-029-14) give us a unique perspective of Iran: based on Iran's policies for "Rectification of Energy Consumption", till 2016, energy intensity should reduce 33 % and till 2021 it should reduce 50 % compared to the energy intensity of the year 2011. In this way the cumulative energy saving in the country is estimated to reach around 6,600 MBOE which is approximately 4 times of the primary energy supplied to the country for year 2009. As a result, Iran could avoid the threats of the energy consumption trends for the country.

### Conclusions and key messages

Panel 3 covers a wide variety of topics. We have evidence that much more should be done to implement the Energy Efficiency Directives. The panel reveals that instruments to properly quantify environmental benefits of energy efficiency measures are still at inception stage, and European states adopt different strategies in support of enterprises. The policies presented and discussed show that future efforts are needed in order to harmonize the approach to energy efficiency issues, especially considering the impact of different national policies on industries located in different European countries, and thus working in the same competitive environment. Nevertheless, from the variety of papers presented in this panel, it becomes evident that the energy efficiency potentials are substantial and worth further investigation, as able in some context to reverse the existing growing energy consumption trends. Additionally, it seems reasonable that a unique approach for all existing technologies would not work effectively, and thus policies and programmes should be properly shaped according to the specific contexts in which they should be in place. The studies have here shown that a greater collaboration between the different stakeholders (policymakers, final users, technology suppliers, energy suppliers, etc.) might represent a great driver to the promotion of industrial energy efficiency and, thus, really boost the technology transfer of energy-efficient technologies.