



Energy efficiency and sustainability assessment of about 500 small and medium-sized enterprises in Central Europe region



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ABSTRACT

Nowadays more than 20 million small and medium-sized enterprises (SMEs) are located in the European Union (EU): they are a key driver for economic growth, innovation, employment and social integration. The first step towards better industrial energy and environmental performance is the acknowledgement of the savings potential that can be realized by the company ownership and management board. Following this goal, the CEEM (Central Environmental and Energy Management) project provided to about 500 Central Europe SMEs of 5 countries (Austria, the Czech Republic, Hungary, Italy and Slovenia) a user friendly and free of charge web tool called 3EMT (Eco Energy Efficiency Management Tool). Through a questionnaire the 3EMT analyzes and sums up eco-energy patterns, helps to self-assess the company environmental performance, benchmarks a company with other Central Europe's enterprises, delivers a customized Assessment Report, suggests further services and facilities. In this paper, the large 3EMT database is analyzed, and statistics focused on SMEs eco-energy performance and future & innovation perspectives are presented and discussed. Furthermore, key challenges and key intervention points were defined by local stakeholders (policy makers, Energy Service Companies, SMEs representatives, researchers), this paper summarizes the main policy outcomes.

1. Introduction

Right now there are about 22 million SMEs in the EU28, representing 99 of every 100 businesses, employing 89 million people (2 in every 3 employees) and generating around €3700 trillion in added value (EC, 2014). SMEs are defined as businesses that employ less than 250 people and have an annual turnover of less than €50 million and/or a total balance sheet of less than €43 million (EC, 2003). From the numbers presented, it is evident that the more than 20 million SMEs in the EU are a key driver for economic growth, innovation, employment and social integration (EC, 2014).

1.1. CEEM project approach: open research questions and aims

Efficient use of resources is a key component for the Europe 2020 strategy and it is one of the main drivers for competitiveness (EC, 2010a). According to the Executive Agency for Small and Medium-sized Enterprises (EASME) there is still a large untapped potential for resource efficiency improvements in Europe (<https://ec.europa.eu/easme>).

This opportunity however requires a value chain approach to be combined with the implementation of complex technical solutions at company level. Therefore, the first step towards better industrial performance is the acknowledgement of the savings potential by the company ownership and management board. Very commonly top managers and, more in general, decision makers, do not have expertise in or do not give priority to energy efficiency if it does not bring economic profit or if it cannot provide a “green image”. As a consequence, company commitment can be hard to attain, and the energy efficiency projects need to be supported financially and technologically through adequate and convincing State incentives.

The main goal of the CEEM (Central Environmental and Energy Management) project is to provide Central European SMEs, which usually lack the capacity to conduct their own energy audits, with a user friendly and free of charge web tool with which to let them self-assess their resource efficiency performance against different parameters. This tool is intended to provide information on appropriate resource efficiency measures and their costs and, at the same time, collect and supply related data and statistics. These data are useful for policy makers who want to design new sustainable industrial policies that are

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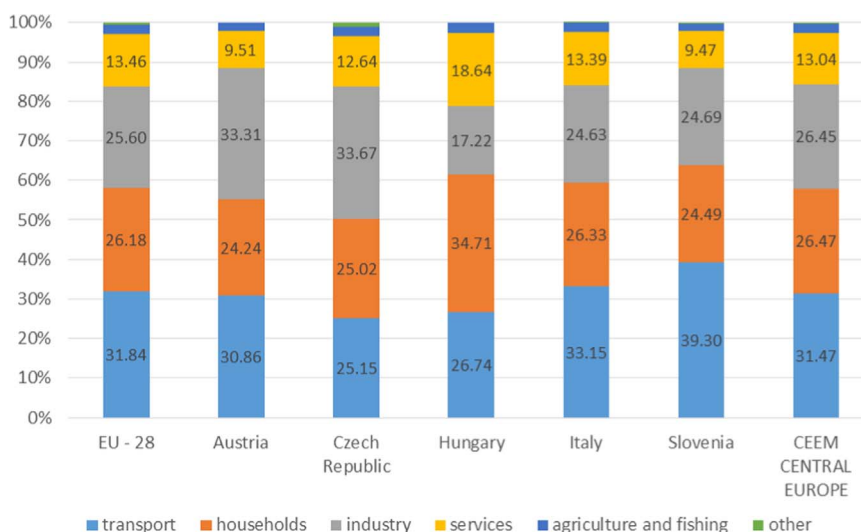


Fig. 1. Final energy consumption (% by sector, 2012).
Source: Eurostat.

harmonized throughout the Central Europe area. In addition, entrepreneurs, energy managers and production managers can become aware of environmental issues and of green technologies opportunities to clean up the production processes.

A new online software tool, called the Eco-Energy-Efficiency Management Tool (3EMT), has been developed by the CEEM Consortium. A detailed description of the 3EMT, including technical details, is reported by Puskas et al. (2014). About 500 Central European companies from 5 countries (Austria, the Czech Republic, Hungary, Italy and Slovenia) tested the tool and entered their data on energy use, environmental habits and green investments into a questionnaire. All these companies obtained a personalized Assessment Report suggesting ways to achieve greener production processes, with measures such as reducing supply chains, cutting CO₂ emissions and eliminating wasteful practices; all changes that reduce production costs. As many as 100 case studies were documented and discussed in regional and transnational forums that involved companies, policy makers and other stakeholders.

In this paper, the 3EMT database is analyzed, and official statistics at European, National and Regional level, focused on SMEs eco-energy performance and future & innovation perspectives are presented. Furthermore, key challenges and key intervention points were defined country by country and 5 Territorial Strategies were elaborated; this paper summarizes the main policy outcomes.

1.2. Current energy efficiency and sustainability in the European industrial sector

Despite the recent economic crisis, the industrial sector of the EU 28 still plays an important role in the overall final energy consumption. Data from Eurostat show for the year 2012 an average value of 26% (Fig. 1, source: Eurostat 2012). Austria and the Czech Republic significantly exceed this average, Italy and Slovenia are in line with this value, while Hungary is significantly below.

In terms of energy mix the EU 28 and the CEEM countries are strongly dependent on fossil fuels; petroleum products and gases account for 62% of the final energy consumption in the EU 28 (Fig. 2, source: Eurostat 2012). Energy security is widely recognized as one of the main issues for most European countries, and great efforts are made by EU Commission to increase internal energy production, in particular from renewable energy sources (RES). All CEEM countries are on track for 2020 RES targets. Austria presents the highest share of RES, with 32%, followed by Slovenia (20%), Italy (13%), the Czech Republic (11%) and Hungary (10%) (source: Eurostat 2012).

The most recent EU sectorial overview (EC, 2014) highlights “widening gaps in electricity and gas prices compared to main competitors worldwide, in particular following the so-called shale gas revolution in the US”. A competitive industry in the EU cannot be developed and maintained without control of energy prices and costs. With regards to electricity prices the CEEM countries enjoy an advantage compared to the EU 28 average; only the Italian enterprises have to face very high electric costs (0.20 €/kWh against an average 0.15 €/kWh of EU 28). Considering gas prices, the Czech Republic and Italy are slightly under the EU 28 average, while Hungary, Austria and Slovenia are slightly over (Table 1, Source: Eurostat 2014).

Energy efficiency is considered as the most effective way to respond to increasing energy prices. The EU manufacturing sector still enjoys a wide advantage in terms of energy intensity¹ compared to its US competitor, not only in absolute level (more than 3 times lower) but also in terms of trends. Between 2001 and 2011 the EU industry evolved from an energy intensity of 150 to 121 ktoe/Bn€, a decline of 19%; during the same period the US industry went from 440 to 400 ktoe/Bn€, a decline of 9% (EC, 2014).

1.3. Current European industrial policies for energy efficiency and sustainability

The 2010 Communication “An Integrated Industrial Policy for the Globalisation Era Putting Competitiveness and Sustainability at Centre Stage” (EC, 2010b), a flagship initiative of the Europe 2020 strategy, sets out an intent that “aims to boost growth and jobs by maintaining and supporting a strong, diversified and competitive industrial base in Europe, offering well-paid jobs while becoming more resource efficient”. Moreover, it is suggested that the transition to a sustainable economy has to be seized as an opportunity to strengthen competitiveness: “There will be no sustainability without competitiveness, and there will be no long-lasting competitiveness without sustainability. And there will be none of them without a quantum leap in innovation” (EC, 2010b).

At present the European Union energy efficiency target is not on track. The Directive 2012/27/EU on energy efficiency (European Council, 2012) establishes a common framework of measures for the promotion of energy efficiency within the European Union in order to

¹ Energy intensity is calculated dividing the final energy consumption by the gross value added in constant prices. It can be understood as the amount of energy sources needed to obtain one unit of value added.

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