

European Union Research and Development Funding on Smart Cities and their Importance on Climate and Energy Goals

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Abstract

The scope of this paper is to examine the European Union support in terms of research and development funding on the topic of Smart cities. A detailed literature review, based on a project-by-project investigation, and data analysis process identified these expenditures since the research on this topic was first funded. The portion of the Sixth and Seventh framework programs funding dedicated to Smart cities is only 3% of the total energy projects funding and an all time low of 1% is expected within Horizon 2020. The low funding for the investigated field fails to capitalize on the high savings potential represented by the urban primary energy use in Europe. Restructuring the research and development funding distribution for energy could better capture the potential primary energy savings of the European urban sector and contribute to achieving the European Union's climate and energy goals for 2020, 2030 and 2050.

Keywords: European Union, cities, primary energy, research and development funding, smart cities

1. Introduction

After World War II the reconstruction of Europe's economy and establishment of lasting peace was necessary. The major challenge was neutralizing European countries' competition over natural resources. Thus, in 1951 the European Coal and Steel Community (ECSC) was founded. It was an international organization serving the unification of European nations, setting up a common coal and steel market among its member countries. The first member states were France, Federal Republic of Germany, Italy, Netherlands, Belgium and Luxembourg, leading the way to the creation of the EU (Dinan 2014).

The EU is currently facing unprecedented climate and energy challenges and, to overcome these challenges, has established specific goals for the years 2020, 2030 and 2050. By 2020, the EU aims to decrease greenhouse gas (GHG) emissions to 20% below 1990 levels. The energy use produced by renewable energy sources (RES) is expected to be 20%. A 20% drop in primary energy consumption is to be accomplished by upgrading energy efficiency as well (EC 2015a).

In order to provide a coordinated approach between EU member states and ensure regulatory certainty for investors, an integrated policy framework is necessary to achieve the 2030 goals. By that year, the EU aims to decrease domestic GHG emissions by 40%, compared to 1990 levels. The energy produced by RES is expected to be 27% of the total, and permanent improvements in energy efficiency are also foreseen by national policy measures (EC 2015b).

Further efforts are needed by the EU to achieve the 2020 targets, as well as the goals for 2030 and 2050. While the EU is on the right track to reach its RES and carbon emission targets by 2020, it is very likely that the energy efficiency targets will not be met (EC 2011a). The EU member states have affirmed the goal of decreasing Europe's GHG emissions by 80 to 95% in comparison to 1990 levels by 2050 (EC 2015c).

In 2010 the primary energy utilization in Europe was almost 1,800 [Mtoe/a] (EUROSTAT 2013). The cities of the EU account for approximately 70% of the primary energy consumption, and this portion is expected to rise to 75% by 2030 (EIFER 2015). Three-quarters of Europe's population lives in urban areas and is responsible for roughly the same amount of CO₂ emissions (Faure & Peeters 2008; EEA 2015). The entire primary energy consumption savings potential at EU level corresponds to estimated overall 390 [Mtoe/a] each year. Partially because of its large share of whole primary energy usage, the majority of these are attributed to savings in the urban sector (EC 2008; Terluin & Post 2000; BPIE 2015).