



Analyzing the effects of the benchmark local initiatives of Covenant of Mayors signatories

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ABSTRACT

In 2014, the European Union established a new climate and energy framework for 2020–2030, setting three key targets: a 40% emissions reduction and the achievement of a 27% share of renewable energy production and improvements in energy efficiency. All levels of governments should be involved in reaching these goals, with the role of local authorities being mainly important. Thus, the Covenant of Mayors has been developed as an initiative consisting of a voluntary agreement between local governments to reduce emissions, through specific action plans including policies promoting energy saving and renewable energy.

The aim of this paper is to analyze the main benchmark actions performed, based on the database offered by the Covenant of Mayors organization. A total of 4741 so-called Benchmarks of Excellence from almost 1300 cities were registered, being undertaken mainly by Italian, Spanish, Portuguese and Belgian municipalities. The greatest number of actions is related to municipal buildings, public lighting and local electricity production, which are also the greatest emissions reducing actions. In terms of energy savings, actions are highlighted that are related to a modal shift to public transport, municipal building envelopes, and agriculture and forestry, while actions generating more renewable energy production are related to combined heat and power areas.

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1. Introduction

The European Union has come a long way since it adopted its first package of climate and energy measures in 2008. Nowadays, the EU is on track to meet these targets for emissions reduction and renewable energy production, and has also achieved notable improvements in energy efficiency. Furthermore, in 2014, EU countries agreed on a new framework for climate and energy for the period between 2020 and 2030, which set three key targets: a 40% greenhouse gas emissions reduction below 1990 levels, at least a 27% share for renewable energy and at least a 27% improvement in energy efficiency (European Commission, 2014). These targets are in line with the medium term ambitions of the Paris Agreement (UNFCCC, 2015), which set out an action plan to limit global

warming to well below 2 °C above pre-industrial levels, and pursue efforts to limit the temperature increase to 1.5 °C.

To meet these goals, the EU considers it necessary to ensure that all levels of governments are involved in climate policy, implementing energy and environmental measures at all territorial levels, with local emphasis (European Parliament and the Council, 2009). Thus, the European Commission (2016) considers it is necessary to work at city level and intensify urban policies to better contribute to the EU's low carbon transition, as urban communities are the place where a large part of the future transformation will happen. Some authors, such as Di Leo et al. (2015), indicate that it is necessary to encourage sustainable energy systems at the local scale for translating the EU's energy policies into concrete actions. Likewise, as stated in Heidrich et al. (2013), it is recommended to embed adaptation and mitigation efforts in the EU within the urban planning framework. Therefore, as stated in Castán Broto (2017), cities and urban areas can help bridge the gap between the commitments arising from the Paris Agreement, and the requirements for emissions

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reductions needed to keep temperature changes under 1.5° degrees.

Around the world, the recognition of the contribution of local areas to energy and environmental policies has led to the foundation of numerous climate change networks such as the “C40 Cities” network and ICLEI - Local Governments for Sustainability (ICLEI, 2010). In the EU, local initiatives have also been developed, such as the *Covenant of Mayors* (2013) and the Smart Cities Initiative (European Commission, 2009). These networks have promoted the growth of the climate strategies of cities (Fünfgeld, 2015).

Thus, in January 2008, the European Commission launched the Covenant of Mayors, which was a voluntary agreement by which towns, cities and regions voluntarily commit to reducing their CO₂ emissions beyond the EU 20% target. In addition, building on its success, the *Mayors Adapt* (2014) initiative was launched, inviting cities to introduce a parallel process for cities wishing to tackle the issue of adaptation to climate change. In October 2015, a new integrated Covenant of Mayors for Climate & Energy was launched. New local and regional signatories voluntarily committed to implementing EU climate and energy objectives in their territory, pledging to reduce CO₂ emissions by at least 40% by 2030, and to adopt an integrated approach to tackling mitigation of, and adaptation to, climate change (European Committee of the Regions, 2015)

In order to reduce emissions and achieve these targets, signatories must develop specific action plans. Thus, municipalities have an active role in committing to the European energy and climate targets (Labaeye and Sauer, 2013; Pablo-Romero et al., 2015a, 2016; Radulovic et al., 2011). Along this line, Dawson et al. (2014) state that the Covenant of Mayors successfully encourages mitigation planning. Nevertheless, some authors, such as Reckien et al. (2014), consider it necessary to gain more knowledge about the development of these plans in Europe. In that sense, an increased number of comparative studies analyzing cities adaptation and mitigation plans have been observed in recent years. In this regard, the studies by Heidrich et al. (2016) and by Reckien et al. (2014) refer to the plans of 200 European urban areas. Likewise, some studies have focused on toolkits created to facilitate the elaboration of the action plans in some signatory municipalities (such as Bjelic and Ciric, 2014; Kyriakarakos et al., 2014; Marinakis et al., 2015). Alternatively, some other studies have explained the experiences of addressing these plans in specific municipalities. Among them may be cited the studies by Christoforidis et al. (2013), Damsø et al. (2016), Doukas et al. (2012), Famoso et al. (2015), Heidrich et al. (2013), Lombardi et al. (2014), Magni and Maragno (2014), Marinakis et al. (2017), Oliver-Solà et al. (2013), Pablo-Romero et al. (2015b) and Rivas et al. (2015).

Despite the incipient interest in the study of local authorities' planning to promote energy efficiency and the use of renewable energies, little has been said about the impact of these plans. Thus, in the framework of the action plans made by the Covenant of Mayors signatories, there are several reports related to energy savings or emissions reduction targets, such as those by Cerutti et al. (2013), Kona et al. (2015, 2016), and Melica et al. (2014) referring to the Covenant of Mayors initiative. Likewise, the study by Pablo-Romero et al. (2015a) analyzes the estimated emissions reductions by the signatory municipalities and the reasons for the differences observed between them. Furthermore, the study by Pablo-Romero et al. (2016) analyzes whether joining the Covenant of Mayors and making action plans is having a positive impact on reducing emissions through energy saving or promoting renewable energy.

Nevertheless, to our knowledge, there are no studies focusing on the local initiatives that Covenant actors have realized in their territories, which could be useful actions for other local authorities

to replicate. Based on the *Benchmarks of Excellence* database offered by the Covenant of Mayors organization, the aim of this paper is to analyze which are the main benchmark actions performed by the European cities in order to reduce CO₂ emissions in their municipalities. With that aim, this study analyzes the benchmark CO₂ actions undertaken by the signatories to reduce emissions by sectors (municipal, residential and tertiary buildings, public lighting, industry, transport and local electricity and heat production) and areas of intervention. The study also analyzes the main instruments used to perform these actions in terms of CO₂ reductions, energy savings and renewable energy produced, and in terms of economic cost and financing sources. Knowing the main characteristics of these actions, which local territories consider relevant examples for other local authorities to replicate, may help to achieve the new targets included in the framework for climate and energy for the period between 2020 and 2030.

2. Benchmark actions: main figures

The Covenant of Mayors is a movement that succeeded in mobilizing a great number of local and regional authorities to develop action plans and direct investments towards climate change mitigation measures. In 2008, the European Commission launched the Covenant, which developed as the number of signatories grew. Initially, the Covenant of Mayors signatories agreed to the development of a sustainable action plan in which they committed to reduce their local emissions beyond the 20% by 2020. Nowadays, this target has been enlarged, and new signatories now pledge to reduce CO₂ emissions by at least 40% by 2030 and to adopt an integrated approach to tackling the mitigation of, and adaptation to, climate change.

At the end of 2016, the number of signatories was 6371. The first signatories were entitled to develop Sustainable Energy Action Plans (SEAPs) with the aims of cutting their CO₂ emissions by 20%, with the latter signatories being required to submit Sustainable Energy and Climate Action Plans (SECAPs) aiming to reduce them by 40% and also to include climate adaptation plans. Currently, the number of signatories which have submitted either SEAPs or SECAPs amounts to 5679. Additionally, every two years from the first action plan sent, the signatories send monitoring reports in which they present the progress regarding their Action Plans in order to check the compliance of the interim results with the foreseen objectives.

Signatories are also called upon to make known the main local initiatives they have realized in their territories, which they consider may be useful actions for other local authorities to replicate. By the end of 2016, there was a total of 4741 Benchmarks of Excellence registered, having been sent by almost 1300 cities. Fig. 1 shows that 56% of these benchmarks were undertaken by Italian cities, 24% by Spanish municipalities, 4% by Portuguese municipalities and 3% by Belgian municipalities. This distribution is in line with the distribution of signatories' action plans that have been sent (Italy 53%, Spain 25%, Belgium 3.5% and Portugal 2%).

Table 1 shows the main descriptive values related to CO₂ emissions, energy savings, renewable energy produced and implementation cost related to these benchmark actions. The second row in Table 1 shows these values for total benchmarks, while the third row shows these values for total benchmarks with a declared implementation cost higher than €1, with the aim of eliminating those actions that did not have any cost, or because municipalities did not declare the cost because they did not know it. The following rows show the values for the main countries. The total of implemented benchmarks amounts to 4236, reducing 23904936.4t of CO₂ emissions. From these benchmarks, 1048 are undertaking actions which generate energy savings and 954 are

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