

Determinants of energy efficiency and renewable energy in European SMEs

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Executive summary

1. Motivations underlying the research

In recent years, public policies for transitioning to a sustainable energy model have focused on two objectives: the promotion and diffusion of energy efficiency (EE) and the adoption new sources of renewable energy (RE) from green energy technologies. In the short term, public policies pursuing greenhouse gas emission reduction primarily use regulations and financials tools but, in the longer term, the most important determinants of success or failure in environmental protection are related to the development and more efficient adoption of new technologies. These goals are not independent and present significant synergies, however the relationship between EE and RE has received limited attention from policy makers and academics. There is a notable lack of empirical studies focused on how these determinants affect the performance of European firms.

This paper aims to reduce this gap by analysing the drivers of both environmental strategies at firm level, based on an extensive sample of 8,213 European Small and Medium-Sized Enterprises (SMEs). Our starting point is that both EE and RE measures carried out by SMEs tend to increase the share of resource efficiency actions and reduce the total final energy consumption at country level. In 2015, according to Eurostat's Structural Business Statistics Database, European SMEs generated 66.8% of employment and 57.4% of added value (European Commission 2016). Since they also generated approximately 64% of the industrial pollution in Europe, they also have a very significant environmental impact (European Commission 2010).

Following Horbach (2008), we examine the drivers of EE and RE strategies from the supply side, demand side and environmental policy perspectives, as well as the firms' structural characteristics and country factors in line with resource-based and evolutionary approaches.

2) Information sources and econometric strategies

The empirical part of the paper relies on the Flash Eurobarometer Survey 426 (FL426) on “*Small and Medium Enterprises, Resources Efficiency and Green Markets*” addressed to more than fifteen thousand managers of European firms between the 1st and 18th of September 2015.

Empirically, we explore the factors influencing the adoption of EE and RE actions from temporal and geographic perspectives by means of a bivariate probit procedure. In the former, we distinguish between implementing sustainable energy measures now, and the capacity to plan additional energy actions in the proximate future and consider possible complementarities between these. In the latter, we are interested in examining the differences that might exist between three clusters of EU country members. In the “Core countries” cluster we include

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countries that enjoy higher levels of productivity, have GDP per capita above the EU average, and are intensive in exports of high technological content; the “Mediterranean countries” comprise the four countries of Southern Europe; while in “New EU countries” we include the Central and Eastern Europe countries.

3) Main conclusions and policy implications

This paper finds differences between the drivers of RE and EE measures across the country clusters. The empirical results show that Core and Mediterranean countries benefit from firms anticipating future changes in legislation. In contrast, because of public support, New EU countries are more likely to implement EE measures. Firm characteristics such as size and age are also key factors when it comes to introducing EE. On the other hand, RE is more linked to public support and the environmental awareness of the firms. Specially, public incentives play a crucial role among Core and New EU countries. The econometric estimations also show that sustainable energy practices are closely related to the ability of firms to undertake other measures for managing resources more efficiently such as saving water, minimizing waste or designing new products that are easier to maintain, repair or reuse. Our results suggest that sustainable energies actions (both EE and RE) are highly persistent at the firm level and also across countries and that there are complementarities between EE and RE practices.

The most relevant results can be summarized as:

- 1) Sustainable energies measures (EE and RE) are highly persistent at the firm level and across countries in the European Union;
- 2) High complementarities between EE and RE practices are found. Also, European SMEs firms undertaking such measures are more likely to continue applying them in the future;
- 3) EE strategies are influenced by cost saving and regulations, in contrast, RE strategies are more linked to public support and environmental awareness;
- 4) The drivers of EE and RE, in addition to their persistence and the complementarities between them, highlight the need to deploy an energy policy that jointly pursues EE improvements and the promotion of RE.

These results provide some recommendations for European policymakers suggesting the need to design an energy policy for SMEs that jointly pursues both EE and the diffusion of RE according to the technological gap of each member country.

References

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