GREAT GOOD PRACTICE GUIDELINES SERIES
ISSUE THREE OF FIVE

REGULATORY BARRIERS AND POLICY RECOMMENDATIONS






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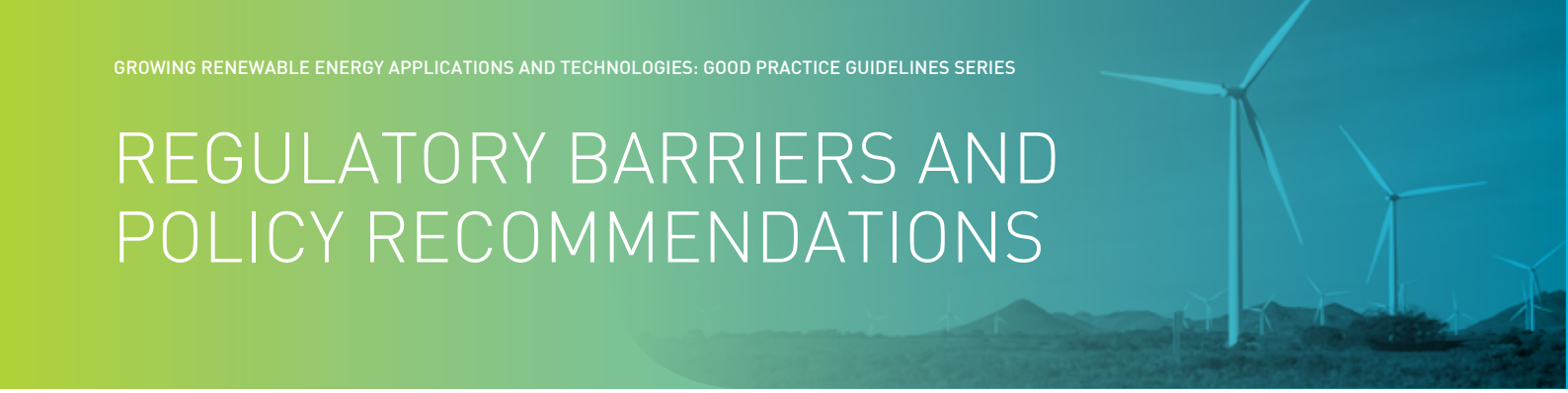

In light of the European Union's objectives to develop a sustainable, reliable and efficient electricity market, renewable and distributed generation technologies are being deployed, together with smart grid technologies which allow their active participation in the electricity market. However, these technologies are still facing technical, economic and regulatory barriers, particularly towards deployment by residential consumers and small and medium enterprises.

Therefore, following the results of the environmental analysis, the regulatory barriers for further deployment are analyzed. A regional comparison of the regulatory framework of Flanders, the Netherlands, Ireland and the United Kingdom is conducted which results in a number of policy recommendations that would facilitate the integration of sustainable technologies in the electricity sector.

GREAT, supported by INTERREG, aims at accelerating the deployment of smart grid benefits in North West Europe by means of encouraging communities and small to medium size enterprises to develop technological solutions for smart grids, renewable energy and distributed generation.

Approach

Environmental Impact of Smart Grid Technologies

Regional Analyses of the Regulatory Framework

Policy Recommendations

- An environmental impact analysis of a representative smart grid architecture during its operational lifetime is conducted. This allows to determine carbon emission s avings following the smart control of rooftop photovoltaics and heat pumps in residential dwellings and office spaces in Belgium.
- A regional analysis of the regulatory framework is made regarding the integration of these sustainable technologies within small and medium enterprises and residential consumers. By means of the results of a survey, regulatory barriers, the primary regional differences and best practices are identified.
- Policy recommendations and guidelines are formulated based on the results of the environmental analysis and the regulatory framework in place. These general recommendations are applicable in the United Kingdom, Ireland, the Netherlands and Flanders, as well as in the rest of Europe.

Our aim is to provide policymakers and regulatory authorities with policy recommendations and guidelines with respect to the market and regulatory framework concerning rooftop photovoltaics and heat pumps on community and SME level; and provide structured cooperation between small and medium sized enterprises and research institutes and technology developers.

Output

- CO2 Emission Savings Resulting From The Smart Control Of Photovoltaics and Heat Pumps in Residential Dwellings And Small And Medium Enterprises, Van Dievel, P., Patteeuw, D., May, K., De Vos, K., & Helsen, L. C. Solar Integration Workshop, October 19-20, 2015, Brussels Belgium
- Environmental and electricity market regulation of smart grid application for communities and SME's within Northwestern European regions, May, K., Van Dievel, P., De Vos, K., Moretti, M. & Witters, N., IEEE Energycon 2016, April 4-8, 2016, Leuven Belgium

REGULATORY FRAMEWORK

The emphasis of the assessment lies on four aspects of regulation which are seen as key for investments and operation of sustainable technologies by residential consumers and SMEs.

- financial support mechanism increases the attractiveness for grid users to invest in sustainable technologies;
- the decision to roll-out smart metering systems, and its practical implementation, facilitates the deployment of smart grid applications within residential communities and SMEs;
- the structure of the electricity retail price provides grid users with direct financial incentives for the integration of sustainable technologies and the smart control thereof;
- the availability of demand-response services determines the possibility of grid users to participate in remunerated services, increasing the financial revenue of local sustainable technologies.

Regional differences in regulatory practices and barriers identified

The regulatory assessment has uncovered the regional differences across Northwestern Europe and identified major barriers towards further integration of distributed renewable generation and smart grid technologies.

- Support Policy: In general, most regions implement a combination of direct subsidies and investment support. Most regions have decided upon a smart meter roll-out, but different strategies are being deployed.
- Electricity Prices: Retail prices are subject to regulatory provisions, more specifically regarding the network tariff, and do not adequately incentivize investments in smart grid technology.
- Market Entry: Network services are opening up for new technologies providing flexibility, such as demand response, but do not yet facilitate residential participation.

CO2 EMISSIONS SAVINGS

In order to grasp the full potential CO2 emissions saving, the operational life time of heat pumps and rooftop photovoltaic installations have been simulated under different operating objective:

- Minimal emissions
- Minimal electricity cost
- Minimal grid interaction

Saving potential

The simulation results show strong reductions in emissions compared to conventional methods for generation and space heating. In Belgium, photovoltaics reduce annual CO2 emissions resulting from electricity generation by 133 – 410 kg/kW. Heat pumps achieve an annual emission saving of 193 – 423 kg/kW, using a condensing gas boiler as a reference scenario. Smart control does not result in strong additional emission reductions, but may result in strong benefits in terms of grid interaction and consumer electricity cost.

Policy recommendations

Based on the environmental analysis, and the regional comparison of the regional framework, policy recommendations are formulated which are intended for regulatory authorities and which provide structured cooperation opportunities between SMEs and research institutes as well as between SMEs and technology developers.

- Heat pumps and photovoltaics reduce carbon emissions substantially, incentivizing their further integration in the power system.
- Smart control of distributed energy resources provides opportunities for further emission reduction, reduced costs, and smaller grid dependency.
- Regulation on retail electricity prices and network tariffs should allow for alternative and tailored solutions in order to reap the benefits of smart grid technologies to their full extent;
- The market design should facilitate procurement of flexibility services by identifying products, actors and their roles.
- The roll-out of smart meters facilitates provision of flexibility services by distributed energy resources and deployment of smart grid infrastructure
- Regulatory barriers concerning the remunerations of DSOs, as well as other elements such as privacy should be relieved to enhance the adoption of smart grid technologies.


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