



Regional solutions to deliver a smart grid future

Activity report

SET-UP 
Interreg Europe



European Union
European Regional
Development Fund

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INTRODUCTION

Energy efficiency is at the cornerstone of EU energy policy and is one of the main Europe 2020 targets (20% energy savings by 2020). In this scenario, **smart grids are a key component of the EU strategy** towards a low-carbon energy future, ensuring increased energy efficiency, improved energy supply security and better integration of renewable energy generation. Whilst investment decisions lie mainly with market players, public policies play a key role in facilitating and driving the development of low-carbon innovation and accelerate their application.

SET-UP is perfectly consistent with this in targeting regional policies that support investment to increase levels of energy efficiency. Funded by Interreg Europe, this interregional cooperation project brings together 6 European regions and 1 Advisory Partner around one common objective: to **improve regional energy performance thanks to enhanced policies** on smart grids. According to the European Commission⁽¹⁾, 950 smart grid projects focused on R&D and demonstration have been developed since 2002, with significant participation from research centres and service providers. SET-UP is innovative in that it focuses on the **role that public authorities can play in the smart grid field** and emphasises the importance of the active involvement of policy makers in the process of deployment.

Regional authorities can improve energy management in different ways: through financial incentives, targeted capacity building schemes and regulated market frameworks. **Integrated regional low-carbon strategies** are key to identifying suitable actions for a specific territory, channel public and private investment, and increase the awareness and participation of all relevant stakeholders, from businesses to citizens to energy companies and investors.

Driven by this common vision, project partners have engaged in an **interregional learning process** based on the exchange of Good Practices and experiences. Building on regional competencies clustered around

the smart grid sector, they have focused on solutions to three main challenges to smart grid deployment: consumer engagement, business models and funding opportunities.

As a result of the exchange and capacity building process, these solutions have been collected in regional Action Plans, that represent, for concerned regional authorities, a concrete road map for **designing and targeting more and better funding** towards integrated smart grid strategies. During project Phase 2 (2019–2021), these regional Action Plans will be put into practice.

This report aims to introduce the SET-UP project and its approach to smart grid deployment in partner regions. The following chapters present the policy improvement process undertaken during the project Phase 1, as well as the methodology applied to the interregional exchange. Lessons learnt from the cooperation and identified Good Practices are illustrated in this report which is to be shared with European stakeholders active in the energy sector.

PROJECT FEATURES

Objective: to improve the energy performance of partner regions thanks to enhanced policies on smart grids.

Regions involved: Brittany (FR), Andalusia (ES), Algarve (PT), Hungary, Lithuania, Leicester (UK)

Advisory partner: Regen

Implementation period and activities:

Phase 1 (Apr. 2016 – Mar. 2019): interregional learning process, based on the exchange of Good Practices and leading to the definition of regional Action Plans.

Phase 2 (Apr. 2019 – Mar. 2021): implementation and monitoring of regional Action Plans for improved policy instruments.



Funding:
€ 1.35 M ERDF



Website:
www.interregeurope.eu/set-up

(1) Gangale F., Vasiljevska J., Covrig F., Mengolini A., Fulli G., Smart grid projects outlook 2017: facts, figures and trends in Europe, EUR 28614 EN, doi:10.2760/701587

#1

WHAT IS A SMART GRID?

Project partners define smart grids (SG) as **digitally enabled energy systems** that use two-way digital communication technologies to automatically monitor energy flows and adjust these flows in response to changes in energy supply and demand.

In particular, smart grids:

- Encourage localised energy saving with demand response support and the integration of energy from renewable sources;
- Allow for more decentralised generation and greater flexibility of energy storage and consumption;
- Are characterised by the participation of multiple actors (consumers, generators, prosumers);
- Allow the individual consumers to generate onsite power (prosumers)

Smart grid development plays a key role in the transition towards a low-carbon economy.

In Europe, several initiatives have been carried out in order to make the grid smarter. Over the past few years, public and private investments have promoted **numerous R&D and demonstration projects** to support, for example, the integration of new technologies, capabilities and resources into the grid. Other initiatives have addressed the need to enable the active involvement of end users.

The development and market uptake of innovative technologies are central in the process of smart grid deployment. **Additional important key factors**, such as the social acceptance, the policy and regulatory framework, the availability of funding mechanisms should also be considered. As these factors may differ between regions, taking into account all these different dimensions is essential to ensuring successful smart grid deployment at a regional level.



#2

THE ENERGY SYSTEMS INCLUDED IN THE SET-UP PARTNERSHIP: KEY THEMES AND CHALLENGES

There are three overarching drivers for smart grids:

- Renewable energy targets associated with binding climate and carbon commitments – the existing 2020 targets and the newly confirmed 2030 target of at least 32% of final energy consumption from renewable energy sources .
- A growth in Distributed Energy Resources (DERs) – moving away from centralised power production and consumption has put additional pressure on the distribution networks which were designed to only transport power one way.
- Demand changes from the electrification of transport and heat – as the decarbonisation of the power sector continues, the more challenging sectors of transport and heat will use the low carbon electricity provided. How the electricity network provides sufficient capacity to consumers at a reasonable price is a key driver for smart grids.

Each SET-UP partner has a slightly different set of national energy characteristics to take into account,

depending on the country. A key driver for smart grids has been to facilitate progress against renewable energy targets. Two countries, Hungary and Lithuania, have already met their 2020 Renewable Energy targets⁽³⁾ (Table 1). However, as discussed previously, the newly ratified 2030 target, will maintain ambition for further renewable energy deployment and decarbonisation across the EU.

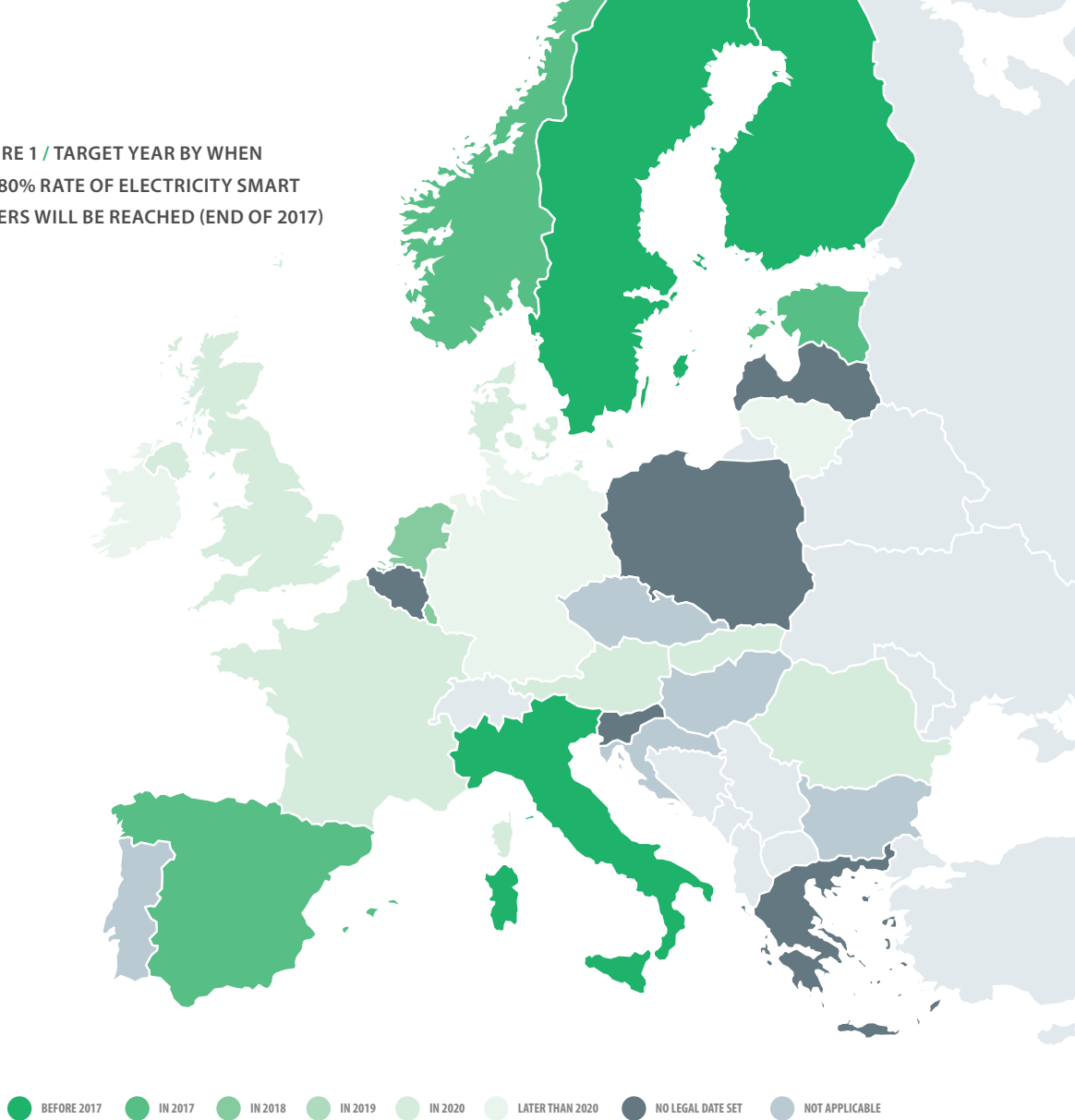
There are also significant differences between the partner countries in terms of electricity market framework, with varying numbers of nationwide electricity suppliers, from 213 in Spain to 23 in Portugal (Table 1). With the price of electricity varying considerably between countries, 23,83 Euro cents/kWh for household consumers in Spain, compared to 17,54 Euro cents/kWh in France first half 2018⁽⁴⁾.

A further aspect of the smart grid rollout is the deployment of smart meters as stipulated in Annex I of the Electricity Directive. Different levels of ambition from each country have been identified up to the 2020 deadline (Figure 1).

TABLE 1 / OVERVIEW OF ENERGY CHARACTERISTICS IN PARTNER COUNTRIES

Partner region	Country	Renewable energy of final electricity consumption in 2017 (%)	2020 Renewable energy target met?	Transmission System Operator	Number of Distribution Systems Operators	Number of electricity suppliers (with nationwide offer) in 2017
AREAL, Algarve	Portugal	28.1		REN	13	23
Andalusian Energy Agency, Andalusia	Spain	17.5		REE	5	213
Tolna County Development Agency	Hungary	13.3	✓	MAVIR	6	27
BDI, Brittany	France	16.3		RTE	158	39
Leicester City Council, Leicester	UK	10.2		National Grid	7	100
KREA, Kaunas	Lithuania	25.8	✓	Litgrid	1	10

**FIGURE 1 / TARGET YEAR BY WHEN
THE 80% RATE OF ELECTRICITY SMART
METERS WILL BE REACHED (END OF 2017)**



This short overview of illustrates the similarities and differences in the energy characteristics across the SET-UP countries. While there is considerable diversity, there are a number of shared challenges for effective smart grid implementation:

- How to charge consumers for electricity network access
- Maintaining security of supply while integrating more variable sources of generation
- The level of interconnection and integration with other energy markets
- The role of prosumers and their ability to enter new markets
- Communicating benefits of smart grids to consumers.

(2) EP, 2018 <http://www.europarl.europa.eu/news/en/press-room/20180614PR05810/energy-new-target-of-32-from-renewables-by-2030-agreed-by-meps-and-ministers>

(3) Eurostat, 2019 <https://ec.europa.eu/eurostat/documents/2995521/9571695/8-12022019-AP-EN.pdf/b7d237c1-ccca-4adc-a0ba-45e13602b428>

(4) CEER, 2018 <https://www.ceer.eu/retail-mmr>; Eurostat, 2018 https://ec.europa.eu/eurostat/statistics-explained/index.php/Electricity_price_statistics

(5) ACER, 2018 http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Publication/MMR%202017%20-%20CONSUMER%20PROTECTION.pdf

#3

THE APPROACH OF SET-UP

SET-UP focuses on the role that public authorities can and should play in the smart grid sector. It considers public policies, namely Operational Programmes financed under the European Regional Development Fund Regional (ERDF ROP), as a driver to smart grid development and a mechanism to coordinate the energy transition process in a territory.

By addressing the Operational Programmes of the 6 partner regions, SET-UP promotes the development and implementation of **impact-oriented initiatives to better support smart grid deployment** at a territorial level, with a positive influence also on economic development. Available funding will be used to support, for example, technological innovations, innovative business schemes and other integrated smart grid planning proposals.

The project uses **interregional exchange** to build on regional competencies clustered around the smart grid sector and identified in the smart specialisation strategies. Sharing experience and capitalising on successful initiatives is at the core of the learning process undertaken within SET-UP and helps public authorities respond to rising challenges and opportunities in line with identified territorial needs.

Interregional exchange is centred on the role and use of smart grids. It focuses on the identification of efficient **solutions to the main social, economic and financial challenges** related to smart grid deployment:

- Empowering consumers and ensuring their engagement in the energy transition process;
- Securing funding sources and suitable instruments to offer tailored financing solutions;
- Identifying suitable business models for the deployment of smart grids.

As a result of this capacity building process, **new policy actions** are defined based on the lessons learnt at

project level. To guarantee consistency with the needs of each territory, regional private and public stakeholders of the energy sector are actively involved all along the interregional learning process and contribute to creating a common framework for action in the short and long term.

EXPECTED IMPACT

Overall, thanks to lessons learnt from the SET-UP project:

- **a more efficient use of funds** is reached, by integrating successful experiences from other regions in regional funding programmes (2014-2020 ERDF Operation Programmes) and strategies;
- the **implementation of new smart grid projects** and a better management of the policy instruments are expected;
- public authorities and regional stakeholders **increase their professional capacity**, leading to a better understanding and practical application of smart grid initiatives.

In the medium to long-term, SET-UP is expected to lead to **better energy demand management**, reduced energy consumption and greater energy security, with associated socio-environmental and economic benefits and a reduction in greenhouse gas emissions. All of these lead to secondary impacts such as job creation, health benefits and minimising impact on the environment.

The policy instruments targeted by the project are regional Operational Programmes financed by ERDF, which are available in all European regions. Lessons learnt within SET-UP will benefit public authorities from other regions, thus contributing to the development of a new low-carbon economic sector in Europe.



BENEFICIARIES OF THE INTERREGIONAL LEARNING PROCESS

IN THE SHORT TERM:

Managing authorities of the 6 partner regions: they are responsible for the targeted ERDF policy instruments and the project learning process helps them define suitable actions to improve their energy policy.

Regional stakeholders: key stakeholders involved in project activities (e.g. universities, clusters, local energy agencies, etc.) can explore existing projects and identify new cooperation opportunities.

Managing authorities of other regions in Europe: identified Good Practices and results of the action plan implementation are available for other public authorities looking for efficient measures to integrate in their policies.

IN THE MEDIUM TO LONG TERM:

Beneficiaries of the policy instruments improved thanks to SET-UP: depending on the actions defined in each regional plan, beneficiaries can include businesses, consumers, local communities, energy suppliers, and territories.

#4

SUCCESSFUL SOLUTIONS TO ADDRESS COMMON CHALLENGES

Knowledge sharing is key to stimulate public authorities to design tailored, evidence-based policy measures. In a fast-evolving context, it helps policy makers identify current trends, detect future opportunities and share innovative solutions to common problems.

To better respond to the social, economic and financial challenges related to smart grid deployment, project partners have identified and exchanged on **successful initiatives** available on their territory. These Good Practices have already provided tangible and measurable

results in supporting the transition to a smarter grid and present the **potential to be transferred** to a different geographic area.

All Good Practices identified within SET-UP are available on the project website and on the Good Practice database managed by Interreg Europe, so as to benefit public authorities from other European regions looking for inspiring solutions to foster the smart grid industry in their territory.

www.interregueurope.eu/set-up/good-practices

EMPOWERING CONSUMERS

Consumers are major players of the energy transition process. Knowledge exchange focuses on the identification of suitable measures ensuring social acceptance, social confidence and greater consumer involvement, along with technologies and innovative solutions that support regional policy priorities.

THE SOCIAL DIMENSION OF ENERGY TRANSITION

Smart grid offers an opportunity for consumers to change from being passive users of energy to becoming active and flexible producers of energy – also known as “prosumers”. In some EU member states, the energy market will be opened to prosumers, including domestic and commercial users of energy, providing further choice in terms of how they use and generate electricity. Prosumers could be grouped together to make a more meaningful impact and provide further benefits. This is a key part of the clean energy for all Europeans policy framework⁽⁶⁾.

Thanks to interregional exchange, solutions to engage consumers in the energy transition process (e.g. smart meters, awareness raising initiatives, demand response pilot projects) are analysed and shared among project partners.

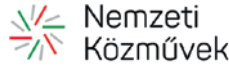
DEVELOPING ECONOMIC MODELS

The paradigm shift towards decentralisation leads to the rise of new business opportunities. An analysis of the economic drivers for the delivery of smart grids, including regional regulatory frameworks, helps provide local players with better guidance towards suitable business models.

SECURING FUNDING SOURCES

The transition to a smart grid requires substantial investments. Available funding opportunities are investigated, and actions prioritised in order to reach a more efficient use of funds and maximise the impact of public support to smart grids deployment.

⁽⁶⁾ EC, 2018 <https://ec.europa.eu/energy/en/topics/energy-strategy-and-energy-union/clean-energy-all-europeans>



Smart metering – Smart Energy GB (United Kingdom)

An innovative national campaign to promote the roll-out and awareness of smart meters for households and SMEs.

POTENTIAL FOR LEARNING

Educating people to use a smart meter and learn how it can be useful in the transition to a smart way of living is essential.

Self-consumption legislation (Portugal)

A legal framework applicable to the production of electricity for self-consumption and for the sale to public electricity grid from renewable resources

EVIDENCE OF SUCCESS

Around 10,000 self-consumption orientated electricity production units installed over a 2-year period

Smart Synergy Project (Hungary)

A pilot project to evaluate the benefit of smart metering roll-out for suppliers and consumers

FACTOR OF SUCCESS

Analysis of the willingness of customers to use smart meters and their role in the development of smart grids

SOLENN - Solidarité Energie iNnovation (Brittany)

A project to test electricity demand management and power supply security solutions by involving local community stakeholders.

FACTOR OF SUCCESS

A local support service to ensure community engagement



SmartCity Malaga (Andalusia)

A large-scale project to test and optimise the integration of smart grid technologies based on the concept of Living lab

EVIDENCE OF SUCCESS

Increased consumption of renewables, improved energy efficiency, reductions in CO2 emissions

SMILE - Smart Ideas to Link Energies (Brittany)

A large-scale project supporting the development and implementation of major industrial and territorial projects related to smart grids

FACTOR OF SUCCESS

The engagement of all public and private stakeholders of the smart grid industry

Inovgrid (Portugal)

A large-scale pilot project that acts as an open platform to introduce innovative equipment, promote consumer engagement and validate a business case

EVIDENCE OF SUCCESS

A case study selected by the European Commission to illustrate a cost-benefit analysis methodology



Green BELLE - Green Business Energy in Leicester and Leicestershire (Leicester)

An ERDF (European Regional Development Fund) project aiming to support local SMEs transition to the low carbon economy through capital grants and energy advice

POTENTIAL FOR LEARNING

A grant is a huge motivating factor to support investment in low carbon, provided that the application process is simple

Local Energy Loops (Brittany)

A regional financial scheme to promote the development of local energy projects, based on an integrated approach

FACTOR OF SUCCESS

A required co-funding from local authorities to ensure the commitment of policy makers and leverage extra public funding

Smart Grid Incentive Programme (Andalusia)

A programme providing non-refundable funds for investments in smart grid projects, in line with the goals of the regional energy strategy

EVIDENCE OF SUCCESS

189 projects have applied over a 2-year period, representing an investment of around 28 million €

OFGEM Low Carbon Networks Fund (United Kingdom)

A £ 500 million fund for Distribution Network Operators (DNOs) to try new technology to provide security of supply

EVIDENCE OF SUCCESS

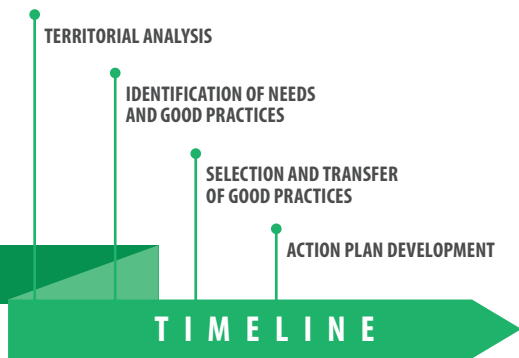
The fund has succeeded in encouraging DNOs to innovate

#5

THE EXCHANGE METHODOLOGY USED WITHIN SET-UP

The SET-UP exchange methodology was designed to incentivise active participation of all partners, to ensure that the process of **transferring practices and experiences** was supported by continuous exchange and that local activities and lessons to be learnt were shared thoroughly within the partnership.

Participative exercises complemented the learning activities organised during the entire project duration, capturing partners' attention and attracting extremely positive feedback from all participants.



TERRITORIAL ANALYSIS

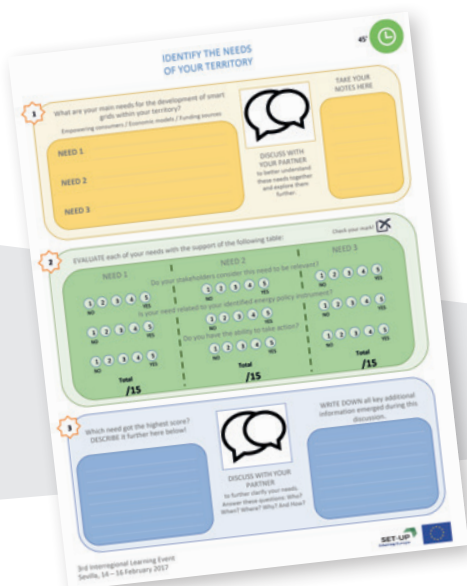
SET-UP started with an analysis of the partners' local energy framework and state of the art to identify valuable experiences and Good Practices. Partners undertook an analysis of their territories focusing on the main social, economic and financial aspects related to smart grid development. According to partners, this activity, carried out with the aim of sharing information within the partnership to explain their territorial forces and weaknesses, was a project highlight. It pushed them to achieve a real understanding of their territory and forced them to set aside time to carry out a territorial assessment, first step for any meaningful improvement at policy level.

IDENTIFICATION OF NEEDS AND GOOD PRACTICES

Partners worked on identifying and analysing their needs, thanks to the Defiscope, a tool that helped them to identify their top three needs, rank them based on the relevance for stakeholders, the link with the energy policy and the ability to take action.

In the meantime, partners worked with their stakeholders to identify outstanding experiences related to smart grid financing and management, territorial animation linked to stakeholder engagement and existing business models.

11 Good Practices and many more interesting findings were regularly shared with partners.



SELECTION AND TRANSFER OF GOOD PRACTICES

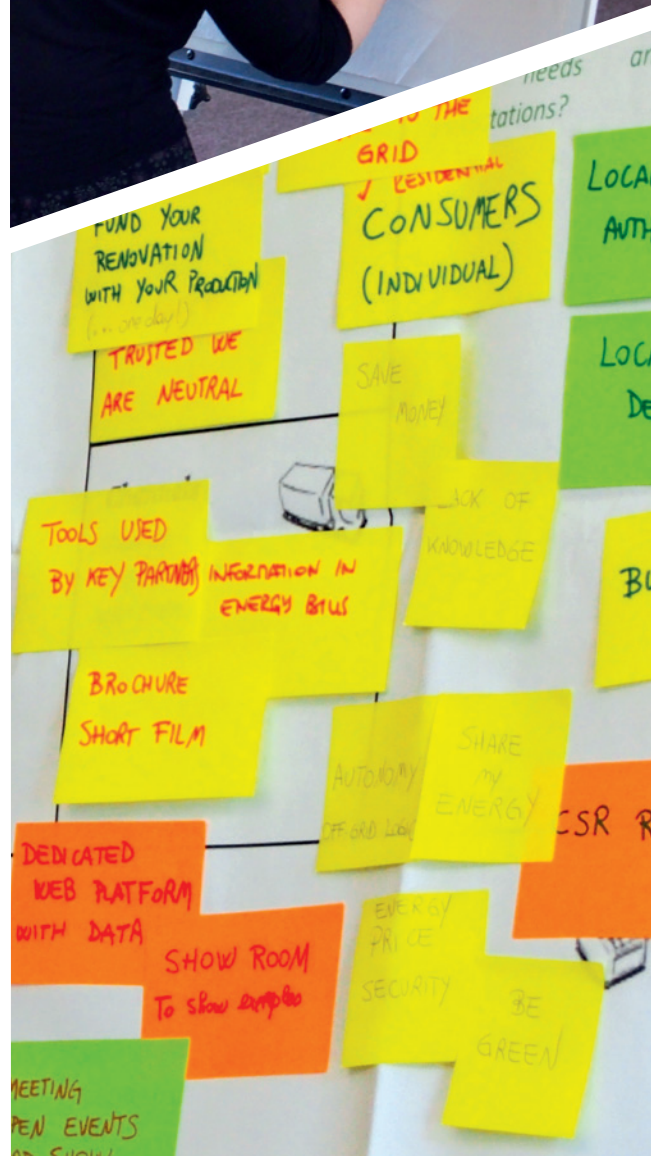
In this phase, partners rated the Good Practices, based on their needs and on the overall results presented, to ensure that only high-quality experiences were selected. SET-UP organised a good practice stock exchange, where needs and solutions met. Partners competed to offer their innovative solutions to the identified needs presenting the key selling points of their Good Practices through an Investor pitch.



The next steps, designed to ensure full understanding of all the characteristics of the selected Good Practices, were the organisation of B2B meetings between “buying and selling” partners and of staff exchanges involving partners and stakeholders.

ACTION PLAN DEVELOPMENT

The experiences shared during the project were then reviewed in a perspective of transfer and adaptation, in order to draw up regional action plans. Partners continued exchange activities and supported each other thanks to Peer review sessions that helped analyse and improve the different regional action plans. In this last phase, the focus shifted towards the policy improvements that could be obtained by modifying regional or national policy instruments, thus achieving long-lasting results inspired by SET-UP and with a positive impact on the territory.



#6

SHARED RESULTS OF THE LEARNING PHASE

The interregional learning process undertaken during Phase 1 has enabled each partner region to identify the actions that are needed to develop and/or accelerate the deployment of smart grids in their territory. Emanating from the project cooperation, these actions have been defined by taking into account the regional framework and the territorial needs identified together with regional stakeholders.

Despite the difference between the energy systems and diversity of policy contexts of the partner regions, SET-UP partners have drawn common conclusions about the features of the transition to a smarter grid and the role of public authorities in this process.

► SET-UP partners have observed a general trend towards **decentralisation** as an alternative model to centralised power systems. By valuing renewables as the main energy source, decentralisation requires technology development, new business approaches and local acceptance.

In this context, **regional organisations have an active role to play**. The regional scale is relevant to address the challenges related to a decentralised energy generation and identify solutions that meet territorial needs. Regions can provide the right scale for implementing demonstration projects, validating economic models, federating stakeholders and creating new business opportunities.

► Project partners agree on **collaboration as a key factor of success** for smart grid deployment. When considering the socio-economic dimension of a smart grid, it is vital that all players of the value chain, from suppliers to consumers, are involved in this process.

By stimulating an economic dynamic at territorial level, public authorities can significantly contribute to creating business opportunities and supporting the smart grid sector in its early phase. The setup of a collaborative framework can encourage the matching between offer (solution providers) and demand (end-users) to test innovative technologies and validate new business models.

► The smart grid deployment process is complex and there is **no one-size-fits-all solution**. Although interregional exchange is key to capitalise on previous experience, the definition of a regional action plan for smart grid development should take into consideration the features of the regional framework.

SET-UP partners recognise the important role of regional funding in the promotion and support of initiatives that are able **to address specific territorial needs**. Public funding can participate in technological development or be used to encourage the implementation of support activities, including business support and consumer-oriented initiatives.

► **Consumer information and engagement** is key to ensure social acceptance of new solutions and make consumers active players of the transition to a smarter grid. Although technology enables consumers to get access to information on their energy consumption, it can't guarantee their engagement by itself.

Project partners believe that awareness raising, communication and support activities can contribute to the co-construction of new models along with consumers. The scale of the action can also have an impact on consumer involvement. Thanks to their proximity to consumers, local organisations can deliver tailored support services and contribute to **building consumer trust** in the changing energy system.



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In partnership with:

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