

Action Plan of the SET-UP Project:

Smart Energy Transition to upgrade regional performance

March 2019



Agencia Andaluza de la Energía
CONSEJERÍA DE HACIENDA, INDUSTRIA Y ENERGÍA

ACTION PLAN - Andalusia

Introduction

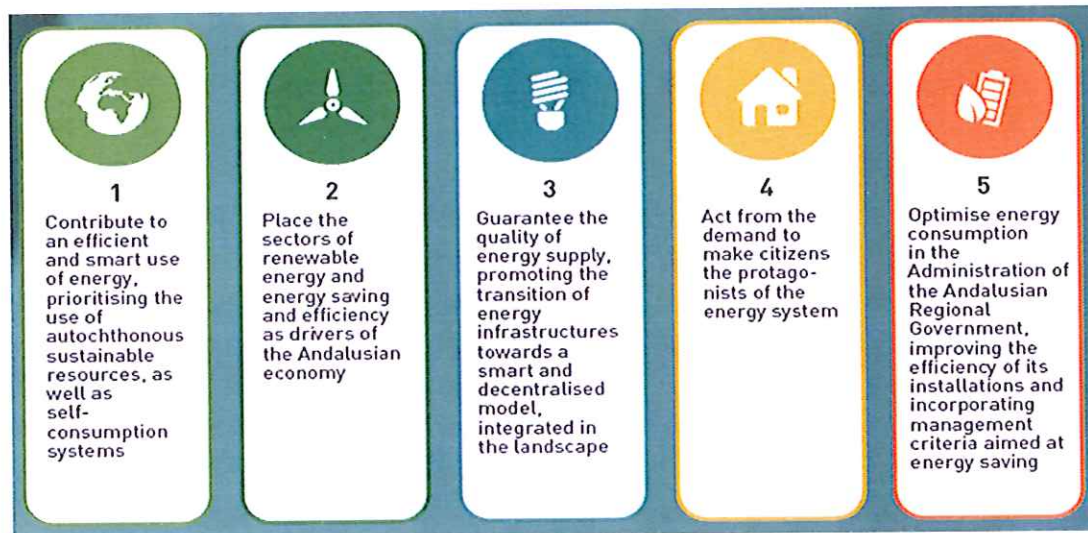
Andalusia's energy policy

The guidelines of Energy Policy in Andalusia are developed in the “Energy Strategy for Andalusia 2020”.

The Strategy collects the guidelines governing the regional energy policy in coming years towards an adequate energy model, low in carbon, intelligent and of quality, without losing sight of the horizon 2030-2050.

It proposes actions in all sectors of the Andalusian society: citizens, businesses and industry and administrations. It is the result of the experience and results obtained from previous planning, and it has been developed through a process based on open governance, counting on the participation the most representative stakeholders of the energy sector, citizens and the Administration.

The strategy is based on **5 principles** that constitute the commitments for the energy future in Andalusia:



Based on these principles, the Energy Strategy for 2020 sets energy targets in the region in line with European policy, exceeding what is established in the European Strategy 2020:

- 25% reduction of primary energy consumption trend
- Renewable energy contribution of 25% of gross final energy consumption
- 30% reduction of CO2 emissions compared to 2007
- 5% consumption of electricity generated from renewable sources
- 5% improvement of the quality of supply.



To achieve these objectives, the Strategy includes **5 Action programs**:

- Smart Energy
- Improving competitiveness
- Improvement of infrastructure and quality of energy services
- Energy Culture
- Energy Management of public administrations in Andalusia

The "Smart Energy" programme aims to promote the improvement of energy efficiency by saving energy and using renewable sources. At the same time, it tries to set up a more distributed and close to the energy system demand, boosting self-consumption, improving mobility and promoting multimodal and sustainable transport.

It is structured in two action lines:

- Building and sustainable urbanism: which will affect the incorporation of smart energy management of municipalities, neighbourhoods, buildings, business parks concept, promoting the use of ICT in performances such as electrical and thermal consumption with renewable energy and high efficiency cogeneration and distributed generation.
- Mobility and efficient transport: measures to increase efficiency by optimizing plans for transport management to boost mobility and low environmental impact.

One of the tools designed to achieve the goals of the Strategy is the incentive scheme "Andalusian Energy Development Programme A+", that manages ERFD funds. Within this framework, the Andalusian Regional Government has included an incentive line for the promotion of smart grid projects. The scheme aims to achieve better e-connected cities and persons through actions related to smart grids, quality of supply, sustainable mobility or public awareness.

Andalusian Action Plan contents

The SET-UP project has been an outstanding opportunity to know and share how other regions in Europe are addressing the challenge of integrating Distributed Energy Resources in their systems and convert the current networks in smarter ones.

With this Action Plan the Andalusian Energy Agency aims to promote smart grids, attract investment and exchange ideas with all the different stakeholders involved in the energy industry of our region.

With these ideas in mind, we are going to commit to propose and implement three different actions, which holistically expect to facilitate the efficient and effective deployment of the smart grids, anticipating future energy scenarios that will convert the energy consumer in a more active player:

- Priority action 1: modification of the Smart Grid line of the Incentive Programme for the Sustainable Energy Development of Andalusia 2020 "Andalucía +" - with this action we modify the prior conditions of the incentive programme and we aim to make it more concise and explicative for the applicants.
- Priority action 2: development of Smart Grid project in Cartuja Island.
- Priority action 3: set up the "Andalusian Network for Clean Energy Innovation", which will create a new ecosystem of energy transition players, centering around innovation, and driven by a business perspective. With two well defined objectives:
 - advance on the promotion and impulse of the "Smart Grid line of the Incentive Programme for the Sustainable Energy Development of Andalusia 2020"



- creation of a Smart Grid Working Group that will work as a platform to explore and share the potential of a smart electricity system and seek concrete and realistic solutions for developing the smart grid of the future.

With this project and the different actions proposed, we desire to make Andalusia one of Europe's leading Smart grid territories, bringing together the stakeholders of the territory and the Andalusian smart grid industry and get the most from an exceptional energy potential.



Action Plan

Part I – General information

Project: **SET-UP**

Partner organisation: **Andalusian Energy Agency**

Other partner organisations involved (if relevant): **N/A**

Country: **Spain**

NUTS2 region: **Andalusia**

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Part II – Policy context

The Action Plan aims to impact:

- **Investment for Growth and Jobs programme**
- **European Territorial Cooperation programme**
- **Other regional development policy instrument : Energy Strategy for Andalusia 2020.**
(Web:<https://www.agenciaandaluzadelaenergia.es/EEA/files/assets/basic-html/index.html#4>)

Name of the policy instrument addressed:

Andalusia ERDF 2014-2020; Objective T.O. 4. Priority Line 4d: The development and application of intelligent distribution networks operating at low and medium voltage

Web:

<https://fondos.ceic.junta-andalucia.es/economiainnovacionciencia/fondoseuropeosenandalucia/prog4.php>



Part III – Details of the actions envisaged

ACTION 1 - Modification of the Smart Grid line of the Incentive Programme for the Sustainable Energy Development of Andalusia 2020 “Andalucía +”

1. Context

In September 2017 Andalusia launched a call for a Smart Grid project in the framework of the Incentive Programme for the Sustainable Energy Development of Andalusia 2020 “Andalusia +”, with a budget of 27 MW.

However, although many applications have been received, the fund has still not been used up completely. We have noted that more specific and clarifying explanations of the scope of the actions would be necessary in order to both clarify all potential solutions that are included in the deployment of smart grids and at the same time, facilitate the process for the applicant to know if their solution would fit in this specific action.

In this context, we have identified the following needs for improvements in our policy instrument:

- Development of smart grid integral projects in neighbourhoods, industrial parks, ports, etc. in Andalusia
- Improvement of the procedure for applying incentives for integral projects
- Encourage the implementation of innovative technologies in the smart grid sector

The GPs and lessons learnt in the SET-UP project have allowed us to know how integrated smart grid projects work in different environments, for example, areas with weak networks in the SENSIBLE project, isolated territories in Ushant, scientific and technological parks in Oceanópolis or urban projects in Innogrid. All these projects have inspired us to introduce modifications to our Incentive Programme scheme that facilitates the promotion of these types of projects in Andalusia.

The methodology of the SMILE project has allowed us to look deeper into the definition of a collaborative process among stakeholders that allows projects to be carried out, as well as the need for dissemination programmes among users, DSO, companies in the sector, etc.

The lessons learnt from these above specific projects can be summarised as follows:

- How the use of renewable energy installations and storage for self-consumption in Ushant Island made the island more sustainable and efficient.
- Self-consumption project in Oceanopolis (Brest).
- The SMILE projects’ methodology that manages all projects together has been a good lesson to coordinate in a better manner our smart grid line of incentives.
- SENSIBLE project in Evora (Portugal): testing solutions of energy management and energy storage systems not only for final clients but also for distribution grid management, both under normal and emergency operations, has shown us new ideas and projects that have been included in our smart grid line of incentives.
- Innogrid project in Evora (Portugal): Smart metering project involving 30,000 consumption points, using the smart meters called “energy boxes” for collecting data about individual consumption profiles and collective grid demands, combining metering functionalities with consumption management capabilities. From this project we have learnt the need to add a new category called Data Analytics to better use data for operating systems.



2. Actions

With these needs previously explained in mind and taking into account the lessons learnt in the GPs, the following modifications from the Catalogue of Energy Actions of the Smart Grid incentive line are proposed:

1. New types of actions, aimed at the development of Smart grid:

- Actions aimed at shaping a more efficient energy model by incorporating elements that enable smart energy management in the field of smart mobility or the shaping of neighbourhoods and smart business parks in the urban areas.
- Development of infrastructures to provide energy supply services to companies, as well as for other services, that offer companies tools for optimised energy management, facilitate the use of renewable energies or allow the development of the activities of the spaces. Among other actions, investments are considered for energy storage, energy supply through alternative fuels, operations in electricity networks to improve the quality of supply, to expand its capacity or facilitate the integration of renewable energies, as well as for an advanced energy measurement for the companies, the bidirectional transmission of information in the electric networks or the implementation of consumption management systems for the companies that use the electricity network.

2. New evaluation criteria to calculate the incentive :

A specific percentage of the incentive, called "Demonstration project of Priority Technological Initiatives (ITPs)" is highlighted. It concerns projects of demonstration of technologies or prototypes of equipment or elements necessary for energy efficiency, the use of renewable energies, sustainable mobility, the deployment of smart grids, control or energy monitoring.

Thus, in the Catalogue of Energy Actions under the Smart Grids incentive line, under the incentive concept "A. Tools to promote smart grids", a new specific percentage of 60% will be incorporated which is associated with the implementation of the project "Demonstrative project of Priority Technological Initiatives".

3. Modification of the general exploitation conditions:

The amount of the incentive cannot exceed the difference between the costs which can be subsidized and the operating profit of the investment. In the smart grid actions, the benefit of the project will be deducted from the incentive costs beforehand.

The following steps have been or will be followed for the modification:

- Collect lesson learnt from the GPs that might apply to this line of incentives
- Prior consultation on the need for modification
- Consultations with stakeholders
- Drafting of the modification proposal
- Dissemination of the modification proposal

3. Players involved

In this action the following players will be involved:

- Andalusian Energy Agency: coordination of the modification through consultation, modification, drafting and dissemination.



- Andalusian Regional Government: Regional Ministry of Finance, Industry and Energy & Regional Ministry of Economy, Knowledge, Business and Universities. Approval of the modification proposal.
- Other players that the modification will impact directly or indirectly such as the Andalusian Federation of Municipalities and Provinces, Industrial and business parks in Andalusia, ports, Engineering companies, energy strategy and smart grid consultancies and businesses of the sector, DSOs...

4. Schedule

Design of the modification: Jun-Dec 2018

End of approval process: September 2019

Launch of modified call: November 2019

Implementation of funded projects: Until 2023

5. Costs

Budget remaining of initial 27 M: The funds available for the "smart grids" line in the incentive programme managed by the Andalusian Energy Agency is approximately 20 million euros, although a wide variety of projects are included within these lines. If it is estimated that the projects directly related to the purpose of this action may account for 50% of the projects to be subsidised, the budget finally affected by the policy change is approximately 10 million euros.

6. Funding sources

ERDF 2014-2020, Objective T.O. 4



ACTION 2 – Development of pilot project “Smart Cartuja”

1. Context

“Cartuja Island” is an area of 5 km² that housed the Universal Exhibition of 1992, and now is a technological science park that has reached a turnover of 2,200 million euros from 459 companies and 17,400 employees.

Endesa (DSO responsible for electrical distribution in Cartuja Island) and Cartuja Scientific and Technological Park (park management entity, hereinafter PCT) are very interested in the implementation of a Smart City model on the Cartuja Island, making it a flagship project of sustainability at international level and a model of energy transition of cities.

However, the necessary involvement of different stakeholders (DSO, the park manager (PTC), public companies from both the regional and local administration, private, the city of Seville and the University among others) make the governance of the project difficult.

Endesa and PCT Cartuja have participated in SET-UP as stakeholders. The interregional learning process has allowed them to know about good practises in other regions related to technologies and specially the governance process to develop a project that needs the implication of different stakeholders.

Their participation has been especially relevant in the staff exchange in Brittany (May 2018), in which they participated together with the General Manager of the Andalusian Energy Agency, where they could learn about the different instruments for boosting the implementation of smart grids in this region.

In this sense, during the study visit they could learn first-hand about the governance of the Smile project launched in 2016 by the Regions of Brittany and Pays de la Loire. It should be highlighted that in this project, related to the present action, is the creation of a coordinator team integrated by different expert groups and animators that has inspired the definition of the governance for the Cartuja project: leadership of a project team that will supervise and promote the progress of the different stages divided into 4 areas: energy, infrastructure, transport and buildings, coordinated by their respective working groups.

Also, the Solenn project, which aims to provide local solutions to the Breton Electricity Pact associated to the electricity demand management and power supply security enhancement, has given ideas to Endesa and PCT on how to engage consumers and companies in Cartuja to join the project. In this way, Local Energy Loops in the Capucin district and Ushant showed how to get stakeholders on board and join them to build and integrate the project.

Related to smart grid technologies, also during the staff exchange in Brittany, Endesa and Cartuja had the opportunity to visit and know in more detail the smart grid project and solutions implemented in Ushant island, which has allowed them to learn about the integration of different renewable sources and storage system, solutions that will be applied in Cartuja Island as described later.

A first version of the Cartuja project was presented to the SET-UP partners and stakeholders in Brest (May 2018) in order to receive their feedback from the French partners and their stakeholders.



To sum-up, the learning process from the SET-UP project has been very important in the decision-making for the signing of the collaboration agreement between Endesa, PTC as park manager, Seville City Council and the Andalusian Energy Agency as an entity of the regional administration. In this sense, the SET-UP project is specifically named in this collaboration agreement as an inspiring project of the Cartuja project.

The SET-UP project has facilitated the knowledge of projects and experiences in smart grids in other regions to the parties involved in the agreement, which has meant the definitive impulse to the signing of the agreement.

Once the project is launched, in later stages the park companies will be incorporated as the main users of the Smart grid.

2. Actions

The main objective of the “Smart Cartuja” project is to ensure 100% renewable quality electricity supply in the island at competitive prices, through a public-private partnership that will be articulated through an open innovation ecosystem. This partnership will ensure the deployment of the first basic elements. The initial investment capacity, with a vision of long-term return, together with the configuration of a governance model for the participating institutions, will be the way to overcome barriers and ensure the kick-off of the project.

As a starting point an agreement document has been signed between Endesa (DSO responsible for electrical distribution in Cartuja) and Cartuja Scientific and Technological Park (park management entity, hereinafter PCT) to carry out the project.

Within the framework of this agreement, a Master Plan has been drafted with short, medium and long term objectives, including the necessary measures for the transformation of the existing spaces in the SMART CITY model, which, among others, allows to reach before 2025 the energy and climate objectives established by the European Union for 2030.

The Plan, led by a project team that will supervise and promote the progress of the different stages, will be divided into 4 areas: energy, infrastructure, transport and buildings, coordinated by their respective working groups.

Main actions proposed:

- Efficiency actions in buildings and transport, decreasing about 30% of the current consumption. The energy rehabilitation processes in buildings estimate a reduction of 35% of current consumption, thanks to bioclimatic guidelines, renovation of air conditioning systems, LED lighting and Smart lighting systems.
- Renewable energy installation, mainly photovoltaic. 30 MWp photovoltaic with an annual production of 59 GWh is proposed, which would cover 70% of the current needs of the island, or 100% planned after adopting the proposed efficiency measures. The necessary investment is estimated between 27 and 30 M€. A PPA model with a duration of 10 years with the companies and institutions of the park is proposed for the commercialization of the photovoltaic energy.
- In a later stage, large photovoltaic installations would be complemented with the integration of distributed energy resources (self-consumption and storage systems), which requires the development of smart grids, based on monitoring and TICs.



- Sustainable mobility: a renewal of around 20% by electric vehicles in 2025 is proposed, which means between 1,100 and 2,300 vehicles, as well as the installation of a charging point for every 10 electric vehicles, reaching a minimum of 140 charging points on the island.
- Digitalization: a key element in the development of the project. A platform for intelligent management will be created for the collection, exchange and analysis of information. In the short term, the platforms will integrate services such as street lighting, daily travel needs, or the management of certain information services that facilitate life for the citizen. In the long term, these may cover operational processes, logistics, air quality and even connected vehicles for traffic management. In later phases of the project, through the Transactive Energy systems, we will be able to incorporate the advantages of Blockchain.

Once the Plan is elaborated, the following phases consist of:

- Search of partners and campaign of implication of stakeholders and companies.
- Definition of the best organising and economic tools to carry out the actions of the Plan.
- Development of the actions in the plan.
- Monitoring: periodic processes for monitoring and updating activities.
- Evaluation process.

The total duration of the project will be 4 years in 3 phases, but could be extended.

Phase I:

- Photovoltaic plant of 22 MWp
- Development of the smart grid in the distribution network
- Power purchased agreement
- Led street lighting
- Smart metering

Phase II:

- Renewable PV parking
- Self-healing smart grid
- Storage for ancillary services
- Aggregation and demand response

Phase III:

- Virtual power plant
- Analysis of new roles of the DSO

3. Players involved

ENDESA (DSO)

PCT - Cartuja Scientific and Technological Park (management entity of the park)

147 entities in the park, belonging to different sectors (public administration, technology companies, cultural, sports, communication, universities...)

Seville Local Government

Regional Government and Andalusian Energy Agency (incentives)

4. Schedule



First Document of Agreement between Endesa and PCT: already signed

Master Plan: Already prepared

Sign of the agreement between the main stakeholders: PCT, Endesa, Andalusian Energy Agency and Seville local government: March 2019

Engagement of stakeholders and constitution of working groups: 2019

Definition of better organisation and financial tools: Sep 2019-1st semester 2020

Development of the actions proposed in the Master Plan:

Phase I: 2020-2021, phase II: 2021-2022, phase III: 2023

5. Costs

Photovoltaic plant: 27-30 M€

Rest of the actions: not defined yet.

6. Funding sources

Private and public funds (ERDF 2014-2020, Objective T.O. 4)

ACTION 3 – Set up the "Andalusian Network for Clean Innovation" to boost smart grid projects

1. Context

Andalusia has many Universities, Research Centers, Innovative companies, Startups, DSOs and energy services companies that can provide innovative smart grid solutions to the Andalusia Region. However, during the last years we have noted that many of these innovative players are selling their products or services either in other regions of Spain or out of the country.

With this action, mainly based on the lessons learnt in the SMILE project in Brittany region, we aim to attract Andalusian companies to promote new smart grid projects that could be funded in our incentive scheme A+. To achieve so, we have taken into consideration some of the lessons learnt in the SMILE project:

- it has been carried out in a territory with similar conditions to those of Andalusia: a large geographical extension, large population and plenty of skilled companies installed in the region.
- we share similar ambitions: to make Andalusia one of Europe's leading Smart grid territories, bringing together the stakeholders of the territory and the Andalusian smart grid industry and getting the most from an exceptional energy potential.
- the methodology applied in SMILE to get involved many companies can fit very well with our incentive call, supporting, enhancing and promoting the Smart grid related know-how in Andalusia.
- try to anticipate and create a solid energy plan that would enable Andalusia to be ready and cope efficiently with the future energy scenarios.
- Build a business oriented ecosystem where all innovators players, as well as power industry and opinion leaders, can build a bridge together and foster Andalusian energy



innovation companies.

2. Actions

The aim of the Andalusia Network for Clean Innovation is to create a new ecosystem of energy transition players, centering on innovation, and driven by a business perspective.

This network will work as an accompanying measure to improve the main policy instrument addressed by the SET-UP project, which is the Andalusia ERDF 2014-2020; Objective T.O. 4. Priority Line 4d: The development and application of intelligent distribution networks operating at low and medium voltage.

This policy instrument is currently managed by the Andalusian Energy Agency through the Andalusian Sustainable Energy Development Programme A+. The scheme tries to get better e-connected cities and persons. Aimed at citizens, self-employed, companies, public entities and other entities. It includes a **closed catalogue** of 17 actions related to smart grids, quality of supply, sustainable mobility or public awareness.

The present action will allow detecting both innovative technologies that are mature enough to be incorporated to the current catalogue of actions in our incentive scheme and interesting projects that could apply to the scheme. It will act with two main objectives:

- To advance in the promotion and impulse of the “Smart Grid line of Andalusian Sustainable Energy Development Programme A+” that will offer funding to solutions that can provide responses to the challenges of today’s and tomorrow’s Andalusian Smart Grid. We will promote the call of incentives and attract Andalusian innovator companies such as start-ups, research centers, energy services companies, citizen initiatives, suppliers, energy strategy consultancies or institutions.
- The creation of a permanent Smart Grid Working Group. The Agency is aware that the cooperation of several different actors is required in order to make the electricity network of Andalusia smarter. Thus, a shared view of the different stakeholders regarding the smart electricity system of the future is needed. Through the Andalusian Network for innovation, the creation of a Smart Grid Working Group will be proposed that will work as a platform to explore and share the potential of a smart electricity system and seek concrete and realistic solutions for developing the smart grid of the future.

The Andalusian Network for Clean Energy Innovation will carry out the following actions:

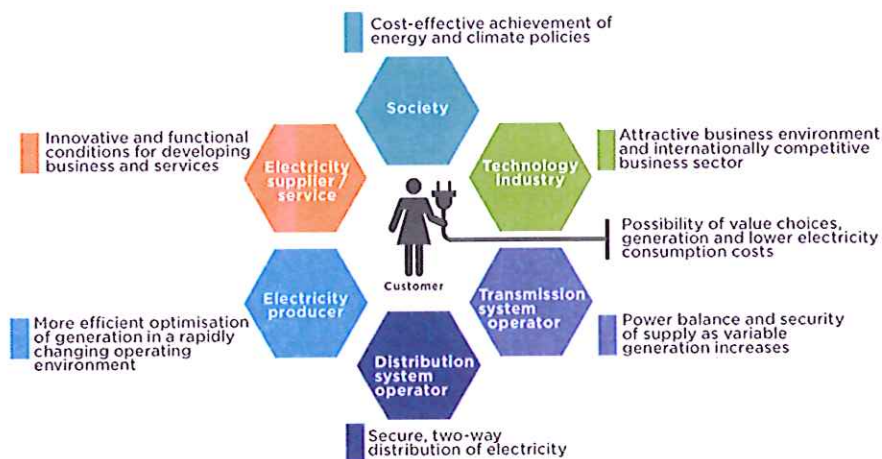
-To achieve the first objective:

- “Energy innovation dinner/lunch debate”, that will have the aim to bring together stakeholders from different parts of the region in order to promote, discuss, debate and respond questions that participants of the call might have.
- Webinars. This kind of format allows us to involve a lot of participants not only from Andalusia but from the whole country and respond to questions and proposals that stakeholders might have. At the same time we can reach people that cannot attend the lunch/dinners.
- LinkedIn group that will constitute a platform that will be used as a space to easily keep in touch and where all members of the Andalusia Network for Innovation can continue

keeping in touch with all the information regarding the call and at the same time networking and exchanging ideas, businesses, opinions etc. In addition, all information about “Energy innovation dinner/lunch debate” and webinars will be published through this group.

-To achieve the second objective:

- Promote the platform locally and regionally to attract valuable stakeholders
- Select a wide range of stakeholders that represent the entire value chain and that provide a vision that encompasses all viewpoints. A detailed vision might be:



- To constitute the working group: local ministers, energy agencies, DSOs, universities, energy services companies etc...
- Appointment of adviser, members, and experts of the working group
- Working together in identifying the real needs that the Andalusian electricity system requires to become smarter and aligned with the upcoming policy

3. Players involved

The Andalusian Energy Agency is the organization that will be the coordinator of this action. A shared view of the different stakeholders regarding the smart electricity system of the future is needed. Thus, it is very important that representatives from stakeholders that constitute the entire value chain can participate in the Andalusian Network for Clean Innovation, including:

- EV system providers
- Storage or battery companies
- Innovative startup
- Energy Strategy Consultancies
- Flexibility service providers
- Aggregators
- Data Analytics services
- Power utilities
- Distributions System Operators



- Transmission System Operator
- Energy Service Companies
- Energy Hardware and software providers
- Research centers
- Universities
- ...

To sum up, all players that can constitute a rich network for innovation of smart grids that convert the Andalusia region in one of the relevant and leading points in Spain and Europe in the smart grids domain.

4. Schedule

Jun 2019-Oct 2019: Involvement of the stakeholders and constitution of the group

From Nov 2019: Development of the activities of the network

5. Costs

Operation costs of the network will be covered by own funds of the Andalusian Regional Government through staff costs and external services of the AEA

An estimated cost from the beginning of the activities until the SET-UP project deadline for phase 2 (March 2021) is 68.000 € (including the setting-up of the Platform, meeting costs, external expertise, and management of the Network).

6. Funding sources

AEA own funds

Date: 30-JULIO-19

Signature: 

Name: Jorge Juan JIMÉNEZ LUNA

Title: Director Gerente (Managing Director)

Agencia Andaluza de la Energía / Andalusian Energy Agency

Gobierno Regional de Andalucía / Regional Government of Andalusia

Stamp of the organisation (if available):



