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ACTION PLAN

Autonomous Region of Sardinia, Italy

REGIONE AUTÒNOMA DE SARDIGNA
REGIONE AUTONOMA DELLA SARDEGNA

ASSESSORADU DE S'INDÚSTRIA
ASSESSORATO DELL'INDUSTRIA

INDEX

ENERSELVES PROJECT DATA

Part I – General Information

Project: ENERSELVES – POLICY INSTRUMENTS FOR AUTOCONSUMPTION IN BUILDINGS (PGI02505)

Partner organisation: AUTONOMOUS REGION OF SARDINIA

Other partner organisations involved (if relevant):_____

Country: ITALY

NUTS2 region: SARDINIA

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Part II – Policy context

The Action Plan aims to impact: Investment for Growth and Jobs programme

Name of the policy instrument addressed:

Policy 6 Regional Operational Programme Sardinia ERDF 2014 2020 Action 4.3.1 Realisation of smart energy distribution networks (smart grids) and interventions on strictly complementary transmission networks aimed at directly increasing the distribution of energy produced by renewable sources, the introduction of equipment fitted with digital communication systems, intelligent measuring, checking and monitoring of "cities" and periurban areas.

Interaction with other policy instruments

Another policy instrument will be improved through the Action Plan (Actions group 2) which is the Regional Operational Programme Sardinia ROP ESF (8.1.1 and 8.5.1 actions) with reference to the training and empowerment activities for technical professionals.

0 INTRODUCTION

The Autonomous Region of Sardinia (RAS) participates in the Enerselves project with the Industry Department, Energy and Green economy Service.

The Enerselves Project - Policy instrument for energy self-consumption in buildings aims to:

- promote new policies to support the integration of renewable energy into building for self-consumption, financed by Structural Funds and other EC instruments;
- design policies to promote only those renewable energies for self-consumption technologies with greater benefits in each region;
- support the integration of RES in buildings.

Produced by each partnership region, the action plan is a document providing details on how the lessons learnt from the cooperation will be exploited to improve the policy instrument related to our region. It specifies the nature of the actions to be implemented, the knowledge apply from Enerselves Project to their specific cases, their time-frame, the players involved, the costs, the funding sources and the expected potential impact due to their implementation. The Regional Action Plan details how the lessons learned from good practices previously applied by the ENERSELVES Partners will be adapted and applied in the Sardinian context to improve the policy instruments throughout the project.

The Action Plan is the key document elaborated during the first phase of the project, thanks to which the results of the regional context analysis regarding the project themes are synergically integrated with the lesson learnt from the stakeholders' participation and the knowledge exchange.

The Action Plan of the Autonomous Region of Sardinia aims to improve the policy instruments ROP ERDF 2014 2020. In particular, it aims to improve Action 4.3.1, Priority Axis IV, of the Regional Operational Programme Sardegna ERDF 2014 2020 –Realization of smart energy distribution networks (smart grids and micro grids) and interventions on strictly complementary transmission networks aimed at directly increasing the distribution of energy produced by renewable sources, the introduction of equipment fitted with digital communication systems, intelligent measuring, checking and monitoring of "cities" and periurban areas.

The programme aims, through the 4.3.1 action, to create a system of smart grids in order to ensure security and stability in the regional energy's sector, while further diversifying the energy mix and decreasing harmful greenhouse emissions.

The action 4.3.1 is synergic with R.O.P. ERDF actions 4.1.1. and 4.1.2 in promoting ecoefficiency and in the reduction of primary energy consumption in buildings and public facilities. The 4.3.1. action is also connected with the new Regional Energy Plan: GO 1 "Transforming the Sardinian energy system towards an integrated intelligent configuration (Sardinian Smart Energy System)" and GO 3 "Increasing efficiency and energy savings".

The indicators for Priority Action 4.3.1, Specific Objective 4 are listed below:

OUTPUT INDICATORS				
ID	**INDICATOR**	**M.U.**	**TARGET VALUE (2023)**	**FONDO**
CO33 (4.3.1)	**Additional energy users connected to smart grids**	**Number**	**1300**	**FESR**
PO04b (4.3.1)	Management and monitoring systems installed (for energy efficiency)	Number	600	FESR

The "Additional energy users connected to smart grids" is also the proposed self-defined performance indicator by our region within the Enerselves project. The target value planned for 2023 is currently under review. Consequently, the intermediate target value for 2020, at the moment estimated in 600 additional energy users connected to smart grids, could change.

The AP represents the results of cooperation activities with the project Partners and of the consultation of local stakeholders within the ENERSELVES project. It describes a number of 3 actions groups which are developed in analysis sheets.

All the described actions of the Plan have to be considered as complementary and related to each other in order to achieve the Enerselves objective for Sardinia Region (PP7).

The actions groups detailed by the following AP will be implemented between January 2019 and December 2020 and will be monitored during the whole process.

1 ACTIONS GROUP 1: INCENTIVES FOR THE DEVELOPMENT AND PROMOTION OF EXPERIMENTAL SMART GRIDS AND MICRO GRIDS IN PUBLIC SECTOR

1.1. The background

One of the key subjects for the transition to a low carbon economy is the development of new technologies for converting and storing electricity, aimed at ensuring energy demand supply even when RES fail. To offset energy fluctuations, the power network needs flexible electricity producers, such as decentralized energy storage systems in order to accumulate electricity when energy production from RES exceeds demand and to release it when it is necessary. Energy Storage systems, in particular those destined for the electricity, play a strategic role in the implementation of the regional energy planning, as shown in the Regional Environmental Energy Plan (PEARS), and in achieving the objectives for the ENERSELVES project.

The development of this actions group is aimed at increasing energy self-consumption from renewable energy sources already installed and it will determine positive effects both in terms of costs reduction on energy supply and in terms of a minor impact on the electrical grid.
This will allow an increase in the distribution of the electrical power obtained from renewable sources. Therefore, interventions in the public sector will be preliminary to private applications.
The Regional Administration has identified two priority areas, in which to carry out the first experimental Smart grids. These are two Municipalities characterized by their own power grids. In 2017, in accordance with the Regional Resolution n.51/17, 2 million euros have been allocated in order to envelope an experimental Smart Grid in Berchidda and Benetutti. Further interventions, like micro-grids, will be carried out in other Municipalities and in public facilities. For this reason in 2018 the regional Administration published a call addressed to Municipalities, in order to co-finance "Energy Efficiency and the implementation of micro grids in public facilities". All the financed projects, for a total amount of about € 44.000.000,00, will be realized by December 2020. In addition, 24 million euros have been allocated in order to envelope experimental smart grid in the regional University Campus located in Cagliari and Sassari.

In 2017 a call was launched for Municipal Administrations, aimed at financing energy storage, control and management systems that allow reaching at least 50% of instantaneous self-consumption for energy produced by RES from existing plants. The interventions financed by the first call for proposals, for a total amount of about € 5.000.000,00, was completed in December 2018.

In accordance with this strategy, with regard to the energy production technologies from solar or thermal sources, the regional government promotes the dissemination of small/medium size plants, adjusted on the needs of the final consumers. In particular, after an analysis of the regional socio-cultural structure, this kind of plants has been considered suitable to satisfy the local needs in terms of energy consumption, because they are characterized by small territorial occupations and intended to be connected to micro-grid.

1.2. Knowledge acquired from Enerselves Project and applied to the Sardinian Action Plan

The strategic importance of smart grids and micro-grids development was confirmed during the meetings with the other Partners of the ENERSELVES project.

Enerselves project has helped to improve multi-level governance by involving regional stakeholders interested in developing energy efficiency and renewable energy sources. Thanks to the project activities, the Sardinia Region has tried to reach a better decision-making system. Numerous meetings were organized to share good practices and facilitate the experience exchange and a diligent comparison has been made on these issues.

The Energy and Green Economy Service of the Industry Department has transferred the precious lesson learned to the various regional departments and stakeholders who directly collaborate with the Sardinia Region in implementing the various programs to increase efficiency and RES for self-consumption in buildings (e.g.: AREA, Sardegna Ricerche).

The main good practices and experiences learned during the project and analyzed for the development of this Actions group are listed below:

Partner experience and practice	How this PEP has contributed to the Action Group
PEP: The Solar Park at Olsgården Location: North of Ronneby. Olsgården Region: Sweden	The study visit to the retirement home Olsgården, owned and managed by the municipal company AB Ronnebyhus, has been very interesting and useful. The retirement home consists of several different buildings with a solar cell park on the rooftops, which belongs to the top 10 in Sweden in terms of peak power. This good practice could be replicated in similar buildings managed by public administrations as social housing buildings.
PEP: Villa with solar cells and battery for storage of self-production Region: Sweden	The study visit made during the meeting held in Sweden was of great interest, because it was possible to visit a residential building with a photovoltaic and storage system through which the energy produced was entirely put at the service of the user housekeeper. This is the model that we would like to implement in the regional context starting from the public sector in order to develop this type of energy model and to involve its application also in the private sector.
PEP: Edificio Rojo Location: Street San Vicente 54, Badajoz Region: Spain	The Edificio Rojo hosts the Territorial Service of Environment from the Regional Government of Extremadura. In 2014 this building became one of the most innovative buildings of the region for its energy efficiency level and its divulgation. During the presentation of the project the following innovative factors were pointed out: ▪ The first geothermal facility for self-consumption in public buildings in the region. ▪ One of the first photovoltaics facilities for self-consumption in public buildings in the region. ▪ First building fully monitored for energy consumption and

	production, in the region ▪ Didactic and interactive contents, designed for using on mobile devices ▪ Contents specially designed for students at several levels. ▪ Web designed for participation of the educational community. In this case the didactic role of the pilot project and the applied educational model have inspired the design of some of the actions inserted in our Action Plan. Sardinia Region considers the realization of experimental projects (as micro-grids and smart grids) in the public sector as a driving force for the development and dissemination of technologies aimed at improving energy efficiency and spreading RES for self-consumption in the private sector.
PEP: the SHERPA project (Shared knowledge for energy renovation in buildings by public administration) Region: Malta	It is an Interreg MED project that intends to raise awareness and capacity for better energy management in public buildings on a transnational level, with a focus on the reinforcement of the capacities of public administration at regional and sub-regional levels so as to improve the energy efficiency in their public buildings' stock and reduce CO_2 emissions. The project intends to test and implement a holistic, transnational approach based on 4 key performance elements in energy efficiency in buildings: governance, information, awareness and training and financing. This exchange of experience was very precious for the planning of our operative model on public buildings because it helped us to draft a road map for the development and implementation of energy efficiency in buildings strategies. In our Action Plan the 4 key performance elements are considered fundamental in order to reach the final goal of the project.
PEP:PEGASUS project Region: Malta	Micro-grid business models are being designed as part of this project, based on real energy generation and consumption data being collected through a pilot implementation in Gozo. The purpose of these micro-grids is to optimize the aggregated energy consumption of a pool of consumers. The project also focuses on the awareness of stakeholders on the topic, the micro-grids and building the capacity of public sector personnel on SEAP and ERDF measures and governance models. The specific project includes many activities consistent with the final objective of the Sardinia region. For this reason, the sharing activity with the project Partner and the stakeholders involved during the workshop in Malta will also take place during the implementation phase of the Action Plan actions closely related to this specific intervention.
PEP: PV Installation at the Ministry	The PV plant installation on the roof of the Ministry for Gozo is

for Gozo Region: Malta	an expression of a "leading by example" policy and a show-case of environmentally-friendly energy generation in Gozo, which is the same strategic policy chosen by Sardinia Region to achieve the objectives of the Action Plan.
Good practices implemented by the Enerselves Partners in public buildings and residential buildings.	The analyzed good practices are related to retrofitting interventions in public building (schools and offices) and private ones. The main activities aim to achieve a better level of envelope thermal insulation, energy saving in lighting, energy efficiency in heating and cooling systems, integration of PV systems and solar thermal systems, integration of monitoring/control systems. All these interventions are considered fundamental for the implementation of Sardinia region Action Plan and can be replicated on our regional context.

1.3. Actions group description

This actions group aims to promote distributed storage, technological adaptation and the consequent efficiency improvement of existing and new energy plants (PV and Wind power plants) in public buildings.

The Actions group described above is composed of the following three specific actions and sub-actions:

SPECIFIC ACTIONS AND SUB-ACTIONS	
Specific Action	**Description**
SA 1	Economic incentives for the realization of municipal electric micro grids Promotion of energy storage systems in the Municipalities, in order to achieve at least 50% of instantaneous self-consumption of energy produced by RES plants already installed. Also through the Enerselves project and the good practices sharing activity the funding program for public micro-grid has been confirmed and strengthened. Sardinia Region will promote economic incentives for energy storage systems, control and management systems which are aimed at maximizing the self-consumption in public buildings. A second call of the grant programme will finance other interventions that will be completed by 2020.
SA 2	Energy retrofitting and the installation of RES plants for self-consumption in social housing buildings. In 2017 the regional Industry Department (ENERSELVES Partner), the regional Public Works Department, the Social Housing Agency of Autonomous Region of Sardinia - AREA (ENERSELVES stakeholder) and Sardegna Ricerche Agency (ENERSELVES stakeholder) signed an agreement for the implementation of these interventions identified with the resolution no. 27/2 of 6th June 2017. As part of the mentioned agreement, Sardegna Ricerche conducted the energy audits on the buildings, to evaluate the feasibility and effectiveness of potential

	interventions to improve energy efficiency and to integrate RES for self-consumption. The regional Industry Department and Sardegna Ricerche will help AREA to evaluate, on the basis of the experience learnt within the ENERSELVES Project, the optimal ways to make these buildings more efficient and the possibility of replicating some project partners' good practices.
SA 3	Development of information and dissemination events in order to promote the benefits and the opportunities due to energy production from RES for self-consumption and to the installation of energy storage in public buildings.

1.4. Players involved

- Sardinia Region
- Sardegna Ricerche regional Agency for research, innovation and technological development in Sardinia.
- Social Housing Agency of Autonomous Region of Sardinia (AREA)
- University of Cagliari
- University of Sassari
- Energy Service Companies
- Local Municipalities
- Technical Experts and Professionals

1.5. Timeframe

ACTIONS GROUP 1												
Specific Action	**2018**				**2019**				**2020**			
Specific Action 1												
Specific Action 2												
Specific Action 3												

1.6. Costs

Specific Action 1: 856.981,50 €

Specific Action 2: € 8.110.000,00 (planned budget for the design and construction of the whole project, the described specific activity is referred to a part of it: the development of the interventions final program). For the implementation of this specific action only administrative costs (staff, structure costs…) will be considered.

Specific Action 3: not definable (this is a sub action that could be implemented within the actuation of the specific action 1 and/or 2).

1.7. Funding sources

Specific Action 1: National Funds (Development and Cohesion Fund).

Specific Action 2: ROP ERDF.2014-2020 / Regional Funds

Specific Action 3: ERDF/ National Funds (Development and Cohesion Fund)/ Regional Funds.

1.8. Impact expected

- Realization of smart grid and micro-grid related to public buildings (municipal buildings, schools)
- Implementation of local energy distribution networks equipped with digital communication systems with smart control and monitoring, which will allow a more efficient use of RES and an improvement in the stability and efficiency of the energy system.
- Development of low and medium voltage smart networks using ICT technologies.
- Energy retrofitting in public buildings and social housing buildings
- Architectural integration of PV solar systems in buildings.
- Development of experimental projects in the public sector that will be useful for the dissemination of these technologies also in the private sphere.

2 ACTIONS GROUP 2: INCENTIVES FOR THE DEVELOPMENT AND PROMOTION OF EXPERIMENTAL MICRO GRIDS IN PRIVATE SECTOR

2.1. The background

In 2016 the Regional Council approved the Environmental Energy Plan of Sardinia Region (PEARS). The developed strategy aims to improve at regional level the target set by the European Union.

The Autonomous region of Sardinia has set at 50% the reduction of climate-changing gas emissions associated with users' final energy consumption, by 2030. The idea that drives the plan actions is to achieve this objective through an overall energy efficiency and energy saving interventions to be implemented also through the local increase in the use of energy produced from renewable sources.

The Environmental Energy Plan reflects the choice to promote a new model of circular economy that minimizes the consumption of land, landscape and natural resources and that finds its characteristic elements in:

- the use of existing widespread generation with installation of medium-small size RES plants calibrated on users consumption profiles,
- the promotion of distributed energy storage,
- the technological upgrading and the consequent efficiency improvement of existing plants powered by both of renewable and non-renewable sources.

In order to achieve the goals of the Regional Environmental and Energy Plan it is necessary to promote this model and act in the private sector which has a high influence on the regional energy balance.

From many years Sardinia region implemented policies to promote the dissemination and integration of RES production facilities in public and private buildings, however no incentives for energy storage devices in private buildings have been provided yet.

The Enerselves project gave us the opportunity to share good practices and experiences regarding the various available technologies in the field of self-consumption by RES. Moreover the learning process has been enriched also by the chance to learn about different support methods implemented in the other regions for the promotion and dissemination of these technologies.

On the basis of this experiences exchange, the Sardinia region has developed this group of actions which is aimed primarily at interventions in the private sector.

2.2. Knowledge acquired from Enerselves Project and applied to the Sardinian Action Plan

During the sharing events with the local stakeholders, Sardinia region planned a participatory workshop, organized according to the Metaplan model. The Metaplan technique develops opinions, builds a common understanding and objectives and helps to formulate recommendations and action plans to focus on a problem and its possible solutions. Visualization is one of the main features of this methodology and represents a powerful tool for participatory workshops. It enables information to be

retained and used, in contrast to ordinary meetings which are often full of repetition and where many ideas are not recorded or taken into account.

The participatory workshop has represented a precious opportunity to acquire the different stakeholders point of view (first of all private subjects and ESCO representatives) on the issues related to the diffusion of RES power plants for self-consumption in buildings. On this occasion, the Action Plan goals and the possible areas of intervention were analyzed with the various local stakeholders. The sharing activity was guided through the use of facilitating techniques that are aimed at the identification of problems and the formulation of the corresponding solutions.

As a result of the participatory activity, problems and possible solutions were collected. Among the main problems considered as an obstacle to the diffusion of these technologies in residential and non-residential buildings, the participants have highlighted the following: the lack of information by private individuals on these issues and the high cost of energy storage devices.

Hence the idea of promoting and encouraging energy storage devices also in the private sphere, starting from small and medium enterprises.

The main good practices and experiences learned during the project and analyzed for the development of this Actions group are listed below:

Partner experience and practice	How this PEP has contributed to the Action Group
PEP: Villa with solar cells and battery for storage of self-production Region: Sweden	As said before (AG 1) this is the model that we would like to implement in the regional context starting from the public sector in order to develop this type of energy model and involve its application also in the business enterprise sector.
PEP: BuS.Trainers project, an Erasmus plus project Region: Malta	This project aims to increase the knowledge and capacities of trainers in the building sector. The project was presented as an ongoing good practice for the improvement of green skills and energy efficiency in the building sector in order to incentivize the construction of nearly – zero – energy buildings. The project with this specific training courses typology (focused on several topics such as life cycle assessment, sustainable construction, environmental certification and labeling, eco-friendly and innovative materials, deconstruction, energy efficiency and renewable energy sources) has inspired Sardinia region for the development of a specific action related to training and empowerment activities for technical professionals.
PEP:PEGASUS project Region: Malta	As said before (AG 1) the project includes many activities consistent with the final objective of the Sardinia region. For this reason, the sharing activity with the project Partner and the stakeholders involved during the workshop in Malta will also take place during the implementation phase of the Action Plan actions.

2.3. Actions group description

This actions group aims to promote distributed electric energy storage, technological adaptation and the consequent efficiency improvement of existing and new energy plants (PV and Wind power plants) in private buildings.
Furthermore it has been decided to identify an action that would lead to improve the integration between the objectives of the Sardinia ROP ERDF (4.3.1 action) and the ROP ESF (8.1.1 and 8.5.1 actions), with reference to the training and empowerment activities for technical professionals. This is also a way to promote and encourage an increase of self-consumption by RES in private sector (tertiary and residential).
The Actions group described above is composed of the following three specific actions and sub-actions:

SPECIFIC ACTIONS AND SUB-ACTIONS	
Specific Action	**Description**
SA 1	Economic incentives for the promotion of decentralized energy production and energy storage systems and smart control and monitoring devices in the private sector, to encourage self-consumption for existing and/or new plants in buildings (business enterprise sector). The regional Industry Department will collaborate with other relevant actors, for example the regional Agency for research – innovation and technology, with the objective to give priorities for prosumers and the development of micro-grid (electric energy storage systems, management and control systems).
SA 2	Development of information and dissemination events in order to promote the benefits and the opportunities due to self-consumption from RES for and to the installation of energy storage systems. It is very important to improve users' awareness in the field of self-consumption from RES (new technologies for self-consumption, funds and grants available, optimal solutions for RES integration, administrative procedures for new installations). Communication and dissemination activities have to be planned in order to improve users' awareness in this field. Furthermore, in order to share the Enerselves project experience all the good practices collected will be published on the "Energy" section of the institutional website of Sardinia Region.
SA 3	Financing of training courses related to smart grids and energy efficiency within the projects: ▪ S.E.M.I.N.A.R.E. Integrated Enhancing Energy Systems Required for the Environment and Energy Recovery; ▪ Renewable energy sources; ▪ Energy impact. All these projects have been launched by the regional Work Department within the public call "Integrated activities for empowerment, vocational training, skills certification, job support, promotion of new entrepreneurship, transnational mobility in the areas of Green & Blue Economy". These training courses aim to train about 185 citizens which will be able to obtain

	a skills certification in the field of smart-grid for efficient energy management, which is also a priority area of the regional Smart Specialization Strategy (S3). The definition of these projects is the result of a specific analysis of training and professional needs concerning the whole Sardinian territory. A network of companies and public institutions (as regional departments and agencies) has contributed to the detailed training courses planning. The Regional Industry Department is one of the actors involved in these planning activities. During this phase we've collaborated addressing the accredited training agencies in planning an educational offer focused on courses aimed at acquire design and management skills in the field of micro grids, smart grids and energy storage devices for self-consumption in buildings. The first training courses have been started during the phase 1 of the ENERSELVES project and other editions will take place until the end of the ROP ERDF 2014-2020.

2.4. Players involved

- Sardinia Region
- Sardegna Ricerche Agency regional Agency for research, innovation and technological development in Sardinia
- University of Cagliari
- University of Sassari
- Energy Service Companies
- Local Municipalities
- Technical Experts and Professionals
- Citizens

2.5. Timeframe

ACTIONS GROUP 2												
Specific Action	**2018**				**2019**				**2020**			
Specific Action 1												
Specific Action 2												
Specific Action 3												

2.6. Costs (if relevant)

Specific Action 1: 1.000.000,00 €

Specific Action 2: not definable (this is a sub action that could be implemented within the actuation of the specific action 1 and/or 3).

Specific Action 3: 1.173.899,00 € (planned budget for the implementation of all the projects)

2.7. Funding sources (if relevant):

Specific Action 1: ROP ERDF / Regional funds

Specific Action 2: ROP ERDF/ National Funds (Development and Cohesion Fund).

Specific Action 3: ROP ERDF.

2.8. Impact expected:

- Realization of micro-grid related to private buildings (tertiary sector).
- Implementation of local energy distribution networks equipped with digital communication systems with smart control and monitoring, which will allow a more efficient use of RES and an improvement in the stability and efficiency of the energy system.
- Dissemination and training activities.
- Certified technicians and technical advisors in the field of smart-grid and efficient energy management.

3 ACTIONS GROUP 3: FINAL PROGRAM FOR ENERGY EFFICIENCY AND SMART GRID IN THE BUILDINGS OWNED BY THE REGIONAL ADMINISTRATION

3.1. The background

The Autonomous Region of Sardinia considers energy efficiency and energy saving in the electrical, thermal and transport sectors as key factors in achieving the goals of its Regional energy and environmental Plan. Each action regarding these themes must be adapted to the regional context, in order to ensure a better quality of life for citizens, to preserve the environment and to promote competitiveness and territorial development. Also in this case, energy efficiency and energy saving actions in the public sector have to be considered strategic in respect of the whole collective interest.

Energy efficiency and energy saving are seen as basic conditions to reach the goal of the Enerselves project.

As mentioned also in the previous chapters the regional Administration considered experimental intervention in the public sector as a driver for the future applications in the private one. This is why Sardinia Region has planned a specific intervention on its main office buildings.

Thanks to the study and analysis of the good practices collected by the Partners during the project ENERSELVES it was possible to identify interesting and replicable solutions for this case. Furthermore, several choices in the current regional activity planning have been confirmed and validated.

3.2. Knowledge acquired from Enerselves Project and applied to the Sardinian Action Plan

The main good practices and experiences learned during the project and analyzed for the development of this Actions group are listed below:

Partner experience and practice	How this PEP has contributed to the Action Group
PEP: Monitoring self-supply and demand online, Olofströmshus. Location: Olofström Municipality Region: Sweden	The Lecture about "Monitoring self-supply and demand online", a project applied in Olofström municipal buildings, has allowed us to identify some fundamental solutions to create a smart grid and monitor and control its energy parameters. The monitoring systems described ensure that municipal buildings become energy efficient in the long term, which is one of the main Sardinia Region goals. These are the main points on which we paid particular attention: ▪ SCADA System Supervisory Control and Data Acquisition, monitoring system for energy use and self-production of energy production in buildings. It has proven as a very good tool for the maintenance staff when optimizing operation of the buildings. As it has been highlighted during the presentation SCADA system is a suitable technology for several partners in the project.

	▪ It was highlighted that in order to keep a low energy level after implementing measures, it has also required an efficient control system and continuous maintenance. The FMS Facility Management System has been indicated as a good tool because it gives bug reports, planned maintenance activities and what has been implemented. We considered very interesting the chance to retrieve on-site all building's information about the different systems only by using a tablet. The lecture illustrated the great importance of monitoring for a good and easy management of the energy. ▪ To gain control, it can be used a control system, but it is also necessary to influence the behavior of users. One of the first things to do it's to increase understanding of how different behaviors or adjustments affect energy consumptions (for example temperature adjustments).
PEP: House of Parliament Location: Gozo Region: Malta	The House of Parliament building in Gozo is a significant good practice in the field of energy self-consumption in public buildings. It is a successful example of NZEB combining passive design, low energy consumption and use of renewable energy sources. These are the main points on which we paid particular attention: ▪ Envelope design: the stone envelope was designed to reduce solar heat gain and allow natural ventilation. The thickness of the envelope has been dimensioned according to the energy balance, also providing insulation of walls and roofs. Moreover, the irregular morphology of the façade creates indirect shadows, reducing the surface temperature. ▪ The use of Renewable Energy Sources (RES): Energy needs can be covered almost entirely (100% in winter and 80% in summer) by 160 sq. m of PV panels, located on the roof. ▪ Installation of energy saving devices and smart control tools (efficient lighting with presence detection; low-energy air displacement systems; rainwater harvesting systems; building management system; mechanical ventilation and heating/cooling shut down automatically when windows are open; metering and sub-metering of equipment). It has been considered a very helpful example to follow in order to select the most effective actions for the energy retrofitting in regional buildings.
Good practices implemented by the Enerselves Partners in public buildings and residential buildings.	The analyzed good practices are related to retrofitting interventions on public building (schools and offices) and private ones. The main activities aim to achieve a better level of envelope thermal insulation, energy saving in lighting, energy efficiency in heating and cooling systems, integration of PV

	systems and solar thermal systems, integration of monitoring/control systems. All these interventions are considered fundamental for the implementation of Sardinia region Action Plan and can be replicated on our regional context.

3.3. Actions group description

The Actions group described above is composed of the following three specific actions:

SPECIFIC ACTIONS AND SUB-ACTIONS	
Specific Action	**Description**
SA 1	In 2017, the Regional Industry Department (ENERSELVES Partner), the regional Public Works Department (ENERSELVES stakeholder), the Social Housing Agency of Autonomous Region of Sardinia (AREA) (ENERSELVES stakeholder) and Sardegna Ricerche Agency (ENERSELVES stakeholder) signed an agreement for the implementation of interventions in the field of energy efficiency and smart grids development. These interventions have been identified through an approved preliminary program. The mentioned agreement was related to two different Action line: ▪ Action Line 2 addressed to energy retrofitting in social housing buildings; ▪ Action Line 5 addressed to the main regional buildings located in Cagliari. In 2018 the agreement has been modified in relation to the Action line 5 and the Industry Department has been identified as the only administrative responsible for the realization of the energy efficiency and smart grid implementation program. The Regional Industry Department, within the modified agreement in force with Sardegna Ricerche and the regional Local Authorities Department (new project stakeholder), coordinated the analysis activities on the buildings that have been carried out with 5 energy audits made by the company ESCo Italia and a feasibility study entitled "Implementation of an energy efficiency intervention and micro-network of buildings owned by the Regional Administration" by the University of Cagliari. The expected interventions can be divided into two macro-categories: ▪ energy efficiency; ▪ realization of energy production plants from RES and smart grid construction. Furthermore, the energy retrofitting activity will lead to the realization of a nZEB. The next step for the development of the action foresees the definition of the Final Program to identify the specific interventions that will be implemented in the analyzed buildings. Obviously the lesson learned within the Enerselves project and the experience exchange with the project Partners will have a fundamental role in the planning activity. **This specific action concerns the definition of the Final Program of the interventions.**

SA 2	Development of the call for tenders for the assignment of the design services related to the interventions planned in the Final Program.

3.4. Players involved

- Sardinia Region
- Sardegna Ricerche Agency regional Agency for research, innovation and technological development in Sardinia.
-
- Sardinian Social Housing Company (AREA)
- University of Cagliari
- Energy Service Companies
- Local Municipalities
- Technical Experts and Professionals

3.5. Timeframe

ACTIONS GROUP 3												
Specific Action	**2018**				**2019**				**2020**			
Specific Action 1												
Specific Action 2												

3.6. Costs:

Specific Action 1: 5.046.800,00 € is the budget related to the realization of Building Energy retrofitting and Smart Grid in the main regional office buildings. For the implementation of this specific action only administrative costs (staff, structure costs…) will be considered.

Specific Action 2: For the implementation of this specific action only administrative costs (staff, structure costs…) will be considered. The amount for the design service can be estimated in about 350.000,00 € as part of the planned budget for the implementation of the whole project.

3.7. Funding sources:

Specific Action 1: Regional fund.

Specific Action 2: National Funds (Development and Cohesion Fund 2014-2020) / Regional fund.

3.8. Impact expected

- Final Program of the interventions approved.
- Publication of the call for tenders for the assignment of design services and award of the contract.

ANNEX 1

LIST OF ACTIVITIES AND MEETINGS WITH THE LOCAL STAKEHOLDERS

One of the fundamental ENERSELVES tasks is the sharing of practices aimed at the integration of renewable energies in buildings. To this end, local and international meetings enabled the sharing of project themes, the good practices and local dissemination.

The local meetings allowed the creation of a network between the stakeholders involved and those who participated in the international meetings reported their experiences, forming relations with partners and stakeholders from other nations.

Another important aspect is the involvement of the political class, through the local public authorities, that allowed a wide sharing of the good practices learned and all the project objectives.

Participation in interregional meetings has allowed both project staff and stakeholders to deal with different realities that have faced problems similar to those present in Sardinia. The local meetings were used both to transfer skills on a large scale, but also to focus the objectives to be indicated in the action plan thanks to meetings, focus groups and individual meetings.

MEETING/ACTIVITY	DATE	STAKEHOLDERS INVOLVED	MAIN OUTCOMES
1 IE – Bajadoz (SPAIN)	22th-23th/02/2017	Centro regionale di programmazione - RAS	Start of the learning process thanks to the study of the Extremadura's best practice, first comparisons with the models made in Sardinia
2 IE – Ronneby (SWEDEN)	10th-11th/05/2017	ESCo Engineering	Study visits focused on renewable energy storage and micro grids with consequent comparisons with the Sardinian solutions
1st Local Event – MEM (CA)	15th/06/2017	40 participants (public administrations, private companies)	Dissemination of information learned during the first two interregional meetings and discussion with local entrepreneurs on the issues of self-consumption in buildings

MEETING/ACTIVITY	DATE	STAKEHOLDERS INVOLVED	MAIN OUTCOMES
3IE - Bruxelles	20th/06/2017	AREA (Regional Social Housing Company), Arborea Municipality	First presentation of some best practices and comparison between the partners with the involvement of the stakeholders. Participation in the sustainable energy week with an eye on the proposals in the sector from across Europe
4IE – Kielce (POLAND)	12th-13th/09/2017	Thera.bio	Case studies with focus on the use of geothermal energy and evaluation of local smart grids for the purposes of actions to be included in the action plan
2nd Local Event - Arborea	23th/11/2017	110 participants (public administrations, private companies, 6 classes from local school)	Comparison between local entrepreneurs, public authorities and students on the best practices visited during the previous interregional meetings.
5IE – Iasi (ROMANIA)	30th-31th/01/2018	Thera.bio, Cagliari Municipality	Focus on the photovoltaic system in Miroslava Municipality and comparisons with the Sardinian plants, in order to refine the action plan
6IE - MALTA	16th-17th/05/2018	AREA (Regional Social Housing Company)	Very significant case studies of the RAS action plan thanks to the climatic characteristics of the island of Malta that make it very similar to Sardinia.
3rd Local Event - Bruxelles	4th/06/2018		Comparison with the project partners on the drafting of the action plan.
7IE – Sardegna (ITALY)	5th-7th /011/2018	(public administrations, private companies, University, Sardegna Ricerche)	Meeting of a large number of Sardinian stakeholders with foreign partners and stakeholders, with a consequent exchange of ideas, which were implemented during the last local meeting
4th Local Event - Sardegna Ricerche (CA)	11th/12/2018	ESCo Engineering, Thera.bio, Sardegna Ricerche	The participants, thanks to their experience in the field, proposed smart solutions to solve regional energy efficiency problems and collaborate to the action plan's creation.

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Date: 10 LUG. 2019

Signature: _____

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Director of Energy and Green Economy Service

Stamp of the organisation (if available): _____