Tips Learned

7th Interregional Event

ENERSELVES
Policy instruments for energy self-consumption in buildings

Country: **Italy**
Region: **Sardinia**
Host partner: **Autonomous Region of Sardinia**
Dates: **5th-7th November 2018**

Introduction

The Autonomous Region of Sardinia (RAS) hosted the last Enerselves interregional meeting in Cagliari, with the aim of showing to the partners and their stakeholders the Sardinian excellence in the field of energy efficiency through the presentation of regional plans for the increase of green energy and the visit to various RAS best practices.

Another event's aim was the Enerselves project presentation to the Sardinian public through a dissemination event that saw the participation of many professionals in the renewable sector

The event was divided into three days, the first was held by the steering committee, the second by the study visits and the third by the dissemination event.

5th November – Steering Committee

- 14.30 – Welcome coffee
- 15 – 17. 30 Steering committee
- 20.30 – Networking dinner

The steering committee was focused on five different topics:

- The Lille meeting in September that the LP had with the JS
- Financial situation
- Communication
- Project's activities
- Project management

The LP answered all the questions posed by the partners on the items listed above, indicating the upcoming deadlines and the future of the project.

6th November – Study visits

9.30 Meeting to the Hotel Regina Margherita and transfer to Sardegna Ricerche in Macchiareddu

10.30 – Welcome coffee

11 – Visit to Sardegna Ricerche Laboratory

13 – 14 Light lunch

15 – Visit to Marino Hospital (Example of Photovoltaic System and Solar thermal system in a hospital)

16.30 Visit to AREA building (Example of Building Integrated Photovoltaic System in a public building)

20.30 –Dinner

The study visits led the participants to move in the morning to the Sardegna Ricerche office in Macchiareddu.

The Authonomous Region of Sardinia has entrusted Sardegna Ricerche with the following tasks:
1. Assist the Regional administration with designing and implementing actions in the field of research and technology development, human capital development and the promotion of scientific culture
2. Implement programmes aimed at promoting the development of technology and production clusters, industry integration and the development of a network of centres of competency and excellence
3. Foster the set up of innovative enterprises, establishing the appropriate infrastructure and organisational conditions
4. Promote, manage and develop the Science and Technology Park of Sardinia, fostering the location of research, innovation and technology transfer activities at the Park.

Sardegna Ricerche also performs the following tasks:

1. It provides individual or associated enterprises with services targeting the introduction of new technologies, management upgrading and the support of corporate activities

2. It organises and delivers advanced training of highly innovative content to enterprises and research organisations

3. It can also pursue other activities delegated to it by law, or on the basis of agreements with public administrations or other public or private parties.

The Sardegna Ricerche office located in Macchiareddu is called 'Piattaforma Energie Rinnovabili' (Renewable Energy Facility) and carries out since 2010 research into renewable energy technologies and microgrid energy systems.

The facility has over 600m^2 of laboratories dedicated to research activities covering a range of technical applications, including renewable energy to grid integration, microgrids, biomass, hydrogen, energy storage, vehicle to grid integration.

The Piattaforma opens its laboratories and facilities to people working in academia, research organisations and industry, providing space and services; it also organizes dissemination activities for stakeholders, decision makers and end-users, and offers training and research opportunities for students.

During the visit, partners and stakeholders have discovered the various techniques adopted by 'Renewable Energy Platform' to obtain an energy island capable of achieving instantaneous energy balancing in any environmental and operational condition.

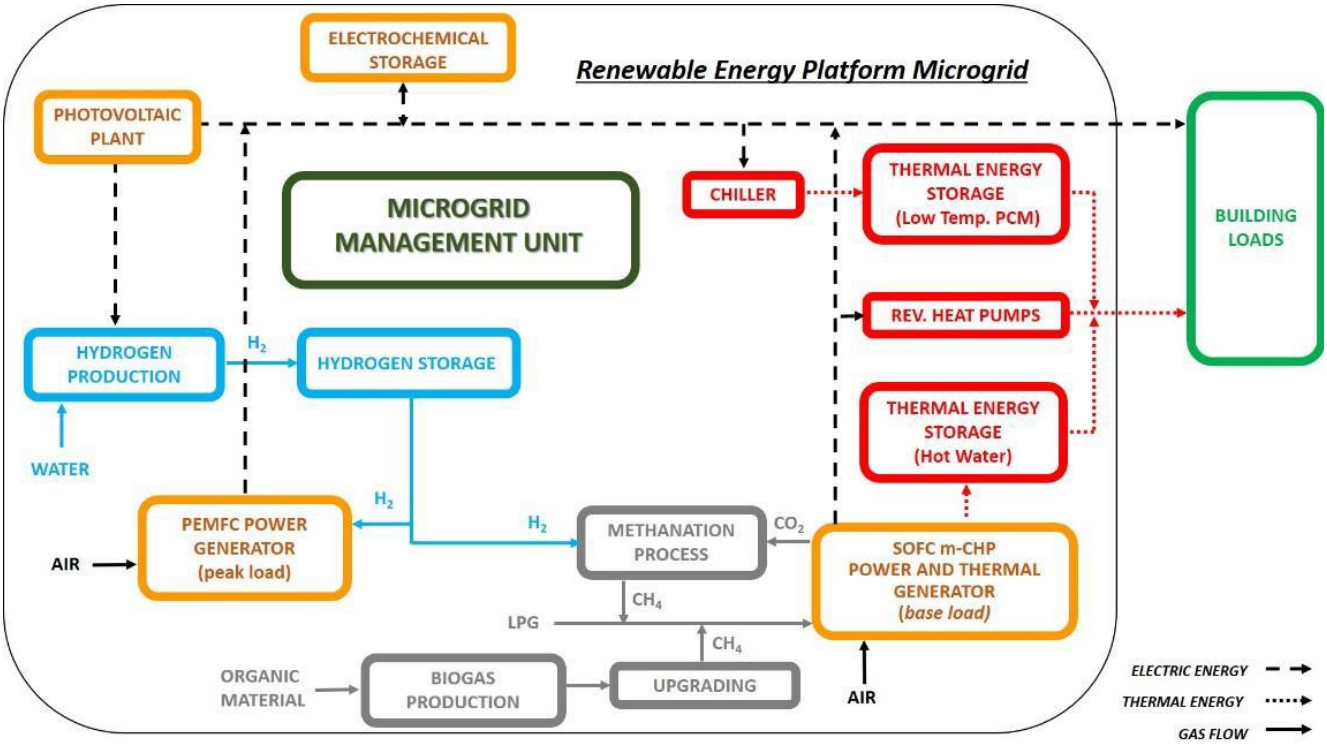
The microgrid is designed to be flexible and suitable for R&D activities, and to achieve the following goals:

- Optimize the integration of the existing production and storage systems with the electric and thermal demand;

- Minimize CO_2 emissions;

- Test and integrate different storage systems (thermal, chemical and electrochemical);

- Achieve instantaneous energy balancing of the building in any condition.



Available Equipment

- Anaerobic digestion pilot plant (working volume of 1 m^3) capable of operating under psychrophilic, mesophilic and thermophilic conditions

- Fast catalytic pyrolysis plant with a maximum feeding capacity of 100 kg/h

- Hydrogen generators (2 Nm3/h PEMFC technology)

- Hydrogen storage tanks in the gaseous phase (4,5 kg or 50 Nm3) and through metal hydrides (0,15 kg)

- Fully instrumented PEMFC stack (1,2 kW)

- PEMFC Power System for microgrid support with 5 kW of electric power

- Test station for feeding and management of low-power fuel cells and metal hydride vessels

- Three PV systems (6, 8, 12 kWp), characterised by the implementation of high concentration PV, amorphous and high efficiency monocrystalline PV panels

- Microgrid 6 kW test bench for the implementation of control algorithms

- Microgrid supplied by a PV 12 kWp facility and supported by a 10 kWh capacity storage

- Test bench for electro-mobility testing (charging station, control of charging station, propulsion system)

- Power system simulator with a rated power of 50 kVA

- Characterization, modelling and control of energy storage systems

- Method and Analysis procedure for power quality characterization of microgrid, smart grid and power systems

In the afternoon the Enerselves group moved to the Marino Hospital where the engineers in charge showed the Photovoltaic system and Solar thermal system integrated in a Hospital.

The last study visit was in the Social Housing Agency of Autonomous Region of Sardinia Headquarters (AREA) that has a Building Integrated Photovoltaic System.

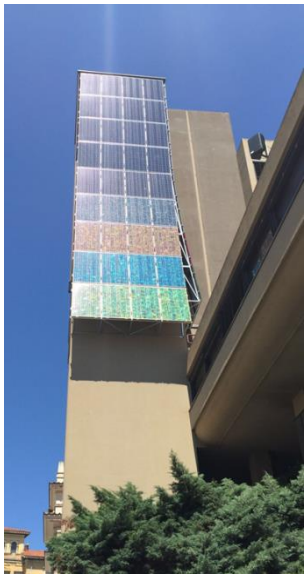
The plant has been realized with the FOSTEr in MED project, which aims to promote the adoption of innovative solar photovoltaic (PV) technologies in the Mediterranean area, and in particular in six countries: Egypt, Jordan, Italy, Lebanon, Spain and Tunisia. The AREA building has been chosen for Italy.

The grid-connected PV system total capacity is about 19 kWp. The plant is divided into 3 main sections: two vertical structures and a shading device structure.

The two vertical sections of the PV plant are located in the stairwells towers (A Tower and B Tower). One of them, which is called “Sail”, is characterized by the particular shape of the modules’ steel support structure, while the other one is coplanar with the envelope of the second tower.

The whole PV system is characterized by colored polycrystalline silicon panels and the shading device structure is composed of transparent modules (glass-EVO-glass panels).

The total estimated energy production is of 17.600 kWh/year.



7th November – dissemination Event

- 9:00 – Participants Registration
- 9.30 – Welcome Speech (Councilor Maria Grazia Piras and Stefano Piras)
- 9.45 – Presentation of ENERSELVES and SOCIAL GREEN projects (Rachel Tully)
- 10:15 – Autonomous Region of Sardinia Good Practices (Stefano Piras – Giovanni Satta)
- 10.30 – Energy efficiency and energy saving in the social housing sector: what is AREA role? (Valentina Carboni)
- 10:45 – Energy efficiency and micro-grid: Baradili case study (Mayor Lino Zedda)
- 11:15 Coffee break
- 11.45 Political Round Table (political representatives of partner nations)
- 13.00 Light lunch

The last day was held the dissemination event that involved the Sardinian stakeholders, the representatives of the Autonomous Region of Sardinia and the political figures from each nation involved in the project, through a comparison of ideas and approaches to renewable energy issues.

After the institutional greeting of the RAS Councilor Maria Grazia Piras and the Green Energy Service Director Stefano Piras, the lead partner presented ENERSELVES and GREEN ENERGY projects to the audience composed of project partners, stakeholders and Sardinian sector professionals interested in the topics.

Stefano Piras presented the RAS promotion of the green energy use and the strategic projects that the Sardinian region is carrying out.

These projects involve different subjects, but are always oriented towards maximizing self-consumption and energy efficiency in all sectors and reducing the impact of fossil fuels in favor of renewables, in a framework of distributed energy that is calibrated on the needs of consumers and oriented to the Smart Grid model.

The projects are:

- Experimental projects for the construction of micro-grids in municipal areas
- Experimental development project for the construction of smart grids in Municipalities of Berchidda and Benetutti
- Pilot project for the development of smart-grid in Cagliari and Sassari University
- Energy efficiency measures and creation of a micro-grid in buildings owned by the Regional Administration
- Experimental plant in the Ottana industrial area

(for more informations, 3 presentation: https://drive.google.com/drive/folders/1BE7KtDf4gdkKoFZcKKz8I6CcVd_2vbZk?hl=it)

Giovanni Satta's intervention instead gave a general overview of the regional programs for the development of solar energy's evolution.

The RAS path begins with the preparation and implementation of a regional program aimed at public bodies, to finance the construction of photovoltaic systems for the renewable energy production and solar panels for the production of hot water for domestic or industrial use, in compliance with the provisions of the Regional Energy Plan. (4 presentation: https://drive.google.com/drive/folders/1BE7KtDf4gdkKoFZcKKz8I6CcVd_2vbZk?hl=it)

The intervention of the RAS social housing agency (AREA) was aimed at showing how it is possible to make more efficient different buildings types, from historical ones to new social houses, passing through the company's institutional headquarters.

The redevelopment of a building dating back to 1939 is very interesting as it presented very complicated architectural and legislative constraints to manage, but the results obtained allowed to reduce the depopulation of the historical centers of the internal sardinian countries, recover the historical building heritage, use materials

and high performance technologies with easy installation and maintenance that are environmentally friendly, minimizing CO_2 emissions.

(5-6 presentations: https://drive.google.com/drive/folders/1BE7KtDf4gdkKoFZcKKz8I6CcVd_2vbZk?hl=it)

The Baradili Mayor did the last intervention speaking about his eco-sustainable municipality. Baradili was selected among the 20 pioneering communities of Sardinia during the first phase of the project «Smart City - Municipalities in class A» and it has made 4 interventions thanks to joining the JESSICA Fund:

1.Photovoltaic frame

2. Biomass boiler in the Municipal House

3. Solar thermal system in sports facilities

4. Park LED lighting

Baradili is a virtuous example in Sardinia as can be seen from the 2018 results:

- Reduction of CO_2 emissions (PAES target Y.2020 40%) **- 45%**
- Reduction of energy consumption (target PAES Y.2020 20%) **- 35%**
- Production of electricity from RES (target PAES Y.2020 30%) **40%**
- Production of thermal energy from RES (target PAES Y.2020 30%) **47%**

(7 presentation: https://drive.google.com/drive/folders/1BE7KtDf4gdkKoFZcKKz8I6CcVd_2vbZk?hl=it)

The round table

The final part of the dissemination event was characterized by a comparison between the politicians of the nations involved in the project who shared their vision on the importance of renewable energy and self-consumption in buildings, highlighting the strengths and weaknesses of the political path that every municipality, region and nation is doing to abandon fossil energies in favor of renewables.

Despite every nation finds the most appropriate methods to increase the use of renewable energy and self-consumption in buildings, thinking to its social fabric, to its territory, it's clear that the spirit that moves European politics in this field is unique and all European citizens are looking towards a future where energy is increasingly sustainable and clean.