



Implementation of RES & EE measures in rural contexts

Synthesis report on the COMPOSE project

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This document has been realised by

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Introduction

The COMPOSE project builds on existing experiences and results of several MED and other EU funded projects and initiatives to provide a holistic approach: the COMPOSE model for RES planning promotes inclusion of RES and EE measures as a horizontal criterion for territorial planning. In order to showcase the impact of several RES and EE measures, the partnership of COMPOSE implement 15 pilot actions in 11 MED Regions: Slovenia, Cyprus, France, Greece, Italy, Portugal, Spain, Croatia, Albania, Bosnia and Herzegovina and Montenegro. The result of the project is an integrated know-how on RES development planning, based on development planning methodology. Based on 15 implemented pilot cases, partners worked actively with local action groups and concluded this work with signing of Memorandum of understanding, in order to involve important actors into the policy development process which will increase the share of RES and EE measures to achieve Paris goals.

The present document has been elaborated by the Interreg MED Renewable Energy Community, in collaboration with the COMPOSE project partnership, to give an overview of the main results and outcomes obtained by the project in terms of technical results and also contribution to the model developed by the Community of *Ecosystemic Transition Unit (ETU)*. This model has been built on the basis of the activities and results of the 6 modular projects belonging to the Interreg MED RES Community and dealing with:

- > **COMPOSE**: Rural Communities engaged with positive energy
- > **StoRES**: Promotion of higher penetration of distributed PV through storage for all
- > **PRISMI**: Promoting RES integration for smart Mediterranean islands
- > **ForBioEnergy**: Forest Bioenergy in the protected Mediterranean areas
- > **LOCAL4GREEN**: Local fiscal policies for Green Energy
- > **PEGASUS**: Promoting effective generation and sustainable Use of electricity through microgrids

An *Ecosystemic Transition Unit* is a territory implementing its energy transition taking into account an ecosystemic approach, based on the following main pillars: technological (energy facilities), social (energy community), legal (energy governance) and territorial (energy planning). As a conclusion of these 3 years of work, both for the project and for the Interreg MED RES Community, but also as a starting point for the implementation of the *ETU* at territorial level and consequently the transferring and capitalisation of the results of the projects of the community, it was important to underline better the different contribution each project gave to the *Ecosystemic transition Unit* Concept.

The present document is composed by 4 different sections:

1. a general section, with the main features of the project and its general outcomes
2. a technical section dedicated to the results of the project pilot actions
3. a policy section, synthetizing the main policy recommendation of the project
4. a section dedicated to specify the contribution of the project to the “Ecosystemic Transition Unit” model

ENJOY THE READING!



Title of the project: COMPOSE – Rural communities engaged with positive energy

Partners and associated partners:

Partners

1. Institute of Agriculture and Forestry Maribor - Slovenia, Lead Partner
1. Agricultural University of Tirana - Albania
2. Energy Agency of Arrabida - Portugal
3. Granollers City Council - Spain
4. Group for Environment, Renewable Energies and Solidarity (GERES) - France
5. Institute for Strategic Studies and Prognoses (ISSP) - Montenegro
6. Kyoto club - Italy
7. Lakatamia Municipality - Cyprus
8. Regional Energy Agency North (REAN) - Croatia
9. Technical University of Crete, Renewable & Sustainable Energy Systems Laboratory - Greece
10. Srebrenik Municipality - Bosnia & Herzegovina.

Associated partners

1. Association of Municipalities and Towns of Slovenia - Slovenia
2. Ministry of Economic Development and Technology - Slovenia
3. Ministry of Infrastructure - Slovenia
4. Ministry of Agriculture, Forestry and Food - Slovenia
5. Municipality of Slovenska Bistrica - Slovenia
6. Municipality Zreče -Slovenia
7. Kamza Municipality - Albania
8. Koprivnica-krizevci County - Croatia
9. Municipality of Anogeia - Greece
10. Municipality of Rethymno - Greece
11. Network of the Insular CCI of the European Union - Greece
12. Region of Crete - Greece
13. Italian LA21 Association - Italy
14. New Products and Digital Systems - Portugal
15. Regional Development Association of the Setúbal Peninsula - Portugal

Budget and duration:

- > Total budget: 2.500.000 €
- > ERDF Budget: 2.200.000 €
- > Duration: 36 months

Testimony of lead partner

COMPOSE shall contribute to an increased sustainable RES planning capacity at the decision-making and planning-expert levels, whose main objective is to promote new business models and technology development to compose green economy by connecting local potentials to sustainable energy supply chains. It provides a RES development planning synthesis model and therefore the increase of renewable energy mix in selected areas.



Project outcomes


COMPOSE methodological approach

The COMPOSE consortium produced a step-by-step methodological approach for efficient development of RES and energy efficiency measures, with a specific focus to Mediterranean rural and insular areas/communities, aiming to increase the share of green energy sources in the local energy mix with local stakeholders' participation and social acceptance as key elements.

The **local energy planning steps** proposed by the **COMPOSE model** can be summarized as follows:

1. **Choosing a problem:** the aim is to identify the priority RES and EE projects, which will contribute most to the local community's socio-economic and technological development.
2. **Creating a local action group (LAG):** aims to identify and engage the local stakeholders who can contribute to the design and efficient implementation of a local RES or energy efficiency project. Significant benefits can be derived when a sustainable energy project is developed through participatory approaches, including: incorporating the experience, knowledge and concerns of the community in the plan, minimizing or even avoiding potential conflicts. The different nature of each energy project, its requirements, level of impact to the different stakeholder groups should be taken into account when selecting the appropriate LAG members.
3. **Local action plan:** a local energy action plan translates long-term strategy into action. With a well-balanced action plan, based on the consultation from key stakeholders, local communities may benefit from energy security, better quality of life, increased opportunities for all citizens, reasonable use of natural resources, social cohesion and economic prosperity.
4. **Creating local partnerships:** aims to build a partnership committed to the accomplishment of the project, with clear obligations and responsibilities. Local partnerships concretize the EE/RES measures defined by the LAG, in a form of an implementation partnership or business initiative.
5. **Implementation procedures:** this step aims to put ideas into reality and deliver concrete projects on the field by following appropriate procedures and providing technical expertise, necessary support and documentation.
6. **Monitoring and evaluation:** Monitoring and assessing the actual performance and impact of a project, with a predefined set of indicators, helps to verify if the goals set have been reached, to take corrective actions, to predict potential barriers, to improve the implementation process for similar projects and gain insights for future planning.

The above steps are complemented with two horizontal steps aiming to local community empowerment:

- A. Empower local skills and policies:** aims to build an appropriate capacity building plan, tailored to the specific local skills needs and gaps, as a mean to empower local communities to apply energy efficiency and renewable energy best practices.
 - B. Awareness raising:** aims to promote achievements and benefits of implemented projects to specific target groups and the wider public. Awareness raising campaigns can be realised in each step and can serve different purposes, depending on the step's objectives and the target audience.
- 

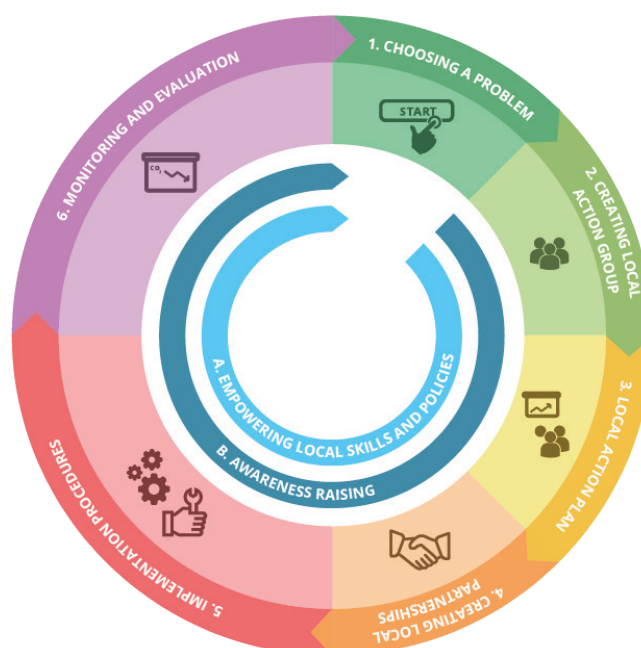


Figure 1 - COMPOSE Model – Local energy planning and community empowerment steps

Showcases of sustainable energy project

The COMPOSE model was tested on the field, through the implementation of 15 sustainable energy demonstration actions, with high replication potential, which promote the use of RES and energy efficiency measures by exploiting the local potential, creating sustainable supply chains and enhancing local growth and economy in 11 Mediterranean countries (Albania, Bosnia & Herzegovina, Croatia, Cyprus, France, Greece, Italy, Montenegro, Portugal, Slovenia and Spain). More than 336 GWh/y electricity will be generated from RES and 558 kt CO₂ emissions/y will be avoided, till 2030, in the COMPOSE countries, due to the development, operation and multiplier effect of those projects.

The **Sustainable Energy Planning Toolbox (COMPOSE toolbox)**¹ is another key legacy of the project. The toolbox navigates to the step-by-step, bottom-up COMPOSE methodological approach, offering advice on how to implement each development step and access to: planning and design tools, databases to help define projects' baseline, practical guides to assist the development process, the recent EU energy policies and supporting instruments, real sustainable energy case studies and other useful resources to support decision-making and planning process for the sustainable development of local RES and energy efficiency measures. It supports policy makers, development planners and local authorities' technical staff, who are involved in the development and implementation of local/regional energy plans, to the transition towards low carbon communities, exploiting the local potential and integrating not only technical, but also socio-economic and environmental aspects.

¹ <https://compose.interreg-med.eu/the-compose-sustainable-energy-planning-toolbox/>





Figure 2 - Navigate to the COMPOSE Sustainable Energy Planning Toolbox

Capacity of replication in other territories

Pilot testing enabled a representative input for the COMPOSE model, whose main added value is the replicability potential in the whole MED territory. Exchange of experience gained, lessons learnt and good practices were provided by a multidisciplinary team of partners, coming from universities with technical expertise, territorial authorities responsible for development planning, relevant associated partners and networks of multipliers who joined COMPOSE and actively supported the main goal of the project, which is to increase the share of renewable energy sources in the local energy strategies and mix in targeted MED territories: rural areas and islands. The COMPOSE team reached out a wide audience; more than 140.000 people were reached through awareness raising activities to influence local acceptance towards small-scale renewable energy projects, 105 key stakeholders were involved in Local Action Groups and 20 Capacity Building Workshops were implemented involving 470 policy decision makers and development planners.

Contribution to know how and added value

The project resulted in an integrated, bottom-up, holistic approach for designing, planning, implementing & evaluating sustainable energy projects, which was tested and verified with 15 real sustainable energy demonstration actions. Partners worked intensively with the local action groups, associate partners and networks of multipliers and concluded this work with the endorsement of a **Memorandum of Understanding on Energy Transition**², in order to motivate relevant actors involved into the policy development process to increase the share of RES and EE measures towards the achievement of Paris Agreement goals. More than 250 entities at the policy / decision making and local/ regional planning levels have signed the COMPOSE MoU by the end of the project.

Pilot 1 - Renewables connecting municipalities through their joint local potential

Location: Slovenska Bistrica and Zreče, Slovenia

Budget: 110.000 €

Description

The action promotes **energy efficiency and RES use in public buildings**. Feasibility studies and investment plans are foreseen to substitute fossil fuels with local energy sources:

- a) for the energy renovation of a sport centre towards zero energy levels
- b) a biomass heating system covering a school's energy needs.



Figure 3 - COMPOSE Pilot in Slovenka Bistrica: Designing a nearly Zero Energy Sports Hall

Result

The study propose **wood biomass heating** for a small village, Stranice, where the new biomass heating boiler will substitute **annual energy consumption of 220 MWh** from fossil fuels. **3 implementation scenarios** were studied for the **sport hall in Slovenska Bistrica**, to assess alternative funding sources. Overall, the study examined **different scenarios of EE and RES measures, aiming to substitute annual consumption of 110 MWh electricity, 147 MWh heating and 12 MWh sanitary water from fossil fuels**.

Impacts to be achieved by 2030:

- > CO₂ saved: 84 t/y;
- > Thermal energy generated from RES: 252.778 kWh;
- > Energy saved through the adoption of EE : 107.963 kWh.



Pilot 2 - Energy saving and renewable invest potential in public building

Location: Lakatamia, Cyprus

Budget: 80.000€

Description

The action foresees the **reduction of energy consumption and CO₂ emissions in two public buildings** owned by the Municipality of Lakatamia, with the installation of a **Building Energy Management System (BEMS)**.

Energy audits were performed to identify the energy needs, the savings and RES potential of the two municipal buildings, along with the savings potential that a BEMS could offer through controls and automations.



Figure 4 - COMPOSE Pilot in Lakatamia: BEMS installation at the Town Hall

Result

A **BEMS** was finally installed at the Municipal Town Hall first floor, in August 2018. It measures the total consumption of the building and manages to localize circuits of the different zones of the first floor. The BEMS functions include measuring of voltage, current and power factor and track the energy consumption instantaneously. It also allows downloading of all data for specific timeframes, in csv format.

An energy saving training campaign has been initiated leading to behavioural change of building users.

Impacts to be achieved by 2030:

- > CO₂ emissions saved: 225 t/y;
- > Electricity generated from RES: 257.000 kWh/y;
- > Energy saved through the adoption of EE measures: 830.000 kWh/y.

Pilot 3 - From energy saving to RES investments

Location: Provence-Alpes Côte d'Azur, France

Budget: 85.800€

Description

The pilot action raises public awareness on energy related issues, focusing to people with lower income. Home energy visits enhance energy diagnosis aiming to reduce energy consumption and encourage behavioral change of households and impulse a dynamic on green economy in the area. 40 households were directly supported and 500 vulnerable households were reached, with the collaboration of local companies and authorities.



Figure 5 - COMPOSE Pilot in Alpes Côte d'Azur Provence: Energy visits to lower income households

Result

The key elements of the action included:

- > Enhancement of the local housing retrofitting plan due to the identification of energy needs and appropriate solutions, through targeted energy visits to vulnerable households identified by social support organizations.
- > Capacity building activities on energy savings tips and measures, for the local social organisations' staff.
- > Awareness raising activities on renewable energy development through participative approaches (crowd funding, project development by citizens, cooperative economy).

Impacts to be achieved by 2030:

- > CO₂ emissions saved: 510 t/year;
- > Electricity generated from RES: 12,000 MWh/y;
- > Energy saved through EE: 1,200 MWh/y.



Pilot 4 - Fostering social acceptance and local investments of small-scale RES

Location: Rethymno Prefecture, Crete, Greece

Budget: 64.500 €

Description

The pilot action demonstrates the positive effects of RES applications, aiming to foster social acceptance and enhance local small RES investments.

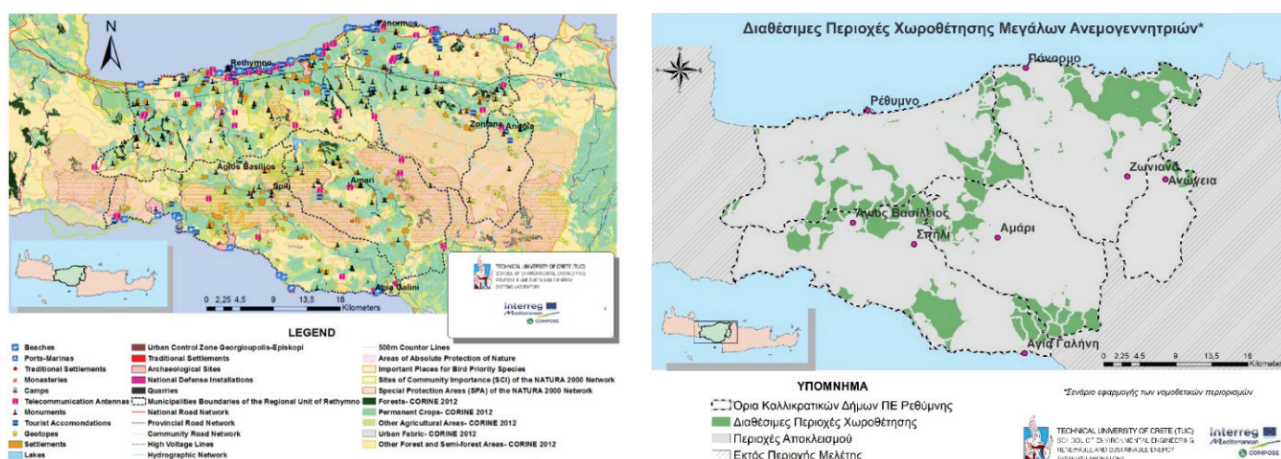


Figure 6 - COMPOSE Pilot in Rethymno: Maps presenting key parameters and optimum siting of RES

Result

A **web tool** was developed to **identify optimum siting** and to support a **quick assessment of the feasibility of small-scale RES applications**, using GIS & multi-criteria analysis. The tool provides a spatial and quantitative presentation of the available siting areas for RES installations in the Prefecture of Rethymno, taking into account **legal constraints and addressing socio-environmental concerns related to RES siting**, through a wide set of evaluation criteria.

A Q&A publication presents opportunities for small-scale RES investment including benefits, costs and payback period of different RES installations, current policy measures and relevant regulations.

Impacts to be achieved by 2030:

- > CO₂ saved: 27.450 t/y;
- > Electricity generated from RES: 84.510.000 kWh/y.

Pilot 5 - Biomass potential in rural island communities

Location: Anogeia, Crete, Greece

Budget: 60.000€

Description

The pilot analyses the impact of traditional fireplaces on indoor/outdoor air quality and educates local population to use efficient and environmentally friendly heating systems.



Figure 7 - COMPOSE Pilot in Anogeia Municipality: Indoor air quality monitoring

Result

- > A replicable methodology for the **assessment of social, economic and environmental impacts from the use of wood biomass** was developed.
- > Furthermore, a technical study assessed the **feasibility of a local chips production plant, 1,000 or 5,000 t of wood pellets capacity**, to boost the exploitation of locally produced biomass assessing different implementation scenarios.
- > A **practical guide**, including technical advices and solutions **on the improvement of heating systems and rational exploitation of the biomass residues** was delivered.

Impacts to be achieved by 2030:

- > CO₂ saved: 13.2 t/y;
- > Thermal energy generated from RES: 186.000 kWh/y.



Pilot 6 - From Used Cooking Oils (UCO) to biodiesel

Location: Rethymno, Crete, Greece

Budget: 72.000€

Description

The action aims to increase the UCO recycling rate and enhance its safe disposal, in the Municipality of Rethymno, by expanding and optimizing the collection network through the integration of “smart” sensors to the UCO collection bins and the monitoring of data transferred with GSM technology to a web-based platform.

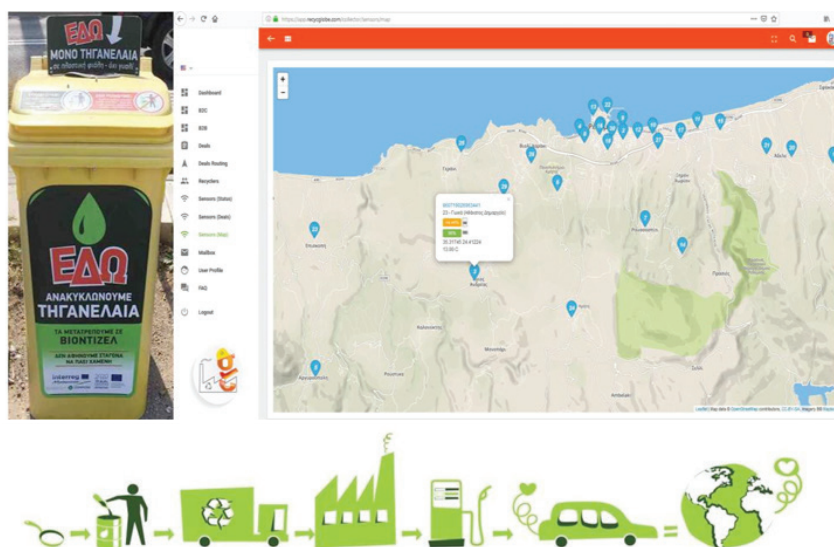


Figure 8 - COMPOSE Pilot in Rethymno: Smart UCO collection network and monitoring platform

Result

The **platform allows real-time monitoring of the UCO bins' filling level** and the optimization of the collector drivers' routes. It sends alerts at selected fill rate, temperature raise, battery level, unauthorized movements or vandalism incidents. Through the new **smart management system**, the collection efficiency is increased and operational costs are reduced. Fewer collection trips mean less fuel consumption and less greenhouse gas emissions.

A **small-scale biodiesel production unit** demonstrates the transformation of local collected UCO to biodiesel, while targeted communication activities **for citizens and schools challenge a behavioural change towards UCO proper recycling**.

The action, initiated by the Technical University of Crete, delivered a fully operational **“smart UCO collection to biodiesel system”** and a **viable business model** for local UCO collection, transformation and exploitation which can be easily replicated in other MED areas.

Impacts to be achieved by 2030:

- > CO₂ saved: 17 t/y;
- > Fossil fuels saved: 48.5 toe/y.

Pilot 7 - Greening Capalbio energy

Location: Capalbio, Italy

Budget: 55.000€

Description

The pilot action aims to challenge behavioural change of citizens and tourists towards energy efficiency and RES best practices.

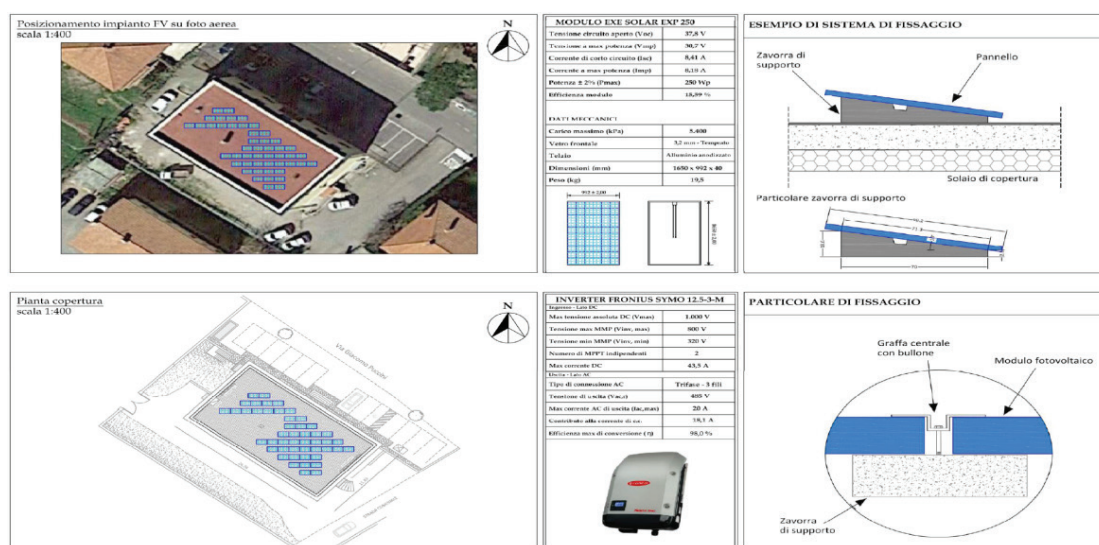


Figure 9 - COMPOSE Pilot in Capalbio: PV installation at the Municipality building

Result

- > A **10 kW PV plant** was installed on the roof of the **municipality building**, with a **monitor display informing citizens** on the energy production and CO₂ emissions savings achieved.
- > An **Energy Development Plan** for the Municipality of Capalbio was also developed, assessing different sustainable energy solutions, aiming to increase RES share in the local energy mix.

Impact to be achieved by 2030:

- > CO₂ emissions saved: 175 t/y;
- > Electricity generated from RES: 304.500 kWh/y.



Pilot 8 - Energy upgrading in historical rural municipalities

Location: Giove, Italy

Budget: 38.000€

Description

The pilot action demonstrates the feasibility and benefits of the integration of a PV system into the roof of the Town hall.



Figure 10 - COMPOSE Pilot in Giove: Dissemination activities at schools

Result

- > A **4 kW BIPV³ plant with red panels** was integrated into the roof of the **historic municipal building**. The system includes a **display, demonstrating the energy production achieved and greenhouse gas emissions saved**.
- > A study providing **recommendations to Giove Municipality's** staff for potential **future investments on RES and energy efficiency** has been realised
- > A **targeted campaign focused on raising citizens' interest in BIPV** systems on historic buildings, aim to foster replications to nearby communities and other historic MED cities, has been done.

Impacts to be achieved by 2030:

- > CO₂ emissions saved 78 t/y;
- > Electricity generated from RES: 110.000 kWh/y.

Pilot 9 - RES in rural environments - Sesimbra

Location: Sesimbra, Portugal

Budget: 72,260€

Description

This pilot aims to enhance the energy independence of Sesimbra Natura Park's buildings, by replacing conventional energy technologies with RES.



Figure 11 - COMPOSE Pilot in Sesimbra: PV installed at Sesimbra Natura Park

Result

- > A **“living-lab”** involving different local stakeholder groups assessed a set of technological, pedagogical and business solutions.
- > A **small-scale 12 kW PV system** was installed and monitored using appropriate energy metering and is expected to raise awareness and to motivate rural communities to adapt similar technologies.

Impacts to be achieved by 2030:

- > CO₂ emissions saved: 150 t/y;
- > Electricity generated from RES: 648,000 kWh/y.



Pilot 10 - RES in rural environments - Biovilla

Location: Biovilla, Portugal

Budget: 62,760€

Description

This pilot aims at creating long-term sustainability of the Biovilla's buildings.



Figure 12 - COMPOSE Pilot in Biovilla: Installation of small scale RES equipment

Result

- > A **“living-lab”** allowed the evaluation of different small-scale RES equipment and helped to raise energy awareness of the local community and to create new opportunities for green entrepreneurship.
- > **Solar dehydrators** used by the regional producers (to preserve the surplus food), a **solar stove** (for food preparation and as a didactic element), **solar pumps and lamps**, were installed.
- > A **digital platform**, linked to energy monitoring equipment, presents -real time- the energy consumption and CO₂ savings to the end users.

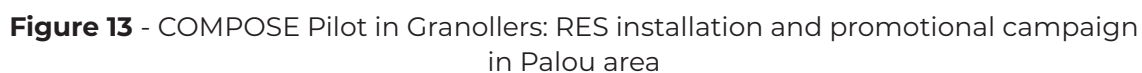
Impacts to be achieved by 2030:

- > CO₂ emissions saved: 31 t/y;
- > Energy saved through the adoption of EE & RES: 17,150 kWh/y;



Budget: 113.880€

The action aimed to mobilize energy related business and general public focusing to people with lower income. Demonstrative biomass and PV installations are in place. Wide awareness raising campaign has been initiated to enhance citizens' behavioural change towards energy efficiency and RES.



Result

The Municipality of Granollers carried out the following activities:

- > **Awareness raising campaign**, focused on vulnerable households. 8 training sessions on energy savings and RES promotion and engagement of more than 90 local stakeholders, led to energy saving of 2.803 electricity kWh/y, 5.241 gas kWh/y, 418 water m³/y in 11 public facilities.
- > **3 demonstrative small PV systems** were installed, offering 31 MWh/y energy savings.
- > Development **study of a thermal network from local forest biomass**, with a potential to achieve savings of 158.217 kWh/y, 43 TnCO₂ eq /y of GHG emissions, 12.414 €/y.
- > **Study on the “Strategy on mobilising investments for RES & EE measures in the rural area of Granollers”** aiming to contribute to the local community’s growth and creation of new jobs at local RES companies (suppliers and installers), facilitating the improvement of the existing power grid and reducing its external dependency.

Impacts to be achieved by 2030:

- > CO₂ emissions saved: 390 t/y;
- > Electricity generated from RES: 648,000 kWh/y
- > Thermal energy generated from RES: 815,000 kWh/y



Pilot 12 - Development of Energy Investment Plan

Location: Koprivnica-Krizevci, Croatia

Budget: 60.715€

Description

The pilot targets to the establishment of strong cooperation with local authorities to develop strategies for sustainable energy investments on a regional scale.



Figure 14 - COMPOSE Pilot in Koprivnica-Krizevci: Building local partnerships

Result

An Energy Investment Plan (EIP) incorporating multi-level governance principles has defined appropriate investment projects, based on a sectoral approach (i.e. aggregation of similar projects in terms of technology, size, target groups etc.), which are expected to contribute to increased RES share in the energy mix, GHG⁴ emissions' reduction and therefore to increase energy independence in the region.

Impacts to be achieved by 2030:

- > CO₂ emissions saved: 19,250 t/y
- > Electricity generated from RES: 58,759 MWh/y
- > Thermal energy from RES: 406,576 MWh/y
- > Energy saved through EE: 6,605 MWh/y

4 Greenhouse Gas



Pilot 13 - Fostering RES awareness through School Programmes

Location: Kamza Municipality, Albania

Budget: 34,000€

Description

This pilot targets to increase energy independence and behavioural change towards the reduction of energy consumption and GHG emissions.



Figure 15 - COMPOSE Pilot in Kamza: Biomass heating system in Kindergarten

Result

- > A study assessing biomass use, as public buildings' heating source, was developed and a biomass heating system has been installed in a kindergarten for demonstrative reasons.
- > A report studying the fuelwood demand in Albania and the feasibility of a biomass plant in Kamza Municipality was delivered, including recommendations on wood biomass residues' usage.
- > Training activities, promoting the efficient use of biomass towards local stakeholders, municipality staff, school teachers and parents were initiated.

Impacts to be achieved by 2030:

- > CO₂ emissions saved: 169 t/y;
- > Thermal energy generated from RES: 268.800 kWh/y.

Pilot 14 - RES for Municipality development

Location: Srebrenik, Bosnia-Herzegovina

Budget: 30.000€

Description

The pilot action studies a biomass heating plant reconstruction project aiming to exploit the local biomass potential.



Figure 16 - COMPOSE Pilot in Srebrenik: Design plans of a new biomass heating plant

Result

A **technical study for a district heating system** to substitute the energy from coal, exploiting wood biomass (wood chips) in a modern boiler, has been delivered for the city of Srebrenik. The **business model** proposed an innovative approach to involve relevant actors to the local biomass value chain.

Impacts to be achieved by 2030:

- > CO₂ emissions saved: 885 t/y;
- > Waste to energy: 4,200 toe /y;
- > Thermal energy generated from RES: 726,000 MWh/y.





Pilot 15 - Wind Farm in Montenegro

Location: Krnovo, Montenegro

Budget: 26,000 €

Description

The action evaluates the effects of a large-scale RES investment (72 MW wind farm), recently developed in Montenegro.

Result

Realisation of an **economic analysis aiming to assess the sustainability of the wind farm**, the impacts in the local economy, environmental and social impact and investigates its contribution to the national goals for RES share and the correlation with the market liberalization in Montenegro.

Impacts to be achieved by 2030:

- > CO₂ emissions saved: 510,000 t/y;
- > Electricity generated from RES: 220,000MWh/y.



Policy recommendations

The policy recommendation of the COMPOSE project are mainly summarised in the **COMPOSE Memorandum of Understanding**, entitled “**Energy transition: from global necessity to local opportunity**”.

Preamble

We are facing an unprecedented human-caused climate crisis whose effects are already tangible. The scientific community, most recently with the October 2018 Intergovernmental Panel on **Climate Change’s Global Warming of 1.5 ° C** special report, has been reiterating its call for the urgency to act to reconsider the relationship between current growth patterns and the irreversible damages to ecosystems, the risks of social instability, uncertainty and increased costs to prevent, mitigate and adapt to the consequences of ungoverned climate changes.

The world has recognized what is at stake with the **Paris Agreement** and the **Sustainable Development Goals** (SDG), specifically **SDG 7. Ensure access to affordable, reliable, sustainable and modern energy for all**. The **European Commission** has proposed the Strategy on the sustainable use of natural resources, the Strategy on bio economy and has adopted A clean planet for all, a long-term vision for a competitive and climate neutral economy by 2050, prioritizing attention on energy policies and low-carbon economy through an energy model that increases energy efficiency (EE) and promotes energy production from renewables (RES).



Reshaping our energy future

To build the prosperous society of the future we need to reconsider our present energy model: the COMPOSE project, with Partners in 11 Mediterranean countries - Albania, Bosnia & Herzegovina, Croatia, Cyprus, France, Greece, Italy, Montenegro, Portugal, Slovenia and Spain - has implemented 15 small-scale projects, demonstrating the advantages of energy transition concept shifts at the local level.

Tested working methods, with the key elements of the bottom-up and participatory approaches, have resulted in transferable and replicable elements as well as potentials for scaling up, on the basis of the win-win energy reshaping opportunity for local communities, with positive impacts ranging from CO₂ emission decrease to new jobs creation, optimization of local biomass management and reduction of bio waste, the creation of local supply chains, opening new and green business and improving the local population's quality of life.

The COMPOSE Memorandum of Understanding

By signing this Memorandum of Understanding, we manifest interest:

- > To promote RES and EE-based energy planning, to test and apply the COMPOSE approach, based on participatory co-development, social and technological innovation and optimization of local natural resources as a possible driver for local sustainable development.
- > To share information regarding COMPOSE and our own projects, contributing to the dissemination and relevance of energy-conscious communities in the Mediterranean area and beyond.
- > To support the ambitious implementation of the December 2015 climate change Paris Agreement, for a carbon neutral EU by 2050.

It is possible to **manifest its own interest and agreement**, signing the COMPOSE project MoU at the following link: <https://compose.interreg-med.eu/memorandum-of-understanding/memorandum-of-understanding/>

By the end of the project, **more than 250 entities** at the policy / decision making and local/regional planning levels have signed the COMPOSE MoU.



Contributions to the Ecosystemic Transition Unit model

The Ecosystemic Transition Unit model has been defined by the Interreg MED Renewable Energy Community during on the basis of the activities and results of the projects belonging to the community, as a capitalisation methodology of the latest. An Ecosystemic Transition Unit **is a territory implementing its energy transition taking into account an ecosystemic approach**, based on the following main aspects/pillars: **technological** (energy facilities), **social** (energy community), **legal** (energy governance) and **territorial** (energy planning).

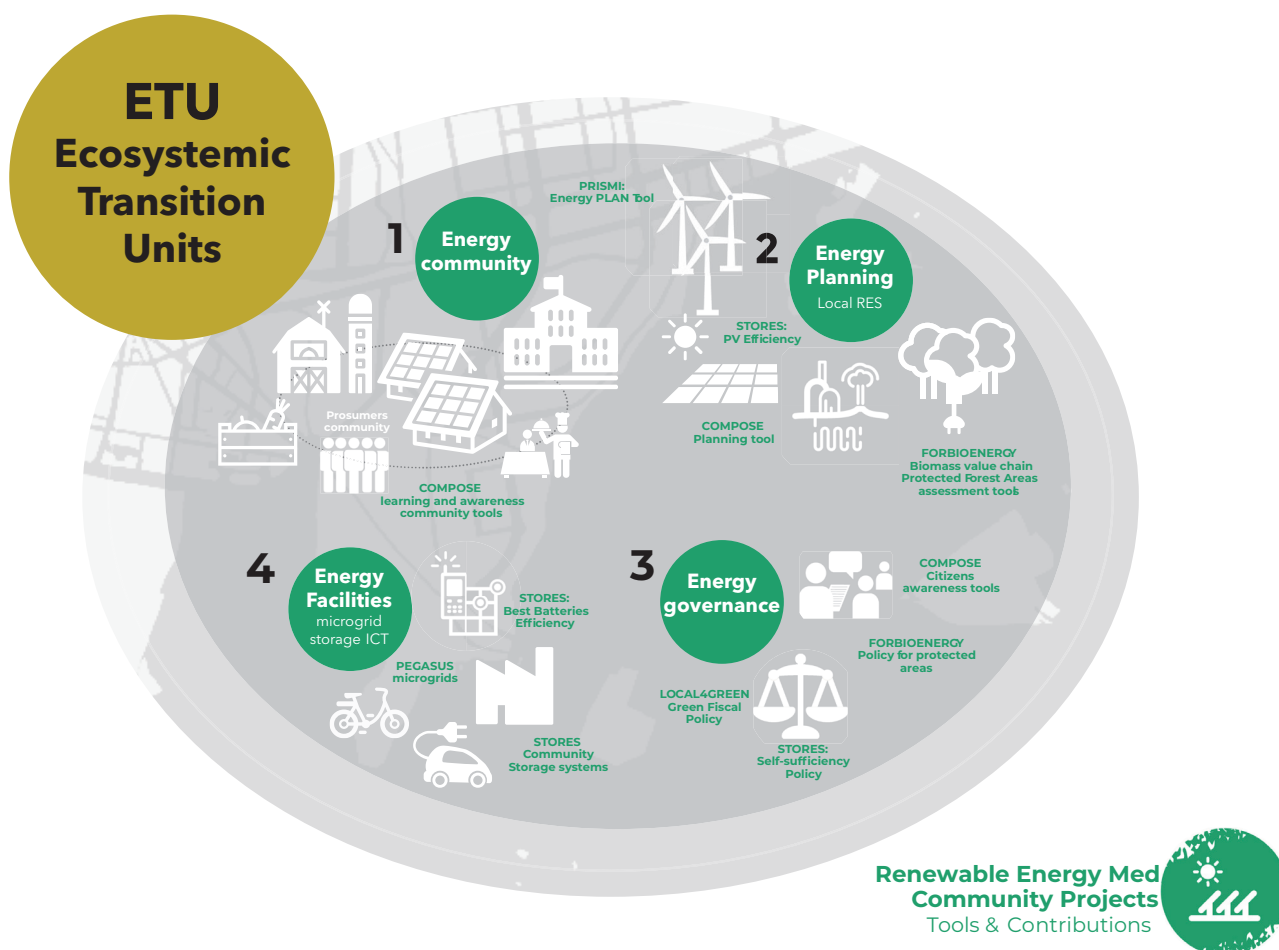


Figure 17 – Scheme representing the 4 components of the *Ecosystemic Transition Unit* model

In that conclusion phase of the project of the community, it is important to understand more precisely the **contribution of each project to the general ETU model**. Regarding the COMPOSE project, it is possible to underline the following impacts on the 4 main characteristics of an ETU:

Energy Community

The COMPOSE methodology has been developed for the implementation of Renewable and energy efficiency measures at local level, through the creation of a local action group, involving all the local stakeholders and also the citizens. This methodology can be applied to create energy communities, as a local action group acting for the local production and share of energy produced by renewable sources.



Moreover, to monitor and assess the pilot actions' impact on communities, partners agreed on common indicators, taking into account environmental, energy and economic aspects with horizontal measuring of social capital indicators, targeted to determine life quality, growth and sustainability. During the final stage of the project, the COMPOSE team reached out to large group of stakeholders, offering know-how, experience and best practice examples to influence local acceptance towards small-scale renewable energy projects.

Energy planning

The [Sustainable Energy Planning Toolbox](http://www.reselplan-toolbox.eu) allows to navigate to the COMPOSE step-by-step, bottom-up methodological approach for designing, planning, implementing and evaluating sustainable energy projects. It offers insights on how to implement each development step and access to appropriate design tools, databases, practical guides and other useful resources, towards a sustainable development of local RES and energy efficiency measures, exploiting the local potential and integrating not only technical, but also socio-economic and environmental aspects. It can be useful to the policy makers, development planners and local authorities' technical staff involved in the development and implementation of local/regional energy plans to the transition towards low carbon communities. The online tool is available at the following link: www.reselplan-toolbox.eu.

Energy facilities

In the framework of the COMPOSE project, a huge set of RES facilities have been studied and implemented mostly for demonstration purposes. All the installed pilot plants give also an overview of capacities and potentialities that can be replicated in other contexts.

Energy Governance

On the [Sustainable Energy Planning Toolbox](http://www.reselplan-toolbox.eu) developed by the COMPOSE project, it is possible to access to the most recent EU policies collected in the "EU Policy" section of the toolbox. This collection allows to a user to have a general overview of the energy transition policy framework at EU level.



Conclusion

The COMPOSE project addressed the development and implementation of RES and EE measures at local level in rural contexts. One of the main outcome of the project is the COMPOSE methodology, created especially to build Local Action Groups aiming to develop Local Action projects for the implementation of RES and/or EE measures for the energy transition of territories. The second main outcome of the project is a support tool for the planning and implementation of these kind of measures and projects. These tools are valuable assistance instruments for the staff of the local stakeholders involved in their energy transition process and will allow them to implement, step-by-step, local actions for increasing the RES of their energy mix and their Energy Efficiency. Moreover, the COMPOSE project was focused also on citizens awareness raising, fundamental basis for a bottom-up process of territorial sustainability change and energy system switch.

As part of the Interreg MED RES Community, the COMPOSE project participates mainly and in a very relevant way to the “Energy planning” and “Energy Community” as *Ecosystemic Transition Unit* components. The model of *Ecosystemic Transition Unit* has been thought to be used by the territorial/energy planners of the local authorities of remoted and isolated territories in the MED areas. As a community, our main work now is to diffuse these results, policy recommendations and tools already available and tested and to support local authorities to applied it on their own territory.

This report describes very briefly the *modus operandi* of the COMPOSE project and more precisely the pilot activities implemented in the MED area, in order to make the conclusions, results, and tools created, easily understandable and applicable for the national and local authorities potentially interested in applied it in their process of energy transition. For more details, it is possible to refer to the COMPOSE project website (<https://compose.interreg-med.eu/>) and particularly its deliverable library (<https://compose.interreg-med.eu/what-we-achieve/deliverables-database/>) and to the Interreg MED RES Community website (<https://renewable-energies.interreg-med.eu/>) and its deliverable library (<https://renewable-energies.interreg-med.eu/what-we-achieve/deliverable-library/>).



