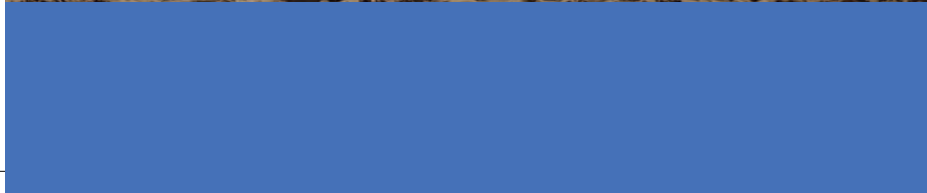




**RURAL
COMMUNITIES
ENGAGED
WITH POSITIVE
ENERGY**



Final publication- COMPOSE Interreg
MED project



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CLIMATE CHANGE, THE NEED FOR ACTION





The Mediterranean is a diverse geographical area of different economic, social, political and environmental conditions. On the other hand, the whole Mediterranean region faces growing energy demands and it is one of the world's climate change hotspots. It is one of the most vulnerable regions to climate change and will increasingly be exposed to extreme climate events, rising air and sea temperatures and water scarcity.

It has become clear that the only way to reach the objectives of the Paris Agreement is through a complete and comprehensive decarbonization of our energy systems. Both present and future generations are relying on us to chart a course towards a future that is not threatened by climate change. Renewable energies (RE) and energy efficiency offer a unique opportunity for the Mediterranean countries to reduce their vulnerability in terms of energy security and climate change. Using more and more RE offers this opportunity and, what's more, can serve as a means of socio-economic development. RE transition ensures that energy can continue to play the fundamental role in socio-economic development it has played so far, but without environmental degradation and the concentration of economic power in the hands of a few. Rural and island areas of the Mediterranean area should also promote agroecological concepts which are focused on smallholder farming within villages or states. Such a transition to sustainable agriculture, which often includes the use of mini-grids, solar systems or biomass energy use, promotes rural economic development and boosts eco-tourism. Progressive revitalization of the energy market basic conditions at local and regional levels, starting from the improvement of the technical know-how and market viability in communities is needed. This also means creation of job opportunities in innovative sectors, quantitatively depending on the dimensions of each local community. Besides RE, energy efficiency is one of the most cost-effective ways to ensure energy-security and reduce greenhouse gas emissions. It is often referred to as the 'low-hanging fruit', but challenges remain high, particularly because of the diversity of energy uses.

But the designing of new RE models is very complex and

require the involvement of experts from different backgrounds. This task requires a large amount of financial and human resources. Under most conditions, increasing the share of RE in the energy mix will require policies to stimulate changes in the energy system. Additional policies would be required to attract the necessary increases in investment in technologies and infrastructure. Specific policies for research, development, demonstration and deployment help to level the playing field for renewable energy. It is more sustainable to develop renewables strategy together with key governmental bodies, NGOs, research institutions, energy agencies, companies and other relevant local, regional or national change agents. Stakeholder involvement is crucial, but is not easy to achieve.

Research projects like COMPOSE are important building blocks in the process of RE systems planning and their increase in the energy mix. Projects that promote an increase in RE capacity installations can help to overcome various barriers such as institutional barriers related to existing industry, infrastructure and regulation of the energy system, lack of general information and access to data relevant to the deployment of RE, lack of technical and knowledge capacity, and barriers related to societal and personal values affecting the perception and acceptance of RE technologies.

The COMPOSE project is only the starting point and the implementation of the energy action plans is still to be organised. Nevertheless, all partners involved now benefit from new approaches for developing and improving their sustainable energy policies as well as from a strong involvement from local actors.

Lučka Kajfež Bogataj



Besides air, water and food, energy is one of the most important resources for the existence and development of humanity. Energy drives all development in the world and its accessibility directs the evolutionary cycle on earth. With the technical and economic development and raising of personal standards, these needs will grow. Consequently, the boundaries of environmental and spatial sustainability will soon be reached and exceeded. The step of balancing and modelling acceptance of the use of natural resources will require a high level of awareness and an "ascetic attitude" to personal consumption.

More and more settlements and cities are considering how to manage their resources more sustainably and efficiently.

In doing so they want to have clean drinking water, clean air, sustainable electricity and a regulated living environment. Renewable energy sources (RES) are becoming crucial for meeting the growing energy needs of a modern society. Technology for the production of energy from RES is rapidly evolving, which also provides new opportunities for the decarbonisation of local energy systems.

The Mediterranean area is extremely diverse in climatic and topographic conditions. The inclusion of renewable sources is at its very beginning. However, it has many natural resources for a high degree of energy self-sufficiency. The current situation calls for the use of RES potentials. The introduction of RES and energy-efficiency measures are inextricably linked to the innovation of society, not only from a technical point of view, but from a social one as well. Such an aspect, however, requires a different approach when planning development with renewable energy sources and energy efficiency. This interferes with the essence of individual business planning and the way of transferring local (regional, national) visions into concrete

development opportunities. All the activities must contribute to increasing the capacity of sustainable renewable energy sources, which are planned at decision-making and expert-planning levels. By changing the perception of renewable energy sources and the energy efficiency of sectorial policies to horizontal principles, the investment will become more attractive to investors and in promoting new business models, technological development in the field of green energy, and strengthening the green economy at the macro and micro levels.

In the final publication in front of you, the Compose project represents holistic planning tools at the level of municipalities and regions of the Mediterranean, as well as the recommendations of the approach to development planning for greater integration of renewable energy sources and energy-efficiency measures. The project partners have made a significant step forward in thinking and the importance of using local energy sources on the road leading to more sustainable energy supply and reducing the risk of energy poverty.

However, there are many challenges that still remain and COMPOSE partners are considering them today for new project opportunities in the future.

Dr. Stane Klemenčič





**CONNECTIVITY,
PARTNERSHIP,
RESOURCE
MANAGEMENT**

COMPOSE project builds energy communities

The COMPOSE project builds on existing experience, best practices and know-how of MED/ EU-funded projects and provides a new holistic approach for RES planning models that promote the increase of RES in the regional/local energy mix, through the development of sustainable energy supply chains and the enhancement of local businesses. The COMPOSE model has been tested by implementing 15 demonstration actions in 11 MED regions: Slovenia, Cyprus, France, Greece, Italy, Portugal, Spain, Croatia, Albania, Bosnia and Herzegovina and Montenegro.

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.

Compose project has joined a wide range of stakeholders in 11 MED regions



8. AWARENESS RAISING: PROMOTION, COMMUNICATION AND DISSEMINATION

This is a horizontal step with the aim of developing a comprehensive communication and awareness-raising document and capacity-building activities.

7. MONITORING AND EVALUATION

Monitoring and assessing a project's impact, with a predefined set of indicators, helps to improve the whole planning process in the next iteration, to communicate its outcomes, and facilitates the replication and transfer of successful initiatives.

6. IMPLEMENTATION PROCEDURES

In this phase, the ideas are put into reality to become concrete projects in the field, by following appropriate procedures and providing technical expertise, necessary support and documentation.

5. CREATING LOCAL PARTNERSHIP

Creating local partnership means developing a partnership committed to project accomplishment. Local partnerships concretize the EE /RES measures, defined by the LAG, in a form of an implementation partnership or business initiative.

1. CHOOSING A PROBLEM

The aim is to simplify the identification priority of 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)

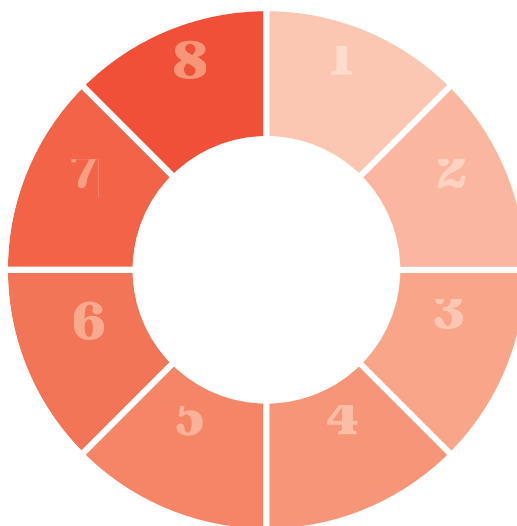
Engaging local communities and stakeholders in developing efficient and meaningful local plans is crucial. Significant benefits can be derived from genuine participatory approaches including: incorporating the experience, the knowledge and concerns of the community in the plan; minimizing or even avoiding potential conflicts. The different nature of each RES/EE project, its requirements, and level of impact on different stakeholder clusters should be taken into account when selecting appropriate LAG members.

3. LOCAL ACTION PLAN

A local energy action plan translates long-term strategy into actions. With a well-balanced energy action plan, local communities may benefit from a higher quality of life, with increased opportunities for all citizens, reasonable use of natural resources, social cohesion and economic prosperity.

4. EMPOWER POLICIES AND LOCAL SKILLS

The challenge is capacity building and awareness raising as a mean of empowering local communities to enhance energy efficiency and renewable energy best practices.



Include forests for a step toward 1,5°C

In remote areas, wood biomass can be a substitute for fossil fuels in the very near future. Local action groups in the Municipalities of Zreče and Slovenska Bistrica recognized a local potential from forests in the surroundings. Feasibility studies show great potential of saving CO₂, which is close to 150 t eq annually. The project contributes to the exploiting of a local energy source from local forests of the high natural value area of Pohorje. According to the feasibility study, local farmers or local enterprises could contribute with biomass supply and services. Local biomass is a step forwards to the energy independence of small communities. It is foreseen to implement two investment potentials, which are the renovation of a sports centre towards zero-energy level and a biomass heating system covering a school's energy needs and exploiting the potential of a local wood.



MACRO OBJECTIVE:

Involve a local action group to boost the local economy

SPECIFIC OBJECTIVES:

- Raise awareness about the importance of the quality of biomass fuel
- Improve local-based energy supply chains
- Take advantage of Natura 2000 biomass potential

Well-managed forests can provide energy security and energy independence for rural communities. They are the most abundant energy source in Slovenia.

IMPACTS ACHIEVED BY 2030:

- CO₂ saved: 84 t CO₂/y
 - Thermal energy generated from RES: 252,778 kWh/y
 - Energy saved through the adoption of EE: 107,963 kWh/y
-



The Municipality of Srebrenik is located in the Dinaric Alps, in a traditional industrial area full of minerals assets like arsenic, nickel, cobalt, coal and industrial stone. Due to its geographic position, the municipality used a district heating system using local coal. Now, the system is old, inefficient and the air quality is very bad. The local action group, formed in the COMPOSE project, set the fundamentals for the new district heating, using woodchips from local forests. In the project, a private-public partnership is proposed, with complete reconstruction of the heating system for the city of Srebrenik. An appropriate business model ensures an innovative approach in involving relevant actors in the local biomass value chain.

MIDDLE: The Srebrenik delegation visited the lead partner in Maribor and biomass centres in Slovenia

MACRO OBJECTIVE:

To improve the air quality and to create new jobs

SPECIFIC OBJECTIVES:

- Establish RES cooperative
- Boost the local energy economy

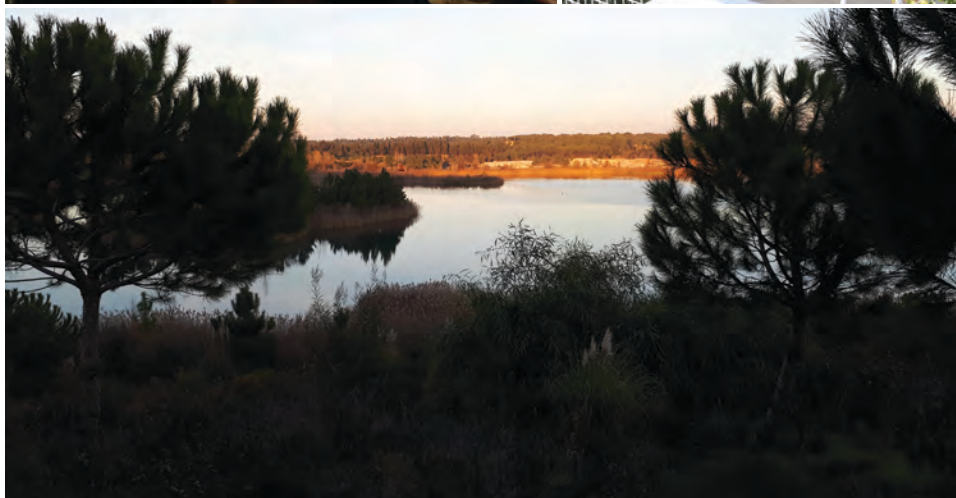
The Municipality of Srebrenik is looking for the co-financing of an investment in biomass district heating.

IMPACTS ACHIEVED BY 2030:

- CO₂ saved/y: 255 t Waste to energy: 4,200 (toe)
 - Electricity generated from RES: 726,000,000kWh/y
-

Biomass resources: A challenge for remote areas

Granollers, famous for its traditional agriculture, has been identified as a potential case study area for an RES demonstration project. There is a great opportunity to improve local potential for energy saving and local biomass resources usage in four public facilities: the old school, the agricultural development office, Palou public centre and the Palou football ground. Good practice will assist in supporting the implementation of additional micro investments and achieving a behavioural change among the inhabitants.



MACRO OBJECTIVE:

To develop local investment opportunities in EE measures and RES pilot projects

SPECIFIC OBJECTIVES:

- Engaging local stakeholders in energy-saving measures and RES implementation
- Raise awareness about RES benefits
- Increase RES share in the local energy mix

This capacity-building campaign engaged more than 90 local inhabitants and other stakeholders in the Palou area.

IMPACTS ACHIEVED BY 2030:

- 30,000 kWh/y from biomass waste
-

TOP LEFT: Stakeholders discuss RES potentials in Granollers.

BOTTOM: Natural park Biovilla.



In the mountainous villages of Crete, winters are hard with low temperatures, heavy snowfall and strong winds. For heating purposes, households use mainly traditional fireplaces or wood stoves. The Technical University of Crete analysed the impact of traditional fireplaces on indoor/outdoor air quality, in the village of Anogia, and taught the local population how to choose more efficient and environmentally friendly heating systems. A replicable methodology for the assessment of social, economic & environmental impacts from the use of wood biomass, lessons learnt and key findings from the statistical analysis of data collected in Anogia during the field surveys surveys and measurements and a practical guide on heating systems with the exploitation of the biomass residues were delivered. A feasibility study of a local production plant for pellets was developed aiming to boost the exploitation of locally produced biomass.

MACRO OBJECTIVE:

Increase the energy independence of mountain villages by exploitation of local biomass residues for heating purposes in small chip production units

SPECIFIC OBJECTIVES:

- Raise awareness of the local population and local authorities about more

efficient biomass heating systems.

- Provide local actors with a business opportunity of setting up and operating a local small wood pellets production unit
- Reduced costs for heating for rural households

An easily transferable business plan

for setting up and operating a local small wood pellet production unit in mountainous rural areas

IMPACTS ACHIEVED BY 2030:

- 5,000 m³ from biomass residues
 - CO₂ emissions saved/y: 13.2 t
 - Thermal energy generated from RES: 186,000 kWh/y
-

Change habits through making decisions conscious



A new “smart” Used Cooking Oil (UCO) collection system, which was launched in Rethymno, increases waste management efficiency and promotes clean fuels. The Renewable and Sustainable Energy Systems Lab of the Technical University of Crete, in collaboration with local stakeholders, defined an operational scheme for a full UCO-to-biodiesel chain. A total of 30 point integrating sensors with GSM technology were installed. The sensors transfer real-time data to a web-based platform which monitors the filling level and the location of the bins, provides optimum routes for the UCO collector and sends alerts in case of leaks, unauthorised movements or temperature rise. Dedicated signage promotes proper UCO disposal. This smart system increases UCO collection efficiency and reduces operational costs. Fewer collection trips mean less fuel consumption and greenhouse gas emissions. A small-scale biodiesel production unit tests the UCO transformation to a clean fuel. A feasibility study examines the specifications of local biodiesel production from locally collected UCO for the benefit of the local economy and environment.

MACRO OBJECTIVE:

- Behavioural change of citizens and school children towards recycling
- Improvement in quality of life with cleaner atmosphere and water resources
- GHG emissions reduction by decrease of fossil fuels use
- New job opportunities by creating new business models and local investments

SPECIFIC OBJECTIVES:

- Increase rate of UCO recycling
- Safe disposal of UCO
- Raise awareness of citizens about UCO recycling benefits
- Initiate viable local energy synergies

Rethymno region collects used cooking oil at 20 locations.

IMPACTS ACHIEVED BY 2030:

- CO₂ emissions saved/ y: 17 t
- Energy saved: 480,000 kWh/y



Analysis of the potentials developed for the Palou area indicated additional potential strategies for energy-efficiency measures and renewable energy sources. Drawing up strategies and development plans is crucial for further project implementation and funds mobilization. The COMPOSE project managed to connect three sectors: farming, industry and residential, which signed the partnership agreement of the investment plan and realizable actions.

The sustainability of the partnership is ensured through active participation of representatives of the Ajuntament of de Granollers, its environment and green spaces as well as economic promotion departments. It is crucial to cooperate with inhabitants and farmers in the local Palou area.

MACRO OBJECTIVE:

- Development of local investment opportunities for EE and RES pilot projects
- Behavioural change of citizens and potential micro investors in relation to EE and RES measures

SPECIFIC OBJECTIVES:

- Energy saving in the operation of public facilities in rural and suburban areas
- Engaging local stakeholders in energy-saving measures and RES implementation
- Raise awareness about RES benefits
- Increase RES share in the local energy mix
- Reduce energy dependence

A bottom-up approach means to bring together numerous small pieces to bring things into reality.

IMPACTS ACHIEVED BY 2030:

- CO₂ saved/y: 212 t
- Electricity generated from RES: 208,000 kWh/y
- Thermal energy generated from RES: 815,523 kWh/y

Energy poverty is a social problem. It is our problem!

Old Mediterranean towns are beautiful with their narrow streets and colourful window-shutters. Some of the problems we focus on in old city centres are vacancy, ageing (ameriški spelling) of inhabitants and degradation of building conditions. Low-income households mainly live in houses in bad condition with high energy costs.

Aiming to decrease the trend of energy poverty in Provence Alpes-Côte d'Azur, the COMPOSE project contributed with energy visits to complete the territorial energy diagnosis and specify the type of energy-efficiency measures and renewable energy possibilities. Local craftsmen and local authorities developed proposals for implementing individual or collective energy-efficiency measures. Considering the market analysis supported by the community approach seems an efficient solution for the mitigation of energy poverty.

"A LOCAL
STAKEHOLDERS'
NETWORK
TOGETHER
AGAINST ENERGY
POVERTY."

MACRO OBJECTIVE:

- Reduce energy consumption of households
- Encourage the green economy in the area
- Activate a collective dynamic on energy (EE and RES)

SPECIFIC OBJECTIVES:

- Raise awareness of the public about energy transition and involve them in concrete measures with

- the support of the local authority
- Support local companies / craftsmen creating customised solutions for the area's inhabitants in conjunction with inhabitants' feedback and the local authority

**800–1000 people informed on RES;
almost 100 households supported.**

IMPACTS ACHIEVED BY 2030:

- 40 households directly supported

- and 500 vulnerable households reached
- 20 households benefiting from energy monitoring
- 40,000 kWh/year saved and about €4000 saved
- 45 social workers, charitable organizations and craftsmen involved
- Further energy-saving measures planned for vulnerable households



An awareness-raising campaign was addressed in the area of Palou was addressed to mobilize the opportunities for saving energy and development of RES projects. The consortium used the ESTALGIA methodology, called "D.E. Palou" ("Denomination of Energy Palou") with the aim of fighting against energy poverty and consequently supporting local investors to apply RES and EE measures. The main actions included the design and implementation of 8 informative and training sessions on energy saving and RES promotion in Palou area; the quantification of energy saving in 11 public facilities monitored was also achieved.

MACRO OBJECTIVE:

- Local investment opportunities (EE measures and RES pilot projects)
- Behavioural change of citizens and potential micro investors in relation to applying EE and RES measures.

SPECIFIC OBJECTIVES:

- Energy saving in the operation of public facilities in rural and suburban areas
- Engaging local stakeholders in energy-saving measures and RES implementation
- Raise awareness of RES

benefits.

- Increasing RES share in local energy mix
- Reducing energy dependence

8 informative and training sessions on energy savings and RES promotion carried out in Palou area.

IMPACTS ACHIEVED BY 2030:

- Energy saving in 11 public facilities: 2803 electricity kWh/y, 5241 gas kWh/y, 418 water m3/y
- Engagement of more than 90 local stakeholders

The sun is simply one big battery for us

The buildings of Can Cabanyes and Can Muntanyola public centre in the Municipality of Granollers are equipped with new power plants, installed on their roofs. In accordance to previously implemented analysis of the potential, energy saving, reduction of greenhouse gas emissions and economic savings are expected. The investment was carried out by Granollers city council from its own budget.



MACRO OBJECTIVE:

- Local investment opportunities (EE measures and RES pilot projects)
- Behavioural change of citizens, and potential micro investors in relation to application of EE and RES measures

SPECIFIC OBJECTIVES:

- Energy saving in the operation of public facilities in rural and suburban areas
- Engaging local stakeholders in energy-saving measures and RES implementation
- Raising awareness about RES benefits
- Increasing RES share in the local energy mix
- Reducing energy dependence

Granollers city invests in self-sufficient energy systems for public buildings.

IMPACTS ACHIEVED BY 2030:

- 17,000 kWh/y from solar radiation (pending to define concrete potential according to energy demand)

Lakatamia Municipality focused on high-cost energy consumption, mainly caused by heating and cooling needs of the municipal buildings. The purpose of the pilot was the reduction of energy consumption and CO₂ emissions in two public buildings, with the installation of a Building Energy Management System (BEMS). The BEMS enables the identifying of areas, systems and processes in the two buildings, that consume larger energy amounts, where actions for energy reduction through equipment optimization have to be taken. The BEMS can also reduce energy consumption through controls and automation. Constant monitoring by the energy team of the Municipality provides the opportunity to further reduce energy consumption and for continuous process optimization. A training session aims at increasing awareness and helps tackle problems in energy consumption that come through user's habits.



MACRO OBJECTIVE:

- Increase energy efficiency
- Reduce greenhouse gas emissions
- More energy-efficient processes
- Initiation of energy saving educational campaigns
- New skills acquired by personnel of the energy team conducting the monitoring
- Behavioural changes of building users

SPECIFIC OBJECTIVES:

- Raise awareness about the various systems for energy consumption
- Monitoring of energy consumption
- Training of building users
- Targeted energy upgrades on equipment and the building envelope

BEMS is an innovative monitoring system for lower energy consumption.

IMPACTS ACHIEVED BY 2030:

- Upgrading of the 3kW PV to a 5kW PV; production of 4500 kWh energy from PV on Citizen's Service Bureau
 - CO₂ saved: 225 t CO₂/y
 - Electricity generated from RES: 257,000 kWh/y
 - Energy saved through the adoption of EE: 830,000 kWh/y
-

Wind energy – another gift from nature

the island of Crete is an off-grid insular area with several barriers to promoting RES applications, including a growing local resistance to RES installation. The Renewable and Sustainable Energy Systems Lab of the Technical University of Crete explored the RES potential of the Regional Unit of Rethymno and developed an innovative and replicable methodology to identify optimum areas for RES applications, using GIS & multi-criteria analysis. To demonstrate the positive effects of small-scale RES applications to local communities and present RES potential as a development opportunity, a tailored web tool was delivered

"TO DEMONSTRATE THE POSITIVE EFFECTS OF SMALL-SCALE RES APPLICATIONS TO LOCAL COMMUNITIES AND PRESENT RES POTENTIAL AS A DEVELOPMENT OPPORTUNITY"

allowing users to quantify and quickly assess the siting and feasibility of small-scale RES. An awareness campaign was implemented with the contribution of RES experts and a Q&A publication on small-scale RES systems was offered to foster knowledge and consensus of local people.

MACRO OBJECTIVE:

- Increase of energy produced from RES in the local energy mix
- GHG emissions reduction by decreasing the use of fossil fuels for electricity production
- Improvement of the quality of life with cleaner atmosphere
- Lower energy bills in households due to self-production
- Foster local development

SPECIFIC OBJECTIVES:

- Exploit RES potentials in small scale at the local level
- Raise awareness about small-scale RES, to push development at the local level
- Investment opportunities for local suppliers and engineers

Transferable methodology to identify optimum areas for small-scale RES applications.

IMPACTS ACHIEVED BY 2030:

- CO₂ saved: 27,450 t CO₂/y
 - Electricity generated from RES: 84,510,000kWh/y
-

Krnovo Wind Farm (KWF) impact pilot action is designed to evaluate the impact of the greatest investment in general, in Montenegro since 1980. Its installed power is 72 MW while annual production is estimated in between 200–230 GW.

The COMPOSE project contributed with a long-term sustainability analysis, an analysis of the impact on the local economy and an analysis of the impact of guaranteed pricing for the next 12 years. KWF stands for evaluating the impact of KFW on the economy, energy consumption and citizens as well as the potential impact for the cluster and circular economy. We believe that KWF will be a generator of jobs and a significant tool for reducing energy power as well as for promotion of the green economy. The Krnovo Wind Farm is expected to be a generator of changes in the local circular economy and an impact mechanism for RES changes and further improvement of the energy sector in Montenegro.

MACRO OBJECTIVE:

- GHG emissions reduction
- New jobs
- New business

of such projects on the local economy

The impact analysis will show the eligibility of further investments in wind plant energy.

SPECIFIC OBJECTIVES:

- Raise awareness of public
- Increase RES share in the local energy mix
- Potential establishment of an RES cooperative
- Identification of impact

IMPACTS ACHIEVED BY 2030:

- CO₂ saved/y: 510,000 t
- Electricity generated from RES: 220,000,000 kWh/y



Old places have soul

The community of Giove in Umbria was first mentioned in the early 12th century. Located on the left bank of the River Tiber, it is a very attractive town for tourist visits throughout the year. Thus, the importance of innovative energy solutions, which respect the old architecture and are at the same time sustainable, is increasing. This pilot action demonstrates a small-scale installation of a PV demonstration unit integrated into the roof of the municipality building. The purpose of the action is to raise citizens' interest in BIPV systems on historic buildings and it is expected to foster replication to nearby communities.



MACRO OBJECTIVE:

- Increase local energy independence
- Behavioural changes in citizens' and tourists' daily lives
- Greenhouse gas (GHG) emissions reduction

SPECIFIC OBJECTIVES:

- Raise awareness among tourists and the public in general about RES integration in historic buildings
- Increase RES share in the local energy mix
- Energy saving and more EE measures in the operation of public buildings and lighting

Public interest for BIPV systems integrated in historic buildings is increasing.

IMPACTS ACHIEVED BY 2030:

- 75.0 kW PV installation, including LED devices within the public lighting network.
 - CO₂ saved/y: 78 t
 - Electricity generated from RES: 110,000 kWh/y
-



Founded in the Bronze Age, Capalbio is a beautiful medieval town in southern Maremma, lively all year round. Thus, the awareness-raising and informational campaigns about energy efficiency for tourists, visitors and locals were a great challenge. The behavioural change of citizens and tourists towards energy efficiency and RES best practices and the increase of the RES share in the local energy mix were the aims of the action. A small-scale PV installation on the Capalbio Municipality building assisted awareness-raising activities. The Greening Capalbio Energy Development Plan is focused on short- and mid-term policies, which means toward a greening development policy plan. A public display presenting energy-production data and GHG emissions saved is also installed along with the PV demonstration unit on the Capalbio Municipality building. As a multiplying effect, the COMPOSE pilot project led to the submission and approval of two new RES installations by the Italian Environment Ministry's Kyoto Fund: PV plant and heat pump installations in Capalbio's primary and junior high school buildings.

MACRO OBJECTIVE:

- Increase local energy independence; behavioural changes in citizens and tourists' daily lives; greenhouse gas (GHG) emissions reduction

More than a thousand people were involved in the awareness-raising campaign in Giove and Capalbio.

The Municipality of Capalbio installed a 19.5 kW PV, 50.0 kW heat pump and substituted the previous high-consumption lighting system with LED in the local primary and junior high school buildings.

IMPACTS ACHIEVED BY 2030:

- CO2 saved/y: 175 t
 - Electricity generated from RES: 304,500 kWh/y
-

Live nature, save nature

The two pilot cases carried out in Portugal, in Sesimbra Natura Park (Herdade da Mesquita) and Biovilla, aim at creating energy independence and the long-term sustainability of buildings, “living-labs” directly involving different types of actors and target public. The implementation of these projects allows the testing and assessment of technological, pedagogical and economic/business solutions and procedures.

In both cases, a digital platform in the main building monitors and shows energy consumption and production in real time. This information allows better planning of the use of facilities and equipment and contributes to awareness raising and behaviour change for a more rational use of energy.

Sesimbra Natura Park is a nature-based tourism project, developed in an area of 867 ha, with infrastructure and equipment for recreation, leisure and specific activities for companies, schools, organized groups, families and individual visitors.

A Photovoltaic Solar Power Plant of 44 modules with 11.9 kWp was installed in an area of 71.9 m².

“THE INSTALLATION NOT ONLY LEADS TO AN IMPORTANT DECREASE IN THE ELECTRICITY BILL BUT ALSO BECOMES A NEW DIDACTIC ELEMENT FOR VISITING GROUPS AND AN ADDED VALUE FOR THE PROJECT.”

The production of this clean and renewable energy meets about 50% of the electricity needs of Sesimbra Natura Park, enough to water their 3.5 hectares of fruit trees. The installation not only leads to an important decrease in the electricity bill, but also becomes a new didactic element for visiting groups and an added value for the project.

MACRO OBJECTIVE:

- Increase local energy independence; behavioral changes in the daily lives of citizens and tourists greenhouse gas (GHG) emissions reduction

SPECIFIC OBJECTIVES:

- Raise public awareness of RES building integration
- Increase RES share in the local energy mix
- Energy savings and more EE in the operation of buildings.

11.9 kWp PV plant is installed in Sesimbra Natura Park.

IMPACTS ACHIEVED BY 2030:

- CO₂ saved/y: 9.8 t
- Electricity generated from RES: 21,619 kWh/y

ABOUT 50% OF THE ELECTRICITY NEEDS MET BY RES PRODUCTION, ENOUGH ENERGY TO WATER 3.5 HA OF FRUIT TREES.

Biovilla is a cooperative for sustainable development that manages a 55-hectare nature-based tourism, training and awareness project integrated in the Serra da Arrábida Natural Park, focused on sustainability in the use of resources.

A photovoltaic pumping system (that can be moved and can take advantage of all the water stored in 4 wells) for agriculture was installed within this pilot case, increasing production and allowing the facility to be shared with the local community. The Pilot also includes a solar grill and a solar stove for food preparation, using RES not only for cooking, but also for sharing moments within the community and as a didactic element.

Finally, a dehydrator (a solar drying system made from a recycled container) was installed. It preserves the surplus foods (fruits, vegetables, legumes, spices and teas) naturally from the organic production of Biovilla and its neighbours. The dehydrator also

has a social contribution, serving not only to Biovilla, but also the whole community of regional organic producers.

The third use of this equipment is seed management: native seeds are dehydrated to accelerate the natural process of transformation and this way they can be more effectively and are more effectively and more quickly introduced into the ecosystem all over Portugal, for the purpose of reforestation of areas affected by forest fires, and the subsequent increase of biodiversity.



TOP: Solar dryer for local products and PV plant with 44 modules installed.

MACRO OBJECTIVE:

- Increase local energy independence
- Behavioural changes in the daily lives of citizens and tourists
- Re-duction of greenhouse gas (GHG) emissions

SPECIFIC OBJECTIVES:

- Raise public awareness about RES building integration
- Increase RES share in the local energy mix
- Energy savings and more EE in the operation of buildings

Equipment benefits not only to Biovilla but also the whole community of regional organic producers.

IMPACTS ACHIEVED BY 2030:

- 5768 kWh/y solar radiation
- CO₂ saved/y: 2.9 t
- Energy saved through RES production: 7311 kWh/y
- Energy saved with the monitoring system: 480 kWh/y
- Energy saved in food conservation due to the solar dehydration process: 2000 kWh

Idea, plan, action = inspiration for the future

In Croatia, energy development plans are a part of spatial plans. In the frame of COMPOSE, the Energy Investment Plan (EIP) for Koprivnica- Križevci county initiated and improved multi-level governance principles, as one of the main challenges in achieving scalability of projects. Using diverse financial models is the innovative praxis, available for smaller, rural municipalities. Projects identified in the EIP base on sectoral approach, i.e. aggregation of similar projects in terms of technology, size, target groups, etc. All projects contribute to GHG emission reduction, to an improvement in the quality of life in the region and greater energy independence. Implemented activities include the establishment of strong cooperation with local authorities. EIP proposes multiplying-effect actions, e.g. light pollution reduction, improved working environment, creation of new jobs, etc. Along with the preparation of the EIP, REA North identified investment into two small PV plants as a very useful and appropriate activity that builds on and adds value to the Energy Investment Plan. This activity enabled REA North to capitalize on implemented activities and test/prove/showcase similar investments for the entire public sector.



MACRO OBJECTIVE:

The Energy Investment Plan will be focused on achieving GHG reduction goals through energy savings and increased usage of RES

SPECIFIC OBJECTIVES:

The EIP primarily aims at energy efficiency and increased share of RES in the energy mix. The region is characterised by significant dependence on fossil fuels (especially natural gas) and relatively high energy usage both in private and public sectors and therefore the project will focus on public buildings that could be viewed as a role model for the private sector.

More than 21 MEUR investments planned in Koprivnica- Križevci county.

IMPACTS ACHIEVED BY 2030:

- CO₂ saved: 9488 t/y
- Electricity generated from RES: 23,146 MWh/y
- Thermal energy from RES: 12,508 MWh/y
- Energy saved through EE: 6605 MWh/y



The main objective of the pilot case carried out in the Municipality of Manza was to, was to promote public awareness about the significance of GHG emissions and the options for reducing them, fostering informed decision making and actions not harmful to the environment. This pilot aimed to increase energy independence and behavioral change, and to reduce energy consumption and GHG emissions. A study of biomass, as a heating source for public buildings, was developed, and a biomass heating system was installed in a kindergarten. This practical case is easily transferable and spread to other communities. It is expected to affect the increased use of renewable energy in energy production and reduce CO₂ emissions. As a result, a mature technical study with financing data on the capacities and the use of biomass as a potential heating source for public buildings, using waste biomass was developed.

MACRO OBJECTIVE:

Increase energy independence and behavioural change among different target groups of the general public (less consumption) to decision makers (understanding the benefits of treating energy aspects of any projects as a horizontal principle with development planning)

SPECIFIC OBJECTIVES:

- Upgrading of existing heating systems (carbon) in public and private buildings with the use of biomass combustion technologies
- Increase rate of waste and organic residues recycling
- Raise awareness of local communities in the Municipality of Manza
- Municipality Energy savings in the operation of a public building

The Municipality of Manza is a snapshot of how to reduce energy costs.

IMPACTS ACHIEVED BY 2030:

- 4.5 kWh/kg biomass residues annually
 - CO₂ saved/y: 254 t
 - Thermal energy generated from RES: 1,533,000 kWh/y
-

Memorandum of Understanding

Energy transition: from global necessity to local opportunity

Preamble

We are facing an unprecedented man-made 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 urgent action to reconsider the relationship between current growth patterns and irreversible damage to ecosystems, the risks of social instability, uncertainty and increased costs to prevent, mitigate and adapt to the consequences of uncontrolled climate changes.

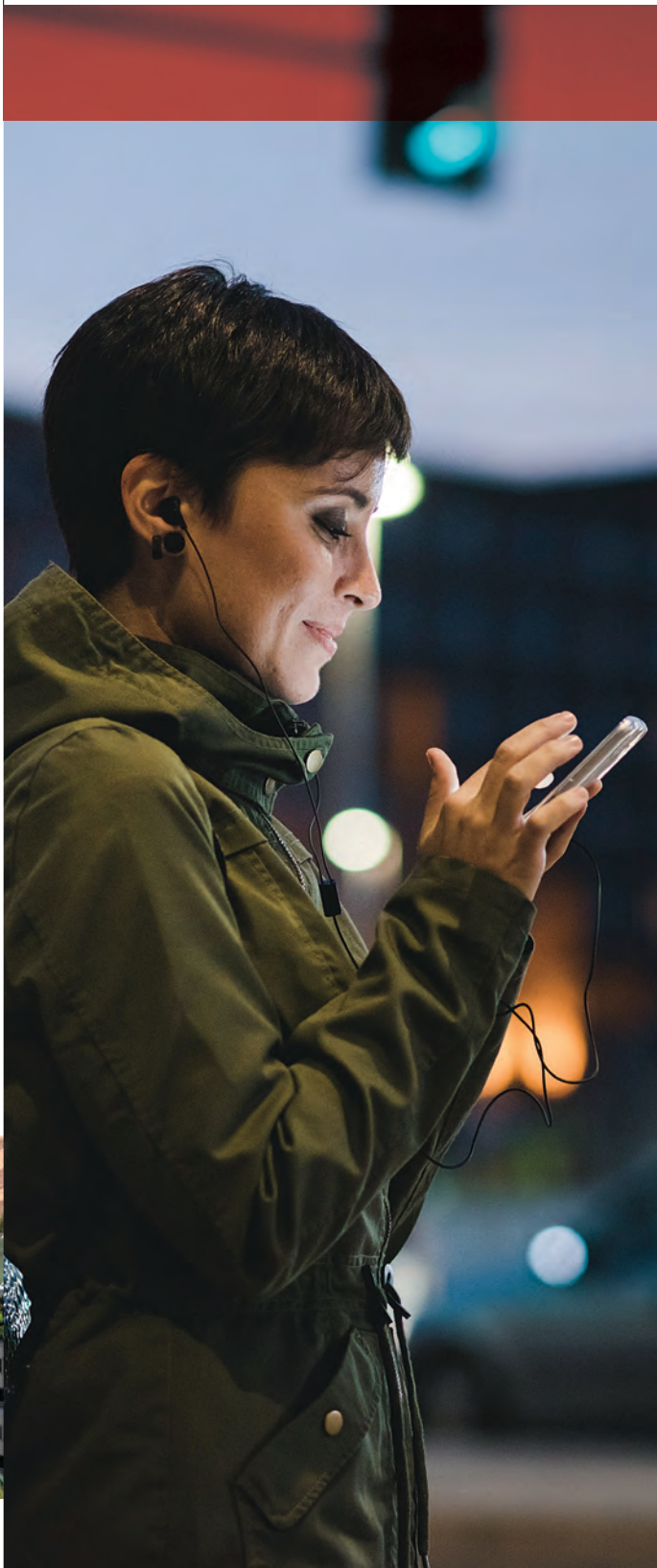
The world has recognized what is at stake with the Paris Agreement and the Sustainable Development Goal (SDG), specifically SDG 7. Ensure access to affordable, reliable, sustainable and modern energy for all. The European Commission has proposed the

Strategy on the Sustainable Use of Natural Resources and the Bioeconomy Strategy 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, along with the key elements of bottom-up and participatory approaches, have resulted in transferable and replicable elements as well as potentials for scaling up, on the basis of win-win energy reshaping opportunities for local communities, with positive

"THE WORLD HAS RECOGNIZED WHAT IS AT STAKE WITH THE PARIS AGREEMENT AND THE SUSTAINABLE DEVELOPMENT GOAL (SDG), SPECIFICALLY SDG 7."

impacts ranging from CO₂ emissions decrease to creation of new jobs, optimization of local biomass management and reduction of bio waste, the creation of local supply chains, opening new and green businesses 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.

