Interreg MED

Renewable Energy

Community’s Good Practices
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This Booklet provides Access to Results, Tools and Guides from all recent Interreg MED projects related to the renewable energy transitions of rural and island areas
Biomass for energy

Best practices for a Viable Value Chain for the recovery of residential cooking oils for energy

Feasibility study for a biomass heating system covering a school’s energy needs, by substituting fossil fuels with local energy sources.

Recommendations for a new regulatory framework and permit route concerning plant biomass use in protected areas

New framework for the analysis of risks and benefits on ecosystems and society of the use of plant biomass for energy via indicators

Traceability protocol ensuring sustainable forest biomass production

Business models for viable microgrids

CITIZEN AWARENESS-RAISING TOOLS

Renewable Energy Living Labs

COMPOSE Solar Energy living lab

Practical Guides for citizens

Energy efficiency and renewable energy guide to reduce citizens’ ecological footprints

Guides for stakeholders to empower citizens to use energy efficiency and renewables to eliminate energy poverty

Guide to common methodology to involve all stakeholders in renewables and energy efficiency

Practical guide for empowering citizens to leverage renewables and energy efficiency against energy poverty

Participative approach to policy concerning renewables and energy efficiency

CONCLUSIONS
OVERVIEW

In order to respect Europe’s engagements in terms of renewable energies and climate change mitigation, local communities must now plan and implement their energy transitions to climate neutral and renewable solutions. This urgent process is characterized both by numerous challenges and by the numerous advantages that renewables bring to communities. These challenges are especially difficult and these advantages are especially positive for rural and island areas. Indeed, rural and island areas have specific limitations in terms of energy systems, they typically have more limited access to energy resources, and they commonly have higher energy costs than mainland, urban areas. Even the grids of islands are challenging, and their local high voltage grids tend to be very linear and poorly adapted to high fluctuations in production and demand.

To support the energy transition, Interreg MED co-funded six modular projects which focused on solving key challenges of energy transitions in rural and island areas. As summarized on the Community’s YouTube channel, these projects developed good practices, tools and guides which are very useful for local stakeholders planning their energy transitions. The horizontal project, Greencap, also co-funded by Interreg MED is dedicated to ensuring the replication and capitalization of modular project results.

This guide was prepared by Greencap to summarise and provide access to relevant good practices, tools and guides for rural and island areas. These tools can be categorized in several categories as shown in the figure below.
Figure 1. Overview of exploitable results, best-practices and guides developed by the Interreg MED renewable energy community
PLANNING TOOLS FOR MANAGING THE ENERGY TRANSITION

The below described tools enable local stakeholders to predict the amount of energy that would be produced in various scenarios and to predict the impact of RES (renewable energy systems) on the existing grid. This is very important for ensuring that the investments made provide the needed results. Indeed, local authorities are not energy experts. They need objective, scientifically sound and easy-to-use tools to ensure that their decisions yield the best societal, environmental, climate and financial outcomes. In the absence of such tools, there is a risk that poor decisions would lead to wasted public funds, slowed energy transition and loss of confidence of the general public in the energy transition.

Biomass for energy

The below tools are designed to help local territories to best plan the future or increased use of biomass for energy. The tools will be available online and target regional and local key decision-makers and forestry engineers, as well as national institutions dealing with biomass and RES in general. They are relevant for Mediterranean countries and beyond, especially those dealing with administrative barriers to biomass use.

Methodology for identifying the most relevant biomass and quantities to use for energy

The methodology is based on Territorial analysis and the identification of 5 biomass districts based on (i) the availability of biomass resources for energy use; (ii) traffic; and (iii) local energy needs. Each district was classified in terms of territorial and administrative framework; geomorphological and bioclimatic aspects; land use according to the Corine Land Cover (CLC) classification; territorial, landscape and environmental restrictions; distribution and classification of the main road system; energy needs and private companies operating in the biomass sector.
The methodology was disseminated in the scope of the ForBioEnergy project via local community targeted events, external events, social media (facebook, linkedin, twitter) the project web page, 64 articles published in print form and in digital form, storytellings in a narrative and in a video form, the project final conference, and USB sticks that will be given to participants at the final conference.

**Biomass energy potential assessment**

Open source DSS is being developed for the assessment of biomass energy potential. This tool will be useful for decision-making bodies to assess the impacts of various scenarios and to review costs and benefits of decision that are to be made.

**New forest management plan at the biomass district level**

This Forest Management Plan for Biomass districts in protected areas was developed as well. In the plan, the best forestry practices for each forest type were identified in order to preserve and conserve forest ecosystems and to assess the biomass that may be available for energy purposes. In addition, the exploitable biomass for energy purposes deriving from other forest-wood supply chains was evaluated, following the concept of the cascade use of biomass.

**New models and systems for sustainable forest-wood-energy supply chains**

This methodology facilitates the planning and management of a sustainable agroforest supply chain in protected areas.
Tools to help local authorities to plan which mix of renewable energies and storage to implement in rural and island areas

Digital, integrated toolkit to predict the energy production, return on investment and grid impact of various renewable energy scenarios - techno-economic feasibility analysis

This toolkit provides a rather complete basis for rural and island territories to devise a pragmatic, successful Sustainable Energy Action Plan (SEAP). To access this toolkit, developed by the PRISMI project, for free, Subscribe to the PRISMI Network and send an email with the signed documents to davide.astiasogarcia@uniroma1.it. The integrated toolkit includes a methodology and computer software tools for decision-support. Moreover, the PRISMI team of experts is available to provide training and support so that the toolkit is very useful for non-expert public, territorial administrations in rural and island areas.
The main advantages of the PRISMI toolkit versus the state of the art are:

1. user-friendly methodology for assessing the island RES potential and designing the optimal energy mix for small Mediterranean islands in order to increase the RES penetration,

2. user-friendly software for assessing the wind energy potential (wind power calculator) and predicting the technical feasibility of RES penetration on the existing grid (load flow tool),

3. brief but precise guidelines for using the EnergyPLAN software for small islands.

The integrated toolkit contains the following tools.

- **MAPPING GIS TOOL**

  > This GIS geo-database contains data layers and queried thematic maps showing existing RES data and potential in case studies. The GIS tool contains data about the RES potentials across the Mediterranean (solar, wind, wave and tidal) but also shows information about environmental constraints (SCI and SPA sites, Ramsar areas, etc.), the existing energy systems (thermoelectric plants, PV plants, wind turbine generators, etc.) and buildings as well as thematic maps. The GIS database can be used for free by anyone who joins the PRISMI network. Thematic maps are also downloadable directly from the PRISMI website.

- **EnergyPLAN for energy scenario modelling**

  > This tool was proven in 6 case studies to enable the reliable modelling of various energy scenarios across the Mediterranean. Linked post-processing tools and a use guide facilitate the understanding of EnergyPLAN results and thus to ease the development of SEAPs. The results of modelling enable information socioeconomic and environmental feasibility analysis based on various solutions for the diversification of RES production and the positive synergies between transport and energy sectors by studying the introduction of EVs in both public and private mobility.
Wind Power Calculator

- This excel tool calculates the expected annual wind power output on any site on any Mediterranean island based on hourly NASA wind profiles. The tool should be used for advisory purposes and can rapidly provide rough estimations, although it cannot replace standardized procedures and measurement campaigns necessary to properly plan wind energy developments.

- The tool is simple to use in the Windows operating system, relies on compact data bases, and uses open data (i.e. MERRA wind speed estimations) as well as local data if available for more accurate estimations (met mast yearly data). The tool's portability allows users to directly run it without installation procedures and dependencies.
- **Post-processing Load-Flow Tool**
  > Once a draft plan for RES implementation (based on RES potentials) has been devised, this tool analyses the impact that specific RES implementation would have on the grid in order to prevent grid damage and to enable the planning of potential grid investments.

  > The Load-flow tool consists of a software application able to use GIS data jointly with electrical grid characteristics. The aim of this tool is to facilitate the analysis of the above-mentioned energy plans and solutions by providing the user with specific implementation examples and recommendations regarding operating challenges for the electricity grids of islands. By means of this analysis, the user can identify cases in which the installation of RES plants at specific points of the island grid could cause violation of the operating limits.

- **Guidelines for using the Integrated toolkit to develop SEAPs**
  > The integrated toolkit was tested to develop preliminary Sustainable Energy Action Plans (SEAP) or Sustainable Energy and Climate Action Plans (SECAP) in six Case Studies across the Mediterranean. Using the toolkit, the six territories in the case studies were able to carefully develop the inventory of demands and emissions, identify mitigation actions and evaluate their predicted impacts on the islands. The results of the case studies include clear guidelines for SEAP / SECAP development. This governance tool highlights many interesting measures identified in the six case studies. All SEAPs aimed at: 1) diversifying the energy production via solar photovoltaïc, biomass and wind energy where possible; 2) increasing energy efficiency in buildings and lighting (indoor and street lamps); 3) promoting the use of electric vehicles, car sharing and alternative mobility such as walking and cycling; and 4) raising public awareness.
Several papers have been written to describe the PRISMI toolkit and the six case studies in which it was tested. The full list of publications prepared during the project period can be found in **PRISMI Deliverable 2.3.1.** The following articles were published after the end of PRISMI:


**Online Simulation Tool to plan for the optimized storage of solar PV energy**

The StoRES project developed this reusable simulation methodology for national and local public administrations, policy makers, other stakeholders and even the general public. It will be publicly available on the project’s website starting in June 2019. The **Storage Optimization Tool** aims at calculating the optimal size of a hybrid PV+Storage system in terms of the net present value of the investment. A financial analysis is undertaken for a period of 20 years, taking into consideration technical and financial parameters and various options of energy policies. The tool’s predictions are based on actual data obtained from the 14
PV + storage pilots implemented across the Mediterranean in StoRES, and its recommendations are relevant across the region. A report on the tool is also available in the toolbox.
FISCAL TOOLS

**National and International Handbooks for setting-up local fiscal policies to support the energy transition**

The LOCAL4GREEN project prepared an innovative handbook for local authorities explaining the participative methodology to design feasible and effective fiscal policies to promote RES at the local level. The methodology facilitates the decision making process by the local authorities, providing matrices for prioritization and other user-friendly tools. It was tested in 75 pilot municipalities and enabled local authorities in nine countries to successfully design 127 local fiscal policies.

The methodology can be used by any local authority in any country and takes into account the technical, legal and economic local frameworks as well as the social cohesion, gender equality and other environmental concerns. The handbook is available in **English**, **Spanish**, **French**, and **Slovenian** plus an International version summarizing lessons learned and innovative fiscal policies designed in all of the countries. The international handbook provides a comparative description of the most interesting fiscal policies implemented in each country, facilitating the transnational transfer.

**Fiscal legislation texts for easy replication**

Click on the links below to access reusable fiscal legislation texts for efficient replication or adaption. These innovative fiscal tools were developed by the Local4Green project. The **Spanish fiscal texts** are available in five regions, and their fiscal policies include a municipal tax on vehicles and another on economic activities, as well as a new permitting fee and tax for construction and renovations, a real estate tax and a new tax on the Increase in Value of Urban Land. **Maltese fiscal texts** are available for 14 territories in Malta and include examples such as fees for bike sharing and taxes for the use of public beaches. **Croatian fiscal texts** cover 5 territories and promote renewable energy systems via public utility fees, for example. Local **Slovenian fiscal texts** cover local communal contributions in 8 territories. Fourteen territories implemented **Greek fiscal texts** based on, for example, a street cleaning fee and revenues from leasing/
renting municipal properties. In Italy, seven territories implemented novel tax frameworks with a focus on building permitting. In Portugal, ten territories tested novel taxes/charges for Construction and Land Development, Municipal Real Estate Tax and Corporate Income Tax. In Albania, three territories tested pilot fiscal policies to support the energy transition via local waste collection, lighting and real estate taxes as well as parking fees. Finally, in Cyprus, three territories tested an accommodation tax for tourists and an income tax for professionals.
GOVERNANCE TOOLS AND POLICY RECOMMENDATIONS

PV with energy storage

Lessons learned from 14 pilots implementing PV with energy storage

Lessons learned from the 14 pilots implemented across the Mediterranean in the StoRES project are summarized for various stakeholders, from policy makers to companies involved in the energy transition and the general public.

Policy recommendations

Based on the insight gained during the 14 pilots implemented in the StoRES project, key policy recommendations have been proposed for the exploitation of PV and Storage in the following countries: Cyprus, France, Greece, Italy, Portugal, Slovenia and Spain.

Biomass for energy

The below tools are designed to help local authorities to best govern and evaluate the use of biomass for energy. The tools can be online (tool 1, tool 2) as of September 2019. The tools are for regional and local key decision-makers and forestry engineers, as well as national institutions dealing with biomass and RES in general. They are relevant for Mediterranean countries and beyond, especially those dealing with administrative barriers to biomass use.

Best practices for a Viable Value Chain for the recovery of residential cooking oils for energy

Even though Used Cooking Oils (UCOs) generated in restaurants are often collected by authorized service providers, most EU countries lack efficient systems to collect and treat such oils produced in
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Households. The COMPOSE project shares its best practice scheme for a full UCO-to-biodiesel chain, combining “smart” systems that were shown to increase UCO collection efficiency and to reduce operational costs and greenhouse gas emissions.

Feasibility study for a biomass heating system covering a school’s energy needs, by substituting fossil fuels with local energy sources.

The design process follows the COMPOSE methodology and incorporates a multistakeholder participatory approach. The approach can be replicated in other areas with similar characteristics by Local Authorities, RES investors, Citizens and Local Communities. The business model is useful for other municipalities as it can yield returns on the investment of public money in renewable energy systems and energy efficiency while creating local jobs. The study is in Slovenian and should be adapted to the local/regional regulations, needs and conditions.

Recommendations for a new regulatory framework and permit route concerning plant biomass use in protected areas

This proposed regulatory framework facilitates the production of sustainable bioenergy, through a simplified authorization procedure, especially for protected areas.

New framework for the analysis of risks and benefits on ecosystems and society of the use of plant biomass for energy via indicators

This methodology enables the sound analysis of the risks, benefits and impacts of the production of biomass for energy. It describes and evaluates a set of indicators for short-, medium- and long-term scenarios. Indicators concerning threats to animal communities and habitats, social and economic factors, ecosystemic services of forests, etc. are included.
Traceability protocol ensuring sustainable forest biomass production

Preliminary Quality requirements for biomass from the protected areas were drafted, providing:

- An overview of existing traceability protocols, quality standards for solid biofuels and combustion technologies with recommendations for the key actors to use them when establishing new wood-energy supply chain within a biomass district in a protected area.

- A feasibility study of a chosen wood-energy supply chain sourced in protected areas that would provide the possibility to implement traceability protocols, acquire standards for the solid biofuels from the chosen biomass district and choose or propose a combustion system that is in compliance with the standards for biomass heating systems.

Business models for viable microgrids

In the PEGASUS project, four microgrids business models are being developed and will be available online in the PEGASUS deliverable library. These business models propose viable organizations for microgrids in different countries and conditions and to meet the needs of different end-user types.

The proposed models are based on microgrid organisations which were empirically tested in seven demonstrations which varied from village-scale (40 – 171 households + public offices) to building-scale (1 – 10 buildings) to lab-scale and included one medium-voltage microgrid as well. Micro-grids included 100 kWp PV parks, rooftop PV systems and/or autonomous PV systems. In some cases, storage systems and/or an electric vehicle charging station were also included. Resulting data was gathered over the course of one year, and provides insight into microgrid function, requirements, costs and revenues.

The economic and technical feasibility studies are ongoing to use these empirical data to develop the most relevant microgrid business models. The team expects that the results will be replicable first in PEGASUS partner countries (France, Italy, Greece, Slovenia, Croatia, Malta, Cyprus) and then all over Europe.
CITIZEN AWARENESS-RAISING TOOLS

A very useful global toolbox for awareness-raising and community-building was developed by the COMPOSE project and is available at: www.reselplan-toolbox.eu. Additional specific tools are described below.

![Compose tool interface](image)

Figure 2. Compose tool interface

Renewable Energy Living Labs

COMPOSE Solar Energy living lab

This living-lab located in beautiful Biovila, Portugal, was added onto a renewable energy pilot installation. The lab allows individual testing and assessment of various small-scale RES equipment (digital energy monitoring, stand-alone photovoltaics, PV pump, solar dehydrator, solar grill and stove) to raise energy awareness of the community and create new opportunities for green entrepreneurship. Lessons learnt and expected benefits are also shared in an exploitable format. The platform has attracted great media and stake-
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holder interest and welcomes environmental associations, teachers and a wide variety of actors, such as at the Climate Change 2018 National Congress – CNAC (February 2018, 500 participants). All information is provided in Portuguese.

Practical Guides for citizens

Energy efficiency and renewable energy guide to reduce citizens’ ecological footprints

The COMPOSE Booklet summarizes the basics of climate change and actions that citizens, households, students and tourists can take in order to reduce climate change impacts by adopting good energy practices in their everyday lives. The complete booklet and the shorter one for students are available in Italian and can be adapted to local/regional needs in areas beyond Capalbio, where they were prepared.

Guides for stakeholders to empower citizens to use energy efficiency and renewables to eliminate energy poverty

Guide to common methodology to involve all stakeholders in renewables and energy efficiency

The COMPOSE project developed a Common Methodology for Demonstration (CCMD) as a holistic approach aiming to foster the implementation of local energy plans, taking into account not only technical, but also socio-economic and environmental aspects. The Methodology comprises 8 key implementation steps and suggests tools, databases, methods and useful tips to assist planners and decision. The concept includes energy efficiency measures as well as renewable energy production. The PDF methodology and later the user-friendly web application can be found online. The web tool is designed to provide useful information, links, resources, databases and tools for each one of the CCMD steps. The methodology has been widely disseminated, for example, in over 20 workshops and over 50 publications, and leverages experience gained with 15 pilot actions in 11 MED countries and feedback obtained from Pilot Action leaders, local policy makers and planners, Local Action Groups.
members and RES/Sustainable energy experts. This methodology for citizen-empowered decision-making is supported by the below training material as well as some guides found in the Governance chapter of this collection of best practices.

- **Methodology for optimum siting of renewable energy systems using GIS and multi-criteria analysis**
  > This tool explains how to develop dynamic and quantitative maps of alternate scenarios of the available areas for RES installations, taking into account energy potentials, as well as a wide range of legal, technico-economic, landscape and socio-environmental evaluation criteria. The tool is applicable for both small and large scale applications and is useful for development planners, local authorities, decision makers, environmental associations and citizens of rural communities. The detailed presentation of the web tool/methodology is in Greek language and covers the Greek context, but an English summary is provided.

- **Training material to transfer the COMPOSE Common Methodology during Capacity Building Workshops**
  > The training material enables the transfer of lessons learned during 15 RES development projects. It can be used for local skill-building to increase capacity for efficient development of sustainable RES projects through bottom up development processes. Lessons learnt and examples of Cases Studies testing the CCMD in the field are included. Also, fundamental concepts in Green economics, Circular Economy, EU & national funding schemes, Innovative business models, and stakeholders engagement are provided. A list of resources, where users may find further technical information, practical guides, legislation, existing examples, as well as best cases from relevant applications across Europe, useful to policy makers and development planners are included in the training material. As of writing, the material has been used in 20 workshops with 450+ attendees in 11 rural areas for policy decision makers and development planners. The training material available is in English and should be adapted to the local/national needs.
**Practical guide for empowering citizens to leverage renewables and energy efficiency against energy poverty**

This guide was developed in the Palou area (Granollers, Spain) during the COMPOSE project and includes technical information and advice for how to implement an effective and well-organised **awareness raising campaigns** about the use of energy efficiency measures and renewables against energy poverty. This guide can be a useful tool for development planners, local and regional authorities, development agencies, environmental associations and teachers. Its approach was applied during 10 awareness-raising events in the Palou area were enriched by the use of posters, stickers, leaflets, social networks and articles published in local media.

The guide also presents practical tips and arguments on energy efficiency and good practices that can be recalled during the campaign. A list of steps needed to raise awareness are shortly presented (analysis of the potential to implement RES; run pilot projects oriented to self-consumption; motivation of future investments, etc.) The handbook also provides energy indicators for a 6-month period to be monitored in order to evaluate the benefits of the proposed approach. This tool is in Spanish, and should be adapted to the local/regional needs.

**Participative approach to policy concerning renewables and energy efficiency**

COMPOSE engaged in transnational policy planning by developing a policy recommendation for regional, national and European decision makers, signed in the summer of 2019, as a **Memorandum of Understanding** between stakeholders, policy makers, development planners, renewable energy investors, energy communities and citizens. The policy recommendations are the results of workshops, capacity building, public events and other COMPOSE actions. Related training material available is in English and should be adapted to local or national needs.
CONCLUSIONS

The Interreg MED Renewable Energy Community is dedicated to the replication of these best-practices and the use of these tools for a smooth energy transition which is both socially and environmentally responsible for a bright future across rural and island areas in the Mediterranean and beyond. Please address questions and contacts to danilo.ceh@bistra.si.