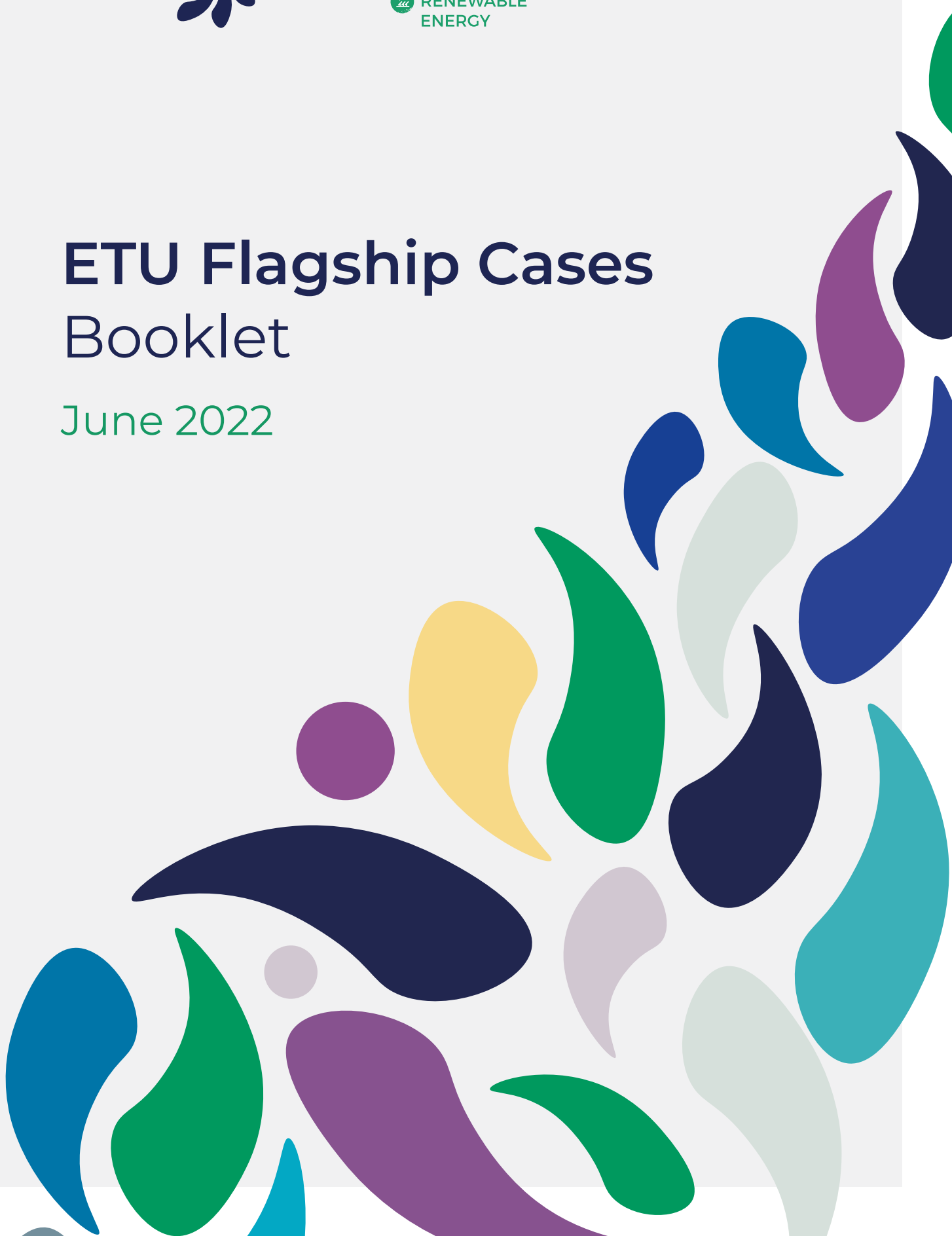




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ETU Flagship Cases Booklet

June 2022



Acknowledgments and credits

ETU FLAGSHIP CASES BOOKLET

Interreg MED Renewable Energy Project

June 2022

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3. North-West Croatia Regional Energy Agency
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6. REVOLVE
7. Cooperase
8. Municipality of Brdovec
9. Municipality of Onda
10. Municipality of Ragusa
11. Municipality of Magliano Alpi
12. Municipality of Vall d'en Bas
13. Municipality of Procida
14. Municipality of Skopelos
15. Municipality of Naxos & Cyclades
16. Municipality of Bocairent
17. Rural Bridge
18. Association of Municipalities Oltrepò Mantovano
19. Energy Community of Maira and Grana Valleys Association
20. La Sapienza University
21. University of Zagreb
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1. About the ETU Flagship Call

A. Objectives of the Call

The ETU Initiative Flagship Call was announced formally on the 2nd of February of 2021. Prior to this date, a session within the Training Programme was dedicated to explaining the ETU model, the Flagship Call, the criteria, and the steps to follow to submit a proposal. The project announced the call on the [website](#)¹ and promoted it on social media. Terms of reference were provided in English, Spanish, Italian, and Greek. The initial deadline of 12th March 2021 was extended to 22nd of March, with a total number of 18 eligible applications received.

B. Eligible criteria

Selection of Cases

The selection process followed two stages. The first stage evaluation by project partners giving a punctuation according to the following three main aspects:

- 1. Challenges to achieve with the ETU model (35%).** Every proposal had to present their project or energy plan and explain which ETU principles they were focusing, and also the number of ETU toolbox tools they were expecting to applying and test. This element was scored as follows: 1 point (low) – few challenges targeted; 3 points (satisfactory) – cases met minimum number of challenges set by the call; 5 points (high) – proposals exceed the minimum required.
- 1. Mainstreaming Impact (40%).** This assessed the real capacity of the proposal to mainstream tools provided by the modular projects. This element was scored as follows: 1 point (low impact) – little potential to re-use results from modular projects; 3 points (medium impact) – potential to re-use one tool; 5 points (high impact) – potential to apply 2 or more tools in the project.
- 1. Implementation (25%).** This assessed the implementation capacity of the applicant, and was scored as follows: 1 point – no technical support appointed to follow the process; 3 points – some technical support appointed; 5 points – comprehensive technical support appointed.

This scoring process selected two types of cases: 9 flagship cases and 5 territorial cases. For each type, a strategy and action plan was to be followed by local project partners in coordination with the modular projects involved.

¹ <https://renewable-energies.interreg-med.eu/no-cache/news-events/news/detail/actualites/etu-initiative-flagship-call-1/>

C. Final ETU Flagship Cases

The 9 flagship cases selected received technical support from the Interreg MED Renewable Energy Community to apply the ETU model and toolbox. The cases represented different types of territories: 3 urban areas, 3 islands and 3 rural areas. The objective for flagship cases was to integrate the ETU principles and toolbox into their local policies and energy transition projects and plans, using the ETU model as the methodological framework. The 9 cases were:

1	Magliano Alpi	IT/ RURAL	REC
2	Ragusa, Sicily	IT/ RURAL +URBAN	REC
3	Rio Monachil	ES/ RURAL+URBAN	REC
4	Brdovec	CR/ URBAN	SECAP
5	Vall d'En Bas	ES/ RURAL	REC
6	Onda	ES/ URBAN	SECAP
7	Procida	IT/ ISLAND	CETA
8	Naxos and Small Cyclades	GR/ ISLAND	ETP
9	Skopelos	GR/ ISLAND	ETP

1 Magliano Alpi



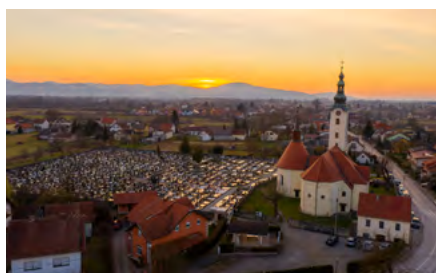
2 Ragusa



3 Rio Monachil



4 Brdovec



5 Vall d'En Bas



6 Onda



7 Procida



8 Naxos and Small Cyclades



9 Skopelos



D. ETU Territorial Cases - Assessment Group

The territorial cases selected comprised a group of rural areas facing challenges due to their territorial characteristics. Four cases work on energy transition actions through the association of small municipalities in rural areas. The case of Ghezala in Tunisia was also included due to its particularity of being in a Southern Mediterranean country. These cases have been invited to test the tools into their contexts.

1	Mancommunity Bocairent	ES/ ASS. OF MUNICIPALITIES	ETP
2	Ghezala, Tunisia	TU/ OUT EU	REC
3	Los Pedroches	ES/ ASS. OF MUNICIPALITIES	REC
4	Oltrepò Mantovano Municipalities	IT/ MANCOMMUNITY	SECAP, REC
5	Maira and Grana Valleys Union	IT/ MANCOMMUNITY	REC, TP, ETP

2. Mainstreaming experience

After the announcement of the selected cases, the mainstreaming process was structured into stages. The first stage was to identify the needs of local entities according to the performance and status of their projects and energy plans. For this purpose, several bilateral meetings were carried out between modular projects and the local entities involved. In the second stage, the proposals for each case were structured into scenarios with strategic objectives to complement the process of the projects. The value chain between the application of the rest of the ETU toolbox was also defined, ensuring the feasibility and consistency of the analysis, according to their specific technical needs in each case. Between April 2021 and March 2022, several meetings, working sessions and workshops were organized by the Interreg MED Renewable Energy partners to facilitate the mainstreaming process.

Methodological approach

A. Alignment to ETU principles and identification of main needs

The first step was to identify the cases' alignment with and contribution the following ETU principles:

2. **Ecological response to the climate crisis:** contribution to climate change action from an holistic perspective including a cross-cutting and multidisciplinary approach.
3. **Territorial equity:** contribution for an equilibrated land use planning, exploiting the maximum local RES.
4. **Social innovation:** contribution to innovation, equality, empowerment of citizens and protection of vulnerable groups.
5. **Green Economy:** contribution to the encouragement of local green businesses and green job creation.
6. **Cooperation and commitment:** contribution to the involvement of multiple stakeholders including local authorities, researchers, businesses, and civil society.

Each case had to identify its main needs, aligned with the ETU principles, and the tools within the ETU toolbox that would be used to address them within the framework of the mainstreaming exercise.

B. Definition of strategy and scenarios

The second step was the definition of the strategies by scenarios approach, both structured according to ETU pillars: energy planning, energy facilities, energy community and energy governance.

Pillar 1: Energy Planning. This pillar represents the **territorial component** of tools that support energy technicians, engineers and urban planners with the development of their energy plans and the definition of future self-sufficiency scenarios and horizon targets, based on the potential of local renewable energy sources. Irradiation, wind, biomass, geothermal and hydropower are all factors that should be integrated into territorial planning, as well as demographic and economic activity growth..

Pillar 2: Energy Facilities. This pillar represents the **technological component** of the ETU model and refers to all that is related to energy infrastructure allocated in the territory in terms of equipment and facilities such as windmills, biomass or biogas plants, hydrogen plants, district heating, and the electrical grid distribution. This pillar also considers everything related to energy efficiency from buildings' **energy consumption to energy production, distribution, and storage systems**. This pillar pays attention to technological innovations, smart solutions and tools that support the design, deployment and management of the energy facilities and equipment required.

Pillar 3: Energy Community. This pillar represents the **social component** of the ecosystemic transition, with the main objective of enhancing the well-being and livelihoods of all people. This means ensuring access to clean energy for all. Vulnerable groups, such as those excluded by gender or poverty, should be integrated into energy systems to ensure equal access to it. The community pillar also links energy to social innovation through capacity building and co-creation processes around energy transition.

Pillar 4: Energy Governance. This pillar represents the level of organization of the ecosystemic transition unit, focusing on increasing the circularity of the processes involved. This pillar gathers governance tools from the legal, regulatory and policy frameworks at the local level to encourage multi-level coordination towards a green local economy.

The scenarios proposed prepared the measures and proposals according to the following criteria:

- **Scenario 1** - project current situation with current targets of the project or plan.
- **Scenario 2** - ETU Flagship case with implementation of measures and strategies in short-term
- **Scenario 3** - ETU Flagship case with implementation of measures and strategies in long-term

C. The ETU toolbox

In this mainstreaming exercise, Flagship Cases had the support of the following tools:

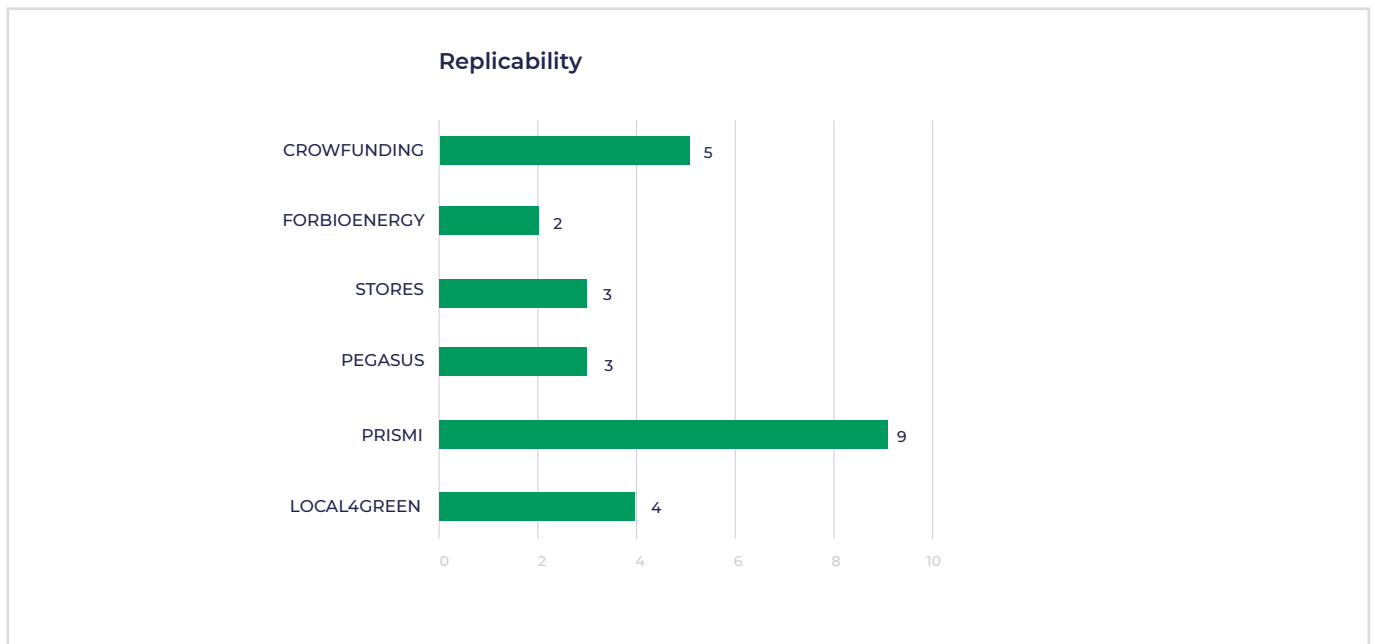
1. **PRISMI:** the PRISMI project toolkit enables the identification of potential renewable energy resources within the limit of the municipality. It estimates three self-sufficiency scenarios.
2. **PEGASUS:** Based on the results obtained on the potential RES, the requirements of microgrids will be analyzed through PEGASUS.
3. **StoRES:** According to the potential RES and definition of microgrids, guidance and advice will be provided on more feasible storage systems.
4. **LOCAL4GREEN:** identifying potential local fiscal policies to implement based on the scenarios and strategies proposed.
5. **CROWDFUNDING:** Plan for a crowdfunding campaign based on scenarios for the short and long-term.

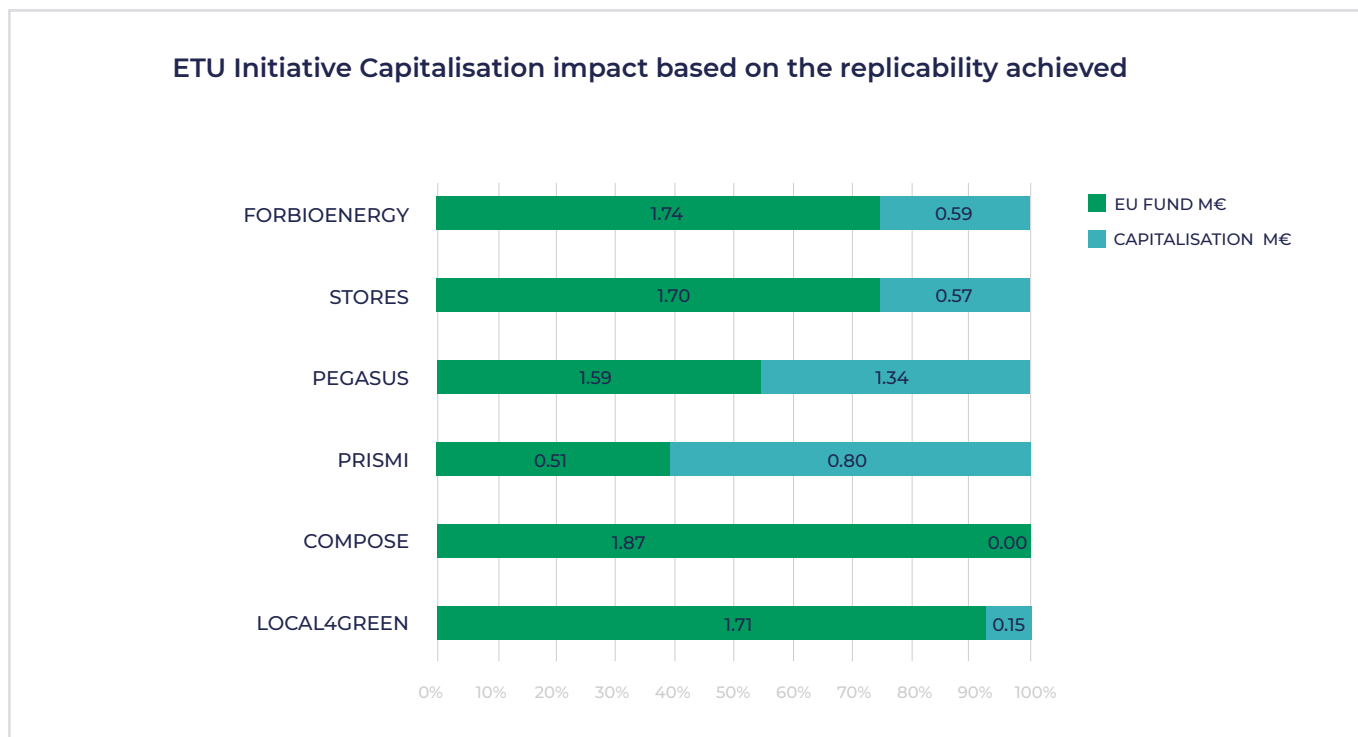
D. Summary of results and indicators

Capitalisation Impact

This mainstreaming exercise allowed the application of the ETU toolbox in different contexts. Almost all tools managed to be replicated, including the crowdfunding coaching. The PRISMI tool has been the most replicated of all the tools, providing support to Spanish, Italian and Croatian cases. ForBioEnergy, PEGASUS, StoRES and LOCAL4GREEN have also been mainstreamed in the scenarios analyzed for some of the cases. To measure the impact of this replicability, we quantify capitalization against the EU funds received by the projects that have benefited from this replication.

The overall investment in the Interreg MED Renewable Energy Community modular projects (from 2016-2019) and the horizontal project (from 2016 - 2022) amounts to €13.3M. Of this, 85% has been co-funded by the EU, €11.7M through the Interreg MED Programme, and €1.6M co-funded by project partners. We estimated an average cost of the replicable outcomes by modular project. Then we estimate the equivalent cost of their replicability according to their application in all flagship cases. This also includes the horizontal project effort by providing the crowdfunding coaching and the ETU model methodology. The following graphic expresses the proportion of the capitalisation impact in terms of costs. The Renewable Energy Community achieved €3.7M of capitalization, which represents 27.8% of the total amount (€13.3M) and 31.5% of total EU funds. One interesting key finding is the fact that PRISMI, a study project, had the lowest budget amount and could be replicated in 9 cases: a capitalization of 1.6 times its EU funding. We recommend applying this estimation in order to provide an alternative methodology to assess the impact of EU projects after the end of their implementation.





ETU Metrics

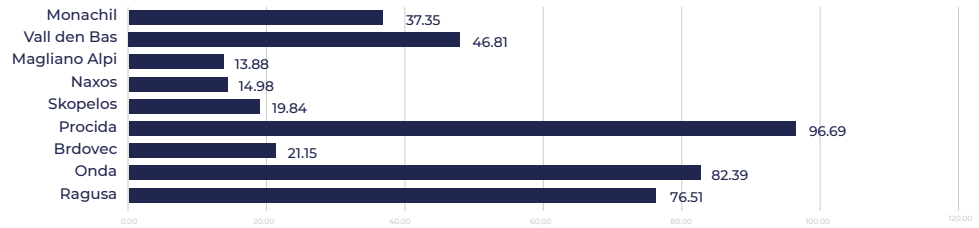
The analysis of the current situation was also complemented by the ETU assessment system indicators responding to each one of the components. As not all data was available within the timeframe of the mainstreaming exercise, we adjusted the criteria by adapting to other available variables. As a result, we have relevant data to compare across cases. The graphics provide an overview of the different areas, looking at their impact on territorial land use, energy consumption and CO₂ emissions ratios, as well as economic activities, aging and income, among other factors. In most instances, the indicators are expressed per inhabitant, to enable a comparative analysis across types of territories.

INDICATOR	UNIT	RAGUSA	ONDA	BRDOVEC	PROCIDA	SKOPELOS	NAXOS	MAGLIANO ALPI	VALL DEN BASS	MONACHIL
Population municipality	Inhabitants	73,409.00	24,980.00	11,134	10,298.00	4,960.00	17,970.00	2,166.00	3,093.00	8,007.00
Extension	km ²	444.67	108.20	1,446.00	4.10	96.30	430.00	33.22	90.57	88.85
Density population by extension	inhab/km ²	165.09	230.8	7.70	250.00	51.51	41.79	65.20	34.15	90.12
Density housing	viv/ha	33.46	43.66	7.05	96.69	19.87	13.92	13.88	16.10	35.78
Density population by residential land-use	pob/ha (residential use)	76.51	82.39	21.15	96.69	19.84	14.98	13.88	48.61	37.35
Land use agriculture per inhabitant	m ² /inhab	5,815.13	324.68	825.97	16.55	1,552.42	1,752.92	0.00	10,303.94	691.97
Energy consumption/inhabitant	MWh/inhab/year	17.77	7.42	10.54	6.04	6.26	no data	-	16.50	6.39
Energy electricity consumption/inhabitant	MWh/inhab/year	7.19	1.60	3.65	0.00	4.44	no data	0.00	10.61	4.55
CO ₂ emissions per capita	Tn/year/inhab	4.69	2.98	2.12	1.67	4.03	3.62	0.00	4.14	0.00
Income	EUR/year	16,980.00	24,538.00	4,400.00	21,116.00	no data	no data	18,460.00	18,147.00	25,561.00
Ageing	-	23.10	16.64	-	24.40	no data	no data	22.50	20.66	14.50

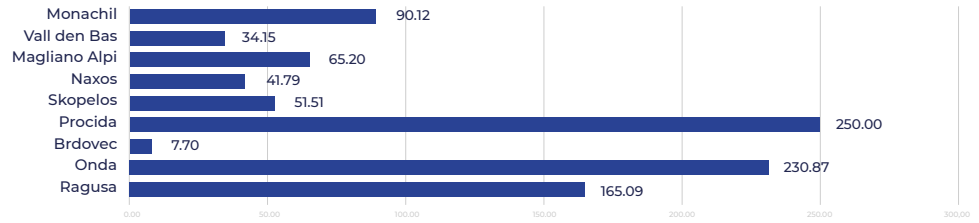
Ecosystemic Transition Unit - ETU



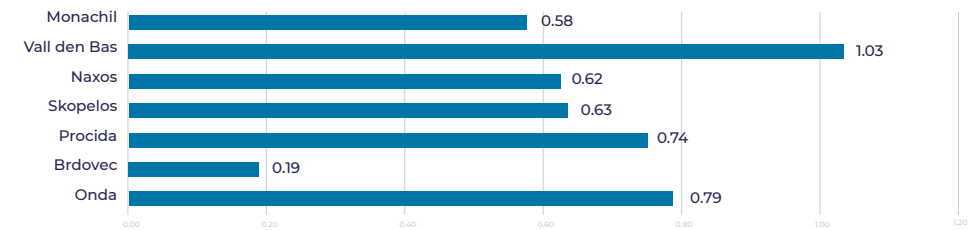
Compactness



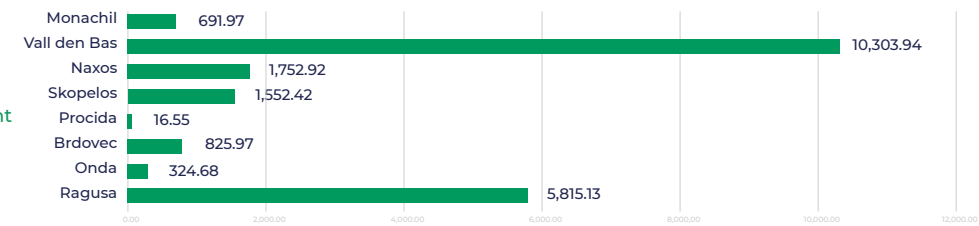
Population density inhabitants/km²



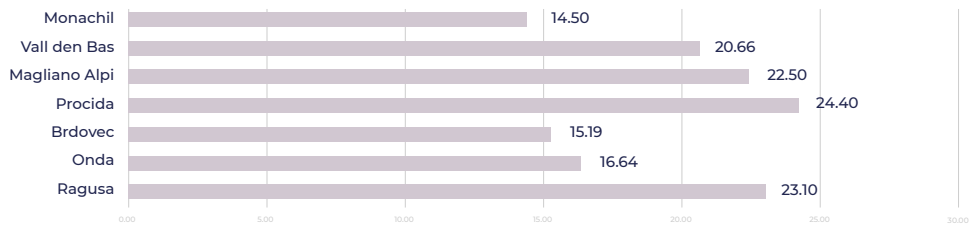
Vehicles/inhabitant



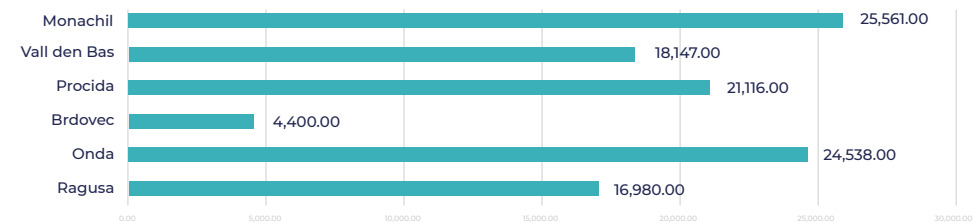
Agriculture fields m²/inhabitant



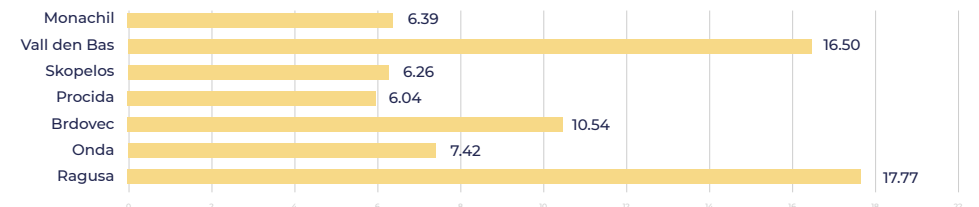
Aeging



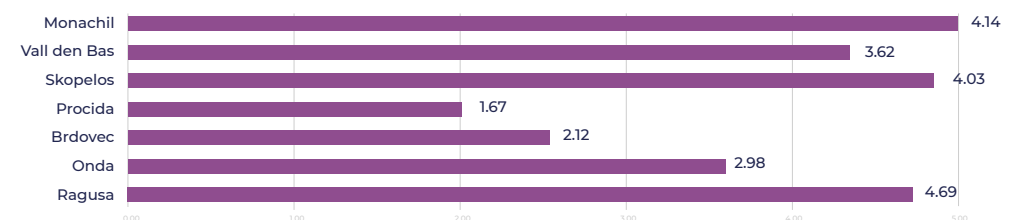
Average Income



Energy consumption per capita (MWh/inhab year)



CO₂ eq emissions/inhabitat



ETU Flagship Cases Factsheets



ETU Flagship Case

Vall d'en Bas

DESCRIPTION OF THE SITE

Key features

Location	Girona
Population	3,093 inhabitants
Size	90.57 km ²
Population density	34.15 inhab/km ²
Density of houses	16.10 viv/km ²
Population density of residential land	48.61 inhab/ha
Energy consumption	16.50 MWh/inhab/year
Electricity consumption	10.61 MWh/inhab/year
CO ₂ emissions	12,810.43 tn/inhab/year
Agricultural land per inhabitant	10,303.94 m ² /inhab
Average annual income per capita	18,147.00 EUR
Ageing (% population > 65 years)	20.6%
Economic activities per 100 inhabitants	3.14

Description of the ETU flagship case

Vall d'en Bas is located in a rural area of Girona, Catalonia, and is made up of seven isolated villages spread over a geographical area of 90 km², and is around 500 meters above sea level. The municipality of Vall d'en Bas merged in the past 4 municipalities: Sant Esteve d'en Bas, Sant Privat d'en Bas, Joanetes and La Piña. The Flagship Case in Vall d'en Bas, COBAS, consists about the development of local renewable energy communities. The village currently has a project a municipal sports pavilion and could supply some 25 families and 24 municipal facilities located within a radius of 500m, as well as an electric recharging point. The municipality aims to extend the renewable energy communities to its neighbor's villages: **Veïnat Cirera and Veïnat de les Olletes**, where it is foreseen to subsidised two solar photovoltaic installations in two different municipal social premises. Vall d'en Bas joined the ETU Initiative to evaluate the feasibility of starting a small REC pilot to test to scale-up later on. The basic idea is to form a consolidated community of neighbors that will participate in the project and make it their own, counting always with the support of the City Council as a key player.

Alignment with ETU principles



ECOLOGICAL RESPONSE TO THE CLIMATE CRISIS

Vall d'en Bas has a high landscape value and high vulnerability to climate change due to high touristic pressure. The REC helps to promote sustainable lifestyles.



TERRITORIAL EQUALITY

The REC can support strategic planning of the local renewable energy sources in Vall d'en Bas, as a starting point for resilient territorial planning.



SOCIAL INNOVATION

As a rural territory Vall d'en Bas face the challenge of revitalizing its social structure. A crowdfunding campaign can accelerate the implementation starting in one of the public schools.



GREEN ECONOMY

Vall d'en Bas must face its economic revitalisation. The municipality has many farms, which could become suitable bases for the installation of solar photovoltaic panels. This would increase the added value of the products produced.



COOPERATION AND COMMITMENT

Vall d'en Bas is strongly committed to their 2030 agenda and coordinates closely with the Deputy of Girona.



ETU Flagship Case

Rio Monachil

DESCRIPTION OF THE SITE

Key features

Location	Monachil, Granada
Population	8,007 inhabitants
Size	88.85 km ²
Population density	90.12 inhab/km ²
Density of houses	35.78 viv/km ²
Population density in residential land	60 inhab/ha
Energy consumption	6.39 MWh/inhab/year
Electricity consumption	4.55 MWh/inhab/year
CO ₂ emissions	No data
Agricultural land per inhabitant	691.97 m ² /inhab
Average annual income per capita	25,561.00 EUR/year
Ageing (% population > 65 years)	14.5 %
Economic activities per100 inhabitants	9.9 activities

Description of the ETU flagship case

The Community of Rio Monachil is located in Granada, Andalusia, gathering the four municipalities of Monachil (7,407 inhab.), La Zubia (18,425 inhab.), Cajar (4,781 inhab.), and Huétor Vega (11,844 inhab): a total of 45,457 inhabitants in an area of 113.9 km². The REC Flagship Case Rio Monachil is an ongoing project that started in October 2020. An association has been created in the municipality to enable neighbours to produce their own renewable energy and share any surplus. This has been achieved with a participatory process involving the population of Monachil. In the next stage, the aim is to build 3 installations in the villages of Monachil to serve as pilots. The actions envisaged through the ETU Flagship are:

- Awareness-raising and participation and dissemination activities.
- Training on energy issues and participation in the empowerment of the Energy Community driving group.
- Advice and support on facilitation issues for the internal management of the Community.

The first installations were carried out in June 2021 (35 kW installed) and were targeted to families in energy poverty through finance agreements with the city council of Monachil.

Alignment with ETU principles



ECOLOGICAL RESPONSE TO THE CLIMATE CRISIS

Rio Monachil contributes to adaptation to climate change by encouraging resilient planning and aligning the renewable energy communities of four municipalities.



TERRITORIAL EQUALITY

Rio Monachil brings together 4 municipalities with different characteristics (residential, business, villages) and a total of more than 44,000 inhabitants in the metropolitan belt of Granada.



SOCIAL INNOVATION

The community has been built in a participatory manner with the local population concerned and public authorities. Self-management: Technical-legal.



GREEN ECONOMY

The project promotes commitment to responsible practices in social, labour and environmental issues and targets REC to families in energy poverty.



COOPERATION AND COMMITMENT

Energy communities are emerging in different parts of Spain with clear values of cooperation between them to join forces and achieve greater results.



ETU Flagship Case

Ragusa

DESCRIPTION OF THE SITE

Key features

Location	Sicily, Italy
Population	71,300 inhabitants
Size	444 km ²
Population density	160.58 inhab/km ²
Density of houses	33.46 houses/ha
Population density of residential land	76.52 inhab/ ha residential land
Energy consumption	17.77 MWh/inhab/year
Electricity consumption	7.19 MWh/inhab/year
CO ₂ emissions	4.69 tn/year/inhab
Agricultural land per inhabitant	0.58 ha/inhab
Average annual income per capita	16,980 EUR
Ageing (% population > 65 years)	23.10%
Economic activities per 100 inhabitants	13.46 activities

Description of the ETU flagship case

The Ragusa Municipality is located in a rural area in Sicily, 20km from the sea. It has around 70,000 inhabitants and an area of 444 km². The Ragusa Municipality finalised its SECAP in 2021 and wanted to implement one pilot project to establish an REC in the rural area of San Giacomo, where there is a municipal structure - currently used as a school complex - suitable for allocating a medium-sized solar energy plant and aggregating in the rural REC local private residents and SMEs. The project is at the level of planning and assessing technical and economic feasibility. It is necessary to accelerate the involvement of consumers who will be able to take advantage, in collective self-consumption, of energy produced in accordance with the public notice issued by the municipality in force today. The Ragusa Municipality joined the ETU Initiative to benefit from technical support in designing the REC infrastructure and in raising citizens' awareness of energy transition and the advantages of the REC. It also needs help establishing sustainable energy planning and supporting this with local fiscal policies.

Alignment with ETU principles



ECOLOGICAL RESPONSE TO THE CLIMATE CRISIS

The REC instrument appears to be extraordinarily important in this decentralized paradigm shift.



TERRITORIAL EQUALITY

The REC contributes to combating energy poverty and the valorisation of less dynamic rural areas.



SOCIAL INNOVATION

The REC gives a central role to the citizen as prosumer, and provides fairer and more sustainable access to the electricity market.



GREEN ECONOMY

Citizen-prosumer groups can provide services such as the generation and sale of energy, energy retrofit and energy efficiency.



COOPERATION AND COMMITMENT

Citizens become active consumers (and in some cases producers). Community means above all the ability to associate at a local level, with a logic that benefits people. Specially in a context that claims the creation of territorial value through innovation.



ETU Flagship Case Magliano Alpi

DESCRIPTION OF THE SITE

Key features

Location	Piedmont, Italy
Population	2,140 inhabitants
Extension	33.22 km ²
Density population by extension	65.2 inhab/km ²
Density house	5 house/ha
Density population by residential landuse	13.88 inhab/ha residential use
Energy consumption per inhabitant	5 MWh/inhab.
Electricity consumption per inhabitant	1.17 MWh/inhab.
CO ² emissions per capita	0.76 tn/year/inhab.
Land use agriculture per inhabitant	1.35 (ha/inhab.)
Income	17,967 €/year
Ageing (% population > 65 years)	22.54%
Economic activities/100 inhabitants	9

Description of the ETU flagship case

Magliano Alpi is a mountainous Municipality in the South-Western part of Piedmont, at 400 metres above sea level. The territory spreads over an area of 33,22 km² and is divided into two different parts, 50 km far from each other. In 2020, Magliano Alpi founded the **first Italian Renewable Energy Community (REC)** and called it "Energy City Hall" (ECH). The REC-ECH combines public and private Points of Delivery: as an example, the Municipality, as a prosumer, has its own PV installations and shares the renewable energy. Magliano Alpi wants to play an active role in the relaunch of the territory based on energy transition, and it involves citizens, SMEs, designers, technicians, and artisans in using the REC-ECH as a powerful green catalyst for energy innovation. The Magliano Alpi Municipality joined the ETU Initiative to increase the citizens' awareness of energy transition and the REC impacts and to have the technical support to design the second CER infrastructure (it planned to build two other CERs in 2021). It also needs help establishing sustainable energy planning and its support through local fiscal policies.

Alignment with ETU principles



ECOLOGICAL RESPONSE TO THE CLIMATE CRISIS

Magliano Alpi has a strong commitment to developing innovative models for the relaunch of the territory based on energy transition. It was the first Municipality in Italy to implement a REC and it plans to build many others in the following years. Renewable Energy Communities allow to reduce the consumption of fossil fuels and thus CO² emissions.



TERRITORIAL EQUALITY

The REC-ECH is the first of a series of RECs that are planned to be built in the period 2021-2023. These RECs will involve neighbouring Cities, with the aim to create an overall energy production of 3 MW from Renewable Energy Sources (RES).



SOCIAL INNOVATION

Among the benefits of RECs, there is a significant reduction in energy costs. This reduction can also be conveyed through fair and supportive initiatives to significantly reduce the costs of bills for the weakest classes, helping combat energy poverty. In addition, renewable energy communities enables to reduce fossil fuel consumption and, therefore, CO² emissions. Citizens will have clear information and operational options to create opportunities for aggregation around the principles of the sustainable economy, helping the diffusion and knowledge, and bridging the information gap that typically prevents many people from understanding and participating in the advantages of the energy transition.



GREEN ECONOMY

RECs are private non-profit entities whose members include public bodies like the Municipalities: this a powerful opportunity to foster Public-Private Partnership (PPP), a major enabler of innovative business models, to boost the green economy. The REC-ECH of Magliano Alpi adopted a cooperative structure to maximize the re-distributive and sharing potential of the revenues coming from energy management at the local level. The main advantages are reducing electricity bills and costs, enabling the centralised purchase of devices and infrastructure, and creating short, local supply chains for energy services.



COOPERATION AND COMMITMENT

The REC-ECH is based on synergies among all stakeholders, notably the citizens (who pay lower bills) and local economic operators (SMEs, designers, etc.) who widen their business creating new jobs. These outcomes can be practically seen by all stakeholders, fostering cooperation, and raising awareness. Moreover, the REC-ECH is starting a cooperation with the *Smart Grid Interoperability Lab of the Joint Research Center (JRC) of the European Commission* and with the *Smart Cities & Communities Laboratory of ENEA*, with local Energy Utilities and with several Cities who asked support to design, create and manage their own RECs.



ETU Flagship Case Procida

DESCRIPTION OF THE SITE

Key features

Location	Campania, Italy
Population	10,500 inhabitants
Size	4.26 km ²
Population density	2,417 inhab/km ²
Density of houses	53.5 houses/ ha residential land
Population density of residential land	96.69 inhab/ha
Energy consumption	6.04 MWh/inhab/year
Electricity consumption	19.92 MWh/inhab/year
CO ₂ emissions	1.67 tn/year/inhab
Agricultural land per inhabitant	0,0017 ha/inhab
Average annual income per capita	21,116 EUR
Ageing (% population > 65 years)	24.44%
Economic activities per100 inhabitants	5.7 %* (estimated)

Description of the ETU flagship case

Procida is an island in the Campania region of Italy, 3.4km from the mainland. The island has an area of 4.26km² and around 10,500 inhabitants, one of the highest population densities in the EU. From an energy point of view, Procida is connected to the national electricity grid by an underwater cable connecting to the neighboring island of Ischia. Much of its coastline is protected by the Protected Marine Area of the Kingdom of Neptune. In 2020, the 'Procida Carbon Free' movement was born, which aims to decarbonise the island in 5 years. The proposal of Procida as a Flagship Case is based on the drafting of the Clean Energy Transition Agenda (CETA) to identify a vision shared by local actors of the actions to be taken for the decarbonisation of the island. Becoming a Flagship Case for the application of the ETU model would allow the island to be a model in the context of green policies and ensure the development of an ecosystemic approach. It will also help Procida to establish sustainable energy planning, supported by local fiscal policies.

Alignment with ETU principles



ECOLOGICAL RESPONSE TO THE CLIMATE CRISIS

An integrated resource management strategy oriented towards the sustainable use of resources is the basis of the ecosystem footprint of this project proposal.



TERRITORIAL EQUALITY

CETA could be a tool to identify possible paths, shared objectives, and effective strategies without altering the territory but rather maximizing its potential.



SOCIAL INNOVATION

“An island that does not isolate” is one of the tenets of this proposal, which aims to develop a network and raise awareness.



GREEN ECONOMY

The local energy production from RES would allow the creation of green jobs and even businesses on a medium and long term.



COOPERATION AND COMMITMENT

This project will make the island's energy transition process more efficient, as it will trigger a synergy mechanism. Procida could be a pilot case from which could inspire other minor islands to start their energy transition process.



ETU Flagship Case Onda

DESCRIPTION OF THE SITE

Key features

Location	Valencia
Population	24,980 inhabitants
Extension	108.20 km ²
Density population by extension	230.9 inhab/km ²
Density house	43.7 viv/km ²
Density population by residential land use	82.4 inhab/ha
Energy consumption per inhabitant/year	7.42 MWh/inhab/year
Electricity consumption per inhabitant	1.60 MWh/inhab/year
CO ₂ emissions per capita	2.98 tn/inhab/year*
Land use agriculture per inhabitant	811 m ² /inhab
Income	24,538 EUR/year/home
Ageing (% population > 65 years)	16.6%
Economic activities/100 inhabitants	7.09 activities

Description of the ETU flagship case

Onda is located in the north of the Valencian Community, in the region of Plana Baja, in the province of Castellón. Its municipal district, which at 108.84 km² is one of the largest in the province, is located inland, just 20 km from the coast, in the intermediate zone between the Sierra de Espadán mountain range and the La Plana plain, which stretches all the way to the Mediterranean Sea. The current population of Onda is 24,859 inhabitants. The population density is around 230 inhabitants per square kilometer. The City Council of Onda is committed to the fight against climate change, which is why it created an office as an instrument for the management and development of all projects related to energy efficiency in several areas, mainly the rehabilitation of buildings, sustainable transport, and mobility and GEI emissions. The Flagship case in Onda is represented by the application of the ETU model and toolbox into their ongoing Sustainable Energy Climate Action Plan, approved in April 2022. The proposal is part of the local policy to combat climate change and promote the use of renewable energies, as well as the fulfillment of the 2030 Agenda and its Sustainable Development Goals. The aim is to extend and complement the Energy Saving and Sustainability Plan approved by Onda Town Council.

Alignment with ETU principles



ECOLOGICAL RESPONSE TO THE CLIMATE CRISIS

The City Council of Onda established CO₂ emission limits and measures to be taken in order to achieve the SECAP targets aligned to Agenda 2030 in Onda and SDGs.



TERRITORIAL EQUALITY

By 2030, increase sustainable urban planning, revitalizing poor areas.



SOCIAL INNOVATION

Ensure access to adequate, safe and affordable housing and basic services for all people. Significantly reduce the proportion of young people (aged 15-24) who are not in employment, education and training (12,13%).



GREEN ECONOMY

Adopt a tax bonification by increasing RES in their industrial buildings.



COOPERATION AND COMMITMENT

Draw up by-laws and call for subsidies in order to establish a policy of demand and support and economic advantages that encourage the promotion of private-public efforts. Incorporate climate change measures into local plans.



ETU Flagship Case Brdovec

DESCRIPTION OF THE SITE

Key features

Location	Brdovec, Croatia
Population	11,134
Area (km ²)	37.6
Population density (inhabitants/km ²)	296.11
Number of households	3,709
Density population by residential land use (inhabitant/ha)	92.54
Energy consumption per capita (MWh/year)	10.54
Electricity consumption per capita (MWh/year)	3.65
CO ₂ emissions per capita (tonnes/year)	2.12
Agricultural land use per capita (ha)	0.7
Average income per capita (EUR/year)	4,400
Aging population (% population > 65 years)	15.19
Economic activities/100 inhabitants	0.33

Description of the ETU flagship case

Brdovec is a municipality in Zagreb County, measuring 37.6 km² – the county's largest municipality. The Municipality of Brdovec signed the EU Covenant of Mayors initiative on November 15 2011. The Municipality of Brdovec has prepared a Sustainable Energy Action Plan (SEAP) as part of the Covenant of Mayors initiative, which was officially approved by the Municipality Council on November 13 2012. The SEAP was prepared according to the Guidebook: How to develop a SEAP, and includes 23 measures for reducing CO₂ emissions from buildings, transport and public lighting. Its target is to reduce CO₂ emissions by at least 21% in comparison to 2009. According to available data, the Municipality's total energy consumption is roughly 90,000 MWh per year, with buildings consuming 78% of this total. The baseline emission inventory of the Municipality of Brdovec is roughly 23kt CO₂. This includes direct CO₂ emissions occurring due to fuel burning and indirect CO₂ emissions from electricity and thermal energy consumption from buildings, transport and public lighting.

Alignment with ETU principles



ECOLOGICAL RESPONSE TO THE CLIMATE CRISIS

The alignment of energy and sustainable mobility plans ensures a holistic approach to climate change action. The plan aims to reduce CO₂ emission reduction by more than 20% in relation to 2009.



TERRITORIAL EQUALITY

The Case has high replicability for other cities and Municipalities in internal Croatia.



SOCIAL INNOVATION

The project will ensure inclusive access to clean energy, including vulnerable population.

Considering the facts that the Sustainable Energy Action plan and the Sustainable Urban Mobility plan include measures for almost all sectors (except industry), the project will impact citizens, SMEs and local authorities, including municipal administrations, and other sectors.



GREEN ECONOMY

The main advantages are:

1. Reduction of cost of electrical energy
2. Reduction of cost of heating
3. Reduction of cost of cooling
4. Promotion of local suppliers
5. Reduction of cost of transport
6. Reduction of CO₂ emissions
7. Improvement in life quality for citizens
8. Aid for Preservation of Employment after (COVID-19) impact
9. Creation of new jobs
10. Use of locally available energy sources
11. Increase in investment
12. Potential increase in economic growth



COOPERATION AND COMMITMENT

As already explained above, the project is based on synergies among all stakeholders, notably the citizens (who pay lower bills for energy) and local economic operators (SMES, designers, etc.) who widen their business at local level (that means jobs) and help maintain value where it is physically generated. These outcomes can be practically seen by all stakeholders, fostering cooperation and raising awareness.



ETU Flagship Case

Naxos and Small Cyclades

DESCRIPTION OF THE SITE

Key features

Location	Greece
Population	18,904
Area	496 km ²
Density population	44 inhabitants/km ²
Residents (houses)	7,014 Permanent residencies
Density population by residential land use	26.1 m ² / person (for permanent residents)
Energy consumption per inhabitant	6.2 MWh / person
Electricity consumption per inhabitant	4.9 MWh / person
CO ₂ emissions per capita	3.4 tons / person
Land use agriculture per inhabitant	4.6 km ² / person
Income	≈ 25,000 €/capita
Ageing (% population > 65 years)	19%
Economic activities/100 inhabitants	≈ 1,500

Description of the ETU flagship case

The Municipality of Naxos and Small Cyclades are located in the area of the South Aegean and includes Naxos, Donoussa, Koufonisia, Keros, Schinoussa, Heraklia, and other smaller uninhabited islets. The size of the municipality is 495.76km². Naxos, the largest island of the Cyclades, is accessible from mainland Greece by ferries from the port of Piraeus, and it also has an airport. The island is famous as a source of emery, a rock rich in corundum, which until modern times was one of the best abrasives available. In Naxos, RES capacity is 10.7MW, from which 8.6MW are generated by the 11 wind turbines and the rest are agricultural or domestic solar PVs. The peak demand for the island is estimated at 30MW during the summer, whereas during the winter it falls to 12-13MW. Naxos has significant building stock, which needs energy upgrading. The objective of the project is to investigate the feasibility of the energy upgrade, starting with municipal buildings. More specifically, different scenarios were examined at two local schools involving the installation of energy production and storage systems through photovoltaic units and batteries. The solutions were integrated into the policy of gradually upgrading the entire stock of the buildings as a measure for mitigation of emissions.

Alignment with ETU principles



ECOLOGICAL RESPONSE TO THE CLIMATE CRISIS

Mitigation of GHG emissions by increasing the energy efficiency, energy-saving, and self-sufficiency level of the existing building stock located across its territory.



TERRITORIAL EQUALITY

The energy transition strategy for buildings can be applied both to small villages of the island and to the more populated settlements.



SOCIAL INNOVATION

The creation of an energy community is a long-term plan which is in close relation to the empowerment of the local citizens.



GREEN ECONOMY

The integration of alternative energy production and the ability to store it and potentially sell surplus back to the grid creates important economic value.



COOPERATION AND COMMITMENT

Bidirectional work and cooperation among the local actors (such as representatives of school and municipality) is vital for successful implementation.



ETU Flagship Case Skopelos

DESCRIPTION OF THE SITE

Key features

Location	Greece
Population	4,960
Area	96 km ²
Density population	52 inhabitants/km ²
Residents (Houses)	1,965
Density population by residential land use	29.6 m ² / person (for permanent residents)
Energy consumption per inhabitant	6.5 MWh /person
Electricity consumption per inhabitant	5.3 MWh /person
CO ₂ emissions per capita	3.7 tons / year
Land use agriculture per inhabitant	2.9 m ² / person
Income	≈ 25,000
Ageing (% population > 65 years)	21%
Economic activities/100 inhabitants	≈ 1,000

Description of the ETU flagship case

Skopelos is an interconnected island located in the western Aegean Sea, and one of several islands that comprise the Northern Sporades Island group, which lies east of the mainland Pelion peninsula and north of the island of Euboea. It has an area of about 96km² and the current population is 4,960 inhabitants. The island of Skopelos is characterized by its dense forests and the blue of its sea, and this is the reason it was formally declared a green and blue island on the 5th of May 1997 by the international organization of Biopolitics. The renewable energy capacity is limited to PV stations which produce up to 0.21MW, while the peak demand for the whole island equals 10MW and the average demand is around 2.5MW.

Skopelos consists of coniferous and mixed forests that cover 67% of its territory. The scope of the project in the framework of ETU is to identify the potential energy production originating from the residual forest biomass. Processing raw biomass into solid biomass fuel (pellets, briquettes, woodchips) could be used locally in appropriate heating boilers to contribute to the island's energy supply, or branded as a high-value local product and exported to the rest of

Sporades archipelago or even mainland Greece.

Alignment with ETU principles



ECOLOGICAL RESPONSE TO THE CLIMATE CRISIS

The municipality of Skopelos adopts an ecological response to the climate crisis by decarbonizing the existing heating system through the replacement of conventional boilers with suitable biomass boilers.



TERRITORIAL EQUALITY

Cooperation between nature and urban areas which is a necessary element for the utilization of forest biomass.



SOCIAL INNOVATION

The creation of an energy community dedicated to the utilization of the forest residual biomass for the energy transition of the island is a long-term people oriented action.



GREEN ECONOMY

The creation of the supply chain of forest biomass will create green jobs locally while the product will be a point of reference towards the island's energy transition.



COOPERATION AND COMMITMENT

Bidirectional work among the local actors is vital so for the successful implementation, for the awareness of the local society, and for the further continuation of the project.

ETU Territorial Cases Factsheets

ETU Territorial Case

Association of Municipalities Los Pedroches

DESCRIPTION OF THE SITE

Key features

Province	Cordoba, Spain
N associated municipalities	17 municipalities
Population	52,439 inhab.
Size	3,612 km ²
Population density	14.52 inhab/km ²
Manure production	886,982.14 t/year
Slurry generation	674,388 m ³ /year
Energy consumption	92,530 MWh/year

PROPOSAL

Biogas potential production (7plants)	48,990 MWh/year
Proportion of energy needs met through biogas	36.6 % covered
PV solar power production	2.6 MW
Area required for PV installation	1,969.32 m ²
Elect. consumption	4.55MWh/inhab/yr
CO ₂ eq emissions reduced	17,973t CO ₂ eq/year
Investment required Biogas plants	13,350.000 EUR
Investment required PV Solar panels	2,363.190 EUR

Description of the ETU flagship case

The Comarca Los Pedroches is a region with an important primary industry, mainly intensive livestock farming and agriculture. Intensive livestock farming produces a large amount of waste which is not currently being recovered and which causes serious environmental damage by polluting aquifers and emitting greenhouse gases as a result of the inadequate treatment of livestock waste.

Andalusia has 31.3% of the population at risk of energy poverty (INE 2019), compared to the national average of 20.7%. Pedroches has an even lower income compared to Andalusia overall. At the same time, the level of energy self-sufficiency of the Andalusian Autonomous Community is only 18.4%, compared to 26.1% nationally and 44.9% in Europe.

The project consists of the creation of a network of 17- 20 energy communities in the region of Los Pedroches, of which 6 will have a biogas plant valorising livestock waste. The aim is to produce affordable energy, using the waste produced by the livestock industry, sludge from urban sewage treatment plants, and solar energy, as well as other possible sources of renewable energy. The energy communities will be hybrid, powered by photovoltaic energy and a biogas plant to process livestock waste from nearby farms. The biogas plant will function as an energy storage (battery), in order to be able to supply peak demand and when there is not enough solar energy (at night, cloudy, winter, etc.). This will all be coordinated under the umbrella of an association to ensure the proper functioning of the individual plants and the fulfillment of the objectives, as well as to allow economies of scale. The project is in the technical study phase and is building collaboration relations with the agents involved: local councils, livestock cooperatives, local electricity distributors, olive cooperatives, the rural development group, neighborhood associations, business associations, the Mancomunidad, experts, the Andalusian Regional Government, the Andalusian Energy Agency, the Cordoba Provincial Council, Emproacsa and MITECO.

Alignment with ETU principles



**ECOLOGICAL
RESPONSE TO
THE CLIMATE
CRISIS**

The project will reduce emissions and the pollution of aquifers by nitrates, by recovery of organic livestock waste.



**TERRITORIAL
EQUALITY**

The project will increase energy equality in rural areas, alignment of economy, and land use planning.



**SOCIAL
INNOVATION**

The project requires the strong involvement of citizens, public authorities, livestock companies and agricultural cooperatives.



**GREEN
ECONOMY**

The transition to the use of biogas in transport & industry. promotes green entrepreneurship.



**COOPERATION
AND
COMMITMENT**

The system of local energy communities is itself a cooperative system committed to the territory facilitating local economic development. The projects is working on the engagement of municipalities and key stakeholders in the territory to form part of the energy plan.

ETU Territorial Case

Association of municipalities in Bocairent

DESCRIPTION OF THE SITE

Key features

Country, Province	Bocairent
N associated municipalities	4 municipalities: Bocairent, Agres, Alfafara and Banyeres de Mariola
Population	12,059 inhabitants
Size	193 km ²
Population density	62.48 inhab/km ²
Agricultural land use per inhabitant	1,636.62 m ² /inhab
Average income per capita	22,104 EUR/year
Ageing (% population > 65 years)	27.98%
Economic activities per 100 inhabitants	3.53 activities
Forest area	11,636 ha
Energy consumption	378.39 MWh/year

PROPOSAL PUBLIC FACILITIES

Biomass potential production	1,744 t/year (agriculture) + 1,120 t/year (forestry)
Forest area for biomass	6,979 ha
Heat consumption per year	151.35 t/year
CO ₂ eq emissions reduced	106.64 t CO ₂ eq/year
Investment required	1,071.203.18 EUR

Description of the ETU flagship case

The abandonment of agricultural areas and the shift from intensive use of the forest ecosystem (livestock and fuel use) has increased the risk of forest fires. Forest management entails an economic cost and generates a significant amount of forestry waste. To minimize these costs, Bocairent Town Council proposes the use of the forestry waste for energy use in biomass boilers in public schools as well as the production of compost. Agricultural pruning waste, which is currently disposed of by burning, would also be reused this way. This project aims to reduce the cost of energy by using existing biomass, a fuel with an overall balance of CO₂ emissions equivalent to zero, making it an economical and renewable source of energy, and to maintain sustainable forest management to reduce the risk and intensity of forest fires.

The aim of the plan is to create jobs linked to the green and circular economy that will help to fix population in inland municipalities. Bocairant has developed its biomass plant and is currently implementing the management biomass plan.

Alignment with ETU principles



ECOLOGICAL RESPONSE TO THE CLIMATE CRISIS

The project will reduce CO₂ emissions and mitigates the risk of forest fire.



TERRITORIAL EQUALITY

The Biomass Plan in Serralada Mariola allows the establishment of resilient planning for four municipalities around forest management, biodiversity protection and energy planning.



SOCIAL INNOVATION

The biomass plan implies not only improving the green economy but also creating jobs linked to the circular economy that help to fix the population in the municipalities.



GREEN ECONOMY

Although the project does not aim to exploit biomass for economic profit (the purpose is to protect and improve forest areas), it is clear that the management and recovery of forest and agricultural waste will reduce the cost of energy. In addition, as indicated in the project report, jobs linked to the circular economy (recovery of forestry and agricultural waste) will be created, which will help to fix the population in the participating inland municipalities.



COOPERATION AND COMMITMENT

The supra-municipal consortium l'Ombria de la Serra Mariola strengthens political commitment at various levels, streamlining a common fiscal and administrative policy for all participants.



ETU Territorial Case

Association of Municipalities of Maira and Grana Valleys

DESCRIPTION OF THE SITE

Key features

Location	Maira and Grana Valleys
Number of municipalities	21 municipalities
Population	30,000 inhabitants
Extension	800 km ²
Density population	37.50 inhab/km ²
Land use agriculture per inhabitant	1.67 m ² /inhab
Income	28,387 €/year
Ageing (% population > 65 years)	24.5 %*
Economic activities/100 inhabitants	7.9 activities*
Forest area	57 %
Energy consumption	135,082 MWh/year

THE PROPOSAL IN NUMBERS

Hydroelectric production	260,000 MWh/year
RECs in phase of activation	2

Description of the ETU flagship case

The Energy Community of Maira and Grana Valleys Association (CEVMG), formally established on 28/01/2021, represents 21 municipalities from the 2 valleys Maira and Grana in the Piedmont Region, and will play a key role in the perspective of distributed generation, energy saving and energy sharing from renewables. The EC Strategic Plan is the driving force for all planned activities in the coming years. The CEVMG's initiative, which came about as a result of the regional call for tenders issued in 2019, has complied with the subsequent national regulations on the subject and is preparing in this first phase to occupy the role of aggregator of Renewable Energy Communities. The tasks of the association will not be limited to simply providing technical and administrative support to the RECs during the embryonic phase, but, through the Coordination Office, it will organize the management of the works, ensuring their efficiency and functionality.

Energy management in the public sector is one of the most relevant objectives of the project. The public sector in the area has high energy consumption, justifying a special office, the Energy Environment Office, to be set up to support the entire territory in 2020. This office will be replaced by the Association Coordination Office provided for in the CEVMG statute. The aim is to support public authorities in a key sector in the years to come, for which they would otherwise lack the professional skills needed to seize the opportunities that lie ahead.

Alignment with ETU principles



ECOLOGICAL RESPONSE TO THE CLIMATE CRISIS

The energy management of the whole area will contribute to fighting against climate change thanks to a more efficient management and more efficient actions undertaken on a huge territory.



TERRITORIAL EQUALITY

All municipalities participating in the CEVMG, even the smallest ones, which today do not have technical expertise, will be able to access the services of a Coordination Office competent in energy and environmental matters.



SOCIAL INNOVATION

Reverse the risk of abandonment, desertification, and backwardness. Energy Community becomes an engine of development for the territory; focusing in water and biomass with the involvement of the population.



GREEN ECONOMY

The strategic plan will pay particular attention to the development of: RES (hydroelectricity and biomass) and mobility, favoring the creation of related local value chains, green businesses and jobs.



COOPERATION AND COMMITMENT

The CEVMG, which represents the coordination of 21 municipalities, has already made itself available, and will do so even more in the future, to collaborate with similar realities in order to disseminate and replicate its experience. The CEVMG will become the reference entity for energy sector measures included in the National Strategy for Inner Areas of the Maira and Grana Valleys.

ETU Territorial Case

Association of Municipalities Oltrepò Mantovano

DESCRIPTION OF THE SITE

Key features

Location	Oltrepò Mantovano
Number of municipalities	19 municipalities
Population	95,000 inhabitants
Extension	705 km ²
Density population	134.75 inhab/km ²
Land use agriculture per inhabitant	395 m ² /inhab
Income	31,000 €/year/inhab
Ageing (% population > 65 years)	23 %
Economic activities/100 inhabitants	8.6
Energy consumption	824,964 MWh/year

Description of the ETU flagship case

The Oltrepò Mantovano area includes 19 municipalities (located in the south of Lombardy and bordering with Veneto and Emilia-Romagna regions) and around 100,000 inhabitants, with a current increase of energy production plants in three categories:

1. 2 thermoelectric power stations in Ostiglia and Sermide, which are implementing an extension of the power production, marginally for Sermide, but doubling power production in Ostiglia.
2. Installation of small PV systems on both public and private buildings.
3. Biomass plants (food, vegetable and zootechnical wastes) built by local companies (with particular reference to those in the agri-food sector, the most important production sector in the area, with a strong rural identity).

This proliferation of facilities is poorly coordinated at territorial level and, in the first and third categories, clearly oversized in relation to local needs. In the case of thermal power plants, the strategy is national and the influence of the consortium and individual municipalities is limited to non-binding opinions. However, if the other two categories are taken into account, it becomes clear that coordination at supra-municipal level is essential to optimize construction, production and consumption.

In particular, it would be relevant to use the power of the tools developed by the ETU initiative to programme and promote two interventions:

1. Creation, in a shared process with the territory (bottom-up approach), of the Oltrepò Mantovano Area SECAP and its valorisation as a strategic planning tool for energy and climate to 2030 by local authorities;
2. The creation of one or more energy communities coordinated at municipal and supra-municipal level.

Alignment with ETU principles



ECOLOGICAL RESPONSE TO THE CLIMATE CRISIS

Realizing a SECAP for the whole area and implementing the actions will reduce carbon emissions and result in more sustainable territorial planning.



TERRITORIAL EQUALITY

An energy community is a local and effective response to energy production and consumption needs, providing energy to disadvantaged households and neighborhood commercial activities in small towns or hamlets.



SOCIAL INNOVATION

The energy community enables a new way of public-private interaction that includes the citizen as an active collaborator in the community's well-being. The co-participation of farms, industrial companies and individual citizens create the community engagement process.



GREEN ECONOMY

The local agri-food value chain would benefit from increases in the green economy and a more intensive application of processes based on the use of energy from RES.



COOPERATION AND COMMITMENT

The decades-long cooperation of the Oltrepò Mantovano Consortium with the associated municipalities would be strengthened and, within the framework of the energy community, would be structured on at least 3 levels: Consortium, Municipalities and Citizens.



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