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Energy Transition

Joint Technical Paper

Interreg Euro-MED Green Living Areas Mission (C4LA)

October 2026

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Introduction

The present document is a comprehensive report prepared by all the actors of the Green Living Areas (GLA) Mission of the Interreg Euro-MED programme, engaged in projects related to the Energy transition, coordinated by the Community4LivingAreas project partners. The main objective is to give a picture of what has been done by the GLA mission as a whole, in the 2021 – 2027 programming period, to support the energy transition of the Mediterranean territories. The document will show which solutions have been developed, the challenges they can address, and the territories in which they have already been tested, allowing other territories to get inspired for a replication of the implemented measures.

In this peculiar historical and geopolitical moment, transitioning to renewable energy sources is becoming crucial not only for reducing carbon emissions and combating climate change, but also to strengthen the countries, companies, and households' economies. The transition to green energy has gained significant momentum in recent years, driven by the urgent need to reduce greenhouse gas emissions but also to ensure independence from fossil fuels. Renewable energy sources, defined as wind power, solar power, hydropower, tidal power, geothermal energy, ambient heat captured by heat pumps, biofuels, and the renewable part of waste, offer sustainable and increasingly cost-effective alternatives to traditional fossil fuels. Green energy planning encompasses various strategies, including boosting renewable energy production, enhancing consumption efficiency, and minimising energy overconsumption, to create a sustainable and balanced energy ecosystem.

To really boost the energy transition at Mediterranean level, we need to take into account what has already been developed and what are the best practices existing. For these reasons, the capitalisation of the main outcomes of the 5 projects of the GLA mission **ProLightMED, LOGREENER, EnerCmed, RECinMED, RENEWPORT** is essential. These 5 projects dedicated their efforts to support:

- the creation of renewable energy communities (EnerCmed & RECinMED),
- the public lighting efficiency (ProLightMED),
- the energy transition of specific territories like ports (RENEWPORT) and
- the energy transition as a whole (LOGREENER).

In the document, we firstly analysed the main challenges and aspects related to the energy transition of the Mediterranean territories and in what way a territory can act to implement an effective transition. Followingly, the main solutions developed by the group of projects of the Green Living Areas Mission are presented in the view of local plans realisation. The different pilot actions are successively showcased to better understand how it is possible to realise relevant steps for the green transition.

1. What are the main challenges and aspects regarding the energy transition for the MED territories?

Local and regional authorities, particularly municipalities, play a pivotal role in spearheading the adoption and integration of renewable energy sources within their jurisdictions. Municipalities are uniquely positioned to influence and accelerate the green energy transition. They can develop comprehensive energy plans that align with both national and European climate objectives, ensuring a cohesive and strategic approach to sustainable energy. By implementing localised green energy initiatives, municipalities can address the specific needs and capacities of their communities, fostering resilience and sustainability.

Municipal green energy planning encompasses several key activities:

- Development of local energy strategies: Municipalities are responsible for crafting tailored energy strategies that incorporate renewable energy targets, energy efficiency measures, and long-term sustainability goals.
- Implementation of local renewable energy projects: Municipalities can facilitate the installation of renewable energy systems, such as solar panels, wind turbines, and geothermal systems, on public buildings and land.
- Regulatory and policy support: Municipalities play a role in ensuring that local policies and regulations support the development and integration of renewable energy infrastructure.

However, implementing the clean energy transition in EU Mediterranean municipalities involves navigating distinct administrative, structural, and geographic hurdles. While these local authorities operate within the overarching legislative framework of the EU Green Deal and have access to EU cohesion funds, localized application faces complex friction. The primary challenges uniquely impacting EU Mediterranean municipalities can be categorised as follow:

1. Administrative understaffing and the "capacity gap"

There is a massive operational divide between ambitious EU climate mandates and the actual execution capabilities of southern European town halls:

- The SECAP bottleneck: Under the EU Covenant of Mayors, municipalities are expected to design and implement complex Sustainable Energy and Climate Action Plans (SECAPs). Small, rural, or insular Mediterranean towns rarely have the dedicated energy managers, data analysts, or technical staff required to draft or execute these plans.
- Complex EU funding bureaucracy: Accessing direct EU funds, aiming at supporting the SECAP design or energy transition local project, requires navigating dense administrative compliance and co-financing rules. Larger, wealthier northern EU cities easily absorb these overheads, whereas under-resourced Mediterranean municipalities frequently miss out due to a lack of specialized grant-writing expertise.

2. Grid fragility and the "tourism paradox"

The physical infrastructure of Mediterranean coastal networks struggles with intense seasonal and geographical volatility:

- The tourism spike: Coastal municipalities suffer from extreme seasonal population swelling during the summer. Local grids must be scaled to handle massive peak demands for air conditioning and hospitality services, leading to highly inefficient system under-utilisation during the winter.
- Technological and infrastructure limitations: Integrating renewable energy sources into the existing power grid can be challenging due to differences in energy generation and consumption patterns. Upgrading grid infrastructure to accommodate variable renewable energy sources is necessary but costly. Other challenges emerge due to energy storage. The intermittent nature of renewable energy sources, such as solar and wind, requires effective energy storage solutions to ensure a reliable energy supply. Current storage technologies can be expensive and have limitations in capacity and efficiency. Moreover, many EU Mediterranean municipalities are located on islands or in isolated mountainous terrain. Integrating intermittent solar or wind power into these weak, non-interconnected distribution grids threatens grid stability without expensive local energy storage solutions.

3. Regulatory rigidity and centralised governance

Despite EU directives pushing for decentralized energy, municipal autonomy is frequently bottlenecked by national frameworks:

- Slow permitting and bureaucracy: In many southern EU member states, energy governance remains highly centralized. Municipalities must wait through lengthy, bureaucratic national or regional permitting processes to clear local renewable or energy efficiency projects.
- Immature energy community frameworks: While the EU legally mandates the creation of Local Energy Communities (allowing citizens, private and municipalities to jointly generate and share power), national transpositions in several Mediterranean countries remain legally ambiguous. This slows the municipal adoption of shared rooftop solar or localized micro-grids.

4. Severe financial constraints and risk perception

Financial health at the local level severely restricts the long-term investments required for carbon neutrality:

- High upfront capital costs: Deep energy retrofits for aging public building stocks and public lighting overhauls require significant initial investments. Many Mediterranean municipalities suffer from existing debt burdens and constrained local budgets, leaving little room for green capital expenditure.
- Private investment barriers: Local authorities frequently struggle to structure projects in a way that attracts private capital through Public-Private Partnerships (PPPs), often due to perceived macroeconomic, regulatory, or currency risks associated with regional deployment.

5. Architectural and natural preservation & climate change

The historical and geographical identity of Mediterranean towns introduces unique structural friction:

- Strict heritage protection laws: A vast portion of Mediterranean municipal building stock is protected under rigid historical preservation laws. These regulations routinely ban or heavily restrict the installation of visible rooftop photovoltaic (PV) panels, external insulation, or modern double-glazing on traditional structures.
- Environmental backlashes: While renewable energy projects are environmentally beneficial, they can sometimes disrupt local ecosystems. For example, wind farms can impact bird and bat populations, and hydroelectric projects can alter aquatic habitats. Furthermore, the development of large-scale renewable energy projects can lead to land use conflicts, particularly in areas with valuable natural habitats or agricultural land. Balancing energy production with environmental conservation is a key challenge.
- Community opposition and delays: Local communities may oppose the development of green energy projects due to concerns about visual impacts, noise pollution, and changes in land use. This opposition can lead to significant delays and increased project costs. Misunderstanding or misinformation about the benefits and impacts of green energy projects can fuel resistance. Effective community engagement and education are necessary to address these concerns and build support.
- Degradation of facilities due to climate change: Extreme temperatures overload energy systems, increasing consumption, operational costs, and maintenance frequency while shortening infrastructure lifespan. Severe weather events like high winds, heavy precipitation, and flash floods physically damage wind turbines, solar panels, and power plants, disrupting supply and requiring expensive repairs. Furthermore, droughts drastically reduce the efficiency of water-dependent hydroelectric plants, and the resulting wildfires present severe safety risks and extensive damage to the distribution grid.

The MED ports: a closed ecosystem in the city with specific challenges…

EU Med ports are under a highly specific, high-pressure dynamic. Because these ports sit within the European Union, their energy transition is no longer a voluntary sustainability goal. It is a legally mandated race against the clock. Here is the focused breakdown of the unique aspects and acute challenges shaping EU MED ports today.

Unlike ports in other regions, EU MED ports are bound by the strict, punitive timelines of the EU's Fit for 55 package and the European Green Deal. Two regulations in particular dictate their immediate roadmaps:

- Fuel EU Maritime: Imposes step-by-step limits on the greenhouse gas intensity of energy used on board ships, forcing a shift to renewable and low-carbon fuels, therefore obliging ports to accommodate the refuelling infrastructure for such new fuels;
- AFIR (Alternative Fuels Infrastructure Regulation): Legally mandates that by 2030,

all major EU ports (part of the TEN-T core network) must provide Onshore Power Supply (OPS) for container ships and passenger vessels above 5.000 gross tonnage (GT).

Core Aspects of the Energy transition of EU MED ports:

- The Onshore Power Supply (OPS) or Shore-Side Electricity (SSE) systems: on the heart to the port energy transition, it allows docked ships to shut down their fossil-fuel auxiliary engines and plug directly into the local electrical grid. It drastically cuts greenhouse gas emissions and port noise by up to 98%. Many EU ports may pair OPS directly with renewable energy sources like wind and solar to maximize environmental benefits.
- Green hydrogen and fuel bunkering gateways: EU MED ports are positioning themselves as the primary entry points for Europe's future hydrogen economy. They are forming "Green Shipping Corridors" to import, store, and bunker green ammonia, methanol and hydrogen.
- Industrial co-location (port-city clusters): Ports like Marseille and Barcelona are integrating with surrounding industrial zones to create localized smart grids. They aren't just transitioning their own cranes; they are partnering with local refineries and chemical plants to share clean energy infrastructure.

The unique challenges for EU MED Ports:

- The "carbon leakage" and southern competition threat: This is the primary economic anxiety for EU MED ports. Because strict EU environmental regulations and carbon taxes (via the EU Emissions Trading System - ETS) increase operational costs, there is a severe risk that global shipping lines will bypass EU MED hubs entirely. Ships can divert to rapidly expanding, non-EU transshipment hubs just across the basin in North Africa or the UK/Balkans to avoid EU compliance costs.
- Severe grid constraints and "last-mile" power: Connecting a single large cruise ship to the grid can require up to 15–20 MW of power, equivalent to running a small city. Several mediterranean grid infrastructure, historically designed to push power *to* coastal tourism centers rather than handle heavy industrial loads, requires massive structural upgrades to handle these sudden, massive surges.
- Volatility of the onshore electricity prices: one of the main financial obstacles for shipowners and slows down the financial return on investment in Shore-Side Electricity (SSE) systems, especially for these reasons:
    - **Fragmentation of network tariffs**: Electricity rates vary significantly between countries and even between different ports due to fixed system charges and network costs. The EU does not regulate the final price of Shore-to-Ship Power (SSE), leaving tariff determination to individual Member States, utilities, or Port Authorities.
    - **Committed power charges**: Passenger ships (especially large cruise ships) require massive peak power (often exceeding 10–15 MW). Paying fixed costs

for "committed power" on berths that are not utilized 24/7 represents a heavy financial risk for terminal operators.

- **The taxation paradox**: Historically, maritime fuels have enjoyed substantial tax exemptions, whereas shore-based industrial electricity is subject to high excise duties and taxes.

- Financing and the "chicken-and-egg" dilemma: Building OPS berths and hydrogen bunkering facilities requires hundreds of millions of euros. However, ports face a dilemma: shipowners are hesitant to retro-fit their vessels until port infrastructure is ready, while ports are wary of investing heavily in specific fuel infrastructures (like ammonia vs. methanol) before a clear global market standard emerges. However, from 2030, container and passenger ships with a gross tonnage of over 5.000 Gt will be required to connect to and use shore power for all on-board energy operations, subject to certain restrictions for short stops (less than 2h) or in emergencies.
- Lack of standardization of the ships: Ships vary significantly in their power demands, socket placements, and grounding configurations, requiring complex, flexible management systems for the OPS.
- The tourism and port-city friction: Because ports like Genoa, Nice, and Barcelona are deeply woven into dense, historic urban fabrics, space is at a premium. Finding physical room to build massive electrical substations, battery storage banks, or alternative fuel tanks without triggering fierce pushback from local populations over safety and aesthetics is an ongoing bottleneck.

2. How can a territory implement energy transition strategies?

Through the realisation of strategies and plans, a municipality can have a long-term vision of what they want to achieve, defining step-by-step measures to be implemented to reach the targeted objectives. The Covenant of Mayors is supporting this process and proposes SEAPs and SECAPs as instruments for municipalities to set their objectives and targets and define the implementation of actions, with a constant monitoring allowing to take measures in case of difficulties in the realisation.

A SECAP, or Sustainable Energy and Climate Action Plan, is a strategic document developed by local authorities under the EU's Covenant of Mayors initiative. It outlines actions to reduce CO2 emissions by at least 40% by 2030 compared to a baseline year, while also addressing climate change adaptation through risk assessments and resilience measures. Key components include a Baseline Emission Inventory (BEI), vulnerability analysis, and targeted measures across sectors like buildings, transport, and energy efficiency.

SECAP development process

Developing a SECAP follows a structured process that typically unfolds in four main phases:

1. **Initiation**: Establish an internal coordination structure, appoint a responsible coordinator, and engage stakeholders through participatory processes.
2. **Planning**: Conduct a Baseline Emission Inventory (BEI) and climate risk/vulnerability assessment (RVA); draft the plan with targets, actions, and financing strategies.
3. **Implementation**: Execute the defined measures across sectors like energy, transport, and buildings, involving public and private partners.
4. **Monitoring**: Regularly track progress, report to the Covenant of Mayors every two years, and update the plan as needed.

Several mitigation measures are introduced to overcome the challenges highlighted in the previous section:

- Enhanced maintenance protocols for renewable energy facilities: Implementing proactive and predictive maintenance programs can help identify potential issues before they lead to significant damage. Regular inspections and maintenance schedules can reduce the likelihood of failures and extend the lifespan of energy infrastructure.
- Diversified energy sources: Integrating a mix of renewable energy sources, such as solar, wind, hydro, and geothermal, can distribute the risk and reduce the impact of localized extreme weather events on the overall energy supply.
- Advanced monitoring systems: Utilizing IoT and AI-driven monitoring systems can provide real-time data on infrastructure health and environmental conditions, enabling timely interventions and reducing downtime.

- Community engagement and education: Conducting comprehensive outreach and education programs can address misconceptions and highlight the benefits of green energy projects. Transparent communication and involving community members in the planning process can build trust and support.
- Implementing energy communities: Energy communities are a key pillar of the energy transition and are nowadays part of a resilient territorial planning
- Incorporating local preferences: Adjusting project plans to accommodate local concerns, such as visual and noise impacts, can help alleviate opposition. This might include designing visually appealing installations or implementing noise reduction technologies.
- Innovative financing models: Exploring alternative financing options, such as public-private partnerships, green bonds, and community funding models, can alleviate financial constraints. These models can attract investment by spreading risk and offering attractive returns.
- Government grants and subsidies: Leveraging available government grants and subsidies for renewable energy projects can reduce the financial burden on municipalities. Keeping abreast of funding opportunities and application processes is essential.
- Environmental impact Assessments: Conducting thorough environmental impact assessments (EIAs) prior to project initiation can identify potential ecological impacts and inform mitigation strategies. This process ensures that projects are designed to minimize environmental disruption.
- Sustainable land use planning: Prioritizing the use of degraded or non-agricultural land for renewable energy projects can minimize conflicts with natural habitats and agricultural activities.
- Policy advocacy and alignment: Working with regional and national authorities to align policies and regulations can create a more supportive environment for green energy projects. Consistent and clear policy frameworks reduce uncertainties and foster investor confidence.
- Capacity building: Enhancing the capacity of local government officials and stakeholders to navigate regulatory landscapes and implement green energy projects effectively can ensure smoother project execution.
- Research and development: Supporting research and development efforts to improve renewable energy technologies and storage solutions can drive innovation and reduce costs over time. Collaborative initiatives with academic and industry partners can accelerate technological advancements.

Renewable energy communities and self-consumption: new model to spread the energy transition everywhere and create more autonomous units

The global shift toward sustainability is no longer just about massive solar farms or offshore wind turbines; it is becoming personal. Renewable Energy Communities (RECs) and collective self-consumption are emerging as the blueprint for a decentralized, democratic

energy transition.

Traditionally, energy has been a one-way street: large plants generate power, and we pay to use it. These new models flip the script by turning citizens into prosumers—individuals who both produce and consume their own green energy. At the same time, they create new opportunities for citizens, public authorities, businesses, and civil society organisations to actively participate in the energy transition and collectively benefit from locally generated renewable energy. By sharing locally produced electricity within a neighborhood or district, communities can:

- Boost autonomy: Reduce dependence on volatile global energy markets and national grids.
- Lower costs: Significantly cut electricity bills through shared infrastructure and self-consumption incentives.
- Combat energy poverty: Ensure that clean, affordable power is accessible to everyone, including low-income households.
- Promote social inclusion by enabling citizens and local stakeholders who might otherwise be excluded from renewable energy investments to participate in and benefit from the energy transition.
- Strengthen local governance by fostering collaboration between citizens, public authorities, businesses, and civil society organisations around shared energy objectives.

Creating resilient units

By transforming cities and towns into a network of autonomous energy units, we make the grid more resilient. Instead of relying on a few single points of failure, the "energy transition everywhere" model relies on millions of interconnected hubs. This localised approach minimises energy waste during transport and fosters a sense of collective responsibility toward the planet.

Energy communities are not just a technical solution. They are a social revolution, proving that the path to a zero-emission future starts right at home.

Addressing challenges in green energy planning requires a multifaceted approach, including community engagement, securing diverse funding sources, implementing resilient infrastructure, and navigating complex regulatory environments. By understanding and strategically addressing these challenges, municipalities can effectively promote the transition to sustainable energy systems, contributing to a greener and more resilient future.

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Tools of the GLA Mission projects

Supporting the local energy transition



3. How the Interreg Euro-MED Green Living Areas mission can support the energy transition of the territories

The Green Living Areas Mission includes several projects dealing with energy transition and not only. The most relevant results have been categorised and published on a dedicated online platform to allow an easy and accessible access. Moreover, the main results of the project of the mission have been classified also to understand the contribution that they can give to local plans such as SEAP, SECAP, Urban Greening Plan, SUMP and SULP.

a) The Ecosystemic Transition hUb

The Green Living areas mission currently manages 5 projects dealing directly with energy transition and providing tools and instruments that can be useful for Mediterranean territories. Moreover, other projects belonging to the Mission are providing tools to support the financing of such projects, the engagement of citizens and local stakeholders, and other tools that could support for the implementation of a local energy transition project. Even if a local public authority is interested in merging the energy and mobility topic, it is still possible to find tools supporting logistics, SUMP realisation, E-Mobility…

The Ecosystemic Transition hUb is the place where it is possible to find all the most relevant tools and solutions provided by the projects of the mission.

Moreover, the online platform is open to evaluating other tools and solutions provided by other projects and organisations, enriching the set of tools and solutions offered to the territories.

Hereafter, a short overview of the solutions already available or soon in release for supporting the energy transition at local level.

b) The main tools of the Green Living Areas Mission

LOGREENER toolkit for local green energy transition

LOGREENER | Interreg Euro-MED | Co-funded by the European Union

Solution profile	Description
Solution	LOGREENER toolkit
Type of solution	Online toolkit and planning resources
Territory and intended users	Urban and rural authorities, planners and energy agencies
Related local planning	SECAP and equivalent local energy plans
Developed by	LOGREENER consortium
Source and access	https://etuinitiative.eu/solutions/logreener-toolkit-to-guide-local-green-energy-transition/ Online toolkit: https://reselplan-toolbox.eu/logreener/ Project documentation: https://logreener.interreg-euro-med.eu/what-we-achieve/

The LOGREENER toolkit combines three complementary resources. The COMPOSE tool provides a structure for designing, implementing and monitoring sustainable-energy projects. The PRISMI tool supports the modelling of renewable-energy scenarios and consideration of local integration options. LOCAL4GREEN focuses on fiscal policies and incentives that local authorities can use to encourage renewable energy. Bringing them together helps users connect technical choices with governance and policy measures.

The main challenge addressed is the gap between having an energy-transition objective and having the capacity to prepare an actionable local programme. A municipality may need to improve its baseline, compare photovoltaic options or examine incentives for households. The toolkit provides a common entry point to these tasks, rather than requiring staff to locate and combine separate project outputs.

Its added value is the integration of planning guidance, modelling resources, policy examples, case studies and training materials. Users can apply the relevant components to an existing investment problem or use a broader combination when preparing a local plan. The original working document identifies MUSOL Foundation as a contact point through Francesco Filippi at francesco.proyectos@musol.org.

For replication, the authority should first identify its immediate planning task and the data already available. An energy agency or other technical intermediary can then help select and apply the relevant modules. The public guidance and examples support adaptation to local administrative

capacity; they do not remove the need to validate data and commission the studies required for investment.

LOGREENER TOOLKIT ACROSS THE PLANNING CYCLE: SECAP · HEATING AND COOLING PLAN		
Toolkit components: ① COMPOSE: design, implementation and monitoring of energy projects · ② PRISMI: renewable energy scenario modelling · ③ LOCAL4GREEN: local fiscal policies and incentives · ④ Case studies and training materials		
PLANNING STAGE	**SECAP (COVENANT OF MAYORS)**	**HEATING AND COOLING PLAN**
1. Preparation and governance ① ④	Set up the coordination structure, assign roles and define the planning task, using COMPOSE guidance and training materials (Initiation).	Establish the working group and define the scope of local heating and cooling planning together with the energy agency.
2. Baseline and energy assessment ① ②	Organise municipal energy data and review the evidence used for the Baseline Emission Inventory.	Map heating and cooling demand and local renewable supply options as input to the scenario work.
3. Scenario comparison and action design ② ③	Model renewable energy scenarios with PRISMI and select mitigation actions, recording the assumptions used (Planning).	Compare renewable heating and cooling options and select locally permissible incentives from the LOCAL4GREEN examples.
4. Implementation and incentives ③ ④	Introduce fiscal incentives for renewable installations and assign delivery tasks within the authority (Implementation).	Support households and businesses in switching to renewable heating and cooling through targeted incentives.
5. Monitoring and review ①	Track progress with the COMPOSE monitoring structure and feed results into the two-year Covenant of Mayors reporting cycle.	Update demand and supply data and review the plan as installations and incentives take effect.
Stage mapping: Elaboration based on the Covenant of Mayors SECAP cycle and Local Heating and Cooling Plan requirements under the Energy Efficiency Directive (EU) 2023/1791. The mapping describes possible uses of the LOGREENER components; it does not imply that the project has delivered or validated a complete statutory plan.		

RENEWPORT Renewable Energy Toolkit for Mediterranean ports

RENEWPORT | Interreg Euro-MED | Co-funded by the European Union

Solution profile	Description
Solution	RENEWPORT Renewable Energy Toolkit
Type of solution	Web tool for renewable-generation assessment
Territory and intended users	Ports and port authorities, with technical and municipal partners
Related local planning	Port energy plans and contributions to territorial SECAPs
Developed by	RENEWPORT consortium
Source and access	ETU solution page: https://etuinitiative.eu/solutions/renewport-the-renewable-energy-toolkit-for-med-ports/ Online tool: https://renewport.digiport.com.es/login?callbackUrl=https%3A%2F%2Frenewport.digiport.com.es%2F Project documentation: https://renewport.interreg-euro-med.eu/what-we-achieve/

The RENEWPORT toolkit helps port authorities examine photovoltaic and wind generation in relation to current and future energy needs. It provides calculations and visualisations with outputs that can be viewed or downloaded. The working document describes graphs, statistics and datasets exportable in CSV, JSON or PDF formats.

The toolkit addresses the need to identify suitable renewable options before selecting an investment. Its port focus makes it useful where energy demand, available surfaces and operational constraints differ from a conventional municipal-building project. The official project description explains that both less experienced users and technical users can work with different levels of input detail. Preliminary benchmarking, testing and evaluation resources accompany the tool.

The practical role proposed in this report is screening and comparison. A port should use the results to narrow options and prepare a brief for technical and financial studies. Structural conditions, marine exposure, safety, connection capacity and access for maintenance still require site-specific examination. The tool should therefore be embedded in the port's decision process alongside engineering and operational assessment.

The official project results page and the ETU solution page provide access routes to the toolkit and its supporting material. Because the results page also retains development-stage wording, users should identify the version and associated reports they are applying rather than assuming every published description refers to the same release.

RENEWPORT RENEWABLE ENERGY TOOLKIT ACROSS THE PLANNING CYCLE: SECAP · PORT ENERGY AND ENVIRONMENTAL PLAN		
Tool components: ① Current and future port energy demand · ② Photovoltaic and wind generation assessment · ③ Visualisations and exportable outputs (CSV, JSON, PDF) · ④ Benchmarking, testing and evaluation resources		
PLANNING STAGE	**SECAP (COVENANT OF MAYORS)**	**PORT ENERGY AND ENVIRONMENTAL PLAN**
1. Preparation and coordination ①	Involve the port authority in the municipal climate team and agree the inventory boundary between port and city (Initiation).	Set up the port energy team and define the scope of port energy and environmental planning.
2. Energy demand baseline ① ③	Coordinate port energy data with the Baseline Emission Inventory to avoid gaps or double counting.	Compile present and expected port energy needs, including operations, buildings and future electrification.
3. Renewable potential screening ② ③	Identify candidate photovoltaic and wind actions on port land and buildings for the mitigation portfolio.	Compare photovoltaic and wind options against port demand and export the results for internal discussion.
4. Option appraisal and project preparation ③ ④	Select options for detailed feasibility, grid connection and financing studies, and assign owners and budgets (Implementation).	Use the calculated outputs to prepare technical briefs; check structural, marine, safety and connection conditions on site.
5. Monitoring and learning ④	Report renewable generation in the port within the territorial monitoring and reporting cycle.	Compare installation performance with the initial assumptions and update future investment choices.
Stage mapping: Elaboration based on the Covenant of Mayors SECAP cycle and port energy and environmental planning practice (for example the Italian DEASP for port system authorities). RENEWPORT is a screening tool: its results support, but do not replace, site specific engineering and operational assessment.		

EnerCmed resources for energy communities and resilient neighbourhoods

EnerCmed | Interreg Euro-MED | Co-funded by the European Union

Solution profile	Description
Solution	EnerCmed integrated REC and neighbourhood-resilience resources
Type of solution	Guidelines, mapping, terms of reference, feasibility resources and NbS portfolio
Territory and intended users	Municipalities willing to implement a REC and/or NbS in their territory
Related local planning	Integrated SECAP mitigation, adaptation and energy-poverty actions
Developed by	EnerCmed consortium
Source and access	Official deliverables: https://enercmed.interreg-euro-med.eu/what-we-achieve/

EnerCmed connects renewable energy communities and self-consumption schemes with nature-based approaches in marginalised neighbourhoods. Its public project description places affordable energy and participation by vulnerable populations alongside urban heat and climate resilience. The project's contribution is therefore broader than identifying a site for renewable generation.

The published deliverable set offers concrete preparation resources. Background analysis (D.1.1.1) considers REC rules, public infrastructure, heat and energy poverty. Mapping (D.1.2.1) combines thematic analysis with citizen dialogue and institutional input. Terms of reference (D.1.3.1) cover social engagement, technical parameters, legal arrangements and heat-related considerations. Preliminary assessment (D.2.2.1) addresses technical and economic sustainability, while D.2.4.1 provides a portfolio of small-scale nature-based solutions.

The value of this resource set is its connection of different municipal functions. Energy specialists can consider generation opportunities, social services can help identify participation barriers, and planners can examine heat exposure and the public realm. The proposed use is to build a coordinated intervention in which each component has a clear purpose, rather than assuming that an energy installation will automatically resolve neighbourhood vulnerability.

For transfer, an authority should first identify a neighbourhood where energy affordability and climate exposure overlap, then assess potential members, public assets and local delivery capacity. The design should distinguish renewable-generation benefits from the comfort and resilience outcomes of nature-based interventions. Each needs an appropriate baseline and provision for operation and maintenance.

The resources are presented here as a documented methodological package. The existence of maps and assessments demonstrates preparation work; it should not be treated as proof that every mapped energy community is legally established or that all associated investments are operational.

ENERCMED RESOURCES ACROSS THE PLANNING CYCLE: SECAP · URBAN GREENING PLAN

Resources: ① Background analysis (D.1.1.1) · ② Mapping with citizen dialogue (D.1.2.1) · ③ Terms of reference (D.1.3.1) · ④ Preliminary technical and economic assessment (D.2.2.1) · ⑤ Portfolio of small scale nature-based solutions (D.2.4.1)

PLANNING STAGE	SECAP (COVENANT OF MAYORS)	URBAN GREENING PLAN
1. Preparation and context ①	Bring energy, social and planning departments together and review REC rules, public infrastructure, heat and energy poverty (Initiation).	Set up a multi actor partnership that includes social services and residents of vulnerable neighbourhoods (Getting started).
2. Assessment and mapping ① ②	Add energy poverty and heat exposure to the Baseline Emission Inventory and the Risk and Vulnerability Assessment.	Map heat hotspots, green space gaps and potential REC sites through citizen dialogue and institutional input (Assess and plan).
3. Action design ③ ⑤	Define REC actions with technical, legal and social terms of reference, linked to adaptation measures (Planning).	Select small scale nature-based solutions from the portfolio for the same neighbourhoods.
4. Feasibility and delivery ④	Assess technical and economic sustainability and prepare an implementable business model (Implementation).	Plan operation, maintenance and budget for the selected greening interventions.
5. Monitoring and review ② ⑤	Track energy, affordability and participation indicators within the reporting cycle.	Monitor comfort and climate resilience outcomes separately from the energy benefits.

Stage mapping: Elaboration based on the Covenant of Mayors SECAP cycle and EU Urban Greening Plan guidance. EnerCmed links energy communities with nature-based solutions in vulnerable neighbourhoods; the mapping presents a methodological package and does not imply that every mapped energy community is legally established or operational.

These are the more relevant available solutions at the 01/10/2026. The document will be updated each year, with the new finalised solutions.

These solutions have already been tested on MED territories, and you can find the description of the pilot action here: https://etuinitiative.eu/pilots/.

In following, you can have an overview of what will be available in 2027.

RECinMED tools for inclusive renewable energy communities

RECinMED | Interreg Euro-MED | Co-funded by the European Union

Solution profile	Description
Solution	RECinMED renewable energy community resources
Type of solution	Urban solar toolkit, rural methodology and island feasibility resources
Territory and intended users	Urban neighbourhoods, rural territories and islands
Related local planning	Community energy actions within SECAPs and local energy strategies
Developed by	RECinMED consortium
Source and access	Project website: https://recinmed.interreg-euro-med.eu/

RECinMED addresses the creation and operation of inclusive Renewable Energy Communities (RECs). The published output framework distinguishes a rural methodology, an urban solar toolkit and island energy-management and feasibility self-assessment resources. This territorial differentiation matters because settlement density, available assets, community organisation and operating conditions shape the type of initiative that can work.

The Community Engagement JTP describes the urban Solar Community Toolkit as a combination of a digital platform for rooftop potential and expected savings, plug-and-play solar kits and an engagement strategy. It identifies Granada as the testing context and links the approach to households, schools, businesses and community organisations. The energy dimension of the toolkit is inseparable from explaining participation, building trust and establishing shared responsibilities.

Its added value for municipalities is a practical bridge between renewable potential and a community capable of acting on it. Roof and consumption information can inform possible generation, while engagement identifies prospective members and their needs. Legal, governance and financial arrangements then determine whether the initiative can proceed and how benefits will be shared.

For replication, authorities should establish which territorial resource is relevant and check national community-energy and self-consumption rules. Necessary preparation may include roof access, demand data, technical design, membership arrangements and an assessment of affordability. Municipal support should address barriers faced by tenants and households unable to make an initial investment. These are implementation considerations derived in this report, rather than a claim that the toolkit resolves every legal or financial issue.

The official project descriptions identify pilots in Granada, Gavião and Šolta, but use mixed implementation and future-oriented wording. The supplied JTP describes testing in Granada; neither source set used here establishes a common set of verified generation or household-savings results across the three settings. The examples below therefore identify the territorial application

and the approach, without attributing completed installations or quantified benefits beyond the available evidence.

RECINMED RESOURCES ACROSS THE PLANNING CYCLE: SECAP · HEATING AND COOLING PLAN · CLEAN ENERGY TRANSITION AGENDA			
Resources: ① Urban Solar Community Toolkit · ② Rural REC methodology · ③ Island energy management and feasibility self assessment · ④ Territorial action plans			
PLANNING STAGE	**SECAP (COVENANT OF MAYORS)**	**HEATING AND COOLING PLAN**	**CLEAN ENERGY TRANSITION AGENDA (ISLANDS)**
1. Preparation and mobilisation ① ②	Mobilise residents, businesses, schools and the municipality around a community energy action (Initiation).	Engage stakeholders and identify buildings and groups interested in shared renewable supply.	Bring the island community and the transition team together behind a shared energy vision.
2. Assessment and baseline ① ③	Feed roof potential, demand and expected savings into the Baseline Emission Inventory and the energy analysis.	Map local energy demand and renewable potential, including community rooftop solar.	Use the island self-assessment to describe the energy system, demand, and local resources.
3. Community design and prioritisation ② ③	Define membership, governance and benefit sharing, and prioritise REC actions among the mitigation measures (Planning).	Integrate community solar and self-consumption into the renewable supply measures of the plan.	Check the feasibility of island energy communities and select priority transition pathways.
4. Implementation and community set up ① ④	Combine technical design with legal and financial preparation and establish the energy community (Implementation).	Deploy shared solar capacity that contributes to local energy supply targets.	Translate priorities into territorial action plans with owners and funding routes.
5. Monitoring and replication ④	Track generation, participation and the distribution of benefits for the reporting cycle.	Track generation and savings, and extend the approach to further neighbourhoods.	Review progress and transfer the model to other islands and rural territories.
Stage mapping: Elaboration based on the Covenant of Mayors SECAP cycle, Local Heating and Cooling Plan requirements under the Energy Efficiency Directive, and the Clean Energy Transition Agenda approach of the Clean energy for EU islands initiative. The three columns reflect the urban, rural and island resources of RECinMED; the mapping does not attribute verified installations or savings to the pilots in Granada, Gavião and Šolta.			

ProLIGHTmed approach to efficient municipal public lighting

ProLIGHTmed | Interreg Euro-MED | Co-funded by the European Union

Solution profile	Description
Solution	ProLIGHTmed public lighting strategy and implementation approach
Type of solution	Joint strategy, financing approaches, action plans and pilot experience
Territory and intended users	Municipalities responsible for public-lighting assets
Related local planning	Public lighting measures within SECAPs and municipal investment plans
Developed by	ProLIGHTmed consortium
Source and access	Project website: https://prolightmed.interreg-euro-med.eu/

ProLIGHTmed focuses on improving the energy efficiency of public lighting. Its published scope combines a joint strategy with financing methodologies, action plans, pilot activity and cross-border knowledge transfer. This offers a useful municipal entry point because the authority can connect a defined service and asset base to procurement and investment decisions.

The challenge is to translate technical potential into a financed upgrade that maintains the service over time. The original energy working document identifies public-lighting efficiency as a core project contribution. The practical application proposed here begins with a reliable asset inventory and baseline, followed by assessment of technology, operating arrangements and lifecycle costs.

A municipal action should specify the intended lighting service and the evidence required to assess it. Changes in installed power, controls and operating hours need to be considered together; electricity savings alone do not show whether the redesigned service meets local needs. The authority should assign responsibility for maintenance and the collection of consumption data before procurement. These are analytical implementation recommendations, rather than attributed contents of a standalone ProLIGHTmed software tool.

The project's published materials describe strategic and financial support alongside pilots. The report therefore treats ProLIGHTmed as a coordinated approach and resource set. It does not claim that a separate downloadable ETU flagship toolkit has been verified. The main transfer opportunity is to use documented methods and implementation experience when preparing a comparable municipal lighting action.

PROLIGHTMED APPROACH ACROSS THE PLANNING CYCLE: SECAP · PUBLIC LIGHTING PLAN		
Approach components: ① Joint public lighting strategy · ② Financing methodologies · ③ Local action plans · ④ Pilot actions · ⑤ Cross border knowledge transfer		
PLANNING STAGE	**SECAP (COVENANT OF MAYORS)**	**PUBLIC LIGHTING PLAN**
1. Preparation and commitment ①	Include public lighting in the climate commitment and assign responsibility for the lighting asset base (Initiation).	Define the intended lighting service, roles and the scope of the municipal lighting plan.
2. Baseline and asset inventory ① ③	Compile lighting assets, energy use and operating hours for the Baseline Emission Inventory.	Build a reliable inventory of luminaires, controls, condition and service needs.
3. Options and action design ③	Compare upgrades and control arrangements and select the lighting action for the mitigation portfolio (Planning).	Set technical standards, control and dimming strategies, and priority zones for renewal.
4. Financing and implementation ② ④	Connect the action to a financing route (for example energy performance contracting) and define procurement and lifecycle costs (Implementation).	Deliver a pilot at a defined site and record implementation issues and maintenance arrangements.
5. Monitoring and extension ④ ⑤	Compare energy and service indicators with the baseline and report savings in the monitoring cycle.	Use pilot evidence and partner experience to decide whether and how to extend the upgrade.
Stage mapping: Elaboration based on the Covenant of Mayors SECAP cycle and municipal public lighting planning practice. ProLIGHTmed is treated as a coordinated approach and resource set; the mapping does not refer to a separate downloadable ETU toolkit.		

c) How the Green Living Areas projects support the realisation of a SECAP

The following tables focus on the five core energy projects and explain how their tools and resources can support specific SECAP tasks, from baseline assessment and action design to financing, implementation and monitoring. The mappings are analytical guidance for local authorities; they do not replace the Covenant of Mayors methodology or imply that a project tool prepares a complete SECAP.

LOGREENER across the local energy planning cycle

Planning stage	Contribution of the solution	Use in the local plan
Preparation	Use COMPOSE guidance to structure the process.	Define coordination, stakeholders and the planning task.
Baseline	Organise and review municipal energy information.	Improve the evidence used for the local energy assessment.
Scenario comparison	Apply PRISMI resources to renewable options.	Compare feasible measures and record assumptions.
Policy and action design	Consider LOCAL4GREEN fiscal examples.	Select locally permissible incentives and supporting actions.
Implementation and review	Use project guidance and training resources.	Assign delivery tasks and maintain monitoring within the authority.

Planning-stage mapping: Analytical elaboration based on the documented solution components. The mapping describes possible uses and does not imply that the project has delivered or formally validated a complete statutory plan.

RENEWPORT across port and territorial energy planning

Planning stage	Contribution of the solution	Use in the local plan
Energy context	Compile present and expected port energy needs.	Coordinate the port baseline with the municipal inventory boundary.
Potential screening	Compare photovoltaic and wind options.	Identify candidate renewable-generation actions.
Option appraisal	Review calculated outputs and assumptions.	Select options for detailed feasibility and connection assessment.
Project preparation	Use results to inform technical briefs and investment choices.	Assign owners, budgets and a financing route.
Operation and learning	Compare installation performance with initial assumptions.	Update future project choices and territorial reporting.

Planning-stage mapping: Analytical elaboration based on the documented solution components. The mapping describes possible uses and does not imply that the project has delivered or formally validated a complete statutory plan.

RECinMED across community energy and SECAP preparation

Planning stage	Contribution of the solution	Use in the local plan
Mobilisation	Engage residents, businesses and the municipality.	Define a community-energy action and intended beneficiaries.
Assessment	Explore roof potential, demand and expected savings.	Assess renewable opportunities alongside local energy needs.
Community design	Clarify membership, governance and benefit allocation.	Include participation and affordability arrangements in the action.
Preparation and delivery	Combine technical design with legal and financial preparation.	Assign delivery responsibilities and implement the selected scheme.
Monitoring and transfer	Track generation, participation and distribution of benefits.	Report the action and adapt the approach to further areas.

Planning-stage mapping: Analytical elaboration based on the documented solution components. The mapping describes possible uses and does not imply that the project has delivered or formally validated a complete statutory plan.

EnerCmed across integrated neighbourhood planning

Planning stage	Contribution of the solution	Use in the local plan
Context assessment	Combine energy-poverty, climate and infrastructure information.	Identify neighbourhood priorities across SECAP pillars.
Opportunity mapping	Use local analysis and dialogue to identify potential RECs.	Select sites and prospective participants for further study.
Design	Apply technical, legal and social terms of reference.	Define the energy action and complementary adaptation measures.
Feasibility	Assess technical and economic sustainability.	Determine whether an implementable business model can be prepared.
Delivery and review	Provide separate indicators for energy and neighbourhood measures.	Review affordability, participation and climate-resilience outcomes.

Planning-stage mapping: Analytical elaboration based on the documented solution components. The mapping describes possible uses and does not imply that the project has delivered or formally validated a complete statutory plan.

ProLIGHTmed across a municipal lighting action

Planning stage	Contribution of the solution	Use in the local plan
Baseline	Compile assets, energy use and service needs.	Establish the lighting action baseline within the SECAP.
Options	Compare proposed upgrades and control arrangements.	Select a technically suitable intervention.
Investment preparation	Connect action planning to a financing approach.	Define procurement, lifecycle costs and responsibilities.
Pilot delivery	Apply the selected approach at a defined site.	Record implementation issues and operational arrangements.
Evaluation	Compare energy and service indicators with the baseline.	Use evidence to decide whether and how to extend the upgrade.

Planning-stage mapping: Analytical elaboration based on the documented solution components. The mapping describes possible uses and does not imply that the project has delivered or formally validated a complete statutory plan.

Conclusion

This document is part of a bigger framework for the development of Greener Living areas, needed an ecosystemic approach, considering not only the energy aspects, but also the mobility, the territorial planning, the community engagement, and the finance to support the green transition. Four other reports like this one have been prepared to cover the mentioned topics, and together, the 5 documents represent the whole Green Living Areas mission of the Interreg Euro-MED programme.

The five core energy projects contribute complementary resources to this wider framework. LOGREENER supports local planning, renewable-energy scenarios and fiscal incentives; RENEWPORT focuses on renewable-energy opportunities in ports; RECinMED addresses the organisation of inclusive energy communities in urban, rural and island settings; EnerCmed connects community energy with neighbourhood resilience; and ProLIGHTmed supports the preparation of energy-efficient public-lighting measures. Their combined value lies in helping authorities connect strategic objectives with specific actions and the practical arrangements needed to deliver them.

SECAPs provide a common planning framework in which these contributions can be brought together. The planning-cycle tables show where particular resources can support baseline assessment, the comparison of options, action design, financing, implementation and monitoring. Local authorities can use this mapping to select tools that address a defined planning task, while maintaining coherence between mitigation, adaptation and energy-poverty objectives. The tools support the planning process; they should be applied alongside the relevant Covenant of Mayors guidance and the authority's adopted commitments.

Transfer to another territory requires adaptation to local energy demand, available assets, administrative capacity, national rules and financing conditions. Technical assessment should be accompanied by stakeholder involvement, clear ownership and provision for long-term operation and maintenance. Authorities should also distinguish expected benefits from measured results, assigning indicators and responsibilities before implementation so that experience can inform future decisions.

The ETU Initiative and cooperation within the GLA Mission can help municipalities, port authorities, energy agencies and community organisations identify relevant resources and exchange implementation experience. Connecting these resources to local plans and investment programmes offers a practical route from individual project outputs to sustained territorial action.