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# Make more with less

**Enhancing  
Resource Efficiency**  
in the Mediterranean  
Agro-food Sector  
and Cities for a  
Circular Economy

**Interreg**  
*Mediterranean*



EUROPEAN UNION



**GREEN GROWTH**

Project co-financed by the European  
Regional Development Fund

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**Enhancing Resource Efficiency** in the Mediterranean Agro-food Sector and Cities for a Circular Economy

INTERREG MED GREEN GROWTH COMMUNITY

## About the Circular Economy White Papers

This White Paper is part of a series of thematic Circular Economy White Papers presenting the contributions of the Interreg MED Green Growth community and their efforts in transitioning towards a circular economy, in the areas of 1) Resource Efficiency, 2) Green and Smart Public Services, 3) Waste Prevention and Management and 4) Competitiveness and Innovation.

*A circular economy is 'where the value of products, materials and resources is maintained in the economy for as long as possible, and the generation of waste minimised'.*

European Commission 2015<sup>1</sup>

The thematic White Papers are complemented with a transversal White Paper and accompanied by a set of Policy Recommendations and Legal Recommendations in the same thematic areas. The elaboration of the White Papers was led and developed by the SYNGGI project based on contributions from modular projects of the Interreg MED Green Growth Community<sup>2</sup>, through dedicated Thematic Working Groups on the four thematic areas.

## Resource Efficiency and the Circular Economy

A more efficient use of resources<sup>3</sup> is a key pillar for the transition towards a circular economy in Europe. Important progress has already been made over the past decades (for instance, the overall resource productivity of European economies has increased by approximately 40% since 2000<sup>4</sup>), however, the current linear "Take-Make-Waste" economic model is still highly resource-intensive.

<sup>1</sup> European Commission (2015). Closing the loop - An EU action plan for the Circular Economy.

<sup>2</sup> <https://green-growth.interreg-med.eu>

<sup>3</sup> The EU's Roadmap to a Resource-efficient Europe defines resources as "all the resources that are inputs into our economy - metals, minerals, fuels, fish, timber, water, soil, clean air, biomass, biodiversity and land and sea."

<sup>4</sup> Eurostat (2019). Material flow accounts and resource productivity.

<sup>5</sup> European Commission (2011). Commission Staff Working Paper. Roadmap to a Resource Efficient Europe.

<sup>6</sup> European Commission (2015). Closing the loop - An EU action plan for the Circular Economy.

<sup>7</sup> European Commission (2017). European Semester Thematic Factsheet – Resource Efficiency.

<sup>8</sup> European Commission (2018). A European Strategy for Plastics in a Circular Economy. Brochure.

*“Resource efficiency is a way to deliver more with less. It increases aggregate economic value through more productive use of resources over their life cycle. It requires using those resources in a sustainable way, within the planet’s long-term boundaries. This includes minimising impacts of one resource’s use on other resources, including the environment.”*

European Commission 2011<sup>5</sup>

With the EU Circular Economy Action Plan adopted in 2015<sup>6</sup>, the European Commission stresses the economic case to increasing resource efficiency as an opportunity to generate new and sustainable competitive advantages for the EU. Transitioning from the current linear economy model towards a circular economy model by ‘closing the loop’ of product life cycles through better reuse and recycling has benefits for the environment and the economy<sup>7</sup>. The Circular Economy Action Plan identified plastics as a key priority. To address the challenges posed by plastics throughout the value chain, the European Strategy for Plastics in a Circular Economy<sup>8</sup> was adopted in 2018 and aims at transforming the way plastic products are designed, used, produced and recycled in the EU.



<sup>9</sup> European Commission (2017). Resource Efficiency.

<sup>10</sup> European Commission (2011). Roadmap to a Resource Efficient Europe.

<sup>11</sup> European Commission (2011). Roadmap to a Resource Efficient Europe.

<sup>12</sup> Eco-innovation refers to all forms of innovation – technological and non-technological – that create business opportunities and benefit the environment by preventing or reducing their impact, or by optimising the use of resources

*“Resource efficiency makes economic sense. It is the one basic principle that underpins the entire circular economy strategy and it is fundamental to green growth. By using fewer resources, in a more efficient manner, Europe can retain its competitive edge, create green growth, sustainable jobs and protect the environment better.”*

European Commission 2017<sup>9</sup>

Already in 2011, the European Commission launched the Resource-efficient Europe flagship initiative under the Europe 2020 Strategy<sup>10</sup>. The initiative promotes a shift towards a resource-efficient and low-carbon economy to help achieve more sustainable growth. Energy is central in the Europe 2020 Strategy (with targets of 20% increase of energy from renewables and a 20% increase in energy efficiency by 2020). The Roadmap to a Resource-efficient Europe<sup>11</sup> supports the flagship initiative and outlines the structural and technological changes required by 2050 in order to decouple economic growth from resource use and its subsequent environmental impact.

Together, the Circular Economy Action Plan and the Roadmap to a Resource-efficient Europe aim to change the past and the current patterns of a highly resource-intensive economic development model in the EU that results in high levels of pollution, environmental degradation and the depletion of resources. More sustainable production and consumption patterns in line with the principles of a circular economy are required to reduce the resource depletion and the associated environmental degradation and pollution. Moving towards a more productive and less resource-intensive economy needs to be based on investments in eco-innovation<sup>12</sup>, which in turn can lead to significant economic opportunities in terms of new technologies and new green industries, with positive impacts on competitiveness and job creation (see also White Paper No. 4 “Fit for a Circular Future. Promoting Competitiveness and Innovation of Mediterranean SMEs for a Circular Economy”). Enhancing resource efficiency is therefore a key aspect of Europe’s transition towards a circular economy, and an important pillar for Europe’s future economic development and environmental health.



## The Interreg MED Green Growth community and its contribution to enhancing resource efficiency for a circular economy

The objective of the Interreg MED Green Growth community is to promote sustainable development in the Mediterranean area, based on sound management of natural resources taking into account innovation while considering the effects on the labour market by promoting social justice and green jobs. Several projects of the Interreg MED Green Growth community contribute to enhancing resource efficiency:

**PEFMED** (Uptake of the Product Environmental Footprint across the MED agro-food regional productive systems to enhance innovation and market value) tests the applicability of the EU Product Environmental Footprint method in Mediterranean agro-food systems, with the aim of greening the agro-food supply chain, including a higher resource efficiency and the decrease of environmental impacts.

**MED GREENHOUSES** (Green Growth through the capitalization of innovative Greenhouses) promotes, disseminates and transfers innovative approaches for the establishment of efficient greenhouses, minimizing water and energy demand.

**REINWASTE** (REmanufacture the food supply chain by testing INNOvative solutions for zero inorganic WASTE) promotes the adoption of greener innovative concepts in the agriculture and food industry to prevent inorganic waste and thus ensuring that the sector is less resource intensive.

**CAMARG** (Clusters of innovative zero-km Agro-food MARKET places for Growth) supports the marketing of local zero-km agro-food products, making the value chain less resource intensive.

**MADRE** (Metropolitan Agriculture for Developing an innovative, sustainable and Responsible Economy) ga-



thers stakeholders related to metropolitan and peri-urban agriculture and creates a transnational cooperation in the Mediterranean area to foster a change process in the urban food supply model.

**ESMARTCITY** (Enabling Smarter City in the MED Area through Networking) promotes and applies the Smart City concept through the implementation of pilot projects in different countries of the Mediterranean area, which enables cities to use energy more efficiently in buildings and public lighting.

## Challenges and opportunities addressed by the Interreg MED Green Growth community projects

The overall challenge addressed by the Interreg MED Green Growth community projects is the high level of resource intensity forming part of the economies of the Mediterranean countries. This is, amongst others, the case in the Mediterranean agro-food sector, as well as in cities across the Mediterranean region, in terms of energy intensity. According to the European Commission, in industrialized countries the food, housing and mobility sectors are typically responsible for 70-80% of all environmental impacts. Hence, enhancing resource efficiency in these sectors is key for a transition towards a circular economy and provides the opportunity for new and innovative business models, while at the same time tackling challenges related to pollution, environmental degradation, climate change and energy supply. A circular economy model related to agriculture is closely connected to technologies and practices that minimize waste and pollution, keeping products and materials in use and regenerating the natural systems. Agricultural production that embraces sustainability and circularity is also a fundamental aspect of organic production techniques and the paradigm of localized, small-scale food systems.

A circular economy model for cities is closely related to the smart city paradigm, through which resource efficiency, sustainability, social inclusivity and the well-being of citizens are pursued through technological and social innovation.



## Tackling Resource Efficiency in the Agro-food Sector

The challenges related to producing enough food for the world in 2050 are becoming more and more clear. This calls for increased production with less input of resources such as water, fertilizers, land, energy, chemicals and labour intensity. It also calls for higher resource efficiency coupled with a minimum or zero effect on the environment with higher sustainability rates.

In the Mediterranean agriculture and food industry, there is a high level of resource intensity along the value chain during the production, packaging and transport of food products:

- Main resource inputs for production being; land, water, energy, fertiliser and pesticides. In urban and peri-urban agriculture, the optimization of the use of land and water as two of the most critical and expensive resource inputs is of particular importance.
- Inorganic materials (films, nylon, greenhouse coverings, agrochemical packaging etc.) are often poorly recycled while some are abandoned in nature. For food packaging, plastics are widely used. This plastic waste from food products contributes to around 9 million tons of plastic that ends up in the ocean each year, of which 80% of the waste originates on land.
- Fuel is needed to transport the products – from the farm to the location processing and packaging to the point of sale to the final consumer.

### The specific challenges tackled by the projects are:

- Difficulties for companies to measure the environmental footprint of their products, including the efficiency of resource use.
- It is estimated that about 120.000 ha are covered with greenhouses in the Mediterranean region, and are predominantly low cost, low tech, labour intensive and rudimentary equipped structures. Provided with access to available technologies, the greenhouses offer opportunities for increased resource efficiency, high quality production and enhanced food security.
- Difficulties exist for agro-food producers to market and sell their products locally, competing with large retailers.
- There is a lack of available technologies and solutions for food packaging as an alternative to plastic packaging.
- There is a lack of consideration for metropolitan/urban and peri-urban agriculture in public policies, which prevents the consolidation of successful models that can explore alternative food supply chains to reach a wider group of consumers.

*The objective of the Interreg MED Green Growth community is to promote sustainable development in the Mediterranean area*

## Tackling Resource Efficiency in cities

In the urban context, there is high potential for increasing energy efficiency in urban infrastructures, especially in terms of public lighting and public buildings. Concerning street lighting, approximately 35 TWh of electricity is used by over 56 million functioning streetlights across Europe. With outdated and inefficient street lighting systems, up to half of the municipal energy bills goes to street lighting alone. As public lighting is costly, measures for improving lighting infrastructure have not been widely undertaken. Public buildings account for the second main energy consuming sector in municipalities at European level, and are seen as a first step to start improving the building stock. Buildings are responsible for approximately 40% of energy consumption and 36% of CO<sub>2</sub> emissions in the EU.

### The specific challenges tackled by the projects are:

- Public authorities require enhanced awareness regarding solutions for increasing energy efficiency in city infrastructure, and efforts in all municipal departments are needed. While at technical level there is an increased level of knowledge, at public procurement and legal departments there is a requirement to further stress the possibilities.
- Realising efficiencies: Up to 70 % of the original energy consumption can be saved in street lighting by reinvesting in new technologies, and up to 50% by replacing the luminaires only. About 35% of the EU's buildings are over 50 years old and almost 75% of the building stock is energy inefficient, while only between 0.4-1.2% of the building stock is renovated each year. Therefore, more renovation of existing buildings has the potential to lead to significant energy savings – potentially reducing the EU's total energy consumption by 5-6% and lowering CO<sub>2</sub> emissions by about 5%.

## Solutions provided by the Interreg MED Green Growth community projects

To address the challenges and opportunities, the Interreg MED Green Growth community projects provide several concrete solutions that promote eco-innovation, green growth, circular economy and the efficient use of resources in the agro-food sector and in cities across the Mediterranean region. These solutions are:

### Tools, technologies and services

#### • PRODUCT ENVIRONMENTAL FOOTPRINT (PEF)

The PEFMED project applies and tests the European Product Environmental Footprint (PEF) method across different product chains and clusters (dairy, cured meat, olive oil, wine, feed, bottled water) in various Mediterranean regions. The result from this application with a specific “PEFMED method”, which entails the involvement of different stakeholders (PEF experts, business analysts, S3 managers, sector experts and national agro-food associations) and includes the application of the PEF combined with socio-economic Key Performance indicators, supports Mediterranean companies in the agriculture and food industries to innovate in key green production processes while ensuring full respect for local agro-food traditions. Among other, this enables companies to identify potentials for enhancing resource efficiency and for improving their environmental and socio-economic performance by decreasing greenhouse gas emissions and the use of water and energy.

The Product Environmental Footprint (PEF) is a method for assessing the environmental impact of products along their whole life cycle. It was first introduced by the European Commission under the Communication “Building the Single Market for Green Products” (2013), it was tested by a specific pilot phase at European level and is currently in the transition phase.

#### • INNOVATIVE GREENHOUSE TECHNOLOGIES

The MED Greenhouses project capitalises on the results of other successful projects by promoting, disseminating and transferring innovative greenhouse technologies to companies and other stakeholders in the Mediterranean region. One particular solution the project has capitalised on is geothermal greenhouses. The use of low geothermal energy in greenhouses not only permits cultivation all year round, increase in production, improved protection against plant diseases and considerable improvement in yield values, but it also substitutes fossil fuels with renewable sources of energy and enhances the resource efficiency in intensive agriculture.

#### • ALTERNATIVE PACKAGING SOLUTIONS

To limit the production of inorganic waste in the agro-food sector, the REINWASTE project identifies and tests solutions to optimise the use of bio-based packaging materials and to redesign products and processes in the dairy, meat and horticulture sectors. The project compiles a dataset of Key Enabling Technologies (KETs) and products with the most promising zero waste solutions – among other chemical recycling and depolymerization – and implements pilot tests in the Agriculture sector and in the Food Industry. Biobased and biodegradable materials – such as Polyhydroxyalkanoates (PHA)– are of great interest for replacing fossil polymers, however, ongoing research aims at making these new materials appropriate for the food industry.

#### • AGRO-FOOD ELECTRONIC MARKETPLACE

The CAMARG project tests and validates an e-commerce solution as a marketplace to support small producers (farmers, food artisans, small retailers) in the Mediterranean to directly reach consumers in their vicinity with their products and be able to compete with mass retailers.

Shortening the supply chain in the agro-food industry leads to a reduction of resources used for transport, storage and delivery. At the same time, the solution has advantages for the consumers who are able to access high quality seasonal and local produce at an affordable cost. There are 54 producers involved among the four regions, offering a total of 358 products in more than 11 different food categories. So far, the marketplace has achieved more than 60 deliveries, 570 newsletter subscribers, and more than 1000 followers on social media. The customers are made up of more than 85% women.

#### • SMART SOLUTIONS FOR ENERGY EFFICIENCY IN CITY INFRASTRUCTURE

The ESMARTCITY project implements pilot tests that deal with utilising existing infrastructure at city level for the development of further services that promotes innovation and entrepreneurship. The pilot tests demonstrate the Smart City concept's potential to increase energy efficiency in two domains: Energy Efficient Public Buildings and Public Street Lighting. In those pilot cases, certain pre-conditions have to be met, the most important of which is the openness of the data and, possibly, the existence of APIs (application programming interfaces) that permit access to the data generated by the Smart City infrastructures. In this context, the pilot testing and the infrastructure built by it, are not isolated solutions but rather open solutions as they are not privately-owned.



## • ASSESSMENT METHODOLOGY FOR BEST PRACTICES IN URBAN AND PERI-URBAN AGRICULTURE

The MADRE project uses an assessment methodology for urban and peri-urban agriculture based on good practices collected by local partners from Barcelona, Montpellier, Marseille, Bologna, Tirana and Thessaloniki. This methodology is related to one of six innovation systems: farmers' innovation, social innovation, consumer innovation, academic research, territorial innovation and transnational innovation. The contribution of a good practice to eight major challenges defined by the project - (1) Job creation, (2) Social inclusion (3) Educational, health and nutritional benefits, (4) Quality upgrading and value creation (5), Organisational benefits, (6) Territorial integrity and land management (7) Environmental benefits, (8) Synergies - was then assessed first by the initiative leader or the local partner and then by ANIMA Investment Network. For this second assessment, the context in which the initiative was introduced, the local challenges faced and the stakeholders involved have also been taken into account. The final assessment is the average between the two ratings. The MADRE Catalogue promotes a selection of the best practices collected from the 6 cities for the 6 innovation areas of urban and peri-urban agriculture to

show the variety of solutions found in very diverse local contexts. Best practices can also be uploaded in the MADRE Digital Platform.

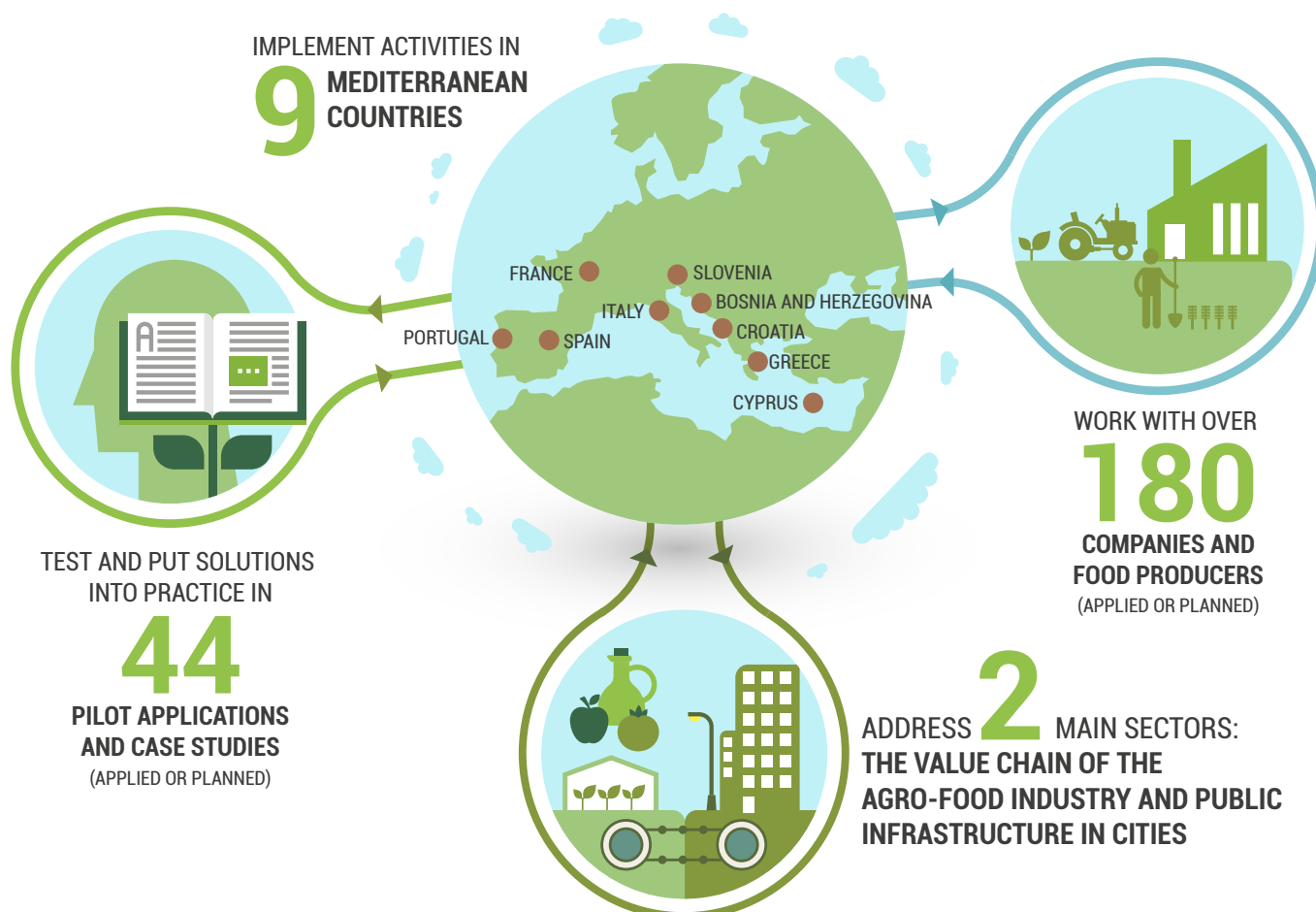
## Pilots, results and key Success factors

A common approach of the projects of the Interreg MED Green Growth Community is to apply, test and validate solutions in different sectors and regions, and thus provide evidence for improvements in terms of enhancing resource efficiency and green growth in the Mediterranean region.

### TOGETHER, THE FEATURED PROJECTS

- Implement activities in 9 Mediterranean countries: Albania, Bosnia & Herzegovina, Croatia, France, Greece, Italy, Portugal, Slovenia and Spain.
- Test and put solutions into practice in 59 pilot applications and case studies (applied and planned)
- Address 2 main sectors: The value chain of the agro-food industry and public city infrastructure (buildings and energy efficiency)
- Work with over 434 companies (applied and planned)

# TOGETHER, THE FEATURED PROJECTS



## Application of PEFMED method in Taleggio cheese supply chain in Lombardy, Italy (PEFMED)

The PEFMED method (PEF + socio economic indicators) was tested by ENEA and Federalimentare Servizi in the Caseificio Sangiovanni dairy company, located in Lombardy (Italy), with the aim of both assessing the environmental and socio-economic performance of the entire Taleggio cheese supply chain and identifying improvement potentials. Figure 1 shows the system boundaries of Taleggio cheese production. The application of the PEFMED method entailed the involvement of different stakeholders (PEF experts, business analysts, S3 managers, sector experts) and highlighted the raw milk production phase as the most significant environmental hotspot (Figure 2). As regards the dairy company, the main environmental impacts stemmed from the energy and heat consumption for dairy processing. The installation of solar thermal panels was identified in the business plan as an interesting opportunity for the dairy company, which could decrease their use of resources and improve the environmental performance at the same time.

*The installation of solar thermal panels was identified in the business plan as an interesting opportunity for the dairy company, which could decrease their use of resources and improve the environmental performance at the same time.*

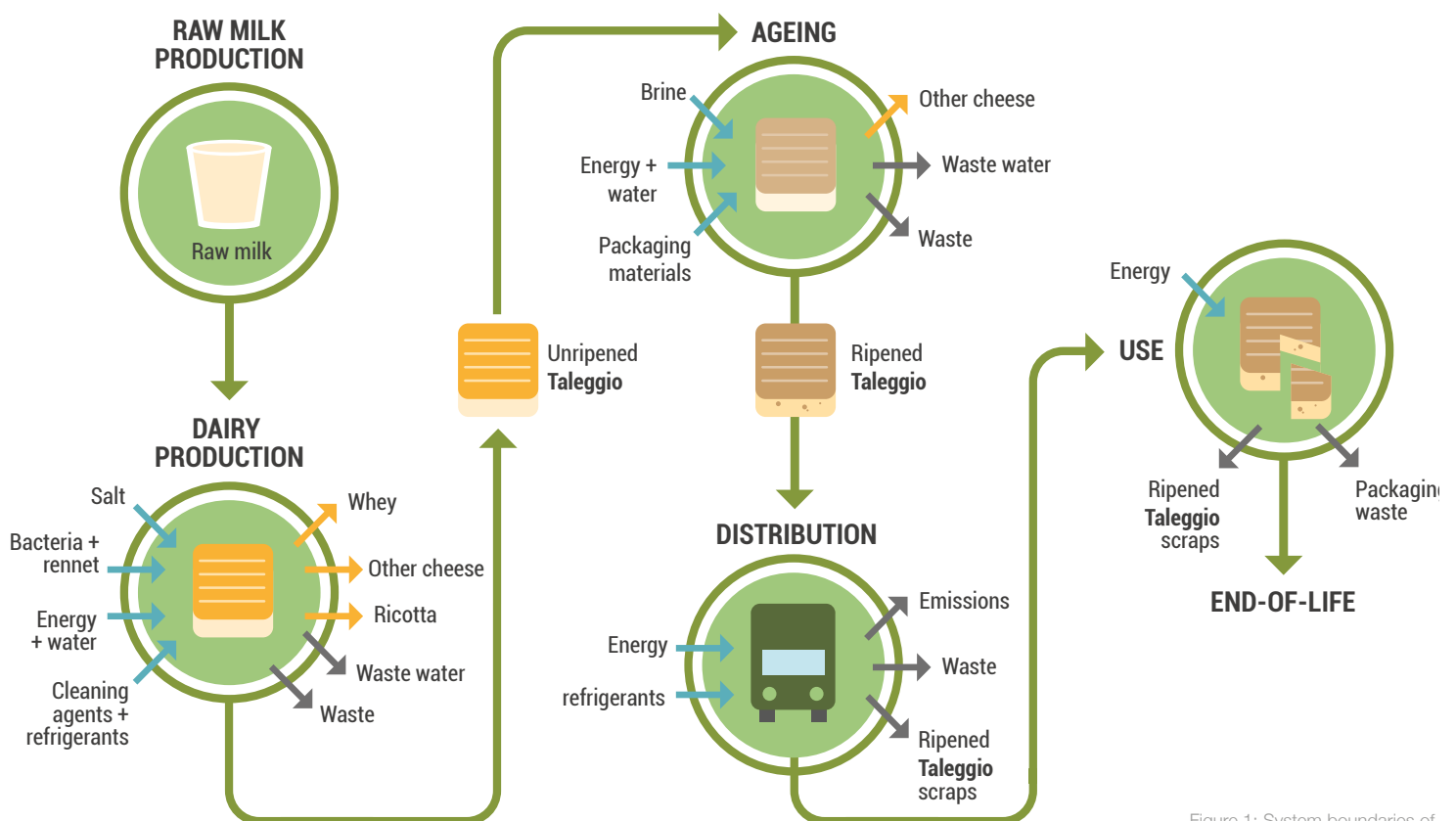


Figure 1: System boundaries of Taleggio cheese production chain



**THE MOST CRITICAL  
LIFE CYCLE STAGE  
OF TALEGGIO  
CHEESE IS RAW  
MILK PRODUCTION,  
WHICH ACCOUNTS  
FOR MORE THAN  
80% OF THE TOTAL  
ENVIRONMENTAL  
IMPACT**

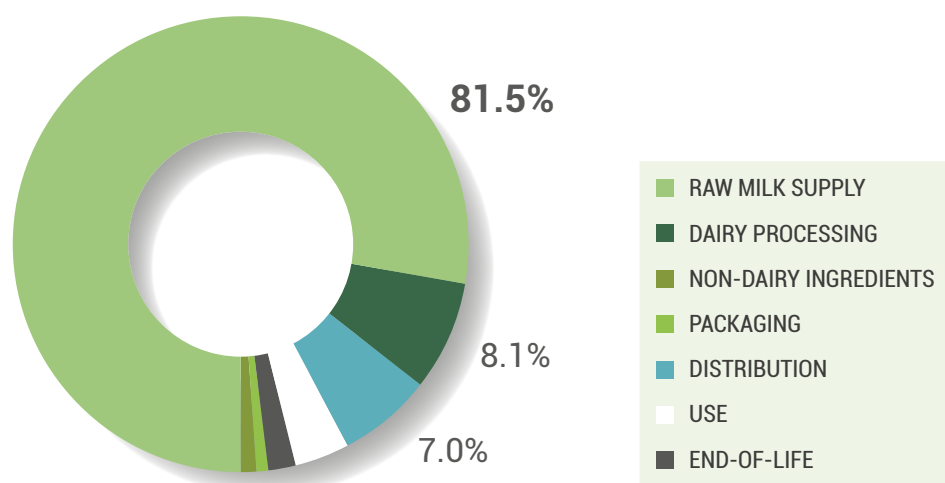


Figure 2: Main environmental results



The MED Greenhouse is an innovative greenhouse technology that was developed during the LIFE+ Adapt2change project, and is now disseminated and transferred through the MED Greenhouses project as a capitalising project through studies, workshops, trainings, action plans, etc. The MED Greenhouse is based on Geothermal Heat Pumps Systems that exploit shallow geothermal energy (exploitation of stored energy of low depth rock and surface / ground water with temperatures <25°C).

Compared to conventional greenhouses and to open cultivation practices, the MED Greenhouses can achieve, among others, the following:

**UP TO 67% ENERGY SAVINGS**

**45-100% WATER SAVINGS  
COMPARED TO CONVENTIONAL  
GREENHOUSES**

**46-52% LESS CARBON EMISSIONS**

**30%-60% LESS FERTILISER USE**



**Pilot testing of the Esmartcity Project in Portugal, Spain, France, Italy, Bosnia Herzegovina, and Greece on public lighting and public buildings.**

## ONE PILOT PROJECT WITH SEVERAL DEPLOYMENTS



The pilot testing comprises a number of different sites in 6 different partner countries. In order to ensure conformity and coordination within the pilot, there are different preparatory activities to take into account. The preparatory activity is followed by the pilot testing comprising of: (i) pilot deployment following a common approach detailed in the preparatory phase, (ii) pilot capacity building offered towards SMEs and network-

ked community to enable experimentation and co-creation over the deployed pilots. During the assessment phase, a benchmarking of the pilot sites before and after the intervention, as well as lessons learned, will be documented leading to a Green Paper for Innovation Policy Change, detailing the project proposals for policy improvements so that sustainability of project results is ascertained.

## OPEN DATA IN SMART CITIES

### DATA CAN CHANGE CITIES AND THEIR ECONOMIES



Increasing City Efficiency



Improving city planning and reaction to risks



Involving and better connecting the citizens



Creating innovation ecosystems

### DATA ECOSYSTEM



**Suppliers:** data creation



**Aggregators:** data aggregation



**Developers:** data analysis/Products and services

### BUILDING A CITY ECOSYSTEM BASED ON OPEN DATA



**Data governance:** strategy, open data policy, overcoming barriers



**Sustainability:** data consistency, existence of APIs



Security and privacy



**Share data:** collaboration and co-creation



New services on top of data: innovation, new business endeavours

### WHERE TECHNOLOGY COMES IN



**Data hubs:** gather all installed sensor data, bring data ecosystem together



**APIs:** share data services, boost the development of services, applications and products



**Marketplace:** Expose data services



## Andalusian pilot of the CAMARG project

The 'Poniente Granadino' region is a rural area located in the western part of the province of Granada, in the south of Spain. It is characterized by a heavy intensity of agriculture and livestock in the local economy, in some areas it is the only source of income. At the same time there is a growing food industry, which brings an excellent opportunity to add value to raw materials produced in the territory, as well as a source of creation of skilled jobs and wealth for the area.

The value proposal of the CAMARG project in Poniente Granadino is promoting the concept of a short marketing and distribution channel for the sale of agro-food products produced in the area to customers in rural and urban areas, through an electronic commerce platform. The customer can buy different high-quality food products that are produced in their area directly from the producers registered in the platform, in an easy, agile and simple way, and at a lower price.



## Menjadors ecològics (organic dining rooms)

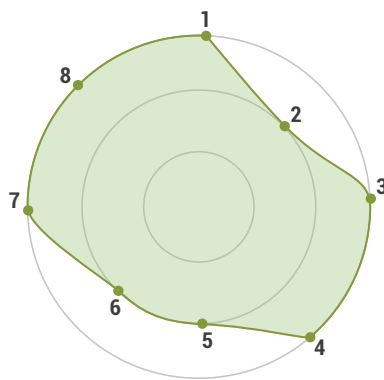
### MADRE

#### best practice assessment

Menjadors Ecològics (Organic Dining Rooms) is a non-profit association that provides integrated advice and support to canteens, including a diagnosis of the current service and a feasibility study of the organic dining service, support in the design and use of an organic school garden, review of menus or proposal of healthy menus for the different seasons, and advice on the assembly of a new kitchen or the adaptation of the existing one. The association also offers

services focused on facilitating the change process for all parties involved: audits, courses, workshops and talks. Finally, it implements policy advocacy activities to encourage new regulations and procedures that favour local and organic products in school canteens. The main innovation of this initiative is considering schools as an essential link in the agri-food chain. Making school canteens more sustainable is important not only to better feed and educate children, but also to transform the whole food system. The first 4 years of existence of the association have seen a rapid development of organic canteens state-wide. The association supported this process in many cities of Catalonia and the rest of Spain.

## ASSESSMENT AGAINST 8 KEY CHALLENGES FOR METROPOLITAN AND PERI-URBAN AGRICULTURE



- 1 Job creation
- 2 Social inclusion
- 3 Educational, health and nutritional benefits
- 4 Quality upgrading and value creation
- 5 Organisational benefits
- 6 Territorial integrity / Land management
- 7 Environmental benefits
- 8 Synergies

## PILOTS OF THE REINWASTE PROJECT



Interreg  
Mediterranean  
ESMARTCITY

Project co-financed by the European  
Regional Development Fund

Key success factors for the Interreg MED Green Growth Community's projects include a focus on user needs, the activation of clusters, a high level of interest and enga-

gement from stakeholders, and the close collaboration among many different partners in the implementation of the projects.



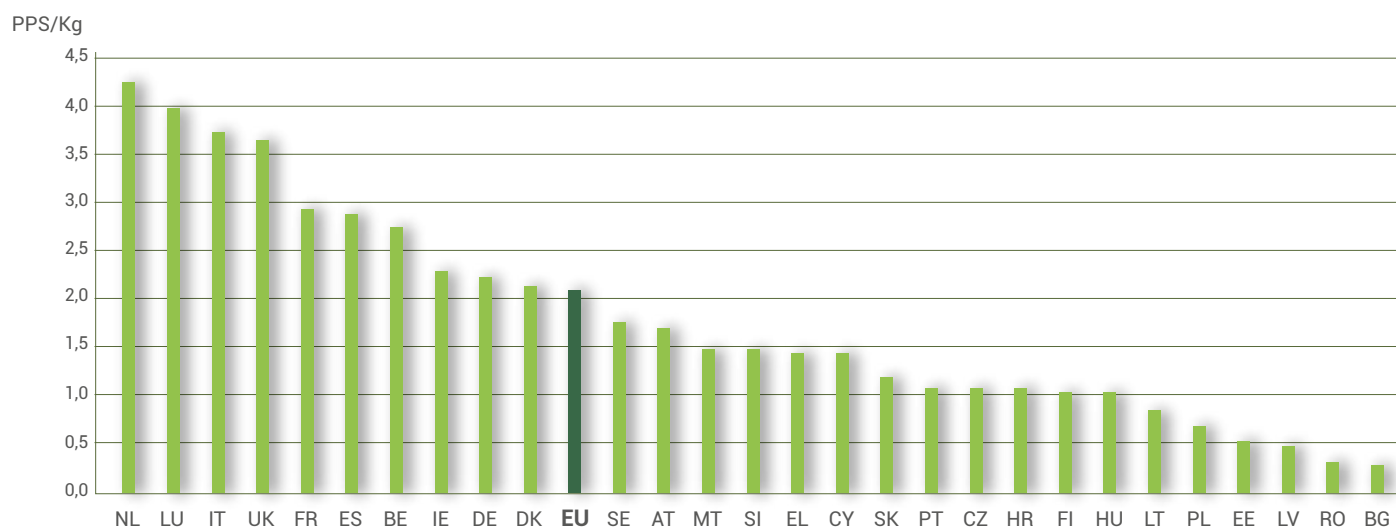
## Circular economy monitoring indicators

The European Commission's Monitoring Framework for the Circular Economy Action Plan adopted in 2018<sup>15</sup> aims at assessing progress towards a circular economy in the EU and its Member States. It does not include a specific indicator on resource efficiency but focuses on the EU's self-sufficiency in terms of raw materials<sup>16</sup> (and in particular on critical raw materials), given the existing and potential supply risks for raw materials originating largely from outside of the EU.

The EU Resource Efficiency Scoreboard<sup>17</sup>, which monitors the progress in implementing the Europe 2020 flagship initiative, includes resource productivity as the lead indicator, measured as Gross Domestic Product (GDP) divided by the domestic material consumption (DMC). Resource productivity in the EU increased by 32.3% in the decade from 2007 to 2016 and was 2.1 EUR/kg of GDP in 2016, with significant differences among EU Member States (see figure below<sup>18</sup>).



## RESOURCE PRODUCTIVITY (2016)



Source: EUROSTAT 2017

15. European Commission (2018). Monitoring framework for the circular economy.

16. The indicator is: "The share of a selection of raw materials (including critical raw materials) used in the EU that are produced with the EU." The EU raw material strategy covers all raw materials used by European industry except materials from agricultural production and materials used as fuel.

17. European Commission (2016). Resource Efficiency Scoreboard.

18. European Commission (2017). European Semester Thematic Factsheet – Resource Efficiency.





Under the Agenda 2030, Sustainable Development Goal (SDG) 12 “Ensure sustainable consumption and production patterns” includes a target related to resource efficiency, namely “by 2030, achieve the sustainable management and efficient use of natural resources”. The corresponding indicators are i) Material footprint, material footprint per capita, and material footprint per GDP, and ii) Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP.<sup>19</sup>

Building on the work of the Interreg MED Green Growth Community projects, the following indicators are proposed for monitoring the transition towards a circular economy with specific focus on resource efficiency in agriculture and cities in the Mediterranean region. These can be applied at local, national and regional level.

- Share (%) of the energy savings achieved due to the use of an eco-innovative technology (such as MED Greenhouses) compared to conventional ones.
- Increase (%) in water efficiency achieved due to the use of an eco-innovative technology (such as MED Greenhouses) compared to conventional ones.
- Share (%) of CO<sub>2</sub> emissions decreased due to the use of an eco-innovative technology (such as MED Greenhouses) compared to conventional ones.
- Decrease (%) in fertilisers use due to the use of an eco-innovative technology (such as MED Greenhouses) compared to conventional ones.
- Number of conventional technologies (such as conventional greenhouses) replaced by and eco-innovative technology (such as MED Greenhouses) and number of eco-innovative technologies (such as MED Greenhouses) applied/constructed in the Mediterranean region.
- Reduction of inorganic waste (tons) through alternative solutions and Key Enabling Technologies.
- Energy consumption in public lighting and public buildings facilities.
- Introduction of open data platforms and involvement of SMEs.

19. United Nations (2019). Sustainable Development Goals Knowledge Platform.

## Call to Action

With several projects, the Interreg MED Green Growth community makes an active contribution to the implementation of the EU Circular Economy Action Plan, the EU Strategy for Plastics in a Circular Economy, the Resource-efficient Europe flagship initiative and the Roadmap towards a Resource-efficient Europe, as well as to the Agenda 2030, particularly SDG 12 (Ensure sustainable consumption and production patterns), SDG 2 (End hunger, achieve food security and improved nutrition and promote sustainable agriculture) and SDG 13 (Take urgent action to combat climate change and its impacts).

Collectively, the Interreg MED Green Growth community contributes to enhancing the efficiency in the use of a variety of key resources such as land, energy, water, plastics, fuel and other materials. The projects contribute to resource efficiency through promoting innovative technologies and solutions for specific sectors and contexts, namely by:

- Reducing resource demand in the agro-food sector based on an assessment of the environmental footprint of products.
- Reducing demand for water, energy and fertilizer and reduced CO<sub>2</sub> emissions in intensive agriculture through innovative greenhouse technology.
- Reducing the use of fossil-based resources for packaging in the agro-food industry through alternative packaging solutions (biodegradable materials and re-usable packaging).
- Reducing resource use and CO<sub>2</sub> emissions in the agro-food sector through shortening of supply chains.
- Reducing energy use in city infrastructure through smart lighting and smart building solutions.

*enhancing  
the efficiency  
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*With several projects,  
the Interreg MED Green  
Growth community makes  
an active contribution to  
the implementation of the  
EU Circular Economy  
Action Plan*

In order to reach the full potential of the presented solutions throughout the Mediterranean region, the Interreg MED Green Growth community calls for action in the following aspects:

### The European Commission and EU Member States

- To promote the dissemination, transfer and uptake of the solutions and innovations for measuring and enhancing resource efficiency.
- To promote investments in eco-innovation to support sustainable and resource efficient production patterns.
- To address users' perceptions and to raise awareness among citizens to promote sustainable consumption patterns.
- To put in place policy and legislation to promote resource efficiency and sustainable consumption and production patterns, for example on plastic use
- Strengthen local food systems by promoting urban and peri-urban agriculture.

### Regional and local authorities in the Mediterranean

- To develop action plans and programmes that incentivize the uptake of eco-innovations.
- To adopt and promote the Smart City paradigm shift.

### SMEs

- To respond to the growing customer demands for green products and services by investing in eco-innovation and resource efficiency along the value chain.
- To engage in innovation networks and clusters and share knowledge and experiences on best practices and solutions to make value chains more resource efficient.





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## Further information and contact:

### Interreg MED Green Growth Community / SYNGGI project:

Website: <https://green-growth.interreg-med.eu>

Contact: **Mercè Boy Roura** (Lead Partner)  
BETA Tech Center at Universitat de Vic  
Universitat Central de Catalunya (Spain)  
[merce.boy@uvic.cat](mailto:merce.boy@uvic.cat)  
[medgreengrowth@uvic.cat](mailto:medgreengrowth@uvic.cat)

### PEFMED:

Website: <https://pefmed.interreg-med.eu>

Contact: **Caterina Rinaldi** (Lead Partner)  
ENEA C.R. Bologna (Italy)  
[caterina.rinaldi@enea.it](mailto:caterina.rinaldi@enea.it)

### Further resources:

- Blog: <http://www.pefmed-blog.eu/>
- Wiki platform: <https://www.pefmed-wiki.eu/home>
- Infosheets: <https://www.pefmed-wiki.eu/pefmed/infosheets>
- Environmental tools: <https://www.pefmed-wiki.eu/pefmed/tool-lca>
- Socio-economic tool: <https://www.pefmed-wiki.eu/pefmed/tool-socioec>
- Final publication:  
[https://drive.google.com/file/d/1n\\_XA3yKr22z-93VuLBOFs2HhAxfilUUcM/view](https://drive.google.com/file/d/1n_XA3yKr22z-93VuLBOFs2HhAxfilUUcM/view)

### MED GREENHOUSES:

Website: <https://medgreenhouses.interreg-med.eu>

Contact: **Prof. Alexandros Papachatzis**  
(Lead Partner), TEI of Thessaly (Greece)  
[papachad@teilar.gr](mailto:papachad@teilar.gr)  
[med\\_greenhouses@teilar.gr](mailto:med_greenhouses@teilar.gr)

### REINWASTE:

Website: <https://reinwaste.interreg-med.eu>

Contact: **Rafael Fernandez Gomez** (Lead Partner),  
AGAPA (Spain),  
[reinwaste.agapa@juntadeandalucia.es](mailto:reinwaste.agapa@juntadeandalucia.es)

### CAMARG:

Website: <https://camarg.interreg-med.eu>

Contact: **Matea Rešetar / Tanja Putar**  
(Communication partner)  
Regional Development Agency of Slavonia & Baranja  
(Croatia)  
[matea.resetar@obz.hr](mailto:matea.resetar@obz.hr)  
[tanja.putar@obz.hr](mailto:tanja.putar@obz.hr)

### MADRE:

Website: <https://madre.interreg-med.eu>

Contact: **Valeria Stacchini** (Communication partner),  
Città Metropolitana di Bologna (Italy),  
[valeria.stacchini@cittametropolitana.bo.it](mailto:valeria.stacchini@cittametropolitana.bo.it)

### Best Practice Catalogue:

[https://madre.interreg-med.eu/fileadmin/user\\_upload/Sites/Green\\_Growth/Projects/MADRE/MADRE\\_best\\_practice\\_catalogue.pdf](https://madre.interreg-med.eu/fileadmin/user_upload/Sites/Green_Growth/Projects/MADRE/MADRE_best_practice_catalogue.pdf)

### ESMARTCITY:

Website: <https://esmartcity.interreg-med.eu>

Contacts: **Athanasios P. Kalogeras**  
(Communication partner)  
Research Centre ATHENA  
Industrial Systems Institute (Greece)  
[kalogeras@isi.gr](mailto:kalogeras@isi.gr)

**Gonzalo Esteban López** (Project partner)  
Agencia Provincial de la Energía de Granada (Spain)  
[areatecnica@apegr.org](mailto:areatecnica@apegr.org)

### Related projects/initiatives:

- DIGITAL CITIES CHALLENGE: <https://www.digitallytransformyourregion.eu>
- GREENCAP: <https://renewable-energies.interreg-med.eu/>
- SET UP: <https://www.interregeurope.eu/set-up/>
- GREEN MIND: <https://greenmind.interreg-med.eu/>



## About the Interreg MED Green Growth Community and the SYNGGI Project

The Interreg MED Green Growth community is a thematic community of projects in the framework of the Interreg MED programme, which is a transnational European Cooperation Programme for the Mediterranean area. The Interreg MED Green Growth community counts with 15 projects focussed on different topics related to green growth such as sustainable agro-food systems, eco-innovation, green manufacturing, green public procurement, waste management and smart cities, among others.

The specific objectives of the Interreg MED Green Growth community are:

### **1. Empowered Green Growth community for Mediterranean and non-Mediterranean stakeholders:**

creation of a solid community that acts as a hub to collect project results, disseminate and capitalize them among partners, consortia, stakeholders and countries.

### **2. Upgrading Green Growth community networks:**

the community creates bridges and seeks collaboration with networks, institutions and programmes inside and outside the Interreg MED cooperation area to transfer the knowledge and results of the projects and to promote synergies among initiatives in the Mediterranean region.

**3. Capitalization Support:** capitalization and transfer activities are performed to outreach the project results and potential replication of projects to other countries. Common policy outcomes are produced to contribute to the vivid legal framework that needs constant revision and input.

It is the first time that in such an extended scale, more than 150 partners from the quadruple helix (public authorities, industry, academia and civil society) from 12 countries are exchanging knowledge in the field of green growth in the northern and eastern area of the Mediterranean region. The Interreg MED Green Growth community has partners from Albania, Bosnia-Herzegovina, Croatia, Cyprus, France, Greece, Italy, Malta, Montenegro, Portugal, Slovenia and Spain. The total budget of the funded projects under the Interreg MED Green Growth community is of approximately 34 million Euros.

SYNGGI – “Synergies for Green Growth Initiative – Energising the Impact of Innovation in the Mediterranean” is the project managing the Interreg MED Green Growth community (2016-2019). The SYNGGI project acts as a dynamic network to unify project results, support MED stakeholders and create a fruitful and collaborative environment for all implicated bodies. The methods that are used within that framework aim to stimulate sharing of project results and findings and enhance the cross-sectoral innovation practices among Mediterranean key stakeholders. The community disseminates the projects’ results and good practices to stakeholders and policy-makers from the Interreg MED cooperation areas and beyond. Moreover, strong emphasis is given on the capitalization process, with the objective to create common policy outcomes to contribute to the vivid legal framework that needs constant revision and input, such as the EU Circular Economy Action Plan and other environmental policies.



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*“Technical Information  
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