



# EU funding strategy for four regional heating and cooling projects

*External study performed by  
PNO Consultants*



*for the Joint Research Centre*

Roel van der Veen  
Esmee Kooijman  
2019

This is an external study report made for the Joint Research Centre (JRC), the European Commission's science and knowledge service. It aims to provide evidence-based scientific support to the European policymaking process. The scientific output expressed does not imply a policy position of the European Commission. Neither the European Commission nor any person acting on behalf of the Commission is responsible for the use that might be made of this publication.

#### Contact information

Name: J. Carlsson  
Address: European Commission, DG JRC, Westerduinweg 3, 1755 LE Petten, the Netherlands  
Email: [johan.carlsson@ec.europa.eu](mailto:johan.carlsson@ec.europa.eu)  
Tel.: +31-224-565341

#### JRC Science Hub

<https://ec.europa.eu/jrc>

JRC116309

EUR 29728 EN

PDF ISBN 978-92-76-02084-4 ISSN 1831-8424 doi:10.2760/847152

Luxembourg: Publications Office of the European Union, 2019

© European Union, 2019

Reuse is authorised provided the source is acknowledged. The reuse policy of European Commission documents is regulated by Decision 2011/833/EU (OJ L 330, 14.12.2011, p. 39).

For any use or reproduction of photos or other material that is not under the EU copyright, permission must be sought directly from the copyright holders.

How to cite this report: Van der Veen, R.S., Kooijman, E.D., *EU funding strategy for four regional heating and cooling projects*, EUR29728, Publications Office of the European Union, Luxembourg, 2019, ISBN 978-92-76-02084-4, doi:10.2760/847152, JRC116309

All images © European Union 2019

#### EU funding strategy for four regional heating and cooling projects

This report contains a tailored EU funding strategy for four regional heating and cooling projects, namely: Andalucía (ES), Western Macedonia (EL), Castilla y León (ES) and North East Romania (RO). This study follows a previous study, which provided an overview of EU funding sources for the regional heating and cooling sector.

## Contents

List of abbreviations and definitions .....	4
1. Executive Summary .....	6
2. Introduction .....	7
3. Public Funding Strategy Andalucía Project.....	9
3.1 Project.....	9
3.2 EU public funding options.....	13
3.3 Recommended EU funding strategy .....	23
3.4 Next steps.....	25
4. Public Funding Strategy Western Macedonia Project.....	29
4.1 Project.....	29
4.2 Public funding options.....	32
4.3 Recommended EU funding strategy .....	39
4.4 Next steps.....	42
5. Public Funding Strategy Castilla y León Project.....	45
5.1 Project.....	45
5.2 Public funding options.....	48
5.3 Recommended EU funding strategy .....	53
5.4 Next steps.....	55
6. Public Funding Strategy North East Romania Project .....	57
6.1 Project.....	57
6.2 Public funding options.....	59
6.3 Recommended EU funding strategy .....	64
6.4 Next steps.....	65
7. Conclusion .....	67
References .....	68
List of figures and tables .....	70

## List of abbreviations and definitions

<b>AC</b>	Associated Countries
<b>bn</b>	Billion
<b>CC</b>	Candidate Countries
<b>CCS</b>	Carbon Capture and Storage
<b>CEF</b>	Connecting Europe Facility
<b>CF</b>	Cohesion Fund
<b>CHP</b>	Combined Heat and Power (or cogeneration)
<b>COSME</b>	Competitiveness of Enterprises and Small and Medium-sized Enterprises
<b>CSA</b>	Coordination and Support Actions
<b>DG</b>	Directorate-General
<b>EC</b>	European Commission
<b>EASME</b>	Executive Agency for Small and Medium-sized Enterprises
<b>EBRD</b>	European Bank for Reconstruction and Development
<b>EE</b>	Energy Efficiency
<b>EEPR</b>	European Energy Programme for Recovery
<b>EFSI</b>	European Fund for Strategic Investments
<b>EIB</b>	European Investment Bank
<b>EIC</b>	European Innovation Council
<b>EP</b>	European Parliament
<b>EPC</b>	Energy Performance Contracting
<b>ERC</b>	European Research Council
<b>ERDF</b>	European Regional Development Fund
<b>ES</b>	Energy System
<b>ESCO</b>	Energy Service Company
<b>ESF</b>	European Social Fund
<b>ESI Funds</b>	European Structural and Investment Funds
<b>ETC</b>	European Territorial Co-operation
<b>ETS</b>	Emissions Trading Scheme
<b>EU</b>	European Union
<b>GEFF</b>	Green Economy Finance Facilities
<b>H2020</b>	Horizon 2020
<b>HVAC</b>	Heating, Ventilation and Air Conditioning
<b>IA</b>	Innovation Action
<b>IB</b>	Intermediate Bodies
<b>ICT</b>	Information and Communication Technology
<b>INEA</b>	Innovation & Networks Executive Agency
<b>JASPERS</b>	Joint Assistance to Support Projects in European Regions
<b>JESSICA</b>	Joint European Support for Sustainable Investment in City Areas
<b>JRC</b>	Joint Research Centre
<b>LIFE PF4EE</b>	LIFE Private Finance for Energy Efficiency

<b>M</b>	Million
<b>MA</b>	Managing Authority
<b>MFF</b>	Multiannual Finance Framework
<b>MS</b>	Member State(s)
<b>NCP</b>	National Contact Point
<b>NER</b>	New Entrant's Reserve
<b>NGO</b>	Non-Governmental Organizations
<b>OCT</b>	Overseas Countries and Territories
<b>OP</b>	Operational Programme
<b>PDA</b>	Project Development Assistance
<b>PM</b>	Particulate Matter
<b>PV</b>	Photovoltaic
<b>R&amp;D</b>	Research and Development
<b>REI</b>	Renewable Energy Installation
<b>RES</b>	Renewable Energy Source
<b>RIA</b>	Research and Innovation Action
<b>S3PE</b>	Smart Specialisation Platform on Energy
<b>SCC</b>	Smart Cities and Communities
<b>SF</b>	Structural Funds
<b>SFSB</b>	Smart Finance for Smart Buildings
<b>SME</b>	Small and Medium-sized Enterprises
<b>TA</b>	Technical Assistance
<b>TC</b>	Territorial Cooperation
<b>TRL</b>	Technology Readiness Level

## Disclaimer

This report contains information on EU funding sources. All information in this report has been researched and compiled with utmost diligence of EU funding experts.

Nevertheless there is no guarantee that the presented information captures all types of funding for regional heating and cooling projects and the latest information, given that funding programmes are subject to changes.

For the project descriptions, the authors had to rely on the information provided by project promoters.

## Executive Summary

This report contains tailored EU funding strategies for four regional heating and cooling projects, namely: Andalucía (ES), Western Macedonia (EL), Castilla y León (ES) and North East Romania (RO). It follows a previous study, which provided an overview of EU funding sources for the regional heating and cooling sector.

The heating and cooling projects analysed from these regions are the following:

- Develop smart thermal grids for thermal energy in ports (Andalucía);
- Installation of (co-firing) biomass boilers in the existing district heating network and autonomous high-efficient biomass boilers in households (Western Macedonia);
- Development of an online platform where consumers (potential or not) and installers can meet. The main objective with the platform is to promote thermal renewable energy installations by providing quality assurance to consumers (Castilla y León);
- Development of an energy-efficient heat pipe/heat pipe heat-exchanger to recover heat from used water in buildings (North East Romania).

The study provides an overview of the projects, followed by a short introduction of the EU funds that match each project. Subsequently, a recommended EU funding strategy is provided for each project. Preferably, the funding strategy provides a combination of EU funding sources. Finally, each funding strategy includes the next steps for the application process.

These funding strategies include EU funding sources of the current programming period (2014-2020). Where possible, an outlook will be provided for the period beyond 2020 (2021-2027). The overview focuses on public funding, both grants and other (innovative) financial instruments, such as soft loans and guarantees.

## 1 Introduction

Heating and cooling in buildings and industry accounts for approximately half of the EU's final energy consumption. When considering EU households, almost 80% of total final energy use is used for heating and hot water. While cooling is a small share of total energy use, demand from households and businesses is increasing during the summer months. This trend is also linked to climate change and temperature rises.<sup>1</sup>

Some 85% of heating and cooling is still generated from fossil fuels and in order to reach the EU's climate and energy goals<sup>2</sup>, the heating and cooling sector must strongly reduce its energy consumption and its use of fossil fuels. The European Commission (EC) has policies towards a more efficient and decarbonised heating and cooling sector, such as the Energy Efficiency Directive<sup>3</sup>, the EU Strategy on Heating and Cooling<sup>4</sup> and the final recast of the Renewable Energy Directive<sup>5</sup>. In addition, most EU regions have included the heating and cooling sector as a priority in their smart specialisation strategies and corresponding budget allocations.

For this reason, heating and cooling is one of the areas of the smart specialisation platform on energy (S3PEnergy)<sup>6</sup>. The EC's Joint Research Centre (JRC) runs this platform in close collaboration with the Directorate-General for Regional and Urban Policy (DG REGIO) and the Directorate-General for Energy (DG ENER). The platform provides support to the EU Member States and regions for the optimal and effective uptake of EU funds for sustainable energy. In line with this platform, the JRC decided to specifically support the effective uptake of available EU funding sources for regions with particular interests in the thematic area of sustainable heating and cooling.

To this end, the JRC asked PNO Consultants to prepare an overview of available EU funding sources<sup>7</sup> and subsequently provide selected regions with a tailored EU funding strategy for their heating and cooling projects. The selection was based on project proposals from regions participating in the heating and cooling initiative of S3PEnergy. One selection criterion was to have different types of projects, i.e. technology to be implemented/developed, others were cost of project, its innovativeness, and geographical location. The objective was to showcase that EU funding sources would change based on those criteria. It has to be noted however that, as a general rule of thumb, chances of obtaining public funding decrease with distance. Meaning that local, regional and national subsidies have typically higher winning chances than funding from EU programmes. It is therefore recommended to start any public funding strategy as close to home as possible.

---

<sup>1</sup> European Commission (2018). Heating and Cooling. Retrieved on 28 September 2018 at [ec.europa.eu/energy/en/topics/energy-efficiency/heating-and-cooling](https://ec.europa.eu/energy/en/topics/energy-efficiency/heating-and-cooling).

<sup>2</sup> European Commission (2015). Energy Union Factsheet. MEMO/15/4485. Brussels, 25 February 2015.

<sup>3</sup> European Union (2018), Directive 2018/2002 of the European Parliament and of the Council of 11 December 2018, amending Directive 2012/27/EU on energy efficiency. Official Journal of the European Union, L328/210, 21.12.2018.

<sup>4</sup> European Commission (2016). Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. An EU strategy on Heating and Cooling. COM(2016) 51 final, Brussels, 16.2.2016.

<sup>5</sup> European Union (2018). Directive 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources (recast). Official Journal of the European Union, L328/82, 21.12.2018.

<sup>6</sup> European Commission, Joint Research Centre (2018) Energy and the Smart Specialisation Platform on Energy (S3PEnergy) via [s3platform.jrc.ec.europa.eu/s3p-energy](https://s3platform.jrc.ec.europa.eu/s3p-energy)

<sup>7</sup> Van der Veen, R.S., Kooijman, E.D., Identification of EU funding sources for the regional heating and cooling sector, EUR29663 EN, Publications Office of the European Union, Luxembourg, 2019, ISBN 978-92-76-00163-8, doi:10.2760/994541, JRC115765

This report contains the EU funding strategy for heating and cooling projects in four regions, namely: Andalucía (ES), Western Macedonia (EL), Castilla y León (ES) and North East Romania (RO).

The heating and cooling projects in these regions are the following:

- Develop smart thermal grids for thermal energy in ports (Andalucía);
- Installation of (co-firing) biomass boilers in the existing district heating network and autonomous high-efficient biomass boilers in households (Western Macedonia);
- Development of an online platform where consumers (potential or not) and installers can meet with the main objective to promote thermal renewable energy installations by providing quality assurance to consumers (Castilla y León);
- Development of an energy-efficient heat pipe/heat pipe heat-exchanger to recover heat from used water in buildings (North East Romania).



## **2 Public Funding Strategy Andalucía Project**

### **2.1 Project**

#### **2.1.1 Description**

Ports in the EU are still highly dependent on fossil fuels and to reduce their carbon footprints have high priority<sup>8</sup>.

The geostrategic position of Andalucía in the extreme south of Europe, between both Europe and Africa and between the Atlantic Ocean and the Mediterranean Sea, makes it important for the EU to count on energy efficient port spaces for the development of economic activities. Andalucía covers a surface of more than 87 000 km<sup>2</sup>, but it has only 6 of the 395 Spanish energy distributions networks.

The proposed project entitled 'Networks of Networks' aims to demonstrate the benefits from the use of smart thermal grids to provide thermal energy in three ports. Today either individual or centralised boilers provide the heat demand. About the same amount of fossil thermal production would be replaced in all three ports.

These smart thermal grids will integrate different renewable energy technologies available in the field of heating and cooling such as marine geothermal, solar thermal and biomass gasification.

Renewable technologies for heating and cooling are not well known by the citizens, public administration and companies, who moreover are not convinced about the benefits of energy distributions networks. This project will demonstrate thermal energy smart grids and will therefore contribute to citizens' awareness and confidence in such systems. Because of this, the main challenge of the project will be to secure funding.

#### ***Project objectives and activities***

The aim of the project is to demonstrate that energy demand of public and private buildings can be supplied by different combinations of renewable energy technologies when integrated in a smart thermal grid, thereby increasing the efficiency of the energy supply. More specifically, the project's objectives are:




- Realize the integration of renewable energy sources in 3 port areas, Sevilla, Málaga and Motril Granada, by developing thermal energy networks;
- Demonstrate the benefits of supplying heat and cooling needs by a combination of different RES technologies;
- Demonstrate that public and private energy demand can be supplied by different combinations of renewable energies and show how a public private partnership can work together locally to meet the energy demand.

Currently, the ports do not have a thermal energy distribution infrastructure and thus in this project, the infrastructure still needs to be built. The proposed thermal networks are aligned with the expected development of the ports. Moreover, the approach in this project demonstrates the adequacy of energy efficient practices that are aligned with national and regional energy policies and plans.

The proposed thermal energy networks will consist of the following:

---

<sup>8</sup> Portopia (2017). European Port Industry Sustainability Report 2017. Retrieved on 9 January 2019 at [portopia.eu/wp-content/uploads/2017/11/D8.3](http://portopia.eu/wp-content/uploads/2017/11/D8.3)

NW1. Málaga Port	NW2. Sevilla Port	NW3. Motril Granada Port
		
Heating distribution: 2,0 km Cooling distribution 1: 0,5 km Cooling distribution 2: 1,0 km	Heating distribution: 3,5 km Cooling distribution 1: 0,5 km Cooling distribution 2: 0,2 km	Heating distribution: 0,9 km Cooling distribution: 0,9 km

#### Málaga Port (Tourist area)

Low temperature solar thermal (5.7 MWt)  
Hydraulic maritime geothermal heat pump (3.8 MWt)  
Cool production by PV reversible heat pump (1.9 MWt)

#### Sevilla Port (Industrial and public)

2 Biomass gasifications with a total capacity of (1.5 MWt and 1 MWe)  
Biomass thermal generation CHP (5 MWt, 13 MWe)  
Concentrated solar energy  
Cool production by absorption machine (3.8 MWt)

#### Motril Granada Port (Public buildings)

Hydraulic maritime geothermal (0.5 MWt)  
Biomass gasification (0.5 MWt)  
Concentrate solar energy (0.3 MWt)  
Cool production by absorption machine (0.2 MWt)

### **Expected results**

In Table 1 the expected results of the project are shown.

**Table 1 Expected energy demand, supply and savings for the proposed energy networks in three ports**

	Málaga Port	Sevilla Port	Motril Granada Port
Expected energy demand	100% thermal	100% thermal and electrical	100% thermal and electrical
Expected energy supply (GWh/year)	Heat: 5.4 Cool: 3.4	Heat: 3,4 Cool: 2.2 Electricity: 16.7	
Expected fossil energy replaced (GWh/year)	8.8	5.6	0.6

### **Organisation**

This project is initiated by Junta de Andalucía, the regional government organisation for the Spanish autonomous community of Andalucía that is based in Sevilla. Moreover, several project partners will be involved as the project integrates public and private building owners in the three targeted ports in a public-private partnership. The project partners are:

- Port Authorities (Málaga, Sevilla, Motril Granada), in order to provide high added value services in the port. The port authorities are part of the national ministry;
- Companies and tech-producers, in order to offer the best technologies in generation and distribution of renewable thermal energy, combining different types of demand existing in ports.

The number of users engaged is 10 for Málaga Port, 14 for Sevilla Port and 4 for Motril Granada. In Sevilla Port, these users are large, and small and medium size companies that consume thermal (heat and cold) energy. In Málaga, most consumers of the thermal energy network are small companies. In addition, there are public services in the port terminals for ferries and cruises, as well as museums and restaurants. Finally, the Motril's network will provide energy services for an industrial area with a fish market and public buildings. In this case, almost all the customers will be small size companies or port authorities.

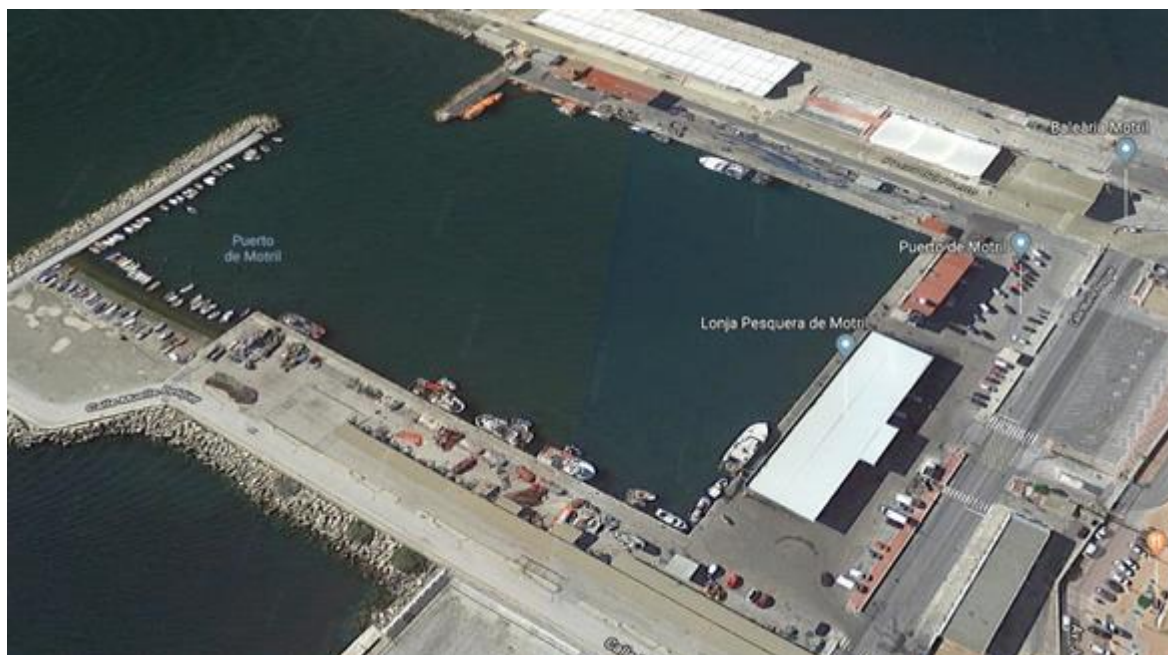


**Figure 1. Overview of buildings in Sevilla Port energy network.**



**Figure 2. Overview of buildings in Málaga Port energy network.**





**Figure 3. Overview of buildings in Motril Granada Port energy network.**

### **Planning**

There is no detailed project planning yet. The planned end date is 31/03/2023.

### **2.1.2 Budget**

#### **Project costs**

The RES options proposed, for the selected ports, will demonstrate the advantages of renewable energy-based distribution systems to public entities, private investors and citizens. The foreseen facilities will be extendable so that new users of the network can be added without specifying new civil works that impede the investments.

In table 2 the project costs per port and per technology can be found.

**Table 2. Project costs per technology and per port.**

Málaga Port		Sevilla Port		Motril Granada Port	
Marine G.H.P	EUR 2.0M	Gasification	EUR 7.3M	Marine G.H.P.	EUR 0.4M
Solar & Abs.	EUR 2.3M	Absorption	EUR 6.9M	Gasification	EUR 2.5M
Network distr.	EUR 4.0M	Biomass CHP (Networks civil works included)	EUR 29.5M	Solar & Abs.	EUR 0.5M
Tech room	EUR 3.7M			Network distr.	EUR 2.5M
PV	EUR 1.0M				
<b>Total</b>	<b>EUR 13.0M</b>	<b>Total</b>	<b>EUR 43.7M</b>	<b>Total</b>	<b>EUR 5.9M</b>

## ***Funding needs***

In order to realize this project, EU funding is required in the form of grants and loans. The project promoter, Junta de Andalucía, has indicated that 20-30% of the budget for investments needs to be covered with EU grants. The rest of the budget could be derived from other sources, such as EU loans. European cooperation for this project is possible, as one of its aims is to demonstrate the advantages of thermal energy networks in harbours and knowledge sharing. It is not clear if co-funding will be available from the ports or companies that will be part of the energy networks.

### **2.1.3 Public funding priorities**

#### ***Energy/CO<sub>2</sub> savings***

Ports are still quite reliant on fossil fuels and energy management is one of the key environmental priorities of European ports as they are the main entry points of energy commodities, as well as locations for energy production. As the demand for renewable energy increases in the energy sector, as well as in ports, port authorities can serve as facilitators and promoters of the energy transition for the whole port cluster and stakeholders.<sup>8</sup>

#### ***Research and Innovation***

The activities proposed in this project focus on the implementation and demonstration of thermal energy networks in ports by combining different renewable energy technologies. The combination of different sources of thermal energy and the carbon intensive location in ports makes this project innovative, as well as the use of some novel technologies. Ocean thermal energy conversion through the use of hydraulic maritime geothermal heat pumps in combination with a thermal energy network has only been applied in a few cases, mainly on islands (such as Hawaii). This technology uses the temperature difference between cooler deep and warmer shallow or surface ocean waters to run a heat engine to produce energy, usually in the form of electricity.<sup>9</sup> Next to this, producing thermal energy through biomass gasification, specifically with waste streams from the port itself, is a new application. This project is therefore an interesting and potentially impactful demonstration of lowering the carbon footprint of port areas.














## **2.2 EU public funding options**

As the proposed project will have different phases, possible public funding instruments for the preparation and implementation are taken into account in this section. In table 3, an overview of the different funding options is given.

---

<sup>9</sup> Climate Technology Centre and Network (2019). Ocean thermal energy conversion. Retrieved on 24 January 2019 at [ctc-n.org/technologies/ocean-thermal-energy-conversion](https://climate-technologies/ocean-thermal-energy-conversion)

**Table 3. Overview of different funding options for the Andalucía project.**


Funding instrument	Type of funding	Winning chances
European Regional Development Fund (ERDF)	Grant	
Horizon 2020 <ul style="list-style-type: none"> <li>LC-SC3-EE-16-2018-2019-2020</li> <li>LC-SC3-RES-4-2018</li> <li>LC-SC3-RES-8-2019</li> </ul>	Grant	
Horizon 2020 Topic LC-SC3-EE-11-2018-2019-2020	PDA	
ELENA	PDA	
LIFE	Grant	
INTERREG: European Territorial Co-operation (ETC)	Grant	
URBACT III	Grant	
Connecting Europe Facility – Energy	Grant	
JESSICA	TA	
JASPERS	TA	
European Fund for Strategic Investments (EFSI)	Guarantees	
European Energy Efficiency Fund	Guarantees	
Energy Performance Contracting (EPC)	-	

The suitability of a funding instrument is indicated in three levels. The classification of the levels is as follows.

WS:

 **High;** fits the project well, financing is available in the short term

 **Medium;** fits the project, financing is available

 **Low;** fits the project partially, financing is limited

### 2.2.1 European Regional Development Fund (ERDF)

The ERDF, which allocates budget to EU Member States, is one of the main financial instruments of the EU's Cohesion Policy<sup>10</sup>. ERDF's purpose is to contribute to reduce disparities between levels of development of EU regions. The main focus areas are innovation and research, the digital agenda, support for SMEs and the low-carbon economy.

<sup>10</sup> European Commission (2014). An Introduction to EU Cohesion Policy 2014-2020. June 2014.

Under ERDF, Spain's Multiregional Operational Programme (OP) 2014-2020 has a budget of more than EUR 14 billion. This programme has the following priorities<sup>11</sup> that are relevant for this project:

- Support the transition towards a low carbon economy through: energy efficiency in enterprises, houses and public infrastructure; the production, distribution and use of renewable energy; support for multimodal sustainable urban mobility; research and innovation in low carbon technologies (38%);
- Sustainable and integrated urban development (18%).

Beneficiaries can apply for ERDF funding through the managing authority in their Member State, in the case of Spain this is 'Ministerio de Hacienda y Administraciones Públicas - Subdirección General de Administración del FEDER'.<sup>12</sup>

### **Relevance for the project**

As this project contributes to the Operational Programme's priorities, such as the energy transition and sustainable and integrated urban development, it is likely that the proposed activities here are eligible to receive ERDF funding.

### **2.2.2 Horizon 2020**

Horizon 2020 is the financial instrument implementing the Innovation Union<sup>13</sup>, an European 2020 flagship initiative aimed at securing Europe's global competitiveness. The program offers research institutes, companies and governments the chance to get financing for the development and demonstration of innovations through Research & Innovation Actions (RIA), Innovation Actions (IA) and Coordination and Support Actions (CSA) under three research priorities: Tackling Societal Challenges, Industrial Leadership and Excellent Science.

Under the first research priority, relevant calls for this project are under the theme *Secure, clean and efficient energy*<sup>14</sup>:

- LC-SC3-EE-16-2018-2019-2020: Supporting public authorities to implement the Energy Union;
- LC-SC3-RES-4-2018: Renewable energy system integrated at the building scale;
- LC-SC3-RES-8-2019: Combining Renewable Technologies for a Renewable District Heating and/or Cooling System.

For most Horizon 2020 calls, a project consortium should contain at least a minimum of three beneficiaries from three different EU Member States or H2020 associated countries. In recent Horizon 2020 Work Programmes, some calls require only one beneficiary from an EU Member State or H2020 associated country. For all project types additional beneficiaries/linked third parties from any country are usually allowed as well depending on the call requirements.

Grants vary roughly between EUR 2 and 20 million per call, depending on the type of project. The funding percentage for RIA is 100% of eligible costs (unless the call specifies another rate). For IA this percentage is 70% (100% for non-profit organisations) of eligible costs (unless the call provides specifies another rate), and thus co-funding is required. For CSA the funding percentage is 100%.

---

<sup>11</sup> European Commission (2014). Multiregional OP for Spain ERDF 2014-2020. [ec.europa.eu/regional\\_policy/en/atlas/programmes/2014-2020/spain](https://ec.europa.eu/regional_policy/en/atlas/programmes/2014-2020/spain)

<sup>12</sup> [dgfc.sepg.hacienda.gob.es](https://dgfc.sepg.hacienda.gob.es)

<sup>13</sup> European Commission (2018). Innovation Union. Retrieved on 17 October 2018 at [ec.europa.eu/info/research-and-innovation/strategy](https://ec.europa.eu/info/research-and-innovation/strategy)

<sup>14</sup> European Commission (2018). Horizon 2020 – Work Programme 2018-2020. 10. Secure, clean and efficient energy. Decision C(2018)4708 of 24 July 2018.

### ***Relevance for the project***

For this project, three relevant H2020 calls were found, however two of these calls have already been closed. At the moment of writing it is not clear if similar call topics will be published within the programme. Both LC-SC3-RES-4-2018 and LC-SC3-RES-8-2019 would have been relevant for this project, as they respectively focus on 1) the combination of different renewable energy technologies to heating and cooling needs of commercial or public or industrial buildings, and 2) cost-effective solutions for district heating and/or cooling systems which allow satisfying at least 50% of the energy demand of the system by the use in the district of one or more renewable energy technologies.

The H2020 call LC-SC3-EE-16-2018-2019-2020 is still open, but fits the project's activities less well as it focuses on the political and public mobilization of energy efficiency investments rather than implementing measures. The budget per project under this call is therefore only EUR 1-1.5 million.

### **2.2.3 Horizon 2020 Topic LC-SC3-EE-11-2018-2019-2020 (PDA)**

The European Commission has set up a series of facilities funding Project Development Assistance (PDA) to support ambitious public authorities - regions, cities, municipalities or groupings of those - and public bodies in developing bankable sustainable energy projects. As part of the Horizon 2020 EE11 topic, Project Development Assistance (PDA)<sup>14</sup> supports building technical, economic and legal expertise needed for project development and leading to the launch of concrete investments, which are the final aim and deliverable of the project. Next to the development of energy efficiency projects, (applied) research can be (co)financed under PDA.

Proposals in this topic focus on one or more of the following sectors:

- Existing public and private buildings including social housing, with the aim to significantly decrease energy consumption in heating/cooling and electricity;
- Energy efficiency of industry and service; energy efficiency in all modes of urban transport (such as highly efficient transport fleets, efficient freight logistics in urban areas, e-mobility and modal change and shift); and
- Energy efficiency in existing infrastructures such as street lighting, district heating/cooling and water/wastewater services.

Funding rates are 100% of eligible costs (unless the call provides another rate) and for each action the contribution from the EU ranges between EUR 0.5 and 1.5 million. This contribution should trigger investments that are 15 times higher, such that the total investment portfolio is EUR 7.5 – 50 million.

### ***Relevance for the project***

This project focuses on the development of thermal energy networks in ports. As mentioned before, this includes the development of energy efficiency projects in existing public and private buildings, industry and service and transport and existing infrastructure and thus includes project preparations projects related to heating and cooling networks. More specifically, the project could use H2020 PDA for the preparation of the implementation of the project, including securing finances for the investments, stakeholder involvement, technical preparation of the project etc.



## 2.2.4 ELENA

ELENA is a joint initiative by the EIB and the European Commission under the Horizon 2020 programme. ELENA provides grants for technical assistance focused on the implementation of energy efficiency, distributed renewable energy and urban transport projects and programmes. The programme co-finance energy efficiency and distributed renewable energy projects, related to the following<sup>15</sup>:

- public and private buildings, commercial and logistic properties and sites, and street and traffic lighting to support increased energy efficiency;
- integration of renewable energy sources (RES) into the built environment;
- investments into renovating, extending or building new district heating/cooling networks, including networks based on combined heat and power (CHP);
- local infrastructure including smart grids, information and communication technology;
- infrastructure for energy efficiency, energy-efficient urban equipment and link with transport.

ELENA is open to any public or private entity/project promoters such as local, regional or national authorities, transport authorities and operators, social housing operators, and other companies to develop and launch investible (bankable) Investment Programmes.

Typically, ELENA supports projects above EUR 30 million with a maximum 3-year implementation period for energy efficiency. Smaller projects are supported when they are integrated into larger investment programmes. ELENA co-finances/covers up to 90% of eligible project development costs, which may include expenses related to feasibility and market studies; programme structuring; energy audits; financial structuring and/or preparation of tendering procedures and contractual arrangements. It does not cover costs related to the investment itself.

ELENA funding could be combined with a direct loan from the European Investment Bank (EIB) to cover the project's investment costs. Direct loans are usually long-term loans that are provided to private or public sector project promoters where the investment cost exceed EUR 20-25 million. The financing terms of this type of loan in terms of maturity and grace period are tailored to the type of investment. Moreover, appropriate security is required.

### ***Relevance for the project***

Similarly to H2020 PDA, ELENA can co-finance the preparation of the implementation of the project, including securing finances for the investments, stakeholder involvement, technical preparation of the project etc. Moreover, ELENA can be combined with a direct loan from the EIB to cover the project's investment costs after the preparation phase.

## 2.2.5 LIFE

LIFE is the EU's multiannual programme for Environment and Climate for the period 2014–2020 and is structured around the two sub-programmes LIFE Environment and LIFE Climate Action<sup>16</sup>. The latter is most relevant for this project, as it focuses on projects that reduce greenhouse gas emissions, contribute to supporting efforts leading to increased resilience to climate change and/or promote awareness raising on climate matters.

<sup>15</sup> European Investment Bank (2010). Sectoral summary sheet. ELENA – European Local Energy Assistance. QH-80-09-999-EN-C.

<sup>16</sup> European Commission (2013). Decision No 1386/2013/EU of the European Parliament and of the Council of 20 November 2013 on a General Union Environment Action Programme to 2020 'Living well, within the limits of our planet'. Official Journal of the European Union, L 354/171.

Projects under LIFE Climate Action could focus on: energy efficiency and renewable policies, enabling legislative frameworks for private sector contribution, inter alia, to restoring public finance, reducing energy dependency, accelerating innovation and creating jobs while reducing emissions.<sup>17</sup> Under LIFE Environment projects implementing integrated and comprehensive policies for sustainable urban planning and design through innovative approaches regarding urban public transport and mobility, sustainable buildings, energy efficiency or urban biodiversity conservation are eligible.<sup>18</sup>

The programme is open to the participation of entities registered in the Member States of the European Union being (1) public bodies, (2) private commercial organisations and (3) private non-commercial organisations (including NGOs). There is no fixed minimum size for project budgets, but projects are typically between EUR 0,5 and 5 million. The maximum percentage that the LIFE programme funds is 60% of total eligible costs.

### **Relevance for the project**

The LIFE programme mainly supports demonstration and market uptake projects, and therefore the projects proposed in Andalucía on the development of thermal energy networks in ports is relevant for this programme. The combination of different renewable energy technologies of different TRL, as well as its environmental impact and demonstration character, makes that this project fits well within LIFE. However, in terms of budget and funding percentage, LIFE may not be interesting as it only covers 60% of eligible costs and projects are typically smaller than the ones proposed here.

Considering this, applying for the LIFE programme may only be interesting for the thermal energy network in the Motril Granada Port, as the required budget is much lower than for the other projects. Moreover, some of the renewable energy technologies proposed in this project – particularly maritime geothermal heat pump and biomass gasification – are the relatively innovative compared to the other technologies proposed (e.g. with the lowest TRL levels).

## **2.2.6 INTERREG: European Territorial Co-operation (ETC)**

INTERREG aims to strengthen Europe and reduce economic disparities between regions and Member States by stimulating cooperation projects. In 79 programmes, countries and regions work together in different ways on challenges on innovation, research, sustainable energy, climate adaptation and transport. Projects have to involve partners from at least three countries, from which at least two partners must be from the EU member states. The requirements differ per programme. There are three main programmes within INTERREG, focusing respectively on cross-border, transnational and interregional cooperation in the EU.<sup>19</sup>

The region of Andalucía is part of two transnational cooperation programs (INTERREG B): South West Europe and Mediterranean Area. These programmes support a wide range of project investment related to for instance innovation, environment, accessibility and urban development.<sup>20</sup> Moreover, INTERREG C operates at pan-European level, covering all EU Member States, and builds networks to develop good practice and facilitate the exchange and transfer of knowledge and experience by successful regions.<sup>21</sup>

Beneficiaries for INTERREG B & C are public authorities on local, regional and national levels, managing authorities and intermediate bodies in charge of the 'Investment for Growth and

<sup>17</sup> European Commission – LIFE Programme (2018). LIFE Climate Action. Guidelines for Applicants 2018.

<sup>18</sup> European Commission – LIFE Programme (2018) LIFE Environment and Resource Efficiency. Guidelines for Applicants 2018.

<sup>19</sup> INTERREG Europe (2018). Interreg Europe Programme Manual. Version 5, 13 April 2018.

<sup>20</sup> European Commission (2018). Interreg B - Transnational cooperation. Retrieved on 4 January 2019 at [ec.europa.eu/regional\\_policy/nl/policy/cooperation/european-territorial/trans-national/](https://ec.europa.eu/regional_policy/nl/policy/cooperation/european-territorial/trans-national/)

<sup>21</sup> INTERREG Europe (2018). Interreg Europe Programme Manual. Version 5, 13 April 2018.

Jobs' or 'European Territorial Cooperation' programmes and agencies, research institutes, thematic and non-profit organisations in collaboration with local policy makers.

INTERREG programmes will co-finance up to 85% of project activities and private non-profit bodies at a rate of 75%. Depending on the number of partners involved, the average total budget of a project is expected to be EUR 1-2 million. Different conditions apply for INTERREG B, covering larger areas of co-operation such as Mediterranean regions.

### ***Relevance for the project***

One of INTERREG's focus areas is sustainable energy and under the programme, several district heating and cooling grids are funded. The thermal energy networks in ports as proposed in this project, therefore do fit well within INTERREG. The region of Andalucía is part of transnational and interregional INTERREG programmes. However, the transnational programmes that the region is part of do not support projects on energy grids. INTERREG's interregional programme would fit the project, as it needs budget for investment for the development of a thermal energy network, as well as wants to demonstrate a good practice and to share knowledge. As mentioned before, collaboration with other regions in the EU and outside of Spain is a requirement for receiving funding under this programme.

### **2.2.7 URBACT III**

URBACT III provides a framework of networks between local and regional bodies facing similar urban challenges and is organised around four main objectives<sup>22</sup>:

1. Capacity for Policy Delivery: to improve the capacity of cities to manage sustainable urban policies and practices in an integrated and participative way.
2. Policy Design: to improve the design of sustainable urban policies and practices in cities.
3. Policy Implementation: to improve the implementation of integrated and sustainable urban strategies and actions in cities.
4. Building and Sharing Knowledge: to ensure that practitioners and decision-makers at all levels have access to knowledge and share know-how on all aspects of sustainable urban development in order to improve urban development policies.

To reach these objectives, URBACT III develops 3 types of interventions, namely transnational exchanges, capacity-building and capitalisation & dissemination. URBACT is largely a support and networking organisation, and funds limited number of projects. The URBACT III programme co-finances recipients in the form of subsidy to implement programme activities such as capacity building for urban stakeholders, expertise at project and programme level and National URBACT points.

The beneficiaries are (semi) public bodies, such as cities, municipalities, metropolitan authorities, universities and research centres, and similar organisations from EU 28 Member States. The standard network budget is EUR 600 000 – 750 000 for the activity to share good practice within the Transfer network. As Andalucía is categorized as transition region under ERDF, projects under URBACT III receive up to 85% of this amount.

### ***Relevance for the project***

As part of the development of thermal energy networks in ports, capacity building among stakeholders needs to be done. This is where the project could apply for funding from URBACT

---

<sup>22</sup> URBACT (2017). The URBACT III Programme. Programme Manual, 8<sup>th</sup> Version. Approved by the Monitoring Committee on 17 November 2017, Mouans-Sartoux, France

III, as this programme supports urban sustainable policies and practices in general, and focuses hereby on knowledge and capacity building. Energy related solutions could be a topic under this, however, projects implementing solutions are not eligible. Rather, URBACT III focuses on building networks for knowledge sharing, which could be beneficial for the proposed project but only covers a small part of its activities.

### **2.2.8 Connecting Europe Facility (CEF)**

The Connecting Europe Facility (CEF) finances projects which fill the missing links in Europe's energy, transport and digital backbone<sup>23</sup>. The main aim of CEF Energy is to connect so-called energy islands, to ensure security of supply and to support large scale deployment of energy from renewable sources.

In the energy sector, the CEF supports projects of common interest that pursue one or more of the following objectives:

- Increasing competitiveness by promoting the further integration of the internal energy market and the interoperability of electricity and gas networks across borders;
- Enhancing the EU's security of energy supply;
- Contributing to sustainable development and protection of the environment, by the integration of energy from renewable sources into the transmission network and by the development of smart energy and carbon dioxide networks.

Proposals for CEF Energy can be submitted by a Member State or by public or private undertakings or bodies established in Member States (with the agreement of the Member States concerned). There are no size requirements regarding the requested total budget for proposals submitted under the CEF Energy programme and the expected maximum grant percentage is 50%.

#### ***Relevance for the project***

CEF Energy mainly focuses on the connection of energy networks throughout the EU, and has projects of common interest list for these connections. Next to this, there are open calls, which support demonstration projects that enhance energy security of supply, integrates the EU internal energy market and that integrates renewable energy sources into the network, as well as develop smart grids and CO<sub>2</sub> networks. Energy related solutions, such as district heating and cooling networks, could thus be supported under CEF Energy. However, such projects have not been funded before and therefore chances of receiving funding for the proposed thermal energy networks in ports are unlikely under this programme.

### **2.2.9 Joint European Support for Sustainable Investment in City Areas (JESSICA)**

Joint European Support for Sustainable Investment in City Areas (JESSICA) supports sustainable urban development and regeneration through financial engineering mechanisms<sup>24</sup>. EU countries can choose to invest some of their EU structural fund allocations in revolving funds to help recycle financial resources to accelerate investments in Europe's urban areas. These investments, which may take the form of equity, loans and/or guarantees, are delivered to projects via so-called Urban Development Funds and, if required, Holding Funds.

---

<sup>23</sup> European Commission (2013). Regulation (EU) No 1316/2013 of the European Parliament and of the Council of 11 December 2013 establishing the Connecting Europe Facility, amending Regulation (EU) No 913/2010 and repealing Regulations (EC) No 680/2007 and (EC) No 67/2010. Official Journal of the European Union, L 348/129.

<sup>24</sup> European Investment Bank (2018). Supporting Urban Development (JESSICA). Retrieved on 18 October 2018 at [eib.org/en/products/blending/jessica](http://eib.org/en/products/blending/jessica)

The type of projects supported by JESSICA focus on the following:

- urban infrastructure, including energy;
- heritage or cultural sites;
- redevelopment of brownfield sites;
- creation of new commercial floor space for SMEs, IT and/or R&D sectors;
- university buildings;
- energy efficiency improvements.

More specifically, the priorities are in line with the country's operational programme (see section 3.2.1).

In southern Spain, the following fund is still open for applicants: HF Andalucía - AC JESSICA Andalucía, S.A. (amount signed EUR 80.5 million)

### ***Relevance for the project***

As this project does fit into JESSICA's focus on urban infrastructure and energy efficiency improvements as well as into the Spain's operational programme, it is eligible to receive funding under this programme. However, here funding is only offered in the form of equity investments, loans and guarantees.

## **2.2.10 Joint Assistance to Support Projects in European Regions (JASPERS)**

Joint Assistance to Support Projects in European Regions (JASPERS) promotes the efficient use of EU Structural Funds, thereby stimulating future investment. JASPERS helps cities and regions absorb European funds through top-quality infrastructure projects<sup>25</sup>.

JASPERS supports project preparation, independent quality review and capacity building for infrastructure projects in different sectors, among these are Energy and Solid Waste and Smart Development. Energy related solutions, such as urban energy infrastructure (for heating and cooling) and improving energy efficiency of the built environment, are topics under which projects are supported. JASPERS can for instance help prepare projects to:

- build wind farms, solar rooftops, geothermic and biomass facilities to increase the share of renewable energy in the energy mix;
- rehabilitate district heating plants and networks to reduce energy losses and thus improve energy efficiency;
- retrofit old buildings for a higher energy performance to improve comfort and reduce energy consumption.

Potential beneficiaries include public bodies, enterprises (especially SMEs), universities, associations, NGOs and voluntary organisations. Main focus is on projects with total eligible cost exceeding EUR 50 million (and in some cases EUR 75 million).

### ***Relevance for the project***

As mentioned above, thermal energy networks in ports, as proposed in this project, would fit under JASPERS' priority areas. Nevertheless, the programme focuses on large infrastructure projects and from the three networks proposed, only the network in Sevilla might be eligible in terms of budget.

---

<sup>25</sup> [jaspers.eib.org](http://jaspers.eib.org)

### **2.2.11 European Fund for Strategic Investments (EFSI)**

The European Fund for Strategic Investments (EFSI)<sup>26</sup> aims to help overcome the current investment gap in the EU and is one of the three pillars of the Investment Plan for Europe. The fund supports investments in different fields, including research and development, digital, transport and social infrastructures, energy and resource efficiency, and environmental.

EFSI funding can be provided to projects from the public sector, as well as to private promoters participating in public projects. Local authorities, public sector companies, as well as large businesses and SMEs can benefit from EFSI support, which is maximum 50% from a total amount of projects/investments of EUR 50 million.

#### ***Relevance for the project***

EFSI supports initiatives related to energy and resource efficiency, and the environment. Energy related solutions, such as urban energy infrastructure are topics under which projects could be supported under this fund could receive funding from EFSI, however, the maximum support – which is in the form of guarantees and no grants – is only up to 50% the total amount of budget.

### **2.2.12 European Energy Efficiency Fund**

The European Energy Efficiency Fund is intended for local or regional authorities, or public and private institutions acting on behalf of those authorities, that want to implement projects in the context of energy efficiency and sustainable energy.

In this fund no grants or subsidies are given, instead the fund works with financial support mechanisms such as guarantees or 'soft' loans. One of the possible projects is in investments in energy efficiency and renewable energy projects in the range of EUR 5 -25 million.

#### ***Relevance for the project***

The European Energy Efficiency Fund has financed energy projects related to energy efficiency measures and building retrofitting, as well as heat supply networks and clean urban transport<sup>27</sup>. Thermal energy networks thus could be eligible for funding under this fund as well.

### **2.2.13 Energy Performance Contracting (EPC)**

Energy Performance Contracting (EPC) is an innovative form of financing energy efficiency measures that is increasingly important in the world of energy financing. EPC shifts the costs and part of the benefits of energy efficiency investments to an external contractor. This external contractor is called an Energy Service Company, or ESCO. The ESCO takes care of the energy efficiency investments, guarantees a decreased energy bill and may even finance the investments upfront. A pre negotiated percentage of the savings on the energy bill shall go to the ESCO for a fixed contract period to cover the investment and potential ESCO profit. Until then, the savings for the client will be modest, but after the contract period the client will profit from a significantly lower energy bill.

The energy performance risk, and sometimes also the financial investment lie with the ESCO. Another advantage of this model is that the proposed energy savings are likely to be achieved, due to the ESCOs expertise and financial interest. Finally, there is no need for the client to monitor the results; the nature of an energy performance contract is such that the ESCO has all the incentives to deliver the agreed savings.

---

<sup>26</sup> European Commission (2015). The European Fund for Strategic Investments (EFSI) – Questions and Answers. 13 January 2015.

<sup>27</sup> European Energy Efficiency Fund (2019). Retrieved on 4 January 2019 at [eeef.eu/eligible-investments](http://eeef.eu/eligible-investments)



## **Relevance for the project**

In this project, smart grids for thermal energy will be developed in port areas. Different stakeholders will be part of this network, either as a prosumer (e.g. delivering heat to the grid) or consumer of thermal energy. As the infrastructure for this network requires investment, an ESCO could be a way to finance this.

## **2.3 Recommended EU funding strategy**

The activities proposed in this project focus on the implementation and demonstration of thermal energy networks in three ports in the region of Andalucía by combining different renewable energy technologies. The combination of different technologies and the carbon intensive activities in ports makes this project innovative, as well as the use of some novel renewable energy technologies, such as hydraulic maritime geothermal heat pumps and biomass gasification. Moreover, ports are still quite reliant on fossil fuels and their energy management is one of the key environmental priorities of European ports as they are the main entry points of energy commodities, as well as locations for energy production. This project is therefore an interesting project from a public funding perspective.

In table 3, an overview is shown of the public funding options for this project. The project could also be divided into three subprojects, with different budgets and energy technology options (table 2). In this report, all possible EU funding strategies are explored and therefore, some of the funding instruments proposed in this strategy might be only relevant for a specific subproject rather than for the overall project.

As this project contributes to the priorities of the Operational Programme, such as the energy transition and sustainable and integrated urban development, it is highly likely that the proposed activities here are eligible to receive funding from the [European Regional Development Fund \(3.2.1\)](#). However, ERDF funding for the current funding period (2014-2020) is exhausted for the Andalucía region. The Operational Programme for the next funding period (2021-2027) is not yet published but is likely to match the projects priorities. Nonetheless, the project initiator has indicated that the project is expected to start before 2021. Moreover, it needs to be taken into account that funding from ERDF is maximum EUR 2 million per company that participates in the project, due to regulations on State Aid. More information can be found in the JRC report on *Identification of EU funding sources for the regional heating and cooling sector*<sup>7</sup>.

For preparatory activities needed for the implementation of the project, both [Horizon 2020 Project Development Assistance \(3.2.3\)](#) and [ELENA \(3.2.4\)](#) are suitable for the overall project as both funds including the financing for securing of finance for the required investments, stakeholder involvement and technical preparation of the project. However, ELENA has a lower funding percentage than H2020 PDA (90 instead of 100% of eligible costs).

For the overall project, [INTERREG European Territorial Co-operation \(3.2.6\)](#) might be a good fit. Under the INTERREG programme, there are already several district heating and cooling grids funded. The most promising programme for this project therefore seems to be INTERREG Europe, as the project needs budget for investment for the development of a thermal energy network, as well as it wants to demonstrate a good practice and to share knowledge. An important requirement of this programme is however to collaborate with at least two other regions in the EU.

Applying for the [LIFE \(3.2.5\)](#) programme may only be interesting for the thermal energy network in the Motril Granada Port, as the required budget is much lower than for the other projects. Moreover, some of the renewable energy technologies proposed in this project – particularly maritime geothermal heat pump and biomass gasification – are the relatively

innovative compared to the other technologies proposed (e.g. with the lowest TRL). Funding is in the form of a grant that covers up to 60% of eligible costs.

Unfortunately, under [Horizon 2020 \(3.2.2\)](#) the relevant calls for this project are already closed. There is one call that might still be somewhat relevant – this call focuses on the political and public mobilization of energy efficiency investments rather than implementing measures and with a budget of only EUR 1-1.5 million. The same goes for [URBACT III \(3.2.7\)](#), that focuses on knowledge and capacity building and particularly on developing European networks for this. This could be beneficial for the proposed project, but covers only a small part of its activities.

Next to this, the [European Fund for Strategic Investments \(3.2.11\)](#) and [European Energy Efficiency Fund \(3.2.12\)](#) both fund initiatives related to energy and resource efficiency, and the environment. Energy related solutions, such as urban energy infrastructure are also funded under these instruments, especially under the European Energy Efficiency Fund. Under EFSI the maximum support in the form of guarantees is only up to 50 % the total budget, while guarantees under the European Energy Efficiency Fund could be as high as 100 % of the budget. The maximum funding is EUR 25 million, but it is possible to use this fund as co-funding in combination with grants. Therefore, it seems to be a more suitable option to meet the funding needs of this project than EFSI.

In terms of technical assistance and funding, [JESSICA \(3.2.9\)](#) and [JASPERS \(3.2.10\)](#) are relevant as well. JESSICA focuses on urban infrastructure and energy efficiency improvements as well as into the Spain's operational programme, it is eligible to receive funding under this programme. Thermal energy networks in ports, as proposed in this project, would fit under JASPERS' priority areas. Nevertheless, the programme focuses on large infrastructure projects and from the three networks proposed, only the network in Sevilla might be eligible in terms of budget. Next to this, both programmes only offer funding in the form of equity investments, loans and guarantees.

Finally, [Energy Performance Contracting \(3.2.13\)](#) might be another possibility for funding the project. This EPC shifts the costs and part of the benefits of energy efficiency investments to an external contractor: an Energy Service Company (ESCO). The ESCO takes care of the energy efficiency investments, guarantees a decreased energy bill and may even finance the investments upfront. As investments are relatively high in this project, and different stakeholders are involved, EPC could be a way to finance the investments of the thermal energy grid.

### ***Funding advice***

Based on the information available at the moment of writing, the following EU public funding instruments are thought to provide the best match with the project on thermal energy networks in three ports in Andalucía:

- ELENA, for the preparation of the project. This could be combined with a direct loan from EIB;
- LIFE, for the Motril Granada Port activities;
- INTERREG Europe, for the Sevilla and Málaga Port activities.

The amount of funding and timing of the recommended instruments are shown in table 4 below.



**Table 4. Funding and timing of the recommended instruments for the Andalucía project.**

Funding instrument	Project phase	Amount of funding	Timing	Other requirements
ELENA	Preparation	90% of preparatory activities	Application possible throughout the 2014-2020 period	Beneficiary is required to co-fund activities (at least 10% of budget)
LIFE Climate Action (Motril Granda port)	Implementation	Up to 60% of eligible costs, in this case ~EUR 3.5 million	Expected timing: Opening call March 2019, deadline proposal September 2019. Start project from July 2020.	Demonstration of innovative and close to market technologies
INTERREG Europe	Implementation	75 or 85% of project activities, budget expected ~EUR 1-2 million	Depends on the programme. Contact 'Ministerio de Hacienda y Función Pública' for more information	Collaboration with at least 2 other EU regions required

The total budget for the project in Andalucía is fairly large and it will be difficult to cover a significant share of the budget through EU funds. The project promoter aims to cover about 20-30% of the budget through EU subsidies, in order to leverage the required private funds. Typically, such investments would be covered under the structural funds. But the budget for the current funding period is exhausted, and the Operational Programme has not been published yet for the next funding period (2021-2027). The project promoter expressed disappointment that the availability of centrally managed investment subsidies at EU level is limited. In case structural funds are depleted or poorly managed, few alternative public funding options exist for large investment projects.

The centrally managed EU funds, aiming primarily at innovation, can cover 10-15% of the funding in a very optimistic scenario. Realistically, with the success rate of these funds, this percentage will be rather in the range of 5-10%. In order to still secure enough funding, it might be strategic to implement the project, consisting of three subprojects, in different phases. From a funding perspective this might be beneficial. When one subproject is implemented first, it will demonstrate a thermal energy grid in a port area and it might be easier to attract funding (also from private sources) for the other subprojects as the perceived risk is then lower.

The advice is therefore to apply for (in this order):

- 1) ELENA
- 2) LIFE
- 3) INTERREG Europe

## 2.4 Next steps

The first step is to apply for ELENA. When granted, this funding could be used for preparatory activities of the project, including a business plan and securing (EU) funding for the project activities and investments after the preparatory phase.

- 1) ELENA application steps:

a) Inventory of concrete activities per theme

- Based on the inventory of the first interactive session with the National Enterprise Agency and / or relevant stakeholders. Relevant questions include:
  - Planning of activities;
  - Estimated costs of the activities;
  - Financial commitment in relation to investments;
  - Analysis of relevant parties and drivers of activities.
- On the basis of the results of this session, make a selection of the most relevant activities and bundle this into a project (idea).
- Design and issue fact flyer about the project idea with the aim of activating and mobilizing the parties.

b) Project development

- Setting up a workshop session for various stakeholders by theme to get commitment for the project idea. The aim is to bring together ambitions or investment intentions by looking for agreements and / or connection.
- Combining these individual projects parts per theme into one broad investment path with commitment from all parties.
- Description of final project idea.

c) Drafting application

- ELENA application process consists of two steps:
  - The first phase is the feasibility phase in which the project and associated costs must be described in number of pages and submitted to EIB;
  - On the basis of project idea feedback and coordination from EIB, including a go / no go for completing the application.

There is the possibility to combine ELENA with an EIB direct loan for the project's investments. When this loan is over EUR 25 million, it can be directly requested from EIB. The application for such a loan should at least contain a comprehensive feasibility study. Next to this, it should include the following aspects:

- General information about the enterprise (or institution), its legal status, principal partners and shareholders, organisational structure;
- Technical and environmental data of the project:
  - General purpose, justification and location;
  - Legal status of the proposed project, relationship with the borrower's other activities;
  - Licences and concessions obtained;
  - Technical description: technology, site development, buildings, production and storage plant, general services, transport systems and equipment;
  - Environmental impact assessment, where relevant and appropriate, including reference to relevant laws, mitigating measures to protect the environment, specific studies;
  - Engineering studies and implementation plan: consultants (if any), procedures for tendering and awarding contracts, supervision, works schedule and implementation timetable;

- Detailed cost estimate, itemising site and plant expenditure, provision for physical and price contingencies, interest during construction, initial and start-up expenses;
- Operation: raw materials and products, flowcharts, consumption and output levels, managerial staff and workers, management organisation, technical assistance where applicable.
- Financial data of the project:
  - Breakdown of project operating and maintenance costs, depreciation and overheads;
  - Financing plan for the project and schedule of projected expenditure;
  - Projected cashflows, profit and loss accounts, and balance sheets, until the project is expected to break-even;
  - Estimate of project working capital requirements over time;
  - Calculation of the project's Internal Rate of Return;
  - Security and guarantees offered.

The second step is to apply for the LIFE Climate Action programme, specifically for the Motríl Granada port, as this project could demonstrate the combination of innovative renewable energy technologies in a smart heating and cooling district network. By starting with this project, the business case can be proved and demonstrated, thereby making it easier to mobilize the relevant stakeholders and funding from other, non-EU sources. Moreover, the project budget does fit within the requirements of this programme. Furthermore, funding from the LIFE is possible even when applying for a direct loan from the EIB, as long as this funding is used for different activities.

## 2) LIFE application steps

### a) Project development

- Kick-off session with the project beneficiaries to discuss:
  - Innovativeness and demonstration character of the technologies used;
  - Type, planning and estimated costs of activities;
  - Analysis of other relevant parties and drivers of activities;
  - Financial commitment of beneficiaries in relation to investments.
- Description of a final project idea. Consult national contact point or the national enterprise agency for feedback, if possible.

### b) Drafting application (one-stage). This includes:

- The identification of the problem;
- Description of the baseline;
- Description of the objectives of the project;
- Description of the activities of the project;
- Detailed budget.

The third step would be to apply for the INTERREG Europe programme, specifically for the projects in the ports of Sevilla and Málaga. This INTERREG programme would fit the projects, as both need budget for investment for the development of a thermal energy network, as well as wants to demonstrate a good practice and to share knowledge. As mentioned before, collaboration with other regions in the EU and outside of Spain is a requirement for receiving funding under this programme.

### 3) INTERREG Europe application steps:

#### a) Project submission. The following documents are needed:

- Application form;
- Partner declaration;
- Letters of support, if applicable.

#### b) Project selection

- Eligibility assessment of the project, focusing on the following criteria:
  - Respect of the deadline;
  - Completeness of the application;
  - Correctness of the application form;
  - Correctness of the partner declarations and letters of support, if applicable;
  - Geographical coverage of the partners;
  - Focus on structural funds.
- Quality assessment of the project, focusing on the following criteria:
  - Strategic assessment criteria – to assess the project’s contribution to the achievement of programme objectives. This includes the relevance of proposal, the quality of results and the quality of partnership.
  - Operational assessment criteria – to assess the consistency and feasibility of the proposed project, as well as its value for money. This includes the coherence of the proposal and quality of approach, the communication and management and budget and finance.

The final result of an assessment is a qualitative reflection on interdependent criteria, in which both strategic and operational criteria are important. In order to help applicants with this process, project idea feedback can be requested, and several information meetings are organised. As the application process is found to be quite difficult, it is recommended to start early with involving partners and assessing the project idea on the criteria of the INTERREG Programme.

## **3 Public Funding Strategy Western Macedonia Project**

### **3.1 Project**

#### **3.1.1 Description**

Due to the Greek economic conditions, energy poverty is a rising issue in the heating sector and the potential of using renewable fuels is increasing. Located in the coldest climatic zone of Greece, the region of Western Macedonia has high heating requirements. Moreover, this region has a significant number of isolated urban areas due to its terrain. 100 000 households in the cities of Kozani, Ptolemaida and Amynteo are now heated by district heating systems from lignite power plants. Other households have decentralized heating.

In order to secure a sustainable energy supply, the first phase out of local lignite plants occurred during the period 2010 – 2015, where 663 MW of the oldest lignite-fired units ceased operation. A second, more severe wave of lignite sector reduction will occur in 2020, when 6 lignite-fired plants with a total capacity of 1812 MW will terminate operation. By 2030, 4 units of 1220 MW capacity will reach their end of lifetime, leaving only 15% of the initial lignite capacity in operation in the region. A new power plant of 660 MW is expected to be commissioned until 2022.

The project 'Installation Biomass Boilers in existing DH in the Region of Western Macedonia' will replace fossil fuels with biomass in the thermal energy grids by converting lignite-coal power plants.

Alternative fuels and RES potentials as well as new heating system concepts are not thoroughly exploited in the region, using extended knowhow on district heating design, construction and operation. A cost-benefit analysis showed that the installation of a biomass boiler and the co-firing of biomass and lignite into the existing district heating network constitute the best solution in terms of costs and benefits for the coverage of the heating demand. In this case, the biomass should be locally sourced.

#### ***Project objectives and activities***

The aim of the project is to replace fossil fuels with a renewable energy source for heating in Western Macedonia through partial substitution of the heat energy recovered from coal-fired power plants with new installed biomass-boilers. This is done through three different measures:

1. Installation of co-firing biomass boilers and lignite in the existing district heating network;
2. Installation of biomass boilers in the existing district heating network;
3. Promote autonomous high-efficient biomass boilers in households.

Biomass or biogas CHP plants can be installed for the production of heat, while the potential utilisation of the biomass including the capability of co-firing with lignite in the existing district heating network can be considered as an alternative solution. On the other hand, autonomous high efficient biomass boilers can be provided to households that are not connected to the district heating network.

#### ***Expected impact***

The proposed project is part of the Energy Heating and Cooling Action Plan of the regional authority in Western Macedonia. The objective of this plan is to maximise the substitution of consumed fossil fuels for domestic heating and electricity with renewable and efficient heating and cooling systems, which will exploit the existing RES potential of the region. Specifically,

the objective is to double the current penetration of RES in the residential and tertiary sector in 2030 compared to 2012.

The fulfilment of the targets of the regional RES H-C plan will contribute to achieving the 2020 national target considering the penetration of RES in the gross final energy consumption. The substitution of heating oil will amount to 40%, while the exploitation of existing biomass potential is expected to reach 75% of the total available biomass in the region. A critical parameter for the efficient exploitation of the available biomass is the development of the appropriate supply chain of the required fuel input. Furthermore, 10% of the foreseen interventions should be implemented in energy poor households.

The proposed activities will result in the following economic benefits for the users:

- Low purchase heat energy cost;
- Efficient and low energy consumption systems;
- Decrease of energy poverty.

### **Organisation**

This project is initiated by ANKO, the regional development agency of Western Macedonia, which is based in Kozani. This agency will mainly provide technical support as regional energy expert. Moreover, several project partners will be involved in a public-private partnership. The project partners are:

- Region of Western Macedonia Authority (as regional administrative body)
- Local District Heating Companies (as the responsible body for the district heating operation and implementation new energy measures)

Number of users engaged are 300 000 throughout the project, which are mainly households. Moreover, during the implementation of the project the goal is to involve local biomass suppliers, such as wood enterprises, and forestry cooperatives in order to benefit the local economy and ensuring sustainable supply chains for biomass used in heating.

### **Planning**

There is no detailed project planning yet. The installation of (co-firing) biomass boilers in the existing district heating network is scheduled for the first 3 years of the project, in which boilers are respectively installed in year 1 and year 3 (phase 1 and 2). For the installation of 15 000 boilers in residential buildings, the aim is to do this latest 2030, with a minimum instalment of 2 000 boilers annually (phase 3).

#### **3.1.2 Budget**

##### **Project costs**

A cost-benefit analysis showed that the installation of a biomass boiler and the co-firing of biomass and lignite into the existing district heating network constitute the best solution in terms of costs and benefits for the coverage of the heating demand in this region. In table 5 the project costs can be found.

**Table 5. Budget for the Western Macedonia project.**

Measure	Estimated investment (EUR million)
Installation of co-firing biomass boilers and lignite in the existing district heating network	15
Installation of biomass boilers in the existing district heating network	17.5
Installation of 15 000 boilers in residential buildings	60
<b>Total</b>	<b>92.5</b>

### ***Funding needs***

The aim is to channel EU structural funds for the realization of this project. It is not clear if co-funding will be available from the households or companies that will be part of the energy network.

### **3.1.3 Public funding priorities**

#### ***Energy/CO<sub>2</sub> savings***

The Western Macedonia region still produces 80% of Greece's lignite. In the EU Clean Energy Package, this is therefore one of the fourteen coal and carbon-intensive regions that are part of the Platform on Coal Regions in Transition<sup>28</sup>. Under this package, the EU has set ambitious targets for the reduction of CO<sub>2</sub> emissions, in which the coal sector plays an important part. In 2015, coal combustion was equal to 37% of the total CO<sub>2</sub> emitted by Greece and in order to be able to reach renewable energy targets, energy production based on lignite needs to be replaced by RES.<sup>29</sup>

#### ***Labour***

As coal and carbon-intensive regions, including Western Macedonia, often have an economy that is driven by coal, the Platform on Coal Regions in Transition helps to develop projects with the potential to kick-start a viable economic and technological energy transition. About 49% of the production and 24% of the working population in Western Macedonia is employed in the secondary sector, which is dominated by lignite mining and electricity production activities. It is therefore important that projects contributing to the renewable energy transition take into account the socioeconomic factors, such as employment, and support the local economy by involving SMEs in the region.<sup>30</sup>

















<sup>28</sup> European Commission (2019). Coal and other solid fuels. Retrieved on 4 January 2019 at [ec.europa.eu/energy/en/topics/oil-gas-and-coal/coal-and-other-solid-fuels](https://ec.europa.eu/energy/en/topics/oil-gas-and-coal/coal-and-other-solid-fuels)

<sup>29</sup> Wuppertal Institute (2018). Phasing-out Coal, Reinventing European Regions: An Analysis of EU Structural Funding in four European Coal Regions.

## 3.2 Public funding options


As the proposed project will have different phases, possible public funding instruments options for the preparation and implementation are taken into account in this section. In table 6, an overview of the different funding options is given.

**Table 6. Overview of different funding options for the Western Macedonia project.**

Funding instrument	Type of funding	Winning chances	The suitability of a funding instrument is indicated in three levels. The classification of the levels is as follows:   <b>High;</b> fits the project  <b>Medium;</b> fits the project, financing is available  <b>Low;</b> fits the project partially, financing is limited
European Regional Development Fund (ERDF)	Grant		
Horizon 2020 <ul style="list-style-type: none"> <li>LC-SC3-EE-16-2018-2019-2020</li> <li>LC-SC3-RES-4-2018</li> <li>LC-SC3-RES-8-2019</li> </ul>	Grant		
Horizon 2020 Topic LC-SC3-EE-11-2018-2019-2020	PDA		
ELENA	PDA		
INTERREG: European Territorial Co-operation (ETC)	Grant		
Connecting Europe Facility - Energy	Grant		
JASPERS	TA		
European Bank for Reconstruction and Development (EBRD)	Guarantees		
European Fund for Strategic Investments (EFSI)	Guarantees		
European Energy Efficiency Fund	Guarantees		
Research Fund Coal & Steel	Grant		
Green bonds	Loans		
Energy Performance Contracting (EPC)	-		

well, financing is available in the short term

 **Medium;** fits the project, financing is available

 **Low;** fits the project partially, financing is limited

### 3.2.1 European Regional Development Fund (ERDF)

The ERDF allocates budget to EU Member States and is one of the main financial instruments of the EU's Cohesion Policy<sup>30</sup>. ERDF's purpose is to contribute to reduce disparities between

<sup>30</sup> European Commission (2014). An Introduction to EU Cohesion Policy 2014-2020. June 2014.



levels of development of EU regions. The main focus areas are innovation and research, the digital agenda, support for SMEs and the low-carbon economy.

Under ERDF, Western Macedonia's Operational Programme (OP) 2014-2020 has a budget of more than EUR 311 million. This programme has the following priorities<sup>31</sup> that are relevant for this project:

- "Preserving and protecting the environment and promoting resource efficiency" (ERDF – 18% of EU allocation).
- "Promoting sustainable transport and removing bottlenecks in key network infrastructures, including energy network" (ERDF – 16% of EU allocation).
- "Enhancing competitiveness of SMEs" (ERDF – 9% of EU allocation).
- "Supporting the shift towards a low-carbon economy in all sectors" (ERDF – 8% of EU allocation).

### **Relevance for the project**

As the proposed project contributes to the OP's priorities, it is highly likely that the proposed activities here are eligible to receive funding as well, especially when including SMEs and vocational programs to stimulate employment in the renewable energy sector.

### **3.2.2 Horizon 2020**

Horizon 2020 is the financial instrument implementing the Innovation Union<sup>32</sup>, a European flagship initiative aimed at securing Europe's global competitiveness. The program offers research institutes, companies and governments the chance to get financing for the development and demonstration of innovations through Research & Innovation Actions (RIA), Innovation Actions (IA) and Coordination and Support Actions (CSA) under three research priorities: Tackling Societal Challenges, Industrial Leadership and Excellent Science.

Under the first research priority, relevant calls for this project are under the theme *Secure, clean and efficient energy*<sup>14</sup>:

- LC-SC3-EC-2-2018-2019-2020: Mitigating household energy poverty
- LC-SC3-CC-6-2018: Transition in coal intensive regions
- LC-SC3-RES-8-2019: Combining Renewable Technologies for a Renewable District Heating and/or Cooling System.

For most Horizon 2020 calls, a project consortium needs to contain at least a minimum of three beneficiaries from three different EU Member States or H2020 associated countries. In recent Horizon 2020 Work Programmes, some calls require only one beneficiary from an EU Member State or H2020 associated country. For all project types additional beneficiaries/linked third parties from any country are usually allowed depending on the call requirements.

Grants vary roughly between EUR 2 and 20 million per call, depending on the type of project. The funding percentage for RIA is 100% of eligible costs (unless the call specifies another rate). For IA this percentage is 70% (100% for non-profit organisations) of eligible costs (unless the call specifies another rate), and thus co-funding is required. For CSA the funding percentage is 100%.

<sup>31</sup> Operational Programme Western Macedonia, 2014-2020. <https://cohesiondata.ec.europa.eu/programmes/2014GR16M2OP006>

<sup>32</sup> European Commission (2018). Innovation Union. Retrieved on 17 October 2018 at [ec.europa.eu/info/research-and-innovation/strategy](https://ec.europa.eu/info/research-and-innovation/strategy)

### ***Relevance for the project***

For this project, three relevant H2020 calls were found, however two of these calls have been closed already and at the moment of writing it is not clear if similar call topics will be published within the programme timing. Both LC-SC3-CC-6-2018 and LC-SC3-RES-8-2019 would have been relevant for this project, as these respectively focus on 1) the transition to renewable energy sources, specifically in coal regions, and 2) cost-effective solutions for district heating and/or cooling systems which allow satisfying at least 50% of the energy demand of the system by one or more renewable energy technologies.

The H2020 call LC-SC3-EC-2-2018-2019-2020 is still open, but fits the project's activities less as it focuses on energy poverty of households. This includes the facilitation of behaviour change and implementation of low-cost energy efficiency and the set-up of financial and non-financial support schemes for energy efficiency and/or small scale renewable energy investments for energy poor households. This would fit the project's activity of the installation of high-efficient biomass boilers in households. The budget per project under this call is EUR 1-2 million.

### **3.2.3 Horizon 2020 Topic LC-SC3-EE-11-2018-2019-2020 (PDA)**

The European Commission has set up a series of facilities funding Project Development Assistance (PDA) to support ambitious public authorities - regions, cities, municipalities or groupings of those - and public bodies in developing bankable sustainable energy projects. As part of the Horizon 2020 EE11 topic, Project Development Assistance (PDA)<sup>14</sup> supports building technical, economic and legal expertise needed for project development and leading to the launch of concrete investments, which are the final aim and deliverable of the project. Next to the development of energy efficiency projects, (applied) research can be (co)financed under PDA.

Proposals in this topic focus on one or more of the following sectors:

- Existing public and private buildings including social housing, with the aim to significantly decrease energy consumption in heating/cooling and electricity;
- Energy efficiency of industry and service; energy efficiency in all modes of urban transport (such as highly efficient transport fleets, efficient freight logistics in urban areas, e-mobility and modal change and shift); and
- Energy efficiency in existing infrastructures such as street lighting, district heating/cooling and water/wastewater services.

Funding rates are 100% of eligible costs (unless the call provides another rate) and for each action the contribution from the EU ranges between EUR 0.5 and 1.5 million. This contribution should trigger investments that are 15 times higher, such that the total investment portfolio is EUR 7.5 – 50 million.

### ***Relevance for the project***

This project focuses on the replacement of lignite with RES in district heating networks, as well as to provide decentralized renewable energy supply to households that are not connected to this network and thus includes project preparations projects related to heating and cooling networks. More specifically, the project could use H2020 PDA for the preparation of the implementation of the project, including securing finances for the investments, stakeholder involvement, technical preparation of the project etc.

### 3.2.4 ELENA

ELENA is a joint initiative by the EIB and the European Commission under the Horizon 2020 programme. ELENA provides grants for technical assistance focused on the implementation of energy efficiency, distributed renewable energy and urban transport projects and programmes. The programme co-finances energy efficiency and distributed renewable energy projects, related to the following<sup>16</sup>:

- public and private buildings, commercial and logistic properties and sites, and street and traffic lighting to support increased energy efficiency;
- integration of renewable energy sources (RES) into the built environment;
- investments into renovating, extending or building new district heating/cooling networks, including networks based on combined heat and power (CHP);
- local infrastructure including smart grids, information and communication technology;
- infrastructure for energy efficiency, energy-efficient urban equipment and link with transport.

ELENA is open to any public or private entity/project promoters such as local, regional or national authorities, transport authorities and operators, social housing operators, and other companies to develop and launch investible (bankable) Investment Programmes.

Typically, ELENA supports projects above EUR 30 million with a maximum 3-year implementation period for energy efficiency. Smaller projects are supported when they are integrated into larger investment programmes. ELENA co-finances/covers up to 90% of eligible project development costs, which may include expenses related to feasibility and market studies; programme structuring; energy audits; financial structuring and/or preparation of tendering procedures and contractual arrangements. It does not cover costs related to the investment itself.

ELENA funding could be combined with a direct loan from the European Investment Bank (EIB) to cover the project's investment costs. Direct loans are usually long-term loans that are provided to private or public sector project promoters where the investment cost exceeds EUR 20-25 million. The financing terms of this type of loan in terms of maturity and grace period are tailored to the type of investment. Moreover, appropriate security is required.

#### ***Relevance for the project***

Similarly to H2020 PDA, ELENA can co-finance the preparation of the implementation of the project, including securing finances for the investments, stakeholder involvement, technical preparation of the project etc. Moreover, ELENA can be combined with a direct loan from the EIB to cover the project's investment costs after the preparation phase.

### 3.2.5 INTERREG: European Territorial Co-operation (ETC)

INTERREG aims to strengthen Europe and reduce economic disparities between regions and Member States by stimulating cooperation projects. In 79 programmes, countries and regions work together in different ways on challenges on innovation, research, sustainable energy, climate adaptation and transport. Projects have to involve partners from at least three countries, from which at least two partners must be from the EU member states. The requirements differ per programme. There are three main programmes within INTERREG, focusing respectively on cross-border, transnational and interregional cooperation in the EU.<sup>20</sup>

The region of Western Macedonia is part of two cross-border programs (INTERREG A): Greece-FYROM and Greece-Albania, and three transnational cooperation programs (INTERREG B): Adriatic-Ionian, Balkan-Mediterranean and Mediterranean Area. These programmes support a

wide range of project investments related to for instance innovation, environment, accessibility and urban development.<sup>20</sup> Moreover, INTERREG C operates at pan-European level, covering all EU Member States, and builds networks to develop good practice and facilitate the exchange and transfer of knowledge and experience by successful regions.<sup>21</sup>

Beneficiaries for INTERREG B & C are public authorities on local, regional and national levels, managing authorities and intermediate bodies in charge of the 'Investment for Growth and Jobs' or 'European Territorial Cooperation' programmes and agencies, research institutes, thematic and non-profit organisations in collaboration with local policy makers.

INTERREG programmes will co-finance up to 85% of project activities and private non-profit bodies at a rate of 75%. Depending on the number of partners involved, the average total budget of a project is expected to be EUR 1-2 million. Different conditions apply for INTERREG B, covering larger areas of co-operation such as Mediterranean regions.

### ***Relevance for the project***

The region of Western Macedonia is part of cross-border, transnational and interregional INTERREG programmes. One of INTERREG's focus areas is sustainable energy and under the programme, the development of several district heating and cooling grids is funded. For this project, only the programmes Greece-Albania, Mediterranean Area and INTERREG Europe are relevant as priorities cover low carbon economy, including an increase in RES and improvements in energy efficiency. The first does not cover the Kozani region in Western Macedonia. However, the programme has not financed projects before on the installation of (co-firing) biomass boilers in an existing district heating network. Nevertheless, it seems that this project could fit within INTERREG when considering its priorities.

### **3.2.6 Connecting Europe Facility (CEF)**

The Connecting Europe Facility (CEF) finances projects which fill the missing links in Europe's energy, transport and digital backbone<sup>24</sup>. The main aim of CEF Energy is to connect so-called energy islands, to ensure security of supply and to support large scale deployment of energy from renewable sources.

In the energy sector, the CEF supports projects of common interest that pursue one or more of the following objectives:

- Increasing competitiveness by promoting the further integration of the internal energy market and the interoperability of electricity and gas networks across borders;
- Enhancing the EU's security of energy supply;
- Contributing to sustainable development and protection of the environment, by the integration of energy from renewable sources into the transmission network and by the development of smart energy and carbon dioxide networks.

Proposals for CEF Energy can be submitted by a Member State or by public or private undertakings or bodies established in Member States (with the agreement of the Member States concerned). There are no size requirements regarding the requested total budget for proposals submitted under the CEF Energy programme and the expected maximum grant percentage is 50%.

### ***Relevance for the project***

CEF Energy mainly focuses on the connection of energy networks throughout the EU, and has projects of common interest list for these connections. Next to this, there are open calls which support demonstration projects that enhance energy security of supply, integrates the EU internal energy market and that integrates renewable energy sources into the network, as

well as develop smart grids and CO<sub>2</sub> networks. Energy related solutions, such as district heating and cooling networks and adaption thereof, could thus be supported under CEF Energy. However, such projects have not been funded before and therefore chances of receiving funding for the proposed project are unlikely under this programme.

### **3.2.7 Joint Assistance to Support Projects in European Regions (JASPERS)**

Joint Assistance to Support Projects in European Regions (JASPERS) promotes the efficient use of EU Structural Funds, thereby stimulating future investment. JASPERS helps cities and regions absorb European funds through top-quality infrastructure projects<sup>33</sup>.

JASPERS supports project preparation, independent quality review and capacity building for infrastructure projects in different sectors, among these are Energy and Solid Waste and Smart Development. Energy related solutions, such as urban energy infrastructure (for heating and cooling) and improving energy efficiency of the built environment, are topics under which projects are supported. JASPERS can for instance help prepare projects to:

- build wind farms, solar rooftops, geothermic and biomass facilities to increase the share of renewable energy in the energy mix;
- rehabilitate district heating plants and networks to reduce energy losses and thus improve energy efficiency;
- retrofit old buildings for a higher energy performance to improve comfort and reduce energy consumption.

Potential beneficiaries include public bodies, enterprises (especially SMEs), universities, associations, NGOs and voluntary organisations. Main focus is on projects with total eligible cost exceeding EUR 50 million (and in some cases EUR 75 million).

#### ***Relevance for the project***

As mentioned above, installation of (co-firing) biomass boilers, as proposed in this project, would fit under the priority areas of JASPERS to rehabilitate district heating plants and increasing the share of renewable energy. As the programme focuses on large infrastructure projects, only the large activities are proposed in this project. Moreover, the costs of the project are lower than typical projects under JASPERS. It is therefore uncertain if the entire project will be eligible for funding.

### **3.2.8 European Bank for Reconstruction and Development (EBRD)**

The European Bank for Reconstruction and Development (EBRD) is an international bank with a public mandate. This public role puts the energy sector “at the centre of the Bank's mandate to foster the transition to market-oriented economies and its function to promote environmentally sound and sustainable development”. The EBRD was founded to further progress developing economies towards market-oriented economies. In the EU, it is therefore active in the emerging economies of Eastern Europe.

Through credit lines such as the Sustainable Energy Financing Facilities (SEFFs) and Green Economy Finance Facilities (GEFFs), the EBRD extends credit to local financial institutions that seek to develop sustainable energy financing as a permanent area of business. Finance for sustainable energy projects is provided for two key areas: energy efficiency and small-scale renewable energy. Local financial institutions lend the funds which they have received from the EBRD to their clients, which include small and medium-sized businesses, corporate and residential borrowers, and renewable energy project developers.

---

<sup>33</sup> [jaspers.eib.org](https://jaspers.eib.org)

### ***Relevance for the project***

EBRD supports sustainable energy projects and especially focuses on the financing of energy efficiency measures and small-scale renewable energy. It therefore normally supports SMEs and other clients that develop relatively small renewable energy projects. As the budget for the project in Western Macedonia is relative large (EUR 92.5 million), receiving funding from EBRD for the proposed project seems unlikely. However, for parts of the project, such as the installation of (co-firing) biomass boilers in the existing district heating network, funding might be possible.

### **3.2.9 European Fund for Strategic Investments (EFSI)**

The European Fund for Strategic Investments (EFSI) aims to help overcome the current investment gap in the EU and is one of the three pillars of the Investment Plan for Europe. The fund supports investments in different fields, including research and development, digital, transport and social infrastructures, energy and resource efficiency, and the environment.<sup>27</sup>

EFSI funding can be provided to projects from the public sector, as well as to private promoters participating in public projects. Local authorities, public sector companies, as well as large businesses and SMEs can benefit from EFSI support, which is maximum 50% from a total amount of projects/investments of EUR 50 million.

### ***Relevance for the project***

EFSI supports initiatives related to energy and resource efficiency, and the environment. Energy related solutions, such as urban energy infrastructure are topics under which projects could be supported under this fund could receive funding from EFSI, however, the maximum support – which is in the form of guarantees and no grants – is only up to 50% of the total amount of budget.

### **3.2.10 European Energy Efficiency Fund**

The European Energy Efficiency Fund is intended for local or regional authorities, or public and private institutions acting on behalf of those authorities, that want to implement projects in the context of energy efficiency and sustainable energy.<sup>28</sup>

In this fund no grants or subsidies are given, instead the fund works with financial support mechanisms such as guarantees or 'soft' loans. One of the possible projects is in investments in energy efficiency and renewable energy projects in the range of EUR 5 – 25 million. This could include energy-efficient buildings or residential areas and projects in the context of sustainable energy, such as cooling and heating networks.

### ***Relevance for the project***

The European Energy Efficiency Fund has financed energy projects related to energy efficiency measures and building retrofitting, as well as heat supply networks and clean urban transport.<sup>28</sup> Installation of (co-firing) biomass boilers in the existing district heating network, thus could be eligible for funding under this fund as well.

### **3.2.11 Research Fund Coal & Steel**

The Research Fund for Coal and Steel (RFCS)<sup>34</sup> supports research and innovation projects in coal and steel sectors. Every year, around EUR 40 million is made available to universities, research centres and private companies to fund projects. These projects cover production

---

<sup>34</sup> European Commission (2018). Research Fund for Coal and Steel Information Package 2018 - Proposal preparation and submission.



processes application, utilisation and conversion of resources safety at work, environmental protection and reducing CO<sub>2</sub> emissions from coal use and steel production. Moreover, one of the priority activities is in 2018 Pilot/Demonstration projects and Accompanying Measures enhancing the delivery of EU policies in the coal industry:

- Climate policy;
- Increasing flexibility of coal-based power;
- Improving flue gas clean up technologies;
- Carbon capture and use (CCU);
- Alternative uses of coal, lignite and CO<sub>2</sub>;
- Sector coupling.

### ***Relevance for the project***

The RFCS focuses mainly on research and innovation in the coal and coal-intensive industry, such as the steel industry. As the project in Western Macedonia does not apply innovative technologies for uses of existing coal power plants and its inputs, it is unlikely that the project will be eligible for funding under this fund.

### **3.2.12 Energy Performance Contracting (EPC)**

Energy Performance Contracting (EPC) is an innovative form of financing for energy efficiency measures that is increasingly important in the world of energy financing. EPC shifts the costs and part of the benefits of energy efficiency investments to an external contractor. This external contractor is called an Energy Service Company, or ESCO. The ESCO takes care of the energy efficiency investments, guarantees a decreased energy bill and may even finance the investments upfront. A prenegotiated percentage of the savings on the energy bill shall go to the ESCO for a fixed contract period to cover the investment and potential ESCO profit. Until then, the savings for the client will be modest, but after the contract period the client will profit from a significantly lower energy bill.

The energy performance risk, and sometimes also the financial investment lie with the ESCO. Another advantage of this model is that the proposed energy savings are likely to be achieved, due to the ESCOs expertise and financial interest. Finally, there is no need for the client to monitor the results; the nature of an energy performance contract is such that the ESCO has all the incentives to deliver the agreed savings.

### ***Relevance for the project***

Energy Performance Contracting might be a relevant financing option for the autonomous biomass boilers that will be installed in households that are not connected to the grid. It is expected that financing these boilers will be difficult, as these are a relatively large investment for households. An ESCO could cover these upfront investments and guarantee performance.

## **3.3 Recommended EU funding strategy**

The activities proposed in this project focus on the replacement of fossil fuels by a renewable energy source for heating in Western Macedonia through partial substitution of the heat energy recovered from coal-fired power plants with biomass boilers. This is done through three different measures:

- Installation of co-firing biomass boilers and lignite in the existing district heating network;
- Installation of biomass boilers in the existing district heating network;
- Promote autonomous high-efficient biomass boilers in households.

The Western Macedonia region still produces 80% of Greece's lignite and is one of regions in the EU in which the economy is driven by coal. In order to reach renewable energy targets, energy production based on lignite needs to be replaced with a renewable energy source, such as local biomass.

In table 5, an overview is shown of the public funding options for this project. As the project can be divided in three phases, some of the funding instruments are more relevant for one of the phases than for the overall project.

The European Regional Development Fund (4.2.1) is the first relevant option for funding as it contributes to the OP's priorities, such as promoting resource efficiency and preserving the environment and a sustainable energy network. Especially when including SMEs and vocational programs to stimulate employment in the renewable energy sector, it is likely that this project is eligible to receive funding under ERDF. However, it needs to be taken into account that funding from ERDF is maximum EUR 2 million per company that participates in the project, due to regulations on State Aid. More information can be found in the JRC report on Identification of EU funding sources for the regional heating and cooling sector.

For preparatory activities, needed for the implementation of the project, both Horizon 2020 Project Development Assistance (4.2.3) and ELENA (4.2.4) are suitable for the overall project as both funds including the financing for the securing of finance for the required investments, stakeholder involvement and technical preparation of the project. However, ELENA supports bigger projects compared to H2020 PDA (> EUR 30 million) and thus seems to be a better fit for the project. ELENA has a lower funding percentage than H2020 PDA, namely 90 instead of 100% of eligible costs.

For the installation of (co-firing) biomass boilers and lignite in the existing district heating network, INTERREG European Territorial Co-operation (4.2.5) might fit. Even though there are several district heating and cooling grids funded under this programme, it has not funded activities on using renewable energy sources in existing district heating networks. Nevertheless, it seems that this project could potentially fit within INTERREG transnational when considering its priorities. An important requirement of this programme is however to collaborate with at least two other regions in the EU. The project could for instance involve a partner from another EU Member State with state-of-the-art expertise in the field of (co-firing) biomass for heat production.

In terms of technical assistance and funding, JASPERS (4.2.7) might be relevant. The installation of (co-firing) biomass boilers, as proposed in this project, would fit under JASPERS' priority areas. However, the programme focuses on large infrastructure projects and the project's costs are lower than typical projects under JASPERS. It is therefore uncertain if the entire project will be eligible for receiving funding.

The European Fund for Strategic Investments (4.2.9) and European Energy Efficiency Fund (4.2.10) both fund initiatives related to energy and resource efficiency, and the environment. Energy related solutions, such as urban energy infrastructure are also funded under these instruments, especially under the European Energy Efficiency Fund. Under EFSI the maximum support in the form of guarantees is only up to 50% the total budget, while guarantees under the European Energy Efficiency Fund could be as high as 100% of the budget. The maximum funding is EUR 25 million, but it is possible to use this fund as co-funding in combination with grants. Therefore, it seems to be a more suitable option to meet the funding needs of this project than EFSI.

In addition, the European Bank for Reconstruction and Development (4.2.8) supports sustainable energy projects and especially focuses on the financing of energy efficiency measures and small-scale renewable energy. As the budget for the project in Western Macedonia is relative large (EUR 92.5 million), receiving funding from EBRD for the proposed



project seems unlikely. However, for parts of the project, such as the installation of (co-firing) biomass boilers in the existing district heating network, funding might be possible.

Considering Horizon 2020 (4.2.2), the most relevant calls for this project are already closed. There is one forthcoming call that focuses on energy poverty in households that would support the installation of high-efficient biomass boilers in households. This includes the facilitation of behaviour change and implementation of low-cost energy efficiency and the set-up of financial and non-financial support schemes for energy efficiency and/or small scale renewable energy investments for energy poor households. The budget per project under this call is EUR 1-2 million.

Moreover, Energy Performance Contracting (4.2.12) might be another possibility for funding the project. This EPC shifts the costs and part of the benefits of energy efficiency investments to an external contractor (ESCO) that takes care of the investments and guarantees a decreased energy bill. As the proposed investments for households are quite large, EPC seems to be particularly relevant for the installation of biomass boilers in households.

Finally, the Research Fund Coal & Steel (4.2.11) focuses mainly on research and innovation in the coal and coal-intensive industries, such as the steel industry, but as the project in Western Macedonia does not incorporate innovative technologies or uses of existing coal power plants and its inputs, it is highly unlikely that the project will be eligible for funding under this fund.

### **Funding advice**

Based on the information available at the moment of writing, the following EU public funding instruments are recommended for the project on biomass installations in the existing district heating network in Western Macedonia:

- European Regional Development Fund, for infrastructural investments;
- ELENA, for the preparation of the project. This could be combined with a direct loan from EIB;
- European Energy Efficiency Fund, in order to complete financing needs for investments;
- Energy Performance Contracting, for the installation of 15 000 biomass boilers in residential buildings.

The amount of funding and timing of these instruments are shown in table 7 below.

**Table 7. Funding and timing of the recommended instruments for the Western Macedonia project.**

<b>Funding instrument</b>	<b>Project phase</b>	<b>Amount of funding</b>	<b>Timing</b>	<b>Other requirements</b>
ELENA	Preparation	90% of preparatory activities	Application possible throughout the 2014-2020 period	Beneficiary is required to co-fund activities (at least 10% of budget)
European Regional Development Fund (ERDF)	Implementation	Depending on the project and Western Macedonia's Operational	Application possible throughout the 2014-2020 period, contact the <i>Managing Authority of Western</i>	Max. funding amount capped at EUR 2 million per project beneficiary (state aid regulation)

		Programme	<i>Macedonia Region</i> <sup>35</sup> for more information	
European Energy Efficiency Fund	Implementation	EUR 5 – 25 million	Contact Deutsche Bank <sup>36</sup> for more information.	Beneficiaries should be public authorities or entities acting on behalf of those, such as utility companies.
Energy Performance Contracting	Implementation	-	-	-

The project proposed in Western Macedonia, consisting of three different types of activities, is planned to be implemented in different phases and from a funding perspective, this might be beneficial. The total project budget is fairly large and it will be difficult to cover a significant share of the budget through EU funds. Typically, such investments would be covered under the structural funds. However, the budget for the next funding period (2021-2027) is not yet published.

Therefore, the advice for now would be to apply for a subsidy for the project preparation phase and an EU loan to cover the co-financing for the structural funding. In addition, the project initiator was interested in the opportunities that EPC can offer for their project. More specifically, it is recommended that the funding strategy for this project would be the following:

- 1) ELENA;
- 2) ERDF;
- 3) EU loans (e.g. EEFF or EIB);
- 4) Energy Performance Contracting.

### 3.4 Next steps

The first step is to apply for ELENA. When granted, this funding could be used for preparatory activities of the project, including a business plan and securing (EU) funding for the project activities and investments after the preparatory phase.

1) ELENA application steps:

a) Inventory of concrete activities per theme:

- Based on the inventory of the first interactive session with the National Enterprise Agency and / or relevant stakeholders. Relevant questions include:
  - Planning of activities;
  - Estimated costs of the activities;
  - Financial commitment in relation to investments;
  - Analysis of relevant parties and drivers of activities.
- On the basis of the results of this session, make a selection of the most relevant activities and bundle this into a project (idea);

<sup>35</sup> [www.pepdym.gr](http://www.pepdym.gr)

<sup>36</sup> European Energy Efficiency Fund (2018). Technical Assistance. Retrieved on 4 January 2019 at [eeef.eu/eeef-ta-facility](http://eeef.eu/eeef-ta-facility)

- Design and issue fact flyer about the project idea with the aim of activating and mobilizing the parties.

b) Project development

- Setting up a workshop session for various stakeholders by theme to get commitment for the project idea. The aim is to bring together ambitions or investment intentions by looking for agreements and / or connection.
- Combining these individual projects parts per theme into one broad investment path with commitment from all parties.
- Description of final project idea.

c) Drafting application

- ELENA application process consists of two steps:
  - The first phase is the feasibility phase in which the project and associated costs must be described in number of pages and submitted to EIB;
  - On the basis of project idea feedback and coordination from EIB, including a go / no go for completing the application.

The second step is to apply for an EU loan for the overall project, this could be either via EIB or EEF-F programmes. Most institutions require a detailed project proposal with a planning and budget that is financially sound. The preparatory activities under ELENA should be enough to apply for most of the aforementioned loans.

*2a) European Regional Development Fund (ERDF)*

This fund is managed on a national and regional level of EU Member States by managing authorities of the Operational Programmes. Because of this, funding priorities, application process and selection criteria differ per region. The Operational Programmes for the next funding period (2021-2027) have not been published yet. It is therefore recommended to contact the Managing Authority of Western Macedonia Region<sup>36</sup> by that time, in order to understand the funding priorities and application procedure for funding from ERDF.

*2b) EIB direct loan*

This type of loan can cover project's investments and as it is more than EUR 25 million, it can be directly requested from EIB. The application for such a loan should at least contain a comprehensive feasibility study. Next to this, it should include the following aspects:

- General information about the enterprise (or institution), its legal status, principal partners and shareholders, organisational structure;
- Technical and environmental data of the project:
  - General purpose, justification and location;
  - Legal status of the proposed project, relationship with the borrower's other activities;
  - Licences and concessions obtained;
  - Technical description: technology, site development, buildings, production and storage plant, general services, transport systems and equipment;
  - Environmental impact assessment, where relevant and appropriate, including reference to relevant laws, mitigating measures to protect the environment, specific studies;

- Engineering studies and implementation plan: consultants (if any), procedures for tendering and awarding contracts, supervision, and work schedule and implementation timetable;
- Detailed cost estimate, itemising site and plant expenditure, provision for physical and price contingencies, interest during construction, initial and start-up expenses;
- Operation: raw materials and products, flowcharts, consumption and output levels, managerial staff and workers, management organisation, technical assistance where applicable.
- Financial data of the project:
  - Breakdown of project operating and maintenance costs, depreciation and overheads;
  - Financing plan for the project and schedule of projected expenditure;
  - Projected cashflows, profit and loss accounts, and balance sheets, until the project is expected to break-even;
  - Estimate of project working capital requirements over time;
  - Calculation of the project's Internal Rate of Return;
  - Security and guarantees offered.

#### *2c) European Energy Efficiency Fund (EEE-F)*

- Deutsche Bank, as the Fund Manager of EEE-F, conducts the initial screening of the project to check its eligibility against the investment guidelines and the overall portfolio fit. For this, a project proposal, including a detailed budget, is required.
- In case of a positive outcome of this first stage, detailed due diligence of the project will be done by DB. For this, further project information is needed, such as:
  - The financial model;
  - A comprehensive project description with technical details.
- Project evaluation by DB. This will first focus on the portfolio fit with respect to applicable risk ratios and risk-return considerations and on environmental and social objectives, and legal, financial and technical specifications.
  - If necessary, the Investment Manager will support the potential beneficiary to identify more feasible financing structures.
- The Investment Manager will prepare an Investment Proposal and the project will be presented to the Investment Committee and Management Board, where it needs to be approved.
- Upon approval, the Investment Manager will ensure that the projects comply with the terms and conditions agreed upon prior to the investment, including regular reviews of financial, social and environmental performance.

The third step is to look into the possibility of using an ESCO for the financing of the project using Energy Performance Contracting. In the last phase of this project, autonomous biomass boilers will be installed in households that are not connected to the grid. It is expected that financing these boilers will be difficult, as these are a relatively large investment for households. An ESCO could cover these upfront investments and guarantee performance. The easiest option to realise this would be to ask the suppliers of the REI to provide a performance guarantee on their product and/or prefinance the installation. An alternative could be to approach one or more trusted ESCOs in the region to find out whether they would be willing to provide such REIs on an EPC basis to customers.

## **4 Public Funding Strategy Castilla y León Project**

### **4.1 Project**

#### **4.1.1 Description**

In the region of Castilla and León, Spain, there was found that adoption of thermal renewable energy technologies in households and business is negatively affected by the consumers' perception of the reliability of technologies in general, particularly considering installers. In order to reach the region's renewable energy targets for households, the level of trust between consumers and installers needs to be improved.

This project comprises the creation of a "Consumer defender, consultant and informer" service for Thermal Renewable Energies Installations (TREIs) owners and potential owners, implemented through an online platform.

The proposed development of these three services is based on the fact that, currently, there are a relevant number of poorly designed, installed or maintained renewable energy installations. Moreover, there is no trustworthy point of contact for TREIs' potential owners or, once the equipment has been installed, for those consumers that face problems with the installation.

As renewable energy is a growing market, it attracts new and sometimes inexperienced companies or professionals without sufficient training and knowledge. Moreover, there seems to be a tendency of professional associations to cover or underestimate bad practices in TREIs rather than correcting them. Lastly, there is a lack of quality assurance of TREIs – such as labels - to guarantee quality and performance. There is an exception in case of biofuels. In the region, the biomass association (Avebiom) has created a quality label.

All this creates an investment barrier for potential consumers that this project aims to overcome.

#### ***Project objectives and activities***

The aim of the project is to increase the market share of TREIs by providing assurance and relevant information to potential consumers, both households and SMEs. In addition, this project aims to increase competitiveness in the market for installers and suppliers of TREIs by involving them in improving customer satisfaction.

As a way to build trust among potential consumers, this project creates three initiatives that will be implemented through an online platform:

- A service of "consumer defender" that offers an arbitration system for the issues that can appear in the installation, operation, maintenance and management (private property, ESCOs, etc.) of TREIs. This could also include financial instruments (grants, EPCs, guarantees, etc.) and legal (technical, taxes, environmental, etc.) procedures.
  - This service will be a collaboration between the regional administration and all the professional associations, installers, ESCOs, financial institutions and equipment companies that desire to participate. Moreover, independent experts will be involved in the providing of recommendations and advising on issues presented by TREI owners. This advice will be captured in an online FAQ report, with the goal to help others with similar issues.
  - The coordination of this service, with the formal procedures established, is likely done by regional and local consumption authorities.
- A service of "consumer consultant" that offers potential TREI owners an integrated advice that will consist of a comparison of thermal renewable energy technologies. A

final advice will be given, based on the potential owner's characteristics and preferences. The advice will consist of the TREI's economic, technical, financial and environmental aspects and over the installation's lifetime.

- Moreover, independent experts will be involved in the providing of recommendations and advising on issues presented by TREI owners. This advice will be captured in an online FAQ report, with the goal to help others with similar issues.
- A service of "consumer informer" that through the concept of Frequently Asked Questions FAQ's, offers a practical and independent information service. These FAQ's will complement the user experiences and provides practical information about installers, equipments, financial products, etc.

### **Expected impact**

The expected impact of the project is to directly contribute to the energy transition in the region Castilla y León. More specifically, expected impacts are to:

- Generate credibility and avoid disappointment among potential and actual TREIs owners;
- Involve associations and companies in increasing transparency and better performance and implementation of TREIs (through better service of installers);
- Generate a greater demand for new installations.

### **Organisation**

This project is initiated by Ente Regional De La Energía (EREN), the regional energy agency that belongs to Junta de Castilla y León, which is the governing and administrative body of the Spanish autonomous community of Castilla y León.

The platform is developed based on the abovementioned agreement and is foreseen to be managed by both public and private bodies involved. In any case, if within a period of four years a significant quantitative and/or qualitative involvement of the companies is not achieved, then this initiative will probably be ended.

### **Planning**

The proposed project is one of the more than 70 initiatives that are part of the Castilla y León Renewable Thermal Strategy. This project is planned to be approved in 2019 and will be fully operational until 2030.

In first and second years the activities mainly consist of:

- Web development (first FAQs list included), publicity and communication;
- Start with the awareness process for associations, companies and professionals;
- Development of the first version of the complaint procedure for one technology.

The expected intensity of the activity to be done by this initiative will not be the same throughout the project period. Thus, the initiative will take a number of years to reach its full "standard" level. From this level, it is expected that the need for arbitration, integral advising and new information will be lower. A breakdown of activities over the project period is shown in Table 8.

**Table 8. Breakdown of activities and focus areas over the project duration of the Castilla y León project.**

Technologies	2020 - 21	2022 - 23	2024 - 25	2026 - 27	2028 - 30
Solar					
Biomass					
Biofuel consumption					
Geo/aerothermal					

Standard activity levels: 25% ; 50% ; 75% ; 100%

## 4.1.2 Budget

### Project costs

The total budget for the period 2020-2030 is around EUR 1.2 million. In table 9 an overview is shown.

**Table 9. Budget overview for the Castilla y León project.**

Technologies		Budget
Solar	Solar thermal (80%)	EUR 315 000
	Solar photovoltaic (20%)	
Biomass	Pellets (70%)	EUR 315 000
	Chips, logs, etc. (30%)	
Biofuel consumption	Pellets (70%)	EUR 288 000
	Chips, logs, etc. (30%)	
Geo/aerothermal	Geothermal (50%)	EUR 288 000
	Aerothermal (50%)	
<b>Total</b>		<b>EUR 1 206 000</b>

This budget allocation is made for the activities to run and maintain the platform:

- Technical design and web maintenance (10% of annual budget);
- FAQs maintenance and creation of new web contents (20% of annual budget). This includes advices for the user, installers and supplier's information, descriptions of technologies, technical, regulatory and/or legal aspects, complaints related with technologies and/or companies, etc.;
- Management of received complains and integral advising requirements (70% of annual budget). It is expected to manage an average of 70 claims/requirements per year and technology.

Moreover, it has been budgeted that the "standard activity level" of this initiative per technology would be EUR 36 000 per year.

### Funding needs

Funding for this project is partly covered by the Regional Government of Castilla y León, (as part of a Regional strategy). However, financial sustainability on the long run requires funding from other stakeholders as well. Specifically, the costs for independent experts used in the arbitration/integrated advice services can potentially be financed by associations, users and EREN.



The exact funding needs have not been quantified yet, but funding is proposed to be distributed as follows:

- Regional authority: 40%;
- Installers, manufacturers, etc.: 40%;
- Others (Users, National Administration, Municipalities, EU, etc.) 20%.

### **4.1.3 Public funding priorities**

#### ***Energy/CO<sub>2</sub> savings***

Households and SMEs are important stakeholders in the transition to a more renewable energy system. However, currently, it seems that there are barriers for the adoption of renewable energy installations. One of these barriers is public trust in the companies that install renewable energy systems. If this barrier is overcome, it is expected that more TREIs will be installed and that this results in a higher share of renewable energy and reduction of CO<sub>2</sub> emissions in the region of Castilla y León. This would contribute to the regions, national and EU renewable energy targets.

#### ***Innovation***

The activities proposed in this project focus on the development of tools for potential TREIs owners based on two needs, namely the need for:

- friendly, tangible, exhaustive and specific information on TREIs (integral advising / FAQs) and;
- assurance on the installation's quality and performance, by providing specific advice on any related issue that a TREI owner might encounter.

These types of services are novel in this specific market segment and could potentially have a high impact. Additionally, this platform could potentially be further developed into a one-stop-shop for consumers, where they can find suitable and rated TREIs, as well as installers, and financial instruments such as grants. Moreover, (learnings from) this platform can be shared in other regions and countries where similar barriers for the implementation of TREI occur.






#### ***Labour***

Over time, these services will be able to serve as a matchmaker for potential consumers and companies installing TREIs. It is expected that this arbitration / integral advice system will increase the market for TREIs, as well as the competitiveness of SMEs.

## **4.2 Public funding options**

As the proposed project will have different phases, possible public funding instruments options for the preparation and implementation are taken into account in this section. In table 10, an overview of the different funding options is given.

**Table 10. Overview of different funding options for the Castilla y León project.**

Funding instrument	Type of funding	Winning chances	The suitability of a funding instrument is indicated in three levels. The classification of the levels is as follows:
European Regional Development Fund (ERDF)	Grant		
Horizon 2020 <ul style="list-style-type: none"> <li>LC-SC3-EC-1-2018-2019-2020</li> <li>LC-SC3-EE-2-2018-2019</li> </ul>	Grant		
INTERREG: European Territorial Co-operation (ETC)	Grant		
URBACT III	Grant		
Energy Performance Contracting (EPC)	-		

d in three levels. The classification of the levels is as follows:

 **High;** fits the project well, financing is available in the short term

 **Medium;** fits the project, financing is available

 **Low;** fits the project partially, financing is limited

#### 4.2.1 European Regional Development Fund (ERDF)

The ERDF allocates budget to EU Member States and is one of the main financial instruments of the EU's Cohesion Policy<sup>37</sup>. ERDF's purpose is to contribute to reduce disparities between levels of development of EU regions. The main focus areas are innovation and research, the digital agenda, support for SMEs and the low-carbon economy.

Under ERDF, Spain's Multiregional Operational Programme (OP) 2014-2020 has a budget of more than EUR 14 billion. This programme has the following priorities<sup>38</sup>:

- Support the transition towards a low carbon economy through: energy efficiency in enterprises, houses and public infrastructure; the production, distribution and use of renewable energy; support for multimodal sustainable urban mobility; research and innovation in low carbon technologies (38%);
- Sustainable transport; through investment in railways RTE-T), improvement of regional mobility by supporting interconnections with RTE-T and modal nodes; improvement of interoperability and noise reduction (30%);
- Sustainable and integrated urban development (18%);
- Improve water quality (13%).

Beneficiaries can apply for ERDF funding through the managing authority in their Member State, in the case of Spain this is 'Ministerio de Hacienda y Administraciones Pública - Subdirección General de Administración del FEDER'.<sup>39</sup>

<sup>37</sup> European Commission (2014). An Introduction to EU Cohesion Policy 2014-2020. June 2014.

<sup>38</sup> Multiregional OP for Spain ERDF 2014-2020. [ec.europa.eu/regional\\_policy/en/atlas/programmes/2014-2020/spain](https://ec.europa.eu/regional_policy/en/atlas/programmes/2014-2020/spain)

<sup>39</sup> [www.dgfc.sepg.hacienda.gob.es/sitios/DGFC](http://www.dgfc.sepg.hacienda.gob.es/sitios/DGFC)

### **Relevance for the project**

The proposed project contributes to the OP's priorities to support the transition towards a low carbon economy by increasing the use of thermal renewable energy. Moreover, the project's activities are likely to support or even create a larger market for renewable energy installations, including support for SMEs. Stimulating the regional economy is a key priority for ERDF and it is therefore likely that the proposed activities are eligible to receive funding.

#### **4.2.2 Horizon 2020**

Horizon 2020 is the financial instrument implementing the Innovation Union<sup>13</sup>, an Europe 2020 flagship initiative aimed at securing Europe's global competitiveness. The program offers research institutes, companies and governments the chance to get financing for the development and demonstration of innovations through Research & Innovation Actions (RIA), Innovation Actions (IA) and Coordination and Support Actions (CSA) under three research priorities: Tackling Societal Challenges, Industrial Leadership and Excellent Science.

Under the first research priority, relevant calls for this project are under the theme *Secure, clean and efficient energy*<sup>14</sup>:

- LC-SC3-EC-1-2018-2019-2020: The role of consumers in changing the market through informed decision and collective actions.
- LC-SC3-EE-2-2018-2019: Integrated home renovation services.

For most Horizon 2020 calls, a project consortium needs contain at least three beneficiaries from three different EU Member States or H2020 associated countries. In recent Horizon 2020 Work Programmes, some calls require only one beneficiary from an EU Member State or H2020 associated country. For all project types additional beneficiaries/linked third parties from any country are usually allowed as well depending on the call requirements.

Grants vary roughly between EUR 2 and 20 million per call, depending on the type of project. The funding percentage for RIA is 100 % of eligible costs (unless the call specifies another rate). For IA this percentage is 70 % (100 % for non-profit organisations) of eligible costs (unless the call specifies another rate), and thus co-funding is required. For CSA the funding percentage is 100 %.

### **Relevance for the project**

For this project, two open H2020 calls were found that only partly fit the project's activities.

- The H2020 call LC-SC3-EE-2-2018-2019 partially fits the project's activities as they are currently defined. This call focuses on the creation or replication of innovative local or regional "integrated home renovation services" that cover the "whole customer journey". This includes monitoring of works and quality assurance of renewable energy installations, as the proposed project aims to do. Moreover, projects funded under this topic should "improve trust and awareness of homeowners towards such services", which is the key objective of this project too. There are two critical notes to be placed, that require attention in case the project promoter considers to apply under this call:
  - First, this call also asks for technical and social diagnosis, technical offer, contracting of works, structuring and provision of finance (e.g. loans or EPCs) etc. - e.g. the whole 'customer journey'. The project promoter indicated that this could potentially be met through close coordination between the "consumer defender" and "consumer consultant" services of this initiative. In order for this project to be eligible for H2020 funding under this call, it should thus focus on building a more integrated platform than currently foreseen, with different services for consumers,

from the information, decision, financing, installation and monitoring phase of TREI.

- Second, the call aims at "integrated home renovation services". Although not explicitly stated in the call text, the EC probably expects more integral home renovation measures than merely replacing Thermal Renewable Energies Installations (TREIs)

The budget per project under this call is EUR 0.5-1.5 million. An exceptional feature of this call, as compared to other H2020 calls, is the possibility to apply as single applicant.

- Another call that addresses the projects thematics is the H2020 topic LC-SC3-EC-1-2018-2019-2020, as in 2019 this call focuses on consumer awareness and collective action to reduce energy consumption, e.g. by replacing inefficient appliances. The budget per project under this call is EUR 1-2 million. Unfortunately the 2018 call provided the best fit, as it focused on 'activities informing and motivating consumers to change old and inefficient appliances with the highest energy saving potential (e.g. boilers, local space heaters, air heaters) to more efficient and clean energy heating and/or cooling solutions.' The upcoming call of 2019 has a strong focus on energy communities and collective action. As the proposed project focuses on information provision and market creation for TREI instead of collective solutions, this project does not really match the 2019 call very well.

A general Horizon2020 requirement, which also holds for these calls, is that proposed projects always have to demonstrate that they go beyond state-of-the-art at EU level.

#### **4.2.3 INTERREG: European Territorial Co-operation (ETC)**

INTERREG aims to strengthen Europe and reduce economic disparities between regions and Member States by stimulating cooperation projects. In 79 programmes, countries and regions work together in different ways on challenges on innovation, research, sustainable energy, climate adaptation and transport. There are three main programmes within INTERREG, focusing respectively on cross-border, transnational and interregional cooperation in the EU.

The region of Castilla y León is part of the cross-border program (INTERREG A): España-Portugal, as well as one transnational cooperation program (INTERREG B): South West Europe. These programmes support a wide range of project investments related to for instance innovation, environment, accessibility and urban development. Moreover, INTERREG C operates at pan-European level, covering all EU Member States, and builds networks to develop good practice and facilitate the exchange and transfer of knowledge and experience by successful regions.

Beneficiaries for INTERREG B & C are public authorities on local, regional and national levels, managing authorities and intermediate bodies in charge of the 'Investment for Growth and Jobs' or 'European Territorial Cooperation' programmes and agencies, research institutes, thematic and non-profit organisations in collaboration with local policy makers.

INTERREG programmes will co-finance up to 85% of project activities and private non-profit bodies at a rate of 75%. Depending on the number of partners involved, the average total budget of a project is expected to be EUR 1-2 million. Different conditions apply for INTERREG B, covering larger areas of co-operation such as Mediterranean regions.

#### ***Relevance for the project***

One of INTERREG's focus areas is sustainable energy, however, the programme focuses mainly on investments for the development of energy projects and knowledge sharing between European regions. As this project aims to collaborate and share knowledge and experiences

about the platform, but does not incorporate investments into renewable energy installations but rather focuses on informing consumers and market creation, it seems that the project is not eligible for funding under INTERREG.

#### **4.2.4 URBACT III**

URBACT III provides a framework of networks between local and regional bodies facing similar urban challenges and is organised around four main objectives<sup>23</sup>:

1. Capacity for Policy Delivery: to improve the capacity of cities to manage sustainable urban policies and practices in an integrated and participative way.
2. Policy Design: to improve the design of sustainable urban policies and practices in cities.
3. Policy Implementation: to improve the implementation of integrated and sustainable urban strategies and actions in cities.
4. Building and Sharing Knowledge: to ensure that practitioners and decision-makers at all levels have access to knowledge and share know-how on all aspects of sustainable urban development in order to improve urban development policies.

To reach these objectives, URBACT III develops three types of interventions, namely transnational exchanges, capacity-building and capitalisation & dissemination. URBACT is largely a support and networking organisation, and funds limited number of projects. The URBACT III programme co-finances recipients in the form of subsidy to implement programme activities such as capacity building for urban stakeholders, expertise at project and programme level and National URBACT points.

The beneficiaries are (semi) public bodies, such as cities, municipalities, metropolitan authorities, universities and research centres, and similar organisations from EU-28 Member States. The standard network budget is EUR 600 000 - 750 000 for the activity to share good practice within the Transfer network. As Castilla y León is categorized as a more developed region, projects under URBACT III receive up to 70% of ERDF contribution.

#### ***Relevance for the project***

URBACT III supports urban sustainable policies and practices in general, and focuses hereby on knowledge and capacity building. It mainly focuses on building networks for knowledge sharing, which could be beneficial for the proposed project but only covers a small part of its activities. In addition, as part of the development of the online platform, capacity building among stakeholders needs to be done. For this, the project might be eligible for URBACT III funding.

#### **4.2.5 Energy Performance Contracting (EPC)**

Energy Performance Contracting (EPC) is an innovative form of financing energy efficiency measures that is increasingly important in the world of energy financing. EPC shifts the costs and part of the benefits of energy efficiency investments to an external contractor. This external contractor is called an Energy Service Company, or ESCO. The ESCO takes care of the energy efficiency investments, guarantees a decreased energy bill and may even finance the investments upfront. A pre negotiated percentage of the savings on the energy bill shall go to the ESCO for a fixed contract period to cover the investment and potential ESCO profit. Until then, the savings for the client will be modest, but after the contract period the client will profit from a significantly lower energy bill.

The energy performance risk, and sometimes also the financial investment lie with the ESCO. Another advantage of this model is that the proposed energy savings are likely to be achieved,

due to the ESCOs expertise and financial interest. Finally, there is no need for the client to monitor the results; the nature of an energy performance contract is such that the ESCO has all the incentives to deliver the agreed savings.

### **Relevance for the project**

Energy Performance Contracting is not relevant for the project as it is defined now, as it does not include finance solutions as a service on the platform. Nevertheless, it might be interesting in a later stage of the platform, when it also serves as matchmaker between consumers and installers, to also include this. An ESCO can be included as a finance provider for consumers that cannot afford the investment in TREI. In this way, more consumers are enabled to obtain a TREI. Moreover, the project's main objective is to increase trust in these technologies. A performance guarantee, which is the basis of EPC, is a highly effective instrument to increase trust in a technology.

## **4.3 Recommended EU funding strategy**

The activities proposed in this project focus on the development of a "Consumer defender, consultant and informer" service for Thermal Renewable Energy Installations (TREIs) owners, implemented through an online platform. Once this platform is established, it will be able to serve as a matchmaker for potential consumers and all potential suppliers (manufacturers, installers and maintainers, financial institutions, etc.) related with TREIs. It is expected that the three services proposed will increase the market for TREIs, as well as the competitiveness of suppliers (especially in case of SMEs). The main goal of this platform is therefore to increase the share of renewable energy, mainly among households and SMEs, as well as TREI owner' satisfaction, in the region of Castilla y León.

In table 10, an overview of the public funding options for this project is shown. Although the project design seems fit for its purpose, there are limited options for EU public funding. There are a few reasons for this:

- The proposed platform is not (from a technical or organisational perspective) state-of-the-art at EU level. Even though some of its functionalities are quite novel, such as the FAQ section by an independent expert, this does not seem to be in line with any of the current priorities of EU public funding programmes and calls.
- The proposed platform does not offer integrated services to overcome all barriers for TREI implementation in households, however it tackles some of the main problems in this specific regional context. These barriers are:
  - The lack of reliable and specific information (technical, commercial, legal, financial, consumer`s rights, alternative technologies, etc.);
  - The lack of trust in installers;
  - Lack of financing.

This initiative aims to contribute to overcome two of these barriers, but will not include activities on financing TREIs. Including this service would increase EU funding opportunities.

- The proposed project focuses on a small scale (regional) and the duration of the project is relatively long (12 years), which makes the budget rather small and makes it difficult to find funding for the entire project period as EU public funding programmes are based on a policy framework of 7 years.

Hence, as the project is designed now, it seems to have a better match and higher winning chances with regional and local funding. As indicated in table 7, there are some EU public funding instruments that might apply to this project, if some adjustments are made.

The European Regional Development Fund (5.2.1) is the first option for funding for the project in Castilla y León as it contributes to the OP's priorities of supporting the transition towards a low carbon economy and to support local SMEs. Depending on other projects funded, the proposed activities might be eligible to receive funding under ERDF.

As the project focuses on knowledge provision and aims to share knowledge and best practices with others, INTERREG European Territorial Co-operation (5.2.3) and URBACT III (5.2.5) might be interesting programmes. Both provide grants for building networks for knowledge sharing, which could be beneficial for the proposed project but only covers a small part of its activities and focuses more on the dissemination of results, rather than the proposed activities in the platform.

Considering Horizon 2020 (5.2.2), the most relevant calls for this project focus on "integrated home renovation services" and on "setting up and/or supporting energy communities to increase energy efficiency and/or optimise energy management to integrate a higher share of renewable energy". Both calls do not provide a full fit to the project as it is designed, however, the first does include monitoring of works and quality assurance of renewable energy installations. Projects under this call do need to provide the entire 'customer journey' and focus on integral home renovation, which would require the project promoter to increase the project scope. For the project to become eligible for H2020 funding under this call, it should thus focus on building a more integrated platform with different services for consumers, from the information, decision, financing, installation and monitoring phase of TREIs. This could potentially be met through close coordination between the "consumer defender" and "consumer consultant" services of this initiative.

If this platform is further developed into a one-stop-shop for consumers, where consumers can find suitable and rated TREIs, as well as installers, and financial instruments such as grants, [Energy Performance Contracting \(5.2.5\)](#) might be another possibility for funding the project. EPC shifts the costs and part of the benefits of energy efficiency investments to an external contractor (ESCO) that takes care of the investments and guarantees a decreased energy bill. As the proposed investments for households are quite large, EPC seems to be particularly relevant for the installation of thermal renewable energy technologies in households.

### ***Funding advice***

Based on the information available at the moment of writing, the following EU public funding instruments are recommended for the project on creating an online platform that provides confidence to consumers in renewable energy installations in the region of Castilla y León:

- European Regional Development Fund
- Energy Performance Contracting
- Horizon 2020, call LC-SC3-EE-2-2018-2019

The amount of funding and timing of these instruments are shown in table 11 below.



**Table 11. Funding and timing of the recommended instruments for the Castilla y León project.**

Funding instrument	Project phase	Amount of funding	Timing	Other requirements
European Regional Development Fund (ERDF)	Implementation	Depending on the project and Spain's OP	Application possible throughout the 2014-2020 period, contact the Ministerio de Hacienda y Administraciones Públicas - Subdirección General de Administración del FEDER' for more information	Max. funding amount capped at EUR 2 million per project beneficiary (state aid regulation) Beneficiaries should be public authorities or entities acting on behalf of those, such as utility companies.
Energy Performance Contracting	Implementation	-	-	-
Horizon 2020 • LC-SC3-EE-2-2018-2019	Implementation	EUR 0.5-1.5 million	Deadline 3 September 2019 (call open on 12 March 2019)	Cross border collaboration is not required for this call(!)

## 4.4 Next steps

As mentioned before, the project as it is proposed here, seems to have a much better match and higher winning chances with regional and local funding – there are limited options for EU public funding. In the Recommended EU funding strategy, suggestions have been made on how to redesign the project in order to make it fit better in EU funding programmes. In addition, for the project as it is now, three funding opportunities have been identified.

The first opportunity is the European Regional Development Fund (ERDF). This fund is managed on a national and regional level of EU Member States by managing authorities of the Operational Programmes. Because of this, funding priorities, application process and selection criteria differ per region. Moreover, the project does not fit well within the OP's priorities. It is therefore recommended to contact the 'Ministerio de Hacienda y Administraciones Públicas - Subdirección General de Administración del FEDER' before applying to ERDF, in order to get more information about the process and the project criteria.

Another funding opportunity might be to use an ESCO for the financing of the project using Energy Performance Contracting. An ESCO can be included as a finance provider for consumers that cannot afford the investment in TREI. In this way, more consumers are enabled to obtain a TREI. Moreover, the project's main objective is to increase trust in these technologies. A performance guarantee, which is the basis of EPC, is a highly effective instrument to increase trust in a technology. The easiest option to realise this would be to ask the suppliers of the TREI to provide a performance guarantee on their product and/or prefinance the installation. An alternative could be to approach one or more trusted ESCOs in the region to find out whether they would be willing to provide such TREIs on an EPC basis to customers.

When the project is redesigned in order to fit the specific Horizon 2020 call requirements, the following steps should roughly be taken to submit an application:

- a. Determine call requirements and project eligibility
  - Read the general and specific call documents. General documents are listed on the Call Documents page, while topic specific documents are available on each topic's page under "Topic Conditions and Documents".

- The submission system helps to determine general eligibility (related to the number of required partners or the place of establishment of organisations), but based on the call requirements, a more in depth assessment is required. The respective eligibility conditions are referred to on the topic page (see also the Work Programme, Annex D "Type of Action - Specific provisions and funding rates" or the Work Programme for ERC calls).
- Check the standard administrative forms and templates to get a better understanding of the call requirements.
- b. Find project partners (if applicable)
  - Most calls require the participation of several participants in the proposal. Partner search is facilitated by National Contact Points or by the partner search web page.
- c. Write your application
  - Planning of the work (work packages, deliverables, milestones)
  - Read the requirements for the technical annex, in which the proposed work has to be described in detail. Make sure to also considering the evaluation criteria of the call/topic. For most types of action the technical annex must give a detailed description of the project idea and the work plan, which:
    - divides the planned work into work packages;
    - assigns the related responsibilities and resources within the consortium;
    - sets out a project time schedule, main milestones and deliverables;
    - describes the project management structure;
    - describes the dissemination and exploitation plan and communication activities.
  - Draft a budget
    - Check the required budget table included in the administrative forms of the proposal, which is specific for the given type of action. The budget table categories may vary per type of action.
  - Additional annexes or supporting documents may be required, e.g. consortium description, supporting documents for ethics issues.

## **5 Public Funding Strategy North East Romania Project**

### **5.1 Project**

#### **5.1.1 Description**

##### ***Project activities***

The project aims to recover heat from waste water. The research is focused on developing an energy-efficient heat pipe/heat pipe heat exchanger which can recover a significant amount of heat from the residual energy of used water from buildings.

The structure of the project is based on the following activities:

- Fundamental research of the equipment and the materials used;
- Case study. In-situ analysis of the system;
- Implementation. Results, conclusions and implementation instructions.

Key elements and milestones of the project:

- Experimental analysis of the heat pipes;
- Experimental analysis of the paraffin RT-20;
- Computer Fluid Dynamics (CFD) simulation of the heat recovery system;
- Building the equipment. Experimental analysis of the heat recovery system. Case study.
- Implementation. Results, conclusions and implementation instructions.

The fundamental research is based on the analysis of the materials used, the components of the system and the feasibility of the solution. After the building of the equipment, a case study will determine the efficiency of the system in different scenarios. An in-situ analysis will show the behaviour of the equipment integrated into the building.

The proposed device has a lot of advantages such as low cost of manufacturing, exploitation, and maintenance, it is easy to install and use, and it reduces the amount of energy demand for the hot water preparation.

The heat pipe heat exchanger has a modular and compact design and it contains two main parts, the evaporator, and the condenser, separated by a separation plate. In the condenser zone, there are three elements: the coil for the secondary agent, the paraffin RT-20 which is encapsulated within the housing, and nine heat pipes. The heat pipes are introduced vertically through the separation plate, and they will recover the heat from the primary agent which flows through the evaporator and transfer it to the upper part in the condenser. The paraffin which fills the condenser will melt and transfer the excess of heat to the secondary agent which flows through the coil inside the condenser.

The prototype will be installed in a building to perform in situ tests and the research needed to develop the manual for the use and the implementation of this equipment as a product of wide use. For this pilot, the Metropolitan Church of Moldova and Bucovina in Iasi was selected. This selection was based on two aspects:

1. a social one related to the location for the implementation of the prototype, the basic idea being to provide the community with a research product. A case study must be supported by the owners, which can provide the location without any restriction. Also they are interested in the equipment, which can offer advantages for the whole community.

2. a legal one, trying to overcome the barriers to ownership of the building during the project implementation and ultimately the right to manufacture and use the equipment.

The hot water demand is not high in churches but the plan is to recover thermal energy from the used water from one of the buildings inside a church complex such as a dining hall for priests and nuns and produce hot water for the church or other buildings inside the complex.

### **Expected impact**

The idea of heat recovery from low-temperature residual sources is a topic of major interest worldwide. The use of a phase change material, paraffin RT-20, for improving the efficiency of our system, and the use of heat pipes which are essentially a means of transferring high rates of heat across small temperature gradients form the innovative character of this heat recovery system.

The solution can also be used in the residential sector, it would be very efficient in a hotel for example where the thermal energy wasted in used water can be significant. It can also be used in the industrial sector where thermal energy could be recovered from the cooling fluids.

### **Organisation**

The project team consists of the following organisations:

- "Gheorghe Asachi" Technical University of Iasi – coordinator of the project (project beneficiary)
- The Construction Guild of Iasi – project partner (The Construction Guild of Iasi will ensure the realization of the case study)
  - Alternative Vector Trust (SME) is the Guild member that will probably realise the project
- Metropolitan Church of Moldova and Bucovina – project partner (the Metropolitan Church of Moldova will provide the location for the case study)

In order to produce the prototype and the necessary adjustments for its implementation in the building chosen for the case study, the Constructors Guild of Iasi was selected. Among the members of the this guild, the viable option at this moment is an SME that proves through the experience gained in the field that it can participate in the project and can ensure a successful completion of the project. This company is Alternative Vector Trust.

### **Planning**

The duration of the project will be 36 months.

The first step of the project is to transpose the idea (principle and technology) and to realize the prototype, as well as testing it in the laboratories of the "Gheorghe Asachi" Technical University of Iasi, to establish the reliability parameters and maximize its efficiency.

In parallel, the consortium will select, together with the representatives of the Metropolitan Church of Moldova and Bucovina, a building with a social function (shelter for various categories of poor population etc.) where, depending on the situation, the design for prototype installation will be realised and it will be put into operation.

#### **5.1.2 Budget**

Total estimated costs are EUR 100 000, as follows:

- Laboratory research: EUR 25 000;
- Building the equipment and in-situ analysis of the system. Case study: EUR 50 000;

- Implementation. Results, conclusions and implementation instructions: EUR 25 000.

### 5.1.3 Public funding priorities

#### Energy/CO<sub>2</sub> savings

The direct impact on energy or CO<sub>2</sub> savings is limited, due to the relatively low energy demand of the church. However, the technique has good replication potential and, upon successful demonstration, could lead to significant savings throughout the EU.

#### Innovation

The use of a phase change material, paraffin RT-20, for improving the efficiency of our system, and the use of heat pipes which are essentially a mean of transferring high rates of heat across small temperature gradients are the innovations to be demonstrated.








#### Other

No other relevant beneficial effects have been identified at this stage.

## 5.2 Public funding options

This chapter presents the EU funds that best match the innovative heat transfer project and discusses the possible match. In table 12, an overview of the different funding options is given.


**Table 12. Overview of different funding options for the North East Romania project.**

Funding instrument	Type of funding	Winning chances	The suitability of a funding instrument is indicated in three levels. The
European Structural & Investment Funds (ESIF)	Grant		
Horizon 2020, e.g. <ul style="list-style-type: none"> <li>• LC-SC3-RES-5-2018</li> <li>• LC-SC3-EE-1-2018-2019-2020</li> <li>• LC-SC3-EE-6-2018-2019-2020</li> </ul>	Grant		
Fast Track to Innovation (FTI)	Grant		
LIFE	Grant		
INTERREG: European Territorial Co-operation (ETC)			
InnovFin SME Guarantee Facility	Loan		
Energy Performance Contracting (EPC)	-		

classification of the levels is as follows:

 **High;** fits the project well, financing is available in the short term

 **Medium;** fits the project, financing is available

 **Low;** fits the project partially, financing is limited

### 5.2.1 European Structural & Investment Funds (ESIF)

#### ***Cohesion Fund (CF)***

The Cohesion Fund (CF)<sup>10</sup> funds transport and environment projects in countries where the gross national income (GNI) per inhabitant is less than 90% of the EU average. The Cohesion Fund supports projects in the following areas:

- Supporting the shift towards a low-carbon economy;
- Promoting climate change adaptation, risk prevention and management;
- Preserving and protecting the environment and promoting resource efficiency;
- Promoting sustainable transport and improving network infrastructures.

#### ***European Regional Development Fund (ERDF)***

The ERDF allocates budget to EU Member States and is one of the main financial instruments of the EU's Cohesion Policy<sup>10</sup>. ERDF's purpose is to contribute to reduce disparities between levels of development of EU regions. The main focus areas are innovation and research, the digital agenda, support for SMEs and the low-carbon economy.

These EU funds are channelled through the national and regional authorities and jointly managed by these authorities and the EC. The Member States draw up Operational programmes to detail how money from the European Structural and Investment Funds will be spent during the programming period.

#### ***Relevance for the project***

For Romania, the Operational Programme includes the priority of "promoting the low-carbon economy through investments in energy efficiency in buildings, public lighting and sustainable multimodal urban mobility." The innovative heat transfer project fits this thematic objective.

Each country and region distributes the funds in accordance with their own political agenda, within the framework set by the EC. Typically, projects funded through ERDF and CF have a regional impact and are larger than the EUR 100 000 that this project is budgeted for. However, strong differences are seen between countries in regions when it comes to dispersing the structural funds.

### 5.2.2 Horizon 2020

Under the first research priority in Horizon 2020, relevant calls for this project are under the theme *Secure, clean and efficient energy*<sup>14</sup>. An example of a relevant call for this project is LC-SC3-RES-5-2018: Increased performance of technologies for local heating and cooling solutions.

For most Horizon 2020 calls, a project consortium needs to contain at least a minimum of three beneficiaries from three different EU Member States or H2020 associated countries. In recent Horizon 2020 Work Programmes, some calls require only one beneficiary from an EU Member State or H2020 associated country. For all project types additional beneficiaries/linked third parties from any country are usually allowed as well depending on the call requirements.

Grants vary roughly between EUR 2 and 20 million per call, depending on the type of project. The funding percentage for RIA is normally 100% of eligible costs. For IA this percentage is 70% (100% for non-profit organisations) of eligible, and thus co-funding is required. For CSAs the funding percentage is 100%.

### **Relevance for the project**

The subject of innovative heat transfer matches several calls from the Horizon 2020 Work Programmes, mostly the WP 10 - Secure, clean and efficient energy. Mostly, heat transfer technologies are only part of the call topic, meaning that they should be part of a broader project, aimed at for instance affordable building renovation. The most relevant call topics for this project are shortly highlighted below, but this overview is non-exhaustive.

LC-SC3-RES-5-2018: Increased performance of technologies for local heating and cooling solutions. Budget indication for this call is EUR 3 to 10 million. The deadline of this call has passed but similar calls are expected to return in the next Work Programme (after 2021).

LC-SC3-EE-1-2018-2019-2020: Decarbonisation of the EU building stock: innovative approaches and affordable solutions changing the market for buildings renovation. Proposals should also consider energy efficient and low carbon solutions to retrofit building-level heating and cooling systems. A project under this call should be much broader than just an innovative heat transfer demonstration, as the word 'also' in the previous sentence already implies. Budget indication for this call is between EUR 3 and 4 million, deadline 03 Sep 2019.

As the technology could also be used in the industry, one topic regarding industrial energy efficiency is also highlighted: topic LC-SC3-EE-6-2018-2019-2020 has been designed to address the cross-cutting priority of SET Plan Action 6: maximising the recovery of industrial excess heat/cold in a cost efficient manner. However, the 2018 call that was technology oriented has already passed. The 2019 call is aimed at streamlining the business models, which may not match as well with the innovative heat transfer project. Budget indication 2018 call is EUR 3 to 4 million, 2019 EUR 1 to 2 million.

Matching the project with these calls will be challenging. The Horizon 2020 programme funds state-of-the-art innovation at a European level. This means that the heat transfer technology to be demonstrated has to be among the most innovative technologies in the EU.

Further, these Horizon 2020 calls require cooperation with several project partners from at least 3 EU Member States.

Then, in accordance with the ambition level, the project needs to be upscaled to a budget in the order of >EUR 1 million, as this is the level of funding expected for a typical Horizon 2020 call topic.

Finally, these call topics provide only a partial match with the innovative heat transfer project. This means that the project has to be expanded/adapted to fully match the scope and expected impact as set out in the call text.

### **5.2.3 6.2.3 Fast Track to Innovation (FTI)**

The Fast Track to Innovation (FTI)<sup>40</sup> is a pilot within the Horizon 2020 programme and provides funding for bottom-up proposals for close-to-market innovation activities in any area of technology or application. This thematic openness – combined with the possibility for all kinds of innovation actors to work together and deliver innovation onto the market and/or into society – is set to nurture trans-disciplinary and cross-sectoral cooperation.

The FTI's aim is to:

- Reduce time from idea to market;
- Stimulate the participation of first-time applicants to EU research and innovation funding;

<sup>40</sup> European Commission (2018). Horizon 2020 – Fast Track to Innovation. Retrieved on 3 September 2018 at [ec.europa.eu/programmes/horizon2020/en/h2020-section/fast-track-innovation-pilot](https://ec.europa.eu/programmes/horizon2020/en/h2020-section/fast-track-innovation-pilot)



- Increase private sector investment in research and innovation.

Being part of the EIC pilot, the programme can help partners to co-create and test breakthrough products, services or business processes that have the potential to revolutionise existing or create entirely new markets. Actions should be 'business-driven' and are intended to give breakthrough innovation ideas the last push before shaking up the market.

### ***Relevance for the project***

In order to be eligible for the FTI, the project should be centered around an innovative SME, with the ambition to put the innovative product on the EU market. This product should be state-of-the-art. The project seems to match these requirements, but for this financing instrument, projects of around EUR 1 to 2 million are expected and EU cooperation is required, so the innovative heat transfer project would need to be upscaled substantially.

## **5.2.4      6.2.4 LIFE**

LIFE is the EU's multiannual programme for Environment and Climate for the period 2014–2020 and is structured around the two sub-programmes LIFE Environment and LIFE Climate Action<sup>41</sup>. The latter is most relevant for this project, as it focuses on projects that reduce greenhouse gas emissions, contribute to supporting efforts leading to increased resilience to climate change and/or promote awareness raising on climate matters.

Projects under LIFE Climate Action could focus on: energy efficiency and renewable policies, enabling legislative frameworks for private sector contribution, inter alia, to restoring public finance, reducing energy dependency, accelerating innovation and creating jobs while reducing emissions.<sup>42</sup> Under LIFE Environment projects implementing integrated and comprehensive policies for sustainable urban planning and design through innovative approaches regarding urban public transport and mobility, sustainable buildings, energy efficiency or urban biodiversity conservation are eligible.<sup>43</sup>

The programme is open to the participation of entities registered in the Member States of the European Union being (1) public bodies, (2) private commercial organisations and (3) private non-commercial organisations (including NGOs). There is no fixed minimum size for project budgets, but projects are typically between EUR 0.5 and 5 million. The maximum percentage that the LIFE programme funds is 60% of total eligible costs.

### ***Relevance for the project***

The LIFE programme mainly supports demonstration and market uptake projects, which would match the development stage of the innovative heat transfer project.

Again, the project ambition level and budget would have to increase to match the expectations of the LIFE programme. There is no fixed minimum size for project budgets. However, large projects (i.e. over EUR 5 million total costs) have been financed several times in the past, whereas small projects (below EUR 500 000) have seldom succeeded due to the limited output and consequently the low added value.

## **5.2.5      INTERREG: European Territorial Co-operation (ETC)**

INTERREG aims to strengthen Europe and reduce economic disparities between regions and Member States by stimulating cooperation projects. In 79 programmes, countries and regions

---

<sup>41</sup> European Commission (2013). Decision No 1386/2013/EU of the European Parliament and of the Council of 20 November 2013 on a General Union Environment Action Programme to 2020 'Living well, within the limits of our planet'. Official Journal of the European Union, L 354/171.

<sup>42</sup> European Commission – LIFE Programme (2018). LIFE Climate Action. Guidelines for Applicants 2018.

<sup>43</sup> European Commission – LIFE Programme (2018) LIFE Environment and Resource Efficiency. Guidelines for Applicants 2018.

work together in different ways on challenges on innovation, research, sustainable energy, climate adaptation and transport. There are three main programmes within INTERREG, focusing respectively on cross-border, transnational and interregional cooperation in the EU.

For the period 2014-2020, Romania participates in the following ETC Programmes:

- INTERREG V-A Romania Bulgaria Programme
- INTERREG V-A Romania Hungary Programme
- Joint Operational Programme Romania – Ukraine
- Joint Operational Programme Romania – Republic of Moldova
- IPA Cross-border Cooperation Programme Romania - Serbia
- Joint Operational Programme Black Sea Basin
- Danube Programme
- Hungary – Slovakia – Romania – Ukraine Programme
- URBACT III Programme
- ESPON 2020 Programme
- INTERREG EUROPE Programme
- INTERACT III Programme

Of these INTERREG programmes, few are relevant for the subject and location of this project. The regional programmes mostly focus on other priorities, or cover other regions in Romania.

### ***Relevance for the project***

INTERREG Europe does cover Romania and the low carbon economy is one of its four priority themes.

As it happens, the municipality of Iasi is already involved in an INTERREG Europe project that will address the challenge of how best to meet EU energy efficiency targets for buildings in Europe's regions (CLEAN).

Similar to the Horizon 2020 programme however, applying for the INTERREG programme would require the project to scale up in terms of ambition and scope and it would require cross-border cooperation.

Since INTERREG has less specific calls than Horizon 2020, this option would leave more room to shape the project according to one's own best judgement.

### **5.2.6 InnovFin SME Guarantee Facility**

InnovFin provides financial support for research and innovation projects for different types of organisations. The programme covers a wide range of financial instruments; loans, guarantees and equity-type funding. InnovFin is available in all EU Member States and Associated Countries under the H2020 Programme and financing is either provided directly or via an intermediary. For SMEs, the most relevant instruments are the InnovFin SME Guarantee and Equity.

InnovFin SME Guarantee Facility provides finance to SMEs and small mid-caps (<500 employees) that are active in the value chain of research & innovation investments, in sectors covered by Horizon 2020 (this includes clean energy). This finance is channelled through financial intermediaries and consists of guarantees and counter-guarantees on debt financing between EUR 25 000 and EUR 7.5 million.

## **Relevance for the project**

The InnovFin SME Guarantee facility aims at funding innovative SMEs. This would require this project to focus on the SME to become eligible for the funding. The funding would consist of a loan with favourable conditions, made possible by the Guarantee Facility. In Romania, such loans are provided by the following intermediaries:

- ProCredit Bank Romania S.A.
- UniCredit Bank S.A.
- UniCredit Leasing Corporation IFN S.A.

The project could thus be technically eligible for this funding instrument, provided that the required innovation will be done by the SME and that the funding threshold of EUR 25 000 will be reached.

This instrument could be interesting if it would prove impossible to attract commercial financing. Otherwise, the financial advantage (e.g. lower interest rates on the loan) would probably not justify the required effort of framing the project as an SME innovation project and preparing an application.

## **5.3 Recommended EU funding strategy**

Table 12 provides an overview of matching EU funding sources, with an indication of the winning chances in the last column.

The innovative heat recovery system is interesting for public funding from a thematic perspective. A system that would be able to recover waste heat in the residential sector and in the industry could play an important role in the energy transition.

Given the limited size and scope of the project, we would recommend applying for local, regional or national subsidies. As a general rule of thumb, chances of obtaining public funding decrease with distance. Meaning that local, regional and national subsidies have typically much higher winning chances than EU programmes. Any public funding strategy should therefore start as close to home as possible. In this case, this is particularly recommended giving the limited size and scope of the project.

In case the attempts to find funding close to home have not been successful, EU funding comes in the picture. As explained above, this will be challenging for this project, but not impossible.

Funding programmes that are managed by the EU aim at larger projects and typically require cross-border cooperation. The European Structural & Investment Funds (ESIF) (6.2.1) are the exception as they are managed jointly by the EU and national authorities and likely offer the best alternative of any EU funding source for this project.

However, the vast majority of EU funding instruments are aimed at projects with a larger ambition level in terms of scope, impact and corresponding budget. EU projects typically have a budget of EUR 1 million or larger, whereas the budget for this project is EUR 100 000.

To become eligible for EU funding, the innovative heat recovery project should be upscaled. For most EU funding programmes, this would also require cross-border cooperation.

One way to upscale the project could be to also develop innovative heat recovery pilots outside Romania. These pilots could for instance demonstrate other heat recovery techniques or similar techniques with other phase change materials. Results could be compared to draw conclusions with respect to technical and economic efficiency and practical implementation. Alternatively, the same technique could be demonstrated in more than one setting: e.g.

residential buildings, commercial buildings and/or industry. This would significantly increase replication potential, a key objective of any funding programme.

Running for instance three pilots in several Member States would require additional analysis, additional management efforts and the project would need a strategy to disseminate and exploit the results. Such a project would have a higher ambition level, scope and consequently a budget that would be substantially larger.

### ***Build the project around an innovative SME***

If the project would be centered around an innovative SME, then dedicated SME grants such as Eurostars<sup>44</sup> or the Horizon 2020 SME instrument could become relevant. This would still require the higher ambition level as explained earlier. Currently, the innovation appears to come from the University, whereas the SME has merely an operational role.

As explained above, the project is already rather small for a single EU grant, let alone multiple funding sources. If the project would be upscaled, it would be an option to apply for one funding source to cover the R&D activities of the SME involved (e.g. Eurostars). Another funding source could then cover the actual investment (e.g. ESIF).

Alternatively, a loan from the InnovFin SME Guarantee Facility could be used as co-financing for grants like LIFE or INTERREG that cover only part of the project costs.

### ***Funding advice***

Based on the information available at the moment of writing, the following EU public funding instruments are recommended for the project on creating an online platform that provides confidence to consumers in renewable energy installations in the region of North East Macedonia:

- European Regional Development Fund

The amount of funding and timing of this instrument is shown in table 13 below.

**Table 13. Funding and timing of the recommended instruments for the North East Romania project.**

<b>Funding instrument</b>	<b>Project phase</b>	<b>Amount of funding</b>	<b>Timing</b>	<b>Other requirements</b>
European Regional Development Fund (ERDF)	Implementation	Depending on the project and Romania's Operational Programme	Application possible throughout the 2014-2020 period, calls differ per region	Max. funding amount capped at EUR 2 million per project beneficiary (state aid regulation)

## **5.4 Next steps**

The Recommended EU funding strategy has been discussed with the project initiator. The project initiator understands the limitations that the budget/scale of their project represents in terms of EU funding opportunities. The suggestions to reshape/upscale the project in order to become eligible for some of the EU funds were discussed internally at the project initiator, but for good reasons they agreed among them to keep the project as it is. This effectively rules out many of the EU funding opportunities.

<sup>44</sup> For more info see <https://www.eurostars-eureka.eu/>

The option of applying for structural funds was also discussed, but even though the structural funds appear to be the best funding match on paper, the project initiator did not have very positive experiences with the structural funds in their region (in particular with respect to long evaluation times).

## 6 Conclusion

This report aims to identify relevant EU funding sources for four projects in the heating and cooling sector, located in three different Member States.

A few key characteristics mainly determine the chance of success for EU funding:

- Match with policy priorities;
- Replicability;
- EU cross-border cooperation;
- Innovativeness;
- Project size and impact.

For this study, we examined these aspects for each project. The findings will be summarised shortly below.

All four projects under study match the policy priority of energy efficiency and show a sufficient degree of replicability.

Cross border cooperation is currently not foreseen for any of the projects, even though some are open to this option. This would significantly improve funding opportunities since for many EU subsidies this is a requirement.

The centrally managed EU funds are established to support the EU's innovation strategy. Any project application should therefore demonstrate state-of-the-art innovation to be eligible. Mostly this concerns technological innovation like the technologies proposed for the projects in Andalucía and Romania. Increasingly, also process and organisational innovation, as in the Castilla y Leon project, becomes eligible although opportunities at the moment remain limited.

Large investments are funded mainly through the EU Structural and Investment Funds (ESIF). These are mainly relevant for the projects in Andalucía and Western Macedonia, which contain substantial investments. For innovation funding these projects might have to define sub-projects to match the funding level of many EU programmes, whereas the Romanian project would need to upscale significantly to become eligible for either the structural funds or the innovation funding.

As a general rule of thumb, chances of obtaining public funding decrease with distance meaning that local, regional and national subsidies have typically higher winning chances than EU programmes. Any public funding strategy should therefore start as close to home as possible.

Finally, any EU funding strategy preferably already starts in the project design phase. This allows the applicant to maximise the match with EU funds early on and incorporate it in the design of the project. This concerns the key characteristics as listed above, but also programme- or call-specific elements that are identified as priorities by the managing authority of a funding instrument.

The EU public funding strategies that are worked out for the 4 projects demonstrate that an innovation project rarely aligns perfectly with the priorities and conditions of a funding instrument. At the same time, the cases show that with some flexibility and creativity each project can be matched with several financial instruments and exploit the financial, networking and exposure benefits of EU funding.

## 7 References

### Chapter 2

- <sup>1</sup> European Commission (2018). Heating and Cooling. Retrieved on 28 September 2018 at [ec.europa.eu/energy/en/topics/energy-efficiency/heating-and-cooling](http://ec.europa.eu/energy/en/topics/energy-efficiency/heating-and-cooling).
- <sup>2</sup> European Commission (2015). Energy Union Factsheet. MEMO/15/4485. Brussels, 25 February 2015.
- <sup>3</sup> European Union (2018), Directive 2018/2002 of the European Parliament and of the Council of 11 December 2018, amending Directive 2012/27/EU on energy efficiency. Official Journal of the European Union, L328/210, 21.12.2018.
- <sup>4</sup> European Commission (2016). Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. An EU strategy on Heating and Cooling. COM(2016) 51 final, Brussels, 16.2.2016.
- <sup>5</sup> European Union (2018). Directive 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources (recast). Official Journal of the European Union, L328/82, 21.12.2018.
- <sup>6</sup> European Commission, Joint Research Centre (2018) Energy and the Smart Specialisation Platform on Energy (S3PEnergy) via [s3platform.jrc.ec.europa.eu/s3p-energy](http://s3platform.jrc.ec.europa.eu/s3p-energy)
- <sup>7</sup> Van der Veen, R.S., Kooijman, E.D., Identification of EU funding sources for the regional heating and cooling sector, EUR29663 EN, Publications Office of the European Union, Luxembourg, 2019, ISBN 978-92-76-00163-8, doi:10.2760/994541, JRC115765

### Chapter 3

- <sup>8</sup> Portopia (2017). European Port Industry Sustainability Report 2017. Retrieved on 9 January 2019 at [portopia.eu/wp-content/uploads/2017/11/D8.3](http://portopia.eu/wp-content/uploads/2017/11/D8.3)
- <sup>9</sup> Climate Technology Centre and Network (2019). Ocean thermal energy conversion. Retrieved on 24 January 2019 at [ctc-n.org/technologies/ocean-thermal-energy-conversion](http://ctc-n.org/technologies/ocean-thermal-energy-conversion)
- <sup>10</sup> European Commission (2014). An Introduction to EU Cohesion Policy 2014-2020. June 2014.
- <sup>11</sup> European Commission (2014). Multiregional OP for Spain ERDF 2014-2020. [ec.europa.eu/regional\\_policy/en/atlas/programmes/2014-2020/spain](http://ec.europa.eu/regional_policy/en/atlas/programmes/2014-2020/spain)
- <sup>13</sup> European Commission (2018). Innovation Union. Retrieved on 17 October 2018 at [ec.europa.eu/info/research-and-innovation/strategy](http://ec.europa.eu/info/research-and-innovation/strategy)
- <sup>14</sup> European Commission (2018). Horizon 2020 – Work Programme 2018-2020. 10. Secure, clean and efficient energy. Decision C(2018)4708 of 24 July 2018.
- <sup>15</sup> European Investment Bank (2010). Sectoral summary sheet. ELENA – European Local Energy Assistance. QH-80-09-999-EN-C.
- <sup>16</sup> European Commission (2013). Decision No 1386/2013/EU of the European Parliament and of the Council of 20 November 2013 on a General Union Environment Action Programme to 2020 ‘Living well, within the limits of our planet’. Official Journal of the European Union, L 354/171.
- <sup>17</sup> European Commission – LIFE Programme (2018). LIFE Climate Action. Guidelines for Applicants 2018.
- <sup>18</sup> European Commission – LIFE Programme (2018) LIFE Environment and Resource Efficiency. Guidelines for Applicants 2018.
- <sup>19</sup> INTERREG Europe (2018). Interreg Europe Programme Manual. Version 5, 13 April 2018.
- <sup>20</sup> European Commission (2018). Interreg B - Transnational cooperation. Retrieved on 4 September 2018 at [ec.europa.eu/regional\\_policy/nl/policy/cooperation/european-territorial/trans-national/](http://ec.europa.eu/regional_policy/nl/policy/cooperation/european-territorial/trans-national/)
- <sup>21</sup> INTERREG Europe (2018). Interreg Europe Programme Manual. Version 5, 13 April 2018.
- <sup>22</sup> URBACT (2017). The URBACT III Programme. Programme Manual, 8<sup>th</sup> Version. Approved by the Monitoring Committee on 17 November 2017, Mouans-Sartoux, France.
- <sup>23</sup> European Commission (2013). Regulation (EU) No 1316/2013 of the European Parliament and of the Council of 11 December 2013 establishing the Connecting Europe Facility, amending Regulation (EU) No 913/2010 and repealing Regulations (EC) No 680/2007 and (EC) No 67/2010. Official Journal of the European Union, L 348/129.
- <sup>24</sup> European Investment Bank (2018). Supporting Urban Development (JESSICA). Retrieved on 18 October 2018 at [eib.org/en/products/blending/jessica](http://eib.org/en/products/blending/jessica)



<sup>26</sup> European Commission (2015). The European Fund for Strategic Investments (EFSI) – Questions and Answers. 13 January 2015.

<sup>28</sup> European Energy Efficiency Fund (2019). Retrieved on 4 January 2019 at [eeef.eu/eligible-investments](http://eeef.eu/eligible-investments)

#### **Chapter 4**

<sup>29</sup> European Commission (2019). Coal and other solid fuels. Retrieved on 4 January 2019 at [ec.europa.eu/energy/en/topics/oil-gas-and-coal/coal-and-other-solid-fuels](http://ec.europa.eu/energy/en/topics/oil-gas-and-coal/coal-and-other-solid-fuels)

<sup>30</sup> Wuppertal Institute (2018). Phasing-out Coal, Reinventing European Regions: An Analysis of EU Structural Funding in four European Coal Regions.

<sup>31</sup> European Commission (2014). An Introduction to EU Cohesion Policy 2014-2020. June 2014.

<sup>32</sup> Operational Programme Western Macedonia, 2014-2020.  
<https://cohesiondata.ec.europa.eu/programmes/2014GR16M2OP006>

<sup>33</sup> European Commission (2018). Innovation Union. Retrieved on 17 October 2018 at [ec.europa.eu/info/research-and-innovation/strategy](http://ec.europa.eu/info/research-and-innovation/strategy)

<sup>35</sup> European Commission (2018). Research Fund for Coal and Steel Information Package 2018 - Proposal preparation and submission.

<sup>36</sup> [www.pepdym.gr](http://www.pepdym.gr)

<sup>37</sup> European Energy Efficiency Fund (2018). Technical Assistance. Retrieved on 4 January 2019 at [eeef.eu/eeef-ta-facility](http://eeef.eu/eeef-ta-facility)

#### **Chapter 5**

<sup>38</sup> European Commission (2014). An Introduction to EU Cohesion Policy 2014-2020. June 2014.

<sup>39</sup> Multiregional OP for Spain ERDF 2014-2020. Retrieved on 12 February 2019 at [ec.europa.eu/regional\\_policy/en/atlas/programmes/2014-2020/spain](http://ec.europa.eu/regional_policy/en/atlas/programmes/2014-2020/spain)

<sup>40</sup> [www.dgfc.sepg.hacienda.gob.es/sitios/DGFC](http://www.dgfc.sepg.hacienda.gob.es/sitios/DGFC)

#### **Chapter 6**

<sup>41</sup> European Commission (2018). Horizon 2020 – Fast Track to Innovation. Retrieved on 3 September 2018 at [ec.europa.eu/programmes/horizon2020/en/h2020-section/fast-track-innovation-pilot](http://ec.europa.eu/programmes/horizon2020/en/h2020-section/fast-track-innovation-pilot)

## List of Tables

Table 1 Expected energy demand, supply and savings for the proposed energy networks in three ports.....	10
Table 2. Project costs per technology and per port.....	12
Table 3. Overview of different funding options for the Andalucía project. ....	14
Table 4. Funding and timing of the recommended instruments for the Andalucía project.	25
Table 5. Budget for the Western Macedonia project. ....	31
Table 6. Overview of different funding options for the Western Macedonia project. ....	32
Table 7. Funding and timing of the recommended instruments for the Western Macedonia project. ....	41
Table 8. Breakdown of activities and focus areas over the project duration of the Castilla y León project. ....	47
Table 9. Budget overview for the Castilla y León project. ....	47
Table 10. Overview of different funding options for the Castilla y León project. ....	49
Table 11. Funding and timing of the recommended instruments for the Castilla y León project. ....	55
Table 12. Overview of different funding options for the North East Romania project. ....	59
Table 13. Funding and timing of the recommended instruments for the North East Romania project. ....	65

**List of Figures**

Figure 1. Overview of buildings in Sevilla Port energy network. ....11

Figure 2. Overview of buildings in Málaga Port energy network. ....11

Figure 3. Overview of buildings in Motríl Granada Port energy network.....12

## **GETTING IN TOUCH WITH THE EU**

### **In person**

All over the European Union there are hundreds of Europe Direct information centres. You can find the address of the centre nearest you at: <http://europea.eu/contact>

### **On the phone or by email**

Europe Direct is a service that answers your questions about the European Union. You can contact this service:

- by freephone: 00 800 6 7 8 9 10 11 (certain operators may charge for these calls),
- at the following standard number: +32 22999696, or
- by electronic mail via: <http://europa.eu/contact>

## **FINDING INFORMATION ABOUT THE EU**

### **Online**

Information about the European Union in all the official languages of the EU is available on the Europa website at: <http://europa.eu>

### **EU publications**

You can download or order free and priced EU publications from EU Bookshop at: <http://bookshop.europa.eu>. Multiple copies of free publications may be obtained by contacting Europe Direct or your local information centre (see <http://europa.eu/contact>).

## JRC Mission

As the science and knowledge service of the European Commission, the Joint Research Centre's mission is to support EU policies with independent evidence throughout the whole policy cycle.



**EU Science Hub**  
[ec.europa.eu/jrc](https://ec.europa.eu/jrc)



@EU\_ScienceHub



EU Science Hub - Joint Research Centre



Joint Research Centre



EU Science Hub