

Clean energy for EU islands: **e-LAFITI** Elaphiti Islands, Croatia

Clean energy for EU islands

e-Lafiti

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Executive Summary

Elaphiti is a small archipelago consisting of several islands stretching northwest of Dubrovnik, in the Adriatic Sea. Elaphiti applied to the Clean energy for EU islands technical assistance in April 2021 seeking support on the mapping of the local stakeholders together with an overview of the proper funding and financing possibilities for the island's clean energy transition.

The archipelago is still taking the first steps in the energy transition. This report provides guidelines on how to further develop the energy transition on the islands. The main objectives of the Elaphiti technical assistance are:

- Mapping the island's local stakeholders and defining their role on the *Elaphiti energy transition*.
- Overview of the European, national, and local policies and regulations.
- Provide tailored funding and financing possibilities to finance the different actions and measures to be implemented in the scope of the *Elaphiti energy transition*, together with an action plan for the action's appliance.
- Propose *Elaphiti's Energy Transition* governance, i.e., define who, how, when and within what timeframe should perform the different tasks of the *Elaphiti Energy Transition*.

With the support provided in this technical assistance, Elaphiti islands are better prepared and organised to address the challenge of the energy transition. A solid foundation has been boosted by holding meetings with the different institutions and stakeholders and organising a workshop, where the common interest of all actors has been demonstrated.

Introduction

General information

The Elaphiti Islands or the Elaphites (Croatian: Elafitski otoci or Elaphiti) is a small archipelago consisting of several islands stretching northwest of Dubrovnik, in the Adriatic Sea. The Elaphiti archipelago covers a total area of 28 km² and consists of four islands with an area of more than 1 km², a dozen islets with an area of 0.01 to 1 km² and 20 cliffs and reefs with an area below 0.01 km².



Figure 1 - Aerial photography of Elaphiti islands.

The Elaphiti Islands are also mostly hilly. The highest is in the island of Šipan, which rises to a height of 234 m above sea level on Velj vrh. The islands of Lopud and Jakljan and the islet of Olipa rise more than 200 m, while Koločep is slightly lower (125 m above sea level). The largest island of Šipan had an area of 16.2 km². The three only inhabited islands are Šipan with 419 inhabitants, Lopud with 249, and Koločep with 163 inhabitants, in 2011.

The islands are characterised by Mediterranean evergreen vegetation and attract large numbers of tourists during the summer tourist season, mainly due to the island's beaches and beautiful landscapes. Administratively, Elaphiti belongs to the City of Dubrovnik. Due to the indentation and the multitude of islands, the length of the coastline around the local self-government unit is as much as 146 km, of which 55 km refer to the mainland and 91 km to the Elaphiti Islands.

The Elaphiti Islands had poor shipping transport until the end of the 20th century. The ships sailed two- or three-times a week, once a day. Since the independence of Croatia, once the connection between the city and the islands was introduced, there was a revival in the maritime transport of local passengers, tourists, and excursionists. On 18 December 1997, the construction of the ferry port in Suđurđe na Šipanu was completed. Today, the ship sails to Koločep, Lopud and Suđurđa four times a day. Until July 2011, the ship sailed all the way to Šipanska Luka, but then, due to unprofitability and reduced costs, it was decided that the ship would start and end its trip in Suđurđa. There are no cars on Koločep and Lopud, and there are on Šipan due to the 4 km long distance between the two settlements. On 22 October 1998, the Dubrovnik bus company Libertas

introduced the regular bus line Šipanska Luka-Suđurađ. This is a small bus, and the line is used to transport school children.



Figure 2 - Map of Elaphiti Islands Archipelago and ferry crossings (image: https://croatiaspots.com/elafiti/).

Elaphiti Islands are under Dubrovnik administration, which is a city in the south of Croatia, the administrative centre of the Dubrovnik-Neretva County and one of the most important historical and tourist centres in Croatia. According to the 2011 census, Dubrovnik had 42 615 inhabitants and covers an area of 143.35 km². Since 1979, the city of Dubrovnik has been added to the UNESCO World Heritage List. Maritime trade is the base of the historical Dubrovnik city's prosperity. The governing bodies of the City of Dubrovnik are the City Council and the Mayor (councillors and the mayor are elected directly for a four-year term).

The city developed on the east coast of the Adriatic Sea, where several Adriatic islands end, and the open sea begins. It lies on the southern slopes and at the foot of the hill Srđ. The wider Dubrovnik area includes a narrow coastal belt about 250 km long, stretching from Klek in the west to Sutorina and Cape Prevlaka in the east. Dubrovnik has more than 250 sunny days a year. The average annual temperature is 16.6°C, and the summer 26°C. Snow and low temperatures are a real rarity. The coldest month of the year is January, and the warmest is August.

Demography

Despite strong tourism development and general well-being, the area of the city of Dubrovnik is one of the local self-government units in Croatia that is experiencing a decline in population. In the period from 2001 to 2011, Dubrovnik recorded a decline of 6.6%, which is twice as much as the Croatian average.

The three only inhabited islands are Sipan with 419, Lopud with 249 and Kolocep with 163 inhabitants in 2011. A drop in population of more than 5% is recorded in all settlements on the Elaphiti Islands except Suđurađa. The population density is about 30 inhabitants per square kilometre in the Elaphiti Islands.

When it comes to age groups, parts of the area of the city of Dubrovnik, which includes Elaphiti, have a much more unfavourable age structure compared with other Croatian areas. The share of the population under the age of 15 was only 14%, and the share of the population over the age of 64 was 22%.

Dubrovnik energy transition

By 2030, the City of Dubrovnik aims to create the preconditions for the transition of the existing energy system to a new, smarter system with integrated infrastructure and services tailored to all consumers. The city's energy development plans to be a hotbed of innovation and projects, and in 2050 Dubrovnik aims to become a CO_2 -neutral society.

The main objectives of <u>Dubrovnik's sustainable energy action plan</u>¹ are to ensure long-term security of energy supply with maximum use of their own resources, while respecting the strictest criteria for environmental protection, nature, and historical and cultural assets. The action plan considers the expressed demands of citizens for safe, clean, efficient, and affordable energy, especially energy in public and service sector buildings, households, transport sector, public lighting, water supply and sewerage, waste collection and treatment, industry, agriculture, and fisheries.

The energy transition will include the City of Dubrovnik, all city administrative units, public companies, domestic and foreign entrepreneurs, the University of Dubrovnik and visiting researchers, sister cities, citizens, tourists and all friends and admirers of the City of Dubrovnik and all that it represents.

Electricity consumption

Data for the analysis of electricity consumption on Elaphiti were provided by Elektrojug Dubrovnik. Based on this, the 2021 annual electricity consumption per capita was estimated at 4 247 kWh / year. The total electricity consumption in 2021 on Elaphiti was 8.32 GWh / year². The maximum load was 2.5 MVA. There is no local generation on the islands that is connected to grid. All energy is delivered from the mainland by submarine cable, except a couple of separate systems with photovoltaic modules with negligible power.

¹ <u>https://joint-secap.unicam.it/sites/default/files/2021-09/IT-</u>

HR_JOINT%20SECAP_final%20deliverable%284.3%29_Annex%20II%20Part%20B.pdf

² This information was provided by Dubrovnik development agency by inquiring it to the local electricity distribution operator, which made these calculations for 2021.



Figure 3 - Schematic representation of Elaphiti islands electricity connection.

Project objective

Elaphiti islands are now starting their energy transition. The main goal of the Clean energy for EU islands technical assistance is to provide capacity building to facilitate the development of the *Elaphiti Energy Transition*, i.e., assist Elaphiti islands to design the basis for the development of a transition agenda. With the secretariat's support, it is intended that the islands have the appropriate structure to define the island's vision for the medium and long term and to design the suitable measures to decarbonise the Elaphiti islands. The project beneficiaries are the City of Dubrovnik Development Agency (DURA) and Dubrovnik municipality.

Currently, there are already some actions/measures carried out in the islands with the goal to decarbonise the Elaphiti archipelago. For instance, supported by the <u>EU Islands Facility NESOI</u>, DURA is working on a feasibility study for electric boats and their charging infrastructure as a regular transportation system from Dubrovnik to Elaphiti islands. More concretely, the study will evaluate the impacts such as economic, technical, legal, and environmental for different types and sizes of electric boats that could serve the needs of inhabitants and tourists.

With the NESOI project and with this technical assistance, Dubrovnik Development Agency in cooperation with the city of Dubrovnik want to contribute to a coal-free islands by 2050, turning the archipelago into energy self-sufficient islands with a crisis-resistant community.

The support provided has two main tasks: the mapping of the local stakeholders and an overview of the funding and financing possibilities for the future measures. The first step is the **mapping of the local stakeholders**. The Green Cooperative in cooperation with the Dubrovnik Development Agency will inform local stakeholders about potential opportunities for the use of renewable energy sources. Furthermore, the **funding and financing possibilities** will be overviewed together with an action plan for *Elaphiti energy transition* actions appliance.

Identification of local stakeholders for Elaphiti's energy transition and proposal for governance model

Stakeholder mapping and involvement

Stakeholder identification is key to developing an effective strategy. Stakeholders need to be involved in the *Elaphiti Energy Transition* from the very beginning to ensure that stakeholders' views and concerns are included in the island's vision and strategy, and then in the implementation of measures identified within the energy transition.

A cooperation between the Dubrovnik Development Agency and the Clean energy for EU islands secretariat was held to design a roadmap to implement Elaphiti's clean energy transition framework. The very first step is to encourage the involvement of the different stakeholders, with very different profiles, taking into consideration the measures and the strategies already in place. The stakeholders around Elaphiti Islands can be divided in four different groups, based on the quadruple helix (Figure 4), by:

- Civil society organisations representing Elaphiti community:
 - o NGOs.
 - Tourist communities.
 - Local action group.
 - Informal organisations.
 - Natural persons.
 - Family farms.
 - Consumer associations.
 - Cooperatives.
- Public authorities:
 - City of Dubrovnik.
 - o Dubrovnik-Neretva County.
 - Development agencies.
- Schools and universities:
 - o Educational institutions.
 - o Universities, polytechnics, and colleges in the territory of the Republic of Croatia.
- Business sector:
 - o Energy companies.
 - o Entrepreneurs / Croatian Chamber of Commerce / Croatian Employers' Association.
 - City and municipal companies.
 - o Media.
 - o Craftsmen / Croatian Chamber of Trades and Crafts.



Figure 4 - The quadruple helix approach for Elaphiti Energy Transition.

Civil society organisations

Organisations involved:

Local association Kalamota; the Lopud Youth Association – LUNA; the local association of olive oil producers; church representatives; Tourist Board of the City of Dubrovnik; Tourist Board of the Dubrovnik-Neretva County; Dubrovnik Tourist Guides Association.

The role:

Civil society organisations will primarily engage in the transfer of experiences and good practices from other Croatian islands to the Elaphiti Islands. They will also raise awareness of the local population and other stakeholders on the island. One of the set tasks is to coordinate joint activities in the field of energy transition with other Adriatic islands and to provide educational and professional assistance in the implementation of various solutions.

Business sector

Organisations involved:

Mainly companies engaged in tourism: Lafodia Hotel Lopud; TUI BLUE Kalamota Island Kolocep; Hotel Bozica; i Hotel Šipan; Villa Glavović i Villa Vilina. Also travel agencies operating in Dubrovnik islands to present the possible use of electric boats to transport tourists to Elafiti: Vivado, Elite Travel, Dubrovnik Boat Tours, Lea Tours and AdriaticGlobal.

The role:

Businesses strive to implement renewable energy sources if they do not have them or to expand the existing capacity by seeing the benefits of using them. They also expressed their desire to develop their own Energy Transition Strategies. They see how they can valorise a reduced carbon footprint either by directly reducing operating costs or by better and more competitive market positioning.

Public Authorities

Organisations involved:

Local and regional government.

The role:

Local and regional government has positioned itself as an important and active part in the Energy Transition on the island (see section below regarding meetings and consultations). They will participate in the process of energy transition by creating the necessary spatial planning conditions for the construction of the necessary energy facilities. The development agencies, such as DURA, will help the energy transition team with their expertise, and the tourist boards will support and participate in promotional activities towards entities from the tourism sector and tourists.

As mentioned previously, Elaphiti Islands are at a very early stage in the energy transition, so there are still no plans, documents, or measures available. Now, the local government is working on community awareness and the current focus of interest is energy efficiency, transport, renewable sources, energy and cost management, social acceptability, and environmental and climate protection. Some of these topics were discussed during the meetings and consultations (therefore, more details about the role/involvement of local and regional government on these measures is available in the next section).

Nevertheless, the main role of local and regional governments is to mobilise local potential, create opportunities for local people and to become part of the energy transition and actively participate in its implementation. It is desirable to connect the activities of local and regional governments in the social protection of needy citizens (for example in the measures related to energy renovation of buildings) and thus achieve two of the strategic goals at once: social acceptance, and climate protection.

In summary, local and regional governments may act as a promoter of energy efficiency and RES projects, a generator of entrepreneurial ideas and important coordination in their implementation. By creating a cheerful outlook towards the transition of the energy sector, local and regional self-government should be a promoter and educator of the ideas of transition and a mobiliser of change. Cooperation between state institutions and local and regional governments is important, providing all the necessary bases and information, producing credible energy statistics at all levels, as well as the smooth and fast flow of all necessary information.

Schools and universities

Organisations involved:

Kindergartens, primary schools, sports halls.

The role:

Primary and secondary education has the task of transferring knowledge, and the process of energy transition will involve staff and students through educational activities. Also, buildings in which educational programs are carried out (kindergartens, primary schools, sports halls, etc.) are planned to be energetically renovated and use renewable energy sources.

From the very beginning, numerous representatives of stakeholders have been involved in the process of thinking and designing the *Elaphiti Energy Transition* through a process of individual and group consultations.

Meetings and consultations

On March 3rd, 2022, Dubrovnik Development Agency -as the project's leading organisation- in collaboration with the Clean energy for EU islands secretariat -through its regional partner (Island Movement)- organised two meetings to discuss the *Elaphiti Energy Transition* roadmap to all the relevant stakeholders. These meetings, which were conducted in terms of fostering *Elaphiti's Energy Transition*, brought together stakeholders from the city of Dubrovnik interested in participating in these activities. The guiding idea was to strengthen networking capacity, knowledge exchange and identification of key challenges in the application of energy transition of Elaphiti Islands.

More concretely, in the first meeting, the roadmap for *Elaphiti Energy Transition* plan was presented and discussed with all the relevant stakeholders, such as representatives of the island, the Ministry of Defence, Dubrovnik city administration and citizens. In the second meeting, which was held in the City Hall, the feasibility study for the introduction of electric boats on Elaphiti Islands was presented as well as the discussion of alternatives for renewable energy use on permanent households, together with the different possibilities for financing these measures from EU and national sources (primarily from the Environmental Protection and Energy Efficiency Fund – <u>FZOEU</u>).

The first conclusion from the meetings is that the institutions showed a good interest in developing the *Elaphiti Energy Transition* plan, and to contribute to the *Transition Team* to develop a sustainable energy community on Elaphiti Islands. It was also concluded that the switching to renewable energy potential in the island is vast, however there is still a low interest from the citizens. Although this interest is expected to grow due to the potential shortage of gas and the increase in the price of electricity in the coming years, the strategies to overcome this were discussed. Moreover, it was concluded that there is a high interest among accommodation service providers on the islands, especially apartment and hotel owners, who see the transition to renewable sources as an opportunity for savings as well as to secure energy supply.

Finally, it was also concluded that the City of Dubrovnik, which is administratively responsible for the islands, will start mapping the potential and the action plan for savings, so that in the new financial period, it will be possible to apply for funds to support the implementation of the specific measures (energy renovation of buildings, transport, increase of RES, etc.). On this topic, the City of Dubrovnik has several successful examples of installing solar panels on public buildings (schools, kindergartens, city administration), sustainable public lighting and use of water, and therefore has experience applying identical solutions on the islands. The document that will be prepared by the city administration in coordination with the *Transition Team*, will define in detail what, how and where, and will also include financial assistance for private households that would encourage and support the population in switching to renewable energy sources.

It is also relevant to highlight that a series of online meetings were also held with representatives of the Faculty of Shipbuilding and Mechanical Engineering (with expertise in the field of energy efficiency), the city administration, and other stakeholders, to further discuss the technical details of the measures mentioned above.

Stakeholders involved in the meetings were:

- Civil society organisations:
 - o DURA Dubrovnik development agency.
 - o DUNEA The Regional Development Agency Dubrovnik-Neretva County.
 - Local committee MO ŠIPAN.
 - Local committee MO Koločep.
 - Local committee MO Lopud.
 - Local committee MO Suđurađ.
 - Private citizens.
- Public authorities:
 - Dubrovnik-Neretva County Administrative department of economy and maritime affairs.
 - City of Dubrovnik Administrative department for European funds, regional and international cooperation.
 - o City of Dubrovnik Administrative department for tourism, economy, and the Sea.
 - The Port of Dubrovnik Authority
- Business sector:
 - o Croatian Chamber of Commerce Dubrovnik County Chamber.
 - The Institute for restoration of Dubrovnik.
- Schools and universities:
 - Crafts and technical school Dubrovnik.
 - Faculty of Shipbuilding and Mechanical Engineering

Elaphiti Energy Transition governance

To successfully implement the *Elaphiti Energy Transition*, it is necessary to determine who, how, when and within what timeframe should perform certain tasks like development, implementation, and monitoring *Elaphiti Energy Transition*.

In this context, during the meetings and consultations detailed above, the project promoters and relevant stakeholders asked for support to propose an adequate transition governance. The proposed governance is available in the annex of this report. The governance proposed is a starting point for the *Elaphiti Energy Transition* organisation – it can be and should be adapted organically, if necessary.

Policy and regulations

European policy and regulation

Energy is one of numerous combined competences between the European Union (EU) and the Member States. EU policy is currently based on three pillars: competition, sustainability, and security of supply. Through policy and regulation, the EU encourages the interconnection of energy networks and energy efficiency.

To accomplish the EU energy and climate goals for 2030, EU countries developed a 10-year integrated **national energy and climate plan (NECP)** for the 2021 to 2030 timeframe, which was launched under the <u>Regulation on the governance of the energy union and climate action</u> (EU/2018/1999), which decided the expected guidelines to the final NECP be submitted to the Commission. The national plans summarise the intention of the EU countries regarding energy efficiency, renewables, greenhouse gases (GHG) emissions reduction, interconnections, research, and innovation, etc.³.

Under the same regulation, the EU State Members were invited to communicate the long-term greenhouse gas emission development strategies. The long-term strategies should be consistent the Member States' integrated NECP for 2021-2030 period⁴.

In 2019 the EU refitted its energy policy framework to support the citizens to retreat from fossil fuels towards cleaner energy - the <u>Clean energy for all Europeans package</u>. More specifically, aims to deliver on the EU's Paris Agreement obligations for decreasing greenhouse gas emissions.

Considering the EC proposals published in 2016, the package comprises eight new laws (energy performance in buildings, renewable energy, energy efficiency, governance of the energy union, electricity regulation, electricity directive, risk preparedness and European Union agency for the cooperation of energy regulators). After political agreement by the EU Council and the European Parliament (completed in May 2019) and the application of the distinct EU rules, EU countries had one-two years to change the new directives into national law.

In December 2019, the European Commission (EC) presented '<u>The European Green Deal</u>' establishing a new growth strategy aiming to "convert the EU into a fair and prosperous society, with a modern, resource-efficient, and competitive economy, where there are no net emissions of greenhouse gases in 2050 and where economic growth is dissociated from resource usage."

For the clean energy transition, the European Green Deal target on three key principles, which will support decrease greenhouse gas emissions and increase the life quality of EU citizens:

- Ensuring a secure and affordable EU energy supply.
- Developing a fully integrated, interconnected, and digitalised EU energy market.
- Prioritising energy efficiency, improving the energy performance of our buildings and developing a power sector based largely on renewable sources.

The EC's main goal to accomplish this are:

³ <u>https://energy.ec.europa.eu/topics/energy-strategy/national-energy-and-climate-plans-necps_en</u>

⁴ <u>https://ec.europa.eu/info/energy-climate-change-environment/implementation-eu-countries/energy-and-climate-governance-and-reporting/national-long-term-strategies_en</u>

- Build interconnected energy systems and better integrated grids to support renewable energy sources.
- Promote innovative technologies and modern infrastructure.
- Boost energy efficiency and eco-design of products.
- Decarbonise the gas sector and promote smart integration across sectors.
- Empower consumers and help EU countries to tackle energy poverty.
- Promote EU energy standards and technologies at global level.
- Develop the full potential of Europe's offshore wind energy.

In March 2020, the EC published the <u>European Climate Law</u>, which writes the European Green Deal objectives into a law. The law establishes the intermediate goals for decreasing "net greenhouse gas emissions by at least 55% by 2030, compared to 1990 levels". The law also intends to guarantee that whole EU policies contribute to this objective and that all economy and society sectors contribute to the objectives accomplishment. The main objectives are:

- Set the long-term direction of travel for meeting the 2050 climate neutrality objective through all policies, in a socially fair and cost-efficient manner.
- Set a more ambitious EU 2030 target, to set Europe on a responsible path to becoming climate-neutral by 2050.
- Create a system for monitoring progress and take further action if needed.
- Provide predictability for investors and other economic actors.
- Ensure that the transition to climate neutrality is irreversible.

The Climate Law also addresses the necessary steps to get to the 2050 target, which can be consulted <u>here</u>.

More recently, in May 2022, the EC launched the <u>**REPowerEU Plan**</u>, in response to the difficulties and disruptions of the global energy market caused by the Russian invasion of Ukraine. In this context, there is a dual urgency to change the EU's energy system: finishing the EU's dependence on Russian fossil fuels, which are currently treated as an economic and political weapon, and cost European taxpayers around €100 billion a year, but also to face the climate crisis.

The measures within the scope of REPowerEU Plan are on energy savings, diversification of energy supplies, and accelerated roll-out of renewable energy to replace fossil fuels in homes, industry, and power generation. The Recovery and Resilience Facility is the basis of the plan, supporting coordinated national and cross-border infrastructure planning and financing, as well as energy projects and reforms. Therefore, the EC recommends the Member State to perform <u>amendments</u> to the RRF regulation in order to integrate the REPowerEU Plan. More information about the plan is available <u>here</u>.

National policy and regulation

The <u>Croatian NECP</u> builds on the work done on the Low-Carbon Development Strategy of Croatia until 2030 with an outlook to 2050 and the Croatian Energy Development Strategy until 2030 with an outlook to 2050. The draft NECP covers all five dimensions (energy efficiency, renewables, greenhouse gases emissions reduction, interconnections, research, and innovation), and the national objectives and targets are shown in detail in the report.

Regarding the <u>Croatian long-term greenhouse gas emission development strategy</u>, the EC developed a table with the summary of the main finding which can be consulted <u>here</u>. The full report is available in the local language <u>here</u>.

In summary, the national objectives and targets are:

- Energy efficiency:
 - The specified target of cumulative savings until 2030 of 1,289.8 ktoe (54.0 PJ) is calculated with the assumed maximum allowable target reduction of 35%, in accordance with Article 7 (3a), item (b) of Directive 2018/2002.
- Renewables:
 - Target for 2030 in the gross direct consumption of energy is 36.4%.
 - Target for 2030 in the gross direct consumption of electricity is 63.8%.
 - Target for 2030 in the gross direct consumption of energy for heating and cooling is 36.6%.
 - Target for 2030 in the direct consumption of energy in transport is 13.2%.
- GHG emissions:
 - Reduction of 43% in GHG emissions compared to the 2005 level, in the European Emissions Trading System (ETS sector).
 - $\circ~$ Reduction of 7% in GHG emissions compared to the 2005 level, in the non-ETS sector.

Presently, there is no particular support for the development of renewable energy sources on the Croatian islands. Nevertheless, depending on the tender, islands that fits in a certain category can get special points (Islands Act NN 116/18, 73/20, 70/21). Until now, there are no subsidies, special feed in tariffs or premiums, nor are there specific permitting or grid policies in place. However, investment subsidies are available for small scale projects based on Public Calls from Croatian Fund for Environment Protection and Energy Efficiency⁵.

In the following subsections, we include an overview of the legislation and regulation for clean energy projects on Croatian islands. This overview is based on the Clean energy for EU islands secretariat legal and regulatory inventory, which is available <u>here</u>.

RES technologies supported

Croatia supports a large variety of technologies for electricity generation, energy efficiency, heating, cooling, and transport through different schemes. Lending mechanisms to stimulate energy efficiency and renewable energy projects is offered by the <u>Croatian Bank for</u> <u>Reconstruction and Development</u>. Electricity generation from renewable energy sources (e.g., solar and wind power) is supported by a feed-in tariff/premium. The measures on the transport sector are supported through a subsidy scheme for low- or zero-emission vehicles comprising a quota for the use of biofuel.⁵ The different support schemed available can be consulted in the <u>state-of-play</u> <u>inventory of legislation and regulation for clean energy on European islands.</u>

Electricity grid

The electricity grid of Croatia prioritises the delivery of renewable electricity to the grid and provides non-discriminatory connection for renewable energy sources

⁵ <u>https://clean-energy-islands.ec.europa.eu/insights/publications/croatia-regulatory-factsheet</u>

RES projects authorisation process

For renewable energy projects implementation, a variety of permits is necessary, such as from the county and municipality, national level ministries, Croatian Air Traffic Control, the national distribution and transmission system operators and the energy regulator. However, the process is simplified for rooftop PV and net metering.

Supported energy efficiency measures

It is required that the new buildings follow the standards established by the European Directive on the Energy Performance of Buildings, i.e., nZEB (nearly zero energy building) standard. The measures are supported by subsidies of the Energy Efficiency and Environmental Protection Fund and by low-interest loans of the Croatian Bank for Reconstruction and Development (only available for public and private sectors).

Supporting policies

Croatia provides recognised training programmes for installers of renewable energy installations in the housing and buildings sector, namely for electricity, heating, and construction. Public authorities achieve their role through public buildings energy renovation, with the objective of annual renovation rate of 1,0% of surface area of all public buildings, in 2021 and 2022.

Self-consumption and community energy

Currently, the legislative framework does not clearly define the energy sharing (multiple users in and the energy communities. Prosumers are more clearly defined and frequently exist in Croatia, but there is still room for improvement of the regulatory framework and implementation of more supporting measures.

More information about the legislation and regulation for clean energy projects on Croatian islands is available <u>here</u>.

Regional policy and regulations

The main directions of development of the electric power system are in the construction of generation and transmission facilities that use renewable energy such as solar energy. Construction conditions for solar power plants are harmonised with the conditions of nature protection, where it is necessary to emphasise the harmonisation with the established National Ecological Network (CRO-NEN) as part of the Pan-European Ecological Network (PEEN) and NATURA 2000 is the use of solar energy by building solar power plants and other plants to use solar energy.

Given the accelerated development of technologies for the use of solar energy, the <u>spatial plan for</u> <u>Dubrovnik Neretva County</u> does not limit the use of solar energy within the planned spaces. If these new technologies are completely environmentally friendly (assessment of environmental impact is required) and within the planned spaces, the implementation is facilitated.

Suitable funding options for Elaphiti project

This section presents an outline of the different funding mechanisms and schemes currently available in the EU and Croatia and offers guidance on which path to take and where to look with regards to financing energy transitions. The most suitable possibilities are available below, while complementary information is available on the appendix of this report.

Recovery and Resilience Funds

The Covid-19 pandemic revealed several realities about the lack of economic resilience in remote areas. Islands have been exposed to considerable economic consequences. Recovery and resilience funds have been designed to respond to the pandemic negative impacts, by promoting the adoption of clean technologies and renewables, upskilling local labour forces, renovating buildings to increase their energy efficiency, modernising digital tools, and more.

The Recovery and Resilience Facility

The Recovery and Resilience Facility will make €672.5 billion in loans and grants available to support reforms and investments undertaken by Member States. The objective is to reduce the economic and social impact of the covid pandemic and make European economies and societies more sustainable, resilient, and better prepared for the challenges and opportunities of the green and digital transitions. Member States prepared recovery and resilience plans that set out a consistent package of reforms and projects of public investment. To benefit from the support of the Facility, these reforms and investments should be on the ground by 2026. The plans should effectively address challenges identified in the <u>European Semester</u>, particularly the <u>country-specific recommendations</u> adopted by the Council. The Commission strongly encourages Member States to put forward investment and reform plans in the following areas:

- Power up: clean technology and renewables.
- Renovate: energy efficiency of building.
- Recharge and refuel sustainable transport and charging stations.
- Connect: roll-out of rapid broadband services.
- Modernise: digitalisation of public administration.
- Scale-up: data cloud capacities and sustainable processors.
- Reskill and upskill education and training to support digital skills.

The recovery and resilience plan for Croatia has a total budget of HRK6.14 billion (\in 818.4 million) in grants. The Croatian plan allocates 40% of the total budget in measures that support climate objectives. These comprise reforms and investments to stimulate the uptake of renewable energy, energy efficiency and post-earthquake reconstruction of buildings and sustainable mobility. Climate change adaptation actions involve improved management of water resources and flood protection measures. The plan will likewise enhance the Croatian rich biodiversity through the restoration of rivers, floodplains, and lakes. Investment support schemes will support businesses, including SMEs, in their green transition. The most important goals of the plan are related to the implementation of sustainable waste management projects (C1.3. R2), which is a burning problem on all Croatian islands, including the Elaphiti Islands.

The implementation of the establishment of a sustainable and efficient waste management system is based on the new legislative framework that is in the process of adoption. The new Law on Waste Management plans to incorporate new and more ambitious waste management goals into national legislation, which will implement guidelines and plans that contribute to achieving the

goals of the European Green Plan to separate waste generation from economic growth. The priority in the waste management sector is the reduction and reuse of materials. The emphasis is on designing waste-free solutions, keeping products and materials in use, which will enable the restoration of natural systems.

Also, an important goal is the development of sustainable and efficient maritime transport which will increase the safety of navigation, improve transport connectivity of the islands, and improve port infrastructure to reduce the negative impact of the maritime transport sector on the environment. More information about Croatian recovery and resilience plans is available <u>here</u>.

European Structural and Investment Funds (ESIF)

Over half of EU funding is channelled through ESIF. The ESIF are embedded in a normative framework and follow an implementation process resulting from a negotiation between the European Commission and each Member State. The final product is a partnership agreement between EC and Member States, which also involves stakeholders at the local and/or regional levels. One may ask how these funds are relevant for the EU Islands Energy Transition projects; well, ESIF focusses on innovation, sustainability and (regional) economic development. This means that the funds emphasise the importance of promoting the growth of the economy while stimulating eco-friendly innovation and sustainable growth. This includes clean energy initiatives and solutions.

Croatia is receiving a total of €368 million in Cohesion Policy Funds between 2021 – 2027, distributed according:

- €313 million for the European Regional Development Fund (ERDF) and European Social Fund + (ESF+), which is around 80% of the total budget.
- €36 million for Cohesion Fund (CF).
- €19 million under the Just Transition Fund (JTF).

Additionally, Croatia will receive additional funding to help with the recovery of Croatia – an amount of €574 million for the current programmes under REACT-EU.

Fund for Environmental Protection and Energy Efficiency

The Fund for Environmental Protection and Energy Efficiency (FZOEU) is an extra-budgetary fund used to invest funds in programs and projects for environmental and nature protection, energy efficiency and the use of RES. The Fund has the role of Intermediate Body 2 for the use of EU structural instruments in the Republic of Croatia in the field of environmental protection and resource sustainability, climate change, EnU and RES. The activities of the Fund include activities related to financing the preparation, implementation and development of programs and projects and similar activities in these areas. The Fund receives funding from the Fund's earmarked revenues:

- Compensation of environmental pollutants.
- Environmental user fees.
- Fee for environmental pollution by waste.
- Special environmental charges for motor vehicles.

The Fund's resources for each business year are spent in accordance with the Fund's Work Program and the Financial Plan adopted by the Board of Directors. Funds allocated by the Fund can be obtained in the form of loans, subsidies, financial aid, and donations, and are awarded based on the implementation of public tenders, which are announced according to the Annual Program for Public Procurement and Tenders.

The Ministry of Regional Development and European Union Funds

The Ministry of Regional Development and European Union Funds implements the Island Development Program once a year, is local in nature and aims to enable the island community to implement priority small capital infrastructure projects which systematically seek to reduce regional development inequalities and differences in Croatia. The main goal of the Program is to create favourable preconditions for sustainable island economic and social development by increasing the quality of life on the islands through financial support and encouraging the development of island specifics.

The scope of the Program refers to all inhabited islands of the Republic of Croatia located around six coastal-island counties to which the islands territorially and administratively belong.

The program is intended for construction, reconstruction, renovation, arrangement, modernisation, communal, transport, social, public, entrepreneurial or tourist infrastructure, and support is also focused on infrastructure projects that contribute to environmental protection and energy efficiency and / or are intended for the use of renewable sources energy.

The program is implemented through an annual public call for proposals for island development projects.

National funding and financing programmes

Croatian Bank for Reconstruction and Development

The Croatian Bank for Reconstruction and Development (HBOR) is a development and export bank established for the purpose of lending to the reconstruction and development of the Croatian economy. The founder and owner (100%) of HBOR is the Republic of Croatia, which guarantees all incurred liabilities. The line of environmental protection and sustainable development is a lending program focused on projects of environmental protection, energy efficiency and renewable energy sources. The beneficiaries of the loan are local and regional self-government units, utility companies, companies, craftsmen, and other legal entities. Investments are possible in fixed assets that do not include the preparation of project documentation and permanent working capital. As a rule, HBOR lends up to 75% of the estimated value of the investment without VAT. HRK 100 000 is the minimum loan amount, and the maximum amount is unlimited. The repayment period is a maximum of 14 years, with a grace period of three years. The basic interest rate is up to 4% or quarterly EURIBOR + two p.p. per year. Loans can be realised directly or through commercial banks that cooperate with HBOR. Since 2012, HBOR, in cooperation with the EIB, has been providing grants from the European Commission's Energy Efficiency Finance Facility (EEEF) grant. In addition, there is a special line of lending for energy renovation of buildings, which is intended to finance APN's ESCO model of renovation of public buildings, but also other companies and crafts that invest in energy efficiency.

Alternative financing schemes

Public Private Partnership

Public Private Partnership (PPP) is a joint, cooperative action of the public sector with the private sector in the production of public products or the provision of public services. The public sector emerges as a producer and provider of cooperation – as a partner that contractually defines the types and scope of work or services that it intends to transfer to the private sector and that offers public works to the private sector. The private sector appears as a partner that seeks such cooperation if it can achieve business interest (profit), and which is obliged to perform quality contractually obtained and defined tasks.

The goal of a public-private partnership is more economical, efficient, and effective production of public products or services compared to the traditional way of providing public services. PPP occurs in different areas of public administration, in different forms, with different duration and with different intensity, and most often in cases where the public administration is not able to directly perform public affairs under its own direction for two reasons:

- Due to insufficient expertise of public administration employees, when it comes to specifically professional jobs (e.g., medicine, oil, etc.).
- Due to excessive costs of performing public works on their own (e.g., procurement of construction machinery).

The characteristics of PPP projects are:

- Long-term contractual cooperation (maximum 40 years) between the public and private sectors.
- Actual redistribution of business risk of construction, availability, and demand (two of the above three risks must be on a private partner).

The European Union has adopted a Green Paper on a European Union public-private partnership on public contracts and concessions. This document analyses the phenomenon of PPPs, primarily for the purpose of their classification, to determine which forms of such links fall under EU public procurement rules and which may be contracted in other ways. The area of public-private partnership in the Republic of Croatia is regulated by the PPP Act (OG 78/12 and NN 152/2014) and the Decree on the implementation of public-private partnership projects (OG 88/12 and 15/15), the Concessions Act OG 143/12) and the Public Procurement Act (OG 90/11, 83/13 and 143/13) regarding the procedures for the award of public procurement contracts and concession contracts.

The advantage of financing projects through public-private partnerships is the fact that such an investment is not seen as an increase in public debt. The key condition is in the classification of assets considered with the partnership agreement. Contractual property is not considered city property only if there is compelling evidence that the private partner bears most of the risk associated with the partnership. In the conditions of over-indebtedness of local and regional self-government units and the lack of public (non-refundable) funds, the public-private partnership is a model by which it is possible to launch a significantly larger volume of projects in the energy renovation sector.

ESCO model

ESCO stands for Energy Service Company and is the generic name of the concept in the energy services market. The ESCO model includes the development, implementation and financing of projects aimed at improving energy efficiency and renewable energy sources and reducing operating and maintenance costs. The goal of each project is to reduce energy costs and maintenance by installing new more efficient equipment and optimising energy systems, thus ensuring the return on investment through savings over a period of several years depending on the client and project.

The risk of savings is usually borne by the ESCO company by providing guarantees, and in addition to innovative projects to improve energy efficiency and reduce energy consumption or energy production with renewable energy sources, often offer financial solutions for their implementation. During the repayment of the energy efficiency investment, the client pays the same amount for energy costs as before the implementation of the project, which is divided into the actual (reduced) energy cost and the investment repayment cost. After the investment is repaid, the ESCO company leaves the project and hands over all benefits to the client. All projects are specially tailored to the client, and it is possible to expand the project by including new energy efficiency measures with an appropriate division of investment. In this way, the client can modernise the equipment without investment risk since the risk of savings can be taken by the ESCO company. In addition, after the repayment of the investment, the client realises positive cash flows in the period of repayment and long-term savings.

An additional advantage of the ESCO model is the fact that during all phases of the project the service user cooperates with only one company in one place and not with several different entities, which reduces the cost of energy efficiency projects and the risk of investing in them. Also, the ESCO project includes all energy systems at a specific location, which allows for an optimal choice of measures with a favourable ratio of investment and savings.

Users of the ESCO service can be private and public companies, institutions, and units of local and regional self-government.

There are also various variations of ESCOs in Europe, such as Energy Performance Contracting (EPC) and Heat Contracting. The contract heat sales model has been developed and applied to a significant extent in Austria, Finland, Sweden, and other EU countries with significant experience in modern use of biomass from private forests, while in Croatia there is currently no example of application. The basic principle of this model is that private entrepreneurs sell thermal energy to end consumers (for example, public buildings).

Energy cooperatives

Energy cooperatives develop renewable energy projects, which in most cases are fully or partially owned by the community living in the area where the project is being built, and thus the local community directly benefits from RES projects. According to the Law on Cooperatives, they are defined as a voluntary, open, independent, and autonomous society managed by its members, and through their work and other activities or use of its services, based on community and mutual assistance, achieve, promote, and protect their individual and joint economic, social, educational, cultural, and other needs and interests and achieve the goals for which the cooperative was founded. Cooperatives operate on seven cooperative principles, and some of the advantages of energy cooperatives are:

Investing in projects that develop the local community.

- Saving energy costs.
- Reduction of the NIMBY effect.
- Strengthening the sense of community of the local community.
- Solving environmental problems and reducing CO₂ emissions.
- Creation of managerial and technical knowledge in the local community.

The most common types of energy cooperatives are capital-oriented cooperatives, which are financed through membership fees, equity shares, individual membership deposits, loans and investments of external investors, and cooperatives oriented to meet the energy needs of consumers in which the cooperative serves as an intermediary in purchasing energy. wholesale market and thus achieves savings for its members. The models of energy cooperatives developed in Croatia are consumer energy cooperatives, investment cooperatives and development energy cooperatives.

Project Development Assistance (PDA)

To support ambitious public authorities and bodies in developing bankable sustainable energy projects, the European Commission provides project development assistance services. The main objective is to fill the gap between sustainable energy plans and the investment side, by supporting a wide variety of activities required to sustainable energy projects investment. This support is available through direct funding grants to public bodies through the following channels. From the EC PDAs, it worth to highlight:

- <u>Technical assistance facility of European Energy Efficiency Fund (eeeF)</u>, which aims to support investment projects in the energy efficiency, small-scale renewable energy, as well as public urban transport sectors.
- <u>European Local Energy Assistance (ELENA)</u>, which offers grants for technical assistance aimed at the operation of energy efficiency, distributed renewable energy and urban transport programmes.
- Joint Assistance to Support Projects in European Regions (JASPERS), which assists cities and regions to attract European funds through high quality projects. Areas of assistance incudes project review and advice, strategic support, capacity building, implementation support and independent quality review.
- <u>New Energy Solutions Optimised for Islands (NESOI)</u>, a "brother" initiative of Clean energy for EU islands, aim is to fund 60 successful energy transition projects, mobilising more than €100 million of investment and significantly reducing CO₂ and GHG emissions by 2023. The facility provides training, technical support, cooperation opportunities and funding opportunities to assist energy transition plans convert into more renewable energy sources, building and energy infrastructure retrofitting, energy bills reduction, local job creation, etc.
- <u>LIFE Technical Assistance Projects</u> funds the preparation of Strategic Nature and Integrated Projects; projects to facilitate the upscaling or replication of results; projects for the capacity building of member states authorities, etc.

Action plan for the application procedure

- **1.** Identify a relevant funding programme
 - → To receive funding for a project, first identify a relevant funding programme. Also, select a call for proposals that best fits the description of the project. Then, carefully follow the specific application guidelines.
 - → Since each funding programme prioritises a different EU objective, checking the priority of each funding programme is vitally important. Each programme has a unique way of managing the project and they finance diverse types of actions.
 - → Hence, the project will only be accepted for funding if the priorities match those of the funding programmes objectives. It is therefore important to clearly outline the project's objectives and joint activities needed at a European level.
 - → Since the project will need a source of co-financing, check for internal resources. Be prepared for the time and challenging work that goes into writing a project proposal. So, making sure there are enough staff resources at hand is critical.
 - → Finally, keep up to date with information regarding the chosen funding programme. For example, subscribe to the newsletters, or study the work programmes which can be found on the respective websites.
- **2.** Choose amongst the call for proposals
 - → It is important to study all relevant documents such as the call for proposals, the programme guide, the applicants guide and the application form. Summarising the most valuable information will help to understand more about the specific calls.
 - → The most crucial elements to consider in a call for proposals are the objectives, eligible actions, eligibility criteria (e.g., eligible countries, min and max budget, eligible expenditure, eligible activities), co-financing rules, administrative requirements, application form needed, selection process and evaluation methodology, and the deadline for submission.
- **3.** Developing a project
 - → Construct a summary of the project idea and write a preliminary 2-3 pages about the objectives, target group, milestones/main deliverables, and the ideal project partnership (e.g., types of organisations). To develop a good project, make sure to detail the situation that the project wishes to improve thanks to the EU funding. This is important for the funding programmes to know so that they can evaluate project impacts. The sequence of actions during the project should be logical and linked to the project description. The expected results and quantitative estimates of impacts should also be clearly defined. Finally, make it clear which actions the project should fund.
- 4. Identifying partners and stakeholders
 - → The active participation of the main key stakeholders affected by the problem addressed is key to ensuring a successful project partnership, as well as a series of experts to help solve the problem throughout the project.

- → To identify this partnership, think about who is affected by the problem; who will use the solutions/tools developed in the project and how they can be involved; and who can help with solving the addressed problem.
- → Distinguish partners (other organisations that will be involved in the proposal directly) from other stakeholders (e.g., organisations that can be indirectly involved with the project or that might also benefit from the results).
- **5.** Communication, dissemination, exploitation
 - → Communication, dissemination, and exploitation are crucial horizontal activities which must be taken up in EU-funded projects. These activities not only inform about the project and promote its results, but they also ensure that other entities can make concrete use of those projects results and learn from success and/or mistakes.
 - → The EU funding programme will better consider projects that contain good strategies to share and invite other entities to exploit results. This is seen as a key added value in a project proposal.

See <u>here</u> for more guidelines on dissemination and exploitation activities.

- 6. Combining EU funds
 - → Regarding EU funding programmes which focus on achieving similar objectives, it is possible to combine them which can help to boost project results.
 - → For example, synergies can be exploited between H2020 or the new Horizon Europe and CEF actions. Both H2020 and CEF develop synergies with other programmes too. For example, in the promotion of Hydrogen as an alternative fuel. The MEHRLIN project in northern Italy, for instance, has integrated different funding sources, namely CEF, H2020 and LIFE. It will finance (through CEF) the construction of H₂ stations for buses, whilst the LIFE programme is financing the deployment of a fleet of 28 hydrogen fuel-cell cars (Zero Emission LIFE IP). Through the H2020 JIVE project, 27 fuel-cell buses for the same location will also be supported. More information is available <u>here</u>. There are additional examples of synergies between CEF and H2020 projects in INEA's thematic publications <u>on Intelligent Transport Systems</u> and <u>Safe and Green Aviation</u>. Browse other examples of H2020 and CEF Transport projects in the <u>TRIMIS database⁶</u>.

See <u>here</u> and <u>here</u> for more details on synergies between funds.

⁶<u>https://ec.europa.eu/inea/en/synergies</u>

Conclusions

Elaphiti islands are now taking the first steps on their energy transition. With this purpose, the island intends to implement a wide range of actions, with a special focus on the island transport system. Currently, one of the beneficiaries (DURA) is working on a feasibility study which will analyse the solution of implementation of electric boats and their charging as a regular transportation system to Elaphiti islands.

The main goal of this technical assistance was to perform a map of the local stakeholders, involving them in the process as well as finding the suitable funding and financing possibilities for *Elaphiti Energy Transition* actions. These objectives were achieved and with this expertise assistance, the islands have a starting point for their actions, based on the stakeholder's engagement mapping combined with the overview of the local policies and regulations. In the upcoming years, islands have tools to apply to the different funding and financing programmes depending on the action.

Annex

Proposal for governance

Due to the complexity of the process on the one hand, and the importance of the City of Dubrovnik for the Elaphiti Islands on the other, the *Elaphiti Energy Transition* will involve a good number of participants considering the island's sizes, and it is especially important to clearly define the tasks and responsibilities of all involved.

To successfully implement the *Elaphiti Energy Transition*, it is necessary to set up a **Transition Team**. The Transition Team is the nuclear team (from 2 to 5 people) that drives the *Elaphiti Energy Transition* and has an important facilitation and coordination role. Then, it is proposed to appoint a **Management Committee**. The entities composing this committee are responsible for the leading of the energy transition process and for taking some of the important decisions: on its initiative, working and supervisory bodies would be established. These institutions may be municipalities, universities as well as important island associations. In addition to the program coordinator, it is necessary to establish an **Advisory Committee** and a **Community Working Group**.

According to previous experiences and knowledge gained in the implementation of similar projects, it is proposed that in addition to some employees from the City of Dubrovnik, other key stakeholders be included in the *Elaphiti Energy Transition*. With this approach, the result will be maximally adjusted to the needs of all key actors in the City of Dubrovnik, as well as to the citizens and other members of society.

The Advisory Committee is a supervisory and advisory body composed of all public authorities responsible for the relevant regulatory and authoritative roles in the territory, the main stakeholders of the *Elaphiti Energy Transition* and energy experts. The Advisory Committee oversees monitoring the development, implementation and monitoring of the Energy Transition, communication with all persons in the *Elaphiti Energy Transition*, reporting to the European Commission and the City Administration on the course and results of the process. It is desirable that the Management Committee works together with the Advisory Committee team for better communication and monitoring.

A Community Working Group for the implementation of certain measures within the *Elaphiti Energy Transition* is established at the request of the Advisory Committee, and relevant stakeholders are selected considering the needs for the implementation of individual measures.

Elaphiti Energy Transition governance is summarised in a schematic way on Figure 4. This structure can be adapted; however, it must not be fully changed by the Transition Team. This approach is <u>recognised</u> and proven to be successful in the development of transition agendas.



Figure 5 - Elaphiti Energy Transition proposed governance.