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Clean energy for EU islands: Study on regulatory barriers and recommendations for clean energy transition on the islands

Croatia

Study on regulatory barriers and recommendations for clean energy transition on the islands - Croatia

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Readers' Guide

This Study on regulatory barriers and recommendations for the clean energy transition on the islands - Croatia is the result of a consultative process. Based on an inventory of the current legislation and information gathered via surveys and interviews, the Clean energy for EU islands secretariat has brought together relevant stakeholders to identify barriers to the clean energy transition on Croatian islands, and formulated recommendations to overcome them.

After an introduction and explanation of the methodology, the first Chapter provides an overview of the existing policy and legislation for clean energy in Croatia and relevant to Croatian islands.

The second Chapter contains the identified priority legal and regulatory barriers, based on the survey and the interviews (see Annex 1 for a detailed assessment), and the recommendations, based on the Focus Group Meetings (see Annex 2 for more information).

Introduction

Small size, remoteness and climatic vulnerability lead to an unfavourable geographic condition and make that islands are susceptible to external factors. While islands are particularly vulnerable to climate change, they enjoy a naturally high potential of renewable energy sources to harness. Many islands have abundant renewable energy potential, which can be tapped to lead decarbonisation. While access to reliable, clean, and competitive sources of energy remains a main concern of island communities in the EU, islands present unique opportunities to become leaders in clean energy transition.

While it is often technically and financially possible to develop renewable energy projects on islands, EU, national, regional, and local legal frameworks are not always fit-for purpose. This study is the third deliverable of the Task Force 2 – Think Tank on legislation and regulation for islands of the Clean Energy for EU Islands Secretariat. It builds further on the legal inventory of legal and regulatory information on clean energy development for 15 Member States, available online.

This **Study** on regulatory barriers and recommendations for clean energy transition on the islands - Croatia identifies existing and emerging legal, regulatory and policy frameworks that foster the development of local decarbonised energy systems on Croatian islands. It processes gathered inputs from literature review, surveys, interviews, and workshops and highlights best and worst practices, inspiring examples, failures and their lessons learned, and makes concrete recommendations.

Methodological approach

Different methods of information collection were used by the Think Tank to complete the information needs for the detailed inventory:

- Desk research completing the information for the selected Member States was conducted.
- In-depth surveys were created and sent to the consortium's network. 68 stakeholders were engaged, and the response rate was 37%.
- Information templates were be sent to regulators, national authorities, and relevant stakeholders.
- Eleven[1] semi-structured open-ended interviews with national and regional legislators, regulators and academic institutions and relevant actors (citizens, authorities, businesses, and communities) of local energy initiatives were organised. This helped clarify the rationale behind, and interpretation of existing legal developments. In these interviews we identified the key actions drivers, opportunities, and obstacles for the implementation of the action plans they encountered, including possible ways to address, or overcome them.
- Experiences (successful or unsuccessful) from local stakeholders, available through one-on-one contacts, articles in local newspapers or as part of communication provided by (local) advocacy groups were integrated. The contacted actors included those that were identified during the project work from Phase I of the Secretariat and project experiences that arise from the technical assistance in Task Force 1.
- Two online meetings with the Croatia Focus Group. The focus group consists of experts and representatives of national, regional, and local stakeholders relevant for clean energy

[1] A Croatian regional partner of the Clean energy for EU islands secretariat, the Island Movement, is a non-governmental organisation that collaborates and partners with many islands and local organisations as well as with Renewable energy Croatia, that provides the funding for RES for the whole territory of Croatia.

transition on EU islands. The first meeting was organised on 6 April 2022 and focused on the discussion of the key barriers to clean energy projects. The second meeting was organised on 27 June 2022 and focused on the barriers for overcoming the prioritised regulatory barriers (Annex 2).

- The National Stakeholder Meeting was held in Zagreb on 7 September 2022 (see Annex 2 for more details).

Policy and Legislation for clean energy on Croatian Islands

Introduction to the Croatian Energy sector – Relevant Actors

Throughout the study several key stakeholders in the Croatian Energy Sector will be referred to. Hereunder a short overview of these actors and their roles is given.

In Croatia, energy policy is mainly the responsibility of the **Ministry of economy and sustainable development, Directorate for Energy**.[2] The islands development policy is the responsibility of the **Ministry of Regional Development and EU funds, Directorate for Islands**.[3] As the energy transition affects not only the energy sector but also other sectors (transport, water, waste, tourism, agriculture, industry etc.) and allows for decentralisation of energy sector, other sector policies and regional and local government bodies and stakeholders, such as academia, civil sector, private sector, are also relevant and important for implementation of measures.

For energy policy and regulation, The Ministry of economy and sustainable development is supported by the **Croatian Energy Regulatory Agency** (HERA).[4] In addition to HERA, policy makers are also supported by nationally owned **Energy Institute Hrvoje Požar** (EIHP).[5]

Croatian energy markets, both electricity and gas, are operated and managed by **Croatian Energy Market Operator** (HROTE).[6] In addition, HROTE is responsible for managing support for renewable energy generation.

The Croatian electricity transmission system (110 kV and above) is owned and operated by nationally owned **Croatian transmission system operator** (HOPS).[7] The electricity distribution system is owned and operated by single nationally owned distribution system company, **Croatian electricity company distribution system operator (HEP-ODS)**. HEP-ODS is part of **HEP Group**, which also owns the HEP supplier and HEP generation companies, as well as other electricity and gas related companies. Aside from HEP there are other electricity supply and generation companies in Croatia.

Croatian islands and their governance

The Croatian archipelago lies along the eastern coast of the Adriatic Sea and has 1,244 natural formations, of which 78 are islands, 524 are islets, 642 are cliffs and reefs. Of the 78 islands, 52[8] are permanently inhabited, all of which are located relatively close to the shore. Cres and Krk are the largest islands, both with a land area of around 406 km^2. According to the Croatian Islands Act,[9] the peninsula Pelješac is also considered an island. The Croatian legal framework includes it in all island regulations and documents. The Croatian island population makes up 3.3 % of the country's total population, which corresponds to 128,508 people.[10]

[2] https://mingor.gov.hr/
[3] https://razvoj.gov.hr/
[4] https://www.hera.hr/en/html/index.html
[5] https://eihp.hr/en/
[6] https://www.hrote.hr/
[7] https://www.hops.hr/en/Home/Index
[8] 53 (if Pelješac is included) https://registar-otoka.gov.hr/
[9] The Islands Act (Zakon o otocima 116/18, 73/30, 70/21) last updated in 2021 https://www.zakon.hr/z/638/Zakon-o-otocima
[10] https://popis2021.hr/

Croatia has seven coastal counties, of which six have inhabited islands. At the local level, islands have, in general, their own municipalities within these counties, just like the mainland area does. However, more than 30 inhabited islands do not have their own municipality. They are part of the city municipality on the coast or of other islands. There is specific legislation to support economic development of islands, the Islands Act which defines strategies and subsidies for inhabitants and businesses on islands. Notably, the Act on Islands introduced 'Island coordinators' who are designated people responsible for organising and coordinating plans and projects pertaining to the sustainable development of islands.

General policy

The **Integrated National Energy and Climate Plan for the Republic of Croatia** for the period 2021-2030 sets a national RES target of 63.8% in the gross direct consumption of electricity, 36.6% in the gross direct consumption of energy for heating and cooling and 13.2% in the gross direct consumption of energy in transport. The **Strategy for energy development of the Republic of Croatia until 2030, with the view until 2050**,[11] documents the alignment with EU policy and need for energy transition. While it indicates that the possibilities and potential for energy development on the islands is different than on the mainland, it does not detail how this will affect implementation.

A special **Islands Act** from 1999 contains all necessary measures, administrative provisions and requirements, technical and environmental standards, and other basic rules in order to provide all conditions for a safe, environmentally sustainable, and secure development and management of the Croatian islands.[12] This includes the management of other services such as water and waste, as well as energy sources needed for electricity, heating/cooling, and transport. While energy is important, water, waste and transport to/from the islands are equally important. The islands should benefit from innovative solutions that provide cross-sectoral approaches, solving multiple issues.

Taking into account the uniqueness of the islands and balanced regional development as one of the main goals of the Government, at the end of 2018 a new Islands Act (OG 116/2018) was adopted, with additional changes in 2020 (73/20) and 2021 (70/21). The new Islands Act was adopted in order to stimulate the economic development of islands and improve the quality of life of islanders, providing them with new development and economic opportunities through a number of modern mechanisms and solutions to island development policies.[13] The Islands Act includes specific measures such as encouraging the development of civil society and cooperatives on the islands and other measures aimed at demographic and economic revitalisation of Croatian islands. The Croatian Government adopted the **National Island Development Plan 2021-2027**, as a medium-term strategic document.[14]

[11] https://mingor.gov.hr/o-ministarstvu-1065/djelokrug-4925/energetika/energetska-politika-i-planiranje/strategije-planovi-i-programi-2009/2009
[12] https://www.ecolex.org/details/legislation/island-law-lex-faoc120129/
[13] The Islands Act (Zakon o otocima 116/18, 73/20, 70/21) last updated in 2021 https://www.zakon.hr/z/638/Zakon-o-otocima
[14] https://razvoj.gov.hr/o-ministarstvu/djelokrug-1939/otoci/nacionalni-plan-razvoja-otoka-2021-2027/4473

At the end of 2021, the new Electricity Market Act (ZOTEE)[15] – which transposes the fourth Electricity Directive,[16] has been presented alongside the new Renewable energies Act (ZOIEVUK),[17] which replaces the existing Act on Renewable Energy Sources and High-efficiency Cogeneration, regulates important issues for the implementation of energy transition in accordance with the Energy Development Strategy until 2030 with an outlook to 2050 and the Integrated National Energy and Climate Plan (NECP) for the period 2021 – 2030.

Croatian islands are interconnected to the mainland. There is not much electricity production on the Croatian islands. Therefore, the main problem occurs due to need for balancing in the periods of higher demand during the tourist season, as the infrastructure is constructed to support the average demand on the islands.

The cost of energy production on most Croatian islands is not higher than on the mainland and there is thus not a system of socialised costs, compared to countries such as Greece, Spain, Italy. However, most of the technical know-how, technology and maintenance companies are located on the mainland. Therefore, maintenance can be more expensive on the islands as it is not locally available.

The national energy institute (*Energy Institute Hrvoje Požar*, EIHP)[18] helps different ministries with the development of action plans and strategies, but there is not one national clean energy action plan for the Croatian Islands. However, the institute does help with regional and local clean energy planning (SEAPS and SECAPS).

Regulatory best practice

The Croatian Regional Development Act[19] defines the regional coordinator as a regional development agency. The responsibilities are further detailed in Article 25 of the Regional Development Act. The Croatian Islands Act[20] in Article 19, further identifies one person within the regional coordinator to be the island coordinator. The responsibility, among other of the island coordinators is to organise, initiate and coordinate plans and projects important for the development of the islands in their region. Regional island coordinators are installed starting from 2021 and are currently in the process of developing longer term collaboration with local governments on islands or with islands in their territory.

[15] Pursuant to this Act, a producer of electricity licensed to produce electricity may produce electricity in the basic or variable mode of operation, including electricity to cover losses in the transmission and distribution network, as well as electricity energy for balancing the electricity system (hereinafter: "balancing energy") and provide ancillary services. Exceptionally, legal or natural persons may perform the activity of electricity production without a license to perform electric power activity if they have provided professional management and operation of power plants in accordance with technical regulations, requirements and conditions and exclusively for performing the activity: • production of electricity using generating plants whose sum of installed powers is up to and including 500 kW or • production of electricity exclusively for own needs or • production of electricity during the trial operation of production facilities. The main novelty that ZoTEE brings for projects' renewable sources and high-efficiency cogeneration, energy but also electricity storage plants, is an energy approval awarded in a public tender at the very beginning of project development.

[16] Directive (EU) 2019/944 of the European Parliament and of the Council of 5 June 2019 on common rules for the internal market for electricity and amending Directive 2012/27/EU

[17] https://www.zakon.hr/z/827/Zakon-o-obnovljivim-izvorima-energije-i-visokou%C4%8Dinkovitoj-kogeneraciji

[18] http://www.eihp.hr/

[19] https://www.zakon.hr/z/239/Zakon-o-regionalnom-razvoju-Republike-Hrvatske

[20] https://www.zakon.hr/z/638/Zakon-o-otocima

Renewable energy

Support systems

Currently, in Croatia there are no special support systems for the development of renewable energy sources on the islands. However, depending on the tender, islands falling under a specific category can get preferential treatment through additional points (the Islands Act NN 116/18, 73/20, 70/21). So far, there are no specific 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 the Croatian Environment Protection and Energy Efficiency Fund (EPEEF).[21] Within those calls, beneficiaries from islands can receive a larger subsidy than other areas. In general, islands can receive a subsidy of 80% or 60%, based on their economic development. For example, in the Public Call for energy renovation of family houses (EnU-2/21), published by EPEEF on 15.09.2021.[22] The "first group of islands and areas of special state concern are subsidised with up to 80% of eligible costs, the second group of islands and hilly and mountainous areas with up to 60% of eligible costs and other areas of Croatia with up to 40%, according to call conditions."[23] Measures co-financed are: (i) complete energy renovation, (ii) increase of thermal protection, (ii) installation of RES systems. The EPEEF launched similar calls in the past years:

- Public Call for co-financing the use of energy efficiency and renewable energy sources in industrial systems, craft manufactories and family farms
- Public Call for co-financing the use of renewable energy sources (photovoltaic systems) in tourism to natural persons - registered renters and family farms
- Public Call for co-financing the use of renewable energy sources for the production of heat or heat and cooling energy in households, for own consumption
- Public Call for co-financing the use of renewable energy sources in public buildings
- Public Call for co-financing the use of renewable energy sources for the production of electricity in households, for own consumption

Croatia supports a wide range of technologies for electricity generation, energy efficiency, heating, cooling, and transport through different schemes. The Croatian Bank for Reconstruction and Development offers lending instruments to promote energy efficiency and renewable energy projects. Electricity generation from renewable energy sources such as solar and wind power is supported by a feed-in tariff/premium. For transport there is support through a subsidy scheme for low- or zero-emission vehicles and there is a quota for the use of biofuel.

Support schemes:

- Technology-neutral investment loans for renewable energy and energy efficiency projects.
- Feed-in tariffs and Feed-in Premiums are awarded through tender procedures operated by the Croatian Energy Market Operator.
- A net metering system applies to electricity-producing consumers, mainly households. Produced electricity must be used primarily for own consumption.
- Subsidies are granted for the purchase of private electric vehicles and public transportation buses with low and very low CO_2 emissions.

[21] https://www.fzoeu.hr/en/activities-of-the-fund/1325
[22] https://www.fzoeu.hr/hr/natjecaj/7539?nid=165&fbclid=IwAR0J5QC6bayYPVfgWROlfsV4X1fpZ4sMbvTpyEH5kaBajOmbd-S-XZa3Kuc
[23] https://www.fzoeu.hr/hr/natjecaj/7539?nid=165&fbclid=IwAR0J5QC6bayYPVfgWROlfsV4X1fpZ4sMbvTpyEH5kaBajOmbd-S-XZa3Kuc

- Croatia has a biofuel quota that obliges fuel producers to include a percentage biofuel into their products.
- Croatia co-finances the development of the alternative fuels infrastructure such as charging infrastructure.

Grids

The Croatian electricity grid provides non-discriminatory connection for renewable energy sources and priority access to deliver renewable electricity to the grid. There is a single distribution system operator. For installations connecting to the low-voltage network that do not require technical adjustments, the grid access is simplified, as it does not require a study (Annex 3). The country has a smart meter penetration rate of 14.1%. The electricity supplier switching rates for household customers in 2018 was 2.5%.[24]

RES projects authorisation process

A range of permits must be obtained for renewable energy projects including from the county and municipality, national level ministries, Croatian Air Traffic Control, the national distribution and transmission system operators and the energy regulator. For rooftop solar photovoltaics (PV) and net metering, the procedure is simplified.

Supported energy efficiency measures

Croatia requires that all new buildings in the country adhere to the nZEB (nearly zero energy building) standard starting from January 2020. Energy efficiency measures for buildings are supported through subsidies of the Energy Efficiency and Environmental Protection Fund (EPEEF) and through low-interest loans of the Croatian Bank for Reconstruction and Development. These loans are available only for the private and public sector, not for natural citizens.

Energy efficiency action plans are mandatory for regions and for large cities above 35000 citizens, based on Art. 11 of Energy Efficiency Act. Cities of this size are not located on the islands. Therefore, islands are included under regional action plans for energy efficiency. The form of these plans is defined by regulation. Energy efficiency action plans are mainly focused on building renovation and sustainable electrical mobility, and most actions are defined to identify projects that will use national funds for their implementation.

Energy Efficiency Law obliges energy supplies to ensure participation of end-consumers in the energy efficiency of the system by allowing demand response.

Supporting policies

Croatia offers recognised training programmes for installers of renewable energy installations in the housing and buildings sector, in particular for electricity, heating, and construction. Energy audits and energy certifications of buildings are carried out by certified persons. Public authorities fulfil their exemplary role through energy renovation of public buildings, with the goal of yearly renovation rate of 1,0% of surface area of all public buildings in 2021 and 2022. Currently there are few large

[24] Eurelectric – Distribution grids in Europe: Facts and Figures 2020. https://cdn.eurelectric.org/media/5089/dso-facts-and-figures-11122020-compressed-2020-030-0721-01-e-h-6BF237D8.pdf

research, development & demonstration (RD&D) programmes in the country, but there are plans for such programmes in the future.

Self-consumption and community energy

Until recently, energy sharing (multiple users in one building sharing a RES system) and energy communities (multiple users from multiple buildings sharing a RES system) were not well-defined by the legislative framework. Prosumers are better-defined and commonly exist in Croatia, but there is still a need for improvement of the regulatory framework and implementation of more supporting measures.

The new Renewable energy (RES) Act[25] contains provisions on energy communities and active customers in order to enable all end customers to directly participate in the production, consumption, or distribution of electricity. One of the most significant novelties of the new Act is the introduction of the concept of the Energy Community, whereby renewable energy communities are defined as legal entities that meet the following conditions:

- are established in accordance with applicable national law, in open and voluntary participation,
- are independent and under the effective supervision of shareholders or members located in the vicinity of renewable energy projects owned or developed by that legal entity,
- whose shareholders or members are natural persons, small and medium-sized enterprises, or units of local or regional self-government, and
- whose primary purpose is to provide the environmental, economic, or social benefit to the community for its shareholders or members or for the local areas in which it operates, and not for financial gain.

Renewable energy communities have the right to:

1. produce, consume, store, and sell renewable energy, inter alia through renewable energy purchase agreements
2. share, within the renewable energy community, renewable energy produced in generating units owned by that renewable energy community, subject to other requirements of this Article and retaining the rights and obligations of members of the renewable energy community as users
3. access all relevant energy markets directly or through aggregation in a non-discriminatory

Citizen energy communities and prosumers are defined in the Energy Market Act adopted in 2021.

[25] https://narodne-novine.nn.hr/clanci/sluzbeni/full/2021_12_138_2272.html

Identified barriers and recommendations to overcome them

The Clean energy for EU island Secretariat's Think tank has identified legal and regulatory barriers, based on the detailed assessment of the current regulatory framework and consultation with relevant Croatian stakeholders through survey and the interviews (see Annex 1 for a detailed assessment). For each of the regulatory barriers, we propose multiple recommendations. Those barriers and recommendations were presented and discussed within the Focus Group Meetings (see Annex 2 for more information).

Regulatory barriers are presented in the order of their priority for energy transition on the Croatian islands. Some of the barriers that were identified via the surveys and interviews are barriers that exist both on the islands and on the mainland. In the recommendations below, the focus lies on the concrete issues encountered by islands with these regulatory barriers.

The table below represents the list of barriers (marked in dark blue) ordered based on their priority, and the proposed recommendations (marked in white).

Barrier 1**. Lack of clear strategy and coordination of clean energy transition on the islands**

Recommendations:

1.1 Set up a national Taskforce for islands' clean energy transition

1.2 Mandate island or group of islands energy transition plans

1.3 Improve regional and local energy coordination and monitoring

Barrier 2. **Lack of support schemes tailored to island characteristics and capacity**

Recommendations:

2.1 Improve planning and communication of planned funding calls

2.2 Provide technical assistance for clean energy projects for islands

2.3 Foster local stakeholder engagement in energy projects

Barrier 3. **Need for better integration of clean energy transition and spatial planning**

Recommendations:

3.1 Re-assess spatial planning guidelines and restrictions for clean energy projects on the islands

3.2 Identify go-to areas on the islands and adopt regional energy master plans

Barrier 4. **Lengthy permitting procedures for clean energy projects**

Recommendations:

4.1 Introduce simplified procedure and establish single permit

4.2 Set-up regional one-stop shops

Barrier 5. **Lack of support for energy communities**

Recommendations:

5.1 Prioritise regulatory framework and provide right incentives

5.2 Use regulatory sandboxes for community energy initiatives

5.3 Foster local awareness raising and support

Barrier 6. **Lack of security of supply on islands due to seasonality**

Recommendations:

6.1 Adapt grid development methodology from an ad-hoc approach to a future-oriented approach

6.2 Explore framework for remuneration of storage systems

REPowerEU - Proposal for amendment of RED II (and EPBD & EED)[26] and Recommendation on speeding up permit-granting procedures for renewable energy projects

On 18 May 2022 the European Commission has presented the REPowerEU Plan, its response to the hardships and global energy market disruption caused by Russia's invasion of Ukraine. There is a double urgency to transform Europe's energy system: ending the EU's dependence on Russian fossil fuels, which cost European taxpayers nearly EUR 100 billion per year and tackling the climate crisis. There are three main axes:

- Saving energy;
- Diversifying supplies and supporting our international partners;
- Accelerating the rollout of renewables.

Regarding the latter, a massive scaling-up and speeding-up of renewable energy in power generation, industry, buildings, and transport will accelerate our independence, give a boost to the green transition, and reduce prices over time. The Commission proposes to increase the headline 2030 target for renewables from 40% to 45% under the Fit for 55 package. Setting this overall increased ambition will create the framework for other initiatives, including among others:

- A dedicated EU Solar Strategy to double solar photovoltaic capacity by 2025 and install 600GW by 2030.
- A Solar Rooftop Initiative with a phased-in legal obligation to install solar panels on new public and commercial buildings and new residential buildings.
- A Commission Recommendation to tackle slow and complex permitting for major renewable projects, and a targeted amendment to the Renewable Energy Directive to recognise renewable energy as an overriding public interest. Dedicated 'go-to' areas for renewables should be put in place by Member States with shortened and simplified permitting processes in areas with lower environmental risks. To help quickly identify such 'go-to' areas, the Commission is making available datasets on environmentally sensitive areas as part of its digital mapping tool for geographic data related to energy, industry, and infrastructure.

These two last tools are particularly relevant for islands as renewable energy development is often hampered by spatial planning constraints and complicated permitting procedures. Where relevant references to these tools are made in text boxes.

[26] Proposal for Directive amending Directive (EU) 2018/2001 on the promotion of the use of energy from renewable sources, Directive 2010/31/EU on the energy performance of buildings and Directive 2012/27/EU on energy efficiency

1. Lack of clear strategy and coordination of clean energy transition on the islands

The lack of clear strategy and coordination of clean energy transition actions is considered in this study as the main barrier for clean energy developments on the Croatian islands. Both the National Energy and Climate Plan (NECP) and the National Island Development Plan 2021-2027 address the topic of clean energy on Croatian islands. The plans put forward ideas for RES generation for self-consumption to reduce the burden on the transmission system, to showcase and promote pilot projects and developed solutions. The aim is to implement the plans later on the mainland, and to emphasise the need to decarbonise road and marine transport. However, both strategies are vague when defining specific goals, without specifying timelines and projects. For example, the National Island Development Plan defined a specific goal SO 3.2. as "*The development and encouragement of the construction of a system of renewable energy sources, the use of clean energy and energy efficiency.*"

While it is extremely important that such a message is communicated from the national level, it does not indicate preferred priority measures or technologies. It is expected that concrete projects would be defined on the regional or local level. On the regional or local level there are many mandatory plans that define development measures which in one way or another include clean energy topics. These include:

- Regional Development Plans, which recently integrated Regional island development plans;[27]
- Energy Efficiency plans (Energy Efficiency Act),[28] which are prepared on regional level and include mainly state funded planned energy efficiency projects on building renovation and mobility;
- Regional and local annual implementation programs (Strategic planning and development Act[29]) which also indicate if a project is relevant for energy transition; and
- Regional and local spatial plans (Spatial development Act).[30]

Aside from these mandatory plans, through involvement with EU wide initiatives such as Covenant of Mayors, the Clean energy for EU islands Secretariat, or other funded projects, many regional or local governments have developed or are in the process of developing local energy plans, such as Sustainable Energy (and Climate) Action Plan (SE(C)AP) or Clean Energy Transition Agenda (CETA).

It is currently unclear how planning of energy projects is integrated between these different mandatory and non-mandatory sectoral plans. Article 7 of Energy Act[31] indicates that the local and regional level governments should align their development plans with the national Energy Strategy and Implementation plan for energy strategy. There are no foreseen local or regional energy plans.

There is a lack of integral planning between different sectors for the development of energy transition on the islands. For example, installing RES generation on the rooftops of public buildings is supported, while for many islands this cannot be easily implemented because many public buildings are located in the protected areas. In addition, PV installations are not allowed outside of the construction zones. Therefore, such restrictions make it difficult to find a location for a PV

[27] The guidelines for drafting regional development plans were sent to all counties. These guidelines also include special instructions how to elaborate topics related to islands and how to define measures and activities.
[28] Article 11
[29] https://www.zakon.hr/z/975/Zakon-o-sustavu-strate%C5%A1kog-planiranja-i-upravljanja-razvojem-Republike-Hrvatske
[30] https://www.zakon.hr/z/689/Zakon-o-prostornom-ure%C4%91enju
[31] https://www.zakon.hr/z/368/Zakon-o-energiji

installation. Due to lack of nationally set priorities for clean energy development on the islands and lack of integral planning, current clean energy projects are developed "as-needed", and most issues are addressed on a case-by-case basis.

Further, depending on the sector, an especially in the energy sector, there is lack of coordination and collaboration between different levels of government. This lack of feedback loop does not allow for local priorities and needs to be communicated to the national level for preparation of relevant strategies and plans. The Directorate for Energy of the Ministry of Economy and Sustainable Development manages mostly strategic energy projects, while it is expected of municipalities to approve local energy projects. However, local, or regional governments often lack capacity to lead or help in implementation of the clean energy projects.

When it comes to overall sustainable development of the islands, the coordination of issues has started to improve. In the new Islands Act,[32] the Directorate for Islands has recently provided financial support for one employee of the regional coordinator[33] to represent islands' priorities, as regional island coordinator. Island coordinators still need to be better integrated with islands' needs and priorities and improve collaboration with the islands' stakeholders. The Islands Act and its by-laws are a solid basis for the sustainable development of the islands. However, they have only recently been adopted and it is yet to be seen how their implementation will affect the energy transition on the islands.

There is a lack of collaboration among municipalities on the islands. Some islands have multiple municipalities (e.g., Brac island has seven municipalities on the island). The collaboration is discouraged due to different political opinions and priorities. To foster collaboration among municipalities, the national government has indicated that it will support intermunicipal clean energy projects. While the action is preferred, its implementation is not yet clear. In addition, some islands do not have their own municipalities, but are rather part of the mainland municipality. This makes it difficult to prioritise island specific projects.

Croatian best practice

Krk Island – Krk island has seven municipalities and there is coordination of the mayors on the political, decision-making level. They have a monthly meeting and discuss join touristic, communal and energy topics. Krk has a joint communal company for water, waste, and energy for these municipalities.

Due to lack of coordination of the energy transition on the islands, only a few clean energy projects have been implemented on the islands. Aside from rare implementation of rooftop PV by proactive individuals and the good example of islands Krk,[34] there is a lack of examples of best practices which could help promote new projects and increase awareness among local stakeholders.

Recommendation 1.1: Set up a national Taskforce for islands' clean energy transition

Energy sector planning is highly centralised. In order to assure that the national energy plans and strategies are inclusive and help set the framework for the sustainable development of the islands

[32] The Islands Act (Zakon o otocima 116/18, 73/20, 70/21) last updated in 2021 https://www.zakon.hr/z/638/Zakon-o-otocima
[33] Regional coordinator is a regional government body assigned based on the Regional development Act https://www.zakon.hr/z/239/Zakon-o-regionalnom-razvoju-Republike-Hrvatske
[34] https://www.reuters.com/business/sustainable-business/croatian-island-eyes-green-energy-self-sufficiency-this-decade-2021-06-18/

in line with the needs and priorities of the islands, we recommend to form a national Taskforce for islands clean energy transition.

The Taskforce for islands could be built on the idea behind the Island council formed under the Islands Act (Art 18). The Island council is set-up on the national level and its scope of work includes sustainable development of islands. It includes representatives of various sectors, national, regional, and local governments, as well as representatives of national funds, energy companies, private sector, local stakeholders, and academia. Therefore, the Taskforce for islands' clean energy transition could be formed as a working group under the Islands council,[35] in coordination with the Directorate for Energy. It should include external members, such as energy experts and stakeholders involved in implementation of energy projects on the islands. The Islands council provides advice to the Ministry of Regional Development and EU funds, and their mandate is limited to advisory services. The responsibility of further action stays with the Ministry of Regional Development and EU funds. Therefore, any working group under the Islands Council has limited mandate as well.

The Taskforce can be a dedicated team that can analyse all aspects related to the clean energy transition on the islands and propose ways of coordination between sectors on the national level to ensure all tasks are aligned. The taskforce can also be used to provide guidelines that can be communicated from the ministry to the regional and local bodies while taking into account overall sustainable development of the islands. The taskforce can bring together all interests and identify the strategy for clean energy on islands.

In the long term it should be considered to extend the mandate of the Taskforce, so that it can provide advice directly to the National government. The responsibility for action tends to be with various ministries depending on the topic that needs to be improved (energy, spatial planning, construction, culture etc.). Hence, the Taskforce could outgrow into a national body, agency, for islands. This way, the Taskforce can also take a more active role in coordination of activities on national and regional level.

In addition to strategic planning and coordination with the various sectors on the national level and with the stakeholders from the different levels, the Taskforce could be responsible for:

- Monitoring and evaluating the implementation of clean energy projects with regards to foreseen targets within the National Energy and Climate Plan and National islands development plan;
- Identifying bottlenecks and gaps in implementation and coordinating with responsible bodies to overcome them;
- Providing feedback on where additional support is needed. This support could be provided through Croatian Environmental Protection and Energy Efficiency Fund or in collaboration with EIHP, academia and research institutes. The support would be in the form of funding, training, technical assistance, or advice to local or regional governments, energy communities and local stakeholder in planning and implementation of clean energy projects, in coordination with;

[35] Working groups under the Islands council is foreseen by Article 10 of the Bylaw on scope and operation of the Islands Council https://narodne-novine.nn.hr/clanci/sluzbeni/2019_07_71_1508.html , and modified https://narodne-novine.nn.hr/clanci/sluzbeni/2021_10_114_1976.html

- Identify where guideline documents are needed from different sectors and provide feedback on guideline documents to national, regional, and local government for implementation of new procedures;
- Analyse and suggest the optimal way for national, regional, or local governments to provide a platform for collaboration and exchange of experiences among various islands and island stakeholders.

Actors involved:

- **Ministry of Regional Development and EU Funds, Directorate for Islands**
- **Ministry of Economy and Sustainable Development, Directorate for Energy**
- Ministry of Physical Planning, Construction and State Assets
- Ministry of Tourism and Sport
- Ministry of Culture:
- Ministry of the Sea, Transport, and Infrastructure
- Regional governments
- Local governments
- Local stakeholders, such as representatives of civil and private sector
- Academia
- TSO, DSO

Recommendation 1.2: Mandate island or group of islands energy transition plans

Local energy planning assesses the existing demand, the potential for energy savings and energy efficiency, the state of the electricity grid,the need for improvements, and availability of integration of new projects. Most importantly, it defines priorities and needs for improvements in the existing energy system. Energy planning on the level of an island or group of islands should be mandated from the national government through the Energy Act.

As mentioned above, such plans have currently been prepared for fifteen islands[36] in collaboration with the EU initiatives such as Clean Energy Transition Plans (CETA) from the Clean energy for EU islands Secretariat or within Covenant of Mayors. Preparation of such plans help to understand the energy balance and needs of the islands and integrate all sectors including transport (road and marine), electricity and heating/cooling. Planning on the local level helps to identify not only potentials for projects, but also to set priorities based on the sector impact on the overall energy and economy of an island.

REPowerEU – Regions energy management

Regions and cities are playing a leading role in developing energy saving measures tailored to their local context. They should launch awareness and information and support schemes, energy audits and energy management

[36] Brac, Cres-Losinj, Hvar, Korcula and two groups of islands, Elafiti archipelago (Kolocep, Lopud and Sipan) and Zadar islands (Ist, Iz, Molat, Olib, Premuda, Rava, Silba and Skarda)

plans, pledging savings targets, and ensure citizens' engagement such as through the European Mission on climate-neutral and smart cities or the European Urban Initiative under cohesion policy.

Through preparation and implementation of mandatory regional Energy Efficiency Plans there are lessons learned that can help guide the design and implementation of better policy for island energy plans. Moreover, it could be considered how existing regional energy efficiency planning can be extended into much needed regional/local energy planning. Potentially one regional or local plan could cover a broader topic of sustainable energy transition and not just energy efficiency.

Actors involved:

- **Ministry of Economy and Sustainable Development, Directorate for Energy**
- **Local governments**
- Regional governments
- Regional Island coordinators
- Local stakeholders (Academia, Civil sector, Private sector)
- National/regional stakeholders (trade associations)
- TSO, DSO

Recommendation 1.3: Improve regional and local energy coordination and monitoring.

Currently there is two regional and local bodies responsible for coordination and monitoring of local and regional development: regional coordinators, which include islands' regional coordinator, and Local Action Groups (LAG), based on the Regional Development Act (Art. 29).[37] Neither of the two are explicitly responsible for coordination or monitoring of clean energy transition in their region. However, this function is very much needed. Clean energy transition is involved in all development sectors as energy is used for all basic functions.

We recommend that the coordination and monitoring of regional and local energy transition, and not just energy efficiency, is integrated into the responsibility of existing relevant regional (regional coordinator) and local (LAG) bodies, through national legislation. In addition, this should be done in coordinated action with the changes to the Energy Law which will recognise the need for regional and local energy transition coordination and monitoring. While this is probably needed for the whole territory of Croatia it is extremely important for the islands, as the way island territories are spread among municipalities creates complications in coordination of clean energy transition and sustainable management of local island resources. The regional and local bodies should be obliged to collaborate with regional island coordinators and local governments and their mayors.

The Ministry of Economy and Sustainable Development needs to evaluate how energy planning can be coordinated with national energy sector planning and with other regional and local sectoral plans discussed above. Based on lessons learned from Regional Energy Efficiency plans regional bodies and Taskforce for islands can prepare recommendations on how to create an effective

[37] Regional development Act https://www.zakon.hr/z/239/Zakon-o-regionalnom-razvoju-Republike-Hrvatske

feedback loop with regards to energy planning, coordination, and monitoring from regional or local level to national level for future planning and monitoring of implementation.

Actors involved:

- **Ministry of Regional Development and EU Funds**
- **Ministry of Economy and Sustainable Development**
- **Regional coordinators**
- **Local Action Groups (LAGs)**
- **Local governments**
- Regional governments
- Local stakeholders (Academia, Civil sector, Private sector)
- National/regional stakeholders (trade associations)

2. Lack of support schemes tailored to island characteristics and capacity

The National Recovery and Resilience Plan[38] foresees investments in the energy transition on the islands with projects focusing on transmission network improvements, distribution network improvements, modernisation of the network, and on improvement of the subsea cables towards Hvar-Korcula and Krk-Losinj-Cres. The Croatian Environmental Protection and Energy Efficiency fund provides open calls for funding opportunities where islands can apply. While there is no specific funding available only for the islands, the Fund opens calls for support up to 80% of the investment costs from islands from first group and up to 60% for islands from the second group.[39]

In addition, Ministry of Regional Development and EU funds is in the process of adoption of the Integral territorial program 2021-2027, which includes the Initiative for smart islands and energy efficiency as one of the horizontal topics. Based on this program, EUR 150 million of grant resources will be provided for the islands, of which 33 million is for sustainable energy. Specific projects in the public sector (public buildings and areas) will be identified on the regional and local level.

While there is funding available, the way it is granted makes it difficult to be used by the island initiatives or local stakeholder. Funding is distributed through open calls and tenders for projects, depending on the national priorities recognised under NECP and other energy and energy efficiency national plans. Despite annual monthly planning from the Fund, there is still lack of consistency in their frequency or time of year when they are published, as the implementation changes depending on available resources.[40] Therefore, typically local island stakeholders can be aware of the funding opportunities only once the call is open. In addition, short deadlines for submission create additional barriers for the islands to apply. Due to lack of resources of the island municipalities and lack of local energy planning, it takes time to mobilise municipalities and to prepare quality projects and documentation. Under current conditions, only rare local projects can manage to apply and even less to receive funding.

Aside of the issues with design and timing of the funding calls and tenders, another important barrier is the lack of technical know-how by the local stakeholder. The limited resources limit the number of projects that can be well prepared for the funding. Therefore, in existing open calls there are rarely even submitted projects from the islands. There is currently no national, regional, or local body that offers funding for technical assistance to the islands. Based on the request from the local government, a regional island coordinator can provide support. Although when it comes to energy transition topics, regional island coordinators also require capacity building. Currently, technical assistance is accessed through EU initiatives or funded projects.

Centralised planning of sustainable energy development results in planning of larger scale financially viable projects based on the available resources. These projects sometimes do not correspond to the local needs and priorities of the island stakeholders and lack support of the island civil society. In order to compete with such projects many islands and local stakeholders need to join in collaboration in order to prepare one larger scale financially viable project. This takes extensive local planning, resources, and time.

[38] https://ec.europa.eu/info/business-economy-euro/recovery-coronavirus/recovery-and-resilience-facility/croatias-recovery-and-resilience-plan_en
[39] https://www.fzoeu.hr/hr/natjecaj/7539?nid=165&fbclid=IwAR0J5QC6bayYPVfgWR0lfsV4X1fpZ4sMbvTpyEH5kaBajOmbd-S-XZa3Kuc
[40] Currently due to Covid-19 pandemic and energy crisis caused by Ukraine-Russia war, the funding is less predictable as national budget planning changes according to the needs.

Recommendation 2.1: Improve planning and communication of planned funding calls

When it comes to available funding, in order to enable island local projects to participate in the open calls and tenders, there should be a clear annual or bi-annual frequency of calls, with the same deadline each year. Such planning of the open calls from the Environmental Protection and Energy Efficiency Fund (EPEEF)[41] creates consistency and certainty, allowing local stakeholder and local governments to organise with local stakeholders, plan and prepare viable projects for funding. Moreover, the calls should be relatively consistent in the required documentation allowing streamlining of the project preparation.

The Fund refers to the national planning, and specifically NECP, for the priority topics when planning the annual funding calls. Therefore, in order to assure that the future calls can include separate calls for island projects, the NECP update in preparation for 2023 should include island energy transition as one of the priorities.

Regulatory best practice

Island specific support policy

Italy
In Italy, the Decree of Ministry of Economic Development of 14 February 2017 defined objectives and incentive methods for renewable energy in the small Italian islands non-interconnected with the electricity grid of the continent. Specifically, it established the minimum development objectives for the production of electricity and thermal energy from renewable sources, and the methods for supporting the investments needed for their realisation. According to several stakeholders, this Decree has been proven very useful for all Italian Islands. On Salina Island for example, a project of 200 kW PV has been developed for the association of hoteliers of Salina. Via the Decree this project receives Feed-in Tariffs, which is now, with high energy prices, particularly relevant. Also, for Pantelleria the Decree was effective: the municipality has presented five projects on energy efficiency in municipal buildings that have been all financed via the Decree.

Actors involved:

- **The Environmental Protection and Energy Efficiency Fund**
- **Ministry of Economy and Sustainable Development, Directorate for Energy**
- Ministry of Regional Development and EU Funds:
  - Directorate for Islands
  - Directorate for Strategic Planning and Coordination of EU Funds
- Regional governments
- Local governments
- Local stakeholders (Civil society, private sector etc.)
- Academia
- TSO/DSO

[41] https://www.fzoeu.hr/en/activities-of-the-fund/1325

Recommendation 2.2 Provide technical assistance for clean energy projects for islands

As mentioned above, there is a lack of resources and technically skilled personnel on the local level for planning and preparation of clean energy projects. We recommend that the NECP update identifies the need for technical assistance and capacity building in regard to clean energy transition on the regional and local level. Based on this the EPEEF can in the future provide funding for technical assistance to the islands from the Croatian energy experts, through a call for technical assistance. A pool of energy and island experts can be formed which would be matched with requested technical assistance. This way local and national knowledge can be mobilised to accelerate the energy transition on the islands.

Technical assistance can take the form of, for instance, workshops for municipalities, guidelines for energy transition, preparation of local energy plans, preparation of technical documentation for clean energy projects or roadmaps for project implementation and involvement of local stakeholders. A starting point can be to get in contact with the regional island coordinators and local stakeholders to assess the current needs and priorities, as discussed in recommendation 2.3. Existing education programmes of the EIHP[42] or academic institutions can be consulted to find which support is already being offered.

REPowerEU – Sufficient and adequate staffing

The recommendation on permitting stipulates that Member States should ensure sufficient and adequate staffing, with relevant skills and qualifications, for their permit-granting bodies and environmental assessment authorities. Member States should use the Union and national funding opportunities available for upskilling and reskilling, in particular at regional and local level, and consider setting up an Alliance for sectoral cooperation on skills to bridge the skills gap of staff working on permit-granting procedures and on environmental assessments.

Actors involved:

- **The Environmental Protection and Energy Efficiency Fund**
- **Ministry of Economy and Sustainable Development, Directorate for Energy**
- **Regional governments, including regional island coordinators**
- Ministry of Regional Development and EU Funds:
  - Directorate for Islands
  - Directorate for Strategic Planning and Coordination of EU Funds
- EIHP
- Local governments
- Local stakeholders (Academia, Civil sector, Private sector)
- National/regional stakeholders (trade associations)
- TSO, DSO

[42] http://www.eihp.hr/

Recommendation 2.3: Foster local stakeholder engagement in energy projects

The currently planned energy projects aim to fulfil national goals and obligations in the most optimal way, from an energy and a financial point of view. However, energy projects use local resources and hence should address local needs and involve local stakeholders. We recommend analysing islands energy needs and priorities. Local energy needs and priorities can be assessed using island/local energy plans discussed in recommendation 1.3. The Taskforce for islands can identify islands energy needs and priorities, based on existing regional and local plans and involvement of relevant regional and local experts. Based on this analysis, the Taskforce can provide recommendations to the Directorate of Energy to reassesses the allocation of EU and national funds to dedicated projects on the islands and to design policy to foster local stakeholder involvement.

REPowerEU - public acceptance of renewable energy projects

Consideration 18 of the Recommendation highlights that the lack of public acceptance of renewable energy projects is another significant barrier to their implementation in many Member States. To address this, the needs and perspectives of citizens and societal stakeholders should be taken into account at all stages of renewable projects development – from policy development to spatial planning and project development – and good practices for ensuring just distribution of the various impacts of installations among the local population should be encouraged.

To encourage and foster local stakeholder collaboration and provide a platform for the local energy projects to develop, the national energy policy should encourage and require local stakeholder participation in energy projects on the islands. This can be encouraged either through requirements for a share of local ownership or additional financial support for projects that foster local stakeholder involvement.

With a focus on private financial initiatives, municipalities require a push from local stakeholders to get clean energy projects off the ground. Engagement of the local stakeholders including such private parties, is therefore important. Giving these stakeholders a better voice, will help them to influence municipalities and continue to promote mobilisation of private investment.

With regards to local needs and priorities, we recommend a platform where local stakeholders from different islands can connect, share ideas, and find common projects. The platform should be provided by the Taskforce for islands, in a joint effort with regional coordinators, including the regional island coordinator and the local island governments. Currently initiatives such as the Island Movement[43] or the Green Energy Cooperative[44] have been creating such platform to unite stakeholders and raise awareness.

Regulatory best practice

Participation of local stakeholders in energy projects

Scotland – Local Energy Scotland developed a 'Community and Renewable Energy Scheme (CARES) Toolkit', a step-by-step guide for the process of developing a renewable energy project. A specific module of this toolkit deals with 'Shared Ownership',

[43] https://islandmovement.eu/en/about-us/
[44] https://www.zez.coop/

explaining some of the legal structures that exist such as, Owner operator, Commercial developer led, Joint ventures, Shared revenue, Split ownership, etc.

Spain, Balearic Islands - The Balearic Climate change and Energy Transition Act,[45] approved in February 2019, requires the public administrations of the Balearic Islands to support participation of citizens, civil society organisations and local renewable energy communities in the deployment and management of renewable energy systems. More precisely, Article 49 of the Act defines that the local participation of at least 20% should be encouraged or obliged for RES projects with less than 5.0 MWp or more than 5 MWp, respectively.

Regular meetings can be useful for stakeholders to discuss their needs and priorities. This can also serve as a platform for trade associations. Municipalities, through the island committee, are then invited to join to hear how the different municipalities and regions approach clean energy. The information shared can serve as input for the guidelines (recommendation 1.3) and for the integrated plans (recommendation 3.1). Relevant parties include:

- EPEEF[46] for funding
- EIHP[47] and HAMAG BICRO[48] for support
- HERA for tariffs
- TSO (HOPS) / DSO (HEP-ODS)
- More potential stakeholders can be found through the partners of the EIHP: https://eihp.hr/partneri/.

Actors involved:

- **Ministry of Economy and Sustainable Development, Directorate for Energy**
- **Ministry of Regional Development and EU Funds, Directorate for Islands**
- **Regional coordinators, including regional island coordinators**
- **Local governments**
- Local stakeholders (Academia, Civil sector, Private sector)
- National/regional stakeholders (trade associations)
- TSO (HOPS), DSO (HEP-ODS)

[45] http://www.caib.es/sites/canviclimatic2/es/llei_de_ccite/

[46] https://www.fzoeu.hr/en/activities-of-the-fund/1325
[47] https://eihp.hr/
[48] https://hamagbicro.hr/

3. Need for better integration of clean energy transition and spatial planning

The Croatian territory is split into the city of Zagreb and 20 counties, of which six have inhabited islands. Spatial planning includes national spatial plans, regional (county level) and local spatial plans. Each of the lower-level spatial plans has to respect restrictions defined by the above defined spatial plan.[49] Two aspects of the spatial planning disproportionately affect islands' clean energy transition: energy strategy not being one that directly impacts the space (as shown in Figure 1) and significant coverage of the island land and surrounding sea area with the protected area (Figure 2). The land use and priorities are further regulated by the regional and local spatial plans. The Spatial Development Strategy of the Republic of Croatia[50] identifies the specifics and complexity of spatial planning on the islands, amongst others due to fragmentation of islands into multiple local governments and, even in case of Pag island, multiple counties. This creates additional complexities with spatial planning.

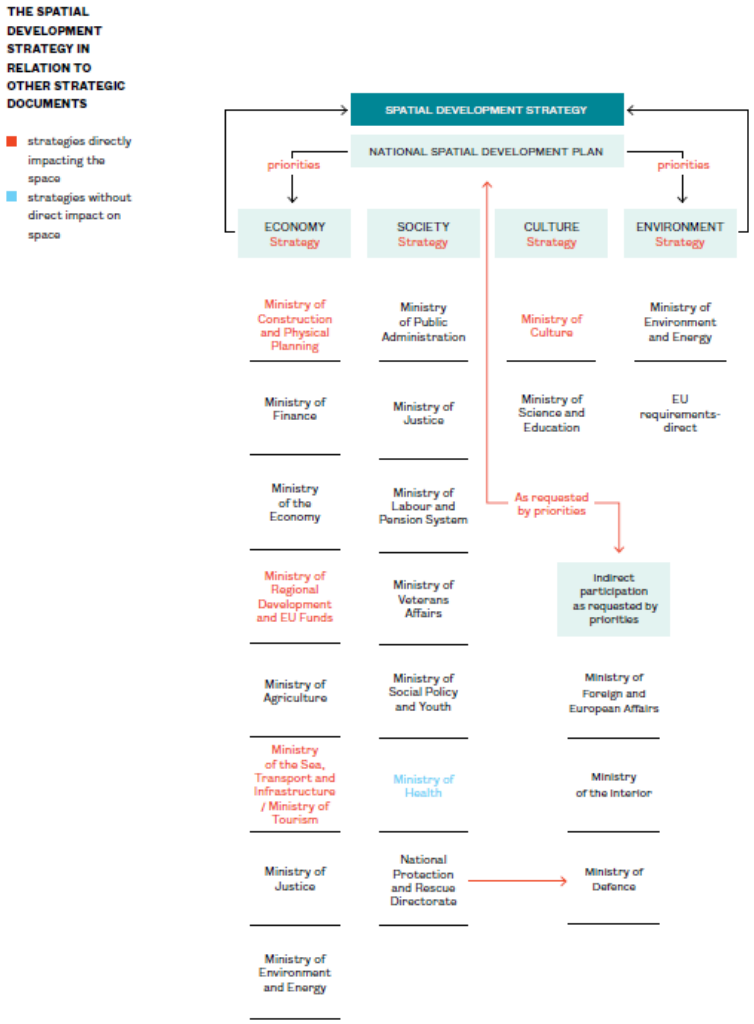


Figure 1 Diagram showing the Spatial Development Strategy in Relation to other strategic documents and policies – Source

[49] https://rainman-toolbox.eu/wp-content/uploads/2020/06/RAINMAN_Spatial-Planning_Croatia.pdf
[50] https://mpgi.gov.hr/UserDocsImages/Zavod/Publikacije/Spaltial.Development.Strategy.pdf

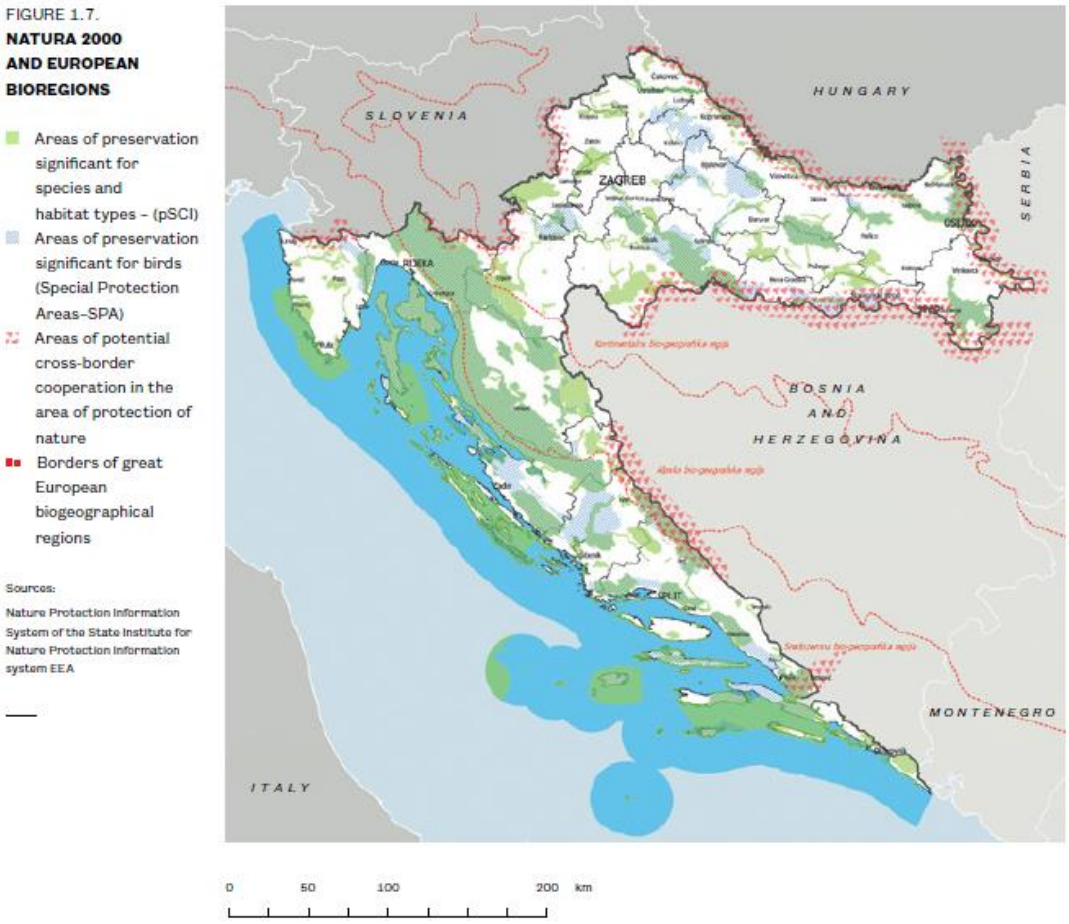


Figure 2 Protected areas on the Croatian islands and around them as shown in the Spatial Development Strategy of the Republic of Croatia – Source

Spatial planning is a complex process which takes into account existing studies and input data from various aspects, including protection of nature and environment, demographic, sociological, landscape and tourism, agriculture, and energy. The process of preparation of spatial planning documents asks for opinions from various relevant sectoral bodies. However, if the input data for optimal energy projects on the islands is not available then such aspects are not included.

Islands have limited land area and there are currently no guidelines in spatial plans on priorities between sectors (tourism, agriculture, environment, energy) for specific regions, taking into account the need for the energy transition and mitigation and adaptation to climate change. With significant coverage of islands with protected areas and restrictions on type of areas where clean energy project can be implemented (such as no implementation of PV plants outside of the construction zones), it leaves whole islands without possible location for clean energy projects.

In addition, lack of integration of clean energy projects, or areas where the projects can be possible in the spatial plans causes lengthy and complex procedure for planning of energy projects on the islands that involves various levels of government and sector opinions.

When it comes to marine spatial planning, different marine areas are covered by different local plans which include both terrestrial and marine areas. Currently there is no single marine spatial

plan, although the preparation of the State Plan for Spatial Development for the entire terrestrial and marine area (up to the external limit of territorial waters) of Republic of Croatia has started.[51]

Different regional governments that include islands have different strategies towards the clean energy development of islands. For example, Zadar county and Sibenik-Knin county see clean energy projects as a priority and allow local municipalities to define specific areas where they could be implemented. In other regions, clean energy project areas are strictly defined on the regional level allowing little flexibility or choice to the local governments and stakeholders. Introduction of changes to the spatial plans require procedure that typically lasts more than two years, which can drastically slow down the project.

Moreover, generalised limitations for renewable energy projects which might be justified on the mainland, create significant barrier for the islands, considering the local context. For example, limiting installation of PV to the rooftops of public buildings, can mean no possible areas for PV installation on the islands where public buildings are under cultural heritage protection. Moreover, refurbishment of cultural heritage buildings is even more expensive due to the specific requirements.

Recommendation 3.1: Re-assess spatial planning guidelines and restrictions for clean energy projects on the islands

Existing protected areas and spatial restrictions result in lack of areas for implementation of clean energy projects. Therefore, we recommend that the national spatial planning guidelines for clean energy projects be re-assessed taking into account specifics of islands development, clean energy technologies and climate crisis. While such re-assessment might be needed for the whole territory of Croatia, climate change disproportionately affects islands which is why these areas should be treated with more attention. Such guidelines provided from the national level can be used to improve regional and local spatial plans and allow for simpler and faster adjustments of the spatial plans in the future, especially in light of go-to areas discussed in recommendation 3.2 below. In addition, other sectors, such as cultural heritage and environmental protection, can provide their updated guidelines for clean energy projects to be included in the spatial planning guidelines.

While different sectors can provide guidelines for integration of clean energy projects that should be included in the spatial planning guidelines, the main responsibility lies with the national, regional, and local governments responsible for energy sector to provide priority areas (recommendation 3.2) as well as existing relevant national, regional, and local energy plans which can be used as basis for spatial planning. Spatial planning guidelines for integration of energy projects with other sectors should keep in mind a holistic approach to energy transition needed for the islands sustainable development. A holistic approach facilitates the integration of several sectors including water management, waste management, transport (road and marine), electricity and heating/cooling infrastructure and generators, implement energy efficiency, create flexible electricity systems that provide security of supply and increase share of renewable energy projects. A holistic approach to energy planning should results in clear priorities of various sectors on the use of resources on the islands.

[51] https://maritime-spatial-planning.ec.europa.eu/countries/croatia

Actors involved:

- **Ministry of Physical Planning, Construction and State Assets**
- **Ministry of Economy and Sustainable development, Directorate for Energy**
- **Regional coordinators, including regional island coordinators**
- **Regional governments**
- Ministry of Regional Development and EU funds, Directorate for islands
- Ministry of Tourism and Sport
- Ministry of the Sea, Transport, and Infrastructure
- EIHP
- Local governments
- Local stakeholders (Academia, Civil sector, Private sector)
- National/regional stakeholders (trade associations)
- TSO, DSO

Recommendation 3.2: Identify go-to areas on the islands

Integration of spatial planning and sectoral strategies and plans[52] is fundamental in identifying and accessing suitable land for renewable energy projects but is not a common practice, as discussed above.

In order to accelerate the energy transition on the islands, the implementation procedure of clean energy projects needs to be simplified. We recommend identifying go-to areas specifically for one or more renewable energy sources on each of the islands. Go-to areas are those areas that are particularly suitable to develop any size renewable energy project. Go-to areas can be specific to technology and should be identified taking into account climate change, environmental protection, cultural heritage, and other restrictions. Authorisation procedures for projects in go-to areas should be simplified.

The Ministry of Economy and Sustainable development keeps a Registry of renewable energy and high-efficiency cogeneration projects and plants.[53] As already recognised by the Ministry in the *Analysis with recommendations for removing barriers and simplification of administrative procedures that limit the use of renewable energy sources*[54] published in June 2022, the Registry needs to be updated and technically improved. We recommend that the Registry is expanded to include go-to areas for the RES projects, including the areas on the islands.

Aside from regional energy efficiency plans, there are currently no mandatory regional energy plans. Therefore, we recommend the regional and local energy plans, proposed in recommendation 1.3, are aligned with identified go-to areas.

[52] Such as regional energy efficiency plans, regional development plans, regional and local implementation programs, proposed mandatory islands energy plans.

[53] https://mingor.gov.hr/o-ministarstvu-1065/djelokrug/uprava-za-energetiku-1999/registar-oiekpp/5332

[54] https://mingor.gov.hr/UserDocsImages/UPRAVA%20ZA%20ENERGETIKU/PROCJENA%20S%20PREPORUKAMA%20ZA%20UKLANJANJE%20PREPREKA%20I%20RASTERE%C4%86ENJE%20ADMINISTRATIVNIH%20POSTUPAKA%20KOJI%20OGRANI%C4%8CAVAJU%20VE%C4%86E%20KORI%C5%A0TENJE%20ENERGIJE%20IZ%20OBNOVLJIVIH%20IZVORA.pdf

Go-to areas have to be prepared in coordination with DSO (HEP-ODS), and TSO (HOPS) where relevant, who would help identify possible areas where clean energy projects can be integrated and those that could benefit from smart grid solutions, such as flexibility, demand side management, aggregation, or storage systems.

The go-to areas should be integrated with the regional and local spatial planning documents. Consequently, projects in these zones should be subjected to fast-track and simplified permitting procedures and lightened environmental impact assessments in line with REPowerEU recommendations.

Collaboration with local stakeholders, through the Taskforce for islands will aid in forming which energy solutions are necessary, and best suited to the local or regional level. Since go-to areas might be decided on the regional level, we recommend that engagement of local stakeholders, and significantly local municipalities, get a formal role in decision-making procedures. Stakeholder engagement should be a mandatory part of the legislative procedure, where relevant.

REPowerEU – Renewable go-to areas

Article 1(1) adds a new definition to Article 2 of Directive (EU) 2018/2001, to define 'renewables go-to area'. Which means *a specific location, whether on land or sea, which has been designated by a Member State as particularly suitable for the installation of plants for the production of energy from renewable sources, other than biomass combustion plants*. Article 1(4) inserts a new Article 15b on the obligation for Member States to identify the land and sea areas necessary for the installation of plants for the production of energy from renewable sources in order to meet their national contributions towards the 2030 renewable energy target. Article 1(5) inserts a new Article 15c on the obligation for Member States to adopt a plan or plans designating 'renewables go-to areas', which are particularly suitable areas for the installation of production of energy from renewable sources.

> A faster roll-out of renewable energy projects could be supported by strategic planning carried out by Member States. Member States should identify the land and sea areas necessary for the installation of plants for the production of energy from renewable sources in order to meet their national contributions towards the revised 2030 renewable energy target set out in Article 3(1) of Directive (EU) 2018/2001. The identification of the required land and sea areas should take into consideration the availability of the renewable energy resources and the potential offered by the different land and sea areas for renewable energy production of the different technologies, the projected energy demand overall and in the different regions of the Member State, and the availability of relevant grid infrastructure, storage and other flexibility tools bearing in mind the capacity needed to cater for the increasing amount of renewable energy.
>
> **Member States should designate as renewables go-to areas those areas that are particularly suitable to develop renewable energy projects, differentiating between technologies, and where the deployment of the specific type of renewable energy sources is not expected to have a significant environmental impact.** In the designation of renewables go-to areas, Member States should avoid protected areas to the extent possible and consider restoration plans. Member States may designate renewable go-to areas specific for one or more types of renewable energy plants and should indicate the type or types of renewable energy that are suitable to be produced in each renewable go-to area.

Actors involved:

- **Ministry of Economy and Sustainable development, Directorate for Energy**
- **Regional coordinators, including regional island coordinators**
- **HEP (DSO)**

- **Ministry of Physical Planning, Construction and State Assets**
- **Regional governments**
- Ministry of Regional Development and EU funds, Directorate for islands
- Ministry of Tourism and Sport
- Ministry of Culture
- Ministry of the Sea, Transport, and Infrastructure
- EIHP
- HOPS (TSO)
- Local governments
- Local stakeholders (Academia, Civil sector, Private sector)
- National/regional stakeholders (trade associations)

4. Lengthy permitting procedures for clean energy projects

The permitting procedure for RES plants in Croatia includes five main steps as indicated in Annex 3 of this Study. The permitting procedure involves various permitting bodies on local, regional, and national level. In addition, different permits are dependent on each other, which additionally complicates the process. For example, spatial planning is a prerequisite for acquiring many permits. Therefore, if the project is not foreseen in the spatial plan, amending the spatial plan can add at least one year for the complete permitting procedure.

In June 2022 Ministry of Economy and Sustainable Development published the "Analysis with recommendations for removing barriers and simplification of administrative procedures that limit the use of renewable energy sources."[55] This document provides analysis of all permitting steps for implementation of RES projects on the territory of Croatia and provides recommendations for their simplification.

The permitting procedure is simplified for PV or solar thermal installed on the rooftops of buildings/houses and if the electricity is used for self-consumption (not connected to the grid). However, this includes only small installed capacities and cannot be the main driver for clean energy transition. Large RES projects are uncommon for the Croatian islands and even when planned can take three years or more to be realised (e.g., Vis PV plant).

Specifically for Croatian islands, a lack of clarity with regards to land ownership and cadastre complicate the permitting and implementation process.[56]

Such lengthy permitting procedures, pose a significant barrier to implementation, and are seen as risk to financing and investment.

Recommendation 4.1: Introduce simplified procedure and establish single permit

We recommend that the Ministry of Physical Planning, Construction and State Assets addresses the lengthy procedures by amending regulation so that less time is needed to set up clean energy projects. The above-mentioned analysis of administrative barriers and recommendations for RES projects, published by the Ministry of Economy and Sustainable development outlines 10 measures which include improving coordination between energy and spatial planning, increasing capacity of all relevant institutions involved in the process and many more.

Priority should be given to easing the permitting requirements or providing fast and simplified procedures for clean energy projects. The Ministry should use existing simplified procedures for connections to the low-voltage network that do not require technical adjustments, and rooftop PV and net metering, as an example.

While Ministry of Physical Planning, Construction and State Assets has digitalised their spatial planning and construction permits,[57] there should be a country wide effort for complete permitting process to be digitalised as much as possible.

[55] https://mingor.gov.hr/UserDocsImages/UPRAVA%20ZA%20ENERGETIKU/PROCJENA%20S%20PREPORUKAMA%20ZA%20UKLANJANJE%20PREPREKA%20I%20RASTERE%C4%86ENJE%20ADMINISTRATIVNIH%20POSTUPAKA%20KOJI%20OGRANI%C4%8CAVAJU%20VE%C4%86E%20KORI%C5%A0TENJE%20ENERGIJE%20IZ%20OBNOVLJIVIH%20IZVORA.pdf

[56] Land on the islands is very often owned by multiple parties, of which some are located in Croatia and other in different countries and can be extremely hard to reach. .

[57] https://ispu.mgipu.hr/#/

A possible simplification can be to explore options for a single permit, for instance for any clean energy project on the islands or for a specific size and type of the project which is considered a priority in strategic documents. Other additional recommendations for simplification of the procedures are to:

- Modify some administrative requirements to allow the modification of projects already in the pipeline (allowing to take advantage of the most recent technological development).
- Simplify and harmonise the criteria across the different institutional levels (municipal, regional, and national) and between sectors (energy, construction, environment, culture, tourism, agriculture etc.). This way procedure for specific size or type of plants can be streamlined and made faster and easier to follow through.

Regulatory best practice

Simplified procedure for RES projects

Greece - introduced a simplified procedure for ground mounted PV plants with installed capacity lower than 1 MW where some steps in the authorisation process are removed (certification of the RES producer), while other are simplified to the single permit (administrative authorisation and gird connection).

Portugal – stopped requiring environmental impact assessments for new PV projects with a capacity of under 50 MW.[58]

Spain - has adopted a temporary accelerated procedure[59] for wind farms less than 75 MW and PV plants with installed capacity less than 150 MW. The efforts are aimed at accelerating clean energy transition.

Lengthy procedures indicate lack of human capacity at the key institutions, whose approval or assessment is needed to approve the project. The above-mentioned analysis sees this as one of the main barriers. In that case, the national government, together with regional and local government can design systematic programs to increase awareness and knowledge of existing human resources. In addition to measures recommended by the Ministry's analysis, we stress the need for capacity building regarding clean energy projects on regional and local levels.

REPowerEU – Sufficient and adequate staffing

The recommendation on permitting stipulates that Member States should ensure sufficient and adequate staffing, with relevant skills and qualifications, for their permit-granting bodies and environmental assessment authorities. Member States should use the Union and national funding opportunities available for upskilling and reskilling, in particular at regional and local level, and consider setting up an Alliance for sectoral cooperation on skills to bridge the skills gap of staff working on permit-granting procedures and on environmental assessments.

Actors involved:

- **Ministry of Physical Planning, Construction and State Assets**

[58] https://www.pv-tech.org/portugal-to-waive-environmental-impact-studies-for-solar-plants-under-50mw/

[59] Until 24 December 2021. Accelerated procedure is directed to environmental permit for projects not located in Natura 2000 Network areas and in low to moderate sensitivity areas
https://www.pv-magazine.com/2022/03/31/spain-streamlines-permits-for-utility-scale-solar-supports-another-7gw-under-self-consumption/

- **Ministry of Economy and Sustainable development, Directorate for Energy**
- Ministry of Regional Development and EU Funds, Directorate for Islands
- Ministry of the Sea, Transport, and Infrastructure
- Ministry of Culture
- Regional governments
- Local governments
- Local stakeholders (Academia, Civil sector, Private sector)
- HOPS (TSO)
- HEP-ODS (DSO)

Recommendation 4.2: Set-up regional one-stop shops

A range of permits must be obtained for renewable energy projects including at the municipal level, regional and national level, distribution and transmission system operators, and the energy regulator. As the permitting procedure consists of many steps and parties involved, the government should organise regional level one-stop shops for clean energy project. The one-stop shop should be managed by a designated body, that is in collaboration with regional islands coordinator who is aware of the local situation. The applicant for a clean energy project provides needed documentation and communicates with only this one authority at the regional level. This authority is ultimately responsible for the distribution of the documentation to the relevant bodies for approval, the follow-up with those bodies to deliver their responses in time and to coordinate between those bodies and the applicant.

REPowerEU – One-stop-shop

The recommendation on permitting stipulates that Member States should design a one-stop-shop for granting permits for renewable energy projects required in Directive (EU) 2018/2001 in such a way as to limit the number of authorities involved to what is necessary and maximise efficiency, taking into account public resources and the benefits of concentrating technological, environmental, and legal expertise.

A one-stop shops would make coordination (including with local stakeholders) and monitoring of clean energy projects easier. It would also help identify bottlenecks in implementation, understanding where there is a need for additional training or improved legislation. Moreover, a one-stop shop could function on the regional level, taking into account existence of regional islands coordinator and obligation for regional Island development plans. If energy plans on the level of an island or group of islands were mandatory, as previously recommended, the work of the one-stop shop could be easily guided to meet local need and priorities and national targets.

Actors involved:

- **Regional governments**
- **Ministry of Regional Development and EU Funds, Directorate for Islands**
  - **Regional island coordinators**
- **Ministry of Economy and Sustainable development, Directorate for Energy**
- Ministry of Physical Planning, Construction and State Assets
- Ministry for Culture

- Local governments
- Local stakeholders (Academia, Civil sector, Private sector)
- TSO, DSO

5. Lack of support for energy communities

Croatia has adopted the RES Act[60] that transposes the Renewable Energy directive 2018/2001[61] (RED II) when it comes to renewable energy communities,[62] collective-self consumption within the same apartment building, peer-2-peer exchange, and active consumers. The Electricity market Act[63] defines citizen energy communities and transposes the Electricity Market Directive 2019/944.[64] The Acts have been adopted by the end of 2021. However, there is still need for clarity on how the follow up regulation will support energy communities and other collective energy actions.

There have been actions to raise awareness about energy communities and possible involvement of local island stakeholders. However, there is still no clarity on what might be benefit for the local citizens and stakeholders in being part of an energy community. Such uncertainty leads to lack of activities from the local actors.

Recommendation 5.1: Prioritise regulatory framework and provide right incentives

Energy communities can help faster uptake of renewable energy or implementation of energy savings or efficiency measures among households and local stakeholders, who are usually less responsive. The involvement of local stakeholders increases the acceptance of the local community towards the renewable energy projects and helps bring benefits of such projects back to the local community. Therefore, prioritisation of development of the regulatory framework for energy communities should be one of the points of attention for clean energy transition on the Croatian islands. We recommend faster adoption of the regulation to provide clarity to the ecosystem in which energy communities should operate.

REPowerEU

Consideration 18 of the Recommendation highlights that the lack of **public acceptance of renewable energy projects** is another significant barrier to their implementation in many Member States. To address this, the needs and perspectives of citizens and societal stakeholders should be taken into account at all stages of renewable projects development – from policy development to spatial planning and project development – and good practices for ensuring just distribution of the various impacts of installations among the local population should be encouraged.

Regarding **facilitating citizen and community participation**, Member States should stimulate the participation of citizens, including from low and middle-income households, and energy communities in renewable energy projects, as well as take measures to encourage passing the benefits of the energy transition on to local communities thus enhancing public acceptance and engagement. Member States should implement simplified permit-granting procedures for renewable energy communities, including for the connection of community-owned plants to the grid

Energy communities and any community/local stakeholders' involvement in energy projects represents a new approach for both energy sector and local stakeholders. Therefore, to create more interest in energy communities and enable their uptake, the regulatory framework should provide

[60] https://www.zakon.hr/z/827/Zakon-o-obnovljivim-izvorima-energije-i-visokou%C4%8Dinkovitoj-kogeneraciji
[61] https://energy.ec.europa.eu/topics/renewable-energy/renewable-energy-directive-targets-and-rules/renewable-energy-directive_en
[62] https://www.energy-community.org/dam/jcr:3b5ce3f6-e5d8-4800-94b3-b1d691374a55/RECG-HROTE_052022.pdf
[63] https://narodne-novine.nn.hr/clanci/sluzbeni/2021_10_111_1940.html
[64] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32019L0944

support/benefit for energy communities involved in sustainable energy project. The support can be in the form of incentives for specific projects, tax benefits and technical assistance for starting an energy community.

Regulatory best practice

Simplified procedures for energy communities

Ireland – Energy communities do not need to have a planning permission before their grid application while commercial projects do need to have it, making it less burdensome. On top of that new bill has recently passed simplifying authorisation procedure for community projects[65].

As previously discussed, permitting procedures are lengthy and complex, which creates a barrier for an energy community to organise to have ownership of an energy project. Therefore, another important support mechanism would be simplified procedures for energy communities to realise clean energy projects.

Actors involved:

- **Ministry of Economy and Sustainable Development, Directorate for Energy**
- **National Regulatory Authority, HERA**
- **National electricity market operator, HROTE**
- Ministry of Regional Development and EU Funds, Directorate for Islands
- Local stakeholders (Academia, Civil sector, Private sector)
- TSO, DSO

Recommendation 5.2: Use regulatory sandboxes for community energy initiatives

Regulatory sandboxes[66] allow controlled environments for testing of new tariffs and innovative technologies. While regulatory sandboxes for testing of innovative technology for DSO[67] or TSO[68] are possible, regulatory sandboxes that allow for variation in tariffs cannot be implemented. We recommend developing regulatory framework to allow regulatory sandboxes with electricity tariffs, for special cases allowed by HERA.

Regulatory sandboxes can be used to provide a legal basis for localised experiments within energy communities until the full legislation with relevant regulations is available. Regulatory sandboxes are ways for authorities, tasked with implementation and enforcing of specific legislation, to test innovative approaches and technologies in real-life situations through time limited implementation of except to the existing legislation. This way incentives for clean energy transition on the islands

[65] Planning and Development (Solar Panels for Public Buildings, Schools, Homes, and Other Premises) (Amendment) Bill 2021 (https://www.oireachtas.ie/en/debates/debate/seanad/2021-06-28/18/).

[66] https://www.consilium.europa.eu/en/press/press-releases/2020/11/16/regulatory-sandboxes-and-experimentation-clauses-as-tools-for-better-regulation-council-adopts-conclusions/

[67] Metodologiju za određivanje iznosa tarifnih stavki za distribuciju električne energije https://narodne-novine.nn.hr/clanci/sluzbeni/2022_07_84_1283.html

[68] Metodologiju za određivanje iznosa tarifnih stavki za prijenos električne energije https://narodne-novine.nn.hr/clanci/sluzbeni/2022_07_84_1284.html

can be tested without a permanent change in legislation. It also gives room to evaluate the success of the experiment. Moreover, testing within regulatory sandboxes can help test different subsidies

REPowerEU

Innovation and sandboxing

Article 1(3) of the proposed amendments to RED II inserts a new paragraph 2a in Article 15 requiring the Member States to promote the testing of new renewable energy technologies while applying appropriate safeguards:

> '*Member States shall promote the testing of new renewable energy technologies* ***in pilot projects in a real-world environment****, for a limited period of time, in accordance with the applicable EU legislation and accompanied by appropriate safeguards to ensure the secure operation of the electricity system and avoid disproportionate impacts on the functioning of the internal market, under the supervision of a competent authority.*'

Consideration 18 of the Recommendation highlights that barriers resulting from permit procedures might also affect the future deployment of innovative decarbonisation technologies needed for climate neutrality. Setting up regulatory sandboxes, that is to say the testing, in a real-life environment, of innovative technologies, products, services or approaches, which are not fully compliant with the existing legal and regulatory framework, could support innovation and facilitate the subsequent adaptation of the regulatory environment to accommodate them.

Member States are encouraged to put in place **regulatory sandboxes** to grant targeted exemptions from the national, regional, or local legislative or regulatory framework for innovative technologies, products, services, or approaches, to facilitate permit granting in support of the deployment and system integration of renewable energy, storage, and other decarbonisation technologies, in line with Union legislation.

through tariffs or various ways of integration of community energy initiatives with the electricity grid. Croatian islands allow for a great opportunity for such sandboxes due to geographical constrains.

Regulatory sandboxes have been implemented in Italy,[69] Austria, Germany, and Netherlands for temporary tests of specific energy tariffs.[70]

Actors involved:

- **Ministry of Economy and Sustainable development, Directorate for Energy**
- **National Regulatory Authority, HERA**
- Ministry of Regional Development and EU Funds, Directorate for Islands
- Regional and local governments
- Island coordinators
- Local stakeholders (Academia, Civil sector, Private sector)
- DSO

[69] https://www.iea-isgan.org/wp-content/uploads/2021/10/Regulatory-Sandbox-2.0_For-Publication.pdf
[70] https://fsr.eui.eu/regulatory-sandboxes-in-the-energy-sector-the-what-the-who-and-the-how/

Recommendation 5.3: Foster local awareness raising and support

Currently, local stakeholders do not see the benefits of energy communities or community energy initiatives, as they are also not aware of many options that energy transition and clear energy technologies can offer. There are not many examples of community involvement in sustainable energy projects.

Therefore, there is a need for collaboration between national government, regional islands coordinators and islands to find a best way to raise awareness of the local stakeholder. We recommend having sustainable energy offices organised by local governments in coordination with the regional island coordinator, per island or group of islands where local stakeholders can receive information about the current regulation, possible support schemes and technical options on how they can get involved in energy transition on the islands. The offices can also work with the civil sector to disseminate best practices and provide more visibility to existing projects and activities on the islands.

Actors involved:

- **Local governments**
- **Regional island coordinators**
- Ministry of Economy and Sustainable development, Directorate for Energy
- Ministry of Regional Development and EU Funds, Directorate for Islands
  - Regional Island coordinators
- Regional governments
- Local stakeholders (Academia, Civil sector, Private sector)

6. Lack of security of supply on islands due to seasonality

Following on the National Island Development Plan 2021-2027, Croatian islands are facing grid constraints due to the aging infrastructure that leads to the lack of security of supply during peak hours during the summer season. To cope with this, the Croatian National Recovery and Resilience Plan[71] foresees investments in the energy transition on the islands with projects such transmission network improvements, distribution network improvements, and modernisation of the network (which is foreseen for the whole country). For the islands, the improvement of the subsea cables towards Hvar-Korcula and Krk-Losinj-Cres are the main projects.

In Croatia, grid capacity for demand related reasons is socialised and centrally planned. It is based on 10-year development plans. Grid capacity upgrades are demand led. This means that the DSO projects how demand will grow and upgrades the grids accordingly. It is not based on potential generation capacity. As such, any (renewable) energy project, whether on an island or not, has to apply and then the grid could get upgraded if needed. It is acknowledged that a grid upgrade on the mainland would be cheaper, quicker, and easier than the grid upgrades on islands. This general policy on grid development for generation thus has a disproportionate impact on (island) grid development.

Aside from improvement of the electricity grid lines, the security of supply on the islands can be improved with the implementation of storage and improving the flexibility of the local grids. The Electricity Market Act,[72] adopted at the end of 2021, provides the legal framework for use of energy storage, aggregation, and demand side flexibility. No energy license is needed for the operation of storage behind-the-meter or storage that is not connected to the grid and has less than 500 kW capacity. Aggregated and storage capacity greater than 500 kW can participate in the wholesale market. Current legislation represents a good starting point. However, regulation on how the implementation of storage systems will be supported is not yet clear.

Recommendation 6.1: Adapt grid development methodology from an ad-hoc approach to a future-oriented approach

If there is no availability on the grid, the developer of a renewable energy project either has to pay for the network to be upgraded or downscale the size of the project.[73] To allow Croatian islands to fully benefit from the renewable energy potential they have, this logic should be turned around and a more forward-looking grid development policy is needed. The DSO should analyse, together with the island stakeholder, the potential production capacity from renewable energy on the islands and tailor its grid development plans to this anticipated growth. The anticipated growth should be reflected not only in relevant spatial plans (recommendation 3.1), but also in RES-registry including go-to areas (recommendation 3.2), and regional or local energy plans (recommendation 1.2), which should be taken into account for grid planning purposes.

Increasing flexibility of the grid to integrate future RES generation provides a more secure and efficient grid. It is nevertheless important to note that while grid planning should be forward-looking, the risk of planned RES projects not being implemented has to be taken into account.

[71] https://ec.europa.eu/info/business-economy-euro/recovery-coronavirus/recovery-and-resilience-facility/croatias-recovery-and-resilience-plan_en
[72] https://www.zakon.hr/z/377/Zakon-o-tr%C5%BEi%C5%A1tu-elektri%C4%8Dne-energije
[73] Methodology for calculation of costs for connection to electricity grid (2022) https://narodne-novine.nn.hr/clanci/sluzbeni/2022_07_84_1282.html

REPowerEU – RE, grids and storage regarded as 'overriding public interest'
Article 1(10) of the proposed amendment to RED II inserts a new Article 16d to ensure that plants for the production of energy from renewable sources, their connection to the grid, the related grid itself or storage assets are presumed to be of overriding public interest for specific purposes.
Renewable energy sources are crucial to fight climate change, reduce energy prices, decrease the Union's dependence on fossil fuels and ensure the Union's security of supply. For the purposes of the relevant Union environmental legislation, in the necessary case-by-case assessments to ascertain whether a plant for the production of energy from renewable sources, its connection to the grid, the related grid itself or storage assets is of overriding public interest in a particular case, Member States should presume these plants and their related infrastructure as being of overriding public interest and serving public health and safety, except where there is clear evidence that these projects have major adverse effects on the environment which cannot be mitigated or compensated. Considering such plants as being of overriding public interest and serving public health and safety would allow such projects to benefit from a simplified assessment.
Member States should implement long-term grid planning and investment consistent with the planned expansion of renewable energy production capacities, taking into account future demand and the objective of climate neutrality.
Member States should establish simplified procedures for repowering existing renewable energy plants, including streamlined procedures for environmental assessments, and adopt a simple-notification procedure for their grid connections where no significant negative environmental or social impact is expected.
Member States should ensure that system operators (i) apply a transparent and digital procedure for grid connection applications; (ii) provide information on grid capacities; and (iii) optimise the use of grid capacity by allowing its use by power plants combining multiple complementary technologies

Actors involved:

- **DSO (HEP-ODS)**
- **TSO (HOPS)**
- **National Regulatory Authority, HERA**
- **Ministry of Economy and Sustainable Development, Directorate for Energy**
- Regional and local governments
- Local stakeholders (Academia, Civil sector, Private sector)

Recommendation 6.2: Explore framework for remuneration of storage systems

While Croatia has prepared a solid legislative basis for the storage systems, there is currently no subsidy or remuneration scheme for the use of storage systems. An example of remuneration schemes from EU Member States is given below. We recommend the preparation of the regulatory framework for implementation and remuneration of storage systems. It is important to keep in mind the need for such systems on the Croatian islands and for assuring security of supply on the islands.

Islands can be best places where innovative technologies can be tested using regulatory sandboxes.

Regulatory best practice

Frameworks for storage

Few countries currently provide a comprehensive regulatory framework for energy storage, with the majority of jurisdictions currently allowing storage to be defined as "generation" for the purposes of licensing and other regulatory requirements. However, some countries like the UK, Belgium and Ukraine have provided a more elaborate framework, mainly regarding revenue streams to help different storage technologies to develop, for example capacity markets, ancillary services, and other grid services.

Belgium has changed its Electricity law to have a specific definition of storage:[74] 'Energy Storage' means, in the electricity system, the postponement of the final use of electricity until a time later than that at which the

[74] Article 2.62 and 2.6 of the Electricity Act

electricity was generated, or the conversion of electrical energy into a form of energy that can be stored, the storage of such energy, and the subsequent conversion of such energy into electrical energy or another energy. While 'electricity' storage' means energy storage where electricity is taken from the grid via the same installation in order to be fully injected back into the grid later on, taking into account efficiency losses. Noteworthy is that the Electricity Law does not assimilate electricity storage to electricity generation, and consequently a generation licence is not required.

Regarding revenue streams a Capacity Remuneration Mechanism (CRM) was recently introduced in Belgium by the country's Transmission System Operator. Beginning of October 2021, the first CRM auction was organised to select capacity offers for delivery period 2025-2026: a (priced) demand curve was set by Royal Decree, and prequalified capacity holders were able to submit bids to the market (for existing or new capacity). Some Battery Energy Storage Systems participated in the auction. Also, Ancillary services to maintain frequency and voltage at appropriate levels exist in Belgium and Battery Energy Storage Systems can participate in them.

In the **United Kingdom**, there are at least six markets that batteries can operate in, covering wholesale, balancing, ancillary services, time-of-use, stabilisation, and infrastructure. National Grid issues contracts for short-term generating capacity to cover sudden failures at power stations and other significant network issues. These typically cover events lasting a few seconds or minutes in duration. As a result of these characteristics, the differing services are typically available to different classes of generators (or demand reduction technologies), each having different technical and regulatory requirements. Some of these include: Short Term Operating Reserve (STOR), Demand Management (DM), Fast Reserve and Frequency Response. Energy storage is particularly suitable for both Fast Reserve and Frequency Response since both of these services require the rapid (second-by second) provision of reliable power which energy storage technologies are ideally placed to deliver.

The UK Government provides for funding to install new renewable energy storage technologies in the country under the Longer Duration Energy Storage Demonstration (LODES) competition.[75] As part of this initiative, the government has awarded GBP 6.7m (USD 9m) to 24 projects across the country under the LODES competition, which is worth GBP 68m (USD 91m) of capital funding in total.

Until recently, few countries had a specific support system for storage. Some countries, like the exemplary list below, provide support for (residential/small-scale) storage either as 'stand-alone' or combined with PV.

- Since 2019 Flanders (**Belgium**) grants rebates (premium) for the purchase of domestic batteries to encourage solar power self-consumption.[76] The Flemish government has extended the premium until 2024 and released additional budgets. The rates are as follows: 0-4 kWh: EUR 225 per kWh, 4-6 kWh: EUR 187.5 per kWh, 6-9 kWh: EUR 150 per kWh, Above 9 kWh: no additional premium. Maximum premium per battery: EUR 1725, max 40% of invoice incl. VAT.
- In **Germany**, the KfW funding for renewable energies (Program 270) has been very successful. It is a low-interest promotional loan for (among others) the construction, expansion, and acquisition of systems for the use of renewable energies, such as battery storage and photovoltaic systems. With the KfW 270 development loan, you finance up to 100% of the investment costs for an electricity storage system or the acquisition costs of a photovoltaic system in general.
- In **Malta**, a subsidy is given for an installation of new PV system with an inverter and battery storage facilities.[77] It covers 80% of eligible costs of the Battery Storage up to a maximum of EUR 3,600 per system and EUR600 per kWh.
- In the Azores region of **Portugal,** a specific subsidy for projects on production and storage of electricity from renewable resources covers 25% percent of the eligible costs, up to a maximum of EUR 4,000 per establishment.[78]
- In **Ireland,** the Solar PV scheme provides subsidies for the purchase and installation for roof-mounted PV (up to 2 kWp and with battery storage up to 4 kWp). The 2 kWp of PV systems are subsidised (EUR 900 per kWp). If

[75] https://www.gov.uk/government/collections/longer-duration-energy-storage-demonstration-lodes-competition
[76] Decision of the Flemish Government of 28 June 2019
[77] Promotion of Renewable Energy Sources in the Domestic Sector – Grant Scheme 2021/RES; https://www.rews.org.mt/#/en/sdgr/463-2021-renewable-energy-sources-scheme
[78] PROENERGIA. DLR 14/2019/A & Ordinance 73/2019

the roof-mounted PV is combined with battery storage, then an additional grant for further 2 kWp is offered (EUR 300 per kWp). Consequently, the maximum level of support reaches EUR 2,400 (chapter 2 Solar PV Scheme).

- **Austria** has launched a rebate program for solar-plus-storage installations offering homeowners EUR 250 per kW of solar rooftop generation capacity and EUR 200 per kWh of storage.
- In **Italy** rebates exist for two different kind of projects – installations of PV systems linked to storage systems, and the deployment of standalone storage systems linked to existing solar arrays. For this second category of rebates will cover 100% of project costs.

Actors involved:

- **Ministry of Economy and Sustainable Development, Directorate for Energy**
- **National Regulatory Authority, HERA**
- DSO, TSO (HEP-ODS)
- Regional and local governments

Conclusions

The Clean energy for EU islands secretariat conducted an analysis of the legal and regulatory framework which supports clean energy project in Croatia. The resulting Regulatory inventory[79] is publicly available online. Based on the analysis of the inventory and information gathered via surveys and interviews, the Clean energy for EU islands secretariat has brought together all relevant stakeholders in Focus Groups and a National Stakeholder Meeting to identify barriers to the clean energy transition on Croatian islands, and formulated recommendations to overcome them. This mission has gained in importance since the publication of the REPowerEU package.

Croatia has adopted new legislation in the energy sector to align with the EU directives and to provide an enabling framework to support the clean energy transition. Croatia has a national Directorate for Islands and regional Island coordinators whose aim is to support islands sustainable development and create a connection among local, regional, and national level to create policy with island needs and priorities in mind. Despite important recent measures to facilitate the energy transition, several major challenges for the clean energy transition on the Croatian islands remain. These barriers relate to strategic planning and coordinating the islands' energy transition among sectoral silos, lack of islands' tailored energy planning and financial support, complex and long permitting procedures, lack of support for island stakeholder involvement in energy projects, and grid constrains. To overcome these barriers, recommendations build on the existing regulatory framework and activities that are ongoing in Croatia.

Energy needs and priorities of Croatian islands should become more visible to the regional and national government. Better communication and collaboration with local stakeholders and those involved in the implementation of the projects on the islands is needed to create a feedback-loop from the local to the national level. National energy planning should be clear on the role islands play in the overall energy transition.

Energy transition is key for mitigation and adaptation to climate change, which disproportionately affects the islands. Therefore, energy transition planning should be holistic, avoiding silo-like policy and planning on national and regional level. Spatial planning needs to better integrate energy planning, especially through identification of go-to areas for small and large projects, taking into account islands characteristics. Faster and easier authorisation and permitting should be possible for clean energy projects, in particular in these go-to areas.

In light of the current energy crisis and climate change, the energy transition, significantly on the islands needs to be accelerated. To ensure that quality clean energy projects are ready for implementation, the national and regional governments should support identification and preparation of such projects. This could be done through directed technical assistance and planned funding calls that can be accessed by island stakeholders.

Integration of clean energy projects in the electricity grid includes planning with both energy security and flexibility in mind. Therefore, support for pilot projects and technologies that increase flexibility and modernise the grid on the islands is needed.

[79] https://clean-energy-islands.ec.europa.eu/regulatory-inventory

Finally, the energy transition on the islands has to benefit island stakeholders. Involvement of local stakeholders in clean energy projects can be encouraged or mandated with regulation. The regulatory sandboxes can also be used on the islands to test innovative technical, tariff, or regulatory framework.

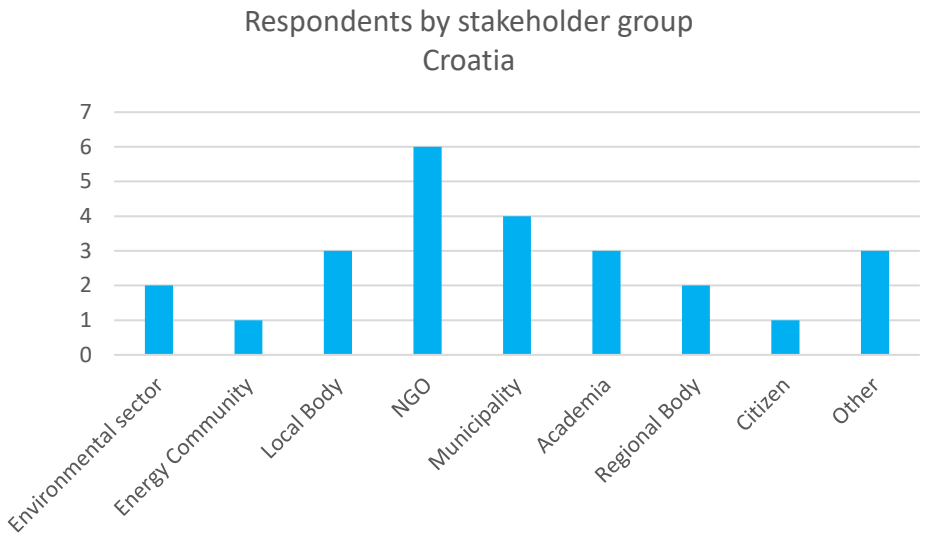
These recommendations answer to the most pressing barriers and should be implemented in the short-term. In the longer term the involvement of various stakeholders through a more permanent Taskforce for islands with participation from local to national level is needed.

Annex 1: Detailed analysis of the Survey results

The survey for legal and regulatory barriers for clean energy on Croatian islands has been sent to 71 contacts, representing 68 stakeholders from national and local governments, over academia to energy associations and NGOs. In addition, the survey was publicly accessible and could have been forwarded to more contacts or organisations which we cannot account for. The survey has been completed by 25 responders. However, the response rate cannot be evaluated as the survey was publicly available as well.

Responders of the survey are representatives of nine stakeholder groups. The majority of respondents are from the stakeholder group NGOs, representing 24 %. This is followed by respondents from the stakeholder category Municipality, representing 16%

The representatives from the stakeholder groups Local Body, Academia, and other (consisting of a development agency, a research institute, and a stakeholder active in air transport) are represented with 12% each. The environmental sector and regional body represent 8% and energy communities or cooperatives and citizens are represented by one stakeholder.



The main barriers that were identified were the following:

- Lack of support schemes tailored to islands characteristics (regulatory and financial); Islanders lack the capacity to apply for calls from the EPEEF.
- Lack of long-term vision on how different land use on islands (renewable energy project, agriculture, tourism, cultural heritage, natural protection, etc.) are coordinated to assure sustainable economic development
- Lack of financial/funding mechanisms for collective/community involvement in clean energy projects. As well as lack of institutionalised platforms for information exchange, awareness raising and capacity building on local or regional level on the topic of self-consumption and community energy.

These and other barriers are elaborated upon in more detail in the sections below.

General

Survey results

The survey has asked the respondents to give their opinion the following three statements regarding strategic energy planning for clean energy on Croatian islands using a Likert scale. The results are presented in numerical form showing the average from all responses. The numerical representation is from 1-5, with 1 representing not at strong disagreement to 5 representing strong agreement.

Barrier	Rating
Island(s) energy plans would help align local and national regulation, spatial plans, restrictions for clean energy	4.2
National obligation for islands to develop energy action plans would lead to accelerated realisation of clean energy projects on islands	4.0
Islands should be better integrated in the National Energy and Climate Plans	4.4

If we take into account only statements that were agreed and strongly agreed upon, or equal or above rating of 4,0, all statements were agreed upon by the respondents.

While there was almost complete agreement that islands should be better integrated in the National Energy and Climate Plans, for the statements 'Island(s) energy plans would help align local and national regulation, spatial plans, restrictions for clean energy' and 'National obligation for islands to develop energy action plans would lead to accelerated realisation of clean energy projects on islands', several stakeholder groups such as NGOs, Municipalities and Other had a more neutral stance on them. Renewable energy.

Interview results:

From the interviews with Croatian stakeholders, the following general barriers for clean energy development on Croatian islands have been retained:

- Due to the efforts of the national and local RES community in the last three years, the topic of renewable energy transition has been brought into the focus of the public policies. The awareness is constantly increasing as a result of continuous strategic work. Significant additional work is, nevertheless, required in the area of the implementation of the RES public policies through the creation of RES measures and financial mechanisms to facilitate the energy transition in both mainland and islands.
- A new legal framework is recently adopted – such as the new Electricity Market Act (ZOTEE) and the new Renewable energies Act (ZOIEVUK). However, specific regulation that further defines how things will be installed are still to be prepared. According to certain stakeholders, the government needs to involve the right stakeholders in order to make sure that these regulations are well developed.
- On the contrary other stakeholder indicated that for long term planning and implementation, the islands do not require much involvement from the national level. While it can prove useful, it often slows down the process. The main issues are not at national level but at local level; namely:

  - spatial planning restrictions – spatial plan is adopted recently but if there are any needed changes, the process is complex and too long. The changes to the spatial plan have to be approved on different government levels.
  - lack of capacity of the local municipalities – one island can have multiple municipalities which each have limited capacity. One office per island for energy transition would be useful to help municipalities but also other local stakeholders to accelerate clean energy transition.
- There is not one national clean energy action plan for the Croatian Islands. However, one stakeholder indicated that this is not a barrier as such. Islands receive particular attention via a grant from the EPEEF that is higher than on the mainland, as explained above in the section "Policy and Legislation for clean energy on Croatian Islands – support systems." In the NECP it is specified that islands should receive particular attention regarding energy efficiency and renewable energy.
- There are also few examples of realised clean energy projects on the islands. Best practices first need to be implemented and then advertised. Moreover, clean energy is not yet seen as an option that can be used for attracting tourists. People are not aware of this being something that is interesting to tourists.

- With the new legislative framework for energy adopted in Croatia, no energy project can be realised unless it is foreseen by the spatial plan. This does not apply for smaller projects that can be installed on the roofs of existing structures. Spatial plans are developed on county (zupanija) level and therefore the local municipalities should have a say in how their space is planned.

Renewable energy

General

Survey results

The survey has asked the respondents to rate the following five general barriers to renewable energy development on Croatian islands based on their importance using Likert scale. The results are presented in numerical form showing the average from all responses. The numerical representation is from 1-5, with 1 representing not at all important to 5 representing very important.

Barrier	Rating
Lack of long-term planning at regional/island level (e.g., lack of clear renewable energy targets)	4.2
Lack of support schemes tailored to islands characteristics (regulatory and financial)	4.3
Lack of electricity price differentiation between mainland and islands hampering realisation of island-based clean energy projects	3.2
Lack of awareness and capacity of the stakeholders for developing clean energy projects	4.2

Lack of clarity regarding financial, social, or environmental benefits to islanders	4.0

If we take into account only barriers that are considered important or very important (with an aggregated rating of 4.0 and above) there are four barriers put forward by respondents.

They include from least to most important:

- Lack of long-term planning at regional/island level (e.g., lack of clear renewable energy targets)
- Lack of awareness and capacity of the stakeholders for developing clean energy projects
- Lack of support schemes tailored to islands characteristics (regulatory and financial)

The barrier 'Lack of support schemes tailored to islands characteristics (regulatory and financial)' is rated as "very important" by respondents from the stakeholder groups Environmental Sector, Energy Community or Cooperative and Citizen, while this barrier is rated as "fairly important" by the other stakeholder groups, except respondents from the stakeholder group Other, who rated it as "not important".

The barrier 'Lack of long-term planning at regional/island level (e.g., lack of clear renewable energy targets)' is rated as "very important" by respondents from the stakeholder groups Environmental Sector and Academia, while this barrier is rated as "fairly important" by the other stakeholder groups, except respondents from the stakeholder group Other, who rated it as "less important."

The barrier 'Lack of awareness and capacity of the stakeholders for developing clean energy projects' is rated as "very important" by respondents from the stakeholder groups Environmental Sector, Energy Community or Cooperative and Citizens, while this barrier is rated as "fairly important" by the other stakeholder groups, except respondents from the stakeholder group Other, who rated it as "less important."

Interview results:

From the interviews with Croatian stakeholders, the following general barriers for renewable energy development on Croatian islands have been retained:

- The specific higher funding amounts for islands under the Calls from the Croatian Environmental Protection and Energy Efficiency Fund (EPEEF: as described in the Policy and Regulation part above) have worked well and this measure contributes to the development of clean energy and energy efficiency on the islands.
    - Usually around 5% of the projects that apply are actually funded. One of the criteria is first come first serve, which makes it less user friendly. 3-4 % of all the funds that have been dispersed in the past years have been provided for the projects on the islands. The possible solution would be to separate this funding for regions or for islands, so that way the islands could have more projects.
    - The EPEEF indicated that islanders lack the capacity to apply for these funds. There is certainly motivation, but the municipalities lack the technically and administratively skilled personnel to prepare applications for funding.
- There is a lack of funding-ready RES projects on the islands. There is no technical knowledge or capacity to prepare projects that can receive funding.

- A general barrier is the lack of know-how on sustainable development (including clean energy) on the local level, including local governments. While there is a Clean Energy Action Plan for Brac, little of the 8 local municipalities are aware of the CEAP. On the other hand, there is the national energy institute (*Energy Institute Hrvoje Požar*, EIHP[80]) with a lot of know-how on energy, which could be more involved in the activities on the islands. EIHP could be a lot of help in educating local people on the islands in the local municipalities about clean energy and sustainable development topics and their possibilities on how this can be used for tourism or other aspects of the island development.
- The topic of electrification of transport has received little attention so far. Many islands are small and electric bikes and cars could be a solution as there are many bike tracks on the islands nowadays.

RES projects authorisation process (permitting and spatial planning)

Survey results

The survey has asked the respondents to rate the following six barriers to renewable energy development regarding permitting and spatial planning on Croatian islands based on their importance using Likert scale. The results are presented in numerical form showing the average from all responses. The numerical representation is from 1-5, with 1 representing not at all important to 5 representing very important.

Barrier	Rating
Complex administrative procedure	3.8
Long (>2 years) permitting procedure	3.7
Lack of permitting exemption for small-scale systems (PV, battery, EV chargers)	3.9
Spatial planning legislation related to protected areas restrictions and RES installations not adjusted to the local island's characteristics	4.0
Renewable energy projects seen as conflicting to environmental protection of the islands/area around islands	3.5
Lack of long-term vision on how different land use on islands (renewable energy project, agriculture, tourism, cultural heritage, natural protection, etc.) are coordinated to assure sustainable economic development	4.3

If we take into account only barriers that are considered important or very important (with an aggregated rating of 4.0 and above) there are two barriers put forward by respondents.

They include from least to most important:

[80] http://www.eihp.hr/

- Spatial planning legislation related to protected areas restrictions and RES installations not adjusted to the local island's characteristics
- Lack of long-term vision on how different land use on islands (renewable energy project, agriculture, tourism, cultural heritage, natural protection, etc.) are coordinated to assure sustainable economic development.

This latter barrier is rated as "fairly important" or "very important" by respondents from the stakeholder groups Environmental sector, NGO's, Energy Community or Cooperative, Academia and Citizens.

Interview results:

From the interviews with Croatian stakeholders, the following barriers for renewable energy development, regarding permitting and spatial planning, on Croatian islands have been retained

- Regarding permitting, the main issue is the difficult ownership structure of land. There are many different small parcels belonging to a multitude of public and private persons. This makes it difficult to develop medium to large-scale projects. The more people involved, the more the not in my backyard-risk in permitting procedures increases.
    - For PV, although the legislation prescribes certain deadlines for the authorisations, sometimes it takes much longer. However, if well prepared it is not impossible to get a permit.
- Regarding spatial planning there are several issues.
    - Currently the only projects that are possible to do on islands is to put solar on own rooftop for own consumption by the citizens. In the urban centres where the buildings are historically protected, it is not possible to install PV.
    - The new regional spatial plan for Split-dalmatian region has been adopted recently. It foresees very little space on the islands for PV. The other parts of the land do not say that it is forbidden to have RES installed, but there still needs amendments to the spatial plan before the project is approved.
    - The last spatial plan (for Split-dalmatian region) was adopted seven to eight years ago, and this process took a really long time. The spatial plan is prepared in coordination with national and regional government. Initiatives from local governments start but the request needs to go to regional and then national government. It is needed that this process is changed as this might be the biggest barrier for renewable projects on the islands.
- For Cres Losinj for example, offshore wind turbines are not possible since by law they must be located at least one kilometre from the coast. There are also strict regulations regarding bird protection. That is why the municipality focusses on solar. The spatial plan has indicated five suitable locations for solar parks. Due to the fact that it was identified in a spatial plan, permitting should not be an issue. They will be operational within the next two to three years.

Grids

Survey results

The survey has asked the respondents to rate the following four grid connection barriers to renewable energy development on islands based on their importance using Likert scale. The results

are presented in numerical form showing the average from all responses. The numerical representation is from 1-5, with 1 representing not at all important to 5 representing very important.

Barrier	Rating
Limited priority access for renewable energy	3.3
Insufficient capacity due to grid infrastructure constraints	3.7
Limited sustainable back-up options to assure security of supply	3.4
Lack of systematic approach to grid development needs for integration of RES	4.0

If we take into account only barriers that are considered important or very important (with an aggregated rating of 4.0 and above) there is one barrier put forward by respondents, namely the lack of systematic approach to grid development needs for integration of RES. Only the respondents from the stakeholder group NGO rate them as "less important".

The respondents from the stakeholder groups Energy Community or Cooperative, Municipality, Regional Body and Citizens rated 'Limited priority access for renewable energy' as "fairly important" while other respondents rate them "less important" or take a neutral stance on them.

The respondents from the stakeholder groups Energy Community or Cooperative, Other, Municipality, Academia, Citizen, Environmental sector rated 'Insufficient capacity due to grid infrastructure constraints' as "fairly important" or "very important" while other respondents rate them "less important" or take a neutral stance on them.

The respondents from the stakeholder groups NGO, Academia, Regional Body, Citizen, Environmental sector rated 'Limited sustainable back-up options to assure security of supply' as "fairly important" or "very important" while other respondents rate them "less important" or take a neutral stance on them.

Interview results:

From the interviews with Croatian stakeholders, the following barriers for renewable energy development, regarding the grid, on Croatian islands have been retained:

- There are no main legal or regulatory issues regarding the electricity grids on the Croatian islands. They are all interconnected. Sometimes in summer, there are peaks in consumption that might cause congestion problems but that is mainly a technical issue, not a legal barrier. The national utility is pushing hard for renewables development, also on the islands, which would help cope with the seasonal demand peaks[81]. Half a billion of budget is allocated to grid development.

[81] See for example: https://www.hep.hr/projects/renewable-energy-sources/unintegrated-solar-power-plants/3423

Energy Efficiency

Survey results

The survey has asked the respondents to rate the following four barriers to energy efficiency projects on Croatian islands based on their importance using Likert scale. The results are presented in numerical form showing the average from all responses. The numerical representation is from 1-5, with 1 representing not at all important to 5 representing very important.

Barrier	Rating
Energy efficiency in generation/transport/use is not considered the first priority in strategic documents/regulation	3.6
Lack of clear energy efficiency targets	3.9
Lack of availability of easy-to-use support schemes (including funding)	4.1
Lack of clear regulations for energy service companies	3.8

If we take into account only barriers that are considered important or very important (with an aggregated rating of 4.0 and above) there is one barrier put forward by respondents, namely "Lack of availability of easy-to-use support schemes (including funding)".

The barrier 'Lack of availability of easy-to-use support schemes (including funding)' is rated as "very important" by respondents from the stakeholder group Citizen, while respondents from the stakeholder group Local Body rate it as "less important'.

Aside from this, the barrier 'Lack of clear energy efficiency targets' is rated as "very important" by respondents from the stakeholder groups Energy Community or Cooperative and Citizens.

Interview results:

From the interviews with Croatian stakeholders, the following barriers for renewable energy development, regarding energy efficiency, on Croatian islands have been retained:

- There are no legal barriers regarding energy efficiency as such. Energy efficiency receives particular attention in the NECP and executing policies. There is an ESCO-scheme for the public sector, which works well. The EPBD related legislation is implemented and works well in practice, there are no legal barriers in this regard.

Self-consumption and community energy

Survey results

The survey has asked the respondents to rate the following seven barriers to community energy projects and energy sharing on Croatian islands based on their importance using Likert scale. The results are presented in numerical form showing the average from all responses. The numerical representation is from 1-5, with 1 representing not at all important to 5 representing very important.

Barrier	Rating
Lack of a legal and/or regulatory framework for energy communities / community energy actions	3.9
Lack of a legal framework for prosumers	3.5
Lack of political support for community/citizen involvement	3.8
Community energy initiatives have to meet the same requirements as traditional energy companies (burdensome, complex permitting procedures, high financial	3.8
Lack of institutionalised platforms for information exchange, awareness raising and capacity building on local or regional level (advisory services, information campaigns, best practices etc)	4.2
Lack of financial/funding mechanisms for collective/community involvement in clean energy projects	4.2
Inadequate existing regulatory frameworks	3.8

If we take into account only barriers that are considered important or very important (with an aggregated rating of 4.0 and above) there are two barriers put forward by respondents.

They include from least to most important:

- Lack of institutionalised platforms for information exchange, awareness raising and capacity building on local or regional level (advisory services, information campaigns, best practices etc)
- Lack of financial/funding mechanisms for collective/community involvement in clean energy projects

The barrier 'Lack of institutionalised platforms for information exchange, awareness raising and capacity building on local or regional level (advisory services, information campaigns, best practices etc)' is rated as "very important" by respondents from the stakeholder groups Energy Community or Cooperative and Other, while respondents from the stakeholder group Academia take a rather neutral stance on it.

The barrier 'Lack of financial/funding mechanisms for collective/community involvement in clean energy projects' is rated as "very important" by respondents from the stakeholder groups Energy Community or Cooperative and Other, while respondents from the stakeholder group Regional Body take a rather neutral stance on it.

Interview results:

From the interviews with Croatian stakeholders, the following barriers for self-consumption and community energy on Croatian islands have been retained:

- The new Renewable energy Act contains provisions on energy communities. It can be a possible solution for people who cannot finance their own RES plants. However, it is only one article which

has still many details to be worked out in bylaws. It is difficult to point towards legal barriers, since the whole concept of energy sharing, and energy communities has just started. The new Renewable energy Act contains provisions on energy communities and active customers, and it is to be seen what the issues are.
    - For example, on Cres there are already 40 transformer units.
- The role of local government in the energy community should be significant. They could be the ones helping the energy community start, they can be part of it. There are some local governments on the islands that would be interested, but the biggest problem is the lack of local know-how.

Other barriers

Socio-economic barriers or issues discussed in the interviews:

- On the smaller islands, population is decreasing. Many people are moving away.
- The people are aware that their electricity bills are high, but they don't see examples and ways of how to lower them. Islands movement and local actors are planning to organise a road show in spring to educate local people on what can be done. Any help on these aspects from the Secretariat would be extremely helpful. But Island Movement should not be the only one working on it. Islands should mobilise other local communities and associations that can be used.
- One of the characteristics of the Croatian islands is that there is a specific percentage of people on the islands that have no problem to self-finance RES generation for self-consumption or that are able to do it through the assistance from banks. This needs to be more supported, and people must be introduced to these concepts so that other people can see example of the RES technologies used by the people in their neighbourhoods. There is a high need for local examples of best practices for large uptake on the islands.

Measures to overcome the identified barriers

Survey results

The survey has asked the respondents to rate the following nine measures for overcoming the barriers for clean energy projects on the islands based on their importance using Likert scale. The results are presented in numerical form showing the average from all responses. The numerical representation is from 1-5, with 1 representing not at all important to 5 representing very important.

Measures	Rating
An island specific strategic document that will find compromises between environment conservation, agriculture, preservation of historical sites, tourism, and sustainable and clean energy.	4.1
Involvement of key stakeholders in preparation of island specific strategic document	4.4
Subsidies for fossil fuels are redirected to support clean energy projects through the avoided GHG emissions method	3.8
Increasing stakeholder awareness on economies of clean energy projects	4.7

Capacity building or advisory services on clean energy projects for islands	4.7
Regional/local one-stop shop for clean energy project on islands	4.6
Single permit for clean energy projects on the islands	4.4
Develop enabling framework (clear regulation and financial mechanisms) for operation of energy services companies	3.9
Create enabling framework (regulation, financing, permitting procedures, social support) for energy communities, cooperatives, and other community	4.6

If we take into account only measures that are considered important or very important (with an aggregated rating of 4.0 and above) there are seven measures put forward by respondents.

They include from least to most important:

- An island specific strategic document that will find compromises between environment conservation, agriculture, preservation of historical sites, tourism, and sustainable and clean energy.
- Involvement of key stakeholders in preparation of island specific strategic document
- Single permit for clean energy projects on the islands
- Create enabling framework (regulation, financing, permitting procedures, social support) for energy communities, cooperatives, and other community
- Regional/local one-stop shop for clean energy project on islands
- Increasing stakeholder awareness on economies of clean energy projects
- Capacity building or advisory services on clean energy projects for islands

Regarding the Single permit for clean energy projects on the islands, respondents from the stakeholder groups Local Body and Other take a neutral stance, while the other respondent's rate this as an "important" or "very important" measure.

When assessing correlation between all barriers presented in the survey the measure 'single permit for clean energy projects on the islands' is highly correlated to the barrier 'Spatial planning legislation related to protected areas restrictions and RES installations not adjusted to the local island's characteristics.' This means that rating of both barriers is positively correlated among all respondents.

<u>Interview results:</u>

From the interviews with Croatian stakeholders, the following measures to overcome some of the above-mentioned barriers for clean energy development on Croatian islands have been retained:

Regarding strategic planning:

- None

Regarding renewable energy in general:

- Regarding the lack of capacity of the island municipalities, there are several possible solutions

    - Provide dedicated training: EIHP could be a lot of help in training local people on the islands in the local municipalities about clean energy and sustainable development topics and their possibilities on how this can be used for tourism or other aspects of the island development.
    - Increasing personnel: Local experts and/or local offices for sustainable energy are needed so that local municipalities can be aware of these concepts and know how to include these aspects in their work and planning.
    - Setting up local advisory services or offices where people can learn from best practices and technical assistance.

- Regarding the low amounts of funding from the Public Calls from Croatian Fund for Environment Protection and Energy Efficiency flowing to the islands (3-5%), a possible solution could be to separate this funding for regions or for islands, so that the islands could have more projects.
- Stimulation of electrification of transport; both vehicles and bikes

Regarding spatial planning and permitting:

- The local government should identify areas where PV plants could be installed but this is not possible unless spatial plan is changed.

Regarding the grid:

- None

Regarding energy efficiency:

- None

Regarding energy communities:

- Training programmes for local governments on how to guide energy community projects or how to participate in them.
- The EPEEF is thinking of providing specific support (via calls for proposals) for NGOs regarding renewables and energy efficiency, where hopefully this framework for energy communities will be used.
- Examples of islands/projects as best practice or to contact:

    - In bigger island, there are several municipalities. There are some examples where they worked together on sectoral topics should as waste. They establish a 'communal cooperation'. This could be fostered for energy; cooperation of different island municipalities (on the same island) in the development of joint renewable energy projects.
    - Cres-Losinj is a good example of islands where there are a local initiative and people ready to plan energy transition on the island.
    - Krk is another good example, where local stakeholders have prepared a technically viable project and have received all the necessary documentation.

Annex 2: Croatia stakeholder meetings

Croatia Focus Group

Croatia Focus Group invited members:

- Ministry of Economy and Sustainable Development
- Ministry of Regional Development and EU funds
- Croatian electricity market operator (HROTE)
- Energy Institute Hrvoje Pozar
- RES Croatia
- Croatian Environmental Protection and Energy Efficiency Fund
- Island Development Agency, OTRA
- Island Movement
- Humac Ltd, Brac island
- DOOR NGO

First Croatia Focus Group meeting

Title CE4EUI - Croatia Focus Group - Study on regulatory barriers and recommendations for clean energy development on islands.

When Wednesday, 6 April 2022, 10:00-12:00 CET.

Where Online

List of attendees

CE4EUI Secretariat

Island movement

The Ministry of Economic and Sustainable Development

The Ministry of Regional Development and EU funds, Directorate for islands

Energy Institute Hrvoje Pozar

Croatian Environmental Protection and Energy Efficiency Fund

Humac Ltd (Island Brac)

OTRA – Island development agency

DOOR NGO

The Croatia Focus Group Meeting 1 (HRFG1) focused on the barriers highlighted in the Report: Detailed Regulatory Analysis Croatia.

The resulting discussion among all stakeholders focused on the following barriers:

- National plans include islands, but are too vague on the priority projects
- Slowness of energy permitting and authorisation procedures
- Lack of integration of energy sector planning in spatial plans
- Collaboration of national, regional, and local governments
- Lack of capacity for local stakeholders to prepare fundable projects
- While funds are available, the timing for application is too short or calls are not planned
- Lack of support for energy communities
- Lack of best practice examples for clean energy projects on the islands
- Local energy plans are being prepared but there is a lack of technically skilled workforce.

Second Croatia Focus Group meeting

Title CE4EUI - Croatia Focus Group - Study on regulatory barriers and recommendations for clean energy development on islands.

When Monday, 27 June 2022, 10:00-12:00 CET.

Where Online

List of attendees

CE4EUI Secretariat

Island movement

The Ministry of Regional Development and EU funds, Directorate for islands

Energy Institute Hrvoje Pozar

Croatian Environmental Protection and Energy Efficiency Fund

OTRA – Island development agency

HROTE – Croatian electricity market operator

The Croatia Focus Group Meeting 2 (HRFG2) focused on the recommendations for overcoming priority barriers detailed in the draft Study on regulatory barriers and recommendations for clean energy transition on the islands - Croatia.

The resulting discussion among all stakeholders focused on the following topics:

- Local island committees
- Regional plan for sustainable development of islands and local energy plans
- Clean energy projects and protected areas on and around the islands
- Planning projects on the islands involves various stakeholders and at various level of government
- Financial support can be more predictable and tailored to the islands

National Stakeholder Meeting

Title	CE4EUI – Croatia National Stakeholder Meeting- Study on regulatory barriers and recommendations for clean energy development on islands.
When	Wednesday, 7 September 2022, 09:30-15:30.

The NSM was held in the Ministry of Regional Development and EU funds in Zagreb with representatives from Ministry of Regional Development and EU funds, Ministry for Physical Planning, Construction and State Assets, Ministry for Culture and Media, Croatian Regulatory Energy Agency, Croatian Transmission System Operator (HOPS), Environmental Protection and Energy Efficiency Fund, Energy Institute Hrvoje Pozar, Faculty for Mechanical Engineering and Naval Architecture, Renewable Energy Sources of Croatia, Zadar County Development Agency ZADAR NOVA, Regional Development Agency of the Primorje-Gorski Kotar County, RERA – Public institution for coordination and development of Split-Dalmatia county, LIRA – Public institution for development of Licko-Senjaska county, Island development agency – OTRA and Island movement.

During the National Stakeholder Meeting on legal and regulatory barriers and solutions to clean energy transition on Croatian Islands, a diverse group of stakeholders engaged in building consensus on some key actions to take.

The participants spoke about strategy and coordination of energy transition on the Croatian islands and ways to integrate clean energy in all aspects of sustainable development. Potential of recognizing islands as innovation and energy transition labs was discussed. Planning, preparation, and implementation of clean energy projects on the islands was discussed, especially from the point of view of specialized funding, national and regional support, including capacity building and technical assistance. Finally, for easier project implementation the participants discussed options for better integration of energy planning with spatial planning and possible solutions that REpower EU offers in this aspect.

Annex 3: Permitting procedure for RES plants

In the description of permit and authorisation processes the focus lies on onshore wind and solar energy (PV), as these are renewable energy sources for which the largest growth in usage is projected by the Integrated National Energy and Climate Plan for the Republic of Croatia for the period 2021-2030. The share of PVs is projected to increase eight-fold by 2030, while a doubling is projected for onshore wind, in terms of final electricity consumption in Croatia.

Croatia also has very beneficial geographical and geomorphological features for the usage of solar and wind energy. This also applies to geothermal energy, but that is currently underdeveloped in Croatia.

Choosing the appropriate site is the most important step in order to achieve the best production and business results. It is important to check the local spatial plan to find out which areas are restricted and to assess the potential of amending spatial plans if needed.

An environmental impact assessment (EIA) procedure must be carried out before any permits or other approvals for the project are given. Other administrative authorisations, such as the location permit, the building permit, the use permit, electricity production licence, grid connection, etc. are obtained later.

For placement of PV panels on top of an existing building, which is considered a simple construction, neither a building permit nor an electricity production permit is needed.

The investor must obtain the electricity production licence from the Croatian Energy Regulatory Agency (HERA) and the grid connection permit, along with some other authorisations of the project before the connection, from the distribution system operator (HEP ODS).

Following are the five main steps in the permitting procedure of RES plants:

- Site selection procedure
- Administrative authorisation process (Assessing the impact on the environment and obtaining all necessary permits (location permit, building permit, etc.))
- Electricity production licence process
- Grid connection permit process
- Use permission

Site selection procedure

The site selection procedure is governed by Physical Planning Law and Environmental protection Law, and it is the responsibility of the regional or local authorities.

Generally, there are a lot of factors impacting the optimal choice of a site for a commercial RES installation (onshore wind or ground PV). Private PV installations on buildings are discussed below.

For onshore wind and ground PV – locations for optimal production should be identified in accordance with geographical and geomorphic features of the area and desired technological parameters of the system coupled with economic and practical implications of the project.

For example, for wind power, the Croatian Hydrometeorological Institute provides the Croatian Wind Atlas. This is a map of Croatia depicting estimations of the average annual wind speed (m/s) and annual wind power density (W/m^2) at altitudes of 10 to 80 m above the ground.

Furthermore, spatial plans, maps of habitats, and maps of protected areas should be consulted in order to determine land purposes, conditions for land use, and to account for possible conflicting interests with the project and to eliminate sensitive or prohibited areas from planning. It is also advisable to find out, as early as possible, the willingness of the local authorities (municipality and the county) to support the project. Moreover, in many habitats and protected areas, it is imperative to undertake appropriate compensation measures.

Concerning property rights, the project developer either acquires the project site by purchasing the land or (most commonly) rents/leases it from the owner. As most of the land used for onshore wind power projects are state-owned, questions of public procurement law can arise. This should be dealt with in an early stage in order to avoid (judicial) conflicts later on.

As far as the local grid is concerned, the Croatian TSO (HOPS) or the DSO (HEP-ODS) should be contacted at an early stage in order to find out the available grid capacity in the desired area.

For PV on buildings, the aforementioned factors and considerations do not apply as it mostly involves private installations.

Administrative authorisation process

Spatial planning

In Croatia, spatial planning is governed by the Physical Planning Law. The spatial plan (art. 53 et seq. Physical Planning Act) is the basic document of spatial planning of each unit of local self-government. The plan is adopted by the representative body of the local self-government unit, i.e., the municipal or city council. The spatial plan determines the directions for the development of activities and the purpose of land use. Plans of a lower level (e.g., the municipality), must be in line with those of a higher level (e.g., the county). The competent body for the development of the spatial plan at state level is the Ministry of Physical Planning and Construction.

The process of drawing up a local spatial plan can be initiated by anyone. At least once a year, the mayor is obliged to consider the submitted proposals (art. 85 Physical Planning Act). Art. 94 of the Physical Planning Act foresees a compulsory public consultation in the spatial plan drafting process, which anyone can participate in. Before the adoption of the spatial plan the Ministry of Physical Planning and Construction must give its approval that the plan is in line with the Physical Planning Act (art. 61).

If the spatial plan does not already foresee a special area for the construction of wind farms or ground-mounted PV installations, the developer should already at an early stage get in touch with the competent zoning board in the local government.

Counties and municipalities are the main responsible body for spatial planning.

Environmental Impact Assessment (EIA)

Typically, larger onshore wind or solar power projects have to carry out an Environmental Impact Assessment (EIA), especially in regions with larger numbers of protected birds or other animals

such as bats. The EIA is governed by the Environmental Protection Law and the Regulation on the Environmental Impact Assessment.

The EIA entails a process of assessing the acceptability of the intended project with regard to the environment and it determines the necessary environmental protection measures in order to minimise the impacts and achieve the greatest possible preservation of environmental quality. The assessment procedure is carried out at an early stage of the project planning. For wind power projects with capacity higher than 20 MW and all power plants with capacity higher than 100 MW an EIA needs to always be carried out. For solar power plants as free-standing installations an assessment must be made of whether an EIA has to be carried out or not (EIA screening).

The competent body for the EIA is the county administration.

The EIA procedure is initiated based on a written request from the project developer. The impact of the project on the environment will be assessed by a commission of scientists and professional experts. The commission, after determining that the Environmental Impact Study is complete and acceptable, proposes to the competent body to initiate a public consultation on the study.

Location permit

Spatial plans are implemented by issuing location permits and building permits (also based on the Building Act) (art. 114 Spatial Planning Act).

The location permitting procedure is mainly governed by the Physical Planning Law (art. 125 et seq. Physical Planning Act). It is initiated at the request of the interested party. The positive decision of the EIA on the project has to be included in the request. The authorities responsible for issuing the location permit are the administrative bodies that perform the tasks for spatial planning and construction of counties. Before the decision is taken, a public hearing is organised by the competent authority.

Building permit

There are no principal differences for wind power plants or other constructions. Therefore, normal building regulations apply. The procedure is mainly governed by art. 106 et seq. of the Building Act.

According to art. 128 of the Building Act, in combination with art. 5 of the Ordinance on simple buildings, rooftop PV systems do not require a building permit if they are built on an already existing building. Of course, the project developer is still obliged to comply with building regulations and the spatial plan. However, PV or solar thermal collectors can be built without a building permit even in contradiction to the spatial plan, but only if the energy is not fed into the grid, i.e., they are used for self-consumption purpose (art. 128 par. 5 item 3 Building Act). There is also an obligation to notify the competent building authority of the beginning of construction works. Furthermore, simple constructions (house-mounted PV systems) do not need to acquire an energy approval, nor an EIA.

Air permit

For reasons of aviation safety, constructions of onshore wind turbines must also obtain an approval from the Croatian Air Traffic Control (Act on Establishing the Croatian Air Navigation Services). The Croatian Air Traffic Control decides whether the turbine can be built taking into account air traffic, lighting, and colour of the wind turbine.

Energy approval

The issuance of the energy approval is governed by art. 12 and 13 Electricity Market Act and in more detail by the Energy approval Ordinance. The purpose of this act is to ensure the safety of power generation systems (art. 4 Energy approval Ordinance).

If for the construction of a generating plant a location permit is prescribed, the energy approval is issued after the location permit or otherwise after the issuance of the building permit (art. 5 Energy approval Ordinance). The request for energy approval is submitted to the Ministry of Economy and Sustainable Development.

The Energy approval Ordinance provides specific technical prerequisites for wind power turbines, such as provisions on minimum distance, space, and capacity, etc. After acquiring the energy approval, the project developer can obtain the status of an eligible producer (art. 3 Energy approval Ordinance), which is an essential prerequisite for eligibility under the Croatian auction support scheme for renewable energies.

Electricity production license process

In Croatia, natural and legal persons can generally only produce energy if they have previously obtained a license for performing an energy activity from the Croatian Energy Regulatory Agency (CERA), which, among other things, enables electricity production (art. 15 and 16 par. 1 Energy Act).

However, all producers with a total installed capacity of up to 1 MW are exempted from this obligation (art. 16 par. 3 of the Energy Act and art. 10 par. 2 of the Electricity Market Act), along with private producers who have installed PV panels on top of their homes for their own energy needs.

Currently, there are 68 registered electricity producers in Croatia (holders of the License for performing an energy activity).

The process of obtaining this permit is mainly governed by the Ordinance on licences for performing energy activities and on keeping of the register of issued and cancelled licences, and the Energy Activity Regulation Law. The prerequisites are to prove the necessary technical, professional, and financial qualification to provide the envisaged service of electricity production. The permit may be withdrawn by CERA, if the said requirements are no longer met.

Most of the electricity production permits are granted for a period of five to seven years.

The CERA is obliged to issue a decision on the energy activity permit within 30 days from the date of submission of an application. If inspection of the construction is needed, the permit must be issued within 60 days (art. 12 of the Ordinance on licences for performing energy activities and on keeping of the register of issued and cancelled licences). Three months prior to expiry of the permit, the producer of energy must apply for a new permit (an extension) (art. 17 of the Ordinance on licences for performing energy activities and on keeping of the register of issued and cancelled licences).

Grid connection permit process

There are two major types of procedure with HEP ODS for connection to the electric grid: the simple connection and the complex connection.

Complex connection procedure

The grid connection procedure begins with the request of the project developer to the grid operator to prepare a Study of the optimal technical solution of the connection. After the study is prepared, the project developer has to conclude a Grid Connection Agreement with the system operator and has to obtain the electricity assent issued by the system operator. The procedure for issuing the electricity assent determines the individual technical conditions for the connection of the installation to the electricity network.

Finally, the investor or the owner of the installation is obliged to submit a request for concluding an Agreement on the Grid Use and a formal request for the beginning of the grid use in accordance with the General conditions on grid use and electricity supply.

The grid connection process is mainly governed by the Energy Act (art. 32 et seq. Energy Act), the Regulation on issuing the electricity assent and establishing conditions and deadlines for connecting to the grid, and further special by-laws such as the Transmission/Distribution System Network Rules and the Rules on connection to the transmission/distribution grid.

Pursuant to art. 19, par. 2 of the RES Act, eligible producers of electricity from renewable energy sources have priority access to the grid if this does not affect the security of the system.

Art. 5 of the Regulation on issuing the electricity assent and establishing conditions and deadlines for connecting to the grid provides different deadlines for the issue of the documents important for the grid connection process.

Simple connection procedure

The simple connection procedure, for house-mounted PV panels, is similar, but somewhat simpler. The investor must submit a request for the electricity assent, after which the investor has to submit a request for confirmation of the main project. Afterwards, the investor must pay the fee for building of the connection, which is then built by the system operator. Furthermore, the investor must conclude an Agreement on the Grid Use with the system operator.

Finally, when the Agreement is concluded, the system operator activates the connection and issues a confirmation on beginning of usage of the network.

Use permission process

For roof-mounted PV systems the project developer also needs to acquire a use permission, pursuant to art. 182 et seq. Building Act (2013). This permit allows for usage of the completed construction. The competent authority is the same as for the location or building permit (art. 99 Building Act).

The technical inspection is performed for the purpose of determining whether the construction of the installation is in accordance with the building permit (art. 139 Building Act). Articles 140 and 144 of the Building Act also prescribe deadlines, which competent administrative bodies must respect concerning performing of the technical inspection and issuance of the Use permit. (.