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

Greece

Clean energy
for EU islands

Study on regulatory barriers and recommendation for clean energy transition on the islands - Greece

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Readers' Guide

This Study on legal and regulatory barriers for the clean energy transition on Greek islands 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 Greek islands, and formulated recommendations to overcome them.

After an introduction and explanation of the methodology, the first Chapter of this Study provides an overview of the existing policy and legislation for clean energy on Greek 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 and in-person National Stakeholder Meeting (see Annex 3 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** identifies existing and emerging legal, regulatory and policy frameworks for the development of local decarbonized energy systems on Greek islands. It aims to provide insight in whether the legislation fosters or hinders energy transition and ability of islands to develop and implement their plans. It analyses inputs from literature review, surveys, interviews and workshops and highlights best and worst practices, inspiring examples, failures and their lessons learned, and provides 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. 95 stakeholders were engaged, and the response rate was 15.80% (Annex 1).
- Information templates were sent to regulators, national authorities and relevant stakeholders.
- Thirteen semi-structured open-ended interviews with academic institutions and relevant actors (NGOs, associations and energy industry) of local energy initiatives were organised (Annex 1). 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 Greece Focus Group. Focus group consists of experts and representatives of national, regional and local stakeholders relevant for clean energy transition on EU islands. The first meeting was organized on 3rd of March and focused on the

discussion of the key barriers to clean energy project, while the second one, organized on 11th of May focused on the barriers for overcoming the priority regulatory barriers (Annex 3).

- National Stakeholder Meeting was held in Athens on 20 September 2022 (see Annex 3 for more details).

Policy and Legislation for clean energy on Greek Islands

Introduction to the Greek Energy sector – Relevant Actors

Throughout the study several key stakeholders in the Greek Energy sector, relevant for energy transition on the islands, will be referred to. Therefore hereunder a short overview of these actors and their role is given.

In Greece, energy policy is mainly the responsibility of the **Ministry for environment and energy**[1]. When it comes to islands and marine policy, the **Ministry for shipping and island policy**[2] is the main actor. As the energy transition affects other sectors 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.

When it comes to the energy policy and regulation, The Ministry of environment and energy is supported by the **Regulatory Authority for Energy** (RAE)[3]. In Greece, the energy sector policy and organisation of the sector is different between, on the one hand, the mainland and islands that are electrically interconnected with the mainland, and, on the other hand, islands that are not electrically interconnected with the mainland, so called non-interconnected islands (NIIs).

When it comes to the electricity market, **Hellenic Energy Exchange S.A**. (HEnEx)[4] has been designated by RAE to act as the electricity market operator and is currently operating the day-ahead market. In addition, The **Administrator of Renewable Energy Sources and Guarantees of Origin** (DAPEEP S.A.)[5] manages the Renewable Energy Sources (RES) and High-Efficiency Cogeneration of Electricity and Heat (CHP) of the National Interconnected System, as well as the Guarantees of Origin of electricity produced by RES and CHP. When it comes to NIIs, the management of operation, market operation and the electricity system is the responsibility of the **Hellenic Electricity Distribution Network Operator** S.A. (HEDNO)[6].

The Greek electricity grid is owned and managed by two companies. The electricity transmission system is owned and operated by the **Independent Electricity Transmission Operator** S.A. (ADMIE)[7]. The Electricity distribution system is owned and **operated by HEDNO, subsidiary or PPC**. The Greek electricity sector includes many power producers and suppliers.

Greek islands and their governance

Greece has more than 6,000 islands, of which 227 are inhabited. Some islands are interconnected to the mainland electricity system and some are not, the so-called Non-interconnected islands (NIIs). The latter consist of 28 autonomous systems. Crete is one of the most populous islands in the

[1] https://ypen.gov.gr/

[2] https://www.ynanp.gr/el/

[3] https://www.rae.gr/?lang=en

[4] https://www.europex.org/members/henex/

[5] https://www.dapeep.gr/etairia/orama-kai-skopos/

[6] https://deddie.gr/en/deddie/i-etaireia/ruthmistiko-plaisio/

[7] https://www.admie.gr/i-etaireia/omilos-admie/admie-ae

Mediterranean (8,336 km^2 - 634,930 inhabitants). It is considered an interconnected island[8] as of 1 November 2021. Besides Crete there are around 25 medium-sized islands (100-1,000km^2) and a large number of small islands (below 100 km^2). Evia, Crete, Rhodes, Corfu and Lesvos account for almost 80% of the islands' population[9,10]. Greece is currently carrying out interconnection plans, notably for Crete and several islands of the Cyclades. 15% of the total population of Greece lives on the islands. This corresponds to 1,650,000 people.

The country is split into 13 regions, of which 4 cover only islands, specifically the region of Crete, Ionian islands, North Aegean and South Aegean, while 4 other regions include some islands and part of mainland such as Attica, Macedonia and Thrace, Thessaly and Central Greece and Peloponnese, Western Greece and Ionian. The regions plan and implement policies. Public authorities on islands are managed in the same way as other administrative entities in Greece.

The Greek islands have been important economic, commercial and cultural centres with a long history. It is worth noting that the Minoan civilisation in Crete as well as the Cycladic civilisation are considered the first civilisations in Europe. Hence Greek islands are an important and crucial part of Greek and European culture and identity.

General policy

The **Integrated National Energy and Climate Plan for Greece** for the period 2021-2030 aims to increase the overall share of renewable energy sources (RES) in its gross final energy consumption to 35% by 2030. In the electricity sector, the share of renewables will rise to at least 60% by 2030. In the heating and cooling sector RES share in gross final energy consumption will rise to 42.5% by 2030 (30.6% in 2020) and RES share in final consumption for transport will rise from 6.6% in 2020 to 19% in 2030. Installed capacity of RES to total generation capacity was over 18 % in the NII region in 2019[11].

Regarding **Strategic Energy Planning**, Greece acknowledged in its Ten-Year Development Plan[12] that islands are crucial for the energy transition and the national economic growth by dedicating separate sections of the plan to the issues that islands are facing[13]. The proposed solutions focus on the interconnection of the islands with the mainland. If such solution is not feasible due to financial or technical limitations, the development of self-sufficient renewable energy systems will be encouraged. Such solution would bring a drastic reduction of the of electricity generation costs, replacement of thermal with renewable energy plants and numerous other environmental benefits.

[8] Defined as small connected system as defined by Directive EU 2019/944 https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019L0944&from=EN

[9] Katsoulakos, N.M. (2019) An Overview of the Greek Islands' Autonomous Electrical Systems: Proposals for a Sustainable Energy Future. Smart Grid and Renewable Energy, 10, 55-82. https://doi.org/10.4236/sgre.2019.104005

[10] https://www.statistics.gr/2011-census-pop-hous

[11] Katsoulakos, N.M. (2019) An Overview of the Greek Islands' Autonomous Electrical Systems: Proposals for a Sustainable Energy Future. Smart Grid and Renewable Energy, 10, 55-82. https://doi.org/10.4236/sgre.2019.104005

[12] Anexartitos Diacheiristis MetaforasIlektrikis Energeias' (ADMIE) draft Ten-Year Development Plan (TYNDP) 2022–2031, released in January 2021

[13] Tsagkari, Marula & Jusmet, Jordi. (2020). Renewable Energy Projects on Isolated Islands in Europe: A Policy Review. International Journal of Energy Economics and Policy. 10. 21-30. 10.32479/ijeep.9683.

In parallel, the GR-eco islands initiative[14] for the clean energy transition of islands and other independent projects are being implemented to foster energy transition on the islands. The new Climate Act[15] (L.4936/22) has been adopted in May 2022. This act obliges all municipalities, including island municipalities, to have local Plan for Emissions Reduction in line with National Energy and Climate Plan by 31/03/2023. It also forbids the use of oil for power production on the islands (unless there is a risk for the energy supply security for the island) starting from 1/1/2030.

Greece has adopted its Territorial Just Transition Plan for the islands of the North Aegean, South Aegean and Crete[16]. A series of actions are foreseen for these islands including energy transition and climate neutrality, circular economy and efficient use of resources, sustainable urban mobility etc.

Isolated island systems have higher investment and operating costs for energy generation, which normally should have been reflected on the electricity prices the end-consumers pay monthly. However, end-consumers in the whole territory of Greece pay Public Service Obligation (PSO) charges on their electricity bills intended to cover the higher price of electricity production on the Greek islands. This system is known as the system of **unified prices**. The PSO charges represent an amount which is annual estimation that is being collected at the Special Account for PSO managed by The Hellenic Electricity Distribution Network Operator (HEDNO) that has a role of the Operator of the Special Account of PSO.

In an effort to foster the acceptance of the renewable energy projects, in 2018[17] the Greek government proposed a return % share of the renumeration of the RES producers to the local stakeholders located in proximity to the renewable energy projects[18], based on Art 25 of the Law 3468/2006. This has been slightly modified starting with 2023 with Law 4964/2022[19] so that RES and hybrid stations[20] provide either 2 €/MWh of produced electricity injected into the grid or 3% of the remuneration for the electricity injected into the grid. The collected amount is split so that 40% is returned to the end-consumers living in the area of RES plants via the energy suppliers and 60% is returned to the municipalities that are in proximity of RES plants. The Operator of the Renewable Energy Sources and Guarantees of Origin (DAPEEP) is responsible for managing the RES special account for the interconnected part of Greece. For NIIs HEDNO is responsible for these operations.

In Greece, energy suppliers are obliged to offer uniform pricing to all end-customers across the Greek territory, according to Law 4001/2011 Art. 58B on 'Ensuring uniform pricing of electricity consumers'. Each energy supplier is free to offer its own retail price, but is obliged to offer the same price to both the end-customers of the interconnected system and the non-interconnected islands.

[14] https://clean-energy-islands.ec.europa.eu/news/gr-eco-islands-turning-greek-islands-models-green-sustainable-development

[15] https://www.taxheaven.gr/law/4936/2022

[16] https://ec.europa.eu/commission/presscorner/detail/en/ip_22_3711

[17] Art 25 of the Law 3468/2006

[18] https://www.researchgate.net/publication/343565822_Renewable_Energy_Projects_on_Isolated_Islands_in_Europe_A_Policy_Review

[19] Articles 87 and 94 of Law 4964/2022 https://www.taxheaven.gr/law/4964/2022

[20] Article 87 part 2 of Law 4964/2022 indicates four type of producers exempt from this fee, including RES in buildings, RES owned by prosumers, PV with installed capacity less than 1 MW and other PV plants, as indicated in the article.

There are no **regulated monopolies. The** electricity supply and electricity generation on the islands are fully deregulated. However, due to prior regulations[21] the Public Power Corporation (PPC) is the main energy generator for the islands and currently owns and operates all of the oil-fired thermal power plants on the islands. In addition, PPC, PPC RES (renewable energy generator) and HEDNO are part of the PPC Group.

Clean energy support systems

Support systems

As mentioned above, one of the most crucial distinctions with regard to RES in Greece is between mainland grid and interconnected islands and non-interconnected islands. This differentiation is crucial as it affects the type and level of support, for which RES plants are eligible. RES projects in Greece on non-interconnected islands can benefit from a Feed-in Tariff, regardless of the capacity (size) of the project, whereas on interconnected islands there is a maximum threshold of 400kW[22]. In addition, RES on interconnected islands that participate in the electricity market may benefit from a Feed-In Premium tariff, while bigger PV (>500kW) and onshore wind plants (> 3MW) can take part in tenders. There is also a subsidy for RES plants on non-interconnected islands employing two or more RES technologies (hybrid plants[23]).

There are also some special incentive and subsidy schemes in place for islands specifically. For instance, there is currently a national subsidy scheme, based on the Ministerial Decision 77472/520[24], running (GO ELECTRIC[25]), to promote the e-mobility uptake at a national level by providing subsidies to citizens, taxis and legal entities for purchase of EVs, electric motorcycles, e-bikes or electric scooters and subsidies for natural persons for installation of private home chargers. GO ELECTRIC 2, as a continuation of the subsidy program, has started in July 2022. Specifically for the islands, the scheme provides additional incentives for a legal entity to purchase up to 6 vehicles (instead of 3 vehicles for the rest of the country) and increased tax benefits (greater reduction of taxable income for legal entities that are participating in the scheme and are based on islands). Another special subsidy scheme for the uptake of e-mobility runs also specifically for the island of Astypalea, with even higher subsidies.

Greece supports solar PV, onshore wind power, hydro power and biogas/biomass, with a focus on hybrid plants[26] for non-interconnected islands. In the heating and cooling sector, solar thermal, biomass, aerothermal, geothermal and combined heat and power (CHP) plants are incentivized for use for self-consumption. Different support schemes are given for citizens for their own use or building use and different for the private companies or cooperatives. Incentives are not given for district heating or cooling infrastructure on the islands.

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[21] PPC was the single national electricity company before unbundling and opening of electricity market.

[22] In case an open energy market is established in a non-interconnected islands, the RES stations >400kW must be automatically remunerated with a feed-in-premium scheme (according to the Law 4414/2016, Art. 8 and Art. 11)

[23] Hybrid plants terminology is reserved only for Non-interconnected islands. While for interconnected system this is referred to as RES plus storage system. As defined in the Law 3468/2006,

[24] Ministerial Decision 77472/520, published in Official Journal B 3323/07.08.2020 based on the Law 4710/2020 on promotion of e-mobility.

[25] https://kinoumeilektrika.gov.gr/

[26] According to the Law 3468/2006. Hybrid power systems (HPS) are plants that use at least one RES technology and a controllable unit with storage. Additionally, the maximum RES production must be at most 120% of the storage installed capacity.

Generally available support schemes, whose details are provided in the Regulatory inventory[27], are:

- Subsidies are offered to small hydro power plants, CHP plants, hybrid plants and other RES only for autonomous production (RES E) as well as for geothermal, aerothermal heat pumps and biomass (pellets), solar thermal technologies, solar water heaters and solar heating (RES H&C).
- Tax relief is offered to small hydro power plants, CHP plants, hybrid plants and other RES only for autonomous production.
- Feed-in tariff - RES plants below 400 kW on interconnected islands and all RES on non-interconnected islands are eligible for a Feed-In Tariff.
- Premium tariff (Feed-In Premium) - RES and CHP plants on interconnected islands participate in the electricity market and may be awarded with a sliding feed-in premium.
- "Virtual net-metering" is available for city/regional councils, schools, universities, farmers, farming associations and Energy Communities.
- Subsidy for purchase of EVs (GO ELECTRIC) by different categories (natural persons, enterprises, taxi owners) and subsidy for installation of EV chargers for natural persons.
- The production of biofuels is eligible for subsidy or tax relief. A biofuel quota scheme is in place. However, it is not applicable to islands (both interconnected and non-interconnected).

Best practice
Greek islanders can benefit from energy efficiency funding. First, an energy audit needs to be carried out. After such an audit islanders can apply for funding which can cover between 30% and 70% of the price.

RES projects authorization process

Greece uses **tenders and auctions** for large projects and **application/approval process** for smaller projects. There are five main steps in the authorisation procedure of renewable energy projects in Greece. They include site selection process, certification of the RES producer, administration authorisation, grid connection permit and other (including installation licence and operation licence). The simplified procedures have been implemented for the step: licensing and permitting (first legal package) and grid connection permit (Law 4951/2022 adopted in July 2022). Within this process the simplified licensing and permitting procedure exists for RES plants with installed capacity less than 1 MW. In addition, Law 4951/2022 simplifies the grid connection permit, going from a two-step procedure to a single step and digitalizing the DSO application procedure starting from August 2022. The details on the permitting procedures are provided in Annex 2.

In specific cases, renewable energy projects can benefit from special permits. Some cases include the project on the islands of Astypalaia and Agios Efstratios which run due to the Law 4495/2017, Art 151 (defining Special pilot projects (SPPs)) and Art 152, respectively.

Electricity grid

RES are prioritised in the electricity network, while there are curtailment[28] provisions for interconnected wind power plants. ADMIE (TSO) and HEDNO (DSO) are primarily the responsible

[27] https://clean-energy-islands.ec.europa.eu/index.php/regulatory-inventory

[28] Curtailment is the reduction in electricity generation. It typically occurs because of transmission congestion or lack of transmission access, but it can also occur for reasons such as excess generation during low load periods that could cause baseload generators to reach minimum generation thresholds

authorities for the grid procedure. There is one distribution system operator (HEDNO)[29]. The country has a smart meter penetration rate of 2.6%. The electricity supplier switching rates for household customers in 2018 was 4.5%.

Supported energy efficiency measures

Energy efficiency measures are promoted/supported for refurbishment of buildings for citizens, for replacement of public lighting for public authorities and for improvement of energy efficiency in industry.

Supporting policies

Greece established Private Vocational Training Centres, which can offer specific seminars for the accreditation of RES installers. Apart from that, universities offer within their curriculum specific training courses on RES. Public sector authorities are supported by an "Electra Fund" in implementing energy efficiency measures.

Self-consumption and community energy

Greece introduced the concept of energy communities into its legislation in 2018[30]. Energy communities can benefit from special provisions such as participating in the EU projects, owning RES plants and operating virtual net-metering. The legislation has been undergoing revision since 2021.

To this date, the concept of prosumer is not legally defined. However, the concept of autonomous producer bears many similarities with the notion of prosumer. The net-metering scheme can be used by the autonomous producers that use following technologies: PV, small wind turbines, biogas, biomass/bioliquids, CHP, and small hydroelectric stations[31]. Moreover, all RES technologies used by autonomous producers for self-consumption can receive subsidies.

[29] In addition to HEDNO, Athens International airport electricity grid is operated by its own DSO, according to Article 131 of Law 4001/2011.

[30] Law N4513/2018

[31] According to ministerial decision GOG B' 759/05.03.2019 (ammended by GOG B' 3971/30.08.2021 and GOG B' 6287/29.12.2021)

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 Greek stakeholders through a survey and interviews (see Annex 1 for a detailed assessment). For each of the regulatory barriers, the Secretariat identified multiple recommendations. Those barriers and recommendations were presented and discussed within the two online Focus Group Meetings and in-person National Stakeholder Meeting (see Annex 3 for more information).

Regulatory barriers are presented in the order of their priority for energy transition on the Greek 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 for energy transition on the islands, lack of coordination and monitoring of implementation**

Recommendations:

1.1 Set-up an agile national Island Taskforce for clean energy transition on the islands

1.2 Ensure a holistic approach to energy transition on the islands and provide capacity building

Barrier 2. **Lack of island specific energy planning and integration with spatial planning**

Recommendations:

2.1 Reassess spatial planning guidelines for implementation of clean energy projects on the islands

2.2 Adopt national and regional master plans for clean energy projects

2.3 Mandate adoption of island or group of islands energy plans

Barrier 3. **Complex and long permitting procedure for RES projects**

Recommendations:

3.1 Further simplify permitting procedure for RES projects

3.2 Set-upa regional one-stop shop

3.3 Account for island energy and economy conditions when defining procedures for clean energy projects

Barrier 4: **Lack of clarity regarding short and mid-term actions to allow clean energy transition and ensure security of supply on the islands**

Recommendations:

4.1 Develop framework for uptake of energy storage systems and demand-side response

4.2 Allow installation of RES with flexible assets

4.3 Use regulatory sandboxes for testing of innovative solutions

Barrier 5. **Bureaucracy and administrative burden for the community energy initiatives**

Recommendations:

5.1 Simplify the procedures and requirements for energy communities

5.2 Create a platform for knowledge transfer and support

Barrier 6. **Clean energy project subsidies equalise interconnected islands and mainland**

Recommendation:

6.1 Re-evaluate support schemes for interconnected islands

Barrier 7: **The regulated price for electricity generation in non-interconnected islands hinders clean energy transition**

Recommendation:

7.1 Revise the system of regulated reimbursement of operation costs

REPowerEU – Proposal for amendment of RED II (and EPBD & EED)[32] 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 are used as an economic and political weapon and cost European taxpayers nearly €100 billion per year and tackling the climate crisis. There are three main axis:

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

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 600 GW 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.

On the same day the European Commission (DG ENER) published the report "Technical support for RES policy development and implementation – Simplification of permission and administrative procedures for RES installations (RES Simplify)". The aim of the report is to provide insights on the most important obstacles impeding the diffusion of renewable energy technologies in the permitting and grid connection procedures. It also discusses best practice examples deployed by the EU Member States and general best-practice recommendations which can be promoted with regard to permitting new and repowered renewable energy installations and connecting them to the grid. Relevant recommendations and examples are given throughout the study where relevant.

[32] 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 for energy transition on the islands, lack of coordination and monitoring of implementation

Both the energy sector strategies and the long-term energy planning are highly centralised. The National Energy and Climate Plan (NECP) for Greece does not provide a clear strategy or vision for energy transition on the islands. The NECP identifies the transmission interconnection for the islands and reduction of carbon emissions for thermal generation as the main measures for the islands. On the one hand, the Ministry for environment and energy is in charge of strategic planning of energy transition for the whole territory of Greece, including the islands. On the other hand, one of the main aspects of energy consumption, marine transport, is coordinated by the Ministry for shipping and island policies. There is lack of clear and unified strategy for how the islands will go from the current state to sustainable and decarbonised islands with secure energy supply (i.e. specifically in regard to existing generation, priority clean energy technologies, energy efficiency, road or marine transport, sector coupling project (water/waste and energy)).

There are many ongoing activities related to the islands. They include: significant investments in the transmission interconnections; digitalisation and upgrades of the distribution network; paused realization of more than 95 GW of approved RES projects[33], accelerated action for implementation of hybrid plants on the non-interconnected islands, funding for clean energy transition on the islands through the GR-eco initiative[34] (e.g. Chalki[35]) and innovative and good practice projects on few islands (such as Tilos[36], Astypalea[37], Crete[38], Sifnos[39], Agios Efstratios[40], Ikaria[41]). Unified national coordination of these activities and funds, coordination of various sectoral policies affecting islands on the national, regional and local level, monitoring of implementation and contribution towards the national goals (NECP), scaling up and replication of successful projects, institutional support and capacity building are currently missing. Moreover, there is lack of exchange of lessons learned from completed projects to allow for minimization of the implementation mistakes in the future and to integrate them in further strategic planning on national level.

Energy transition as a process includes implementation of, often, decentralized clean energy technologies, as well as the need for inclusion of such projects into the local or regional plans (spatial, climate etc.). This requires not just clear guidelines from the national government, but also know-how and capacity that local and regional authorities are often missing.

Recommendation 1.1: Set-up an agile national Islands Taskforce for clean energy transition of the islands

Islands represent specific energy systems for Greece and therefore require a specific strategy and implementation for the energy transition, in comparison to the mainland. Due to the above

[33] https://balkangreenenergynews.com/95-gw-of-renewable-projects-compete-for-completion-in-greece/

[34] https://www.pv-magazine.com/2021/11/05/greece-launches-gr-eco-islands-initiative-with-e100-mlllion-pot/

[35] https://www.dimoschalkis.gr/anakoinoseis/1st-gr-eco-island-chalki/

[36] Kaldellis, J.K. Supporting the Clean Electrification for Remote Islands: The Case of the Greek Tilos Island. *Energies* **2021**, *14*, 1336. https://doi.org/10.3390/en14051336

[37] https://smartastypalea.gov.gr/

[38] https://minoanenergy.com/en/

[39] https://sifnosislandcoop.gr/en/

[40] https://www.aistratis-greenisland.gr/the-project/

[41] http://www.ikaria-pnp.com/naeras.htm

mentioned reasons, we recommend improved coordination and monitoring of the energy transition on the Greek islands. We recommend creating an agile Islands Taskforce on the national level. The goal of the Taskforce would be to represent island needs, priorities and characteristics regarding energy transition and help shape national energy and islands policy.

Currently there are existing committees such as the Inter-ministerial committee for NECP and the Committee for implementation of GR-eco initiative, formed based on the Climate Law 4936/2022 adopted in May 2022. While both of these committees address important aspects foreseen under a potential Island Taskforce, such as intersectoral approach to national energy planning and intersectoral approach to implementation of energy transition action under GReco initiative[42], they still cover only part of the needed activities to ensure full coordination and monitoring of energy transition on the Greek islands. To ensure that formation of the Islands Taskforce does not entail organising yet another committee, the government needs to ensure Island Taskforce is coordinated with the existing committees and there is a clear distinction in mandate.

As discussed above, due to many ongoing initiatives aimed at energy transition on the Greek islands, the Islands Taskforce is urgently needed to represent local needs and priorities in these processes and ensure lessons learned from on-the-ground implementation are taken into account. The Taskforce is needed to coordinate between different sector policies on the national level and between national, regional and local level. Moreover, in addition to the representatives of different national, regional and local authorities, the Taskforce would have to include representatives of civil society, private sector, local stakeholders, relevant energy companies and academia. Most importantly the Taskforce should include experts directly involved with implementation of the projects on the ground. The Taskforce would be responsible for defining the short, mid and long term strategy on how national goals identified in NECP can be transferred to the regional and local goals and actions, relevant for the islands.

In addition, the Taskforce should be responsible for:

- Monitoring and evaluating the implementation of clean energy projects in regards to foreseen targets;
- Coordinating various funding to find the balance between local needs and highest impact;
- Identifying bottlenecks and gaps in implementation of projects on the ground and coordinating with responsible bodies to overcome them;
- Providing support through funding, training/capacity building, technical assistance or advice to local or regional governments, energy communities and local stakeholder in planning and implementation of clean energy projects;
- Provide guideline documents to national, regional and local government for implementation of new procedures[43];
- Provide a platform for exchange of experiences and lessons learned from completed and ongoing projects, among various islands and island stakeholders .

REPowerEU – RES Simplify
The RES Simplify report contains some useful recommendations and examples for political backing of RES:
Integrated planning system from national to local.
A general planning strategy can enhance local and regional involvement. Such a strategy includes breaking down national targets to the regional and local levels. Measures should be implemented to legally ensure the availability of sufficient land area for a target-compliant RES development (e.g. x% of national area is allocated to wind

[42] Article 21 of the Climate Law 4936/2022 https://www.taxheaven.gr/law/4936/2022

[43] Based on the experience from implementation of projects on the ground.

power). This could feature regional targets, but would leave decisions about specific locations in the hands of local actors.
Germany: The German Renewable Energy Act requires the federal states to report to the federal government on the status of renewables. This particularly includes permitted RES installations, the progress of repowering, and the area of land which is available for further wind energy deployment according to regional and urban land-use plans. If the available area is not sufficient, reasons and proposals for improvement have to be provided. Monitoring reports are assessed by a cooperation committee of the Federal Ministry of Economy and Energy and the federal states. Based on the committee's assessment, the Federal Government report on the progress of RES deployment with a view to reaching the RES targets and provides recommendations for further measures (Tagesspiegel Background 2021).

Actors involved:

- **Ministry for environment and energy**
- **Ministry for shipping and islands policy**
- **Ministry for development and investment**
- Ministry for finance
- Ministry for infrastructure and transport
- Regional and local governments
- HEDNO
- TSO
- Local stakeholders
- Academia
- Private sector representatives

Recommendation 1.2: Ensure holistic approach to energy transition on the islands and provide capacity building

There is a need for a holistic approach when dealing with the energy transition, as part of sustainable development of islands. A holistic approach connects the topics of energy, transport (road and marine), water and waste management, making use of the synergies that emerge towards decarbonisation. When it comes to energy, the focus should be on understanding how to deal with existing infrastructure and generators, implement energy efficiency, create flexible electricity systems that provide security of supply and increase share of renewable energy projects. Finally it is important to integrate energy transition planning with the marine spatial planning and other uses of the sea surrounding the islands. In this process identification of actions that allow for sector-coupling (e.g. energy and water, waste, transport, tourism, agriculture or culture) should be encouraged.

With the new Climate Law[44] adopted, the regional and local authorities are tasked with adopting a plan for adaptation to climate change and municipal emission reduction action plans, respectively. In addition to existing sectoral policies and spatial plans, it is important to provide guidelines to regional and local authorities on how topics of energy transition, energy efficiency, climate change, spatial planning etc. fit together and can be harmonised to ensure united planning and synchronised implementation. The Taskforce for clean energy on the islands could be tasked to identify and prepare needed guidelines. However, even without the existence of the Taskforce (recommendation 1.1), the Ministry for environment and energy should identify a body tasked to do this. In addition, capacity building is needed for local and regional stakeholders with regards to

[44] https://www.taxheaven.gr/law/4936/2022

holistic approach to energy transition planning and implementation, as this represents a change from the separate sectoral (silo) approach currently implemented.

REPowerEU – RES Simplify
The RES Simplify report contains some useful recommendations and examples to ensure that responsible authorities are fit for purpose.
Authorities should be put in a position that they can make robust decisions on applications within the required deadlines or even faster. Key measures include that a sufficient number of staff should be assigned to deal with applications. Furthermore, responsible staff have to be trained to have a sufficient level of expertise to evaluate permissions. This can be supported by central, possibly national, departments, for instance. These would be staffed with experts that can assist their regional or local colleagues on specific issues.

Finland: As onshore wind has expanded rapidly within the last decade in Finland, the municipal authorities' expertise with it has also increased drastically. Municipal environmental and construction authorities exchange information with each other and have begun to network country-wide. In addition, construction permit decisions from projects all across Finland are public documents and can be consulted as examples when in doubt.

Lastly, it should also be assessed if additional staffing in the administrative authorities is required or temporary posts or technical assistance to the local governments is needed.

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 for environment and energy**
- **Ministry for shipping and islands policy**
- Ministry for rural development and food
- Regional and local governments
- HEDNO
- Local stakeholders
- Academia
- Private sector

2. Lack of island specific energy planning and integration with spatial planning

National legislation for spatial planning in Greece has been significantly changed in the last decade with modifications introduced on an almost annual basis[45]. The most recent changes were introduced with the Law 4759/2020 on "Modernization of Spatial and Urban Planning Legislation" [46]. The current system foresees existence of local spatial plans developed on municipality level which regulate land use for a territory of a municipality[47]. Greek islands lack local spatial plans, and some do not have modern cadastral plans. Preparation of local spatial plans is foreseen to be implemented under the approved National Recovery and Resilience Plan (NRRP) pillar on "Energy upgrade of the country's building stock and spatial reform"[48]. However, the plan only foresees this to be done as a priority for touristic areas by 2024.

Moreover the Marine spatial plan for Greece is still in development[49]. It is foreseen to be implemented within the NRRP's Green transition funding. Integration of clean energy planning within the Marine spatial plan is yet unclear.

The spatial planning provides guidelines on renewable energy projects on the national level for the whole territory of Greece through a Special Spatial plan[50]. While these guidelines are clear, when combined with, for example, strict restrictions regarding cultural heritage[51] and building preservation, in implementation they have a disproportionately negative effect on the clean energy transition on the islands .

While the Special Spatial plan provides guidelines, this still leaves unclear how energy sector planning integrates into the spatial, urban and marine planning and which locations are priority for clean energy projects. Moreover, without existing regional or local energy plans it will be difficult to integrate energy transition priorities in preparation of spatial plans. While some municipalities have implemented local energy plans and strategies through voluntary initiatives (i.e. Covenant of Mayors or the Clean energy for EU islands secretariat[52]) there is no existing obligation on the local governments to prepare such plans. The new Climate Law[53], adopted in July 2022, brings the obligation for development of Regional Climate Change Adaptation plans and Municipal Emission Reduction plans which can help bring energy priorities under spotlight.

For example, continuous energy planning from the electricity grid perspective and integration of renewable energy projects happens within NIIs. HEDNO provides capacity availability[54] based on the generation plants that have connected to the grid or have received a grid connection offer.

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[45] https://fig.net/resources/proceedings/fig_proceedings/fig2021/papers/ts08.4/TS08.4_perperidou_11177.pdf

[46] https://www.economia.gr/creating-or-a-modern-spatial-planning-legislation-2/

[47] https://www.oecd.org/regional/regional-policy/land-use-Greece.pdf

[48] https://greece20.gov.gr/pylwnes-aksones/

[49] https://maritime-spatial-planning.ec.europa.eu/countries/greece

[50] https://fig.net/resources/proceedings/fig_proceedings/fig2021/papers/ts08.4/TS08.4_perperidou_11177.pdf

[51] Digital map of the protected areas and sites publicly available at https://www.arxaiologikoktimatologio.gov.gr/

[52] 12 islands have developed Clean Energy Transition Agendas with assistance of the Clean Energy for EU islands secretariat: Andros, Chalki, Chios, Kasos, Kastellorizo, Kos, Ikaria, Samos, Sifnos, Symi, Trizonia and Zakynthos.

[53] https://www.taxheaven.gr/law/4936/2022

[54] https://deddie.gr/en/themata-tou-diaxeiristi-mi-diasundedemenwn-nisiwn/ape-sta-mdn/sundeseis-stathmwn-ananewsimwn-pigwn-energeias/

Such an availability overview is used by investors to propose locations for new RES generation plants.

Recommendation 2.1: Reassess spatial planning guidelines for implementation of clean energy projects on the islands

While the local spatial plans and Marine spatial plan are to be realised within NRRP, the clean energy transition on the islands is already ongoing and should not wait for their implementation. Therefore, we recommend that the Ministry for environment and energy reassesses existing spatial planning guidelines with regards to clean energy project on the islands and provides new guidelines/standardised procedures on how clean energy projects should be planned and implemented with regards to the land use priorities on the islands. Such guidelines have to take into account the characteristics of islands. The use of the guidelines would help ensure that the approval process is not additionally complicated or delayed during the process of adoption of local spatial plans.

The guidelines can be included in the existing guidelines for energy projects within the Special Spatial plan. While led by the Ministry for environment and energy, the preparation process should involve representatives of the regional governments aware of existing spatial planning documents, local governments who will be implementing the guidelines and experts and academia involved in realisation of clean energy projects on the islands. This can be through collaboration with the Island Taskforce (recommendation 1.1).

Actors involved:

- **Ministry for environment and energy, Directorate for spatial planning**
- **Ministry for environment and energy, Directorate for energy**
- Regional governments
- Local governments
- HEDNO
- TSO

Recommendation 2.2: Adopt national and regional master plans for clean energy projects

The national government should initiate the preparation of national guidelines and regional Clean energy master plans that investigate and approve the areas or sites for clean energy development island by island. Based on the national guidelines identified in the Special Spatial plan and NECP goal, the national government should identify regions that can be further developed within the regional clean energy master plans. The master plans have to be integrated with the spatial planning, maritime spatial planning and coordinated with other sectoral plans on regional or local level (local energy plans, regional or local climate plans, etc).

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.

These Master Plans should also identify go-to areas specifically for one or more renewable energy sources and storage projects, in coordination with local needs and priorities, as well as the state of the electricity grid. Consequently, projects in these zones should be subjected to faster and simplified permitting procedures or lightened environmental impact assessments.

Actors involved:

Ministry for environment and energy
Ministry for shipping and island policy
HEDNO
ADMIE/IPTO
Regional and local governments
Local stakeholders

REPowerEU – accelerated procedures.

As explained in the section below on spatial planning, the proposed amendment to the renewable energy directive foresees in the identification of go-to zones.

In the designated renewables go-to areas, renewable energy projects that comply with the rules and measures identified in the plan or plans prepared by Member States, should benefit from a presumption of not having significant effects on the environment. Therefore, there should be an exemption from the need to carry out a specific environmental impact assessment at project level in the sense of Directive 2011/92/EU of the European Parliament and of the Council[55].

The designation of renewables go-to areas should allow renewable energy plants, their grid connection as well as co-located energy storage facilities located in these areas to benefit from predictability and streamlined administrative procedures. In particular, projects located in renewable go-to areas should benefit from accelerated administrative procedures, including a tacit agreement in case of a lack of response by the competent authority on an administrative step by the established deadline, unless the specific project is subject to an environmental impact assessment. These projects should also benefit from clearly delimited deadlines and legal certainty as regards the expected outcome of the procedure.

Following the application for projects in a renewables go-to area, Member States should carry out a fast screening of such applications with the aim to identify if any of such projects is highly likely to give rise to significant unforeseen adverse effects in view of the environmental sensitivity of the geographic area where they are located that were not identified during the environmental assessment of the plan or plans designating renewables go-to areas carried out in accordance with Directive 2001/42/EC. All projects located in renewables go-to areas should be deemed approved at the end of such screening process.

[55] Directive 2011/92/EU of the European parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment

Article 1(6) of the proposed amendment replaces Articles 16 of Directive (EU) 2018/2001, extending the scope of the permit-granting process, clarifying the start of the permit-granting process and asking for the most expeditious administrative and judicial procedures available for appeals in the context of an application for a renewable energy projects. Article 1(7) inserts a new Article16a, which regulates the permit-granting process in renewables go-to areas. Member States shall ensure that the permit-granting process referred to in Article 16(1) shall not exceed one year for projects in renewables go-to areas. The permit-granting process for the repowering of plants and for new installations with an electrical capacity of less than 150 kW, co-located energy storage facilities as well as their grid connection, located in renewables go-to areas shall not exceed six months. Article 1(8) inserts a new Article 16b, which regulates the permit-granting process outside renewables go-to areas. Member States shall ensure that the permit-granting process referred to in Article 16(1) shall not exceed two years, for projects outside renewables go-to areas. Article 1(9) inserts a new Article 16c, which regulates the permit-granting process for the installation of solar energy equipment in artificial structures.
Member States should establish timeframes and lay down specific procedural rules with a view to ensuring the efficiency of the legal proceedings related to access to justice for renewable energy projects.
Member States should create a single unified application process for the entire administrative permit application and granting process. Simultaneous applications should be prioritised over sequential applications if different authorisations are required, including for related grid projects.
Member States should introduce fully digital permit-granting procedures and e-communication to substitute the use of paper. Relevant information should be made available to project developers centrally as part of an online manual of procedures, including templates for applications, environmental studies and data, as well as information on options for public participation and administrative charges.

Recommendation 2.3: Mandate adoption of island or group of islands energy plans

Local energy planning assesses the existing demand, the potential for energy savings and energy efficiency, the state of the electricity grid and 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. Such plans have currently been prepared for some islands 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 helps 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 identify not only viable projects, but also set priorities based on the sector impact on the overall energy, economy and sustainable development of an island.

The Ministry for environment and energy needs to evaluate how energy planning can be coordinated with the other local requirements for spatial planning, Municipal Plans for Emission Reduction (based on the Climate law), marine and port planning and other local requirements, so that it provides the benefit of identifying local energy priorities and projects but does not additionally burden local administration. Moreover, a local energy plan has to be synchronised with the regional master plan for clean energy projects presented in the recommendation 2.2. On the other hand, pre-existence of the local energy plans makes the preparation of the regional master plan easier as it can take into account local priorities.

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 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.

If multiple islands are part of the same energy system and want to coordinate their energy planning, they should be able to prepare a joint energy plan.

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.

Actors involved:

- **Ministry for environment and energy**
- **Ministry for shipping and island policy**
- **HEDNO**
- TSO
- Local governments
- Local stakeholders (civil and private sectors)

3. Complex and long permitting procedure for RES projects

As previously explained, there are five main steps in the authorisation procedure of renewable energy projects in Greece (details in Annex 2). Clean energy projects are facing complex and lengthy authorisation and permitting procedures. For example, in the wind energy sector, projects currently require 8 to 10 years to get approved, far more than the 2 years target set by the Renewable Energy Directive (EU) 2018/2001. Currently many applications of hybrid plants to connect to the grid on non-interconnected islands are put on hold[56], awaiting regulation on the pricing system for hybrid plants to obtain a binding offer. Environmental assessments executed at the beginning of the project become irrelevant at a later stage due to long permitting times. Administrative authorisation process, which includes various sector authorisations, public acceptance and limited grid capacity are the main factors slowing down the process. For example, while there is a digital map of cultural heritage sites[57], the Ministry of Culture with its regional offices has been overwhelmed with applications for RES projects that need to be assessed, in many cases involving a site visit to the planned location. Local acceptance of the projects is missing as they are planned top-down and do not take into account local needs and priorities. Finally, grid capacity limitations are expected to be alleviated with the planned interconnection of the islands.

Further, small islands face challenges with financial viability of their low capacity renewable energy projects, given the small overall energy demand. The limited available capacity would mean that there is very little room for competition. In some small systems, already when just one wind turbine is present with a grid contract to inject power, there is no more room for new projects, as even a small additional power injection would go against the contractual rights of the existing wind turbine. Therefore energy transition on the island can be blocked due to reserved capacity for a project which is paused in authorisation and might not respond to the needs and priorities of the local island stakeholders.

Recommendation 3.1: Further simplify permitting procedure for RES projects

While the procedure for small RES projects, such as PV below 1 MW has been implemented and there are simplifications in the grid connection procedures with the new legislation in 2022, the permitting and authorisation process needs to be further simplified for all clean energy projects. To accelerate the energy transition and in light of the ongoing energy crisis, we recommend the national government to continuously evaluate existing procedures. The energy and climate crisis disproportionately affect the islands and therefore they should be at the focus of need for simplified procedures. The evaluation can identify implementation bottlenecks (e.g. parts of regulation which are still too complex, unnecessary requirements etc.). The identified bottlenecks can be removed by amending regulation to further simplify the procedure, easing the permitting requirements or providing fast and simplified procedure for clean energy projects. Stakeholders that have a role in the implementation and execution of the procedure (e.g. local governments, grid operators) should be involved in the evaluation process and preparation of the further simplified procedure. Their involvement can be implemented through the Islands Taskforce (recommendation 1.1), which would notify the relevant bodies when a bottleneck is identified.

[56] The projects that have been approved by the regulatory authority for energy are provide on the website https://geo.rae.gr/

[57] https://www.arxaiologikoktimatologio.gov.gr/

In addition, following the example of the grid connection permit[58], the permitting process should be digitised as much as possible. Implementation of standardised and digitalised authorisation procedures across all the levels of governance (local, regional, national) needs to be encouraged to reduce the administrative weight on permit granting.

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 priority in strategic documents.

REPowerEU – RES Simplify

The RES Simplify report contains some useful recommendations and examples for eased procedures for RES self-supply and small-scale RES

Easing and simplifying procedures for projects is a simple approach to speed up permitting. It helps planners and authorities alike and increases the speed at which projects are realised. By simply reducing the number of necessary permits for projects, developers need to prepare less documents. Authorities on the other hand receive less applications and can therefore use their resources to permit large and important projects. Eased procedures for RES self-supply and small-scale RES streamline the necessary checks and balances between project planners and authorities. This can be implemented due to the limited impact these installations are to have on the environment and energy systems.

Austria: In Upper Austria there is an exemption from the electricity generation licence for small hydropower plants with a capacity of up to 400 kW. This is seen as a simplification of the procedure.

Portugal: A new legislation aims at simplifying the licensing rules and regulatory procedures applied to production units for self-consumption (unidade de produção para autoconsumo – UPAC). For certain facilities (depending on the installed capacity), a mere notification to the Directorate-General of Energy and Geology is required in order to start operating the unit (for others not even that is required), which is a positive reinforcement for small and medium-sized photovoltaic producers as well as owners of small/mini wind turbines. Small power plants with a capacity of up to 1 MW can apply for a fast application via a web page to gain the grid connection permit.

Portugal: For certain small-medium sized power plants, it is only necessary to notify the (Portuguese) Directorate-General of Energy and Geology (DGEG) of their intention to connect the unit to the grid – and, for specific cases, not even a notification is required. Such instrument provides agility to photovoltaic projects that fit in the criteria, reducing costs and optimising time efficiency of projects.

Spain: The Autonomous Community of Andalucía does not request a building permit for self-consumption units with power up to 10 kW.

Other additional recommendations for simplification of the procedures are:

- Modify some administrative requirements to allow the modification and speeding up of projects already in the pipeline (allowing to take advantage of the most recent technological developments). In addition, remove restrictions on the repowering of existing parks.

- Simplify and harmonise the criteria across the different institutional levels (municipal, island, regional and national).

- Stop requiring environmental impact assessments for new solar projects with a capacity of under 50MW, as recently announced by Portugal[59]. Moreover, recently due to energy crisis and global political situation, Spain has adopted a temporary accelerated procedure[60] for

[58] Grid connection permit application process is foreseen to be completely digitized starting from August 2022, Law 4951/2022

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

[60] 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

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.

REPowerEU – RES Simplify
The RES Simplify report contains some useful recommendations and examples for the use of e-communication, including a mechanism for monitoring project progress
Digitalisation eases procedures for applicants and authorities alike. Officials can sort, store and review digital documents easily, and share them between the parties involved. This would allow applicants to see in what stage their application currently is. This accelerates the permitting process and provides transparency.

Germany: In 2010, the State of Lower Saxony introduced an electronic authorisation application form for immission protection applications (ELektronische immissionsschutzrechtliche Antragstellung - ELiA), which today is used by eight German federal states and offers an encrypted submission of application documents.

Actors involved:

Ministry for environment and energy
Regional governments
Local governments
DSO (HEDNO)
TSO
Local stakeholders

Recommendation 3.2: Set-up regional one-stop shops

As the permitting procedure consists of many steps and parties involved, the government should organise a one-stop shop at a regional level for clean energy projects. The one-stop shop is managed by a designated body on the regional level. 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 – RES Simplify
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.
The RES Simplify report contains some useful recommendations and examples for one Stop Shop / consolidation into one single application process
Applicants can contact a One Stop Shop (OSS) to obtain all permissions for their project. That OSS can either provide permissions or act as a contact point to facilitate the entire process, as defined in art. 16 (1) RED II. Depending on technology and size, the OSS can be either technology specific and/or have limited regional competences. In any case, it should be clear for a project developer to know which OSS it must approach. OSS should be introduced as an option for applicants, allowing them alternatively to directly contact individual authorities. This way applicants can benefit from their own experience and personal contacts.

Denmark: The Danish Energy Agency (DEA) serving as an OSS for offshore procedures is very efficient, according to relevant stakeholders. All the permitting decisions are coordinated by DEA with other authorities, which are responsible for different offshore interests. The resulting licenses are thus "comprehensive" in the sense that they are granted on behalf of several authorities and include conditions stipulated by all these. The mentioned licences do not completely preclude the need to obtain permits from other authorities as seen above. The system however eases the process for the developer greatly, and also

https://www.pv-magazine.com/2022/03/31/spain-streamlines-permits-for-utility-scale-solar-supports-another-7gw-under-self-consumption/

provides more certainty that the project can be established, as all relevant authorities have cleared the project on the stated conditions

A one-stop shop 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, one-stop shop functions even better when regional or local strategic energy document indicates identified priorities for an area, as proposed by the clean energy master plan above.

The need for the single contact point that would, upon the request of the applicant, guide through and facilitate the entire administrative permit application and granting process, is already imposed by the revised Renewable energy directive 2018/2001/EU[61], specifically Article 16.

Actors involved:
- **Ministry for environment and energy**
- **Ministry for rural development and food, Directorate for decentralized units**
- **Ministry for shipping and island policy**
- **Ministry for culture and sports**
- **Regional governments**
- Local governments
- DSO, TSO
- Local stakeholders

Recommendation 3.3: Account for island energy and economy conditions when defining procedures for clean energy projects

Ten-Year Development Plan[62] considers islands crucial for the energy transition. While the energy transition on all islands should be inclusive to local stakeholders and benefit the local economy, islands can face various challenges in this process. For example, due to small energy demand and isolated energy systems, small non-interconnected island systems represent a special case for the clean energy transition as their energy transition and economy can be disproportionately affected by a single project or change to the energy system. We recommend that strategic energy planning, through a regional clean energy master plan takes into account local energy and economy characteristics of islands when defining implementation conditions and guidelines for go-to areas and their priority technologies. For example, the realisation of projects on islands where one small RES project covers the local needs should include a requirement of socially inclusive investment, highly coordinated with the local municipality and stakeholders and require their involvement, through for example energy communities.

Actors involved:
- **Ministry for environment and energy**
- Ministry for shipping and island policy
- Regional and local governments
- HEDNO
- Local stakeholders

[61] https://joint-research-centre.ec.europa.eu/welcome-jec-website/reference-regulatory-framework/renewable-energy-recast-2030-red-ii_en

[62] Anexartitos Diacheiristis MetaforasIlektrikis Energeias' (ADMIE The Ten-Year Development Plan 2022-2031 approved according to the GOG B' 4789/12.09.2022.

4. Lack of clarity regarding short and mid-term actions to allow clean energy transition and ensure security of supply on the islands

Currently, island electricity grids have insufficient capacity for increased share of RES. While HEDNO has plans to upgrade the grid, financing can be problematic, especially for small islands where it can be economically unfavourable. Implementation of energy efficiency and energy savings measures is not very much prioritised. While innovative technologies can help modernise the grid and better integrate renewable energy projects, the maintenance of such systems is highly dependent on the private investor and their know-how.

In addition, a very strict regulatory framework has created a situation where temporary supply loss on the islands is seen as significant as the major black-out on the mainland, creating a pressure on network operators and dispatchers to prioritise security of supply over testing required for innovation or implementing efficiency measures. Therefore to ensure security of supply the RES share on non-interconnected islands is limited to 30% of system demand[63].

A study done by Hatziargyriou et al. shows that under the newly introduced generation management framework in combination with storage the share of RES can be increased beyond the 30 % share[64]. However, energy storage can only be implemented if it is combined with an energy resource, within a hybrid system or behind the meter and cannot be developed on its own. Moreover, a renumeration framework has not been applied even for hybrid systems. Therefore, using energy storage to increase RES penetration becomes unattractive. The legal framework for market participation of storage units has been adopted in July 2022 with the Law 4951/2022[65]. The law addresses three categories of storage projects: stand-alone energy storage; combined storage with renewable power systems (hybrid plants); and behind-the-meter storage by electricity consumers. Stand-alone energy storage for NIIs systems is only allowed as fully integrated network element of the DSO.

The accepted long-term solution is the plan to interconnect most islands with the mainland electricity grid and upgrade the grids of the Ionian islands network by 2029[66]. This solution represents a significant infrastructure investment which will definitely improve the security of supply of the islands and allow for increased use of RES, in the long-term. However, for autonomous islands energy systems clean energy transition and security of supply might be achieved in a more economical way by using decentralised small RES generation and storage systems[67].

Recommendation 4.1: Develop framework for uptake of energy storage systems and demand-side response

Considering the Law 4951/2022 that includes the legal framework for storage has been adopted in July 2022, this recommendation comes in line with existing activities. Adoption of the legal

[63] Imposed by NII Grid Code

[64] " Non-Interconnected Island Systems: The Greek Case " by Nikos Hatziargyriou, Ioannis Margaris, Irene Stavropoulou, Stavros Papathanasiou and Aris Dimeas https://ieeexplore.ieee.org/document/7942257/authors#authors

[65] https://www.taxheaven.gr/law/4951/2022

[66] By 2024, 10 Cycladic islands (Andros, Tinos, Mykonos, Syros, Paros, Naxos, Santorini, Folegandros, Milos, Serifos); Crete with Attica and Skiathos (the islands of Skopelos and Alonissos will benefit) with Evia are planned to be interconnected. By 2029, the Dodecanese and the NE Aegean are interconnected, while the Ionian Islands network is upgraded.

[67] Katsoulakos, N.M. (2019) An Overview of the Greek Islands' Autonomous Electrical Systems: Proposals for a Sustainable Energy Future. Smart Grid and Renewable Energy, 10, 55-82. https://doi.org/10.4236/sgre.2019.104005

framework is necessary for further clean energy transition on the islands. There is a specific need for a remuneration mechanism and operating procedures for storage (stand alone or part of the hybrid plant). It should provide investors with clear visibility on the remuneration parameters of this technology and encourage its penetration. Tilos project[68] represents a good example of inclusion of the battery technology in the island energy system.

It is important to distinguish between operation of storage that is involved in the wholesale market and those functioning on NII islands that are not part of the market, keeping in mind that the use of storage is crucial to assuring security of supply with continued energy transition. Currently on the NIIs the storage systems can be implemented within hybrid generation plant[69] or behind-the-meter[70], unless it is necessary for the operation of HEDNO.

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.

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 and Belgium have provided a more elaborate framework, mainly for 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[71]: 'Energy Storage' means, in the electricity system, the postponement of the final use of electricity until a time later than that at which the 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. '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.

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 organized 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

[68] Kaldellis, J.K. Supporting the Clean Electrification for Remote Islands: The Case of the Greek Tilos Island. *Energies* **2021**, *14*, 1336. https://doi.org/10.3390/en14051336

[69] As indicated by HEDNO storage system cannot be added to the existing RES plant on NII in order to be considered hybrid plant. The changes to the Law 4951/2022 are expected to be made to clarify in this direction.

[70] Only under the net-metering scheme (ministerial decision GOG B' 759/05.03.2019) for NIIs.

[71] Article 2.62 and 2.6 of the Electricity Act

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 markets 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[72]. As part of this initiative, the government has awarded £6.7m ($9m) to 24 projects across the country under the LODES competition, which is worth £68m ($91m) of capital funding in total.

Until recently, few countries had a specific support systems 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[73]. The Flemish government has extended the premium until 2024 and released additional budgets. The rates are as follows: 0-4kWh: 225€/kWh, 4-6kWh: 187.5€/kWh, 6-9kWh: 150€/kWh, Above 9kWh: no additional premium. Maximum premium per battery: 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 percent 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[74]. It covers 80% of eligible costs of the Battery Storage up to a maximum of €3,600 per system and €600/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[75].
- In Ireland, the Solar PV scheme provides subsidies for the purchase and installation for roof-mounted PV (up to 2kWp and with battery storage up to 4 kWp). The 2kWp of PV systems are subsidized (EUR 900 per kWp). If the roof-mounted PV is combined with battery storage then an additional grant for further 2kWp is offered (EUR 300 per kWp). Consequently, the maximum level of support reaches EUR 2,400 (ch. 2 Solar PV Scheme).
- Austria has launched a rebate program for solar-plus-storage installations offering homeowners 250€/kW of solar rooftop generation capacity and €200/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.

While there are foreseen changes[76] to the energy market and balancing framework to include demand side response and aggregation, the framework needs to take into account the island

[72] https://www.gov.uk/government/collections/longer-duration-energy-storage-demonstration-lodes-competition

[73] Decision of the Flemish Government of 28 June 2019

[74] 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

[75] PROENERGIA. DLR 14/2019/A & Ordinance 73/2019

[76] https://www.rae.gr/wp-content/uploads/2021/07/Greece_market_reform_plan_-V5-July-16_Clean-final.pdf

specifics. In developing new rules for the participation of demand response in the market, the global best practices should be taken into account to fast-track its deployment[77].

A system for remunerating these services and a competitive mechanism should be defined so that it is provided by the most efficient operators and agents. European markets that have successfully enabled participation in the wholesale markets, such as Belgium and France, can also offer useful experiences.

Best practice

Greece – Astypalaia island
The special pilot project of Astypalaia includes the operation of electric vehicles and there is a provision for charging when RES production is available. That scheme could be seen as a scheme of demand-side response given that it was combined with financial incentives for EV charging during high-RES production periods.

Actors involved:
- **Ministry for environment and energy**
- **Regulatory energy agency**
- **Hellenic electricity market operator**
- HEDNO
- ADMIE
- Energy companies
- Local stakeholders

Recommendation 4.2: Allow installation of RES with flexible assets
We recommend that HEDNO and RAE consider changing NII Grid code to allow extra RES capacity to be installed on an island even if its grid is considered saturated and the relative RES installation share is capped, provided that the proposed RES generation is coupled with management of flexible load (e.g. e-mobility, desalination unit etc).

This is also in line with the support for hybrid plants, as those utilize RES generation and storage, while this option would couple RES generation with other flexible devices. Such a measure can encourage innovation in implementation as well as sector coupling projects which will utilise existing device flexibility and foster further integration of RES.

Actors involved:
- **Regulatory energy agency**
- **HEDNO**
- Ministry for environment and energy
- Energy companies
- Local stakeholders

Recommendation 4.3: Use regulatory sandboxes for testing of innovative solutions
Considering that islands have their own specificities when it comes to energy systems and markets, the implementation of new technologies, innovative operation, tariffing and business models, the islands can be used as a testing site for energy transition.

[77] https://www.raponline.org/wp-content/uploads/2020/07/rap-kolokathis-spain-power-system-transformation-july-2020.pdf

We recommend using the regulatory sandbox[78] approach to allow specific islands to experiment with, for example different designs of electricity tariffs (hourly tariff, time of use tariff, etc.). 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 exceptions to existing legislation. This way incentives for clean energy transition on the islands can be tested without a permanent change in legislation. It also gives room to evaluate the success of the experiment.

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.

Choice of the islands and grids within which different regulatory sandboxes should be implemented can be decided in collaboration with the Greek Islands Taskforce (recommendation 1.1) which will ensure local inputs. In the planning, it is important to keep in mind the whole lifecycle of such projects and the possibility for their replication. Mainly once implemented these technologies need to be maintained and the operation and maintenance options should ensure access to adequate know-how and human capacity.

Regulatory sandboxes have been implemented in Italy[79], Austria, Germany and Netherlands for temporary tests of specific energy tariffs[80].

Actors involved:

- **Ministry for environment and energy**
- **Regulatory energy agency**
- **HEDNO**
- Local stakeholders (civil and private sector)
- Academia

[78] 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/

[79] https://www.iea-isgan.org/wp-content/uploads/2021/10/Regulatory-Sandbox-2.0_For-Publication.pdf

[80] https://fsr.eui.eu/regulatory-sandboxes-in-the-energy-sector-the-what-the-who-and-the-how/

5. Bureaucracy and administrative burden for the community energy initiatives

Energy communities are regulated by the Law 4513/2018[81]. The topic was further regulated with the Law 4685/2020 where benefits provided to energy communities were retroactively limited for smaller initiatives and ones not including local government[82]. In October 2021, the Law 4843/2021 was adopted which amends the Law on Energy communities in regards to their management of RES projects[83]. This makes for a complex navigation of the rules that apply to energy communities.

Excessive bureaucracy and administration imposed on small community initiatives leads to unfair competition between the community initiatives and energy companies, which are highly aware of the functioning of the energy system and have available human and other resources needed. For example, since mid-2020, the regulation has required consortia implementing renewable energy projects to provide high financial guarantees. While these guarantees are needed for the RES projects with high installed capacities to ensure that the companies that are going to implement the project have the financial means to do so, such conditions create a significant barrier for energy communities which implement small RES projects.

Further, bureaucracy and complicated regulatory frameworks are discouraging the involvement of the local population and stakeholder in the energy sector, since they lack the know-how to navigate through it. The requirements and procedures are often in conflict with short provided deadlines of funding opportunities, which citizens and local stakeholder cannot meet due to lack of the resources and knowledge. Therefore, requiring the same efficiency in preparation and the same procedure for small community energy projects provides an advantage for projects that are not initiated by energy communities.

Recommendation 5.1: Simplify the procedures and requirements for energy communities

Simplification of the authorisation and permitting procedures for clean energy projects has been already discussed. However, to support realisation of involvement of local stakeholders through energy communities, we recommend further simplification of the procedures and requirements for the energy communities and projects that include 20 % or more share of local stakeholders.

REPowerEU - facilitating citizen and community participation
To facilitate 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 and reduce to a minimum production licensing procedures and requirements, including for renewables self-consumers.
The EU Solar Strategy highlights that better information is key to enhance clarity and predictability on the benefits of selfconsumption for potential investors, citizens and SMEs. Investment costs, financial support, increase of property value, network tariffs, generation and consumption profiles and return on investment are all relevant factors impacting investments. One-stop-shops in Member States should share such information and give citizens advice on both energy efficiency measures and solar energy projects in an integrated manner, from the technical requirements to administrative steps and support measures.

[81] https://clean-energy-islands.ec.europa.eu/index.php/legal/country/4942/category_legal/226

[82] Marula Tsagkari, 'How Greece Undermined the Idea of Renewable Energy Communities: An Overview of the Relevant Legislation', 17/1 Law, Environment and Development Journal (2020), p. 85, available at http://www.lead-journal.org/content/c1701.pdf

[83] https://www.lexology.com/commentary/energy-natural-resources/greece/rokas-law-firm/amendments-regarding-energy-communities

Community energy projects still face significant barriers, including difficulties in securing financing, navigating licencing and permitting procedures or developing sustainable business models. In addition, as they are often initiated by a group of volunteers, they suffer from limited time and lack of access to technical expertise. Member States should establish appropriate incentives and adapt administrative requirements to the characteristics of energy communities. An integrated 3-step "learn-plan-do" programme could help energy communities build technical expertise and secure access to financing. The assessment and removal of existing barriers would level the playing field with more professionalised and established market participants.

Involvement of local stakeholders through energy communities helps bring the benefits of clean energy transition to the local island economy for further developments in energy or different priority sectors. Moreover it allows for increase of involvement and knowledge of local stakeholders on energy topics which further increases interest and acceptance of clean energy projects.

Such policies provide benefits to the projects that are supported by the local community, matching the local priorities and needs.

Actors involved:
- **Ministry for environment and energy**
- Regional and local governments
- Local stakeholders

Recommendation 5.2: Create a platform for knowledge transfer and support

Energy communities are beneficial from the point of view of involvement of local communities[84], and achieving just transition. Moreover, involvement of energy communities in the energy transition aims to help increase knowledge of energy topics, implementation of energy efficiency measures and uptake of renewable energy.

Greece has few examples of the energy communities on islands including: "Minoa Energy", "Energy Community of Sifnos" and "Energy Community of Thalis". Since starting involvement in the energy community and energy sector requires some initial know-how, exchange of best practices or experiences and guidance from the existing initiatives is needed for the wide scale roll out of energy communities on Greek islands.

National government should help set up a platform, trainings or conferences with island stakeholders to foster the discussion, give light to the best practices or even provide funding for mentorship programmes. This can be coordinated and monitored by the Taskforce for islands mentioned above.

Moreover, there is a need for assistance for energy communities to navigate their way through the energy sector, authorisation and permitting procedures as well as ways to access technical assistance for preparation of quality projects and finding the appropriate partners and funding for implementation of projects. We recommend that the national or regional government can set up help desks to provide assistance to local stakeholders on their path to increased involvement in the energy sector.

[84] Assuring energy projects benefit local communities and economy

Actors involved:
- **Ministry for environment and energy**
- Regional and local governments
- Local stakeholders

Recommendation 5.3: Re-evaluate the concept of energy communities for islands

Island communities are compact. The initiatives in regards to energy, water, waste, transport, tourism and agriculture should be coordinated together. As the human capacity on the islands are limited, the concept of an energy community should have a different definition for the autonomous island systems. Energy communities on autonomous islands should allow involvement not only of local government but also local utilities to help manage different aspects of the development together with all local stakeholders. Moreover energy communities should encourage sector-coupling projects to allow for stacked benefits.

Actors involved:
- **Ministry for environment and energy**
- HEDNO
- Local governments
- Local stakeholders (civil and private sector)

6. Clean energy project subsidies equalize interconnected islands and mainland

The majority of Greek islands are interconnected with the mainland power system, however an important number of them are not interconnected, making up the non-interconnection islands (NII). This distinction is crucial as it affects the type and level of support, for which RES plants are eligible[85]. The interconnected islands cannot seek an equal financial support, compared to the non- interconnected islands, even though they bear higher costs of investment of RES projects than the mainland.

In addition the issues of the limited resources of local stakeholders and limited know-how makes the maintenance of the clean energy projects more expensive regardless of the fact that the island is electrically interconnected.

Recommendation 6.1: Re-evaluate support schemes for interconnected islands
While interconnected islands have more flexibility and capacity for the connection of RES projects to the electricity grid, investment and operation costs of the projects are still higher. Therefore, we recommend existing support schemes for RES projects to be re-evaluated to account for island local characteristics beyond the electrical interconnection.

The non-interconnected islands do have a higher concern for security of supply and should not have the same support as the interconnected islands. However, the clean energy projects on the interconnected islands should not always be treated as the projects on the mainland as this undermines the previously mentioned investment characteristics of the islands.

Actors involved:
- **Ministry for environment and energy**
- Regional and local governments
- Local stakeholders

[85] For example, RES projects on non-interconnected islands can benefit from a Feed-in Tariff, regardless of the capacity (size) of the project, whereas on interconnected islands there is a maximum threshold of 400kw. In addition, RES on interconnected islands that participate in the electricity market may benefit from a Feed-In Premium tariff, while bigger PV (>500kW) and onshore wind plants (> 3MW) can take part in tenders. There is also a subsidy for RES plants on non-interconnected islands employing two or more RES technologies.

7. The regulated price for electricity generation in NII hinders clean energy transition

Non-interconnected islands have higher electricity generation costs due to existing oversized thermal generation technology and seasonality of the demand on most of the islands. To ensure security of supply existing thermal power plants either have higher capacity or there is a temporary use of diesel generators. Based on the Regulation for Electrical System Operation Code for Non-Interconnected Islands (NII)[86] the conventional power plants are reimbursed for the operation costs that include among others all operation, assets and fuel costs and complete costs for temporary operation of diesel generators. The current system does not incentivise existing generation plants to become more sustainable, efficient or flexible in their operation as regulated price covers the needed operational costs.

Moreover, for smaller energy systems, the lower capacity thermal power plants are used. In high demand times, in such systems, there is a need for more temporary generation using diesel generators. Therefore the current system pays for more inefficient and hence more expensive generation the smaller the island system is[87].

Recommendation 7.1: Revise system of regulated reimbursement of operation costs
In the future when more islands will be interconnected, the islands are expected to decrease the use of existing thermal power plants. While large investments in modernising this thermal generation would not be required, we recommend evaluating and revise the existing systems of regulated reimbursement of their generation costs. The revision should provide incentive to accelerate introduction of alternative fuels and improving efficiency, but also to incentivise the clean energy transition and energy diversification.

The solution could provide a timeline for the thermal power plants to gradually decrease the support for the operations. Part of the financing could be redirected to support innovative projects on the islands working towards the same goal.

During the evaluation of the existing system the national government and Regulator should take into account both just transition and the importance of security of supply on the islands.

Actors involved:
- **Ministry for environment and energy**
- **Regulatory energy agency**
- **Ministry for investment and research**
- PPC
- HEDNO
- Energy companies
- Regional and local government

[86] https://deddie.gr/en/themata-tou-diaxeiristi-mi-diasundedemenwn-nisiwn/ruthmistiko-plaisio-mdn/kwdikas-diaxeirisis-ilektrikwn-sustimatwn-mdn/kwdikas-diaxeirisis-mdn/

[87] Katsoulakos, N.M. (2019) An Overview of the Greek Islands' Autonomous Electrical Systems: Proposals for a Sustainable Energy Future. Smart Grid and Renewable Energy, 10, 55-82. https://doi.org/10.4236/sgre.2019.104005

Conclusions

The Clean energy for EU islands secretariat conducted an analysis of the legal and regulatory framework which supports clean energy projects in Greece. The resulting Regulatory inventory 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 Greek islands, and formulated recommendations to overcome them. This mission has gained in importance since the publication of the REPowerEU package.

Greece has been actively working to improve the enabling framework for energy transition with the adoption of a legislative framework to support electricity market changes, use of innovative technologies such as storage, accelerating e-mobility and simplifying authorisation procedures. With the Recovery and Resilience fund which helps implement interconnection of island systems and the GReco initiative which supports sustainable development of islands, island energy transition is accelerating in pace. However several major challenges for the clean energy transition on the Greek islands remain. These barriers relate to strategic planning and coordination of energy transition on the islands, lack of involvement of local stakeholders and experts involved in implementation of projects, lack of local energy planning and integration with spatial planning. Complex and lengthy authorisation procedures and grid constraints to further integration of renewable energy are also identified as some of the most important remaining barriers. To overcome these barriers, recommendations build on the existing regulatory framework and activities that are ongoing in Greece.

Many different initiatives and projects are active on Greek islands with the aim to accelerate the energy transition. While this is a positive trend, there is a need for better coordination of the activities and clear shared strategy in order to ensure resources are efficiently spent. Moreover, the lessons learned from existing and completed projects should guide the further planning and implementation. A nationally organised agile Island Taskforce is needed as a coordination and advisory body to represent island needs and priorities on the national level.

Taking into account climate change and the current energy crisis there is a need to accelerate decarbonisation actions and energy transition, especially on the islands. Clean energy projects help decarbonisation and decentralisation of the energy sector an. Local and regional energy planning need to reflect local needs and to be aligned with other sectoral constraints. Spatial planning guidelines should simplify authorisation procedures. To further shorten the authorisation procedures digitalisation of process, harmonisation of forms and simplification of required permits is needed. The process of planning and authorisation needs to take into account local characteristics and variations between islands and their economies and allow for flexibility in implementation with involvement of local governments.

Greek islands are either interconnected to the mainland electricity grid or non-interconnected. While Greece is investing significant resources to interconnect island systems in the next 10 years and increase capacity for RES integration, efforts are needed to foster flexibility and modernisation of the existing grid. Use of storage systems and other flexible devices in innovative ways in coordination with new renewable installations should be encouraged through remuneration mechanisms. Such implementation also requires updating existing grid regulations and codes. Regulatory sandboxes are proposed as a way to test innovative technologies and implementation methods before development of supporting regulation.

Even interconnected islands still face challenges with increased investment costs. Support schemes should reflect this additional costs. Moreover, it needs to be clarified which role existing thermal generation plays in this process and if they can be used to foster the change.

Finally, no transition will happen on the islands without involvement of local stakeholders and civil society. Clean energy projects should aim to satisfy both strategic national goals and local needs and priorities. Local acceptance of renewable energy projects has all too often stopped energy transition on the islands in the past. To ensure that sustainable development benefits local stakeholders, socially responsible investments that involve local stakeholders in ownership or management of the projects through energy communities should be fostered. Simpler procedures, capacity building and legal framework that allows for local involvement in energy projects is a necessary framework for the energy transition on the Greek islands.

The proposed recommendations are in line with existing activities in Greece but require improved coordination, engagement with local stakeholders and experts and multi-level governance.

Annex 1: Detailed analysis of the survey results

The survey for legal and regulatory barriers for clean energy on Greek islands has been sent to 50 contacts, representing 39 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 23 responders. However the response rate cannot be evaluated as the survey was publicly available as well.

Responders of the survey are representatives of 10 stakeholder groups. The responders are relatively distributed among the different stakeholders with island municipalities representing 22 %, national government bodies 22 %, academia 13 %, private energy industry (ESCOs, SMEs, etc.) 9 %, local body 9%, other (research institute and association of local and regional governments) 9 % of the respondents. The rest of the stakeholder groups (NGOs, energy communities or cooperatives, regional body and energy suppliers) are represented with 5 % of respondents or 1 representative.

Figure 1 - Overview of the respondents by stakeholder group

Aside from the surveys, thirteen semi-structured interviews were organized with representatives from the Ministry for environment and energy, Hellenic Electricity Distribution Network Operator S.A. (HEDNO), Public Power Corporation S.A. (PPC), The Hellenic wind energy association (HWEA), Network of Sustainable Greek islands (DAFNI), University of West Attica, National Technical University of Athens (NTUA), Hellenic Mediterranean University and Local island municipality of Halki.

The most important barriers that were identified by the survey respondents were the following:

- Complex administrative procedure for permitting,
- Lack of awareness and/or capacity of the stakeholders for developing clean energy projects,
- Lack of long-term planning developed at regional/island level,
- Lack of clarity regarding financial, social or environmental benefits to islanders,
- Insufficient capacity due to grid infrastructure constrains.

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 on the following three statements regarding **strategic energy planning for clean energy** on Greek 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 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	4.3
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 barriers that are considered important, with an aggregated rating of 4.0 and above, the respondents agreed with all three statements.

"National obligation for islands to develop energy action plans would lead to accelerated realisation of clean energy projects on islands lack of long-term planning developed at regional/island level" is the statement which has (strong) agreement by respondents from the municipality, local body, governmental body, energy community or cooperative, regional body, energy industry, energy supplier and other stakeholder groups. On the other hand, respondents from academia, non-governmental organization and energy industry & environmental sector stakeholder groups have indicated that they are neutral towards this statement.
When it comes to the statement that "Island(s) energy plans would help align local and national regulation, spatial plans, restrictions for clean energy" the respondents from the stakeholder groups energy industry, energy community or cooperative, regional body and other stakeholder groups strongly agree with it.
Overall, the respondents had the strongest agreement with the statement "Islands should be better integrated in the National Energy and Climate Plans".

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

- The unified energy prices system does not provide right price signals for the deployment of renewables on islands. Without this system in place, the islanders would be potentially looking for cheaper energy options, and could choose optimal clean energy projects. However if they would have to pay the real costs of energy, the islanders might move away from the islands because of the excessive costs of living.
- Unclear distinction of responsibilities between different energy market actors and an important level of complexity regarding emergency response. According to the Greek legislation, if an island is not interconnected with the mainland, it is considered as an

electrical island (non-interconnected island). In case of non-interconnected islands, HEDNO is responsible for electricity distribution and balancing. It is also considered the electricity regulator. When the island is interconnected with the mainland, it falls under jurisdiction of the TSO, and it participates in the wholesale market. The Public Power Corporation (PPC), the biggest electric power company in Greece[88], is one of the largest generators on the islands with ownership of all thermal plants. At the same time, PPC is the parent company of HEDNO, however in practice these companies are independent. On some islands (all NIIs) HEDNO regulates and controls PPC's (generation) activity.

- Top-down approaches in RES implementation. In the past, most of the RES initiatives and projects were decided at a national level, which led to the resistance of the locals against the RES projects.

Renewable energy

General

Survey results:

The survey has asked the respondents to rate the following eight **general barriers to renewable energy projects** on Greek 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
No specific attention to islands in national level auctions/tenders for RES project	3,2
Lack of auctions or tenders for clean energy projects on the regional/local level	2,9
Complexity of support systems	3,1
Lack of clarity regarding financial, social or environmental benefits to islanders	4,3
No regulations for curtailment of RES plants for non-interconnected islands	2,2
Lack of legal framework and support for energy storage	4,1
Lack of long-term planning developed at regional/island level	4,3
Lack of awareness and/or capacity of the stakeholders for developing clean energy projects	4,3

If we take into account only barriers that are considered important, with an aggregated rating of 4.0 and above', there are 4 barriers put forward by respondents.

They include from least to most important:

- lack of legal framework and support for energy storage,
- lack of long-term planning developed at regional/island level,

[88] The Greek state has 34% of ownership in PPC currently

- lack of awareness and/or capacity of the stakeholders for developing clean energy projects and,
- lack of clarity regarding financial, social or environmental benefits to islanders.

Lack of legal framework and support for energy storage is rated "very important" by all representatives from the academia, energy community or cooperative, regional body and energy supplier stakeholder groups.

Lack of long-term planning developed at regional/island level is rated as "very important" by all respondents from the academia, local body, energy industry & environmental sector, regional body, energy communities or cooperatives and energy supplier stakeholder groups. When assessing correlation between all barriers presented in the survey this barrier is highly correlated to the spatial planning barrier to renewable energy projects that "Lack of long-term vision on how different land use on islands are coordinated to ensure sustainable economic development". This means that rating of both barriers is positively correlated among all respondents.

While other barriers have various ratings, "lack of awareness and/or capacity of the stakeholder for developing clean energy projects" is rated "fairly important" or "very important" by all stakeholder groups. This is the second most important barrier for municipalities and national government bodies.

"Lack of clarity regarding financial, social and environmental benefits to islanders" is rated as "very important" barrier by government bodies, regional bodies, energy communities and cooperatives and energy industry, while it is the highest rated barrier by NGOs and third most important by municipalities. Of all the barriers rated in this survey this barrier has highest correlation to the spatial planning barrier of "renewable energy projects seen as conflicting to environmental protection of the islands/area around islands". This means that respondents that highly rated one barrier also highly rated the other barrier.

The municipalities rated "complexity of support systems" as the most important general barrier to renewable energy projects on the Greek islands. This barrier is highly positively correlated to three additional barriers from the rest of the survey including the barrier to energy efficiency projects that "Complex funding instruments for energy efficiency and two barriers for community energy on Greek islands", 'Community energy initiatives have to meet the same requirements as traditional energy companies" and "Lack of institutionalised platforms for information exchange, awareness raising and capacity building on local or regional level".

Interview results:

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

- The applications for renewable energy projects are limited by a cap of 30%. This means that no more than one-third of power demand on non-interconnected islands can come from renewables[89]. This so-called "rule-of-thumb" might be seen as a barrier, as it limits

[89] The operation of the Electrical Systems of the Non-Interconnected Islands, which includes the operation of the production, the functioning of the market and of the systems of these islands, is the responsibility of HEDNO S.A. (the Greek DSO), and is conducted in accordance with the "Operation Code of Electricity Systems of Non-Interconnected Islands", issued pursuant to article 130 of Law 4001/2011. Following the Regulatory Authority's (RAE) Decision No. 96/2007, all Greek islands (interconnected and non-interconnected) have been characterized in terms of wind and solar capacity. Based on the articles 8,10 and 11 of the Regulation of Electricity Generation and Supply Licenses (Government Gazette B '1498 / 8.12.2000), RAE defines, after a study carried out by the DSO, the updated margins for installation of additional RES capacity in the non-interconnected islands, according to which only 1/3 of the energy on non-interconnected islands can come from renewable sources.

the productions of renewable energy on the non-interconnected islands. A recent study shows that "*under the newly introduced generation management framework, a total RES capacity in excess of 1000 MW can be hosted on the non-interconnected Islands, leading to a feasible potential for RES energy penetration around 50% of the annual load demand. High RES penetration levels can only be achieved via the integration of dispatchable RES stations, while the introduction of storage is the main enabling factor for the transition from the current RES energy penetrations of around 20%, based only on wind and PV, to the level of 50% and beyond*"[90].

- Non-interconnected islands have the right for higher incentives for RES generation. However, even though connected to the mainland, interconnected islands still have higher prices for renewable energy projects than the mainland.
- The rigid regulatory framework discourages any potential for innovation and out-of-the-box thinking in renewable energy projects.
- Since mid-2020, the government has been asking consortia implementing renewable energy projects for large financial guarantees. While these guarantees are needed for the big projects to ensure that the companies that are going to implement the project have the financial means to do so, this condition should not be applied to energy communities. These guarantees can be provided only by large companies and leads to dominant positions.
- Lack of involvement of the local stakeholders in the renewable energy projects. There are numerous cases in which RES projects lost their licenses and locals block their renewal and further implementation, unless they were involved in the project.
- While energy storage has been mentioned by several interviewees as a key aspect for renewable energy development, a framework for its development, integration and renumeration is still missing[91]. Currently, energy storage can only be implemented if it is combined with an energy resource (hybrid system) and cannot be developed on its own; as mentioned in the part 'Policy and Legislation' above, it was mentioned that there is a subsidy for projects on non-interconnected islands involving two or more technologies. A renumeration framework has not been applied even for hybrid systems. This leads to abandonment of RES projects by island, which prefer to wait for an interconnection instead.
    - An interviewee mentioned that the government has announced that it is working on the legal framework for market participation of storage units. It will include some categories, mainly storage behind the meter, which will be eligible for state aid.
        - The reform includes policies that target three categories of storage projects: stand-alone energy storage; combined storage with renewable power systems; and storage projects installed by Greece's electricity consumers. Most crucially, storage projects installed alongside renewable energy systems that do not charge from the electricity network will be eligible to participate in the county's renewable energy tenders.
- It is important that operators of storage unit have a clear view on how they will be remunerated by the market, and thus the hope is that this framework will be clear enough. There is an amount of 200 million euros allocated in the RRF, for capital grants for storage installation through a competitive tender. Determining a feed-in tariff is very complex. Developers must conduct a separate assessment per island taking into account the fuel cost,

[90] " Non-Interconnected Island Systems: The Greek Case " by Nikos Hatziargyriou, Ioannis Margaris, Irene Stavropoulou, Stavros Papathanasiou and Aris Dimeas

[91] The draft Law has completed public consultation on 10/05/2022. It includes necessary regulation for the development and operation of energy storage systems. It amends the current laws based on the Electricity direvtive 2019/944/EC and brings forth the aggregation as a new activity of electricity companies.

the operational cost and the cost of the most expensive thermal engines in order to estimate the feed-in tariff.

- Regulation for clean energy projects that involve sector coupling i.e. energy and water sectors, is unclear. Energy can become a priority only if it can be combines with other major problems that islands are facing such as water scarcity or waste pollution.
- It is very difficult for developers to be allowed to use public domain to develop renewable energy projects.
- Whereas operating under an energy stock exchange is a good solution for the mainland Greece, due to technical constraints and unpredictable weather conditions, such solution is not optimal for the islands. They should have a fixed price (with manual adjustments), via feed-in tariffs.
- According to the Greek long term national plan, the country aims to interconnect all islands with the mainland and between themselves by 2030. Such big project requires a lot of planning and investment, Greeks do not see the need of investing in improving existing thermal plants which are being used as base load on most of the islands. The functioning costs of the thermal plants are covered by the operational costs, they have no incentive for more efficient operation. Thermal plants are not incentivised to use a more sustainable fuel or to upgrade their operation as such actions would not be covered under the regular costs. From a company's perspective, this would be a loss.

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 Greek 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	4,4
Long (>2 years) permitting procedure	4,2
Lack of permitting exemption for small-scale systems (PV, battery, EV chargers)	3,0
Spatial planning legislation related to protected areas restrictions and RES installations not adjusted to the local island's characteristics	3,8
Renewable energy projects seen as conflicting to environmental protection of the islands/area around islands	4,2
Lack of long term vision on how different land use on islands are coordinated to ensure sustainable economic development	4,1

If we take into account only barriers that are considered important, with an aggregated rating of 4.0 and above, there are 4 barriers put forward by respondents. They include from least to the most important:

- Lack of long term vision on how different land use on islands are coordinated to ensure sustainable economic development,
- Renewable energy projects seen as conflicting to environmental protection of the islands/area around islands,
- Long (>2 years) permitting procedure,
- Complex administrative procedure.

"Lack of long term vision on how different land use on islands are coordinated to ensure sustainable economic development" is rated as "fairly important" or "very important" by respondents representing academia, municipality, local body, energy industry & environmental sector, regional body, energy community or cooperative, energy supplier and other stakeholder groups.

"Renewable energy projects seen as conflicting to environmental protection of the islands/area around islands" is rated as "fairly important" to "very important" barrier by the respondents from all stakeholder groups, except for respondents from municipality and energy supplier stakeholder groups.

"Long (>2 years) permitting procedure" is rated as "fairly important" to "very important" by representatives from all stakeholder groups except for representatives from municipality and energy industry stakeholder groups.

"Complex administrative procedures", which is rated as the most important barrier for permitting and spatial planning is rated as "very important" by all representatives from non-governmental organization, local body, energy industry & environmental sector, energy community or cooperative, and energy supplier stakeholder groups.

All of the mentioned barriers related to permitting are rated as "fairly important" or very important, 4,0 or above, by respondents from the local body and regional body stakeholder groups.

All the listed spatial planning barriers are rated "very important" by all respondents from the energy industry, energy community or cooperative and regional body stakeholder groups.

Interview results:

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

- The RES authorisation process is both complex and lengthy. Even though the government took measures to simplify the procedure, there are still many authorisations needed for a RES project and there is no administrative body that coordinates the whole process. Archaeological approval often delays RES projects. Greece has already undertaken steps in the right direction and adopted a first legal package to simplify the rules for licensing and permitting. The second package, related to next steps in the permitting process, such as grid connection, is expected.
- Lack of spatial plans for the islands, even though they have been already included in the recovery and resilience funding.

- Spatial planning rules are not clear or transparent. Spatial planning legislation for RES installations is not adjusted to islands' specificities such as issues with land conflict, mixed-used areas and aesthetic impact of the project.
- Long permitting time due to which the environmental assessment executed at the beginning of the project becomes irrelevant at a later stage. This also has an impact on the community acceptance, as local stakeholders are frustrated with uncertainty over if and when a project will be implemented.
- Projects are not coordinated with local stakeholders who very often are not informed of what is happening in their area.

Electricity grid

Survey results:

The survey has asked the respondents to rate the following 4 **grid connection barriers** to renewable energy development on Greek 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	2,8
Insufficient capacity due to grid infrastructure constrains	4,3
Limited sustainable back-up options to ensure security of supply	4,2
Lack of systematic approach to grid development needs for integration of RES	3,8

If we take into account only barriers that are considered important, with an aggregated rating of 4.0 and above, there are two barriers put forward by respondents. They include from least to the most important:

- Limited sustainable back-up options to ensure security of supply,
- Insufficient capacity due to grid infrastructure constrains.

"Limited sustainable back-up options to ensure security of supply" is rated "fairly important" or" very important" by respondents from all stakeholder groups, except for respondents from non-governmental body, municipality and government body stakeholder groups who consider it important.

"Insufficient capacity due to grid infrastructure constrains" is rated the most important in this section for all stakeholder groups, except for representatives from energy industry & environmental sector and local body stakeholder groups.

Interview results:

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

- Even though Greece has a long-term plan to connect the islands to the mainland[92], the plan has no room for development and most projects are on hold. Developing a framework for energy storage would solve some of the grid related issues in the meantime.
    - HEDNO indeed has plans to upgrade the networks, accompanied with smart meters and digitalisation projects. However, financing is lacking; on some islands there are only a few inhabitants and upgrading the grids there is not a financial priority. A specific subsidy (or other financial measure) for upgrading the grid could be helpful to speed up the process.
- Lack of framework and incentives for replacement of fuel oil in thermal plants with renewable diesel (approx. 85% GHG reduction).
- Lack of specific planning for the renewables development in islands with relevance to their status before and after the interconnections to the mainland electricity system (issues of security of supply, grid stability, system and grid capacity, etc.).
- Even though interconnected islands are electrically interconnected, in case of issues with such connection, they still face a problem with the security of supply. Therefore, geographical islands even if electrically interconnected should not apply the same regulation and restrictions as the mainland. The geographical islands should still prioritise security of supply and power back-up.

Energy Efficiency

Survey results:

The survey has asked the respondents to rate the following five **energy efficiency barriers** to renewable energy development on Greek 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 energy efficiency targets	3,3
Complex funding instruments for energy efficiency	3,3
Insufficient funding instruments for energy efficiency	3,8
Lack of clear regulations for energy service companies	3,2

If we take into account only barriers that are considered important, with an aggregated rating of 4.0 and above, none of the barriers were put forward by respondents. The following barrier is considered by respondents as relatively important and rated the highest among other barriers for energy efficiency projects:

- Insufficient funding instruments for energy efficiency.

[92] ADMIE's draft Ten-Year Development Plan (TYNDP) 2022–2031

"Insufficient funding instruments for energy efficiency" is rated "fairly important" to "very important" by respondents from municipality, local body, energy industry, energy community or cooperative, energy supplier and other stakeholder groups. This is also highest rated barrier for all stakeholder except for respondents from the local and regional body stakeholder groups.

Interview results:
From the interviews with Greek stakeholders, the following **barriers for energy efficiency** on Greek islands have been retained:

- Due to national heritage restrictions and building preservation restrictions, it is forbidden to instal energy efficient equipment such as solar collectors.
- The cost for energy retrofitting in islands is always higher in comparison to the mainland due to climate conditions, lack of economies of scale, transportation costs etc.
- Collective use of energy efficiency measures or support is not yet implemented.
- During the clean energy transition to carbon neutral electricity systems in islands, major cuts to diesel consumption and therefore GHG emissions could result from the optimization of the thermal power plants operation with the integration of storage systems which could in parallel offer Green Services to the systems (virtual power plants with new renewable capacity, smart grids, etc). There is a lack of legal framework and incentives for energy efficiency measures in existing thermal power plants (i.e. coupling with BESS) which could substantially decrease GHG emissions.
- Islands also have limited resources and technical personnel capacity to apply and follow up on energy efficiency measures

Self-consumption and community energy

Survey results:
The survey has asked the respondents to rate the following eight **community energy projects and energy sharing barriers** to renewable energy development on Greek 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 scope of the legal framework for energy communities (virtual net metering, hot water, transport)	2,6
Inadequate existing regulatory framework	2,6
Lack of trust in community energy initiatives	3,4
Lack of involvement of municipality or supplier in energy community	2,5
Lack of political support for community/citizen involvement	3,3
Community energy initiatives have to meet the same requirements as traditional energy companies	3,0
Lack of institutionalised platforms for information exchange, awareness raising and capacity building on local or regional level	3,4

Lack of financial/funding mechanisms for collective/community involvement in clean energy projects	3,7

If we take into account only barriers that are considered important, with an aggregated rating of 4.0 and above, none of the barriers were put forward by respondents. The following barrier is considered by respondents as relatively important and rated the highest among others:

- Lack of financial/funding mechanisms for collective/community involvement in clean energy projects.

"Lack of financial/funding mechanisms for collective/community involvement in clean energy projects" is rated "fairly important" to "very important" by respondents from all stakeholder groups, except two. The respondents from energy supplier and regional body stakeholder groups consider this barrier as don't know or not at all important, rating it at 0 and 1 point on the Likert scale, respectively.

When assessing correlation between all barriers presented in the survey this barrier is highly correlated to two other barriers to community energy projects and energy sharing, namely: "lack of political support for community/citizen involvement" and "lack of institutionalized platforms for information exchange, awareness raising and capacity building on local or regional level". This means that respondents that highly rated one barrier also highly rated two others.

While other barriers have various ratings, "Lack of political support for community / citizen involvement" is highly rated, and thus considered as fairly to very important, by all respondents but non-government organisation, regional body and energy supplier. This barrier is highly correlated with "Lack of awareness and/or capacity of the stakeholders for developing clean energy projects barrier". This means that respondents that highly rated one barrier also highly rated two others.

Interview results:

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

- Low participation of islanders, as it is difficult to convince them to invest in a renewable energy projects due to unclear risks and benefits of such participation.
- Red tape and bureaucracy, as it is difficult for local actors to navigate through complex procedures.
- Limited installation capacity for prosumers on islands.
- Lack of technical and legal capacity for energy community initiatives within the municipal administrations.
- Lack of clarity regarding benefits for the energy production companies in working with an energy community, instead of municipality or other local stakeholders.

Measures to overcome the identified barriers

Survey results:

The survey has asked the respondents to rate the following eleven **measures for overcoming 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.

Measure	Rating
Simplified permitting process for RES projects – e.g. regional or local one-stop shop	4,2
Simplified permitting through single permit process	3,9
Support of hybrid (2 or more RES working together) plants for non-interconnected islands	3,7
Support for RES for hot water for self-consumption	3,9
Tax relief offered for RES self-consumption	4,1
Virtual net-metering offered to public bodies or associations/energy communities	3,9
Community (energy) initiatives to better represent local priorities and/or involvement in clean energy projects	3,6
Co-planning / co-development mechanisms in place to prevent conflicts between investors and islanders	4,0
Compromises between environment conservation, agriculture, preservation of historical sites, tourism and sustainable and clean energy	4,2
Subsidies for fossil fuels are redirected to support clean energy projects through the avoided GHG emissions method	4,3
Capacity building or advisory services on clean energy projects for islands	3,9

If we take into account only barriers that are considered important, with an aggregated rating of 4.0 and above, there are five very important measures considered by respondents. They include from least to most important:

- Co-planning / co-development mechanisms in place to prevent conflicts between investors and islanders,
- Tax relief offered for RES self-consumption,
- Simplified permitting process for RES projects – e.g. regional or local one-stop shop,
- Compromises between environment conservation, agriculture, preservation of historical sites, tourism and sustainable and clean energy,
- Subsidies for fossil fuels are redirected to support clean energy projects through the avoided GHG emissions method.

“Co-planning / co-development mechanisms in place to prevent conflicts between investors and islanders” is rated “fairly important” or “very important” by respondents from all stakeholder groups. However, two respondents from non-government organisation and energy supplier stakeholder groups consider this measure as not important, rating it at 0 (don’t know) and 2 (slightly important) points on the Likert scale, respectively.

"Tax relief offered for RES self-consumption" is rated "very important" by respondents from the stakeholder groups local body, energy industry, energy community or cooperative, regional body and other.

"Simplified permitting process for RES projects – e.g. regional or local one-stop shop" is rated "very important" by respondents from the stakeholder groups non-government organisation, local body, energy industry and energy community or cooperative.

"Compromises between environment conservation, agriculture, preservation of historical sites, tourism and sustainable and clean energy" is rated "very important" by respondents from the stakeholder groups academia, municipality, local body, governmental body, energy industry, energy community or cooperative, regional body and other.

"Subsidies for fossil fuels are redirected to support clean energy projects through the avoided GHG emissions method" is the most important measure rated by respondents from the stakeholder groups industry, energy community or cooperative.

Interview results:

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

Regarding strategic planning:

- Local energy planning should become an obligation. There is a momentum for local municipalities to become the leaders of the clean energy transition, but a clear plan is needed to bring together all actors involved. Without a clear plan, it either takes too long to develop projects or initiatives, or there is resistance from the island inhabitants. Planning should thus be mandatory for all stakeholders to work in the same direction. Interviewees mentioned that in order overcome the many barriers such as permitting and grid development) and keep convergence with other priorities such as environmental protection, tourism, historical buildings, etc. local or regional strategic energy planning is needed.
- Decarbonization of islands necessitates resilient and robust electricity systems that can reliably support extensive renewable generation. The basis for this is the establishment in each island of a facility technically capable of offering to the autonomous electricity system, both short-term (<1 sec, mainly from storage) and long term (several days, mainly from biofueled units (should logistics and pricing of biodiesel become favourable)) security of power supply and emergency reserve through a single holistic integrated system, capable also of providing central storage capacity to the system. Based on such system, a wide range of renewables can be then developed.
    - In order to promptly allow for new clean energy projects, the basic facility described above could technically be deployed fast in every island within the existing base load and dispatch stations. What is needed is the policy acknowledgment of its necessity and the establishment of the appropriate relevant remuneration mechanism.

Regarding renewable energy in general:

- There is currently an unwritten 'rule-of-thumb', defined based on the data on current generation and capacities, according to which only 1/3 of the energy on non-interconnected islands can come from renewable sources. Possible measure to overcome this barrier could be to increase the 1/3 cap while ensuring higher demand response and flexibility measures so as not to pose additional risks to the energy system and security of supply. According to

HEDNO a higher penetration of renewables is technically possible, thus this regulatory cap of 30% could indeed be moved upwards.
- Develop a supportive framework for energy storage beyond the inclusion of storage in the subsidy for hybrid projects.
- The system of unified energy prices should be re-examined to see how this can help the energy transition, while at the same time taking into account the just transition for the islanders.

Regarding permitting and spatial planning:
- In order to avoid the land-use conflicts on the islands and to ensure renewable energy development, there is a need of clear and transparent rules for spatial planning.
- Spatial planning regulation should correspond to islands' specific issues, such as land conflict, mixed-used areas and aesthetic impact (a respective typology addressing these issues could be created). In addition, a community-centred planning, especially for small islands, should be foreseen while co-planning procedures should be applied for all cases to smoothen conflicts between investors and islanders.
- In order to speed up the permitting process, a one-stop-shop, an office in which multiple services could be provided, should be applied.
- Local plans, including local stakeholders and assessing their needs, should be established and applied.

Regarding the electricity grid:
- Developing a framework for energy storage would solve some of the grid related issues that non-interconnected islands are currently facing.
- According to an interviewee, the government has announced that it is working on the legal framework for market participation of storage units. There will be some categories, mainly storage behind the meter, which will be eligible for state aid.
    - The reform includes policies that target three categories of storage projects: stand-alone energy storage; combined storage with renewable power systems; and storage projects installed by Greece's electricity consumers. Most crucially, storage projects installed alongside renewable energy systems that do not charge from the electricity network will be eligible to participate in the county's renewable energy tenders.
    - It is important that operators of storage unit have a clear view on how they will be remunerated by the market, and thus the hope is that this framework will be clear enough. There is an amount of 200 million euros allocated in the RRF, for capital grants for storage installation trough a competitive tender.

Regarding energy efficiency:
- Funding instruments should provide premiums when it comes to energy efficiency projects on islands. Or there should be island specific funds for island energy efficiency projects.

Regarding self-consumption and community energy:
- The government should better communicate about the legal framework and the advantages of the citizens participation in the renewable energy projects. In addition, project developers wishing to create an energy community should also be encouraged to seek the local participation, by for example first offering shares to the inhabitants of the surrounding municipalities. A one-stop-shop or single contact point, that also provides training, could be established.

- Reducing red tape and or training stakeholders on how to navigate through complex procedures should be envisaged.
- Without committed support from the government (technical, capacity building, financial) real citizen involvement will not happen. Specific and targeted incentives and funding sources should be offered at a local level, giving all stakeholders the opportunity to participate in the energy transition as members of the energy communities.

Examples of islands/projects as best practice

- **Minoa Energy Community, Crete**, has been building 400 kW PV, which is financed by the local citizens for their own collective self-consumption through net metering[93]. The Minoan concept of cooperative is being successfully transferred to other islands such as Kassos, Syros, Chios and Halki.
- **Sifnos Island Cooperative**[94] aims to generate electricity from RES installations jointly owned by the inhabitants and the friends of the island who will be prosumers. This concept of cooperative is also being successfully transferred to other islands.
- **GReco island project in Chalki**[95], which will become a green island where residents will have lower energy bills, modern digital infrastructure, and cleaner air. To achieve its ambitious objectives, the government has collaborated with various companies, including the Greek Public Power Cooperation (PPC).
- **Insulae H2020 project**[96], in which PPC Renewables is collaborating with three islands to bring together hybrid plants with local involvement and tackling issues of energy poverty.
- **Tilos project**[97], exemplary project of battery inclusion in the Tilos island electricity system.
- **Astypalea smart and sustainable island project**[98]**,** is a good example of inclusion of electric mobility infrastructure and services.

[93] https://minoanenergy.com/en/

[94] https://sifnosislandcoop.gr/en/

[95] https://www.themayor.eu/fr/a/view/greek-project-transforms-halki-into-a-modern-green-island-9287

[96] http://insulae-h2020.eu/partners/greece/ppc-renewables/

[97] Kaldellis, J.K. Supporting the Clean Electrification for Remote Islands: The Case of the Greek Tilos Island. *Energies* **2021**, *14*, 1336. https://doi.org/10.3390/en14051336

[98] https://smartastypalea.gov.gr/

Annex 2 : Detailed description of the RES permitting procedure

According to the Greek regulatory framework for development of RES plants, the following steps need to be completed:

Site selection

The site selection is based on the Special Spatial Planning Framework for RES, which is currently under revision.

Certification of the RES producer

Certification of the RES Producer substituted the previous Electricity Production License for RES. This replacement aspires to reduce the duration of the permitting process.

Administrative Authorisation

This step includes the Environmental Impact Assessment (EIA) approval by the Decentralised Administrations or the Ministry of Environment and Energy (MEE).

Grid Connection Permit

This step includes Binding Grid Connection Offer (BGCO), which is relevant for the connection of a RES installation to the electricity grid.

Other

The Installation License authorises the construction of a RES installation, while the Operation License permits the operation of a system. The Operation License is only issued after all other permits have been secured.

1) Site selection process

Site selection for renewable energy installations in Greece is primarily defined in the RES Special Spatial Plan (Ministerial Decree 49828/2008). This step applies to all new installations. It should also be noted that the RES Special Spatial Plan was also approved by the State Council (Higher Administrative Court). The site selection is examined and approved at the 'Administrative Authorisation' stage.

For onshore wind

The location of each wind farm is based on specific criteria such as:

- The load-bearing capacity of areas (maximum density of typical wind turbines per municipality) for wind farm development (4% on non-interconnected islands, 5% in wind suitable areas (continental Greece except wind priority areas), and 8% in wind priority areas
- Excluded areas
- Criteria for the inclusion of onshore wind in the landscape, and
- Minimum distances from various land uses.

For ground-mounted PV

Restrictions mainly concern PV ground-mounted installation on high-yield agricultural fields. The ratio of agricultural land for each Regional Unit is stipulated in art. 2 Min. Decision 74123/2971. Firstly, 0.5% of the total cultivated land (1% for the Region of Attica and for the Greek Islands) is estimated in each Regional Unit and then the maximum area for PV installation over 1 MW is defined.

For hydropower

Chapter 3 of the RES Spatial Plan foresees provisions with regard to the installation of small hydropower plants. More specifically, it is defined:

- the location of water basins with exploitable hydraulic potential

- the identification of areas of incompatibility or exclusion, within which the location of small hydropower plants and related works is prohibited
- the determination of the criteria for assessing the bearing capacity of small hydropower plants the determination of the criteria and rules for the integration of small hydropower plants in the natural, cultural and man-made environment of the settlement area.

2) Certification of the RES producer

Since May 2020, the Electricity Production License for RES was substituted by the Certification of the RES Producer. The submission and approval process are also amended and simplified. It is foreseen that RAE issues the Certifications within 20 days from the date of submission (art.11 Law No. 4685/2020).
In general, RES project developers submit an application to RAE within the first 10 days of February, June and October (art. 11 Law No..4685/2020). In practice, this certification constitutes 'a project feasibility approval', where specific parameters are examined.
Two specific categories are defined (art. 10 Law No. 4685/2020):
Non-special projects (Onshore with capacity below 150 MW, PV, Small hydropower plants below 15MW) have to pay a fee that varies between EUR 1,000 (for capacity below and equal 150 MW) and EUR 3,000 (for capacity below 1MW).
For special projects (onshore > 150 MW) additional technical details are required. These include the technical, energy and feasibility study, compatibility with the RES Special Spatial Plan and the financial capacity of the plant producers to realise the project.

3) Administrative authorization process

The administrative authorization procedure includes the issue and approval of Environmental Impact Assessment (EIA). In general, there are two stages of the EIA approval procedure (art.4 Law No. 4014/2011). The first stage includes the submission of the EIA to the competent authority (MEE or the Decentralised Regional Administration) and it is examined whether the EIA is complete. The second stage foresees that the EIA study is forwarded to other competent authorities and agencies (e.g., responsible for forestry, archaeology, etc.) in order to collect their opinion. If other competent authorities and agencies do not respond within the deadlines set in the Law No. 4685/2020, the authority proceeds with the EIA approval. Nevertheless, exceptions apply with regard to views and comments of certain agencies, which are considered essential (e.g., archaeological and forestry). Here, in case of no answer, the issue will be examined by the Central (or the Regional) Council of Environmental Licensing within 20 days. The EIA approval is valid for 15 years.
With regard to IEA requirements the projects are divided in three categories (Min. Decision 74463/4562)

- Category A1 (wind power plants with capacity above 60 MW and wind power plants with capacity above 45 MW and located in protected area or including the construction of a High Voltage Line longer than 20 km): Projects must submit an IEA study and their application is examined by MEE.
- Category A2 (wind power plants with capacity between 10 MW and 60 MW, and wind power plants with capacity between 10 MW and 45 MW located in a protected area, PV plants with capacity above 10 MW, small hydro power plants with capacity below and equal 15 MW): Projects must submit an IEA study and their application is examined by the Decentralised Regional Administration.

- Category B (wind power plants with capacity below 10 MW, PV plants with capacity below and equal 10 MW, small hydro power plants with capacity below 0.5 MW): Projects must meet pre-defined environmental terms (Standard Environmental Requirements procedure) and their application is examined by the Decentralised Regional Administration.

Especially, for small hydropower plants, a permit for the exploitation of water resources for electricity generation is required (water use authorisation). The permit analyses the availability of the water quantities used by the plant. In addition, a further license is required to carry out water exploitation projects (realisation of water exploitation works). However, for small hydropower plants (up to 10 MW), a Single Permit, which includes both licenses, is issued (Joint Min. Decision 146896/2014). Both licenses are examined by the Decentralised Regional Administration.

4) Grid connection permit process

For RES plants, HEDNO (RES plants below 8 MW) or ADMIE/IPTO (RES plants above 8 MW, except in NIIs where HEDNO is responsible) issues Grid Connection Offer (GCO). After the EIA approval, ADMIE or HEDNO check whether the transmission/ distribution grid can accommodate the RES project. From 01/08/2022 all connection applications for RES and CHP stations concerning mainland Greece and Interconnected Islands will be exclusively submitted on the online platform provided by the website of HEDNO together with all required documentation (Art. 5, Law 4951/2022).

If there is enough capacity in the local electricity grid and the connection solution can be implemented without any technical problem, the System Operator (ADMIE or HEDNO) issues the Grid Connection Offer (GCO). If not, the System Operator suggests an alternative solution or does not proceed with the issuance of a GCO.

Within 2 months after the GCO issuance, the plant developer must pay a Bank Guarantee to the System Operator. The amount is contingent upon the project's total capacity and varies between EUR 7/kW (for capacity above 100MW) and EUR 42/kW (for capacity below 1MW).

In addition, the plant operator has to pay the full amount for all grid connection works realised by ADMIE/ HEDNO (par. I.1.2. Law No. 4152/2013).

A similar process is followed for smaller RES Plants. More specifically, for RES projects that are not obliged to obtain a Certification of RES Producer and an EIA approval (PV < 1MW in Category B projects), the grid connection offer is automatically binding (BGGO) (art. 8 3468/2006).

5) Other

Further two licenses are included in the RES permitting process.

- The **installation license** is a checklist on aspects of spatial planning, land use rights, project commissioning and environmental compliance. The BGCO and the IEA approval are prerequisites. After its issue, the project developer is permitted to construct the RES installation. It is valid for 2 years and can be extended twice under certain conditions (art. 8 par. 10 Law No. 3468/2006).
- The **operation license** is the final license for the RES and is issued by the Decentralised Regional Administration (for Categories A2 and B projects) and MEE (Category A1 projects) after the construction and successful start of the power plant.

In addition, the Centre of RES and Energy Saving is responsible for carrying out measurements to monitor the performance of RES installation (art. 8 Law No. 3468/2006).

Annex 3: Greece Stakeholder Meetings

Greece Focus Group

Greece Focus Group invited members:

- Ministry of Environment and Energy
- Regulatory Authority for Energy
- Transmission System Operator (IPTO)
- Distribution System Operator and Islands Network Operator (HEDNO)
- Public Power Corporation (PPC)
- National Technical University of Athens (NTUA)
- University of West Attica (UNIWA)
- Hellenic Mediterranean University
- Centre for Renewable Energy Sources (CRES)
- Network of Sustainable Greek Islands (DAFNI)
- Chalki Municipality and Energy Community
- Hellenic Wind Energy Association

First Greece Focus Group (ELFG1) meeting

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

Time Thursday, 3 March 2022, 10:00-12:00 CET.

List of attendee

CE4EUI Secretariat

Center for Renewable Energy Sources (CRES)

National Technical University of Athens (NTUA)

University of West Attica (UNIWA)

Hellenic Mediterranean University (HMU)

Network of Sustainable Greek Islands (DAFNI)

Hellenic Wind Energy Association (HWEA)

Public Power Corporation (PPC)

Islands Network Operator (HEDNO)

Regulatory Authority for Energy (RAE)

Ministry of Environment and Energy

The First Greece Focus Group Meeting (ELFG1) focused on the barriers highlighted in the Report: Detailed Regulatory Analysis Greece.
Lucija Rakocevic, CE4EUI Secretariat presented the Clean energy for EU islands secretariat and the activities on policy and regulation, as well as the process leading to the current Report on the regulatory barriers and opportunities for clean energy developments on the islands.
Christina Protopapadaki, CE4EUI Secretariat presented the main findings outlined in the report, highlighting the barriers that were found to be the most important.
After presentation of the results attendees were invited to provide their opinion on the identified barriers, additional barriers and their priority. The following points summarise the discussion.

The discussion during the First Greece Focus Group Meeting (ELFG1) was on the following barriers:

- Role of the islands in the overall energy transition and lone term national planning
- Lack of coordination of island energy transition from the national level
- Lack of local/regional energy and climate plans
- Complex and long permitting procedures
- Slow legislative processes slowing down energy transition
- Limited grid capacity
- Specifics of the small islands and their integration into the energy transition
- Lack of attention for energy efficiency
- Lack of regulatory support for local community initiatives

Second Greece Focus Group (ELFG2) meeting

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

Time Wednesday, 11 May 2022, 10:00-12:00 CET.

List of attendees

CE4EUI Secretariat

Center for Renewable Energy Sources (CRES)

National Technical University of Athens (NTUA)

University of West Attica (UNIWA)

Hellenic Mediterranean University (HMU)

Network of Sustainable Greek Islands (DAFNI)

Hellenic Wind Energy Association (HWEA)

Public Power Corporation (PPC)

Islands Network Operator/DSO (HEDNO)

Independent public transmission system operator (IPTO/ADMIE)

Regulatory Authority for Energy (RAE)

Ministry of Environment and Energy

Chalki Municipality, and Chalki EC

The Second Greece Focus Group Meeting (ELFG2) focused on the proposed recommendations for overcoming priority barriers identified in the draft Study on regulatory barriers and recommendations for clean energy transition on Greek islands.
Lucija Rakocevic briefly presented the Clean energy for EU islands secretariat and the purpose and process of the Study on regulatory barriers and recommendations for clean energy transition on Greek islands.
Christina Protopapadaki presented the main barriers and the proposed recommendations to overcome them. After presentation of the results, attendees were invited to provide their opinion on the proposed recommendations to the priority barriers. The following topics were discussed:

- National taskforce focused on managing and coordinating energy transition on the islands is needed
- Addressing existing approved RES projects
- Know-how and human capacity missing for energy transition on the islands
- Need for consistent, systematic and inclusive planning from national level with local involvement
- Missing energy companies and private sector as stakeholders in recommendations
- Energy efficiency needs to be further addressed in the recommendations
- Electricity grid and maintenance should be further addressed in the recommendations
- Regulated prices for generation of thermal plants on the islands
- Energy communities and local participation on the rise but need more support

National Stakeholder Meeting

Title	CE4EUI – Greece National Stakeholder Meeting- Study on regulatory barriers and recommendations for clean energy development on islands.
When	Tuesday, 20th of September 2022, 09:00-15:00.

The NSM was held at the University of West Attica in Athens. The meeting included participants from national institutions, including Ministry of Environment and Energy, Ministry of Maritime Affairs and Insular Policy, Ministry for Development and Investments and Ministry of Culture. Academic representatives from University of West Attica, Hellenic Mediterranean University and University of the Aegean were present. Energy sector companies were represented by Distribution System Operator and System operator for non-interconnected islands (HEDNO) and Public Power Corporation. Other stakeholders that represented regional and local stakeholders included Centre for Renewable Energy Sources (CRES), Network of Sustainable Greek Islands (DAFNI), Samos Energy Community, Electra Energy cooperative and Energy Community of Chalki.

The participants spoke about strategy and coordination of energy transition on the Greek islands, focusing on GReco initiatives, installation of hybrid plants and need for better coordination of island activities with the local stakeholder and experts involved in implementation of projects on the islands (e.g. in the process of Hybriid plants implementation). In addition participants accented the need to transfer lessons learned from completed and ongoing projects on the islands.
The touristic pressure on the Greek islands and the unplanned construction were discussed as part of the need for better planning of use of local island resources in line with sustainable development. The restrictions to energy projects can be too stringent. Each sector should provide guidelines that can be included in the Special Spatial plan which is currently being revised.
Discussion focused on three priority barriers and proposed recommendations.

Barrier 1. **Lack of clear strategy for energy transition on the islands, lack of coordination and monitoring of implementation**

Recommendations:

1.1 Set-up an agile national Island Taskforce for clean energy transition on the islands

1.2 Ensure a holistic approach to energy transition on the islands and provide capacity building

Barrier 2. **Lack of island specific energy planning and integration with spatial planning**

Recommendations:

2.1 Reassess spatial planning guidelines for implementation of clean energy projects on the islands

2.2 Adopt national and regional master plans for clean energy projects

2.3 Mandate adoption of island or group of islands energy plans

Barrier 3. **Complex and long permitting procedure for RES projects**

Recommendations:

3.1 Further simplify permitting procedure for RES projects

3.2 Set-upa regional one-stop shop

3.3 Account for island energy and economy conditions when defining procedures for clean energy projects