

Introducing the Clean Energy for EU Islands Secretariat

Simon De Clercq* †, Achim Woyte †, Giustino Emilio Piccolo ‡

* Clean Energy for EU Islands Secretariat

Aarlenstraat 63, 1000 Brussels, Belgium

Email: Simon.DeClercq@euislands.eu

† 3E, Grids, Storage & Markets

Kalkkaai 6, 1000 Brussels, Belgium

‡ Climate Alliance

Galvanistr. 28, 60486 Frankfurt am Main, Germany

Abstract—The Clean Energy for EU Islands Initiative was launched in May 2017 to provide a long-term framework to accelerate the transition towards clean energy on Europe’s more than 2200 inhabited islands. As a support to the launch of the initiative, the Clean Energy for EU Islands Secretariat was set up to act as a platform of exchange of practice for island stakeholders and to provide dedicated capacity building and advisory services. The Secretariat aims to support the transition processes on all EU islands. To focus its efforts, 26 islands were selected to receive island-specific methodological support to develop strategic energy transition plans. The Secretariat works according to a participative, bottom-up approach that on one hand aims to overcome the island’s main challenges and on the other hand recognises the potential of islands to emerge as ideal test beds for the deployment of innovative energy technologies.

I. INTRODUCTION

The launch of the Clean Energy for EU Islands Initiative in May 2017 underlines the European Union’s intent to accelerate the clean energy transition on Europe’s more than 2200 inhabited islands. The initiative aims to reduce the dependency of European islands on energy imports by making better use of their own renewable energy sources and embracing modern and innovative energy systems.

As a support to the launch of the initiative, the Clean Energy for EU Islands Secretariat (EU Islands Secretariat) was set up to act as a platform of exchange for island stakeholders and to provide dedicated capacity building and advisory services.

Islands and island regions face a particular set of energy challenges due to their geographic and climatic conditions:

- Lack of connections with mainland energy systems which generates high dependence on imported fossil-fuel based energy sources;
- Lack of energy market opportunities and a strong dependence on good political will, coupled with the need of a structural transformation of the islands energy infrastructure;
- High diversity in size, geographical location, energy mix options and economy of island communities, which limits large-scale investment opportunities.

At the same time, the strong sense of island community and territorial potential can present an opportunity to drive the island’s energy transition. For this, islands may emerge

as ideal test beds for the deployment of innovative technologies and the development of solutions that maximize the synergies between energy, transport, water etc.

The EU Islands Secretariat works on addressing these challenges by tapping into the islands-specific conditions. The aim of the support provided by the Secretariat is to focus on the transition process ensuring its ownership and responsibility.

II. METHODOLOGY

The EU Islands Secretariat’s objective is to facilitate and accelerate the transition of EU islands towards island-wide clean energy systems. The Secretariat supports an effective and sustainable transition process on as many islands as possible. Its services are bundled in order to create a one-stop shop for islands to accelerate the transition. In order to achieve this objective, the Secretariat’s activities focus on three core areas: technical support, capacity building and community engagement.

A. Technical support

The Secretariat provides technical and methodological support for the energy transition process as well as for individual projects. Today, many islands and island communities are interested to harness energy efficiency, renewables, and smart-grid technology to improve their islands’ energetic autarky, reduce their fossil fuel dependency and improve their economic tissue. However, often this interest is not strategically focussed. Local stakeholders do not always know where to start, where to find technical information and where to find financing. The Secretariat provides guidance to these stakeholders through different means such as a methodological guidebook to develop strategic energy transition plans, specific guidance on drafting individual plans and concrete guidance on project funding and technical and financial due diligence.

B. Capacity building

The Secretariat aims to create capacity, experience and innovation at the local level as needed to launch and implement the energy transition locally. Today, sustainable energy projects on islands are often launched, developed and financed by large mainland actors since they have the knowledge and the means to develop complex projects. Island



Fig. 1: The Secretariat's quadruple helix

communities often miss the required technical and financial knowledge and experience to take initiative themselves. The Secretariat facilitates the network of local stakeholders and trains its members based on the needs identified by the island communities. Through the network it also facilitates the horizontal exchange of experience among the stakeholders on different islands.

C. Community engagement

The Secretariat enhances dialogue platforms at the lowest governance level: energy transition working groups of citizens, schools and SMEs. Supported by island authorities and academic institutions, these working groups help create the vision from the start, co-develop the decarbonisation plan and participate in its implementation.

An important concept in the Secretariat's operation is the quadruple helix model (Figure 1). It is used to develop, manage and contribute to local islands ecosystems and drive local interdisciplinary teams. Through its operation, the Secretariat ensures the right balance between the involvement of public authorities, private sector, grassroots movements and knowledge institutes.

The Secretariat communicates to the island stakeholder groups and disseminate its services, its networks and the concrete success stories of islands embarking on the clean energy transition. Increasing the visibility of island issues at the regional, national and European levels is an important aspect of this work.

D. Island Clean Energy Transition Agendas

One of the main methodological tools of the Secretariat is the Island Clean Energy Transition Agenda (ETA), a strategic roadmap for the transition process towards clean energy as desired by the stakeholders on the island. It spells out a vision of the island that is shared between the relevant island actors and determines possible pathways to achieve this vision.

The island's transition process aims in the first place to decarbonise the island's energy supply. The process is an opportunity to achieve additional objectives such as reducing pollution, strengthening the local economy and improving the quality of life of inhabitants and visitors, while maintaining or improving the quality and security of energy supply.

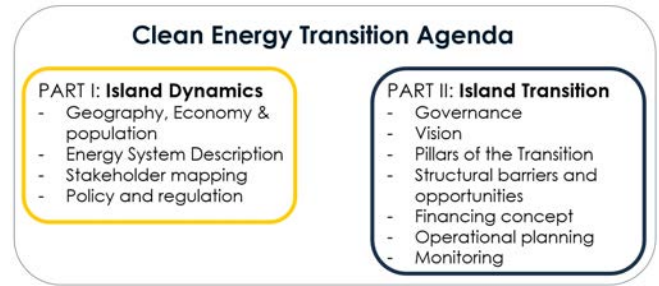


Fig. 2: Structure of an Island Clean Energy Transition Agenda

The ETA is developed and agreed upon by the stakeholders on the island in their local language. ETAs are island-wide, i.e. cover the entire territory of an island or archipelago.

The structure of an ETA is shown in 2. The methodology is based on best practices and lessons learnt from transition management experiences in Europe to address climate change at a local level. Transition management has been an inspiration for this methodology [1].

The ETA is structured in two parts. The aim of Part I is to create a thorough understanding of the island dynamics, focussing on the present situation on the island. This first part is written by the transition team, a small group of dedicated islanders.

Part II comprises the island transition path. This starts from a future vision of the island: what does the transitioned island look like? By identifying strategic targets, transition pillars, structural barriers and opportunities, this vision is linked to the present. Governance of the transition process plays an important role in the transition path. It answers the question: what actions will connect the envisioned future with the present situation? The second part can be written by the same team as the first part, however it requires the consultation of a larger stakeholder group.

The ETA is meant to bring added value to the ongoing island climate action by engaging all island stakeholders to work towards the common goal of decarbonisation. It describes the strategy regarding the engagement and mobilisation of the local community. By jointly preparing the agenda, the actors make a first step in moving their island-wide clean energy transition forward.

E. EU Islands: "Pilots" and "Pioneers"

The support activities of the Clean Energy for EU Islands Secretariat serve to mainstream energy transition on islands and enable the local community on the islands to lead their energy transition. The Secretariat builds a community welcoming all EU islands to share and support each other in this process.

In order to focus the Secretariat's efforts, 26 islands were selected to receive island specific support to develop a Clean Energy Transition Agenda.

In a first stage, the Secretariat collaborates with six "pilot" islands to co-author their ETA. The experiences, learnings and practices from these cases serve to develop guidance material that will support all EU islands in their transition. The six "pilot" islands are:



Fig. 3: The initiative's "pilot" islands in purple and "pioneering" islands in black [2]

Aran Islands, Ireland	La Palma, Spain
Cres-Lošinj Archipelago, Croatia	Salina, Italy
Culatra, Portugal	Sifnos, Greece

In parallel, the Secretariat provides support to twenty "pioneering" islands to develop ETAs. This support includes review and island-specific advice on the development of the agenda. The twenty "pioneering" islands are:

A Ilha de Arousa, Spain	Korcula, Croatia
Azores, Portugal	Mallorca, Spain
Brač, Croatia	Marie-Galante, France
Cape Clear, Ireland	Menorca, Spain
Crete, Greece	New Caledonia, France
Favignana, Italy	Off-grid
	Scottish Islands, UK
Gotland, Sweden	Öland, Sweden
Hvar, Croatia	Orkney, UK
Ibiza, Spain	Pantelleria, Italy
Kökar, Finland	Samos, Greece

Figure 3 shows the geographical distribution of the supported islands.

III. PILOT ISLAND: THE ARAN ISLANDS

The Aran Islands in Ireland were selected as one of the Secretariat's "pilot" islands. The Secretariat supports the ongoing transition process by co-authoring the archipelago's Energy Transition Agenda. In order to make the transition of the Aran Islands successful, the Secretariat focuses on engaging the local actors and supporting the island with defining its energy strategy and putting it into practice.

A. Geographical situation

The archipelago consists of three islands: Árainn, Inis Meáin and Inis Oírr. They are situated 5-20 nautical miles in

the Atlantic Ocean off the Irish west coast (Figure 4). The three islands fall under the administration of County Galway.

The islands are interconnected with each other; Árainn is connected to the Irish mainland through an approximately 5 MW subsea cable. There is currently no local power generation.

The population adds up to around 1200 permanent residents, 712 of which on Árainn.

Visitors cannot bring cars to the islands and there are no rental car companies on the islands. Only residents and local businesses own cars and drive on the islands.

B. Community engagement

The Secretariat works together with stakeholders on the Aran Islands from the four strands of the quadruple helix. In November 2018, a delegation from the Secretariat visited the island of Árainn. They met 16 local and national stakeholders to explore their vision, strategy and concrete actions for the archipelago's clean energy transition.

Citizens and several business owners are strongly engaged through the Aran Islands Energy Co-op (*Comharchumann Fuinneamh Oileáin Árann teo, CFOAT*), to make the island fully powered by renewables. They have a strong strategic vision and are currently pursuing several actions towards the clean energy transition of the islands.

The CFOAT, as main protagonist, has an ambitious and concrete vision, stated through its strategic objectives:

- "To secure the future energy needs of the three Aran Islands by gaining a controlling interest in the local sources of alternative energy production.
- To reduce and gradually remove the dependency of the Aran Islands communities on fossil fuels (oil, gas, coal, including transport) by replacing them with alternative and more sustainable sources of energy.



Fig. 4: Location of the three Aran Islands in the Atlantic Ocean [3]

- To preserve the islands' unique language, heritage and culture by providing sustainable employment and a sustainable environment for people to live in.
- To facilitate the conversion of homes and other buildings on the three islands to be more sustainable in their energy usage.
- To provide low-cost energy to industry so as to create employment on the islands.
- To create, provide and encourage employment in projects of sustainable energy.
- To facilitate and at least part-own initiatives and projects in research and development into sustainable energy.
- To provide education and training to both residents and non-residents in sustainable living.
- The create on the three Aran Islands an example of best practice in sustainability to the rest of Ireland and to the world.
- To use the three Aran Islands as a platform from which to promote sustainability and environmental protection worldwide." [4]

C. Energy

An energy master plan for the two largest islands, Árainn and Inis Meáin, was finalised in 2018 [5]. It gives a breakdown of the islands' energy consumption. When converted to primary energy equivalents, the overwhelming share of energy consumption is used for transportation (Árainn 57%, Inis Meáin 80%), followed by thermal fuel (Árainn 26%, Inis Meáin 12%); the rest is from imported electricity. The major share of transportation fuel is used for powering the ferries (Árainn 78%, Inis Meáin 97%). Accordingly, the ferry makes 44% of primary energy consumption for Árainn and 78% for Inis Meáin. This breakdown indicates that for the decarbonisation of the islands, decarbonising the ferries should be a top priority, followed by space heating.

A master plan for the smallest islands, Inis Oírr, is currently being elaborated.

D. Discussion

1) *Energy Consumption of Ferry Transport:* Sea transport with the ferry is the major single energy demand related to the islands. The ferry companies are long established businesses who want to exploit their existing assets as much as possible. They are in strong competition with each other.

Decarbonizing ferry transport would require switching from diesel fuel to electricity, hydrogen or a hybrid solution.

Opportunities for this transition will appear when depreciated assets need to be replaced.

2) *Energy Demand for Heating:* Renovation and retrofitting of homes and other buildings is the essential first step for decarbonizing the heat sector. The CFOAT's programme for home retrofitting has been very successful. Out of approximately 500 homes on the islands, 353 have signed up for a retrofit. Finding reliable contractors is a major challenge for this programme.

3) *Electricity:* Electricity demand is the smallest type of demand on the islands. Nevertheless, the CFOAT pursues to build a 2.7 MW wind power plant on Árainn. This is motivated by several drivers:

- Take ownership of the generation assets where this power today is generated on the mainland. This will create profit that will benefit the economy of the islands;
- Decarbonizing the electricity consumption, even though it is a relatively small share of all energy used;
- Generating excess energy for future modal shifts of energy use, e.g., towards electric heating with heat pumps, shifting to electric vehicles, the local production of hydrogen as fuel for the ferry, or simply for export of excess electricity to the mainland;
- Security of supply, in case of a cable cut with the mainland; notably, this would require dispatchable generation or electricity storage on the islands. While this also depends on the wind power plant's control settings, in case of a backup, the wind power plant only may not be able to operate the grid in a stable mode.

The CFOAT is currently trying to identify a suited location that would respect the following criteria:

- Not on a main tourist route on the island,
- Not obstructing the primary view of any resident of Árainn,
- Not within 500 meters of any home,
- Not in an area of visual beauty.

Several sites have been checked and will be discussed with the local community during a community gathering. The CFOAT expects that a site which respects the above conditions will receive overwhelming support from the local community. As an additional complexity, all three islands are considered Special Areas of Conservation (SACs). This is governed at county level. For the wind power plant to move forward, the CFOAT would need an exception.

E. Transition Priorities

The Secretariat observes a strong commitment and willingness of the Aran Islands Energy Co-op to support the transition by all consulted stakeholders. The Secretariat sees five priority topics for a successful transition process as envisioned by the Aran Islands Energy Co-op:

- Energy Consumption of Ferry Transport, which makes by far the largest share of energy demand related to the islands.
- Energy Demand for Heating, which is number two in primary energy demand and where good progress has already been made through a home renovation programme.
- Electricity, where the Aran Islands Energy Co-op is looking to develop a wind power plant.

- Innovation and Economic Growth, which is a long-term target of the co-op. Especially the desire to develop or attract research and innovation activities will need to be developed in detail and then pursued.
- Community Building, which for the Aran Islands implies to widen the group of active supporters to the co-op and members.

IV. CONCLUSION

The Clean Energy for EU Islands Secretariat aims to support EU islands to overcome their barriers for clean energy transition. It provides technical support, capacity building and community engagement to optimally tap the islands-specific conditions and to address the challenges faced by island stakeholders. The Secretariat works according to a transversal approach to create a platform that includes local authorities, citizens, industry and academia to drive the transition process.

ACKNOWLEDGMENT

The authors would like to thank Avril Ní Shearcaigh and Dara Ó Maoildhia from the Aran Islands Renewable Energy Cooperative for their effort and enthusiasm in their collaboration with the EU Islands Secretariat.

REFERENCES

- [1] C. Roorda, J. Wittmayer, P. Henneman, F. van Steenberg, N. Frantzeskaki, D. Loorbach, *Transition management in the urban context: guidance manual*, DRIFT, Erasmus University Rotterdam, Rotterdam, 2014.
- [2] Map adapted from the Council of the European Union. https://www.consilium.europa.eu/media/30582/061_14_carte_a4_en_web.pdf
- [3] Map by Hogweard - Aran Islands locator.svg, Public Domain. <https://commons.wikimedia.org/w/index.php?curid=36811932>
- [4] Aran Islands Energy Cooperative Ltd. *Aims and Objectives*, Colm Ó hIarnáin Center, Kilonan, Inis Mór, Aran Islands, Co. Dublin. Galway, 2016.
- [5] M. J. Rivas, J. Stanley, and G. Forkan, *Energy Master Plan 2018 - Araínn and Inis Meáin*, REnergia & Plan Energy for CFOAT, 2018.