CLEAN ENERGY FOR EU ISLANDS

2030 CULATRA

# CLEAN ENERGY TRANSITION AGENDA

## Culatra Island, Portugal

Version November 2019

**CLEAN ENERGY FOR EU ISLANDS**

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# Preface

The Island Clean Energy Transition Agenda is a strategic roadmap for the transition process towards clean energy. It is designed by the local community, for the local community. Starting from an examination of the current dynamics on the island, the Clean Energy Transition Agenda spells out a vision of the island that is shared by the members of the island community. The perspectives of different island stakeholders are aligned to work towards this common vision by identifying possible pathways, including common goals and effective strategies.

The Clean Energy Transition Agenda was developed jointly by University of Algarve and by the Residents Association of Culatra Island (Associação de Moradores da Ilha da Culatra), with the support from the Coordination and Development Commission for the Algarve Region, and the Municipality of Faro. The Transition Agenda was reviewed by the Clean Energy for EU Islands Secretariat.

The present document should be considered a draft version of Culatra's Transition Agenda and awaits approval of the entire Transition Team. It illustrates the strategies that are currently developed and considered by the Transition Team to accelerate the clean energy transition. The production and updating of relevant content and information, which will feed the final version of the agenda, are ongoing processes.

The Clean Energy for EU Islands Secretariat is an initiative on behalf of the European Commission aimed at catalysing the clean energy transition on EU Islands. The Secretariat is managed by Climate Alliance, REScoop.eu and 3E, and collaborates with a wide range of local stakeholders, authorities, academia and citizens. The work done by the Secretariat is done in close collaboration with local, regional, national and international partners, with particular support from the Technical Educational Institute of Crete and the University of the Balearic Islands.

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# Part I: Island Dynamics

## 1. Geography, Economy & Population

### Geographic Situation

Culatra Island is located in the Algarve region, the southernmost region of mainland Portugal. It is one of the five barrier islands that compose the Ria Formosa Natural Park, a multi-inlet barrier island system in southern Portugal. The Ria Formosa system is unique and remarkable, and amongst the most studied coastal areas of Portugal on a wide range of topics from geomorphology and coastal dynamics to ecology, biodiversity, economy and social values. Ria Formosa was legally constituted as a Natural Reserve in 1978 and as a Natural Park in 1987, being considered one of the most important areas for nature conservation in Portugal. The embayment is characterised by large salt marshes, sand flats and a complex network of natural and partially dredged channels, covering 8.4 x107 $m^2$. The barrier system is extremely dynamic which has been related to tidal inlet evolution, shoreline evolution, longshore drift, overwash processes, dune formation, backbarrier processes and artificial nourishment actions.

Culatra Island has about 7 km length and a maximum width of 1.2 km, comprising a total area of 4.34 $km^2$. The island is permanently inhabited by around 1000 people, who mainly live from fishing and tourism. The only method to reach the island is by ferry, from Olhão and Faro. Furthermore, there are no paved roads on Culatra and it is only possible to explore the island by foot, on wooden paths. The island (Figure 1) can be divided in three different areas according to morphodynamic characteristics. The west end of the island is partially artificial due to the presence of the Faro-Olhão Inlet jetties (built between 1927 and 1955) and a seawall/groin system (built in the early 1980's) that was constructed to protect the human occupation (the Farol nucleous). In this area the beach is relatively narrow, and a dune bluff makes the transition to the dune system in the majority of the area evidencing the lack of sediment supply. During the 1980's, occupation eastward of the seawall/groin system increased rapidly over an ancient washover breach. The central area on the island was the historical location of an ancient inlet that, like other natural inlets of the system, used to migrate eastward. The inherited morphology in this area reflects the diverse ages of the sand bodies alternating dune ridges with ancient tidal channels and washover breaches. Permanent human occupation in this area is present exclusively on the inner margin of the island (Hangares nucleous and Culatra village). In the unoccupied eastern area, an inlet dominated evolution occurs, with the development of curved sandy spits. The morphology is constituted by sand ridges separated by active tidal channels on the inner part, and by washover on the ocean side. In this area, extensive overwash can occur under combined storm surge, spring tides and storm conditions.

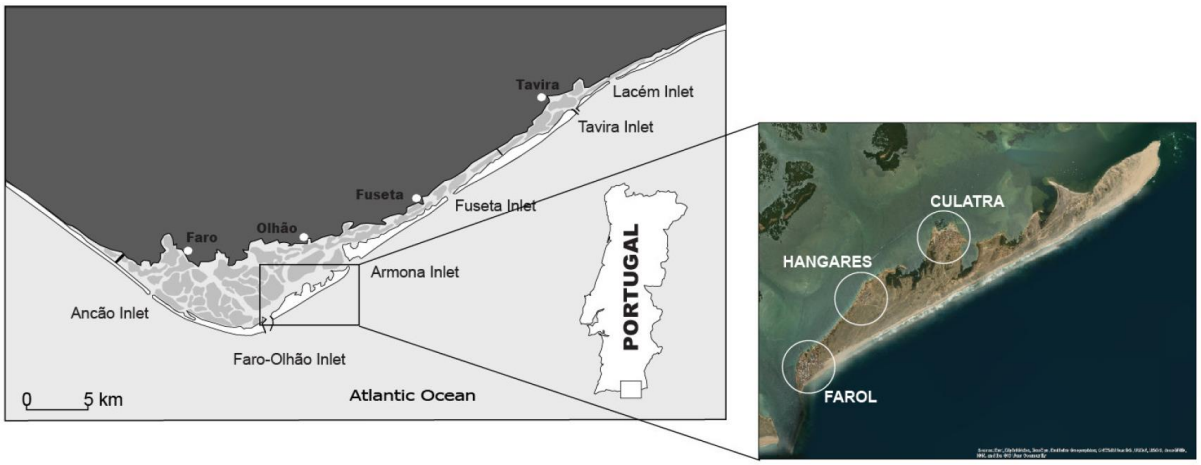


*Figure 1: Situation of Culatra Island in the Atlantic Ocean. (Source: CULATRA 2030 – Sustainable Energy Island)*

## Demographic Situation

The island is permanently inhabited by around 1000 people, who mainly live from fishing and tourism. The people are living in in three large settlement on the island where the Culatra Village is the largest settlement on the island with 759 inhabitants. This village has a church, a school, a social centre, a health unit, a fishing port, supermarkets and several restaurants and cafes. The population is mainly linked to artisanal fishing and shellfish activities and has inhabited this area for the last 150 years. The population is stable and heterogenic. The family economy is based on natural resources, artisanal fishing, mollusc farming and aquaculture, being one of the youngest fishing communities in the country. Although some younger members have recently been encouraged to take on academic studies, they remain to live on the island. Most of the younger population however pursue to continue their family legacy i.e. dedicate themselves to mollusc farming and fishing activities.

The second largest settlement is Hangares with 103 inhabitants living in houses of illegal genesis, originally supporting the fishing activities on the island. The smallest settlement is the village of Farol with 84 inhabitants. Faro is an urban settlement that includes restaurants, cafes, restaurants, a medical centre and a supermarket. It is characterised by seasonal occupation and most of the buildings are only occupied in the summer season.

Tourism activities on the island have a significant impact on the island population. In the high season from June to August, the population on the island triples compared to the permanent population. The island furthermore sees a minor raise in population during the midseason from April-May and September-October.

### *A brief historical background on Culatra*

The citizen engagement is, historically, strongly present on the island since the very beginning of the community's establishment. The housing settlement of Culatra Island dates from the 16th century, as a seasonal movement of people who came to work in the sardine fishing communities. Due to the abundance of fish, shellfish and the amenity of the waters of the Ria Formosa Natural Park, some families decided to settle, building temporary housing. After these first settlements, an increased migration to Culatra took place, which implied the progressive multiplication of housing. Because of the territorial isolation, social isolation was much more pronounced, and the community was not part of the general improvement in living conditions that over time was created by the central and local administration. Faced with these constraints, the resident community engaged in collective actions to meet their basic needs,

such as electricity, drinking water, sanitation, education, health, urban planning, among others. It is in this context that the Association of Residents of Culatra Island (AMIC) was created in 1987. Since this date, the resident community, as well as the settlements, have been provided with infrastructure that significantly improved the social and economic life for the inhabitants. Most of the work done by AMIC since its start were focused on creating conditions to ensure continuity, sustainability and dignity of the community, preserving the identity and defence of the Culatra Fishing Community.

Recently, the National Government recognised the presence of the community on the island by granting legal status to occupy the Public Maritime Domain. This means that inhabitants will receive concessions for land use for the next 30 years and will thus be allowed to legalise their houses. These concessions can be renewed if the families provide proof of their continued link with the fishing activities on the island.

### Local Government

In terms of territorial administration, Culatra Island is integrated in the Faro Municipality, which is one of the 16 municipalities of the Algarve region.

Faro Municipality established a set of measures in the context of the Sustainable Energy and Climate Action Plan, developed under the Covenant of Mayors framework. Even if the accomplishment of the established objectives is below expectations, it reveals the motivation of local entities to take part on this change. Besides this initiative, the effort to create an integrated approach between all the Algarve region municipalities in the context of the "Intermunicipal Plan for Adaption to Climate Change" can also be highlighted. The plan is focused on identifying the main current and future climate vulnerabilities and on the possible adaptation strategies for the municipalities. The plan identifies several adaptation measures to face different climate change scenarios. The ones relevant to energy are:

- Energy efficiency: promote bioclimatic architecture in existing buildings, facades and roofs;
- Energy usage: encourage smart electricity consumption and promote the use of renewable energy, in general.

### Economic Activities

The main economic activities on Culatra are fishing and tourism, both of which are highly linked to Ria Formosa. The natural reserve is the most productive aquaculture zone in Portugal representing about 41% of the Portuguese production and is composed of mollusc farming, preponderant activity, and fish farming. Mollusc farming in Ria Formosa is one of the most economically significant activities. The amount of boats relative to population is thus also high with around 128 fishing boats registered for local and inshore fishing. The resources of the lagoon system are an important source of income for a large part of the population living in the Ria Formosa area, especially for the Culatra Island residents, where the vast majority of the economic income is related to mollusc farming or fishing. While the fishing activities have economic activity all year, the economic activities driven from tourism are characterized by their seasonality.

Following the general trends from the Algarve region, the tourism activities in the island have more activity in the midseason from April-May and September-October and in the high season from June to August. More recently, and because of the increase in tourism, there has been an expansion of commercial activity caused by tourism, which was accompanied by the installation of services and local trade support to responds to the diverse needs of the resident

population. The community now counts 8 restaurants and bars, 5 commerce establishments and 3 establishments that provide services to the community.

### Connection to the mainland

The only method to reach the island is by ferry, from Olhão and Faro to the Culatra Village. In high season, there can be over 10 departures per day to Culatra but this amount of departures is reduced significantly in the off-season. Several islanders and residents therefore also have private boats to get to and from the island.

Culatra is electrically interconnected with the mainland of Portugal through a 15 kV submarine cable which was installed in 1998. This cable provides electricity to parts of the island but has broken down several times in the past causing power outages of large parts of the island.

Freshwater supply and basic sanitation were introduced in 2010. The water is pumped to the island through a pipe from East Olhão and the sewage is pumped out through a collector back to the mainland.

# 2. Energy System Description

The tree villages, Culatra, Farol and Hangares, that compose Culatra Island have different realities in regard to their energy system. While most of the houses of the main village, Culatra village – which are the current focus of the transition process due to their legal status - are connected to the interconnected electrical distribution grid, 25% of all houses of Culatra Island do not have grid-connected electricity supply. Part of the houses of the Farol village and all the houses of the Hangares village are completely autonomous.

Measured data on the final energy consumption of the island is not available. The final energy consumption has therefore been estimated based on national and local statistics of energy consumption, combined with appropriate assumptions of usage. The results of the estimation and the calculated emissions for the island are shown in Table 1. The emissions are calculated with factors for $CO_2$ emissions per MWh for specific fuel types to give an estimate of the standard $CO_2$ emission on the island. These values are shown in Table 2. These values are the standard emission factor and not the life cycle assessment (LCA) emission factor. The emission factor for electricity consumption can be calculated by using the national emission factor for consumed electricity. For Portugal, this factor is 0.369 $tCO_2$/MWh [1].

*Table 1: Estimate of the final energy consumption in MWh and the calculated $CO_2$ emissions in $tCO_{2,eq}$ on Culatra in 2018.*

| **Data for year 2018** | Final energy consumption [MWh] | $CO_2$ emissions [$tCO_{2,eq}$] |
|---|---|---|
| **Electricity consumption** | | |
| Residential | 2079 | 767 |
| Primary sector | 1039 | 383 |
| Industries | 0 | 0 |
| Tertiary sector | 159 | 59 |
| **Transport on the island** | | |
| Vehicles, diesel | 31 | 8 |
| Vehicles, gasoline | 85 | 21 |
| **Transport to and from the island** | | |
| Maritime transport, diesel | 317 | 85 |
| Maritime transport, gasoline | 3799 | 946 |
| **Heating fuels** | | |
| Gas | 610 | 123 |
| Diesel | 16 | 4 |
| Gasoline | 8014 | 19595 |
| **Total** | **16149** | **4392** |

*Table 2: Standard emission factor, used by the Covenant of Mayors [1]*

| **Type** | **[tCO2/MWh]** |
|---|---|
| Motor Gasoline | 0.249 |
| Gas oil, Diesel | 0.267 |
| Residual Fuel Oil | 0.279 |
| Natural Gas | 0.202 |

In order to further investigate the results from Table 1, the total energy consumption breakdown is presented graphically in Figure 2. It can be observed that the largest energy sector on the island is the heating sector, which consumes 54% of the entire energy consumed on Culatra. The second largest sector is the transport to and from the island with 25%, then electricity with 20% and the smallest sector is the transportation on the island which only makes up 1% of the total energy consumed.

Investigating the percentage distribution of the $CO_2$ emissions related to each sector shows an almost identical percentage distribution as the final energy consumption. This is due to the types of fuels consumed and the scale of the consumption on Culatra. The distribution of emission per sector is segmented in the following way: heating 48%; electricity 28%; transport to and from the island 23%; transport on the island 1%.

When discussing these estimated values, it is important to note that a more elaborate assessment of the island energy system is necessary in order to draw more accurate conclusions.

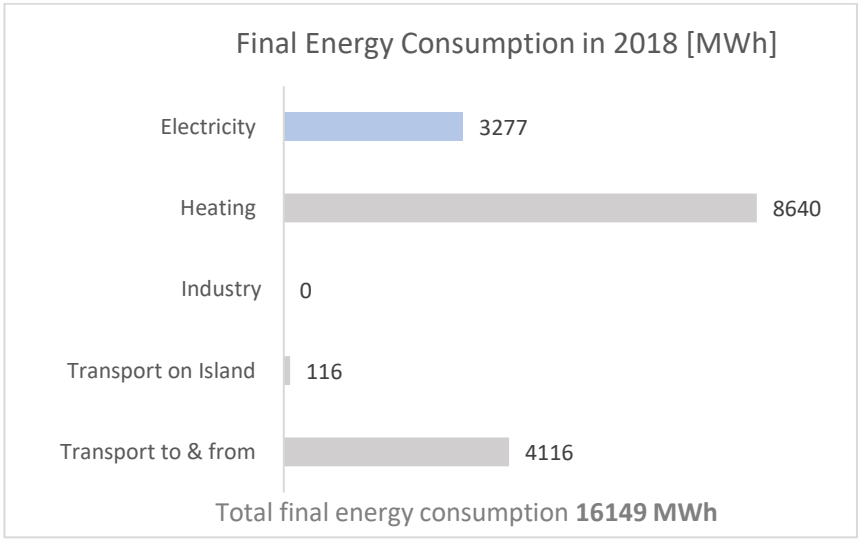


*Figure 2 Final energy consumption in MWh for year 2018 on Culatra*

There is no local renewable electricity production that feeds into the island grid. It can nevertheless be argued that the main grid on the island has renewable energy in its electricity mix because of the interconnection with the mainland grid of Portugal. In 2016, the Portuguese electricity mix had a share of renewable energy of 54.1%. The electricity consumed in the main grid on Culatra in 2016 could therefore also be said to be 54.1% renewable. This is of course not relevant for the periods when the submarine cable is not functioning, and the local diesel generator is used to generate electricity.

Despite the lack of locally produced renewable energy that feeds into the island electricity grid, several of the energy autonomous houses on the island rely on renewable energy to meet their individual heating and electricity demand.

### Electricity

The electrical interconnection from mainland Portugal provides Culatra village with electricity. Most of the houses in Culatra village are connected to the electrical distribution grid, yet 25% of all houses do not have electricity supply. Since historically there have been problems with

the submarine cable causing blackouts, a diesel generator (410 kVA, 380V) is also present on the island.

Part of the houses of the Farol village and all of the houses of the Hangares village are completely disconnected from the local distribution grid and rely on small-scale fossil and renewable energy sources for electricity. These houses generate their own energy from renewable sources and store that energy in batteries, for later usage.

The entire electricity grid on the island is low voltage, which is why local power losses and potential losses due to the transport of electricity from the mainland through a submarine cable could be significant.

The island has furthermore been the focus of some projects from the Portuguese Distribution System Operator - EDP. These projects have resulted that 316 of the houses on the island are connected to the electricity grid and have a smart meter installed. However, inhabitants are not yet using the information transmitted by these devices. This relates to the fact that the data was not requested; and secondly, if the vision is to collectively ask for the data, an energy community has to be legally formalised, which was dependent of the European Communities Directive transposition to the Portuguese law. This was finally approved in October 2019 and will be in force from the 1st of January 2020.

### Heating and cooling

The heating on the island mainly happens during the winter and consists of electric heating and heat pumps. There is little to no cooling present on the island. The majority of the houses are simple constructions that are not properly isolated. Because most of the residents are fishermen with fluctuating and lower income, energy poverty is a reality and a high percentage of the electricity bill is used to heat each house.

### Transport on the island

Transport on the island is highly affected by the fact that there are no paved roads on Culatra. As such, the transportation sector on the island only counts few vehicles such as tractors and motor tricycles to carry goods and to assist residents with reduced mobility. All vehicles on the island are powered by fossil fuels.

### Transport to and from the island

Transport to and from the island is possible via a passenger ferry from Olhão and Faro to Culatra Village and Farol. Ferries operate four times during the winter and eight times during the summer season and are all diesel fuelled. A lot of people on the island also have their own private maritime transport to get to and from the island. The owner of the commercial establishments daily transport all goods and fuel to the island, mainly from the city of Olhão. Each individual daily transport all the fishing and shellfish to Olhão in order to be stocked and sold in the city market.

# 3. Stakeholder mapping

All the stakeholders identified below are involved in clean energy transition actions. In this context, a cooperation agreement was established between the University of Algarve and the Culatra Island Residents Association to design a roadmap to implement a clean energy transition framework. This will help to pursue the goal of converting Culatra Island into the first sustainable Portuguese community in terms of energy production, distribution and consumption. The first step in the approach of this initiative considered the crucial involvement of the different profiles of stakeholders, considering the actions and the strategical orientations already taken by such entities, the public mission of some of the stakeholders and the sectorial approach of some others. Therefore, the stakeholders were divided in four different profiles, which correspond to the intervention that each one of them has on the island:

1. Public Authorities: the public authorities were included in the stakeholders group considering their level of territorial intervention: at a national level, the Minister of the Sea, at regional level, the Algarve Coordination and Regional Development Commission - CCDR Algarve, and at local level the Faro's Municipality and the United Parishes of Sé and São Pedro.
2. Regulatory entities: considering that Culatra Island is located in a protected ecosystem, it was of major importance to involve, from the start, the Portuguese Environment Agency (APA) and the Institute of Conservation of Nature and Forests (ICNF), both entities with regulatory intervention on this particular territory. Additionally, also the Maritime National Authority with the competence over this island was integrated in the stakeholder group, as well as Polis Ria Formosa Society, responsible for the elaboration and implementation of the Culatra Nucleus Intervention and Re-qualification Project (PIR).
3. Associations: when considering the clean energy transition activities and actions, civil society organisations can be considered as core stakeholders. Particularly in Culatra Island, which consists of an established fisherman's community, it is not possible to design the future actions to convert the island in a pilot community in energy sustainability without involving the community in the actions taken. For this reason, the involvement of four citizens associations that have established relations within this community was considered: the Culatra Island Residents Association (AMIC), as the representatives of the Island community, the Association for the study and conservation of the Oceans (aECO), Sciaena, who have already implemented actions to raise awareness across sustainability and environmental preservation with the Culatra Island community, and the Association Make it Better, as an expert in the implementation of community participatory methodologies (through the implementation of a participatory community diagnosis) and sustainability awareness actions.
4. Enterprises: considering the entrepreneurial ecosystem that surrounds the island in general, and the energy sector in particular, it is crucial to involve the business and entrepreneurial stakeholders that can offer the know-how and the best-suited technological solutions for the island territory. In this process, 5 companies and 2 non-profit associations related to the energy sector were considered: Two companies in the maritime transportation sector, 2 companies in the waste management sector, 1 company in the water supply sector and 1 company in fishing, the main economic activity of the island.

The University of Algarve, as lead organisation of this initiative, organised several meetings to present the Culatra 2030 roadmap to all the stakeholders. Inquired about their interests and

availability to contribute to go further on the actions to the clean energy transition on the island, all the participating entities have shown great interest in build a common project, a master action plan, and to take part in different work groups to build a sustainable energy community in Culatra island.

### Civil society organizations

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| **AMIC – Culatra Resident Association** | *Organization*<br>The Association of Residents of Culatra Island (AMIC), created in 1987, is responsible to ensure continuity, sustainability and dignity of the community, and the preservation and defence of the identity of the Culatra Fishing Community. |
| | *Perspective on the transition*<br>AMIC represent Culatra's inhabitants and will be the direct beneficiary of the energy transition. Their perspective is to drive the transition on their own island by creating a Renewable Energy Community, favouring employment and social cohesion and fight energy poverty. These are key aspects for developing a stronger circular economy and preserve/protect the environment. |
| | *Engagement*<br>The AMIC is one of the four signatories of the Memorandum of Understanding with the EU Island Secretariat. It is not possible to design the future actions to convert the island in a pilot community in energy sustainability without involving the community in the actions taken. AMIC's role is to participate in the definition of the requirements from the residents and fishermen perspective, including the buildings that will support the solar plant and in the definition of the economic model that will support the cost of the equipment, its installation and maintenance. |
| **Clube União Culatrense** | *Organization*<br>The Clube União Culatrense (CUC), created in 1974, is the principal sport association present in the island, very cherished by all residents, some of them former players and directors, and where various sports are practiced such as athletics, gymnastics, soccer, table tennis, pétanque, cycling and recreational activities. |
| | *Perspective on the transition*<br>The club is an important actor on the transition since it organizes most of the recreational activities for the residents. Discussions were initiated to engage the society on the transition agenda, by promoting the use of the plastic free single cup and revert part of the profits of the events to the Green Sustainable Culatra2030 fund. Also, part of the interventions to upgrade the solar generation are projected to the club infrastructure. |
| | *Engagement*<br>So far, the engagement of CUC translates in the permission to use its installations and facilities for public consultation and workshops. The CUC recent changed the directorial board and the objective/perspective is to involve the community as one of the most important actors on the fund raise collection. |

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| **Associação Nossa Senhora dos Navegantes (ANSN)** | *Organization*<br>The Nossa Senhora dos Navegantes Association is a private non-profit social solidarity institution. Its general objective is to contribute to the promotion of different age groups of the population in the educational, cultural, sport and economic aspects. Its headquarters are in the Social Center in Culatra Village, which was created with the aim of serving the entire community, allowing the child population to have a space for their psycho-social development and contribute to the improvement of the living conditions of the elderly population. |
| | *Perspective on the transition*<br>The ANSN is an important actor in the transition since its aim is to engage the community on several aspects of daily life. Discussions were initiated to engage the ANSN on the transition agenda, by promoting the use of the plastic free single cup and revert part of the profits of the events to the Green Sustainable Culatra2030 fund. Also, part of the interventions to upgrade the solar generation are projected to the Social Centre, including the building efficiency. |
| | *Engagement*<br>So far, the engagement has translated in ANSN's participation in fundraising for the Green Sustainable Culatra2030 fund by involving the community on creating new ideas and projects to be implemented. |
| **Make it Better, Association for Innovation & Social Economy (miB)** | *Organization*<br>MiB is an association for innovation and social economy that creates, develops, adapts and applies working models and tools for sustainable and responsible development, cooperating and supporting the groups that need it most. Its mission includes human development of society in all its aspects, namely economic, social, environmental and cultural, linked to the moral duties of solidarity and justice. |
| | *Perspective on the transition*<br>The planning, preparation and implementation of Culatra 2030 initiative implies the mobilisation of the distinctive pillars that generally support and regulate the development of Culatra island. One of these pillars is undoubtedly the set of island communities. To this extent, a fundamental participatory approach (Annex I) was prepared as way to enrol and empower local communities and its citizens in the whole process, along the entire path from planning to implementation. |
| | *Engagement*<br>Make it Better is leading the participatory diagnosis of the island with the island community. The participatory project will be crucial to decide what the community wants, since the premise behind the transition is that is led by the community. A primary workshop was organised in Culatra by the Transition Team to introduce the Culatra 2030 project. The action took place in the football court, converted for the occasion, and drew the participation of hundreds of island residents. This demonstrates the high local interest in the topic. Consequently, several actions and workshops were organized to engage all members of the community in this process, a strategy that is an ongoing process. They are also responsible for several actions on the |

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| | sustainability theme, such as environmental marketing. Examples are the creation of the recycle cup, the bags for shopping to replace the plastic ones and on coordinating all the project image to the exterior. Finally, they are also responsible to create transparency and equity rules to allow the access to the Green Environmental Fund Culatra2030. |
| **AECO** | *Organization*<br>The Association for the study and conservation of the Oceans (AECO) is a non-governmental environmental association which mission is to support ocean research, education and conservation in order to draw attention, and inspire action, to protect marine life, including in this concept the local communities, dependent on fishing or other sea-related activities. |
| | *Perspective on the transition*<br>AECO has strong links with the Culatra' community, developing several actions to protect the ecosystem, plastic reduction and empowerment of the inhabitants to take action. |
| | *Engagement*<br>Raise awareness across sustainability and environmental preservation with the Culatra Island community. Contribute for the creation of the business model to manage the anchoring area that will contribute to the Green Environmental Fund Culatra2030. |
| **SCIAENA** | *Organization*<br>SCIAENA is a non-governmental environmental association whose mission is to promote the improvement of the marine environment by encouraging the sustainability of fisheries and other forms of use and minimizing the impacts of pollution though knowledge, education, communication and political intervention. |
| | *Perspective on the transition*<br>From SCIAENA's perspective, contributing to the fight against climate change is imperative for any environmental organization. In addition to the global impacts that ultimately affect the entire balance of the oceans, SCIAENA finds that various activities taking place in the seas and coastal areas that contribute to accentuating climate change, such as tourism, are also some of the ones that have broader direct impacts on ecosystems that SCIAENA wants to preserve. |
| | *Engagement*<br>SCIAENA are working with the Culatra Resident Association (AMIC) on projects related to reduction of plastic pollution of aquatic environments and sustainable fisheries. They would like to start working on the renewable energy transition and started to organize workshops to debate the theme. |

## Businesses

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| **EDP Distribuição** | *Organization*<br>EDP Distribuicão is the main energy supplier in the country. Their mission is to ensure the electricity supply, provide services for the suppliers and ensure grid expansion and reliability. |
| edp distribuição | *Perspective on the transition*<br>As a Distribution System Operator, EDP has been closely involved in the energy transition process through a vast number of projects and innovative activities, ranging from smarter grids, digitalisation, grid resiliency and islanding operation, consumer engagement and active participation. |
| | *Engagement*<br>EDP's role is to collaborate on data sharing with the new Renewable Energy Community, which will allow dimensioning the power plant, facilitate the creation of a renewable energy communities and enhance stability of the power network for the island grid connected with the mainland following the established roadmap. |
| **CME** | *Organization*<br>CME is the leading Portuguese company operating in the area of electrical engineering and has a multidisciplinary team that is highly qualified and ready to design and develop innovative projects integrated in all areas, corresponding to high levels of energy demand. |
| cme | *Perspective on the transition*<br>The company has strong experience in the renewable energy market, providing specialized services, covering the whole field of renewable energy projects. Their most relevant expertise for the energy transition is: work planning and project execution, MV/HV/VHV powerline execution and the implementation of communication networks. |
| | *Engagement*<br>CME will participate in the analysis of the implications that the solar generation units will have in the electrical grid of the island and the required upgrade to the existing grid, including the cost analysis. |
| **ISQ** | *Organization*<br>ISQ is the largest Iberian Peninsula engineering and certification consulting group. In the energy sector ISQ has a set of inspection, testing, technical consultancy and human resources training services for the energy market aimed at improving the efficiency and safety of facilities and equipment. |
| ISQ | *Perspective on the transition*<br>ISQ has a modern and well-equipped network of accredited fixed and mobile laboratories, ensuring compliance with applicable laws, standards, directives and codes. |
| | *Engagement*<br>ISQ, recognized as a Notified Body and accredited as a Sector Inspection Body under various European Directives, is essential as |

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| | advisor for the entire strategy envisaged to the roadmap implementation. |
| **Akuo Energy Portugal** | *Organization*<br>Akuo Energy is the first French renewable energy independent power producer and developer. The company is present across the whole value chain, including project development, financing, construction, and operation. As of the end of 2018, Akuo Energy had invested more than EUR 2.2 billion for a total capacity of 1.2 GW in operation or under construction and had over 3 GW in projects being developed. With more than 350 employees, the group, whose headquarters are in Paris, France, has offices in 18 countries around the world. Akuo Energy aims a global production capacity of 3,500 MW in 2022. |
| | *Perspective on the transition*<br>Akuo has years of experience on island community transition processes and has just been awarded 370 MW (equivalent to 462,5 MWp) of the 1,400 MW of solar PV energy available via the call for tender organized by the Portuguese State, i.e. a third of the national objective. Akuo is thus strengthening its presence in Portugal and will play a key role on the transition agenda of the country. |
| | *Engagement*<br>Akuo will collaborate in the specification of the type of renewable energy equipment that best meets the requirements of the inhabitants. Akuo will also work on the development of the economic model to create additional social benefits for the inhabitants, as to promote the creation of the Renewable Energy Community. |
| **EasySmart Grid** | *Organization*<br>Easy Smart Grid develops smart grid technologies that can integrate more variable renewable energy. It creates a market platform where energy producers and consumers can exchange energy and flexibility. Easy Smart Grid promises a simple, robust and affordable solution to activate all Demand Side Management potential (i.e. low-cost storage) in electric grids. |
| | *Perspective on the transition*<br>As one of the companies that is following the EU Island Secretariat Agenda, Easy Smart Grid is developing tools to match supply and demand at any time, leveraging low cost energy storage and enabling the use of more volatile renewables (from sun or wind). |
| | *Engagement*<br>EasySmart Grid is able to provide a simple interface for all grid users and ensures fair reward for flexibility. It has developed a fully de-central architecture without a complex and expensive communication infrastructure, improving system availability and customer data protection. |

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| **Enercoutim** | *Organization*<br>Enercoutim is a business association that seeks to foster rural economic and social development by optimizing local resources by supporting multidisciplinary and technology-based projects in the clean energy and sustainability sectors. The company has developed and is currently managing the Solar Demonstration Platform in the Municipality of Alcoutim in the Algarve region of Portugal. The shared renewable energy infrastructure of the Solar Demonstration Platform currently has a production capacity of 4 MW split between 3 CPV technologies; significant expansion of the installed capacity is under development. The platform operates on 100ha and combines renewable energy generation, innovation-driven energy models and sustainable agriculture models. |
| ENERCOUTIM | *Perspective on the transition*<br>Enercoutim is facilitating the development of microgrid pilot projects in the Algarve region, supports R&D and recently developed research infrastructure. It operates the platform under a plug-and-produce approach, and currently works on integrating energy storage facilities. It also has been engaged in R&D projects of grid digitalization and green hydrogen. |
| | *Engagement*<br>Enercoutim collaborated and gave a strong contribution to the definition of the Culatra2030 Roadmap. Enercoutim's experience on applying for H2020 and Horizon Europe project is key on several areas of the roadmap. Their interest is to use Culatra as a test bed project focusing on R&D opportunities that will further support the Algarve Regional Strategy for 2030, including the test of new approaches and business models that can lead to best practices for overall implementation within the region. |
| **AREAL** | *Organization*<br>AREAL is a non-profit association made up of several local and national entities that work in cooperation with international entities in the same area. The association promotes regional energy innovation by developing projects aimed at increasing use of renewable energy sources, increasing energy efficiency and certification through the introduction of the latest technologies. |
| AREAL | *Perspective on the transition*<br>AREAL's mission is to stimulate energy efficiency and renewable energy for the sustainable development of the Algarve. In this context, AREAL is partner of the SET-UP project – Smart Energy Transition to Upgrade Regional Performance, cofounded by the Interreg Europe Programme, a project constituted by eight partners from six European regions, including the Algarve region. The SET-UP project has the overall goal of improving energy performance of the six participating regions, through the enhancement of policies on smart grids. On a medium to long term, better energy demand management will lead to reduced energy consumption and greater energy security, with connected socio-environmental and economic benefits. SET-UP uses interregional |

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| | exchange to build regional competencies on smart grids, supported by selected regional policy instruments focusing on solutions to three main challenges to smart grid deployment: (1) empowering consumers; (2) economic and business models; and (3) investment possibilities for smart network infrastructure. Culatra Island was purposed as a test-bed for the above initiatives. |
| | *Engagement*<br>AREAL is interested in developing regional energy innovation projects aimed at increasing the use of renewable energy sources, increasing energy efficiency and certification through the introduction of the latest technologies. The association sees several project opportunities on Culatra, including a project on water management together with Águas do Algarve. |
| **Turbine Kreuzberg** | *Organization*<br>Turbine Kreuzberg is a digital commerce company with offices in Berlin (DE), Stuttgart (DE), Leipzig (DE) and Faro (PT). Turbine Kreuzberg develops product platforms, marketplaces, custom applications and drives the digital revolution. They are experts in digital strategy, technology and design to enable the digital transformation. |
| TURBINE KREUZBERG | *Perspective on the transition*<br>Turbine Kreuzberg has a strong experience in developing digital solutions. Currently they are implementing an internal plan to become a company with a positive $CO_2$ footprint. Also, they started working on strategies and solutions to support other organizations to reduce their impact on the environment. They are eager to create solutions that can support the project and the community of Culatra. |
| | *Engagement*<br>Turbine Kreuzberg is interested in collaboration and exchange with all stakeholders in the project. They would like to support the project with digital expertise and technology. |
| **SunConcept** | *Organization*<br>SunConcept is a local company specialized in the development and manufacturing of electro-solar propulsion vessels, aimed at market segments with specific needs, namely the recreational segment but also the commercial and professional, such as tourism and fishing. |
| SUN CONCEPT SOLAR BOAT BUILDERS | *Perspective on the transition*<br>Sun Concept promotes the use of renewable energy in the Nautical sector by creating integrated technological solutions with the aim of developing clean, energy efficient and independent vessels, believing that respect for the ecological limits of the terrestrial ecosystem is a non-negotiable condition for socio-economic development. Their perspective is to gradually replace the combustion diesel engines by solar-electric boats, especially for fishermen and tourist boats within the Ria Formosa Natural Park. |
| | *Engagement* |

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| | SunConcept is working with the local fishermen on the development of a new electric-solar boat to replace the actual combustion power boats and on the analysis of the economic model that could future support the construction and operation of a ferry passenger' vessel. |
| **Molhe Leste** | *Organization*<br>The Molhe Leste Beach Concession is situated on the Culatra-Mar Beach on the Culatra Island. The company offers a safe and clean beach, in its natural environment with an exclusive rental service of shades and sunbeds, bar service, massage and now rental of kayaks and SUP's. |
| | *Perspective on the transition*<br>Molhe Leste is an active member in the transition. The idea behind the beach concession is to be sustainable and the company invested in solar panels and small wind generators to increase its self-sufficiency and carbon neutrality. Their goal is to represent an example of respect to the environment and to expand the environmental awareness of all visitors. |
| | *Engagement*<br>Molhe Leste is actively working with the resident association on developing several projects through sport activities focused on sustainable and health life styles. A new settlement is being developed at the beach, which will be an example of a green efficient building, using 100% renewable energy with minimal impacts on the landscape. The company is also developing projects on reduced mobility access to the beach and on developing sport activities for the elderly and physically disabled persons. |
| **Guerreiro & Guadiana A.C.E** | *Organization*<br>Guerreiro & Guadiana is the naval company responsible for the regular transport of passengers between Olhão and Culatra Island / Farol Nucleus, a concession given by Docapesca - Portos e Lotas, SA. |
| | *Perspective on the transition*<br>The company recently invested in a new boat to improve the service and is looking for opportunities in the renewable energy sector. |
| | *Engagement*<br>In association with SunConcept, the company is interest in studying the possibility of investing in a passenger ferry vessel that is 100% renewable. Although the company is willing to invest in it, it needs financial support to accomplish this future goal. |
| **Docapesca, SA** | *Organization*<br>Docapesca is the largest European company operating in the fisheries sector and is 100% owned by the Portuguese Government. The strategic policy of Docapesca is based on creating sustained value for its stakeholders – shareholder, customers, employees, suppliers and society – underpinned by a relation of cooperation and proximity. |

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| DOCAPESCA PORTOS E LOTAS, S.A. | *Perspective on the transition*<br>Docapesca's commitment is to make the demands of the fisheries sector compatible with the preservation of marine resources. As such, the company has been promoting the requalification and modernization of the fishing harbour and adjacent areas within the Culatra fishing village. It also plays a key role in environmental and sustainable issues, and has done significant capacity building with the fishermen on waste collection and recycling obsolete fishing gear. |
| | *Engagement*<br>Docapesca is working together with AMIC, particularly on the recovery and modernization of the fishing harbour and adjacent infrastructures. As one of the managing authorities, Docapesca will be signing a triparty agreement between the Portuguese Environmental Agency (APA) and AMIC to allow AMIC to explore the funds of the Culatra' island anchorage areas. The funds collected will revert to the Green Environmental Fund Culatra2030 to support the inhabitants to improve their housing in terms of energy generation and efficiency. |
| **ALGAR** | *Organization*<br>Algar is a reference company in the environmental sector in the Algarve region. Its main activity is to operate the region's integrated waste system including selective collection, transfer, sorting of materials for recycling, energy utilization of biogas produced in landfill, composting of green waste and treatment of urban solid waste deposited in landfill. |
| Algar Valorizamos o ambiente | *Perspective on the transition*<br>Algar is responsible for the waste separation and treatment, while Fagar (municipality company) is responsible for the collection. Any discussion about the waste of Culatra has to involve both entities. Technologies that have been developed for the mainland can be replicated on the island. The conversion of waste to energy is a possibility, though the primary focus should lie on waste reduction. |
| | *Engagement*<br>Several actions need to be taken regarding waste on Culatra. Some ideas were already proposed: (1) first the waste collection should be selective; (2) community should be capacitated to separate organic matter (that will soon be mandatory); (3) existence of emerging technologies / models for the territory, which can be replicated in waste treatment on the island. The conversion of waste to energy can be done in a pilot project though waste reduction should be the primary focus. |
| **FAGAR** | *Organization*<br>Fagar is a municipal company whose mission is to manage, operate and maintain public water distribution systems, domestic and rain sewage drainage, urban waste collection and transportation; urban cleaning of the municipality of Faro, from a perspective of economic, financial, technical, social and environmental sustainability. |

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| Fagar | *Perspective on the transition*<br>Fagar has huge costs in Culatra regarding waste management, transportation and treatment and are a direct beneficiary of the sustainable solutions envisaged for the island. The company showed willingness to study solutions that could contribute to improve the economic sustainability of waste management on the island. |
| | *Engagement*<br>So far, Fagar has shown engagement and has cooperated to develop the clean energy transition agenda. The company was invited to all meetings and general waste quantities were provided. However, a greater involvement is expected during later project stages, especially when a waste treatment plant is designed in collaboration with ALGAR and AMIC. They are also expected to contribute to studies on new solutions for the collection and transportation of the waste inside and out of the island since diesel tractors and combustion engine boats are used. |
| **Águas do Algarve SA** | *Organization*<br>Águas do Algarve has the mission of ensuring the supply of water for human consumption and the treatment of wastewater in accordance with the highest standards of quality and reliability, within a framework of economic, social and environmental sustainability. The company's main objective is to supply drinking water in quantity and quality throughout the year, as well as to provide the Algarve Region with a safe system, improving service levels and promoting quality environmental aspects, namely the water quality of beaches and rivers in the Algarve, which are essential for the well-being of the population and for the economic and tourist development of the Region. |
| ÁGUAS DO ALGARVE Grupo Águas de Portugal | *Perspective on the transition*<br>Águas do Algarve is the company responsible for freshwater supply and wastewater treatment on the island. Water is transported via a conduct from Olhão to Armona island and then through the Armona Inlet to Culatra. The wastewater is transported to Farol and then to Olhão West to be treated in a wastewater treatment plant. High costs are involved in this process. The company seeks to find solutions that can improve the overall process. So far it owns 55 installations equipped with micro production units of photovoltaic electric energy for sale to the utility grid with an installed capacity of 220 kW. It also owns two other production units, one based on a 10 kW mini-hydro and the other on biogas with an installed capacity of 45 kW. Since August of 2015, the company also has two photovoltaic power plants with an installed capacity of 432 kW in a self-consumption regime. |
| | *Engagement*<br>The company is available to discuss different solutions to improve the water supply on the island. The possibility of installing a production station of desalinated water on the island can be considered, as well as pre-treatment of water for secondary use. |

## Public Sector

Governmental Actors

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| **CCDR Algarve** | *Organization*<br>Integrated in the Ministry of Planning and Infrastructures and jointly managed by the Ministry of Environment, the Algarve Regional Coordination and Development Commission (CCDR-Alg) is a decentralised body of the central government. Its mission is to promote the framework conditions for the development of the Algarve region. |
| | *Perspective on the transition*<br>The CCDR Algarve promoted a strong debate under the "2030 Energy Transition Agenda" for the Algarve Region. Principal outputs from the discussions revealed the need to: invest in renewable energy for the production of electricity and storage; stimulate energy efficiency; develop micro-grids, with decentralized generation and adequate Energy Management Systems; stimulate the digitization of energy systems, allowing greater consumer involvement; promote active collaboration with stakeholders from related sectors such as Fisheries, Tourism, Agriculture, IT; promote electrification of transportation and reduce dependence on fossil fuels; and search for interregional collaboration. |
| | *Engagement*<br>The CCDR is one of the four signatories of the Memorandum of Understanding with the EU Islands Secretariat. There is strong support from CCDR for the project as it is completely aligned with the region's decarbonisation and climate-energy strategic plans. CCDR has administrative and financial autonomy and is tasked with coordinating and promoting governmental policies regarding regional planning and development, environment, land management, inter-regional and cross-border cooperation and also support local government and inter-municipal associations. Since the fields of intervention of CCDR also encompass the management of regional operational programmes financed by European Union funds, as well as other regional development financing instruments, it is actively working with Culatra2030 to identify funding opportunities to support actions of the roadmap. CCDR considers that the Culatra territory should be seen as a living laboratory and that the island's transition can act as a source of expertise for clean energy projects on the rest of the region. |
| **Faro Municipality** | *Organization*<br>Faro Municipality is the main local authority, the Algarve's administrative capital. The municipality comprises 4 parishes: United Parishes of Conceição and Estoi, Santa Bárbara de Nexe Parish, Montenegro Parish and United Parishes of Sé and São Pedro. This last one has jurisdiction over Culatra and has around 65.000 inhabitants distributed over 210 km². Around 30% of that area is part of the Ria Formosa Natural Reserve. |

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| | *Perspective on the transition*<br>Reaffirming the interest of the Covenant of Mayors, the Municipality of Faro approved on January 2017 the renewal of its participation in the Covenant and its intention to promote the necessary steps for the implementation of the Sustainable Energy and Climate Action Plan. In an attempt to accomplish the objectives underlined under the Covenant of Mayors, Faro Municipality integrated 30 measures in the Sustainable Energy and Climate Action Plan, which are to be applied to the entire municipal territory. |
| | *Engagement*<br>The Faro Municipality is one of the four signatories of the Memorandum of Understanding with the EU Island Secretariat. The role of the Municipality will involve legal issues regarding the energy efficiency of buildings, approving solutions that can contribute to the energy transition, especially at households and public school. |
| **United Parishes of Sé and São Pedro** | *Organization*<br>The United Parishes of Sé and São Pedro is a Portuguese parish in the municipality of Faro with 74.75 km² area and 44 119 inhabitants (2011). Its population density is 610.6 inhabitants per square km. It was incorporated in 2013, as part of a national administrative reform, by the aggregation of the former parishes of Sé and São Pedro and has its headquarters in Sé. |
| | *Perspective on the transition*<br>Reaffirming the interest of the Covenant of Mayors, the Municipality of Faro approved on January 2017 the renewal of its participation in the Covenant and the intention to promote the necessary steps for the implementation of the action plan for sustainable energy and the climate. In an attempt to accomplish the objectives underlined under the Covenant of Mayors, Faro Municipality integrated 30 measures in the action plan for sustainable energy and climate, which are to be applied to all the Municipality territory. At the local level the implementation of these measures is responsibility of United Parishes of Sé and São Pedro. |
| | *Engagement*<br>Indirectly, and as part of the Faro Municipality, the United Parishes of Sé and São Pedro is also one of the four signatories of the Memorandum of Understanding with the EU Island Secretariat. The role of the United Parishes of Sé and São Pedro will involve legal issues regarding the energy efficiency of buildings, approving solutions that can contribute to the energy transition, especially for households and public schools, but also on transport since most of the diesel engine vehicles that support the Social Centre are property of the Parish. |
| **POLIS Litoral Ria Formosa** | *Organization*<br>The Polis Litoral Ria Formosa, SA is a public company established between the Government and municipalities of Loulé, Faro, Olhão and Tavira. This company was created within the scope of Polis Litoral - |

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| | Integrated Operations of Requalification and Valorization of the Coastal Area - and aims at the management, coordination and execution of the investment to be carried out in Ria Formosa, in the area and in the terms defined in a local Strategic Plan prepared for this purpose. |
| RIA FORMOSA POLIS LITORAL REQUALIFICAÇÃO E VALORIZAÇÃO DA ORLA COSTEIRA | *Perspective on the transition*<br>The Polis Litoral Ria Formosa SA is responsible for the elaboration and implementation of the Culatra Nucleus Intervention and Re-qualification Project (PIR), within the scope of the attributions granted to it by Decree-Law no. 92/2008, of June 3. The PIR is an instrument / tool to guide the actions to be implemented in the residential area of Culatra Village, located entirely in the area of the public water domain, and integrating the protected area of the Ria Formosa Natural Park. |
| | *Engagement*<br>The Polis Litoral Ria Formosa SA engagement is to provide knowledge on the barriers and constrains to intervene in the territory and are empowered with the capacity to launch and manage the civil engineering works in the area, in conformity with the legal bidding documents. |
| **APA – Agência Portuguesa do Ambiente** | *Organization*<br>The APA is a society' oriented organization. Resulting from the merger of 9 bodies in 2012 (Decree-Law No. 56/2012 of 12 March), its mission is the integrated management of environmental policies, in articulation with other sectoral policies and with a wide range of partners, aiming at a high level of protection of the environment. |
| apa agência portuguesa do ambiente | *Perspective on the transition*<br>APA works on topics such as water and coastline, waste, climate and air change, noise, radiological emergencies, environmental impact assessment, circular economy, or environmental education, and is responsible for the Portugal State Environment Report. |
| | *Engagement*<br>APA is key to the success of Culatra's transition, since it is the leading environmental regulator in Portugal. It works on topics such as water and coastline, waste, climate and air change, noise, radiological emergencies, environmental impact assessment, circular economy, or environmental education, and is responsible for the Portugal State Environment Report. It has been working closely with AMIC on the licence process of the Culatra Village households by monitoring, planning, evaluating and licensing the occupation on the Maritime Public Domain. Together with Docapesca and AMIC, it is one of the signatories of the three-party protocol that will permit the management of the anchorage facilities by AMIC, allowing the collection of funds to the Green Environmental Fund Culatra2030. |

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| **ICNF** | *Organization*<br>The Institute for Nature Conservation and Forests is a public institute integrated in the indirect administration of the State, endowed with administrative, financial autonomy and own patrimony. It has five Regional Directorates, covering the entire continental territory. The Culatra Island territory is part of the Ria Formosa Natural Park, under the Algarve Regional Directorate. |
| ICNF | *Perspective on the transition*<br>Culatra Island is located in the Natural Park of Ria Formosa (PNRF). The PNRF was created by Decree-Law No. 373/87, of December 9, which reclassified the Ria Formosa Natural Reserve, created by Decree No. 45/78, of May 2. The legal document that supports the creation of PNRF is an instrument for protection and conservation of the lagoon system, an area of high ecological interest, of great scientific, economic and social value, and which, due to its size, diversity and structural complexity, constitutes the most important wetland in the south of the country. This means that any action that leads to an intervention in the territory has to comply with the rules established by the PNRF-ICNF. |
| | *Engagement*<br>PNRF-ICNF's engagement in Culatra's transition is key to the project's success. Several meetings were organized between UAlg and AMIC to understand the existent barriers and constrains for the development of the different phases of the project to ensure that the actions do not collide with the conservation of this protect area. The role of PNRF-ICNF is to provide advice on and license to those interventions. |
| **Capitania do Porto de Olhão** | *Organization*<br>The Capitania do Porto de Olhão is the local representative of the National Maritime Authority, responsible for coordinating the activities to be carried out by the Navy, the Directorate General of the Maritime Authority (DGAM) and by the Maritime Police General Command (CGPM) in the public and maritime domain spaces under national sovereignty and jurisdiction. |
| AUTORIDADE MARITIMA NACIONAL | *Perspective on the transition*<br>By developing actions leading to a more sustainable management of the Maritime Domain Space, the Culatra 2030 initiative will support the mission of the Capitania do Porto de Olhão, empowering the community to protect and respect the environment and the and maritime spatial planning. |
| | *Engagement*<br>Capitania do Porto de Olhão's engagement is to provide guidance and legal supervision of the illegal actions taking place in the area where inhabitants of Culatra live. The combined efforts between the state and AMIC are crucial to ensure the appropriate use of the anchorage areas and control access of the maritime tourist companies to the fishing harbour. This will have a positive effect on the island sustainability and a direct impact on the quality of life of Culatra inhabitants, who are subject to high pressure of tourism activities and illegal fishing. |

## Schools and Academia

Higher Education and Research

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| **University of Algarve (UAlg)** | *Organization*<br>Representing the only public higher education institution in the Algarve, UAlg is an important centre for cultural, scientific and technological development, with strong regional, national and international ties. The student population is today close to 8,000 and employs over 700 academics. It has three faculties and four schools, offering a range of quality undergraduate and postgraduate courses. In these last three decades, UAlg has affirmed its capacity in research and consolidated the link established with regional businesses and with public and private organisations, encouraging the transfer of knowledge and contributing to sustainable development with an impact across the community. |
| UAlg UNIVERSIDADE DO ALGARVE | *Perspective on the transition*<br>UAlg is one of the most active stakeholders when considering the implementation of activities dedicated to the clean energy transition on Culatra Island. The perspective of the university is to provide continuous knowledge to support the transition of the region as a whole and seek new areas of knowledge that can be beneficial for academia. |
| | *Engagement*<br>The role of UAlg in the transition is to coordinate of the initiative Culatra 2030, providing technical and academic knowledge to all involved stakeholders in line with the Culatra 2030 roadmap, the National Plan for Energy and Clime 2030 and the 2050 Portuguese Carbon Neutrality Roadmap. It was also responsible for setting up the community and multi-stakeholder engagement plan with Make it Better. |

# 4. Policy and Regulation

## European policy and regulation

In 2016, the European Commission presented several measures aimed at providing a stable legislative framework needed to facilitate the energy transition. In this context, the EU Regulation 2018/1999 established that all Member States should prepare and submit to the European Commission a National Energy and Climate Plan (NECP) with a medium-term perspective (2021- 2030), aiming to achieve the goals set for 2050. In the context of energy, looking into a 2050 horizon, the carbon neutrality perspective allows us to anticipate the following changes:

- an energy transition based on the complete decarbonisation of the energy sector, with the totality of the electric energy being generated using renewable energy sources, which in turn will require a significant rethinking of the transmission and distribution grids, including storage capacities, decentralized production, digitization and interconnections;
- a strong focus on energy efficiency, a cross-cutting theme for all sectors with a strong emphasis on industry, residential, services and mobility;
- a complete decarbonisation of the road and rail transport sectors, including the implications in terms of technologies and its substitution (with a clear focus on electric mobility, smooth mobility and shared mobility), but also in what relates to the models of territorial organization of cities, their implications in terms of mobility needs, as well as the implications in terms of collective mobility versus individual mobility;
- a strong focus in innovation and in the creation of new business models in the industrial sectors, including agro-food, reinforcing the perspectives of the circular economy and of the "industry 4.0", supporting innovative, efficient, greener and zero emission solutions in the next 30 years;

As above, a carbon-neutral society based on a circular economy, which conserves resources at its highest economic value, is also creating employment (but more qualified), wealth (but more sustained) and well-being (but more shared).

## National policy and regulation

The objective of Portugal is to be neutral in emissions of greenhouse gases (GHG) by 2050. In order to achieve the objective of carbon neutrality in 2050, a GHG emission reduction between 85-90 % will be required. However, the largest reduction of emissions will have to be achieved in the 2020-2030 decade, with decreases ranging from -45% to -55%. As defined on the Energy and Climate Action Plan 2030 (PNEC2030) the Portuguese goals for the 2030 horizon are:

- Achieve a reduction of CO2 emissions, compared to 2005, by -17%;
- 47% of energy consumption must result from renewable energy sources (% of the gross final energy consumption) distributed by:
  - (i) A weight of 80% of renewable energy in the consumption of electricity;
  - (ii) A weight of 20% of renewable energy in transportations;
  - (iii) A weight of 38% of renewable energy in cooling and heating systems;
  - (iv) Increase Energy Efficiency by 35% (% of reduction of gross primary energy);
  - (v) Increase the electrical interconnections with Europe by 15%.

- Some of the more specific goals of PNEC2030 include:
  (vi) To generate practically the same amount of solar energy as wind energy by 2030;
  (vii) Introduce heat pumps in 15% of homes;
  (viii) Achieve a reduction of 82% in the urban solid waste that is deposited in landfills;
  (ix) Reduce between 4 and 9 % of the urban solid waste that produced per capita;
  (x) Assure almost all the electricity needed by light goods vehicles;
  (xi) Achieve a ratio of 33% in electric mobility;
  (xii) Reconfigure the energy market.

To achieve these goals the PNEC2030 was written in coordination and articulation with:

- The Roadmap for Carbon Neutrality in 2050 (Roteiro para a Neutralidade Carbónica 2050) including decarbonization, renewable energy and energy efficiency, and
- The National Investment Plan 2030 (Plano Nacional de Investimentos 2030) which include the Large Structural Projects.

Currently, the context of auto consumption is being widened, from homes and businesses to local communities and municipalities. These may play a central role in the transition to a greener, more inclusive, democratic, transparent and participatory energy system. Yet, no legislation and regulation exist to date to allow the creation of energy communities focusing on decentralized production. On January 3, 2019, a proposal for regulation of the services of the Smart Grids was placed under public consultation. Still, the draft proposal does not yet clarify how Portugal intends to move forward with the Energy Communities in Portugal.

### Local policy and regulation

Faro Municipality established a set of measures in the context of the Sustainable Energy and Climate Action Plan, developed under the Covenant of Mayors framework. Even if the accomplishment of the objectives established are below expectations, it reveals the motivation of local entities to take part in this change. Besides this initiative, the effort to create an integrated approach between all the Algarve region municipalities in the context of the "Intermunicipal Plan for Adaption to Climate Change" can also be highlighted. The plan is focused on identifying the main current and future climate vulnerabilities and on the possible adaptation strategies that the municipalities can adopt. The plan identifies several adaptation measures to face different climate change scenarios and the ones relevant to energy are:

- Energy efficiency: promote bioclimatic architecture in existing buildings, facades and roofs;
- Energy usage: encourage smart electricity consumption and promote the use of renewable energy, in general.

Furthermore, Faro Municipality signed the Covenant of Mayors pledge in November 2011. Within the framework of the Covenant of Mayors, and in line with its European counterparts, Faro Municipality has committed to the following targets:

- Exceed the European Union's 2020 targets of at least 20% reduction of CO2 emissions in its territory;
- Present a Sustainable Energy and Climate Action Plan;
- Submit an implementation report no later than two years after submission of the action plan for evaluation and monitoring;
- Organize awareness initiatives, in cooperation with the European Commission and other stakeholders;

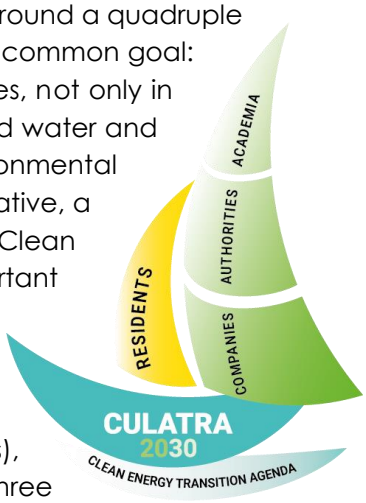
- Attend and contributing to the annual Conference of European Union Mayors;
- Inform the local/regional media about the evolution of the action plan.

In January 2017, Faro Municipality reaffirmed their interest and pledge to the Covenant of Mayors, with a renewal of its participation in the Covenant. This confirms the intention to promote the necessary steps for the implementation of the action plan for sustainable energy and the climate. In an attempt to accomplish the objectives underlined under the Covenant of Mayors, Faro Municipality integrated 30 measures in the action plan for sustainable energy and climate, which are to be applied to all the Municipality territory.

# Part II: Island Transition Path

## 1. Transition Governance

The transition governance is ensured by a set of bodies, structured around a quadruple helix approach, which are statutorily and strategically aligned by a common goal: the global development and sustainability of the island communities, not only in terms of clean energy, but as well in terms of effective and qualified water and waste management, and transversally in social, economic, environmental and cultural frames. Entailed by the Clean Energy for EU Islands initiative, a new opportunity has come to develop, prepare and implement a Clean Energy Transition Agenda for Culatra Island. This agenda is an important governance tool to guide and support, at all stages, the transition path here presented.




The set of bodies mentioned above, constituted by private and public organisations, and by natural persons (community members), as detailed in **Annex I** (Participatory Approach), are structured in three different levels. These 3 levels of bodies, directly involved in the setting, development, and later in the implementation of the different transition agenda measures, with distinct roles, can be outlined as follows:

**A.** Management Committee
**B.** Communities of the Island
**C.** Advisory Committee

**A.** The "Management Committee" is composed of:
- (i) University of Algarve as project leader, which is embodied by a group of investigators – the energy multidisciplinary research group;
- (ii) Resident Association of Culatra Island (AMIC), which is embodied by its board of directors and technicians, providing representation and community and territorial liaison;
- (iii) Make it Better – Innovation & Social Economy (miB, NGO), embodied by its board of directors and technicians, providing expertise and implementing the participatory approach in which the whole transition process is based.

**B.** The "Communities of the island" level is composed of groups of:
- (i) Local residents: all residents represented, with special attention to the participation of different segments: youth, women, elderly, men and other segments;
- (ii) Local companies: all companies represented, with special attention to the following sectors: fisheries (shell fish nurseries, shell fish collectors, fishermen and fishing companies), commerce, tourism, services and other;
- (iii) Civil society: all other civil society organisations and representatives from all the groups in the island, such as those representing or working in the following fields: education, culture and recreational, sports, social, health and welfare.

This level thus includes the three associations on the island; AMIC, ANSN and CUC, the restaurants, cafes and services, which all were invited to the participatory process.

**C.** The "Advisory Committee" is composed of all public authorities responsible for the relevant regulatory and authoritative roles in the territory, such as:

(i) Institute for Nature Conservation & Forestry (ICNF): This institution is directly represented by the Ria Formosa Natural Parque (PNRF);

(ii) Portuguese Environment Agency (APA): This institution is directly represented by the Regional Water Basin Administration (ARH Algarve);

(iii) Ministry of the Sea (MM): This institution is directly represented by the DOCAPESCA, a public company having operational and managerial roles in all nautical ports and fishing stocking infrastructures, the main sector of activity in the island;

(iv) Ria Formosa POLIS LITORAL, the regional public Society for the Coastline Re-qualification & Valorisation;

(v) National Maritime Authority: The institution is represented by the Captaincies of the Port of Olhão, the institution influencing the territory in terms of maritime use;

(vi) Regional Coordination and Development Commission (CCDR Algarve). The institution is the intermediate level of government, between central government and local governments;

(vii) Municipality of Faro represented here by the Chamber House (CMF - Câmara Municipal de Faro), being the local government level of administration for the territory, in articulation with the Union of Parishes of Faro, the smallest yet closest administrative level of public governance in the island.

The planning, preparation and implementation of the Culatra2030 initiative involves the mobilization of the different stakeholders identified in the Advisory Committee, which support and regulate the development of the island. The seven public organizations share responsibilities in terms of territory management, englobing environmental, legal and economic issues which means that any development on the island has to have a positive technical support of all these entities.

Fostering the engagement and the effective involvement of these stakeholders, several meetings were organised to present and discuss the Culatra 2030 initiative, promoting an in-depth dialogue and identifying barriers and opportunities to the Culatra2030 initiative' design and implementation. Inquired about their interest and availability to contribute to go further on the actions to the clean energy transition on the island, all the listed stakeholders have shown great interest in building a common project, a master action plan, and to take part in different work groups to build a sustainable energy community in Culatra island.

As regards for the "Transition Team", as set under the Clean Energy Transition Agenda guidelines, it is thus composed of the Management Committee, as described here above (A), and by the signatories of the memorandum of understanding with the EU Island Secretariat i.e. the University of Algarve (lead partner), the Resident Association of Culatra Island (AMIC), the Algarve Regional Coordination and Development Commission (CCDR Algarve) and the Faro Municipality (CMF).

In the operational point of view, the Transition Team will lead the whole process, from designing the agenda to its implementation, by defining the steps of the agenda based on a participatory process, with a clear objective of empowering the local community to take the transition process into their own hands.

The participatory process is entirely supported by the communities on the island, which, by participating actively in a diagnosis procedure, will identify the main problems and needs to

address, and further in the identification of solutions or alternative actions for those problems and needs.

Once the solutions are identified, they pass through a validation and viability analysis done by the Advisory Committee (C) that represents all entities with either environmental, economic and legal jurisdiction over the territory, thus ensuring that all of the purposed solutions are technically possible and legally aligned with the different instruments ruling the implementation areas in the island.

To give practical response to the actions and solutions meanwhile validated by the Advisory Committee, three working groups will be set around the sustainability frames previously identified as the most relevant for the island:

- Energy working group;
- Water working group;
- Waste working group.

These groups will each be responsible for designing comprehensive and integrated action plans on the respective themes. They will also be responsible for the negotiation phase, and consequently for the implementation and follow-up of the previously designed action plans.

The working groups are constituted based on the quadruple helix, by:

- Community (a set of voluntary interest groups will be created in function of people's main interests, will to participate, and vision);
- Academia (the University of Algarve and the research groups);
- Public Authorities (the relevant members of the Advisory Committee for each working group), and other relevant public authorities - local, regional, national or European;
- Specialised companies (the enterprises and organisations relevant to offer or develop practical "solutions" – products or services - for the transition process);
- And any other relevant stakeholders that, in function of the transition developments, may show relevancy to the Culatra 2030 initiative.

Under these working groups, and as example, the University of Algarve invited all the relevant energy stakeholders to an energy group, involving academia actors, energy associations and companies. The role of the group is to study and propose to the community different options to accomplish the transition objectives, identify collaboration opportunities and apply for funding for those ideas. The University of Algarve, as independent actor, coordinates the participation within the energy group to ensure that no party takes control over the envisaged project objectives i.e. develop a self-sufficient, resilient and safe energy system under the form of an energy community in which residents are prosumers.

Finally, a more informal group of non-profit environmental associations was created with the specific mission of safeguarding all issues related with environmental sustainability, as well as to promote new ideas on circular economy. The mission of these associations is to provide environmental awareness to the community, by developing sustainable actions such as plastic use reduction, habitat protection and implement a healthy sustainable life style. All these actions will have a direct impact on the island transition project and sustain the growth of the Green Environmental Fund, which has the objective of eradicating energy poverty and sustain social cohesion. Further information regarding the participatory process can be consulted in the Annex I to the present document.

# 2. Vision

The vision of Culatra 2030 Initiative is to create an energy community that manages its own energy and shares it, according to the rules that it establishes. The intention is to define and implement a model of participatory economics, which allows the distribution of costs and the income that results from renewable generation, supporting the involvement of the community, investment in equipment and its operation, in a temporary horizon of decades. Before 2030 a set of renewable generation systems (predominantly photovoltaic), will be installed, allowing that 100% of the consumption of electricity will result from renewable energy sources. It is therefore needed to implement a complete energy management system, which uses storage, and is able to automatically manage the consumption according to generation while taking into account the preferences of the users.

In order to realize the vision set by Culatra Island, the Resident Association of Culatra Island (AMIC) in collaboration with University of Algarve set up the guidelines for a participatory process with the island community led by 'Make it Better'. The vison of Culatra 2030 is

*To introduce a decentralized system of electricity generation, creating a spirit of community that enables the population of Culatra Island to: (1) become energetically auto-sufficient; (2) treat and value its waste; and (3) produce fresh water for self-consumption." The achievement of the proposed goals is essential to create long-term conditions for the residents living in this fragile environment, to continue their traditional economic activities, preserving their identity and cultural values, and to seek new economic activities compatible with the rational use of natural resources. The heterogeneity of the electrical grid, when combined with the necessary introduction of renewable energy sources, makes Culatra Island an ideal setup to test new forms of energy management. As such, key to the project success is the involvement of the local community in both the planning and on the development of the renewable energy system plants, via the establishment of energy communities and other similar unions.*"

From a social point of view the expression "renewable energy community" is associated with the concept of community owned property, with local electricity production and/or renewable source, where decision-making is taken collectively, through the elected and statutory bodies. This perspective emphasizes the importance of the social component associated with the constitution of these communities. Energy communities as the one envisaged for Culatra Island can play a relevant role in the generation of electricity in a decentralized way. A decentralized system of electricity production only intends to respond to the consumption for which it was dimensioned, structured in such a way that it can have a degree of autonomy from the centralized system, although maintaining its link to the centralized system.

To accomplish the purposed goals, and taking into consideration the contributions of key companies in the energy sector, a roadmap for the implementation of the "Culatra 2030 - Sustainable Energy Community initiative" was purposed:

1. The introduction of decentralized renewable energy generation and storage systems;
2. The implementation of a sea water desalinization power plant supplied by local produced energy;
3. Induction and promotion of energy efficiency and sustainability actions among permanent residents and occasional tourists;
4. Stimulation of digitalization of energy systems, enhancing consumer participation;
5. Promotion of the use and electrification of transport, mostly using electric boats.

# 3. Pillars of the Energy Transition

Culatra 2030 Sustainable Energy Island is a test bed project for energy transition, fully aligned with the EU, National and Regional polities. The involvement of the local community is key to the project success in both the planning phase and during the development of renewable energy systems, via the establishment of energy communities and other similar unions. To achieve these goals, cooperation with the Clean Energy for EU Islands Secretariat and other European regulatory authorities is essential to formulate and implement a specialized regulatory framework for the operation of clean energy systems within the island.

The planning, preparation and implementation of the Culatra 2030 initiative implies the mobilisation of distinctive pillars that generally support and regulate the development of the Culatra island. To this extent, a fundamental participatory approach was applied as way to enrol and empower local communities and its citizens in the whole process, all along the path, from planning to implementing phases. The following pillars were considered:

- Electricity generation, storage and distribution;
- Housing climatisation and building efficiency;
- Transport on the island;
- Transport to and from the island;
- Water supply and treatment;
- Waste management and valorisation;

Some examples of strategies and actions to accomplish the objectives proposed in each pillar are presented below.

| **Pillar:** Electricity generation, storage and distribution | |
|---|---|
| **Objective:** Self-sufficient electricity supply system based on solar PV, battery storage technologies and smart grid distribution. | |
| **Strategies:**<br>- Dimension and operate a self-sufficient electricity supply system based on solar PV;<br>- Dimension and operate a scalable power energy storage and the control system;<br>- Create a design and installation of a local smart grid that allows the intelligent use of energy by identifying the peak hours and efficient management of available energy resources. | **Actions:**<br>- The specification of several photovoltaic plants is already ongoing. It started by considering a photovoltaic unit, to build over the new fishermen' sheds (the current sheds will be replaced). Several scenarios were already considered for that location. The obtained results have shown that more areas of photovoltaic panels must be added to reach the self-sufficiency of the island. So, currently common infrastructures are being added, to increase the amount of solar generation. |

**Pillar:** Transport on the island

**Objective:** Decarbonise the island's transport system by focusing on the socio-economic activities and solar-electric mobility.

| **Strategies:** | **Actions:** |
|---|---|
| - Promote the use of solar boats in the economic activities of the residents and visitors in order to reduce the ambient noise, level of fuel engine boats and increase the environmental quality status of Ria Formosa;<br>- Design and install a solar boat charging station at the fishery harbour;<br>- Develop an island-wide public transport system that runs completely on electric vehicles. | - Design with SunConcept a boat/solar platform for the activity of fishermen and shellfish activities allowing the gradual replacement of combustion-based engines in boats;<br>- Find funding at regional, national and European level to invest in those boats;<br>- Organize and legislate the Maritime Spatial Domain in collaboration with regulatory bodies and authorities in favour of the use of solar-electric boats in Ria Formosa, especially on the activities related with tourism, which cause severe damage to the environment;<br>- Limit the number of Maritime Tourism companies operating in Ria Formosa and privilege those that operate using solar-electric boats. |

**Pillar:** Transport to and from the island

**Objective:** Decarbonise the island's transport system

| **Strategies:** | **Actions:** |
|---|---|
| - Involve the principal transportation company in the Transition Agenda process, to support access to transition funds. Those funds would allow the company to use green hydrogen as a ferry fuel converting the actual fleet to green energy carriers. | - Develop a feasibility study to evaluate the use of green hydrogen and/or electric-solar energy to power the maritime ferry passengers;<br>- Create a fund for fundraising to build a hydrogen/solar or electricity-powered passenger transport ferry;<br>- Dimension a small electrolysis system for hydrogen production, storage and use. |

**Pillar:** Housing acclimatisation and public building efficiency

**Objective:** Increase the energy efficiency and energy generation capability of buildings.

| **Strategies:** | **Actions:** |
|---|---|
| - Interventions in public and common use infrastructures, such as the school, the social centre, the Residents' Association, etc.;<br>- Determine thermal loads and propose new green building solutions, including passive heating and cooling technologies.<br>- Optimize the air quality and space experience by its occupants, using natural lighting and natural ventilation.<br>- Modernize housing on the island by integrating new concepts of bio-architecture, such as windows adapted to the island environment, rooftop improvement, wall insulation (cork), waste and water consumption management. | - Creation of the Green Sustainable Culatra2030 Fund, managed by the AMIC for the environmental sustainability of the island, which will allow residents to access a microcredit plan to finance passive energy efficiency measures and decentralized energy generation. The fund will be strengthened by the management of funds from the anchorages, a nautical shop, a service station for the sailing boats, by collecting contributions from visitors through the negotiation of a percentage of the boat's career ticket, through awareness campaigns, cultural events, crowdfunding, among others. |

**Pillar:** Water supply and treatment

**Objective:** Produce water for self-consumption

| **Strategies:** | **Actions:** |
|---|---|
| - Dimension and operate a scalable desalination water plant. The solution has to be simple and easy for the residents to carry out maintenance tasks.<br>- Evaluate the best solutions and feasible investments for water supply and management with Águas do Algarve and Fagar, such as simplified solutions to the pre-treatment of waste water for sanitary use. | - The feasibility study of a desalination plant is ongoing at the Mechanical Institute of University of Algarve by considering the analysis of current technologies;<br>- Empower the community to reduce the water consumption and install water collector systems on the island to be used by the community;<br>- Promote the water certification of commercial establishments, public establishments and residence houses;<br>- Study the feasibility of pre-treatment of part of the wastewater in the island using exceeding renewable generated energy. The sub products would be water for sanitary use, lowering water consumption, and a mud that can be used on as a fertilizer or on production of a biogas. |

**Pillar:** Waste management and valorisation

**Objective:** Use island sustainability as a pillar for transition.

| **Strategies:** | **Actions:** |
|---|---|
| - Sensitive to the urgent need to create an example of global change in the community's lifestyle, the issue of plastic reuse and reduction was chosen as a banner of environmental sustainability. In this regard, several environmental non-governmental organizations were invited by the Coordinating Group to give concrete ideas to the "Green Island, Plastic Free Zone" objective, enabling the community to give a clear example of active citizenship. | - Create the "Zero Plastic Zone" Seal (Seal ZP0), a distinctive mark to be attributed to entities that demonstrate positive behaviours within the campaign, namely by reducing the use of plastic, by replacing single-use plastics with more respectful environment materials and with less ecological footprint. Build capacity and responsibility for waste production and management practices in the island community;<br>- Organize thematic workshops that address the main target groups of the campaign (resident people; island visitors; main economic agents of the island) that show solutions and existing best practices in reducing, reusing and replacing plastic with greener materials;<br>- Develop fundraise campaigns and merchandising to support the Green Sustainable Culatra2030 Fund;<br>- Implement innovative projects on waste management and treatment;<br>- Study and implement new solutions for the collection and transportation of the waste inside and out of the island to replace diesel tractors and combustion engine boats that are currently used;<br>- Implement waste digitalization to reduce quantities and promote separation, with benefits on the costs of waste collection;<br>- Evaluate new mechanisms to utilize waste from the fishing activities to supply fuel for energy production. |

# 4. Barriers and Opportunities

The Algarve, the southernmost region of mainland Portugal, with an area of 5,412 km² and a resident population of 451,005 inhabitants, is the main tourist region of our country and one of the most emblematic in Europe. Its temperate Mediterranean climate is characterized by mild and short winters and long, hot and dry summers. According to the Regional Strategy for Research and Innovation for Intelligent Specialization (RIS3) developed by Algarve Regional Coordination and Development Commission, the Algarve has a number of essential conditions that can lead to the development of a value chain in renewable energies. In particular, the climate conditions suitable for the use of solar, wind and marine energy; biofuels; existence of academic research centres and active experience of cooperation with companies and public entities; as well as experience of cooperation in pilot projects and public-private partnerships.

In respect to the production of energy from renewable resources, wind power is the main source of energy in the Algarve, mainly through the wind farms installed in the West Coast. Solar irradiation in the region, particularly in the East Algarve, is among the best in Europe, which, together with the advancement of solar technology and its decreasing cost, represents a strategic opportunity for the region and can become a future boost of economic growth. Although the renewable production potential in the Algarve region is high, it represents only 4.3% of installed wind power, with a production of 4.9% of the continent's overall value, and 11.3% of installed photovoltaic power with output representing 11.9%.

The main concern of the Coordinating Group of the "Culatra 2030 - Sustainable Energy Community" initiative was to understand the legal and conditioning instruments for the execution of the several planned projects, in order to contribute to the territorial valorisation and environmental sustainability of the island and the fishing community. In terms of environmental barriers, Culatra Island is situated in the Natural Park of Ria Formosa (PNRF). The PNRF was created by Decree-Law No. 373/87, of December 9, which reclassified the Ria Formosa Natural Reserve, created by Decree No. 45/78, of May 2. The legal document that supports the creation of PNRF is an instrument for protection and conservation of the lagoon system, an area of high ecological interest, of great scientific, economic and social value, and which, due to its size, diversity and structural complexity, constitutes the most important wetland in the south of the country.

The PNRF partially overlaps with the Ria Formosa Special Protection Area (SPA), classified by Decree-Law no. 384-B / 99, dated September 23, and the Ria Formosa / Castro Site of Community Importance (SIC) Marim, classified by Council of Ministers Resolution No. 142/97 of 28 August, both within the scope of the Natura 2000 Network. The two principal territorial management instruments applicable to the Ria Formosa are the Vilamoura-Vila Real de Santo António Coastal Ordinance Plan, approved by Council of Ministers Resolution no. 103/2005, of June 27, and the Ria Formosa Natural Park Ordinance Plan, approved by Council of Ministers Resolution No. 78/2009, of September 2. Both legal documents contain directives aimed at preserving and qualifying the PNRF area, inserted in the public water domain, and would be barriers to any process of requalification of the Culatra Village. As such, the installation of solar panels in areas classified as National Ecological Reserve, Sites of the Natura 2000 Network or the National Network of Protected Areas, such as the Ria Formosa, requires the appreciation of the public interest of the project and an environmental impact study. It is key to demonstrate that the installation of such power plant brings benefits to the local population and that the location of those agree with the guidelines provided by the entity responsible for the park.

However, in September 2018, the Government officially recognized the Village of Culatra as a consolidated fishing residential nucleus (Ordinance No. 277-B / 2018). This document values the fact that the Village of Culatra corresponds to a fishing nucleus with historical roots, with clear evidence of ancient occupation and, therefore, it has a social, economic and cultural status worthy of recognition and appreciation. This recognition opened the door for the community to apply for housing licences within the public water domain valid for the next 30 years and eventually renew if the fishing identity of the village and inhabitants is maintained. From these meetings and in view of the legal framework of the Culatra Village, which is in the process of obtaining permits for housing in the public water domain, it was agreed that there was a need to recover buildings and existing infrastructure in order to meet the objectives outlined in the energy transition, identifying the Polis Litoral Ria Formosa SA as a key actor in this process. The Polis Litoral Ria Formosa SA is responsible for the elaboration and implementation of the Culatra Nucleus Intervention and Re-qualification Project (PIR), within the scope of the attributions granted to it by Decree-Law no. 92/2008, of June 3 . The PIR is an instrument / tool to guide the actions to be implemented in the residential area of Culatra Village, located entirely in the area of the public water domain, and integrating the protected area of the Ria Formosa Natural Park. The PIR is identified in Article 84 of the Regulation of the Coastal Planning Plan Vilamoura - Vila Real de Santo António, hereinafter referred to as POOC, approved by the Council of Ministers Resolution No. 103/2005, of 27 June. It is an exception legal instrument elaborated by the Ministry of the Environment, to intervene and requalify the UOPG IV - Nucleus of Culatra. The entity responsible to assess the environmental impact study is the territorially competent Coordination and Regional Development Commission, considering existing energy and environmental policies. This represents an open opportunity to requalify the urban area of Culatra Fishermen Nucleus without interfering with the environmental constrains.

In terms of political constrains, the ERSE 2017 directives for the Energy Regulation in Portugal points to the urgent need to create the appropriate means to incorporate more renewable energy into the networks, simultaneously promoting the overall economic efficiency of the electricity system and security of supply. Portugal is preparing for the transition from the fossil fuel-based economic model to renewable energy. In 2015, the Portuguese Government set the amount of 95 euro per megawatt hour for small electricity production units, resulting in a strong incentive for small producers. However, more regulation and incentives for decentralized production systems (such as solar photovoltaic) and storage are urgent, particularly at the community level. These producers and consumers will constitute local microgrids that will have to be managed by energy cooperatives. For this, new business models are required to allow that investment in microgrid production is amortized in the short to medium term. On October 2018, the Portuguese Government established a working group with the objective of achieving carbon neutrality by 2050, by identifying incentives that harm the environment and proposing their phase-out, and to propose a revitalization of the carbon tax, considering possible impacts on the economic sectors concerned. On January 2019, ERSE approved the regulation of the Services of the Intelligent Networks of Distribution of Electric Energy.

After a preparation period of more than two years, the publication of eight legislative documents constituting the European Clean Energy Package for all Europeans was completed on 14 June 2019. As stated by Miguel Arias Cañete, Commissioner for Climate Action and Energy, *"This is the most ambitious set of energy proposals ever put forward by the European Commission. It was adopted in record time, with impressive support from the European Parliament and the Council. With its conclusion, we have made the EU Energy Union*

*- one of the ten political priorities of the Juncker Commission - a reality. I truly believe this will accelerate the transition to clean energy and give all Europeans access to safe, competitive and sustainable energy.*" These measures include the implementation of Renewable Energy Communities, as grid-connected, self-consumption power generation and consumption systems.

In line with the above-mentioned European policies, the Portuguese Decree-Law 162/2019 published last October 2019, supports the creation of collective self-consumption and Renewable Energy Communities, as well as their respective communities. With the publication of this Decree Law, both, the Portuguese Entidade Reguladora dos Serviços Energéticos (ERSE) and Direção Geral de Energia e Geologia (DGEG), intend to start the establishment of Pilot Projects in Portugal, which will serve as a laboratory for the creation of "regulatory greenhouses". That is, places to research and propose innovative energy management solutions that bring benefits to these same communities and the economic activities that exist in these sites. The electrical grid of Culatra island is the perfect place to start implementing a Renewable Energy Community, allowing the future dissemination and replication of the obtained results to other electrical grids.

Regarding electric mobility, the Portuguese Government recently approved in their 2019 budget the granting of tax benefits to individual companies and entrepreneurs using electric or electro-solar vessels. From now on, the expenses and losses of the taxation period related to taxable depreciation of tangible fixed assets corresponding to electro-solar (or exclusively electric vessels) are 120% of the respective amount. This law is applicable when determining the taxable income of IRC taxpayers who are principally engaged in a commercial, industrial or agricultural activity, and/or when determining the business and professional income of IRS taxpayers with organized accounts.

| | Positive | Negative |
|---|---|---|
| Internal | ***Strengths***<br>- The overall commitment of the transition team on making Culatra Island the first energy community in Portugal;<br>- High innovation potential of the transition agenda, especially at the electrical supply, grid management, transportation and water production;<br>- The heterogeneity of the electrical grid makes the Culatra Island an ideal setup to test new forms of production, storage and energy management;<br>- Great opportunity to innovate at the business level model, as well as provide all relevant information to stakeholders such that the objectives of the clean energy package can be met;<br>- The community spirit and the capacity of inhabitants' resilience to the environment, historically facing and overcoming challenges to improve their life quality;<br>- The solar energy potential which if managed through an intelligent electricity supply system, can be an effective solution in the energy supply with an enormous capacity of transference and replication in other places of the region;<br>- The current legal status of the urban area of Culatra Fishermen Nucleus. This represents an open opportunity to requalify the urban area of Culatra Fishermen Nucleus without interfering with the environmental constrains. | ***Weakness***<br>- The consolidation of the strategic sector of the Renewable Energies for the Algarve lacks the necessary development of technologies and demonstration tests in the region;<br>- Most of the technologies envisaged to be implemented under this initiative are not developed in the region and the region lacks the means for its development;<br>- The socio-economic context of the community, mainly living from the income of fishing and shellfish culture;<br>- The amount of energy that is generated using renewable energy sources is still negligible and the community needs to be empowered to take action and face the challenges on energy transition;<br>- The limited involvement of some key stakeholders that support the pillars of the transition;<br>- Lack of an organized structure to compete for the financing mechanisms that would allow the transition roadmap to be implemented;<br>- The risk that one party takes "control" of the project as this would eliminate an important objective of the transition agenda: to effectively democratise Culatra's energy system. |

| | | |
|---|---|---|
| External | ***Opportunities*** | ***Threats*** |
| | - The project is fully aligned with EU, National and Local policy regarding energy transition;<br>- The Culatra 2030 Sustainable Energy Island project is strongly driven by the need to implement an energy transition agenda in the region;<br>- Solar irradiation in the region, particularly in the East Algarve, is among the best in Europe, which, together with the advancement of solar technology and its decreasing cost, represents a strategic opportunity for the region and can become a future boost of economic growth;<br>- The positive reaction of all regulatory bodies, enterprises, community and academia on the defined energy transition roadmap;<br>- The existent opportunities to all involved stakeholders on the energy topic which will contribute in favour of the implementation of innovation projects;<br>- The high interest of EDP Distribution, the main energy supplier, to develop solutions for the island grid to improve integration and use of digitalised smart grids and/or thermal networks based on high flexibility services from distributed generation, local power balancing, demand response and storage of electricity at different scales;<br>- The fact that the context of auto consumption is being widened, from homes and businesses to local communities and municipalities. These may play a central role in the transition to a greener, more inclusive, democratic, transparent and participatory energy system. | - The goal of creating an Energy Community is excellent, but comes with many open-ended questions in terms of its structure, execution and the decision-making framework;<br>- Currently, there is no legal legislation, regulation and incentives that allow the creation of energy communities focusing on decentralized production (such as using solar photovoltaic);<br>- Although PNEC2030 and RNC2050 were created, the Portuguese Government did not yet clarify how Portugal intends to move forward with the Energy Communities to support economy transition and decarbonization;<br>- A part of the residents' houses is still in the process of legalization, which requires architecture and engineering projects to be approved by the city council. As such it is not yet possible to intervene directly in the housing roofs to increase the energy production on the island;<br>- Some barriers imposed by the legal regulatory documents, which obliges constant adaptions of the roadmap;<br>- The overlap of power and competences between the regulatory entities in the territory, which are occasional barriers to joint action. |

# 5. Pathways

The 6 pillars outlined for Culatra involve strategies and actions in interdependent energy-related areas. The vision of Culatra includes cross-sectoral integration where decisions for one pillar impact the other pillars. An overview of the integrated future scenarios for the Culatra energy system is illustrated in Figure 3. The figure outlines the different energy options presented in this transition agenda and shows the various pathways to achieve Culatra's vision. The pillars outlined in this Transition Agenda are based on the Culatra 2030 project whose scope is larger than the island energy system. They are nevertheless all relevant for a transition of the island energy system that is accepted by the community when considered from a holistic point of view.

On the generation side, solar PV has been studied as a generation means for renewable and self-sufficient electricity production on the island. This research has led to several plans for PV development, in which solar plants will feed into the island distribution grid – rather than autonomous generation – to supply most of the electricity demand on Culatra. Scaling the amount of solar PV generation adequately must consider the daily production profile of solar power and the foreseen effect of electrification of transport to and from the island for fishing, aquaculture and tourism, energy in buildings, and water supply.

Electrification of transport, for example through electrical vehicles, solar boats and electrical ferries, increases the island's electricity demand and the amount of local generation needed to be self-sufficient. Technology alternatives for electrified transport to and from the island are hydrogen or a hybrid solution using hydrogen and electricity. If hydrogen is to be produced on Culatra by a small-scale electrolyser with a storage unit, this will furthermore impact the local electricity demand.

Residential consumption plays an important role in Culatra's energy demand. The main technologies are electric heating and heat pumps, both of which consume electricity to meet the heating demand. Energy savings through demand side management and retrofitting of buildings can lower the heating demand, though increased comfort levels can equally lead to an increase in energy consumption. Adapting the building stock to optimise energy consumption on a building level is an important step in this regard.

Using electricity to desalinise water for human consumption on the island integrates water into the power system. Desalination plants are generally power intensive and have brine as an important waste product. The benefits and drawbacks of water desalination have to be considered when operationalising this pillar.

Incorporating and electrifying different sectors through direct use and conversion from solar generation to reduce local $CO_2$ emissions will require coordination between the production and consumption side of the local grid. Flexibility is important in power systems with a high penetration of variable solar power production to absorb excess electricity production to maintain system stability. Electrical storage is a possible solution to allow a greater share of variable production on the island. Likewise, using smart charging of vehicles and boats in an electrified transport sector can act as a battery for the grid. A desalination plant for water production can have an operation strategy that improves power system operation to provide water to the community. Another way to increase flexibility in the grid is through the electrical interconnection with the Portuguese mainland.

Including the community's perspective to understand the actual needs is essential to reach Culatra's vision. All the potential technology pathways, whether they contain hydrogen, batteries, electric vehicles, retrofitting of homes, heat pumps etc. will have to be aligned to achieve a reliable, decarbonised and community-owned energy system within the frame of Culatra 2030.

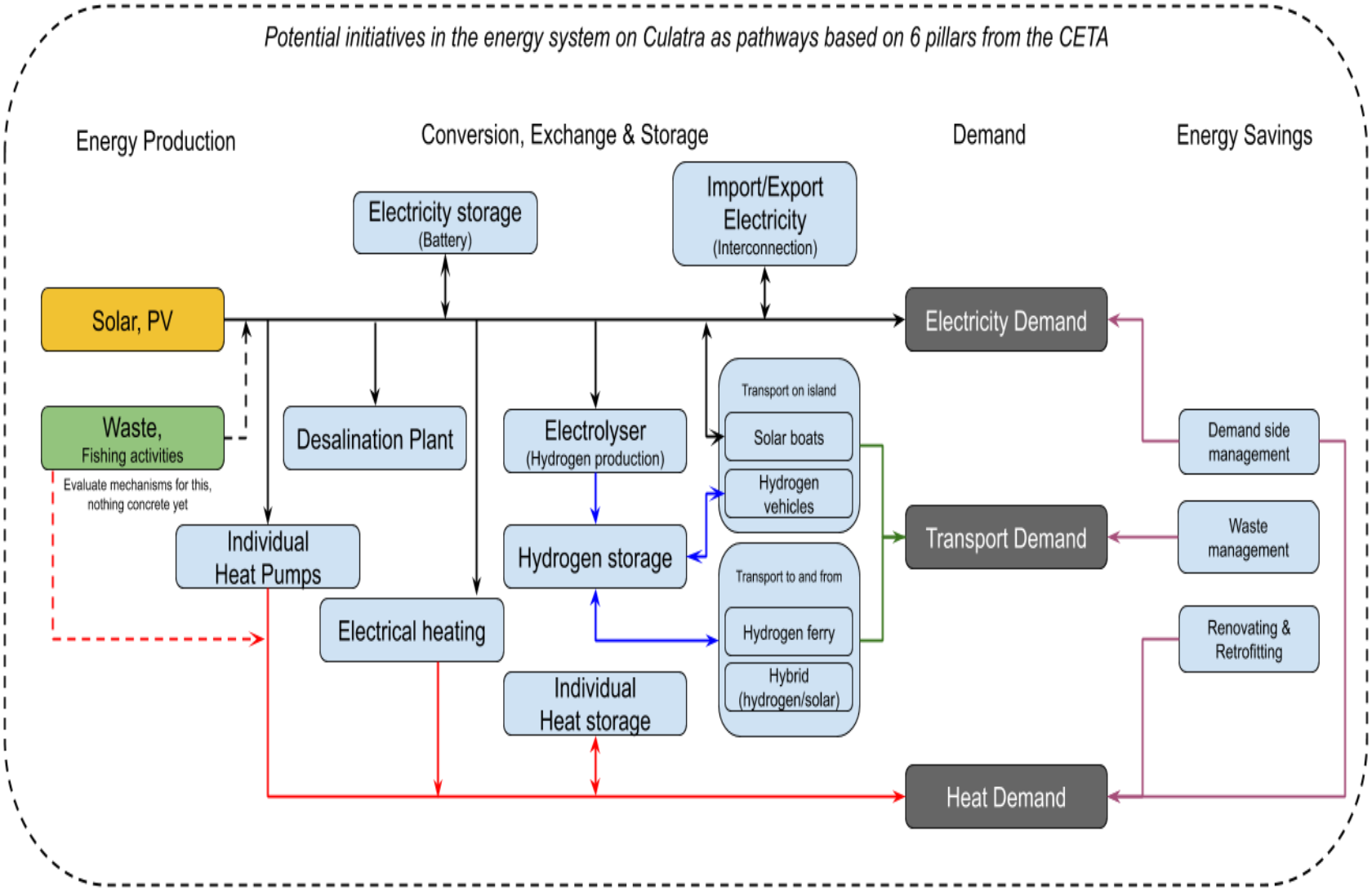



*Figure 3: Transition pathways for Culatra's clean energy transition*

# 6. Financing concept

The identification of funding instruments is an ongoing process. Essential to the success of implementing the Clean Energy Transition Agenda is to ensure that sufficient funding instruments are available to cover the costs that cannot be economically financed as a result of energy savings. The Culatra 2030 transition team already has implemented some ideas on how to fund the transition in the island such as the creation of the Green Sustainable Culatra2030 Fund, managed by the AMIC for the environmental sustainability of the island. This financial instrument will allow residents to access a microcredit plan to finance passive energy efficiency measures and decentralized energy generation. The fund will be strengthened with the management funds of the anchorages, a nautical shop, a service station for the sailing boats, by collecting contributions from visitors through the negotiation of a percentage of the boat's career ticket, through awareness campaigns, cultural events, and crowdfunding, among others. As an example, contacts with Akuo Foundation were established to evaluate the potential fund of the energy power plant. The Akuo Foundation undertakes and supports socially and environmentally sustainable development projects. It offers its partners the opportunity to work alongside to help deprived communities around the world. Akuo Foundation's mission covers four areas of engagement: (1) Providing access to sources of continuous and sustainably competitive renewable energy; (2) Providing access to education and information; (3) Providing access to clean water and to health services; and (4) Protecting the environment and biodiversity.

The Culatra 2030 transition team is also in contact with different programmes to fund different activities, both at national, regional and local local.

At the national level the team is looking into opportunities within the National Investment Program 2030. The National Investment Program 2030 is the strategic investment that Portugal is expected to launch in the next decade and is articulated with the strategic objectives defined for Portugal 2030 and the Roadmap for Carbon Neutrality 2050, for which a broad social, economic and political consensus has been reached. The program is focus on two intrinsically linked key vectors: (1) Mobility and Transport, key factors for the external competitiveness and internal cohesion of the Country; and (2) Environment/Climate Action and Energy, areas intrinsically linked to mobility to the challenges of climate change, decarbonisation and energy transition.

At the regional level, the team is in direct contact with the Algarve Regional Coordination and Development Commission responsible for the funds CRESC 2020. Integrated within the RIS3 approach, the Regional Operational Program CRESC Algarve 2020 underlines specific financial instruments, both for enterprises and public entities, to accomplish the regional objectives related with energy transition.

At the local level, the team is looking to specific lines under Mar2020, a programme that funds innovation on economic sectors related to the sea. As an example, a proposal was already submitted to fund the PV power plant for the fishing sheds and the acquisition of a solar-electric boat. Other examples are the contacts with Faro Municipality with the aim of including some measures of the Covenant of Majors in practice, using Culatra Island as example, as well as to budget the intervention on the public building on their annual budget.

Many other collective financial schemes are being considered as part of an ongoing process that includes all the stakeholders. The idea is to make Culatra an example of a test bed project in energy transition. As one of the main partners is academic, several opportunities exist for

research and development projects, both through European programs such as H2020, Horizon Europe, Interreg, OceanEra and others; but also at national Level, specially the programmes funded by the Portuguese Foundation for Science and Technology (FCT-Portugal).

# 7. Monitoring and dissemination

The Culatra 2030 initiative foresees the development of a peer-to-peer and self-evaluation process. Evaluation will be focused on each of the elements of Transition Agenda cycle – diagnosis, strategic and methodological principles, objectives, resources, action plans implementation and continuity/updating of the actions after transition period – and structured for assessing the respective evaluation dimensions – pertinence, coherence, efficacy, efficiency, execution, impact and general sustainability. The overall monitoring and evaluation procedures envisaged will permit to identify and compare different sets of results and impacts, as way to assess the transition success level. In terms of the expected transition process, and during its construction and implementation, the most relevant indicators should be set based on the main pillars identified above.

Considering the pilot nature of the initiative, and by respectively recording all stages and narratives of the whole process, evaluation is expected to be undertaken in a rigorous manner to produce reliable information through which partners can learn about the process and to identify successes and failures. A participatory evaluation is also expected that involves the island community's main stakeholders.

The evaluation stages (time & frequency) and main activities during transition process are:

- Initial meetings held at the kick-off of the agenda, to discuss the expectations, define indicators, tune monitoring instruments to apply, actions & times of application;
- Building data collecting tools and questionnaires: interview scripts, paper & online, about each one of the evaluation items. An online evaluation platform will be made available for collecting data and to support statistical analysis;
- Application of questionnaires for each action plan or transition measure, processing data collected and preparation of base report;
- Focus groups at intermediate moments, for discussion (problems, learning lessons, strengths, weaknesses) and to develop recommendations about transition management, stakeholder's performance and actions/achievements;
- Application of assessment questionnaire at the conclusion stage of each action plan or transition measure.
- Informal meetings for assessment in the form of debates with different groups & stakeholders to know the external view from the initiative, stakeholders and actions or measure);
- Processing the collected data by examining the results versus the expectations and, when relevant, preparing of evaluation reports. Evaluation reports must fully and comprehensively:
    - Assess the effectiveness: the extent to which objectives are achieved or the likelihood that they will be achieved. The effectiveness of the initiative should be assessed in accordance with the actions and the outputs detailed in the results framework.
    - Assess the sustainability: the extent to which benefits will continue or are likely to continue after transition/actions/measures have come to an end (follow up visible & permanent results);
    - Assess the relevance: the degree to which the actions were justified & appropriate in relation to the need;
    - Assess the efficiency: the analysis of the overall performance, the outputs in relation to the resources, the financial management, the implementation timetable;

- Assess the impact achieved and likely to be achieve in the future, measuring both the positive and negative, foreseen and unforeseen changes and effects on society caused by the initiative as well as its catalytic effects.

Concerning the monitoring of the emissions, an online dashboard and platform will be created by the University of Algarve. That platform will be made publicly available, allowing the dissemination of the results obtained by the project. In terms of electrical energy, the platform will receive and display the data from the photovoltaic generation plants of the island and real-time information about the energy imports and exports to and from the national power grid. The data obtained will be used to compute the net amount of energy produced and consumed in the island's micro-grid and will allow to compute the emission reductions because of local generation. To compute these reductions, the platform will also need to gather the information from the Rede Elétrica Nacional (REN) about the electricity mix at a national level that is generated from non-renewable energy sources. Non-real time information will be also integrated in the platform and will cover the emissions that result from fossil fuel consumption (mainly liquid gas, diesel and gasoline) in the island and in the transportation to and from the island. AMIC will be in charge of collecting data and will pass the information to the University of Algarve who will integrate them in the platform. An online form may be created to gather that data from AMIC and to facilitate its integration in the dashboards. The dashboard with the real time and non-real time results, and the associated reduction in emissions, will be presented to the tourists that visit the island. This can be done both in the public transportation boats and facilities on the island, such as in restaurants.

Further, a process monitoring scheme will be set annually, as suggested under the Clean Energy for EU Islands frame, by the use and application of the self-assessment matrix available for islands to assess the status of their transition process. The initial self-assessment for Culatra scored as seen in table 3.

Table 3: The initial self-assessment for Culatra done by 'Make it Better' on the 4th of September 2019.

| Culatra | CETA | Vision | Community | | Investment Concept | Decarbonisation plan | | | Multi-level gov. |
|---|---|---|---|---|---|---|---|---|---|
| | | | Stakeholders | Organisation | | Island diagnosis | Data | Action plan | |
| **September 2019** | **3** | **4** | **4** | **4** | **3** | **3** | **3** | **3** | **4** |

The score of the self-assessment for each of the indicators is explained below.

## Indicator: Clean Energy Transition Agenda

Score: 3

*The Transition Team has a good understanding of the island dynamics, the different perspectives on clean energy and the barriers and opportunities for clean energy on the island.*

Note: It can be said, in addition, that, in some topics, the Transition Team works together with stakeholders from multiple stakeholder groups to develop a shared vision and transition pathways to achieve the vision. The participatory process is still ongoing at this stage, being reserved for further stages the completion of the Agenda and its acceptance/validation by the Clean Energy for EU Islands Secretariat.

### Indicator: Vision

Score: 4

*There is a long to medium-term island-wide vision on clean energy that includes clear objectives.*

Note: The Culatra2030 initiative started before the application and involvement of the Clean Energy for EU Islands Secretariat. The main vision for the energy transition has existed since then, although not widely shared or known from many of the relevant players in the process. The Clean Energy for EU Islands is an opportunity for involving more stakeholders and to start a wide awareness process regarding sustainability objectives among the community. Soon, there should be a long-term island-wide vision on clean energy, approved by the relevant authority that includes explicit targets.

### Indicator: Community Stakeholders

Score: 4

*There is a commitment from multiple stakeholder groups (2-3) to advance the transition to clean energy on the island. This commitment is formalised at an island level (e.g. the CE4EUI pledge).*

Note: There is an actual commitment among the main stakeholders enrolled in the transition process. The memorandum of understanding signed should soon be reinforced by the signature of the Pledge. There are furthermore different agreements regarding the preparation and application of individual projects that contribute centrally to the implementation of measures of the agenda.

### Indicator: Community organisation

Score: 4

*An island-wide platform is in place that consists of and is supported by actors from multiple stakeholder groups that drives the energy transition process. (e.g. a community initiative with the support from academia).*

Note: Many actors (representing the quadruple helix) are engaged in the initiative, constituting a strong and well-based platform for the Agenda. As described in the Transition Governance section, besides the Advisory Committee (constituted by all public authorities relevant to the agenda design and implementation), the whole initiative is conducted with respect for the participatory approach and with the central involvement of the community and its main representatives and sectors.

### Indicator: Investment concept

Score: 3

*The different funding opportunities for clean energy projects have been listed.*

Note: Funding opportunities are identified (though not yet all) including the creation of a specific autonomous local fund. This local fund (Fund for social and environmental sustainability) is currently being created and should support the co-funding of many of the measures inscribed in the action plans for the CETA. Soon, a basic project pipeline should be identified and the available financing solutions for the different steps analysed (reminding that the participatory diagnosis, still in course, may imply adjustments to the initial funding plans).

### Indicator: Decarbonisation plan – Island Diagnosis

Score: 3

*A technical or economic analysis of the energy system exists on a sub- or supra-island level.*

Note: On the meanwhile, a technical and economic analysis of the island energy system should exist, including a final energy consumption breakdown or energy balance for some of the sectors at stake.

### Indicator: Decarbonisation plan – Data

Score: 3

*An inventory of consumption and $CO_2$ emission data exists, tough this is not entirely based on local reporting or is out of date.*

Note: There were administrative and legal obstacles concerning the collection of data (energy consumption and $CO_2$ emission) from the different sectors in the island. This is now being mitigated. It is therefore expected that, in the short, a wide inventory of consumption and $CO_2$ emission data for all sectors based on local reporting will be available. There will additionally be a periodic reporting process in place.

### Indicator: Decarbonisation plan – Action Plan

Score: 3

*The priorities and key actions and measures on clean energy are selected.*

Note: There is an island-wide action plan on clean energy that describes the necessary actions to achieve the vision, but this is not formalised yet. As the participatory process is still running, some of the final measures to include in the agenda are not yet identified. On the conclusions of the participatory diagnosis, a set of action plans is foreseen to be delivered that will feed into the agenda and, later, lead to their concrete implementation.

### Indicator: Multi-level governance

Score: 4

*There is interaction with some other levels of governance on clean energy transition to align the Clean Energy Transition Agenda with existing plans.*

Note: There is in fact interaction with all relevant local, regional or national authorities on clean energy transition, as shown in the stakeholder mapping in chapter I.3, as well as in the discussion on Transition Governance in chapter II.1. Under these, the multilevel governance is fundamentally assured, from the political and institutional points of view, and the Clean Energy Transition Agenda is being aligned with the existing energy strategies at local, regional and national level.

# Annex I: Participatory Approach

CULATRA 2030

**PARTICIPATORY APPROACH**
**(for the implementation of Culatra 2030 initiative)**

## INTRODUCTION

The planning, preparation and implementation of CULATRA 2030 initiative implies the mobilisation of the distinctive pillars that generally support and regulate the development of the Culatra island. One of these pillars is undoubtedly the set of island communities. To this extent, a fundamental participatory approach is being prepared as way to enrol and empower local communities and its citizens in the whole process, all along the path, from planning to implementing phases.

In the particular case of CULATRA 2030, the methodology selected for the participatory approach is inspired in different methodologies (previously tested and validated on similar fields of intervention) being the main ones the following:

- MEXPAR – Participatory Methodology for Sustainable Development through Rural Extension (EMATER-MG, March 2006, Belo Horizonte - Brazil);
- PNDT - Participatory and Negotiated Territorial Development (Rural Development Division - Food and Agriculture Organization - FAO - United Nations, April 2009).

The present document seeks to summarize, in general terms, the methodological steps envisaged for the implementation of the transition agenda to be set under the Clean Energy for EU Islands programme. The methodological approach presented can be altered or adapted in function of unpredicted deviations or adaptations to the implementation context.

## CONCEPTUAL PRINCIPLES OF THE APPROACH

- **ACTOR BASED**: Recognition of the heterogeneity of the actors' interests and visions of the territory;
- **TERRITORIAL BASED**: Based on the territory as spatial unit of analysis, shaped by the social and historical relations between the actors and the territory;
- **DYNAMIC**: Understanding and learning from the complexity of a changing environment to support positive patterns and help mitigate negative patterns;
- **SYSTEMIC**: Assumption of the complexity of a territorial context and the interdependencies within and between territories;
- **MULTI-SECTORAL**: Integration of the environmental, social, economic, political, cultural dimensions of the actors' visions of the territory;
- **MULTI-LEVEL**: Integration of different territorial levels and scales in the governance system;
- **PARTICIPATORY & NEGOTIATED**: Notion of the territory as a negotiation arena to strengthen dialogue and mutual trust, and increase bargaining power.

## METHODOLOGICAL SUMMARY

### PHASE 1 – VIEWS:
### UNDERSTANDING THE ACTORS & THE TERRITORY AS A SOCIAL PRODUCT

The objective of this phase is to carry out a diagnostic process of the actual situation by considering the actors concerned and the territory as a whole system.

The systemic vision implies a vertical and horizontal dimension of assessment. This process involves qualifying the territory and conducting an analysis of actors and institutions to understand the issues at stake and their causes and interdependencies. Using participatory tools and methods ensures that the whole process is stimulating for social dialogue.

The historical analysis of the territorial system is essential for a coherent understanding of actors' global visions and livelihood strategies and for formulating possible scenarios of evolution of the main issues under discussion (e.g. right and access to resources, land use and management, relationships within the whole productive chain).

### PHASE 2 - HORIZONS:
### DIALOGUE AND PROPOSALS FOR ACTION

The objective of this phase is to open a discussion among the actors over the development of their territory. Once the actors have accepted the different views of the situation and the preconditions for dialogue are met (the actors' margins of flexibility, their willingness and ability to dialogue) concrete proposals for development can be elaborated. These proposals should include alternative scenarios that, through the establishment of a common ground, will eventually ease the consensus building process.

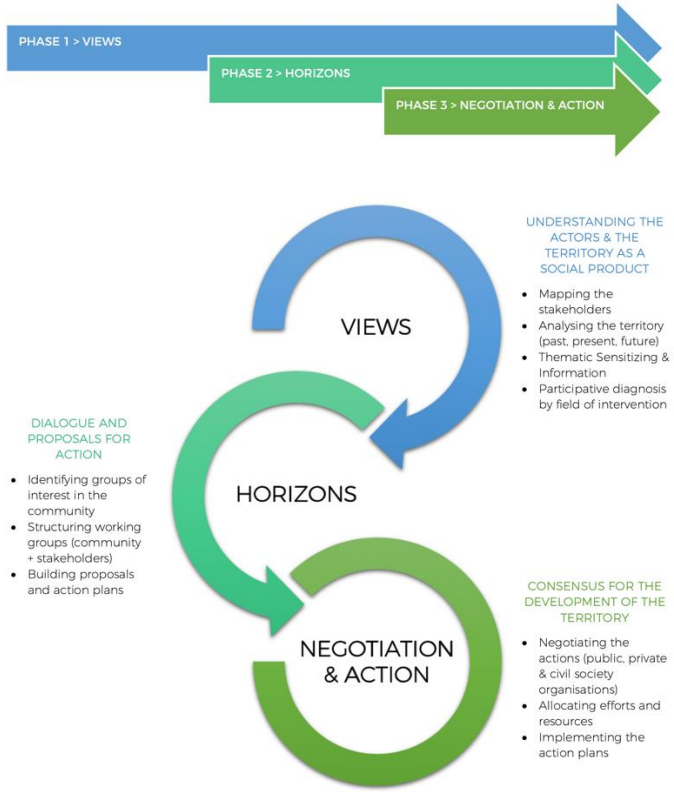
Participation is a continuous and iterative process. Accompanying this process with concrete activities is not limited to one phase in time, but will be implemented along the overall process. The main objective of the participatory process is to strengthen the sustainability of actions, building credibility, strengthening social cohesion, and integrating the territorial system into the overall governance system.

### PHASE 3: NEGOTIATION & ACTION:
### SEEKING CONSENSUS FOR THE DEVELOPMENT OF THE TERRITORY

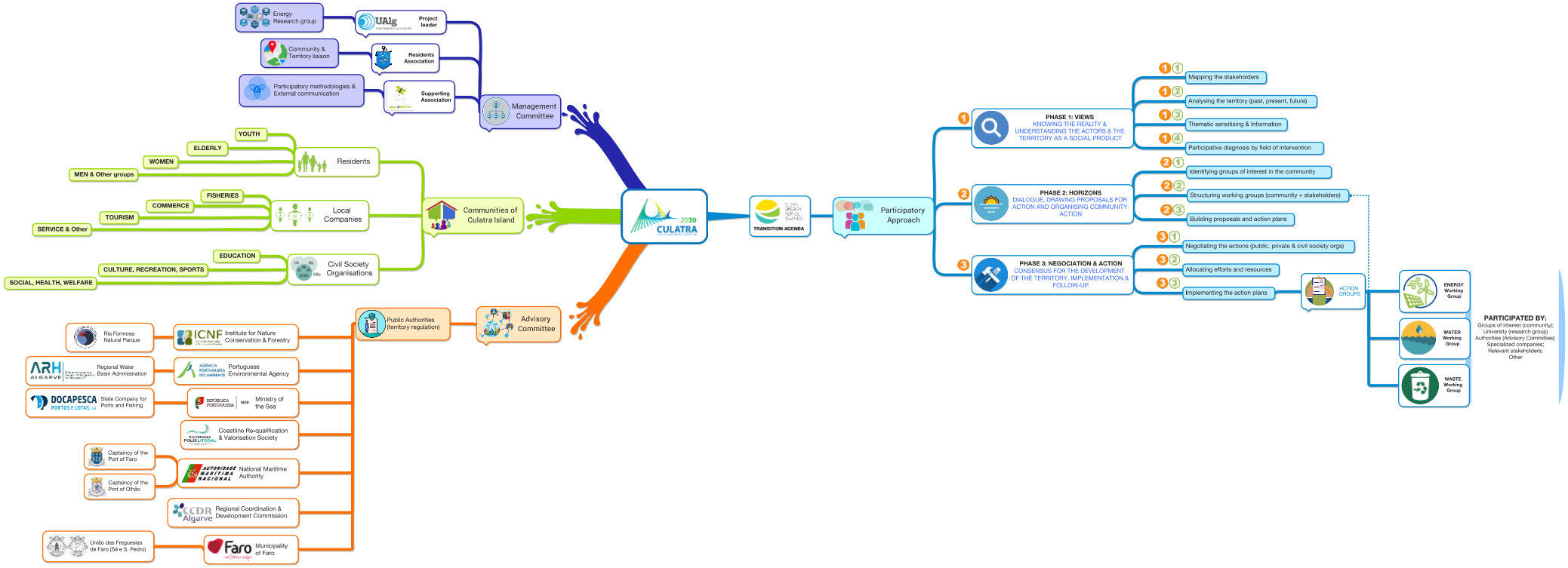
"Dialogue is an essential method of government and programming in the pursuit of sustainable territorial development, able to respond to actual needs and visions of the actors that operate and interact on the territory. The negotiation table represents here the main leading institution and forum in which the largest possible local partnerships will materialize (among local communities, public officials, local representatives of various categories, private individuals, etc.) as well as the arena where local actors, in a spirit of participation and cooperation, can jointly examine the problems and potentials of the territory."

To be ecologically sound, economically viable, socially just, culturally appropriate and humane, development interventions need to address the issue of power asymmetries that are determined by unequal access and control over resources and information, and unequal capacities. Recognizing local resource users as promoters of territorial development requires putting efforts & resources in setting up a multi-level process of dialogue and concrete actions around development issues, with parallel investment in the increase of people's capacities, both in the Government & in Civil Society.

## METHODOLOGICAL SCHEME
PHASES OF THE PROCESS AND ITS MAIN OUTCOMES




NOTE: The methodological approach presented consists only in an overview of the process that will support the transition agenda in the community. Further on, the referred approach will be described in more detail, the critical issues will be highlighted and specific techniques illustrated for each development phase.


Energy Research group
UAlg
Project leader
Community & Territory liaison
Residents Association
Participatory methodologies & External communication
Supporting Association
Management Committee
YOUTH
ELDERLY
WOMEN
MEN & Other groups
Residents
FISHERIES
COMMERCE
TOURISM
SERVICE & Other
Local Companies
EDUCATION
CULTURE, RECREATION, SPORTS
SOCIAL, HEALTH, WELFARE
Civil Society Organisations
Communities of Culatra Island
2030 CULATRA
TRANSITION AGENDA
Participatory Approach
PHASE 1: VIEWS
KNOWING THE REALITY & UNDERSTANDING THE ACTORS & THE TERRITORY AS A SOCIAL PRODUCT
1.1 Mapping the stakeholders
1.2 Analysing the territory (past, present, future)
1.3 Thematic sensitising & Information
1.4 Participative diagnosis by field of intervention
PHASE 2: HORIZONS
DIALOGUE, DRAWING PROPOSALS FOR ACTION AND ORGANISING COMMUNITY ACTION
2.1 Identifying groups of interest in the community
2.2 Structuring working groups (community + stakeholders)
2.3 Building proposals and action plans
PHASE 3: NEGOCIATION & ACTION
CONSENSUS FOR THE DEVELOPMENT OF THE TERRITORY, IMPLEMENTATION & FOLLOW-UP
3.1 Negotiating the actions (public, private & civil society orgs)
3.2 Allocating efforts and resources
3.3 Implementing the action plans
ACTION GROUPS
ENERGY Working Group
WATER Working Group
WASTE Working Group
PARTICIPATED BY:
Groups of interest (community);
University (research group)
Authorities (Advisory Committee);
Specialized companies;
Relevant stakeholders;
Other
Public Authorities (territory regulation)
Advisory Committee
Ria Formosa Natural Parque
ICNF Institute for Nature Conservation & Forestry
ARH ALGARVE Regional Water Basin Administration
Portuguese Environmental Agency
DOCAPESCA PORTOS E LOTAS, s.a. State Company for Ports and Fishing
Ministry of the Sea
Coastline Re-qualification & Valorisation Society
Captaincy of the Port of Faro
Captaincy of the Port of Olhão
National Maritime Authority
CCDR Algarve Regional Coordination & Development Commission
União das Freguesias de Faro (Sé e S. Pedro)
Faro Municipality of Faro

# References

[1] European Commission Covenant of Mayors, Technical annex to the SEAP template instruction document: The emission factors. 2010

Available at:

https://www.eumayors.eu/IMG/pdf/technical_annex_en.pdf

# Disclaimer

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The role of the Clean Energy for EU Islands Secretariat was to advice the islands transition team and to facilitate the written agenda.

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