T3.2 SPAIN REGIONAL REPORT

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Description	A review of the participatory practices in Catalonia, Spain, using the Tramuntana project as a case study

Contents

DISCLAIMER AND FORWARD

This case study about wind energy developments in the region of Catalunya (Spain) has been produced for the Horizon Europe JustWind4All project as part of WP3 task 3.2. The task aims to develop an understanding of regional challenges and opportunities around wind energy governance over the past 5-10 years to formulate key recommendations to foster energy citizenship in effective and just wind energy governance regionally. It is based on a mixed method approach including for each region: document reviews (around 50), 5-10 interviews with wind energy governance actors and a media and policy analysis. A comparative analysis across cases and across the project's regions allows for a better understanding of challenges and opportunities around effective and just wind energy governance.

1 INTRODUCTION

1.1 COUNTRY CONTEXT

Wind energy was the first renewable energy source in Spain. The first turbine prototypes were developed in the 80s, when the Centre for Industrial and Technological Development (Centro para el Desarrollo Tecnológico e Industrial) opened two contests to develop the first turbines of 5 to 10 kW. From then onward, wind technology experienced a fast progress, going from low capacity turbines until reaching commercial level 2 MW turbines (Espejo Marín 2004). Small companies played an important role. They designed the prototypes and bought components from other companies. Eventually this collaboration straightened and expanded to create larger companies with more power in the international market. Today, Spain has wind energy companies such as Endesa and Iberdrola, and turbine producers such as Siemens Gamesa (previously Gamesa Eólica), with a large international influence.

In 2003, at the European Wind Conference (Conferencia Eólica Europea), the development of offshore wind energy was mentioned for the first time by, surprisingly, Greenpeace España. In a report entitled 'Viento em popa', Greenpeace called for studies about the impacts of offshore wind technology and made an initial estimation of the offshore wind potential for each autonomous community (Espejo Marín 2004). In this same year, a project was introduced for the first offshore wind plant in Spain, and the largest in the world, 18 km off the coast of Cádiz, in the Cape of Trafalgar, with a capacity of 1,000 MW. The project was supported by environmental organisations, but not by fishermen and local authorities (Espejo Marín 2004). In the following years, the topic continued to be discussed, but only in 2009 did the national government approve the study and development of offshore wind plants in the country (Pérez 2010).

After Spain introduced a Special Regime for the Promotion of Renewable Energy in 1997, wind installations picked up considerably, with the sector growing steadily until 2012 (Figure 1). In 2012, the government began a comprehensive reform of the sector. The approval of various legislative texts, such as Law 24/2013 and Royal Decree 413/2014, resulted in a new income and expenditure regime for different actors in the electricity system and an adjustment in the remuneration for electricity from renewable energy sources, co-generation and waste. Therefore, a decline in investor confidence discouraged new developments (IEA 2021). As a result, while the increase in wind generation was particularly strong between 2000 and 2013, when installed capacity rose from 2.2 GW to 23.0 GW, installed capacity stalled after 2013, and was still 23.4 GW in 2018.

The situation changed in 2019 when competitive auctions, based on a framework introduced in 2014, in addition to corporate power-purchase agreements, proved successful in boosting the capacity of renewables, including achieving significant cost reductions. Most of these projects have proceeded to enter into service after securing financing. As a result, installed wind capacity reached 25.5 GW in 2019, an increase of 9% compared to 2018.

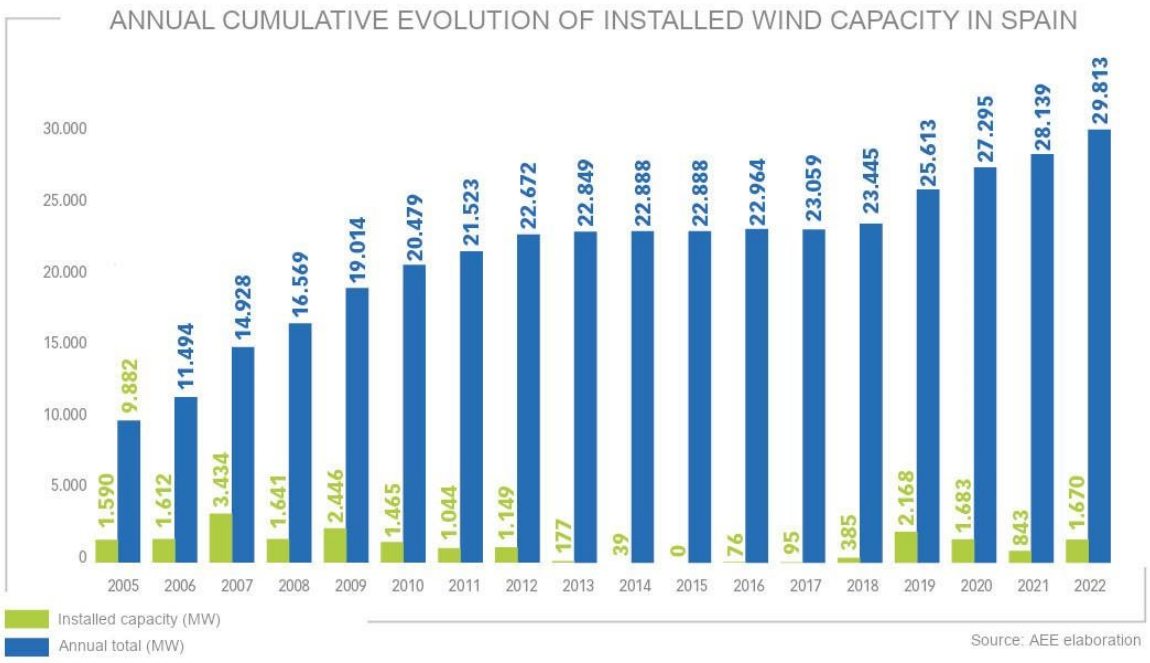

Figure 1. Annual accumulation of installed wind capacity in Spain. Source: Spanish Wind Energy Association

In January 2020, the national government approved the Integrated National Plan of Energy and Climate (PNIEC), a ten-year integrated document mandated by the European Union to each of its member states, in accordance with Regulation (EU) 2018/1999, to meet the overall greenhouse gases emissions targets set by the EU. The PNIEC addresses all five dimensions of the EU Energy Union: decarbonisation, energy efficiency, energy security, internal energy markets and research, innovation and competitiveness. It pursues a 23% reduction in greenhouse gas emissions compared to 1990, 74% of renewable electricity, 42% of renewables in energy consumption, and improved energy efficiency by 39.5% until 2030. This will imply an increase in renewables and, in particular, doubling wind power capacity. In 2023, the plan was updated and put up for public consultation. It had more ambitious targets for 2030: reduce greenhouse gas emissions by 32%, 48% of renewables in energy consumption, 81% of renewable electricity, and improve energy efficiency by 44%.

2021 was one of the best years for wind energy production in Spain. Wind reached a record number of 23% of the total energy production, surpassing even nuclear energy. Wind accounted for half the renewable energy production (46%), which also achieved its best share, increasing 10% since last year. Wind power plants (WPPs) are now the technology with the greatest participation in the national power grid (25.2%), with a current installed capacity of 30 GW. Castilla y León is the region with the highest territorial share of wind power (22%), followed by Aragón (17%) and Castilla-La Mancha (16%) (AEE 2022). During 2021, 842.61 MW of wind power were installed. However, this growth is well below the necessary 2.2 GW per year to achieve the objectives set in the first version of the PNIEC.

Offshore wind is thus seen as an important opportunity to achieve those objectives. Toward this end, the government created an Offshore Wind Roadmap after completing a public consultation on

5 July 2020. The main focus was to enable technological and commercial maturity of floating technologies for application in deep waters in the Atlantic Ocean and the Mediterranean Sea. In that regard, the open sea test site BiMEP began operating an initial 2 MW wind turbine prototype this year (SAITEC 2022). Other research and innovation platforms are being developed, with a special focus on islands (e.g. PLOCAN in the Canary Islands), which have isolated electricity systems, high costs of energy and low penetration of renewable energies. Already, plans in the Canary Islands have received international interest. However, in 2023 Spain is still waiting for the approval of offshore wind projects, and the legislation that establishes the criteria for auctions is not yet ready (Rochas 2023 May 19). Policymakers still lack experience dealing with offshore wind, and the legal framework is still in the making.

In response to the invasion of Ukraine, the Spanish government published the Royal Decree-Law 6/2022, of 29 March (Jefatura del Estado 2022a), to accelerate the development of renewable energy, particularly wind and photovoltaic, in line with the REPowerEU Plan (2022). Measures included a new process to determine the environmental impact of renewable energy projects that translated into a substantial reduction in both the time required and the procedures to be carried out. The decree-law was especially beneficial for small, localised projects that would not be constructed in protected natural areas.

Another aim of this decree-law was to counteract the increase in wholesale prices. Instead, energy prices increased tremendously as project developers rushed to reserve transmission grid nodes for potential projects. To counteract these speculative practices, the Spanish government published the Royal Decree-Law 20/2022, which included a moratorium on new renewable energy projects (Jefatura del Estado 2022b). This allowed the administration time to screen currently submitted projects and eliminate those which were not viable. By eliminating thousands of projects, the bureaucratic saturation now suffered by the administration was alleviated (Duck 2022).

To conclude, the extraordinary development of wind energy in Spain can be explained by three reasons:

- High density of areas with high wind potential;
- National legislation that supported wind energy;
- Regional policies from autonomous governments.

However, the national development of wind energy was not homogeneous throughout the autonomous regions. Communities with high wind potential in their territory, such as Galicia and Navarra, fast tracked wind at the beginning of the century. Conversely, other communities such as Catalonia never caught up and are now far behind. Besides available wind, other social and political reasons led to this disparity in wind development, and these will be discussed in the next sections.

1.2 Regional Context

Catalonia does not stand out as the frontrunner in renewable energy within the nation. While renewable electricity constitutes over half of Spain's installed capacity (54%), Catalonia lags significantly behind with a mere 30%. This figure places Catalonia just ahead of the Valencian Community, where the capacity is 28%, and Murcia, with 29% (data from Xarxa Elètrica, the Electricity Network). In reality, Catalonia contributes only 6.5% of the total renewable power installed across the country.

The reasons pointed by Sergi Saladié i Gil, a geography professor at the University of Rovira i Virgili in Tarragona, are three (ACN 2021 Apr 25):

- lack of initiative and encouragement to develop renewable energy by Spain;
- lack of interest by the Catalan government, which has authority over infrastructure distribution and could establish tax benefits to encourage people to launch projects if businesses do not want to set them up;
- and finally, firms also have a responsibility, because even though some of their projects have been approved, they did not want to launch them due to their own interests.

In the last years, the Catalan government enacted several policies that aimed to accelerate renewable energy development to reach the same shared level of energy in Spain and Europe. In 2017, the Parliament of Catalonia approved the climate change law (Comunidad Autónoma de Cataluña 2017), which determines the necessity to favour the transition to an economy neutral in greenhouse gas emissions, competitive, innovative and efficient in the use of resources; goals also established in the framework of the European Union. The climate change law establishes a set of strategies to make possible the energy transition to achieve a climate-neutral energy model by 2050. In 2019, the regional government declared a climate emergency (Comunidad Autónoma de Cataluña 2020) and passed laws to simplify procedures and remove administrative obstacles for projects with the objectives to accelerate the energy transition.

In 2022, the government approved a new framework entitled PROENCAT 2050, the equivalent to the national PNIEC. This non-binding framework unveiled the Catalan energy perspective towards the horizon 2050 and the energy transition in Catalonia, with plans to reach 62 GW of renewable installed capacity by 2050 (Djunisic 2022 Feb 7). Catalonia still relies on fossil-nuclear power to obtain many of its energy needs (Figure 2), with a near total external dependency. Coal mining in Catalonia closed its doors in the early 21st century, and oil production has gradually reduced its share in the Catalan energy system, until finally closing in 2021. The PROENCAT 2050 continued this trend by establishing a progressive abandonment of nuclear energy and consumption of fossil fuels and the transition to a larger capacity to produce and consume renewable energy. The two major planned investments are in WPPs and photovoltaic solar plants. The transformation is supposed to bring some 5 GW of wind and 7 GW of solar photovoltaic by 2030, and 50% of all energy consumed should come from renewable sources by 2030 — a figure that needs to increase to 100% by 2050 according to the Catalan climate change law (Comunidad Autónoma de Cataluña 2017).

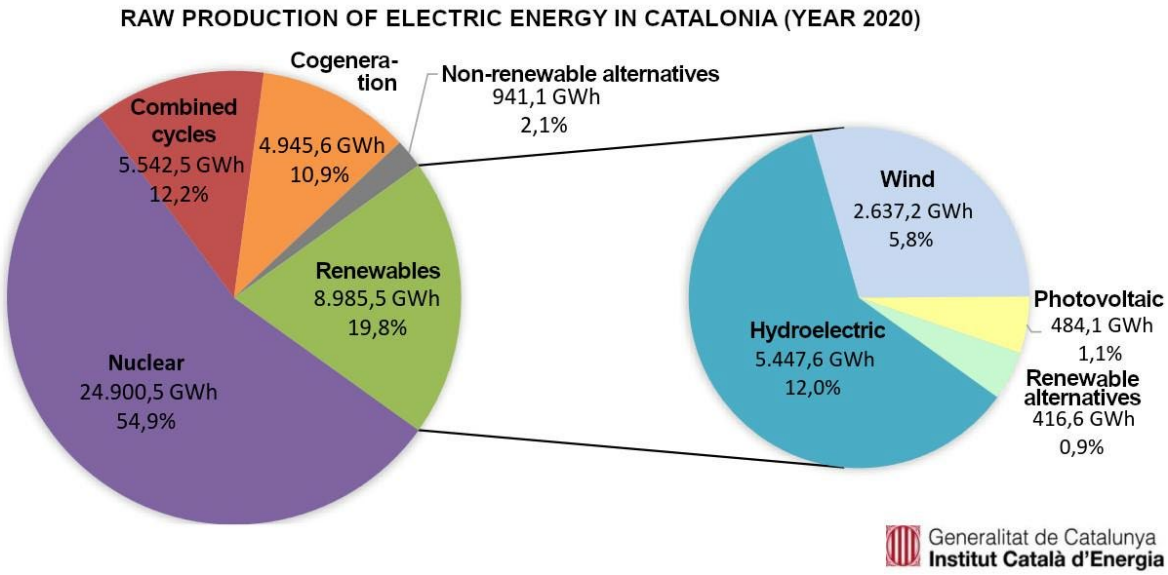

Figure 2. Forms of electric energy production in Catalonia in 2020. Nuclear energy still forms the majority of energy production. Hydro and wind power are the two main sources of renewable energy. Source: Institut Català d'Energia, adapted and translated

Catalonia is aiming to have 1 GW of offshore wind installed by 2030 and 3.5 GW by 2050, according to the energy road map, PROENCAT 2050. According to Teresa Jordà, Catalan Climate Action minister, offshore wind energy can play a very important role in Catalonia's energy transition, since an installation of these characteristics generates a much higher energy production than a solar photovoltaic installation or an onshore WPP (Grau del Cerro 2022 Feb 1).

However, local communities are worried about the impacts that such large projects, backed by an urgent necessity to accelerate renewable energy development, will bring. Saladié stated that large projects are often located far away from places where they are needed and controlled by a small number of large companies (ACN 2021 Apr 25). “The projects are not located in spaces already previously altered by human activity, as the 2017 Catalan climate change law outlines, but in agricultural and natural locations. As a result, the local communities are irritated. The debate is not whether we have to launch an energy transition, but how.”

> *Between the 90s and 2013, the first wave of renewable installations was based on large wind farms, far from the consumption places and in a few companies’ hands and on rural lands. And this model has brought hardly any benefit to local authorities. Back then, it was said that thanks to the large wind farms, these municipalities would be able to overcome all their problems, like depopulation, ageing, lack of economic diversification. According to my research, 80% of the municipalities with wind farms have lost population in the past ten years — Interview with Sergi Saladié i Gil for the Catalan News Agency, 2021*

To soften some of this opposition, the Catalan government approved a new piece of legislation to prioritise the installation of renewable energy systems up to 5 MW and impose tougher requirements for large-scale projects during the permitting process (Comunidad Autónoma de Cataluña 2021). The law facilitates the deployment of distributed and participated renewable energies at industrial sites and residential buildings, thus promoting a “democratic and participatory energy model” (Djunisic

2021 Oct 27). Larger projects (e.g. wind, mega solar) will need an agreement with local territories and in a way that minimises the territorial and social impact. Promoters have to demonstrate they have agreements in place with landowners for at least 50% of the land. They will need to further demonstrate they have offered at least 20% interest in the project to local investors, including municipalities.

1.3 The Case for the Tramuntana Wind Power Plant

In January 2021, the offshore wind developer Blue Float Energy (based in the US) and the engineering group Sener (Spain) presented their project for the first offshore WPP in Catalonia (https://parctramuntana.com/). This massive project involved the installation of nearly 70 floating wind turbines of 15 MW power each and a rotor diameter of 236 m (up to 250 m total height) along the Gulf of Roses, in the Costa Brava (Figure 3). It was initially planned to have a capacity of up to 1000 MW and cover a marine surface area of 166 km^2 (BlueFloat Energy and SENER Renewable Investments 2021). The first phase included 35 turbines with up to 500 MW, which represents 45% of the Girona province consumption; a second phase of the project may add up to 35 more aerogenerators with the same characteristics and reach power levels up to 1000 MW. The WPP is planned to be located 14 km from the Gulf of Roses (project developers initially stated 24 km, but this distance was calculated from the most inland point of the coast), near the municipalities of l'Escala, Roses and Torroella de Montgrí.

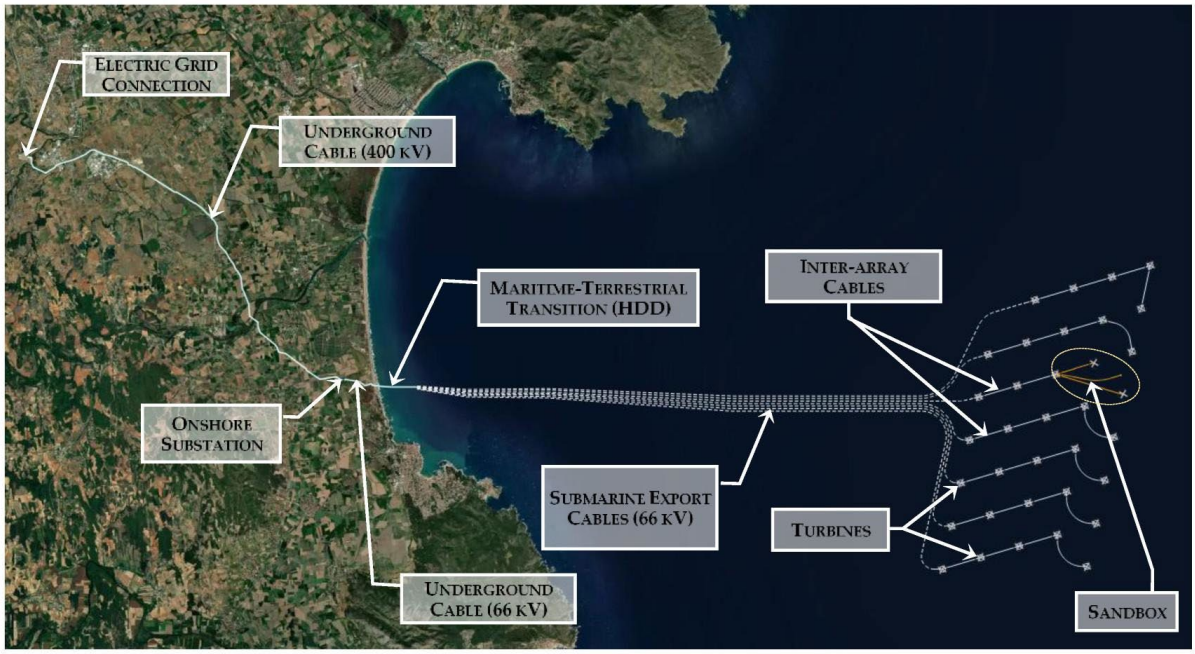

Figure 3. Planned layout of the Tramuntana offshore wind power plant. Image from Diez-Caballero et al. (2022)

Various environmental protection organisations such as IAEDEN (Institució Alt Empordanesa per a la Defensa i Estudi de la Natura: Institution from the Alt Empordà for the Defense and Study of Nature) (IAEDEN 2021), scientists (Lloret et al. 2022), and authorities from the Cape of Creus Natural Park showed their worry about the impact of such a project on the sea birds and cetaceans that regularly visit the place (Oller 2021 Mar 13). A significant part of the economic activity of the county directly or

indirectly depends on the unique landscape the Gulf of Roses offers to visitors. The Bay of Roses is officially recognised by the Most Beautiful Bays in the World Club (Jules 2013) and local communities are afraid that a project like this, which involves the installation of plenty of tall wind turbines near the coast, may ruin the views. Since the project was presented, there have been protests led by different collectives along the region demanding to stop these activities and the implementation of better protections for the environment (ACN 2021 Sep 26; Forest 2021 Jul 12; IAEDEN 2021). Some local governments, political parties, and business associations from different sectors joined these protests and supported the participants' demands. This resistance will be detailed in section 4.

Authorisation for offshore WPPs in the coast of Roses is the responsibility of the State, because it is located in "external waters" and has a capacity of over 50 MW. For this reason, the Catalan Climate Action minister, Teresa Jordà, urged the Ministry of Energy Transition to "incorporate criteria of consensus and territorial dialogue in the processing of the project to facilitate its implementation" (Grau del Cerro 2022 Feb 1). Jordà also advocated achieving maximum consensus with social, economic and scientific players.

Recently, the Spanish Ministry of Ecological Transition approved the Plan de Ordenación del Espacio Marítimo (POEM; Marine Spatial Planning) in February 2023 (Pi et al. 2023 Feb 26). The plan contemplates the Cape of Creus (Roses is located at the southern part of Cape of Creus) as the only possible location for these sorts of offshore WPP projects in Catalonia. The Ministry announced the first auction for the designated space will be in 2023 and the first wind turbines are expected to be built in 10 years. However, the Spanish law that delineates the procedures for these auctions has yet to be published.

The Generalitat de Catalunya (Catalan regional government) advanced in 2023 with a plan to install an experimental offshore WPP at the Gulf of Roses. The PlemCat, an R&D Platform in Marine Energies, is a unique infrastructure led by the Catalonia Institute for Energy Research (IREC) and supported by the Generalitat of Catalunya through the Institut Català d'Energia (ICAEN) (https://www.irec.cat/research/strategic-initiatives/plemcat). It is a unique infrastructure for developing pioneering and innovative projects for the development of various components, thematic areas, and related technical activities to advance and validate floating wind energy, marine energies, and monitor the marine ecosystem for environmental, climate, and biodiversity studies in the Mediterranean Sea. The objective of PlemCat is to position Catalonia's research, development, and innovation sector as a leader in floating wind power and marine sciences and technologies among Mediterranean countries. PlemCat aims to serve as a test laboratory, providing a floating platform in the Mediterranean Sea for the advancement and validation of floating wind power, marine energy and other related technical activities, including the development of advanced simulation models, advanced monitoring, digital twins and control, operation and maintenance through ROV (remotely operated vehicle), climate data, and the design of new mooring systems and floats.

The platform will include different zones at sea for the validation of these activities and tests:

1. Zone for the evaluation of materials and components to understand and identify their behaviour in real marine conditions, and an area for other R&D&I activities;
2. Test zone for prototypes of marine energy generation technologies with positions up to 18 MW;
3. Validation zone for pre-commercial wind generation technologies with long-term permanence.

PlemCat will be located within the area marked as LEBA II by the Levantine-Balearic POEM, in the Gulf

of Roses, situated 16-24 km from the north coast of Catalonia. The platform will be connected to the shore through a 66 kV submarine power evacuation line, facilitating the handling of energy generated during tests.

Currently, six projects led by various national and international firms and industrial conglomerates expressed interest in constructing offshore WPPs with comparable power, turbine quantities, and prospective locations near the Cape of Creus (ACN 2022 Dec 9). Furthermore, there are other projected plans to install onshore WPPs in the Girona province. Nevertheless, the Tramuntana project, in its proposed state, has progressed to an advanced stage and is poised to become the largest WPP in the region.

1.4 Aims and Report Structure

This study traces the development of wind energy governance in Catalonia, zooming in on the Tramuntana offshore WPP as a reference case study. It thus focuses on how to participate in social actions and processes for or against wind energy, and outlines how these actions and processes are co-shaped by regulations, discourses and norms over time. Doing so highlights regional challenges and opportunities of wind energy governance. This report is one out of two focused case study reports that together will provide insights for the formulation of key recommendations to foster energy citizenship in effective and just wind energy governance regionally. It is in this way that it connects to JustWind4All's ambition of understanding **how wind energy governance can become more just and effective**.

Specifically, this report provides a historical understanding of the interplay between diverse types of actors around wind energy development in Catalonia. At the heart of this report is an overview of the historical narrative of how wind energy governance developed around the Tramuntana WPP since the project announcement in 2020 – see Section 4. The historical narrative is followed by an 'Analysis and Discussion' section (Section 5) along the following analytical questions:

1. which governance arrangements and processes are in place; that is, what was the ensemble of actors (human and non-human) that come together in the intentional coordination of social action around wind energy (for and against wind energy);
2. which regulatory, normative and cultural-cognitive institutions are co-shaping social activities around wind energy (these can derive from EU, national, regional and local, for instance, planning processes and landscape governance);
3. which participatory practices are being discussed and/or practised (or not) over time and how are they being perceived and implemented by diverse wind actors;
4. and how are notions of energy justice and energy sovereignty being discussed, narrated and practised (or not) over time? How do they relate to changing governance arrangements and processes?

2 KEY INSIGHTS

- The organisation of public opposition was swift. One month after the project was made public, the first public protest occurred in the Gulf of Roses, and two months after a website was created asking for donations and calling for the project to be stopped.
- The Tramuntana WPP project managed to unite four different sectors with sometimes competing goals against the project.
- Despite the fierce opposition from local stakeholders, the national government has pressured the project to advance by changing the maritime spatial plans.
- This case study highlights the conflicting perspectives towards offshore wind energy between regional and national forces.

3 METHODOLOGY

3.1 DATA COLLECTION AND ANALYSIS

The objective of the project JustWind4All is to understand how wind energy governance can become more just and effective. The project uses a historical and embedded case study approach to trace the development of wind energy governance in European regions over the time span of 5-10 years. For the Catalonia case study, we focused on the timeline of a specific project — the Tramuntana wind power plant (WPP), and the actions and discussions around wind energy justice related to that project.

We carried out a document search and review for Catalan and Spanish newspaper articles, blog posts and other websites for references to the Tramuntana WPP, with an emphasis on public participation. The search was carried out between July and November 2023. We also searched for scholarly articles on the topic, although the scope was lower due to the freshness of the case. These sources were used as a basis to write the current report.

Due to time constraints and the objective of this report, no interviews were conducted to complement the information collected.

3.2 EMPIRICAL REFLECTIONS

Most of the newspaper articles were focused on the resistance towards the Tramuntana WPP, and thus they were written from this perspective. This includes articles that added facts and opinions stated by project developers to balance perspectives. We have acknowledged this bias in our analysis and description of events and opinions. Similarly, we found more blog posts and perspectives from project opponents than from project developers. Therefore, our research will likely include more detailed perspectives from project opponents. This is not an indication that project opponents have more detailed arguments and opinions than project developers (although that could be the case), rather it may signal that, as is common in such projects, opponents are more vocal about their concerns.

We acknowledge the lack of interviews and other forms of direct contact with project participants (as opponents or supporters) is a limitation to the collected information. Nonetheless, the information we collected from the sources we analysed is quite detailed and should cover this limitation partially. For example, the website of the association Stop Macro Parc Eolic Marí has gathered signatures and donations from many different actors, and thus wrote a detailed list of all the arguments they use against the project.

4 Public Participation in the Tramuntana Wind Power Plant

4.1 Pre-Period

The development of wind energy in Catalonia was slow compared to the other autonomous communities. Decree-law 147/2009 (Departamento de Economía y Finanzas 2009), of September 22, posed heavy limits to the implementation of wind and solar power plants in Catalonia and was one of the main reasons why renewable energy development in the region remains far behind other autonomous communities. The current renewable energy share is only 19.8% (Catalan News 2020), almost half of Spain (36.9%) and the EU average (35.1%) (numbers of 2020).

Regions and countries are now facing a climate emergency, a situation acknowledged by the Generalitat de Catalunya (Comunidad Autónoma de Cataluña 2020), the Spanish Government (Euractiv.com with AFP 2020 Jan 22), and the European Parliament (European Parliament 2019). As detailed in previous sections, the regional government enacted the Catalan climate change law in 2017. This law outlined a reduction in greenhouse gas (GHG) emissions to promote Catalonia's transition to a sustainable development model. It set a regional commitment to reduce GHG emissions by 50% by 2030, 65% by 2040 (using 1990 values as a reference), and achieve complete decarbonisation by 2050. However, in 2019, the Spanish Constitutional Court overturned the law, arguing the Regional Government of Catalonia lacks the authority to establish emission reduction targets or control over the energy transition.

In the same year, the government published Decree-Law 16/2019, of November 26 (Comunidad Autónoma de Cataluña 2020), which garnered approval from a majority of the Catalan Parliament. This new regulation was designed to unblock the development of the renewable energy sector in Catalonia. The regulation eliminated occupational limits for photovoltaic facilities and removed restrictions on their location in areas contiguous to industrial land or agricultural and livestock buildings. Priority development areas for wind energy and the tender process that granted permits for those areas were also eliminated (Garcia 2019 Nov 27). This put an end to the regulatory inconsistency that oversaw the implementation of wind and solar power plants since 2009 (Departamento de Economía y Finanzas 2009). Furthermore, it addressed certain unconstitutionalities declared by the Spanish Constitutional Court regarding the climate change law.

To achieve a rapid growth in renewable energy capacity, the Catalan and Spanish governments placed their bets on the liberalised market. The reasoning behind this approach is that companies and investors have enhanced economic opportunities to expedite the development of installations, enabling the government to meet its mandated goals (Riu 2021 Apr 29). This strategy resulted in a new wave of renewable energy in Catalonia, marked by a surge in applications spearheaded by large multinational corporations (Frisach 2021 Dec 2).

4.2 Current Participatory Practices

4.2.1 Opinions and Discussions

The Tramuntana case study is marked by an evident conflict of local communities facing off against economic and political interests. Locals resent what they perceive as outsiders coming in from

Barcelona and Madrid and changing things. The wind park opponents comprise many actors that claim to suffer social (citizens), environmental (scientists and environmentalists), and economic (fishermen and the tourism sector) damage by the power plant.

Many of the actors against the Tramuntana WPP have gathered under the civic platform Stop Macro Parc Eolic Marí (Stop Macro Marine Wind Park, https://stopmacroparceolicmari.org), which was created in 2021 with the goal of uniting these different actors and stopping the project. The platform claims a different model of ecological transition is essential to face the current global challenges, one where energy production is decentralised and takes into account citizens' participation and preferences. According to their statement, the energy transition should minimise the environmental impact by supporting more solar power in urban areas and producing electricity as close as possible to the city centres where it will be consumed. They argue the Tramuntana WPP is a threat to the environment, landscape, and social, economic, and cultural values of the region, and only benefits the energy sector companies. The project badly damages the fishing sector, the tourism sector and all the related local businesses, both land based and marine recreational activities.

In their manifesto (Manifest de l'associació Stop Macro Parc Eòlic Marí de la Costa Brava Nord 2021 Jun 21), they argue the following points:

- Large WPPs are an outdated model of renewable energy production, and they are used by multinational companies to control the energy market and exploit the territory without considering the local landscape, environmental, economic and social values.
- Destruction of the largest marine heritage of Catalonia. Migration of marine birds and mammals will be affected.
- Fishing activity will suffer serious damage due to the sound and visual impact of the power plant. The site is located in an area within a fishing reserve for sustainable management of hake, and the project will result in the loss of important historical breeding fishing sites.
- The tourism and nautical sectors will be very affected since their main asset, the landscape, will be ruined. The bay of Roses and its outstanding elements are officially considered the most beautiful in the world. The natural values of the territory, highly valued by visitors, will also be spoiled. Subscribers are concerned about the impact of the project on the local economy if it moves forward with what they consider to be a big business at the territory's expense.
- The emblematic maritime and terrestrial landscape of Empordà will be totally destroyed. The proposed WPP consists of an 18 km long and 10 km wide installation, and each of the 80 wind turbines (*author note*: the maximum number of turbines ever publicised for the project was 70, although the number 80 has been cited in many sources) has a height of 258 m and a blade diameter of 236 m, with night lighting. There will also be 320 anchors and wiring attached to the seabed, and 40-45 km of very high voltage lines crossing the Gulf of Roses, the Aiguamolls del Empordá Natural Park, and the plains of Santa Llagosta until the substations of MAT. In summary, it will be like seeing 80 towers of Collserola with illuminated blades rotating with an affecting surface of 25,000 Barça fields. The streets and stops of worldly interest of the entire North Coast will lose their horizon.
- The values of Empordà, cultural heritage of the Mediterranean, and a place that inspired genius artists and writers, will be definitively impacted.
- The North Costa Brava macro plant violates all principles of the European Charter for Spatial Planning. It defines the concept of spatial planning as a spatial expression of the economic, social, cultural and ecological policy of society as a whole, and proposes as fundamental objectives of spatial planning: balanced development of regions, quality of life improvement, responsible management of natural resources and environmental protection, and rational

use of the territory. All of this while establishing as one of its main characteristics that decisions must be fully democratic and participatory.

- Opposition to any changes to the Maritime Spatial Planning (POEM) that ends the exclusion zone for offshore wind which governs the area where the WPP will be installed.
- Support for the Energy Transition Plans, such as those that were already approved by Figueres and Roses, where they bet, in accordance with the directives of the Diputació de Girona and the Generalitat de Catalunya, on the implementation of a decentralised and participatory energy transition model. Subscribers want a model that can bring direct returns to companies and citizens of the territory based on the Empordà, mainly by producing solar energy in urban spaces and near large consumer posts, with the least possible environmental impact, in line with the constitution of shared local communities.
- The 6,000 jobs promised locally by the project developers are not guaranteed because only specialised companies participate in the development and maintenance of power plants (see also Riu 2021 Apr 29). Additionally, it is not guaranteed the energy bill will be reduced after the park becomes operational, or that it will be dismantled after its life expectancy of 30 years.
- More studies are needed about alternative energy production projects that are viable and sustainable, and do not jeopardise the economic and environmental values that have been so important to the territory.
- Green energy production is not always translated into sustainable energy production.

Other sectors such as fishing, tourism, environmental organisations and scientists joined the call to stop the project. Many of them are subscribers and donors of the civic platform.

Fishermen fear the impact the offshore WPP will have on their livelihoods. The companies behind the Tramuntana project claim the WPP will be located in an area where fishing is already prohibited. However, this area has been, in fact, established 10 years ago as a *voluntary* closure zone in an area of 80 km^2 by fishermen to promote the growth of hake and recover fish stocks. The intention of the fishing sector is to return to the area near the closure zone to fish once hake has recovered, which they cannot do if the WPP is built.

Environmental entities such as the Institució Alt Empordanesa per a l'Estudi i Defensa de la Natura (IAEDEN) and the director of the Cap de Creus Natural Park, Pon-Feliu, are concerned about the impact the WPP would have on seabirds and cetaceans in the area. IAEDEN in particular has been vocal about their opposition, and has scheduled events, including a concert, that were attended by many citizens and policymakers.

Scientists, namely from the University of Girona and the Institut de Ciències del Mar (CSIC), have called for an independent and rigorous assessment of the social, economic, and environmental impacts caused by large offshore WPP projects. They published a scientific manifest in 2021 and a scientific article in 2022 about the topic, which has been frequently cited by opponents of the project as a justification to stop it.

Protesters have also taken to local newspapers. Scientists have accused the media of being controlled by “almighty oligopolies” and trying to silence them about the park’s impacts (Estévez 2021 Oct 21). They have appealed to the emotions of readers to join the cause and stop the park. The spokesperson of the STOP platform has been particularly active in writing newspaper articles (Molino 2021 Oct 30; Molino 2021 Jul 1; Molino 2021 Apr 13).

Local governments and municipalities have also shown their opposition to the project, and even participated in some rallies organised by protesters. Worth mentioning are the city councils of Torroella de Montgrí, Girona, and Roses. Their reasons against the project have not been disclosed in the media but are assumed to be similar to the other opponents.

The STOP platform and the researchers backing it argue the government should create economic and technical conditions for citizens and companies to invest in local renewable energy production (e.g., roof solar panels). The Catalan Energy Institute (ICAEN) conducted a study concluding that decentralised photovoltaic solar panels could cover 50% of all the energy needs of Catalonia if implemented in optimal areas of infrastructure (Riu 2021 Apr 29). Backed up by this study, project opponents have asked for a national debate to be made to plan renewable energy development in Catalonia. They acknowledge the necessity to transition to renewable energy sources but argue that such macro projects bring more harm than good to local communities. Instead, investing in renewable energy installations close to consumption points would bring benefits to people, which would see their energy bills reduced, the community and the territory. It is not a matter of technical or social complexity, but rather a matter of creating regulations and laws that incentivise people to participate in an energy community.

Project developers say this is not enough to cover the energetic needs of Catalonia and the targets set by regional authorities, and that other forms of renewable energy production need to be sought, such as wind. Project developers have claimed the WPP, at full performance, will cover up to 90% of the province's energy demand, prevent the emission of 42 million tons of CO2, and create up to 6,000 direct and indirect jobs over its lifespan of 30 years (Oller 2021 Mar 13). Well aware of the local community's objections, Sergi Ametller, the project director, says there will be financial compensation for affected businesses, particularly fishermen, in the event authorities do give Parc Tramuntana the go-ahead and insists the WPP's impact will be "minimal" .

National authorities, such as the Ministry for Ecological Transition and the Spanish government, have shown their support for the project, at least indirectly. The General Director of the Spanish Energy Agency, Joan Groizard, maintained the Gulf of Roses in the Maritime Spatial Plan (POEM), giving the go-ahead for offshore wind energy projects in the Gulf of Roses.

Lastly, even the European Union has taken an interest in the project and will assess if the Natura 2000 area located near the park could be negatively impacted by it (ACN 2022 Apr 14).

4.2.2 Timeline of Events

The Tramuntana WPP was first announced in January 2021, with the initial project document made public in the next month (BlueFloat Energy and SENER Renewable Investments 2021). The companies that want the power plant up and running by 2026, with the help of EU's Next Generation Funds, claim the plant will be able to cover 90% of the Girona area's energy needs and create 6,000 jobs during its construction.

There was an immediate backlash by local communities, who feared the socio-environmental values of the Gulf of Roses were endangered by the project. In March, a newspaper article was published with statements from fishermen, IAEDEN, the director of the Cap de Creus Natural Park, and the president of the Empordà Turisme. They mentioned the negative impacts the project would bring to the region and called for alternative solutions (Oller 2021 Mar 13). In the same piece, project developers argued the visual impacts will be minimal, as the WPP will be located 24 km away from the coast, and they are working "to minimize the impact on flora and fauna and ensure the park and coastline will be connected underground".

April 2021 marked the creation of the civic association Stop Macro Parc Eòlic Marí, together with the launch of their website. The association started asking for subscribers and collecting donations to organise protest actions. Because of its broad nature to gather a wide variety of actors that opposed the Tramuntana WPP, this association became the most relevant opponent to the project.

In the same month, researchers from the University of Girona and the Marine Research Institute (CSIC) published a letter calling for public administrations to execute an independent and rigorous assessment of the social, economic, and environmental impacts caused by large WPP projects (Manifest científic per a la protecció dels ecosistemes marins davant dels projectes eòlics a mar 2021). Although the request was general, it was made in response to the Tramuntana project.

On 12 July occurred the first rejection rally against the WPP, in Torroella. Around 200 people gathered at the Medes Space, in the port of L'Estartit, to express their rejection of the project (Forest 2021 Jul 12). The municipal entourage was headed by the mayor, Jordi Colomí, the first deputy mayor and county councillor of the environment, Marc Calvet, and various other councillors. Among the representatives of other administrations, it is worth mentioning the participation of the deputy of the Council of Girona, Montserrat Mindan. The protest had interventions from the spokesperson of the platform "Stop Macroparc Eòlic Marí" Jordi Ponjoan; the technician of territorial defense of the IAEDEN-Salvem l'Empordà Raúl Domínguez; the vice-president of the Regional Council of the Baix Empordà Xavier Dilmé; and a member of the platform Josep Maria Pla. They argued the goals of the European Union to substantially reduce fossil fuels have provided an argument for companies to develop such large projects, and call for more sustainable ways to invest in renewable energy (see the platform's manifesto). The welcome ceremony was attended by the president of the EMD of Estartit, Francesc Ferrer, and the mayor, Jordi Colomí, closed the event.

In August, Jordi Carmona, biologist and member of the Nautical Club of L'Estartit, wrote an opinion article for the Catalan newspaper El Punt Avui (Carmona 2021 Sep 8). He argued the social, cultural, and environmental values associated with the Gulf of Roses are maintained by the strong tourism sector, which will be severely impacted by the Tramuntana project. Achieving the renewable energy targets imposed in decree-law 16/2017 on climate change cannot be done by using Next Generation funds to finance large-scale renewable energy projects that irreversibly prejudice the landscape heritage in favour of manoeuvring monopolies.

In September 2021, more than 300 people gathered at another event (ACN 2021 Sep 26). In the face of the citadel of Roses, there was a performance with a large puppet and a giant, likely symbolising the huge size of the turbines that will be installed. The event was attended by the provincial deputy Montse Mindan, together with the mayor of Roses, Joan Plana (Catalan Republican Left, ERC). In the speech, Mindan insisted they "have an obligation to defend marine biodiversity, which is already suffering a lot". "The warning that scientists give us makes us need to rethink these great projects in order to do things in a different way," said Mindan. Conversely, Plana called for "protagonism" for the territory and claimed they are "an important actor". "We want to be an active part of the debate and to be able to demand that the future energy model is in favour of the citizens and not of the great oligopolies," he said.

With public resistance increasing, the developers opened the door to implement a pilot test in the area with just three wind turbines totalling 50 MW to search for a "consensus" with local communities. The engineer and member of the management team, Sergi Ametller, explained they are studying this pilot with the Government of Catalonia and the Ministry of Ecological Transition with the idea of following an "experimental" project with "unique" prototypes in the Mediterranean (Redacció 2023 Feb 22). Furthermore, the park's developers agreed to reduce the number of turbines from the initially projected 70 to 35, foreseeing a capacity of 500 MW. The WPP was also moved to a slightly different location designed by the Spanish Government as ideal for offshore WPPs (ACN 2022 Apr 14). In fact, the ministry has sent the developers about 900 pages of allegations that they will "study" to incorporate into the preliminary project and commission a socio-economic study to assess its impact (ACN 2021 Nov 4).

In 2022, public activity was reduced but nonetheless the protests continued. In May, five entities opposed to the offshore WPP in the Empordà region held a concert in L'Escala (Alt Empordà) to show the social rejection towards the project (ACN 2022 May 14). After the manifestation a year ago, the entities launched a campaign

of actions to demand a critical reflection about the energy transition model in Catalonia. With this concert, they wanted to highlight the need to preserve the biodiversity of the area where the WPP has been projected. They said that recently the European Union had suggested examining whether the wind turbines could affect a nearby natural space that is part of the Natura 2000 Network. The concert was part of the journey 'The Sea is Life', organised by IAEDEN-Salvem l'Empordà, SOS Costa Brava, the association Stop Macro Parc Eòlic Marí de la Costa Brava Nord, the Forum l'Escala-Empúries, and the Entesa de l'Escala-Debat Constituent, in collaboration with the musician Ramon Manent.

In June, some of the scientists previously involved in the above scientific manifesto published a short communication arguing that offshore wind parks in the Mediterranean «should be excluded from high biodiversity areas containing sensitive and threatened species and habitats, particularly those situated inside or in the vicinity of Marine Protected Areas or areas with valuable seascapes» (Lloret et al. 2022). This publication has been frequently cited by opponents of the Tramuntana WPP to justify the cancellation of the project. Indeed, the article's content was based on, and inspired by, the Tramuntana macro-project.

Interestingly, around the same time, another article was published about the project. The authors argued the projected impacts of the WPP were moderate in many environmental variables, such as impacts on marine fauna and water quality (Diez-Caballero et al. 2022). Moreover, they believe it is important to consider not just the project's negative impacts, but also the emergency in developing such projects that will mitigate the global negative impacts of climate change by reducing CO2 emissions. Later in 2022, the journal issued a correction clarifying that many of the article's authors had ties to SENER and BlueFloat, the companies behind the Tramuntana project.

On 20 September, the project developers held an informative session for the public in the SUF room of Roses. From ten in the morning until eight in the evening, the project developers' team provided informative, audiovisual and didactic material about the project, personally and continuously interacting with the attendees (Navarro 2022 Sep 20). Leaflets and T-shirts were also distributed among the people who approached. "It is very important that people get involved and express themselves in relation to the energy transition. We want to listen to the people of the Empordà. That is why we are in Roses today for this information session. To answer questions, inform about the project, and listen to people", explained the engineer and member of the Tramuntana Park team, Sergi Ametller. But the session was interrupted by twenty opponents of the Tramuntana WPP, including the spokesman for Stop Macro Parc Eòlic Marí, Jordi Ponjoan, who declared he would continue to present his views as well. "We will continue to hold talks in the territory to explain the impacts of both the project and the associated infrastructures, which are perhaps more worrying. This is what will have a negative impact on the natural environment around us, on the seabed, and also on the landscape, on tourism, etc.", he affirmed.

In 2023, the Catalan regional government advanced with an innovative research infrastructure for offshore wind research located in the Gulf of Roses, called PlemCat (Redacció 2023 Feb 22). PlemCat has three zones for carrying out several types of activities, covering research, development, and innovation activities from the laboratory to the market. The connection points of the three zones were auctioned in August to developers interested in testing prototypes (PlemCat team 2023). PlemCat will have two phases for offshore marine technologies, with a power up to 15 MWs, for a total of 75 MWs. In the first phase, it is expected to have three different floating wind prototypes for tests and demonstrations. The second phase is expected to be either a pilot WPP (up to 45 MWs) or additional testing positions (PlemCat team 2023). In May, BlueFloat and Sener, the companies behind the Tramuntana WPP, installed an innovative floating buoy LiDAR (light detection and ranging) equipped to monitor biodiversity data (cetaceans, bats and birds) for environmental studies, as well as weather and ocean parameters (BlueFloat Energy 2023).

Local civil society organisations that positioned themselves against the Tramuntana WPP protested and questioned the platform's legality. The speaker of the Stop Macro Parc Eòlic Marí de la Costa Brava Nord, Jordi Ponjoan, warned that the Generalitat was taking a "false step" because it announced a project in a space where the POEM had not yet been approved, and warns that its approval "can have judicial consequences". He stressed there are other institutions, such as the Diputació, which oppose the project, having issued a report in May 2021. Conversely, the Tramuntana project developers praised the Generalitat initiative.

In February 2023, the State announced the Gulf of Roses will be a part of the POEM as an area where marine WPP can potentially be installed. The plan contemplates the Cape of Creus (in which the gulf of Roses is part of) as the only possible location for these sorts of offshore WPP projects in Catalonia. The director-general of the Spanish Energy Agency, Joan Groizard, announced the first auction for the designated space will be in 2023, but, given the deadlines, the WPPs will not be a reality until the end of this decade. Goizard believes the POEMs ensure the projects implemented will not have an impact on the environment and ecosystems because "they have already been subjected to a strategic environmental declaration". However, each of them will have to present an environmental impact assessment. “If they are not acceptable or risks are detected, the authorisation cannot be given,” he said (Pi et al. 2023 Feb 26).

Unhappy with this decision, the IAEDEN-Salem de l’Empordà and the association Stop Macro Parc Eòlic Marí de la Costa Brava Nord appealed against the Council’s decree (Royal Decree 150/2023 of February 28) that approved the Maritime Spatial Planning (POEM) (IAEDEN 2023). The appeal has been accepted by the Third Chamber of the Supreme Court, thus marking the beginning of the judicial battle for the offshore WPP in the Gulf of Roses. In the appeal, the entities claim:

- Irregularities in the process
- Infringement of the precautionary principle and the establishment of zones for the implementation of wind energy without respecting the criteria and principles of biodiversity protection
- Infraction of the coherence and integrity of the Natura 2000 network and violation of the Natura 2000 network protection regime established in the Habitats Directive on the Law 42/2007
- Lack of adequate and sufficient reasons for the chosen zones
- Infraction of the planning principles of Law 41/2010 of December 29 on the protection of the marine environment
- Flaws and inefficiencies in the environmental assessment and in the procedures of public consultation and citizen participation

They call for the zone’s classification as a high-potential area for biodiversity conservation, with the prohibition of implementing wind energy, as was done in the 2009 planning.

However, various civil society organisations: IAEDEN–Salvem l’Empordà and Stop Macro Parc Eòlic Marí denounced some irregularities in the recently approved document (IAEDEN 2023) and ultimately the Spanish Supreme Court will decide the fate of this plan.

5 Analysis and Discussion

Catalonia is entering a new phase of renewable energy development, including wind energy. After nearly a decade of blocking legislation, the regional government recognized the need to accelerate the energy transition, and created a series of policies and incentives to attract energy companies to invest in renewable energy projects. However, this sudden change in the landscape posed a threat to the cultural, social, environmental and economic values that local communities cultivated through many generations. Consequently, many communities organised actions of resistance against these projects. The Tramuntana project is the first offshore WPP to be projected for Catalonia and embodies this emerging conflict between progress and conservation of local values.

The Tramuntana WPP represents a remarkable case of opposition because it managed to unite four sectors with sometimes competing activities to try and stop its implementation. The local population in the coastal towns — a very touristic area called Costa Brava — saw the project as an external aggression to their traditional marine landscape and their ways of living. Local opposition to turbine installation especially grew around the fishing sector as well as the tourism industry because of concerns related to the consequences of installing turbines (Oller 2021 Mar 13). Concerns arose that the coastal landscape may be adversely impacted by the proposed offshore wind turbines, as their considerable height of up to 250 metres from sea level allows them to be visible from the shore and surpasses the size and power of those in terrestrial WPPs. Moreover, the turbines are projected to be placed near various environmentally protected areas (Diez-Caballero et al. 2022). The planned allocation will include a hake fishing reservoir, which will disturb fishing activities and the efforts of local fishers that are trying to recover the species (Oller 2021 Mar 13). Importantly, locals resent what they perceive as outsiders coming in from Barcelona and Madrid and changing their traditional lifestyle. Local communities defend that project benefits, such as CO_2 emission reduction and more electricity production, do not compensate for the social, environmental, and economic damage it will bring to the region, and fear the project will only bring benefits to the large companies involved. They argue for investments in alternative, less controversial energy sources first, namely decentralised photovoltaic solar panels.

Project developers say that decentralised solar energy is not enough to meet Catalonia's decarbonisation targets, and other forms of renewable energy, such as offshore wind, need to be sought. They claim to be looking for consensus with the territory before advancing with the project. Consequently, they have organised informative sessions for the public and given press releases to insist that environmental impacts caused by the project will be minimal. This has not dissuaded opponents, who have accused project developers of misleading people about the project and by using the media to cover the power plant's impacts.

Opponents of the project protested in many different ways. Leaders of each sector frequently wrote to newspapers. They also organised protests in the streets, which began attracting increasingly more people. Big players often participated in these protests and gave speeches, such as the leaders of different opposition sectors and local government authorities, including those from the surrounding areas.

With reconciliation not possible between either side, the fate of the project now lies in the hands of authorities responsible for licensing the project. The national government already signalled its approval to the power plant by changing the POEM to allow the construction of WPPs in the Gulf of

Roses. But a recent judicial process in the Supreme Court, where local associations denounced irregularities in the process to change the POEM, left the project's fate uncertain.

6 SYNTHESIS AND RECOMMENDATIONS

It is clear the wishes of the project developers do not coincide with the wishes of local communities. The main motivation to build the offshore WPP is driven by economic profit and meeting national and international targets of renewable energy production and decarbonisation. Conversely, local communities are fighting to maintain their traditional way of life and the cultural and natural values of the Costa Brava. The conflict between both groups has now escalated to a point where not even an offshore WPP prototype, with just three wind turbines, proposed by the Generalitat de Catalunya was acceptable. Inevitably this conflict led to a variety of protests that culminated in a judicial action against the POEM that facilitated the project approval.

Our **first and main recommendation** is that local communities need to be engaged very early in the project proposal. Project developers should initiate early collaboration with local authorities, presenting the project's benefits, addressing community concerns, and making necessary adjustments, such as modifying the power plant's design, to prevent unnecessary conflict escalation. In the Tramuntana WPP, project developers never engaged with local communities at the beginning, although it is also unclear how the project was first known.

Our **second recommendation** is to advocate for transparency in project communication, encouraging project developers to openly share information and address local communities' concerns to build trust and facilitate consensus, as observed in the case study where misinformation eroded community confidence. Local communities complained the media were being controlled by project developers to omit important impacts caused by the power plant. Project developers even provided misleading information about the distance the power plant would be to the shore, and were at times confusing about the number of turbines the power plant would have. This undermined the confidence of local communities in the words of project developers and made dialogue and reaching a consensus more difficult.

Our **third recommendation** is to urge project developers to clearly outline and specify compensatory measures for the project's impacts. Compensations that respond at least partially to the concerns of local communities are one of the best tools to increase project acceptance. In the Tramuntana WPP, project developers did state they would offer financial compensations after the first protests surged, but these lacked details to ensure a fair and proportionate resolution.

Finally, we encourage local communities to be open towards renewable energy projects, emphasising their importance to decarbonise the economy and reduce CO_2 emissions, while acknowledging that alternative proposals should be critically evaluated for efficiency and feasibility. While the platform Stop Macro Parc Eòlic Marí presented an alternative solution to the project – investing in decentralised photovoltaic solar panels – this proposal has issues of its own. First, it is far less efficient in producing electricity than an offshore WPP; second, it would take considerably more time to implement in Catalonia. To reach a climate-neutral economy by 2050, as mandated by EU policies and advised by many scientific institutions, renewable energy installations need to be built quickly, with wind energy being one of the most promising sources of renewable energy.

In the end, we highlight the **shared responsibility** that project developers and government authorities have in building projects that **value the region economically, socially, and**

environmentally, stressing the importance of **collaborative efforts, early engagement, and joint problem resolution to achieve community acceptance**.

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ANNEX 1: BIBLIOGRAPHY

All documents consulted were cited in this report.

ANNEX 2: INTERVIEWEES

No interviews were conducted to elaborate this report.

ANNEX 3: MEETINGS AND EVENTS ATTENDED

No events were attended to elaborate this report.