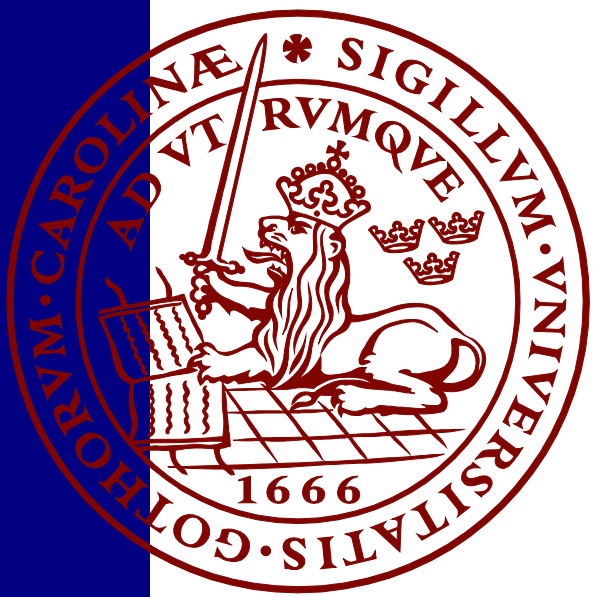
Political Ecology of renewable energy transitions on the Åland Islands

Moon Hee Chu & Miroslav Lakota

Master Thesis Series in Environmental Studies and Sustainability Science,
No 2023:053

A thesis submitted in partial fulfillment of the requirements of Lund University International Master's Programme in Environmental Studies and Sustainability Science (30hp/credits)



LUCSUS
Lund University Centre for Sustainability Studies

Political Ecology of renewable energy transitions on the Åland Islands

Miroslav Lakota, Moon Hee Chu

A thesis submitted in partial fulfillment of the requirements of Lund University International Master's Programme in Environmental Studies and Sustainability Science

Submitted September 27

Supervisor: Mine Islar LUCSUS, Lund University

Empty page

Abstract:

Amidst a climate and biodiversity crisis, transitioning from fossil fuels to renewable energy sources has become imperative. On the Åland Islands, planned large-scale offshore wind farms offer potential economic growth but entail environmental and social impacts. This study investigates the discourses of renewable energy transitions on Åland using a political ecology framework for energy transitions, an energy justice framework, and narrative analysis. We collected data through interviews with local stakeholders and a literature review of academic papers and the local newspapers.

Findings reveal that the energy transition is largely driven by economic growth and profit motives rather than motivation to address the climate crisis. We observed concerns about unequal gender participation in decision-making processes and unawareness or denial of existence of the problem from politicians. The construction of wind farms entails an enclosure of the seabed and land for port development, with potentially adverse environmental impacts.

This paper contributes to sustainability science by providing insights into the complexities and challenges of energy transitions on islands.

Keywords: The Åland Islands, Renewable energy transitions, Offshore wind farms, Political Ecology, Energy justice, Gender

Word count: 12017

Acknowledgements

This work began from the LUCSUS collaboration project - Of People, PV, Power Lines: Energy Islands in the Nordics. We are grateful to be part of the project and would like to thank those who made this project possible.
First, we would like to thank the participants for the interviews in the study. The time to share their thoughts, knowledge, and experiences was valuable for both our study and our experience. We want to thank our supervisor Mine, as well as all my LUMES friends for being supportive throughout the creation of this thesis.
Thank you, Ann, for your advice and encouragement.

A special thank goes to my amazing daughters Nuri and Ellie for being patient when I could not spend time with them and still showing lots of love and support.

Special thank you to my son Alexander for being patient with me in this – indeed interesting – but very hard and stressful period.

Table of Contents

Abbreviations

ÅMHM - Åland Environment and Health Protection Agency
EIA - Environmental Impact Assessment

EJ - Energy Justice

FPE - Feminist Political Ecology

OWFs - Offshore Wind Farms

PE - Political Ecology

SEIA – Socio Economic Impact Assessments

STEM – Science, technology, engineering, and mathematics

Data and media sources

Cited interviews

(Int-Åland Natur och Miljö) - Ålands Nature and Environment organisation

(Int-ÅMHM) – Ålands environmental and health protection authority

(Int-Fågelskydd) – Ålands bird protection association

(Int-Flexens) – Company Flexens

(Int-Harry Jansson) – Deputy of the government Harry Jansson

(Int-Ilmatar) – Company Ilmatar Offshore

(Int-Kommunförbund) - Ålands association of municipalities

(Int-Lumparland) – Lumparland municipality

(Int-OX2) – Company OX2

(Int-Röblom) - Politician Alfons Röblom

(Int-Sunnanvind) – Sunnanvind project team

(Int-Wickström) - Minister of Infrastructure and the Environment Christian Wickström

1 Introduction

The world is facing a human-induced global climate and biodiversity crisis. Widespread disruptions in nature threaten the livelihoods of billions of people worldwide (IPCC, 2023). The burning of fossil fuels has already led to a global increase in temperature by 1,1˚C, causing more frequent and intense extreme weather events such as droughts, heatwaves, rainfalls, and flooding. As stated in the report by IPCC (2023), these events in many cases already exceed the tolerance thresholds of plants and animals, leading to the extinction of species, loss of ecosystems, land and forest degradation and desertification. Furthermore, they also led to adverse social impacts such as reduced availability of drinkable water, decreased agricultural production, an increased spread of infectious diseases and the displacement of populations (IPCC, 2023). As a result, there is an urgent need to reduce greenhouse gas emissions and transition from fossil fuels to cleaner and more sustainable energy sources if we want to preserve the ecosystems and ensure a livable future for all. However, current plans and efforts are insufficient to tackle the climate crisis and we are observing an increasing gap between the actions taken and what is be needed to solve the crisis (IPCC, 2023).

In recent years, the transformations of energy systems have accelerated, exceeding the growth of fossil energy experienced in the 19th and 20th centuries (Knuth et al., 2022). As a result, the call for phasing out fossil fuels and rapidly expanding renewable or low-carbon energy technologies has grown louder and more insistent (Knuth et al., 2022). Globally, in 2022, investments in energy transition technologies reached USD 1,3 trillion, and renewable energy investments of USD 0,5 trillion set new records (IRENA & CPI, 2023). However, these investments are still insufficient to meet the climate goals of limiting warming to 1,5˚C as agreed upon in the Paris Agreement. In fact, they are only one-third of the amount needed annually (IRENA & CPI, 2023). That is despite renewable energy technologies becoming increasingly cost-competitive with fossil fuels and often being the cheaper alternative (IRENA & CPI, 2023).

Energy transitions involving rapid deployment of renewable technologies are essential for combating climate change. According to the analysis of energy transition pathways by Gielen et al. (2019), renewable energy and efficiency improvements can account for 94% of emission reductions by 2050. However, projects aiming to increase renewable energy sources can also entail a variety of social and environmental impacts for local communities, economies and ecosystems (Bridge et al., 2013). Renewable energy projects like wind or solar farms can contribute to land-use conflicts, habitat disruption, and visual or noise pollution (Wolsink, 2007a). Moreover, these projects' equitable

distribution of benefits and burdens is a critical concern, as disadvantaged groups might disproportionately bear the negative consequences (Sovacool & Dworkin, 2015). Understanding and addressing these social and environmental impacts is vital for achieving a fair and sustainable energy transition.

The Åland Islands, an autonomous region of Finland situated in the Baltic Sea, are at the forefront of the global energy transition. As a small island archipelago, Åland faces unique challenges and opportunities in transitioning from fossil fuels to renewable energy sources (Dornan, 2014). Among these are a limited land availability, a remote location, vulnerability to climate change (Melander, 2022), and abundant renewable resources in the form of an unused sea area. The region is currently planning large-scale offshore wind farms (OWFs) with a power generation capacity of 2-5 GW in the north and south, aiming to capitalize on its abundant wind resources while simultaneously promoting sustainable development and reducing greenhouse gas emissions (Flexens, 2023; Ålands landskapsregering, 2023; Ilmatar, 2022; OX2, 2022b). However, these projects also entail social and environmental impacts that require careful examination and management.

Recently, other countries, islands and companies have announced similar ambitious plans to implement large scale offshore wind turbine farms. Among these are for example Denmark, which plans to build an energy island with a production capacity of 3-4 GW near the island of Bornholm (Energistyrelsen, 2021), or the company OX2 which applied for a permit to build a 5,5 GW farm next to Sweden's islands Gotland and Öland (OX2, 2022a). Therefore, an examination of the energy transition in the Åland Islands can provide insightful guidance for other islands and regions encountering similar challenges and opportunities.

1.1 Aim and research questions

This study aims to explore wind power development within the context of the Åland Islands, specifically focusing on the challenges and opportunities associated with the renewable energy transition. Our research is embedded within a larger project that investigates the role of civil society in ambitious low-carbon energy transitions, using Åland and Gotland as critical case studies.

Our paper applies political ecology (PE) and energy justice (EJ) frameworks to address the following research questions:

1. What are the discourses of renewable energy transitions on Åland?
    a. To what extent do these discourses fairly engage with people's livelihoods and

ecological considerations?

b. What are the exclusion and enclosure patterns of renewable energy transition in the wind power sector?
c. How are ecological considerations represented in these discourses?

By examining the discourses surrounding renewable energy transitions in Åland and their implications for local livelihoods and ecology, we aim to contribute to the academic fields of energy transitions, civil society, and EJ. We would like to contribute to sustainability science by expanding the current understanding of the injustices which could appear in future energy systems as a result of current energy transitions. We would like to help identify their potential drivers and the impact on society and the environment. Additionally, our findings will support practitioners in developing more sustainable and equitable planning processes for island communities.

2 Background

2.1 The Åland Islands

Åland is a group of islands located in the Baltic Sea, between Sweden and Finland. The archipelago consists of more than 6,500 islands and has a population of approximately 30,000 people. Due to its location, Åland is a crucial transportion hub between Sweden and Finland and this led to the growth of shipping and trade, with a significant portion of the population employed in these sectors. Although Åland has a large number of businesses, the shipping industry is capital-intensive and accounts for about 20 percent of local GDP as it offers more workplaces than the local labor market (Ålands landskapsregering, 2019). The tourism sector is another important economic sector in Åland. The archipelago is known for its natural beauty and is a popular tourist destination, with around 2.2 million arrivals yearly in the last few years (before Covid-19 pandemic) by ferry (ÅSUB, 2023).

The Åland islands climate with strong winds make the islands suitable for wind production (Ålands landskapsregering, 2023). The islands have already been able to utilize this potential and at the moment approximately 42% of its electricity supply comes from local wind power production (Kraftnät Åland, 2023).

2.2 Governance of Åland

The Åland Islands have a unique status of being autonomous within Finland. Åland has its own parliament, and it governs its internal affairs with its own laws and administration, regarding education, healthcare, and the environment, while Finland is responsible for the foreign affairs such as foreign

policy and defense (Ålands landskapsregering, 2019). For instance, the Åland Environment and Health Protection Agency (ÅMHM) is an authority aiming to safeguard the indoor and outdoor environment of Åland (ÅMHM, n.d.). One of the important tasks of ÅMHM is not only permitting public exercises but also supervising in accordance with what is determined in provincial legislation.

2.3 Municipalities

Åland has 16 municipalities (Figure 1) with each having its own publicly elected municipal assembly who appoints a board, committees, a chief executive (who is responsible for day-to-day operations) and a technical director (Ålands landskapsregering, 2019). The municipalities are responsible for providing the population with education, healthcare, and social services. Mariehamn is the largest municipality by the size of the population, and it serves as an administrative, commercial and cultural center of the region. Other municipalities are predominantly rural of which several already have existing wind farms.

When it comes to renewable energy projects such as wind farms, municipalities are able to get an income from these projects in the form of a property tax (Finish Wind Power Association, n.d.).

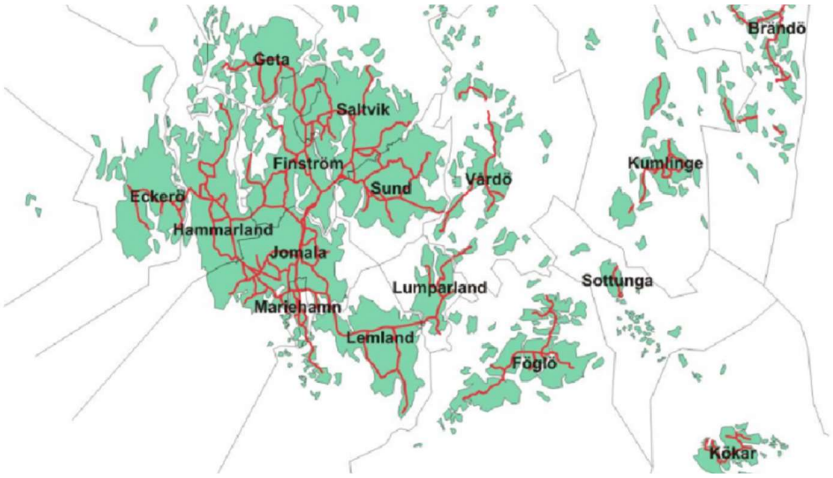


Figure 1. Municipalities on Åland. Source: Kommunförbundet på Åland

2.4 Offshore wind power

Wind power is becoming increasingly recognized as a crucial technology in the transition to renewable energy. In 2020, 35% of all renewable energy investments globally were dedicated to onshore wind power, and a further 12% were invested in offshore wind power (IRENA & CPI, 2023). Furthermore, the European Economic and Social Committee (EESC, 2021) expects offshore wind power to play a vital

role in decarbonizing the European Union's economy.

Offshore wind power is often implemented in the form of large-scale farm sites in order to achieve a high energy density of production (Pryor et al., 2021). The Åland Islands have a high potential for developing wind farms with a capacity of around 4 - but up to 6 - GW (Pyrhönen et al., 2021). Nevertheless, alongside the benefits, large-scale wind power projects can raise concerns about biodiversity, ecosystem impacts, and social acceptance. Some wind farms' large-scale, diverse infrastructure technologies and locations in potentially sensitive environments pose complex environmental challenges (Willsteed et al., 2018). OWFs have been found to have the potential for a significant impact on marine environments and ecosystems (Oh et al., 2021). Additionally, local populations might not find the farms socially acceptable (Oh et al., 2021).

2.5 The current energy network on Åland

Åland's electricity transmission grid is connected to Sweden and Finland. According to (Kraftnat, 2023), the Åland's transmission system operator, the Åland islands imported 51.4% of its electricity from Sweden and Finland in April of 2023. 41.8% was produced locally by wind turbines. This high reliance on imported energy makes the energy system in Åland vulnerable to price fluctuations in the global market (Karlsson, 2021).

2.6 The offshore wind farm projects

In March 2021 the Åland government adopted a maritime plan (as shown in Figure 2) which included several offshore areas on the north and south of the main island selected as suitable for the construction of wind farms (Ålands landskapsregering, 2022). To prepare for a public auction where the government specifies how to lease parts of the seabed and sea space for building OWFs, the government initiated a project called "Sunnanvind". This project aims to establish a framework for the public auction (Ålands landskapsregering, 2023). As of April 2023, three companies have publicly announced plans to attempt to participate in the development of the project. These include:

- Ilmatar offshore - with projects Stormskär and Väderskär on the north of Åland (Ilmatar, 2022)
- OX2 - with projects Noatun North (on the northern side of Åland), Noatun South (on the southern side of Åland) and plans to expand the port Långnäs to include hydrogen e-fuel production (Ålandsbanken, 2023)
- Svea Vind Offshore Ab - with plans to build turbines on the north of Åland (Pussinen, 2022)

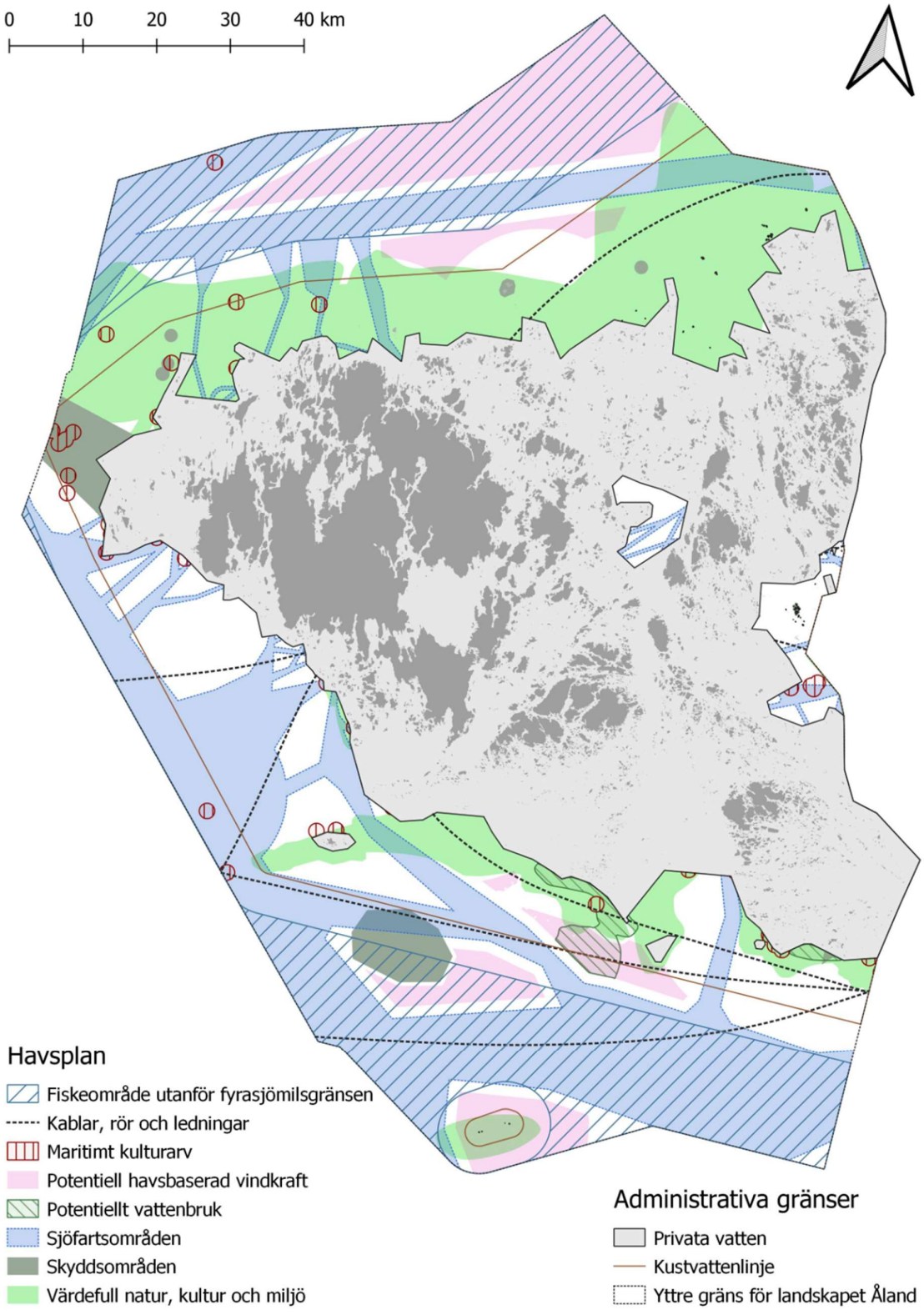


Figure 2. Marine and coastal area plan, showing potential area for OWFs with pink color (Ålands landskapsregering, 2022)

3 Theoretical frameworks

3.1 An introduction to political ecology

Political ecology (PE) is an interdisciplinary field that seeks to understand the complex relationships between society, politics, economics, and the environment (Benjaminsen & Svarstad, 2019; Neumann, 2009). It incorporates both critical social theory and experiences of social movements (Bridge et al., 2018). PE challenges the traditionally apolitical environmental management approaches, which are based on economic management, exploitation, and conservation techniques and aim to achieve high economic efficiency (Paul Robbins, 2019). According to political ecologists, the mainstream management approaches avoid questioning the existing socio-economic arrangements and overlook the root causes of environmental problems (Bridge et al., 2018). PE explicitly addresses the role of power dynamics, politics, and socio-economic factors in shaping environmental issues. Additionally, PE addresses issues with an understanding that it is possible to act in a less exploitative and more sustainable way (Paul Robbins, 2019). Therefore, it offers both a critique of the current knowledge frameworks and an alternative view of the origins of environmental changes (Bridge et al., 2018).

3.2 The political ecology of renewable energy transitions

In the context of energy transitions, PE approaches focus on analyzing the power dynamics, social justice, and environmental impacts of transitioning from fossil fuels to renewable energy sources (Knuth et al., 2022; Sovacool, 2021). Energy in the form of oil, wood, hydropower, or wind power is considered as 'just another resource' which can be extracted and exploited, often at the expense of the local environment and the lives of local people (Huber, 2015). Early PE works focused on the social and ecological costs of fossil fuel usage and the uneven impacts of climate change (Knuth et al., 2022). Nowadays, it is recognized that renewable energy sources and their infrastructures also have costs and trade-offs (Levenda et al., 2021; Newell & Mulvaney, 2013). The production of renewable energy often generates conflicts and resistance from communities similar to those connected with the extraction of fossil fuels (Huber, 2015).

Knuth et al. (2022) argues that PE critiques and engagement are essential because, as renewable energy becomes a priority for private capital and governments, there is a tendency for these actors to favor forms of renewable energy development that facilitate new accumulation or the generation of profit and wealth. Therefore, it is also essential to maintain political pressure to ensure that renewable energy growth displaces and reduces fossil fuel use instead of only increasing the total energy used

(Knuth et al., 2022).

A PE framework (Sovacool, 2021) can help to identify and analyze the potential negative consequences of low-carbon transitions, allowing for a more comprehensive understanding of their social and environmental impacts. The framework has four interconnected concepts: enclosure, exclusion, encroachment, and entrenchment.

'Enclosure' describes how public resources or spaces become privately owned, and private companies take on more prominent roles in once-public areas. It involves private institutions, especially corporations, looking for new ways to profit by expanding their reach into remote areas (Sovacool, 2021). This expansion is part of a strategy of territorial accumulation or growth of capital by extending markets into distant places and allowing capitalism to expand its production of goods and services (Prudham, 2009). Activities aiming at decreasing emissions can also become "enclosed" as a way of "accumulation through decarbonization" (Bumpus & Liverman, 2008). This happens for example when large-scale renewable energy projects rely on taking and enclosing new natural resources, displacing vulnerable populations (Sovacool, 2021).

'Exclusion' refers to the process of systematically denying certain groups or individuals access to resources, opportunities, or decision-making processes. It occurs due to power dynamics, socio-political structures, economic disparities or social marginalization (Ribot & Peluso, 2003), using mechanisms such as discriminatory laws, administrative barriers, or social practices limiting representation or engagement in political activities (Verba et al., 1995). It often disproportionately affects vulnerable and marginalized populations, reinforcing existing injustices and inequalities. In the context of renewable energy transitions, exclusion can manifest in various ways, such as limited access to clean energy technologies, unequal distribution of benefits from renewable energy projects, or lack of participation in energy policy formulation (Sovacool, 2018). Exclusion is often linked with enclosure (Heynen & Robbins, 2005).

'Encroachment' occurs when renewable energy projects harm the environment or disrupt natural areas, ecosystems, and habitats (Sovacool, 2021). While these projects are often viewed as environmentally friendly alternatives to fossil fuels, they often negatively impact the surrounding ecosystems and landscapes (Sovacool, 2021). Encroachment can manifest in various ways, such as pollution of the environment, carbon emissions, displacement of local flora and fauna, disruption of migration patterns, fragmentation of habitats, or alteration of ecosystems (Dannheim et al., 2020;

Hüppop et al., 2006; Sovacool, 2021; Sovacool et al., 2015). Encroachment is especially a concern in climate mitigation and adaptation projects because these are often primarily concerned with protecting humans at the expense of the environment (Turner et al., 2010).

'Entrenchment' refers to reinforcing existing power structures and socio-economic inequalities (Sovacool, 2021). Renewable energy projects can increase structural inequalities and vulnerability of disadvantaged groups by interfering with egalitarian distribution systems, concentrating wealth within a community, or hurting vulnerable members of the community (Sovacool, 2021; Sovacool et al., 2015). Entrenchment can, for example, occur when renewable energy projects become dominated by large corporations or governments, leaving out community-led and decentralized initiatives (Bridge et al., 2013), leading to a lack of local ownership and a lack of consideration for the needs of vulnerable or marginalized communities.

One critique of PE is its potential overemphasis on power relations and conflict, which may obscure instances of cooperation or consensus-building among stakeholders (Forsyth, 2008). By focusing primarily on power dynamics, PE might overlook other relevant factors or processes, such as cultural values or local knowledge, that can play a role in shaping energy transitions (Zimmerer, 2006). Another limitation is the complexity and context-specific nature of PE analyses, which can make it difficult to derive universally applicable solutions or recommendations (Walker, 2005). This can pose challenges for policymakers and practitioners seeking clear guidance for addressing energy transition challenges. Lastly, PE's critical perspective and emphasis on uncovering power dynamics and injustices might introduce potential bias and subjectivity in interpreting energy transition processes and evaluating energy policies and projects (Forsyth, 2008).

3.3 Energy justice and feminist political ecology in energy transitions

Energy justice (EJ) is an approach that seeks to address issues of fairness, equity, and inclusiveness in the development and implementation of energy systems, policies, and practices. It focuses on principles of fairness, equity, and inclusiveness in the distribution of energy resources, and highlights the need for meaningful participation in decision-making processes, recognition of diverse needs, values, and perspectives in energy systems (Jenkins et al., 2016). EJ comprises of three tenets: procedural, distributive, and recognitional (Table 1) (Feenstra & Özerol, 2021).

However in a world where gender inequalities persist in energy systems at all levels, both in the Global South and Global North (Clancy & Feenstra, 2019; Feenstra & Özerol, 2021; Wiese, 2020) the EJ

scholar's works failed to adequately address gender, race, class, and ethnicity inequalities (Sovacool et al., 2023). Feminist Political Ecology (FPE) can be incorporated into EJ to help recognize these problems and address them.

Table 1. Tenets of EJ (Feenstra & Özerol, 2021)

Tenets	**Evaluative**	**Normative**
Distributive	Where are the injustices?	How should we solve them?
Recognition	Who is ignored?	How should we recognize?
Procedural	Is there fair process?	Which new processes to develop?

FPE is a subfield of political ecology which brings feminist perspectives into PE. It recognizes that gendered divisions of labor, decision-making processes, and societal norms can influence the ways in which men and women experience and contribute to energy transitions (Agarwal, 1997; Nightingale, 2006). FPE suggests that gender plays an important role in shaping access to resources, power relations, and environmental change (Sundberg, 2017). According to Bell et al., (2020) the existing energy systems are characterized by deeply entrenched gender inequalities, which manifest in various aspects such as access to resources, decision-making, and labor market opportunities. That being said, feminist perspectives on energy reach beyond gender and they can provide us with a better understanding of the currently unsustainable energy cultures and help us build more just energy systems (Bell et al., 2020). Bell et al. (2020) introduces a framework of feminist energy systems emphasizing the study of power based on four guiding principles and strands of feminist thought - the political, economic, socio-ecological, and technological (Table 2).

Applying a feminist lens to EJ involves transforming patriarchal and other oppressive systems that exploit women in the name of energy security. Justice arises from questioning and eliminating domination, oppression, and injustice (Sovacool et al., 2023).

Table 2. Dimensions of Feminist Energy Systems (Bell et al., 2020)

Feminist Energy Systems	
Dimension	**Vision**
Political	Democratic; decolonial; decentralized; pluralist; publicly owned
Economic	Prioritizes human and more-than-human well-being and biodiversity over profit; refuses the growth imperative; committed to community economies and pink-collar jobs
Socio-ecological	Relational; transparent; attuned to the violence of energy production and engaged in efforts to mitigate or compensate that violence; committed to building a culture of care
Technological	Distributed; community-directed and collaborative; heterogeneous and multiple

3.4 Combining PE, EJ, and Feminist perspectives: rationale and benefits

Our decision to integrate the PE, EJ, and Feminist perspectives in the context of renewable energy transitions is rooted in the multifaceted nature of the challenges we seek to address. We chose the PE framework by Sovacool (2001) as our primary framework due to its focused examination of potential exclusion in decision-making processes, enclosure of natural areas and resources, and entrenchment of certain population segments. Incorporating the EJ framework allowed us to emphasize issues of fairness, equity, and inclusiveness within the energy sector. Furthermore, the deliberate inclusion of a Feminist lens within EJ aims to illuminate gender inequalities inherent in energy systems and amplify the voices of marginalized groups.

4 Materials and methods

4.1 Research Design

Our research design is grounded in a single-case study approach, specifically focusing on an 'Extreme or Unique Case,' as Yin (2017) outlined. We consider the energy transition on Åland as a unique case due to several distinct factors that set it apart from other cases in the literature. First, the small island context gives Åland unique socio-political, economic, and environmental characteristics (Dornan, 2014). Secondly, the ('extreme') scale of the proposed renewable projects far exceeds the needs of the local population, meaning that most of the generated electricity is destined for export. This leads to transforming the local economy and introducing new challenges and considerations.

Following the single-case study approach (Yin, 2017), we selected Åland Island as a boundary for the

study, meaning that we will not concentrate on social or environmental impacts beyond the borders of this region. We did this to limit the scope of the study in order to ensure that we could concentrate on the case in sufficient detail. Initially, we selected PE as a preliminary theory guiding our research, the formulation of our research questions, and the data collection process. The selected theory and research questions were revised when we were performing the analysis of collected data. Besides PE, we decided to use EJ with a feminist lens when discussing issues of fairness, equity, and social distribution of energy-related benefits and burdens.

4.2 Data Collection

4.2.1 Literature review

Before formulating the research questions, choosing theoretical approaches and creating interview guides, we conducted background research to obtain a general overview of the problem area. After conducting the interviews and before analyzing the data, we further expanded the review to account for the newly discovered information.

We searched for the following keywords (and their various combinations):
“energy transition*” on island* AND “offshore wind (power OR energy)”
“energy transition*” AND “Åland” AND “offshore wind (power OR energy)”
“environmental impact*” AND “offshore wind (power OR energy)”
“ social impact*” AND “offshore wind (power OR energy)”
“renewable energy” AND “Åland”
“participation*” AND “energy justice”
“participation*” AND “gender”
“ gender (gap OR segregation OR discrimination)”
“ inequalit*” “ justice”
“political ecology” “feminist political ecology” “energy justice”
“narrative analysis” “semi-structured interview”

We mostly used the following databases - Lubsearch, Google Scholar and Scopus. To limit the scope, we prioritized articles published in the last 7 years.

4.2.2 Semi-Structured Interviews

We conducted semi-structured interviews for our data collection. We chose this method because it

allows flexibility to adopt to unexpected points emerging during the interview (Bogner et al., 2009). The design of the interview guidelines was motivated by a method by Patton (2014), which highlights the importance of utilizing value and knowledge questions in combination with involving a wide variety of stakeholders to understand related stakeholders' opinions, intentions, and expectation The formulated questions were based on the PE energy transition framework by Sovacool (2021) which concentrates on identifying power struggles, exclusions, vulnerabilities of the population, and injustices.

In total, we conducted 13 semi-structured interviews. 11 interviews were done in person on the Ålands Islands, and two were online due to the long distance from Mariehamn, the city we were staying in. All interviews were conducted the interviews in English and recorded using a dedicated primary recorder and a backup audio recorder on a smartphone. Afterward, we transcribed the interviews using three speech recognition tools - 'Whisper' (OpenAI, 2022), a 'Faster Whisper' reimplementation by guillaumekln (2023), and lastly, Otter.ai.

4.2.3 Selection of interview participants

To select participants for interviews, we conducted a stakeholder analysis. At first we identified all potential stakeholders. Afterwards we prioritized them based on their influence over the project and their interest in the project. This prioritization was based on our initial background research and our understanding of the role of the stakeholders in the process. The Table 3 shows which stakeholder groups we selected for interviews and our motivation for selection. The full list of interviewed stakeholders is available in Appendix 1.

We also wanted to directly interview local people, in order to map the differences between the opinions of people without any legal or administrative power and those in power. However, this was in the end impossible due to the timeframe of the project and language barriers.

Table 3. Selected stakeholders

Stakeholder	Reasons for choosing
Project companies	Investors and as a result those who possess the financial and economic power to steer decision makers towards their interest. They are also engaged in the formation of public opinions using information campaigns (OX2, 2023).
Parliamentary politicians	Represent the local people, and will need to approve the project and set laws for distribution of benefits.
Municipalities	They will need to approve building of the project in their area. They might have a better overview of local opinions.
Local authorities	Provide information about the formal processes and their real life implementation.
Local non-governmental organizations	Provide independent overviews of the social and environmental context
Local Independent companies in the sector	Show an independent opinion from the industry on the project.

4.2.4 Review of newspaper articles and other relevant sources

Since we were unable to directly interview people opposing building the OWFs or their representatives, we decided to use opinion articles from the local newspaper Nya Åland published between December 2022 and March 2023 as a source of information about the opposition. While searching for the articles, we searched for the keyword "vindkraft". The list of the opinion articles can be found in Appendix 2.

We also used a text of a petition against OWFs created in December by Fagerström (2022) which was signed by 410 people. As a replacement for a missing interview with a directly impacted municipality, Saltvik, we used the following newspaper article from February:
"Saltvik puts heavy pressure on the government" by (Blix, 2023).

Additionally, as a part of our research we also conducted an observation where we participated in a local event organized by OX2 - Energi Arena (OX2, 2023).

4.3 Methodology: Narrative analysis

Narrative analysis is a qualitative research method that focuses on examining and interpreting stories or narratives shared by individuals or groups. It is a method commonly used in social sciences, humanities, and other disciplines to study people's experiences, identities, and perspectives through their stories. A growing number of researchers in the social sciences use a narrative approach due to its benefit in helping to understand processes and contestation in energy transition (Galan, 2021). Narrative analysis has played an important role in cultural sociological analysis (Arnold, 2015) and it allows researchers to pay attention to the stakeholders' diverse experiences, perspectives, and attitudes, thus gaining insights into how different stakeholders understand and make sense of stories (Mihas, 2023).

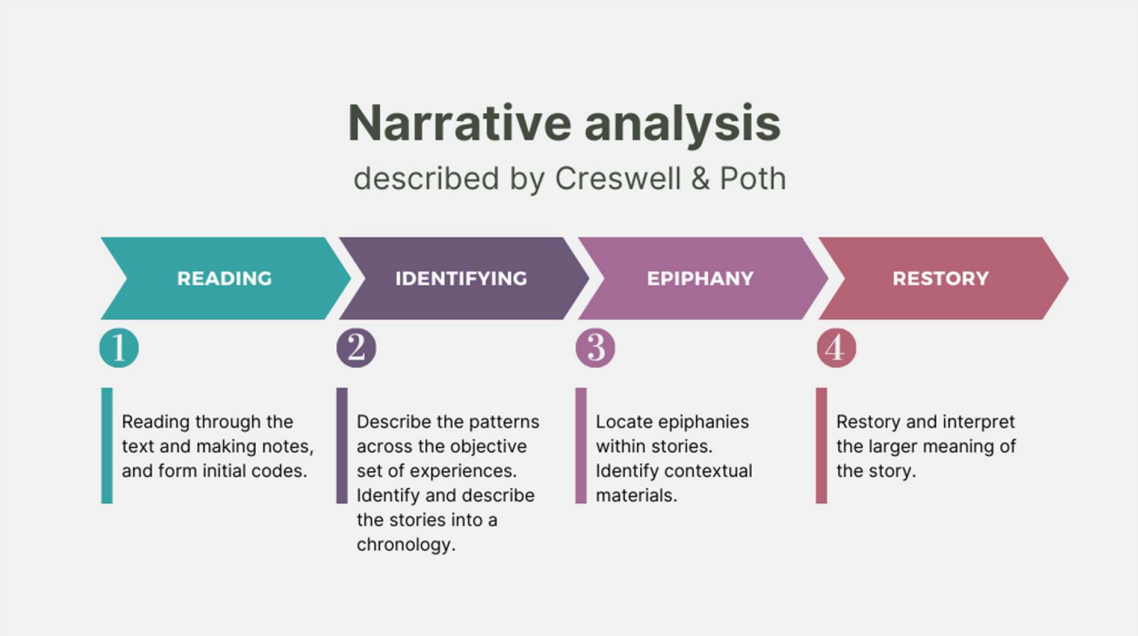


Figure 3. Narrative analysis by Creswell & Poth (2017)

After conducting the data collection and transcribing the interviews we conducted a narrative analysis. Through this process, we looked for patterns and themes that emerged from the stories and tried to understand the meanings and messages they convey (Figure 3), as described by Creswell & Poth (2017).

4.4 Limitations

When booking interviews, it was difficult to engage equally with all groups of stakeholders. While the project companies, and government officials were very responsive and easy to get hold of, we were unable to communicate with politicians in the opposition, representatives of those who oppose building OWFs and private people engaged in the social justice/sustainability area in bärkraft.ax

network. This introduced a very clear bias to our data, because of the limited representation from the opposition. We identified several possible reasons why these issues emerged:

- A language barrier - our knowledge of Swedish is limited and many people on Åland have only a limited knowledge of English.
- Having a limited knowledge about the topic and/or feeling unsure/uncomfortable talking about it due to discomfort and cultural barriers.
- The issue of trust - possibly being perceived as outsiders who might be prejudiced towards their opinion.
- Already being too busy and/or not interested in our research as important/influential enough.

To provide a comprehensive take on the issue we triangulate interviews with newspaper articles and a review of literature.

5 Analysis and results

5.1 The current stage of the project

Interviews with the authorities and project companies helped us understand the current stage of the project. As of the middle of March (when the interviews were conducted), the project Sunnanvind on the Åland Islands was in its planning and development phase. The current focus of the project is on the northern part of the Åland Islands, with the southern part being considered as a potential future option, depending on military interests and other factors (Int-Harry Jansson). The timeline of the project is driven by financing considerations, primarily based on the Recovery and Resilience fund by the European Union (EU), which is set to end in June 2026 (Int-Sunnanvind). Two companies, Ilmatar and OX2, have been conducting extensive surveys and have started the environmental impact assessment (EIA) process (Int-Ilmatar). However, the timeline for further progress is dependent on the government of Åland and their decisions regarding the auction plan and exclusivity (Int-Ilmatar).

The government of Åland (as the owner of the seabed) is expected to make decisions on leasing water areas by next year. However, the construction also needs to be approved by the local municipalities. If all proceeds as expected, the first turbines could be up and running around 2030, which would also mean that a port necessary for construction of the wind farms would need to be ready around 2028 (Int-OX2). Nonetheless, there are some uncertainties that may affect the timeline, such as complaints against the general plan and the availability of windmills (Int-Harry Jansson). Additionally, a pilot study is being performed to find out whether the port Långnäs in Lumparland municipality could be

expanded to host wind turbines during construction and hydrogen/e-fuel production (Int-Lumparland, Int-OX2).

5.2 Motivation for building the wind farms

While analyzing the motivation for building the wind farms we primarily focused on the opinions of companies, government officials and politicians, as they were the ones who were proposing the projects. The participants were not given a clear question about this topic and instead usually commented on it as a part of an answer to another question.

Ilmatar claims that by building wind farms, the company is trying to save the climate, the fragile Baltic Sea, and the Gulf of Bothnia. They see emission-free energy as an over-spanning need because: "you will not have people who care about the environment and the environmental impacts if it is impoverished" (Int-Ilmatar). The story is similar to the company OX2 (Int-OX2) which says that "we are burning our planet totally … so we need to do something quick". At the same time, they see Åland struggling with finding new ways of maintaining a good quality of life for people in the future. They perceive green energy as a potential growth industry for Åland's economy that can secure a good quality of life for the islands' inhabitants (Int-Ilmatar, Int-OX2).

Röblom (Int-Röblom), the former Minister of Environment, thinks that the project will have 'an epic impact on the society', it will bring economic benefit to Åland make money and will open possibilities for new career and education opportunities. Besides this he thinks that "it's also a responsibility to in some extent create energy for export to Sweden and Finland, and to help them also lower their climate footprint" (Int-Röblom), highlighting the strategic location of the Åland Islands, as well as the fact that the energy transition is a global issue, requiring international cooperation.

In contrast, the current Minister of the Infrastructure and Environment says that: "for my party, this is mainly about the economy and the fact that this can bring a large range of job opportunities, infrastructure and cold hard cash to the islands." (Int-Wickström). The energy transition is not his primary driver. Instead, he aims to maximize profit and, at the same time, limit the potential harm to the local environment. He acknowledges that Åland needs to find a new source of economic revenue for the future. However, he lists the energy transition as one of the reasons for this because increasingly strict emission rights are negatively impacting the islands in the marine trade (Int-Wickström).

The deputy of the government (Int-Harry Jansson) also emphasizes the economic benefits of the project, mentioning potential revenue from fees and property taxes for municipalities, as well as the development of new educational programs focused on servicing wind turbines. Additionally, he recognizes that the world is seeing growing movements against fossil fuels and environmental destruction, and therefore views wind farms as a necessary alternative to oil.

From these narratives, it is clear that the economic and financial benefits are the overarching motivation for building these wind farms, with the climate crisis playing a much smaller role and only for some of the stakeholders. The company Flexens (Int-Flexens) provides an additional observation to this narrative when they explain the differing attitudes towards wind power between Finland and Sweden from a municipal perspective. They mention that in 2008, the Finnish government increased the maximum property tax and allowed smaller municipalities to gain significant economic benefits from hosting wind farms. This change in practice effectively removed the municipal veto, resulting in very few Finnish municipalities opposing wind farms due to the financial incentives. In contrast, Swedish municipalities do not have a similar property tax concept, and therefore do not receive the same economic benefits from allowing wind farms on their territory, which led to greater resistance against wind farms in Sweden (Int-Flexens).

5.3 Analysis of the opposition

Social acceptance of OWFs is a crucial aspect to consider in project planning and development (Devine-Wright, 2005). While the public generally supports renewable energy, local opposition to specific projects can be a significant hurdle. This resistance often arises due to perceived negative impacts on local landscapes and seascapes, potential disruptions to local economies, and feelings of injustice over the decision-making process (Firestone et al., 2015; Wolsink, 2007b).

Our analysis reveals a broad range of concerns and opposition to the introduction of large-scale wind power projects on Åland. Röblom (Int-Röblom) categorizes people with concerns about offshore wind power into three distinct groups:

1. Older angry men (55+ age group): This group is characterized by "... yelling and using the most peculiar arguments you could think of, and also using facts quote unquote from different parts of the internet to try to make their case…"(Int-Röblom). Häger also refers to this group as "... 10 or 15 mostly boomer men … They're very negative. So they upscale kind of a little bit vulgar debate sometimes shouting out the same arguments as before even though they have been contradicted" (Int-Ilmatar). Hellström also refers to them as "these older men who want to get

their voices heard and always talk loudest and … they think that their opinions are very important" (Int-Kommunförbund).

2. Conservative environmental groups: This group is concerned about the exploitation of the seabed and the potential environmental impact of offshore wind power projects, "they are open for good arguments and good research results … that group of people that can listen to that kind of facts and perhaps get a little bit more satisfied and calmer about the project " (Int-Röblom). This group could potentially represent Ålands fågelskyddsförening and Ålands Natur & Miljö, since both of them have concerns about the environmental impacts and both submitted comments to the relevant authorities (Int-Fågelskydd, Int-Ålands Natur & Miljö).

3. People worried about the project's scale and economic implications: This group is concerned about the scale of the project, potential involvement of big investors, and the ability of Åland to handle such an undertaking. Their concerns revolve around economic criticisms, such as whether the money will go to foreign countries like China and the involvement of oligarchs (Int-Röblom). According to Holmström (Int-Flexens) "Åland doesn't really have a large industry of some sort. The largest industry we have is the shipping industry with the ferries going back and forth". Since people are not used to such industries, he expects that a lot of people will be afraid of destroying nature (Int-Flexens). This aligns with Hellström's (Int-Kommunförbund) point about people being scared of the scale of the project.

The opposition has raised concerns about a broad variety of topics. These include concerns about:

- Material and special 'inefficiency' of wind turbines. Lansing (2023) in particular proposed Small Modular Reactors (SMRs) as a more efficient and energy-dense alternative to wind power.
- Long term consequences and viability of the project, asking who would be responsible for dismantling of the turbines if the projects become unprofitable in the future (Fagerström, 2022; Jansson, 2023; Toivonen, 2022a, 2022b).
- Environmental harm to the fish (Fagerström, 2022), a release of microplastics and other pollutants (Lansing, 2023; Toivonen, 2022a, 2022b) and impacts of inaudible sounds from the turbines on human health (Toivonen, 2022a, 2022b).
- The aesthetic impact of the turbines and disruption of the view (Fagerström, 2022; Jansson, 2023; Johansson, 2023) and negative impacts on tourism, since Åland is known for its untouched nature (Toivonen, 2022a, 2022b).
- The logistics and infrastructure necessary for construction and maintenance of the turbines

(Grönstrand, 2023; Johansson, 2023) and military risks associated with the presence of strategic energy infrastructure on the islands (Grönstrand, 2023).

- The rights of affected people to be able to be heard, to raise complaints and appeal against the administrative decisions (Fagerström, 2022; Jansson, 2023).

5.4 Unequal representation in planning and decision making process

Public participation in decision-making processes is critical to ensuring social acceptance of offshore wind projects (Aitken, 2010). This includes engaging with local communities and stakeholders early, providing transparent and accessible information about the project, and considering local concerns and suggestions in project planning and implementation. Sustained engagement throughout the project's lifetime is also important to mitigate or avoid longer-term social impacts (Mabon et al., 2017). Jenkins et al., (2016) highlights that community engagements are crucial for successful management of impacts such as avoiding equality and justice issues. Additionally, it helps with making communities feel engaged in the decision-making processes.

The interviews reveal a variety of perspectives on the issue of unequal representation in planning and decision-making processes related to wind farm projects. Both the government officials (Int-Harry Jansson, Int-Wickström) seem to be unaware of any possibility of the issue of unequal representation, with statement such as: “it's up to them to take part, engage themselves. Of course, there will be a critical group, as always, as soon as you present something that we think is the most fantastic option we ever had, and others will be critical” (Int-Harry Jansson).

The Sunnanvind government project team does not see any possibility for discrimination either, neither on the basis of unequal representation or neither based on inaccessible information, as they have a transparent democratic voting system as well as two newspapers and a radio covering the wind farm questions. Further, they think that the Åland community's various clubs and societies contribute to the spread of information, and open hearings and meetings provide a sufficient platform for dialogue (Int-Sunnanvind).

The opinions of other actors, however, are different. Schalin (Int-Flexens) points out that Åland's 16 municipalities are naturally not equally involved in the wind farm projects depending on whether the municipalities own the seabed or not. But he emphasizes that in their small community, individuals can voice their concerns and be heard.

While talking about the port construction, Jansryd (Int-Lumparland) raises concerns about tight project timelines, which could make it difficult to involve all stakeholders. He emphasizes the importance of being 'meticulous' and listening to the population to avoid legal issues that could hinder project progress. Jansyrd also acknowledges that language barriers and lack of knowledge regarding renewable energy for elderly group as obstacles to being represented (Int-Lumparland).

Röblom (Int-Röblom) points out that there are people who feel uncomfortable in writing or speaking in public. Therefore, he advocates for new democratic solutions, such as citizen dialogues, to include underrepresented groups in the decision-making process using safe spaces.

5.4.1 Gender discrimination - a hidden issue

Throughout the interviews we found out that there are people who are strongly concerned about unequal participation of women in the decision-making processes, in the government and in the whole society on Åland. This concern however was not present among all the respondents.

Häger (Int-Ilmatar) and Hellström (Int-Kommunförbund) express their concerns that women are underrepresented in decision-making processes, particularly in relation to infrastructure and energy projects. Häger indicates when asked in a public survey about their opinions about wind energy": "women more or less in every question were underrepresented. Answer don't know to the questions. I don't know how it will impact me. I don't know what I think about it" (Int-Ilmatar). She further adds that male dominance, coupled with the traditional island society, might make it difficult for women to break into these roles and participate in decision-making processes, "More or less, in all boardrooms on Åland, women are underrepresented. Yes. … more or less, it's male-dominated " (Int-Ilmatar).

Hellström acknowledges the existence of a representative democracy but highlights that "there are some inequalities concerning gender in these high decision-making bodies. … those who talk about this project, it's the same, they are the same gender, they are the same age" (Int-Kommunförbund). Another issues she mentions is that "women don't get their voices heard because they might don't want to get them heard because the climate debates are so intent and not very nice always" (Int-Kommunförbund). She further describes that despite the difference of interest between men and women in general, the inequalities visible extends beyond that. She adds that the lack of women participation in the energy debate is not the only area with a gender gap on the island (Int-Kommunförbund).

While participating at the OX2's Energi Arena event we also noticed that the vast majority of the participants were men. This finding is confirmed by the deputy of the government, who however, has a different opinion on the issue:

"Why should you take part in something you don't think is that interesting? … It wasn't many. Perhaps 10% women, not more. … That's quite natural, women do take interest in the softer issues of the society and men generally tend to the technical part of it. At least it's very common on these islands that you should have that division of interest." (Int-Jansson)

5.5 Impacts on the livelihoods of people

Developers of OWFs generally assume that social impacts are unimportant, leading to possible neglect of socioeconomic impact assessments (SEIA) (Glasson et al., 2022). Nevertheless, SEIA is necessary to identify the effects of development on people, determine who benefits and who loses, and support the inclusion of diverse community groups in project planning and decision-making. When OWFs are far at sea, away from the coast, skepticism about the importance of socioeconomic impacts can appear (Haggett, 2008, 2011). However, all OWFs have components that are placed on land, such as cabling, harbors or sub-stations which can impact local industries such as shipbuilding, tourism or fishing (Glasson et al., 2022).

Social impacts need to be measured in the construction, operation, and decommissioning phase, with approaches to mitigating adverse effects and enhancing beneficial effects (Glasson et al., 2022). Consequently, the offshore activities of the construction stage are given the most attention. However, monitoring the project's lifecycle is a weak area in EIA, especially for socioeconomic impacts (Glasson et al., 2022). Therefore, it is essential to set up monitoring mechanisms to provide evidence of actual impacts.

Among the positive impacts of OWFs are their potential contribution to the regeneration of local coastal communities. They can foster the development of new businesses and other supply chain activities, bringing economic benefits and job creation. Additionally, they can increase skills and wages, offer community benefits, and enhance local training and upskilling measures (Glasson et al., 2022).

With the exception of Ålands fågelskyddsförening (who was not given this specific question) all the interview participants saw tax revenue, the growth of economy and job opportunities as a clear benefits for society: "people can see that they will benefit from the project with workplaces to work and ripple effects that come from that" (Int-Ilmatar).

There are mixed opinions about whether the farms could cause a decrease in property values. The minister of infrastructure told us that: “I don't know if the prices for property will decrease on the northern coast, but I think so” (int-Wickström). On the other hand, Schalin doesn’t think that that would be the case (Int-Flexens). Both OX2 (Int-OX2) and Ilmatar (Int-Ilmatar) acknowledge that the projects may impact seaside tourist businesses if these rely specifically on promotion the undisturbed sea view. However, OWFs might also bring new opportunities for tourism. For example: “in Rampion Wind Farm outside of England, there are, I think, five or six companies now just driving tourists out to see these because it is a spectacle” (Int-Ilmatar).

The construction of the port necessary for building the wind farms might however lead to social impacts on the local population. For instance, the transportation and storage for enormous assembly parts and heavy traffic through the municipality. Additionally, due to the huge size of the port needed, people might need to be displaced and resettled (Int-Lumparland).

5.6 Sharing benefit and the potential increases in inequalities

The issue of benefit distribution from wind farms has not yet been discussed between the government and the municipalities (Int-Kommunförbund) however, the conflicts have already arisen. Saltvik municipality is seeking a significant share of the revenues generated by the wind turbine project. They stand firm on their demand for substantial compensation and insist that the property tax should benefit Saltvik. Saltvik's stance is based on the belief that the municipalities hosting the wind turbines should receive more property tax than other municipalities (Blix, 2023).

Wikström (Int-OX2) says that the affected municipalities need to get revenue from the project otherwise they are unlikely to get involved. However, the involved municipalities cannot get all the benefits due to the risk of ceating an economic imbalance between all municipalities. Häger (Int-Ilmatar) also believes that the project could deliver a high risk of inequality in the society. Röblom (Int-Röblom) also highlights the importance of the government decision on how to deal with income from the projects and also the transparency about how the profit is used. Additionally, he requires all Ålanders to acknowledge the purpose of the project that is for the whole society, not only for those municipalities involved in the project.

Holmström acknowledges that the OWFs might make both people and municipalities wealthier, but unequally. He indicates that the municipalities that own the sea water will benefit much more than the

other municipalities. People who get the possibility of having well-paying jobs, renting out properties in those municipalities with wind turbines might benefit from the OWFs more, while the people who are not involved in the sector, they might remain just as before: “It generates a lot of wealth, but not equally for everyone.” (Int-Flexens).

Both Röblom and Wiklund admit the existence of monetary and power inequalities in Åland but as much as many other societies have. However, despite the inequalities at certain degrees, in general they see that Åland has an equal society (Int-Röblom). The deputy of the government strongly believes that the wind farm project would not increase the inequalities in society. The government of Åland will be in charge of the profits from the project and will distribute it through their welfare system such as, healthcare, education, and social affairs. However, he clearly recognizes the need to present a new system of redistribution of the property tax (Int-Harry Jansson).

5.7 Cultural meaning

Research underscores the importance of culturally meaningful aspects, which might impact the attitudes and perceptions of the community (Ellis & Ferraro, 2016). These include the cultural importance of seascapes, visual impact, community well-being, and potential housing price devaluation associated with visible projects (Alem et al., 2020; Ladenburg, 2009). In addition, the concept of cultural ecosystem services provides an understanding of the non-material benefits people derive from ecosystems (Wiersma & Devine-Wright, 2014). For example, people seeking to enjoy an un-degraded coastal setting may feel an emotional loss of the open horizon, or they may experience a sense of being limited due to the presence of OWFs (Glasson et al., 2022).

The cultural meaning of nature attaches great importance to people in Åland. Wickström, the minister of infrastructure and environment, says that nature is integral to their identity. He adds that sea and water are deeply connected to the hearts of Ålanders, as they cherish water activities such as fishing and boating (Int-Wickström). The petition by Fagerström (2022) reveals residents’ worries about the disruption of the sea view by wind turbines. This sentiment is echoed by Johansson (2023), who raises concerns for those who chose to live at the coast specifically because they value looking over an ‘unbroken horizon’, and in the future, they will be impacted by the flashing lights of wind turbines on the night sky. In contrast, Häger takes the example of lighthouses which were built in the 90s on Åland. People did not welcome this mad-made pillar. As Åland is a maritime and islands community, people put pride on their open horizon , both historically and today. When the lighthouse came in, people thought that it looked unattractive and disrupted the horizon view but nowadays it has became a

symbol of Åland's cultural heritage, showing up on stamps and t-shirts. Through this example, she points out that perceptions and feelings change over time (Int-Ilmatar). Additionally, Schalin presents a well-known case in the Turku archipelago. Three wind turbines were erected 15 years ago. While some individuals who sail around the area find the turbines unsightly, he perceives them as pleasing as he knows that electricity comes from the turbines. The notion of beauty is subjective and personal rather than objective. In other words, the practical benefit of electricity generation by wind turbines can shift an individual's perception from being unsightful to being attractive (Int-Flexens).

5.8 The enclosure of sea and land

The government is the owner of the seabed which the wind farms will be built on (Int-Ilmatar). For the port construction, the situation is different as, according to Jansryd, the majority of the land is already privately owned (Int-Lumparland). This could lead to a problem for the investors interested in building the port as they have to convince people to sell their land (Int-Lumparland).

The minister of the infrastructure and the environment does not see many risks with privatization or territorial accumulation: "Well, the seabed isn't used by anyone else right now, and I don't see any way for the public person to use the seabed. So it's hard for me to see what we're sacrificing, except for the view" (Int-Wickström).

The opposition, on the other hand, expresses concerns about companies selling the projects to foreign investors, adding that: "In Norway, foreign ownership is already 61 percent. In Sweden, the state-owned Chinese company CGN is the largest owner of wind power" (Toivonen, 2022a). Wiklund also sees the risk of the construction being done by a company which: "is not kind of ethically or morally very connected to Åland, because then it will be very easy that you could sell that off to other companies that maybe don't have the heart for Åland" (Int-OX2). The deputy of the government encountered worries about Chinese ownership of the project, he himself does not see much of an issue with it: "If there are other owners in 10 years' time, that is, that they have stepped in and changed their ownership from the very start in a few years' time, that will happen. That's the part of the commercial world" (Int-Harry Jansson).

Additionally representatives of the company Flexens have encountered worries that oil industry could buy the land and never build the wind turbines: "There is a little bit of a fear in the industry that the big oil majors like Shell or BP or whoever. Just buys up these concessions and never builds the farms." (Int-Flexens)

5.9 The environmental impacts

Our literature review shows that there are distinct environmental impacts associated with every stage of an OWF's lifecycle. During construction and maintenance operations, there is an increased risk of acute pollution, for example, in the form of oil spills. Besides this, there is also a risk of introducing contaminants into the environment due to an accident or collision (Abramic et al., 2021). A study by Wang et al. (2023) found copper, chromium and zinc pollutants in the sediments of wind farms which led to changes in the sediment quality and present microbial communities. The decommissioning processes at the end of the wind farm's lifecycle could also contribute to marine litter (Abramic et al., 2021). However, this area is relatively unexplored due to the recent nature of wind farm decommissioning (Topham & McMillan, 2017).

Noise pollution is another significant concern, with three phases identified: pre-construction, construction, and operation. During the pre-construction and construction phases, the risk to marine life, including mammals, sea turtles, and fish, is amplified due to disturbances from vessel movements and noise from pile driving and other construction activities (Kikuchi, 2010; Madsen et al., 2006). However, during operation, underwater sound levels are less likely to reach dangerous levels, and impacts on marine life are generally considered insignificant (Dannheim et al., 2019).

Another noteworthy effect of OWFs is their role as artificial reefs, impacting benthic and pelagic habitat distribution. The turbine's foundation can impact seabed communities by providing new habitats for colonizing benthic species and fostering flourishing soft-sediment benthic communities. They can also create alternative ecosystems and food chains, attract a variety of fish, or serve as stepping stones for non-indigenous and nuisance species (Dannheim et al., 2019). While this may enhance local biodiversity, it also disrupts the natural seabed and existing ecosystems (Dannheim et al., 2019). Decommissioning OWFs also presents environmental challenges similar to those during construction. The removal of structures, organisms and the question of the reversibility of impacts are all important considerations (R et al., 2022).

Avian interaction with OWFs is another concern. Birds, especially nocturnal migrants, are attracted to illuminated offshore obstacles (Hüppop et al., 2006; Rodríguez et al., 2019), leading to an increased risk of collision (Masden & Cook, 2016) and elevated energy consumption. OWFs can also lead to displacement, habitat loss, and disruption in the migratory paths (Cook et al., 2018; Heinänen et al., 2020).

Ålands Natur & Miljö has concerns about the potential environmental impact of the OWFs project, particularly its effect on the ecosystem. The organization has suggested that the companies involved perform a life cycle analysis to ensure that all stages of the project are environmentally sustainable. If the EIA shows significant impact, they plan to raise awareness about it (Int-Ålands Natur & Miljö).

Despite the uncertainty of the environmental impact due to the early stage of the project, Häger (Int-Ilmatar) claims that there will of course be environmental impacts associated with the construction of the OWFs, however there are methods which can be used to reduced them. She also emphasizes that Finland has one of the strongest environmental legislations in the world. Additionally she thinks that: "if people don't want any impact at all... Then we can just sit down and do nothing. Yeah, and there will be no development or advancements of society. And the most sustainable energy is the one that is not consumed" (Int-Ilmatar). On the other hand, several stakeholders expressed that the construction of the turbines could actually lead to an improvement of the local biodiversity due to protection from large scale fishing and building of turbine foundations assembling artificial coral reefs (Int-Ilmatar, Int-Harry Jansson, Int-Lumparland, Int-OX2).

6 Discussion and Conclusion

6.1. Reflection on the used data collection methods and the theoretical framework

Our chosen method for data collection - semi-structured interviews - provided us with very detailed answers from the interviewed individuals. However, conducting of the interviews, transcribing and analyzing data were very time consuming. This meant that we had to limit the number of conducted interviews. Additionally, it introduced a bias in the form of a language barrier and required the participants to spend a relatively long time. Even though we tried to ensure that we capture a broad variety of opinions from different stakeholders, all the respondents were in favor of building the OWFs, resulting an additional bias to our findings. As a result, it led us to compensate it by including other sources, such as opinion newspaper articles and findings from our literature review. We could have potentially avoided the bias by making and distributing an online questionnaire in the local language, which could be a suggestion for future studies.

The PE framework helped us to understand the general interplay between society, politics, economics, and the environment on Åland. However, we found the EJ framework as more straight forward to use when interpreting data about the distribution of the benefits of the OWFs, because of its clear

concentration on the distributional, recognitional and procedural justice. This led to us using the PE framework in tandem with the EJ framework.

6.2 Critique of the growth model as a motivation to build the farms

The analysis reveals that economic interests, the vision of economic growth and resulting social benefits are to a big extent the driving force behind the development of the OWF on Åland. However, this focus on growth raises several concerns from a PE perspective regarding unintended consequences. In this section we discuss these concerns in the context of the Sunnanvind project.

6.2.1 Rebound Effect and Increased Consumption

Economic growth has often been associated with increased consumption, which can lead to greater environmental impacts (Martinez-Alier, 2002). The renewable energy generated by the wind farms might contribute to a rebound effect, where the savings in the form of decreased fossil fuel usage and lowered carbon emissions are offset by increased consumption, undermining some of the environmental benefits (Galvin et al., 2021; Kim & Trevena, 2021). It is unclear how big the rebound effect would be in the case of this specific project, but, as Brockway et al. (2021) points out, in projects aiming at improving energy efficiency, close coupling between the economy and carbon emissions can lead to rebound effects exceeding 50% (Brockway et al., 2021).

Historically, globally, the growing share of renewables in the electricity supply has not led to a sustained replacement - or to a "transition" from fossil fuels. Instead, it has only led to an "addition" on top of the already established fossil fuel sources (York & Bell, 2019). The fundamental growth dynamic of the capitalist economies with the connected continuous growth of energy consumption are some of the main drivers behind our inability to disconnect from fossil fuels (York & Bell, 2019). Research by Vogel & Hickel (2023) shows that according to the currently achieved rates of decoupling economic growth from CO_2 emissions, it would take high-income countries on average 220 years to cut their emissions by 95%. In order to reach the targets of the Paris Agreement, the decoupling rates would need to be increased by the factor of ten by 2025. Therefore high income countries are unlikely to achieve growth while fullfilling the Paris Agreement in the future and will need to pursue post-growth reduction strategies (Vogel & Hickel, 2023).

6.2.2 The growth-sustainability trade-off

There is a risk that the focus on economic growth could overshadow concerns about social and environmental impacts. As explained in the analysis, the Sunnanvind project carries social and

environmental risks. At the same time the local authorities are under pressure to speed up the approval process. This pressure comes from several sources:

- The EU project funding - which limits the time scale of the preparation project (Int-Sunnanvind)
- The pressure from the wind turbine suppliers, since it is expected that the production lead time of wind turbines might increase in the future and cause further delays (Int-Harry Jansson)
- The pressure from the project companies, who might want to pursue projects in other regions instead (Int-Harry Jansson, Int-Lumparland).

That being said, there are also legal mechanisms which are putting pressure on the authorities to take opinions of the opposition into consideration and find a consensus with the opposition. These include the right to submit a legal complaint - leading to a likely delay of the project (Int-Harry Jansson, Int-Sunnanvind, Int-Lumparland), and a right of each municipality to decide whether they want to allow the construction of the wind farms in their territory.

6.3 Exclusion in the decision making processes

In this section, we apply the frameworks of FPE and EJ to examine the exclusion in the planning and decision-making processes in the case of the Sunnanvind wind farm project.

Our analysis shows that there is a major concern about women not being involved in the discussions about the wind farm projects and also about them being unfairly represented in the decision making, indicating that procedural justice is being compromised. At the same time, the government claims that they are unaware of any possible discrimination or unfair representation (Int-Sunnanvind, Int-Wickström, Int-Harry Jansson) and the deputy of the government points at a lack of interest of women in technical issues being “natural” (Int-Harry Jansson). This is a big concern, because it suggests that there is a lack of recognition of the underlying factors that might be preventing women from participating. As Hellström points out, the intent of these male-dominated discussions could be making women feel uncomfortable (Int-Kommunförbund). Additionally, his statements overlook the broader socio-cultural context and power dynamics that may contribute to the gendered division of interests.

According to EJ perspectives (Feenstra & Özerol, 2021), both recognition and procedural justice are necessary to ensure distributive justice. In the context of this project this could potentially lead to unfair distribution of benefits. The development of the wind farms is supposed to create new education and job opportunities within the energy sector. Those who can use these opportunities will likely financially benefit more than those who cannot, potentially leading to a rise in inequalities (Int-Flexens).

If women end up being the ones underrepresented in this rapidly expanding sector, it could lead to broadening of the economic and power gap and reinforcement of the current gender divides.

A research by (Clancy & Feenstra, 2019) shows that there is a general underrepresentation of women in the energy sector in the EU - especially in the decision-making roles and technical positions. The lack of role models, gender stereotypes, issues with finding work–family life balance and gender-blind policies were some of the main factors leading to unequal gender representation (Clancy & Feenstra, 2019). Similar factors can be observed also on Åland, such as a lack of women in high positions and boardrooms (Int-Ilmatar) and gender stereotypes (Int-Harry Jansson). The sphere of renewable energy and energy systems development tends to be associated with male roles in engineering and technology (Allen et al., 2019; Lieu et al., 2020). This social differentiation along gender lines is seen in the labor market all around the world with women being underrepresented in Science, technology, engineering, and mathematics (STEM) fields (Clancy & Feenstra, 2019). This paradox stresses the need to address the underlying social structures and distribution of social roles that contribute to the gender gap in decision-making in the renewable energy sector. The lack of representation of women in STEM field is the underlying factor that perpetuates gender segregation (Lieu et al., 2020). This gender gap in STEM fields leads to the lack of women's engagement in renewable energy initiatives as women do not have technical knowledge in the renewable energy sector (Tellhed et al., 2017). Moreover, technology being perceived as a masculine domains continues to impede women's participation (Standal et al., 2020). The EIGE index indicates that the significant barrier for women to participate in decision-making is a lack of time which comes from gender inequalities in time use between men and women for housework and caring responsibilities for family members (EIGE, 2022). This leads to women not being able to engage in social participation.

Women participation in decision-making in the energy sector is essential as it enables them to act as role models for others and affect the attitudes on gender in the sector (O'Neil & P, 2015). Therefore, the change of existing social structure and the distribution of social roles are crucial so that women are enabled to participate in the sector. The relationship between gender and energy systems would need more attention from researchers (Allen et al., 2019).

6.4 Distribution of benefits and costs

According to our analysis, the projects are expected to have positive impacts on the growth of society in the form of income, new jobs, and new education opportunities. It is however possible that some local people will be negatively affected - culturally by degradation of the view (Int-OX2) socially or

environmentally by the construction of the port and by increased traffic (Int-Lumparland) and possibly economically by decreased property values (Int-Wickström) and changes to tourism (Int-Ilmatar, Int-OX2).

At the point of the data collection, there were not any clear suggestions for how to deal with the potential inequalities and ensure that the society will fairly benefit from the wind farm projects, nor how to ensure that the environmental, social and economic burdens will be distributed and compensated fairly. There was also a lack of recognition about the potential growth of inequalities as a result of people not being able to equally access the benefits in the form of new educations and job positions, with only Holmström (Int-Flexens) mentioning it as a possibility. Additionally, as we previously identified, women are specifically at the risk of being discriminated against in the processes of distributing of benefits, due to them being fairly represented in the decision-making processes.

There are also widespread concerns about fair sharing of benefits in the form of tax for the municipalities, because of the current property tax rules and a potential growth of inequalities as a result of them. There have already appeared conflicts about the distribution of the benefits between the government and the municipalities, with the Saltvik municipality expecting to take a larger share of the property tax (Blix, 2023). Currently a single municipality is able to block a big part of the project (Blix, 2023), and therefore can pressure the government to get a larger share of the benefits. This can from one point of view be considered fair, because inhabitants of these municipalities would bear a bigger share of the environmental and social burdens in the form of disturbed view and resulting economic, social and cultural impacts. However, the use of the current system where the municipality gets all the property tax would result in a big raise in inequalities, because it would mean that few municipalities with a relatively small number of people would get a large sum of money (Int-Röblom, Int-OX2, Int-Ilmatar).

6.5 The ecology of wind farms and enclosure of the sea and land

At the point of the data collection, the environmental impacts were still unclear as all the EIAs were in progress (Int-OX2, Int-Ilmatar). However, our literature review shows that there are indeed potential impacts on the local flora and fauna. Several actors have expressed concerns about these impacts (Fagerström, 2022, Int-Fågelskydd, Int-Åland Natur och Miljö), while others discussed potential benefits of the wind-turbine foundation acting like an artificial reef leading to an increase in biodiversity (Int-Ilmatar, Int-Harry Jansson, Int-Lumparland, Int-OX2), or areas which will be protected from large scale fishing operations (Int-Ilmatar, Int-OX2). The opposition has expressed concerns about

the release of microplastics and poisonous materials into the water (Lansing, 2023; Toivonen, 2022a, 2022b).

From the standpoint of PE, the discussion about the degradation of the environment surrounding the project Sunnanvind raises important questions about decision making processes, power dynamics and the value assigned to the environment. When deciding how to construct the wind farms (and whether to do it), the actors of the project will be faced with the question of where to draw the line - How much environmental damage is acceptable for the given benefit? From the PE perspective we can examine what power relations are behind these decisions. As Sovacool (2021) suggests, encroachment - damage to the natural environment - may happen indirectly through commodification, which we will discuss in the following sections.

The project will include territorial accumulation of the seabed and of land by large companies. This is because the investment in a project of this scale would be too large for the local community or the local government (Int-Ilmatar, Int-Harry Jansson). The seabed (or sea area) necessary for construction of the wind farms is currently owned by the government and it will be enclosed as a part of a land lease. This process can be labeled as commodification, because it involves transfer of a natural capital which previously has not been used into a 'commodity' that is being sold on the market (Prudham, 2009). As Prudham (2009) emphasizes, this process is not neutral, but is shaped by actors and power relations. In this case the 'commodified' seabed is being rented after negotiations with stakeholders - the authorities, the companies, the population in exchange for financial and economic benefits. Environmental and cultural degradations and territorial accumulation by private companies are results of this transaction. Some actors have expressed concerns about the potential impacts of this accumulation and the resulting power relations - e.g., they expressed concerns about Chinese companies owning the projects (Toivonen, 2022a) (Int-Harry Jansson), about companies which are not ethically connected to Åland owning the natural resources, or about companies not building the wind farms at all (Int-Flexens).

The expansion of the port Långnäs, necessary for assembly of the turbines would likely mean that a certain part of the land would be enclosed. The land around the port is at the moment already likely privately owned and the company conducting the construction will need to buy it from the private owners (Int-Lumparland). This commodification will result in environmental degradation, and it might mean that some people - those who live in the houses or summer houses nearby will have to resettle (Int-Lumparland).

7 Conclusion and future studies

Our research reveals that economic interests and social benefits are the primary drivers of the project. Due to the rebound effect and insufficient decoupling of the economy from the CO_2 emissions, it is unlikely that the achieved growth would be compliant with the Paris agreement. At the same time there are concerns that social and environmental risks might not be given sufficient attention due to pressure for economic growth. While building OWFs is an important step towards phasing out fossil fuels, it's important that the project is stronger aligned with the Paris agreement through enforcement of policies ensuring that the wind power replaces fossil fuels at a sufficient rate instead of growing the overall consumption. Limiting the total amount of electricity produced or restricting the use of fossil fuels may be necessary (York & Bell, 2019).

From the perspective of justice, the OWFs project has several positive aspects. It is run in a democratic country with a strong legal system, where citizens have a decent access to information and have the ability to be represented and participate in the decision making processes. However despite this, we found that women are being underrepresented and excluded from the discussions about OWFs and the decision-making processes. This raises concerns about the likely unjust distribution of benefits in the form of new education and job opportunities, deepening economic disparities. Additionally there are disputes between the municipalities and the government over distribution of property tax and certain municipalities have the ability to block key aspect of the project.

The construction of the OWFs will result in enclosure of the seabed and commodification of the sea area. It is possible that some people perceive the change of the view of the sea as a diminishment of their unique identity and heritage. Despite ongoing EIAs, the environmental impact of the OWFs still remains unclear. Some actors express concerns about potential harm to local flora and fauna while others suggest potential benefits such as increased biodiversity and protection from large-scale fishing operations. Additionally, the expansion of the port Långnäs for turbine assembly would involve enclosure of land, lead to local environmental degradation and potentially resettlement of residents.

Future studies should concentrate on investigation of the rebound effect of OWFs and finding ways of minimizing it (Galvin et al., 2021). Another area which the studies should concentrate on is the gender gap within the energy transition on Åland. This could involve identifying the underlying drivers of the inequalities - especially in the decision-making processes, researching how important this aspect is for women on Åland, finding appropriate responses and potential solutions, and finding ways of implementing them and monitoring progress.

8 References

Abramic, A., García Mendoza, A., & Haroun, R. (2021). Introducing offshore wind energy in the sea space: Canary Islands case study developed under Maritime Spatial Planning principles. *Renewable and Sustainable Energy Reviews*, *145*, 111119. https://doi.org/10.1016/j.rser.2021.111119

Agarwal, B. (1997). "Bargaining" and Gender Relations: Within and Beyond the Household. *Feminist Economics*, *3*(1), 1–51. https://doi.org/10.1080/135457097338799

Aitken, M. (2010). Why we still don't understand the social aspects of wind power: A critique of key assumptions within the literature. *Energy Policy*, *38*(4), 1834–1841. https://doi.org/10.1016/j.enpol.2009.11.060

Ålands landskapsregering. (2019, September 5). *Fakta om Åland | Åland.ax*. https://www.aland.ax/sv/fakta-om-aland

Ålands landskapsregering. (2022, February 10). *Marin- och kustområdesplanering (Havsplanering) | Ålands landskapsregering*. https://www.regeringen.ax/demokrati-hallbarhet/hallbar-utveckling/marin-kustomradesplanering-havsplanering

Ålands landskapsregering. (2023, March). *Projekt Sunnanvind presenterade Ålands potential för storskalig havsbaserad vindkraft på Vaasa Energy Week (21-22.3.2023) | Ålands landskapsregering*. https://www.regeringen.ax/nyheter/projekt-sunnanvind-presenterade-alands-potential-storskalig-havsbaserad-vindkraft-pa-vaasa-energy

Ålandsbanken. (2023, February 3). *OX2 and the Bank of Åland plan a Mega Green Port project in Åland*. Ålandsbanken. https://www.alandsbanken.com/news/ox2-and-the-bank-of-aland-plan-mega-green-ort-project-in-aland

Alem, M., Herberz, T., Karanayil, V. S., & Fardin, A. A. H. (2020). A Qualitative meta-analysis of the socioeconomic impacts of offshore wind farms. *Sustinere: Journal of Environment and Sustainability*, *4*(3), Article 3. https://doi.org/10.22515/sustinere.jes.v4i3.121

Allen, E., Lyons, H., & Stephens, J. C. (2019). Women's leadership in renewable transformation, energy justice and energy democracy: Redistributing power. *Energy Research & Social Science*, *57*. https://doi.org/10.1016/j.erss.2019.101233

ÅMHM. (n.d.). *Välkommen till Ålands miljö- och hälsoskyddsmyndighet! | Ålands miljö- och hälsoskyddsmyndighet*. Retrieved May 6, 2023, from https://www.amhm.ax/

Arnold, A. (2015). *Narratives of Climate Change. Outline of a systematic approach to narrative analysis in cultural sociology.*

ÅSUB. (2023). *Passengers arriving in Åland 1958–2022.* https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.asub.ax%2Fsites%2Fdefault%2Ffiles%2Fmedia%2Fdocument%2FTU01en_Passengers%2520arriving%2520in%2520%25C3%2585land%25201958%25E2%2580%25932022.xlsx&wdOrigin=BROWSELINK

Bell, S. E., Daggett, C., & Labuski, C. (2020). Toward feminist energy systems: Why adding women and solar panels is not enough☆. *Energy Research & Social Science*, *68*, 101557. https://doi.org/10.1016/j.erss.2020.101557

Benjaminsen, T. A., & Svarstad, H. (2019). Political Ecology. In B. Fath (Ed.), *Encyclopedia of Ecology (Second Edition)* (pp. 391–396). Elsevier. https://doi.org/10.1016/B978-0-12-409548-9.10608-6

Blix, L. (2023, February 1). *Saltvik sätter hård press på LR Kravet för vindkraft: "Fastighetsskatten ska komma oss till godo."* https://app.retriever-info.com/go-article/0577002023020183538 6e6e9533e71ba11097bd3259d18/null/archive/search?type=jwt

Bogner, A., Littig, B., & Menz, W. (2009). *Interviewing Experts*. Springer.

Bridge, G., Barca, S., Özkaynak, B., Turhan, E., & Wyeth, R. (2018). Towards a Political Ecology of EU Energy Policy. In C. Foulds & R. Robison (Eds.), *Advancing Energy Policy* (pp. 163–175). Springer International Publishing. https://doi.org/10.1007/978-3-319-99097-2_11

Bridge, G., Bouzarovski, S., Bradshaw, M., & Eyre, N. (2013). Geographies of energy transition: Space, place and the low-carbon economy. *Energy Policy*, *53*, 331–340. https://doi.org/10.1016/j.enpol.2012.10.066

Brockway, P. E., Sorrell, S., Semieniuk, G., Heun, M. K., & Court, V. (2021). Energy efficiency and economy-wide rebound effects: A review of the evidence and its implications. *Renewable and Sustainable Energy Reviews*, *141*, 110781. https://doi.org/10.1016/j.rser.2021.110781

Bumpus, A. G., & Liverman, D. M. (2008). Accumulation by Decarbonization and the Governance of Carbon Offsets. *Economic Geography*, *84*(2), 127–155.

Clancy, J., & Feenstra, M. (2019). *Women, Gender Equality and the Energy Transition in the EU*. Publications Office of the European Union. https://doi.org/10.2861/750279

Cook, A. S. C. P., Humphreys, E. M., Bennet, F., Masden, E. A., & Burton, N. H. K. (2018). Quantifying avian avoidance of offshore wind turbines: Current evidence and key knowledge gaps. *Marine Environmental Research*, *140*, 278–288. https://doi.org/10.1016/j.marenvres.2018.06.017

Creswell, J. W., & Poth, C. N. (2017). *Qualitative inquiry and research design: Choosing among five approaches* (V-husets bibliotek LTH Risk REF/Cre; Fourth edition). Sage Publications.

Dannheim, J., Bergström, L., Birchenough, S. N. R., Brzana, R., Boon, A. R., Coolen, J. W. P., Dauvin, J.-C., De Mesel, I., Derweduwen, J., Gill, A. B., Hutchison, Z. L., Jackson, A. C., Janas, U., Martin, G., Raoux, A., Reubens, J., Rostin, L., Vanaverbeke, J., Wilding, T. A., … Degraer, S. (2020). Benthic effects of offshore renewables: Identification of knowledge gaps and urgently needed research. *ICES Journal of Marine Science*, *77*(3), 1092–1108. https://doi.org/10.1093/icesjms/fsz018

Dannheim, J., Degraer, S., Elliott, M., Smyth, K. L., & Wilson, J. C. (2019). Seabed communities. In *Wildlife and Wind Farms, Conflicts and Solutions (Volume 3: Offshore: Potential Effects)* (pp. 64–85). Pelagic Publishing. https://epic.awi.de/id/eprint/49664/

Devine-Wright, P. (2005). Beyond NIMBYism: Towards an integrated framework for understanding public perceptions of wind energy. *Wind Energy*, *8*(2), 125–139. https://doi.org/10.1002/we.124

Dornan, M. (2014). Access to electricity in Small Island Developing States of the Pacific: Issues and challenges. *Renewable and Sustainable Energy Reviews*, *31*, 726–735. https://doi.org/10.1016/j.rser.2013.12.037

EESC. (2021). *New approach for a sustainable blue economy in the EU*. European Economic and Social Committee. https://www.eesc.europa.eu/en/our-work/opinions-information-reports/opinions/new-approach-sustainable-blue-economy-eu

EIGE. (2022). *Gender Equality Index | 2022 | European Union*. European Institute for Gender Equality. https://eige.europa.eu/gender-equality-index/2022/country

Ellis, G., & Ferraro, G. (2016). *The Social Acceptance of Wind Energy: Where we stand and the*

path ahead. https://doi.org/10.2789/696070

Energistyrelsen. (2021, March 3). *Denmark's Energy Islands*. Energistyrelsen. https://ens.dk/en/our-responsibilities/energy-islands/denmarks-energy-islands

Fagerström, S. F. (2022, December 30). *NEJ till havsbaserad vindkraft runt Åland.* Skrivunder.Com. https://www.skrivunder.com/nej_tillhavsbaserad_vindkraft_runt_aland

Feenstra, M., & Özerol, G. (2021). Energy justice as a search light for gender-energy nexus: Towards a conceptual framework. *Renewable and Sustainable Energy Reviews*, *138*, 110668. https://doi.org/10.1016/j.rser.2020.110668

Finish Wind Power Association. (n.d.). *Determination of wind farm property tax*. Suomen Tuulivoimayhdistys. Retrieved May 2, 2023, from https://tuulivoimayhdistys.fi/en/wind-power-in-finland-2/wind-power-in-finland/property-tax/property-tax-of-a-wind-turbine

Firestone, J., Bates, A., & Knapp, L. A. (2015). See me, Feel me, Touch me, Heal me: Wind turbines, culture, landscapes, and sound impressions. *Land Use Policy*, *46*, 241–249. https://doi.org/10.1016/j.landusepol.2015.02.015

Flexens. (2023, February 16). *Utredning av Ålands växthusgasutsläpp*. Smart Energy Åland. https://smartenergy.ax/vaxthusgaser-aland/

Forsyth, T. (2008). Political ecology and the epistemology of social justice. *Geoforum*, *39*(2), 756–764. https://doi.org/10.1016/j.geoforum.2006.12.005

Galan, M. (2021). Role of product standards in the acceleration of the Indian energy transition: The case of the Indian off-grid solar sector. *Global Transitions*, *3*, 89–98. https://doi.org/10.1016/j.glt.2021.08.001

Galvin, R., Dütschke, E., & Weiß, J. (2021). A conceptual framework for understanding rebound effects with renewable electricity: A new challenge for decarbonizing the electricity sector. *Renewable Energy*, *176*, 423–432. https://doi.org/10.1016/j.renene.2021.05.074

Gielen, D., Boshell, F., Saygin, D., Bazilian, M. D., Wagner, N., & Gorini, R. (2019). The role of renewable energy in the global energy transformation. *Energy Strategy Reviews*, *24*, 38–50. https://doi.org/10.1016/j.esr.2019.01.006

Gillaumekln. (2023). *GitHub—Guillaumekln/faster-whisper: Faster Whisper transcription with*

CTranslate2. https://github.com/guillaumekln/faster-whisper

Glasson, J., Durning, B., Welch, K., & Olorundami, T. (2022). The local socio-economic impacts of offshore wind farms. *Environmental Impact Assessment Review*, *95*, 106783. https://doi.org/10.1016/j.eiar.2022.106783

Grönstrand, J. (2023, March). *Kan vindkraften bli ett militärt mål?* https://www.nyan.ax/insandare/kan-vindkraften-bli-ett-militart-mal/

Haggett, C. (2008). Over the Sea and Far Away? A Consideration of the Planning, Politics and Public Perception of Offshore Wind Farms. *Journal of Environmental Policy & Planning*, *10*(3), 289–306. https://doi.org/10.1080/15239080802242787

Haggett, C. (2011). Understanding Public Responses to Offshore Wind Power. *Energy Policy*, *39*(2), 503–510. https://doi.org/10.1016/j.enpol.2010.10.014

Heinänen, S., Žydelis, R., Kleinschmidt, B., Dorsch, M., Burger, C., Morkūnas, J., Quillfeldt, P., & Nehls, G. (2020). Satellite telemetry and digital aerial surveys show strong displacement of red-throated divers (Gavia stellata) from offshore wind farms. *Marine Environmental Research*, *160*, 104989. https://doi.org/10.1016/j.marenvres.2020.104989

Heynen, N., & Robbins, P. (2005). The neoliberalization of nature: Governance, privatization, enclosure and valuation. *Capitalism Nature Socialism*, *16*(1), 5–8. https://doi.org/10.1080/1045575052000335339

Huber, M. (2015). Energy and Social Power: From political ecology to the ecology of politics. In *The Routledge Handbook of Political Ecology*. Routledge.

Hüppop, O., Dierschke, J., Exo, K.-M., Fredrich, E., & Hill, R. (2006). Bird Migration and Offshore Wind Turbines. In J. Köller, J. Köppel, & W. Peters (Eds.), *Offshore Wind Energy: Research on Environmental Impacts* (pp. 91–116). Springer. https://doi.org/10.1007/978-3-540-34677-7_9

Ilmatar. (2022, October 10). *Ilmatar begins comprehensive seabed survey for 2.1 GW offshore wind energy project north of Åland*. Ilmatar. https://ilmatar.fi/en/ilmatar-begins-comprehensive-seabed-survey-for-2-1-gw-offshore-wind-energy-project-north-of-aland/

IPCC. (2023). *Climate Change 2023: Synthesis Report. A Report of the Intergovernmental Panel on Climate Change. Contribution of Working Groups I, II and III to the Sixth*

Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, H. Lee and J. Romero (eds.)]. IPCC. https://www.ipcc.ch/report/ar6/syr/

IRENA, & CPI. (2023). *Global landscape of renewable energy finance 2023*. International Renewable Energy Agency. https://www.irena.org/Publications/2023/Feb/Global-landscape-of-renewable-energy-finance-2023

Jansson, R. L. (2023, January 3). *Till vilket pris vill vi ha vindkraft?* https://www.nyan.ax/insandare/till-vilket-pris-vill-vi-ha-vindkraft/

Jenkins, K., McCauley, D., Heffron, R., Stephan, H., & Rehner, R. (2016). Energy justice: A conceptual review. *Energy Research & Social Science*, *11*, 174–182. https://doi.org/10.1016/j.erss.2015.10.004

Johansson, B. (2023, January 23). *Vindkraften och dess inverkan på vår livsmiljö*. https://www.nyan.ax/insandare/vindkraften-och-dess-inverkan-pa-var-livsmiljo/

Karlsson, D. (2021, October 13). *Hur påverkas Åland av höga elpriser?* Smart Energy Åland. https://smartenergy.ax/hur-paverkas-aland-av-hoga-elpriser/

Kikuchi, R. (2010). Risk formulation for the sonic effects of offshore wind farms on fish in the EU region. *Marine Pollution Bulletin*, *60*(2), 172–177. https://doi.org/10.1016/j.marpolbul.2009.09.023

Kim, J. D., & Trevena, W. (2021). Measuring the rebound effect: A case study of residential photovoltaic systems in San Diego. *Utilities Policy*, *69*, 101163. https://doi.org/10.1016/j.jup.2020.101163

Knuth, S., Behrsin, I., Levenda, A., & McCarthy, J. (2022). New political ecologies of renewable energy. *Environment and Planning E: Nature and Space*, *5*(3), 997–1013. https://doi.org/10.1177/25148486221108164

Kraftnat. (2023). *Driftcentralen—Just nu i Ålands stamledningsnät*. https://kraftnat.ax/driftcentralen/

Kraftnät Åland. (2023). *Operations Centre—Currently in Åland's main grid*. https://kraftnat.ax/driftcentralen/

Ladenburg, J. (2009). Visual impact assessment of offshore wind farms and prior experience. *Applied Energy*, *86*(3), 380–387. https://doi.org/10.1016/j.apenergy.2008.05.005

Lansing, K. (2023, February 28). *Alternativ till storskalig vindkraftsindustri i åländska vatten*. https://www.nyan.ax/insandare/alternativ-till-storskalig-vindkraftsindustri-i-

alandska-vatten/

Levenda, A. M., Behrsin, I., & Disano, F. (2021). Renewable energy for whom? A global systematic review of the environmental justice implications of renewable energy technologies. *Energy Research & Social Science*, *71*, 101837. https://doi.org/10.1016/j.erss.2020.101837

Lieu, J. (1, 2), Sorman, A. h. (3, 4), Johnson, O. w. (5), Virla, L. d. (6), & Resurrección, B. p. (7). (2020). Three sides to every story: Gender perspectives in energy transition pathways in Canada, Kenya and Spain. *Energy Research and Social Science*, *68*. https://doi.org/10.1016/j.erss.2020.101550

Mabon, L., Kita, J., & Xue, Z. (2017). Challenges for social impact assessment in coastal regions: A case study of the Tomakomai CCS Demonstration Project. *Marine Policy*, *83*, 243–251. https://doi.org/10.1016/j.marpol.2017.06.015

Madsen, P., Wahlberg, M., Tougaard, J., Lucke, K., & Tyack, P. (2006). Wind turbine underwater noise and marine mammals: Implications of current knowledge and data needs. *Marine Ecology Progress Series*, *309*, 279–295. https://doi.org/10.3354/meps309279

Martinez-Alier, J. (2002). *The environmentalism of the poor: A study of ecological conflicts and valuation* (Sambib 333.7). Edward Elgar.

Masden, E. A., & Cook, A. S. C. P. (2016). Avian collision risk models for wind energy impact assessments. *Environmental Impact Assessment Review*, *56*, 43–49. https://doi.org/10.1016/j.eiar.2015.09.001

Melander, S. (2022). *Somebody should do something: A qualitative study to determine challenges that politicians face in decsion-making to mitigate climate change*. https://urn.kb.se/resolve?urn=urn:nbn:se:hig:diva-39784

Mihas, P. (2023). Qualitative research methods: Approaches to qualitative data analysis. In R. J. Tierney, F. Rizvi, & K. Ercikan (Eds.), *International Encyclopedia of Education (Fourth Edition)* (pp. 302–313). Elsevier. https://doi.org/10.1016/B978-0-12-818630-5.11029-2

Neumann, R. P. (2009). Political Ecology. In R. Kitchin & N. Thrift (Eds.), *International Encyclopedia of Human Geography* (pp. 228–233). Elsevier. https://doi.org/10.1016/B978-008044910-4.00580-0

Newell, P., & Mulvaney, D. (2013). The political economy of the 'just transition.' *The Geographical Journal*, *179*(2), 132–140. https://doi.org/10.1111/geoj.12008

Nightingale, A. (2006). The Nature of Gender: Work, Gender, and Environment. *Environment and Planning D: Society and Space*, *24*(2), 165–185. https://doi.org/10.1068/d01k

Oh, H.-T., Chung, Y., Jeon, G., & Shim, J. (2021). Review of the marine environmental impact assessment reports regarding offshore wind farm. *Fisheries and Aquatic Sciences*, *24*(11), 341–350. https://doi.org/10.47853/FAS.2021.e33

O'Neil, T., & P, D. (2015). *The Power to Decide: Women, Decision-Making and Gender Equality*. https://www.academia.edu/18499044/The_Power_to_Decide_Women_Decision_Making_and_Gender_Equality

OpenAI. (2022, September 21). *Introducing Whisper*. https://openai.com/research/whisper

OX2. (2022a, June 27). *OX2 applies for a permit to construct the offshore wind farm Aurora under the act of Sweden's Exclusive Economic Zone—OX2*. https://www.ox2.com/newsroom/press-releases-news/2022/ox2-applies-for-a-permit-to-construct-the-offshore-wind-farm-aurora-under-the-act-of-swedens-exclusive-economic-zone/

OX2. (2022b, September). *OX2 adds offshore wind project outside Åland of about 5,000 MW to the development portfolio—OX2*. https://www.ox2.com/newsroom/press-releases-news/2022/ox2-adds-offshore-wind-project-outside-aland-of-about-5000-mw-to-the-development-portfolio/

OX2. (2023, February 24). *OX2 presenterar EnergiArena Åland 2023*. https://www.ox2.ax/ox2-presenterar-energiarena-aland-2023

Patton, M. Q. (2014). *Qualitative Research & Evaluation Methods: Integrating Theory and Practice*. SAGE Publications.

Paul Robbins. (2019). *Political Ecology: A Critical Introduction: Vol. 3rd ed*. Wiley-Blackwell. https://ludwig.lub.lu.se/login?url=https://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,uid&db=nlebk&AN=2270618&site=eds-live&scope=site

Prudham, S. (2009). Commodification. In *A Companion to Environmental Geography* (pp. 123–142). John Wiley & Sons, Ltd. https://doi.org/10.1002/9781444305722.ch9

Pryor, S. C., Barthelmie, R. J., & Shepherd, T. J. (2021). Wind power production from very

large offshore wind farms. *Joule*, *5*(10), 2663-2686.

Pussinen, P. (2022, July 8). *Ytterligare ett bolag ger sig in i vindkraftsstriden—Ålandstidningen*. https://app.retriever-info.com/go-article/057700202207086bec1b157d0ae47648ae418f00dbae30/null/archive/search?type=jwt

Pyrhönen, O., Laaksonen, P., Lassila, J., Karjunen, H., Hynynen, K., Taulasto, K., Karppanen, J., & Vilppo, J. (2021). *Carbon Negative Åland: Strategic Roadmap* [Report]. LUT University. https://lutpub.lut.fi/handle/10024/163456

R, H., E, T., & E, J. (2022). Environmental Impact Assessment for the decommissioning of offshore wind farms. *Renewable and Sustainable Energy Reviews*, *165*, 112580. https://doi.org/10.1016/j.rser.2022.112580

Ribot, J. C., & Peluso, N. L. (2003). A Theory of Access*. *Rural Sociology*, *68*(2), 153–181. https://doi.org/10.1111/j.1549-0831.2003.tb00133.x

Rodríguez, A., Arcos, J. M., Bretagnolle, V., Dias, M. P., Holmes, N. D., Louzao, M., Provencher, J., Raine, A. F., Ramírez, F., Rodríguez, B., Ronconi, R. A., Taylor, R. S., Bonnaud, E., Borrelle, S. B., Cortés, V., Descamps, S., Friesen, V. L., Genovart, M., Hedd, A., … Chiaradia, A. (2019). Future Directions in Conservation Research on Petrels and Shearwaters. *Frontiers in Marine Science*, *6*. https://www.frontiersin.org/articles/10.3389/fmars.2019.00094

Sovacool, B. K. (2018). Bamboo Beating Bandits: Conflict, Inequality, and Vulnerability in the Political Ecology of Climate Change Adaptation in Bangladesh. *World Development*, *102*, 183–194. https://doi.org/10.1016/j.worlddev.2017.10.014

Sovacool, B. K. (2021). Who are the victims of low-carbon transitions? Towards a political ecology of climate change mitigation. *Energy Research & Social Science*, *73*, 101916. https://doi.org/10.1016/j.erss.2021.101916

Sovacool, B. K., Bell, S. E., Daggett, C., Labuski, C., Lennon, M., Naylor, L., Klinger, J., Leonard, K., & Firestone, J. (2023). Pluralizing energy justice: Incorporating feminist, anti-racist, Indigenous, and postcolonial perspectives. *Energy Research & Social Science*, *97*, 102996. https://doi.org/10.1016/j.erss.2023.102996

Sovacool, B. K., & Dworkin, M. H. (2015). Energy justice: Conceptual insights and practical applications. *Applied Energy*, *142*, 435–444.

https://doi.org/10.1016/j.apenergy.2015.01.002

Sovacool, B. K., Linnér, B.-O., & Goodsite, M. E. (2015). The political economy of climate adaptation. *Nature Climate Change*, *5*(7), Article 7. https://doi.org/10.1038/nclimate2665

Standal, K., Talevi, M., & Westskog, H. (2020). Engaging men and women in energy production in Norway and the United Kingdom: The significance of social practices and gender relations. *Energy Research & Social Science*, *60*, 101338. https://doi.org/10.1016/j.erss.2019.101338

Sundberg, J. (2017). Feminist Political Ecology. In *International Encyclopedia of Geography* (pp. 1–12). John Wiley & Sons, Ltd. https://doi.org/10.1002/9781118786352.wbieg0804

Tellhed, U., Bäckström, M., & Björklund, F. (2017). Will I Fit in and Do Well? The Importance of Social Belongingness and Self-Efficacy for Explaining Gender Differences in Interest in STEM and HEED Majors. *Sex Roles*, *77*(1), 86–96. https://doi.org/10.1007/s11199-016-0694-y

Toivonen, S. (2022a, December 1). *Den ohållbara vindkraften – Del I*. https://www.nyan.ax/insandare/den-ohallbara-vindkraften-del-i/

Toivonen, S. (2022b, December 4). *Den ohållbara vindkraften del II*. https://www.nyan.ax/insandare/den-ohallbara-vindkraften-del-ii/

Topham, E., & McMillan, D. (2017). Sustainable decommissioning of an offshore wind farm. *Renewable Energy*, *102*, 470–480. https://doi.org/10.1016/j.renene.2016.10.066

Turner, W., Bradley, B., Estes, L., Hole, D., Oppenheimer, M., & Wilcove, D. (2010). Climate change: Helping nature survive the human response. *Conservation Letters*, *3*, 304–312. https://doi.org/10.1111/j.1755-263X.2010.00128.x

Verba, S., Schlozman, K. L., & Brady, H. E. (1995). *Voice and Equality: Civic Voluntarism in American Politics*. Harvard University Press.

Vogel, J., & Hickel, J. (2023). Is green growth happening? An empirical analysis of achieved versus Paris-compliant CO2–GDP decoupling in high-income countries. *The Lancet Planetary Health*, *7*(9), e759-e769.

Walker, P. A. (2005). Political ecology: Where is the ecology? *Progress in Human Geography*, *29*(1), 73–82. https://doi.org/10.1191/0309132505ph530pr

Wang, T., Ru, X., Deng, B., Zhang, C., Wang, X., Yang, B., & Zhang, L. (2023). Evidence that offshore wind farms might affect marine sediment quality and microbial communities. *Science of The Total Environment*, *856*, 158782. https://doi.org/10.1016/j.scitotenv.2022.158782

Wiersma, B., & Devine-Wright, P. (2014). Public engagement with offshore renewable energy: A critical review. *WIREs Climate Change*, *5*(4), 493–507. https://doi.org/10.1002/wcc.282

Wiese, K. (2020). Energy 4 all? Investigating gendered energy justice implications of community-based micro-hydropower cooperatives in Ethiopia. *Innovation: The European Journal of Social Science Research*, *33*(2), 194–217. https://doi.org/10.1080/13511610.2020.1745059

Willsteed, E. A., Jude, S., Gill, A. B., & Birchenough, S. N. R. (2018). Obligations and aspirations: A critical evaluation of offshore wind farm cumulative impact assessments. *Renewable and Sustainable Energy Reviews*, *82*(Part 3), 2332–2345. https://doi.org/10.1016/j.rser.2017.08.079

Wolsink, M. (2007a). Planning of renewables schemes: Deliberative and fair decision-making on landscape issues instead of reproachful accusations of non-cooperation. *Energy Policy*, *35*(5), 2692–2704. https://doi.org/10.1016/j.enpol.2006.12.002

Wolsink, M. (2007b). Wind power implementation: The nature of public attitudes: Equity and fairness instead of 'backyard motives.' *Renewable and Sustainable Energy Reviews*, *11*(6), 1188–1207. https://doi.org/10.1016/j.rser.2005.10.005

Yin, R. K. (2017). *Case Study Research and Applications: Design and Methods*. SAGE Publications.

York, R., & Bell, S. E. (2019). Energy transitions or additions?: Why a transition from fossil fuels requires more than the growth of renewable energy. *Energy Research & Social Science*, *51*, 40–43. https://doi.org/10.1016/j.erss.2019.01.008

Zimmerer, K. S. (2006). Cultural ecology: At the interface with political ecology - the new geographies of environmental conservation and globalization. *Progress in Human Geography*, *30*(1), 63–78. https://doi.org/10.1191/0309132506ph591pr

Appendix 1 - Interviewed stakeholders and used opinion articles

We interviewed the following stakeholders:

Companies applying for building the wind farms:

Ilmatar (Int-Ilmatar) - Anna Häger - Regional manager, Anna Karlsson - communicator and social strategist

OX2 (Int-OX2) - Anders Wiklund - Regional ambassador

We also attempted to interview the company Svea Vind Offshore, however we did not receive a reply from them.

Government representatives engaged in the Sunnanvind project:

Deputy head of the government - Harry Jansson (Int-Harry Jansson)

Minister of Infrastructure and the Environment - Christian Wickström (Int-Wickström)

The team of the project Sunnanvind lead by the project owner - Stefan Fransman (Int-Sunnanvind)

Local politicians representing opinions of the general public:

A former Minister of Energy and Environment (until autumn 2022) and a politician in the opposition - Alfons Röblom (Int-Röblom)

We also attempted to interview politicians Stephan Toivonen and Stellan Egeland - who represent local people in opposition towards the project. In the case of Stephan Toivonen we did not receive a reply and in the case of Stellan Egeland we were unable to agree on an interview.

Authorities giving permits for building of the wind farm:

Head of the Ålands miljö- och hälsoskyddsmyndighet (ÅMHM) (environmental and health protection authority) (Int-ÅMHM) - Helena Boman

Local non-governmental organizations involved in local environmental and social issues:

Forman of Ålands fågelskyddsförening (bird protection association) (Int-Fågelskydd)- Johan Ekholm

Operations manager at Åland Natur och Miljö (local NGO for protection of the environment) (Int-Åland

Natur och Miljö) - Josefine Egenfelt

We also attempted to interview Bärkraft - which is an open network organization for people in Åland building a sustainable society - specifically regarding getting an independent opinion about social issues on Åland, however despite trying to contact 4 people we either did not receive a reply or we were rejected an interview.

Local companies independently engaged in the energy transition on Åland

Flexens (Int-Flexens) - Berndt Schalin - CEO, Jonas Holmström - Citizen Engagement Officer

Representatives of the municipalities:

The director of the Lumparland municipality (municipality where company OX2 plans to build a hydrogen port in connection with the wind farm) (Int-Lumparland) - Mattias Jansryd
The director of the Ålands association of municipalities (Int-Kommunförbund) Minna Hellström

We also attempted to interview Saltvik municipality and Lemland municipality who could represent municipalities which would directly be impacted by, and benefit from the wind farm projects. We did not receive a reply from Saltvik municipality and could not agree on a suitable meeting time with Lemland municipality (but instead got referred to the association of municipalities).

We used the following opinion articles:

“Alternative to large-scale wind power industry in Åland waters” by Lansing (2023).
“At what price do we want wind power?” by Jansson (2023).
“Can wind power become a military target?” by Grönstrand (2023).
“The unsustainable wind power – Part I” by Toivonen (2022a).
“The unsustainable wind power part II” by Toivonen (2022b).
“Wind power and its impact on our living environment?” by Johansson (2023).

Appendix 2 - Interview guide

Interview questions for environmental protection organizations - Ålands Natur & Miljö and organizations representing civil society - bärkraft.ax

Introduction to the interview

- We are students from Lund University working on a master thesis about the role of civil society in the energy transition on Åland Islands.
- We would like to ask you a few questions about the planned offshore wind-farm projects on the north and south of Åland known as the project Sunnanvind. The interview is expected to take 45 min (and as an absolute maximum 1h).
- Could we record the audio from the interview for the purpose of transcribing it? The recordings will be destroyed after transcription is done.

Introduction questions about the person

- Could you tell us your name?
- Could you tell us your name, role in the organization and how did you get involved?

Introduction questions about the project

- Could you shortly explain to us the aims and goals of your organization?
- How has your organization so far engaged in offshore wind power projects?
- How are you collaborating with other organizations or companies that are also involved in the energy transition on Åland island?

THEME 1 - The concept of Exclusion (unfair planning) - RQ2 - How has civil society been involved and fairly represented in the planning of the project and in the decision-making process? Has the local population been informed about the possible negative impacts?

How does your organization engage in the local governing and decision making processes?

Have you engaged in any informational campaign about the project Sunnanvind?

Are there any groups among the local population which are (or are at risk of being) marginalized, discriminated, or unequally represented in the decision making processes?

How will the project affect local people and communities, both in terms of benefits and potential negative impacts?

Have you encountered any concerns from local people? How do you think they should be addressed? Should they receive any compensation?

THEME 2 - The concept of Enclosure (capture of resources) - RQ1 - Will the land/sea area used for the energy transition be transferred into private ownership? Will the energy transition lead to 'green-grabbing', territorial accumulation or expansion of capital?

What is the role of your organization in the process of buying or leasing land, sea bed or other resources to private companies for the purpose of the project Sunnanvind?

Do you see any risks in privatization of the sea bed? Or in territorial accumulation by private companies?

THEME 3 - The concept of Encroachment (destruction of the environment) - RQ3 - Will the energy transition lead to any negative environmental impacts?

Do you know about any potential impacts on the local environment by the offshore wind farm projects?

- local marine environment - marine wildlife and ecosystems
- changes to the water quality, sedimentation,
- local and migratory birds

Are there any protected natural areas, or areas with high biodiversity, which could be negatively impacted by the project?

Has your organization suggested any potential measures to minimize the environmental impacts?

Does your organization plan to engage in dialog with local residents about environmental risks and impacts?

- Are local people sufficiently informed about these impacts?

THEME 4 - The concept of Entrenchment (worsening of inequality or vulnerability) - RQ4 - Will implementation of the project lead to growth of the existing inequalities? Will it disrupt the livelihoods of people, deteriorate the value of cultural expression or limit their practices?

Are there any vulnerable groups in the local community who could be negatively affected by the project, for example by having disrupted livelihoods, limited cultural expression?

- tourist business
- property values
- fishing industry (e.g. by not having access to fisheries)

Are there any inequalities on Åland? Are there any groups which are better off or have more power than the others?

- Could the Wind Farm project in any way increase these inequalities?

What kind of measures do you think should be put in place to ensure that the benefits of the wind farm projects are distributed fairly and do not exacerbate existing inequalities in the local community? (e.g. property tax and kommune)