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# IMPROVING FRAMEWORK CONDITIONS FOR WIND DEVELOPMENT IN SWEDEN

GROWTH ANALYSIS, THE SWEDISH AGENCY FOR GROWTH POLICY ANALYSIS  
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## PREFACE

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Sweden has ambitious climate goals and aims to become net zero in 2045.<sup>1</sup> To reach this, Sweden needs political focus, private investments, and urgency across many different sectors. Renewable energy (RE) from wind, solar, and hydropower is already in high demand from Swedish households and industries and is absolutely necessary for a successful green transition. However, wind developers experience barriers for establishing RE projects in Sweden, which could ultimately lead to fewer investments in RE in the future which may have consequences for the transition of energy-intensive sectors to more renewable practises in Sweden. This may also deter Sweden's attractiveness as a destination for energy intensive industries.

Against this backdrop, Copenhagen Economics has been commissioned by *Growth Analysis*, the Swedish Agency for Growth Policy Analysis, to contrast and compare Swedish permitting process and spatial prioritisation of land areas and seabed – *specifically for wind development* – relative to Denmark and Finland, to uncover barriers for location-specific wind investments in Sweden and identification of best practises to overcome these barriers.

We followed a two-step approach. Firstly, we researched the permitting processes and the spatial planning of land and seabed in the three countries from publicly available resources and government authorities. We comprised this to cover the key aspects of wind development in the three countries. Secondly, we carried out interviews with the Swedish wind developers' association and four developers with industry knowledge and regional market insights to uncover barriers, best practises, and recommendations. The interviews are summarised in an appendix and anonymised to safeguard non-disclosure of commercially sensitive data.

In the report, we distinguish between onshore and offshore wind, as these are different in terms of market maturity and the regulatory framework in the three countries.

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<sup>1</sup> Swedish Government (2021).

## TABLE OF CONTENTS

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Preface	0
Executive summary	2
1 The framework conditions for wind in Sweden, Denmark, and Finland	5
2 Barriers to wind development in Sweden	11
3 Best practices	16
References	21
Onshore permitting and planning	28
Offshore permitting and planning	30
NEKST recommendations	33
Summary of interviews	34

## EXECUTIVE SUMMARY

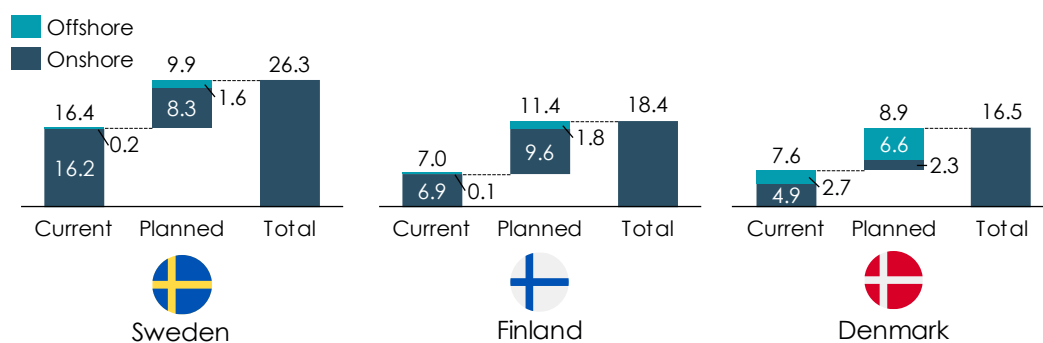
Wind power is one of the key technologies to produce renewable energy (RE) for substituting fossil fuels in energy generation. In total, wind covered 26 per cent of power generation in Sweden in 2023, whereas it covered 56 per cent in Denmark and 18 per cent in Finland.<sup>2</sup>

By the end of 2023, Sweden had 16.2 GW *onshore* wind capacity, see Figure 1, and is expected to add 8.3 GW onshore capacity by 2030. Finland and Denmark had 6.9 GW and 4.9 GW onshore capacity by 2023, respectively. Finland is expected to increase its onshore capacity by 9.6 GW towards 2030, and Denmark by 2.3 GW.

For *offshore* wind, Denmark had 2.7 GW capacity installed by 2023 and is expected to add 6.6 GW of additional capacity by 2030, see Figure 1. Sweden and Finland both have less than 0.2 GW offshore capacity as of 2023, but both countries are expected to increase their offshore wind capacities towards 2030.

**Figure 1: Capacity as of 2023 and expected capacity in 2030 of onshore and offshore wind power in Sweden, Finland, and Denmark**

GW



Note: Denmark is currently planning 9 GW tenders for offshore wind projects, where most is planned to be up and running in 2030. Windeurope estimates this number at 6.6 GW. For Sweden, 3.3 GW of offshore wind is currently approved, but some of these is not expected to be ready by 2030.

Sources: Windeurope (2024), Klima- Energi- og Forsyningsministeriet (2024a) & Svensk Vindenergi (2024)

### *Framework conditions for wind in Sweden, Denmark, and Finland*

Framework conditions cover regulatory conditions, such as permitting processes, spatial planning of a given area for renewable energy production, and general market conditions.

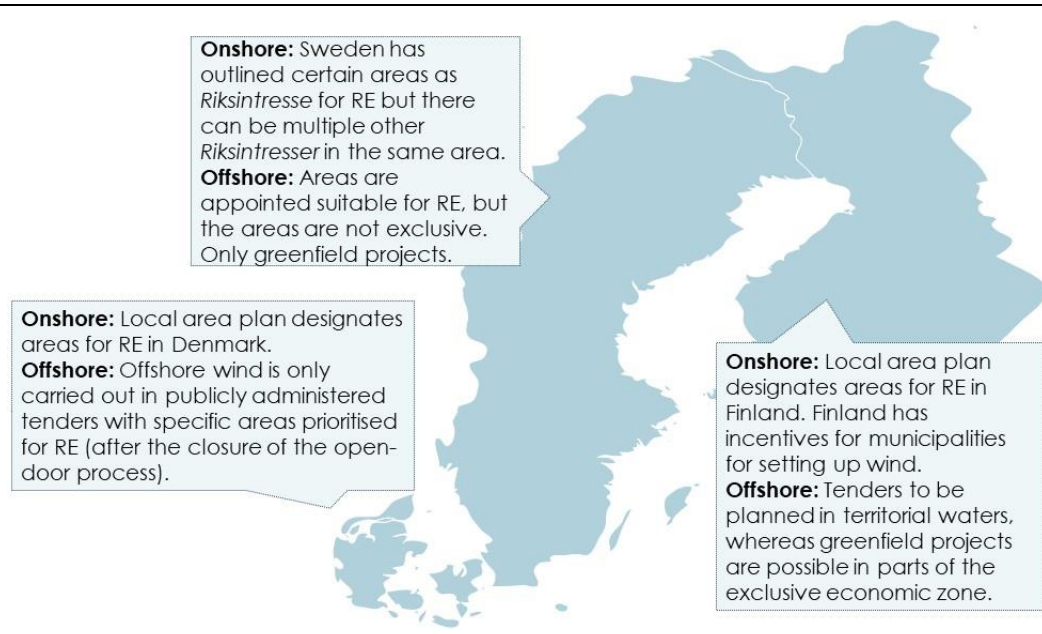
The regulatory frameworks for *onshore* wind differ to some extent in the three countries, see Figure 2. In Denmark and Finland, the local area plans define specific areas for RE, and these plans can be changed to accommodate more RE. In Sweden, municipalities also have spatial planning monopoly, and in addition certain areas are marked as a national interest (*Riksinteresse*) for RE, but the same

<sup>2</sup> Windeurope (2024), p. 10.

areas can attain multiple overlapping national interests. There is no internal priority between these, except for the Armed Forces who always take priority.

Marine plans for *offshore* wind and offshore permitting processes also differ among the three countries, see Figure 2. While all three countries have marine plans and areas dedicated to RE, the plans are not legally binding in Sweden and Finland, meaning that wind developers are not certain that the area will be used for wind development. In Finland, developers can plan greenfield projects in the Exclusive Economic Zone (EEZ), and public offshore wind tenders are planned in territorial waters. In Denmark, all offshore wind is now centrally administered through public tenders. In Sweden, no tenders are planned, and all projects are currently greenfield and fully market-led.

**Figure 2: Onshore and offshore wind frameworks in Sweden, Denmark, and Finland**



### Identified barriers and best practices

We identified several barriers for wind developers specific to Sweden. Learnings from other countries and recommendations from wind developers provide suggestions for what Sweden can do to lower these barriers, see Table 1. We group these barriers in four: *Political uncertainty (barrier I)*, *long permitting processes (barrier II)*, *other stakeholder interests (barriers III, IV, V, and VI)*, and *grid uncertainty (barrier VII)*.

**Table 1: Barriers and best practices for wind development in Sweden**

Barrier	Best practices
<p><b>I: Lack of clear political priority:</b> Contrary to other European countries, Sweden does not have a long-term political goal for the increase in wind power capacity, and regulation has changed back and forth in recent years, which may create uncertainty and deter investments.</p>	<p>Sweden can consider setting long-term, politically binding goals to increase investor certainty.</p> <p><i>Best practice: Denmark has clear targets and plans for onshore and offshore development.</i></p>

<p><b>II: Long permitting processes:</b> Sweden has long permitting processes with many involved stakeholders. The average permitting process for onshore wind in Sweden takes 7-9 years, while it takes 5-6 years in Denmark and Finland.</p>	<p>Onshore: Sweden can consider implementing more parallel permitting processes to lower permitting times.</p> <p><i>Best practice: NEKST, a government appointed task force in Denmark, has provided recommendations for how to lower permitting times in Denmark that could also be considered for Sweden as well. These include the use of the EU exception rule under RED III, and for appeal processes to focus on the <b>isolated elements of the appeal/complaint</b> and not reopen the <b>whole case</b> which will save time in appeal processes.</i></p> <p>Offshore: Some of the processes could be combined under one entity, for example having the appeals for permitting processes under one court to avoid that wind developers must go to multiple different courts to handle appeals.</p>
<p><b>III: Municipal vetoes:</b> 71 per cent of onshore projects in Sweden were dismissed by municipal vetoes during 2020-2022.</p>	<p>Sweden can consider local compensation schemes to increase attractiveness of wind projects locally and/or to make use of the exception rule under the EU Renewable Energy Directive (RED).</p> <p><i>Best practice: In Finland, the local municipality receives the property tax from wind turbines to incentivise municipal approvals.</i></p>
<p><b>IV: Site exclusivity:</b> Exclusivity for offshore development happens late in the permitting process compared to for example Denmark. This creates duplication of costs as multiple developers are spending money on developing the same areas. Similarly, authorities are also required to process several applications for same area by different developers.</p>	<p>Developers could be assigned exclusivity to a site earlier than today, if they, e.g., follow a timeline for reaching the next step in the process, develop the area as prescribed, with a potential penalty payment if the next step is not reached (use it or lose it-exploration permit).</p> <p><i>Best practice: In Denmark, the winners of offshore tenders gain exclusivity. Similarly, the recently terminated Open Door process gave developers early exclusivity to specific areas.</i></p>
<p><b>V: Overlapping interests:</b> Lack of prioritisation of usage of land and sea areas.</p>	<p>According to EU RED III, national governments should appoint areas as so-called acceleration areas, i.e., areas designated for RE development.</p> <p><i>Best practice: The Danish government has recently appointed 32 areas as well-suited for large scale onshore energy parks, although the practical implementation of RE in these areas are not yet clear.</i></p>
<p><b>VI: Role of the Armed Forces:</b> There is uncertainty as to the military's role for onshore and offshore wind developments.</p>	<p>The Swedish government can pre-clear specific areas as prioritised offshore wind areas together with the military. Likewise, earlier site exclusivity for greenfield projects would allow for a more targeted dialogue with the military, as the military would only have to speak to one developer.</p> <p><i>Best practice: In Denmark, offshore sites for public tendering are pre-cleared by the authorities with preliminary environmental impact screening and clearance with military etc.</i></p>
<p><b>VII: Lack of clear grid infrastructure planning:</b> Several barriers pertain to the Swedish grid infrastructure.</p>	<p>Ensure long term clarity around grid build out, which party covers grid connection costs, and plans for international interconnectors.</p> <p><i>Best practice: The Danish Government and TSO are planning long-term grid build out and interconnectors to other countries.</i></p>

The report is structured in three chapters. In Chapter 1, we describe the framework conditions for onshore and offshore in Sweden, Denmark, and Finland. In Chapter 2, we list the identified barriers for onshore and offshore development in Sweden and in Chapter 3, we provide best practises.

CHAPTER 1

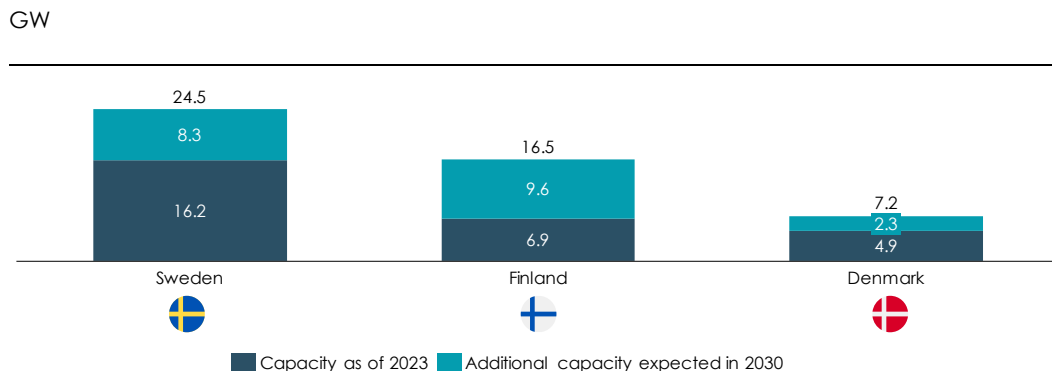
# THE FRAMEWORK CONDITIONS FOR WIND IN SWEDEN, DENMARK, AND FINLAND

In this chapter, we describe the state of play in wind development across Sweden, Denmark, and Finland, and we highlight the differences between the countries' permitting processes and national planning for wind power. We address onshore wind and offshore wind in turn.

### Onshore wind

Onshore wind capacity in Sweden has grown in recent years and 1.9 GW additional onshore wind capacity was installed in 2023 alone.<sup>3</sup> As of 2023, Sweden had 16.2 GW onshore wind capacity, with an expected increase of 8.3 GW towards 2030, see Figure 3. Sweden has higher onshore capacity than Denmark and Finland, but Finland's expected buildout of onshore wind is larger with additional 9.6 GW capacity expected towards 2030.

**Figure 3**  
**Onshore capacity as of 2023 and expected capacity in 2030 in Sweden, Denmark, and Finland**



Sources: Windeurope (2024)

The permitting processes in Sweden, Denmark, and Finland share similarities and differences, see Table 2.<sup>4</sup> The Swedish permitting time for onshore wind is 7-9 years on average, and it is 5-6 years for Denmark and Finland. The longer permitting time in Sweden is partly driven by long processes, especially the consultation period (*Samrådsprocessen*) and the environmental review (*Miljöprövning*), see Box 1.

<sup>3</sup> WindEurope (2024).

<sup>4</sup> See Appendix A for an in-depth description of the process.

**Table 2: Permitting process for onshore wind power for Sweden, Denmark, and Finland**

	Sweden	Denmark	Finland
<b>Principal guiding legislation</b>	The Planning and Building Act, the Environmental Code	The Planning Act	Land Use and Building Act <sup>5</sup>
<b>Permitting process requirements</b>	<ul style="list-style-type: none"> <li>• Provide full EIA to the municipality.</li> <li>• Consult with residents, the municipality, and other stakeholders.</li> <li>• Perform a consultation, if deemed necessary.</li> <li>• Send a permit application to the County Administrative Board.<sup>6</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Align project with local area plan (or lobby for an amendment).</li> <li>• Consult with residents, the municipality, and other stakeholders.</li> <li>• Perform preliminary Environmental Impact Assessment (EIA), and perform full EIA, if deemed necessary.</li> </ul>	<ul style="list-style-type: none"> <li>• Align project with local area plan (or lobby for an amendment) and the regional area plan.</li> <li>• Get positive statement from Finnish Defence Forces.</li> <li>• If large project: Perform EIA. If small project: Perform preliminary EIA, and if deemed necessary perform full EIA.</li> <li>• Get building permit.</li> </ul>
<b>Average permitting time</b>	7-9 years. <sup>7</sup>	6 years.	5 years.
<b>Appeal processes</b>	Maximum 5 weeks for appeal after decision.	4 weeks for appeal of screening decision and 4 weeks for appeal of approval decision. For the <i>energy complaint agency</i> : Maximum 6-month processing time; average of 3-4 months. <sup>8</sup>	Depends on the phase of the permitting process. 30 days after a building permit. <sup>9</sup>
<b>National government</b>	Sets overall objectives. Has final say in defence and other special cases.	Sets overall objectives. Will be able to overrule municipal decisions in future, given proposed new legislation.	The Council of State sets national and regional land use development objectives.
<b>Regional government</b>	The county administrative boards provide planning material for the municipal government. Coordinate state interests.	No role in process.	Regional ELY-center decides whether EIA is required. <sup>10</sup> Regional State Administrative Agencies (AVI) are responsible for water permits.
<b>Municipality</b>	Veto right, without need for motivation or possibility to appeal municipal decision. Spatial planning monopoly.	Veto right. Designates zones for RE projects in the local area plan. <sup>11</sup>	Veto right. Decides on master plans, building permits, and environment permits.
<b>Defence</b>	Swedish Armed Forces' interests take priority, but the Swedish government makes decision in the end. <sup>12</sup>	No role in process, unless in proximity of military areas.	The military has veto rights. All wind turbines taller than 50 meters need approval from the Defence Command of the Defence Force.
<b>Other stakeholders</b>	Indigenous people ( <i>Samebyarna</i> )	Churches have a right to appeal RE projects in proximity to churches. <sup>13</sup>	Border Guard, Indigenous people ( <i>Sámi council</i> ).

<sup>5</sup> Translation of “*Tuulivoimarakentamisen suunnittelu*”, see Rakennetu Ympäristö (2016).

<sup>6</sup> Vattenfall (2024), Länsstyrelserna & Miljösamverkan Sverige (n.d.), Naturvårdsverket (2022).

<sup>7</sup> EMBER (2022) and Svensk Vindenergi.

<sup>8</sup> VidenOmVind (2024).

<sup>9</sup> Finnish Wind Power Association (2019a).

<sup>10</sup> If the project size is above 45 MW or 10 WTGs, EIA is always required. Finnish Wind Power Association (2024k).

<sup>11</sup> Areas designated for RE in Denmark can be found at [Danmarks Miljøportal](#).

<sup>12</sup> Energimyndigheten (2023b) & Länsstyrelsen Örebro län (2014).

<sup>13</sup> Bahn (2022).

**Box 1 A six-stepped permitting process for Swedish onshore development<sup>14</sup>**

**Step 1:** Make agreement with the landowner.

**Step 2:** Surveys of the project area and initial contacts with key stakeholders (1–4 years).

**Step 3:** Consultation period of authorities and locals following a consultation report (1.5–3 years).

**Step 4:** Application for an environmental permit is submitted to the environmental review delegation at the County Administrative Board, which includes an EIA.

**Step 5:** Environmental review – the decision of the environmental review delegation can be appealed to the next instance, the Land and Environment Court, whose judgment can in turn be appealed to the last legal instance, the Land and Environment Court of Appeal. (1–5 years, or shorter if the project is not appealed)

**Step 6:** Test for grid concession. Grid concession (permit for electricity grid) is applied for at the Energy Market Inspectorate. (1–2 years)

**Additionally,** the municipality must approve the project. This happens in parallel to the other steps in the process.

Sweden and Finland both have many stakeholders involved in the permitting process, ranging from all levels of government (municipal, regional, and national) and other public entities, particularly the military. In Denmark, the role of the military is negligible, but churches can veto onshore wind projects if they are in proximity to the church. In all three countries, the municipality can veto projects, but in Finland, the municipality can collect property tax from wind developers. In Denmark, the municipality or residents can also get a financial gain from certain RE projects, for example coastal wind projects.

In Sweden, the Environmental Code states that areas can be marked as a national interest (*Riksintrasse*) for wind power. These are nominated by the Swedish Energy Agency and can be found at *Vindbrukskollen* and cover areas that have good preconditions for RE.<sup>15</sup> The same areas can also be marked with other *Riksintrasser*, i.e., there can be overlapping national interest claims for these areas, and wind power does not have to be prioritised. If the area has been identified as a national interest for the Swedish Armed Forces, it always takes precedence.<sup>16</sup>

In Denmark and Finland, local area plans are conducted by the municipalities wherein areas can be designated for RE. The local area plans can be amended but they must adhere to national regulation, and for Finland's case also to regional plans.<sup>17</sup> In Sweden, municipalities have a planning monopoly which means that they have the right to decide on the purpose of the land.

*Offshore wind*

Even with a coastline of ~3,200 km, Sweden had just 0.2 GW of offshore wind capacity in 2023, whereas Denmark had 2.7 GW capacity and Finland 0.1 GW, see Figure 4. Denmark and Finland have set long-term goals for the build-out of offshore wind capacity, including Denmark's planned 9

<sup>14</sup> Tidningen Energi (2023) and Svensk Vindenergi.

<sup>15</sup> Vindbrukskollen is driven by Energimyndigheten (Swedish Energy Agency/SEA) and the Swedish Counties.

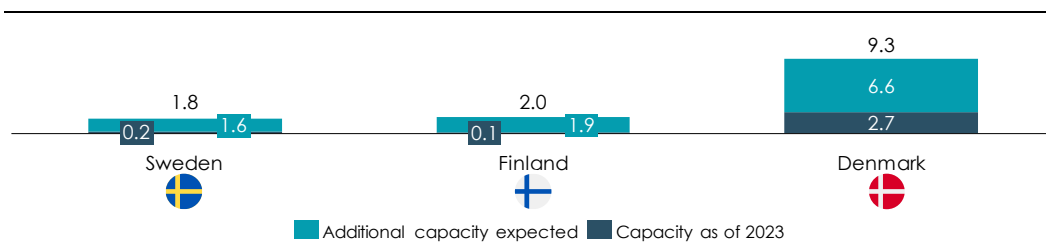
<sup>16</sup> Twelve authorities are responsible for areas of national interests in Sweden. The National Board of Housing, Building and Planning is coordinating among the different authorities. Energimyndigheten (2023b) / (Länsstyrelsen Örebro län, 2014)

<sup>17</sup> The Finnish Land Use and Building Act (132/1999) and VidenOmVind (2024)

GW offshore tenders in 2024-2025,<sup>18</sup> but only 6.6 GW additional capacity is expected to be built by 2030, see Figure 4. Sweden does not have long-term targets. Even so, 1.6 GW is expected to be built before 2030 out in Sweden, see Figure 4.

**Figure 4: Offshore capacity as of 2023 and expected capacity in 2030 in Sweden, Denmark, and Finland**

GW



Note: Denmark is currently planning a 9 GW tender for offshore wind projects. The target is that most of the 9 GW will be up and running in 2030. Windeurope estimates this number at 6.6 GW. For Sweden, 3.3 GW of offshore wind is currently approved, but some of these permits may be retracted due to the municipal veto in the territorial sea (see Box 2) and others may not be ready by 2030.

Sources: (Windeurope, 2024; Klima-, Energi- og Forsyningsministeriet, 2024a; Svensk Vindenergi, 2024)

The Swedish Energy Agency has identified offshore potential of *at least* 30 GW offshore capacity in Sweden,<sup>19</sup> and currently, there is about 44 GW capacity in the permitting process, see Figure 5. In addition, 3.3 GW capacity is already permitted, but have not yet started construction. Several projects overlap geographically, meaning that the capacity in Figure 5 does not reflect the actual potential offshore capacity outcome.

**Figure 5: Projected offshore wind capacity in Sweden by place in permitting process as of February 2024**

GW



Source: Svensk Vindenergi (2024).

The permitting processes for offshore wind differ in Sweden, Denmark, and Finland, see Table 3.<sup>20</sup> For all three countries, there are also differences between the processes in the EEZ and the territorial sea. These differences are substantial in Sweden and Finland.

<sup>18</sup> Danish Energy Agency (2023)

<sup>19</sup> Offshore Wind (2023b)

<sup>20</sup> See appendix A for an in-depth description of the process.

**Table 3: Permitting process for offshore wind power for Sweden, Denmark, and Finland<sup>21</sup>**

	Sweden	Denmark	Finland
<b>Principal guiding legislation</b>	The Environmental Code, Act on Sweden's Economic Zone, Act on Continental Parishes, Electricity Act	Maritime Physical Planning Act	Land Use and Building Act
<b>Greenfield projects</b>	Yes (territorial waters and EEZ)	No <sup>22</sup>	Yes (EEZ)
<b>Tenders/auctions planned</b>	No	Yes	Yes (Territorial waters)
<b>Areas designated for RE</b>	Yes, but overlapping interests	Yes, but with area-specific restrictions	Yes
<b>Are the marine areas designated for RE legally binding?</b>	No	Yes	No
<b>Site exclusivity for developers</b>	Late in the process. Multiple developers can perform separate EIAs simultaneously	Under the 'open-door' initiative, developers gained exclusivity early in the process.  Under the current bidding process, developers gain exclusivity after winning a tender.	<i>In EEZ:</i> Developers gain exclusivity over limited parts of the project area after beginning construction. (undergoing reform). <i>In territorial waters:</i> Developers gain exclusivity after winning a tender.
<b>Responsible for EIA</b>	Developers	Danish Energy Agency	Finnish Land Use Agency
<b>Appeal processes</b>	Maximum 5 weeks for appeal after decision.	4 weeks for appeal of screening decision and 4 weeks for appeal of approval decision. For Energy complaint office ( <i>Energiklagenævnet</i> ): Maximum 6-month processing time. <sup>23</sup>	Depends on the phase of the permitting process. 30 days after a building permit.
<b>National government</b>	Decision entity for permits in EEZ waters, and in special cases also for territorial waters. Adopts marine plans.	Designates zones for offshore wind. <sup>24</sup> Publishes tenders for offshore projects.	The Council of State sets national and regional land use development objectives.
<b>Regional government</b>	The country administrative boards are responsible for coordinating spatial planning and environmental assessments within their respective regions.	No role in process.	Regional ELY-center decides whether EIA is required. <sup>25</sup> Regional State Administrative Agencies (AVI) are responsible of water permits.
<b>Municipality</b>	Has veto rights for coastal projects.	Has veto rights for coastal projects. <sup>26</sup>	<i>Territorial waters:</i> Municipalities decide on master plans, building permits and environment permits.
<b>Defence</b>	Swedish Armed Forces' interests take priority, but national government makes decision in the end. <sup>27</sup>	Role in the public planning process, otherwise not.	The military has veto rights. Wind turbines taller than 50 meters need approval from the Defence Command of the Defence Force. <sup>28</sup>

<sup>21</sup> Borenus (2023), Skyborn Renewables (2023)

<sup>22</sup> Not after the open-door process has been closed.

<sup>23</sup> Nævnenes Hus (2023)

<sup>24</sup> See [havplan.dk](http://havplan.dk) for an overview of the Danish maritime planning.

<sup>25</sup> If the project size is above 45 MW or 10 WTGs, EIA is always required. Finnish Wind Power Association (2024k)

<sup>26</sup> Energistyrelsen, (n.d.)

<sup>27</sup> Energimyndigheten (2023b), Länsstyrelsen Örebro län (2014)

<sup>28</sup> The Finnish Defence Forces (2024)

In Denmark, offshore wind is, as of recent, solely based on public tenders developed from binding Maritime Spatial plans. The Danish Energy Agency conducts an initial environmental screening ahead of the tendering process and subsequently works as a one-stop-shop for permitting for the winning bidder(s).

In Finland, developers can design greenfield projects in the exclusive economic zone (EEZ), and there are planned public offshore tenders in the Finnish territorial waters similar to Denmark.

In Sweden, the marine plans are indicative of where offshore wind farms *can be* established, but these plans are *not legally binding*.<sup>29</sup> Wind developers can design greenfield projects both in territorial waters and in the EEZ. Site exclusivity is only granted to a developer when a permit is granted which is late in the development process.<sup>30</sup> All offshore projects must *also* apply for a permit for underwater activities.<sup>31</sup>

For projects in the *EEZ*, the Geological Survey of Sweden (SGU) must also give permission for exploration of the seabed<sup>32</sup> and the government must give a license for commercial construction. Once the license for seabed exploration has been given, it is the developers themselves who are responsible for the seabed exploration.

For projects in the Swedish *territorial area* (12 nautical miles off the coast), the permitting process for offshore wind power is similar to the process for onshore wind power.<sup>33</sup> In territorial waters, the government is only involved in cases with the armed forces defence and other special cases.

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<sup>29</sup> Svensk Vindenergi (2023a)

<sup>30</sup> The greenfield principle allows offshore wind developers to apply for an offshore exploration permit on their own initiative. *Kammarkollegiet* must approve the use of the area for wind development through seabed exploration. (Regeringen, 2023). Even if *Kammarkollegiet* deems an area suitable for wind development, it does not grant exclusive rights to a single developer. See Havs och Vattenmyndigheten (2023), Regeringen (2023) & Havs och Vattenmyndigheten (2022)

<sup>31</sup> The permits for area use in territorial areas are usually tried jointly for compliance with the Environmental Code by the Land and Environmental Court. See Setterwalls (2021)

<sup>32</sup> SGU (2022)

<sup>33</sup> Malafry & Öhman (2022)

## CHAPTER 2

**BARRIERS TO WIND DEVELOPMENT IN SWEDEN**

In this chapter, we describe the barriers identified through desk research and from interviews with wind developers active across the three countries. We identified seven main barriers for wind developers in Sweden, some of which overlap for onshore and offshore, see Table 4:

**Table 4: Identified barriers for wind developers in Sweden**

	Onshore	Offshore
Permitting	I. Lack of a political vision II. Long permitting processes with many stakeholders III. Municipal vetoes IV. Late granting of exclusivity	I. Lack of a political vision II. Permitting processes with many stakeholders IV. Late granting of exclusivity
Planning	V. Overlapping interests ( <i>Riksintrasse</i> ) VI. Role of armed forces VII. Grid infrastructure: Lack of grid infrastructure planning	V. Non-binding marine plans VI. Role of armed forces VII. Grid infrastructure: Changed political stance on offshore grid connections

We group these barriers in four: *Political uncertainty (barrier I)*, *long permitting processes (barrier II)*, *other stakeholder interests (barriers III, IV, V, and VI)*, and *grid uncertainty (barrier VII)*.

*Political uncertainty (barrier I)*

An overarching political ambition and priority for wind development is lacking in Sweden, and Sweden have not set long-term targets for *onshore and offshore* wind generation capacity. The uncertainty for developers ranges across different levels of government:

- **National government:** Overall targets and selection of areas are lacking for RE, and developers face uncertainty due to changing government and regulation.
- **Regional:** RE interests (*Riksintrasse*) overlap with other interests for the same area.
- **Municipal:** Municipal vetoes happen both early and late in the development process, and there is variation in wind project approvals, both over time and across different political majority in the municipality.<sup>34</sup>

*National government level*

The lack of governmental steer feeds into all other parts of the system, amplifying other barriers as well. Hence, mitigating this barrier could help alleviate some of the other problems that wind developers face, for example, lack of political prioritisation for overlapping interests on land (*Riksintrasse*) and a non-legally binding marine plan with no prioritisation (*barrier V*).

In our interviews, some wind developers indicated that the *political climate* in Sweden is fragile, due to the current composition of the national assembly. This constitutes a risk for developers, as ultimate decision power, for example to approve offshore projects in the EEZ, is at the *national government*. Changing governments coupled with several instances of overturned decisions and

<sup>34</sup> See for example approvals in municipalities across different political party and over time in Chalmers (2023).

changes to who pays for offshore connection points adds to the uncertainty and costs for developers to bring their projects to a final investment decision. For example, different political majorities have changed the position on who (developer or TSO) pays for offshore grid connections (see *barrier VII*).

In its new vision for the energy production in Sweden, the Swedish government stated that they aim to improve the framework for wind development.<sup>35</sup> However, they also raise concerns about the reliability of the energy system in the long term with more intermittent energy. At the same time, multiple public investigations (*utredningar*) regarding wind development are ongoing at the moment, and with the uncertain political climate, wind projects risk getting stalled in the permitting processes, while waiting for the outcomes of the investigations.

#### Regional level

Certain areas are marked as RE interests (*Riksintresse*) area, but these often overlap with *other interests for the same area*, which creates uncertainties for developers to whether they can conduct wind development in that area (see also *barrier V*).

#### Municipality level

The political climate is also unpredictable in some *municipalities*. Both onshore and offshore developers have experienced rejections late in the permitting process due to political reasons (see also *barrier III*). For example, an 864 MW project was rejected by the Swedish government in 2023, despite several attempts by the developer to amend the original application,<sup>36</sup> see Box 2.

#### Box 2 Stora Middelgrund<sup>37</sup>

Vattenfall acquired the Stora Middelgrund project in 2019. A permit had been granted for a total of 864 MW capacity, however Vattenfall augmented the applications to building fewer wind turbines that in turn were larger and more efficient.

The project is located entirely within a Natura 2000 area and many marine animals use the area as breeding grounds. Vattenfall's own EIA as well as an independent scientific report from Aarhus University concluded that with best practices in place, there would be minimal impact on marine animals and seabirds. Despite this and despite the original permit, the Swedish government rejected the project in its entirety and excluded any possibility of amendments to the permit application. In their decision they cited the impact on seabirds and the existence of an established sea route (the S-route).

#### Long permitting processes (*barrier II*)

Developers experience long and arduous permitting processes in Sweden, which constitutes a risk to developers. The *onshore* permitting processes takes 7-9 years on average in Sweden,<sup>38</sup> but only 5-6 years in Denmark and Finland, see Table 2. The long processes in Sweden are driven by the consultation period, which takes 1.5-3 years, and the environmental review, which can take up to 5 years, see Box 1. Even so, onshore wind capacity *has increased* in Sweden in recent years.

<sup>35</sup> Regeringskansliet (2024c)

<sup>36</sup> Offshorewind (2023a)

<sup>37</sup> Søfart.dk (2023), Danish Centre for Environment and Energy (2021) & Regeringskansliet (2023c).

<sup>38</sup> EMBER (2022).

The permitting process remains a barrier for expanding Swedish *offshore* wind.<sup>39</sup> Many offshore projects are currently waiting for the initial EIA approval in Sweden. After this, long governmental processes commence with interactions with many authorities to attain a permit, including the regional government and the military, but ultimately final decisions end at the national government for projects in the EEZ.

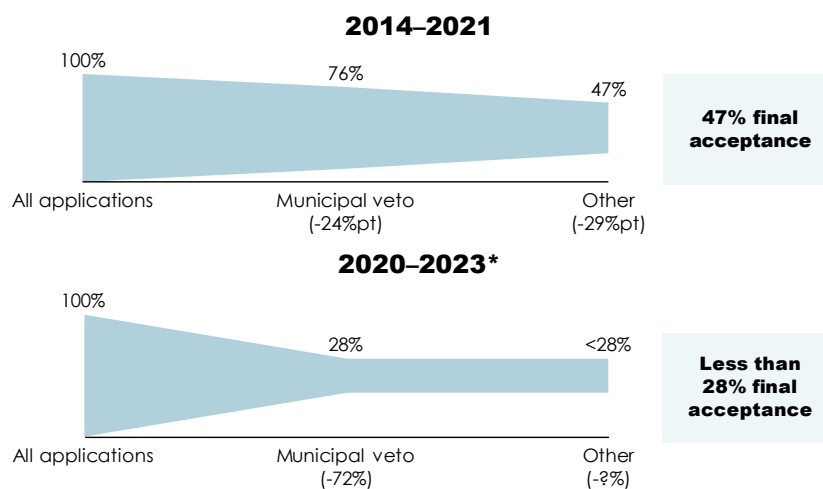
*Other stakeholder interests (barriers III, IV, V, VI)*

Other stakeholder interest barriers pertain to municipal considerations (including *not-in-my-backyard* reservations), late granting of exclusivity with multiple developers examining the same area, and overlapping interests, for example with the armed forces.

Municipal vetoes (*barrier III*) are the primary factor for why many *onshore* and *coastal* projects do not materialise in Sweden. 72 per cent of *onshore* turbines were dismissed by municipal vetoes during 2020-2023<sup>40</sup>, see Figure 6. Another issue is that municipalities can grant permission initially, and then use their vetoes to revoke their decision at any later point in the process, see Box 2.

**Figure 6: Onshore application rejections in Sweden**

Per cent of total turbines by reason for rejection



Note: Some applications were rejected by both the municipality and for other reasons. These applications have been counted under both "other" and "municipal veto" and have thus been added to the total twice for 2014-2021. All rejection numbers have been normalized to achieve the actual success rate of applications (47 per cent). \*Not all reasons for rejections are available for 2020-2022, and the measurement method was different in the 2020-2022 period.

Source: Copenhagen Economics based on Svensk Vindenergi (2023c).

<sup>39</sup> WindEurope (2024).

<sup>40</sup> In contrast to 24 percent on average in the period 2014-2021 and additional 29 percentage points dismissals for other reasons.

**Box 3 An example: Tribbhult wind farm project**

Statkraft Vind AB applied for an environmental permit for a wind farm project in Västerviks municipality, involving up to 26 wind turbines. Statkraft Vind received contradictory statements from the Authorities regarding the project permit:<sup>41</sup>

- In 2019, Västervik's municipal council approved the wind power establishment in its entirety.
- In 2020, the Environmental Assessment Delegation issued a permit to Statkraft Vind for a maximum of 16 – not 26 – wind turbines. This decision was appealed by Statkraft Vind to The Land and Environmental Court (*Mark- och miljödomstolen/MMD*).
- In 2021, during the appeal process, the municipal decided to withdraw its permit for the wind farm project.
- In April 2022, MMD ruled that the municipal county could not withdraw its permit and that Statkraft Vind should be permitted to build 22 wind turbines. This decision was appealed by the municipal county to The Land and Environmental Supreme Court (*Mark- och miljööverdomstolen/MÖD*).
- In August 2023, MÖD ruled that the municipal county was in its right to withdraw its permit and therefore that Statkraft Vind was not allowed to build any wind turbines.

Late granting of site exclusivity (*barrier IV*) and multiple developers examining the same area are two factors that are costly for wind developers in Sweden, particular for *offshore* development. Wind developers gain site exclusivity late in the process, compared to for example Denmark, meaning that multiple wind developers conduct EIA simultaneously in the same area. This increases total development costs for developers as well as public administrative costs.

Wind developers experience that overlapping interests for the same area (*barrier V*) can lead to uncertainty. An area with an RE *Riksintresse* does not have *priority* over other interests with the same status. Similarly, as the Swedish marine plans for RE are not legally binding, and non-RE interest may have claims to the same marine areas as RE.

This is the case for Swedish Armed Force's interests (*barrier VI*) that block projects in Sweden both for *onshore*<sup>42</sup> and *offshore* projects. If the military says "No" to a project, the reasoning is often classified, and developers are not able to discuss what to amend in their project plan for a potential co-existence. On the one hand, developers find it difficult to get a dialogue going with the military. On the other hand, it can be problematic and time consuming for the military to be in dialogue with multiple operators about the same site due to the lack of exclusivity.

*Grid uncertainty (barrier VII)*

There are at least three uncertainties for wind developers when it comes to the grid in Sweden:

1. **Transmission bottlenecks:** Sweden has transmission bottlenecks *within* the country, particular between the North and South of Sweden. This complicates *onshore* wind development as it may be difficult having wind assets in the Northern part of Sweden if they cannot supply other parts of the country.
2. **Changed political stance on grid connections:** In the last years, the regulation for who pays for *offshore* grid connection costs has changed several times. The Swedish TSO, Svenska Kraftnät, was tasked to build up to six offshore grid connection points with a combined capacity of up to 10 GW, and offshore wind developers would not have had to pay for this grid connection.

<sup>41</sup> ENERGYWATCH (2023).

<sup>42</sup> More than 45 per cent of the land area in Sweden is so-called low-flying areas for the military, which restrict onshore development. Karagiannopoulos (2018).

However, the Swedish government recently backtracked on this pledge, adding additional costs for developers.<sup>43</sup>

3. **Lack of interconnectors:** For an energy system relying more on intermittent energy from solar and wind going forward, Sweden lacks interconnection capacity to other countries for energy stability in the future. These connections require long-term planning and political will from bilateral or multilateral agreements and commitments.

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<sup>43</sup> RECHARGE (2024).

## CHAPTER 3

**BEST PRACTICES**

In this chapter, we describe the best practices to mitigate the barriers identified in Chapter 2.

*Addressing political uncertainty (barrier I)*

Several interviewees identified a need for clear political targets for wind development and clarity around future nuclear development for Sweden, which could help steer governmental decisions on policies, processes, and approval of more projects throughout the government. Denmark has clear targets and plans for *onshore* and *offshore* development which is noted by developers as helpful in setting clearer framework conditions.

The Danish government set up a task force with a focus on speeding up *onshore solar and wind development*, see Box 4. The task force released its recommendations in February 2024, which have yet to be discussed politically, but they can serve as inspiration for the corresponding Swedish regulation to support regulatory clarity for wind development in Sweden.

**Box 4 Twenty-seven recommendations for faster wind build-out on land in Denmark**

In 2023, the Danish government established NEKST "The National Energy Crisis Taskforce" under the Ministry of Climate and Energy. The Taskforce consists of three work groups. The work group for "More solar and wind on land" presented their final recommendations in February 2024.<sup>44</sup> The recommendations cover three areas: i) local support, ii) land use, iii) faster processes. See appendix B for all recommendations.

Based on the recommendations, the Danish government will propose legislation in 2024 which aims to shorten the permitting time for renewable energy projects. In addition, the Danish minister for Energy and Climate alluded to increasing the use of the nature exception intervention for setting up RE faster, which was one of the NEKST-recommendations.

*Addressing long permitting processes (barrier II)*

According to EU RED III, the permit processes should be shortened, both in general and for so-called acceleration areas, i.e., areas designated for RE development.

To achieve this, Sweden can work towards more *parallel tracks in the permitting process* such that some tracks can run in parallel, while still allowing the project to move on the next phase in more progressed tracks. This is comparable to the suggestions by Swedish Energy Agency (*Energimyndigheten*) and the Swedish Energy Market regulator (*Energimarknadsinspektionen*) for the buildout of the grid.<sup>45</sup>

Some current processes could be combined in one entity, for example one court could handle several permit applications, as recommended by the public investigation: "Governmental investigative report" (*Betänkande av Regeringsprövningsutredningen*),<sup>46</sup> see Box 5.

<sup>44</sup> Klima-, Energi- og Forsyningsministeriet (2024).

<sup>45</sup> Lantmäteriet (2023) and Svensk Vindenergi.

<sup>46</sup> The investigation is one of three public investigations that are delivering recommendations during 2024 related to wind development in Sweden.

**Box 5 Three public investigations into barriers for wind development<sup>47</sup>**

**Governmental investigative report** (*Betänkande av Regeringsprövningsutredningen*) published in February 2024: A proposal to streamline the legal process for offshore wind power projects in Sweden. One of its suggestions is that one MMD-court (*Mark- och Miljödomstolen*) could handle several permit applications for the same activity, even though they are governed under different laws. The goal of the entire process is to increase the efficiency and fairness of the government's role in examining permits related to environmental concerns. It is also reviewing the government's role as the superior instance in the environmental field.

**Examination of offshore wind power** (*En ordnad prövning av havsbaserad vindkraft*) will be published November 2024: The investigation examines how to expand offshore wind power in a low-cost and climate-friendly way, considering other public interests and environmental impacts, and with aims to simplify and shorten the environmental assessment process. The investigation also considers different offshore project designs including open-door and auctions and mentions the EU's REPowerEU plan for acceleration areas. The investigation will suggest clearer regulation for exclusive rights by establishing a regulatory framework that provides the conditions to achieve these exclusive rights, and it aims to figure out how a fee system should be created to efficiently guide the regulatory process. Recently, the government has requested that this committee also investigates whether Sweden should adopt a purely instruction-based permitting system for offshore wind, i.e. one *without* any open-door elements.<sup>48</sup>

**Simplified and shortened permit processes in the environmental code** (*Förenklade och förkortade tillståndprocesser enligt miljöbalken*) will be published December 2024: The investigation examines the need to simplify environmental regulation for industrial activities in Sweden, especially for those related to renewable energy sources. It will examine splitting the permit examination into two parts: one for the feasibility of the activity and one for the conditions. It also examines the relevant stakeholders and EU directives that the investigator should consider in the dialogue process.

Denmark has a one-stop shop for *offshore* wind permitting situated at the Danish Energy Agency (*Energistyrelsen*). A one-stop shop setup has also been suggested in Sweden.<sup>49</sup> However, as noted by e.g., Svensk Vindenergi, a one-stop-shop might only work to some extent in Sweden. The challenge lies in coordinating various authorities that are governed under different procedural regulations. Overcoming this obstacle demands extensive changes to existing laws. A focus could therefore be to administer the *coordination of the permitting* through one point of contact.

In addition, Danish NEKST recommendations for faster permit processes could be considered in Sweden as well:

- i. Exempting some projects from nature protection laws as outlined in the RED III directive.
- ii. Set time limits for complaints and information gathering (in appeal process).
- iii. Focus on the issue of a complaint, not the whole case (in appeal process).
- iv. Shorter consultation period for renegotiation of environmental assessments.
- v. RE developers should not start projects over from scratch when a project is dismissed.

<sup>47</sup> Regeringskansliet (2024a), Regeringskansliet (2023a) & Regeringskansliet (2023b)

<sup>48</sup> Regeringskansliet (2024b)

<sup>49</sup> By Energimyndigheten (2023).

### Addressing other stakeholder interests (barriers III, IV, V, VI)

**Municipal vetoes** (*barrier III*) may become less pronounced if there are benefits to local municipalities and communities. In Finland, municipalities can collect property tax for wind farms larger than 10 MW. The tax is *locally determined and paid yearly to the municipality* with a maximum cap of 3.1 per cent of the wind turbines' value.<sup>50</sup> Similarly, Denmark also has compensation mechanism for some wind projects. In Danish coastal offshore projects, municipalities and neighbours living within eight times the tip height of wind turbines receive a monetary compensation.<sup>51</sup> These payments have recently been proposed to be increased.<sup>52</sup> In Sweden, a government report recently proposed introducing compensation for neighbours living within ten times the tip height of wind turbines as well as the introduction of a revenue sharing program for municipalities.<sup>53</sup>

To mitigate the barrier for **overlapping interest** (*barrier V*), Sweden could benefit from clearer prioritisation of areas of interest for RE, including:

- Government and municipalities could appoint acceleration areas with *overriding* public interests under RED III. The Danish government has suggested 32 areas for developing land based RE, see Box 6, but it has not yet defined the process for *acceleration areas*.
- Areas for forestry can be appointed as acceleration areas in Sweden. Market actors are currently working to identify which areas are suitable as acceleration areas, presumably commercial forest rather than old forest. Since 69 per cent of Swedish land is forested<sup>54</sup>, only a small share of this area needs to be appointed as acceleration areas.

#### Box 6 Areas designated for energy parks in Denmark

The Danish government has an ambition to increase RE production on land by a factor of four by 2030. Renewable energy projects currently occupy 0.5 per cent of Denmark's land area, and the Danish government aims to increase this figure to 1.3 per cent.<sup>55</sup> 32 areas totalling 112 km<sup>2</sup> have been appointed as suitable for renewable energy projects on land, covering solar power, onshore wind, and Power-to-X.<sup>56</sup> In these areas, environmental and local interests will have reduced influence, allowing the government to override municipal planning. Notably, these designated areas include portions of protected lands (Natura 2000 and under national law) and are determined through collaboration with municipalities and energy developers.<sup>57</sup>

#### Location of potential energy parks



<sup>50</sup> Finnish Wind Power Association (2024e)

<sup>51</sup> Klima-, Energi- og Forsyningsministeriet (2023a)

<sup>52</sup> Klima-, Energi- og Forsyningsministeriet (2023a)

<sup>53</sup> Regeringskansliet (2023d)

<sup>54</sup> The World Bank (2024)

<sup>55</sup> Klima-, Energi- og Forsyningsministeriet (2023a)

<sup>56</sup> Regeringen (2023)

<sup>57</sup> The areas Northern Jutland, Funen, and Lolland-Falster were not selected for the energy parks, as the local TSO grid cannot currently handle adding large scale power production. See Regeringen (2023), pp. 11-12 or Miljøministeriet (2023) for an overview of these areas.

When it comes to late granting of exclusivity (*barrier IV*), several interviewees noted that earlier granting of exclusivity against certain requirements would be beneficial for the process for offshore wind and result in lower risks, DEVEX, and administrative costs.<sup>58</sup> This could be combined with a timeline for reaching the next step in the process and a potential claim if the next step is not reached, i.e., a “Use it or lose it”-mechanism for the offshore sites known from e.g., the mining industry,<sup>59</sup> see also The Swedish Sea and Water Authority’s *own suggestions* in Box 7.

#### **Box 7 The Swedish Sea and Water Authority’s own suggestions for offshore wind in Sweden<sup>60</sup>**

- The public waters of Sweden should be the property of the state and the government should have the right to grant the right to use sea areas.
- Developers should be given temporary exclusivity to examine the right to use a sea area for wind power development to avoid multiple parallel applications that harm the environment and are economically ineffective.
- The state should take a more active role in planning and designating establishment areas in the sea. The developer that wins the allocation of an area gets a certain amount of time to prepare their permit application without competition from other developers.

Sweden could look to the previous Danish open-door process, see Box 8. This resembles the current greenfield model in Sweden, but with earlier site exclusivity. Earlier site exclusivity could for example be granted if developers fulfil certain pre-qualification criteria, including financial backing and a proven track record in offshore development. With this model, there is a risk of favouring large established companies, and a solution could be to also allow consortia of smaller players to prequalify.

#### **Box 8 The Danish open-door process**

The recently terminated ‘Åben dør’ (open-door) process in Denmark, established in 1999, focused on support-free coastal offshore wind projects. The process allowed companies to apply for sea areas without any subsidies or concession payments, taking full responsibility for the development and construction costs of their offshore wind projects. The initiative granted exclusivity to the developer early in the process.<sup>61</sup>

However, the Danish government recently decided to terminate this program due to concerns about its compliance with EU state aid regulations, specifically, the EU’s rules on public procurement.<sup>62</sup> The government believes that the construction of wind farms should be subject to a public procurement process to comply with the state aid regulation.<sup>63</sup> Despite attempts to modify the scheme within the EU regulatory framework, the government found it impractical, leading to its official closure in February 2023. The closure meant that most ongoing applications were rejected. However, the government has announced that projects in advanced stages of the open-door process with existing permits will continue to be processed.

<sup>58</sup> See also *En ordnad prövning av havsbaserad vindkraft* in Box 5.

<sup>59</sup> For example, in Australia, see Copenhagen Economics (2017), p. 25.

<sup>60</sup> Energimyndigheten (2023), Havs och Vattenmyndigheten (2022)

<sup>61</sup> Klima- (Energi- og Forsyningsministeriet, 2023b), Mortensen & Andreasen (2022), Energistyrelsen (2024e), ritau (2023) & Energistyrelsen (2024a)

<sup>62</sup> EUR-Lex (2024)

<sup>63</sup> Energistyrelsen (2023)

Sweden could also consider conducting offshore tenders. While Denmark and other countries around the North Sea have had good experience with such tenders where the auction winners gain exclusivity, more certainty around permitting etc., there are also drawbacks to a tender model. In the design of the 9 GW offshore tenders in Denmark, the Danish government wants to do it all in one go, i.e., ensure certainty around domestic demand, Power-to-X, exports of power and hydrogen in the design as a *prerequisite for the tenders*. It has been argued that there is a risk that the government over specify the tenders, as companies cannot necessarily design for the most commercial attractive projects across all parameters, and the tenders may end up getting delayed and more costly to administer.

To mitigate the barrier around the **armed forces** (*barrier VI*), the Swedish government could make a strategic alliance with the military, where designating areas for RE are aligned upfront. Sweden could more actively utilise the learnings from the EU Symbiosis project, which aims to “*promote coexistence of offshore renewable energy projects and defence operations*”<sup>64</sup>. This could for example be upfront alignment for offshore tenders, as seen for offshore tenders in Denmark, or a selection of specific areas on land for RE development in agreement with the military. In addition, earlier clarity on site exclusivity for developers could help with the dialogue, as the military would only need to discuss with one developer.

#### *Addressing grid uncertainty (barrier VII)*

Several solutions can help mitigate the barriers within the grid uncertainty:

1. **Transmission bottlenecks**: Svenska Kraftnät has provided suggestions to alleviate some of the current bottlenecks in their recently published ten-year plan.<sup>65</sup> Addressing bottlenecks between bidding zones and future bottlenecks would require a more in-depth analysis of the transmission grid.
2. **Changed political stance on grid connections**: There is a need for long-term regulation and commitment which could be guided by the overarching goals previously mentioned. Frequent changes to framework conditions increase uncertainty for developers.
3. **Lack of interconnectors**: Interconnection to other countries in the Baltic Sea could increase the attractiveness of the Swedish market for exports and stability. This requires interconnection planning and multi-country agreements. Sweden could take a leading role due to its presence in the Baltic Sea. Sweden could be more engaged in the dialogue of potentially establishing these connections to for example the Baltic states, Poland etc. The Ostend Declaration and the Marienborg Declaration are two examples of the international cooperation, of which Sweden is committed to the latter.<sup>66</sup>

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<sup>64</sup> European Defence Agency (2024)

<sup>65</sup> Svenska Kraftnät (2024)

<sup>66</sup> The Baltic Sea Energy Security Summit (2022)

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## APPENDIX A

**ONSHORE PERMITTING AND PLANNING****Sweden**

In Sweden, the wind power permitting process is decentralized with municipal governments having power over licensing. Regulations are stated in the Planning and Building Act (*Plan- och bygglov*) and the Environmental Code (*Miljöbalken*).<sup>67</sup> Before applying for a permit, several investigations are carried out, followed by a consultation process with the municipality and other stakeholders.<sup>68</sup> Developers must provide material on the development's location, scope, and form, and apply for a permit along with material for an EIA (*Miljökonsekvensbeskrivning*). The scope of the EIA is decided after an initial investigation that determines whether the potential wind power development can entail a significant environmental impact or not:

- If the wind power development is deemed to potentially constitute a significant environmental impact, a demarcation consultation (*Avgränsningssamråd*) should also be carried out by the developer.<sup>69</sup>
- If the development is deemed not to have a significant environmental impact, a smaller EIA is conducted which has less requirements than the EIA done when a demarcation process is required.<sup>70</sup> The consultation process usually takes between 6 to 12 months.<sup>71</sup>

If granted, the permit covers a limited time and can be appealed. The municipality has veto power over the permit grant for wind power developers. After the consultation process and the EIA, the developer submits a permit application to the County Administrative board. The application is processed and, if complete, sent out for referral. The delegation then decides whether to grant the permit, considering other interests such as Natura 2000 and other national interests.<sup>72</sup> The delegation's decision can be appealed to the Land and Environmental Court and the Supreme court. The time between the application and a decision is usually 2-3 years.<sup>73</sup>

**Denmark**

The primary regulation of the use of land in Denmark is the Planning Act (*Planloven*), under which municipalities can control the development of industry, housing, and infrastructure. These can be found at The Danish Environmental Portal (*Danmarks Miljøportal*).

Onshore RE can only be built in areas which have been set aside for RE in the local area plan (*lokalplanen*). Area plans are updated regularly and can be amended by the municipality. Local stakeholders can object to changes during an 8-week hearing period, following the proposed amendment.<sup>74</sup> The municipality decides whether to accommodate objections, while citizens can appeal the decision based on 'legal aspects'.<sup>75</sup>

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<sup>67</sup> Boverket (2023)

<sup>68</sup> Vattenfall (2024)

<sup>69</sup> Länsstyrelserna & Miljösamverkan Sverige (n.d.)

<sup>70</sup> Naturvårdsverket (2022)

<sup>71</sup> Vattenfall (2024)

<sup>72</sup> Energimyndigheten (2023c), Länsstyrelsen Örebro län (2014)

<sup>73</sup> Vattenfall (2024)

<sup>74</sup> VidenOmVind (2024)

<sup>75</sup> Churches have a right to appeal RE projects if wind turbines are placed within a one km radius of the church, increasing to two km if the turbine is more than 250 meters tall, covering more than 50 per cent of the land area. Flintegaard (2023). Coastal offshore projects must also consider the impact on locals' views and noise levels. Energistyrelsen (2024f)

Municipalities, and neighbours within eight times the tip height of coastal wind turbines and within 200 meters from solar power facilities receive a payment. These payments have recently increased.<sup>76</sup>

Each RE project is pre-screened for environmental impacts based on existing knowledge of the area. If the project is found to have potentially significant environmental impacts, an in-depth EIA is required:

- i. There is a four-week period in which the screening decision can be appealed.<sup>77</sup> As with changes in the area plan the decision can only be appealed based on ‘legal aspects’.
- ii. If a project is found to require an EIA, a two-week initial hearing period is required before starting the EIA.
- iii. Once the authorities have approved the EIA, a further eight-week public consultation period is commenced. During this period, the relevant authority drafts an approval decision.
- iv. The approval decision can again be appealed four weeks after publication. The project can commence after all consultation periods are finished and all appeals have been resolved.<sup>78</sup>

The maximal case *process time* for renewable energy projects in Denmark has been set by law to six months.<sup>79</sup> The average length of the process is 115 days.

Because of the limited amount of undeveloped land and the amount of protected nature in Denmark, the primary area for future RE development will be agricultural land. In 2016, 60 percent of Danish land was used for agricultural purposes, 24 per cent was forest, heaths, lakes and other natural areas, and 13 percent were built areas for buildings, roads, and infrastructure.<sup>80</sup> Additional rules apply for protected areas. 16 per cent of Danish land (and 29 per cent of the Danish maritime area) is protected under at least one law. These areas are largely uninhabited, and special legal considerations arise, particularly concerning biodiversity and other natural features and developing RE projects requires dispensation. The relevant authorities, typically the municipality, assess whether the project could be placed in proximity of protected areas. If the project is not expected to conflict with the stated goals of the nature protection scheme, the project can be given a green light by the Ministry of Environment.

### **Finland<sup>81</sup>**

In Finland, wind power development follows the Land Use and Building Act, with municipalities responsible for local master plans and building permits, and other stakeholders providing statements and approvals. Wind developers have been able to manage their projects’ permitting processes through one electronic contact point after the Act on Permit Granting Processes entered into force.<sup>82</sup> The Act limits the maximum duration for administrative processes for wind power permits to two years.<sup>83</sup>

<sup>76</sup> Klima-, Energi- og Forsyningsministeriet (2023a)

<sup>77</sup> Saarnak, (n.d.)

<sup>78</sup> All appeals sent to an independent judicial entity, ‘Miljø- og Fødevareklagenævnet’.

<sup>79</sup> Nævnenes Hus (2023)

<sup>80</sup> Source: Data from Statistics Denmark. Remaining land is resource extraction and unclassified.

<sup>81</sup> The Finnish Wind Power Association is expecting to have approximately 100 TWh of annual onshore wind power production in 2040 in Finland. See, Finnish Wind Power Association (2024b)

<sup>82</sup> Act on Permit Granting Processes and Certain Other Administrative Procedures for Renewable Energy Plants (1145/2020).

<sup>83</sup> If the plant produces less than 150kW electricity, the process cannot last more than one year in total. See, Finlex (2020b)

Developers conduct a preliminary feasibility study, assessing technical, economic, environmental, and land-use conditions before purchasing or leasing land to apply for a master plan and building rights. If the property is state-owned, negotiations and agreements are handled by the Finnish Land Use Agency (*Metsähallitus*).<sup>84</sup> Once the developer has a right of possession, they may initiate a land use planning process based on a three-level planning hierarchy.<sup>85</sup>

- The highest level of land use planning is the *regional land use plan*. It is prepared and approved by regional councils and implements national land use objectives. Most of the regional plans include areas designated for wind power development. Projects of regional importance, involving 10 or more turbines, must adhere to regional land use planning.
- The two other land use plans are the *local master plan* and the *detailed plan*. Both are drafted, supervised, and approved by municipality councils which makes the political decisions. The local master plan and the detailed plan must align with the regional plan to avoid conflicts.<sup>86</sup>

In some cases, building permits may be granted based on a *deviation permit*, which has a shorter permitting phase but a higher rate of successful appeals. Wind power projects with more than 10 turbines or a capacity of 45 MW or more require an EIA supervised by the regional ELY-centre.<sup>87</sup> The EIA is a prerequisite for approving master plans and building permits.<sup>88</sup> After the municipality council approves the local master plan, the developer can apply for a building permit.<sup>89</sup>

The Finnish Defence Forces have veto rights to wind power projects. All wind turbines taller than 50 meters need explicit approval. It is recommended to apply for approval from the Defence Forces at an early stage of the project. The developer must also negotiate and apply for the grid connection<sup>90</sup> and in some cases permits regarding transportation, archaeological sites, and other aspects.<sup>91</sup>

## OFFSHORE PERMITTING AND PLANNING

### Sweden

The Swedish marine plans are indicative and guiding of where offshore wind farms can be established but are not legally binding.<sup>92</sup> The greenfield principle allows offshore wind producers to apply to develop new offshore wind farms on their own initiative. In the current marine plans, there are energy-areas with the offshore potential of producing 20-30 TWh annually,<sup>93</sup> i.e., around 15 per cent

<sup>84</sup> Finnish Wind Power Association (2024f)

<sup>85</sup> Following the Land Use and Building Act (132/1999)

<sup>86</sup> The building permits for wind power are granted based on the local master plan. Finnish Wind Power Association (2024g)

<sup>87</sup> The EIA follows the Act on Environmental Impact Assessment Procedure (468/1994).

<sup>88</sup> Therefore, it is still required to assess the impacts of the wind turbines, for example, noise, shadow flicker, and landscape impacts in addition to the EIA, see Finnish Wind Power Association (2024m).

<sup>89</sup> Based on the Land Use and Building Act. The application must include the maximum measurements and noise level of the turbine. See, Finnish Wind Power Association (2024a)

<sup>90</sup> Fingrid is responsible for the main grid and conducts necessary assessments of connecting the power plants to the grid, see Finnish Wind Power Association (2024d), FINGRID (n.d.)

<sup>91</sup> The aviation obstacle permit is required for turbines higher than 60 meters (Aviation Act (864/2014)), the water permit is required whenever a project has an impact on the water system, and the environmental permit is required if there is a possibility that the planned wind turbine might result in unnecessary inconvenience for the residents such as noise and/or flicker effects (the Environment Protection Act (527/2014)), see Finnish Wind Power Association (2024j)

<sup>92</sup> Svensk Vindenergi (2023a)

<sup>93</sup> Energimyndigheten (2023a)

of Sweden's current energy production (163 TWh in 2023).<sup>94</sup> A process is underway to change marine plans to increase energy production, with proposals to be presented by the end of 2024, see Box 7. The Swedish Energy Agency and eight other authorities have identified 53 areas for wind power development to enable an additional 90 TWh annual energy production.<sup>95</sup> To reach the goals, 29 per cent of these areas need to be used for wind power production.<sup>96</sup>

Developers must navigate multiple authorities to attain permits. For an offshore wind power developer to gain a permit in *the EEZ* today, they first must show that it has right to disposal of the water area where the potential development would be located. For public water, *Kammarkollegiet* must approve the use of the area for wind farm development through seabed exploration.<sup>97</sup> This exploration requires an exploration permit under the Act on the Continental Shelf. The permit is usually given by the Geological Survey of Sweden (SGU). Furthermore, the government must also give a permit to developers under the Act on the Continental Shelf to e.g. lay underwater cables or construct offshore farms.<sup>98</sup>

Exclusive rights to wind power installations in public waters cannot be granted to a single developer.<sup>99</sup> Even if *Kammarkollegiet* deems an area suitable for offshore wind establishment, it does not grant exclusive rights to a single developer. This leads to multiple developers conducting parallel explorations, causing excessive burden on the environment and authorities.<sup>100</sup>

Permits for projects are granted by the government in the EEZ, or if they are in the interest of national defence or the Act on the Continental Shelf. Placing cables requires a permit under the Act on the Continental Shelf and the Environmental Code.<sup>101</sup> Developers must provide an EIA for their permit application<sup>102</sup> and the government's decision be appealed but can be reviewed but the Supreme Administrative Court.<sup>103</sup>

For projects planned within the Swedish *territorial water* (12 nautical miles off the coast), the permitting process for offshore wind power is similar to the process for onshore wind power.<sup>104</sup>

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<sup>94</sup> Energiföretagen (2023)

<sup>95</sup> Energimyndigheten, Svenska Kraftnät, Försvarsmakten, Havs- och Vattenmyndigheten, Naturvårdsverket, Riksantikvarieämbetet, Sjöfartsverket, Jordbruksverket och Sveriges geologiska undersökning.

<sup>96</sup> Energimyndigheten (2023a)

<sup>97</sup> Regeringen (2023)

<sup>98</sup> Swedish Geological Institute (2022)

<sup>99</sup> Havs och Vattenmyndigheten (2023)

<sup>100</sup> Regeringen (2023), Havs och Vattenmyndigheten (2022)

<sup>101</sup> SvD (2023)

<sup>102</sup> Malafry & Öhman (2022)

<sup>103</sup> Regeringen (2023)

<sup>104</sup> However, all offshore projects must *also* apply for a permit for underwater activities. Malafry & Öhman (2022). The permits for area use in territorial areas are usually tried jointly for compliance with the Environmental Code by the Land and Environmental Court. See, Setterwalls (2021)

## Denmark

Offshore wind projects in Denmark can only be placed in designated maritime zones. There are currently 24 zones ranging from just a few km<sup>2</sup> to more than 10,000 km<sup>2</sup>.<sup>105</sup> Several zones are in the process of being added,<sup>106</sup> and the potential in Danish maritime areas is currently being surveyed by GEUS with data expected to be published in 2024.<sup>107</sup> When this data is published the potential offshore wind capacity can be estimated more precisely. The zones can be viewed online at [havplan.dk](http://havplan.dk).

In the designated zones, there are currently placed 2.7 GW offshore wind capacity in 16 offshore wind farms,<sup>108</sup> with 15 new farms planned.<sup>109</sup> Overviews of existing wind farms and planned wind farms can be found on the Danish Energy Agency's website.<sup>110</sup> The upcoming 2024-2025 offshore tender rounds are for 9 GW capacity and the political agreement specifies 20 percent government ownership of these wind farms.

As with onshore projects, offshore projects are screened for- and, in most cases, evaluated for environmental impacts. The impact that coastal wind turbines have on coastal views has slowed or limited several offshore wind projects,<sup>111</sup> and municipalities have a right to veto offshore projects within 15 km of the coast.<sup>112</sup> Any project built within 3 km of the coast as well as any land-based facilities built in connection with an offshore wind project must comply with the regulations described for onshore.<sup>113</sup>

## Finland

In Finland, the permitting process for offshore wind power in *territorial waters* is similar to onshore but differs in a few ways. Municipalities are responsible for master planning and building permits, while agreements on the use of the area are negotiated with the Finnish Land Use Agency (*Metsähallitus*). Offshore projects must conduct an EIA and apply for a water permit.

Different permitting processes apply to the territorial waters which are expected to be tendered – and a similar process for the EEZ is currently under review.<sup>114</sup> In the EEZ, the Government grants the building permit, and no separate master plan is required. Furthermore, a permit from the Defence Command of the Finnish Defence Forces is not needed in EEZ by the Territorial Surveillance Act. However, the Defence Forces must approve cables running through the territorial waters.<sup>115</sup>

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<sup>105</sup> Energistyrelsen (2021)

<sup>106</sup> Søfartsstyrelsen (2024), see "tilføjet areal".

<sup>107</sup> GEUS (2023)

<sup>108</sup> Energistyrelsen (2024b)

<sup>109</sup> Energistyrelsen (2024d)

<sup>110</sup> Energistyrelsen (2024b), Energistyrelsen (2024d)

<sup>111</sup> Kristiansen (2022)

<sup>112</sup> Energistyrelsen (2024e)

<sup>113</sup> Energistyrelsen (2024c), Plan- og Landdistriktsstyrelsen (n.d.)

<sup>114</sup> The guiding legislation is the Act of the Exclusive Economic Zone of Finland. See, Finnish Wind Power Association (2024l) Finnish Wind Power Association (2024m).

<sup>115</sup> Finnish Wind Power Association (2024h)

## APPENDIX B

**NEKST RECOMMENDATIONS**

The following is based on the final recommendations by NEKST on 26 February, 2024 for “more solar and wind on land”.<sup>116</sup>

**Local support****1. Aligned rules**

- i. Transparency about local benefits from setting up renewable energy facilities on land.
- ii. There should only be one payment scheme for municipalities.

**2. More attractive for the local community**

- i. Advancement of the Green Fund Increased economic incentive for the establishment of RE.
- ii. Increased economic incentives for RE.
- iii. Municipal agreement on RE commitments.
- iv. Voluntary, agreement-based sale of electricity to RE facilities should be enabled.

**Land use:****3. Utilization of areas**

- i. National fund for nature protection and regeneration
- ii. Allow wind turbines in existing production forests and climate forests
- iii. Wind turbines in forests with low biodiversity value
- iv. Temporary exemption from the forest building line for RE
- v. Utilise lowland soils with the highest climate value

**Faster processes:****4. New possibilities from the EU and government competences**

- i. Use of EU exception rule in the transition to the RED III directive
- ii. Designate as soon as possible acceleration areas for both RE and electricity infrastructure based on the RE directive
- iii. Prioritize between RE projects based on objective criteria in the process
- iv. Allow more flexible municipal collaboration forms
- v. A strengthened RE task force

**5. Guidance efforts in the environmental field**

- i. Guidance on the Environmental Assessment Act
- ii. Guidance on exception rules (*undtagelsesbestemmelser*)
- iii. Guidance on prevention and compensation measures (*afværge- og kompensationsforanstaltninger*)
- iv. Improved management plans for Annex IV species
- v. Improved guidance on polluting substances and water quality requirements
- vi. Obligatory requirement for submission and publication of collected data

**6. Efficient appeal processes**

- i. Time limits for complaints and information
- ii. Direct and transparent communication
- iii. Focus on the complaint, not the case

**7. Better processes for dismissed RE projects**

- i. Shorter consultation period for renegotiation of environmental assessments
- ii. RE developers should not start over when a project is dismissed.

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<sup>116</sup> Translated into English from Danish. State of Green (2024)

## APPENDIX C

**SUMMARY OF INTERVIEWS**

Below is a short summary of the interviews with four wind developers and one wind association. The interviews have been anonymised. When we denote “interviewees”, the statement could come from one or more of the interviewees.

**Onshore wind power in Sweden:**

- Interviewees see Sweden’s onshore wind as constrained and less attractive technology compared to offshore wind in Sweden.
- Onshore wind power development in Sweden faces several challenges, such as municipal veto, lack of financial incentives to locals, coexistence with the defence, and long and complex permit processes.
- Interviewees also encounter grid constraints and lack of financial incentives. They call for a long-term and broad political support for renewable energy and a roadmap for the Swedish electricity system.
- Interviewees favour a market-driven approach where developers can define their own projects and routes to market, and advocates for more interconnection planning and multi-country interconnector agreements. They note that Sweden and Poland are less active in these integrated energy systems and collaborations, and that Sweden could take a leading role due to its presence in the Baltic Sea.

**Onshore wind power in Denmark:**

- Interviewees mention that onshore wind power development in Denmark benefits from municipal incentives, and (somewhat) clear spatial planning. Currently, many projects are waiting in the permitting process as political uncertainties have postponed additional roll-out.

**Onshore wind power in Finland:**

- Interviewees mention that onshore wind power development in Finland has low conflicts with municipalities partly due to the compensation through the property tax. They find Finland to be a good market for onshore wind, as it has few conflicts with municipalities and a pragmatic TSO.

**Offshore wind power in Sweden:**

- Interviewees see Sweden as an attractive market for offshore wind, but it needs to fix some issues, such as political uncertainty, the site allocation framework, the grid connection process, the alignment with the armed forces, lack of exclusivity, the high costs of grid connection, the unclear and inefficient permitting process, and the incentives for local municipalities for coastal projects.
- They urge Sweden to have a clear long-term policy and targets for offshore wind, a clearer overarching steer from the government, and to collaborate more with other Baltic countries on integrated energy systems.
- They advocate for a more centralized approach for site allocation, a use-it-or-lose-it principle for earlier granting of site exclusivity. They recommend learning from Denmark’s overall binding planning of the seabed and alignment with the armed forces.

**Offshore wind power in Denmark:**

- Interviewees consider Denmark to have favourable conditions for offshore wind investments, and it is a more mature market than Sweden and Finland.
- Offshore wind power development in Denmark is supported by a predictable and centralized system, a one-stop approach for permitting, and good grid connection and interconnection plans. Interviewees appreciate the visibility and clarity on the timelines, volumes, and design of the tenders. However, they also see limitations in the domestic demand and the export potential of green power.
- The interviewees see a risk that the upcoming tenders for offshore wind will be postponed as the Danish government tries to do everything at the same time. They are concerned about the increasing risks and uncertainties in the tenders, especially regarding the potential future hydrogen pipeline and power-to-x plans. They also criticize the Danish government for not leaving enough flexibility and innovation for the developers.

**Offshore wind power in Finland:**

- Offshore wind power development in Finland is still waiting for a clear framework for shift from greenfield developments to a tender-driven model.
- Interviewees consider Finland as a less developed market for offshore wind than Denmark, with unclear and immature regulatory regimes. They also question the competitiveness of offshore wind in Finland, given the low power prices and the abundant onshore resources.