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Will the introduction of a resource rent tax lead to development of more wind power?

- A study of the effects of the new resource rent tax on Norwegian municipalities' acceptance for land-based wind power

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Will the introduction of a resource rent tax lead to development of more wind power? – A study of the effects of the new resource rent tax on Norwegian municipalities' acceptance for land-based wind power

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Abstract

The amount of energy produced by land-based wind power in Norway has increased significantly the last couple of years. Despite this, estimates from NVE show that Norway could have an energy deficit by 2027. Thus, the country is in need for more renewable energy. However, the development of land-based wind power has met great resistance, especially in relation with the publication of the National Framework for Land-Based Wind Power report from NVE. Following massive complaints from municipalities and others, the report was withdrawn in 2019, and the attitude among the municipalities have been negative since. Hence, a resource rent tax has been proposed on the Norwegian land-based wind power sector, in order to make land-based wind power more attractive among Norwegian municipalities.

The purpose of this thesis is to investigate if the proposed resource rent tax on land-based wind power will change Norwegian municipalities' acceptance for land-based wind power within their municipality. The tax proposal states a resource rent tax with an effective tax rate of 40%, and it is estimated to generate around NOK 2,5 billion in 2023, where 50% of the revenues is going to the municipalities. The research question is answered mainly through a qualitative method, consisting of semi-structured interviews with 17 Norwegian municipalities, both with and without existing land-based wind power. The interviews both provided qualitative and quantitative data that were analysed.

The results show that the current proposal for a resource rent tax has a slightly positive effect for municipalities with a weak economy, and municipalities which put a lower value on their local nature. However, the general findings are that the revenues from the resource rent tax are regarded as too low to have an influence on the general acceptance towards land-based wind power. Still, the results indicate that economic compensation in general is an important argument for municipalities to be more positive towards land-based wind power.

My recommendation is that the authorities should look into alternatives to the proposed resource rent tax scheme, especially at the allocation of the tax revenues among the municipalities. The tax revenues should be distributed in such a way that the host municipalities feel that they receive a compensation which corresponds to the negative effects that wind power entails. By doing this, municipalities are inclined to be more positive towards future development of land-based wind power in Norway.

Sammendrag

Mengden energi produsert av landbasert vindkraft i Norge har økt betydelig de siste par årene. Til tross for dette viser beregninger fra NVE at Norge kan ha et kraftunderskudd innen 2027. Landet er derfor avhengig av mer fornybar energi. Utviklingen av landbasert vindkraft har derimot møtt stor motstand i Norge, spesielt i forbindelse med NVEs publisering av Nasjonal Ramme For Vindkraft. Etter massiv motstand fra kommuner og andre interessenter ble rapporten trukket tilbake i 2019, og holdningen blant kommunene har vært negativ siden. På bakgrunn av dette har det blitt foreslått å innføre en grunnrenteskatt på landbasert vindkraft, for å gjøre vindkraft mer attraktivt blant norske kommuner.

Formålet med denne masteroppgaven er å undersøke om den foreslåtte grunnrenteskatten på landbasert vindkraft vil endre norske kommuners aksept for landbasert vindkraft i deres egen kommune. I skatteforslaget fremkommer det at grunnrenteskatten vil ha en effektiv skattesats på 40%, og beregninger viser at skatten vil generere rundt 2,5 milliarder kroner i skatteinntekter 2023, hvor 50% av disse vil gå til kommunene. Forskningsspørsmålet er i hovedsak besvart ved bruk av kvalitativ metode bestående av 17 semi-strukturerte intervjuer, med kommuner både med og uten vindkraft. Intervjuene ga både kvalitative og kvantitative data som ble analysert.

Resultatene viser at det nåværende forslaget for en grunnrenteskatt har en svak positiv effekt på kommuner med en svak økonomi, og på kommuner som tillegger sin lokale natur en relativt sett lavere verdi. De overordnede funnene viser derimot at inntektene fra grunnrenteskatten blir ansett for å være for lave til å ha en effekt på den generelle aksepten for landbasert vindkraft, men at økonomisk kompensasjon generelt er et viktig argument for at kommuner skal være mer positive til landbasert vindkraft.

Mine anbefalinger er at myndighetene bør se på alternativer til den foreslåtte grunnrenteskatteordningen, hvor de spesielt bør se på fordelingen av skatten mellom kommunene. Skatten bør fordeles på en slik måte at vertskommunene opplever at de får en kompensasjon som står i forhold til de negative effektene som vindkraft fører med seg. Ved å gjøre dette kan kommunene være tilbøyelige til å være mer positive til fremtidig utvikling av landbasert vindkraft i Norge.

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Marius Eng Grønbekk

Ås, May 12. 2023

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1 Introduction

The development of land-based wind power in Norway has increased significantly the last decade. In 2010 the total production of energy from wind power was relatively low, at 873 GWh. However, in 2021 the total production had increased to 11768 GWh (Norges vassdrags- og energidirektorat, 2023b). Hence, the total energy production from land-based wind power today is over 10 times as high as it was in 2010. This increase in energy production from land-based wind power has made it the most important energy source in Norway, second only to hydropower. Today, almost all energy that is produced in Norway comes from renewable sources, and the country usually has an annual surplus of electrical energy (Gulbrandsen et al., 2021). Despite this, there is a constant pressure to develop more renewable energy in Norway. Predictions made by Statnett show that Norway will have an energy deficit by 2027. The reasons for this being that Norway is in the process of restructuring its major sectors to be less dependent on fossil fuels. Among other things, this includes the electrification of Norwegian Oil- and gas platforms. In addition, there are also plans to expand and develop new industries, which in turn will increase the demand for energy even more (Statnett, 2022).

Another important reason for development of more renewable energy is because of the energy exchange Norway has with continental Europe and the UK. This energy exchange gives Europe and UK access to more green energy, while it at the same time enables Norway to import energy from Europe when the domestic supply of energy is low. Put in another way, it makes Europe and the UK less dependent on CO2 intensive sources of energy, while it gives Norway a more stable supply of energy. In addition to this, Norway has increased its climate goals to reduce CO2 emissions with 55% by 2030 to deal with climate change (Regjeringen, 2022c). As many of the rivers and waterways in Norway already are developed for hydropower purposes, land-based wind power is seen as a good and cheap alternative to answers these challenges.

However, the development of more wind power has caused protests, both at a local and national level. Especially after The Norwegian Water Resources and Energy Directorate (NVE) published the “National Framework for Land-Based Wind Power” in 2019, the protests were so massive that the government had to withdraw the report, and the development of land-based wind power were temporarily put on hold (Jakobsen et al., 2019). This has led to less wind power projects being developed than originally planned, and the result is that the current level of renewable power production is not sufficient relative to the goals set by the Norwegian government. Because of this, Norwegian authorities were faced with the challenge of how to incentivise the building of more land-based wind power.

In the autumn of 2022, the Norwegian government announced new incentives to increase the local acceptance for land-based wind power. The incentive was in form of a resource rent tax on land-based wind power, which were set to come into effect in 2023. The tax was suggested to have an effective rate of 40%, and estimations show that the revenues from the tax will be around NOK 2,5 billion in 2023. Half of the revenues from the tax is intended to be distributed to the municipal sector, which is estimated to be around NOK 1,3 billion in 2023 (Regjeringen, 2022a).

With this as a backdrop, the purpose of this thesis is to look at the effects of the new resource rent tax. I will look at if and how the resource rent tax will change Norwegian municipalities acceptance for land-based wind power within their municipality, i.e., if the increased revenues from the new tax can be a contribution to increase the development of land-based wind power in Norway. The method that will be used to gather data on this topic is interviews, where I will interview individuals in the administrations and policy makers in Norwegian municipalities where wind power is applicable.

On 11.05.2023 the government stated that they would postpone the implementation of the resource rent tax to 2024. The reason for the postponement was explained on the basis of the responses received during the hearing of the proposal (Finansdepartementet, 2023). Regardless of this change, this thesis is based on the proposal that was presented by the government in the autumn of 2022, as this was the proposal that was available when the research was conducted, and it is still the only proposal that has been presented. The postponement increases the possibility of the final proposal being different than the one I have based this thesis on. Thus, I must make reservations that the final decision may be different from the one currently proposed.

2 Research Question

Based on the introduction above I present the following research question:

Research question: *Will the new resource rent tax on land-based wind power change Norwegian municipalities' acceptance for wind power plants on land within their municipality?*

To elaborate on the research question, I also have included some sub-questions. My sub-questions are:

Sub-question 1: *Will the impact of the resource rent tax be different in municipalities with and without land-based wind power?*
Sub-question 2: *Will the impact of the resource rent tax be different in municipalities with weak and strong economy?*
Sub-question 3: *Will the impact of the resource rent tax be different in municipalities which have a property tax?*
Sub-question 4: *Will the impact of the resource rent tax be different in municipalities which put a high value on tourism?*
Sub-question 5: *Will the impact of the resource rent tax be different in municipalities which put a high value on their local nature?*

3 Background

3.1 The history of development of land-based wind power in Norway

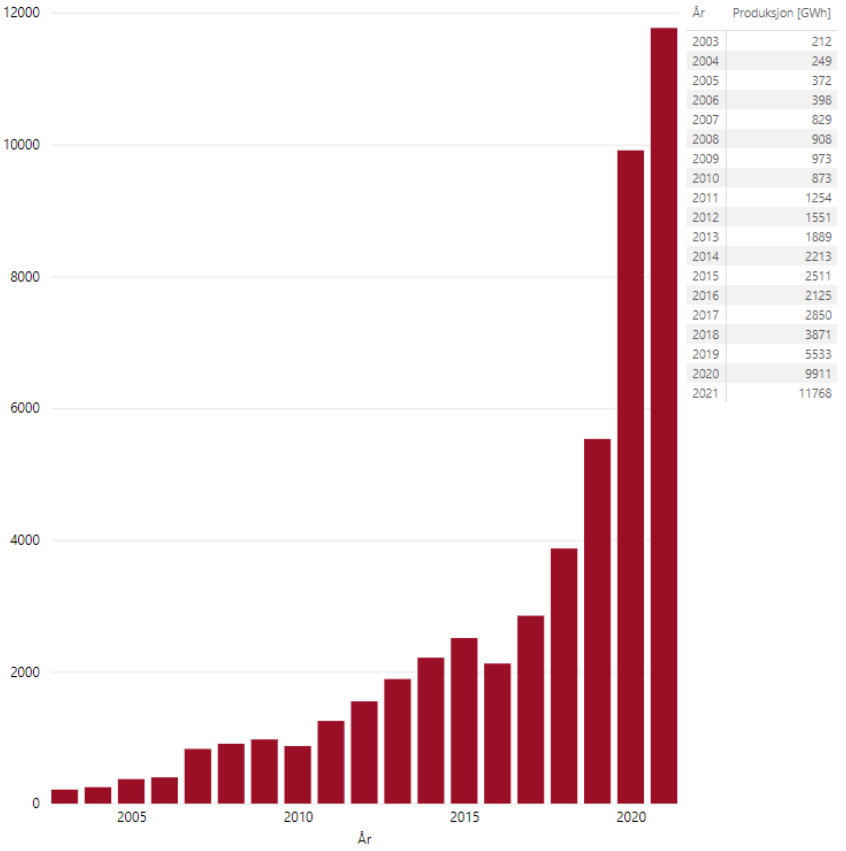
Land-based wind power as a source of energy is a relatively old phenomenon in Norway. The first ever wind power plant in Norway built for energy production was Dahles wind power plant in Andøya. It was built in 1916, and it provided energy for 16 households (Hofstad, 2023). However, the large-scale development of land-based wind power is a rather new phenomenon. The use of wind power as an organized source of energy began at the end of the 1990s, when NVE granted the first licence for the development of a land-based wind power plant. However, these plants were relatively small, both in terms of the amount of electricity they produced and their physical extension. The first land-based wind power plant with an electricity production over a 100 MWh was finished in 2002, the Smøla Vindpark, which had a yearly production of 150 MWh (Inderberg & Saglie, 2021).

In 1999 the Norwegian parliament had set a target which stated that the total energy production from land-based wind power should be equal to 3 TWh by 2010. The target was set to increase energy security, by making Norway less dependent on hydropower (Blindheim, 2013). However, in the early stages of the wind power development, wind power was not profitable. Hence, wind power projects were dependent on subsidies to be developed. The subsidies were administered by Enova, which is a governmental enterprise responsible for financially supporting renewable projects. The support scheme consisted of investment grants, where part of the development costs were covered by Enova (Blindheim, 2013). However, the early phase of the development of land-based wind power was characterised by a slow progress, and few new wind power projects were finalised. The result of this was that the total energy production from land-based wind power were only equal to 1 TWh by 2010 (Inderberg & Saglie, 2021). A study conducted by Blindheim (2013) investigated the reasons for why the target of 3 TWh had not been reached by 2010. The study found that the main reason for the slow development of land-based wind power was because of political uncertainty, which led to that Enova's support scheme did not receive sufficient resources. The result of this was that many wind power projects were denied funding, and the funds that were granted were too low to reach the set target. In addition to this, NVE, which administer the licencing process related to wind power were also underfunded. Hence, they did not have the capacity to process all the applications they received, and this created a bottleneck in the granting of wind power licences. As a result, few investors wanted to take the risk associated with developing wind power. This led to fewer projects being developed, leading to the target of 3 TWh not being met (Blindheim, 2013).

Despite the slow start, the development of land-based wind power began to increase more rapidly from 2012. The main reason was that Norway joined the Tradable Green Certificate Market (TGC) together with Sweden. TGC is a support scheme for power production from renewable energy sources, and the objective of the support scheme is to make it more profitable to invest in renewable power production (Norges vassdrags- og energidirektorat, 2015). The way the certificate market works is that renewable sources of energy, e.g. a land-based wind power plant, can receive green certificates per MWh they produce. To receive green certificates the wind power plant must be approved by the NVE. The certificates that are obtained through production are then sold to power suppliers. The power suppliers are legally obliged to buy the certificates, as they are required to meet a certain quota of renewable energy. This creates a market for the green certificates. This way the producers of renewable energy both get revenues from the electricity certificates they sell to the power suppliers, in addition to the price of the electricity (Norges vassdrags- og energidirektorat, 2015). In relation to this a joint target between the countries was set to increase the energy production by 28,4 TWh by 2020, and this goal was reached in 2019 (Olje- og energidepartementet, 2021).

Compared to the financial support scheme by Enova, the TGC scheme is a market-based scheme, and it is not dependent on subsidies from the government to be effective. The TGC scheme provided an expected extra revenue which was higher than the Enova scheme, but the scheme involves a price risk for the power companies in that the certificate price fluctuates. The reason for the price volatility is both political decisions and the energy price (Fagiani & Hakvoort, 2013). However, the new scheme was regarded by investors as more profitable and more consistent than the Enova scheme, which led to more wind power projects being developed from 2012 and onwards.

Figure 1 below shows the yearly energy production from land-based wind power in the period 2003 to 2021. We can see that the wind power development started to increase from 2012 in relation to Norway joining the TGC. We can also notice that the development of land-based wind power started to increase rapidly from 2018. The explanation for this could be that Norwegian wind power plants had to be put into operation by the end of 2021 to be subject to the certificate market.



År	Produksjon [GWh]
2003	212
2004	249
2005	372
2006	398
2007	829
2008	908
2009	973
2010	873
2011	1254
2012	1551
2013	1889
2014	2213
2015	2511
2016	2125
2017	2850
2018	3871
2019	5533
2020	9911
2021	11768

Figure 1: Yearly energy production from land-based wind power in GWh (NVE)

Source: https://www.nve.no/energi/energisystem/vindkraft/data-for-utbygde-vindkraftverk-i-norge/ (Read: 15.04.2023)

Another important factor which has led to increases in the development of land-based wind power the last couple of years, is the reduction in production costs of wind power. Estimates by NVE, which look at the costs of power production from different sources over their lifetime, called levelized cost of energy (LCOE), shows that the LCOE for land-based wind power has decreased the last couple of years. Estimates from 2018 show that the LCOE for land-based wind power was 34 øre per kWh (Jakobsen et al., 2019), while as we can see in figure 2, the LCOE for 2021 for land-based wind power had been reduced to 30 øre per kWh. We can notice that land-based wind power is the energy source with the lowest production costs, even lower than hydropower (Norges vassdrags- og energidirektorat, 2021a). This implies that land-based wind power has become a very competitive source of energy, as the LCOE for land-based wind power is lower than that of hydropower, which historically has been the cheapest form of energy production.

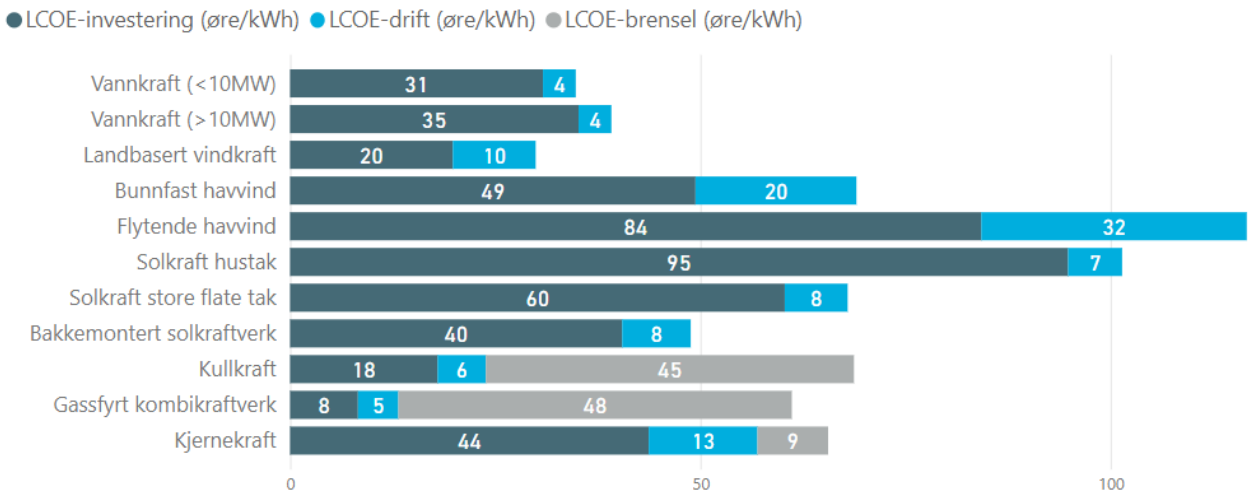


Figure 2: The LCOE of different energy sources, 2021 numbers (NVE)

Source: https://www.nve.no/energi/analyser-og-statistikk/kostnader-for-kraftproduksjon/ (Read: 04.05.2023)

One of the main reasons for the reduction in the LCOE of land-based wind power is mainly due to development of new and better technology. A major factor is that the newest wind turbines are larger and more effective than earlier turbines, both in terms of energy produced and operating costs (Jakobsen et al., 2019).

3.2 National Framework for Land-Based Wind Power

In 2019 the Norwegian Water resources and Energy Directorate (NVE) published the report "*National Framework for Land-Based Wind Power*". The report consisted of two main parts: the first part was an update of the current knowledge base on land-based wind power in Norway, and the second part pointed out areas that were considered to be the most suitable for future development of wind power on land. According to NVE, the report was not intended as a final plan for where to develop wind power, but it should be a guideline document which should lay the foundation for long-term development of land-based wind power in Norway. In addition, it was stated that it should contribute to a more predictable development, with an aim to reduce the conflict level which had arisen around wind power (Jakobsen et al., 2019).

In the first part of the report NVE examined the potential for land-based wind power in Norway. They stated that Norway has one of the best potentials for land-based wind power in Europe. The main reason for this is that Norway's location coincides with what is called the polar front. The polar front is described as the border area where the cold air from the north meets the warm

air from the south, which creates powerful wind systems. This is ideal circumstances for land-based wind power. Thus, a wind turbine located in the most optimal areas in Norway will be more efficient than a wind turbine located in the most optimal areas in e.g., Germany, as it over time will generate more power (Jakobsen et al., 2019).

The updated knowledge base of the report mainly considers how land-based wind power affects both environmental- and societal interests, and where these interests are located. The report looks at the externalities in all the phases of a wind power plant, both during development and in operation. This served as a basis for pointing out the most suitable areas for land-based wind power. NVE addressed one of the main characteristics of land-based wind power, namely that it is a space demanding form of energy production. Hence, land-based wind power will often come into conflict with other land uses, including societal and environmental interests. Based on this, NVE created a list with societal and environmental interests that potentially can be affected by land-based wind power. The interests were mainly based on aspects which had come forward in earlier licencing processes by NVE. Examples of interests that often come into conflict with land-based wind power is wildlife, landscape and nature, but also interests of neighbours. A thematic report was then created to map each interest, and the updated knowledge base consists of 20 thematic reports in total. A different weight was put on the different interests, indicating the degree of emphasis NVE will put on a specific interest in a licencing process. The 20 thematic reports were then the basis for pointing out the most suitable areas for land-based wind power. In general NVE found that wind power can affect many different interests, but that they will vary from case to case depending on the local conditions (Jakobsen et al., 2019).

The selection of the most suitable areas for land-based wind power was carried out with a combination of the updated knowledge base, and an assessment of general evaluations of technical-economic suitability. The Technical-economic suitability included factors such as wind resources, LCOE and costs associated with grid connection. The technical-economic suitability was then weighed against environmental and societal interests. NVE used a three-step method to select the best areas. In the first step, areas that were regarded as being completely unsuitable for wind power were excluded. The non-excluded areas were then mapped on the basis of their wind resources and LCOE. This resulted in 43 areas that were subject for further analysis. In the second step, these 43 areas were analysed on the basis of the thematic analysis on societal and environmental interests. Each area was given a score based on the thematic reports and ranked according to this. In the third step the technical-economic

suitability of the areas was weighted against the environmental and societal interests. This resulted in the designation of 13 areas that were considered to be the most suitable for development of land-based wind power, both in terms of wind resources and low LCOE, but also areas that were deemed to have a low level of conflict (Jakobsen et al., 2019).

The 13 areas included all regions in Norway, except Troms, Oppland, Oslo and Akershus. A common feature among the 13 areas was that they were located between the coast and the highland, and few of the areas were located on the coast. The reason for this was that coastal areas was considered to have a high level of conflict. Another common feature among the designated areas was that most of them were located in Southern Norway, despite the updated knowledge base showing that many of the areas with the best wind resources were located in Northern Norway. This was explained by the fact that the power grid capacity in the northern areas of Norway is limited, and that they also had put a high emphasis on Sami reindeer herding (Jakobsen et al., 2019).

However, despite this relatively thorough report which aimed to make the development of land-based wind power in Norway more predictable and reduce the conflicts that had developed in the last couple of years, it instead led to the conflict level reaching new heights. Especially the second part of the report pointing out the most suitable areas for land-based wind power were seen as very controversial by many. During the public hearing of the report, over 5000 responses had been given. The responses came from both municipalities and interest groups, but also private persons. The result of all the resistance was that the government withdrew this part of the report (Inderberg & Saglie, 2021). In addition to the withdrawal of the report, the processing of licences for land-based wind power in Norway were put on a halt, and it was not resumed until 2022.

As of today, 8,8% of all energy production in Norway comes from land-based wind power (Statistisk sentralbyrå, 2023). There are 65 wind power plants in Norway, with a total of 1392 turbines, producing 16 921 GWh annually (Norges vassdrags- og energidirektorat, 2023a).

3.3 The municipality's role in the licencing process

When looking at the effect of the new resource rent tax on municipalities acceptance for land-based wind power, it is important to look at what kind of authority individual municipalities has in the licencing process and development of new wind power plants. Thus, in this part I will go through the licencing process for land-based wind power and explain the different parts of the process.

3.3.1 Formal practice

In Norway, all land-based wind power plants with a production capacity higher than 1 MW, or which consists of more than five turbines, requires a licence to be developed, according to the Energy Act (Energiloven). The Norwegian Water Resources and Energy Directorate (NVE) is the responsible authority in Norway for the licencing process of wind power plants. NVE is a directorate that is subordinated to the Ministry of Petroleum and Energy. In addition to this, land-based wind power plants that have a production capacity higher than 10 MW have to be subject to an impact assessment (Inderberg & Saglie, 2021). The licencing process for land-based wind power plants consists of mainly 2 phases: The early notification phase and the application phase. These phases are then followed by the detailed planning phase.

In the early notification phase an energy company that has plans to establish a wind power plant in a specific area, has to inform the public about their plans. This is what is known as an early notification, and it is sent to the NVE. The purpose of this is to notify potential stakeholders, like the affected municipality, about the project. The early notification should include a description of the project, and potential externalities on environment and society. NVE then sends the notification on a public hearing to stakeholders like the municipalities, and others who have interests that may be affected by the project. In the hearing NVE wants proposals for which interests should be part of the impact assessment, and here a municipality can express their general views concerning the project. In addition, NVE arrange a meeting with the affected municipality, where they will be informed about the project. This is yet another opportunity for the municipality to express their views on the matter. However, a municipality's formal influence is equal to that of the other stakeholders, and thus they do not hold any executive power in the licencing process. Based on the feedback from the hearing, NVE determines an impact assessment programme for the project. The impact assessment programme sets requirements for what kind of environmental and societal interests that have to be investigated before a licence can be processed (Jakobsen et al., 2019).

The application phase begins when the impact assessment has been conducted, and the developer can apply for a wind power licence. A licence application must contain a thorough description of the project, and also a review of the findings from the impact assessment. The licence application is then also sent on a public hearing to the affected stakeholders, like the municipalities. The purpose of this hearing is to uncover if the interests and the externalities of the project has been sufficiently investigated, if a licence should be granted or not, and what conditions a licence should contain. When NVE decides whether a licence should be granted

or not, an overall assessment is conducted. It follows from the Energy Act that for production of energy, the public benefits of the project have to be larger than the public costs. Stakeholders with a legal right to appeal, like the municipalities, can file an appeal on the licencing decision. If NVE does not take the appeal into account, it is sent to the Ministry of Energy and Petroleum for evaluation. The decision of the ministry is final (Jakobsen et al., 2019).

After a licence has been granted, the detailed planning phase starts. In this phase the wind power plant is planned in detail. Here the developer has to submit a detailed plan and an Environment, transport and construction plan (MTA plan) to NVE for approval before the construction can begin. The plans have to provide a thorough description of the project, and among other things they have to describe placement and height of the turbines (Inderberg & Saglie, 2021). It is often the case that it can take several years from the time a licence is granted until the wind power plant is built. Wind turbines are undergoing a rapid technological development, and in the meantime the wind power technology most likely has developed significantly. Thus, many licences have a built-in flexibility which makes it able to utilize the leading wind power technology. The result of this is that the wind power plant can have drastic changes compared to what was stated in the licence. Features like height and placement of the turbines can be changed (Inderberg & Saglie, 2021). The detailed planning phase is not regulated by law, but NVE has developed a guidance which state that the detailed plans should be developed in consultation with affected municipalities. The guideline also states that it should be a dialogue with the affected stakeholders, and the developer has a responsibility to involve the municipalities in the development of the plans. However, experience from several municipalities has shown that this is not always the case (Inderberg & Saglie, 2021). Thus, compared to the licencing process, the formal authority of the municipality is even weaker in the detailed planning phase.

From this we can see that the municipalities do not have much formal authority in the licencing process and the detailed planning phase. They have formal influence in the form of being a hearing party in the public hearings, and they have the right to appeal the final decision in the licencing process. Still, they have no formal power beyond this and are equal to the other stakeholders. The role of the municipalities in the licencing process for land-based wind power was changed in 2008. Prior to this the licencing process for land-based wind power was subject to the spatial planning of the municipalities, and the municipalities were the highest authority on this matter. Then power producing installations, like land-based wind power plants, had to be part of municipal zoning schemes to be allowed to be constructed. This changed in 2008,

when it was decided that the supply of energy should be a national concern, and the authority on this matter was moved to NVE. Power installations were then exempted from the requirement that they had to be part of municipal zoning schemes, as the approval of a licence for developing land-based wind power has been made equivalent to a spatial planning decision about statutory land use. In addition to this, if a contradiction should occur between a municipal spatial plan and a granted licence for developing land-based wind power in a specific area, The Ministry of Petroleum and Energy can decide that the disputed area should be part of a national spatial plan. Thus, the ministry can overrule the municipal zoning schemes, and the land-based wind power facility can be developed even though it goes against the spatial plans of the municipality. Hence, the municipalities influence on cases concerning wind power has been changed from being the project planner, to becoming a hearing party with the right to appeal (Inderberg & Saglie, 2021). Thus, the formal influence of municipalities on where land-based wind power facilities should be located is limited.

3.3.2 Informal practice

While the formal licencing process for development of land-based wind power explains how the process is in theory, studies have found the real process to be a bit different. In a study by Inderberg and Saglie (2021) they looked at the role of the municipalities in the planning process of land-based wind power. They conducted interviews with both municipal employees and politicians, but also with representatives from NVE and developers of land-based wind power. The study found that besides the formal approach explained above, there also exists an informal practice which is followed quite consistently, particularly in the early stages of the licencing process. In the early phase of a project, before the early notification message is sent to NVE, developers will usually contact the municipality directly. The developers stated that the reason they establish contact with the municipalities at an early point, is to investigate whether the municipality is interested in getting land-based wind power in their municipality. In addition, it was done to gather information that can be useful for potential later stages of the licencing process. The developers expressed that a positive attitude from the municipalities was important for them to continue the project. They stated that if a municipality expressed a negative view in the early phase, they would not go on with the project. At the early stage, NVE have developed a practice where they recommend the developer not to go on with the project if the attitude of the municipality is negative. Further, NVE stated that when the licence application is on public hearing, they put a high emphasis on the attitude of the municipality, and that the licence

application will be rejected if the municipality is negative towards the project at this point (Inderberg & Saglie, 2021).

After the Planning and Building Act was changed in 2008, the municipalities lost their formal influence as the planning authority and was demoted to being a hearing party. Despite this, NVE put a high emphasis on the attitude of the municipalities. The study also reviewed 239 previous licence applications for land-based wind power. They found only one case where the municipality had been negative towards wind power, and the wind power facility actually was built. In all the other cases, a negative attitude from the municipalities had led to the projects being scrapped. Hence, we see that even though their formal authority in the licencing process is weak, municipalities have a strong informal influence on the outcome of a wind power project in that they hold an informal right to veto (Inderberg & Saglie, 2021).

From this we can see that the municipalities in reality have relatively much influence over whether land-based wind power facilities are built or not. The implication of this is that the acceptance of a municipality is an important factor when it comes to the general development of wind power. This is an interesting find, as this could indicate that a resource rent tax on wind power possibly could have a direct effect on the development of land-based wind power, as it could make a municipality more positive towards wind power (Gulbrandsen et al., 2021).

3.3.3 Proposal to increase municipalities' influence in the licencing process

In the beginning of January 2023, the Norwegian Government published a proposal for changes in the licencing process of land-based wind power. The proposal involved transferring the planning and development of wind power plants back to the municipalities, by including it in Planning and Building Act. There should be a condition that there must be developed a zoning plan for an area before a licence to develop land-based wind power can be granted. Thus, the municipalities should be given authority to demand that a developer of a land-based wind power plant must develop a proposal for a zoning plan of the specific area that is to be developed. The zoning plan should include aspects such as the location of the turbines and their maximum height. In addition to this the proposal also states that the right to grant dispensation from the zoning plan should be limited. Hence, the Ministry of Petroleum and Energy can no longer decide that a licence for land-based wind power can come into effect as a national plan (Regjeringen, 2023).

This proposal, as it is presented by the government, seems to be a proposal that can strengthen the formal authority of the municipalities in the licencing process of land-based wind power. If

the proposal is adopted, this means that the municipalities will both have a high degree of formal and informal authority in the licencing process. Hence, the future development of land-based wind power will be very dependent on what kind of attitude the municipalities have towards land-based wind power. This means that factors that can increase the municipalities acceptance for land-based wind power, like a resource rent tax, can potentially have an even greater emphasis in the future.

3.4 Municipal revenues from wind power plants prior to the resource rent tax

This part will go through what has been the tax revenues to the host municipalities from land-based wind power before the resource rent tax was introduced. According to NVE, before the resource rent tax was introduced in 2023, the host municipalities for land-based wind power could potentially get tax revenues from two different taxes. These taxes were the property tax, and the production fee.

As mentioned in chapter 3.1, land-based wind power has not been an industry with very high returns. It has been dependent on subsides from the government to be profitable, and for projects to be developed at all. This stands in stark contrast to hydropower that have had relatively high returns. This is one of the main reasons why wind power has not been taxed at the same level as hydropower (Olje- og energidepartementet, 2020).

3.4.1 Property tax

The Property tax is a municipal tax and is estimated based on what is assumed to be the market value of the wind power facility. There are two different valuation methods that can be used to estimate the property tax. The first method is called technical valuation. The technical valuation is defined as the replacement cost, after deducting the loss caused by wear and tear. The other valuation method is the value of return method. With this method the property tax is based on the rate of return from the wind power facility, often calculated as the net present value of all future income. The technical valuation method is the method which is used the most, but what method should be used depends on which of the methods that best reflects the real value of the wind power facility (Norges vassdrags- og energidirektorat, 2022c). The property tax is an optional tax, and it is up to the municipal council in each municipality whether they want to collect property taxes from wind power plants. In addition to this, the municipalities also have the authority to decide the rate of the property tax, based on guidelines given by the Norwegian Tax Administration (Skatteetaten, 2022).

In 2015 the Minister of Finance proposed to remove the access for the municipalities to collect property tax from wind power plants. This made the host municipalities of wind power react very negatively, and they stated that it was a breach of the social contract between the municipalities and the national government. The proposal was withdrawn, but it made the municipalities feel uncertain about the tax revenues from land-based wind power. (Saglie et al., 2019). Thus, the property tax seems to be an important factor for the municipality's acceptance for hosting land-based wind power.

Inderberg and Saglie (2021) found based on the interviews, that property tax has been one of the main reasons that municipalities are positive towards land-based wind power and want to be host municipalities for these facilities. This was an argument they found in all of the municipalities that partook in the study. Several of the municipal also stated that they would feel it as a betrayal from the government if they reduced the rates of the property tax, or if the right to collect property tax from wind power plants were removed altogether. It was argued that if the access to collect property tax from land-based wind power facilities were removed, then the municipalities would give up valuable local areas without receiving any compensation for it (Inderberg & Saglie, 2021). It should be mentioned that at the time when the study was conducted, the property tax was the only economic compensation the municipalities got from hosting wind power facilities. In another study which looked at what shapes municipalities' perception of fairness in wind power developments, Saglie et al. found that also for municipalities that don't have adopted a property tax, it has not been uncommon for the developer and the municipality to make an agreement where the municipality is compensated with a yearly payment which is similar to the level of the property tax (Saglie et al., 2019). This substantiates that tax revenues is an important aspect of municipalities attitude towards land-based wind power.

3.4.2 Production fee

The other kind of revenue the municipalities get from hosting a land-based wind power plants is a production fee. The production fee is an excise tax, and the facilities subject to this fee have to pay per kilowatt hour of electricity that is produced. The production fee is applicable for land-based wind power plants that are subject to a licence, i.e., wind power facilities that have more than 5 turbines, or have an installed effect of more than 1 MW in total. The production fee on land-based wind power was introduced in the summer 2022. At the time of the introduction, the production fee was equal to 1 øre per kWh electricity produced. From 2023, the production fee was doubled, and is now equal to 2 øre per kWh electricity produced. The

production fee is paid directly to the state, and the state then distributes the revenues from the fee to the host municipalities. The purpose of the production fee is to incentives the host municipality to develop additional wind power production, and to increase the legitimacy of wind power among the municipalities (Skatteetaten, 2022).

3.5 History of resource rent tax in Norway

3.5.1 Resource rent tax on hydropower

In 1992, the Rødseth committee was formed on the basis that the government thought that there existed a resource rent in the hydropower sector. Hence, they believed that the tax scheme should be changed to also take this basis of income into account. The goal of the committee was to investigate if there was a basis for a resource rent tax in the hydropower sector, and possible ways the resource rent could be taxed. They argued that hydropower is regarded as a common resource of national interest, and that a resource rent tax can ensure that more of the extraordinary profit will benefit the Norwegian society. As a result of this, the resource rent tax on hydropower was introduced in 1997 (Finansdepartementet, 2019).

As of March 2023, 89,7% of all energy production in Norway comes from hydropower (Statistisk sentralbyrå, 2023). Today there are 1761 hydropower facilities located in Norway, producing around 136,7 TWh per year (Norges vassdrags- og energidirektorat, 2022e). The current resource rent tax on hydropower facilities applies for plants that have a production of 10 000 kWh or more, and the tax rate is set to 45%. The tax is calculated by taking the market value of the production, and then subtracting the operating costs, property tax, licencing fee and depreciations (Energifakta Norge, 2023). The reason for the deductions in the market value is to ensure the normal return is not subject to the resource rent tax. After the deductions we are then left with what is called the resource rent, which is the basis for the resource rent tax. I will elaborate more on the resource rent and the resource rent tax in chapter 5.

On September 29, 2022, the Norwegian government proposed to introduce a resource rent tax to the land-based wind power sector and the fish farm sector, in addition to increase the resource rent tax rate in the hydropower sector. The government explains the reason for the introduction of the resource rent tax into these sectors is to distribute the profits from natural resources more efficiently. The government argued that these industries were earning high profits on utilising the common resources of Norway, and thus some of this profit should be allocated back to the Norwegian society (Regjeringen, 2022d).

3.6 The Norwegian Energy Market

Electrical power is a commodity with some unusual properties. Unlike most markets, the power market must be in a constant equilibrium. What is meant by this is that at all times, the amount of power produced has to be equal to the amount consumed. The main reason for this is that electrical power is not suitable to be stored. Hence, the most important objective for the energy market is to ensure that it is a balance between the production of power, and the consumption of power (Norges vassdrags- og energidirektorat, 2022a).

The Norwegian energy market mostly consists of renewable energy sources. Hydropower accounts for the largest part, with a production equal to around 89,7% of the total energy production. Land-based wind power accounts for around 8,8% of the energy produced (Statistisk sentralbyrå, 2023). The amount of wind power has increased the last couple of years, and it is assumed that it will increase further in the coming years (Statnett, 2023). This development leads to some challenges. One of the challenges is the characteristics of wind power, as it is what is called an intermittent source of power. What is meant by this is that the wind power production is variable and not constant. Wind power production is mainly dependent on the wind, and the wind speed is affected by the general weather pattern. Thus, the production of wind power cannot be controlled in the same way as hydropower. The challenge with this is that the wind does not necessarily blow when we need the power. In addition, the more intermittent power we have in the energy market, the more challenging it is to maintain the balance between production and consumption. Thus, when the amount of intermittent power increases, higher demands will be placed on the flexibility and storage capacity of other power sources, like the hydropower (Norges vassdrags- og energidirektorat, 2022b).

The energy price is an important signal in the energy market. As in other markets, when the energy price is low this reflects that the supply of energy is high, and when the energy price is high this reflects that the supply of energy is low. Hence, the price of electricity can tell us how high or low the supply of electricity is in a specific area, and thus over a period of time electricity prices can give an indication of where it is necessary to develop more energy production (Norges vassdrags- og energidirektorat, 2022a). The last years we have seen that the energy prices across Norway have been unusually high. The main reason for this is the decrease in the supply of Russian gas, which have increased the energy prices in many European countries which are reliant on gas for electricity production (European Council, 2023).

Closely linked to the energy price is the demand of energy. Today, approximately 50% of the electricity produced in Norway is consumed by households and businesses. 40% of the energy production goes to the industry sector, among others the petroleum sector and factories on the mainland (Norges vassdrags- og energidirektorat, 2021b). Forecasts of the Norwegian energy market shows that the demand for energy will increase much in the coming years. The main reasons for this are the plans for increased emission reductions towards 2030, but also because of plans to develop more green industry in Norway that is reliant on more renewable energy (Statnett, 2022).

The Norwegian energy market is also connected with the electrical grid in other neighbouring countries through power cables. The most important grid connections for Norway are to Sweden, Denmark, United Kingdom and Germany. In most years, Norway is self-sufficient with power, and there is an energy surplus which can be sold to neighbouring countries (Norges vassdrags- og energidirektorat, 2022d). However, in some periods when there is little rainfall, Norwegian hydropower is not sufficient to cover the national demand and consumption. In those periods the grid connections to neighbouring countries are important in ensuring the energy security in Norway, and that the country have access to power in periods where it is not self-sufficient. However, the foreign grid connections also lead to price contagion between countries and regions. This causes increased volatility of the energy price (Norges vassdrags- og energidirektorat, 2022d).

Apart from more wind power on land, the Norwegian government has ambitions that Norway should become one of the world's leading nations in offshore wind. There are plans to develop offshore wind areas equivalent to 30 000 MW by 2040, which is equivalent to around 75% of the current capacity in the Norwegian power system. As of today, the Norwegian government has presented two project areas for development of future offshore wind power: Sørlige Nordsjø II and Utsira Nord, and they have announced competition for these project areas (Regjeringen, 2022b). However, there are a number of challenges associated with the development of offshore wind power. The LCOE for offshore wind power are very high, which makes many projects unprofitable. In addition, offshore wind power is still an immature technology, and major developments of this type of energy is still several years away (Regjeringen, 2022b).

3.7 The proposal for a resource rent tax on land-based wind power

The resource rent tax on land-based wind power was proposed by the Norwegian government on September 28, 2022, and it was initially planned that the tax should come into effect from 2023. The proposal states that the resource rent in land-based wind power should be taxed at an effective rate of 40 %, and that the tax will be designed as a cash flow tax. This means that the revenues and investments of the power companies are the tax base, and these will be taxed when they occur. Hence, there is no need to periodize the investment costs, like is the case with other taxes on profit (NOU 2019:16, 2019). Because of this the resource rent tax is designed to be a neutral tax, meaning that it should not influence a company's investment decisions and general behaviour. The proposal states that the revenues from the wind power plants are based on the spot price of electricity in the energy market and the actual production at a power plant. However, it is emphasized that for fixed-price agreements signed before the tax was announced, the fixed price of the agreement will be the basis of the calculation of the revenues. The proposal also states that in cases were the profit of the land-based wind power companies are negative, the companies can get deductions from the resource rent tax in later years. The government states that the resource rent tax should apply for all land-based wind power plants which are subject to a licence, i.e., wind power plants with more than 5 turbines, or plants with an installed effect equal or higher than 1 MW (Regjeringen, 2022a). The theory concerning the resource rent tax will be presented in chapter 5.

In addition to the taxes on land-based wind power mentioned earlier in chapter 3.4, the companies in this sector are also subject to a corporate tax at a rate of 22%. Just like the resource rent tax, the corporate tax is a tax on the company's profit. The corporate tax will be deducted before the resource rent tax, which means that the real tax rate of the resource rent tax will be at 51,3 % (Regjeringen, 2022a). A challenge with having both a resource rent tax and a corporate tax, is that the profit will be taxed twice. This means that the neutrality of the resource rent tax will be affected.

The proposal from the Norwegian government state that the resource rent tax on land-based wind power is estimated to NOK 2,5 billion in 2023. Of these, 50% of the revenues are to be allocated to the municipal sector, while the rest will be allocated to the government (Regjeringen, 2022a). However, the 50% that are allocated to the municipalities are allocated through the income equalization system, which will affect the distribution of the revenues between the municipalities. In the following chapter I will explain this in more detail.

The Norwegian government states several objectives for why they want a resource rent tax on land-based wind power. The main argument is to distribute the revenues from the country's natural resources in a more efficient way, so that more of the large profits are returned to the local societies. By increasing the tax revenues from this sector, the government also aims to make land-based wind power more attractive to the municipalities. The government also refers to the LCOE estimates from NVE, which show that land-based wind power has become the most cost-effective source of energy. This, in addition to the expectations of continuous high energy prices, the government argues it is justifiable to introduce a resource rent tax in the sector (Regjeringen, 2022a). Further, estimates from NVE shows that 67% of the wind power in Norway is owned by foreign companies (Norges vassdrags- og energidirektorat, 2023c). Thus, the resource rent tax is also a measure to ensure that more of the revenues from wind power are left in Norway, and not taken out of the country.

3.7.1 The Income equalization system

Norwegian municipalities are naturally diverse, and they differ greatly in terms of population, economy, and geography, to mention some. The results of these differences are that the revenues and the costs among municipalities also differs. These differences contribute to that providing public services to the inhabitants, like public schooling and health services, are different from municipality to municipality. Hence, the main objective of the income equalization system is to ensure that all municipalities, despite their differences, can provide the same level of public services. What the system does in practice is mainly two things: it equalizes the differences in costs, and it redistributes some of the tax revenues from the richest municipalities, to municipalities thar are poorer and have lower tax revenues (Kommunal- og distriktsdepartementet, 2023). For this thesis the focus will be on the equalization of the tax revenues.

The tax revenues make up around 40% of the municipalities total revenues. Thus, the tax level is a major part of a municipality's total income. As mentioned, the differences among municipalities does that the tax revenues between municipalities differs greatly. Hence, one of the main objectives of the income equalization system is to redistribute the tax revenues between the municipalities to lessen these differences. The level of tax revenues is calculated per inhabitant. The income equalization system equalizes these differences by redistributing the revenues from municipalities which have a tax level per inhabitant above the national mean, to municipalities which have a tax level per inhabitant below the national mean. The resource rent tax on land-based wind power is one of the taxes that are subject to the income equalization

system (Kommunal- og distriktsdepartementet, 2023). This means that the tax revenues will be redistributed among the whole municipal sector. The exact distribution of the resource rent tax between the municipalities will be elaborated on in the following chapter.

3.7.2 Distribution of the revenues from the resource rent tax

As mentioned, the proposal from the Norwegian government stated that the resource rent tax on land-based wind power is estimated to NOK 2,5 billion for 2023, where 50% of the revenues will go to the municipal sector. However, how much the host municipalities are left with after the tax has been allocated between the municipalities is not clear, as previously mentioned the revenues have to be allocated through the municipal income equalization system.

The Norwegian newspaper Nettavisen has done calculations on how the revenues from the resource rent tax will be distributed amongst the state and the municipalities, by using numbers from Kommunenes Sentralforbund. The calculations show that around 50% of the tax revenues goes to the Norwegian government, i.e., NOK 1.249 billion. However, as figure 3 shows, the share going to the host municipalities will be NOK 460 million, which corresponds to less than 20% of the total revenues. The municipalities without land-based wind power on the other hand will receive around NOK 758 million of the revenues, which is around 30% of the total tax revenues (Heldahl, 2022).

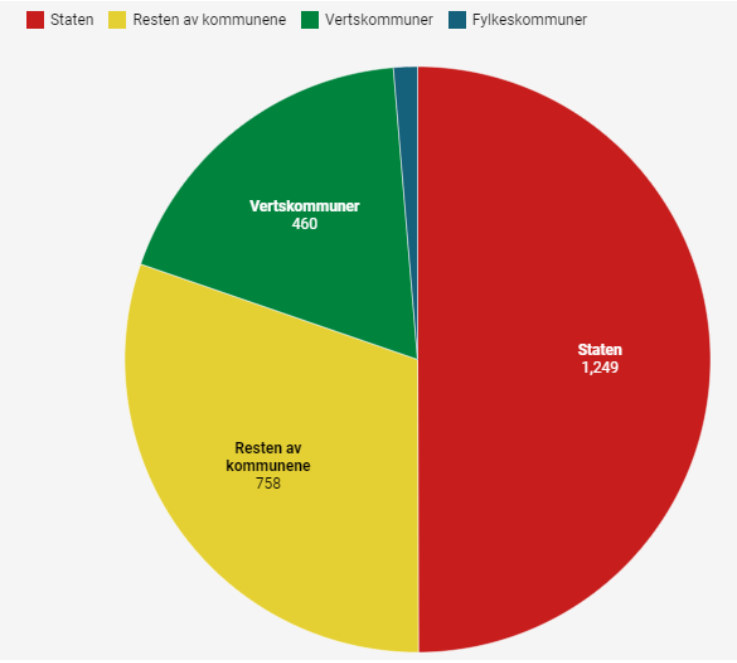


Figure 3: The distribution of the revenues from the resource rent tax (Nettavisen)

Source: ***https://www.nettavisen.no/okonomi/storbyer-uten-vindkraft-stikker-av-med-den-nye-vindskatten-absurd/s/5-95-782319*** ***(Read: 24.04.2023)***

4 Literature Review

In this chapter I will present the literature and studies that are relevant to answer the research question. The chapter will be divided into two parts: The first part will present different studies on social acceptance for land-based wind power. The second part will present studies on the effects of resource rent taxation.

4.1 Social acceptance for land-based wind power

Social acceptance is a broad term which sometimes can be difficult to define. In their paper Wüstenhagen et al. (2007) attempt to define this term by breaking it down into three sub-categories: Socio-political acceptance, Community acceptance, and Market acceptance. Socio-political acceptance is the most general level of acceptance and is defined as the acceptance of policies and technologies on a national level. An example of the socio-political acceptance is national opinion polls on the support for renewable energy. Community acceptance is defined as the acceptance on a local level, among local inhabitants and stakeholders, like the municipality. An example of community acceptance can be the acceptance towards a local wind project in a municipality. Market acceptance is defined as the ability of the market to accept and utilize new technology. An example of market acceptance is consumers switching from fossil fuel vehicles to electric vehicles. (Wüstenhagen et al., 2007). The main focus of this thesis will be on community acceptance.

A concept which is central when talking about community acceptance in relation to wind power, is fairness. Developing a wind power plant can lead to potential negative effects in a municipality, both on nature and societal interests. Thus, it is important for the municipalities that the result of such a process is perceived as fair (Gross, 2007). The term fairness is generally divided into two main categories: outcome fairness and procedural fairness. What is meant by outcome fairness is the distribution of benefits and costs. For example, if a municipality which has developed a wind power plant receives all the negative externalities, but none of the benefits from the power plant, this is regarded as a low degree of outcome fairness. Procedural fairness means that the stakeholders are fully allowed to take part in the development process, and that they should be able to express their opinions and be heard if they have objections. An example is the licencing process for wind power, where the municipalities are not allowed to fully participate, at least in the detailed planning (Gross, 2007). Together outcome fairness and procedural fairness constitute what is called overall fairness.

A study which looked at the importance of fairness in wind power development is Saglie et al. (2019). The study looked at wind power from the municipalities point of view and investigated the motivation for Norwegian municipalities to want to host wind power. They did this by examining the role of the process and outcome fairness, in addition to introducing the term relative fairness, meaning the perception of fairness when comparing your municipality's situation with other municipalities. The study used a qualitative method, including interviews with five Norwegian municipalities which were pro wind power. The study found that the process fairness was relatively strong for most of the licencing process, but it became weaker after the licence had been granted and the detailed planning phase started. The explanation was that the municipalities felt that they did not have much influence over this part of the process, as the developers can make changes to the project after a licence has been granted. The results showed that the outcome fairness was the most important aspect for why the municipalities were positive, and the property tax was pointed to as particularly important for why they had said yes to become host municipalities. In 2015 when the government proposed to remove the municipal access to collect property tax on wind power, several of the municipalities stated that without the tax they might not have wanted to host wind power. Several of the municipalities pointed to their role as providers of welfare and services to the local inhabitants, and thus they were dependent on the revenues from the wind power. The study also found that the negative effect on nature is seen as acceptable when the economic compensation is perceived as sufficient. However, some municipalities did not experience as much economic activity as envisioned and were disappointed. The relative fairness, i.e., comparison with other municipalities, were seen as relatively low, as the municipalities also compared themselves with municipalities with hydropower. As hydropower in general generate high tax revenues, the property tax was not enough to equalize this. Hence, even though the outcome fairness were seen as relatively high, the process- and relative fairness had a negative influence on the overall fairness (Saglie et al., 2019).

Another study that looked at acceptance for wind power was Vuichard et al. (2019). They investigated the effect of different financial participation models on the acceptance for hypothetical wind power projects. The study conducted an experimental survey with Swiss electricity customers. The participants were divided into three groups, and they were asked to imagine that a wind power project was to be developed within their municipality. Each group then got presented with one of three financial participation models. The results showed that the group that had been presented with a financial model based on a resource rent tax, was the most

supportive of the wind power project. However, they found that the higher level of acceptance in the resource rent tax group compared to the control group was not significant, and that the introduction of a financial participation model alone will not change people's attitude towards a wind power project. Thus, they concluded that a financial participation model based on a resource rent tax can increase the acceptance, but that there is no clear relationship between acceptance and financial participation models (Vuichard et al., 2019).

A study by Maleki-Dizaji et al. (2019) did a comparative case study analysis where they looked at wind power projects from six different countries in Europe, and what had been the most successful factors for these communities in creating local acceptance towards wind power. The study found that one of the most important contributions to local acceptance towards the wind power projects, was positive impacts on the local economy. Especially the creation of local jobs was pointed to as one of the most effective factors to increase the acceptance. They also found that establishing passive financial participation like taxes benefitting the host municipalities also was important for the acceptance (Maleki-Dizaji et al., 2020).

In relation to social acceptance, there has also been conducted studies on how the social acceptance towards wind power change over time. Devine-Wright (2005) conducted a literature review where this was one of the questions examined. The study found that most of the literature find a V-shaped pattern when examining the acceptance for wind power over time. People have a relatively high level of acceptance before the wind power is developed. Further the studies show that as the development and construction start, the level of acceptance will start to decrease. However, when the plant is operational the studies show that the acceptance level will increase to the initial level again (Devine-Wright, 2005). The development of the acceptance is presented in figure 4.

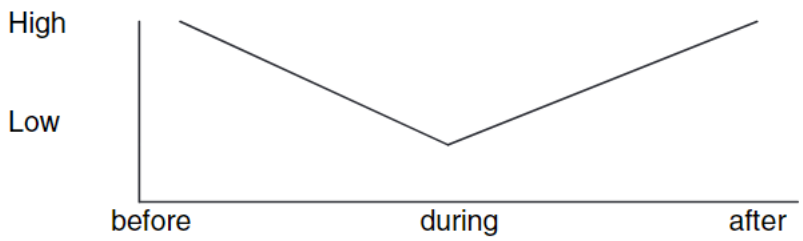


Figure 4: V-shaped relationship between acceptance for wind power and time (Devine-Wright, 2005)

Several studies have also looked at how exposure to wind power developments have influenced people's attitude. Some studies found that people are positively affected by exposure to wind power developments. One example of this is Warren et al. (2005) which conducted three case studies which looked at the attitude amongst the public towards both existing and planned wind power developments in Ireland and Scotland. The case studies were used to test three hypotheses, where two of them were: (a) that local people become more favourable towards wind power plants after construction, and (b) that the degree of acceptance increases with proximity to the wind power plants. The study found that a large majority of the people living in proximity of the wind power plants had a positive attitude towards wind power, while people that lived further away from the wind power plants expressed a more negative attitude (Warren et al., 2005).

However, other studies have found that the exposure to wind power development has a negative effect on the attitude. In their study Swafford and Slattery (2010) conducted a survey questionnaire in Texas to investigate the relationship between proximity to existing wind power plants, and the social acceptance for wind power. The study found that the people living closest to the wind power plants had the lowest acceptance, while the people living further away had a higher acceptance (Swofford & Slattery, 2010). Thus, the literature has been inconclusive when it comes to the effect exposure has on the attitude towards wind power.

Another study looking at the effects of exposure to wind power was Dugstad et al. (2020). They looked at how people's acceptance for new wind power development in Norway is affected by exposure to wind power developments, and the acceptance for increased domestic renewable energy production. They conducted a case-control discrete choice experiment to look into people's willingness to accept for having development of future land-based wind power projects in Norway. They compared two groups, one which was not exposed to wind power development, and a group which was exposed to wind power development. While they found that people in general are positive towards increasing renewable energy production domestically, they found that the acceptance for new wind power development in Norway is low. The findings implied that the respondents on average demanded a reduction of NOK 415 per month in their electricity bill for accepting the development of 3000 wind turbines in Norway. The exposed group had a lower acceptance for new wind power developments than the unexposed group. The results therefore suggest that the exposure of wind power developments, and the experience with the negative effects from wind power can lead to a lower acceptance for development of new wind power. The study pointed to that this was an example

of NIABY, i.e., not-in-anybody's-back-yard, implying that some people don't want wind power in their local area. It was also pointed to that this was an example of green-on-green conflicts, i.e., the conflicts between those that want to reduce emissions of greenhouse gasses by developing renewable energy, and those that don't want local impacts on nature from renewable power development (Dugstad et al., 2020).

When talking about acceptance for wind power, another important aspect is the externalities caused by these installations. A study by Zerrahn (2017) conducted a literature review to examine the externalities from wind power. The study found that people in general are positive towards development of land-based wind power. On the other hand, it was found that wind power led to several negative externalities. The most negative externalities brough up by people were in relation to nature and wildlife, the negative effects on people in the form of noise pollution, and the deterioration of landscapes that people value highly (Zerrahn, 2017).

A study by Linnerud et al. (2022) investigated how the general acceptance for wind power would be influenced by a political change in the focus from land-based wind power, to wind power plants located nearshore or offshore. They conducted a choice experiment where they presented the respondents with three different scenarios of future wind power development. The respondents were then asked to rank the three scenarios based on the following attributes: choice of location, intended use of the energy, ownership, height of turbines, and changes in the monthly electricity bill. The results showed that people prefer nearshore and offshore locations to onshore locations. However, they found that the most important factor for people is that the wind power is subject to local and national ownership and intended use. The results showed that when changing wind power from land to nearshore, people believe it is more important with national ownership and intended use (Linnerud et al., 2022).

Some studies have also looked at the impacts of wind power on the local level of where the wind power projects are located. In a study from Texas, Slattery et al. (2011) estimated the economic impacts of two wind power projects on local municipalities within a 100-mile (160 km) radius of the projects. The study found that the wind power projects led to the creation of around 450 local jobs in each of the municipalities during the construction period, and 250 local jobs in each of the municipality during the operation and maintenance period. The study also found that the economic activity for the local municipalities was substantial, estimated to be USD 730 million in total for the two municipalities over the 20-year life span of the wind power plants. However, the study found that the economic impacts were smaller for small

municipalities which do have little resources and few local businesses that can provide services for the wind power plants (Slattery et al., 2011).

Another study which looked at the local acceptance for land-based wind power was a study by Rand & Hoen (2017). They conducted a literature review on research on local acceptance for wind power in North America over the past 30 years. Some of the major findings from the study was that the impact of wind power on local economic factors is important. They found that inhabitants living in proximity to the wind power plants want the benefits from the wind power, i.e., energy and revenues, to remain in the local community. Those living close to wind power plants also state that it is unfair that they are influenced by the negative aspects of the power plants, while the energy and revenues from the plants are distributed elsewhere. The study also found that participation in the planning and licencing process (process fairness) can increase the acceptance for wind power (Rand & Hoen, 2017).

4.2 Effects of a resource rent tax

In a study by Hillberry and Nguyen (2022) they looked at the effect of a resource rent tax on wind power on two rural counties in Indiana, USA. The study found that a resource rent tax on wind power can generate significantly large revenues for municipalities that host wind power, and they found that the tax can lead to improved aggregated welfare. It was argued that the revenues from the resource rent tax could work as a compensation for the negative externalities that comes with wind power, and that it could contribute to an increased acceptance for wind power among municipalities and local communities (Hillberry & Nguyen, 2022).

5 Theory

In this chapter I will present the theories that are relevant to answer the main objective of the thesis. The chapter is organized into two main parts. The first part will deal with the theories of the resource rent and resource rent taxation. The second chapter will deal with theories on the energy economics of wind power.

5.1 Resource rent and resource rent tax

In most industries there is on average a normal return to investment, meaning that the actors in the industry will receive an average profit compared to the amount they have invested. However, some industries have an above average rate of return to investments. Many natural resource-based industries are in this category and manage to generate very large profits. The extraordinary profit in this sector is what is called the resource rent. The resource rent is defined as the revenues a company is left with after all input costs, like capital and labour costs, and the normal return in the economy have been taken into account (Greaker & Lindholt, 2022).

The main reason for why the resource rent occurs is because natural resource-based industries often have an exclusive access to common pool, finite resources (Greaker & Lindholt, 2022). Both in relation to wind power, hydropower, petroleum and marine farming, the participants in the market need a licence to extract or use the natural resource. As mentioned in chapter 3.3, companies must apply for a licence to enter the market, and in many sectors a limited number of licences will be distributed. The result of this is that few new producers enter the market. Hence, the actors already in the market can achieve a large profit because of the low grade of competition. Greaker and Lindholt (2022) conducted an analysis to estimate the resource rent in the Norwegian wind power sector. The analysis estimated the resource rent for the period 2010 to 2021, and it found that 2021 was the first year in this period with a positive resource rent (Greaker & Lindholt, 2022).

The resource rent tax extracts parts of the resource rent, whereas the normal return on investment is left untouched. The main objective of the resource rent tax is to increase the public revenues, and to redistribute some of the resource rent to society, so that the benefits from our natural resources can be distributed more equally (NOU 2019:16, 2019). Most taxes cause distortions, as they influence the behaviour of people and businesses. This lead to deadweight losses in the economy, as resources are not used in the most efficient way possible. According to the guidelines of the Norwegian tax system, revenues for the public sector should be collected in a way that creates the least possible deadweight losses for society (NOU 2019:16, 2019). For

a resource rent tax to be neutral, the general principle is that it has to be proportional with a company's net present value. This means that all relevant costs are deducted with a value equal to the net present value of the costs, and all relevant income must be taxed with a value equal to the net present value of the income. By extracting equal amounts of the income and costs, the relative return will be the same both prior and after the introduction of the resource rent tax (NOU 2019:16, 2019, p. 90). If a resource rent tax is designed correctly, it will be a neutral tax. This means that wind power projects which is profitable to invest in before the implementation of the tax, also should be profitable to invest in after the tax has been implemented. Thus, a resource rent tax should not alter the investment behaviour of a company (Land, 2008). However, as mentioned in chapter 3.7, when there are several taxes on the profits of a power company, like corporate tax, this will influence the neutrality of the resource rent tax.

The resource rent tax proposed by the Norwegian government is designed as a cash flow-based tax (Regjeringen, 2022a). In a resource rent tax designed as a cash flow tax, the tax base is the net present value of a company's cash flows. The cash flow consists of the revenues from sales minus the investment and operating costs, in addition to the sales of real capital. The revenues and costs of interests are kept outside of the tax base. The net present value of the cash flow is then found by discounting the cash flows by a required rate of return equal to the alternative return. This is then the resource rent (NOU 2019:18).

5.1.1 Optimal development of land-based wind power

Like with any other investment, the developers of land-based wind power want the investment to be as profitable as possible. The following example will show what requirements have to be met for land-based wind power development to be optimal, and how the resource rent occurs.

For the development of a wind power project to be optimal, the price in the market must be equal to or higher than the long-run marginal cost. We are then faced with the two following aspects: The long-run marginal costs have to be defined, and we have to make an assumption about what the energy price is. The long-run marginal costs are found by taking the sum of all the short-term marginal costs and the capital costs. For the project to be profitable over the lifetime of the project (T), it is necessary to obtain a positive revenue after the total operating costs have been deducted to pay for the investment costs (Bye, 2014). In relation to the price, in the short-run it is possible to find the price by simply looking at the price in the market. However, in the long-run the price has to be based on estimates. These estimates have to be based on assumptions which are uncertain, like political uncertainty and changes in the demand.

Hence, these price predictions are uncertain, and the uncertainties will lead to that the developers of wind power plants demand a higher return on investment (Bye, 2014).

Based on the assumptions above, the developer of wind power has a project with a power production capacity *y*, which is measured in kWh (kilowatt hours). We have that the marginal capital cost per additional unit of new capacity is denoted k (Norwegian kroner) /KWh, and that the short-term marginal operating costs is written as d kr/kWh. It is further assumed that the capital cost d, and the energy price p, are constant over the project's lifetime. The real interest rate is denoted i, and it is also assumed to be constant. We assume that the investment happens in the year t = 0, and that the incoming and outgoing cash flows starts in t = 1. The entire lifetime of the project is denoted as T. The net present value for the project will then be:

$$NPV = \sum_{t=1}^{T} (py - dy)(1 + i)^{-t} - ky \qquad (1)$$

Based on equation (1), we can find the long-term cost of capital. First, we use the formula for the sum of a geometric series with the term (T-1). We then have:

$$a(i, T) = \frac{1}{\sum_{t=1}^{T}(1 + i)^{-t}} = \frac{i}{1 - (1 + i)^{-T}} \qquad (2)$$

The expression a(i, T) is the yearly capital costs transformed to an annual payment. Equation (2) can then be rewritten as:

$$\frac{NPV}{a(i, T)} = y[p - (d + a(i, T)^{-1}k)] \qquad (3)$$

As a(i, T) is a positive expression, the NPV ≥ 0 if $[p - (d+a(i, T)^{-1}k)] \geq 0$. The expression a(I, T) we can call an annual cost factor, as it transforms the capital cost to a fixed periodized cost each year, and thus it can be compared with the other periodized costs d and p. We then have the short term marginal cost d, and the long-term marginal cost expressed as $(d+a(i, T)^{-1}k)$, and it includes all the costs associated with power production from land-based wind power. From equation (3) we have that for the investment to be profitable, the energy price must be higher or equal to the long-term marginal cost of capital.

From the equations above we get an increasing supply curve for the development of new wind power projects, where the projects are ranged based on their long-term marginal cost. As the energy price increases, the wind power plants with the highest costs will also become profitable. In figure 5, this gives the rising long-term supply curve S, representing both existing and new power production. We also have the long-term demand curve D, which shows that the demand for energy will increase when the price is reduced. We have the optimal point (p*, y*), where the supply curve and demand curve intersect. From earlier we have that price of energy has to be equal or higher to the long-run marginal cost of capital for development of new wind power to be profitable. If the demand increases, the demand curve will shift outwards, and this will lead to an increase in the energy price. This will result in more wind power projects becoming profitable to develop (Bye, 2014).

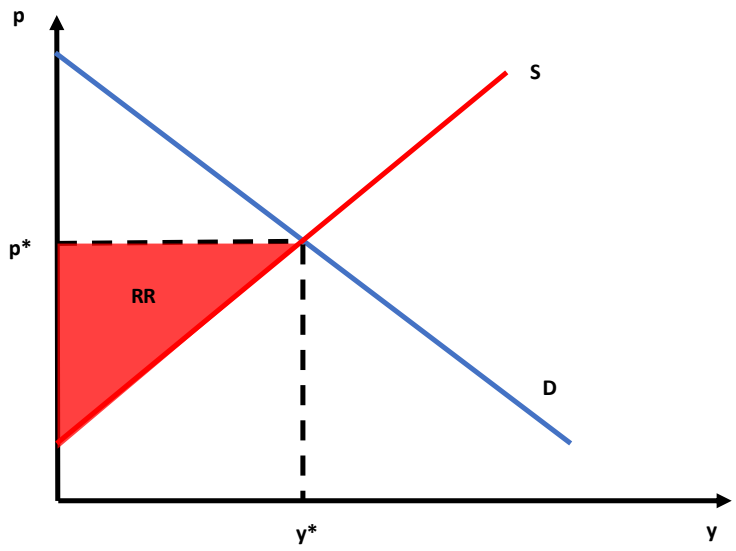


Figure 5: Production of land-based wind power and the resource rent.

As electricity is a homogenous good, all the producers will get the same price when selling it. Hence, the profits of a wind power plant only depend on the production costs of each plant. This means that the power plants with low production costs, furthest to the left in figure 5, will get higher profits than the power plants further to the right. As stated earlier, the long-term marginal cost includes all the costs associated with the power production. The implication of this is that all the costs associated with the power production equals the area beneath the long-term supply curve up to the equilibrium point (p*, y*). The revenue for the producers is denoted as p * y. As figure 5 illustrates, this creates a profit for the producers to the left of the equilibrium, shown by the area RR. It is this profit which is the resource rent. We can see that

the lower production costs a wind power plant has, the higher the resource rent will be (Bye, 2014).

5.2 The energy economics of land-based wind power

As mentioned in chapter 3.6, land-based wind power is what we call an intermittent power source, i.e., it cannot be regulated. The implication of this is that we cannot control when or how much to produce, as this depends on external factors (Norges vassdrags- og energidirektorat, 2022b). This leads to a number of challenges associated with using land-based wind power as a source of energy. One major problem is that power has to be produced when people need to use it, which is challenging with wind power as the wind does not always blow. Thus, land-based wind power is difficult to use as a main source of energy, and it has to be complemented by sources of power that can be regulated, like hydropower.

The following example will show how wind power can be combined with hydropower, and what is then the optimal use of hydropower in combination with wind power. In the example we have the energy consumption over two periods. We assume that we have some wind power production in period t, denoted as u_t, in addition to hydropower production, e_t, which is connected to a reservoir. As the wind power is intermittent, it implies that we can control e_t, but not u_t. We have that the total consumption of energy in each period is $e_t + u_t$, and the demand function is then $p(e_t + u_t)$. Hence, the integral will go from 0 to $e_t + u_t$, and z is used as a helping variable to denote all the consumption from 0 to $e_t + u_t$. We then want to maximize the social surplus of power over two periods. We assume that there are no production costs for either the wind power or hydropower, as the main input factors, wind and water, are very cheap. We also assume that there is no discounting between the time periods, as we suppose there is a short time between the periods. We then want to maximize the social surplus in the two periods:

$$\int_0^{e_1+u_1} p_1(z)dz + \int_0^{e_2+u_2} p_2(z)dz \tag{4}$$

Given the constraints:

$$\begin{aligned} R_1 &= R_0 + w_1 - e_1 \\ R_2 &= R_1 + w_2 - e_2 \\ R_1 &\leq \bar{\mathrm{R}} \end{aligned} \tag{5}$$

Where R_0 is the amount of water in the reservoir before period 1, R_1 is the amount of water in the reservoir at the end of period 1, R_2 is the amount of water in the reservoir at the end of period 2, and $\bar{R}$ is the reservoir capacity. w_t is the inflow in period t. From the constraints we can see that for period 1, the amount of water in the end of the period has to be equal to the amount of water before period 1, plus the inflow in period 1, minus the amount used for energy production in period 1. The same applies to period 2. We can also see that the amount left in the reservoir at the end of period 1 must be less or equal to the reservoir capacity, as there is not possible to use more than the reservoir capacity.

We then have the Lagrange function:

$$L = \int_0^{e_1+u_1} p_1(z)dz + \int_0^{e_2+u_2} p_2(z)dz$$
$$-\lambda_1(R_1 - R_0 - w_1 + e_1) - \lambda_2(R_2 - R_1 - w_2 + e_2) - \gamma_1(R_1 - \bar{R}) \quad (6)$$

Where λ_t is the water value i.e., opportunity cost of water, and γ_1 is the shadow price on the reservoir constraint.

To solve this, we have to use the first order condition by taking the partial derivative w.r.t. e_1, e_2, and R_1. We will assume that $R_0 = R_2 = 0$. We then have the first order conditions (FOC):

$$1.\ L'_{e_1} = p_1(e_1 + u_1) - \lambda_1 \leq 0 \quad \{= 0 \text{ if } e_1 > 0\}$$

$$2.\ L'_{e_2} = p_2(e_2 + u_2) - \lambda_2 \leq 0 \quad \{= 0 \text{ if } e_2 > 0\} \quad (7)$$

$$3.\ L'_{R_1} = \lambda_1 + \lambda_2 - \gamma_1 \leq 0 \qquad \{= 0 \text{ if } R_1 > 0\}$$

By including wind power, it means that we can have zero production from hydropower without consumption being zero. When $e_1 = 0$, this means that that we have inequality in FOC 1.: $p_1(u_1) - \lambda_1 < 0$. We also assume that $R_1 > 0$ so that we have equality in FOC 3. To look at the effects of the wind power, we assume that the reservoir constraint is not binding for period 1, that is $R_1 < \bar{R}$. This implies that the shadow price on the constraint is zero ($\gamma_1 = 0$). We can then see from FOC 3. that we have that the water value is the same in the two periods ($\lambda_1 = \lambda_2$). If the energy

production from hydropower is zero in period 1 ($e_1 = 0$), we certainly want to produce in period 2 ($e_2 = 0$), so that we maintain equality in FOC 2. ($p_2 (e_2 + u_2) = \lambda_2$). We then have:

$$p_1(u_1) < \lambda_1 = \lambda_2 = p_2(e_2 + u_2) \qquad (8)$$

Hence, we can see from equation (8) that we get a lower price in period 1 than in period 2, as we have a large production of wind power in the first period. The optimal would be to save some of the electricity from the wind power to period 2, but this is challenging and require e.g., expensive batteries. This is illustrated in the bathtub diagram below (figure 6):

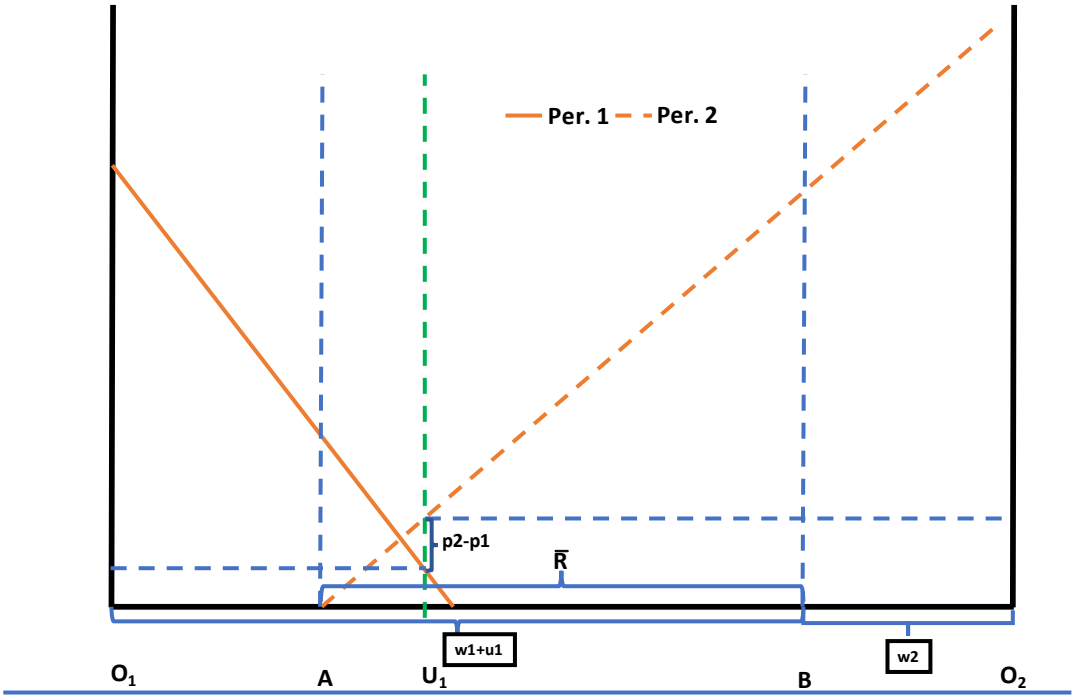


Figure 6: Production of electricity with wind and hydropower combined.

We have that the length of the bathtub is $w_1 + w_2 + u_1 + u_2$, which is the sum of all electricity that can be consumed during the two periods. To simplify, we assume that there is no production from wind power in period 2 ($u_2 = 0$). The distance O_1 – B (vertical blue dotted line) is equal to $w_1 + u_1$, i.e., the maximal amount we can use in period 1. We then have that the distance A (blue dotted vertical line) – O_2 is equal to $\bar{R} + w_2$, i.e., what we maximally can use in period 2 (since $u_2 = 0$). Thus, the solution for the optimal use of hydropower must be between A and B. No wind power can be used in period 2, which is illustrated with the green dotted line at U_1. We

then have that the distance O_1-U_1 is equal to the wind power production in period 1 (u_1). This illustrates that the solution cannot be to the left of U_1, meaning that we have to use at least u_1 in period 1 as it cannot be saved to period 2. We can notice that U_1 is to the left of A, which means that the intermittency constraint might be binding, but not the reservoir constraint. This means that we cannot save anything of u_1 to period 2, and this is illustrated by the demand curves for period 1 and period 2 intersecting in U_1. This implies that the ideal would have been that we could save some of u_1 to period 2, but it is not possible as we cannot control the wind. We then have that the optimal solution is found at U_1, and we can notice that we get different prices in period 1 and period 2.

6 Methods

In this chapter I will present the method I have used to answer the research question and sub-questions of the thesis. Chapter 6.1 will elaborate on the choice of method and research design. Chapter 6.2 will describe the data gathering method, and in chapter 6.3 I will assess the different methods used and look into the reliability and validity of my research methods.

6.1 Choice of method and research design

The research question of this thesis is to investigate if the resource rent tax on land-based wind power will change Norwegian municipalities' acceptance towards land-based wind power within their municipality. To elaborate on my research question, I also have the five following sub-questions:

Will the impact of the resource rent tax be different in municipalities: 1) with and without land-based wind power, 2) with weak and strong economy, 3) which have a property tax, 4) which put a high value on tourism, and 5) which put a high value on their local nature.

According to Saunders et al. (2012), the research design is a scheme for how the research questions in an academic paper are going to be answered (Saunders et al., 2012, p. 159). The first part of the research design is to choose the method that are going to be used in the study. In general, there are three different methods to a research design: quantitative method, qualitative method, and multiple methods research design. My research design is essentially qualitative, as the questions in my interview are mainly qualitative questions, where the respondents must answer open questions about their attitude towards land-based wind power. At the same time, several questions also have quantitative elements to them, in that they ask the municipalities to give a score in relation to their attitude. These will be presented statistically. Hence, the method is mainly qualitative, with elements of quantitative aspects.

The next step is to establish the purpose of the research. There are mainly three types of purposes to a research design, and these are: explanatory, descriptive or exploratory purposes. I have chosen an exploratory research design for my thesis. An exploratory research design is useful to employ when you are working with open questions to understand a new phenomenon, or when you want to obtain detailed information about a subject (Saunders et al., 2012, p. 171). As the resource rent tax on land-based wind power is a relatively new tax, and has not been decided on yet, there is not much literature on its effects on the attitude towards land-based wind power. Thus, there is a need to obtain detailed information on the topic. Based on this, I believe that the explanatory research design is the best fit for my research question.

6.2 Data gathering

In this chapter I will describe the methods I used to collect the data needed to answer my research question and sub-questions. The first part will be explaining my data gathering method, semi-structured interview, how I selected and recruited the municipalities, how the interviews were planned, and how they were conducted.

6.2.1 Semi-structured interview

As stated, the objective of this thesis is to investigate if the new resource rent tax on land-based wind power will change Norwegian municipalities acceptance for land-based wind power within their municipality. To answer this research question, I have applied a qualitative research tool, which is interview. Research interviews are one of the most used research tools to collect qualitative data (Legard et al., 2003). There are mainly three types of interviews: structured interview, unstructured interview, and semi-structured interview. A semi-structured interview is explained as an interview where there is a list of themes and key questions that are covered, but some questions can be included or omitted depending on the interview subject. Most of the questions are open to encourage discussion. Follow-up questions may be required to explore the research questions, and to follow up on responses (Saunders et al., 2012, p. 374-375). I found the form of a semi-structured interview to fit my research question the best, as I wanted both qualitative and quantitative results, and it let the interview subjects discuss and explain freely. Saunders et al. (2012) states that semi-structured interviews are helpful to use when conducting an exploratory study (Saunders et al., 2012, p. 377). The main reason for the choice of interview as my method is that it is a good method for getting detailed information about a topic. In addition, the introduction of the resource rent tax has happened recently, and there does not exist much data on this matter at the present time. Hence, I found interview to be a useful method to obtain new data, although it is time consuming.

6.2.2 Selection and recruitment

To answer the research question, I had to obtain information from Norwegian municipalities. One of the criteria I set, was that the municipalities that were to participate had to have existing land-based wind power within their municipality, or land-based wind power had to have been up for discussion earlier. Hence, when selecting the municipalities to contact, I used the National Framework for Land-Based Wind Power report by NVE as the basis for the selection. I could then be assured that all the municipalities at least have had wind power up for discussion at least once (in 2019). As mentioned in chapter 3.4, in The National Framework for Land-Based Wind Power, NVE pointed out 13 areas in Norway they believe are the most suitable for

future development of land-based wind power (Jakobsen et al., 2019). These 13 areas consisted of 102 municipalities in total, distributed throughout Norway. However, multiple of the municipalities mentioned in the report were part of the municipal reform of 2020, which meant that municipalities merged into larger entities. When taken this into account, the selection pool consisted of 84 municipalities.

To answer sub-question 1, I planned to interview both municipalities with existing land-based wind power, and municipalities without land-based wind power. By adding this layer to my research design, I was able to investigate if municipalities that already have land-based wind power were affected differently by the resource rent tax than municipalities that does not have wind power. In addition to this, I could gather information on general differences between these municipalities, and their motivation for saying yes or no to land-based wind power.

I then used random sampling to choose which municipalities to interview. Before I conducted the random sampling, I had to ensure that I ended up with both municipalities with and without land-based wind power in my sample. In addition, I had to ensure that my sample was representative for the municipalities mentioned in the NVE report. Hence, I reorganized the municipalities into three new groups. These were: Northern- and Central Norway, Western Norway, and Southern- and Eastern Norway. The distribution of municipalities with and without land-based wind power is shown in table 1 below.

Table 1: Distribution of municipalities with and without land-based wind power in the constructed groups

	Northern- and Central Norway	**Western Norway**	**Southern- and Eastern Norway**
Municipalities with land-based wind power	**5**	**7**	**4**
Municipalities without land-based wind power	**18**	**21**	**29**

Another important requirement was that the subjects interviewed had a position in the municipality that were seen as relevant for answering the questions. Thus, this was specified in the first email sent out to the municipalities. At first, I choose 12 municipalities through random sampling, 4 from each of the three groups, where two had existing land-based wind power, and

two did not have land-based wind power. Because of some challenges with some municipalities that did not answer, and some municipalities that responded late, I had to pick more municipalities. In total I sent a request to 55 municipalities, and in the end I were left with 17 municipalities that said yes to participate. That gives a response-rate ratio of around 30%, and the size of the sample made up 20% of the total municipalities mentioned in the report. Of the 17 municipalities, five were from Northern and Central Norway, five were from Western Norway, and seven were from Southern and Eastern Norway. Among the municipalities, 7 did have wind power, while 10 were municipalities without wind power. Municipalities with and without land-based wind power were distributed relatively equally among the three groups. I interviewed one person from each municipality, and I interviewed mainly employees in the municipal administration, but also some politicians (mayors).

6.2.3 Interview planning and interview design

Prior to designing the interview questions, I had familiarized myself with the literature presented in chapter 4 on acceptance for land-based wind power. This was to be able to create good and relevant questions, and to ask follow-up questions where this was necessary. I used one week where I developed the questions, and where my supervisor and co-supervisor came up with suggestions for revisions. When the interview questions were finished, they were sent to the interview subjects for them to prepare themselves before the interview. As the topic of wind power is regarded to be controversial, the interview subjects were also informed that the results from the interviews would be anonymized.

The interview consists of the six following parts:

- Part A: Background questions about the municipality's economy
- Part B: Previous attitude towards land-based wind power
- Part C: Attitude towards land-based wind power today, and after the introduction of the resource rent tax
- Part D: Questions for municipalities with land-based wind power
- Part E: Questions for municipalities without land-based wind power
- Part F: Concluding comments.

Part A consists of general questions concerning the economic situation of the municipalities. The purpose of this part is to be able to differentiate the effect of the resource rent tax on the municipalities on the basis of their economic situation. Part B consists of questions about the municipalities previous attitude towards land-based wind power. These and some other

questions are not directly related to the impact of the resource rent tax. However, they are included to get an understanding of how the acceptance for wind power has developed over time, which I believe is an important aspect to gain a more thorough understanding of how the resource rent tax affects the acceptance towards wind power. Part C consists of questions about the municipalities current attitude towards land-based wind power today, and questions about the influence of the resource rent tax on the attitude. Part D consists of questions to the municipalities with land-based wind power, and part E consists of questions to the municipalities without land-based wind power. In part F the municipalities could come up with additional comments about the topic.

The interview consists of 25 questions in total, including sub-questions. The municipalities with land-based wind power had to answer 23 questions, and the municipalities without land-based wind power had to answer 22 questions. 13 of the questions were designed to both generate qualitative and quantitative answers. These questions included a scale where the interview subjects had to give a grade. Two different scales were used in the graded questions, a 1-10 scale, where 1 is very negative, 10 is very positive and 5 is neutral. The questions using this scale asked the respondents to give a score reflecting their grade of positivity towards land-based wind power, or how the resource rent tax influenced their positivity. I also used Likert-scale from 1-5, where 1 is low weight, 5 is high and 3 is neutral weight. This scale was used in question 12 where the interview subjects are presented with different statements about wind power, and they have to grade the importance of the statement presented in relation to their own municipality. The grading is then followed by a part where the interview subjects are asked to explain their scores.

6.2.4 Execution of the interviews

The interviews were conducted in the period from January 19th to February 17th. A total of 17 interviews were conducted. All the interviews were conducted digitally in Microsoft Teams, and all the interviews were recorded with permission from the participants. The shortest interview lasted for about 20 minutes, while the longest interview lasted for over an hour.

6.3 Assessment of the research quality

In this part I will discuss my research design and methods, and assess both the reliability and validity.

6.3.1 Reliability

Reliability is concerned with how consistent and accurate the applied research method is at producing reliable answers, and to what extent a research method would produce the same results if conducted by others (Saunders et al., 2012, p. 192). According to Saunders et al. (2012), there are mainly four threats to reliability: *Participant error*, *participant bias*, *researcher error*, and *researcher bias*. Participant error deals with all circumstances that can influence the performance of the participants. As the interviews were conducted digitally, I cannot be sure that the interview subjects were not influenced by factors that could affect their performance in the interviews. At the same time, it is nearly impossible to account for all the factors that can influence people, and even more difficult to control them.

Participant bias refers to any factor that can lead to false responses from the participants. In my interviews I interviewed both employees in the municipal administrations, and some politicians. I chose to interview mostly municipal employees, as I believe the employees in the municipal administrations were not directly connected to any political party, and thus I believe that their answers to a low degree were influenced by political views. I also interviewed three mayors (politicians). It is reasonable to assume that these had a higher degree of participant bias than the employees in the municipal administrations, as I have to assume that their answers could be influenced by their political views and party affiliation. At the same time, mayors are elected to represent the whole municipality, and it is therefore also reasonable to assume that they do their best to promote the different views in a local society.

Researcher error refers to any factor that can influence the researcher's interpretation of the information received. I tried to be well prepared for all the interviews. However, I cannot rule out that I did not misunderstand some of the answers that were given in some of the interviews. At the same time, I asked follow-up questions when I felt there were aspects that were unclear.

Researcher bias means all factors that can lead to bias in the registration of the responses. All the interviews were recorded, and when transcribing them I tried my best to write them down verbatim. Thus, I believe the degree of research bias is low in my research methods.

6.3.2 Validity

Validity deals with the degree to which the research methods applied manage to answer the research question of the thesis (Saunders et al., 2012, p. 193). In general, validity is divided into internal validity and external validity. In relation to interviews, internal validity means that the questions asked manage to give the results they are actually meant to measure. External validity refers to if the results of a study can be generalized to other similar situations and settings. When it comes to the internal validity, I believe that the interview questions do a good job in answering the research question. Regarding the external validity, I believe this to be a bit weaker. As mentioned in chapter 6.2.2, the municipalities were divided into groups to obtain a representative sample of the different municipalities in the NVE report. As the sample is equal to 20% of the municipalities mentioned in the report, and equally divided among the different parts of Norway, I will argue that the municipalities which were selected were representative for the municipalities mentioned in the NVE report. However, when conducting interviews, the answers depend on who you are talking to. Because of this, it probably will be challenging to get the exact same answers if these interviews are conducted in other municipalities.

7 Results

This chapter will present the findings from the interviews that were conducted as part of the data gathering. This part will form the basis for answering the research question and sub-questions of this thesis, which will be answered in the discussion chapter. The results will mainly be presented in the order in which the questions were asked during the interviews.

7.1 Part A: The municipalities' economic situation

This part was included to categorize the municipalities into different groups, to investigate if the resource rent tax affected the municipalities differently, based on their economic situation.

Question: How would you characterize the economy of the municipality, compared to other comparable municipalities?

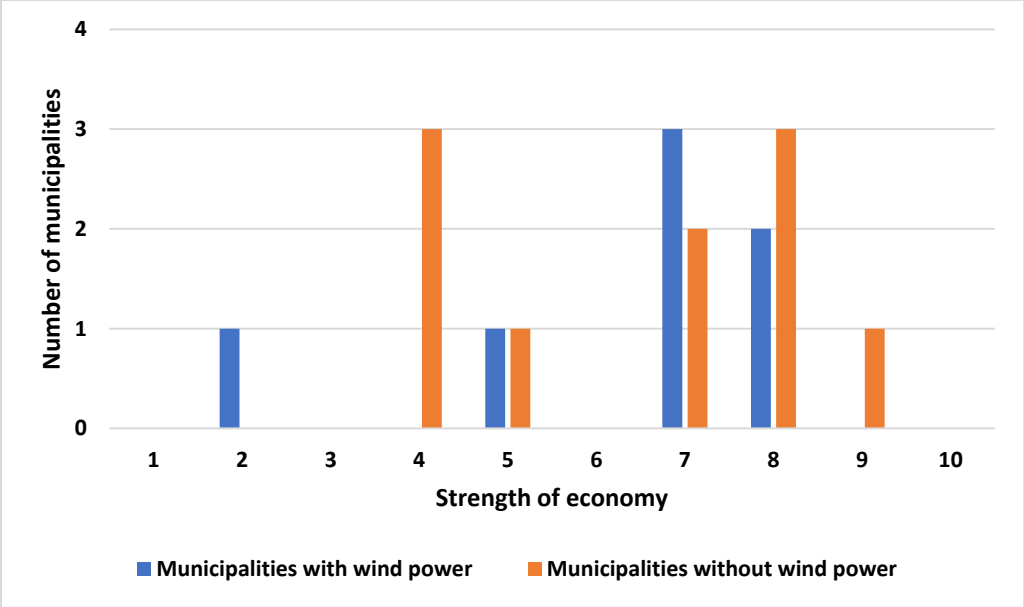


Figure 7: Response to the question: "How would you characterize the economy of the municipality, compared to other comparable municipalities?"

In figure 7 we can see that a majority of the municipalities that took part in the interviews are characterising themselves as having relatively strong economies, compared to other comparable municipalities. We can also notice that some of the municipalities stated that they have average, or below average economic strength. As seen from figure 7, there are no clear differences between municipalities with and without existing land-based wind power regarding their economic situation.

Question: Do the municipality have property tax on power installations, and what are the annual property tax revenues?

In this question the municipalities with land-based wind power were asked about property tax on their wind power plants, while the municipalities without land-based wind power were asked about property tax on power installations.

All of the municipalities with land-based wind power had a property tax on power installations, including land-based wind power. The revenues from the property tax on land-based wind power varied much among the municipalities. The lowest tax revenue was stated to be NOK 4 million, while the highest was NOK 25 million. There were also differences between the municipalities in relation to what proportion of the total income that came from the property tax related to the wind power plants. For some of the municipalities, the property tax from the wind power made up a relatively large part of the total revenues, while for other municipalities the revenues from the tax made up a small share of the total revenues.

For the municipalities without land-based wind power, seven of them stated that they had a property tax on energy installations, including potential land-based wind power. The revenues from the property tax on power installations varied from around NOK 3 million to NOK 200 million. Three of the municipalities did not have a property tax.

7.2 Part B: Previous attitude towards land-based wind power

This part of the results will address the attitude of the municipalities in previous years, more precisely prior to and up until 2019 when NVE published the National Framework for Land-Based Wind Power report.

Question: Has land-based wind power been processed in the municipality in the past (before 2019)?

In this question the municipalities were asked if there had been any processes with land-based wind power in the municipality before 2019. That is, in addition to the process that had been in relation to the National Framework for Land-Based Wind Power report. It should be mentioned that some of the municipalities without land-based wind power haven't had any processes concerning land-based wind power before the NVE report was published in 2019.

Municipalities with land-based wind power

Five of the municipalities with existing land-based wind power had their wind power plants processed before 2010. Two of the municipalities had their plants processed after 2010. Hence, we can see that a majority of the municipalities with existing land-based wind power were relatively early in getting wind power plants.

Municipalities without land-based wind power

Among the municipalities without land-based wind power, six of them had processed cases concerning land-based wind power before 2019. Most of these cases had been processed between 2010 and 2019. In four of the municipalities there had not been any cases concerning land-based wind power prior to 2019. These four municipalities therefore gave the same scores in the two following questions. In general, we can notice that multiple of these municipalities discussed land-based wind power for the first time at a later stage than the municipalities with existing wind power.

Question: How positive or negative was the municipality towards land-based wind power within the municipality at that time?

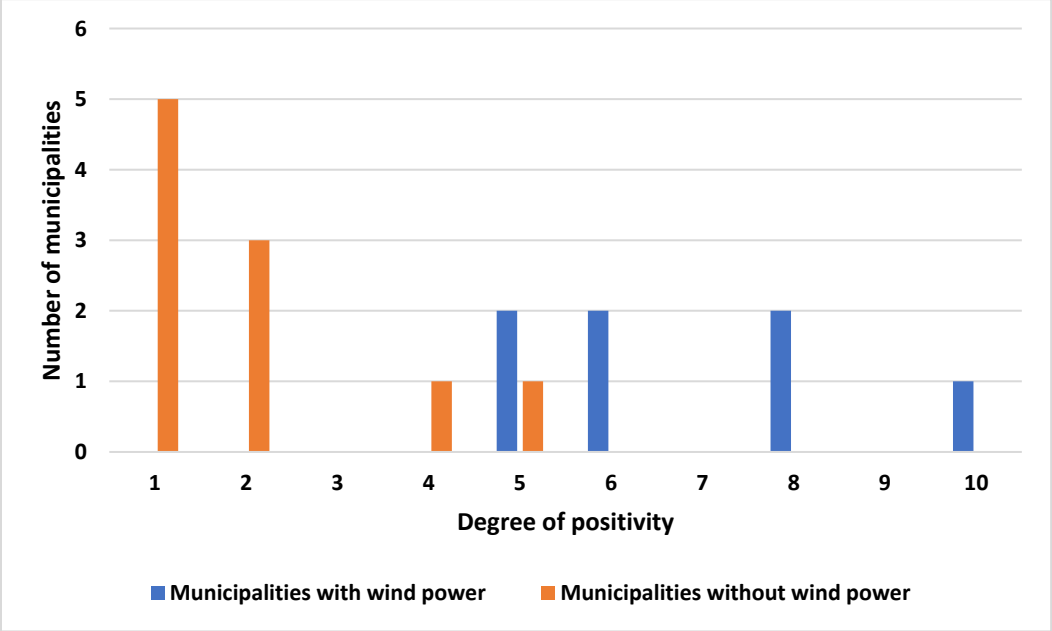


Figure 8: Response to the question: "How positive or negative was the municipality towards land-based wind power within the municipality at that time?"

In figure 8 we can see a clear distinction between the municipalities with and without land-based wind power. We can notice that the municipalities with land-based wind power in general

were more positive towards wind power prior to 2019, while the municipalities without land-based wind power were generally more negative. In the following section I will go through the arguments presented by the different municipalities.

Municipalities with land-based wind power

Most of the municipalities with existing land-based wind power stated a relatively positive attitude towards land-based wind power prior to 2019. This makes sense, as if they had been negative towards land-based wind power, the power plants they have would most likely not have been built in the first place. One of the main arguments for their positive attitude towards land-based wind power prior to 2019, was that it contributed to local development and increased economic activity. The municipalities stated that they had been informed by developers that it could lead to both increased municipal revenues, more local jobs, and development of local businesses. These were aspects many of the municipalities found important. Another argument put forward was that it contributed to energy production and energy security in the municipality. It was also argued that the opinion among the local inhabitants was relatively positive towards wind power at this time. In general, most of the arguments presented were positive.

Municipalities without land-based wind power

Most of the municipalities without land-based wind power stated a relatively negative attitude towards land-based wind power prior to 2019. This makes sense since none of them developed land-based wind power plants in their local area. One of the main arguments against land-based wind power pointed to by all the municipalities, regardless of the degree of positivity, was the negative effect it has on nature and wildlife. Multiple of them stated that the areas proposed for development were important recreational areas, and areas with pristine nature. The negative effect on reindeer husbandry were also pointed to by some of the municipalities. Another major argument against land-based wind power was the resistance and negativity in the local population. The negativity amongst the inhabitants was also explained by the negative effect wind power has on nature. Other arguments on the negative side pointed to by inhabitants was that the wind power plants would cause noise and visual pollution for potential neighbours. Several of the municipalities explained that the local resistance had been massive, and this in turn had influenced the politicians. However, multiple of the municipalities expressed that the negative part of the population in most cases was not the majority, but they were the ones shouting the loudest.

Another major argument pointed to by the municipalities was that they have too little influence in the licencing process. They argued that the licencing process did not sufficiently take into account the municipal self-government. They pointed to that the municipalities did not have much authority in the detailed planning process of the wind power plants, neither the placement of the turbines or their height. Hence, several argued that the authority of the planning process should be transferred back to the municipalities. It was also pointed to the uncertainty surrounding the revenues associated with land-based wind power. Multiple of municipalities stated that it was unsure how much tax revenues a wind power plant would generate to the municipality. Some of them also pointed to that there was a period when the government considered removing the right to collect property tax on wind power, which created uncertainty among the municipalities. Several also argued that the general tax regime for land-based wind power and the revenues generated from it was regarded as being too low, and that they did not justify the negative effects caused by the power plants. The municipalities with a strong economy argued that they were not dependent on the increased revenues a potential land-based wind power plant could provide. Some of the municipalities stated that they had already developed much hydropower, and thus they did not want to sacrifice more of their nature to power production. It was stated that the positive arguments like increased revenues and local jobs did not get much support in these municipalities. In general, the municipalities regarded the negative externalities as being larger than the benefits.

Question: When NVE's report: National Framework for Land-Based Wind Power came out in 2019, areas in the municipality were pointed to as suitable for land-based wind power. How positive or negative was the municipality towards land-based wind power when this report was published?

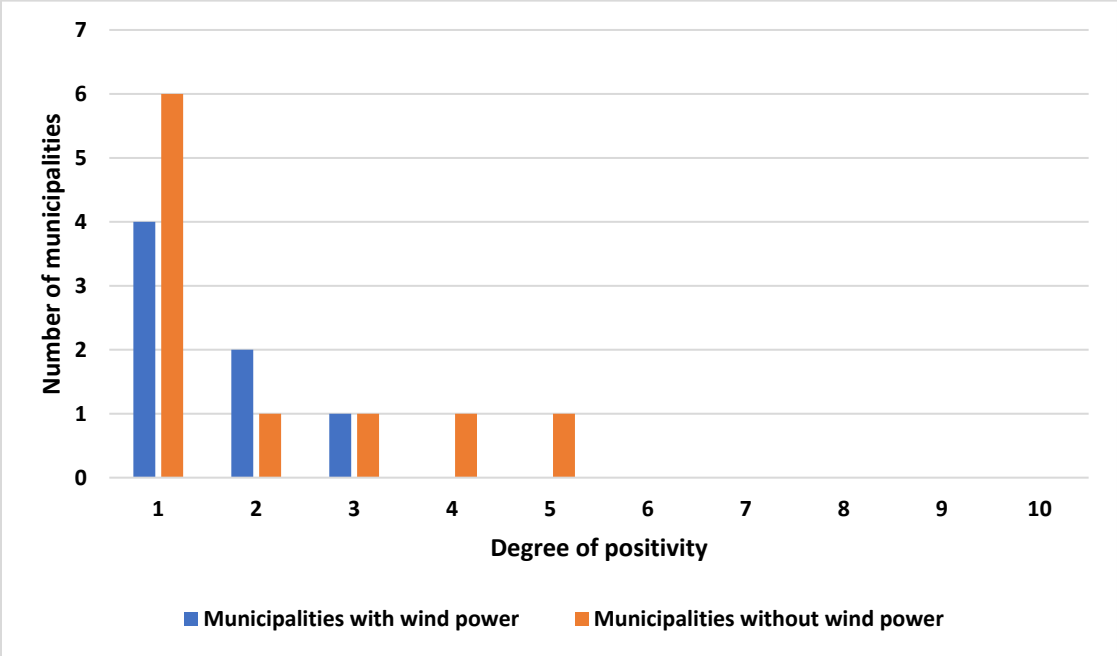


Figure 9: Response to the question: "How positive or negative was the municipalities towards land-based wind power when the report from NVE was published?"

As presented in chapter 3.2, The National Framework for Land-based Wind Power report by NVE, pointed out areas that were the most suitable for land-based wind power in Norway. All the municipalities that were interviewed were mentioned in the report, as they all had areas that were particularly suitable for land-based wind power. Based on this, the municipalities were asked how the report influenced their attitude on land-based wind power.

Compared to the results from the previous question, we can see from figure 9 that in general the municipalities with land-based wind power had become more negative after the report was published. On the other hand, we can notice that the municipalities without land-based wind power had about the same attitude as prior to 2019. We can see that none of the municipalities stated that they were positive towards land-based wind power at this time. Most municipalities were negative, and we can notice that a slight majority of the municipalities answered 1 and considered themselves to be very negative at this point.

Municipalities with land-based wind power

Most of the municipalities with land-based wind power were very negative when the report was published. All the municipalities with land-based wind power stated a lower score here than in the previous question and had become significantly more negative than they were prior to 2019.

One of the main reasons they had become negative compared to earlier was the experiences with the wind power plants they had developed. Many stated that the wind power plants they built caused more negative effects than first expected. The main argument was the same as presented by the municipalities without land-based wind power in the previous question, namely the negative externalities it has on nature. It was also pointed to by some that the wind power plants caused noise pollution for neighbours. In addition to this, several also felt that they had done their share of the green transition, and that they had sacrificed enough nature to this cause. The argument of local and national resistance among inhabitants was also pointed to by these municipalities for making them more negative. Multiple of the municipalities experienced changes in the detail planning of the licence before the wind power plants were finished. The changes involved adjustments in height and location of the turbines, which had a negative effect on their acceptance. Some also stated that the increase in economic activity, especially in local jobs, did not match what had been promised by the developers.

Municipalities without land-based wind power

The municipalities without land-based wind power were still mostly negative towards wind power when the report was published in 2019. The attitude had not changed much among these municipalities compared to their answers on the last question. Compared to the previous question we can notice that one of the municipalities had become more negative towards land-based wind power and moved from 2 to 1. We can also notice that one of the municipalities had become a bit less negative towards land-based wind power and moved from 2 to 3. It is important to point out that 4 of the municipalities had the question of land-based wind power raised for the first time in 2019, and therefore they have given the same answer in both this and the previous question.

The main arguments for why they were negative were essentially the same as in the last question, concerning the negative effects on nature and the resistance from the local population. They expressed that the resistance in the local population had become stronger and more widespread than earlier, because of the creation of national resistance groups like Motvind Norge. Some new arguments were that several of the municipalities felt that the wind power

development was forced upon them through the report. The municipalities with a relatively weak economy expressed that they believed the revenues from the wind power plant to be an important argument. However, they too pointed to the uncertainty related to it and that the potential revenues were too low to make a difference for them. Thus, this argument never gained much support in any of these municipalities. Some had also become more negative from receiving experiences from neighbouring municipalities with land-based wind power. Neighbouring municipalities had experienced that their projects changed, that there was uncertainty about the tax revenues, and uncertainties related to foreign owners of the power plants.

7.3 Part C: Attitude towards land-based wind power today, and after the introduction of the resource rent tax

In this part the municipalities were asked questions about their attitude towards land-based wind power today, and regarding what effects the new resource rent tax has on their acceptability. In addition, the municipalities also had to grade various statements concerning land-based wind power. The answers in this part will be more detailed than in the previous parts, as they deal with the main objective of this thesis.

7.3.1 The municipalities' attitude towards land-based wind power today

Question: How positive or negative is the municipality towards land-based wind power within the municipality today?

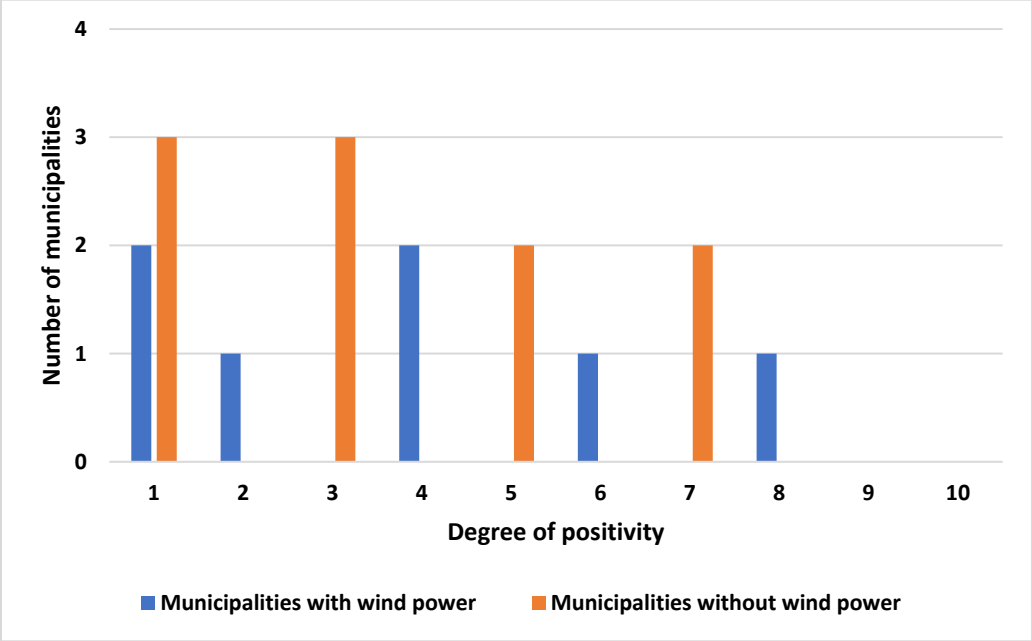


Figure 10: Response to the question: "How positive or negative is the municipality towards land-based wind power within the municipality today?"

Figure 10 shows that there is no clear difference in the attitude between the municipalities with and without land-based wind power on this question. However, we can see that the municipalities in general are less negative towards land-based wind power today than they were in 2019.

Municipalities with land-based wind power

There is no clear trend among the municipalities with existing land-based wind power on this question, but we can notice that they have become less negative compared to 2019. Several of the municipalities with a negative attitude presented many similar arguments that had been pointed to earlier. They stated that parts of the negativity were due to negative experiences with the wind power plants they had built. Arguments concerning negative effect on nature and the resistance in the local population was still the main arguments. Some of the municipalities had also experienced that inhabitants living close to the power plants were negatively affected by loud noise and visual pollution. One of the main challenges with land-based wind power expressed by one of the municipalities is that the negative effects are local, while the positive effects are global. Hence, they stated that it is difficult to compare the positive and negative

effects in a cost-benefit analysis on a local level. Multiple municipalities, regardless of their score, brought forward the argument that they have too little influence in the licencing process. The municipalities had both experienced changes during the development process and changes after their power plants had been finished. More specific these changes were regarding height, placement, and lighting of the turbines. These were changes the municipalities could not stop, as they were regarded as being within the scope of the licence.

The municipalities which had become a bit less negative since 2019 argued that it was a result of the energy crisis and high energy prices, and that they had realized the importance of a secure supply of energy. A few of the municipalities had also received predictions concerning future power deficits in their own municipalities, which had altered their attitude in a positive direction. Another major argument pointed to by the municipalities was that they had plans to develop more local industry, which were dependent on locally produced renewable energy. Thus, they were positive to develop wind power in relation to local industry, as they argued that it is a very important argument that the energy produced in the municipality is used directly by local businesses. The municipalities that gave the most positive score in this question stated that the revenues from the wind power plant made up a large part of their income, and they argued that it was because of the revenues from the power plant they had become a wealthy municipality. Hence, they were positive to expand their existing wind power plant. Even though the municipalities in this group presented several positive arguments, they still shared some of the negative arguments pointed to by the negative municipalities.

In a separate question the municipalities with land-based wind power were also asked how the experience of being a host municipality had affected their attitude. The responses from the municipalities were relatively similar to those presented in figure 10, although there were some differences. The municipalities which had a negative experience pointed to many of the same arguments as earlier. The main arguments were the negative effect the wind power plants had caused on their local nature. Another major argument was that the development of the wind power had caused resistance in the local population. It was also pointed to the negative effect the wind power plants had inflicted on the local inhabitants, like noise pollution and visual pollution. Some also argued that they were negative towards the whole process, and they pointed to the small influence the municipalities have in the licencing process. Among the municipalities stating they have had a positive experience being host municipalities, the main arguments were the increased local economic activity, increased tax revenues, increase in local jobs, and positive effects for local businesses. The argument of increased energy security was

also pointed to. The municipalities which stated their experience had been neutral argued that there had been little resistance in the local population.

In relation to this, the municipalities with land-based wind power were also asked if their wind power plants matched the original plans from the developer and the licence. Four of the municipalities with land-based wind power stated that they had experienced that the wind power plants changed in comparison to the plans that had been presented in the developing process. What had happened in most of these cases was that the number of wind turbines had been reduced, and the height of the turbines had been increased. The changes that were made to the projects was within the limits set by the licence, so the municipalities had no way to complain on these changes. Two of the municipalities stated that the changes that were made to the wind power plants affected them in a negative way. One of the municipalities stated that it made them negative towards the whole process. It created negativity both among the general population and the politicians. The other two municipalities that experienced the same changes to their wind power projects stated that the changes did not affect their acceptance towards land-based wind power.

Two of the municipalities experienced that the wind power plants were changed after some years of operation. In both cases the number of turbines were reduced, and the new turbines were taller. In one of the municipalities this made the population more negative towards the wind power plant. The main reason for this was that the increased heights required the turbines to be better lit, related to air traffic. The result was that the wind power plant became more visible to the local inhabitants, which made them more negative. In the other municipality the change of the height of the turbines had no major negative effects in the municipality. In one of the municipalities the wind power plant was built in accordance with what was presented in the plans and blueprints, but they were still negative.

The municipalities with land-based wind power were also asked if the revenues from the power plants had lived up to their expectations. All of the municipalities stated that the earnings from the land-based wind power plants had been as expected, and as promised from the developers. However, some of the municipalities expressed that the compensation for land-based wind power today is too low, and that they want higher revenues in general for hosting land-based wind power.

Municipalities without land-based wind power

Neither among the municipalities without land-based wind power there was a clear trend in the attitude. One of the main changes from the earlier questions is that we can notice that the municipalities have become less negative towards land-based wind power in general, compared to 2019. However, a slight majority of the municipalities are still negative towards land-based wind power.

The municipalities that were negative pointed to many of the same arguments they had presented earlier. The major arguments were still the negative effect on nature and wildlife, and negativity and resistance in the local population. Some of the municipalities stated that the local resistance had been quite massive the last couple of years. The argument of little influence in the licencing and development process was also put forward. Some of the municipalities which said they were negative towards land-based wind power also stated that they had made resolutions that there should not be developed any land-based wind power in these municipalities at the moment.

The municipalities which had become less negative since 2019 also put forward the argument about the current energy situation in Europe with high energy prices. They argued this situation has increased the pressure to develop more renewable energy. One of the municipalities expressed that they already had an energy deficit in the municipality, which resulted in new businesses not being able to establish themselves in the local area. The municipalities argued that the energy situation probably has increased the legitimacy of land-based wind power, compared to prior years. Some of the municipalities pointed to the doubling of the production fee from 1 to 2 øre as one of the most important factors for why they had become more positive. This is because the revenues from the production fee were transferred directly to the municipalities and were not redistributed through the income equalization system. Some of the municipalities without land-based wind power also stated that they were willing to accept small-scale wind power plants which were directly connected to local power intensive industries. In relation to this, one of the municipalities argued that they had become less negative because the cornerstone company in the municipality were dependent on more renewable energy to develop their business.

Question: Have experiences from neighbouring municipalities with land-based wind power led the municipality to be more positive or more negative towards land-based wind power withing own municipality?

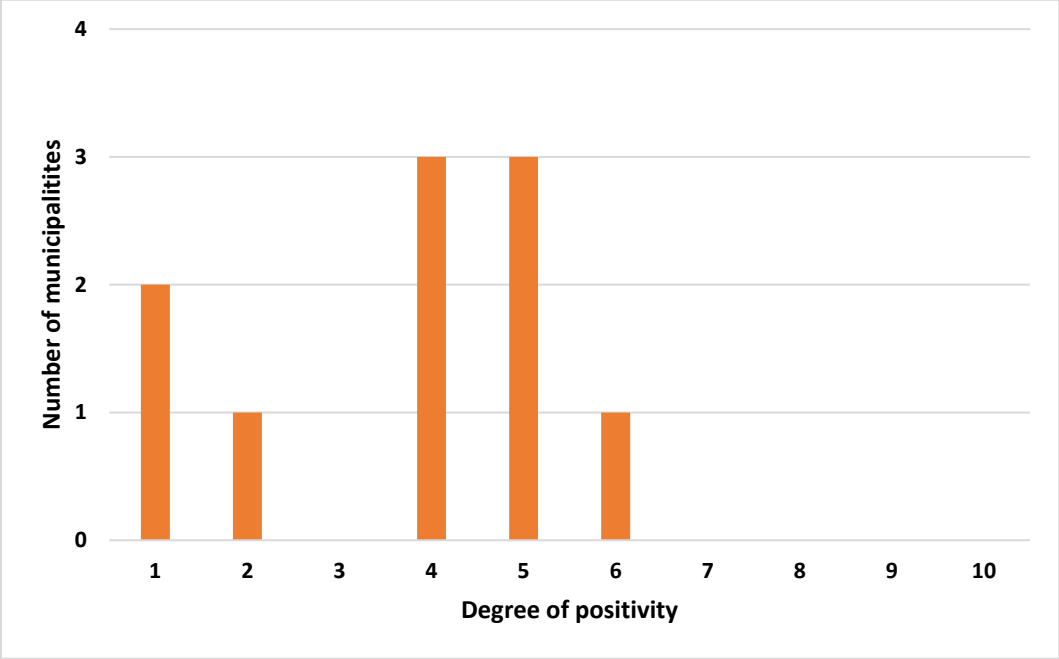


Figure 11: Response to the question: "Have experiences from neighbouring municipalities with land-based wind power led the municipality to be more positive or more negative towards land-based wind power within own municipality?"

The municipalities without land-based wind power were also asked specifically if some of their neighbouring municipalities had land-based wind power, and how the experiences from these neighbours had affected their own attitude towards land-based wind power. From figure 11 we can see that most of the municipalities believe their neighbours to have a negative to neutral influence on their acceptance. We can also notice that none of the municipalities believed the influence from the neighbouring municipalities had affected them in a very positive way.

The municipalities which stated they had been influenced in a negative way argued that the neighbours had experienced a lot of resistance and negativity from the local inhabitants. Another major argument was that the wind power plants in the neighbouring municipalities had been changed compared to the plans that had been presented in the early stages. Several also pointed to that the tax revenues from the wind power plants had not been as high as predicted. An argument pointed to was that some of the neighbouring municipalities had foreign ownership of their wind power plants, which also affected the revenues they received from it.

All the municipalities which gave a negative score stated that the experiences from their neighbouring municipalities did not make them tempted to develop wind power themselves.

The only municipality that stated a positive influence argued that they had experienced that their neighbours have had success with their land-based wind power. They expressed that they have had establishment of new businesses, and that they have received high revenues from their power plants. Thus, they themselves had become a bit more positive towards land-based wind power. The municipalities that had been neutrally affected by their neighbours mentioned the same positive and negative arguments presented by the other municipalities.

7.3.2 Effects of the resource rent tax on the attitude

Question: Has the introduction of the resource rent tax on land-based wind power led to that the municipality is more positive or more negative towards land-based wind power within the municipality than earlier?

In this question the municipalities were answering how the new resource rent tax has influenced their acceptance for land-based wind power. As this is the main objective for the thesis, the result on this question will be extra detailed.

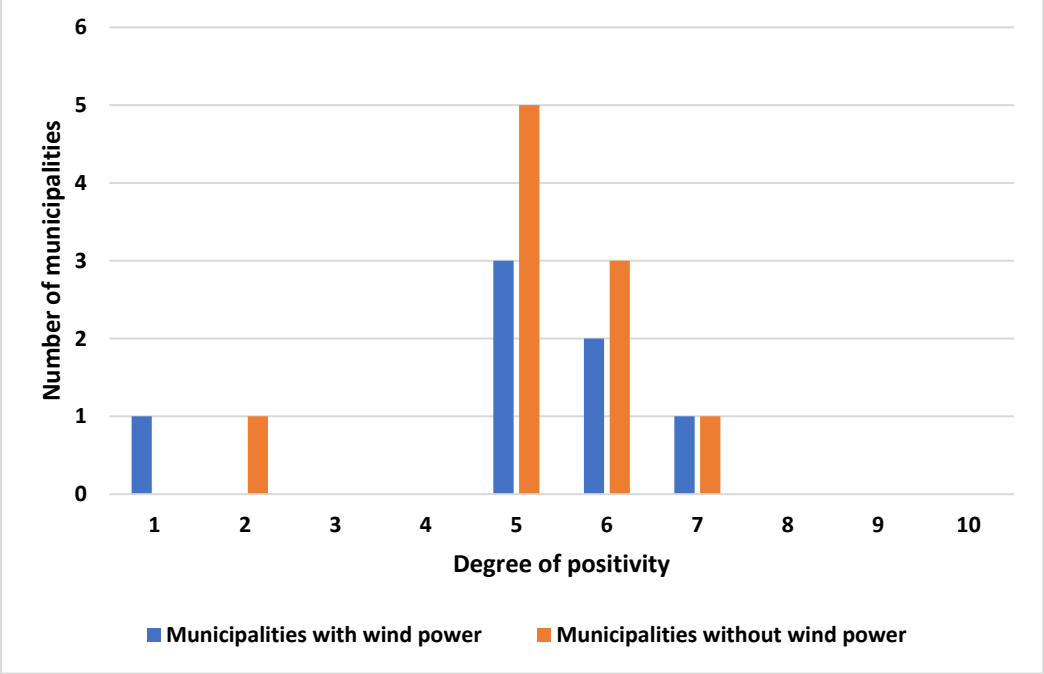


Figure 12: Response to the question "Have the introduction of the new resource rent tax on land-based wind power led the municipality to be more positive or more negative towards land-based wind power within the municipality than earlier?"

The results presented in figure 12 show a clear trend in that most of the municipalities, regardless of whether they have existing wind power or not, believe that the new resource rent tax has a neutral or weak-positive influence on their acceptance for land-based wind power. However, we can notice that two of the municipalities stated that the resource rent tax had a negative influence on their attitude, and they clearly stand out from the rest of the municipalities. We can also see that none of the municipalities stated that the resource rent tax has a very positive effect on their attitude.

On this question both municipalities with and without wind power pointed to many of the same arguments. Almost all the municipalities argued that the introduction of the resource rent tax on land-based wind power is a positive contribution in the wind power debate, and in isolation it affects the attitude towards land-based wind power in a positive direction. Several of the municipalities expressed that it is positive that the tax revenues from land-based wind power are increased, and that the municipalities are compensated more for hosting wind power. Many also stated that it is positive that the tax regime for land-based wind power has become more similar to that of hydropower. The most positive municipality among the municipalities without wind power expressed that the introduction of the resource rent tax had made several of their politicians reassess the question of wind power in their municipality.

However, while many of the municipalities expressed that the resource rent tax is a positive contribution in making land-based wind power more attractive, they stated that the revenues from the tax are too low to have an impact on their general attitude towards land-based wind power. Multiple of them express that they do not want to develop wind power just on the basis of the resource rent tax. Some of the municipalities with land-based wind power expressed that the resistance towards land-based wind power was very strong among their local inhabitants. This was because of the damage the wind power plants had done to their local nature. Further they argued that the revenues from the resource rent tax is seen as too low to compensate for these negative externalities. As one municipality expressed it: "*One does not accept everything the government throws at you just because they tempt you with a carrot*" (My translation).

Almost all of the municipalities, regardless of their grade of positivity, point to the fact that the revenues from the resource rent tax have to be redistributed through the income equalization system as a negative aspect. More specific, they are dissatisfied with the fact that the 50% of the revenues that goes to the municipalities must be shared with the entire municipal sector. Many stated that when the revenues are equalized, the host municipality will end up with a small share. Several argued that more of the revenues should go to the host municipality, as

they have to bear the direct costs of having the wind power plant within their municipality. They argued that this redistribution of the income could lead to reduced incentives for municipalities to sacrifice their own nature to develop wind power. Several expressed that more municipalities probably would be more positive towards land-based wind power if the tax revenues went directly to the host municipality. As one municipality stated: "*There is a cost-benefit analysis when deciding whether or not to develop land-based wind power in your municipality, and then the benefits have to be greater than the costs. In that case how much you are left with in terms of tax revenues is an important element in that matter*" (My translation).

Another negative aspect that was pointed to in relation to the income equalization of the tax revenues were that it would lead to that a large share of the revenues would be redistributed to the most populous municipalities, like Oslo and Bergen. It was stated that municipalities with a smaller population, which is the case for many of the municipalities hosting wind power, will get a smaller share of the revenues. This was expressed as unfair, as not many of the most populous municipalities have wind power themselves. As the representative from one municipality expressed: "*The municipalities that gets challenged to be host municipalities do not think this is fair (that the tax revenues are shared with municipalities without wind power), nor does it contribute to us becoming more positive about being a host municipality*" (My translation). In relation to the redistribution of the tax revenues, some of the municipalities argued that they were more positive towards the production fee, as it goes directly to the host municipality.

Multiple of the municipalities also argue that there has been a great deal of uncertainty and different signals from the authorities concerning how much each municipality will receive in increased revenues from the resource rent tax, and this have affected them negatively. Several of the municipalities expressed that they feared the taxes which were introduced could be removed by the stroke of a pen by politicians. Thus, they called for a framework for the resource rent tax that provides a greater certainty linked to both expected income and the duration of these tax revenues. As one of the interview subjects put it: "If you develop *wind power, it is something you are going to have for the next 20 years to come, and then it's important that you at least not get deprived of this revenue, but rather get* more" (My translation).

Another negative aspect that was pointed to was that the resource rent tax can have a negative effect for the municipalities that own or have ownership in power companies. They stated that the power companies are the ones subject to the resource rent tax, and then the municipalities that have ownership in these companies will get reduced income from them as the profits from

these are taxed harder. The municipalities in this situation will thus both gain some revenues and lose some revenues at the same time. Hence, it was argued that for municipalities that are dependent on the revenues from the power companies, the resource rent tax can affect them negatively.

We can notice that two of the municipalities stated that the resource rent tax had a negative influence on their acceptance. One municipality with wind power, and one municipality without wind power. These municipalities perceived the redistribution of the resource rent tax through the income equalization system as a very negative aspect. They especially pointed to the argument that the income equalization system will lead to that the most populous municipalities in Norway will get the largest share of the tax revenues, and they expressed that they found this extremely unfair as these municipalities do not have wind power of their own.

An important aspect that should be mentioned is that several of the municipalities stated that the resource rent tax had not been discussed specifically in their municipality, and thus they were not a hundred percent sure of the exact effect of the resource rent tax on their acceptability. Some of the municipalities also expressed that there were other factors that were as least as important as the resource rent tax. They pointed to the indirect effects of land-based wind power, such as more local jobs, more local value creation, and increased economic activity.

In relation to this question the municipalities were also asked about their economic situation in relation to the resource rent tax, and if they believed this to influence the impact the tax have on their acceptability. The municipalities which stated they had below average strong economy stated that they believed the resource rent tax to be an important argument, and they were positive towards measures that lead to increased revenues. Despite this, some of the municipalities stated that even tough they had relatively weak economies, the resource rent tax was seen as too low to have an impact on their general acceptability towards land-based wind power. The municipalities with relatively strong economies stated that they were not in need of increased tax revenues, especially when the tax revenues from the resource rent tax are relatively low. Thus, for them the negative effects of wind power surpass the positive effects.

The results in question 8 showed that in general more of the municipalities have got a more positive attitude towards land-based wind power today. In question 9 most of the municipalities agree that the resource rent tax has an isolated positive effect on the attitude towards land-based wind power, but they argue that the revenues from the tax is not high enough to influence their general attitude towards land-based wind power. Hence, there are mainly other factors than the

resource rent tax which have led to the municipalities becoming less negative towards land-based wind power today.

To summarize, all of the municipalities expresses that they think it is important that the municipalities get some kind of compensation for sacrificing the nature in the municipality for the good of the society. They also state that while they believe the resource rent tax to be too low to have an effect on the attitude towards land-based wind power, they express that they believe the economic compensation related to wind power to be a very important argument.

Question: Have land-based wind power been up to evaluation, discussion or public meetings in the municipality after the resource rent tax was announced in the autumn of 2022?

Some of the municipalities with existing land-based wind power have had land-based wind power up to discussion in the municipal council after the resource rent tax was introduced. In two of the municipalities the tax was discussed specifically, and they were informed how much the municipality will get in increased tax revenues from the land-based wind power plants. They stated that they would get NOK 2-3 million in extra tax revenues annually. Both the municipalities expressed that this was a relatively small amount of their total budget, and thus the resource rent tax didn't have that much of an impact in these municipalities. Three of the other municipalities had also discussed land-based wind power after the resource rent tax was introduced, but the resource rent tax was not part of the discussion. The municipalities said that the discussions were more concerned with specific projects and applications from potential developers of land-based wind power. They expressed that the resource rent tax most likely not would be discussed specifically, as the revenues from the resource rent tax are relatively low, and that it doesn't have that much of an impact, as discussed in the previous question. The two other municipalities had not discussed land-based wind power after the introduction of the resource rent tax.

Among the municipalities without land-based wind power, one has had land-based wind power up to discussion after the resource rent tax was introduced, where the resource rent tax was discussed. Three of the municipalities had discussed the topic of land-based wind power, but they did not discuss the resource rent tax. The rest of the municipalities had not discussed the topic of land-based wind power after the resource rent tax was introduced.

Question: If the municipality is negative towards land-based wind power, is there something that can change the municipality's attitude?

All the municipalities were asked if they would have been more positive towards land-based wind power if the resource rent tax level had been higher than 40%, or if a larger share than 50% of the tax revenues had been distributed to the municipal sector. Most of the municipalities expressed that they would have been more positive towards land-based wind power if this was the case. Still, they emphasized that the most important factor was that the revenues to the host municipalities were increased, and they stated it should be a principle that the municipality which bear the costs should be compensated the most. However, numerous municipalities argued that increased tax revenues are not the most important argument for being more positive towards land-based wind power. They stated that they regarded the indirect effects from the wind power to be more important, like local value creation, more local jobs and increased economic activity. As one municipality put it: "*If we are not able to facilitate the development of local business and value creation out here in the districts, it does not matter how much revenues we get from the tax, because then there are no people left to use the revenues on*." (My translation). Some of the municipalities that were very negative towards land-based wind power today stated that the politicians and the population was so negative towards land-based wind power that increased tax revenues would most likely not be sufficient to make them positive. The explanations were the negative effect land-based wind power plants had on their nature.

Both the municipalities with and without land-based wind power pointed to many of the same arguments that could make them more positive towards land-based wind power. Several of the municipalities expressed that a high electricity price over a long period of time, or national energy deficits could make them more positive towards land-based wind power. They argued that the development of more wind power could increase the general energy security, and possibly decrease the energy price. In addition, multiple municipalities expressed that it was very important that the municipality should be more involved in the planning and development process of the wind power plants, and that they should get increased influence in the detailed planning process so the municipalities could control where the wind turbines should be located, and how tall they should be. In this regard the municipalities pointed to that the licencing and planning process for land-based wind power should be moved from the Energy Act and back to the Planning and building Act, so that the process is subject to municipal planning authority.

Some of the municipalities stated that they could become more positive towards land-based wind power if the taxation framework had not been so uncertain as it is today. They stated that there had been multiple changes to the tax system related to energy production, and that the government breaks the social contract with the municipalities. They argued that if the authorities start to remove taxes or change the tax rates, this creates uncertainty among municipalities which have sacrificed their nature areas to energy production. The municipalities argued that they could become more positive towards land-based wind power if the authorities could give them an insurance that the tax regime applies for the entire lifetime of a wind power plant.

The municipalities were also asked what their view was on the income equalization of the revenues from the resource rent tax. Multiple municipalities stated that they believed that the principle should be that the municipality which sacrifices their nature for land-based wind power should get compensated accordingly, and thus get a larger part of the tax revenues from the resource rent tax. One of the municipalities stated that if this principle is not respected, the host municipality can end up with very little compensation if they have to share more and more of the tax revenues with the other municipalities without land-based wind power. Multiple of the municipalities expressed that they could be more positive towards land-based wind power if the wind power plants were developed in relation to local businesses and local industry.

When asked if they believed the general compensation for hosting land-based wind is sufficiently high today, most of the municipalities stated that they think the current compensation is too low.

7.3.3 Municipalities' attitudes to various statements regarding wind power

In this part the municipalities were asked to rate the following statements about land-based wind power on a Likert-scale from 1-5, where 1 was low weight, 5 was high weight, and 3 was neutral.

Statement a) Land-based wind power can improve the economy of the municipality by providing increased revenues

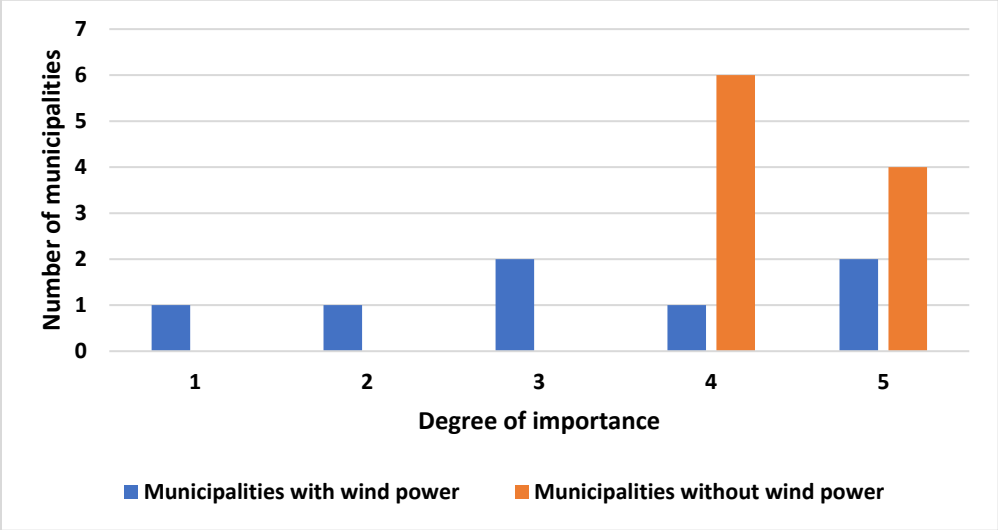


Figure 13: Response to the statement "Land-based wind power can improve the economy of the municipalities by providing increased revenues"

From figure 13 we can see that the municipalities were a bit divided on this statement. Among the municipalities with land-based wind power we can notice that there was no clear trend on the importance of this statement. On the other hand, we can see that all of the municipalities without land-based wind power put a high degree of importance on this statement, showing that the economic aspect of land-based wind power is an important argument when they consider if they want to develop wind power in their local area.

Among the municipalities with land-based wind power there was no clear trend on this statement. However, a slight majority of the municipalities gave a medium to high score on this statement, arguing that they believe the contribution of wind power to the local economy to be an important argument. The municipalities that put a low weight on this claim stated that this argument was not so important for them, as they have a relatively strong economy, regardless of the wind power. A few of the municipalities also stated that the revenues didn't have that much to say, as the negative consequences related to land-based wind power are so massive.

The municipalities without land-based wind power seemed to agree on this statement and put a high emphasis on it. We can notice that the municipalities without land-based wind power in general put a higher emphasis on this argument than the municipalities with land-based wind power. The municipalities stated that improving the municipal income is an important aspect of getting land-based wind power. Several of them argued that revenues from the wind power plants were absolutely crucial for them if they were to say yes to land-based wind power in their municipality.

Statement b) Land-based wind power can lead to more jobs in the municipality

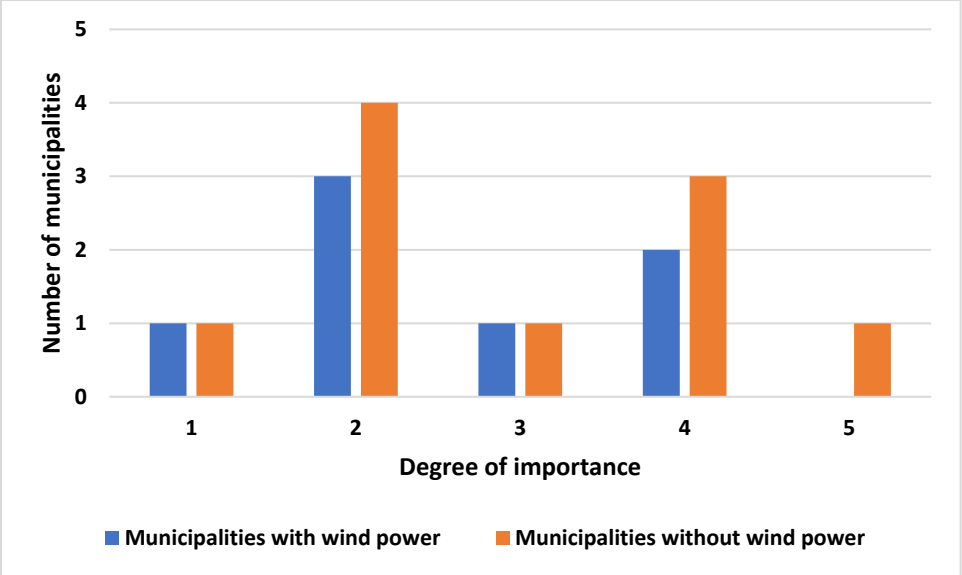


Figure 14: Response to the question "Land-based wind power can lead to more jobs in the municipality"

The municipalities were quite divided on this statement as shown in figure 14, and there is no clear trend in the answers.

The municipalities with land-based wind power showed no clear trend in their answers on this statement. The municipalities which stated that the claim had a lower degree of importance explained that from their own experienced with land-based wind power, it does not generate that many new jobs. One of these municipalities stated that they had a very good growth in local businesses and new jobs, independent of the wind power. Thus, they were not dependent on the wind power for local growth. The municipalities that gave this statement a high degree of importance explained that it was because they believed that the wind power plants can create jobs indirectly through value creation, e.g., that a wind power plant can be used to subsidize local industries with cheap energy directly. It seemed like the municipalities that gave a higher weight to this claim had more thoughts and plans to use land-based wind power in relation to

local industries, while municipalities that gave a low weight didn't have any plans for this kind of use. Most of the municipalities agreed that the direct effect on the number of jobs in a municipality from a land-based wind power is limited.

The municipalities without land-based wind power were also divided on the importance of this statement, and there was no clear trend. The municipalities which gave this statement a low score argued that from their experience from other neighbouring municipalities, wind power plants did not create many local jobs. Some of the municipalities argued that land-based wind power could create some local jobs in relation to the construction process of the plant. These municipalities also argued that it could create more local jobs if the wind power plant were directly connected to local industry and supply them with affordable energy. However, the municipalities stated that there is no guarantee that this will happen in their municipality. It should be added that the municipalities expressed that if they could be sure that the wind power plant created more local jobs, they would have put a higher emphasis on this argument.

The municipalities which put a high degree of importance on this statement argued that this was an important argument for them when deciding whether to acquire wind power or not. They clarified that from their experience the direct jobs related to a wind power was not very many, but that there could be a potential to create more jobs indirectly. There was also argued that a wind power plant could possibly attract new businesses and industries to the municipality. Some of the municipalities also argued they thought the argument to be of high importance, but that they did not necessary believe that a wind power plant would lead to that many new local jobs. Most of the municipalities agreed that land-based wind power create few local jobs directly, but that it can create local jobs indirectly.

Statement c) Land-based wind power can contribute to the green transition in the municipality.

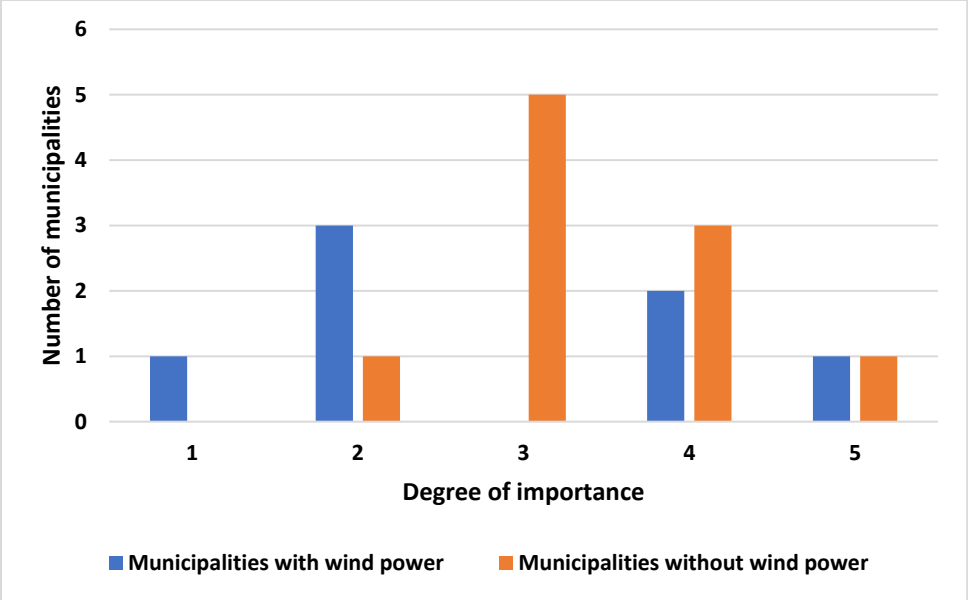


Figure 15: Response to the statement "Land-based wind power can contribute to the green transition in the municipality"

From figure 15 we can see that the municipalities were also split in their answers on this statement, and there is no clear trend. However, apparently the municipalities without land-based wind power seems to put a slightly higher importance on this argument than the municipalities with wind power.

The municipalities with land-based wind power were split on this statement, and there was no clear trend among them. Some of the municipalities which gave a low degree of importance to the statement argued that they had other sources of energy which contributed more to the green transition than wind power. Thus, they argued that wind power does not have that much of an impact on the green transition. A few of the municipalities expressed that the green transition in the municipality itself was not of great importance to the municipality, but it was of a greater importance to the region as a whole. Some of the municipalities that gave a low weight also stated that they were more interested in offshore wind than land-based wind power, and that they believed this could be a better contribution to the green transition than land-based wind. The municipalities which put a hight weight on this statement expressed that they believed wind power to be an important contribution to the green transition in their municipality.

The municipalities without land-based wind power were a bit divided on this statement, but most seemed to believe that the contribution to the green transition is a relatively important

argument for getting land-based wind power. The municipalities which put a high score on this statement argued that it is an important argument when acquiring land-based wind power. However, many of the municipalities, regardless of their score, pointed to that most of the energy produced at a power plant goes directly to the main power grid. Thus, it would not affect the municipality directly, but they believed it to be an important contribution. Some of the municipalities stated that it can contribute to the green transition, but argued that there are other measures that should rather be prioritized in connection with the green transition than land-based wind power.

Statement d) Land-based wind power can contribute to increased energy security in the municipality

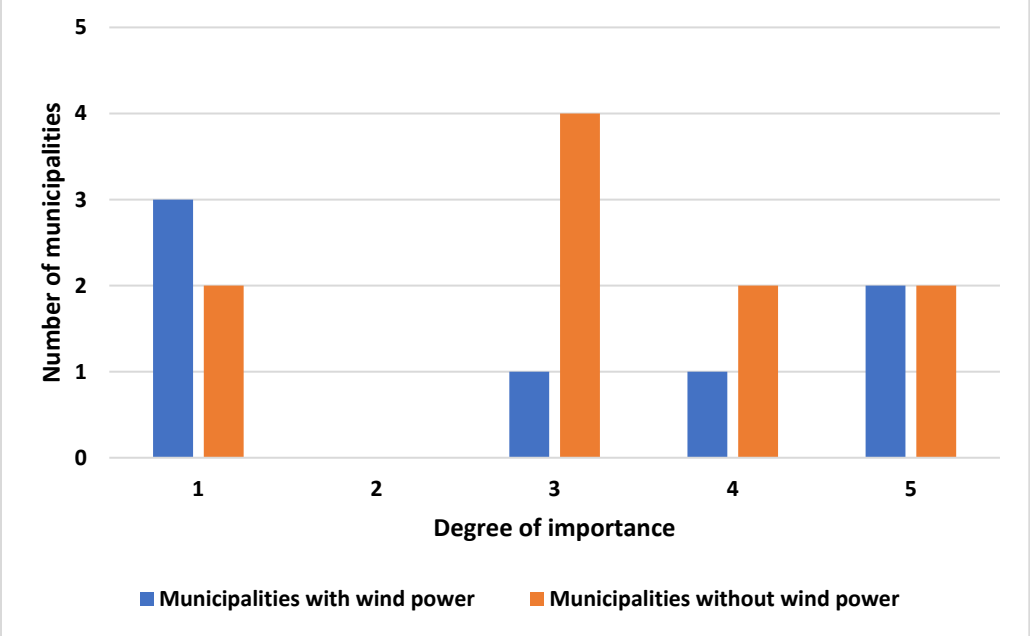


Figure 16: Response to the statement: "Land-based wind power can contribute to increased energy security in the municipality"

The results in figure 16 show that the municipalities were split on the importance of this statement, and there is no clear pattern among them.

Several of the municipalities with land-based wind power repeated the same argument from statement c), that most of the energy from a power plant goes directly to the central grid, and thus the energy security in the municipality will not be particularly improved. Another argument from this group was that wind power in general is not a very good power source when it comes to securing the supply of energy. It was argued that hydropower is a much better source of energy when it comes to increasing the security concerning the energy supply, as hydropower

is a regulated energy source. Wind power on the other hand only generate energy when the wind blows, and will therefore only be a supplement for other forms of energy production. It was also argued that wind power plants don't produce much energy when it is cold and little wind, which is when the extra energy is needed.

The municipalities which gave the statement a hight weight argued that land-based wind power can be an important asset when it comes to securing the energy supply, and that wind power can contribute to a larger energy balance, if you can use the energy locally. These municipalities also argued that we can end up with an energy shortage in the future, both regionally and nationally if we do not develop more sources of energy. They believed that wind power is an important contribution in this context. The municipality which gave a medium score expressed that the security of energy supply was more important on a regional level than at the municipal level, arguing that the municipality already produced enough energy as it is.

The results shows that most of the municipalities without land-based wind power believed this to be a relatively important statement. The municipalities which put a high degree of importance on this statement argued that this was a very important argument for their municipality at the moment, especially emphasising the current power situation with expensive energy and energy deficits in the near future. Multiple of the municipalities which gave the statement a high grade were municipalities which had stated that they either had a problem with power deficits in the municipality, or had stated that this could be a problem in the future.

Those that gave a neutral score stated that this was an important aspect of land-based wind power, but some argued that they already had a sufficient energy supply. Thus, they didn't really see this as a big problem. The municipalities which put a low emphasis on this statement also pointed to the argument that the locally produced energy gets distributed to the main grid, and thus will not affect the local energy security to a large extent.

Statement e) Land-based wind power can have a negative effect on tourism in the municipality

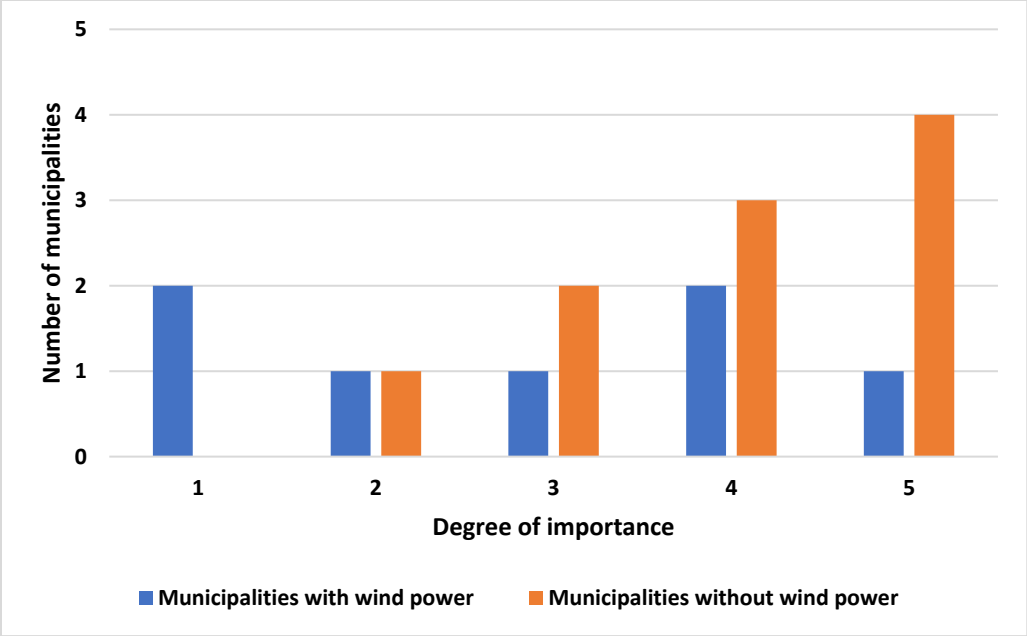


Figure 17: Response to the statement: "Land-based wind power can have a negative effect on tourism in the municipality"

The municipalities were divided on this statement, as we can notice from figure 17. However, it seems that the municipalities without wind power find this argument slightly more important than the municipalities with land-based wind power.

The municipalities with land-based wind power were divided on this statement. The municipalities which stated that wind power doesn't have a negative effect on tourism argued that they never have experienced that the wind power plants they have had caused any particularly negative impact on tourists. Another argument was that some of the wind power plant was located far away from the popular tourist locations in the municipality, and thus it didn't have a large impact on the tourism.

The municipalities which stated that wind power had a negative effect on tourism argued that they have experienced that it has a negative impact on the tourists that come to visit the municipality. One of the municipalities argued that the tourists thought the wind turbines looked ugly. However, one of the municipalities stated that the negativity is still greater amongst the local inhabitants than among the tourists. The municipality that put a medium weight on this statement argued that they had a popular area with cabins, and the wind power plant was visible

from this cabin area. They expressed that the cabin owners to a certain degree was affected negatively by the wind power plant.

The municipalities without land-based wind power were a bit divided on this argument, but it seems they believed it to have a slightly higher emphasis than the municipalities with land-based wind power. We can see that a majority of the municipalities believed this statement to be important. The municipalities which gave this statement a high emphasis argued that they believed that tourism could be negatively affected by land-based wind power, and it was an important argument in the discussion of wind power. Several of the municipalities also stated that tourism and travel were important for their municipalities, and one of them stated that they as a tourism municipality wanted to have their horizon free of wind turbines.

The municipalities which put a neutral and low emphasis on the statement expressed that it depends on where in the municipality the turbines are located, as not all areas will affect tourists to the same degree. Some of the municipalities that gave a low score stated that the areas that were suitable for wind power in their municipality was not areas typically visited by tourists.

Statement f) Land-based wind power can have a negative effect on nature and wildlife in the municipality.

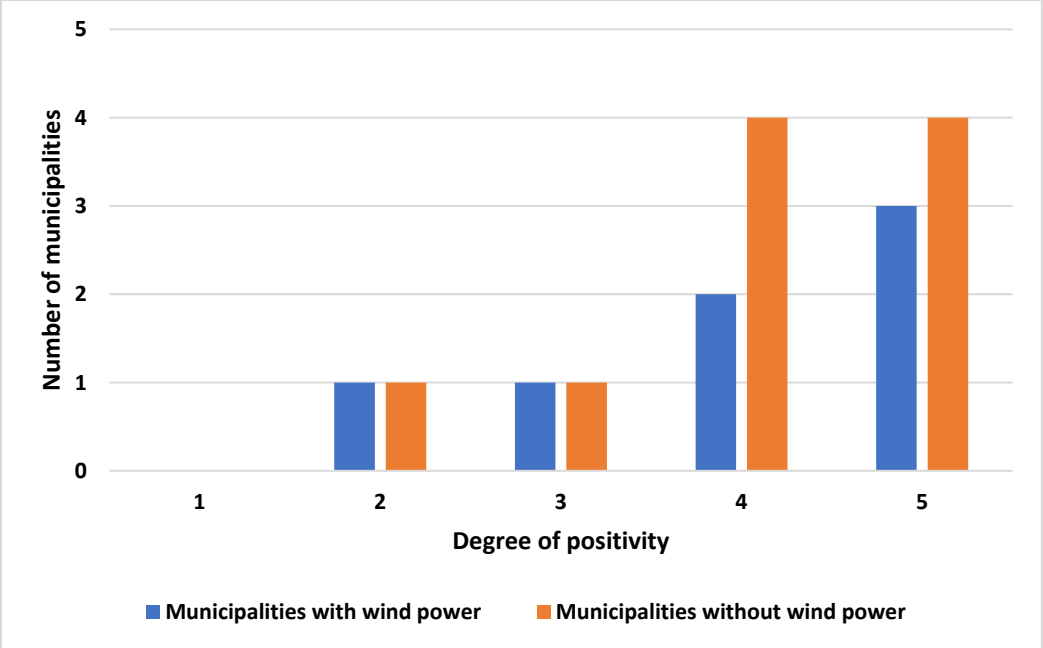


Figure 18: Response to the statement: "Land-based wind power can have a negative effect on nature and wildlife in the municipality".

This seems to be the statement were the municipalities agreed the most. As presented in figure 18, a large majority of the municipalities believed that this argument was important and put a high degree of importance on this statement. We can also notice that none of the municipalities believed this statement to have a very low degree of importance. This is consistent with what the municipalities have stated in earlier questions, where they have expressed that they believe that land-based wind power has a negative effect on the nature in the municipality.

A majority of the municipalities with land-based wind power put a high degree of importance on this statement. The municipalities that put a high emphasis on this statement argued that the negative effects land-based wind power has on nature is one of the most important negative aspects of wind power. The municipalities expressed that their wind power plants have had a negative effect on areas used for recreation and outdoor life. Another argument put forward was that the wind power plants had a negative effect on wildlife. Several of the municipalities pointed to that they were located in an area with many birds, and that the wind turbines had a negative effect on their movement. Another municipality stated that their wind power plant was located next to a wild reindeer area that were affected by the plant. Some of the municipalities expressed that wind power can have a negative impact on nature to varying degrees, but that it depends on where the plant is built.

The municipalities which put a low and medium emphasis on this statement expressed that they had not experienced that their land-based wind power plants have had a very negative impact on their local nature and wildlife. However, they agreed that land-based wind power potentially can have a negative impact on nature and wildlife.

Most of the municipalities without land-based wind power believed that this statement was important. The municipalities without land-based wind power did also agree that this is one of the major negative aspects related to wind power. The municipalities which put a high emphasis on this statement argued that this was one of the statements they believed to be the most important argument, and the most important negative aspect related to land-based wind power. This is also in line with what most of the municipalities answered earlier. Some of the municipalities expressed that wind power plants could affect reindeer husbandry in their municipality.

The municipality which put a neutral score on this statement argued that there could be some nature and wildlife that got affected, but that most of the politicians and inhabitants in the municipality were more focused on travel and tourism. The municipality which stated that this

statement was not very important argued that the area in the municipality that could potentially be used for land-based wind power in the municipality, did not have much nature or wildlife, and thus the effect on this was limited.

Question: Have the political majority in the municipality changed since 2019? If yes: Have this influenced the attitude towards land-based wind power within the municipality

In this question the municipalities were asked if the political majority in the municipality had changed since 2019. Here they were asked what political parties made up the majority in the municipal council, and what parties made up the political majority prior to 2019. They were also asked if there had been any changes since 2019 with regard to the land-based wind power question, for example if any of the parties had changed their opinions on the matter.

The results from the interviews showed that while some municipalities had changed their political majority in 2019, this had no effect on the attitude towards land-based wind power. What parties formed the majority did neither seem to have any influence on the acceptance. However, in some municipalities the politicians had become more positive towards land-based wind power in general.

8 Discussion and findings

In this chapter I will discuss the results presented in chapter 7. The chapter consists of three main parts. The first part will discuss the main findings from the interviews, with basis in the research question and sub-questions. The second part of the discussion will deal with other interesting findings that were not part of the research question. The third part will discuss the limitations of the thesis.

8.1 Main findings

In this part the results will be discussed with the basis in the research question:

Research question: *Will the new resource rent tax on land-based wind power change Norwegian municipalities' acceptance for wind power plants on land within their municipality?*

The sub-questions which elaborate on the main research question will also be discussed in relation to the findings:

Sub-question 1: *Will the impact of the resource rent tax be different in municipalities with and without land-based wind power?*
Sub-question 2: *Will the impact of the resource rent tax be different in municipalities with weak and strong economy?*
Sub-question 3: *Will the impact of the resource rent tax be different in municipalities which have a property tax?*
Sub-question 4: *Will the impact of the resource rent tax be different in municipalities which put a high value on tourism?*
Sub-question 5: *Will the impact of the resource rent tax be different in municipalities which put a high value on their local nature?*

The results from the interviews with the 17 municipalities provided insight into the research question and the sub-questions. When the municipalities were asked directly about the effect of the resource rent tax on their acceptance towards wind power, they argue that the tax has a neutral to weakly positive effect. However, through the interviews it was revealed by the municipalities that even though the resource rent tax had a weakly positive influence on their attitude, they stated that the revenues from the resource rent tax alone was too low to have a

real impact on the general acceptance towards land-based wind power. According to Saglie et al. (2019), outcome fairness, i.e., distribution of benefits and costs, is an important aspect regarding the acceptance for wind power. Many of the municipalities believed the negative effects on nature to be one of the largest costs related to wind power. This corresponds with what was found by Zerrahn (2017). Based on this, it can be reasonable to assume that the municipalities want a larger compensation for hosting wind power, as they believe that the wind power plants cause negative externalities in their local area. For the interviewed municipalities, it seems that the benefits from the resource rent tax fail to outweigh the cost related to the damage on the local nature. Hence, the outcome fairness amongst the municipalities is perceived as being low.

Many of the municipalities pointed to the distribution of the revenues from the resource rent tax through the income equalization system as being a negative aspect. The fact that the host municipalities must share the revenues from the resource rent tax with other municipalities, lead to that they are left with a smaller share of the revenues. In relation to this, several also argued that they believed it to be unfair that the revenues from the tax had to be shared with all the other municipalities. There were mainly two arguments that were put forward in the relation to the unfairness surrounding distribution of the revenues from the resource rent tax. First, the municipalities pointed to the practice that the revenues from the resource rent tax are also distributed to municipalities without wind power of their own. Second, they believed it was unfair that the income equalization led to that a large share of the revenues are allocated to the most populous municipalities, like Oslo and Bergen. This is consistent with several of the findings in Saglie et al. (2019) which found that relative fairness. i.e., the fairness compared to others, is an important aspect in connection to acceptance (Saglie et al., 2019). Thus, we can state that the municipalities both felt a low degree of outcome fairness, and a low degree of relative fairness, which lead to the overall acceptance for wind power not being influenced by the resource rent tax.

When asked which aspects could make them more positive towards land-based wind power, many of the municipalities argued that the resource rent tax could have a larger impact on the attitude towards wind power if more of the revenues had been allocated to the host municipalities. As seen in the results, multiple of the municipalities argued that the host municipality should get a fair compensation, as they are the ones dealing with the negative externalities from the wind power. Overall, the results show that the municipalities believe the tax revenues from wind power to be very important regarding their attitude towards land-based

wind power. Thus, according to the framework of Saglie et al. (2019), increased outcome fairness i.e., higher revenues from the resource rent tax, could contribute to the municipalities becoming more positive towards land-based wind power.

Another essential find was that the resource rent tax can have a negative economic effect on municipalities that have ownership in power companies, as they then get reduced revenues from these entities. This shows that the resource rent tax might have some negative side effects which may not have been the intention of the government. This also influences the outcome fairness of the municipalities.

In relation to sub-question 1, the results from figure 12 indicates that there are no major differences between municipalities with and without land-based wind power when it comes to the effect of the resource rent tax. As we can see from figure 12, the scores of the two groups are almost identical. An explanation to this could be that the revenues from the resource rent tax, as mentioned, are regarded by the municipalities to be relatively low. This leading to the effect of the tax revenues being marginal for all the municipalities, regardless of them having wind power or not. Another possible explanation could be the economic situation in the municipalities in the two groups. When looking at figure 7, we can notice that both the municipalities with and without land-based wind power are relatively equal when it comes to economic strength. Hence, this can be another possible reason for why the effect of the resource rent tax is similar for the two groups. Regardless of what the cause is, the resource rent tax does not have a different effect in municipalities with and without land-based wind power.

When comparing the results from figure 7 with the results in figure 12, I find that most of the municipalities with below average and average strong economies give a positive score to the question concerning how the resource rent tax have influenced their attitude towards wind power. The municipalities with a weaker economy expressed that the resource rent tax was an important argument for the acceptance towards wind power, as they in general were positive towards all contributions that can strengthen their economy. However, they too expressed that the revenues were seen as too low to influence their general acceptance. When checking the results for the municipalities which characterized their economy as above average strength, I find that a majority state that the resource rent tax has a neutral influence on their acceptance. The municipalities with a strong economy expressed that they were not in need of increased tax revenues. These municipalities also argued that from their point of view, the negative externalities from wind power surpasses the positive effects. Hence, the answer to sub-question 2 is that the resource rent tax did seem to have a bit more positive effect in municipalities which

stated they had a below average or average strong economy, than municipalities which stated they had a strong economy.

When comparing the municipalities that had a property tax with the effect of the resource rent tax, the municipalities that have a property tax does not seem to be influenced differently by the resource rent tax than the other municipalities.

Looking at the data behind figure 12 and figure 17, I find no clear connection between the emphasis a municipality put on tourism, and the effect of the resource rent tax. One explanation to this could be that several of the municipalities that partook in the interviews did not have large tourism sectors. Hence, while they believed the statement to be important, the issue itself was not that relevant for several of the municipalities.

Examining the results from figure 18 with the results in figure 12, I find that the municipalities which stated that wind power has a very negative effect on nature and wildlife, believe the resource rent tax to have a neutral effect on the acceptance towards land-based wind power. An explanation for this could be that municipalities which believe that wind power has a very negative effect on their local nature regard the development of wind power as a large cost to their local society. Thus, revenues from the resource rent tax, which are regarded as too low, are not sufficient to make them feel that the negative effects are made up for. At the same time, I can observe that several of the municipalities which expressed that wind power has a less negative effect on nature and wildlife, believe the resource rent tax to have a weakly positive effect on their attitude towards land-based wind power. A possible reason for this could be that these municipalities see the development of wind power as representing lower costs to nature, and thus the revenues from the resource rent tax have a more positive effect on these municipalities. Saglie et al. (2019) found that negative effects on nature caused by wind power can be accepted if the economic compensation is big enough. This strengthens the assumption that the revenues from the resource rent tax are too low to compensate for the negative externalities inflicted on nature. However, in the Saglie et al., study, the municipalities interviewed were all positive towards wind power, which may indicate that the study is not completely comparable to these findings.

Overall, the current proposal for a resource rent tax on land-based wind power does not seem to have a very large impact on the municipalities' acceptance for land-based wind power. However, the results show that tax revenues from wind power in general is very important when it comes to the acceptance towards land-based wind. Thus, if the resource rent tax is increased,

or if a larger share of it is allocated to the host municipalities, this can have a greater impact on the municipal acceptance towards land-based wind power.

8.2 Other findings

One interesting finding was that many of the municipalities were negative towards land-based wind power because they feel that they have too little influence in the licencing process. They argue that the licencing process does not sufficiently take the municipal self-government into account, especially in the detailed planning phase. Multiple of the municipalities with existing land-based wind power stated that they had experienced that their wind power plants had changed compared to the plans presented in the licencing process. This is also consistent with the study by Saglie et al. (2019), which found that the level of process fairness, i.e., how much influence the stakeholders have in the process, became weak in the detailed planning process. Saglie et al. (2019) also found that the process fairness has a negative influence on the overall fairness, and it is likely that this is also the case here. It is reasonable to believe that municipalities can get a higher acceptance for land-based wind power if they receive more influence in the licencing process, as they then are able to have more control over the distribution of the negative effects caused by wind power.

Multiple of the municipalities expressed that aspects such as local jobs, local value creation and a general increase in local economic activity, were equally or more important than the revenues from the resource rent tax. This corresponds with what was found by Maleki-Dizaji et al. (2019) which found that positive impacts on the local economy is important for local acceptance towards wind power, especially increase in the number of local jobs. From the study by Slattery et al. (2011), we see that the development of wind power potentially can create local jobs and increase the local economic activity. However, the study states that the size of the impact depends on local conditions, like how many local companies that can support and contribute to the development of the wind power plants. The study showed that the municipalities which have little resources and few businesses that can provide services for the wind power plants, will receive smaller local impacts from it. This implies that the smallest municipalities without a sufficient framework to support a wind power plant with resources and support businesses, won't be able to have as strong indirect effects from the wind power as larger municipalities.

In relation to the local value creation and increased economic activity, some of the municipalities stated that they could be willing to develop small scale wind power if the power plants were directly connected to local businesses and power intensive industries. As presented

in the results, the argument was that the use of the energy locally is an important argument when deciding whether to develop wind power or not. This is in line with the findings by Rand & Hoen (2017), which found that the acceptance among inhabitants living in proximity to wind power plants can increase if they receive more of the benefits from them, i.e., energy and revenues. Hence, this shows that municipalities can have a higher acceptance for land-based wind power if they experience that wind power have more positive effects on the local society. Again, outcome fairness is shown to be important in relation to the acceptance.

In addition, multiple of the municipalities located near the coast stated that they were more positive towards offshore wind power than land-based wind power. An explanation for this could be that offshore wind power plants can be located far away from the inhabitants, and thus the negative externalities related to wind power will not affect the municipalities and the inhabitants to a great extent. Thus, the municipalities are able to reap the positive effects, while they avoid being exposed to the negative effects. This implies that an offshore power plant is perceived by municipalities as having a higher degree of outcome fairness compared to a land-based power plant and can be easier to accept.

Another interesting finding was that some of the municipalities with existing land-based wind power stated that the negativity among the local populations were so strong, that even higher tax revenues from the resource rent tax would not be sufficient to increase their acceptance for land-based wind power. The main reason for the negativity was explained as being the damage that the wind power plants had caused to their local nature. Hence, this shows that if the negative externalities are regarded as being very severe, even increased economic compensation might not be sufficient to increase the acceptance.

8.3 Limitations

One limitation to the study is that there could be a possibility that the answers given in the interviews could have been influenced by the interview subjects own personal opinions and beliefs. The interview guide stated that the study wanted the objective opinion of the municipalities on the questions that were asked, and that the interview subjects were asked to answer on behalf of their municipality as a whole. This was also communicated to the interview subjects before the interviews were conducted. However, there is a possibility that some of the answers given in the interviews may have been influenced by the interview subjects' personal opinions and beliefs. This is a factor which it is difficult to control for, and I just have to assume that all the interview subjects answered as objectively as they possibly could. Hence, I cannot

rule out that some of the answers given were influenced by personal opinions. In addition, several of the municipalities stated that the resource rent tax had not been discussed in their municipality. Thus, some of the municipalities were a bit unsure of the real effect of the resource rent tax on their acceptance. Hence, I cannot be sure that the results stated by all of the municipalities reflect the true effect of the resource rent tax.

Another limitation to the study is that the sample is relatively small and consists of 17 municipalities. When the sample size is small, it is challenging to draw general conclusions. The problem with small samples is that they are not statistically representative, meaning that the sample is too small to test the differences in the population statistically. However, while the sample is not representative for all municipalities in Norway, it can be argued that it is representative for the municipalities mentioned in the NVE report. This is because the sample make up 20% of the municipalities mentioned in the report. In addition, it can also be questioned how statistically significant my sample is regarding to variation. As stated in chapter 6.2, I picked the municipalities from three groups I created, so that the sample should be representative for the municipalities mentioned in the report. However, I did not account for other variables such as population. Thus, apart from the sample being geographically diverse, the diversity with regards to other factors cannot be guaranteed.

Another possible weakness to the study could be the presence of selection bias in the sample. As mentioned in chapter 6.2, of 55 requests, 17 municipalities answered yes to partake in the interviews. This is a response-ratio of around 30%. Quite many of the municipalities did not answer at all, and most of the municipalities which denied the request answered that they did not have the capacity to partake, or that they did not have anything to offer to the study. A possibility could be that the municipalities that said yes to partake in the interviews could be municipalities that had strong opinions on the subject of wind power, which they wanted to express. Thus, the answers could be biased. However, the fact that a variety of arguments were put forward by the municipalities suggest that the effect of a potential selection bias is limited.

Another limitation with the study could be my inexperience with interviews and interviewing. In the first interviews there were asked fewer follow-up questions. However, this changed in the following interviews where I gradually became more experienced in doing interviews. This could have influenced the responses from the interview subjects in the first interviews, as possible misunderstandings may not got clarified.

9 Conclusion

The main objective of this thesis has been to investigate if the new resource rent tax on land-based wind power will change Norwegian municipalities' acceptance for wind power plants on land within their own municipality. This was elaborated on by the five sub-questions looking at if the effect of the tax was different with regards to: If the municipality had wind power or not, the strength of the economy, the presence of a property tax, appreciation of tourism, and appreciation of nature. Based on the qualitative and quantitative results from the interviews, we can conclude that the current proposal for a resource rent tax on land-based wind power has a limited effect on municipalities' acceptance towards wind power. The main explanation being that the tax revenues are too low to have a real impact on the general acceptance. There were two reasons for this. First, many of the municipalities believe the negative effects of wind power on local nature to surpass the benefits. Second, the allocation of the tax revenues through the income equalization system leads to that host municipalities receive a lower share of the tax revenues. Hence, several of the municipalities' experience both negative outcome fairness and negative relative fairness. Most of the sub-questions did not find any correlation between the different aspects of the municipalities and the effect of the resource rent tax. However, the findings show that the tax seems to have a slightly larger impact on municipalities with a below average and average economic strength, as they are positive towards all measures that can strengthen their economy. The tax also seemed to have a slightly larger impact on municipalities which put a lower value on their local nature. But even these municipalities stated that the revenues from the resource rent tax was too low to have any effect on their general acceptance.

However, the findings show that economic compensation in general is an important aspect when it comes to the municipalities' acceptance towards wind power, either in the form of direct compensation like tax revenues, or indirect compensation like increased local economic activity. This implies that a tax, like the resource rent tax, can have a positive impact on municipalities' acceptance if the municipalities experience that the compensation is proportional to the negative externalities caused by wind power, and they experience positive outcome fairness and relative fairness. The findings also showed that the municipalities are concerned with process fairness, and that the municipalities perceived this as low. Based on the findings of this thesis, the authorities should look into alternatives to the proposed resource rent tax scheme, especially at the allocation of the tax revenues among the municipalities. The tax revenues should be distributed in such a way that the host municipalities feel that they receive a compensation which corresponds to the negative effects that wind power entails, and thus

experiencing a positive overall fairness. By doing this, municipalities are inclined to be more positive towards future development of land-based wind power in Norway.

Based on the relatively small sample of 17 municipalities, this makes it challenging to generalise the findings to all Norwegian municipalities. However, I still believe the sample is representative for the municipalities included in the NVE report and manages to reflect the different attitudes and opinions of Norwegian municipalities regarding the acceptance towards wind power.

For further research on this topic, I suggest that there should be conducted more studies on Norwegian municipalities and their acceptance towards land-based wind power, as this topic has not been widely studied. There should also be conducted more studies on the effect of the resource rent tax in the wind power sector. Future studies should have a larger and more diverse sample of Norwegian municipalities, and apply statistical methods to look into what the optimal allocation of the revenues from the resource rent tax should be, to make host municipalities feel that they receive a fair share of the tax income. More studies on municipalities' acceptance towards wind power can contribute to less conflicts in the future development of land-based wind power.

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11 Appendix

Interview guide

I denne masteroppgaven skal jeg undersøke om den nye grunnrenteskatten på landbasert vindkraft, som blir iverksatt i 2023, påvirker norske kommuners aksept av landbasert vindkraft innad i egen kommune.

De innledende spørsmålene i intervjuet omhandler om kommunen allerede har eksisterende landbasert vindkraft, og generelt om kommunens økonomi. Noen av disse spørsmålene er undersøkt på forhånd, men de er med for å forsikre at informasjonen jeg har stemmer.

De videre spørsmålene i intervjuet omhandler norske kommuners holdning til landbasert vindkraft innad i kommunen, både tidligere holdninger og holdninger etter annonseringen av grunnrenteskatten.

Både kommuner og personer som deltar i intervjuet vil bli anonymisert. Svarene fra hver enkelt kommune vil ikke publiseres i masteroppgaven, men vil være del av en helhet for å undersøke trender og mønstre. Alle som har deltatt i intervju vil få tilbud om å lese igjennom oppgaven før den offentliggjøres.

A: Innledende bakgrunnsspørsmål om kommunens økonomi

1. Har kommunen eksisterende landbasert vindkraft?

2. Hvordan vil du karakterisere økonomien i kommunen, sammenlignet med andre sammenlignbare kommuner? (Skala fra 1-10)

3. Har kommunen eiendomsskatt på næringseiendom?

4. Hvis ja: Omtrent hvor mye får kommunen inn i eiendomsskatt på næringseiendom per år?

B: Tidligere holdninger til landbasert vindkraft innad i kommunen

5. Har landbasert vindkraft vært oppe til behandling i kommunen tidligere (før 2022/2023)?

6. Hvis ja: Hvor positiv eller negativ var kommunen til landbasert vindkraft innad i kommunen den gangen? (Skala fra 1-10)

7. Da NVEs Nasjonal Ramme For Vindkraft kom i 2019, var (deler av) kommunen et av områdene som ble pekt på som aktuelle for landbasert vindkraft. Hvor positive eller negative var kommunen til landbasert vindkraft i kommunen da denne rapporten kom? (Skala fra 1-10)

C: Holdninger til landbasert vindkraft innad i kommunen i dag, og etter innføring av grunnrenteskatten

Den nye grunnrenteskatten på landbasert vindkraft vil skattlegge eventuell grunnrente, det vil si ekstraordinær profitt som kan oppstå ved at man har en eksklusiv rett til å utvinne en naturressurs, for eksempel gjennom konsesjon. Halvparten av disse skatteinntektene skal gå til kommunesektoren. I tillegg dobles produksjonsavgiften, som tilfaller vertskommunen. Det anslås at de totale inntektene fra grunnrenteskatten vil være på rundt 2,5 milliarder kroner i 2023. I underkant av 1,3 milliarder kroner vil da gå til kommunesektoren. Mer informasjon om grunnrenteskatten kan fås på regjeringens nettside: https://www.regjeringen.no/no/aktuelt/grunnrenteskatt-pa-landbasert-vindkraft/id2929117/

8. Hvor positiv eller negativ er kommunen til landbasert vindkraft innad i kommunen i dag? (Skala fra 1-10)

9. Har innføringen av den nye grunnrenteskatten på landbasert vindkraft medført at kommunen er mer positiv eller negativ til landbasert vindkraft innad i kommunen enn tidligere? (Skala fra 1-10)

10. Har landbasert vindkraft vært oppe til vurdering/diskusjon/folkemøter i kommunen etter at grunnrenteskatten ble annonsert høsten 2022?

11. Hvis kommunen er negativ til landbasert vindkraft innad i kommunen, er det noe som kan gjøre at kommunen endrer mening?

12. Under følger en rekke påstander om landbasert vindkraft. Hvordan vil kommunen vektlegge følgende påstander om landbasert vindkraft? (Skala fra 1-5)

    a. Landbasert vindkraft kan bedre kommuneøkonomien i form av økte inntekter

    b. Landbasert vindkraft kan gi flere arbeidsplasser i kommunen

    c. Landbasert vindkraft kan bidra til det grønne skiftet i kommunen

    d. Landbasert vindkraft kan bidra til økt energisikkerhet i kommunen

    e. Landbasert vindkraft kan ha en negativ påvirkning på turisme og reiseliv i kommunen

    f. Landbasert vindkraft kan ha en negativ påvirkning på natur og dyreliv i kommunen

13. Har det politiske flertallet i kommunen endret seg vesentlig siden 2019?

14. Hvis ja: Har dette påvirket synet på landbasert vindkraft innad i kommunen?

D: Spørsmål til kommuner med landbasert vindkraft

15. Hvis kommunen har eksisterende landbasert vindkraft, samsvarer vindkraftanlegget dere har med opprinnelig plan fra utbyggere og konsesjon?

16. Hvordan har det å være vertskommune for landbasert vindkraft påvirket kommunens syn på vindkraft? (Skala fra 1-10)

17. Hvordan har inntjeningen fra vindkraftanlegget vært i forhold til forventingene?

E: Spørsmål til kommuner uten landbasert vindkraft

18. Har noen av nabokommunene landbasert vindkraft?

19. Hvis ja: Har dette medført at kommunen er mer positiv eller mer negativ til landbasert vindkraft innad i egen kommune? (Skala fra 1-10)

F: Avsluttende kommentarer

20. Er det noe mer du ønsker å tilføye?

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