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(Verde Energy, 2020)

# Social Acceptance of the Energy Transition in Longyearbyen

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## **Abstract**

Coal has been the primary source of electricity, heat and employment in Longyearbyen for over a hundred years. With climate change and decreasing prices of coal, the coal power plant will be phased out within the next few years. With this study, we wish to shed some light on diverging perspectives of the energy transition in Longyearbyen. From five semi-structured interviews we identified that there are four potential primary areas where social acceptance and public opinion is important.

Our findings show that there is a concern of lost history and identity with the closure of the coal power plant and mine and that loss of employment may also lead to lost competence in the town. Among the different technologies, an intermediate transition to diesel is perceived confusing, while solar PV is more desirable than wind power despite its technical limitations. With most housing being either state- or business-owned, it is not up to the population to install rooftop PV, and there is some concern that it may drive up rental fees. Concerns for wind is the impact of the landscape aesthetics and on wildlife, which could be mitigated by placing it in areas with already existing infrastructure. Several of the interviewees also express that there is a lack of information and possibility to influence decision-making processes.

We recommend that these themes are explored more in-depth through additional studies and that the relevant authorities find ways to show how the process will continue and clearly outlining if, what, how and when people can participate in shaping the future energy system of Longyearbyen.

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# 1 Introduction

Longyearbyen is a remote town located at latitude 78° North and is situated on the island of Spitsbergen, the largest island in Svalbard (Svalbard Museum, n.d.). The town has roughly 2500 inhabitants (Statistics Norway, 2021) and is the largest settlement on Svalbard. Longyearbyen came to be because of the coal in the mountains that surrounds the town and has been built by the mining industry over the past century (Svalbard Museum, n.d.). Longyearbyen was a typical mining town until 1990 but since then, tourism has slowly become a major industry in the town. Mining remains as one of the main industries, but due to a reduction in coal prices in recent years the operations have been scaled down. Store Norske Spitsbergen Kullkompani still operates a coal mine near Longyearbyen, Mine 7, up the valley of Adventsdalen (THEMA & Multiconsult, 2018).

Today's energy supply in Longyearbyen on Svalbard is mainly based on power and heat production using locally extracted coal (Norwegian Environment Agency, 2020). This in combination with the remoteness and high heat demand make Longyearbyen one of the most polluted towns per capita, with around 70 000 tonnes of CO<sub>2</sub> annually (Multiconsult, 2019). On 11 January 2021, the acting Minister of Petroleum and Energy in Norway, Tina Bru, announced that there will be an energy plan for Longyearbyen in the state budget for 2022 (Ministry of Petroleum and Energy, 2021). The coal power plant in Longyearbyen will be phased out and replaced by a safer and more climate-friendly energy solution. In the long run, the Norwegian Government wants an energy supply with the largest possible share of renewable energy.

## 1.2 Social acceptance

On mainland Norway, the acceptance of different energy technologies by the public have been a topic for much discussion in the last few years. Attitudes toward wind power changed dramatically between 2018 and 2019 according to a survey by CICERO (2019). Although the survey indicates that a majority (51%) of the Norwegian people still supported an increased domestic electricity generation from onshore wind power, the amount had dropped 13.5 percentage points (from 64.5% in 2018). Additionally, following the publication of the national framework for wind power, in April 2019 (NVE, 2019), there was such a strong public reaction and opposition that the Norwegian Water Resources and Energy Directorate (NVE) eventually withdrew the framework (Dugstad et al., 2020). With this recent development of wind power in Norway, there has also been an upswing in criticism of the technology and the social acceptance is in certain regions very low. With the special history and cultural identity of Longyearbyen as a coal mining town, it is interesting to study the social acceptance of changes to the energy system and see if it is different from mainland Norway.

When studying the social acceptance of energy technologies and infrastructure, we may conceptualise it according to Wüstenhagen et al. (2007) who divide it into the three different dimensions of socio-political-, community- and market acceptance.

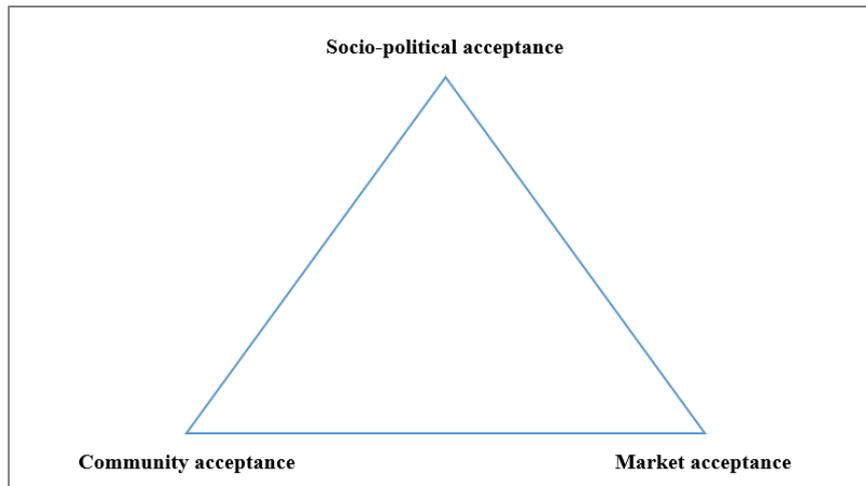


Figure 1: The triangle of social acceptance of renewable energy innovation (Illustrated by Olsson & Vågerö, after Wüstenhagen et al. (2007).

Socio-political acceptance is the acceptance of technologies and policies by the public, key stakeholders and policy makers. It concerns social acceptance at the most general level and can usually be indicated by general opinion polls. However, there can be a strong overall (socio-political) acceptance of energy technologies and still significant opposition and protests. The second dimension, community acceptance, refers to acceptance of a specific projects by local residents and authorities. It is often simplified as NIMBYism (not in my backyard) but actually includes factors related to distributional and procedural justice as well as trust from the local community in the intentions of investors and outside-actors. The third dimension, market acceptance, relates to the process of market adoption and diffusion of innovation for both consumers and investors.

Social acceptance is as such a complex phenomenon and research suggest that the common explanation of NIMBY is only one of many possible reasons of opposition (van der Horst, 2007). A different aspect of social acceptance is that the perceived fairness of energy infrastructure is highly important (Gross, 2007; Wolsink, 2007). Without political support, it will not be possible to achieve national, regional or local targets of low-carbon energy societies (Williams & Doyon, 2019). Although Longyearbyen as a town has a special status due to the Svalbard Treaty and its special territorial status, the way the population perceive different energy technologies should still have an impact on the feasibility of an energy transition.

## 2 Problem statement

The Norwegian Government has strongly indicated that the coal power plant in Longyearbyen will be phased-out and replaced with more environmentally friendly sources of energy. With the ongoing discussion of onshore wind power in Norway and a very top-down decision of the decommissioning of the historically important coal tradition, the question is how accepted these changes are by the people living in Longyearbyen. What different opinions and imaginaries for the future exist and how do they compare? In this report, we therefore explore different perceptions and community acceptance toward Longyearbyen's transition into a more environmentally friendly energy system.

## 3 Findings

### 3.1 Longyearbyen as a coal mining town

Longyearbyen has a special history and identity as a coal mining town. From our interviews we could sense a worry that with the phase out of coal mining activities, the town will lose much of its identity and competence:

*We must remember that in the past it was these people [from the coal industry] who had families and who maintained society here. Now it is tourism that is most of the island and they do not have the same conditions to live here. Poorly paid, expensive dormitory. But if they are going to have a family, they cannot afford to live here, then they have to travel down [to the mainland]. This leads to depopulation (Interviewee 4).*

With the decreasing mining operations, the industry becomes less visible in society:

*At that time [in the late 1990s], there was mining operations in mines three and seven and the miners were seen more clearly in the community. Now you do not see it anymore, it has changed. Mining used to be the primary operation in society (Interviewee 1).*

and the history risk being forgotten (as seen from the response to what the biggest challenges with the transition are):

*...and maybe the fact that Longyearbyen's history falls away a bit. We have been a mining community. That one remembers little about it. It's really a bit fancy to say that you have a mine even if you think it's not that fancy anyway (Interviewees 2 and 3).*

When asked about their attitude towards the current use of coal for energy in Longyearbyen, some of the interviewees mention that they are not too worried about the use of coal:

*We need to think about where we are on the globe. It started with coal and that is why we are here in the first place. For me as an individual, I have no direct problems with being here (Interviewee 1).*

However, interviewees still express that a more environmentally friendly society is desirable:

*So then I think that coal can be perfectly ok, but if they had managed to get a renewable energy solution, then clearly we should go that route (Interviewee 2 and 3).*

The attitude towards coal is as such a bit mixed. Even for people who have not spent all of their lives here, the coal mining practices is still part of the identity of the town. It is considered stable and reliable even if there are occasional outages for the power plant (Interviewee 1).

### 3.2 Perceived challenges with the energy transition

With an energy transition from coal to renewable energy, our interviewees expressed some of their concerns on perceived challenges. One aspect that seems to be particularly relevant in Longyearbyen is the impact on employment in the town:

*You lose jobs in the mine, you lose industrial jobs and it is actually quite important for a society to have industrial jobs permanent, not just tourism. We have seen now under corona how vulnerable society actually is (Interviewees 2 and 3).*

In addition to the employment itself, there may be a loss of important competence if employees do not find new positions in the area:

*The ones who work in the mine have been here for a long time and have a lot of Arctic expertise, including climate [...]. They have a lot of skills that are lost if they have to leave here. Which may also be needed for renewable energy because they have this competence from inside the mine and having lived here for a long time (Interviewees 2 and 3).*

Furthermore, there are some concerns that variable renewable energy (VRE) cannot balance the demand and that an intermediate transition to imported diesel gives limited benefits:

*Sun and wind cannot do it themselves, there needs to be something third. Diesel, pellets or hydrogen. Think of all the shipping? The coal is already here and does not need to be transported (Interviewee 1).*

*I want it to be renewable then. But it is this intermediate process, that we should not switch to diesel. Because it is not renewable at all and it will just be a hassle and transport diesel up from the mainland to burn it here. Then it is much better to use coal that already exists here then, and also keep the jobs for it (Interviewees 2 and 3).*

*The coal here is local and not something that comes from far away. It's really just from right next to here, if you can put it that way. That way, coal is perfectly fine [...]. But I do not think diesel is a good solution. I do not think that sounds environmentally friendly at all. Carrying diesel on a boat which uses diesel to get it up here (Interviewees 2 and 3).*

One of the interviewees (5) claimed that the emission saving from transitioning to diesel was as much as 50% compared to current emission levels, but this information may not have reached people in Longyearbyen and the other interviewees. With more costly solutions to the new energy system, the potential increase in electricity prices was discussed. Although the level of concern varies between the interviewees, there is an agreement that the subsidies create a difference between people:

*No, personally I'm not. But it can affect companies and other people more. There will certainly be reactions if that happens. But then I think there will be support schemes that compensate. But there is a difference between those who have subsidized housing (UNIS employees, the governor) and those who work for [e.g.] Hurtigruten who do not have it (Interviewee 1).*

*Society must make it equal for everyone. As it is today, you have [different] groups of people who work here. Government employees like the governor get everything for free while others get some subsidies while others have to pay for everything themselves. And it is those who have to pay full price who will suffer. And then the state must think about what they want with Svalbard (Interviewee 4).*

### 3.3 Possibilities with different renewable energy technologies

There are several renewable energy technologies to consider for the energy transition in Longyearbyen. So far, the only technology that has been decided by the Community Council to take place in the energy transition is a battery park to handle short-term load fluctuation.

*It is a project we have been working on for a while and which has now been put out to tender so we will now within 1-2 years establish a battery park in Longyearbyen. It has already been politically approved; it has been financed and we are in the tender phase right now» (Interviewee 5).*

#### 3.3.1 Solar power

From the supply-side technologies the interviewees seem to support solar power, although not everyone:

*I think it is wise to have a solar panel then. Since it is sunny here for 4 months. So, I think that's very good. It should at least be a solution in the summer. But what is so difficult up here is that you have such different seasons, so the solar panels do not work in the winter (Interviewees 2 and 3).*

*Solar cells everyone brags about, but it gets colder and the question is how well they work. They can be good in the summer but in the winter, it will be difficult (Interviewee 4).*

Interviewee 5 further says the solar panels is «preferably in parks because it is most operational and economical and the most efficient, but it will certainly be relevant to put on roofs and walls» (Interviewee 5). Solar panels on the rooftops can be an option for many houses, but that can lead to increased rental prices:

*Yes, [I would be open to install solar PV on my roof] but very few people own their homes here. So, it may not be up to us, it's up to the building owners. This could lead to increased rents for the tenants (Interviewee 1).*

When asked If solar panels on the roof become relevant and whether there was in interest in charging an electric vehicle with solar energy the response was:

*No, I will not have an electric car. I could have imagined solar cells, but not an electric car [...]. First, it is loaded with coal power, and it becomes too stupid [...]. We've had some electric shocks up here, and those who drove them have been freezing to death [in the winter]. They do not get them heated. Also, how much do we really drive up here? (Interviewee 4).*

### 3.3.2 Wind power

Onshore wind power as an energy technology is contested on the Norwegian mainland (Dugstad et al., 2020), but could from a technical point of view balance seasonal fluctuations from solar PV in Longyearbyen. Overall, there is some skepticism towards wind power among the interviewees, both due to technical issues such as icing and impact on wildlife:

*I am not against wind power. It could work well with floating wind power. Isfjorden is so big, so maybe it is better to put it there than with a wind farm in Adventdalen. There are some problems with the height of wind power such as ice (Interviewee 1).*

*It would have been possible to have wind turbines here in the winter. But one is against wind turbines because of the bird life and things like that, but the birds travel south and are not here in winter. So, I think it would have been wise with wind in the winter then and sun in the summer (Interviewees 2 and 3).*

The visual impact on the landscape aesthetics is also something that is mentioned:

*But wind power is not particularly pretty to look at (Interviewees 2 and 3).*

*Of course, I think it destroys the environment, it is absolutely awful. I have been on cruises along the entire coast and to see those wind turbines is absolutely awful (Interviewee 4).*

To reduce the visual impact, it was suggested to put wind turbines in areas where there is already built infrastructure and away from the town:

*It would have been possible with wind turbines up on the mountain where there are radars. There are already all these balls that are up on Platåfjellet. So, there I think there is a lot of stuff already. But I probably would not have had any wind turbines in the city. I do not think that would have been so nice (Interviewees 2 and 3).*

We also find that the community council is considering wind power in places where there is already infrastructure, such as on top of Mine seven. The location up at Platåfjellet had previously also been considered but was later disregarded due to risks of much turbulence in the air (Interviewee 5).

### 3.4 Participation and influence on decision-making

We have so far covered the interviewees' different opinions on technologies and change, but also need to discuss the perceived rate of participation and influence on decision-making. Some of the interviewees who have no formal position in a decision-making body feel that there is a large distance between the people and the different levels of governance:

*They have in a way not informed about anything. There may be a small news story and then it is published in Svalbardposten, and they do not have the knowledge to write so detailed. It often comes from the ministers who say that this is the way it shall be (Interviewee 2 and 3).*

*I feel that OED all of a sudden came with new information and that it may be uncertain if there is a change of government. This was not the first time we heard from the government [about the termination of the coal power plant] but it was a bit shocking that they had such strong stances on it (Interviewee 1).*

*They could maybe come up here and see a little, and maybe talk to the locals, and not just take the decisions, it's easy to say things when you sit in Oslo, but when you come here it is a little different (Interviewee 2 and 3).*

One of the interviewees touched upon the impact and influence that participating in local processes (hearings, information meetings) has for the outcome:

*We have nothing to say. We have no influence at all. We may think we have it but we do not (Interviewee 4).*

This can be related to theories of public participation (see e.g. Clausen et al. (2021) or Arnstein (1969)), which separates the existence of involving processes from actual citizen power. It is one thing to have participatory processes where people are open to share their opinion and the ability to actually shape the discussion and influence the outcome. However, due to the very special governing situation of Svalbard with two parallel power structures and a divide between who has power and who hasn't (Lundh, 2021), we have to consider that Longyearbyen is not a normal town with normal rules. It is both a place where people live their lives and it is also a tool for the Norwegian state, which leads to conflicting visions of what you can and should be able to influence. So there is a difference in who governs the process:

*I think that there is a different thing when you talk about things that happen with Lokaltstyret or things that happen with Sysselmannen and remember that those two are very different things[...]. I think Lokaltstyret, so in terms of local issues, they do try [to involve people] (Interviewee 6).*

For the specific case of the energy transition, it is also a matter of timing and fact that the local government has not yet received proper directives from the government:

*You have to keep in mind where in the process we are. By definition, we have no other decision than that the coal power plant will continue to operate, but we have a press release from the OED that something is happening. So it is an involvement of the inhabitants, we are now running a fairly large process that will bottom out in a new local community plan, i.e the text part about how the society should develop, so that the involvement is there, but it is through the larger processes. The inhabitants can say something about whether we should be renewable or not renewable, and be part of these large structural changes, but they can't comment on the small details (...). There has been and is some involvement, but it happens through the major processes in which the inhabitants are involved (Interviewee 5).*

## 4 Method

### 4.1 Choice of method for the data collection

In order to study people in Longyearbyen's attitudes towards an energy transition and preferences for the design of the future energy system, we conducted a qualitative study. In this way, we can gain insight and in-depth understanding of the topic for our project. Semi-structured interview was conducted and is characterized by the existence of an interview guide that consists of some general questions to be reviewed in the interview. The researcher can change both the order and formulation of the various questions along the way and the researcher has the opportunity to come up with follow-up questions. A strength of this type of interview is that the questions are open enough for the informants to express their opinions on a topic, at the same time as the questions are standardized enough to compare data across the informants (Johannessen et al., 2020). This is what we wanted to achieve with the interviews in this project and this form of interview was therefore chosen for the data collection.

### 4.2 Selection of interviewees

The purpose of using a qualitative method is to gain as much knowledge and a comprehensive description as possible of the phenomenon being studied. The knowledge is collected from people with a clear goal and is based on systematic assessments of which areas are most relevant and interesting. It is often referred to as a strategic selection of interviewees. The researcher must first think about which target group must participate in order to gather the necessary data (Johannessen et al., 2020). In this project, the target group has been selected with a view to gaining as much insight as possible into how residents of Longyearbyen experience the energy transition from coal power to renewable energy. We wanted to interview people who consist of different social groups in Longyearbyen, including two researchers at UNIS (Interviewees 1 and 6), two students from Longyearbyen High School (Interviewees 2 and 3), a retired person that previously has worked in the mining industry (Interviewee 4) and one from Longyearbyen Community Council (Interviewee 5). Due to time constraints set by the course, we considered it necessary to interview only one person from each of the mentioned social groups. We are fully aware that these people cannot respond on behalf of all the inhabitants of Longyearbyen, but we still believe that they provide a good representativeness for their attitudes.

### 4.3 Conducting the interviews

In the preparations for the interviews we made an interview guide. The interview guide is a useful tool for inexperienced interviewers, like us, and will make it easier to keep progress and structure during the interviews (Johannessen et al., 2020). Initially, general questions are asked to become better acquainted with the interviewee. The main part consists of themed questions that are the most important and most interesting to get good answers to. Finally, we asked whether they had anything to add which we had not already brought up. After each interview, some interesting topics emerged that we wanted to include in the further interviews.

A total of five face-to-face semi-structured interviews was conducted with representatives from different social groups in Longyearbyen on 28th, 29th and 30th of June 2021 and each interview lasted approximately 30 minutes. During the interviews, we used audio recordings to ensure that we were able to reproduce exactly what the interviewees answered, and that important information did not get lost. Johannessen et al. (2020) states that all data collection must be documented, and when using qualitative data, this is available in the form of text. The audio recordings were thus written as text, also referred to as transcription. After we finished transcribing, we proceeded to analyze the collected data. In the analysis we read the transcriptions a couple of times and translated it to English. After this, the quotes that had the same meaning, were sorted into bigger groups, as presented in the four different themes in chapter 3.

## 5 Conclusion

Our small study shows that there are four potential primary areas where social acceptance and public opinion is important.

In the first topic, there is a concern that the history and identity of Longyearbyen is getting lost when the coal mine is shut down. Secondly, the loss of employment in both the coal mine and power plant is a source of worry for some people in Longyearbyen. There is a risk of lost competence if long-time inhabitants and experienced workers need to move to the mainland for employment. The way the phase out is done and new opportunities are constructed for the workers will likely impact the community acceptance of the transition and any new solution that is suggested. Additionally, the intermediate switch from one fossil fuel to another (even if it leads to significant emission reduction) is perceived poorly by some as it does not lead to a new clean energy system but still comes with negative implications.

Thirdly, we find that most interviewees are positive to solar PV but acknowledge its technical limitation (polar night) as an energy source during the arctic winter. With most of the housing being state- or business-owned, there are few opportunities for individuals to show an interest in rooftop PV. If it is implemented by the house-owner, there was some concern that it might lead to increased rents, impacting the least-subsidised people in Longyearbyen. Electrical cars were not considered to be very important and prioritised as a CO<sub>2</sub> mitigation measure.

Wind power as a technology seems to be less accepted than solar PV but to some acceptable if they are installed in a way which adhere to people's preferences of landscape aesthetics and impact on local wildlife.

Lastly, the way local planning and participation is perceived is certainly important for the social acceptance of an energy transition. We find from our interviewees that there is a feeling of discouragement towards the way information is disseminated to the population and how the decision-making is involving people. Although this may be because the processes are in an early stage of the transition, it creates a poor starting point for future dialogue.

## 6 Limitations and further work

We wish to point out that this study is not comprehensive or representative for the population in Longyearbyen, but rather present a first glance at an interesting and important research area to which time and resources should be directed. We tried to get an interview with someone who works in the coal industry today and an arctic nature guide so we could get a tourism and environmental perspective, but we didn't manage to find someone that had time for an interview in such short notice.

To avoid unnecessary negative sentiments already before the processes begin, we recommend that the relevant authorities find ways to share the process going forward and identifying if, what, how and when people can participate in shaping the discussion. It would also be beneficial with a larger project that includes more interviewees, such as arctic nature guides to get the environmental and tourism perspective.

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