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Nordic Battery Belt

Feasibility study report

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MidtSkandia

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1 Background

This report is part of the Nordic Battery Belt feasibility study project co-funded by Interreg Aurora, Region Västerbotten, Regional Council of Ostrobothnia, Kvarken Council EGTC and MidtSkandia. The report has been produced by Tyréns Sverige AB on assignment by Kvarken Council EGTC.

Battery production is emerging as a key industry in the northern Nordics. With big investments currently under way in Nordland (Norway), Västerbotten (Sweden), Ostrobothnia and Central Ostrobothnia (Finland), a new battery manufacturing region, the Nordic Battery Belt, is being formed.

In the Nordic Battery Belt area, two gigafactories are currently under construction: Northvolt Ett in Skellefteå, Sweden and FREYR Giga Arctic in Mo i Rana, Norway. In addition, several other investments are happening in other parts of the battery value chain (i.e., mining operations, processing of raw materials, production of battery components and battery recycling).

The large-scale investments bring new opportunities for regional growth, but also implicates challenges that need to be handled.

1.1 Aim

The aim of this report is to analyse challenges and opportunities for the continued development of the Nordic Battery Belt region and which of these challenges and opportunities that are suitable to handle in cross-border cooperation.

1.2 Methodology

The result in this study is based on desktop studies, literature reviews and interviews with stakeholders.

The stakeholders that have been interviewed include representatives from Rana Utvikling, Nordland County Council, Skellefteå municipality, Region Västerbotten, the Swedish Government Offices, Vaasa Region Development Company VASEK and Kokkola Region Development Company KOSEK.

2 Results

During the feasibility study, six main themes for challenges and opportunities have been identified: *human capital management*, *energy supply*, *housing*, *transport infrastructure*, *research & development*, and *regional marketing*. Each theme is described in more detail below, together with a summary of related initiatives and projects.

2.1 Human capital management

One of the major challenges for the Nordic Battery Belt is to find enough skilled labour for the job openings in the battery industry and society in general.

Northvolt in Skellefteå says it will hire up to 4 000 employees by 2025[1]. Freyr in Mo i Rana is looking to employ about 1 500 – 2 000 people[2]. Suppliers and other related industries that are being established in the region will also bring new job openings. In a region where the unemployment rate is low[3] and where there already are staff shortages in both the private and public sector, recruiting people with the right skills could prove challenging.

There aren't enough people within commuting distance who are unemployed and have the right skill sets for these job openings. This implies a need to either train unemployed people to attain the right skill sets, recruit local people already employed in other companies, reducing the need of staff by automation, or to recruit people from outside of the region. Due to the scale of job openings, the result will most likely be a combination of all these alternatives.

To maximise regional development, the best option should be to recruit people from outside of the region and have them move to the region (as opposed to commuting to and from the region, i.e., fly-in fly-out). An increased number of employed inhabitants bring increased tax revenues as well as an increased market for new and existing companies. On the other hand, the main risk for regional development is if job opportunities are lost to automation, or if competition for staff leads to staff shortages in other industries.

Training people to attain the right skills is partly done by the companies themselves and partly by education providers such as schools and universities. Matching unemployed people with job and education opportunities is the responsibility of the Public Employment Service, but this service is also available from private companies.

In summary, there are great challenges related to human capital management and finding enough people within – or willing to move to – the region.

Related initiatives

[1] https://skelleftea.se/platsen/naringsliv/naringsliv/stories/2021-11-22-northvolteffekten---en-positiv-laddning-for-hela-skelleftea

[2] https://ru.no/wp-content/uploads/2022/01/2021-111-Ringvirkninger-og-samfunnseffekter-av-Freyrs-etablering-i-Mo-i-Rana-1.pdf

[3] The unemployment rate in January 2023 was 6,5 % in Ostrobothnia, 4,1 % in Västerbotten and 3,4 % in Nordland. The EU average was 6,1 %.

There are quite a few projects and initiatives aimed at solving the issues with finding enough skilled labour.

The Interreg Nord project *Battery Region* has mapped the competence needs of battery value chain actors in the region and how to match that with the education system of the cross-border region.

The *Alliance for Batteries Technology, Training and Skills (ALBATTS)* is an EU Erasmus+ project, led by Skellefteå municipality, aimed at designing a blueprint for competences and training schemes of the future, in the battery and electromobility sector.

Relocate and *React EU Relocate* are two projects, led by Skellefteå municipality, aimed at matching job opportunities in Skellefteå with unemployed people in other parts of Sweden and the EU.

A new public-private cooperation model is currently under development in Skellefteå in a collaboration between Boliden, Northvolt, Skellefteå municipality, Västerbotten Chamber of Commerce, the Swedish Public Employment Service, and eight state agencies.

There are several talent management companies in the private sector, and one of these, *MindDig*, is specifically directed towards the new green industries being established in northern Sweden. They have contracts with both companies and cities/regions in northern Sweden and work to provide them with the right skilled talents.

2.2 Energy supply

Low energy costs and a high degree of sustainable energy production are some of the main competitive advantages of the region that have enabled current large-scale investments of energy-intensive industries.

The northern Nordics has historically provided a surplus of electricity that has been exported out of the region. With the energy-intensive industries now being established however, a greater amount of electricity will be consumed within the region. Since energy demand seems to be rising faster than the rate at which energy supply is being built in the region, this implies that competition over available clean energy will increase and with that also the cost of energy.

Higher energy costs and potential energy shortages mean that the region risks losing its competitive advantage, and thus risks being less attractive for new investments. To maximise the regional development potential, it is therefore crucial to make sure that energy-intensive industries also bring added value to the region (e.g., amount of employees/TWh).

Further increasing the supply of available clean energy could be a way to keep this competitive advantage. Municipalities can enable this by planning geographical areas for energy production. Long-term plans for the development of energy supply should be crucial for long-term investment decisions in the energy-intensive industries.

In a Nordic perspective, there could be opportunities to coordinate and co-plan energy policies to a greater extent.

Related initiatives

The *Bothnia Green Energy* project is an Interreg Aurora project led by the Kvarken Council EGTC. The project aims to stimulate cross-border collaboration and investments in sustainable energy solutions in the geographical area around the Kvarken. The project is divided into three work packages. The first aims to develop a shared Nordic platform for cooperation in the energy sector. The second strengthens the innovation capacity between SME's, energy companies, higher education institutions, and public operators. The third draws up a plan to help identify strategically important international organizations, contacts, and platforms that contribute to growth in the northern parts of the Nordic countries.

2.3 Housing

Enabling more people to move to (and stay in) the region would require more available housing opportunities. The demand for housing and different types of housing, varies in the region. In parts of the region, there is an overall housing shortage and in several parts of the region there is a shortage of specific kinds of housing.

For the relatively small cities of the region that don't have a history of population growth, it is challenging to redirect the public organisation towards planning for growth. For example, Skellefteå has experienced a fast-growing demand in recent years with the influx of people due to the construction of the Northvolt factory. Both the municipal planning and the housing market have struggled to keep up with the pace, which has led to a need for temporary living spaces.

Providing attractive living environments is an important part of the overall regional attractiveness and thus to get people to move to the region. It will require a balance between well-planned, socially sustainable environments and ensuring a fast enough development.

Currently, the economic situation provides a risk factor for the continued development of the housing market in the region. High inflation and rising interest rates have led to a halting of new housing projects.

Cross-border cooperation is complicated by the fact that urban planning systems and legislations differ between the three countries. It could however be interesting to focus on experience-sharing between the countries in order to learn from each other.

Related initiatives

The Swedish Government has allocated specifical funding for innovative and sustainable urban development projects in Norrbotten and Västerbotten. For 2023 the allocated amount is 26 M SEK.

2.4 Transport infrastructure

Battery production requires a lot of input materials and the high-volume production planned in the region will also lead to high output volumes that need to be transported. New job opportunities also imply an increased need for commuting, both locally and regionally. The transport system of the region needs to be able to handle the expected increase in transport volume in a sustainable way.

There are still a lot of uncertainties as of how the emerging battery industry will affect the transport flows of the region. Indicatively though, it seems like the biggest increases in passenger and freight transport flows will be experienced at the local level. To account for this, adjustments in local road systems and port infrastructure might be necessary in parts of the region[4].

In terms of regional transport flows, there are some ongoing initiatives, for example the construction of the new railway link between Umeå and Skellefteå. The lack of a fixed road and/or rail link between Ostrobothnia and Västerbotten as well as the missing railway link between Helgeland and Västerbotten have also been considered for future development[5].

The mandate for planning transport infrastructure lies mainly with the municipalities, regional authorities, and national transport authorities. The national transport authorities are also responsible for cross-border transport infrastructure planning, which can be challenging due to differences in the planning systems[6].

Related initiatives

Nordic Battery Belt Logistics was an Interreg Botnia-Atlatnica project led by Kvarken Council EGTC. The project focused on analysing how the emerging battery industry of the region will affect the transport system.

2.5 Research & development

In the fast-growing battery sector, there is a lot of resources going into research & development. For the region, this could mean an opportunity to diversify the investments in the battery value chain to include R&D in addition to raw materials and production.

[4] Ramboll. 2022. Nordic Battery Belt Logistics – Local & regional supply chains and logistics solutions. https://www.kvarken.org/wp-content/uploads/2022/09/New_Report_Nordic_-Battery_-Belt_Logistics_MASTER_31-5-2022.pdf

[5] Ibid.

[6] Anna Lundgren, Linnea Löfving och Lars Westin. 2023. Cross-border transport infrastructure planning in the Nordic Region – An introduction. Nordregio.

Increased investments in research & development both mean that the companies of the region can get a better position in the global competition and that there are more high-skilled job opportunities in the region. The latter could be especially interesting, since those kinds of jobs generally have a lower probability of being automated[7].

The companies within the battery industry have their own structures for research and development. To some extent these are based in the region, but often R&D positions are located outside of the region.

Within the cross-border region there are several public research institutes and universities that either already work with, or potentially could work with, research & development related to the battery industry.

There have been some initiatives to coordinate research between the companies and the universities of the region. However, few of these initiatives contain a cross-border element.

Related initiatives

There are a few ongoing cross-border research initiatives aimed at developing new technologies related to the battery industry. For example, two such projects were granted funding by Interreg Aurora in the first call: *GreenBattery* aimed at developing biobased batteries, and *EcoLIB* aimed at developing methods for sustainable battery recycling.

There are also initiatives aimed at establishing research clusters or centres in the region. One such example is the Interreg Aurora funded project *Sustainable Hydrogen* that is examining the possibilities for a hydrogen cluster. Another initiative is *Arctic Center of Energy (ACE)* that is being established in Skellefteå as a centre for the integration of education and research related to society's energy transition. ACE will be located at Campus Skellefteå and is a collaboration between Luleå University of Technology, Northvolt, RISE, Skellefteå Kraft and Skellefteå municipality.

RISE Research Institutes of Sweden are coordinating a Vinnova project called "*En Cirkulär Batterivärdekedja för ett Hållbart Elektrifierat Samhälle*". The project is focused on designing an interdisciplinary impact innovation programme to make the most of the opportunities that the battery industry offers for the local society[8].

2.6 Regional marketing

Marketing is a way to attract both further investments and people to the region. This is done on many levels already, both by the companies that are looking to recruit people, and by the public

[7] Carl Benedikt Frey and Michael A. Osborne. 2013. The Future of Employment: How Susceptible Are Jobs to Computerisation?

[8] https://www.vinnova.se/p/en-cirkular-batterivardekedja-for-ett-hallbart-elektrifierat-samhalle/

sector. Ongoing regional marketing initiatives tend to focus on parts of the region, though, and no coordinated effort to market the whole “Nordic Battery Belt region” have yet been initiated.

People from other parts of Europe and the world are probably less focused on which city in the region they are moving to but rather that they are moving to “the Nordics”. A joint regional marketing could bring a greater impact. By marketing the wider region, it is possible to highlight regional opportunities in the form of a broader labour market and access to more leisure activities. This could potentially increase the attractiveness of the region in relation to people pondering where to move by providing a stronger joint offer than if each city or sub-region were to market themselves separately.

For companies looking for an area to invest in, showcasing the broader region also implies they have access to a broader basis of skilled labour, input materials, suppliers, and research institutions.

2.7 Interdisciplinary related initiatives

As described above, there are several related initiatives working with the identified challenges and opportunities. In addition to these however, there are also several interdisciplinary initiatives that are focusing on more than one of these challenges.

In Sweden, the Government has assigned Peter Larsson with coordinating the societal transformation and green industry in northern Sweden[9].

North Sweden Green Deal is an EU-funded project with regional and municipal actors from Västerbotten and Norrbotten. The project focuses on building capacity to handle the societal transformation that takes place in connection with new investments and establishments, such as regional and local attractiveness, competence provision, energy, and sustainable urban planning[10].

VekstMObilisering is a project focusing on regional and local attractiveness, competence provision, mobility, and infrastructure in the Mo i Rana area related to the development of the FREYR gigafactory.

Umeå University have launched a research programme called “*Det nya framtidslandet? Drivkrafter, utmaningar och möjligheter i relation till norra Sveriges (gröna) industrialisering*”. It is a 7-year

[9] https://www.regeringen.se/contentassets/8e9b848837ae4cecab7e6a380a9a0b51/rapport-fran-samordnaren-for-samhallsomstallning-vid-storre-foretagsetableringar-och-foretagsexpansioner-i-norrbotten-och-vasterbotten.pdf

[10] https://utvecklanorrbotten.se/projektstod/north-sweden-green-deal/

research programme that will follow the green industrialisation and related societal transformation in northern Sweden[11].

Umeå University are also launching a cross-border research & development project called "*Bildning i batteribältet*". The project aims to research the role of education in a dynamic regional development in relation to the Nordic Battery Belt.

3 Analysis

The challenges and opportunities that are related to the emerging Nordic Battery Belt can be divided into acute needs that must be handled in order to facilitate the investments, and more strategic long-term opportunities for regional growth.

There are ongoing initiatives in all the identified themes above. However, there are still gaps within each theme and it is possible that there is a lack of coordination of ongoing initiatives and activities, especially in a cross-border perspective.

The challenges vary between different parts of the region, depending on which phase in the investment-cycle that each city and part of the region is in. Different parts of the region will also have different roles.

In the interviews, a discussion has been noted as of whether the Nordic Battery Belt should be considered a regional industrial cluster already or if it is just similar but not interlinked investments in relative geographical proximity.

It should also be noted that there is a competition, both between battery producing companies and between cities or sub-regions. This competition can lead to a lower interest in cross-border cooperation. However, there should be themes and activities that are mutually beneficial for everyone and less prone to competition. Among private sector companies, competition is natural, and it should not be assumed that rivalling companies are interested in partaking in joint projects.

Another question for cross-border cooperation is who has a mandate to tackle which question. Different activities require actions from different stakeholders and levels of stakeholders, and it will be important to identify the most suitable stakeholders for each task.

4 Conclusions

Based on the results from this study, there are both great challenges and opportunities related to the investments under way in the emerging battery belt industrial region.

[11] https://www.umu.se/forskning/projekt/det-nya-framtidslandet/

There are a lot of initiatives in different parts of the region dedicated to handling different parts of these challenges and opportunities. While a lot is happening however, most of the activities are domestic and there are relatively few cross-border initiatives. Reasons for this could include political and systemic obstacles to cross-border cooperation, but also the perceived competition between the different cities and sub-regions.

All in all, this leaves an opening for new cross-border initiatives, given that they are focused on mutually beneficial activities. These could for example include experience-sharing, joint knowledge/strategies, or joint marketing. Through cross-border cooperation, it is also possible to influence EU and nation state policy to a greater extent.