



WIND POWER

Jämtland Härjedalen



90
BILLION

INVESTED IN SWEDEN, 2017–2022

Wind power

- The next major multi-billion business opportunity

During the last ten years wind power has become a desirable area for investment. This is a clear illustration of the increased global interest in renewable energy from large investment funds in recent times. Companies ranging from the Swedish funds AP3 and AP5 to the American fund giant BlackRock have increasingly replaced their investments in oil, coal and gas with solar power and wind power. Large companies such as IKEA, Google and Amazon are pushing hard to climate-compensate their emissions via enormous investments in wind power. Many of these investments are taking place and have taken place in our region. Consequently, a multi-billion industry has been built in Jämtland Härjedalen and our neighbouring regions.

Any companies with relevant competence in terms of operations and maintenance are welcome to contact us. The wind power sector is here to stay, and the politicians are in agreement.



Fredrik Blom
Manager, Business Region MidSweden



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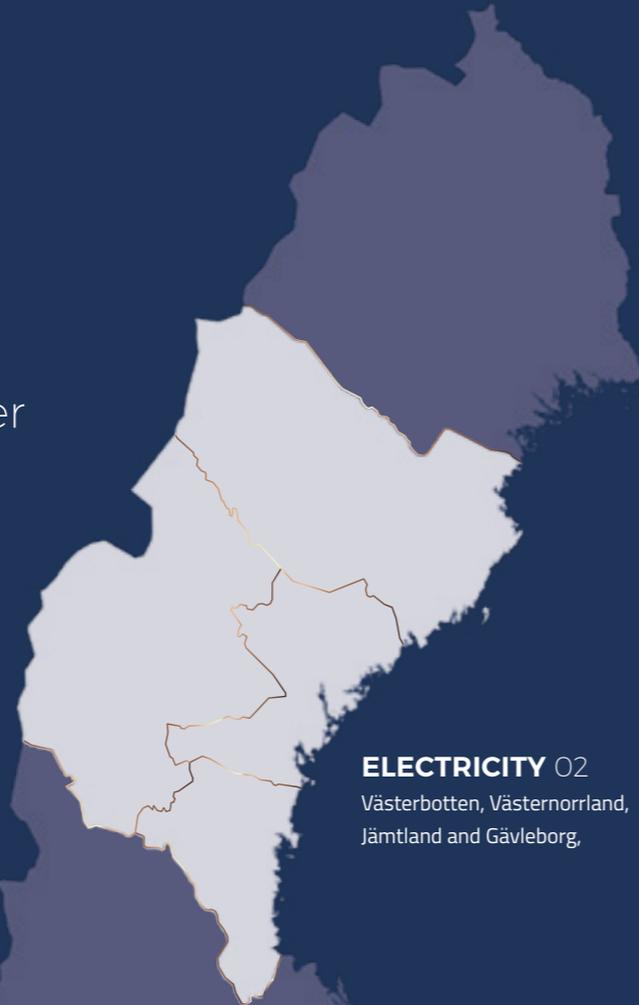
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Jämtland Härjedalen

– a region full of wind power

Wind power expansion has exploded in electricity area 02 during the last ten years. A development which will continue at a rapid pace in the forthcoming years. The need for companies that provide operations and maintenance services will dramatically increase all across electricity area 02.

Such companies will ensure that the billions invested in wind power in the region bear fruit in the next 25 years. Jämtland Härjedalen is strategically located in the centre of electricity area 02.



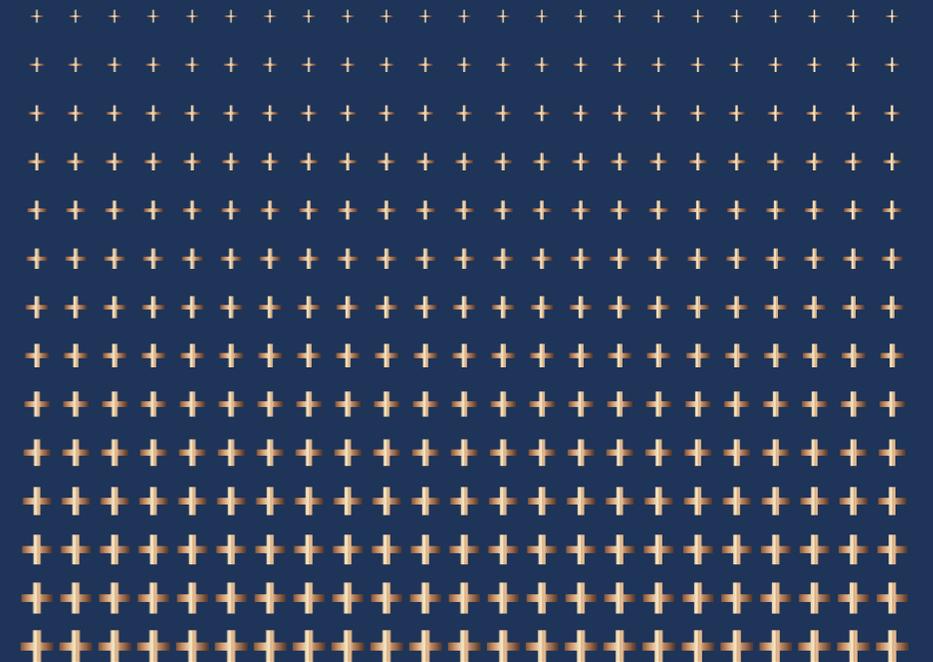
ELECTRICITY 02
Västerbotten, Västernorrland,
Jämtland and Gävleborg,

2012

5 TWh*
SEK 5 billion

2022

20 TWh*
SEK 50 billion



*Annual production calculated based on statistics and forecasts from the Swedish Wind Energy Association. Jämtland Härjedalen's share of the annual production for 2022 is estimated to be 6-8 TWh and approximately SEK 15-20 billion of the investment.



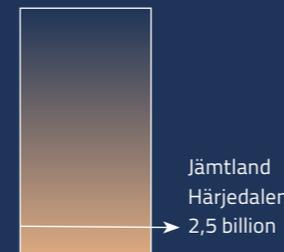
Billions

in business opportunities for at least the next 25 years

Vindkraftcentrum (Wind power centre) has mapped out the services that are directly or indirectly connected to the service and maintenance of a wind farm. Over and above the wind power technician's routine maintenance, there are a number of specialist services that are most often provided by foreign companies. As wind power grows in Sweden, so will the knowledge and experience of national, regional and local companies. Companies are cooperating and business clusters are forming to be able to supply packaged solutions of services that were previously carried out by foreign companies. The market value of these services is difficult to assess, but Vindkraftscentrum estimates the commercial value of blade inspections alone to be approximately SEK 75 million per year, for at least 25 years. The market for reparation of blades is estimated to be even larger. At the next level there are a number of ancillary services that need to be performed to ensure operations and maintenance services. These services will generate even more business for existing or new companies.

3 modest calculations

ROAD MAINTENANCE 40 BILLION³



ROUTINE MAINTENANCE 22,5 BILLION²



BLADE WORK 3,8 BILLION¹



1) Commercial value calculated using Vindkraftcentrum's estimations for blade inspections for the next 25 years and a modest, equal commercial value for repairs for 25 years. 2) Commercial value calculated using SEK 600 per hour worked, for 1,000 wind power technicians in Sweden for 25 years (*compilation by the Swedish Wind Energy Association). 3) Commercial value calculated using current maintenance contracts (SEK 200,000 per 10 km per year) for approximately 10 km of road per wind turbine for 25 years.

Repairs and servicing

– from global to regional business

WPS Sweden

– organic and inorganic growth

Piteå company WPS Sweden AB was established in 2014 and has grown to become one of the largest independent Swedish suppliers of service and maintenance of wind turbines. The company has a successful concept that uses locally employed wind power technicians all over northern Sweden and they have a clear objective to continue to expand both organically and through acquisitions. In May WPS acquired the Östersund company Windrep AB.

“Windrep is a perfect match for our company, it boosts our competence primarily in blade repairs”, says Jonas Björk, CEO WPS Sweden.

The company has simultaneously established operations in another two towns, Östersund and Leksand. Jonas Björk also sees Windrep’s competence and experience from several years of complicated repairing of wind turbine rotor blades as a valuable addition.

“Together we become a more complete partner to the fast-growing wind power sector. Our knowledgeable technicians and our local presence make us the best choice as a partner in the sector”, he says.

The plan is for WPS Sweden to continue to grow in Östersund and the idea is to expand operations in Jämtland Härjedalen. This means that WPS Sweden will need to further widen its spectrum of competence and recruit local service and blade technicians.

“–Both wind power companies and turbine manufacturers benefit from using local or regional suppliers. In our opinion, this is due partly to flexibility and speed, and partly to local professional pride and loyalty”, says Jonas Björk.

GROWTH IN TURNOVER 5 YEARS

2014: SEK 3 MILLION
2019: SEK 30 MILLION

Jemtel Kraftteknik

– growth through a cluster

The company Jemtel originated in traditional electrical installation in Jämtland. Gradually, requests were received from hydropower companies and later from the wind power sector. When the company was working with the electricity at Raftsjöhöjden in Höjdvinds wind farm in 2013, they met a project manager from Siemens during a project meeting. After that meeting, they worked on performing the controls ahead of commissioning in Stamåsen and then the remainder of the farms that Statkraft had built in the area.

“–I asked the project manager why Statkraft had hired a Danish electricity firm. He responded that they performed inspections ahead of commissioning of the farm. When I found out what the work involved, I felt that we could just as well take on that kind of assignment. We got the opportunity and took it”, says Jemtel Kraftteknik’s CEO Roger Jönsson.

Jemtel has now grown via its subsidiary Jemtel Kraftteknik. Requests from both Siemens and Vestas continued to pour in and the company has recruited both electricians and wind power technicians. In just a few years the turnover, results and number of employees doubled. And there are plenty of projects remaining.

“–There are many assignments that we don’t know about. Lifts and other equipment in the turbines have to be serviced and inspected. And still many foreign companies are called in. I am convinced that we could take over all these projects. We just have to be a bit bold”, says Roger Jönsson.

Jemtel Kraftteknik has now merged with Jonssons EI in Åre to be able to take on more work.

“–It seemed unnecessary to compete on every project when we actually complement each other and can grow together”, says Roger Jönsson.

GROWTH IN TURNOVER 5 YEARS

2014: SEK 113,000
2019: SEK 12 MILLION

Business contacts

with the wind power sector

Vindkraftcentrum

– helps companies generate business from wind power

“–We have seen that the major value is in matching the sector with local or regional companies. This creates business opportunities and jobs. We have developed a forecasting tool that gives a reliable prediction of the growth effect that a wind farm can have”, says Vindkraftcentrum’s project manager Torbjörn Laxvik.

Today, regional business is created almost automatically in the building phase as the wind power companies have learnt that it’s both profitable and makes strategic sense to use local and regional contractors. During the operational and maintenance phase there is more business to be had locally.

“–We see that things are also starting to happen when it comes to servicing and repairs. Our digital business platform can be a route in for a first contact. In simple terms, the digital business platform is an interactive database that each project planner can connect to. Local and regional companies can register in the database for business contacts.”

Vindkraftcentrum is a municipal project financed by the Swedish Energy Agency. It is a national initiative aimed at creating local and regional value from wind power investments. Over the ten years that Vindkraftcentrum has existed, focus has turned more to local business development.

Find out more at www.vindkraftcentrum.se



Charlotte Unger Larson

– business developer with a unique network

Our region is full of untapped business opportunity connected to wind power. This is according to Charlotte Unger Larso, former CEO of the Swedish Wind Energy Association. She chose to relocate from Stockholm to Alsen in Jämtland. Today she works as a business developer at Vindkraftcentrum.

“–A wind farm involves some 150 companies from 80 different sectors. It’s easy to forget what this means for everybody who lives in the area – road-building, installation, accommodation and IT services. Subsequent to this comes the 25-year operational phase encompassing service technicians, road maintenance and repairs. Every wind farm becomes a hub for doing business.”

The entire wind power sector was represented on the board of the Swedish Wind Energy Association. This means that Charlotte Unger Larso has a network of contacts covering everything from turbine manufacturers to wind power companies. And she would be very happy to help connect business contacts.

“–All these companies work with renewable energy and sustainability. So flying people with specialist competence from other countries is problematic. This makes local and regional service providers even more important. The closer to the farm the supplier is based, the more renewable the business is.

While she highlights all the opportunities, she also points out the challenge in understanding and knowing about all the competence that exists in the region, and in putting the right competence in touch with the right people to do business.

Contact Charlotte Unger Larson directly, she can share her experience and network:
cul@vindkraftcentrum.se

The sector's players want to work with regional companies

Vasa Vind

“Access to capable staff locally is a pre-requisite for our operations in the farms. At the same time, the wind farms create possibilities for qualified manpower to become established or remain in the local area. Local involvement is important to us and as far as possible, we will continue to work with companies in the area.”

Mattias Sjöberg, CEO Vasa Vind (wind power company)

Siemens Gamesa

“We are very positive to having contracts with organisations in the area. Often, different types of training efforts are needed that incur a cost for the company. But we are very keen for competence to be available close to the turbines.

Hans Carlsson, Country manager Sweden, Siemens Gamesa (turbine manufacturer))

Vestas Wind Systems

“We take a sustainability perspective to everything we do. So if the right competence is available locally or regionally there is no reason not to choose it. Local experience and competitiveness is obviously a better choice.”

Lisa Ekstrand, Head of Sustainability Vestas (turbine manufacturer)

Funding

from wind power

Millions in loans from wind power to drive local growth

An entirely new financing model is available to those who need funds to start up or expand commercial activities in connection with wind power establishment. It builds on the so-called "bygdepengen" (rural community funds), the funds that wind power developers allocate to the rural community where the wind power turbines are built.

Bygdepengen is often dispersed annually directly to village associations. This can mean that it remains to one side and is not used to develop the area in question.

Garantia has therefore initiated a pilot project together with the Swedish Wind Energy Association and Vattenfall. The idea is that a larger portion of the funds should be allocated to financing loans for the business community. A smaller share of the money will also continue to be paid to the village associations. The advantage of the loans is that the money is paid back and can continue to be lent for 30 to 40 years.

As more partners emerge the pot of money for loans will get bigger.

Funding facts via Garantia*:

Garantia's loan products are available to all companies within:

1. Close proximity to the wind farms.
2. Affected municipalities.
3. Relevant labour market areas (commuting distance).

Money can be paid directly and the loan products will be available for an area as soon as a decision has been made to invest in a wind farm.

Rural community funds - public benefit from wind power

In every wind power project it has become common practice to pay compensation to the rural community affected by the wind farm. The money is a voluntary gesture from the wind power company and the amount can vary from project to project. But it is not uncommon for the sum to be several million Swedish kronor.

In Rätan, a village in Berg municipality, the community receives between half a million and a million Swedish kronor every year from Mullbergs wind farm, owned by Jämtkraft and Persson Invest. These funds have so far been used to refurbish and renovate the communal buildings in the area, to purchase track-making machines for ski trails, lawnmowers for football pitches, a film screen and more.

In Havsnäs in Strömsund municipality, villages close-by have received SEK 0.5-0.6 million per year between them from Havsnäs wind farm, which is owned by HG Capital and operated by Vasa Vind. This money has been used for similar projects to those in Rätan. According to the agreement, the money is to go to promoting tourism, jobs, infrastructure and the natural and cultural environment in the area.

Glöte in Härjedalen municipality receives SEK 0.4-0.7 million per year from Glötesvålens wind farm owned by IKEA. The funds are to be used for promoting business, jobs, service and the well-being of residents and visitors. Example projects include improvement of snow-mobile tracks, contributions to operating costs for local cafés and taking care of wind shelters and swimming areas.

*Garantia is a membership company for companies in northern Sweden's inland areas that need credit guarantees when applying for bank loans. Historically, the purpose of the company has been to provide a guarantee instead of the business owner needing to go into personal bankruptcy if the loan cannot be repaid.

Regional labour supply

– enormous hiring needs are a local business opportunity

Wind power technician course in Strömsund

– top of class in filling places

Wind power technician programme at Hjalmar Strömerskolan

Certified health examination

Course start date: August

Study format: Higher vocational
education programme

The short supply of wind power technicians is a challenge for the entire wind power sector. In Strömsund, 100 km north of Östersund, there is a vocational education programme for wind power technicians. Representatives from turbine manufacturers, service companies, the energy sector and the university are all part of the management group. During the last intake, the programme in Strömsund was the only one in the country to fill the quota of course places.

For a wind power company or a service company, being able to recruit wind power technicians locally is hugely beneficial. The closer to the park the better. Currently, all wind power technicians get a job in the region as there is such a shortage of skilled labour, combined with a fast rate of expansion.

The sector is very active and is looking to hire. There are very good career opportunities over the coming years. Since wind power technicians learn all about the wind turbines, there are also good business opportunities for those wanting to start their own company.

“The technology is developing rapidly”, says Jenny Frank, programme manager for the wind power technician programme in Strömsund. “Operations and maintenance are needed for the entire estimated lifetime of the farm, which is usually about 25 years. With the continued expansion and a local labour supply of approximately 30 technicians per year, several hundred wind power technicians will be employed in Jämtland Härjedalen in the near future. This paves the way for huge growth opportunities.”

Greater market share awaits

Much of the work in a wind park is currently carried out by companies based outside Sweden. As the regional knowledge of the entire life cycle of a wind park grows, more and more Swedish entrepreneurs will be able to set up and take market share.

“We believe that our students have a bright future and that they will supply the sector with a much-demanded competence, which in turn will lead to growth”, says Jenny Frank.



Jämtkraft, a power generating company

– strong operator and business partner

CEO Erik Brandsma:

*"We want to collaborate
– together we can be an engine in the transition of energy"*

Jämtkraft Aktiebolag (Limited Company)

Turnover: 6.5 billion

Profits: 0.5 billion

Business activities: Renewable energy generation from water, wind, solar power and biofuels.

Jämtkraft, the power generating company, works with the wind power sector both as a wind power owner and a service provider. Over and above that, Jämtkraft connects the wind farms to the power grid. They are acutely aware of the key role they have in the transition to renewable energy.

"Our aspiration is to be Sweden's best energy partner. We want to collaborate to find new energy and business solutions. Jämtkraft has 100 per cent renewable energy production, that should be attractive to the transport and industrial sectors. Together we can be an engine in the transition of energy", says Jämtkraft's CEO Erik Brandsma.

Working with local companies is a given for Jämtkraft. They are very positive to an increase in local or regional skills linked to wind power operation and maintenance. The opportunities for regional companies to grow market shares vis-à-vis foreign companies are larger now than ten years ago.

Greater business interest today

"–It is easier for us to recruit locally today, largely thanks to the wind power technician education programme in Strömsund. The skills supply is important to the ability to grow the wind power sector in the county. Attractive education programmes and jobs can also contribute to people moving to the region. There is also a greater business interest in wind power now compared to before."

Erik Brandsma is also very positive to progress on the IT side. He sees a strong digital foundation that has developed well. This includes local companies working with systems for artificial intelligence. Digitalisation of the wind power sector using intelligent systems to make operations and maintenance more efficient and to optimise production is part of this.

"–We are currently working with technical solutions for the energy systems of the future. Online battery solutions or hydrogen-based solutions may enable a wind power producer to sell their electricity when there is greatest demand for it. In this way the profitability of the plant is increased. We are very much ahead in this.

Interested in business contacts

As part of its vision to become Sweden's best energy partner, Jämtkraft is interested in connecting with companies that want to develop their own business or create new energy solutions.

–Everything that supports more companies starting up in areas related to wind power is positive for the region, thus positive for us", says Erik Brandsma.





REPOWERING

New, bigger turbines will replace the old ones

The thousands of wind turbines that have been built or are still being built will need to be modernised or replaced after 20 to 25 years. The fact is that the wind power that was built ten years ago is already out-of-date, even if it is profitable. Which is why it is not unusual for wind turbines to be replaced even before they have reached the end of their technical life span.

Repowering is when an entire turbine is exchanged, or parts of the turbine are replaced with more modern, more effective components. Gear boxes and rotor blades are some examples.

“The job is actually a normal building contractor assignment that a local company can no doubt compete for. We already have good skills in the county for these building projects, so we see good opportunities to earn billions in revenues from the repowering business,” says Christer Andersson, Vindkraftcentrum.

New projects worth billions await

Turbines per municipality REPOWERING PROJECTS WITHIN 10-20 years

| Municipality | Number of turbines | Effekt (MW) | Investering* |
|---------------|--------------------|-------------|---------------------|
| Härjedalen | 143 | 646 | 7 billion |
| Strömsund | 143 | 384 | 5,5 billion |
| Ragunda | 54 | 242 | 3 billion |
| Berg | 41 | 115 | 2 billion |
| Bräcke | 37 | 92 | 1.5 billion |
| Östersund | 27 | 63 | 1.2 billion |
| Krokom | 22 | 43 | 0.9 billion |
| Åre | 3 | 2 | 0.1 billion |
| Total: | 470 | 1587 | 21.2 billion |

*Investment calculated using the Swedish Energy Agency's statistics for number of turbines per municipality in 2020. Value is estimated based on 30-40 million for older turbines and 45-50 million for newer turbines.

Photo: Vasa Vind
Johanna Hanno

Plug in to a renewable mix of energy

– views on sustainable business of the future

The fact that power-intensive industrial companies are buying into wind farms is not a new phenomenon. And a greater portion of Swedish industrial manufacturers are starting to understand the advantages of manufacturing where energy is renewable. Which is why the mix of wind power and hydropower that Jämtland Härjedalen offers brings great opportunities.

Gabriella Nilsson, Sweco:

"Make use of the combination of different sources of power generation"

Hybrid systems, such as the combination of wind power and solar electricity, reduce overloading the electricity grid compared with having only one source of power. This is because they generate power at different times of the day and year.

In general, hybrid systems have fewer overloading peaks and less time without generation, which leads to more effective use of the electricity grid, thus reducing the costs of connecting to the grid. This results in reduced costs for renewable electricity, which in the end will benefit the customers.



Andreas Gyllenhammar, Jämtkraft:

"Hydrogen will be the next big thing"

Hydrogen is needed to be able to store electricity when it is generated, instead of wasting it. Wind power and solar power have become cheaper. The same development will continue, even for hydrogen. Today it is expensive. Once generation is scaled up it will be cheaper, and therefore usable as an energy carrier.

From the producer's perspective, this will be an improvement in electricity generation. An electricity company or a wind power owner needs a certain price level of electricity. Using hydrogen, electricity can be stored when demand is low and used when demand rises. This will make electricity consumption and electricity prices more predictable.



Mattias Sjöberg, Vasa Vind:

"Electricity consumers can help in the transition"

For us, long-term energy contracts, referred to as PPA* are an important part of financing new wind farms. By signing these kinds of contracts power-intensive companies have the opportunity to contribute to the expansion of renewable energy.

Major commercial electricity consumers that want to establish operations in Jämtland Härjedalen are welcome to contact us. They may want to balance their emissions with green electricity or obtain a fixed price for electricity for a longer period of time, which creates confidence for both the producer and the consumer.

We are also following developments related to hydrogen and battery solutions with interest. Such commercial, practical solutions enable generation from intermittent energy sources, such as wind power, to be levelled out to the benefit of both the electricity system as a whole and wind power producers.

* Power Purchase Agreements



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