

Statistics and forecast Q1 2020

This is SWEA:s quarterly statistics and forecast for the Swedish wind power market, covering data from turbine manufacturers and wind power developers acting on the market.

SWEA, Swedish Wind Energy Association - Svensk Vindenergi

2020-05-04

The statistics and forecast

- **The statistics** are based on the order books of the turbine manufacturers and project portfolios of the wind power developers presented at an aggregated level
- **The forecast** are based on current and future market conditions.
- **Base case:** Projects with turbine contracts (firm and binding), approximately 30 percent of permitted projects and 15 percent of projects under permission process will be realized. This is the most realistic scenario and is the official forecast.
- **Low case:** Only projects where turbine contracts (firm and binding) have been signed will be realized. In this scenario no further investment decisions are made. Thus, this scenario defines the lower limit of wind power growth in Sweden.
- **High case:** Projects with turbine contracts (firm and binding), around 60 percent of permitted projects and 30 percent of projects under permission process will be realized. This scenario is more optimistic and sets the ceiling for growth of wind power in Sweden.

Previous year

Total by the end of 2018

Turbines: 3 652

Capacity: 7 395 MW

Actual production: 16,4 TWh*

Annual production (estimated): 19,5 TWh**

** Actual production is the real production and depends on wind conditions and when installations are made during the year.*

Added capacity in 2019

1st quarter: 136,2 MW

2nd quarter: 140,8 MW

3rd quarter: 519,0 MW

4th quarter: 792,4 MW

Total: 1588,4 MW

*** Estimated annual production is the annual production the turbines are expected to produce when in operation during a whole year with normal wind conditions.*

Total by the end of 2019

Turbines: 4 099

Capacity: 8 984 MW

Actual production: 19,5 TWh*

Annual production (estimated): 24,7 TWh**

Installations in 2020

Total by the end of 2019

Turbines: 4 099

Capacity: 8 986 MW

Actual production: 19,5 TWh*

Annual production (estimated): 24,7 TWh**

** Actual production is the real production and depends on wind conditions and when installations are made during the year.*

Added capacity in 2020

1st quarter: 207,8 MW (actual)

2nd quarter: 187,0 MW (forecast)

3rd quarter: 604,7 MW (forecast)

4th quarter: 830,6 MW (forecast)

Total: 1830,1 MW

*** Estimated annual production is the annual production the turbines are expected to produce when in operation during a whole year with normal wind conditions.*

Total by the end of 2020 - forecast

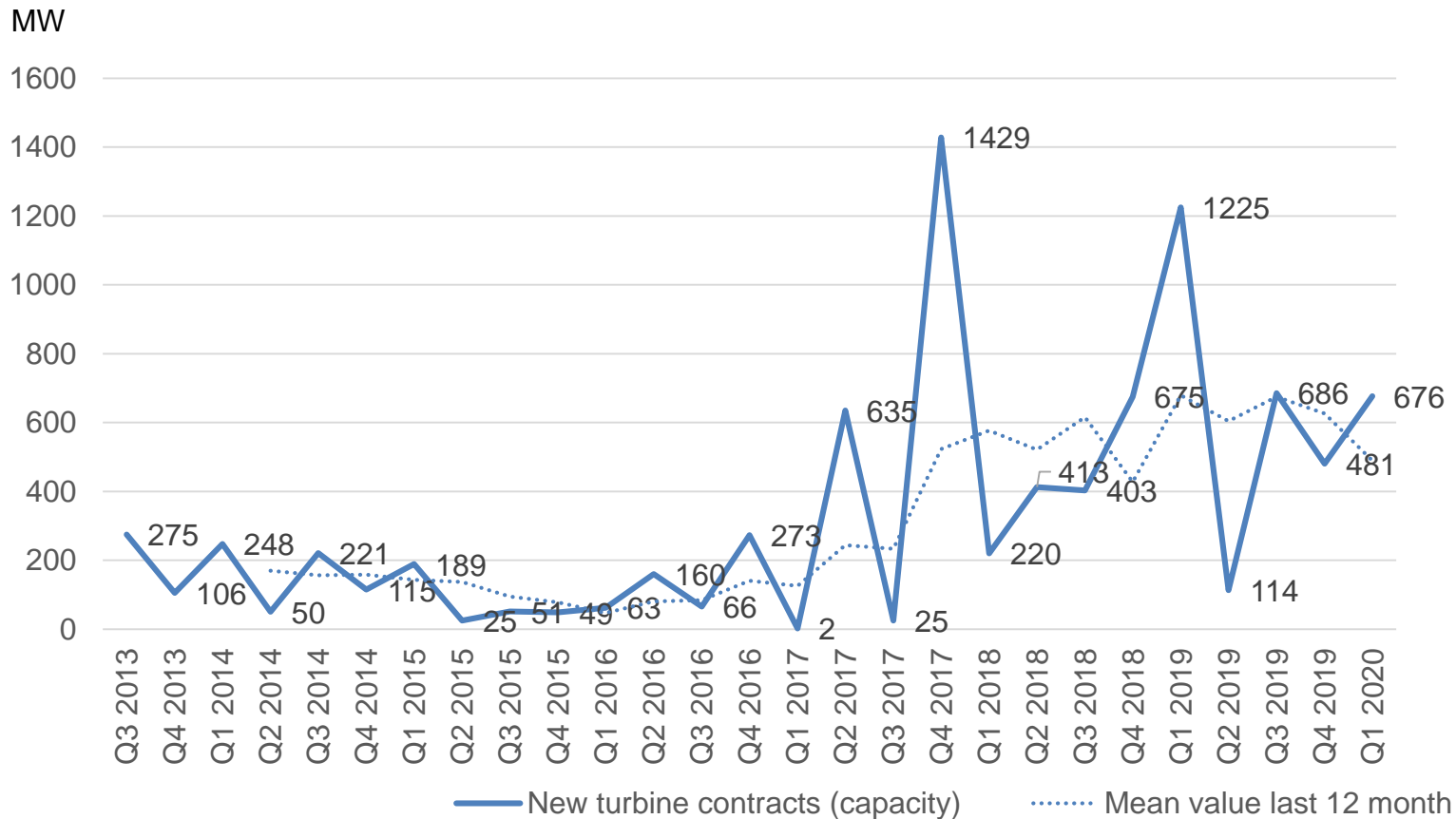
Turbines: 4 540

Capacity: 10 816 MW

Actual production: 26,6 TWh*

Annual production (estimated): 30,9 TWh**

New turbine contracts* (firm and binding)



* Figures from all turbine manufacturers acting on the Swedish market

Order books

Time plan according to turbine manufacturers for wind power installations during year (MW) *

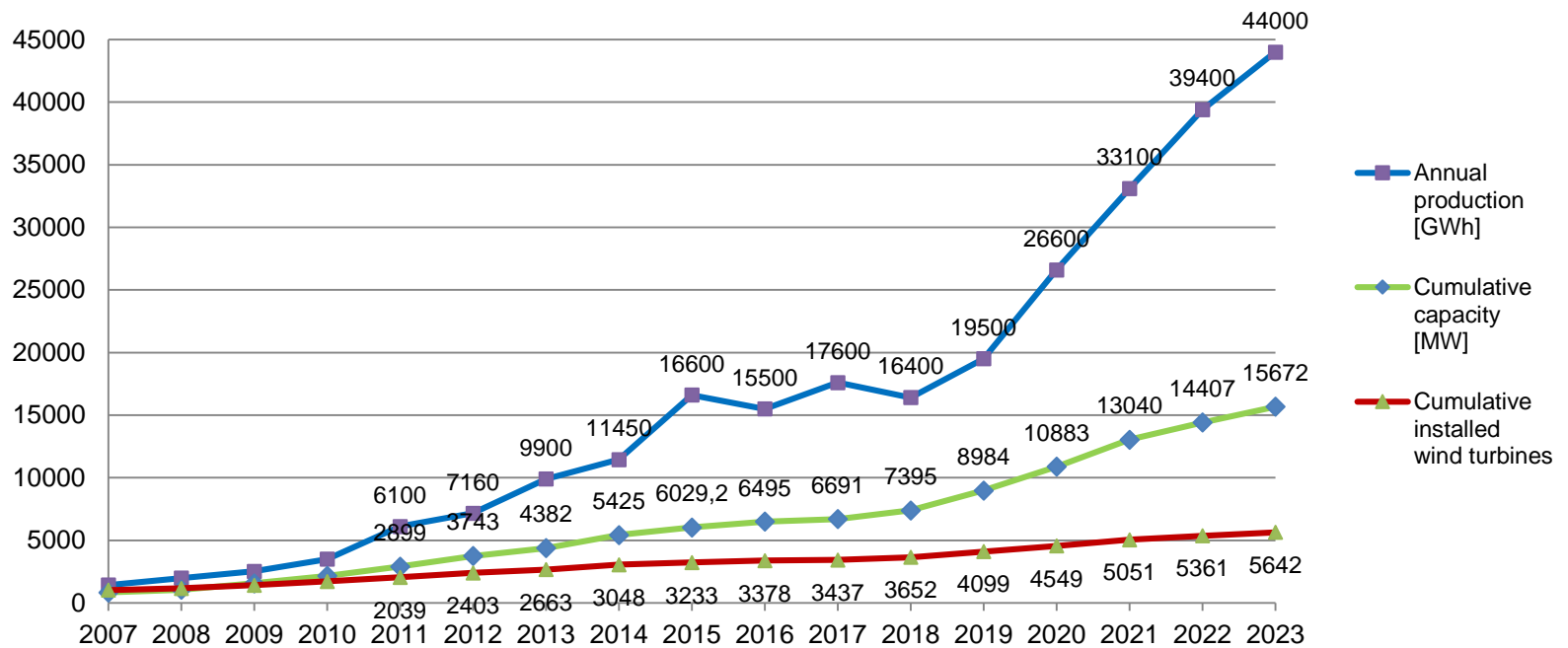
2019	2020 Q1	2020 Q2	2020 Q3	2020 Q4	2020 (Tot)	2021	2022	2023
1590	208	187	605	831	1830	2827	288	0

* Figures from all turbine manufacturers acting on the Swedish market

Base case

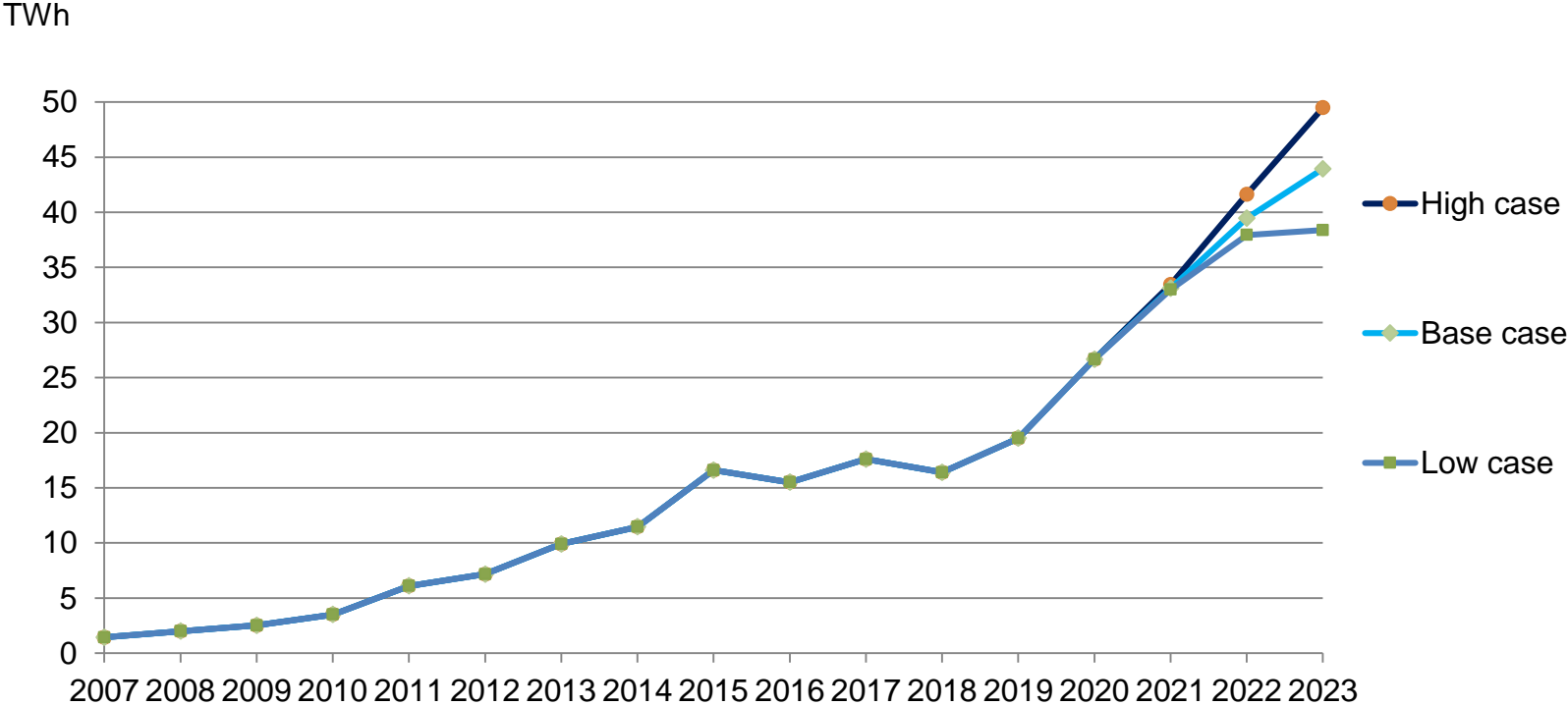
This scenario is the official forecast of Swedish Wind Energy Association

Actual and forecast 2020-03-31



Wind power production – all cases

Actual and forecast 2020-03-31



Assumptions

Part of wind power project portfolio capacity expected to be realized within given time frame depending on scenario (approximate figures)

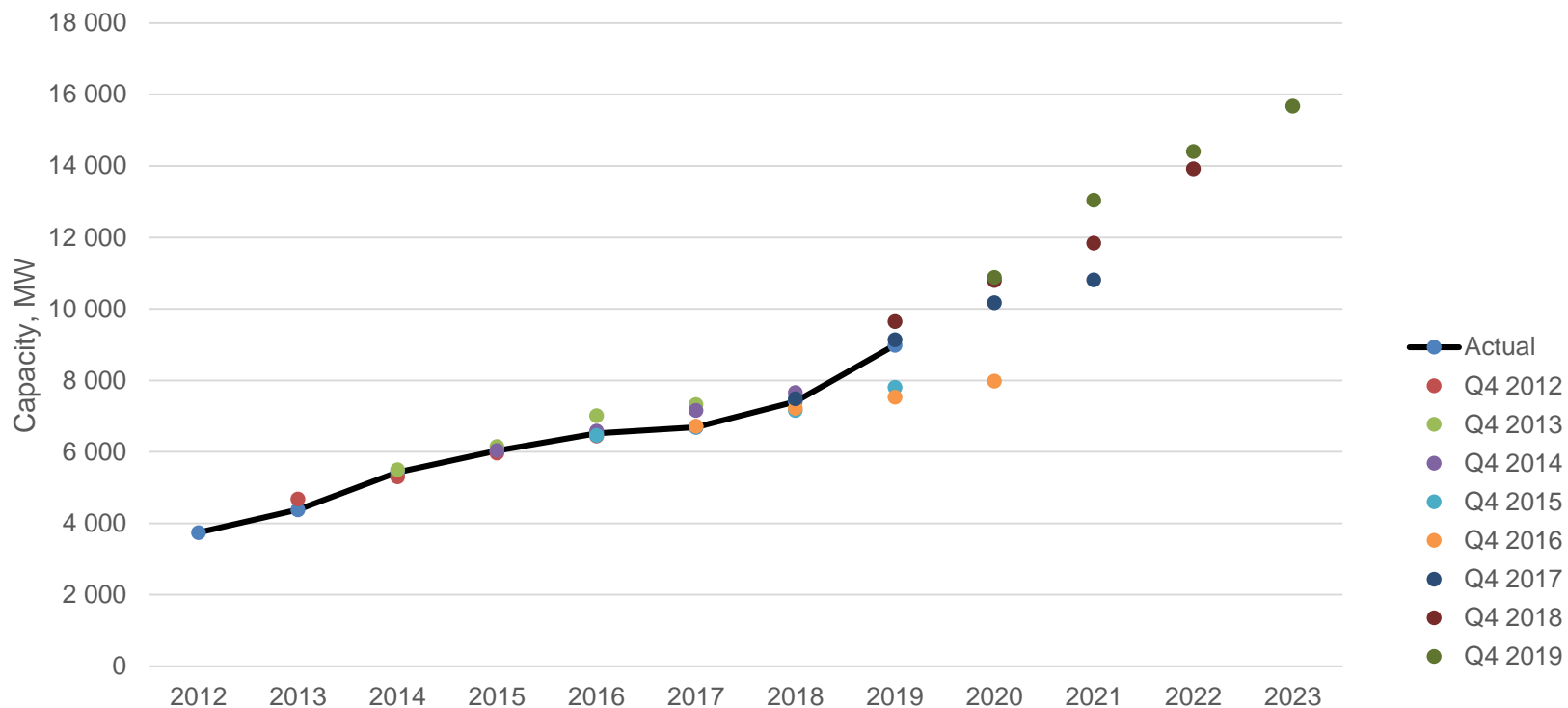
Status	High	Base **	Low
Turbine contracts (firm and binding)	100 %	100 %	95 %
Permitted *	60 %	30 %	0 %
In permitting process *	30 %	15 %	0 %

* Only onshore wind power are expected to be built.

** The base case reflects a possible scenario based on an assessment of current and future market conditions.

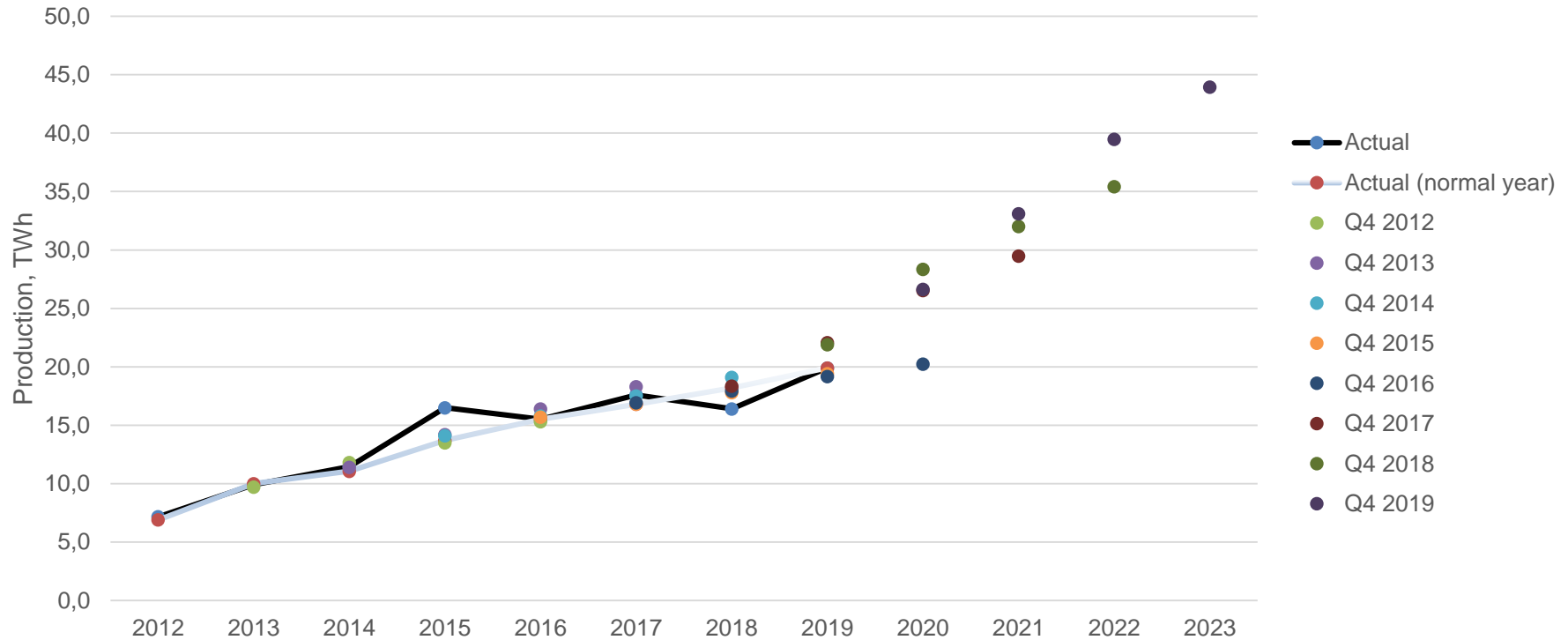
Follow up

Previous forecasts and actual installed wind power capacity



Follow up

Previous forecasts and actual annual wind power production

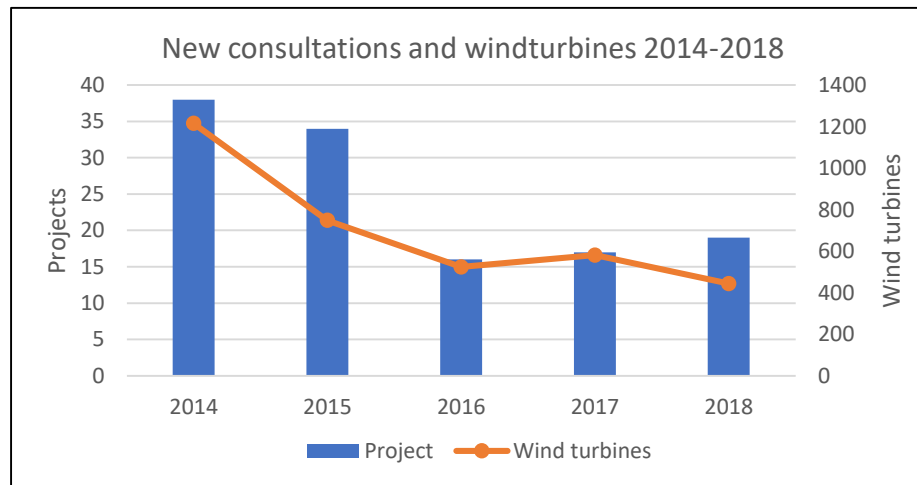


Permitting – a serious obstacle

- The overall picture is that too few new projects are started, as it is very difficult to find new wind power projects in good locations where it is considered likely that a permit will be granted.
- Drawn-out and uncertain permit processes are currently the greatest obstacle to the development of wind power.
- To reach the target of 100 percent renewable electricity generation and at least 90 TWh of wind power by 2040, many new permits for wind farms are needed.
- The time from initial consultation to environmental permit can exceed 10 years. Meanwhile, technological progress is fast, and the terms of the permit seldom leave scope to use the best possible technology, as the Environmental Code instructs that it should.
- The process must adapt to rapid technological developments so that wind resources can be utilized as efficiently as possible.

Fewer new permits and applications

- In 2019, only six wind power projects (135 turbines) received final approval.
- In 2019, only 11 new applications (14 turbines) were submitted.
- The number of new projects, where consultations has been started, has been halved during the period 2014-2018
- Decided cases have decreased from close to 50 parks in 2014-2015 to 25-35 parks in 2017-2018.



Source: *Nätverket vindkraftens klimatnytta* - [report](#)

Permitting – a serious obstacle

- Drawn-out and uncertain permit processes are currently the greatest obstacle to the development of wind power.
- To reach the target of 100 percent renewable electricity generation and at least 90 TWh of wind power by 2040, many new permits for wind farms are needed.
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SWEA:s suggestions to improve and speed-up the process:

- ✓ The municipal veto against wind power should be adjusted so that the municipality's decision comes early, concerns the location and is not allowed to be changed during the process.
- ✓ The municipalities, instead of the state, should be awarded the property tax on wind power.
- ✓ The Environmental Code should be adjusted so that climate benefits are more strongly prioritized when weighed against other interests.

Scenario 2040

The following slides are based on [SWEA's roadmap 2040](#).

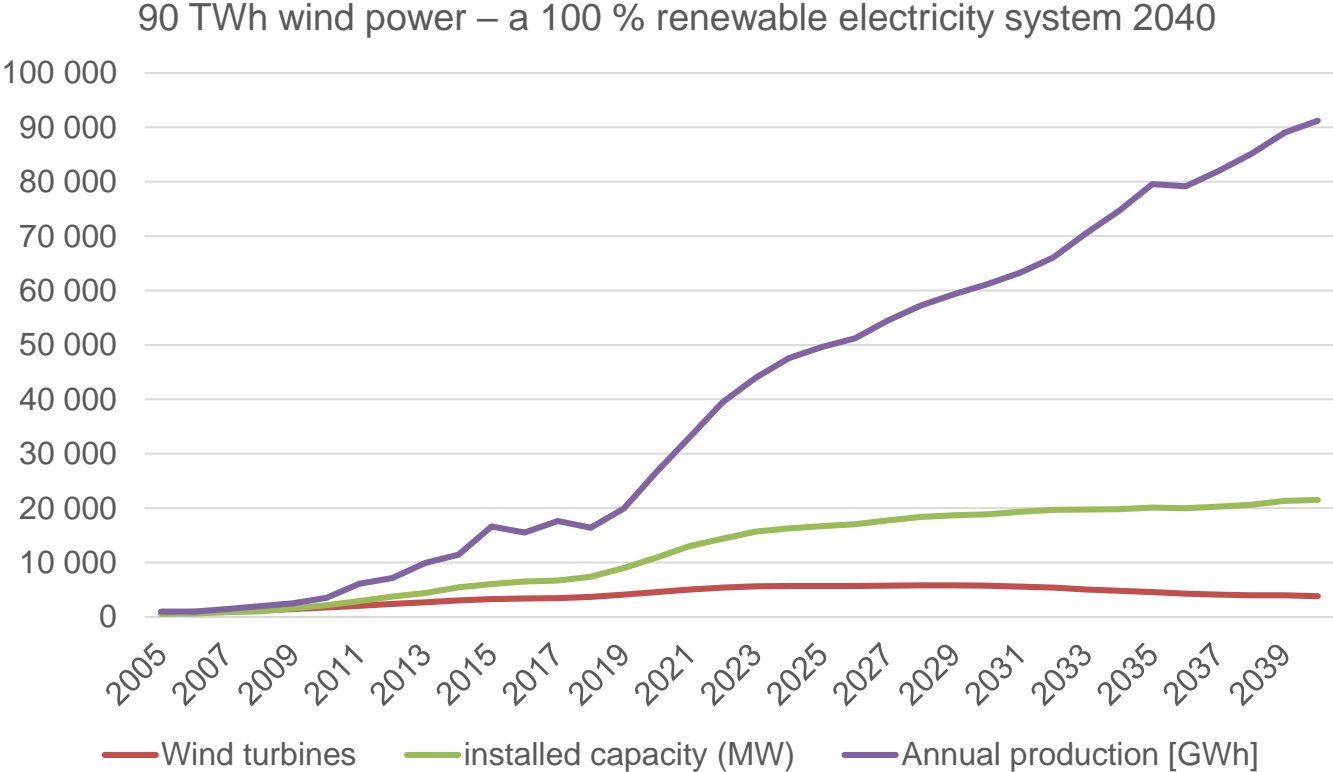
In recent years, most new wind power projects have been built in the north of Sweden. But, the expansion in the north might slow down. After 2023, it is possible that bottlenecks in the grid and price differences makes it more attractive to invest in small projects in the south.

In the medium term, repowering is starting to take place in the south, where also many of the new turbine orders are placed. Together with offshore wind power, which will have a central role in the Swedish electricity system in 2030-2040, the expansion can even out between north and south until 2040.

Even so, Swedish TSO (Svenska kraftnät) still need to strengthen the grid's transmission capacity from north to south. This will be even more critical if Finland does not remain a net importer of electricity.

Interestingly, due to technological development and repowering, the amount of wind turbines in Sweden will peak around 2027 (approx. 5 800 turbines) and then gradually decrease to below 4 000 turbines in 2040.

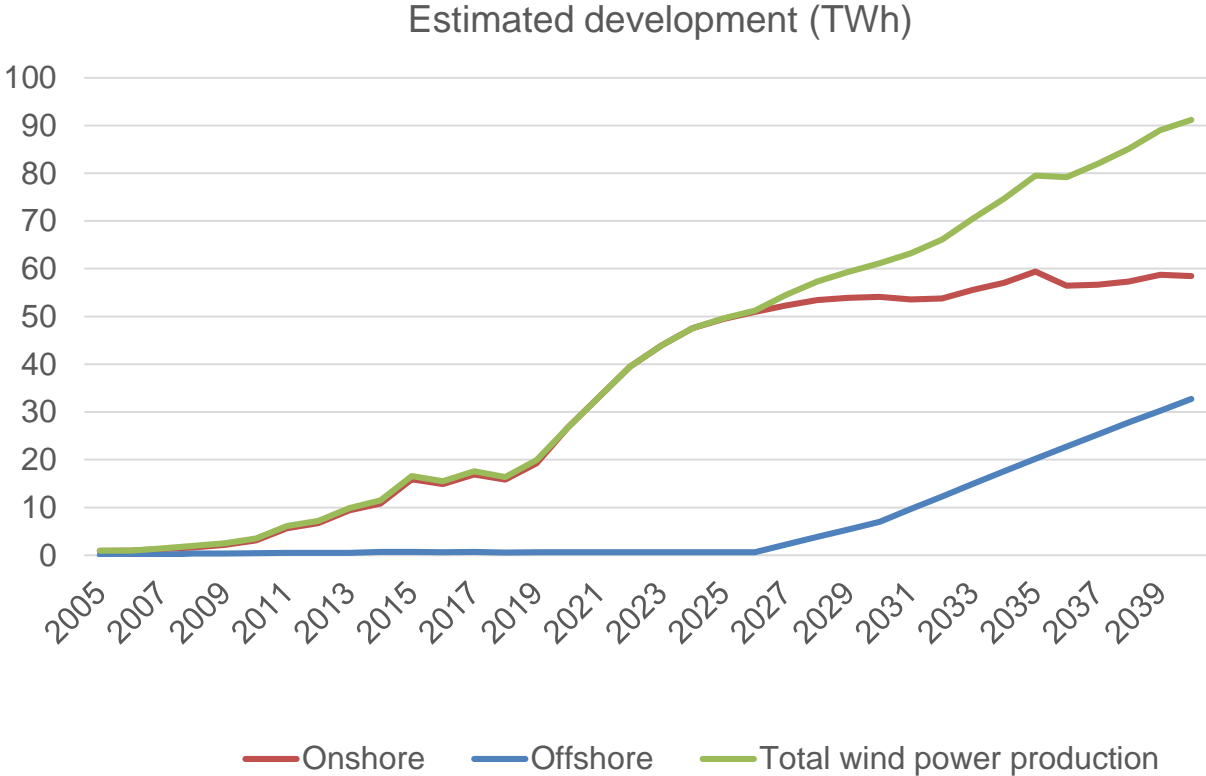
Scenario 2040



Source: [SWEA roadmap 2040](#)



Scenario 2040

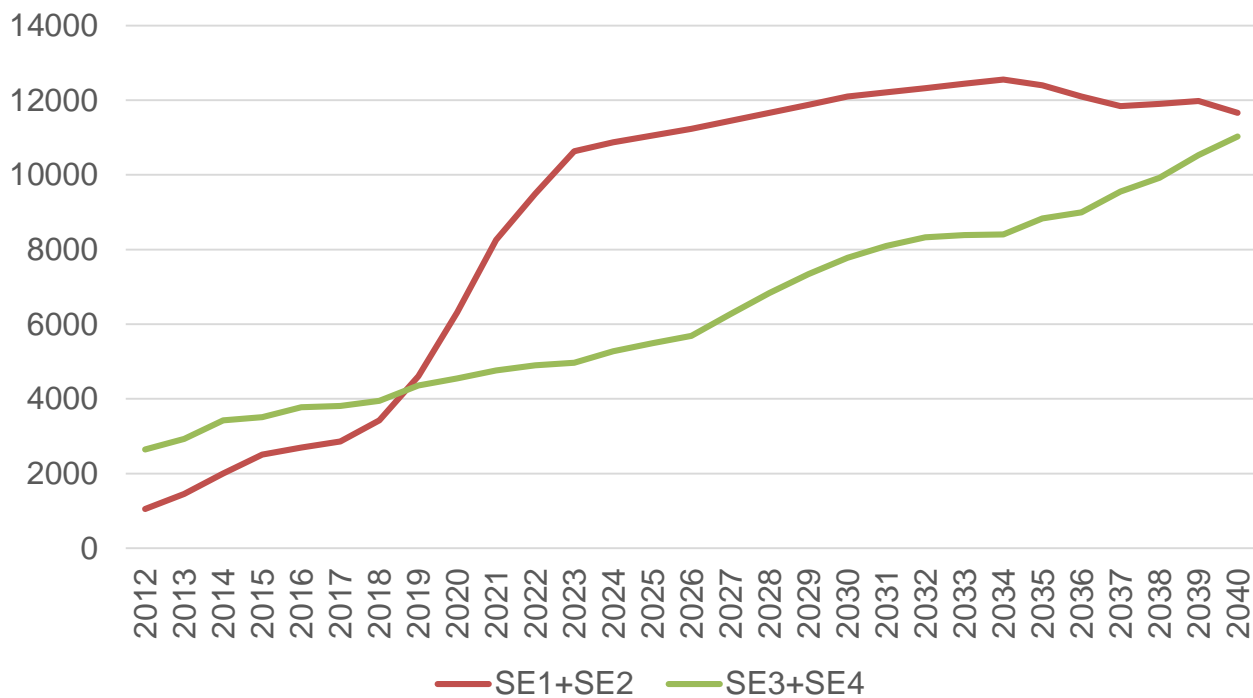


Source: [SWEA roadmap 2040](#)



Scenario 2040

Installed capacity / price area (MW)



Source: [SWEA roadmap 2040](#)



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