Statistics and forecast

This is quarterly edition of statistics and forecasts for the Wind Power Market, covering data from turbine manufacturers and wind power developers acting on the Swedish market (estimated coverage is 100 percent respectively 95 percent of the total Swedish market)

Q4 2019

Svensk Vindenergi – Swedish Wind Energy Association, SWEA
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 aggregated level.

- **The forecast** consists of three future scenarios (low, base, high). They are based on assumptions regarding which projects will be realized - considering today’s market situation and the future’s.

  - **Low case:** Only projects where turbine contracts (firm and unconditional) have been signed will be realized. In this scenario no further investment decisions are made, hence this scenario defines the lower limit of wind power growth in Sweden.

  - **Base case:** Projects with signed turbine contracts, 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.

  - **High case:** Projects with signed turbine contracts, 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.
**Last 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 **

**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:** 1,588.4 MW

**Total by the end of 2019**
- Turbines: 4,099
- Capacity: 8,984 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.

** Estimated annual production is the annual production the turbines are expected to produce when in operation during a whole year with normal wind conditions.
Installations in 2020

Total by the end of 2019

- Turbines: 4,099
- Capacity: 8,984 MW
- Actual production: 19.5 TWh *
- Annual production (estimated): 24.7 TWh **

Added capacity in 2020 (forecast)

- 1st quarter: 363.6 MW
- 2nd quarter: 242.9 MW
- 3rd quarter: 526.5 MW
- 4th quarter: 765.9 MW
- Total: 1,898.9 MW

Total by the end of 2020 (forecast)

- Turbines: 4,549
- Capacity: 10,883 MW
- Actual production: 26.7 TWh *
- Annual production (estimated): 30.9 TWh **

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

** Estimated annual production is the annual production the turbines are expected to produce when in operation during a whole year with normal wind conditions.
## Project portfolio, status by 2019-12-31

<table>
<thead>
<tr>
<th></th>
<th>Onshore</th>
<th>Offshore</th>
<th>Total</th>
<th>Quarterly change</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>In operation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Windturbines</td>
<td>4 020</td>
<td>79</td>
<td>4 099</td>
<td>( +230 )</td>
</tr>
<tr>
<td>Capacity (MW)</td>
<td>8 794</td>
<td>190</td>
<td>8 984</td>
<td>( +792 )</td>
</tr>
<tr>
<td><strong>Under construction</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Windturbines</td>
<td>971</td>
<td></td>
<td>971</td>
<td>( -132 )</td>
</tr>
<tr>
<td>Capacity (MW)</td>
<td>4 271</td>
<td></td>
<td>4 271</td>
<td>( -311 )</td>
</tr>
<tr>
<td><strong>Permitted</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Windturbines</td>
<td>1 546</td>
<td>418</td>
<td>1 964</td>
<td></td>
</tr>
<tr>
<td>Capacity (MW)</td>
<td>6 257</td>
<td>1 925</td>
<td>8 182</td>
<td></td>
</tr>
<tr>
<td><strong>In permission process</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Windturbines</td>
<td>1 361</td>
<td>150</td>
<td>1 511</td>
<td></td>
</tr>
<tr>
<td>Capacity (MW)</td>
<td>5 964</td>
<td>1 750</td>
<td>7 714</td>
<td></td>
</tr>
</tbody>
</table>

* Firm and unconditional turbine order based on investment decisions

** Estimations
Geographical spread

Project status
- In operation
- Permitted
- Rejected
- In permitting process

Source: Vindbrukskollen.se
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) *

<table>
<thead>
<tr>
<th></th>
<th>2020 Q1</th>
<th>2020 Q2</th>
<th>2020 Q3</th>
<th>2020 Q4</th>
<th>2020 (Tot)</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>1588</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>2020</td>
<td>364</td>
<td>243</td>
<td>527</td>
<td>766</td>
<td>1899</td>
<td>2158</td>
<td>193</td>
<td>23</td>
</tr>
</tbody>
</table>

* Figures from all turbine manufacturers acting on the Swedish market
Installed capacity by price area 2023-12-31 (forecast)

MW

Status as of 2019-12-31
- Permission process
- Permitted
- Under construction
- In operation

<table>
<thead>
<tr>
<th>Price Area</th>
<th>MW</th>
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<tbody>
<tr>
<td>SE1</td>
<td>827</td>
</tr>
<tr>
<td></td>
<td>1214</td>
</tr>
<tr>
<td></td>
<td>1615</td>
</tr>
<tr>
<td>SE2</td>
<td>177</td>
</tr>
<tr>
<td></td>
<td>640</td>
</tr>
<tr>
<td></td>
<td>3202</td>
</tr>
<tr>
<td></td>
<td>2634</td>
</tr>
<tr>
<td>SE3</td>
<td>58</td>
</tr>
<tr>
<td></td>
<td>209</td>
</tr>
<tr>
<td></td>
<td>2603</td>
</tr>
<tr>
<td></td>
<td>334</td>
</tr>
<tr>
<td>SE4</td>
<td>67</td>
</tr>
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<td></td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>221</td>
</tr>
<tr>
<td></td>
<td>1552</td>
</tr>
</tbody>
</table>
Wind power production 2020 (forecast)

Actual and forecast

TWh

Production last 52 weeks
Cumulative production
Wind power production – different scenarios

Actual and forecast

TWh


As of 31/12

Increased uncertainty

High case

Base case

Low case

As of 31/12

svensk vindenergi
Base case
This scenario is the most realistic and official forecast of Svensk Vindenergi

Actual and forecast

- **Annual production [GWh]**
- **Cumulative capacity [MW]**
- **Cumulative installed wind turbines**

Increased uncertainty

As of 31/12
## Assumptions

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

<table>
<thead>
<tr>
<th>Status</th>
<th>High</th>
<th>Base **</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under construction</td>
<td>100 %</td>
<td>100 %</td>
<td>95 %</td>
</tr>
<tr>
<td>Permitted *</td>
<td>60 %</td>
<td>30 %</td>
<td>0 %</td>
</tr>
<tr>
<td>In permission process *</td>
<td>30 %</td>
<td>15 %</td>
<td>0 %</td>
</tr>
</tbody>
</table>

* 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

MW

Actual
Q4 2012
Q4 2013
Q4 2014
Q4 2015
Q4 2016
Q4 2017
Q4 2018
Follow up

Previous forecasts and actual annual wind power production

TWh

25
20
15
10
5
0


- Actual
- Actual (normal year)

- Q4 2012
- Q4 2013
- Q4 2014
- Q4 2015
- Q4 2016
- Q4 2017
- Q4 2018