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 2018

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 20 percent of permitted projects and 10 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 30 percent of permitted projects and 15 percent of projects under permission process will be realized. This scenario may be relevant in circumstances leading to higher power prices and sets the ceiling for growth of wind power in Sweden.
Last year

Total by the end of 2017
Turbines: 3,437
Capacity: 6,691 MW
Actual production: 17,6 TWh *
Annual production (estimated): 17,2 TWh **

Added capacity in 2018
- 1st quarter: 8,4 MW
- 2nd quarter: 79,4 MW
- 3rd quarter: 338,8 MW
- 4th quarter: 290 MW
Total: 716,5 MW

Decommissioned capacity during 2018
- 1,2 MW

Total by the end of 2018
Turbines: 3,659
Capacity: 7,406 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.

** 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 2019

Total by the end of 2018
Turbines: 3 659
Capacity: 7 406 MW
Actual production: 16,4 TWh *
Annual production (estimated): 19,5 TWh **

Added capacity in 2019 (forecast)
1st quarter: 192,8 MW
2nd quarter: 436,0 MW
3rd quarter: 626,5 MW
4th quarter: 987,0 MW
Total: 2242,3 MW

Total by the end of 2019 (forecast)
Turbines: 4 248
Capacity: 9 648 MW
Actual production: 21,9 TWh *
Annual production (estimated): 26,9 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 2018-12-31

<table>
<thead>
<tr>
<th>In operation</th>
<th>Onshore</th>
<th>Offshore</th>
<th>Total</th>
<th>Change Q3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windturbines</td>
<td>3 573</td>
<td>86</td>
<td>3 659</td>
<td>(+122)</td>
</tr>
<tr>
<td>Capacity (MW)</td>
<td>7 205</td>
<td>200</td>
<td>7 406</td>
<td>(+389)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>* Under construction</th>
<th>Onshore</th>
<th>Offshore</th>
<th>Total</th>
<th>Change Q3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windturbines</td>
<td>883</td>
<td>883</td>
<td>883</td>
<td>(+58)</td>
</tr>
<tr>
<td>Capacity (MW)</td>
<td>3 395</td>
<td>3 395</td>
<td>3 395</td>
<td>(+285)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>** Permitted</th>
<th>Onshore</th>
<th>Offshore</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windturbines</td>
<td>2 458</td>
<td>503</td>
<td>2 961</td>
</tr>
<tr>
<td>Capacity (MW)</td>
<td>8 382</td>
<td>2 267</td>
<td>10 649</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>** In permission process</th>
<th>Onshore</th>
<th>Offshore</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windturbines</td>
<td>2 048</td>
<td>275</td>
<td>2 323</td>
</tr>
<tr>
<td>Capacity (MW)</td>
<td>7 111</td>
<td>925</td>
<td>8 036</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>Year</th>
<th>2018 Q1</th>
<th>2019 Q2</th>
<th>2019 Q3</th>
<th>2019 Q4</th>
<th>2019 (Tot)</th>
<th>2020</th>
<th>2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>716</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2019</td>
<td>193</td>
<td>436</td>
<td>626</td>
<td>987</td>
<td>2242</td>
<td>713</td>
<td>438</td>
</tr>
</tbody>
</table>

* Figures from all turbine manufacturers acting on the Swedish market
Installed capacity by price area 2022-12-31 (forecast)

<table>
<thead>
<tr>
<th>SE</th>
<th>Permission process</th>
<th>Permitted</th>
<th>Under construction</th>
<th>In operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>SE1</td>
<td>810</td>
<td>919</td>
<td>929</td>
<td></td>
</tr>
<tr>
<td>SE2</td>
<td>286</td>
<td>329</td>
<td>1976</td>
<td>2697</td>
</tr>
<tr>
<td>SE3</td>
<td></td>
<td>74</td>
<td>150</td>
<td>2350</td>
</tr>
<tr>
<td>SE4</td>
<td></td>
<td>54</td>
<td>196</td>
<td>1429</td>
</tr>
</tbody>
</table>

Status as of 2018-12-31

- Permission process
- Permitted
- Under construction
- In operation

MW
Wind power production 2019 (forecast)

Actual and forecast

TWh

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

Actual and forecast

TWh

Increased uncertainty

As of 31/12

High case

Base case

Low case

Svensk Vindenergi
**Base case**

This scenario is the most realistic and official forecast of Svensk Vindenergi

![Chart showing annual production and cumulative capacity and installed wind turbines from 2007 to 2022.](chart.png)

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

As of 31/12

<table>
<thead>
<tr>
<th>Year</th>
<th>Annual Production</th>
<th>Cumulative Capacity</th>
<th>Installed Wind Turbines</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>2039</td>
<td>2899</td>
<td>2042</td>
</tr>
<tr>
<td>2008</td>
<td>2403</td>
<td>3743</td>
<td>2496</td>
</tr>
<tr>
<td>2009</td>
<td>2663</td>
<td>4382</td>
<td>2751</td>
</tr>
<tr>
<td>2010</td>
<td>3048</td>
<td>5425</td>
<td>2966</td>
</tr>
<tr>
<td>2011</td>
<td>3378</td>
<td>6029.2</td>
<td>3337</td>
</tr>
<tr>
<td>2012</td>
<td>3659</td>
<td>6495</td>
<td>3678</td>
</tr>
<tr>
<td>2013</td>
<td>3659</td>
<td>6691</td>
<td>3643</td>
</tr>
<tr>
<td>2014</td>
<td>3937</td>
<td>7406</td>
<td>3937</td>
</tr>
<tr>
<td>2015</td>
<td>4248</td>
<td>9648</td>
<td>4248</td>
</tr>
<tr>
<td>2016</td>
<td>4543</td>
<td>10800</td>
<td>4804</td>
</tr>
<tr>
<td>2017</td>
<td>4804</td>
<td>11842</td>
<td>5042</td>
</tr>
<tr>
<td>2018</td>
<td>5042</td>
<td>12820</td>
<td></td>
</tr>
<tr>
<td>2019</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2020</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2021</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2022</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Increased uncertainty**
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>30 %</td>
<td>20 %</td>
<td>0 %</td>
</tr>
<tr>
<td>In permission process *</td>
<td>15 %</td>
<td>10 %</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

2012 2013 2014 2015 2016 2017 2018

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

Previous forecasts and actual annual wind power production

TWh

Actual
Actual (normal year)
Q4 2012
Q4 2013
Q4 2014
Q4 2015
Q4 2016
Q4 2007

Svensk Vindenergi