Energy Minister Ibrahim Baylan:

„We need new connections for electricity to our neighbouring countries“ 2016-11-23

DEBATT. Det nordiska energisamarbetet behöver ny kraft och en gemensam plan för hur vi ska förstärka kopplingarna både mellan de nordiska länderna och till
Sweden exports
15-20 TWh/year

Interconnections with:
- Norway
- Denmark
- Finland
- Germany
- Poland
- Lituania
SvK Grid Development plan 2016-2025:

Upgrades:
- Denmark-Själland
  400 kV -AC
  New connection
- Germany–Hansa Bridge
  Decision 2017?
  700 MW –DC
- Poland??
Highlights

- 5 out of 8 parties in parliament => Stable agreement

- Goal 2040 : 100% renewable electricity production

- Extended support to renewables 2020-2030 -> 18 TWh

- **Offshore Wind** – Cost for Grid connection should be removed

- Transmission capacity between Sweden and neighbouring countries shall increase
Wind Power

Forecast Low-High
# Sweden Statistics 2016-09-30

<table>
<thead>
<tr>
<th></th>
<th>Onshore</th>
<th>Offshore</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>In operation</strong></td>
<td>3 291</td>
<td>76</td>
<td>3 367</td>
</tr>
<tr>
<td><strong>Installed Power (MW)</strong></td>
<td>6 251</td>
<td>190</td>
<td>6 441</td>
</tr>
<tr>
<td><strong>No of turbines</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Under Construction</strong></td>
<td>110</td>
<td></td>
<td>110</td>
</tr>
<tr>
<td><strong>All permits granted</strong></td>
<td>2 898</td>
<td>453</td>
<td>3 351</td>
</tr>
<tr>
<td><strong>Early planning</strong></td>
<td>&gt;2 800</td>
<td>&gt;750</td>
<td>&gt;12 000</td>
</tr>
</tbody>
</table>

- Estimated total energy: 30 TWh\(\text{Onshore}\) + 10 TWh\(\text{Offshore}\) = 40 TWh

- Total energy based on early planning: >12 000 TWh

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Support scheme – Green certificates

Green certificates

- Support for all new renewable electricity production
- for 15 years production
- Financed by consumers of electricity
- Market solution, no fixed price
- Together with Norway
Green certificates

- Much new production
  - many certificates om the market
  - Pressure on price
  - Low income for the investors
  - Lower pace new investments

2003-2016 Spotprices
Electricity and certificates (red)
Support scheme – Green certificates

The Swedish Electricity Certificate System

1. Electricity producers receive one electricity certificate unit (in electronic form) from the Swedish state for each megawatt-hour (MWh) of electricity that they produce from renewable energy sources or from peat. Norway has a similar electricity certificate system, under which the Norwegian state issues certificates to Norwegian producers of electricity from renewable sources.

2. The electricity producers are free to sell their certificates, thus generating extra revenue for their electricity production.

3. Certificates - both Swedish and Norwegian - are traded on an open market, with the price being determined by supply and demand. Prices are agreed between purchasers and sellers.

4. Purchasers are Swedish or Norwegian parties having quota obligations. They are required to purchase certificates corresponding to a certain proportion of their electricity sales or use, known as their quota obligation. The sizes of quota obligations are set by the Swedish and the Norwegian Act Concerning Electricity Certificates, and create the demand for certificates.

5. If the purchaser is an electricity supplier, he passes on the cost of certificates as part of the price of electricity charged to his customers. In this way, all electricity customers in Sweden and Norway contribute to expansion of the production of renewable electricity.

6. Each year, those having quota obligations must hold (i.e. have purchased) the number of electricity certificates needed to meet their quota obligations to the Swedish or Norwegian states. Once a year, these certificates are cancelled, which means that the holders must start to buy new certificates to meet next year’s quota obligation, thus creating a constant demand for certificates.

Illustration: Bo Reinerczalh
Support scheme – Green certificates

Ambition

- Increase renewables with 28.4 TWh 2012-2020 (with Norway)
- Additional 18 TWh 2020-2030
  - Proposal delay towards 2030
  - Norway?
Opportunities

- High Ambitions
  - Fossil free Sweden
  - 100% renewable
  - More interconnectors
- Support system
- Energy agreement
- Conditions are good
  - A lot of wind
  - Many projects
  - Experienced developers

Treats

- Low energy prices
- Delay of new projects -> 2030
- Common certificates with Norway
Thank you!

For further information:

Mail: info@baltic-integrid.eu
Web: www.baltic-integrid.eu

Baltic InteGrid represented by the Lead Partner:

Institute for Climate Protection, Energy and Mobility (IKEM)
Magazinstraße 15-16, 10179 Berlin, Germany
Phone: +49 (0) 30 408187015
Mail: info@ikem.de
Web: www.ikem.de

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Energy Agency for Southeast Sweden
Pierre Ståhl
+ 46 70 688 7520
pierre.stahl@energikontorsydost.se

<Date>
<Event title>
Sweden Offshore Wind farms

In operation (yellow):

- Largest: Lillgrund 48 turbines
- Latest: Kårehamn 16 turbines 2013
- Decommissioned: Yttre Stengrund 5 turbines 2001-2015