Solar & Wind integration workshop

Solar, *the* piece of the puzzle?

Oktober 2017 Berlin
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TenneT at a glance

History

- 1880-1900
- 1949
- 1998
- 2003
- 2008
- 2010
## TenneT at a glance

Europe's first cross-border grid operator

<table>
<thead>
<tr>
<th>Category</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal employees</td>
<td>3,040</td>
</tr>
<tr>
<td>EBIT</td>
<td>834 (EUR million)</td>
</tr>
<tr>
<td>Assets</td>
<td>18,974 (EUR million)</td>
</tr>
<tr>
<td>Investments (2017-2027)</td>
<td>25 (EUR billion)</td>
</tr>
<tr>
<td>Total grid length</td>
<td>22,573 km</td>
</tr>
<tr>
<td>Number of end-users</td>
<td>41 million</td>
</tr>
<tr>
<td>Number of transformer substations</td>
<td>454</td>
</tr>
<tr>
<td>Total offshore wind connections</td>
<td>15</td>
</tr>
<tr>
<td>Grid availability</td>
<td>99.9999%</td>
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</tbody>
</table>

Investments account for 16.7% of 150 billion in the EU. Number of end-users account for 7.7% of a total of 532 million in the EU.

*Figures for the year ended 31 December 2016 based on underlying financial information*
### TenneT at a glance

**Annual growth 1998-present: 14%**

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
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<tbody>
<tr>
<td>1998</td>
<td>TenneT integrates Dutch high-voltage grids (220/280 kV)</td>
</tr>
<tr>
<td></td>
<td><strong>Total assets EUR 550 million</strong></td>
</tr>
<tr>
<td>2008</td>
<td>TenneT integrates Dutch high-voltage grids (110/150 kV) from Essent, Nuon and Delta</td>
</tr>
<tr>
<td>2009</td>
<td>TenneT integrates German TSO transpower (E.ON Netz)</td>
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<tr>
<td>2010</td>
<td>Large scale investments in the Netherlands and Germany</td>
</tr>
<tr>
<td>2014</td>
<td>Market coupling and further cooperation between TSO's. <strong>Total assets EUR 12.7 billion</strong></td>
</tr>
<tr>
<td>2023</td>
<td>Further growth of assets towards EUR 25 billion</td>
</tr>
</tbody>
</table>
Ownership structure

State of the Netherlands

TenneT Holding B.V. (100%)

TenneT GmbH & Co. KG (100%)

TenneT TSO B.V. (100%)

Non-regulated activities

TenneT Offshore GmbH (100%)

TenneT TSO GmbH (100%)

APX Holding B.V. (70.8%)

NOVEC B.V. (100%)

Relined B.V. (50%)

BritNed (50%)
The TSO tasks

Our three main tasks

1. Transmission services
2. System services
3. Market facilitation
The three speeds

In Europe

1. Policy development
2. Infrastructure
3. Integration of renewables
The three parts of the solution

1. Continued grid investments
2. Storage
3. Flexibility
The three elements of the chain

1. Consumers
2. DSO
3. TSO