Roundtable - Energiewende: Finanzierung des Netzausbaus im Übertragungsnetz
The Main Challenges of the Energiewende for the Electricity System

- Renewable and decentralised generation are rapidly and steadily growing
- Current market design leads to decreasing profitability of conventional generation
- Legal and procedural framework cannot keep pace with renewables expansion
- Increasing gap between grid development and renewables development
- Limited public acceptance for the consequences of the Energiewende
50Hertz as a Part of an International Group

- **elia** (publicly listed in Belgium) - 60%
- **ifm investors** (Australian pension-fund manager) - 40%

---

- **50Hertz Transmission GmbH**
- **50Hertz Offshore GmbH**

---

Cash Pooling agreement and Profit and Loss sharing
Eurogrid/ 50Hertz at a Glance – End of 2014

Note 1: Based on electricity supplied to final consumers in accordance with the RES Provisional data; Source: 50Hertz as at 31/12/2014

<table>
<thead>
<tr>
<th>Metric</th>
<th>2014</th>
<th>Share in Germany</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area</td>
<td>109,360km²</td>
<td>31%</td>
</tr>
<tr>
<td>Total length of lines</td>
<td>9,855km</td>
<td>29%</td>
</tr>
<tr>
<td>Maximum load</td>
<td>~16GW</td>
<td>~21%</td>
</tr>
<tr>
<td>Energy consumption¹</td>
<td>~95TWh</td>
<td>~20%</td>
</tr>
<tr>
<td>Installed capacity</td>
<td>~47,802MW</td>
<td>~24%</td>
</tr>
<tr>
<td>Of which Renewables</td>
<td>~24,938MW</td>
<td>~29%</td>
</tr>
<tr>
<td>Of which Wind</td>
<td>~14,637MW</td>
<td>~40%</td>
</tr>
<tr>
<td>Headcount</td>
<td>849</td>
<td></td>
</tr>
<tr>
<td>Turnover</td>
<td>8.6 bn€</td>
<td>1.0 bn€</td>
</tr>
</tbody>
</table>

Finanzierung des Netzausbaus im Übertragungsnetz / Marco Nix (CFO)
### Business Model TSO (Transmission System Operator) and 50Hertz

<table>
<thead>
<tr>
<th>TSO</th>
<th>50Hertz</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Transmission grid owner</strong></td>
<td>• Base year mechanism (ongoing business)</td>
</tr>
<tr>
<td></td>
<td>• Grid extension (capex) approach</td>
</tr>
<tr>
<td><strong>System operator</strong></td>
<td>• Ancillary services, grid losses</td>
</tr>
<tr>
<td></td>
<td>• Redispatch</td>
</tr>
<tr>
<td><strong>Market facilitator</strong></td>
<td>• Participations in EEX, TSCNET, EGI and cooperation with universities</td>
</tr>
<tr>
<td></td>
<td>• Strong market development commitment</td>
</tr>
<tr>
<td><strong>&quot;Trustee&quot; for performing EEG processes</strong></td>
<td>• Commercial administration</td>
</tr>
<tr>
<td></td>
<td>• Accounting and Cash Management</td>
</tr>
</tbody>
</table>

- **TSO**
  - In charge of operation, extension and maintenance of **very-high-voltage lines** and **connection of offshore wind farms**
  - Responsible for **balancing and control** of the transmission system, 24/7: frequency and voltage control, congestion management
  - Catalyst for the **development of the energy market**, especially in Northern and Central-Eastern Europe
  - Responsible for the **financial management of renewable energies (EEG)**

- **50Hertz**
  - **TSO**
  - **50Hertz**

**Source:** 50Hertz

---

**Finanzierung des Netzausbaus im Übertragungsnetz / Marco Nix (CFO)**
Energiewende is the Major Industrial Project of the German Society Since the Reunification

<table>
<thead>
<tr>
<th>Political targets</th>
<th>Implications for 50Hertz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase out of nuclear energy production until 2022</td>
<td>• Increase of RES generation</td>
</tr>
<tr>
<td>Dynamic RES development (EEG 2.0)</td>
<td>• High utilisation of lignite coal PPs</td>
</tr>
<tr>
<td>Targets: 40-45% in 2025, 55-60% in 2035, 80% in 2050</td>
<td>• Increasing wind generation in 50Hertz control area expected</td>
</tr>
<tr>
<td>Future of coal generation questioned</td>
<td>• No effect in 50Hertz control area due to age of lignite coal PPs</td>
</tr>
<tr>
<td>Target: 40% CO2 reduction until 2020</td>
<td>• Robust 50Hertz grid but north-south transport to be increased</td>
</tr>
<tr>
<td>Grid extension identified as key for successful development</td>
<td>• No change in consumption expected</td>
</tr>
<tr>
<td>Efficiency program to reduce energy consumption</td>
<td>• Regionalisation of RES installations expected</td>
</tr>
<tr>
<td>Increasing cost efficiency and market design adoptions</td>
<td>• Rather no capacity market</td>
</tr>
</tbody>
</table>
Energiewende Germany: Quo Vadis?

EEG-Surcharge

Grid extension/undergrounding

Energy Only Market 2.0

Strategic/climate reserve

Digitalisation of energy transition (TSO as data hub)
Integration of Renewable Energies Requires New Infrastructure

Till 2025:
- ~ 20 GW
- ~ 10 GW

Increasing need for transmission

Installed capacity [GW]
- 2013: RES: 45%, Fossil & Nuclear: 55%
- 2025: RES: 65%, Fossil: 35%

Energy generation [TWh]
- 2013: RES: 24%, Fossil & Nuclear: 76%
- 2025: RES: 45%, Fossil: 55%

Source: Scenario Framework NEP B’2015; AG Energiebilanzen

- Existing lines in north-south direction are overloaded, which leads to increasing redispatch costs (100 – 200 m€ p.a.)

The problem is tightening:
- By 2025, wind power will amount to approx. 45 GW, whereas the existing transmission capacity is only 12 GW
- The nuclear phase out causes a loss of 8 GW of installed capacity in the south of Germany

Grid development is the key to a successful energy transition

Finanzierung des Netzausbaus im Übertragungsnetz / Marco Nix (CFO)
Grid Expansion Projects 2014

1. 380-kV-grid connection substation Förderstedt
2. 380-kV-Line Bärwalde – Schmölln
3. Grid connection substation Parchim/Süd
4. South-West interconnector 2 (SWIC 2) Vieselbach-Altenfeld
5. New construction substation Wolmirstedt
6. Connection Offshore-Wind park (OWP) Baltic 2
7. Connection OWPs Wikinger und Arkona-Becken South-East
8. SWIC 3 Altenfeld – Redwitz (to border Thü/Bay)
9. 3rd Interconnector to Poland (to border GER/POL)
10. 380-kV-Northern Ring Berlin
11. Uckermark-Line Neuenhagen – Vierraden – Bertikow
12. Bertikow – Pasewalk
13. Wolmirstedt – Perleberg
14. Offshore connections Baltic Sea
15. Kriegers Flak Combined Grid Solution
16. Grid connection substation Jessen/Nord
17. Grid connection substation Putlitz/Süd

€ 5bn(+) Capex programme

In operation 🟢 Under construction 🟡 Approval procedure
Energiewende is Ramping up – so is 50Hertz Onshore

- Major substation projects (e.g. Wolmirstedt, Förderstedt)
- Uckermark line
- Berlin northern ring
- SWCL 3rd part

Historical investment volume onshore

<table>
<thead>
<tr>
<th>Year</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>m€</td>
<td>108</td>
<td>106</td>
<td>115</td>
<td>144</td>
<td>248</td>
<td>268</td>
</tr>
</tbody>
</table>

- Northern Line (2012)
- SWCL 2nd part (2014/15)
- High t° cond. Remptendorf
- Förderstedt (2014)
- Bärwalde – Schmölln (2014)

- Already taken into operation
- Under construction or permission phase
Energiewende is Ramping up – so is 50Hertz Offshore

- Baltic 2 almost finished: trial operations started in July 2015.
- Start of construction for Ostwind 1 (formerly named Cluster Westlich Adlergrund) offshore connection in Sept. 2015.

Historical investment volume offshore

<table>
<thead>
<tr>
<th>Year</th>
<th>€</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>46</td>
</tr>
<tr>
<td>2010</td>
<td>73</td>
</tr>
<tr>
<td>2011</td>
<td>131</td>
</tr>
<tr>
<td>2012</td>
<td>110</td>
</tr>
<tr>
<td>2013</td>
<td>154</td>
</tr>
<tr>
<td>2014</td>
<td>304</td>
</tr>
</tbody>
</table>
Cash Flow and Funding

Structure of cash flow (FFO)

➔ currently 350 m€ and growing

Sources of funding

➔ 5 bn€ in the next decade

Figures reflect average approximations and rough relations
Core of the financing strategy will be regular access to the capital markets

**50Hertz sources of liquidity**

*In the context of EEG cash available*

**Annual update**
- DIP

**Private placement market / SSD**
- Key building block, be prepared for any window
  - Access at short notice
  - Market with deepest liquidity
  - As a frequent issuer Eurogrid will benefit from a tight credit curve
- Assess opportunistically every time a new bond is considered
  - Diversify liquidity sources
  - Specific tenors to build a balanced maturity profile
  - May offer better pricing at times
  - Smaller size possible/attractive

**Back-up RCF for short term bridging**

**Back-up liquidity**
- Back-up if other markets are not available
- Made available at very attractive pricing by banks (but with no intention to be drawn for long periods)
## Syndicated Revolving Credit Facility

<table>
<thead>
<tr>
<th>Borrower</th>
<th>Eurogrid GmbH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guarantors</td>
<td>50Hertz Transmission GmbH</td>
</tr>
<tr>
<td></td>
<td>50Hertz Offshore GmbH</td>
</tr>
<tr>
<td>Signing</td>
<td>24 March 2015</td>
</tr>
<tr>
<td>Facility Size</td>
<td>€750m</td>
</tr>
<tr>
<td></td>
<td>Uncommitted accordion option of 1/3 of initial facility amount</td>
</tr>
<tr>
<td>Maturity</td>
<td>5+1+1 years</td>
</tr>
<tr>
<td></td>
<td>Two consecutive extension options for each one year (uncommitted by the lender)</td>
</tr>
<tr>
<td>Margin</td>
<td>27.5 bps</td>
</tr>
<tr>
<td>Covenants</td>
<td>None</td>
</tr>
<tr>
<td>Agent</td>
<td>Commerzbank</td>
</tr>
</tbody>
</table>

All lenders will receive a bookrunner title on coming bond issuance.
Eurobond Issuance June 2015

Investors profile
- Funding Managers: 78%
- Central Banks & Agencies: 8%
- Insurers & Pension Funds: 2%
- Banks & Private Banks: 1%
- Others: 1%

Geographical allocation
- UK: 38%
- Germany: 24%
- BeNeLux: 21%
- Nordic: 10%
- France: 4%
- Others: 3%

Key facts
- Issue date 2nd of June
- Size 500 m€
- 1.8x oversubscription
- 50 investors
- 10y tenor
- 1.875% coupon
- 1.92% yield

Environment/Challenges
- First market approach since 2010
- Low interest rate environment
- Exceptional issuance volume at the longer end the months before
- Worsen Greece crisis
- Partially dry up of markets

Successful comeback to the financial markets after 5 years within a turbulent market environment shows strong credibility of Eurogrid/50Hertz
Eurogrid Issuance November 2015

Investors profile
- Funding Managers: 75%
- Insurers & Pension Funds: 6%
- Banks & Private Banks: 6%
- Central Banks & Agencies: 13%

Geographical allocation
- UK/Ireland: 29%
- Germany/Austria: 15%
- Benelux: 12%
- Nordic: 12%
- France: 8%
- Others: 12%

Key facts
- Dual Tranche Transaction
- Issue date 3rd and 4th November
- 8-year/ €750m/ 1.625%
- 15-year/ €140m/ 2.625%
- Orderbook of €3.4bn (x4.5)
- Over 200 investors

Environment/Challenges
- Low interest rate environment
- High uncertainty
- Volatility in primary and secondary markets led to a lack of ‘long-term’ deals (>10y)

Eurogrid printed the first 15yr issue in months (except Apple) on top of a solid €750m 8yr deal
Financial Debt Maturity Profile

- €150m Overdraft Facility (uncommitted)
- €750m Revolving Credit Facility (committed)
- €500m listed Bond 2010
- €750m listed Bond 2015
- €500m listed Bond 2015
- €140m listed Bond 2015
- €50m Registered Bond (PP)

Listed bonds and RCF are the core of funding sources.
Outlook and Discussions?

- Reliance on Capital Markets?

- Growth Investor basis?
  - Type (public bonds/ private bonds/green bonds)
  - Size
  - Investor diversification

- Transparency?
  - Regulated by BNetzA
  - Burden of proof
Thank you very much for your kind attention!

Marco Nix (CFO)

+49-30 - 5150 - 2400
marco.nix@50hertz.com