Maria van der Hoeven
IEA Executive Director

EU Energy Minister Meeting
Driving smart grid deployment

Variable renewable capacity

<table>
<thead>
<tr>
<th>Year</th>
<th>2010</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity</td>
<td>234 GW (4.5%)</td>
<td>942 GW (13.4%)</td>
</tr>
</tbody>
</table>

Electricity demand in transport

<table>
<thead>
<tr>
<th>Year</th>
<th>2010</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demand</td>
<td>278 TWh (1.6%)</td>
<td>404 TWh (1.4%)</td>
</tr>
</tbody>
</table>

Global electricity demand

<table>
<thead>
<tr>
<th>Year</th>
<th>2010</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demand</td>
<td>17 860 TWh</td>
<td>22 680 TWh</td>
</tr>
</tbody>
</table>

Variable and peak demand

<table>
<thead>
<tr>
<th>Time</th>
<th>0</th>
<th>24h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demand</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Increasing shares of renewables pose new challenges

Installed capacity of wind and solar PV

Wind and solar are set to increase strongly, reaching almost one-fifth of global installed capacity in 2035, but their contribution to security of supply is limited.
A smart, sustainable energy system

- Co-generation
- Renewable energy resources
- Distributed energy resources
- Smart energy system control
- Surplus heat
- Centralised ice production, power and storage
- H₂ vehicle
- EV
Optimize Existing Transmission Resources

- Undersea cables
- Power electronics
- Demand response
- Control room IT
- Renewables management
- Distribution grids
- Storage

Source: IEA, adapted from ENTSO-E, ECF, Imperial College, KEMA
More integrated, more flexible and more market based system operation needed

Market coupling in Europe, 2011

Ireland

Wind as % of Total Electricity Demand (2020 Targets)

Source: Eirgrid 2010 annual report, based on data collated from information submitted in the National Renewable Energy Action Plans by EU Member States to the EU Commission in June 2010
Tracking Clean Energy Progress 2013

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