Energy and Climate Collaboration in Europe: Ways Forward
London, French Embassy, 21st September 2016

National strategies and domestic politics: in what ways do we need our neighbors?

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and Technical University Berlin
Reaching the -40% climate target by 2020

- With current policies: 33-34% GHG reduction by 2020

- Climate Action Programme 2020 adopted in Dec 2014 by Cabinet

Source BMUB
<table>
<thead>
<tr>
<th>Measures</th>
<th>Greenhouse gas emission reduction (million tonnes of CO₂ equivalent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Action Plan on Energy Efficiency (not addressing transport sector)</td>
<td>Approx. 25-30 mill. tonnes (including energy efficiency in buildings)</td>
</tr>
<tr>
<td>Climate-friendly building and housing strategy</td>
<td>Approx. 5.7-10 mill. tonnes (1.5 - 4.7 mill. tonnes of which are in addition to NAPE)</td>
</tr>
<tr>
<td>Measures in the transport sector</td>
<td>Approx. 7-10 mill. tonnes</td>
</tr>
<tr>
<td>Reduction in non-energy-related emissions: industry, the commerce/trade/services sector and waste management agriculture</td>
<td>3-7.7 mill. tonnes</td>
</tr>
<tr>
<td></td>
<td>3.6 mill. tonnes</td>
</tr>
<tr>
<td>Reform of the emissions trading scheme</td>
<td>Dependent on decisions at EU level on structure</td>
</tr>
<tr>
<td>Further measures, especially in the power sector</td>
<td>22 mill. tonnes</td>
</tr>
<tr>
<td>TOTAL</td>
<td>62-78 mill. tonnes</td>
</tr>
</tbody>
</table>

Source: BMUB
Climate Action Programme 2020 is an important milestone for reaching the 2050 climate target.

Building on CAP 2020, a **Climate Action Plan 2050** will be adopted by Cabinet in 2016.

- **Process** for elaboration of the Plan is outlined in the **Climate Action Programme 2020**.
- Climate Action Plan focusses on **long-term climate targets** and designing the **transformation** of society.
- Underpinned by a **broad dialogue and participation process** during 2015/16.
## German climate and energy targets

### 1. Financing framework

<table>
<thead>
<tr>
<th>Category</th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
<th>2050</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Climate</strong></td>
<td></td>
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</tr>
<tr>
<td>Greenhouse gases (vs. 1990)</td>
<td>min. - 40%</td>
<td>min. - 55%</td>
<td>min. - 70%</td>
<td>min. - 80 to - 95%</td>
</tr>
<tr>
<td><strong>Renewable energies</strong></td>
<td></td>
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</tr>
<tr>
<td>Share of electricity</td>
<td>min. 35%</td>
<td>min. 50%</td>
<td>min. 65%</td>
<td>min. 80%</td>
</tr>
<tr>
<td>(2025: 40-45%)</td>
<td></td>
<td>(2035: 55-60%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall share</td>
<td>18%</td>
<td>30%</td>
<td>45%</td>
<td>60%</td>
</tr>
<tr>
<td>(Gross final energy consumption)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>Efficiency</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary energy consumption</td>
<td>-20%</td>
<td></td>
<td></td>
<td>-50%</td>
</tr>
<tr>
<td>Electricity consumption</td>
<td>-10%</td>
<td></td>
<td></td>
<td>-25%</td>
</tr>
<tr>
<td>Energy consumption in buildings</td>
<td>20% heat demand</td>
<td></td>
<td></td>
<td>80% primary energy</td>
</tr>
</tbody>
</table>

### 2. Cross-sector integration?

### 3. Industry Strategy + Policy Transport

Source: BMUB
Make use of renewables to stabilize energy costs

![Graph showing trends over time and comparison between imported fossil fuels, domestic fossil fuels, and renewable energy costs.]

**Similar cost level for serving demand with new wind and solar as with fossil fuel:**
- Cost of learning investment in wind and solar dominates debate but is sunk.

DIW Berlin Calculations based on BP Statistical Review of World Energy; Energy Statistics for the EU-28; Bundesverband Solarwirtschaft e. V.; IEA; European Wind Energy Association; Bundesamt für Wirtschaft und Ausfuhrkontrolle, first published in Energy Journal (forthcoming)
Financing costs increase with (i) country situation (ii) policy design not addressing market imperfection and policy risk

Weighted average cost of capital for wind reported by European investors in 2014

Based on DIA-CORE (2016): The impact of risks in renewable energy investments and the role of smart policies
Power market and renewable policy needs to focus on risk management

1. Cooperation can reduce financing cost for countries.

2. Policy can reduce financing cost for wind and solar by ensuring long-term stable revenue streams.

3. RE benefit from hedge at times of low power prices: Ensure consumers also benefit at times of high power prices.

4. Requires that Power Market Open for Renewables

Next step: Intraday Auctions with Capability Based Bids
Three paradigms of investment for generation adequacy

- Energy & capacity markets
- Energy only market
- Cost-based regulation

- How to define generation adequacy contribution of RE, flexibility options?
- How to integrate with international partners, heat transport?
- How to insure consumers against variable fossil energy and carbon prices?
- Open for and benefiting from ALL flexibility options: Address chicken and egg
- Multi-year hedging contracts required to insure producers and consumers
- Option of strategic reserve as insurance for regulator
- How to compete without threat of entry?

- Regions differ on the emphasis on their paradigm:
- Change of paradigms puts credibility at risk and creates hold-up.

Does Europe require a common paradigm for generation adequacy?

- Comprehensive capacity mechanisms distort energy markets
  - Scarcity signals for investment and flexibility reduced for neighbor countries
  - Cross-border participation reduces contribution to local generation adequacy
  - Independent national implementation conflicts with EU energy objectives

- Comprehensive capacity mechanisms are technology specific
  - Tenders tech. biased: announcement time, time-lag, contract duration
  - Activation tech. biased: penalty terms, collaterals, warning periods, strike price
  - With different technology preferences, EU cannot agree common design

- Therefore important to strengthen wholesale markets
  - Intraday auctions: reference point for contracting and market based T allocation
  - Remunerate system services and scarcity (operational demand response curve)
  - Avoid increasing counter party risks with excessive retail-competition
  - For (political) insurance of generation during transition use strategic reserve
  - Strengthen EU ETS
Strategy for the industry transformation

- Focus on Materials Sector (rather than „energy intensive“)
- Move beyond national lock-in by including more actors
- Align price incentives – starting at national/regional level
  - Shift to use of benchmarks for all special provisions
  - Ensure price relevant in value chain (inclusion of consumption ..)
- Innovation funding for pilots at sufficient scale
  - Join up funding of several countries to achieve scale and facilitate competition
  - Opportunity for cooperation among pro-active countries

For more information see www.climatestrategies.org
- Inclusion of consumption project
- Climate friendly materials policies project