Energy and climate policy in Brandenburg
Status and perspectives

Henning Heidemanns
State secretary
Schönefeld, 25. October 2011
Status – Energy strategy 2020

Key targets:

– CO₂-emissions: 40 % reduction until 2020 and further reduction of 35 % until 2030
– Renewable energies: 20 % of total primary energy supply until 2020 (wind, solar, biomass, geothermal)
– CCS (Carbon Dioxide Capture and Storage) for lignite-fired power plants as bridging technology
– 13 % reduction of final energy consumption until 2020 (1 % p.a.)
Framework – global, european, national and regional

- IPCC: 2°C target is reachable
- "Renewables can cover up to ¾ of the world energy demand in 2050"
- Renewables close to profitability

"20-20-20"-targets for 2020:
- reduction in CO₂-emissions of at least 20% below 1990 levels
- 20% of energy consumption from renewables
- 20% reduction in primary energy use compared with projected levels, to be achieved by improving energy efficiency

- so-called change in energy policy (shut down of nuclear power plants)
- "Green power"-targets:
  2020 35%, 2030 50%, 2050 80%

- "Leitstern"-Award 2008 and 2010 for best strategy and performance in green energies
- N°2 in wind energy, N°1 in biomass energy, N°1-producer of pv-modules
- 2010 45% of electric power from renewables
Renewable energies in Brandenburg – power generation

Rate of the power generation from renewable energies on the power supply in Brandenburg

- Rate of the power generation from renewable energy on the power supply
- Targets of the federal government
  - 2060: 80%
  - 2040: 65%
  - 2030: 50%
  - 2020: 35%

Source: ZAB Energie
Renewable energies in Brandenburg

Source: AfS BB, AG Energiebilanzen, BMWi, LUGV
Renewable energies in Brandenburg – jobs

<table>
<thead>
<tr>
<th>branch</th>
<th>direct and indirect jobs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>05 /2009</td>
</tr>
<tr>
<td>wind</td>
<td>2.850</td>
</tr>
<tr>
<td>solar</td>
<td>2.221</td>
</tr>
<tr>
<td>biomass</td>
<td></td>
</tr>
<tr>
<td>biodiesel</td>
<td>930</td>
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<tr>
<td>bioethanol</td>
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<tr>
<td>geothermal</td>
<td>n.s.</td>
</tr>
<tr>
<td>jobs in renewable</td>
<td>6.001</td>
</tr>
</tbody>
</table>

source: ZAB Energie
**CO₂-emissions in Brandenburg - by sectors**

**CO₂-emissions by sectors**
- households and small consumers
- traffic
- industry / business
- power and heat plants, refinery

**Source:** ZAB, LUGV
# Facts about energy economics

<table>
<thead>
<tr>
<th></th>
<th>2008</th>
<th>Total</th>
<th>Per capita</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>BB</td>
<td>Germany</td>
</tr>
<tr>
<td>Total primary energy supply</td>
<td>646 PJ</td>
<td>14.216 PJ</td>
<td>255 GJ</td>
</tr>
<tr>
<td>Total end energy supply</td>
<td>275 PJ</td>
<td>9.098 PJ</td>
<td>109 GJ</td>
</tr>
<tr>
<td>Power generation</td>
<td>49.011 GWh</td>
<td>637.100 GWh</td>
<td>19,38 MWh</td>
</tr>
<tr>
<td>Power supply</td>
<td>15.021 GWh</td>
<td>618.100 GWh</td>
<td>5,94 MWh</td>
</tr>
<tr>
<td>Power generation of renewable energy</td>
<td>8.532GWh *</td>
<td>92.989 GWh</td>
<td>3,38 MWh</td>
</tr>
<tr>
<td>Installed electric capacity of renewable energy</td>
<td>4.125 MW *</td>
<td>40.169 MW</td>
<td>1,64 KW</td>
</tr>
<tr>
<td>CO₂-emissions</td>
<td>60.925.000 t</td>
<td>752.300.000 t</td>
<td>24,2 t</td>
</tr>
</tbody>
</table>

source: AfS BB, BMWi; * LUGV
Key facts

- Brandenburg is an electricity exporting region (over 50% of the produced electricity is exported)
- Brandenburg generates 45% of electric power from renewables (57% of its own final energy consumption from renewable sources)
- Brandenburg was honored with the “Leitstern” award in 2008 and 2010 as the best federal state concerning renewable energies in Germany
- But some challenges must be further addressed in the future ....
Key problems

1. Volatility
   - Grid
   - Storage

2. Use of farmland
   - Biomass strategy

3. Security of energy supplies
   - Conventional power plants

4. Acceptance
   - Costs
   - Esthetics

Quelle: Prognos AG
Key problems

Dramatic increase in power ramps

* Installed German PV power 2010 as of 6/09/2010 (14.48 GW) and respective ramps (source: sma.de) as basis for linear extrapolation to 2020 (52 GW according to German National Renewable Action Plan 2010) and 2050 (120 GW according to 2010 study of German Federal Environment Authority “Umweltbundesamt”, 100% RES scenario).

** Installed German wind power as average value for 2010 (26.40 GW) and maximum German wind power ramps in 2010 as basis for linear extrapolation to 2020 (46 GW according to German National Renewable Action Plan 2010) and 2050 (105 GW according to 2010 study of German Federal Environment Authority “Umweltbundesamt”, 100% RES scenario). Updated analysis, status quo: 5th May 2011.

source: 50hertz
Key solutions

Upgrade grids
- Length
- Intelligence
- ...

Efficiency
- Virtual power Plant
- Waste heat recovery
- Combined heat and power
- ...

Innovation in storage
- Power-to-Gas
- Hybrid power plant
- eSolcar
- ...

Participation
- Public wind/solar/... parks
- Compensation
- ...

System integration and convergence
Potential of storage technologies

source: DVGW
Power to gas – integration of power and gas grids

- Kernenergie
- Kohle
- CO₂-Abtrennung
- Erneuerbare Energien, Wind

Strom

- Wasserstoff

- GuD-Kraftwerke
- Kraft-Wärme-Kopplung

Gas

- Erdgas
- Biogas
  - Gülle, NAWARO
  - Biomasse, Holz
- Synthetisches Gas
  (z.B. aus Kohle mit CO₂-Abtrennung)

Nutzung von elektrischer Energie und Wärme

source: DVGW
Hybrid power plant: **controlled** delivery of green power

**ENERTRAG Hybridkraftwerk**

Hybrid power plant (ENERTRAG AG)
Rural integrated energy solutions: The Feldheim Pilot

Intelligent power and heat network (Feldheim)
E-Mobility: The eSolCar-Pilot

e-SolCar
(BTU Cottbus)
Production of electricity from geothermal energy
Transmission Control Center (TCC) in Neuenhagen

power network of 50Hertz Transmission GmbH
Pilot „Smart Metering“ in Forst
Status – Energy strategy 2030

- Systematically enhancing our energy strategy
- Managing identified challenges
- Observe regulatory and market environment (e.g. new Federal energy concept, EU energy strategy and internal market regulation)
Moderation model of the “Energy Strategy 2030” process

**2010**
- Draft paper
- Version 1.x

**2011**
- Version 2.x

**2012**
- Version 3.x
- Final version

**extern**
- Dialogue with some 100 energy experts
- Organisations and boards
- Final government decision process
- Parliament

Intern

Parliament
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20. October 2011