Energy transition in Germany: wind energy and the role of social acceptance and citizen participation

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Outline

- The EnergyAgency.NRW
- German Energy Transition and Renewable Energies
- Fact & Figures Wind Energy in NRW
- Sample Wind Energy Projects in NRW
The EnergyAgency.NRW

Services

Networking

Consulting

Marketing Activities

Public Relations, Knowledge Management
North Rhine-Westphalia –

The European Centre of the Energy Sector

- 17.8 million inhabitants
- 34,000 km² in area
- GDP: 599.8 billion € (Germany No. 1, worldwide No. 19)
- 150 million consumer within a radius of 500 km

Energy sector in NRW (2013)

- 28% of German electricity production (175.2 TWh)
- 24% of German electricity consumption (144.7 TWh)
- 43,760 MW\textsubscript{el} installed power generation capacity
- No nuclear energy
- 9.1 % of electricity generation from renewable energies (15.9 TWh, doubled since 2005)
- 200,000 employees in energy sector (of whom 26,100 are in the area of renewable energies)

→ The “Energy Region No. 1” in Europe
Gross power production in Germany in 2015 (TWh*)

* Preliminary figures
** Regenerative part

Source: AG Energiebilanzen, as of: August 2016
Development of Share of Renewables in Germany

- Electricity: 27.8% in 2015
- Heat: 11.1% in 2015
- Mobility: 9.9% in 2015
- Total primary energy consumption: 5.4% in 2015

Source: BMWi, 6/2016
Energy Policy in Germany - Energy Transition

- Phaseout of nuclear energy by 2022
- Development of renewable energy (power, heat and transport sector)
- Less consumption of energy
- Increase of energy efficiency
- Development of new technologies as new source of growth and employment
- Reduction of carbon emissions
- Safeguard of energy security

→ The *Energiewende* is a long-term strategy based on public acceptance
Objective 2025 and 2035: Share of Renewables in Power Consumption

- **2013:** 25%
- **2025:** 40 to 45%
- **2035:** 55 to 60%

**Source:** BMWi based on Working Group on Renewable Energies-Statistics (AGEE-Stat)
Renewable Energy Source Act „EEG“

- 1990 introduction: 3.6 % RES → over 30 % in 2015 → successful instrument
- Since 2015 PV pilot auctions

**EEG 2017**

- 2017: switch from FIT to auctions for wind, PV (> 750 kW) & bioenergy (>150kW)
- 80% of the capacity volume by tenders
- Specific growth targets for wind as cap:
  - Onshore wind power: 2,800 MW / year ⇔ increase 2015: 3,500 MW
  - Offshore wind power: 15 GW by 2030
- Obligation of direct marketing for installations > 100kW → market premium support system
- FIT for small installation < 100 kW
- Garantied allocation for 20 years
Wind Energy Auctions

- 3 times in 2017
- Pay-as-bid, maximum price 7 ct/kWh
- Consideration of different wind conditions → better comparison of projects
- Project realisation time: 2 years
- No self-consumption allowed

Challenges:

- Cost reduction: different opinions from experts
- Diversity of market players: small players and citizen cooperatives could not bear the same risks like big companies which split the risk in different projects
  - Citizen cooperatives as driver of the energy transition
  - Citizen cooperative projects ensure higher acceptance
- Realization of growth targets → PV: only 1,450 MW in 2015 instead of 2,500 MW
Wind Energy in NRW in 2015

New installed capacity in 2015: 421.65 MW (No. 2 in Germany)
Total installed capacity: 4,080.32 MW (No. 5 in Germany)
Total number of installed plants: 3,172

Wind industry is an important economic factor:
- More than 16,500 employees in the wind sector (2013), in Germany 150,000
- Investment of €540 million in NRW in 2015
- Municipal tax revenues & income remain in the region

Source: www.wind-energie.de
Second highest new installation in Germany in 2016
High acceptance of renewable energy plants

Power generation in the neighbourhood is found to be good or very good...

<table>
<thead>
<tr>
<th></th>
<th>%</th>
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<tbody>
<tr>
<td>RE plants in general</td>
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<td>86</td>
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<tr>
<td>Solar parks</td>
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<tr>
<td>Wind energy plants</td>
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<td>Biogas plants</td>
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<td>Gas power station</td>
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<tr>
<td>Coal power station</td>
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<td>22</td>
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<td>Nuclear power plant</td>
<td>4</td>
<td>16</td>
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Approval of renewable energy rises with previous experience.

Source: Poll from TNS Emnid commissioned by the Renewable Energies Agency, 1,006 polled
As of: 8/2015
Citizen-owned installations: driver of the energy transition

- Boom: since 2006 over 800 new energy cooperatives (coops)
- Citizens are financially involved in almost every second installed capacity
  → democratic movement

Ownership of Renewables in Germany

- Energy providers: 9,144 (12.5%)
- Institutional and strategic investors: 30,230 (41.5%)
- Citizens and coops: 33,532 (46.6%)
- Individual owner: 18,362 (25.2%)
- Citizen energy coops: 6,687 (9.2%)
- Citizen as minority shareholders: 8,483 (11.6%)

Total installed capacity: 72.9 GW

Source: Trend Research/Leuphana 2013
Citizen-owned installations: regional added value

- High regional added value in mainly rural areas: construction, but operation & maintenance are even more important (long-term effects!)

→ Example: **2.5 MW wind turbine over 20 year operation period** brings 2.8 m € added value to a municipality (if installer and operator located in municipality) or 3.5 m € (if also produced in municipality)

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<tr>
<th>STEPS</th>
<th>in Mio. €</th>
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<tr>
<td>1st</td>
<td>Fabrication in the municipality</td>
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<td>2nd</td>
<td>Planning &amp; installation by companies located in municipality</td>
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<td>3rd</td>
<td>Operation &amp; maintenance by companies located in municipality</td>
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<td>4th</td>
<td>Operating company located in municipality</td>
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<td>Whole value chain</td>
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</table>
Best Practice – Municipality Saerbeck

NRW Climate Community of the Future

- Rural area with 7,100 inhabitants, around 2,000 jobs on site
- **Objective:** 100 % renewables by 2030 (already achieved!)
- 29 MW installed capacity (wind, PV, bioenergy, CHP)
- High citizen participation & high added value on a local level
- Investment: 70 millions € (8 billion YEN)

→ all investments assured by local people (municipality, coop, local firms & investors) and regional funding programs

→ Benefits remain in community
Best Practice – Citizen-owned wind farm Hilchenbach

Rothaarwind GmbH & Co KG

- 5 Wind turbines
- 87 citizens and municipality are shareholders
- Total invest: 15.5 Mio € (~ 2 billion Yen)
- Equity ratio: 18%
- minimum share: 3,000 € (min ~ 400,000 Yen) (average: 31,704 €) (average ~ 4,3 million Yen)
- Municipality also supported the project during the long planning phase

⇒ High acceptance of project & high added value on a local level
Best Practice - Windpark Hollich GmbH & Co. KG

- Goal: profit for a maximum of people & strengthen solidarity
- 19 wind turbines (29.5 MW), several construction stages (2001 – 2011)
- 8 shareholder, 217 limited partners, 55 landlords
- Investment: 33 millions € (~ 4.5 billion Yen)

Important aspects:

- Members (‘limited partners‘) of the area are preferred → capital remains in the municipality
- Involvement of residents: financial participation, voluntary regular bonus
- Rent for all owner of surface in the area of the turbine (not only the used surface)
- Events like a „Wind party“, donations or non-interest-bearing loan for associations

→ Higher acceptance of projects & high added value on a local level
EnergyAgency.NRW: Supporting Community Power Projects

Network „Community Power Projects and Energy Cooperatives“

Services

- Website:
  - Collection of best practice examples in NRW
  - Background information and news
- Events: Conferences, Workshops, yearly meetings for all members + regular regional meetings
- Training courses (organised with partners)
- Consulting for community power start-ups
Thank you for your attention!

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