Community Wind-Farms in Germany: Status Quo and Forecast

Conférence sur l’éolien participatif en France et en Allemagne / Konferenz zu Bürgerwindparks in Deutschland und Frankreich
Philipp Vohrer, Managing Director, German Renewable Energies Agency
Paris, 3 juillet 2014
The Renewable Energies Agency: the German information platform, jointly funded by government and industry

Federal Ministries
- Federal Ministry for the Environment, Nature Conservation and Nuclear Safety
- Federal Ministry of Food, Agriculture and Consumer Protection

Industry
- renewable organisations
- more than 100 companies

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The German Energy Transition: So far restricted to the power sector

Share of Renewable Energies in Germany's Energy Market from 1998 to 2013

Minimum targets 2050:
- 80% RE
- 60% RE
- „carbon-free“

Source: BMU; as of 03/2014

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Driver of RE power in Germany:
The German Renewable Energy Law “EEG”

Core principles of the EEG:

• guaranteed **connection** for Renewable Energy (RE) electricity plants to the grid

• guaranteed priority **purchase and transmission** for RE power by the grid system operators

• guaranteed **fixed feed-in tariffs** (FIT) for 20 years from the start of operations

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New types of involvement and commitment in the energy sector come into being

- Community ownership models bring together local people’s ecological and economic interests
- Community ownership („Bürgerenergie“) means:
  - Citizens play active role in municipal energy policy
  - Joint financial, conceptual + organizational input
  - Benefit of income is key to local acceptance of RE

Energy Co-operatives in Germany: A Success Story
Over the last few years the number of energy co-operatives has increased sharply.

Source: Klaus Novy Institut; as of 01/2014
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Citizens - the biggest investors on the RE market

- FIT system has led to **democratization** of energy production
- Almost **half of RE capacity** installed in Germany is owned by private individuals, including farmers
- Successful principle: **Community ownership** – local energy for local people
- Economic opportunity also for areas with little growth

**Renewable Energy in the Hands of the People**
Ownership distribution of installed RE capacity for power production 2012 throughout Germany.

- Private Individuals: 35%
- Project Firms: 14%
- The "Big Four" Power Providers: 5%
- Other Power Providers: 7%
- Investment Funds / Banks: 13%
- Industry: 14%
- Farmers: 11%
- Others: 1%

Total: 72,900 MW<sub>el</sub>

Source: trend research; as of: 04/2013

Onshore wind energy – half of installed capacity is community-owned

Installierte Leistung Windenergie (Onshore) nach Eigentümergruppen in Deutschland 2012 in MW (gesamt 30.854 MW)

- Institutionelle und strategische Investoren: 12.160 (39,4%)
- Bürgerenergie im weiteren Sinne: 15.547 (50,4%)
- Einzeleigentümer: 1.295 (4,2%)
- Bürgerenergiegesellschaften: 6.301 (20,4%)
- Bürgerbeteiligungen, überregional, Minderheitsbeteiligung: 7.951 (25,8%)

Bürgerenergie im engeren Sinne: 7.596 (24,6%)

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Community-owned RE create local added value (total amount from RE in Germany 2012: 11 bn. Euro)
RE are highly accepted – particularly among respondents with prior experience

For energy production in the neighbourhood is assessed as good or very good...

- Renewables generally: 73%
- Solar energy: 76%
- Wind energy: 55%
- Biogas: 42%
- Natural Gas: 14%
- Coal: 6%
- Nuclear energy: 4%

*With prior experience

Source: Survey by TNS Emnid 2013, 09/2013
(Netto-)Investitionen in Windenergie (Onshore) nach Eigentümergruppen in Deutschland 2012 in Mio. Euro (gesamt 2.566 Mio. Euro)

- Institutionelle und strategische Investoren: 1.047,2 Mio. Euro (40,8%)
- Bürgerenergie im weiteren Sinne: 667,6 Mio. Euro (26,0%)
  - Einzeleigentümer: 112,7 Mio. Euro (4,4%)
  - Bürgerenergiegesellschaften: 245,4 Mio. Euro (9,6%)
  - Bürgerbeteiligungen, überregional, Minderheitsbeteiligung: 309,6 Mio. Euro (12,1%)

- Energieversorger: 851,7 Mio. Euro (33,2%)

Bürgerenergie im engeren Sinne: 358,1 Mio. Euro (14,0%)

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Forecast: Development of Community RE

Recently adopted by German parliament:

**Amendment of Renewable Energy Sources Act („EEG 2014“):**
- more „market-based“ policies to increase cost-effectiveness
- RE power is required to be traded on European Energy Exchange (EEX) and thus no longer distinguishable from conventional power
- „corridor“ quotas of about 2.5 GW per year for onshore wind and solar
- medium term (2017): replacement of FIT system by competitive bidding system

**Critics:**
- **Electricity prices will rise**, development of RE will slow down for lack of investment security
- **Disadvantage for citizens** and small enterprises: Cannot take risk without long-term security of FIT
- Public acceptance declines, too...?
Example: Niebüll, Schleswig-Holstein

- 9,300 citizens
- 5 wind turbines (Vestas V112, 3 MW, 85 m hub height, power supply for 13,000 households)
- 90% of regional wind farms are community-owned
- Community wind farm; 10 landowners invested 40% of required equity ratio, citizens (only!) and municipality of Niebüll invested 60% by share certificates of 500 Euro
- Wilfried Bockholt, Mayor of Niebüll: „Participation leads to acceptance“
Example: Mühlenfließ-Schlalach, Brandenburg

- 1,000 citizens
- 16 wind turbines (ENERCON E-82/E2, 2.3 MW, hub height 138 m, power supply for 18,000 households)
- Structurally weak area, no financial potential for community-owned wind farm
- Wind farm operator ENERCON includes 130 landowners (directly or indirectly affected) in lease contract
- About 50,000 Euro/y of wind farm's profit feeds municipal foundation (benefit for local infrastructure, sports clubs etc.)

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Example: Ursensollen, Bavaria

- 3,700 citizens
- 2 wind turbines in forest area (Nordex N117, 2.4 MW, hub height 141 m, power supply for 4,000 households)
- 1 wind turbine is citizen-owned, 1 is owned by municipality („Kommunal GmbH“)
- Franz Mädler, mayor of Ursensollen: „Local produced power should be consumed locally“
- Focus on local added value
Thank you for your attention!

RENEWABLES IN GERMANY: 371,000 JOBS IN 2012

The German economy profits by the rise of renewable energies. More than 100,000 people work in the wind and bioenergy sector respectively, about 60,000 in the solar energy sector. The expansion of the industry goes hand in hand with more decentralized power production and positive economic effects for the local communities.

Infographic: Job structure of the Renewable Energy branch

Philipp Vohrer
p.vohrer@unendlich-viel-energie.de
ph.: +49/30/200535-50

www.renewables-in-germany.com
Germany’s Power Mix in 2013

Renewable Energies contributed 152.5 billion kilowatt hours or 24.0 percent to gross electricity production. The share of renewables in electricity consumption increased to 25.4 percent, which equaled 599.8 billion kilowatt hours.

- Natural Gas: 66.0 bn kWh (10.4%)
- Hard Coal: 124.0 bn kWh (19.5%)
- Nuclear Energy: 97.0 bn kWh (15.3%)
- Lignite: 162.0 bn kWh (25.5%)
- Renewable Energies: 152.5 bn kWh (24.0%)
- Photovoltaics: 30.0 bn kWh (4.7%)
- Hydro Power: 21.2 bn kWh (3.3%)
- Biomass: 47.9 bn kWh (7.6%)
- Wind Power: 53.4 bn kWh (8.4%)

Source: AG Energiebilanzen; as of 05/2014  
www.renewables-in-germany.com
Forecast of Levelized Costs of Electricity from Renewable Energies in 2030

Cent per kilowatt hours

*heat extraction not taken account of

Source: Fraunhofer ISE; as of: 11/2013
Investment in RE installations 2000-2013

Sources: federal government, AGEE-Stat; as of 05/2014

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# Added Value Generated by Renewable Energies in Germany

**2012 figures**

<table>
<thead>
<tr>
<th>Energy Source</th>
<th>Value (billion Euro)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Photovoltaics (Electricity)</td>
<td>7.1</td>
</tr>
<tr>
<td>Windpower</td>
<td>4.5</td>
</tr>
<tr>
<td>Biofuels</td>
<td>2.1</td>
</tr>
<tr>
<td>Bioenergy (Electricity)</td>
<td>1.5</td>
</tr>
<tr>
<td>others (Heat)</td>
<td>0.8</td>
</tr>
<tr>
<td>Bioenergy (Heat)</td>
<td>0.5</td>
</tr>
<tr>
<td>Solar Heating</td>
<td>0.4</td>
</tr>
<tr>
<td>Hydropower</td>
<td>0.1</td>
</tr>
</tbody>
</table>

Source: IÖW; as of 08/2013

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Renewable energies: 378,000 Jobs in 2012

Number of jobs according to sector

- Solar energy: 100,500 (27%)
- Wind energy: 117,900 (31%)
- Bioenergy: 128,900 (34%)
- Geothermal energy: 13,900 (4%)
- Hydro energy: 7,200 (2%)
- Public/Non-profit sector: 9,400 (2%)

Total: 377,800 jobs

Sources: DLR/DIW/ZSW/GWS/Prognos, as of: 3/2013

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The fossil fuel/nuclear sector employs some 230,000 people in Germany

Source: BMU

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Repowering offers prospects for further expansion

before repowering

Windfarm Simonsberg (Schleswig-Hostein)

Total capacity: 5.5 MW
Total electricity generation: 14.4 million kWh

after repowering

15 MW
48 million kWh

Source: BWE

Service and repowering of existing windfarms has become an important employment segment in the renewables sector

Potential of repowering in Germany: doubling capacity and tripling energy yield with fewer windmills

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Phase 1
Planning the wind farm
- Site assessment
- Reserving land
- Site analysis and planning
- Planning for grid connection
- Feasibility study
- Manufacturer selection
- Permitting for BImSchG

Phase 2
Financing
- Ca. 20% equity (citizens)
- Ca. 80% borrowed capital (banks)
(Share certificates issued in rounds)

Phase 3
Project implementation
- Roadmap for construction
- Coordination with property owners
- Finalization of warranties etc.

Phase 4
Plant management
- Technical management
- Business management
(These can be handled by or shared with citizenry)

Citizens have input into the project’s design and organization at all levels