Challenges and Perspectives for the Energy Transition in Germany and in Europe

Rainer Hinrichs-Rahlwes

BEE
German Renewable Energy Federation

EREF
European Renewable Energies Federation

Board Member Vice-President

Global Renewable Energy Solutions Showcase – @COP23 – Bonn, 07 Nov 2017

We deliver clean energy. 100 percent.
German Renewable Energy Federation

We are the umbrella organization of the German renewable energy sector. Our members are 49 associations and enterprises with 30,000 individual members and 5,000 companies. Our objective: 100 percent Renewable Energy
About EREF

- Federation of associations from EU Member States, working in the sector of energy produced from renewable sources
- Voice of Independent Producers of Energy from Renewables
- Advocating level playing field and non-discriminatory access to energy markets
- Cooperating with national and European RE-associations for a stable and reliable policy framework in Europe and beyond
- Reaching out to international organisations and networks (e.g. IRENA, REN21, IEA, go100%re ...)

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European Renewable Energies Federation
In Paris, the world has committed to ambitious greenhouse gas reduction targets in order to limit devastating global warming.

Objective: Keep average global temperature well below 2°C above preindustrial levels and to strive for keeping it below 1.5°C.

German Parliament (Bundestag) ratified Paris Agreement – with unanimous consent of all represented parties. Vast majority in European Parliament.
I. German *Energiewende*
II. European Targets & Frameworks
III. The Way Forward
IV. Instead of Conclusions
German citizens support Renewables

95 percent of Germans support increased deployment of Renewable Energy

Increased use and deployment of renewable energy is ...

- Very or extremely important: 65%
- Important: 30%
- Less or not at all important: 4%
- I don’t know, no answer: 1%

08.08.2017  I  Quelle: Umfrage von Kantar Emnid (1.015 Befragte) im Auftrag von AEE07/2017
### Sustainability and climate protection are the most important advantages of renewable energy

Which statements do you agree with?  
(Multiple answers possible)

<table>
<thead>
<tr>
<th>Statement</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>... contributes to a more secure future for our children and grandkids.</td>
<td>75%</td>
</tr>
<tr>
<td>... protects the climate.</td>
<td>72%</td>
</tr>
<tr>
<td>... makes Germany more independent from imports.</td>
<td>62%</td>
</tr>
<tr>
<td>... gives citizens a chance to participate in energy supply matters.</td>
<td>59%</td>
</tr>
<tr>
<td>... leads to more competition in the energy sector.</td>
<td>47%</td>
</tr>
<tr>
<td>... strengthens small and medium sized businesses.</td>
<td>43%</td>
</tr>
<tr>
<td>... ultimately lowers the costs for consumers.</td>
<td>35%</td>
</tr>
</tbody>
</table>

Source: Poll from Kantar Emnid commissioned by the Renewable Energies Agency, 1,016 polled  
As of: 7/2017

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High approval of renewable energy plants near one's own home

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

<table>
<thead>
<tr>
<th>Power Plant Type</th>
<th>Approval</th>
<th>Previous Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>RE plants in general</td>
<td>65%</td>
<td></td>
</tr>
<tr>
<td>Solar parks</td>
<td>72%</td>
<td>94%*</td>
</tr>
<tr>
<td>Wind energy plants</td>
<td>57%</td>
<td>69%*</td>
</tr>
<tr>
<td>Biomass plants</td>
<td>38%</td>
<td>51%*</td>
</tr>
<tr>
<td>Gas power station</td>
<td>20%</td>
<td>50%*</td>
</tr>
<tr>
<td>Nuclear power plant</td>
<td>6%</td>
<td>5%*</td>
</tr>
<tr>
<td>Coal power station</td>
<td>5%</td>
<td>14%*</td>
</tr>
</tbody>
</table>

*Those polled with said plant already in their neighbourhood

Approval of renewable energy increases with previous experience.

Source: Poll from Kantar Emnid commissioned by the Renewable Energies Agency, 1,016 polled
As of: 7/2017

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RENEWABLE ENERGY AGENCY
renewables-in-germany.com
The energy transition follows a transparent, long-term strategy with specific targets.

### 2020 – 2030 – 2040 – 2050 Energiewende Targets

<table>
<thead>
<tr>
<th>Climate</th>
<th>% greenhouse gas reduction (vs. 1990)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2020</td>
</tr>
<tr>
<td></td>
<td>-40</td>
</tr>
</tbody>
</table>

| Renewable Energies | % gross electricity consumption |
|                   | 2020       | 2025       | 2030       | 2035       | 2040       | 2050       |
|                   | 35         | 40 to 45   | 50         | 55 to 60   | 65         | 80         |

| Renewable Energies | % gross final energy consumption |
|                   | 2020       | 2025       | 2030       | 2035       | 2040       | 2050       |
|                   | 18         | 30         | 45         | 60         |

| Energy Efficiency | % primary energy consumption (vs. 2008) |
|                  | 2020       | 2025       | 2030       | 2035       | 2040       | 2050       |
|                  | -20        | -30        | -40        | -50        |

| Energy Efficiency | final energy productivity (vs. 2008) |
|                  | 2020       | 2025       | 2030       | 2035       | 2040       | 2050       |
|                  | +2.1% p.a. (2008-2050) |

| Energy Efficiency | building renovation |
|                  | doubling of renovation rate: 1% → 2% p.a. |

| Energy Efficiency | % transport energy consumption (vs. 2008) |
|                  | 2020       | 2025       | 2030       | 2035       | 2040       | 2050       |
|                  | -10        | -20        | -30        | -40        |

Target settings in line with Paris Agreement?

Energiewende – Implementation

Share of renewable energy in Germany's final energy consumption 1990-2016

- Electricity
- Heat
- Transport

Final energy consumption (2000-2015)

Source: BMWi / AGEE-Stat
as of: 3/2017
Shares of Renewable Energy in 2015 and 2016

Renewable Energy share slightly decreasing from 2015 to 2016: Decrease in Heating and Transport is stronger than growth in electricity sector.
If the trend continues, Germany will not reach the national 2020 target, nor the lower 18%-target, which is binding according to EU Renewable Energies Directive.

**Germany will miss 2020 RE target of 18%**

**Germany will miss 2020 GHG-reduction target of -40%**
Implementing the Paris Agreement

→ Act now
→ Accelerate Renewables deployment
BEE’s suggestions for the next government coalition:

1. **Accelerate RE deployment**: Energy policies need to be adapted to the Paris Agreement’s climate targets.
2. **Legally binding phase out of coal**: Clear roadmap for the reduction of fossil energy sources.
3. **Introduce CO₂-tax/levy for the electricity and heating sectors**: creating a level playing field in a revenue neutral way.
4. **Reduce financial burden for citizens**: industry privilege covered by the federal budget (instead of rate-payers) will reduce EEG-surcharge (and thus electricity prices).
5. **Reduce inflexible fossil residual load**: implementing priority feed-in for renewable energy
6. **Enable sector coupling and support storage**: Remove barriers and create economic incentives.
7. **Adjust grids and grid operation to future needs**: Improve grid monitoring and load forecasts in order to use existing infrastructure more wisely.
8. **Implementing mobility transition**: The mobility sector needs to be consequently shifted towards Renewable Energy. All new cars CO₂-free or CO₂-neutral by 2030.
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“The goal of a resilient Energy Union with an ambitious climate policy at its core is to give EU consumers - households and businesses - secure, sustainable, competitive and affordable energy. Achieving this goal will require a fundamental transformation of Europe's energy system”.

“The EU's climate policy is based on an EU-wide carbon market [...] and an energy policy to make the European Union the number one in renewable energy”.

All scenarios in line with 2050-GHG-reduction targets have high RES-shares in GFEC (57-75%) or dominant RES in electricity (61-86%) (EC Energy Roadmap 2050)
Europe’s 2020 Targets & Framework

- At least 20% Renewable Energy in GFEC
- Differentiated binding national targets
- Indicative trajectory for each MS
- At least 10% Renewables in transport (EU & MS)
- At least 20% Efficiency Increase
- At least 20% (30%) GHG-Reduction
- Legal framework to secure implementation:
  * National Renewable Energy Action Plans
  * Biannual reports
  * Cooperation mechanisms: MS sharing efforts
  * Infringement in case of non-compliance
On Track to EU 2020 RES Target?

“...as the trajectory becomes steeper in the years ahead, efforts to keep on track will need to intensify ...”

Sectors performing differently: RES-E

ii. Electricity

“... well ahead of its aggregated NREAP trajectory ...”

Really?

Figure 4: EU-28 renewable electricity production by source (source: EUROSTAT, Öko-Institut)

Member States on Track to 2020?

Figure 6: Member States current progress towards their 2013/2014 and 2015/2016 indicative RED targets. (source: Öko-Institut, EUROSTAT)

Towards 2030: Reliable framework and ambitious targets?

- **2030 framework and targets** (Council Conclusions October 2014)
  - Energy supply security increasingly important
  - Pivotal role of Energy Efficiency (EE)
  - No national binding targets for RES & EE
  - Robust governance (still to be refined)
  - at least **40% “domestic” GHG-Reduction**
  - at least **27% RES and Efficiency** at EU-level
  - **2020 targets** to be fully implemented

- Legislative process for 2030 targets and framework kicked off by “Clean Energy for all Europeans Package” (Winter Package 30-11-2016)

- **Consensus** between European Council and European Parliament necessary before end of parliamentary term
Winter Package: key points


- **Problematic points:**
  - too low European RES- and EE-targets (27% RES = BAU)
  - no (binding) national targets (what if?)
  - technology neutral auctions required as a rule for RE support
  - insufficient de minimis (500/250 kW, <15% priority)
  - removal of priority access and priority dispatch
  - no effective carbon pricing
  - no phase out plan for fossil and nuclear energy

- **Some of the positive points:**
  - aiming at flexible markets fit for high shares of VRE
  - supporting consumers und self-consumption
  - incentivising decentralised and community power
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Re-establish reliable framework!

- Significantly more **ambitious EU target** (45% RES by 2030) and robust **governance framework** (NCEPs) for target achievement → adjust ambition to Paris Agreement!

- Meaningful benchmarks for **national contributions and trajectories** to 2030 EU-target (**binding national targets**)!

- **National support** systems to be continued after 2020 – including priority access and dispatch where needed

- **Differentiated support** according to technologies, size and ownership of installations remains necessary

- Regular **monitoring and effective instruments** for securing target achievement to be included in the legal framework now – not only in 2025!
**Overall objective:** participation of renewables in **undistorted markets** – including intraday, balancing and system services

**Key 1:** remove **subsidies** for conventional and nuclear energy and develop phase-out strategies for non-RES energy

* Meaningful **carbon pricing** (carbon tax? ETS?) is overdue

**Key 2:** facilitate supply side and demand side **flexibility** (tariff structure, shorter/close to real-time gate closure times ...)

* Facilitate **self-consumption** for industry, cooperatives, private households and **sector coupling** (power-to-x, storage ...)

* Facilitate market participation for millions of **decentralized prosumers**, embrace new **smart business-models**

* Adjust systems and markets to high and **increasing shares of variable and flexible Renewables**
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Necessary reduction paths for CO$_2$ emissions in the EU after 2020

Source: IPCC 2014, Öko-Institut 2017, own calculations by BEE as of: 3/2017

Infographic made by: RENEWABLE ENERGIES AGENCY

THE GREEN ENERGIEWENDE SOFA @greensofa_betd
Towards 100% Renewable Energy

- Paris Agreement requires full decarbonisation of energy sector by 2050
- All serious compliance scenarios see Renewables as dominant energy sources by 2050 the very latest
- Energy Efficiency can significantly accelerate the transition
- Subsidies for coal and nuclear could delay the transition
- Renewables are the lowest cost options in more and more regions – even in distorted markets.
- Sector coupling – i.e. integration of power, heating & cooling and transport – will accelerate system change towards renewables
- Smart grids, grid extension and enhancement are key facilitators – on transmission and on distribution level
- Demand response and storage will become more and more relevant
- A fully Renewables and Efficiency based energy system is the smartest and cheapest option to replace the dirty and risky system of the past.
Thank you for your attention!

Striving for a truly sustainable, renewables based energy system

rainer.hinrichs@bee-ev.de

Invalidenstraße 91
D-10115 Berlin
Tel +49 30 27581700
Fax +49 30 275817020
www.bee-ev.de

Avenue Marnix 28
B-1000 Brussels
Tel. +3222044400
www.eref-europe.org

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We deliver clean energy. 100 percent.