



Federal Ministry
for Economic Affairs
and Energy

2017 Amendment of the Renewable Energy Sources Act and Opening Auctions for other EU-States -

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Key policies in place for the energy transition

10-Point Energy Agenda

1. Renewable energy, Renewable Energy Sources Act

2. European Climate and Energy Framework 2030/ETS

3. Reform of European emissions trading

4. Electricity market design

5. Efficiency strategy

6. Buildings strategy

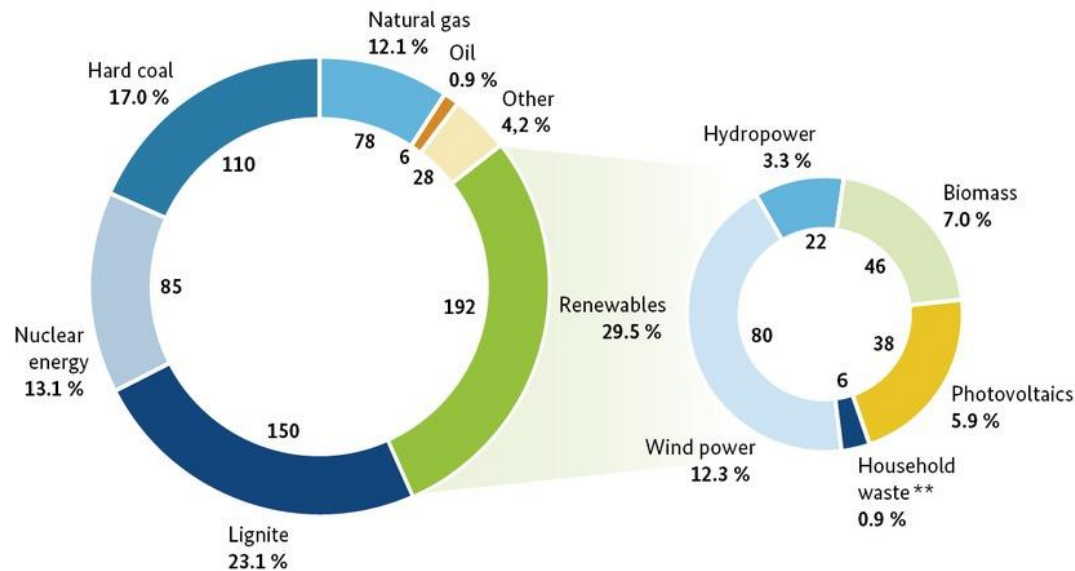
7. Transmission grids

8. Distribution grids

9. Monitoring the energy transition

10. Energy transition platforms

RES Electricity Share in Germany in 2016



* Preliminary figures ** Regenerative part

- 2016: total 650 TWh, renewables share: 192 TWh (30%)
- Renewables have overtaken each conventional source to become the largest electricity source in just ten years.

Objective of the revision EEG 2017

We are switching the funding for renewable energy from prices fixed by government to prices set by **competitive auctions**.



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Overview

1. Guiding principles
2. Tendering scheme in detail
3. Stakeholder diversity
4. Cross-border auctions

1. Guiding Principles

The revision is based on the following **three principles**:

1. The **deployment corridor** for renewable energy will be **adhered to**:
 - **40 - 45% Electricity generation by RES until 2025**
 - **55 - 60% Electricity generation by RES until 2035**
2. Future RES expansion will be continuously ongoing, cost-efficient and grid compatible.
3. All stakeholders will have a fair chance in the auctions.
Stakeholder diversity will be maintained.

2. Tendering scheme in general

Technology specific, but common features:

- From 2017, funding will be auctioned for onshore wind energy, offshore wind energy, photovoltaics, biomass.
- Tendering of **total amount of installed capacity (MW) = auctioned volume**
- **Bids for floating market premium (ct/kWh)**
- Bids will be accepted, starting with the lowest until the amount of capacity that is being auctioned is reached. In principle, the amount of funding corresponds to the individual bid (pay as bid)
- Market premium = fixed statutory tariff of the respective renewable energy plant minus its technology-specific monthly market value (ex post)
- Exemptions: Pilot wind energy plants (125 MW/yr), hydro and geothermal power plants, plants ≤ 750 kW and new installations using biomass ≤ 150 kW

2. Tendering scheme in general

| Onshore Wind | PV | Biomass |
|---|--|--------------------------------------|
| 2017: 1. May 800 MW 1. Aug. } 1000 MW 1. Nov. } each | 2017 - 2020: 1. Feb. } 1. June } 200 MW 1. Oct. } each | 2017 to 2019: 1. Sept. 150 MW |
| 2018 to 2019: 2800 MW 1. Febr. } 1. May } 700 MW 1. Aug. } each 1. Oct. } As of 2020: 2900 MW | | 2020 to 2022: 1. Sept. 200 MW |

2. Tendering scheme in general

| Phase 1 | Phase 2 | Phase 3 |
|---|---|--|
| Federal Network Agency : Announcement | Federal Network Agency : assessment of tender responses <ul style="list-style-type: none">• Bid bonds• Sorting• Awards | Investor: <ul style="list-style-type: none">• Realisation within the period prescribed• Identification of reference value |
| Investor: <ul style="list-style-type: none">• Bidding• Complying with requirements of prequalification | <ul style="list-style-type: none">• Publication and information of bidders | <ul style="list-style-type: none">• Penalty in case of no realisation (bid bond not returned) |

2. Tendering scheme: *Onshore Wind*

- Prequalification: Approval pursuant to Federal Immission Control Act
- Bid bond: 30 €/kW or bank guarantee
- Realisation period: 30 months
- Maximum price: 7 ct/kWh at 100% quality site according to the single-tier reference revenue model; as of 2018: average awarded price plus 8%
- Awarded bid tied to an approved plant (site-related)

2. Tendering scheme: *Offshore Wind*

- Target up to 2030 : 15 GW (accumulated North and Baltic sea)

| Transitional phase (EEG 2014) until 2020 | Transitional phase 2021 to 2025 applied for existing projects in Zone 1 and 2 North Sea plus Baltic Sea | Central Model from 2026 |
|---|--|------------------------------------|
| Commissioning by end of 2020, if an unconditional acceptance for grid access or an allocation of capacity is presented; granting of statutory feed-in tariff pursuant to EEG 2014 | <u>Auctions:</u> April 2017/2018 1550 MW each <u>Commissioning:</u> 2021 – 2022: 500 MW per year; [2021: Baltic Sea only!] | 840 MW per year (700-900 MW) |
| | 2023 – 2025: 700 MW per year | |

2. Tendering scheme: **Offshore Wind**

Transition phase 2021 to 2025:

- Deadlines April 2018/2019 about **3.100 MW in total grid connection capacity** for advanced projects
- Maximum price: 12 ct/kWh; Bid bond: 100 €/kW
- Underbidders have the “right for admittance” to the central model from 2026 in case of surrender of data

From 2026:

- The **central ‘Danish’ target model** will be introduced for **offshore wind**
- Area Development Plan 2019 is the focal planning instrument
- Government examines in advance the sites to be auctioned for wind farms. This ensures optimal dovetailing with the grid connections.
- First auction according to the central model: 1. Sept. 2021; bid bond: 200 €/kW

3. Tendering scheme: **Photovoltaics**

- PV installations > **750 kW**:
 - Ground mounted PV installations (conversion areas, close to motorways)
 - Big Rooftop installations
 - PV installations installed on other physical structures (e.g. landfills)
 - “Opening clause for Federal States”: In order to achieve more competition in auctions, Federal States can authorize either the use of arable or grass land for installing PV systems in certain regions
- Volume: max. 10 MW / project, Maximum price: 8,91 ct/kWh
- Transfer to other site possible but with discount
- Realisation period: 24 months, Bid bond: 50 €/kW
- Prequalification: admission by local authorities and/or area development plan

2. Tendering scheme: **Biomass**

- **New installations < 150 kW** receive statutory feed-in tariff (13 – 23 ct/kWh)
- **Existing installations** (including those < 150 kW) can take part in the auctions in order to receive **10-year follow-up funding**, provided that they generate electricity in a flexible and demand-based manner.
- Bid bond: 60 €/kW; Realisation period: 24 months
- Maximum price for new installations: 14,88 ct/kWh;
Maximum price for existing installations: 16,9 ct/kWh
- Prequalification: Approval
- Flexibility Obligation: Biogas plants will only be granted funding for half of the hours of a year, to encourage these plants to generate electricity at times when the wholesale price is high as little wind and sun is available and **demand is high.**

3. Stakeholder diversity

- Objective: Maintaining a **high level of stakeholder diversity**
- This is the intention behind the **750 kW de minimis threshold**
- This is also the aim of the **simple and transparent auction design**
- **Special rules for citizens' energy projects:**
 - Companies consisting of at least ten private individuals, with the majority of voting rights held by local residents.
 - Municipalities will be given the opportunity to contribute up to 10 % of the investment.
 - No approval under the Immissions Act is required, only proof that the site is available and the presentation of a certified wind survey.
 - They will not be awarded funding based on the price of their bid, but on the price of the highest bid which won funding.

4. Results of PV Pilot auction 2015 - 2017

- 7 rounds as far
- Auctioned volume about 150 – 200 MW per round
- Bidden volume were 3 – 6 times higher than the tendering volume : important for competition
- Awarded price has fallen from 9,17 ct/kWh in the 1st round to 6,58 ct/kWh at least
- Realisation quote in the first rounds: approx. 70%

4. Background PV Market

- Installed capacity of PV in total in Germany: 41 GW;
- Feed- Tariffs < 750 kW (degression rate: 0 %) :

| | < 10 kW | < 40 kW | < 1.000 kW | Ground-mounted |
|----------|--------------|--------------|--------------|----------------|
| EEG 2017 | 12,70 ct/kWh | 12,36 ct/kWh | 11,09 ct/kWh | 8,91 ct/kWh |

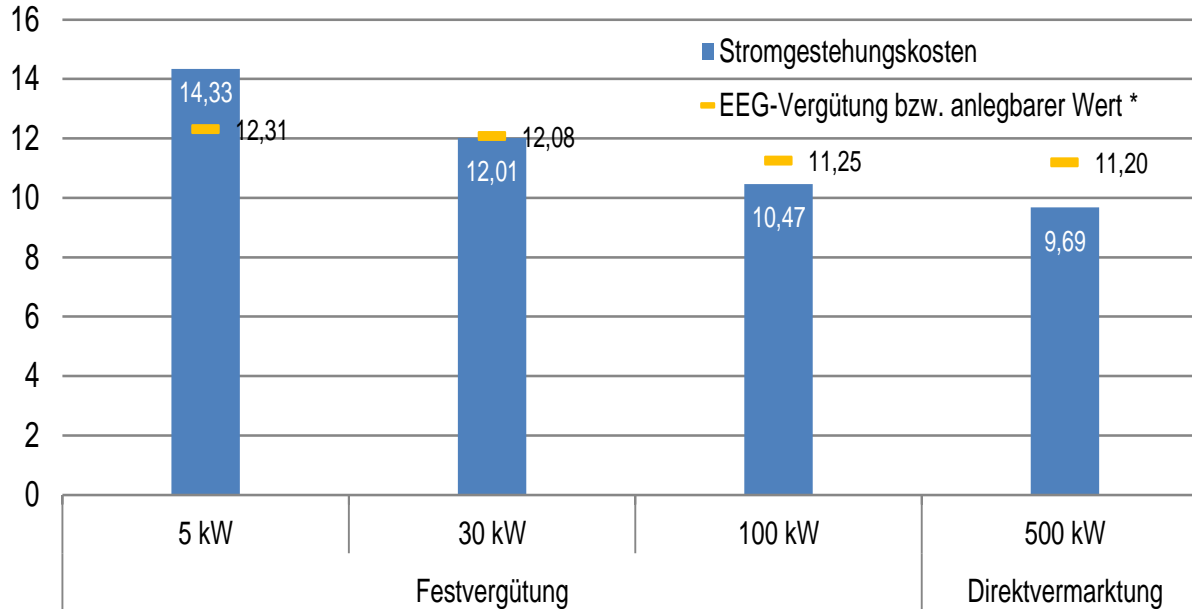
- Installed capacity - corridor: 2.500 MW / year

| 2012 | 2013 | 2014 | 2015 | 2016 |
|--------|--------|--------|--------|--------|
| 7,6 GW | 3,3 GW | 2,0 GW | 1,4 GW | 1,5 GW |

4. Background PV Market

- Feed-in tariffs < LCOE for 5 kW plants
- LCOE < feed-in tariffs for 100 – 500 kW plants

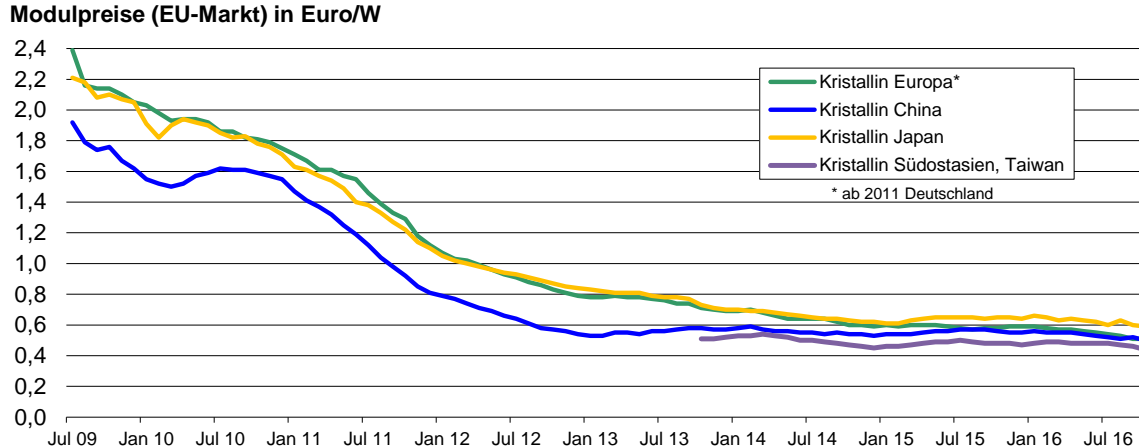
Stromgestehungskosten bzw. Vergütung in ct/kWh



* einschl. Managementprämie

4. Background PV Market

- Installed capacity of PV in total worldwide: 50 GW (2015)
- Production capacity: around 75 – 90 GW \Rightarrow over-capacities are increasing \Rightarrow prices reduction around 20% in last month
- China: 15 GW PV in 2015; 20 GW in first half of 2016 (34 GW in total)



5. Cross-border support: background

- In the case of cross-border support /opening of support schemes , support is paid to installations located in other Member States
- Key goals:
 - Regional integration of national energy policies
 - EU compatibility of national support schemes
 - Joint learning curve and alignment of support schemes
 - Using regional synergies (e.g. diversification of RES)
 - More competition in auctions
- Germany will open up support for 5% of yearly new installed renewable capacity to installations in other Member States from 2017 onwards (ca. 300 MW per year)

Basic Requirements



Cooperation
agreement

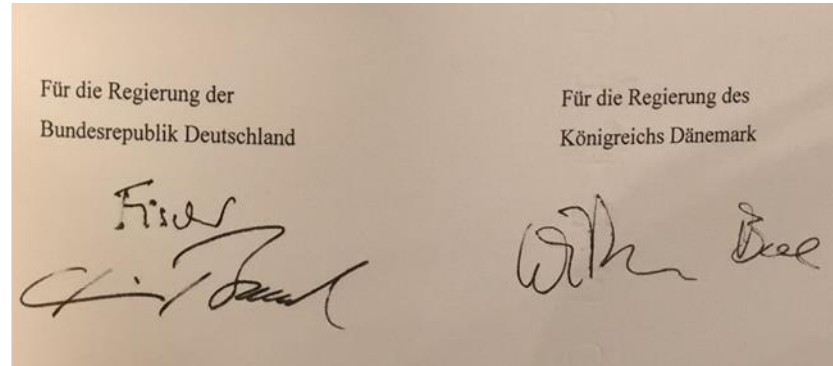


Reciprocity



„Physical“ Import

Cooperation pilot with Denmark



- Cooperation agreement for mutually opened auctions for ground mounted PV installations signed in July 2016
- First cooperation of its kind
- German and Danish opened auctions conducted in 4th quarter of 2016
 - Volume of German auction: 50 MW, fully opened for installations in Denmark
 - Volume of Danish auction: 20 MW, of which 2.4 MW were opened for installations in Germany

Results of the German opened pilot auction with Denmark

| | |
|----------------------------------|--|
| Bidding deadline | 23.11.16 |
| Auctioned volume | 50 |
| Bidden volume | 297 MW |
| Successful bids (awarded volume) | 5 bids with 10 MW each, all successful projects located in Denmark |
| Ø awarded price | 5,38 ct/kWh |
| Price mechanism | Uniform |

Outlook

1. Extension of cross-border support to onshore wind (pilot phase: PV only)
 - Substantially higher volumes than in pilot phase (5% of yearly new installed capacity correspond to ca. 300 MW)
 - Entry into force of revised ordinance for cross-border support foreseen for 2nd quarter of 2017 für wind onshore and PV
2. Ordinance for technology-neutral pilot tender about 400 MW/year (2018-2020)
3. Ordinance for Innovation pilot about 75 MW/year (2019-2020)

Thank you for your attention.

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