KfW Financing of Renewable Sources of Energy

EUFORES Annual High-Level Experts Conference

Dr. Dominik Bach
Brussels, 18.10.2017
1. KfW overview and the German context
More than 65 years of KfW
Financing with a public mission

- Promotional bank of the Federal Republic of Germany
- Established in 1948 as Kreditanstalt für Wiederaufbau
- Shareholders: 80% Federal Republic, 20% federal states
- Headquarters: Frankfurt am Main
- Branches: Berlin, Bonn and Cologne
- Representative offices: about 80 offices and representations worldwide
- Balance sheet total 2016: EUR 507.0 billion
- Financing volume 2016: EUR 81.0 billion
- 6,104 employees (2016)
- Best long-term rating: Aaa/AAA/AAA

1) The average number of employees including temporary staff but without members of the Executive Board and trainees
A bank with a wide array of functions

**Domestic promotion**

**We promote Germany**
- Mittelstandsbank
  - Promotion of SMEs, business founders, start-ups, energy efficiency, use of renewable sources of energy
- Kommunal- und Privatkundenbank/Kreditinstitute
  - Promotion of housing construction and refurbishment, improved accessibility and education
  - Financing of municipal infrastructure and global loans

**International business**

**We support internationalisation**
- KfW IPEX-Bank
  - International export and project finance

**We promote development**
- KfW Development Bank, DEG
  - Promotion of developing and transition countries

**Promotion of environmental and climate protection (esp. RES & EE)**

- **KfW**
  - 26%
  - EUR 21.4 bn (in 2016)
- **KfW IPEX-Bank**
  - 38%
  - EUR 33.7 bn (in 2016)
- **KfW Development Bank, DEG**
  - 26%
  - EUR 16.1 bn
  - 10%
  - EUR 8.9 bn

KfW presentation at EUFores Annual High-Level Experts Conference, Brussels 18.10.2017
Central pillars of Germany’s Energiewende
Ambitious long-term energy and climate targets

- Nuclear power to be phased out by 2022
- Long-term switch to an energy system mainly based on renewables
- Significant reduction of energy consumption of households, industry, and transport

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<th>Expansion of renewable energies’ (RE) share in</th>
<th>2020</th>
<th>2050</th>
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<tbody>
<tr>
<td>Final energy consumption</td>
<td>18%</td>
<td>60%</td>
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<td>Electricity supply</td>
<td>35%</td>
<td>80%</td>
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<th>Greenhouse gas emissions (vs 1990)</th>
<th>2020</th>
<th>2050</th>
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<td>-40%</td>
<td>-80-95%</td>
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<th>Energy efficiency (vs 2008)</th>
<th>2020</th>
<th>2050</th>
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<tr>
<td>Primary energy consumption</td>
<td>-20%</td>
<td>-50%</td>
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<tr>
<td>Electricity consumption</td>
<td>-10%</td>
<td>-25%</td>
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Energiewende in Germany:
Still substantial need for action to meet the 2020 targets

- Greenhouse gas emission reduction referring to 1990: -27.9%
- Proportion of renewables of final energy: 14.8%
- Primary energy consumption referring to 2008: -7.6%

Today’s status
- Too slow: -40%
- On track: 18%
- Too slow: -20%
High demand for investment in energy system transformation
About EUR 40bn p.a. needed in Germany until 2020

- Energy efficient renovation of existing buildings (incl. RE-heating): 16bn € (41%)
- Renewable energy (electricity): 12.4bn € (32%)
- Fossil back-up power plants: 1bn € (2%)
- Electricity grid: 5bn € (13%)
- Energy efficiency of private HH (only electricity), industry, trade, commerce and services (incl. RE-heating), transport: 4.7bn € (12%)

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KfW- Action Plan Energy Transition successfully implemented
103bn EUR for energy projects in Germany in 2012-2016

KfW is an important financier of the German Energy Transition. In 2012 – 2016 KfW committed **103bn EUR**.

KfW’s promotional activities address both pillars of the German energy transition

- Energy efficiency in private, commercial, public buildings, industrial production & processes, urban quarters: **80bn EUR**
- Renewable energies for heat and electricity generation: **23bn EUR**

KfW makes a significant contribution to the achievement of the Federal Government's climate protection goals.
Impacts of Energy Projects in FC - 2016 *
Creation of additional RE Generation (Capacity)

Generation Capacity added: 1.063 MW
- Wind: 42%
- RE mixed: 25%
- Solar: 8%
- Geothermal: 21%
- Hydro: 4%

Additional annual Generation: 5.111 GWh
- Wind: 38%
- RE mixed: 18%
- Solar: 5%
- Geothermal: 33%
- Hydro: 6%

Equals more than 350 Wind Power Turbines with 3 MW each

Equals the consumption of 1.5 million German households **

* Including energy related commitments from the financial sector
** Assuming an average household consumption of 3.5 MWh/a in Germany
2. Key challenges for the further deployment of renewable sources of energy
# 1. Grid integration:

Example of KfW financing: Green Energy Corridors in India. Expansion of Grids and Connection of Renewable Energies

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<th>Challenge</th>
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<td>› Average annual economic growth of 6.4% causes high level of GHG emissions</td>
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<td>› Rising demand of energy and high potential for renewable energies</td>
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<td>› Old and inefficient grids</td>
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<th>Approach</th>
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<tr>
<td>› Connection of renewable energies to the grid</td>
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<td>› Expansion of grids in five Indian federal states by five single projects</td>
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<th>Impact</th>
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<td>› A total of more than 5,800 kilometers of new power lines are being laid and more than 165 switchgear substations installed or renewed</td>
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<td>› Increase in the stability of the transmission grids</td>
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<td>› Connection of additional production capacities which also offers incentives for investors</td>
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<th>Volume of financing</th>
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<td>Total investments of about EUR 5 billion</td>
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<td>KfW EUR 1 billion (interest subsidy)</td>
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FC Total Energy Sector Commitments (2016): **2.5 billion EUR**

Nearly equal share of investments into the electricity grid and RES exemplify magnitude of task

* Including energy related commitments from the financial sector, excluding sectors below 1%
2. High capital costs (in some countries)

Example from KfW: Krnovo, Montenegro - 2015

Financing of a 72 MW wind farm consisting of 26 GE 2.85-103 wind turbines in Montenegro.
Total loan amount: USD 95.4 m

The Challenge
› Short timeline to financial close to meet construction requirements
› Equity raised through mezzanine facility
› First wind farm in Montenegro and first wind farm for KfW IPEX-Bank in the Balkan region

The Solution
› Strong guidance and advise to sponsor
› Underwriting of the full loan amount by two experienced wind financing banks
› Co-Financing by EBRD
› Euler Hermes cover

Value Added by KfW IPEX-Bank
› Global Agent, ECA Agent, Modelling Agent and Security Agent
› Promotion of European exports
### 3. More investments needed into use of RES for heating/cooling

KfW Mittelstandsbank’s demand driven programmes for renewable energies: EUR 5.1bn new commitments in 2016, but most for electricity from RES.

| I. Electricity from renewable energies  
(Programme “Standard“) | II. Heat from renewable energies  
(Programme “Premium“) |
|---|---|
| ‣ Loan amount up to EUR 50m  
‣ Risk-based favourable interest rate  
‣ 2016: EUR 4.5bn new commitments, more than 85% for onshore wind projects (06/2017: EUR 2.3 bn) | ‣ Loan amount up to EUR 10m  
‣ Low-interest loans from KfW with repayment bonus*  
‣ Risk-based favourable interest rate  
‣ 2016: EUR 104m new commitments (06/2017 EUR 52m) |

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<th>III. Storage battery systems for solar power</th>
<th>IV. Offshore wind energy</th>
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| ‣ Low-interest loans from KfW with repayment bonus*  
‣ Risk-based favourable interest rate  
‣ 2016: EUR 104.5m new commitments (06/2017 EUR 69m)  
‣ Since programme start: over 25,000 commitments | ‣ Credit amount up to EUR 800m per project  
‣ Financing up to 50 % of debt  
‣ 95 % guarantee of the Fed. Rep. of Germany  
‣ Since programme start: 5 projects, EUR 1.5bn |

*Repayment bonus is financed by Federal Ministry for Economics Affairs and Energy

In terms of electrical capacity, about 50% of all newly installed RE facilities (excluding wind offshore) in Germany were co-financed by KfW (average 2012-2015).
4. Complex regulatory environment
Example for KfW financing: Šilutė Wind Farm, Lithuania - 2015

The Challenge
› Largest wind farm in Lithuania and first wind farm for KfW IPEX-Bank in the Baltics
› Project located close to a Natura 2000 region
› 12 year loan tenor, Feed-in-Tariff 12 years (no tail under FiT)

The Solution
› Very experienced Sponsor and good project arrangement
› Careful due diligence and tailored environmental and social action plan
› Risk-adequate repayment profile

Value Added by KfW IPEX-Bank
› Prominent role in the Hermes process
› Modelling Bank and Technical expertise
› Ability to provide loan for 12 years

Financing of 60 MW wind farm consisting of 24 GE 2.5-120 wind turbines in South-Western Lithuania close to the Baltic Sea Coast
Total loan amount: EUR 89.3 million

Source: KfW IPEX/Max Wolf

KfW presentation at EUFORES Annual High-Level Experts Conference, Brussels 18.10.2017
Thank you for your attention!

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