KfW Promotional programs for energy efficiency

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Kommunal- und Privatkundenbank / Kreditinstitute
KfW at a glance
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: 80 offices and representations worldwide
Balance sheet total 2016: EUR 507 billion
Financing volume 2016: EUR 81.0 billion
5,807 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

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 countries and emerging economies

Promotion of environmental and climate protection

KfW

KfW IPEX-Bank

KfW DEG
Neutrality through on-lending principle in lending business

No branch network of our own

Customer

Submits loan application with regular bank before start of investment

Financing partner

Enters into the loan agreement and disburses the loan

If approved, customer’s bank forwards application to KfW

Refinances the loan at favourable refinancing interest rates, often with interest subsidies and grants from German government

KfW
Promotion of Energy Efficiency
KfW-Promotional programs for energy efficiency

Overview

Residential Buildings

- „Everyone principle“
- KfW-Efficiency House and Single Measures

Non-residential Buildings

- Corporates, Self-employed
  - Energy-efficient Construction & Refurbishment
  - Loans / grants
- Municipalities / Municipal companies
  - Energy-efficient Construction & Refurbishment
  - Loans

+ Promotion of energy efficient production, facilities and processes, Promotion of utilization of industrial waste heat and Renewable Energies
Promotional programs for energy efficiency

1. **The efficiency standards achieved are higher than the legal requirements**
   German Energy Saving Ordinance (EnEV) is the baseline

2. **The better the energy efficiency level reached, the higher the promotional incentives**

3. **KfW-Efficiency House: brand for energy efficiency**
   › Market standard for new and existing buildings
   › Easy to understand: the smaller the number the higher the energy efficiency

4. **Promotional programs are based on a holistic approach**
   › Open for all types of investors (including contractors)
   › Free choice of technology (heating system and building envelope)
Residential buildings
Energy-efficient Construction and Refurbishment

Basic principles of energy-efficient buildings

**Reduction of heat demand**

- thermal insulation
- air tightness of building envelope
- solar gains (windows)

**Integration of renewable energies**

- biomass
- solar heat
- solar electricity
- heat pump
- heat recovery (ventilation)

Energy-efficient heating system

high efficiency of heat generation, distribution and storage
KfW-Efficiency House
requirements for energy efficiency

Annual Primary energy demand $Q_P$
(required energy demand for heating, ventilation and hot water; considering the energy source, heat generation, storage, distribution etc.)

Transmission heat loss $H_T$ energy loss of the building through its components (building envelope)
Promotional programs for residential buildings – Set-up
Energy-efficient **Construction**

<table>
<thead>
<tr>
<th>Promotional Level based on the Energy Efficiency Ordinance</th>
<th>Annual Primary Energy Demand ($Q_P$)</th>
<th>Transmission Heat Loss ($H_T^-$)</th>
<th>Promotional Loan</th>
</tr>
</thead>
<tbody>
<tr>
<td>KfW-Efficiency House 40 Plus</td>
<td>40 %</td>
<td>55 %</td>
<td>Interest Rate: 1,46 % p.a. effektiv *</td>
</tr>
<tr>
<td>KfW-Efficiency House 40</td>
<td>40 %</td>
<td>55 %</td>
<td>Partial Debt Relief: 15 %</td>
</tr>
<tr>
<td>KfW-Efficiency House 55</td>
<td>55 %</td>
<td>70 %</td>
<td>+ 10 %</td>
</tr>
<tr>
<td>EnEV 2014 (1.1.2016)</td>
<td>75 %</td>
<td>100 %</td>
<td>5 %</td>
</tr>
<tr>
<td>Reference Building EnEV</td>
<td>100 %</td>
<td>100 %</td>
<td></td>
</tr>
</tbody>
</table>

(as % of the requirements defined for the Reference Building)

* As per 03.02.2017, 20 year maturity, 10 year fixed interest rate, 3 years amortisation free period
Energy-efficient construction

About 50% of all newly built housing units in Germany benefit from the promotion for the KfW efficiency house standard.

Promotional volume (Mio. EUR)

<table>
<thead>
<tr>
<th>Year</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5,623</td>
<td>6,996</td>
<td>11,287</td>
</tr>
</tbody>
</table>

No. of housing units

<table>
<thead>
<tr>
<th>Year</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>108,000</td>
<td>141,500</td>
<td>160,140</td>
</tr>
</tbody>
</table>

Investments (Mio. EUR)

<table>
<thead>
<tr>
<th>Year</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>26,400</td>
<td>31,900</td>
<td>39,800</td>
</tr>
</tbody>
</table>

Loan-scheme (lower interest rates and repayment bonus between 5 and 15%)

Reduction of CO₂-Emissions since 2006 = 1.02 million tons per year
Promotional programs for residential buildings – Set-up
Energy Efficient Refurbishment

<table>
<thead>
<tr>
<th>Promotional Level based on the Energy Efficiency Ordinance</th>
<th>Maximum promotional loan amount</th>
<th>Promotional loan</th>
<th>Grant for Investment</th>
</tr>
</thead>
<tbody>
<tr>
<td>KfW-Efficiency House 55</td>
<td>100 TEUR Per housing unit</td>
<td>27,5 %</td>
<td>30 %</td>
</tr>
<tr>
<td>KfW-Efficiency House 70</td>
<td></td>
<td>22,5 %</td>
<td>25 %</td>
</tr>
<tr>
<td>KfW-Efficiency House 85</td>
<td></td>
<td>17,5 %</td>
<td>20 %</td>
</tr>
<tr>
<td>KfW-Efficiency House 100</td>
<td></td>
<td>15 %</td>
<td>17,5 %</td>
</tr>
<tr>
<td>KfW-Efficiency House 115</td>
<td></td>
<td>12,5 %</td>
<td>15 %</td>
</tr>
<tr>
<td>KfW-Efficiency House Monument</td>
<td>50 TEUR Per housing unit</td>
<td>12,5 %</td>
<td>15 %</td>
</tr>
<tr>
<td>Package of measures</td>
<td></td>
<td>7,5 %</td>
<td>15 %</td>
</tr>
<tr>
<td>Single Measures</td>
<td></td>
<td></td>
<td>10 %</td>
</tr>
</tbody>
</table>

Promotional loan:
- Interest rate: 0.75 % p.a. effective *
- Partial Debt Relief:
  - 27,5 %
  - 22,5 %
  - 17,5 %
  - 15 %
  - 12,5 %
  - 7,5 %

Grant for Investment:
- 30 %
- 25 %
- 20 %
- 17,5 %
- 15 %
- 15 %
- 10 %

* As per 16.11.2016, applicable to all maturities
Energy-efficient refurbishment

About 3.5 million promoted housing units since 2006 (~ 9% of the existing housing stock in Germany)

Promotional volume (Mio. EUR)
- 2014: 3,697
- 2015: 3,557
- 2016: 4,051

No. of housing units
- 2014: 232,500
- 2015: 239,200
- 2016: 288,100

Investments (Mio. EUR)
- 2014: 5,948
- 2015: 6,412
- 2016: 10,197

Loan-scheme (lower interest rates and repayment bonus between 7,5 and 27,5 %)
Grant-scheme (between 10 and 30 %)

Reduction of CO₂-Emissions since 2006 = 7.66 million tons per year

Kfw
Energy Efficient Construction and Refurbishment
Promotional effects

- **Annual evaluation of promotional effects** by IWU/Fraunhofer

- **Positive impact for building owners and tenants**
  - Reduced energy bill
  - Positive impact on property value

- **Reduction of CO2-Emissions since 2006 = 8.28 million tons per year (as of 31 May 2016)**

- **Economic stimulus package for SME: 446,500 new jobs created or saved for one year (2015)**

- Positive budgetary effect due to tax income as well as reduced unemployment
Non-residential buildings and public sector
Non-residential buildings – public sector clients

Energy-efficient Construction and refurbishment for non-residential buildings (introduced in 10/2015)

<table>
<thead>
<tr>
<th>Promotional Level based on the Energy Efficiency Ordinance</th>
<th>Promotional Loan</th>
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<tbody>
<tr>
<td>KfW-Efficiency House 55</td>
<td>Up to EUR 25m per investment</td>
</tr>
<tr>
<td>KfW-Efficiency House 70</td>
<td></td>
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<tr>
<th>KfW-Efficiency House 70</th>
<th>Promotional Loan</th>
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<tr>
<td>KfW-Efficiency House 100</td>
<td>Up to EUR 25m per investment</td>
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<tr>
<td>KfW-Efficiency House Monument</td>
<td></td>
</tr>
<tr>
<td>Single Measures</td>
<td>17.5% max. 175 EUR/sqm</td>
</tr>
<tr>
<td></td>
<td>10% max. 100 EUR/sqm</td>
</tr>
<tr>
<td></td>
<td>7.5% max. 100 EUR/sqm</td>
</tr>
<tr>
<td></td>
<td>5% max. 50 EUR/sqm</td>
</tr>
</tbody>
</table>

Promotional volume 2016: EUR 458m

Volume 2016: EUR 133m

- The higher the level of energy efficiency achieved, the higher the level of promotion

- Only small differences compared to promotional offer for corporate sector non-residential buildings:
  - Municipalities: direct loans from KfW (no on-lending) with 0.05% p.a. effective interest rate
  - *Public companies/non-profit companies*: on-lending, conditions based on risk-adjusted interest rate
    - Collateral in line with usual banking requirements
  - Maturities 5/10/20 years; amortisation-free period 1-3 years

*as per 16.11..2016*
The KfW Mittelstandsbank’s product family for energy efficiency includes:

1. Promotion of energy efficient buildings
2. Promotion of energy efficient production facilities and processes
3. Promotion of utilization of industrial waste heat
Non-residential buildings – corporate clients

Energy-efficient Construction and refurbishment (introduced in 10/2015)

Promotional Level based on the Energy Efficiency Ordinance

- KfW-Efficiency House 55
- KfW-Efficiency House 70

Promotional Loan

<table>
<thead>
<tr>
<th>Interest Rate</th>
<th>Partial Debt Relief</th>
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<tr>
<td>Risk-adjusted interest rate from 1% p.a. effective*</td>
<td>5% max. 50 EUR/sqm</td>
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Promotional volume 2016: EUR 2.6bn

Construction

- KfW-Efficiency House 70
- KfW-Efficiency House 100
- KfW-Efficiency House Monument
- Single Measures

Refurbishment

- KfW-Efficiency House 70
- KfW-Efficiency House 100

Promotional Loan

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<tr>
<td>Risk-adjusted interest rate from 1% p.a. effective*</td>
<td>17.5% max. 175 EUR/sqm</td>
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Volume 2016: EUR 377m

<table>
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<th>Interest Rate</th>
<th>Partial Debt Relief</th>
</tr>
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<tbody>
<tr>
<td>Risk-adjusted interest rate from 1% p.a. effective*</td>
<td>10% max. 100 EUR/sqm</td>
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Volume 2016: EUR 108m

<table>
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<th>Partial Debt Relief</th>
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<tbody>
<tr>
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<td>Risk-adjusted interest rate from 1% p.a. effective*</td>
<td>5% max. 50 EUR/sqm</td>
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Volume 2016: EUR 108m

The higher the level of energy efficiency achieved, the higher the level of promotion

- Risk-adjusted interest rate based on individual financial strength
- Collateral in line with usual banking requirements
- Maturities 5/10/20 years

*as per 16.11.2016
Industrial Waste Heat

Overview

Promotion of Measures to prevent/ reduce waste heat losses or increasing use of waste heat within industrial processes.

Reduced-interest rate loans (Interest Subsidy provided by KfW)
repayment bonuses at least 30% of the extra investments costs provided by BMWi

Applicants: German and non-German enterprises, self-employed professionals, enterprises fulfilling services under an energy contracting agreement

Supported by the German Government in the context of the „Offensive Abwärmenutzung“ of the National Action Plan „Energieeffizienz“ (NAPE)
## KfW’s Domestic Promotion of Renewable Energies

### I. Electricity from renewable energies (Programme „Standard“)
- Loan amount up to EUR 50m
- 2016: EUR 4.1bn EUR new commitments

### II. Heat from renewable energies (Programme „Premium“)
- Loan amount up to EUR 10m
- Repayment bonus up to 30 % of costs*
- 2016: EUR 100m new commitments

### III. Storage battery systems for solar power
- Repayment bonus up to 30 % of costs*
- Risk-based favourable interest rate
- 2016: EUR 400m new commitments

### IV. Offshore wind energy
- 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

### Evaluation of the Renewable Energy Programmes:
- Cofinanced a total electrical power of around 3.7 GWel (RE-Standard (I))
- Estimated electricity production of the supported plants amounts to 7 TWh p.a. over their lifetime (I)
- Reduction of 3.8 Mio. t CO2e p.a. (I-IV)
### KfW Renewable Energies Programme “Premium“
**Promotion of large plants in which heat is generated from renewable energies**

<table>
<thead>
<tr>
<th>For whom?</th>
<th>SMEs (EU-Definition) and self-employed professionals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Non-profit organisations, municipal authorities and companies in which municipal authorities hold an interest of more than 25%</td>
</tr>
<tr>
<td></td>
<td>Private individuals which use the generated heat exclusively for their own needs</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>For what?</th>
<th>Construction and expansion of large solar collector systems</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Biomass plants for combustion of solid biomass for thermal utilization</td>
</tr>
<tr>
<td></td>
<td>Heating networks which are supplied from renewable energies</td>
</tr>
<tr>
<td></td>
<td>Systems for development and utilization of deep geothermal energy</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>How?</th>
<th>Loan amount of usually up to EUR 10m, Loan term of up to 20 years, up to 3 years repayment-free</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Risk-based interest rate</td>
</tr>
</tbody>
</table>

Customers benefit from attractive repayment bonuses financed by Federal Ministry for Economic Affairs and Energy (Market Incentive Programme - MAP)

20% additional bonus for replacement of heating

Particularly favourable conditions for small enterprises (EU definition).
Lessons learnt
Promotion of Energy efficiency

› The more **transparent, simple** the promotional scheme …
  › the better it is to understand and
  › the **easier it is to distribute**

› **The mandatory involvement of an energy expert** is very important to
  › provide comfort to the investor regarding his energy efficiency project
  › assures a high degree of quality and reliability regarding energy efficiency level achieved
  › assures target-oriented use of public funds

› **Monitoring of promotional effects** is important to show
  › economic and climatic impact
  › contribution to comply with the goals of the Federal Government
Thank you for your attention!