

»» KfW experience on promotional programs for energy efficiency in (residential) buildings

GRIHA Summit 2018

Bank aus Verantwortung

**KFW**

## »» 70 years of KfW

Financing with a public mission



- › Promotional bank of the Federal Republic of Germany
- › Established in 1948
- › Headquarters: Frankfurt am Main
- › About 80 offices and representations worldwide
  
- › Balance sheet total 2017: EUR 472.3 billion
- › Financing volume 2017: EUR 76.5 billion
- › Employees 2017: 6,284
- › Best long-term rating: AAA/Aaa/AAA

# »» KfW Group



## Domestic promotion

We promote Germany

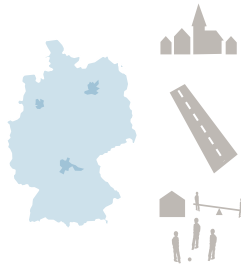
SMEs



Private clients



Municipalities



Support for the environment and climate protection

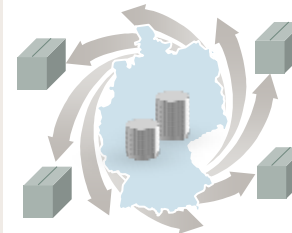
**KfW**

Financing volume (FV): 51.8 billion (2017, EUR)

## International financing

We support internationalisation

Export & project finance



We promote development

Developing & emerging countries



**KfW** IPEX-Bank

FV: 13.8 billion

**KfW**  
**KfW** DEG

FV: 8.2 billion and 1.6 billion



# »» KfW's German Energy Efficient Building Programm

## »» Why to promote energy efficient buildings?

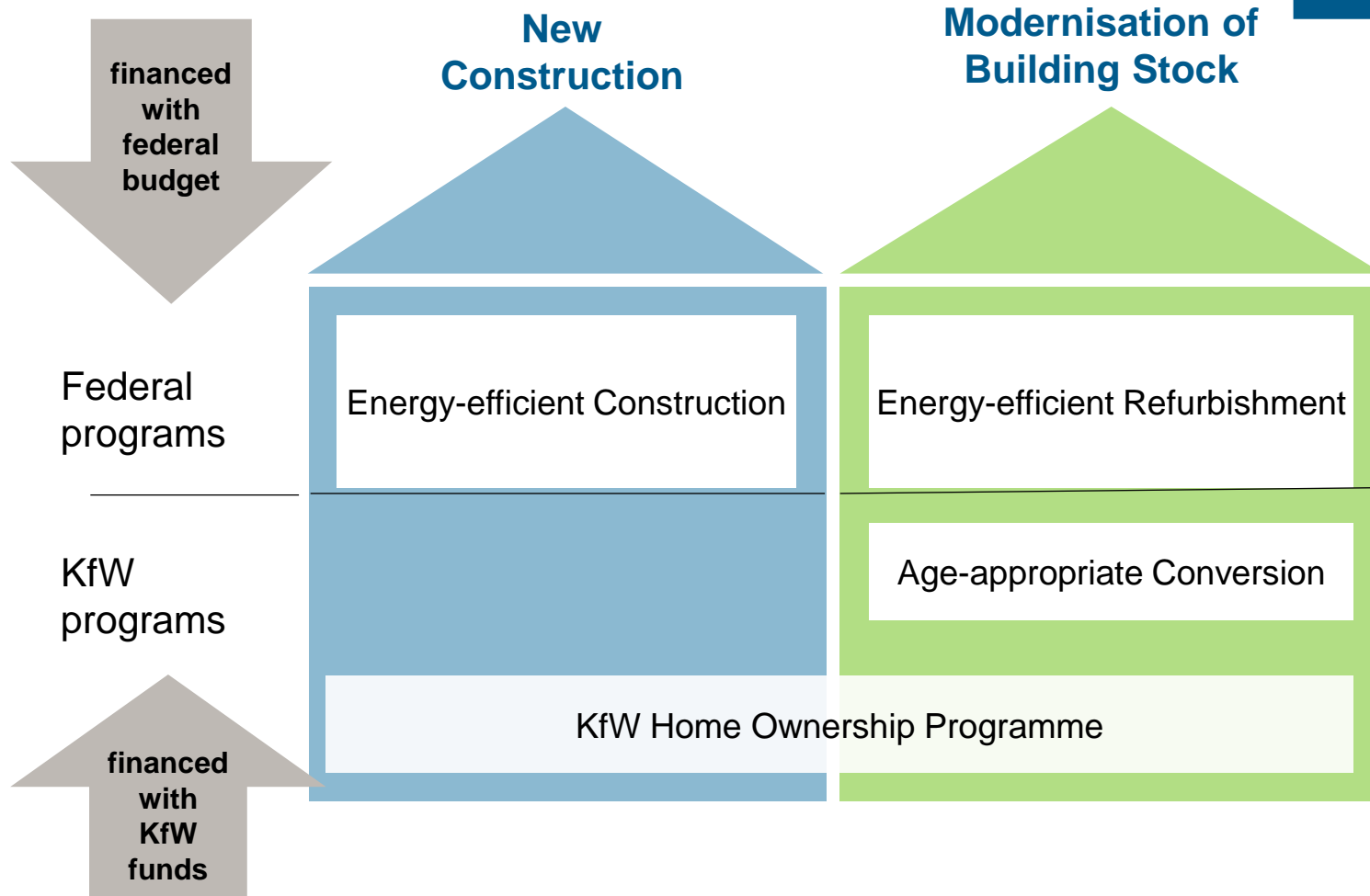
- › Building sector (esp. residential sector) contributes to 1/3 of primary energy consumption in Germany
  - Reducing energy consumption in this sector is essential for achieving the targets of the German energy transition
  - Reduced (fossil fuel based) energy consumption leads to reduced CO<sub>2</sub> emissions helps achieving climate targets and commitments
- › Technical solutions are available
- › Additional benefits can be achieved:
  - Better living conditions / higher comfort
  - Employment generation
  - Reduced fuel imports
- › Energy use in residential buildings of the same region usual are homogeneous allowing for standardized financing schemes (BUT: Buildings are not standardized)



# »» Promotional Programs for Residential Buildings

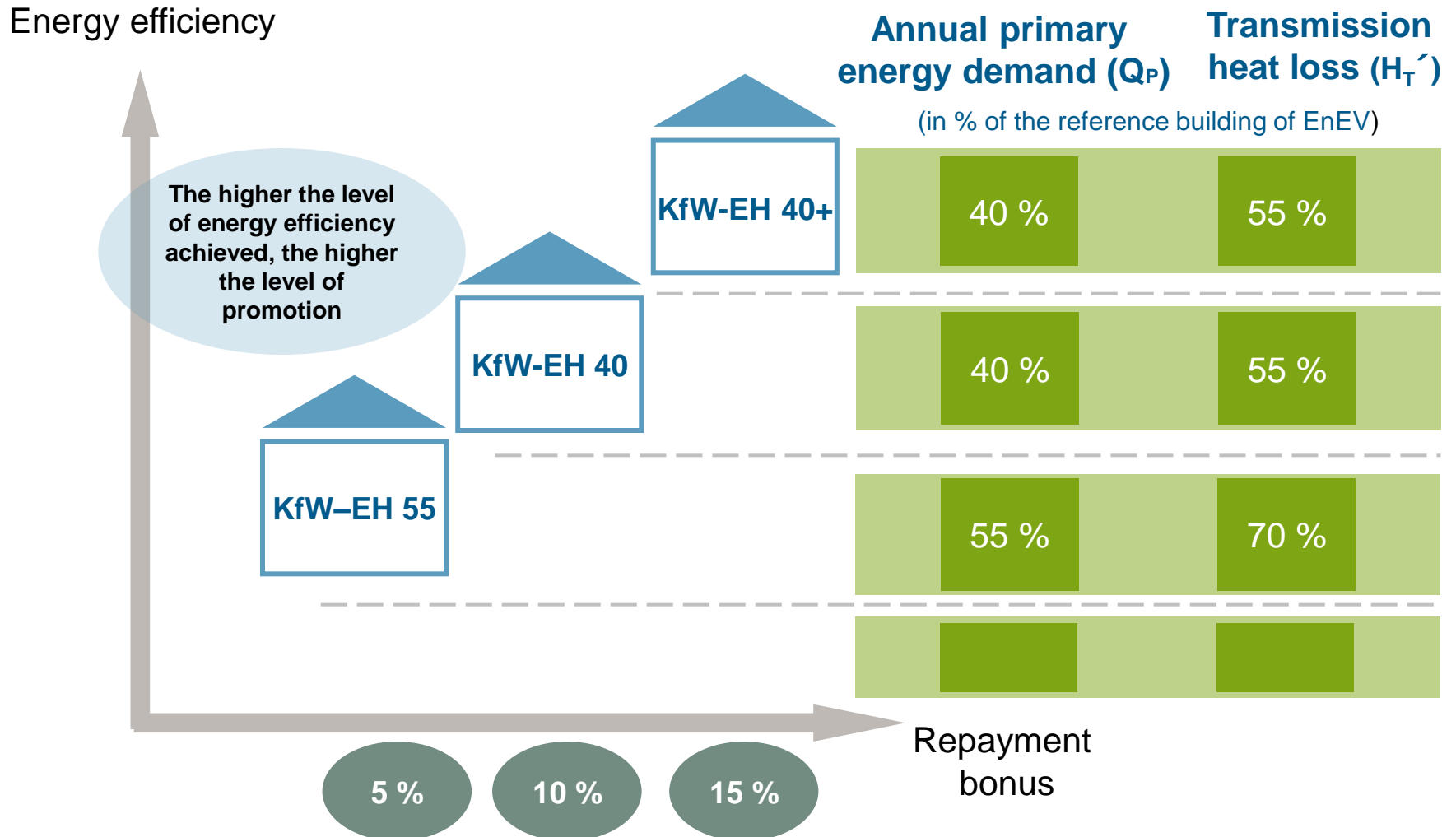
## Overview

Promotional loan and grant programs:  
- can be combined  
- open for all investor types



# »» Energy-efficient Construction

Promotional programs for residential buildings



# »» Energy-efficient Construction and Refurbishment

## Setting standards



- › **Promotional loans:** The higher the energy standard, the higher the interest rate subsidy
- › Valid for residential buildings as well as industrial and municipal buildings
- › Additional incentives through **repayment bonuses**
- › **Grants** are available for certain measures
- › **Resources from Federal Government Budget:** EUR 2 billion in the year 2016

- KfW efficiency requirements set standards for housing construction and refurbishment
- One out of two newly built homes in Germany promoted (is an “Effizienzhaus”)
- The standard is often even applied without KfW finance as it is easier to sell these houses
- 30% of greenhouse gas reduction necessary to reach Germany’s 2020 goal for emission reduction in the household sector





## »» KfW Experience in India

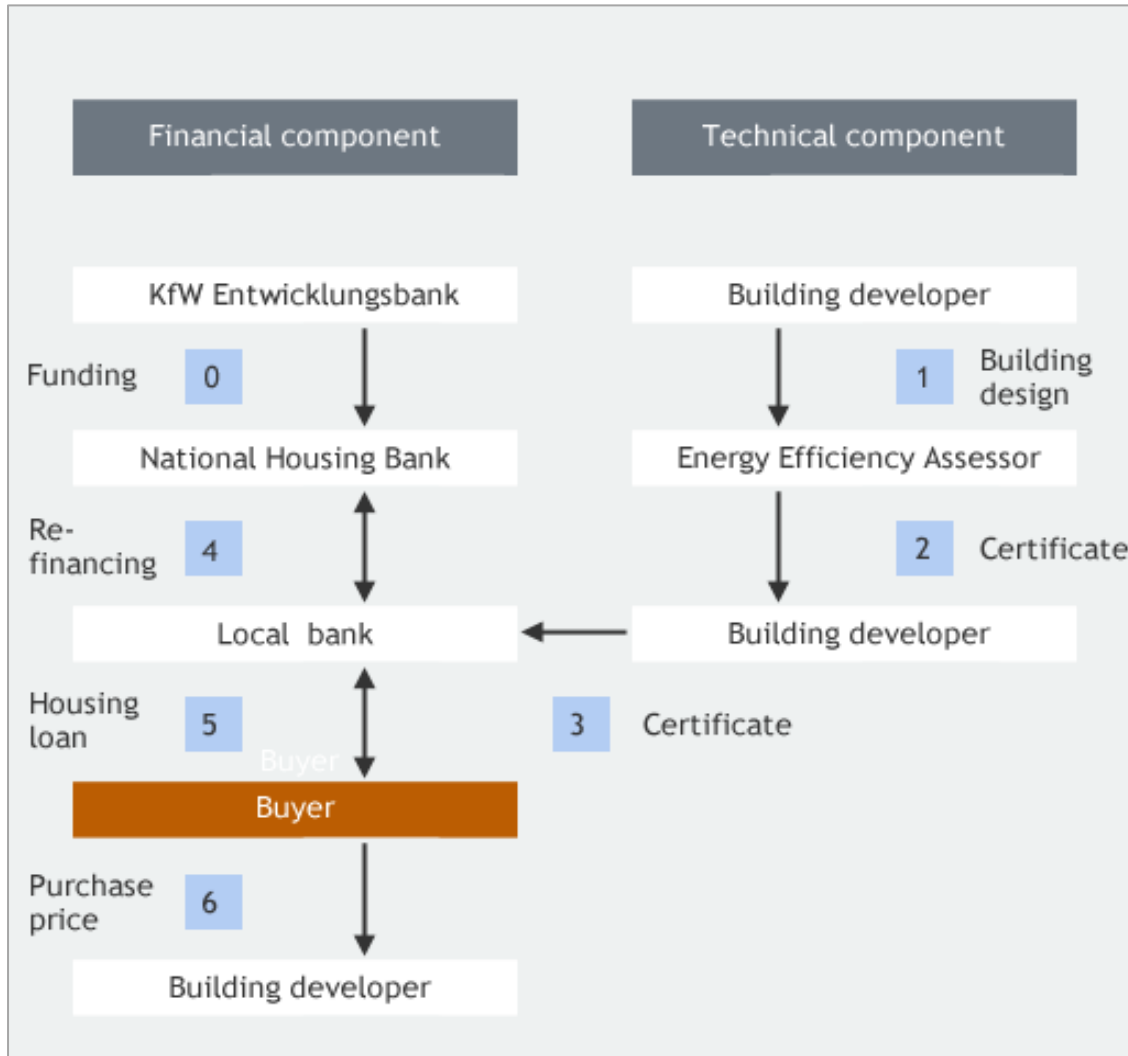
# »» Energy Efficiency in Residential Buildings

## KfW cooperation with the National Housing Bank

- › Line of credit to National Housing Bank (NHB) signed in 2010 to refinance loans for energy efficient houses
- › **Objective:** Establish a pilot programme for promoting energy efficient new residential housing in urban areas
- › **Investment Volume:** 50 m EUR
- › **Technical assistance:** 1.2 m EUR, develop energy efficiency calculation tool, certify buildings, support in implementation, advise & train NHB and financial intermediaries (“primary lending institutions”), architects and building developers, develop marketing strategy



## »» Financing mechanism for EE housing





### What was financed?

- Energy Efficiency Enhancement through **passive measures** (building envelope; hollow bricks, roof installations, shading, windows-to-wall ratio etc.)
- Programm criteria for only passive measure: Energy need at least 18% lower than benchmark building
- Energy Efficiency Enhancement through **active measures** (EE appliances, solar water heater etc)
- Programm criteria for passive PLUS active measures: Energy need at least 30% lower than benchmark building


# »» Energy Efficiency Certificate and calculation software

- Adaptation of EU-energy performance assessment tool to India by Fraunhofer Institute for Building Physics and TERI
- Based on the whole-building-approach
- Robust estimate of the energy performance of a new building as compared to a reference building (standard Indian building)
- Easy to use by architects and auditors
- Easy to compare different EE design, material and technology combinations
- The calculation software can be downloaded for free after registering at [www.ittoolkitindia.com](http://www.ittoolkitindia.com).





EnEff.ResBuild India  
Toolkit for energy efficient residential buildings in India



**Project:** Tower 1, Zed Collective, BCIL

**Building:**

Address of project	Table of results - Electrical energy in kWh/m <sup>2</sup> ·yr*		
Sy.109/4 Avalahalli Village , Next to Towns End Project, Yelhanka Hobli, Bangalore North Taluk, Bangalore	Internal lighting	This building	Reference building
	Common lighting	4.58	12.97
	Parking lighting	0.48	1.47
	Cooling	0.00	0.00
	Occupant/Owner	28.67	26.09
	Heating	0.00	0.00
	Hot water	0.00	13.99
	Ceiling fans	0.02	0.02
	Appliances	28.02	28.02

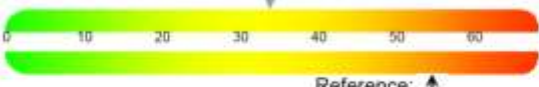
**Building parameters:**

Building type:	Residential building
Total building area:	1,697.00 m <sup>2</sup>
Climatic zone:	Bangalore (Temperate)
Created with:	EnEffResBuild-India Version 0.9.6.0

**Consumption of electrical energy in kWh/m<sup>2</sup>·yr\*:**

\*The consumption is related to the building area.

↓ This building:  
34 kWh/m<sup>2</sup>·yr



Reference: ↑  
55 kWh/m<sup>2</sup>·yr

**Savings:  
38%**

Energy shares considered for the loan application:

<input checked="" type="checkbox"/> Internal lighting	<input checked="" type="checkbox"/> Parking lighting	<input type="checkbox"/> Heating	<input type="checkbox"/> Ceiling fans
<input checked="" type="checkbox"/> Common lighting	<input checked="" type="checkbox"/> Cooling	<input checked="" type="checkbox"/> Hot water	<input type="checkbox"/> Appliances

**Qualitative parameters (0 out of 6 measures are applied in this building):**

<input type="checkbox"/> Daylit area in the core area is 20% to 40%	<input type="checkbox"/> Presence detection or photo sensors for outdoor and
<input type="checkbox"/> Solar street lights	<input type="checkbox"/> Efficient water pumps
<input type="checkbox"/> Efficient transformers	<input type="checkbox"/> Tailored user manual

ISSUED BY:

**The Energy & Resources Institute (TERI)**

**21-02-2012**

Date

Signature

## »» Programm outputs and impacts

- Line of Credit was fully disbursed by 2013
- Certification of 19 buildings with the help of the EE calculation software
- In 12 buildings, 1,912 loans for energy efficient apartments were (re)financed
- Total project cost around 140 mln EUR (10.5 bln INR)
  
- Mostly passive energy efficient measures were implemented
- Average energy savings in apartments with only passive measures: 21%
- Average savings in apartments with active and passive measures: 34%
- Total average energy saving in the programme of around 22%
- Overall energy savings of 40,000 MWh p.a.
- Emission reduction of around 34,000 tCO<sub>2e</sub> p.a.



## »» Conclusions and Recommendations

## »» Lessons Learned from the NHB project

- **INCENTIVES** – Put incentives in place to enhance EE building stock
- **STANDARDS** – Enforceable and country wide standards are of help
- **REPORTING and ACCOUNTABILITY** – Make sure that standards are met (monitoring), also in follow-up
- **PARTNERS** - Find the right partners (technical know-how, banking, housing market, network)
- **COORDINATION** – Create effective coordination, linking relevant stakeholders in finance, energy efficiency and housing
- **TECHNICAL SUPPORT** – Provide technical support on certification, awareness, environmental benefits, etc.



2012: Construction of EE homes in Bangalore

## »» Basic Recommendations for promotional programs

- Define the target group and assess their willingness / incentive to invest in energy saving measures
- Look at the viability of EE measures: Are financial incentives needed?
- Make use of existing structures and capacities
- Identify and address training needs
- Start with SMART promotional criteria
- Use a locally adapted software tool for assessing the building energy performance (initial programs can also focus on minimum criteria)
- Take into account different climatic zones in the country and available materials
- If a reference building approach is used, this should be based on regulatory or, if not available, on market standard



## »» Basic Recommendations (continued)

- A custom-made marketing is essential
- Be aware that money saved on the energy bill might be used again for energy consuming products (consumer electronics, more ACs, etc.) and rebound effects are not unusual
- Establish a stringent monitoring system (quality, O&M), including on-site visits by independent experts (however, find right cost-benefit balance)

### CONCLUSION:

- Promotional programs are an efficient tool to promote energy efficiency in the building sector
  - They can contribute to the implementation of regulations which otherwise might be difficult to enforce (e.g. new ECBC residential standard)
  - In India: Many measures can be implemented at low cost
- Dedicated EE programmes for residential sector make a lot of sense in India

»» Thank you!

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