



**ENERGY EFFICIENCY WATCH**

## **Energy Efficiency Policies in Europe**



### **Case Study**

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*KfW Programme - Germany*



Co-funded by the Intelligent Energy Europe  
Programme of the European Union

## Key facts and figures

<b>Country</b>	Germany
<b>Name of policy</b>	KfW programmes (i) energy efficient construction (EEC) and (ii) energy efficient renovation (EER)
<b>Type of policy</b>	Economic instruments, Financial incentives (Soft loans, grants)
<b>Target sector</b>	Residential sector
<b>Actions targeted</b>	(i) Construction of low energy buildings, (ii) renovation towards low energy buildings as well as single measures
<b>Duration</b>	Since 2009 <sup>1</sup>
<b>Overall target and/or achievements</b>	Targeted final energy savings 2009 – 2013: 27 PJ (EEC), 219 PJ (EER); targeted final energy savings 2014 – 2020: 22 PJ (EEC), 175 PJ (EER) (BMWi 2014a)
<b>Overall aim of the policy</b>	Enhance the energetic quality of the German building stock
<b>Innovativeness</b>	The policy is innovative in certain respects: KfW makes use of a scaling system, on which the amount of funding is tied: the more energy-efficient, the higher is the grant. Hence, if the minimum energy performance standards MEPS are tightened, the scaling system's criteria automatically become stricter. The programme is very transparent for investors.

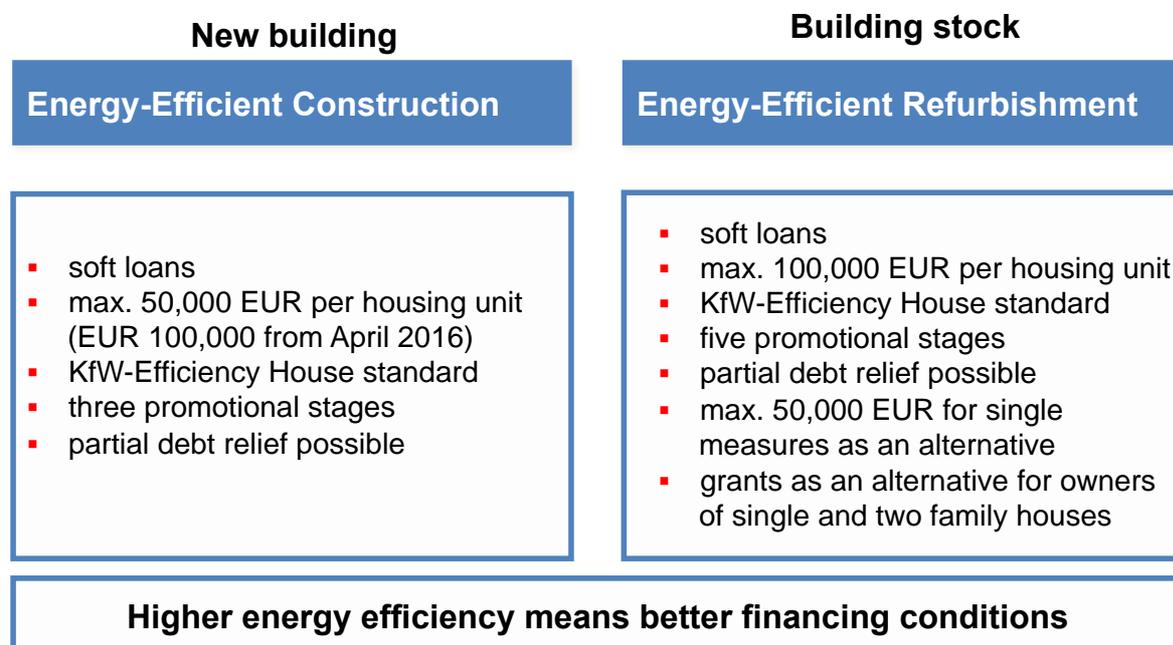


Figure 1: Overview of KfW's financing mechanisms for new and existing buildings (based on KfW 2015a, b, c)

<sup>1</sup> Prior to 2009, KfW managed the CO<sub>2</sub>-Building Refurbishment Programme, out of which EEC and, particularly, EER evolved.

## Policy objectives

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The German state-owned Bank for Reconstruction (Germ.: Kreditanstalt für Wiederaufbau, KfW) manages two programmes to improve the energy efficiency of German residential buildings.<sup>2</sup> While the EEC targets the construction of new buildings, EER addresses the refurbishment of existing buildings.

Both programmes offer financial products (a choice of upfront grants or soft loans, which may have a grant component)<sup>3</sup> to building owners to overcome certain economic barriers (e.g. lack of sufficient loan financing or own upfront capital, short payback expectations) in order to enable them to realise energy-efficient investments. The amount of grant depends on the energy efficiency level achieved: the higher the energy efficiency, the better the financing arrangement.<sup>4</sup>

While the core goal of the programmes is to reduce energy consumption in buildings, they are to achieve a wider spectrum of benefits, as well. For instance, the programmes drive investment in the building sector, which, in turn, foster job creation and/or maintenance in a variety of sub-sectors. Furthermore, reduced energy consumption in buildings mitigates energy import needs and the urgency to develop renewable energy sources.

The German building stock, consuming around 40% of energy in Germany, consists of slightly around 18 million residential buildings and 1.5 million non-residential buildings (BMWi 2014b). Most of these residential buildings (70%) were erected before the 1970s, when the first minimum energy performance standard (MEPS) for buildings was established (dena 2015). Hence, there is substantial room for energy efficiency improvement that can be realised through renovation as well as new buildings that meet or exceed Germany's MEPS.

EEC and EER also affect the dynamic market transformation through incentivising the uptake of best-available technologies. Since an end of the programmes is not planned, both also provide some kind of stimulus to industry stakeholders to push further innovation.

## Beneficiaries and action targeted

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EEC and EER positively affect several actors. Building owners benefit directly as they receive financing and financial incentives (loans, grants) to realise energy efficiency investments. Indirect beneficiaries are, among others, construction companies, technology or material manufacturers (e.g. insulation, windows, boilers), architects, who have specialised in energy efficient building design/realisation. Apart from that, KfW actively recommend the assignment of an energy consultant, who supports building owners in planning an energy-efficient building or who accompanies the construction process.<sup>5</sup> All of these indirect beneficiaries profit from an increased uptake of their services offered. Employment effects, reduced energy demand and emissions also result in further groups benefiting from the measure. Please also note that loans of both programmes are facilitated through the local branch offices of private, municipal, or co-operative banks that the investors normally are customers of. Even though KfW loans are preferential, these banks are allowed to put a price adder covering their costs on the loans they lend on to building owners (cf. Figure 1).

Building owners are not only the main beneficiaries but also the main target group since they are to be motivated to realise energy investment through the financing measures available. In particular, EEC targets investments (that is purchase or investment) in a new, energy-efficient building, while EER facilitates investments in buildings that are subject to refurbishment. In addition to whole-house

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<sup>2</sup> Through the “energy efficiency programme – energy-efficient construction and refurbishment”, KfW also seeks to drive to the energy demand in new and existing non-residential buildings.

<sup>3</sup> The financial products offered through EEC and EER differ to a certain extent. For more in-depth information, please consult, for example, KfW (2015a, 2015b, 2015c) or bigEE (2012).

<sup>4</sup> The energetic performance of a building can be classified into different Efficiency House (EH) Levels – a scaled system simplifying the financing procedure.

<sup>5</sup> If building owners seek to realise a very energy-efficient building that by far exceeds Germany's MEPS, such an energy consultant is even mandatory.

refurbishments, EER also partly finances single measures (e.g. insulation, windows, exterior doors, optimisation of heating systems, installation of a ventilation system).

For whole-house building investments, a classification scheme was developed based on Germany's building MEPS. Through this scheme, KfW-supported buildings can be categorized into different Energy Efficiency levels. The key criteria for categorisation are: the building's annual primary energy demand as well as its transmission heat loss. For new buildings supported by EEC, both values must substantially exceed MEPS for new buildings. For existing buildings subject to energetic renovation, KfW-guidelines are less strict. However, as stated above, the better the energy performance, the more favourable the financing opportunities.

## Design and implementation

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For designing and implementing the programmes, several factors / pre-conditions appear to be crucial. First, several billions of EUR have been made available over the years in order to improve the energy efficiency of buildings through EEC and EER. While the Government provides a certain budget to KfW to implement the programmes, KfW is able to raise further funding at capital markets at very low costs.<sup>6</sup> As a bank, KfW has, second, substantial experience with financing arrangements and, thus, can be regarded as an ideal implementing actor for loan schemes. Moreover, as mentioned above, the programmes rely on the Efficiency House Level classification scheme, which, in turn, depends on the German MEPS.

In 2012, the Government allocated EUR 1.5 billion to finance the grants and reduced interest rates of loans in the scheme. Apart from that, KfW, as a AAA-rated bank, was able to raise EUR 8.4 billion for the loans. These add up to EUR 9.9 billion of loans and grants, which leverage another EUR 17.2 billion of investment (IEA 2013).

While the programmes constitute important measures in Germany's energy efficiency policy package for buildings, several other policies deserve to be mentioned interacting with EEC and EER and multiply the Government's energy efficiency efforts. Among other things, there are:

- **Energy performance certificates** for buildings provide information to building owners (and tenants) regarding the building's energy consumption. Based on this information, owners may decide for energy efficiency investments;
- Energy advice and consultancy services are supported by the Government and offered by various channels (e.g. **On-Site Visit programme, Energy Checks**) providing (i) in-depth data on building energy performance, (ii) offer detailed recommendations on cost-efficient energy-efficiency measures and (iii) information on support programmes such as KfW's EEC and EER;
- The **energy and electricity tax** increased the price of energy and, hence, provides an incentive for energetic building investments to drive down energy costs.<sup>7</sup>

Through EEC and EER, the Government seeks to save energy at large scale. Final energy saving targets are as follows:

- 2009 – 2013: 27 PJ (EEC), 219 PJ (EER);
- 2014 – 2020: 22 PJ (EEC), 175 PJ (EER).

Potential side effects are an important concern to the programmes. For instance, under the EER financial support for comprehensive energetic measures is higher than for single measures in order to avoid lost opportunities. However, as single measures are also funded, investors do not always opt for comprehensive refurbishment.<sup>8</sup> Other unwanted side-effects including the energy rebounds or free-riders are addressed too. With respect to the former, one can assume that owners of an energy-

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<sup>6</sup> KfW is a AAA-rated credit institution and has default guarantees provided by the Government.

<sup>7</sup> Please check, for instance, Federal Ministry for Economic Affairs and Energy (2014) or bigEE (2012) for more information on Germany's policy package for energy-efficient buildings.

<sup>8</sup> Note that single measures cannot be funded under the EEC programme.

efficient building also seek to reduce energy costs in the long-term and realise other energy saving opportunities (e.g. through purchase and use of energy-efficient appliances).

## Policy impacts

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In order to achieve these targets and to adjust the instruments, if necessary, KfW programmes are evaluated annually led by the *Institut für Wohnen und Umwelt*.<sup>9</sup> Among other things, these reports include information on the number of applications funded, energetically enhanced buildings as well as energy and CO<sub>2</sub> savings achieved.

According to the latest evaluation report (Diefenbach et al. 2014), KfW via EEC approved 82,000 applications for new constructions including 129,000 homes.<sup>10</sup> It is estimated that these new EEC-supported building units will annually be saving 336 GWh (1.21 PJ or 0.03 Mtoe) in final energy, 94,000 tons of CO<sub>2</sub> emissions and EUR 43 million in heating costs. Moreover, EEC-support results in employment effects amounting to 341,000 person years through EUR 27.7 billion in total investments, of which the state receives EUR 4.4 billion in VAT. However, these last numbers are based on the total construction cost of the new buildings. Only the incremental cost of improved energy efficiency and the corresponding employment and VAT should be associated with the EEC programme. Available monitoring reports (Diefenbach et al. 2012, 2013, 2014) suggest that final energy savings for the period between 2011 and 2013 were at around 1,000 GWh by the end of 2013. EEC's complement, the EER, approved 111,000 applications for 276,000 homes. According to Diefenbach et al. (2014), each year, the EER-support of 2013 will result in 1,700 GWh (6.12 PJ or 0.15 Mtoe) of final energy savings, 650,000 tons of CO<sub>2</sub> emissions reductions, and EUR 200 million of heating costs mitigated. Additional employment effects are estimated to be 79,000 person years due to total investments of EUR 6.5 billion, of which EUR 1 billion directly returns to the state in the form of VAT. Based on monitoring reports (Diefenbach et al. 2010, 2011, 2012, 2013, 2014), final energy savings for the period between 2009 and 2013 amounted to more than 28,000 GWh by the end of 2013.

Please note that these benefits only refer to the funding period 2013. Further energy savings, monetary, environmental and employment effects have and will be achieved through preceding funding periods.

## Policy Innovation

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While grant- and loan-based financing can be seen as a usual means to support energy-efficient construction and renovation, certain aspects of EEC and EER can be seen as highly innovative. First, KfW makes use of a scaling system for building energy efficiency, on which the amount of funding is tied. A benefit for the investor is that the system is transparent. The fact that relevant information is available online contributes to this. Moreover, the scaling system is tied to Germany's minimum energy performance standard. Hence, if the MEPS is tightened, the scaling system's criteria nearly automatically become stricter, as well. Apart from that, KfW makes use of established structures (local commercial bank offices) to facilitate loans.<sup>11</sup> Last but not least, it should be highlighted once more that KfW can be seen as a unique instrument, which is able to raise capital at low costs due to Government liabilities.

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<sup>9</sup> Evaluation reports of EEC and EER (as well as of preceding programmes) are publicly available in the German language, see <http://www.iwu.de/forschung/energie/laufend/monitoring-der-kfw-energiesparprogramme/>

<sup>10</sup> In the same period, 237,000 new homes were erected. Hence, 54% of newly erected homes were funded through KfW's EEC programme.

<sup>11</sup> If an investors seeks to gain access to KfW grants, then KfW must be consulted directly.

## Lessons learnt 1: Success factors

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EEC and EER are built upon solid institutions, KfW in charge of the overall management of the programme and the private, municipal, and co-operative banking market to facilitate loans. In particular, the fact that KfW is the key actor provides certainty to investors. The involvement of local banks also has several advantages; first, KfW does not have any local branches, which is why it cannot provide face-to-face consultations, in contrast to local banks; second, local banks may have long-standing relations with their clients and information provided may be perceived as very reliable so that investors opt for financial products such as EEC and EER more easily. It should be noted, however, that it took KfW a number of years to raise the interest of the local banks in the schemes, train bank staff, and find the appropriate level of margin offered to the banks for managing the loans. Moreover, the above mentioned transparency of the programmes with information available online increases the trustworthiness of the programmes. In certain circumstances, KfW also supports the assignment of an energy advisor, who helps to plan and realise an energy-efficient building. For the success of the programmes, the frequent evaluation appears to be critical in order for the Government to achieve its energy saving targets.

## Lessons learnt 2: factors to avoid and possible further improvements

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An aspect that is worth discussing is the financing support of single measures, particularly if the energy efficiency levels required for them would classify them as shallow measures – compared to whole-house retrofitting measures that aim at enhancing the overall energy performance of a building. While single measures are eligible for funding under the EER programme and enhance the energy performance of a building to some extent, they certainly result in fewer energy savings than comprehensive measures and may thus create lost opportunities. Whether the termination of support for single measures is a solution, or whether they should be embedded in a deep renovation roadmap for each building, must be assessed in close detail and should definitely be factored in for other country contexts.

One of the options to improve the policy could be to increase the amount of funding with an increasing number of energetic measures realised. For instance, the Tax Credit scheme in France increases financing support to households if, at least, two measures are installed (Government of France 2015).

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## The Project

In 2006, the European Union adopted the Directive on energy end-use efficiency and energy services ("ESD"). The Directive sets an indicative energy saving target of 9 % by 2016 as well as obligations on national authorities regarding energy savings, energy efficient procurement and the promotion of energy efficiency and energy services. It requires Member States to submit three National Energy Efficiency Action Plans (NEEAPs), scheduled for 2007, 2011 and 2014.

The Energy-Efficiency-Watch Project aims to facilitate the implementation of the Energy Efficiency Directive. This Intelligent Energy Europe project tried to portray the progress made in implementation of energy efficiency policies since the Energy Service Directive via NEEAPs screening and an extensive EU wide expert survey.

[www.energy-efficiency-watch.org](http://www.energy-efficiency-watch.org)

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## List of Abbreviations

**EE** – Energy Efficiency, **EED** – Energy Efficiency Directive, **EPC** – Energy Performance Certificates, **EPDB** – Energy Performance of Buildings Directive, **ES&A Targets** - Energy Savings and Action Targets, **ESCO** – Energy Service Company, **ESD** – Energy Service Directive, **EU** – European Union, **EEW** – Energy-Efficiency-Watch, **MEPS** – Minimum Energy Performance Standards, **MRV** – Monitoring, Reporting and Verification, **MURE** – Mesures d'Utilisation Rationnelle de l'Énergie, **NEEAP** – National Energy Efficiency Action Plan, **R&D** – Research and Development