
Evaluation of the KfW funding programs “EBS NWG” in the funding year 2020

Synopsis

Study conducted on behalf of the Federal Ministry of
Economics and Climate Protection (BMWK)

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This project was conducted by

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List of Acronyms

BEG	Federal Funding for Efficient Buildings
BHO	Federal Budget Code
BMWK	Federal Ministry of Economics and Climate Protection
EBS NWG	Energy-efficient Construction and Renovation in the Non-residential Building Sector
EEP	KfW-Energy Efficiency Program
IKK	Municipal investment loan
IKU	Municipal enterprises investment loan
NWG	Non-residential building

PJ

Petajoule

1 Background: Task and Evaluation Design

To support the construction or initial acquisition of energy-efficient non-residential buildings (NWG), the renovation to so-called efficiency buildings, as well as the implementation of single measures to improve building energy efficiency, the CO₂ Building Renovation Program of the Federal Ministry of Economics and Climate Protection (BMWK) provided funding in the form of low-interest loans and, under certain conditions, repayment subsidies through the KfW-funded program, “Energy-efficient Construction and Renovation in the Non-residential Building Sector (EBS NWG)” until its replacement by the new program “Federal Funding for Efficient Buildings (BEG)”. Non-residential buildings of municipal and social infrastructure as well as municipal and commercial enterprises were supported. Until June 30, 2021, funding applications could be submitted to KfW for the following three sub-programs within the EBS NWG:

- Municipal investment loan (IKK) – Energy-efficient construction and renovation (KfW 217 – construction / KfW 218 – renovation)
- Municipal enterprises investment loan (IKU) – Energy-efficient construction and renovation (KfW 220 –construction / KfW 219 – renovation)
- KfW Energy Efficiency Program (EEP) – Energy-efficient construction and renovation (energy efficiency in companies) (KfW 276 –construction / KfW 277 – renovation / KfW 278 – single measures)

The Federal Ministry for Economic Affairs and Climate Protection commissioned Arepo GmbH and the Wuppertal Institute with the evaluation of these programs on their target achievement, impact, and economic efficiency as a contribution to performance review in accordance with §7 of the Federal Budget Code (BHO).

The focus of this synopsis is on the 2020 funding year. The main data and information basis for the evaluation is the KfW's funding data for the 2020 funding year (as of January 20, 2022), an online survey of the funded municipalities, municipal companies/social organizations, and private companies, as well as supplementary stakeholder interviews.

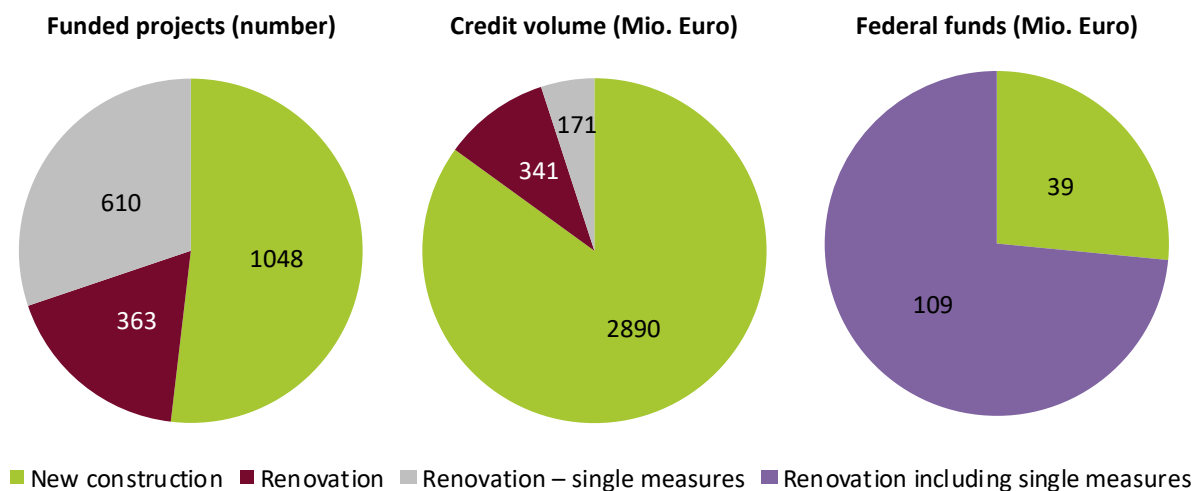
2 EBS NWG Program in 2020

From January 1, 2020, the funding programs were adjusted compared to the previous year due to requirements of the Climate Protection Program 2030. In the renovation funding programs (EEP: KfW 277/278, IKK: KfW 218, IKU: KfW 219), oil condensing boilers and low-temperature boilers with oil or gas are no longer eligible for funding. In the construction funding programs (EEP: KfW 276, IKK: KfW 217, IKU: KfW 220), the use of oil heaters and combinations with oil heaters are no longer eligible for funding. In addition, from January 24, 2020, the repayment subsidies in the renovation funding programs (EEP: KfW 277/278, IKK: KfW 218, IKU: KfW 219) were increased by 10 percentage points for efficiency buildings and by 15 percentage points for individual energy measures.

3 Funding Overview in 2020

The funding year 2020 includes 2,021 funded projects (funding cases), with new construction projects accounting for the largest share at 52 % (see Figure 1). The rest is evenly distributed between renovations (18 %) and renovations with single measures (30 %). The number of credit cases is 2,041. A total of 3.4 billion euros is generated in credit volume. The federal funds spent to enable interest rate reductions and to provide repayment subsidies amount to 148 million euros. This number does not include administrative costs. The investment volume is around 5.3 billion euros.

Figure 1: Funding balance sheet at a glance (2020)



Source: KfW funding data, own illustration.

The focus of demand is on the new construction and renovation of commercially used buildings (EEP: KfW 276/277/278). Around 85 % of the total credit volume is allocated to new construction and only 15 % to renovations. The IKK (KfW 217/218) funding programs have a total share of 13 % of the credit volume, which is mainly used for new construction. In the IKU funding program (KfW 220/219), with a total share of 7 % of the credit volume, loans are likewise in the majority directed towards new construction.

When the number of funding cases is considered in relation to the intended use, most new buildings in the funding program (97 %) are aiming for the highest efficiency standard, namely the so-called KfW efficiency building 55. In the case of renovations, the highest funding standard, KfW efficiency building 70, is aimed for in about 70 % of cases.

For private companies (EEP), the main types of use are administrative buildings as well as production and workshops. The highest demand among municipalities (IKK) is for schools and daycare centers. For municipal companies (IKU), demand is also highest for daycare centers. When evaluating single measures by intended use, it should be noted that for a majority of the funding cases declared as single measures, there is no clear assignment of the type of individual measure. For the remaining 42 % of single measures, it can be observed that the main shares are in insulation, windows, doors and gates, as well as lighting.

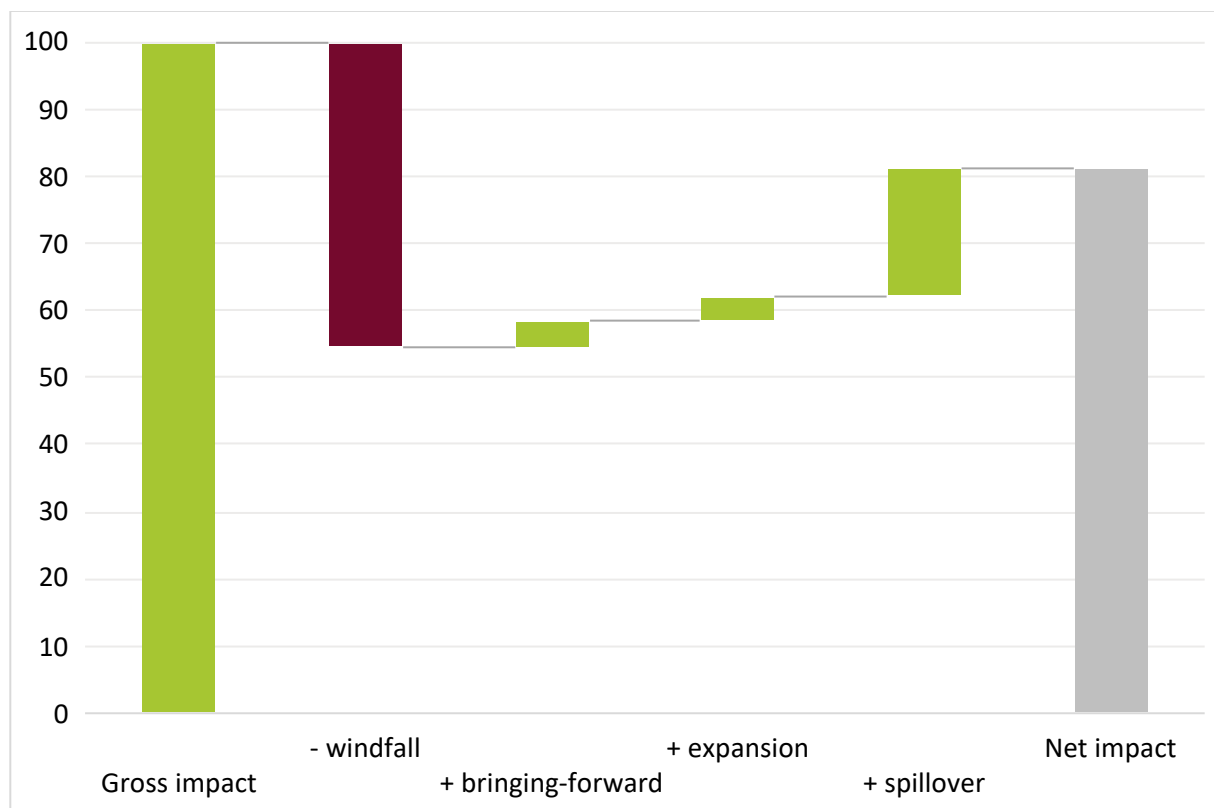
Of those who received funding in 2020, a total of 53 % were located in rural areas. The regional focus of funded new construction and renovation activities is in Baden-Württemberg and Bavaria. Generally, demand is greater in western German states than in eastern ones.

4 Effect Adjustment

The data in the funding statistics of KfW should be considered as gross values which need to be adjusted for windfall effects, bringing-forward effects, expansion effects, and transfer effects. The method used to determine the size of these effects is generally based on the methodological guidelines (Fraunhofer-Institut für System- und Innovationsforschung ISI u. a. 2020). Data to adjust for these effects is based on the responses of the funding recipients in the online survey.

For projects that received funding approval in 2020, the gross funding impact (“Bruttowirkung”) is reduced by 19 %. This value represents a weighted average based on the proportion of each funding program among the participants in the online survey. The adjustment for these effects is shown graphically in Figure 2. A windfall effect (“Mitnahme”) of around 45 % is partially offset by a “bringing forward-effect” (“Vorzieh”) of 4 %, an expansion effect (“Ausweitung”) of 3 %, and a spillover effect (“Übertragung”) of 19 %.

Figure 2: Overview effect adjustment (2020)



Source: Own calculations; N = 521.

The programs directed towards municipalities are characterized by a lower net effect than the programs directed towards municipal companies, social organizations, and private companies. This can

primarily be explained by a significantly higher windfall effect (“Mitnahmeeffekt”). The net impact for the new construction program aimed at municipalities is even less than 50 %. In contrast, the net impacts of the renovation programs for municipal companies, social organizations, and private companies are significantly higher at around 90 %.

5 Target Achievement Control

The aim of the EBS NWG funding programs is to achieve goals such as saving primary and final energy, reducing greenhouse gas emissions, as well as securing or creating jobs and supporting small and medium-sized enterprises. The client defines the target values to be assumed for target achievement control in the evaluation's performance description, however, only for the general Energy-Efficient Construction and Renovation (EBS) programs which includes programs for both residential buildings and non-residential buildings. Accordingly, the EBS programs target:

- Annual primary energy savings of 8.1 PJ,
- Annual final energy savings of 5.8 PJ,
- Annual greenhouse gas savings of 580,000 t CO₂ equivalents,
- As well as securing or creating 340,000 jobs.

The target values refer to gross figures.

With the 2020 funding year, a total of around 336 GWh of final energy savings or 417 GWh of primary energy savings are achieved annually. This results in an annual reduction of emissions of around 107,000 tons of CO₂ equivalents. The contributions that non-residential building funding makes to achieving the goals of the entire building renovation program range between 17% and 21% (see Table 1). Together with the effects achieved by funding residential buildings, the goals can be considered to have been achieved. Nevertheless, it is recommended to differentiate future energy-saving targets for funding programs in the building sector for residential and non-residential building areas.

Table 1: Contribution to Target Achievement (2020)

Target Parameter	2020		
	Achieved Value	Target Value	Contribution to Target Achievement
	PJ	PJ	%
Final energy savings	1.2	5.8	21
Primary energy savings	1.5	8.1	19
	Achieved Value	Target Value	Contribution to Target Achievement
	t CO ₂ equivalents	t CO ₂ equivalents	%
Greenhouse gas savings	107,200	580,000	18
	Achieved Value	Target Value	Contribution to Target Achievement
	Count	Count	%
Jobs saved or created	56,992	340,000	17

Note: Totals may differ due to rounding.

Source: KfW funding statistics, own calculations.

In addition, new construction and renovation activities activated through the funding programs generated gross value-added effects of around 4.2 billion euros and secured or created approximately 57,000 (gross) full-time jobs.

6 Impact Assessment

To assess the causality of the effects of the EBS NWG programs in the funding year 2020, the evaluation mainly builds on the effect adjustment analyses in general and, in particular, the assessment of “windfall-effects”, i.e., to what extent measures would have been implemented without funding. The analyses show that overall, about 68% of municipalities, 34% of municipal companies and social organizations, and 34% of private companies would have implemented the projects in the funding year 2020 to the same extent even without funding. In municipalities, the spillover effect is thus higher than in companies, mainly due to more institutionalized processes and task structures in the implementation of new and renovation measures in municipalities, especially compared to (smaller) companies.

Compared to the construction programs, there are expansion effects are mainly observed in the renovation programs, meaning more extensive measures were implemented than initially planned. The tendency seems to show that the expansion effects are more pronounced in the target group of (private) companies than in municipalities.

At the same time, a consistently high demand and acceptance among funding recipients lends further reason in favor of causality of the effects of the EBS NWG programs. In the funding year 2020, around 12% of the newly constructed usable area nationwide was funded by the EBS NWG. The proportion of

renovation measures funded by the EBS NWG program in the average insulation rate¹ is about 7%. Furthermore, the accessibility of the programs is generally perceived as high among the surveyed borrowers. Also, from the perspective of borrowers, the cost-benefit ratio of using the funding programs is seen positively in the vast majority. In sum, they achieve an energy cost saving of around 1.1 billion euros with the funded projects over their lifetime. Generally, little criticism is expressed about the design of the programs, and borrowers express high satisfaction with the implementation of the programs.

Regarding the question of the role of the renovation programs in a change of energy source, the proportion of heating technologies used shifted significantly in favor of heat pumps (from 6% to 33%) among respondents who changed their energy source during renovations. The usage of solar thermal systems and wood-fired heating systems also increased. It was further found that both natural gas heaters – the most common type of heat generation prior to a renovation measure – and oil heaters are replaced by heat pumps in about 50% of cases. However, oil heaters are also still often replaced by fossil fuel heaters in the form of natural gas heaters (24%). Overall, 83% of respondents who originally used fossil fuels for heating switched to renewable energy sources after making the energy source change.

Another evaluation question concerns the influence of program adjustments on demand. For example, the adjustment of the repayment subsidy aimed to strengthen the incentive for the EBS programs. The survey of borrowers carried out in this context suggests that these adjustments were generally positively evaluated. The proportion of respondents expressing dissatisfaction with the size of the repayment subsidy decreased significantly. A possible indication that the increase in the repayment subsidy also represented a stronger incentive for the use of the renovation programs is the significantly stronger increase in funding numbers in the renovation sector compared to funding numbers in new construction. This increase is characterized by a strong increase in single measures.

In addition to the internal program adjustments mentioned, the influence of external factors can be attributed a smaller role in the development of demand or the achievement of goals and effects of the EBS NWG programs.

The evaluation also shows that the funding programs generally contribute to an increase in knowledge about possible efficiency measures, and the efficiency building types and levels funded by KfW have established themselves as standard.

The calculated funding leverage for the 2020 funding year is about 23, meaning that for each funding euro (federal funds), an additional 23 euros of investment are made by borrowers. With 72 the leverage is more than fourteen times higher for new construction projects than for renovation projects (5). Additionally, the funding triggers (net) investments of around 3.8 billion euros. Taken together, these are significant indications of the causality of funding for the effects observed.

¹ The national insulation rate is used as a proxy for the national renovation rate, for which no information for non-residential buildings exists.

7 Economic Efficiency Control

According to the methodology guidelines, the most important indicator for economic efficiency control is the funding efficiency. For this, the federal funds expended are compared to the final energy and CO₂ savings achieved with the funding programs.

Around 450 euros of federal funds are required per MWh of final energy saved per year. Over the service life of the measures, this value is approximately 22 euros. For new buildings, about 191 euros of federal funds must be used per MWh per year (9 euros over the service life), and for renovations, about 880 euros (44 euros over the service life).

Regarding the CO₂ funding efficiency, it is estimated that approximately 1,400 euros per ton of CO₂ equivalents saved must be expended per year, or nearly 81 euros over the service life of the measures. For new buildings, the corresponding values are 589 euros (per year) and 34 euros (over the service life), and for renovations, 2,826 euros (per year) and 162 euros (over the service life).

8 Summary Assessment

In summary, the analysis of the theory/model of change of the EBS NWG funding programs in the 2020 funding year shows that the approach pursued to achieve the set goals is appropriate and the funding is theoretically causal for the impact. The goal of the funding programs is to provide an incentive to funding recipients (municipalities, municipal companies/social organizations, private companies) to renovate existing buildings to an efficiency building standard or carry out new constructions according to efficiency building standards by providing financing advantages through interest rate reductions for loans as well as repayment subsidies. The measures carried out should represent an improvement in energy efficiency compared to the status quo without the funding program, resulting in energy savings (energy policy objective) as well as savings in GHG emissions (climate policy objective). Additionally, the program has an economic policy objective and is intended to support value creation and employment in small and medium-sized enterprises through the implementation of measures. The analysis of the funding balance sheet and the resulting target achievement and impact assessment show that this approach is generally functional and appropriate. The 2020 funding year contributes between 17% and 21% to the goals defined for the EBS programs overall (i.e., residential and non-residential buildings).

As part of the evaluation, the potential for expansion effects of the original planning through funding, especially in the renovation sector and with private companies, became apparent. It is therefore worth discussing whether this program area or target group should be even more strongly addressed in the future. With regard to the role of financial incentives in the development of demand, an effect of the increase in the repayment subsidy for the renovation programs was found, which was expressed in the form of higher satisfaction with the programs as well as an increase in demand.

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