
Evaluation of the KfW funding programs “EBS NWG” in the funding year 2021

Synopsis

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

Project Organisation:

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 2021 funding year, in which funding applications for the EBS NWG program could still be submitted until June 30, 2021. The main data and information basis for the evaluation is the KfW's funding data for the 2021 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.

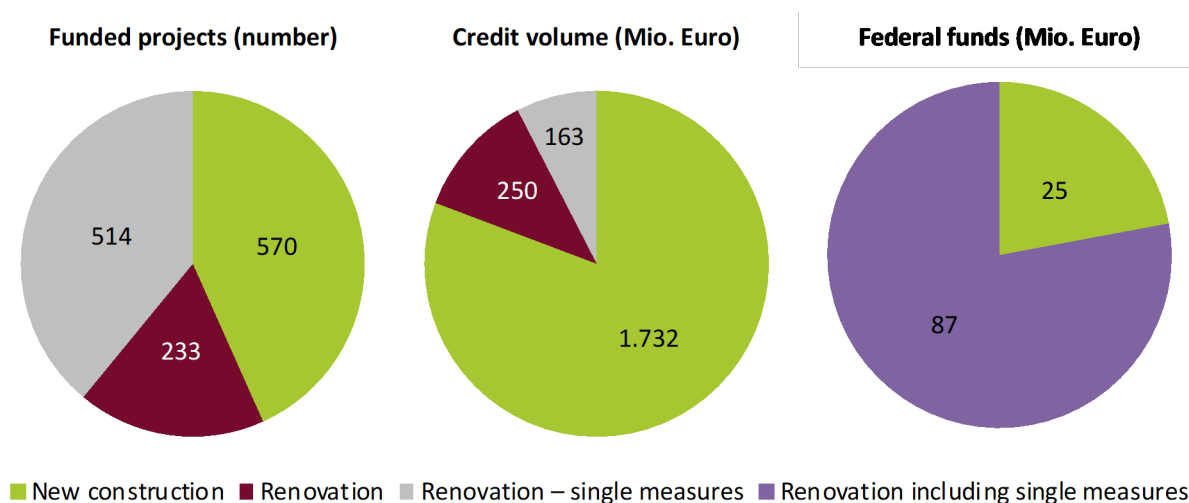
2 EBS NWG Program in 2021

The KfW-managed EBS funding programs were discontinued on July 1, 2021, and replaced in two steps by the Federal Funding for Efficient Buildings (BEG). The grant funding for single measures, BEG EM, managed by BAFA, came into effect in January 2021, however, this program is not part of the evaluation. The remaining BEG funding programs were introduced on July 1, 2021, and replaced the existing EBS NWG programs. Therefore, the evaluation for the year 2021 is based on data only for projects that received funding commitments by June 30, 2021.

3 Funding Overview in 2021

In the funding year 2021, which was limited to the first half of the year due to the introduction of the BEG on July 1, 2021, a total of 1,317 projects (funding cases) were funded with the KfW programs EBS NWG (see Figure 1). The largest share, around 60 %, is attributed to renovations. About two-thirds of these are renovations with single measures. New buildings account for just under 40 %. The total number of credit cases is 1,337. A total of 2.1 billion euros is generated in credit volume. The federal funds spent to enable interest rate reductions and to provide repayment subsidies amount to 111 million euros (this number excludes administrative costs). The investment volume is around 3.5 billion euros.

Figure 1: Funding balance sheet at a glance (2021)



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 81% of the total credit volume is allocated to new construction and only 13% 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 8% of the credit volume, again with new construction taking up the largest share of loans.

When the number of funding cases is considered in relation to the intended use, the majority of new buildings in the funding program (98%) 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 only aimed for in about two thirds of the cases. Over the examined funding period from 2019 to 2021, there is generally a trend towards the highest eligible efficiency standards.

Similar to the previous year, 33% of the funded projects are attributed to administrative buildings (including office buildings), especially among funded private companies, in 2021. The highest demand from municipalities is for schools and kindergartens.

Regarding single measures, insulation, lighting, as well as the replacement or renewal of windows, doors, and gates, represent the majority. In combinations of single measures, different combinations of these three single measures and additional heating and cooling systems are typically used.

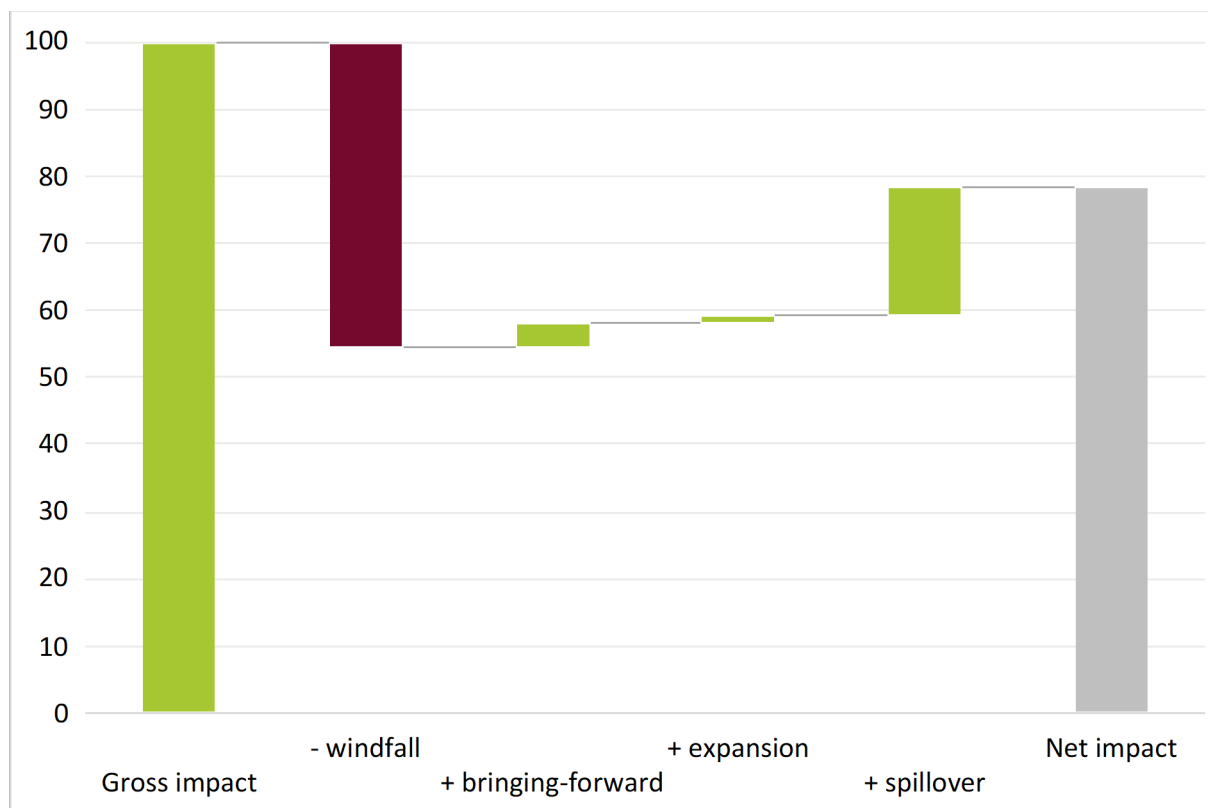
Of those who received funding in 2021, a total of 44% were located in rural areas. The regional focus of funded new construction and renovation activities is in Baden-Württemberg and Bavaria. Generally, demand is greater in western German states than in eastern ones.

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 2021, the gross funding impact (“Bruttowirkung”) is reduced by 22 %. 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 46 % is partially offset by an “bringing-forward-effect” (“Vorzieh”) of 4 %, an expansion effect (“Ausweitung”) of 1 %, and a spillover effect (“Übertragung”) of 19 %.

Figure 2: Overview effect adjustment (2021)



Source: Own calculations; N = 279.

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”). According to the online survey, the IKK programs (KfW 217 and KfW 218) have the lowest net effects at 61 %, while the IKU program (KfW 219) has the highest net effect at 87 %.

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 8.5 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. As these are target values for a whole year and the evaluation only considers the period until 30 June 2021, the target values are adjusted accordingly.

With the 2021 funding year, a total of around 211 GWh of final energy savings or 245 GWh of primary energy savings are achieved annually. This results in an annual reduction of emissions of around 67,000 tons of CO₂ equivalents. The contributions that non-residential building funding makes to achieving the goals of the entire building renovation program range between 22 % and 26 % (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 (2021)

Target Parameter	2021		
	Achieved Value	Target Value	Contribution to Target Achievement
	PJ	PJ	%
Final energy savings	0.8	2.9	26
Primary energy savings	0.9	4.1	22
	Achieved Value	Target Value	Contribution to Target Achievement
	t CO ₂ equivalents	t CO ₂ equivalents	%
Greenhouse gas savings	66,603	290,000	23
	Achieved Value	Target Value	Contribution to Target Achievement
	Count	Count	%
Jobs saved or created	37,745	170,000	22

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 2.8 billion euros and secured or created approximately 38,000 (gross) full-time jobs.

6 Impact Assessment

To assess the causality of the effects of the EBS NWG programs in the funding year 2021, 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 53% of municipalities, 36% of municipal companies and social organizations, and 35% of private companies would have implemented the projects in the funding year 2021 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.

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 2021, about 5 % of newly constructed usable area nationwide was funded by the EBS NWG program. The share of

renovation measures funded by the EBS NWG program of the average insulation rate¹ was about 5.5 %. Assuming the funding numbers would have developed similarly in the second half of 2021 if the EBS NWG would not have ended, the share of newly constructed usable area nationwide funded by the EBS NWG extrapolates to 10 %. Based on the same assumption, yet, for renovations, the share of renovation measures funded by the EBS NWG program of the average insulation rate² extrapolates to about 11%. 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 670 million 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 4% to 31%) among respondents who changed their energy source during renovations. The usage of solar thermal systems and wood-fired heating systems also increased. Unlike in previous years, natural gas heating systems – the most common type of heating system before a renovation – are being replaced not only by heat pumps, but more often by wood-fired heating systems. Furthermore, in about 25% of cases, oil heating systems are still being replaced by fossil fuel heating systems in the form of natural gas heating systems. Overall, 85% of respondents who originally used fossil fuels for heating switched to renewable energy sources after making the energy source change.

With the introduction of the BEG, it became possible to apply for a grant funding for individual renovation measures from January 2021. However, a relationship between the start of BEG funding for individual measures and the continuing increase in demand for the EBS NWG renovation programs could not be conclusively inferred. On the one hand, the EBS NWG programs were used particularly frequently in combination with the newly introduced BEG grant in comparison to other third-party grants. On the other hand, a significant increase in demand for the renovation programs was already observed in the balance year 2020, which is at least partly due to an increase in the repayment grant in 2020 and may have continued accordingly.

The evaluation showed that the EBS NWG funding programs generally contribute to an increase in knowledge about possible efficiency measures and that the efficiency building types and standards supported by the KfW have become established as a standard.

The calculated funding leverage for the 2021 funding year is about 19, meaning that for each funding euro (federal funds), an additional 19 euros of investment are made by borrowers. For new construction projects, the leverage is more than ten times higher (69) than for renovation projects (5). Additionally, the funding triggered (net) investments of around 2.5 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.

² 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 533 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 26 euros. For new buildings, about 239 euros of federal funds must be used per MWh per year (12 euros over the service life), and for renovations, about 823 euros (41 euros over the service life).

Regarding the CO₂ funding efficiency, it is estimated that approximately 1,700 euros per ton of CO₂ equivalents saved must be expended per year, or nearly 104 euros over the service life of the measures. For new buildings, the corresponding values are 801 euros (per year) and 48 euros (over the service life), and for renovations, 2,482 euros (per year) and 157 euros (over the service life). The differences in funding efficiencies between new buildings and renovations are due, among other things, to the fact that the funding of renovations requires more federal funds (especially for repayment grants) than the funding of new buildings.

8 Summary Assessment

In summary, the analysis of the theory/model of change of the EBS NWG funding programs in the 2021 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 2021 funding year contributes between 22% and 26% 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. At the same time, with regard to possibilities to further increase the degree of target achievement of the EBS NWG programs, the level of the financial incentive, especially in the renovation sector, as well as the investor-user dilemma were identified as important factors for program uptake. The former was underscored by the fact that a continuing upward trend in demand for the renovation

programs was observed, especially among commercial enterprises, that was at least in part due to the increase in the repayment subsidy in the previous year.

References

Fraunhofer-Institut für System- und Innovationsforschung ISI, ifeu Institut für Energie- und Umweltforschung Heidelberg, Prognos AG Basel, und Stiftung Umweltenergierecht. 2020. „Methodikleitfaden für Evaluationen von Energieeffizienzmaßnahmen des BMWi“. Karlsruhe/Heidelberg/Basel/Würzburg. https://www.bmwi.de/Redaktion/DE/Downloads/M-O/methodik-leitfaden-fuer-evaluationen-von-energieeffizienzmassnahmen.pdf?__blob=publicationFile.