

Green Bonds – Made by KfW

Impact achieved by KfW's green bond
issuances 2021 & 2022

September 2024

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Basic Information

Reporting period: calendar years 2021 and 2022

Green Bond Frameworks applied:

2021: KfW Green Bond Framework 2019

2022: KfW Green Bond Framework 2022

Approach: Impact reporting based on aggregated data basis for each calendar year.

“Green Bonds – Made by KfW” issued in one calendar year show the same impact per unit financed which remains unchanged over the bond lifetime.

Reporting Framework: Harmonized Framework for Impact Reporting (ICMA), June 2021 edition (with June 2022 Appendix I)

Successful decade of Green Bonds – Made by KfW

Dear investors and interested readers,

We find ourselves in a time that is characterized by multiple crises. Not only do we have to deal with various geopolitical conflicts, but we also must face the challenge of global warming and the threats that come along with it. One of our major tasks is thus to find ways to effectively counteract climate change. To achieve climate neutrality by 2045, enormous investments are required. In Germany alone, EUR 5 trillion have to be mobilized to achieve that goal. The financial sector and capital markets can make an active contribution to that.

Promoting the transformation towards a sustainable future is our mission at KfW. As Germany’s largest promotional bank we see it as our core responsibility to take a pioneering role in the transition to a carbon-neutral future. We have thus established a sustainable finance concept that serves to align our business activities with the UN Sustainable Development Goals and the climate targets set out in the Paris Agreement. Since 2020, all our new financing commitments have been mapped to the SDGs. The mapping revealed that 100 % of these commitments attribute to at least one SDG.

This year, in 2024 – we are celebrating the 10-year anniversary of our green bond programme. Since 2014, we have been issuing green bonds with a total volume of almost EUR 80bn. This makes us one of the largest and most active green bond issuers worldwide. Over the last decade Green Bonds – Made by KfW became an increasingly important funding instrument in our overall funding mix. In the last three years, we funded an average of around 15 % of our yearly issuance volume via green bonds.

Investors highly value Green Bonds – Made by KfW as they are offering a perfect opportunity to combine the security and liquidity typical of KfW bonds with promoting environmental protection and climate change mitigation. The good feedback we receive from market participants motivates us to continuously develop our green bond programme further and adapt it to the needs of our stakeholders. Responding to their feedback, we updated our framework once again last year. The new framework is applicable to all new Green Bonds – Made by KfW issued from 2024 onwards. It expands from three to five project categories and introduces the new categories “Biodiversity” and “Corporate Investments for Climate Change Mitigation”, thereby contributing further to the reduction of greenhouse gas emissions. In addition, and due to specific conditions, certain parts of KfW’s international financings can also be linked to our green bonds.

We set ourselves ambitious targets when it comes to our green bond reporting. Transparency and reliability are key to us. Conse-



Tim Armbruster
Treasurer of KfW

quently, we put a lot of effort in the implementation of a group-wide impact management system, which is based on various impact indicators. These have partly already been developed and will be further expanded in the coming years. The overall target is to develop a group-wide data management system that captures data automatically and efficiently and consolidates them group-wide.

The following report completes the reporting cycle for Green Bonds – Made by KfW issued in 2021 and 2022. Referring to a total of 35 green bonds and 22 re-openings with aggregate net proceeds of EUR 26.8 billion, it includes all relevant information on the issuances and on the distribution of the net proceeds and provides information on the environmental and social impact achieved in the respective years. The impact is calculated based on evaluation results of the underlying loan programmes of the categories “Renewable Energies”, “Energy Efficiency” and “Clean Transportation” provided by independent research institutes.

Enjoy reading!

Yours sincerely,

Tim Armbruster
Treasurer of KfW

Environmental and social impact

Green Bonds at a glance

Green Bonds 2021:
EUR 16.2 billion net proceeds

Green Bonds 2022:
EUR 10.6 billion net proceeds



“Green Bonds – Made by KfW” issued in 2021 and 2022 contributed to the SDGs 7 “Affordable and Clean Energy”, 11 “Sustainable Cities and Communities” and 13 “Climate Action” and thus contribute to a more sustainable future.

Expected reduction of GHG emissions:
4.5 million tons of CO₂-e p.a.

2021	Absolute impact accounting for KfW's financing share	Impact per EUR 1 million investment
Annual greenhouse gas emissions reduced/avoided (CO ₂ -equivalents)	2,200,799 tons	136 tons
Annual final energy savings	216,465 MWh	13.4 MWh
Annual renewable electricity generation	3,395,404 MWh	209 MWh
Renewable energy capacity added	2,112 MWel	0.13 MWel
Number of jobs created and/or preserved	192,902 person years	12 person years

2022	Absolute impact accounting for KfW's financing share	Impact per EUR 1 million investment
Annual greenhouse gas emissions reduced/avoided (CO ₂ -equivalents)	2,309,477 tons	218 tons
Annual final energy savings	196,203 MWh	18.5 MWh
Annual renewable electricity generation	4,159,456 MWh	393 MWh
Renewable energy capacity added	2,414 MWel	0.23 MWel
Number of jobs created and/or preserved	124,974 person years	12 person years
Reduction of air pollutants		
Annual NO _x emissions reduced	7.2 tons	0.682 kg
Annual PM emissions reduced	0.1 tons	0.010 kg
Annual CO emissions reduced	8.7 tons	0.820 kg
Annual NMVOC emissions reduced	1.1 tons	0.103 kg

Green Bonds – Made by KfW

Continuous development and expansion of KfW's Green Bond Framework

As one of the largest green bond issuers worldwide, KfW endeavours to make an active contribution to raising awareness for climate protection through its capital market activities by linking its sustainable lending business to the refinancing side. KfW entered the green bond market as an issuer in 2014. With its high ambitions regarding transparency and impact evaluation, KfW believes it has set standards in the market and significantly contributed to the important growth the market has experienced ever since.

Since 2014, KfW's Green Bond Framework has constantly evolved. With the latest edition of KfW's Green Bond Framework, valid since 1 Jan 2024, net proceeds from “Green Bonds – Made by KfW” are linked exclusively to the financing of green projects under selected KfW's loan programmes in the categories “Renewable Energy”, “Green Buildings”, “Clean Transportation”, “Biodiversity”, and “Corporate Investments for Climate Change Mitigation”.

This report focuses on the impact of green bonds issued in the years 2021 (KfW Green Bond Framework 2019) and 2022 (KfW Green Bond Framework 2022) and the financing of green projects under KfW's loan programmes in the categories “Renewable Energy”, “Energy Efficiency” and “Clean Transportation”.

Second Opinion by CICERO Shades of Green, now part of S&P Global



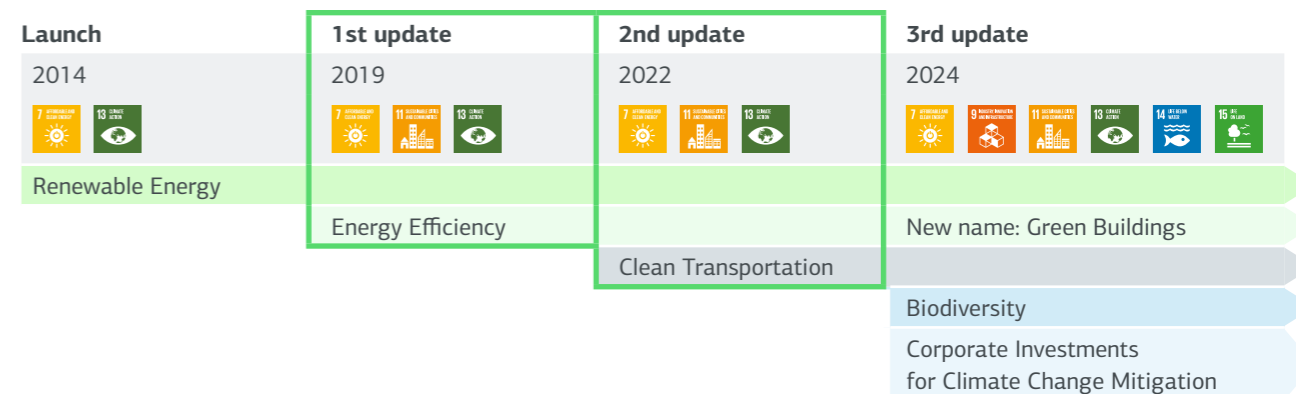
Framework 2019 (assessed by CICERO):

- In line with ICMA GBP (June 2018)
- Shades of Green: **medium green**
- Governance: **excellent**

Framework 2022 (assessed by CICERO):

- In line with ICMA GBP (June 2021)
- Shades of Green: **medium green**
- Governance: **excellent**

Continuous development and expansion of KfW's Green Bond Framework



 KfW Green Bond Framework 2019 relevant for impact calculation 2021
 KfW Green Bond Framework 2022 relevant for impact calculation 2022

Relevant KfW loan programmes

2021: “Renewable Energies – Standard” (no. 270); “Energy-efficient construction and refurbishment (EBS)” (no. 153)
2022: “Renewable Energies – Standard” (no. 270); “Federal Funding for Efficient Buildings (BEG)” (no. 261–264), “Sustainable Mobility for Municipalities” (no. 267) and “Sustainable Mobility for Corporates” (no. 268, 269)

Transparent impact reporting

Measurable climate protection effects for investors

KfW reports the amount and the distribution of disbursements under the respective loan programmes under the frameworks 2019 and 2022 on a yearly basis until full allocation.

The loan programme “Renewable Energies – Standard” is evaluated by the Center for Solar Energy and Hydrogen Research Baden-Württemberg, Germany, (ZSW), the loan programmes “Energy-efficient Construction” and “Federal Funding for Efficient Buildings (BEG)” are evaluated by the economic research centre Prognos, Germany, the Research Institute for Thermal Insulation Munich, Germany, (FIW), the Institute for Building Systems Engineering Research and Application, Germany, (ITG), as well as the Institut für Energie- und Umweltforschung Heidelberg gGmbH, Germany, (ifeu). Relevant loan programmes of the category “Clean Transportation” are evaluated by the ifeu institute.

After the institutions have evaluated the actual impact of the funded projects for each year, KfW publishes its respective impact report. The presentation of impacts is based on the standards set out by the International Capital Markets Association (ICMA) – the Green Bond Principles – and the related Harmonized Framework for Impact Reporting.

KfW’s impact reporting is prepared for each calendar year and shows aggregate data (no project-by-project data). All requests for disbursements for Eligible Green Projects KfW made between 1 January and 31 December of a calendar year are linked to the cumulated net proceeds of all “Green Bonds – Made by KfW” issued in the same calendar year. As a result, all “Green Bonds – Made by KfW” issued in one calendar year show the same impact per unit financed which remains unchanged over the bond lifetime. Quantitative performance indicators of impact measurement refer to loan commitments (or signed loan amounts) while allocation of proceeds is based on requests for disbursements. Due to full or partial waivers of borrowers, requests for disbursements may be lower than loan commitments. Also, the calendar year in which disbursements are made may differ from that in which commitments are made. This may cause a mismatch. KfW is aware of this potential mismatch which, in KfW’s view, is limited and therefore, will not be taken into account.



Green projects

KfW defines detailed formal eligibility requirements for its respective loan programmes. Loans are extended either indirectly to the ultimate borrower via financing partners or, in the context of municipal financing only, to the ultimate borrower directly. In both cases, KfW reviews the individual loan application in order to assess compliance with the eligibility requirements of the respective loan programmes.

The two frameworks applicable for this Impact Report 2021/2022 encompass the following loan programmes:

Eligible categories	Framework 2019	Framework 2022
	Loan programmes	
Renewable Energy	“Renewable Energies – Standard” (no. 270)	“Renewable Energies – Standard” (no. 270)
Energy Efficiency	“Energy-efficient Construction and refurbishment (EBS)” (no. 153)	“Federal Funding for Efficient Buildings (BEG)” (no. 261–264)
Clean Transportation	–	“Sustainable Mobility for Municipalities” (no. 267) and „Sustainable Mobility for Corporates“ (no. 268, 269)

General note

KfW’s loan programs are subject to continuous further development. This means that adjustments may be made to the eligibility criteria, group of beneficiaries, or other aspects within a reporting period.

Comprehensive criteria

for environmental and social eligibility assessment
under the respective loan programmes

KfW's promotional loan programme [no. 270] "Renewable Energies – Standard"

Eligibility and exclusions

What for? The programme provides financings for the construction, expansion and acquisition of plants generating power or heat from renewable energy sources that comply with the requirements defined by the German Renewable Energy Sources Act (Erneuerbare-Energien-Gesetz – EEG). These sources include wind energy, solar energy (photovoltaics), hydropower, biomass, biogas and geothermal energy. Furthermore, grids and plants for the storage of heat are supported.

For whom? Funds are available for private individuals and non-profit organisations which feed the generated electricity/heat into the grid, at least in part, self-employed professionals and farmers, as well as German and non-German enterprises majority-owned by private individuals or municipalities. Investments outside Germany are eligible for German companies, German citizens and joint ventures with a substantial German stake.

Up to 100 % of the investment costs are eligible for financing with a cap at EUR 50 million.

Exclusions

The following plants and projects are excluded:

- Hydropower plants with an installed power exceeding 20 MW,
- plants for the generation of power or heat using fossil fuels as well as plants for heat storage that are directly linked to power or heat generated on the base of fossil fuels,
- projects using any form of trust structures or self dealing,
- equipment for the use of nuclear power.

KfW's promotional loan programme [no. 153] "Energy-efficient construction and refurbishment (EBS)" (until 2021)

Eligibility and exclusions

What for? The programme provides financings for the construction of new energy-efficient residential buildings in Germany, including passive houses, which use 55 % or less primary energy compared to the requirements of the current German energy saving ordinance for new buildings (EnEV). Such buildings are compliant with the so-called KfW55/KfW40/KfW40plus standards.

For submission of the financing application, the involvement of an energy efficiency expert for KfW's promotional products is mandatory.

For whom? Funds are available for private individuals, home-owners' associations, housing companies, housing cooperatives, property developers, owners/operators of residential homes, corporations and institutions under public law as well as contracting providers sponsoring investment measures on newly constructed owner-occupied or rented residential buildings and owner-occupied apartments, first-time buyers of newly constructed residential buildings or owner-occupied apartments.

Up to 100 % of the construction costs (building costs excluding property) are eligible for financing with a cap at EUR 120,000 per residential unit.

Exclusions

The following buildings are excluded:

- The construction or initial acquisition of a residential building with an oil-fired heating system,
- paid or other asset transfers.

KfW's promotional loan programmes [no. 261] "BEG residential building loan efficiency house [no. 263], "BEG non-residential building loan" and [no. 264] "BEG municipalities loan (from 2022 onwards)

Eligibility and exclusions

What for? The programme provides financings for investment measures including the energy-efficient refurbishment and initial acquisition of completed existing non-residential buildings that achieve the energy standard of an "EE efficiency house" or "Efficiency House NH" after completion of the refurbishment measures. An "EE efficiency house" class is achieved if renewable energies and/or unavoidable waste heat provide at least 65 percent of the energy required to heat and cool the building. An "Efficiency House NH" class is achieved if an efficiency house is labeled with a sustainability certificate which confirms that the measure complies with the requirements of the "Sustainable Building" quality seal. Generally, projects must meet the environmental and social requirements and standards applicable in Germany.

For submission of the financing application, the involvement of an energy efficiency expert for KfW's promotional products is mandatory.

For whom?

No. 261/ no. 263: All investors (e.g., homeowners, contractors, companies, non-profit organisations, municipalities) are eligible to apply.

No. 264: Funds are available for local authorities, legally dependent own enterprises of local authorities, municipal associations, special-purpose associations that can be treated as local authorities.

No. 261: Up to 100 % of the investment costs are eligible for financing with a cap at EUR 150,000.

No. 263 / 264: Up to EUR 2,000 per square meter of net floor space, up to a maximum of EUR 10 million per project.

Exclusions

The subsidy programme cannot be used to finance transfers of assets against payment or other transfers of assets that go beyond the acquisition of a residential unit for own use (e.g., for pure transfers of assets between companies and/or persons). In the case of a new building, heat generation based on oil as an energy source is excluded.

KfW's promotional loan programme [no. 262] "BEG residential building loan for single meas- ures" (from 2022 onwards)

Eligibility and exclusions

What for? The programme provides financings for individual measures on completed existing buildings that are at least five years old and lead to an improvement in energy efficiency. Eligible measures may include, for example, the replacement of windows and external doors, insulation of the building envelope, installation or optimization of ventilation systems including heat/cold recovery, replacement of heat generation systems and measures to optimize the heating system in existing buildings in order to increase the energy efficiency of the system. Once the subsidized measures have been implemented, the buildings must fall under the scope of the currently valid Building Energy Act (GEG).

For submission of the financing application, the involvement of an energy efficiency expert for KfW's promotional products is mandatory.

For whom? Funds are available for private individuals, condominium owners' associations, corporations and institutions under public law, for example chambers or associations, non-profit organisations including churches, companies, including sole traders and municipal companies, other legal entities under private law, including housing cooperatives. Funding can be provided by owners, leaseholders or tenants.

A maximum of EUR 60,000 per residential unit and calendar year.

Exclusions

KfW generally excludes certain projects from financing or specifies conditions to be met. Details can be found in the KfW Bankengruppe exclusion list: [2019-07-01 Exclusion List of KfW Group.pdf](#)



Exterior view of a new low-energy house
with a photovoltaic system on the roof



KfW's promotional loan programmes [no. 267–269] “Sustainable Mobility” (from 2022 onwards)

Eligibility and exclusions

What for? The programme “Clean Transportation”, with the standard variant (no. 268) and the individual variant (no. 269), supports companies with investments in ambitious climate protection measures in the field of mobility in Germany. Parallely running, the programme “IKK – Nachhaltige Mobilität” (no. 267) expands KfW's funding activities into the underlying infrastructure to enhance sustainable and clean, for municipalities. Eligible for funding are investments in projects that exhibit zero direct CO₂-emissions, in low-emission vehicles (as per definition) and in the related infrastructure. In addition, investments in information and communication technologies in the field of mobility are supported.

The requirements for the measures are implemented in accordance with the technical criteria of the EU-wide definition of economically sustainable activities (“EU taxonomy”).

For whom? Funds are available for:

1. Companies, businesses and sole proprietorships in the commercial sector which are predominantly privately owned,
2. companies with at least 50 % public-legal participation,
3. non-profit applicants.
4. corporations, institutions and foundations under public law with a majority municipal background.

Up to 100 % of the investment costs are eligible for financing. The funding volume for the standard variant is limited at EUR 50 million, whereas the individual variant can be individually adjusted with at least EUR 25 million being fixed. Funding programme 267 offers loans in the amount of max. EUR 150 million per year.

Exclusions

- Paid or other asset transfers,
- debt rescheduling or refinancing of already started or finished projects,
- Projects in areas in which public borrowers carry out economic activities contrary to EU state aid law.



An engineer checks technical details in a tram production hall.

“This year, in 2024 – we are celebrating the 10-year anniversary of our green bond programme. Since 2014, we have been issuing green bonds with a total volume of almost EUR 80bn. This makes us one of the largest and most active green bond issuers worldwide.”

Tim Armbruster
Treasurer of KfW



2021





Issuance summary and use of proceeds

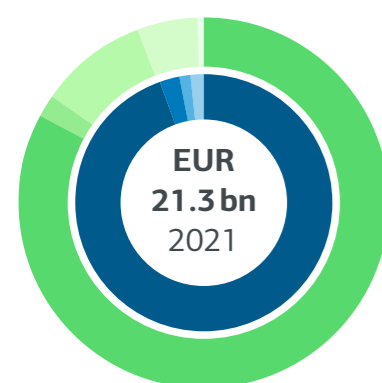
KfW issued 37 “Green Bonds – Made by KfW” in 2021, raising net proceeds in the amount of EUR 16.2 billion, which were fully allocated by year-end.

In the same period, KfW received requests for disbursements under the programme “Renewable Energies - Standard” and the “Energy-efficient Construction” programme in an amount of EUR 21.3 billion. Thus, an amount equal to the net proceeds from all KfW green bonds issued in 2021 was fully allocated as of December 31, 2021.

The majority (84.8 %) of all requests for disbursement were related to projects in the category of energy efficiency, especially residential buildings, while 15.2 % were related to projects in the category of renewable energies (9.5 % wind energy; 5.2 % solar energy, 0.4 % other renewable energies). 94.6 % of the funds were invested in projects located in Germany. The remainder of the projects is located in France (2.6 %), the Netherlands (1.2 %), Poland (0.6 %), Spain (0.3 %), Sweden (0.3 %), Austria (0.2 %), Italy (0.1 %), Ireland (0.1 %), United Kingdom (0.03 %), and Finland (0.03 %).

Net proceeds in foreign currencies were converted into EUR at the ECB's exchange reference rate on the respective pricing date.

-  **37 Green Bonds** in 13 currencies (EUR, USD, GBP, NOK, AUD, CAD, CNY, SEK, PLN, HKD, ZAR, MXN, HUF)
-  **EUR 16.2 billion** Net proceeds
-  **19.6 %** of KfW's total funding (EUR 82.6 bn)
-  **Full Allocation** Disbursements in an amount of EUR 21.3 bn



Requests for disbursements under the eligible loan programmes

- Residential buildings: 83 %
- Other buildings: 1.9 %
- Wind energy: 9.5 %
- Solar energy: 5.2 %
- Other renewable energies: 0.4 %
- Germany: 94.6 %
- France: 2.6 %
- Netherlands: 1.2 %
- Other OECD: 1.6 %

2021

Impact “Renewable Energy”

The independent non-profit research institute Center for Solar Energy and Hydrogen Research Baden-Württemberg, Germany, (ZSW) evaluated the environmental and social impact of projects financed under KfW's programme “Renewable Energies – Standard” based on new commitments in 2021.

In 2021, the volume of commitments under KfW's loan programme “Renewable Energies – Standard” totalled almost EUR 3.8 billion and triggered investments of approx. EUR 5.1 billion – representing an average share of KfW financing amounting to 74.4 %. Thereof, a volume of EUR 1.1 billion and investments of EUR 1.8 billion, were attributable to renewable energy plants built outside Germany. The average investment per commitment amounted to EUR 0.7 million.

Commitments under KfW's programme “Renewable Energies – Standard” in 2021

Number of loan commitments	6,974
Volume of loan commitments (EUR m)	3,762
Thereof outside Germany (EUR m)	1,081
Investments financed (EUR m)	5,054
Thereof outside Germany (EUR m)	1,745
Average loan volume per commitment (EUR)	539,400
Average investment financed per commitment (EUR)	724,700
Average share of financing	74.4 %

Installed electrical power supported in 2021

Plant type	MWel
Biogas	2.3
Solid Biomass	21.3
Photovoltaic energy	2,377.8
Hydropower	0.8
Wind energy onshore	2,017.4
Total	4,419.6
Annual electricity production	7.0 TWh

In 2021, KfW's programme “Renewable Energies – Standard” co-financed plants with a total electrical power of approx. 4.4 GWel, of which 60 % were attributable to plants built in Germany and 40 % to plants built outside Germany. The table provides a detailed picture of the installed electrical power by plant type.

The estimated annual electricity production of the supported plants built in Germany amounts to 4.6 TWh per year over the twenty-year-lifetime of the plants. The plants financed outside Germany produce an estimated 2.4 TWh of electricity per year.

The projects co-financed under KfW's “Renewable Energies – Standard” programme in 2021 had the following environmental and social impact:

	Overall		KfW share	
	Germany	Outside Germany	Germany	Outside Germany
Annual greenhouse gas emissions reduced/avoided due to plants supported	3.42 million tons CO ₂ -equivalents p.a.	0.80 million tons CO ₂ -equivalents p.a.	2.78 million tons CO ₂ -equivalents p.a.	0.50 million tons CO ₂ -equivalents p.a.
Renewable energy capacity added	2,659.5 MWel	1,760.1 MWel	2,164.1 MWel	1,070.9 MWel
Annual renewable electricity generation	4.6 TWh	2.4 TWh	3.7 TWh	1.5 TWh
Number of jobs created and/or preserved	41,410 person years	22,230 person years	33,500 person years	13,800 person years



Project examples Renewable Energy

ENERTRAG Windfeld Mattheshöhe III:

Around 100 kilometers north of Berlin, Germany, four GE 3.6-137 wind turbines with a total installed capacity of 14.52 MW and a hub height of 164.5 meters were installed in the municipality of Uckerfelde (Brandenburg, Germany).

The total investment volume amounted to around EUR 35 million, KfW's share amounting EUR 31.4 million.

Technical information and Image Rights: ENERTRAG Windfeld Mattheshöhe III GmbH & Co. KG, Schenkenberg



Huéneja – BEE Fotosfera Solar:

In sun-drenched Andalusia, the southernmost part of Spain, Hamburg-based Blue Elephant Energy GmbH sponsored the construction of a 100-hectare solar park near the town of Huéneja with an installed capacity of 50 MWp and an annual electricity production of 100 GWh. KfW supported the project with financing from the “Renewable Energy” loan program in the amount of EUR 15 million.

Technical information come from Blue Elephant Energy GmbH, Hamburg.
Image Rights: Diverxia Infraestructuras S.L., Paterna / Valencia, Spain



2021

Impact “Energy Efficiency”

Prognos, a leading economic research centre based in Munich, Germany, together with the Research Institute for Thermal Insulation Munich, Germany, (FIW), the institute evaluated the environmental and social impact of projects financed under KfW’s programme “Energy-efficient Construction” based on new commitments in 2021. Since the programme was substituted by the new programme BEG from July 2021 onwards, the data shown here refer to the first half of 2021 only.

In 2021, the volume of commitments under KfW’s loan programme “Energy-efficient Construction” totalled almost EUR 15.7 billion and triggered investments of approx. EUR 20.7 billion – representing an average share of KfW financing amounting to 75.6 %. The programme exclusively finances construction projects in Germany. The average investment per commitment amounted to EUR 0.34 million.

The projects co-financed under KfW’s “Energy-efficient Construction” in 2021 had the following environmental and social impact:

	Overall	KfW share
Annual greenhouse gas emissions reduced/avoided due to energy-efficient construction supported	88,980 tons CO ₂ -equivalents p.a.	67,233 tons CO ₂ -equivalents p.a.
Annual final energy savings	326,000 MWh	246,325 MWh
Number of jobs created and/or preserved	244,000 person years	184,000 person years

Commitments under KfW’s programme “Energy-efficient Construction” in 2021

Number of loan commitments	61,281
Volume of loan commitments (EUR m)	15,653
Investments financed (EUR m)	20,716
Number of promoted housing (in residential units)	149,230
Average loan volume per commitment (EUR)	255,400
Average investment financed per commitment (EUR)	338,000
Average share of financing	75.6 %



Project example

Energy Efficiency

Wohnquartier Jöllheide

Wohnquartier Jöllheide, a multi-generational residential quarter has been created in all its facets. The quarter is located in Bielefeld, Germany, and includes a nursing home for the elderly, a residential unit for barrier-free living and a day-care facility for children.

Heat for heating and hot water is provided by the district heating network of Stadtwerke Bielefeld. Thanks to the use of combined heat and power, district heating is a very ecological form of heating and has low CO₂ emissions according to the project development company. The buildings are also equipped with an efficient, decentralized ventilation system with heat recovery.

A PV system with an output of 52 kW and a battery storage unit with a capacity of 22 kWh are installed on the buildings. The solar power generated is consumed in the house wherever possible.

The ensemble was built in stages over a construction phase lasting several years with total project costs of EUR 14.7 million. KfW provided loans from both programmes “Energy-efficient construction and refurbishment (EBS)” and “Federal Funding for efficient buildings (BEG)” amounting to a total of EUR 7 million.

The picture above shows the retirement home, which was completed in 2021. The building meets the highest energy efficiency requirements with the KfW 40 Plus standard.

Sources of pictures, technical and financial data: RP Finanz GmbH & Co. Wohnquartier Joellheide KG, Verl and First Retail Consult GmbH, Bielefeld (Project development company).



Aerial view of the entire facility

2022





Issuance summary and use of proceeds

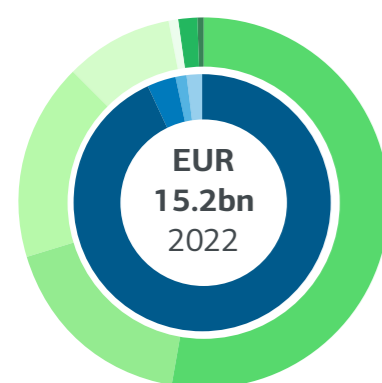
KfW issued 20 “Green Bonds – Made by KfW” in 2022, raising net proceeds in the amount of EUR 10.6 billion, which were fully allocated by year-end.

In the same period, KfW received requests for disbursements in the categories of renewable energies (KfW loan programme “Renewable Energies - Standard”), energy efficiency (KfW loan programme “Federal Funding for Efficient Buildings’ (BEG)”) and clean transportation (KfW loan programmes “Sustainable Mobility for Municipalities” and “Sustainable Mobility for Corporates”). Thus, an amount equal to the net proceeds from all KfW green bonds issued in 2022 was fully allocated as of December 31, 2022.

70.5 % of all requests for disbursement were related to projects in the category of energy efficiency (52.8 % residential buildings; 17.7 % nonresidential buildings), while 27.6 % were related to projects in the category of renewable energies (17.0 % wind energy; 9.5 % solar energy; 1.0 % other technologies). A further 1.9 % came from the clean transportation category (1.5 % public transport vehicles, 0.5 % infrastructure, bicycle lanes and others). 93.2 % of the requested funds were related to projects located in Germany. The remainder was related to projects located in France (3.5 %), the Netherlands (1.4 %), Ireland (0.6 %), Poland (0.4 %), Finland (0.3 %), Spain (0.3 %), Italy (0.2 %) and Austria (0.2 %).

Net proceeds in foreign currencies were converted into EUR at the ECB’s exchange reference rate on the respective pricing date.

-  **20 Green Bonds** in 10 currencies (EUR, GBP, AUD, CNY, SEK, PLN, NOK, DKK, HKD, HUF)
-  **EUR 10.6 billion** Net proceeds
-  **11.9 %** of KfW’s total funding (EUR 89.4 bn)
-  **Full Allocation** Disbursements in an amount of EUR 15.2 bn



Requests for disbursements under the eligible loan programmes

- Residential buildings: 52.8 %
- Other buildings: 17.7 %
- Wind energy: 17.0 %
- Solar energy: 9.5 %
- Other renewable energies: 1.0 %
- Public transport vehicle: 1.5 %
- Other clean transportation: 0.5 %
- Germany: 93.2 %
- France: 3.5 %
- Netherlands: 1.4 %
- Other OECD: 1.9 %

2022

Impact “Renewable Energy”

The independent non-profit research institute Center for Solar Energy and Hydrogen Research Baden-Württemberg, Germany, (ZSW) evaluated the social and environmental impact of projects financed under KfW’s programme “Renewable Energies – Standard” based on new commitments in 2022.

In 2022, the volume of commitments under KfW’s loan programme “Renewable Energies – Standard” totalled almost EUR 6.9 billion and triggered investments of EUR 9.6 billion – leading to an average share of financing of 71.6 %. Thereof, a volume of EUR 1.3 billion and investments of EUR 2.4 billion, were attributable to renewable energy plants built outside Germany. The average investment per commitment amounted to EUR 1.5 million.

Commitments under KfW’s programme “Renewable Energies – Standard” in 2022

Number of loan commitments	6,585
Volume of loan commitments (EUR m)	6,878
Thereof outside Germany (EUR m)	1,252
Investments financed (EUR m)	9,611
Thereof outside Germany (EUR m)	2,375
Average loan volume per commitment (EUR)	1,045,000
Average investment financed per commitment (EUR)	1,460,000
Average share of financing	71.6 %

Installed electrical power supported in 2022

Plant type	MWel
Biogas	5.3
Photovoltaic energy	4,402.2
Hydropower	0.2
Wind energy onshore	3,866.6
Total	8,274.2
Annual electricity generation	13.4 TWh

In 2022, KfW’s programme “Renewable Energies – Standard” co-financed plants with a total electrical power of around 8.3 GWel, of which 75 % were attributable to plants built in Germany and 25 % to plants built abroad. The table provides a detailed picture of the installed electrical power by plant type.

The estimated annual electricity production of the supported plants built in Germany amounts to 10.5 TWh over the twenty-year-lifetime of the plants. The plants financed outside Germany produce an estimated 2.9 TWh of electricity per year.

The projects co-financed under KfW’s “Renewable Energies – Standard” programme in 2022 had the following environmental and social impact:

	Overall		KfW share	
	Germany	Outside Germany	Germany	Outside Germany
Annual greenhouse gas emissions reduced/avoided due to plants supported	6.18 million tons CO ₂ -equivalents p.a.	0.84 million tons CO ₂ -equivalents p.a.	4.88 million tons CO ₂ -equivalents p.a.	0.42 million tons CO ₂ -equivalents p.a.
Renewable energy capacity added	6,205.2 MWel	2,069.0 MWel	4,665.0 MWel	1,022.6 MWel
Annual renewable electricity generation	10.5 TWh	2.9 TWh	8.3 TWh	1.5 TWh
Number of jobs created and/or preserved	95,200 person years	29,360 person years	74,200 person years	15,720 person years

2022

Impact “Energy Efficiency”

Prognos, a leading economic research centre based in Munich, Germany, together with the Research Institute for Thermal Insulation Munich, Germany, (FIW), Institute for Building Systems Engineering Research and Application, Dresden, Germany, (ITG) and the Institut für Energie- und Umweltforschung Heidelberg gGmbH, Germany, (ifeu) evaluated the environmental and social impact of projects financed under KfW's programme “Federal Funding for Efficient Buildings (BEG)” based on new commitments in 2022.

In 2022, the volume of commitments under KfW's loan programme “Federal Funding for Efficient Buildings (BEG)” totalled almost EUR 15.4 billion and triggered investments of approx. EUR 21.6 billion – representing an average share of KfW financing amounting to 71.5 %. The programme exclusively finances construction projects in Germany. The average investment per commitment amounted to EUR 0.73 million.

The projects co-financed under KfW's “Federal Funding for Efficient Buildings (BEG)” in 2022 had the following environmental and social impact:

	Overall	KfW share
Annual greenhouse gas emissions reduced/avoided due to energy-efficient construction supported	173,760 tons CO ₂ -equivalents p.a.	124,157 tons CO ₂ -equivalents p.a.
Annual final energy savings	566,736 MWh	404,952 MWh
Number of jobs created and/or preserved	250,749 person years	179,168 person years

Commitments under KfW's programme “Federal Funding for Efficient Buildings (BEG)” in 2022

Number of loan commitments	29,500
Volume of loan commitments (EUR m)	15,418
Investments financed (EUR m)	21,578
Number of promoted housing (in residential units)	131,598
Average loan volume per commitment (EUR)	523,000
Average investment financed per commitment (EUR)	731,500
Average share of financing	71.5 %

Aerial view of the entire facility



Project example

Energy Efficiency

YASKAWA

The Japanese manufacturer of industrial robots has built a new training and office building for its European headquarter in Hattersheim, near to Frankfurt/Main, Germany, with total project costs of EUR 22 million, thereof KfW funds EUR 16 million. Architects: Feldmann Architekten GmbH, Gießen; Construction Company: Weimer GmbH, Lahnau.

The building is equipped with state-of-the-art heating and air conditioning technology and is heated and cooled by two heat pumps. All offices including other usable areas are equipped with underfloor heating or underfloor cooling (thermal floor).

All rooms are supplied with sufficient fresh air via an automatic ventilation system. The air volume is adjusted to the actual room occupancy via CO₂ sensors to ensure good air quality while optimizing energy consumption.

All windows are triple-glazed. External blinds are controlled depending on solar radiation and the sky direction in order to use solar energy to heat the building on the one hand and to protect the building from excessive energy input on the other.

The PV systems on the main building and the parking garage have a total output of 273 kWp. From March to October, the PV system covers around 75 % of total electricity consumption. State-of-the-art LED technology in and around the building guarantees long-term energy savings.

To support e-mobility 25 charging points of 11 kW each have been installed.

All information on the building technology and its energy impact comes from Yaskawa Europe GmbH

By moving from the previous location Eschborn, Germany, to the new headquarter building in Hattersheim, Germany, Yaskawa Europe GmbH was able to impressively reduce its total energy consumption by almost 80 %.

	Old location: Eschborn	New location: Hattersheim
Usable space: office building, academy, repairs, laboratories and warehouse	8,728 sqm	7,913 sqm
Gas heating	Yes	–
Heat pump	–	Yes
PV system	–	Yes (273 kWp)
EV charging stations	–	Yes (25)

Consumption data in kW/h

a) Power consumption	307,861	294,161
b) Gas consumption	743,464	–
c) Charging stations	–	341
d) PV system	–	61,631
Sum: a+b+c-d	1,051,325	232,871
Total savings:	–	- 77,85 %
kW/h per sqm:	120,45	29,43
Savings per sqm:	–	- 75,57 %

Sources of pictures, technical and financial data: Yaskawa Europe GmbH, Hattersheim



Impressions from the Yaskawa building (left to right): the PV systems on the rooftop, green roofs in the building's center, the use of LEDs in the interior.

2022

Impact “Clean Transportation”

Institut für Energie- und Umweltforschung (ifeu), an independent non-profit environmental research institute based in Heidelberg, Germany, evaluated the environmental impact of projects financed under KfW's programme “Sustainable Mobility” based on new commitments in 2022.

In 2022, the volume of commitments under KfW's loan programme “Sustainable Mobility” totalled almost EUR 0.6 billion and triggered investments of approx. EUR 1 billion – representing an average share of KfW financing amounting to 55.6 %. The programme exclusively finances mobility projects in Germany.

The environmental impact was calculated and taken into account where it was clearly definable. This applies to 64 of the 76 loan commitments or 62.5 % of the commitment volume (EUR 355 million). The positive environmental impact of the remaining 12 loan commitments was not taken into account as it was neither clearly definable nor could it be clearly calculated.

The projects co-financed under KfW's programme “Sustainable Mobility” in 2022 had the following environmental impact:

	Overall	KfW share
Annual greenhouse gas emissions reduced/avoided	10,354 tons CO ₂ -equivalents p.a.	7,666 tons CO ₂ -equivalents p.a.
Annual NO _x emissions reduced/avoided	29 tons p.a.	20 tons p.a.
Annual PM emissions reduced/avoided	0.4 tons p.a.	0.3 tons p.a.
Annual CO emissions reduced/avoided	31 tons p.a.	24 tons p.a.
Annual NMVOC emissions reduced/avoided	4 tons p.a.	3 tons p.a.

Commitments under KfW's programme “Sustainable Mobility” in 2022

Number of loan commitments	76
Volume of loan commitments (EUR m)	567
Investments financed (EUR m)	1,020
Average share of financing	55.6 %



Project example

Clean Transportation

In 2022, KfW was providing EUR 100 million to finance new trams for the city of Frankfurt/Main, Germany. Stadtwerke Frankfurt took the funds on behalf of its subsidiary Verkehrsgesellschaft Frankfurt (VGF). They were used for the procurement of state-of-the-art trams of the Citadis SX05 series from the manufacturer Alstom, which operates under the “T”-generation carriage in the VGF vehicle fleet. The new design of these tramcars for Frankfurt were developed in close cooperation by both partners.

The vehicles are characterised by maximum energy efficiency and a large amount of space and accessibility. The first of the 58 new trams were commissioned in December 2022.

“Promoting the transformation towards a sustainable future is our mission at KfW. As Germany’s largest promotional bank we see it as our core responsibility to take a pioneering role in the transition to a carbon-neutral future.”

Tim Arbruster
Treasurer of KfW



Methodology and assumptions used for impact calculation of “Green Bonds – Made by KfW”

KfW calculated the impact of its green bonds issued in 2021 and 2022 based on the numbers provided by the external evaluators of the underlying promotional programmes:

Loan programme (loan programme number)	Evaluated by	Impact for the year
Renewable Energies – Standard (270)	Center for Solar Energy and Hydrogen Research Baden-Württemberg, Germany, (ZSW)	2021, 2022
Energy-efficient Construction (153)	Prognos, Germany and the Research Institute for Thermal Insulation Munich, Germany, (FIW)	2021
Federal Funding for Efficient Buildings (BEG) (261–264)	Prognos, Germany, the Research Institute for Thermal Insulation Munich, Germany, (FIW), Institute for Building Systems Engineering Research and Application, Dresden, Germany, (ITG) and the Institut für Energie- und Umweltforschung Heidelberg gGmbH, Germany (ifeu)	2022
Sustainable Mobility for Municipalities (267) and Sustainable Mobility for Corporates (268, 269)	Institut für Energie- und Umweltforschung Heidelberg gGmbH, Germany (ifeu)	2022

The impact is quantified for financed renewable energy plants inside and outside Germany, supported energy-efficiency related construction and sustainable mobility projects in Germany only.

All KPIs are calculated on the basis of KfW’s average financing share of the total impact as well as the share of allocation of green bond proceeds to each programme

The next section gives a brief overview of the methodology used by the external evaluators to estimate the positive impact of “Green Bonds – Made by KfW”.

“Renewable Energies – Standard” until 2021

Annual GHG emissions reduced/avoided in tons CO₂-e

Savings in greenhouse gas (CO₂, CH₄, N₂O) emissions due to supported renewable energy installations in Germany are calculated based on emission reduction factors provided by the German Umweltbundesamt (UBA – German Environment Agency). These factors reflect the specific fossil fuel mix that the renewable energy source replaces. They describe net emission savings, setting off the volume of emissions caused by the use of renewables (final energy supply) against the volume of gross emissions that are no longer being released thanks to fossil sources having been replaced with renewables.

All upstream process chains involved in the production and supply of the various energy sources and in installation construction and operation (but not dismantling) are also taken into account.

When calculating the savings in greenhouse gas emissions due to supported plants in countries other than Germany, emission reductions are estimated based on greenhouse gas emission factors (given as CO₂-equivalents per kWhel) of the average electricity mix of the respective countries.

In many countries outside Germany in which installations are co-financed, electricity generation already has a low carbon intensity (e.g. in France due to a high share of nuclear energy or in Sweden due to a high share of renewable and nuclear energy). Therefore, the total savings in greenhouse gas emissions from supported plants outside Germany are comparatively low.

Annual renewable electricity generation

Based on current studies, energy carrier-specific full load hours were determined for reference plants, e.g. onshore wind power plants. The renewable electricity generation estimated in this way was extrapolated taking into account the renewable energy capacity added.

Number of jobs created / and or preserved in person years

The calculated employment effects take into account the production, construction and operation of the financed facilities. The number of jobs created and/or preserved is not available for projects outside Germany. KfW’s KPI calculation is based on the assumption that the employment effects achieved inside Germany apply also to renewable energy plants financed outside Germany.

“Renewable Energies – Standard” since 2022

Annual GHG emissions reduced/avoided in tons CO₂-e – IFI approach (applied for 2022 impact calculation)

The “International Financial Institution Framework for a Harmonised Approach to Greenhouse Gas Accounting” (IFI approach) provides a framework for determining greenhouse gas savings from investment projects¹. This is intended to enable better comparability of the reduction in greenhouse gas emissions achieved in different projects. The Technical Working Group of the International Financial Institutions (IFI TWG) has agreed guidelines for various areas of application, including renewable energy, water supply and transport projects. The IFI TWG also provides country-specific “default” CO₂ emission factors that can be used to determine avoided emissions for various applications. These emission factors are updated at regular intervals, the most recent version available is the IFI Dataset (version 3.2)², published in April 2022. Emission factors are given for different emission profiles, of which “firm energy” (applicable to hydro energy, biogas and solid biomass) and “intermittent energy” (applicable to solar and wind energy) are relevant here. No “default” emission factors are available for the heating sector.

The current IFI guidelines focus on individual (large) projects for which detailed data is available. Due to the large number of installations funded by KfW and for reasons of data availability, a detailed assessment at the level of individual projects is unrealistic. Instead, an analysis at the level of the application areas, which are sufficiently homogeneous so that typical parameters can be uniformly assumed, appears appropriate. For the evaluation, the most recent IFI grid emission factors are applied (see footnote 2). As the default grid emission factors only include direct emissions at the site of power production, the IFI guidelines stipulate that life cycle emissions are also to be considered in the project assessment. For this reason, country-specific life cycle upstream emission factors for electricity grid emissions, and emissions associated with transmission and distribution losses provided by the International Energy Agency (IEA) are applied. These upstream emission factors, however, cover CO₂-equivalent emissions (i.e. including CH₄ and N₂O), whereas the IFI default grid factors only consider CO₂ emissions. Adding up both to a certain extent implies a blur. Neglecting emission avoidance of CH₄ and N₂O in the IFI default factors tends to underestimate the real emission avoidance, which appears acceptable aiming at a conservative estimate.

For life cycle emission factors for the relevant electricity generation technologies, ZSW refers to the IPCC Special Report on Renewable Energy Sources and Climate Change Mitigation (SRREN)³. For the avoided emission calculations, the 50th percentile values have been used. This data set is considered to be commonly accepted and still in use e.g. by the IRENA in the Avoided emissions Calculator⁴.

Comparison of previous and IFI approach

The approach applied in previous years initially was developed for the evaluation of greenhouse gas avoidance due to renewable energy plants co-financed in Germany. Effects for installations abroad were only considered from 2013 onwards with a simplified approach based on average grid emissions for national electricity grids. This simplified approach does neither include up- and downstream emissions of grid power replaced nor the emissions of the Renewable Energy plants assessed, nor does it distinguish the feed-in profile of the Renewable Energy plant. Insofar, the IFI approach is more comprehensive with respect to assessing the GHG reductions due to installations co-financed abroad. On the other hand, for assessing plants in Germany, the net emission avoidance factors provided by UBA are much more detailed and up-to-date than the average factors applied in the IFI approach. It should be noted, however, that the UBA factors assume that only electricity from conventional (i.e. fossil and nuclear) plants is substituted, whereas the IFI factor includes all sources. With higher shares of renewable energy in the electricity mix this leads to higher avoidance factors than using the average mix.

The approach applied previously has its strength in assessing GHG savings from plants in Germany due to the more consistent, comprehensive and up-to-date net avoidance factors provided every year by UBA. These comprise factors for renewable heat production plants and consider power substitution effects in the European grid. The calculations based on the IFI approach, on the other hand, allow the addition of emission savings due to plants in Germany and abroad. Furthermore, they are more comprehensive than the approach applied previously when assessing GHG savings due to plants built abroad, even if the factors used are not as up-to-date as would be desirable. Disadvantages of the IFI approach are that no default factors are available for heat production and that the default grid emission factors provided currently do not consider the impact of interconnections of the national electricity grids with neighboring countries.

The calculation of annual renewable electricity generation and number of jobs created / and or preserved in person years in 2022 follow the same approach as before.

¹ See IFI Approach to GHG Accounting for Renewable Energy Projects, available at [IFI TWG – List of methodologies | UNFCCC](#)

² See Harmonized IFI Default Grid Factors 2021 v3.2, available at [Harmonized IFI Default Grid Factors 2021 v3.2 | UNFCCC](#)

³ See Moomaw, W., P. Burgherr, G. Heath, M. Lenzen, J. Nyboer, A. Verbruggen, 2011: Annex II: Methodology. In IPCC Special Report on Renewable Energy Sources and Climate Change Mitigation [O. Edenhofer, R. Pichs-Madruga, Y. Sokona, K. Seyboth, P. Matschoss, S. Kadner, T. Zwickel, P. Eickemeier, G. Hansen, S. Schlömer, C. von Stechow (eds)], Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA; available at [www.ipcc.ch/site/assets/uploads/2018/03/Annex-II-Methodology-1.pdf](#)

⁴ See [www.irena.org/Data/View-data-by-topic/Climate-Change/Avoided-Emissions-Calculator](#). Last accessed 12 January 2024

“Energy-efficient Construction” until 2021

Annual GHG emissions reduced/avoided in tons CO₂-e / Annual final energy savings

Basis for the scientific approach is the building model developed by the Research Institute for Thermal Insulation Munich, Germany, (FIW) together with Institute für Technische Gebäudeausrüstung Dresden Forschungs und Anwendung GmbH, Dresden, Germany, (ITG) which describes the building stock in Germany according to its areas and structural conditions and is based on various data sources.

For the calculation of energy savings and the reduction of GHG emissions, every financed energy-efficient new building is compared with a ‘reference building’, i. e., a comparable new building in accordance with the German Energy Saving Ordinance (Energieeinsparverordnung, EnEV).

The calculation is based on a standardised determination of the expected energy demand for heating and for electricity of buildings financed. The actual consumption in the buildings considered may deviate from this estimation, which can lead to deviations in the savings.

Number of jobs created / and or preserved in person years

The calculated employment effects take into account the production and construction of the financed energy-efficient building.

“Federal Funding for Efficient Buildings (BEG)” since 2022

Annual GHG emissions reduced/avoided in tons CO₂-e / Annual final energy savings

Model-based impact assessment: The impact assessment as part of the evaluation is based on a specific building model that is used to simulate the subsidized building stock. In addition to the funding data, other data is also used. This includes, for example, empirical data from the survey of grant recipients on the condition of the building (in the case of refurbishments, in particular the initial condition before the measure), energy sources used, etc. The modeling is based on individual intended uses, which form the basis for modeling the building model. In this way, an attempt is made to represent reality as accurately as possible. On a methodological basis and due to the empirical data used, this may result in deviations from other, methodologically equally legitimate approaches to determining impact (e.g. via emission reduction factors).

As part of the evaluation by Prognos, the total savings triggered by the “Federal Funding for Efficient Buildings” (BEG) funding program are determined, regardless of the sector in which they occur. Emissions are accounted for at the point of origin – the building (polluter pays balance). If fossil fuels are used in the building, only the direct emissions are taken into account, without emissions from the upstream chain (e.g. transportation). Emissions that are caused by electricity and district heating and therefore do not occur directly in the building are also accounted for using this method. As they are direct effects of the funding program and the funds used, they are included in contrast to the sector-specific calculation in accordance with the Climate Protection Act.

The methodology used is therefore consistent with the BMWK’s methodological guidelines for evaluations and NAPE (Nationaler Aktionsplan Energieeffizienz) reporting.

Number of jobs created / and or preserved in person years

The investments made as part of the BEG funding program have an impact on several sectors within the value chain. Both the “direct” effects in the associated capital goods manufacturing sectors and the “indirect effects” are taken into account. The latter arise when companies in one sector are also dependent on intermediate goods from companies in other sectors in the course of production.

As a result, the investments made due to the BEG lead to value added effects, whereby the gross value added is mainly generated in the construction of new residential buildings. Due to the company structure in the construction industry, the majority of this takes place in small and medium-sized companies.

The calculated gross value added effects are accompanied by corresponding employment effects. The level of these effects can be estimated using sector-specific labor productivity indicators.

“Sustainable Mobility”

Annual GHG emissions reduced/avoided in tons CO₂-e

Relative greenhouse gas (CO₂, CH₄ and N₂O) emissions due to financed vehicles and transport infrastructure in Germany were calculated by ifeu (Institut für Energie- und Umweltforschung Heidelberg), Germany.

Relative emissions are the difference between the absolute emissions of the financed project and a business-as-usual scenario¹. In both scenarios, direct (tank-to-wheel) and upstream (well-to-tank) emissions as well as emissions from manufacturing vehicles were considered. For infrastructure projects, emissions from the construction of the infrastructure itself were also included if relevant.

The business-as-usual scenarios were designed according to the principle of conservatism, i.e. they account for expected future changes, for example by taking as reference the projected future fleet of vehicles that is supposed to run during the lifespan of the financed project. Based on physical activity data (e.g. annual mileage), relative emissions were calculated for the whole lifetime of the vehicle/infrastructure and then divided by its lifetime (10 to 35 years depending on the type of vehicle/infrastructure) to obtain annual relative GHG emissions.

Aside from the data provided by the applicant to the funds, ifeu used default values (e.g. emissions factors), which in majority were taken from the transport emission model TREMOD².

Annual air pollutant emissions reduced/avoided

Relative air pollutant (NO_x, particular matter, CO and non-methane volatile organic compounds) emissions were calculated similarly to relative GHG emissions with the difference that only direct (tank-to-wheel) emissions were considered, as the negative effect of air pollutants mostly occurs locally.

¹ A business-as-usual scenario describes what would happen without KfW’s financing of a project.

² The emission calculation model TREMOD maps motorised traffic in Germany with regard to its transport performance, mileage, energy consumption and the associated greenhouse gas and air pollutant emissions for the period 1960 to 2022 and in a trend scenario up to 2050. TREMOD has been developed by ifeu on behalf of the German Environment Agency (UBA) since the 1990s.

Appendix

2021 Overview – issuances, use of proceeds and impact






Issuances including re-openings in 2021

KfW Green Bond	ISIN	Coupon p.a.	Valuta	Maturity	Volume in millions	Net Proceeds in EUR millions
HKD 2021/2022	XS2282088256	0.05 %	12 Jan 21	12 Jan 22	HKD 200	21
HKD 2021/2022	XS2284256133	0.05 %	18 Jan 21	18 Jan 22	HKD 150	16
ZAR 2021/2028	XS2288932853	5.80 %	19 Jan 21	19 Jan 28	ZAR 300	16
MXN 2021/2025	XS2291329030	4.40 %	25 Jan 21	25 Jul 25	MXN 1,000	41
CNY 2021/2024	XS2291810419	2.14 %	26 Jan 21	26 Jan 24	CNY 150	19
NOK 2021/2023	XS2046690827	1.25 %	02 Feb 21	28 Aug 23	NOK 5,000	493
NOK 2021/2023	XS2046690827	1.25 %	08 Feb 21	28 Aug 23	NOK 2,000	197
CAD 2021/2026	US500769JL97*	0.75 %	17 Feb 21	19 Feb 26	CAD 1,000	647
ZAR 2021/2028	XS2288932853	5.80 %	22 Feb 21	19 Jan 28	ZAR 200	11
HKD 2021/2022	XS2309811672	0.05 %	05 Mar 21	05 Mar 22	HKD 200	21
HKD 2021/2022	XS2309811755	0.01 %	09 Mar 21	09 Mar 22	HKD 100	11
NOK 2021/2025	XS2315837778	1.25 %	16 Mar 21	08 Aug 25	NOK 3,000	297
CNY 2021/2023	XS2320033835	2.52 %	23 Mar 21	23 Mar 23	CNY 380	49
SEK 2021/2026	XS2321476793	0.25 %	22 Mar 21	09 Sep 26	SEK 2,000	196
PLN 2021/2025	XS2321685526	0.63 %	23 Mar 21	25 Jul 25	PLN 500	109
AUD 2021/2024	AU3CB0265239	1.50 %	23 Mar 21	24 Jul 24	AUD 450	303
CNY 2021/2024	XS2322827382	2.70 %	25 Mar 21	25 Mar 24	CNY 1,250	161
EUR 2021/2029	XS2331327564	0.00 %	14 Apr 21	15 Jun 29	EUR 4,000	4,065
CNY 2021/2023	XS2320033835	2.52 %	17 Jun 21	23 Mar 23	CNY 170	22
AUD 2021/2024	AU3CB0265239	1.50 %	25 Jun 21	24 Jul 24	AUD 400	262
GBP 2021/2026	XS2034715305	0.88 %	29 Jun 21	15 Sep 26	GBP 500	596
CNY 2021/2024	XS2322827382	2.70 %	30 Jun 21	25 Mar 24	CNY 500	65
NOK 2021/2023	XS2046690827	1.25 %	28 Jul 21	28 Aug 23	NOK 3,000	290
AUD 2021/2024	AU3CB0265239	1.50 %	05 Aug 21	24 Jul 24	AUD 350	225
ZAR 2021/2022	XS2382954670	4.85 %	03 Sep 21	03 Sep 22	ZAR 750	43
HKD 2021/2022	XS2384597709	0.01 %	14 Sep 21	14 Sep 22	HKD 200	22
HUF 2021/2023	XS2384732090	1.63 %	14 Sep 21	14 Sep 23	HUF 5,750	16
CNY 2021/2022	XS2388202272	2.75 %	20 Sep 21	20 Sep 22	CNY 400	52
EUR 2021/2031	XS2388457264	0.00 %	22 Sep 21	15 Sep 31	EUR 3,000	3,022
NOK 2021/2023	XS2046690827	1.25 %	30 Sep 21	28 Aug 23	NOK 2,000	199
GBP 2021/2026	XS2034715305	0.88 %	04 Oct 21	15 Sep 26	GBP 750	882
CNY 2021/2024	XS2322827382	2.70 %	15 Oct 21	25 Mar 24	CNY 500	68
USD 2021/2026	US500769JQ84*	1.00 %	20 Oct 21	01 Oct 26	USD 3,000	2,577
AUD 2021/2024	AU3CB0265239	1.50 %	27 Oct 21	24 Jul 24	AUD 100	66
CNY 2021/2023	XS2403288447	2.95 %	29 Oct 21	29 Oct 23	CNY 300	40
PLN 2021/2023	XS2404276300	2.00 %	03 Nov 21	03 Nov 23	PLN 400	87
EUR 2021/2031	XS2388457264	0.00 %	16 Nov 21	15 Sep 31	EUR 1,000	1,005

Allocation: All bonds fully allocated

* SEC registered global bond.

Distribution by category		Distribution by region	
Energy efficiency	84.8 %	Germany	94.6 %
Renewable energy	15.2 %	Other OECD	5.4 %

	Absolute impact accounting for KfW's financing share	Impact per EUR 1 million investment
 Greenhouse gas emissions reduced/avoided (CO ₂ -equivalents)	2,200,799 tons	136 tons
 Annual final energy savings	216,465 MWh	13.4 MWh
 Annual renewable electricity generation	3,395,404 MWh	209 MWh
 Renewable energy capacity added	2,112 MWel	0.13 MWel
 Number of jobs created and/or preserved	192,902 person years	12 person years

Appendix







2022 Overview – issuances, use of proceeds and impact

Issuances including re-openings in 2022

KfW Green Bond	ISIN	Coupon p.a.	Valuta	Maturity	Volume in millions	Net Proceeds in EUR millions
PLN 2022/2024	XS2433824757	3.90 %	18 Jan 22	18 Jan 24	PLN 500	110
DKK 2022/2024	XS2438629573	0.00 %	31 Jan 22	15 Nov 24	DKK 1,000	135
CNY 2022/2025	XS2451378181	2.75 %	03 Mar 22	03 Mar 25	CNY 2,000	279
SEK 2022/2025	XS2466052979	1.50 %	07 Apr 22	07 Apr 25	SEK 2,000	193
EUR 2022/2032	XS2475954900	1.38 %	05 May 22	07 Jun 32	EUR 3,000	2,975
HKD 2022/2023	XS2483518705	1.90 %	23 May 22	23 May 23	HKD 300	37
CNY 2022/2025	XS2451378181	2.75 %	31 May 22	03 Mar 25	CNY 250	35
HKD 2022/2023	XS2496684601	2.73 %	05 Jul 22	05 Jul 23	HKD 300	36
EUR 2022/2029	XS2498154207	2.00 %	05 Jul 22	15 Nov 29	EUR 4,000	3,967
HUF 2022/2024	XS2498552194	9.00 %	08 Jul 22	08 Jul 24	HUF 30,000	75
HUF 2022/2024	XS2498552194	9.00 %	26 Jul 22	08 Jul 24	HUF 10,000	24
PLN 2022/2024	XS2433824757	3.90 %	10 Aug 22	18 Jan 24	PLN 200	40
CNY 2022/2025	XS2451378181	2.75 %	10 Aug 22	03 Mar 25	CNY 250	36
PLN 2022/2024	XS2433824757	3.90 %	18 Oct 22	18 Jan 24	PLN 150	29
EUR 2022/2032	XS2475954900	1.38 %	07 Nov 22	07 Jun 32	EUR 1,000	880
GBP 2022/2025	XS2555201487	3.88 %	14 Nov 22	02 Sep 25	GBP 850	972
AUD 2022/2026	AU3CB0294270	4.10 %	22 Nov 22	20 Feb 26	AUD 750	491
NOK 2022/2027	XS2563353957	3.37 %	06 Dec 22	02 Dec 27	NOK 1,500	145
HKD 2022/2023	XS2563983894	4.57 %	12 Dec 22	12 Dec 23	HKD 300	37
AUD 2022/2026	AU3CB0294270	4.10 %	14 Dec 22	20 Feb 26	AUD 150	98

Allocation: All bonds fully allocated

Distribution by category		Distribution by region	
Energy efficiency	70.5 %	Germany	93.2 %
Renewable energy	27.6 %	Other OECD	6.8 %
Clean transportation	1.9 %		

	Absolute impact accounting for KfW's financing share	Impact per EUR 1 million investment
 Annual greenhouse gas emissions reduced/avoided (CO ₂ -equivalents)	2,309,477 tons	218 tons
 Annual final energy savings	196,203 MWh	18.5 MWh
 Annual renewable electricity generation	4,159,456 MWh	393 MWh
 Renewable energy capacity added	2,414 MWel	0.23 MWel
 Number of jobs created and/or preserved	124,974 person years	12 person years
Reduction of air pollutants		
 Annual NO _x emissions reduced	7.2 tons	0.682 kg
Annual PM emissions reduced	0.1 tons	0.010 kg
Annual CO emissions reduced	8.7 tons	0.820 kg
Annual NMVOC emissions reduced	1.1 tons	0.103 kg

Appendix

The independent economic research institutes ZSW, Prognos, FIW, ITG and ifeu provided the respective evaluations which build the basis for this report:

ZSW: Dr. Bickel, P., Kelm, T.: Assessment of environmental and social impacts of the KfW loan programme “Renewable Energies – Standard” for the year 2021, Evaluation commissioned by KfW Group, Stuttgart, March 2023 and Assessment of environmental and social impacts of the KfW loan programme “Renewable Energies – Standard” for the year 2022, Stuttgart, January 2024.

Prognos AG/FIW München: Dr. Heinrich, S., Langreder, N., Thormeyer, C., Grodeke, A., Hoch, M., Prof. Dr. Holm, A., Kokolsky, C., Empl, B.: Synopsis – Evaluation of the EBS WG funding programmes in the funding year 2021 (1st half-year), Basel/München, April 2022 of Evaluation of the “Energy-efficient construction and refurbishment” funding programmes for residential buildings (EBS WG) as part of the BMWK’s CO₂ building refurbishment programme in the funding period 2018 to 2021. Evaluation commissioned by the Federal Ministry for Economic Affairs and Climate Action (BMWK) (in German language).

As of the date of this Impact Report, the Prognos AG/FIW München evaluation report is not publicly available.

Prognos AG/FIW München/ITG Dresden/ifeu: Dr. Heinrich, S., Langreder, N., Grodeke, A., Jessing, D., Wachter, P., Empl, B., Dr. Winiewska, B.: Evaluation des Förderprogramms „Bundesförderung für effiziente Gebäude (BEG)“ in den Teilprogrammen BEG Einzelmaßnahmen (BEG EM), BEG Wohngebäude (BEG WG) und BEG Nichtwohngebäude (BEG NWG) im Förderjahr 2022
a) Förderwirkungen BEG WG 2022
b) Förderwirkungen BEG NWG 2022
c) Förderwirkungen BEG EM 2022
Im Auftrag des Bundesministeriums für Wirtschaft und Klimaschutz (BMWK), Basel/München/Dresden, Januar 2024

ifeu – Institut für Energie- und Umweltforschung Heidelberg gGmbH: Allekotte, M., Colson, M., Spathelf, F.: „Methodenpapier: Berechnung der Umweltwirkung der Clean Transport-Projekte der KfW“, Heidelberg, 2024, in addition: case-based evaluation of Clean Transportation projects and aggregation of impact values on behalf of KfW. Both documents are publicly not available.

The ifeu evaluation of KfW’s loan category Clean transportation is not publicly available.

Exclusion List of KfW Group

Version 1, published on 1 July 2019

I. Exclusions

In the following areas KfW Group does not offer financing for new projects or purposes:*

1. Production or trade in any product or activity subject to national or international phase-out or prohibition regulations or to an international ban, for example
 - i) certain pharmaceuticals, pesticides, herbicides and other toxic substances (under the Rotterdam Convention, Stockholm Convention and WHO “Pharmaceuticals: Restrictions in Use and Availability”),
 - ii) ozone depleting substances (under the Montreal Protocol),
 - iii) protected wildlife or wildlife products (under CITES / Washington Convention)
 - iv) prohibited transboundary trade in waste (under the Basel Convention).
2. Investments which could be associated with the destruction** or significant impairment of areas particularly worthy of protection (without adequate compensation in accordance with international standards).
3. Production or trade in controversial weapons or critical components thereof (nuclear weapons and radioactive ammunition, biological and chemical weapons of mass destruction, cluster bombs, antipersonnel mines, enriched uranium).
4. Production or trade in radioactive material. This does not apply to the procurement of medical equipment, quality control equipment or other application for which the radioactive source is insignificant and/or adequately shielded.
5. Production or trade in unbound asbestos. This does not apply to the purchase or use of cement linings with bound asbestos and an asbestos content of less than 20 %.
6. Destructive fishing methods or drift net fishing in the marine environment using nets in excess of 2.5 km.
7. Nuclear power plants (apart from measures that reduce environmental hazards of existing assets) and mines with uranium as an essential source of extraction.
8. Prospection, exploration and mining of coal; land-based means of transport and related infrastructure essentially used for coal; power plants, heating stations and cogeneration facilities essentially fired with coal, as well as associated stub lines.***
9. Non-conventional prospection, exploration and extraction of oil from bituminous shale, tar sands or oil sands.

II. Supplementary Requirements

In selected sectors, KfW Group ties its direct financial commitment for concrete new projects to the following qualitative conditions:*

1. Outside the EU and the OECD high income countries, large agricultural or forestry enterprises producing palm oil or wood must either comply with recognised international certification systems (RSPO or FSC) or equivalent regulations to ensure sustainable cultivation conditions, or must be in the process of achieving compliance.
2. Large dam and hydropower projects use the recommendations of the World Commission on Dams (WCD) as orientation.****
3. Projects for non-conventional prospection, exploration and extraction of gas will disclose in accordance with international standards,
 - that no material groundwater drawdown or contamination is to be expected,
 - that measures for resource protection (in particular water) and recycling are taken,
 - that suitable technology is used for safe drilling, which includes integrated bore piping and pressure testing.

* Deviations can result from mandated transactions (Zuweisungsgeschäft) in accordance with § 2 (4) of the Law Concerning KfW, or from instructions of the relevant federal ministries.

** “Destruction” means (i) the destruction or severe deterioration of the integrity of an area caused by a major and prolonged change in the use of land or water, or (ii) the alteration of a habitat which leads to the inability of the affected area to perform its function.

*** Investments in power transmission grids with significant coal-based power feed-in will only be pursued in countries and regions with an ambitious national climate protection policy or strategy (NDC), or where the investments are targeted at reducing the share of coal-based power in the relevant grid. In developing countries, heating stations and cogeneration facilities (CHP) essentially fired with coal can be co-financed in individual cases based on a rigid assessment, if there is a particularly high sustainability contribution, major environmental hazards are reduced, and if there demonstrably is no more climate-friendly alternative.

**** Dams with a height of at least 15 meters measured from the foundation or dams with a height between 5 and 15 meters with a reservoir volume of more than 3 million cubic meters.

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Frankfurt, September 2024