

Public Finance Institutions & the Low-Carbon Transition Case Study: KfW Bankengruppe

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This case study has been prepared by CDC Climat Research based on publicly-available information and data shared by the institution studied. It was prepared as a working document as part of the joint OECD-CDC Climat study on the role of public financial institutions (PFI) and the low-carbon transition. The study analyses the role of five PFIs in fostering the low-carbon energy transition through domestic climate finance activities.³ It the key tools and instruments currently used by these institutions to mobilise private sector investment, principally in OECD countries.

Public financial institutions (PFIs) are well-positioned to act as a key leverage point for governments' efforts to mobilise private investment in low-carbon projects and infrastructure. Between 2010-2012, these five institutions have provided over 100 billion euros of equity investment and financing for energy efficiency, renewable energy and sustainable transport projects. They use both traditional and innovative approaches to link low-carbon projects with finance through enhancing access to capital; facilitating risk reduction and sharing; improving the capacity of market actors; and shaping broader market practices and conditions.

The final report of the study is available at: <http://www.cdcclimat.com/Public-financial-institutions-OECD.html?lang=en>

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Executive Summary: KfW Bankengruppe

Key Figures

Country	Germany
Created	1948
Rating	Fitch Ratings: AAA / stable Moody's: Aaa / negative Standard & Poor's: AAA / stable
Assets under management	EUR 511 billion as at the end of 2012
Investment in Low-Carbon Areas	2010 - 2012: Total estimated at EUR 58.2 billion or 35% of total domestic business volume over the same period. ⁴ <ul style="list-style-type: none">- Renewable energy: EUR 24.5 billion or 15% of total domestic business volume- Energy efficiency: EUR 33.7 billion or 20% of total domestic business volume- Sustainable transport: not estimated

The Contribution of the Group KfW to the Low-Carbon Energy Transition

Mandate

The *Kreditanstalt für Wiederaufbau* (KfW) was created in 1948 with the initial mandate to reconstruct the German economy after the Second World War. The current activities of KfW continue to be tied with the political priorities of its two shareholders: the German Federal Government and the German States (Länders). Set out by the Law on Kreditanstalt für Wiederaufbau (KfW-Law, *Gesetz über die Kreditanstalt für Wiederaufbau*), KfW has the mandate of promoting and financing measures in the areas of SMEs, start-ups, risk capital, housing, environmental protection, infrastructure, innovation, social measures and education, financing of municipalities and development cooperation and specific areas of project and export finance (Art. 2 paragraph 1 KfW-Law – “promotional business”). Furthermore, the Government may assign specific business on an individual basis to KfW (Art. 2 paragraph 4 KfW-Law – “assigned business”), as has happened, for example, in the case of the special loan program during the recession 2009/2010.

KfW has long been involved in environmental protection. Today, KfW supports the German Federal Government's 2010 “Energy Turnaround Action Plan” (or “Energiewende” in German) and its programs are in line with the Federal strategy in terms of sustainability. By 2020, Germany aims to reduce greenhouse gas emissions by 40% compared with 1990 as well as reduce primary energy consumption by 20% (compared with 2008). By 2050, Germany aims to reduce greenhouse gas emissions by at least 80% as well as reduce primary energy consumption by 50% by improving energy efficiency and encouraging the use of renewable energies.

⁴ Calculated based on data from KfW annual reports, and described in detail in Section II of this case study.

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As such, KfW is active in a number of areas related to climate change – particularly in terms of providing intermediated lending for energy efficiency and renewable energy programs. KfW offers programs tailored for public authorities as well as households and small and large companies. KfW's investment activities in low-carbon projects occur principally through facilitating the access to capital by providing subsidized concessional loans by on-lending through local finance institutions. In the case of some large-scale projects, KfW equally provides direct debt at market rates filling a market gap for high-volume, long-term finance for these projects.

Through its ability to blend both market and public financial sources to finance projects, work with a network of local commercial banks and provide holistic financing packages, KfW is already playing an important role in achieving German national energy efficiency and renewable energy targets.

KfW has a number of characteristics that make it both an existing and future player in the low-carbon energy transition.

- Combining capital from the international financial markets and public sources to provide concessional funding.
- Providing concessional loans while leveraging the expertise of local finance institutions through “on-lending”: KfW in Germany generally does not lend directly to enterprises or individuals, but rather lends through local commercial banks (the “on-lending banks”) by providing refinancing loans with liquidity at low rates and long maturities to them. The fact that commercial banks do not rely on their own capacity to raise these funds enables KfW to crowd-in commitment of these banks in projects with risk profiles that they are not used to dealing with.
- Holistic financing programs to target key market segments and leverage private actors: in addition to providing concessional loans, KfW has developed a number of market offers targeting specific sectors and technologies to help overcome barriers to investment. In many instances it provides more than just financing, taking a broader approach that addresses many of the capacity and expertise challenges.

KfW has demonstrated an ability to leverage private financing through its programs. Through its lending for energy efficiency in the housing sector in 2011, KfW made EUR 6.5 billion in commitments leading to EUR 18.4 billion of total investments across 282 thousand housing units. This was done at a cost to the federal budget of EUR 934 million – representing a leverage effect of almost twenty-fold (20 private euros spent for 1 euro of public funds).⁵

Current Levels of Investment in the Low-Carbon Economy:

KfW has established a target of having one-third of all investments contribute to low-carbon and environmental-related activities. In 2011, EUR 22.8 billion in funding for climate and environmental

⁵ Presentation of Gudrun Gumb (2012) *German approaches in promoting energy efficiency – KfW best practice experience*. Presentation at Workshop on Energy Efficiency, London.
http://www.feslondon.org.uk/fileadmin/downloads/London_Friedrich_Ebert.pdf

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protection in Germany (18.4 billion) and abroad (5.2 billion)⁶ was committed by KfW Bankengruppe, totally close to one-third of all the bank's promotional and development funding programs. More specifically, climate-related domestic business volume made up approximately 35% of KfW's total domestic business volume between 2010 – 2012, as shown by Table 1 below.

Table 1: KfW Climate-Related domestic business volume between 2010 - 2012

	2010		2011		2012 ⁷		2010 – 2012	
	%	EUR bn	%	EUR bn	%	EUR bn	%	EUR bn
Renewable energy	15%	9.6	14%	7.0	16%	7.9	15%	24.5
Energy efficiency	16%	10.3	19%	9.7	27%	13.7	20%	33.7
Sustainable transport	<i>No dedicated infrastructure financing</i>							
Total Climate-Related domestic business volume	31%	19.9	33%	16.7	43%	21.6	35%	58.2
Total domestic business volume**		64.4		50.9		50.6		165.9

Sources: Authors calculations based on the annual reports of KfW.

- **Renewable Energy – EUR 24.5 billion or 15% of total domestic business volume (2010 - 2012)**

KfW has been promoting renewable energies for almost 20 years. It is involved in two principal ways. Firstly, the “*Renewable Energy Program*” for investments in renewable power plants is one of the flagship initiatives of KfW concerning environmental protection. The program stimulates investments in renewables such as solar, wind and hydropower, biomass and deep geothermal energy and provides concessional loans through local finance institutions (on-lending) and limited direct lending to municipalities. Second, KfW provides support for offshore wind both through direct loans and on-lending. As KfW's role in these projects is to provide financing packages of necessary size and tenor, lending occurs at market rates. Moreover the KfW has been promoting investments in renewable energy in the domestic heating market such as installations for solid biomass for thermal use, large solar collectors, local heat grids into which heat from renewable sources is fed and installations for utilising deep geothermal energy.

- **Energy efficiency – EUR 33.7 billion or 20% of total domestic business volume (2010 - 2012)**

⁶Presentation of Gudrun Gumb (2012) *German approaches in promoting energy efficiency – KfW best practice experience*. Presentation at Workshop on Energy Efficiency, London.

http://www.feslondon.org.uk/fileadmin/downloads/London_Friedrich_Ebert.pdf

⁷ KfW committed EUR 65 million to the Energy Turnaround Financing Initiative in 2012. However, this is not included in the table above, since funds are used for renewable energy as well as energy efficiency projects. The EUR 542 million for KfW Offshore Wind programme is not part of the total for 2011's renewable energy business volume, for the purpose of comparability.

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KfW offers a number of programs specifically targeting energy efficiency in the housing sector, small- and medium-enterprises as well as municipalities. These programs typically use KfW on-lending model leveraging the capacity and involvement of local finance institutions. In some cases, KfW provides direct loans for large projects through commercial bank consortia. In general, direct lending occurs at current market rates – focusing on providing the volume and tenor necessary for investment.

To incentivize increased ambition in energy efficiency projects in the housing sector, KfW uses a partial debt relief ranging from 2.5% to 17.5% of the original loan principal indexed to the final level of efficiency achieved compared to national standards in effect. In some cases where project developers and owners neither need nor desire a loan, KfW can deliver a grant, calculated as a percentage of the investment sum. Grants can range from 2.5% to 17.5% of total retrofitting costs, dependent on the achieved efficiency standard and the type of retrofitting (comprehensive or individual measures).

- **Sustainable transport projects - EUR 184 million (2010 – 2012)⁸**

KfW does not have a special domestic program dedicated to public transport infrastructure. Nevertheless, it has a number of programs fostering different low-carbon transport. For example, KfW-Environmental Program fosters different kinds of low-emission vehicles.

Climate Finance Tools and Instruments supporting project finance

- **The provision of long-term capital**

KfW is able to provide comparative low interest rates through the blending of multiple sources for its financing. For some programmes, this may include lending at rates typically below what project developers could access otherwise. KfW can provide such below-market interest rates on loans through its ability to leverage capital at low rates on the international capital markets given its high credit rating. These low rates are then passed on through either direct or intermediated lending. KfW provides the commercial bank with a low interest rate compared to market terms; local commercial banks pass these rates on to beneficiaries with a small increase to cover their credit risk and handling. KfW determines the maximum amount of this margin, in order to secure the transmission of the promotional advantage to the beneficiary.

Second, for specific programs approved by the Federal German government, low interest rate loans are combined with a subsidy (such as the repayment bonus indexed to the final level of energy efficiency achieved). In some instances, this is further enhanced through the inclusion of an initial repayment-free period. The repayment-free start-up period allows beneficiaries to keep their cash for other uses during early phases of the project when cash inflows may be particularly scarce. This can be conceived as a tool to help beneficiaries start projects while benefiting from a capital that they could not have afforded otherwise at this stage.

⁸ This figure matches the total volume of low-emission vehicles financed through KfW-Environmental Program between 2010 – 2012.

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- **Derisking**

KfW has few dedicated instruments for risk transfer and sharing for low-carbon projects. In general, KfW uses exemptions for liability to commercial bank intermediaries within the on-lending system. or in terms of sector and technology-specific tools. In the off-shore wind energy program, KfW offers loans financing for unforeseen cost overruns that reduce the risk of financial failure in case of such unforeseen event.

- **Filling the capacity gap**

Given the decentralized and the large number of projects that KfW finances, it rarely provides direct advisory services through its own experts to clients engaging in innovative low-carbon technologies. Rather, it supports the use of external expertise, typically through grant funding to procure advisory services. Its *Energy Advice program for SMEs* provides support for SMEs to contract with an independent accredited energy expert who is to provide initial advice (i.e. detection of possible sources of energy savings) and/or detailed advice (i.e. building an energy saving concept). Through the *Energy efficient renovation – construction supervision* program, KfW provides grants to project developers and owners to hire a professional energy-efficiency expert to supervise the construction. The grants cover 50% of the total supervision costs up to a maximum of EUR 4,000.

Table 2: KfW's roles and financial instruments to finance the low-carbon transition

Detailed functions	Energy Efficiency	Renewable Energy	Low-carbon Transport
I. Access to long-term financing			
<ul style="list-style-type: none"> • Long-term capital provider • Facilitate access to private capital 	<ul style="list-style-type: none"> • Subsidized on-lending • Performance-indexed repayment bonuses • Grants • Repayment-free start-up period of loans • Pooling capitals: loan under a bank consortium 		
II. De-risking			
<ul style="list-style-type: none"> • Risk sharing • Credit enhancement mechanisms 	• On-lending system (full liability for the intermediary bank)		
		• Loan financing unforeseen cost overruns (off-shore wind)	
III. Filling the capacity gap			
<ul style="list-style-type: none"> • Aid project development • Reducing project risk 	<ul style="list-style-type: none"> • Energy efficient renovation – construction supervision • Energy Advice program for SMEs • Urban renewal: strategic city planning (for municipalities) 	<i>No dedicated activity</i>	<i>No dedicated activity</i>

Mainstreaming Climate and Energy across all Activities:

KfW is a signatory to the UN *Principles for Responsible Investments* (PRI) as well as the *UNEP Statement by Financial Institutions on the Environment and Sustainable Development*. The bank acts as a Social Responsible Investor (SRI) accordingly, as confirmed by rating from independent SRI agencies. KfW has developed a “sustainability management system” as an organisational framework for implementing sustainability guidelines of the group. KfW’s target of having one-third of all investment activities (domestic and international) will contribute to climate and environmental investments is evaluated through a positive list, including but not limited to: Energy efficiency measures leading to absolute reductions of energy consumption or 20%/15% specific savings for brownfield/greenfield investments ; Renewable energy projects including respective grids and storage; Public urban transport; and Production equipment for climate technologies.

KfW regularly commissions ex-post evaluations of the impact of its key promotional programs for Germany. These are macroeconomic assessments, comprising a calculation of avoided GHG emissions. The evaluation looks at greenhouse gas emission reductions, the impact on employment and growth.

In terms of adaptation, KfW *Entwicklungsbank* (development bank) has introduced a systematic climate change assessment in 2011, which looks at climate protection and adaptation risks, opportunities and solutions. This assessment focuses on the impacts of climate change and the project’s resilience to these effects. The potential and future levels of GHG emissions that the project will emit are, however, not quantified.

Further, KfW as a signatory of the UN Principles for Responsible Investment (PRI) has taken steps to integrate these criteria into the management of their EUR 20 billion liquidity portfolio. Using a ranking system that takes into account criteria including the quality and scope of reported programs targeting renewable energy and the reduction of GHG emissions, KfW prioritized investments in issuers with high environmental performance scores.

However, to date, it does not appear the climate-related criteria have been integrated into the analysis of individual investment projects.

1 The Role of KfW in the Low-Carbon Transition

The *Kreditanstalt für Wiederaufbau* (KfW) was created in 1948 by the “Law Concerning Kreditanstalt für Wiederaufbau” (KfW-Law, *Gesetz über die Kreditanstalt für Wiederaufbau*). It was originally mandated to reconstruct the German economy after the Second World War. Today, KfW is involved in a broad range of economic, social and ecological areas in Germany, Europe and worldwide.

The current activities of KfW continue to be tied with the political priorities of its two shareholders: the German Federal Government and the German States (Länders). Set out by the Law on Kreditanstalt für Wiederaufbau (KfW-Law, *Gesetz über die Kreditanstalt für Wiederaufbau*), KfW has the mandate of promoting and financing measures in the areas of SMEs, start-ups, risk capital, housing, environmental protection, infrastructure, innovation, social measures and education, financing of municipalities and development cooperation and specific areas of project and export finance.⁹ Furthermore, the Government may assign specific business on an individual basis to KfW, as has happened, for example, in the case of the special loan program during the recession 2009/2010.¹⁰

KfW has long been involved in environmental protection. In the 1980’s, rising public awareness of the importance of environmental protection in Germany led to the launch of KfW’s first promotional scheme addressing this issue. Today, KfW is involved in a number of areas related to climate change – particularly in terms of providing intermediated lending for energy efficiency and renewable energy programs. (KfW; United States securities and exchange commission 2012)

1.1 Germany’s bank to support both domestic and international policy objectives

KfW supports the German Federal government’s as well as the individual German State’s (Länder) policy objectives both domestically as well as internationally. This case study will focus specifically on the domestic policy objectives, particularly those linked to climate- and energy-related areas.

1.1.1 An institution acting both domestically as well as internationally

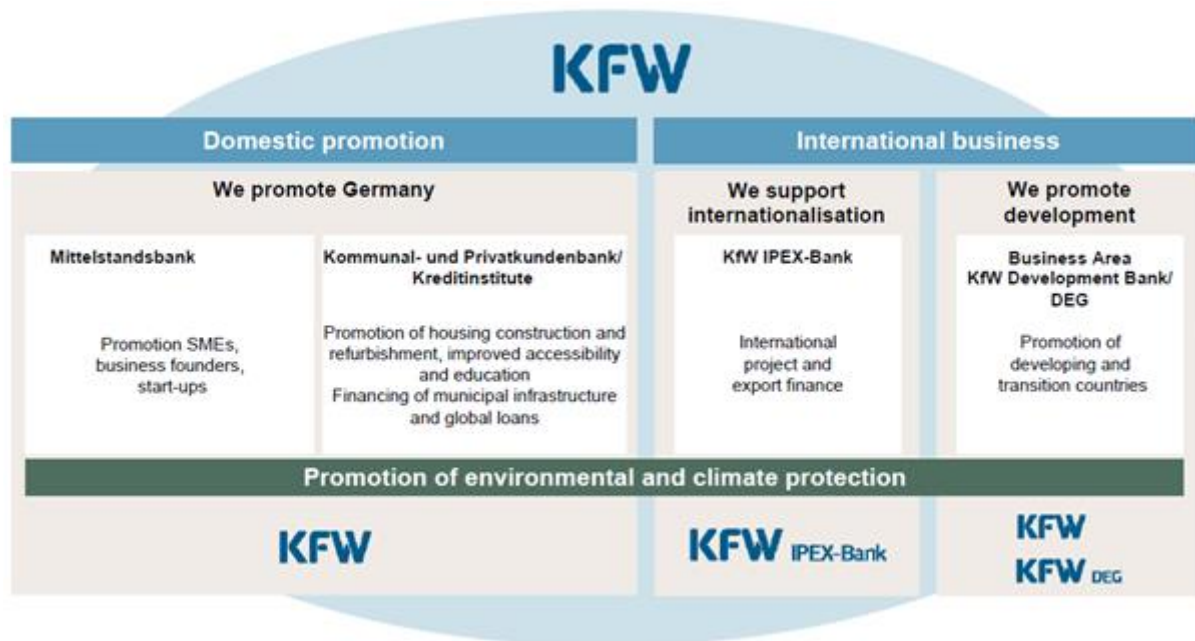
KfW’s main promotional activities are split between three business units and two subsidiaries. The overarching structure is defined by two axes: the promotion of domestic German economy, and promotional international finance.

⁹ Art. 2 paragraph 1 KfW-Law – “promotional business”

¹⁰ Art. 2 paragraph 4 KfW-Law – “assigned business”

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Figure 1: KfW's structure and business areas



Source: KfW presents itself – Structure and Mission of KfW as of November 2013

KfW's domestic promotional activities are split between two business areas:

- **KfW Mittelstandsbank (SME Bank)** KfW Mittelstandsbank brings together all KfW's offers for business start-ups and small and medium-sized enterprises, thus promoting commercial investments over the entire life cycle of a company.
- **KfW Kommunal-und Privatkundenbank (/Kreditinstitute (Municipal and Private Client Bank/Credit Institutions))** offers financing for infrastructure projects primarily for municipalities, grants global funding instruments to promotional institutions of the German Federal States and other financial institutions, and provides housing-related loans and grants as well as financing for education, both to private individuals.

Additionally, KfW performs, as business assigned to it under Article 2 paragraph 4 KfW-Law, capital market-related financing activities and other tasks on behalf of the German Federal Government, including selling shares in privatized state-owned companies and managing outstanding receivables relating to German reunification.

Internationally KfW has two principal areas of activity, namely the promotion of internationalisation of the German economy and the promotion of development. These are carried out by KfW's subsidiary KfW-IPEX-Bank GmbH on the one hand, and by KfW's business area KfW Entwicklungsbank (*Development Bank*) and the subsidiary DEG on the other hand:

- **KfW-IPEX-Bank GmbH** provides project and export finance for SMEs and large German and European companies with projects focused on infrastructure, climate and environmental protection, and supplies of raw materials.¹¹
- **KfW Entwicklungsbank (*Development Bank*)** is in charge of the financial cooperation between Germany and public organisms in developing countries. The “financial cooperation” work of KfW Development Bank is complemented by “technical cooperation” by GIZ¹² and other public agencies. The main sectors of financial cooperation are water supply and sanitation, renewable energy and energy efficiency, as well as the development of the financial sector.
- **DEG – Deutsche Entwicklung Gesellschaft mbH (*German Investment Corporation*)** takes minority equity stakes and provides loans to private companies investing in developing countries. It pursues a business model broadly similar to that of the International Finance Corporation of the World Bank Group. Its main sectors of activity are banking, agro-business, renewable energy, telecommunications and manufacturing.

1.1.2 Designing domestic programs in a cooperative process with German Federal Government and Länders

The German Federal Government is a principal shareholder of KfW (80%) with the remaining 20% held by the German States (Länder). Shares cannot be transferred but among the current shareholders. KfW works in strong connection with the Ministries of the German Federal government. In its regular field of activity (promotional business, Article 2 paragraph 1 KfW-Law) KfW also develops programs and new initiatives out of its own initiative, but in close cooperation with the government Ministries and complying with larger government strategies; before any of KfW's programs may be put into practice, KfW normally is mandated to do so by a Federal Government Ministry in writing by a mandate letter/contract.

KfW's corporate governance is set out in the KfW-Law. Article 7 of the KfW-Law provides for a Board of Supervisory Directors on which Federal Government Ministers constitute a strong group, with the Federal Minister of Finance and the Federal Minister of Economics and Energy taking annual turns to preside over this body. Other members are appointed by the Bundestag, the Bundesrat or the Federal Government. The Board of Supervisory Directors has a strong role in approving the basic strategy of KfW.

KfW typically designs its dedicated support programs in cooperation with a Federal Ministry, in particular the Federal Ministry of Economics and Energy, the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety, the Federal Ministry for Economic Cooperation and Development and/or the Federal Ministry of Transport and Digital Infrastructure.

¹¹ IPEX Bank's main sectors of activity are ports, airports, toll roads, bridges and tunnels, railways, ships, planes, telecommunications, energy and manufacturing.

¹² GIZ (Deutsche Gesellschaft für internationale Zusammenarbeit) is the German Society for international Cooperation. As a federal enterprise, it supports the German Government in achieving its objectives in the field of international cooperation for sustainable development.

- In the case of a mandate letter/contract, KfW is free to determine the conditions of a loan program within the boundaries set forth in the mandate. KfW can design the financing instrument, funding or risk sharing with commercial banks in some cases, depending on the specificity of the mandate.
- In the exceptional case of assigned business (Article 2 paragraph 4 KfW-Law), the business activity (such as the special loan program during the recession 2009/2010) will be assigned to KfW by a specific written instrument. This assignment defines the structure of the business, which will be carried on behalf of, under the responsibility of and – generally – at the risk of the Federal Government.

While funds are allocated to program on a yearly basis, there has been a public consensus that KfW's domestic programs should last for a period ranging from 5 to 10 years.

The sectors in which KfW intervenes are strictly in line with the Federal German Strategy and reflect the national interpretation of European State-Aide and competition legislation.

1.1.3 KfW's responsibility in the implementation of the « green » mandate

The KfW-Law mandates the institution to promote environmental protection (Article 2, paragraph 1, number 1 d)). The strength of implementation of this mandate is strongly connected to the larger German Federal strategy for sustainability.

Since the 1980's environmental protection and climate change protection finance have emerged as a new important focus of KfW's work. Beginning in 1984 with an environmental program dedicated to SMEs, it has continued in 2011 with the German Federal Government energy turnaround policy (detailed in Section 2). In line with national policy, KfW has launched a range of new and revised promotional products under the "*Energiewende Action Plan*". Today, KfW has an internal objective of at least 30% of Green commitment per year, meaning that approximately one-third of all investment activities (domestic and international) will contribute to climate and environmental investments. (KfW 2012a)

1.2 Characteristics to support a low-carbon, climate resilient transition

KfW has a number of characteristics that make it both an existing and future player in the low-carbon energy transition. Through its ability to blend both market and public financial sources to finance projects, work with a network of local commercial banks and provide holistic financing packages, KfW is already playing an important role in achieving Germany's national energy efficiency and renewable energy targets.

1.2.1 Combining capital from the international financial markets and public sources to provide concessional funding

KfW's promotional and development programs typically provide loans at below-market interest rates. KfW is able to support these activities through leveraging capital from the international financial markets at advantageous rates. It is able to cover the remaining cost providing concessional finance through its own funding and public funding sources, including budget funds from the Federal Government as well as the other public funds (see example of the Energy and Climate Fund below).

KfW does not hold any customer deposits, as prohibited by law. Thus, the bank fulfils its financial needs through the capital markets and other funds. KfW covers over 90% of its borrowing needs using the international capital markets with funding volumes totalling to more than EUR 79.7 billion in 2011 and EUR 78.7 billion in 2012. (KfW 2013a) The Federal Republic guarantees virtually all bonds and credits from KfW (as defined in Article 1a KfW-Law), and KfW is recognized by some sources as the “safest bank in the world.”¹³ In addition to its exemption from corporate taxes due to its legal status as a public agency, the group can thus raise funds on advantageous terms. As such, it is able to provide loans at rates typically below that which project developers could have access without using its own or other public forms to subsidize programs.

KfW can further reduce the cost of capital through dedicated funds to reduce the interest rates of its promotional loan programs. The Federal Ministry involved in a specific program can (but does not always) provide additional funding to cover the interest subsidies of that program. This applies both to climate-related programs and general development activities.¹⁴

Further, in the frame of the energy-efficient housing program, KfW has the right to use a share of the *Energy and Climate Fund* (EKF) launched by the German government in 2011. The Fund is replenished from the German auctioning of EU ETS emission allowances.¹⁵

1.2.2 An established record in providing concessional loans while leveraging the expertise of local finance institutions through “on-lending”

Since its creation in 1948, KfW has issued loans totalling close to EUR 1,000 billion. (KfW 2012b)¹⁶ KfW owns no branch offices and thus distributes its promotional loans to final beneficiaries through the branch network of German commercial banks.¹⁷ In this so-called “on-lending system“, the commercial bank handles the application of the final beneficiary, assesses its credit worthiness and concludes the credit agreement with the beneficiary (see **Erreur ! Source du renvoi introuvable.**). The commercial bank directly assumes the risk for this operation. In turn, KfW assesses the eligibility of the individual applications with its own criteria and commits a refinancing loan to the commercial bank.¹⁸

¹³ The US economic magazine “GlobalFinance” has crowned KfW as the World’s Safest Bank in 2013, for the fifth time in a row. (KfW 2013d)

¹⁴ For instance, the “BMU Environmental innovation program” is funded by the Federal Ministry for the Environment, Nature and Conservation and Nuclear Safety (BMU).

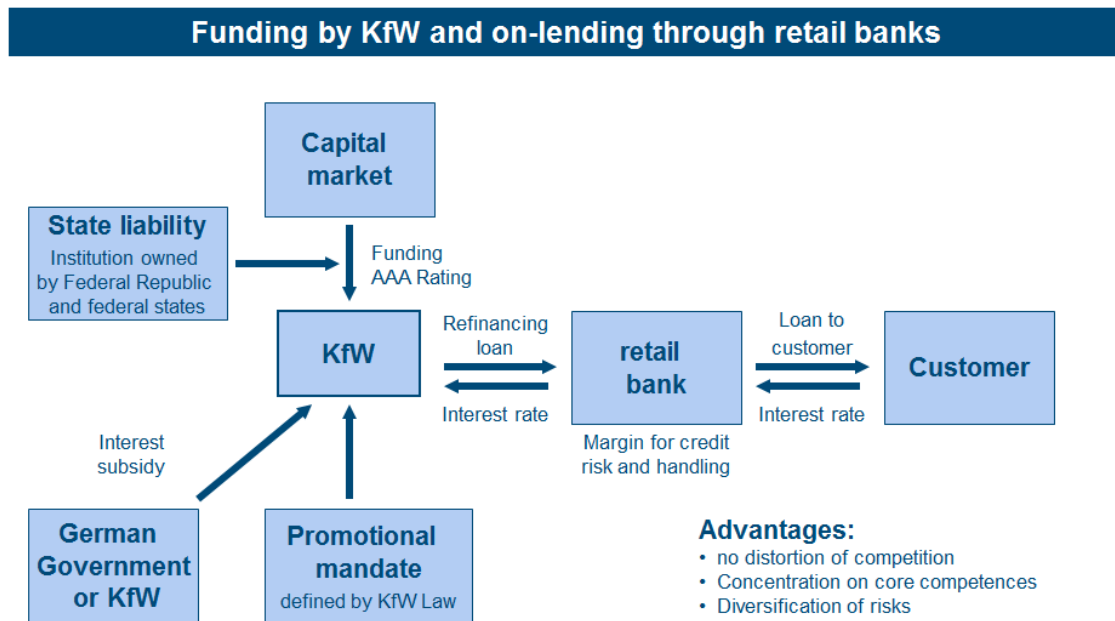
¹⁵ The use of these funds does not directly affect the State budget and debt. However, in turn, this source of funding fluctuates with the changes in prices of carbon allowances. The currently low carbon price led to a loss in revenue in 2012 and 2013, and thus impacts directly on the available amount of aid. In 2012, the EUR 380 million revenue of the fund was far below the expected EUR 780 million, and the federal budget exceptionally compensated for this unexpected loss.

¹⁷ Exceptions to this on-lending system exist in some promotional programs. For instance, local authorities can apply for a loan directly to KfW in the frame of the « Renewable Energies Program –Premium ».

¹⁸ This model does not apply to public sector borrowers and to grants given to private customers and companies. For instance, grants are available for energy-saving investments in homes which can be applied for directly with KfW and are disbursed directly by KfW to the recipients.

Through this approach, KfW avoids entering into competition with commercial banks, and rather facilitates their business in areas within its mandate. KfW provides commercial banks which act as intermediaries for its programs with liquidity at low rates and long maturities. The fact that commercial banks do not rely on their own capacity to raise funds on the markets enables KfW to crowd-in commitment of these banks in projects with risk profiles that they are not used to dealing with.

Figure 2: KfW commercial bank "on-lending" system



Source: Author after the presentation of Dr.-Ing. Rudolf Hennes (2012), *Promoting energy Efficiency in Germany, Paris*.

1.2.3 Offering holistic financing programs to target key market segments and leverage private actors

In addition to providing concessional loans, KfW has developed in cooperation with its stakeholders a number of market offers targeting specific sectors and technologies to help overcome barriers to investment. In many instances it provides more than just financing: it takes a broader approach that addresses many of the capacity and expertise challenges (grants for initial studies; aid to hire energy efficient experts). Lending is provided with repayment-free start up for better debt-servicing as well as sometimes with incentives to increase the ambition of projects (repayment bonuses).

KfW has demonstrated an ability to leverage private financing through its programs. In 2011, KfW committed EUR 6.3 billion for the renewable energies programs in Germany and it resulted in EUR 8.3 billion private investment mobilized. (KfW 2012c) Through its lending for energy efficiency in the housing sector, KfW made EUR 6.5 billion in commitments leading to EUR 18.4 billion of total investments across 282 thousand housing units. This was done at a cost to the federal budget of EUR 934 million – representing a leverage effect of almost twenty-fold (20 private euros spent for 1 euro of public funds). Furthermore, in 2010, for each euro dedicated to thermal renovation, the State received 2 to 4 euros back through taxes and avoided cost of unemployment only thanks to a rise in activity. (Gudrun Gumb 2012)

2 Current activities related to the Low-Carbon Energy Transition in Germany

The German Federal Government's *Energiewende* or "energy transition" aims to decrease the use of carbon-intensive and non-sustainable energy sources in the country. In 2010, the German Government adopted the "Energy Concept for an environmentally sound, reliable and affordable energy supply" developed by the Federal Ministry of Economics and Energy and the Ministry for the Environment, Nature Conservation, Building and Nuclear Safety. It sets priorities in key fields of action, including: renewable energy, energy efficiency, buildings, mobility, research into innovation and new technologies, efficient grid infrastructure for electricity and integration of renewables.

The German objectives are:

- By 2020:
 - Reducing greenhouse gas emissions by 40% (compared with 1990)
 - Reducing primary energy consumption by 20% (compared with 2008)
- By 2050:
 - Reducing greenhouse gas emissions by at least 80%
 - Reducing primary energy consumption by 50% by improving energy efficiency and encouraging the use of renewable energies

Moreover, after the nuclear power plant accident in Fukushima, the German Government has adopted ambitious targets¹⁹ for transforming its energy supply. Further, the *German Renewables Resources Act* (EEG) obliges grid operators to give priority to the purchase of electricity from renewable energies. It also guarantees long term (15 to 20 yrs) minimum sale prices for electricity from renewables.

KfW supports this "energy transition" and anticipates that at least EUR 27 billion will need to be invested each year to achieve objectives by 2020. In turn, it has developed the "KfW Energy Turnaround Action Plan" which aims at meeting these financing requirements. The Action Plan has the following implications:

- From 2012 to 2017, KfW will provide EUR 100 billion to support the energy turnaround (including renewable energies and energy efficiency).
- Increasing the committed amounts to the programs, to finance more projects;
- Increasing the maximum loan amount to promote larger scale projects (e.g. larger onshore wind farms);
- Restructuring and expanding offers to private individuals, companies and municipalities.

¹⁹ In summer 2011, Germany adopted decisions on the gradual phase-out of nuclear power by 2022, greater energy efficiency and an accelerated switch to renewable energies. These decisions of June and July 2011 supplement and accelerate implementation of the measures set out in the Energy concept of September 2010. <http://www.bmu.de/en/topics/climate-energy/transformation-of-the-energy-system/resolutions-and-measures/>

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The programs that were improved in KfW's Energy Turnaround Action Plan are presented in Table 3 below. Three main fields are promoted: renewable energies, energy efficiency, and innovation for the energy turnaround. Given that KfW's business units are split according to the targeted group of actors (private customer, SMEs, municipalities), the programs are differentiated accordingly.

Table 3: KfW Energy turnaround Action Plan

KfW Energy Turnaround Action Plan		
Renewable Energy	Energy Efficiency	Innovation
KfW Offshore Wind Program	Energy Efficiency Program	ERP – Innovation Program
Energy efficient construction (Residential Building) and Refurbishment (Residential and Non Residential Building)		
KfW – Renewable Energy Program Standard (power) – Premium/ Geothermy variant (heat)	Energetic Urban Renewal Energy Efficient Renovation – Quarter Supply	
BMU – Storage Program (for PV installations)	Investment loans for municipalities – energy efficient city lighting	
	Municipal energy supply	
Energy Turnaround Finance Initiative		

<u>Legend:</u>	
Programs of SME Bank (KfW Mittelstandsbank)	Programs of Municipal and Private Client Bank/ Credit Institutions (KfW Kommunal- und Privatkundenbank/Kreditinstitute)

Source: Author after the presentation of Dr.-Ing. Rudolf Hennes (2012), *Promoting energy Efficiency in Germany, Paris*.²⁰

2.1 Quantifying the current role of KfW: one third of all KfW's investments is "green"

Climate change and other environmental issues are part of the institutions top priorities. To reflect the importance of climate change and the environment in general, KfW has set an objective to make approximately one-third of all new commitments in climate change and environmentally sustainable activities.

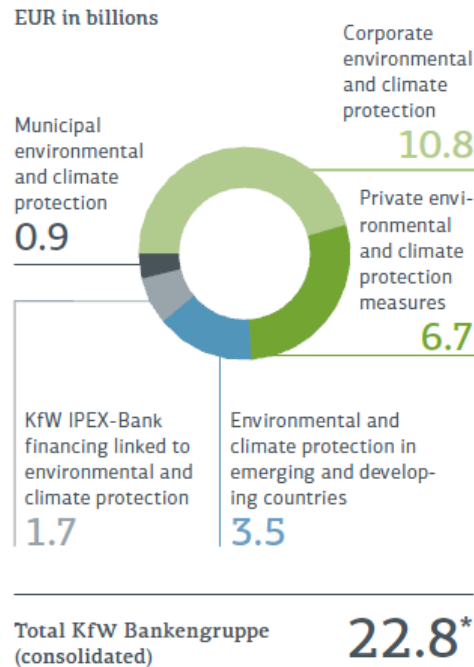
In 2011, KfW Bankengruppe committed EUR 22.8 billion in funding for climate and environmental protection in Germany (18.4 billion) and abroad (5.2 billion). (KfW 2012a) The total figure of EUR 22.8 billion represents approximately one-third of the bank's promotional and development funding

²⁰ KfW Privatkundenbank and KfW Kommunalbank have been regrouped as one business area since April of 2013, and are thus presented as the KfW Kommunal- und Privatkundenbank/Kreditinstitute in the table. However, former KfW Privatkundenbank was originally involved in the launch of the Energy efficient construction and refurbishment program, while former KfW Kommunalbank was involved in the launch of all the programs of the future KfW Kommunal- und Privatkundenbank/Kreditinstitute presented in the table.

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programs. Among these, concerning domestic commitments EUR 7.6 billion was for renewable energy through KfW Renewable energies programs²¹, and EUR 6.6 billion was for energy efficiency in domestic buildings through KfW Energy-efficient construction and refurbishment programs.(KfW 2012c)

Figure 3: 2011's commitment volume of KfW climate and environmental protection finance



Source: KfW *Our responsibility. Shaping social challenges – Sustainability report 2012*

As for climate-related domestic business volume specifically targeted in this study, this made up approximately 35% of KfW's total domestic business volume along the 2010 – 2012 time period, as shown by Table 4 below. The higher figure of 43% for 2012 is principally due to a rise of committed funds in the energy-efficient construction and refurbishment programs compared with 2011, and within a context of lower total annual domestic business volume compared with 2010.

Table 4: KfW Climate-Related domestic business volume between 2010 – 2012

	2010 ²²	2011 ²³	2012 ²⁴	2010 – 2012
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²¹ This figure for German investments does not include KfW's Offshore Wind Energy program and KfW IPEX-Bank project finance.

²² KfW Annual Report 2011

²³ KfW Annual Report 2012

²⁴ KfW Annual Report 2012 ; KfW committed EUR 65 million to the Energy Turnaround Financing Initiative in 2012. However, this is not included in the table above, since funds are used for renewable energy as well as energy efficiency projects. The EUR 542 million for KfW Offshore Wind programme is not part of the total for 2011's renewable energy business volume, for the purpose of comparability.

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	%	EUR bn	%	EUR bn	%	EUR bn	%	EUR bn
Renewable energy	15%	9.6	14%	7.0	16%	7.9	15%	24.5
Energy efficiency	16%	10.3	19%	9.7	27%	13.7	20%	33.7
Sustainable transport	No dedicated infrastructure financing							
Total Climate-Related domestic business volume	31%	19.9	33%	16.7	43%	21.6	35%	58.2
Total domestic business volume ²⁵		64.4		50.9		50.6		165.9

Source: Authors calculations based on the annual reports of KfW.

2.2 Sectors of investment in low-carbon projects

KfW provides financing for renewable energy and energy efficiency to a broad range of actors (households, private companies, municipalities) through multiple dedicated programs. This strong commitment echoes the German Federal government strategy developed in the Energy Concept.

2.2.1 Scope, range and beneficiaries of low-carbon activities

KfW provides financing for project for energy efficiency or renewable energy of different sizes and for a range of actors. As seen in Table 5, KfW's involvement in these projects focuses principally on facilitating the access to capital by providing subsidized concessional loans by on-lending through local finance institutions. In the case of some large-scale projects, KfW equally provides direct debt at market rates filling a market gap for high-volume, long-term finance for these projects. As described below, KfW has few climate-specific programs for sustainable transport. Further, while KfW does focus on adaptation to climate change, this occurs principally through its international activities which are beyond the scope of this study.

As seen in Table 6, KfW offers programs tailored to public authorities as well as households and small and large companies. Debt funding is typically channelled to companies as well as private beneficiaries through the on-lending system. This allows for involvement of the existing commercial banking sector and provides KfW with a broad distribution network that is already close to the beneficiary. Conversely, public authorities can apply for a promotional program directly to KfW, with no intermediary bank. A variety of loan options are available to SMEs and large companies. There are programs in which the same interest rate applies to SME as well as to large companies. For example within the KfW Environmental Program, large and medium companies get the same interest rate; small enterprises can further benefit from an even lower rate. In certain cases, large companies are provided by KfW with high-volume loans at market prices, and they are in certain programs eligible to apply for concessional loans as well.

As seen in Table 7, KfW is principally involved in providing financing for the construction phase of projects. Through both direct and on-lending arrangements, it provides low-interest loans that often benefit from no-pay periods ranging from two to five years. In energy efficiency projects in private

²⁵ KfW Annual Report 2011 and KfW Annual Report 2012

households, building held by local authorities, municipally-owned companies and non-profit organizations, KfW often provides a repayment bonus at the end of the construction period once the improvement in energy efficiency has been certified by an accredited expert.

KfW is also involved in pre-construction phases, where it provides grants for beneficiaries to pay services of qualified experts. This occurs in the field of energy efficiency, with KfW providing grants for the studies on potential energy savings or for energy-efficient urban planning (see Section 3).

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Table 5: principle sectors, project types and instruments of intervention of KfW

	Renewable Energy		Energy Efficiency				Transport
	Small Scale	Large-Scale	Small Scale		Large Scale		Small and Large Scale
			Residential	SMEs	Commercial/ Industrial	Public Buildings	SMEs / Large firms
Access to Capital	- On-lending concessional debt	- Direct market-rate debt (off-shore wind)	- On-lending concessional debt	- On-lending concessional debt	- On-lending concessional debt - Direct market-rate debt (<i>Energy Turnaround Initiative</i>)	- On-lending concessional debt	- On-lending concessional debt
Derisking	<i>No dedicated tools identified</i>						
Capacity/ Expertise			- Grants for external expertise	- Grants for external expertise - Energy Advice program for SME		- Grants for external expertise	

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Table 6: Beneficiaries of KfW programs

Program	Public beneficiary	Private beneficiary		
	Municipalities	Utilities/ Large firms	SMEs	Households
Renewable Energy				
Renewable energy (Standard / Premium))	X	X	X	X
Storage Program		X	X	X
Offshore Wind energy		X		
Energy Efficiency				
Energy efficient construction and rehabilitation (EECR)				X
Energy Efficiency Program		X	X	
Energy Advice program for SMEs			X	
Energetic Urban Renewal	X			
Energetic Urban Renewal – Quarter supply	X			
Energy Efficient City Lighting	X			
Municipal Energy Supply	X			
Transversal				
Energy Turnaround Financing Initiative		X		
Transport				
		X	X	

Table 7: Phases of involvement and principal forms of intervention of KfW

	Phases of Involvement		
	Development:	Construction:	Operational:
Renewable Energy		- Debt financing for greenfield	
Energy Efficiency	- Financing of Studies (grants)	- Debt financing for greenfield and brownfield	
Sustainable Transport	Debt financing		

2.3 Renewable energy

KfW has been promoting renewable energies for almost 20 years. It is involved in two principal ways. Firstly, the “*Renewable Energy Program*” is one of the flagship initiatives of KfW concerning environmental protection. The program stimulates investments in renewables such as solar, wind, hydropower and biomass through the provision of concessional loans through local finance institutions (on-lending) and limited direct lending to municipalities. Second, KfW provides support for offshore wind projects. As KfW’s role in these large-scale offshore-wind projects is to provide financing packages of necessary size and tenor, direct lending may occur at un-subsidized market

rates. From 2010 to 2012, the domestic business volume related to renewable energy totalled EUR 24.5 billion, or 15% of all KfW domestic business volume over this period. This does not include the EUR 542 million invested in 2011 in the frame of the KfW Offshore Wind program, nor commitments to the transversal Energy Turnaround financing Initiative presented in section 2.5.(KfW 2012b; KfW 2013b)

KfW is equally involved in investments in renewable energy through the Marguerite Fund²⁶, along with other European PFIs and the European Commission. This program is explained in detail in the CDC and the EIB annexes.

2.3.1 Renewable Energy Program

KfW's *Renewable Energy Program* is made up of three programs targeting the deployment not only of different technologies, but equally different beneficiaries. The program provides long-tenor below-market interest loans for a broad range of investors, from private individuals to SMEs and municipalities. The "Premium" version focuses on SMEs. In general, the below-market interest rate loans cover up to 100% of the costs of the system. The loans equally benefit from a repayment-free start-up period for the projects. (see Table 8):

- **The Standard program** focuses on the production of electricity and (to a small extend) heat from renewable energies (solar PV, biomass, onshore wind farm construction or modernisation, CHP power stations, low-voltage and medium-voltage power grids). The high-volume, below-market rate loans cover up to 100% of the investment costs eligible for financing, up to EUR 25 million. Lending occurs through the on-lending network. As equally supported by the German Federal policy, KfW strongly focuses on wind energy. In 2011, around 70% of new onshore wind power capacity in Germany was financed by KfW.
- **The Storage program** provides financing for new installations of stationary battery storages systems combined with photovoltaic systems. The loans provided through the on-lending system cover up to 100% of investment costs.
- **The Premium program** promotes large plants in which heat is generated from renewable energies²⁷. The concessional loans cover up to 100% of the financeable costs of investment, up to EUR 10 million.

Within the Premium program, special provisions are made for deep-geothermal projects. The "Deep Geothermal Energy" segment of the Premium program is designed to finance facilities for the development and utilization of geothermal energy deeper than 400 meters. However as of the end of 2013, this program had not been used. The Premium and the Storage program offer an additional

²⁶ As one of the six Core Sponsors of the Marguerite Fund, KfW contributed EUR 100 million at the beginning of an initial closing period which started on December 3, 2009 and ended March 3, 2010. (KfW 2010)

²⁷ Construction and expansion of large solar collector systems, biomass plants for combustion of solid biomass for thermal utilisation, heating networks which are supplied from renewable energies, systems for development and utilization of deep geothermal energy, high efficient heat pumps.

repayment bonus after completion of the investment, provided that the investor proves that the investment achieves KfW's requirements, with a statement of expenditure. Repayment bonuses are offered in the Premium Program and the Storage program and are financed from the budget of the German Ministry of Environment (BMU).

2.3.2 Offshore wind program

As equally supported by the German Federal policy, KfW tackles wind energy finance. KfW-offshore wind energy program aims at financing up to 10 offshore wind farm projects in the coming years in the German Exclusive Economic zone (EEZ), or in the 12 nautical-mile zone of the North Sea and the Baltic Sea. Loans are granted strictly on a first-come first-served application basis; that is, based primarily on the loan commitments of the respective financing consortiums. The wind farms must meet the requirements of German legislation on Renewable energy sources in the electricity sector.²⁸

KfW plays a role in providing the high-levels of capital needed for these projects as well as the long-term investment tenors required. It is involved in the capital-intensive phase of construction, providing long-term financing at un-subsidized market rates. In total, KfW finances up to 50% of the total debt capital requirements, not more than EUR 400 million per project.

Financing for offshore wind projects can take two forms (see Table 8) plus an additional direct loan to cover unforeseen cost overruns in the construction phase:

- **Direct loans** through a banking consortia: private commercial banks contribute on the same terms and conditions and, in total, at least in the same amount as KfW.
- **Financing packages** composed of a loan from KfW through on-lending with a local commercial bank (without providing a subsidy to the local finance institution) combined with an unsubsidized direct loan from KfW of up to equal volume.

KfW's participation in a given project however is typically dependent on an equity share of usually one third of the overall capital requirements having already been paid in to the project company.

²⁸ The wind farms must meet the requirements of the Act Revising the Legislation on Renewable Energy Sources in the Electricity Sector (Gesetz zur Neuregelung des Rechts der Erneuerbaren Energien im Strombereich) of 25 October 2008 (Federal Law Gazette (Bundesgesetzblatt) 2008 Part I Number 49, page 2074).

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Table 8: Renewable Energy programs

	Renewable energies program- Standard (Electricity & Heat)	Renewable energies program- Storage	Renewable energies program – Premium (Heat)	KfW Offshore Wind Energy Program
Government mandate	<ul style="list-style-type: none"> - In accordance with the Renewable Energy Law (EEG) / German Renewables Resources Act (EEG) - Strengthen the role of renewable technologies in the heat market / Market Incentive Program by the Federal Ministry for the Environment²⁹ 			
Program Objective	Support electricity production from RES, CHP plants, small heat production installations. ³⁰	Finance storage systems that comply with high-quality standards, and that reduce the pressure on the local grid.	Support energy heat produced in large installations and from renewable energy sources.	Establish up to ten off-shore wind farms off the German coast within the German Exclusive Economic Zone (EEZ)
Identified need	<ul style="list-style-type: none"> - Provide long-term financing to a large number of projects 			<ul style="list-style-type: none"> - High loan volumes - Long tenors - Specific risk structure associated with offshore wind farms to be addressed
Recipients	Private individuals and not-for-profit organisations which feed the generated electricity/heat into the grid; Self-employed professionals farmers; German and non-German enterprises majority-owned by private individuals; Enterprises in which local authorities, churches or charities hold an interest; Investment funds	Private individuals; Not-for-profit organisations; Self-employed professionals, farmers; Enterprises	Private individuals and not-for-profit organisations which use the generated heat exclusively for their own needs; Self-employed professionals; Small and medium-sized enterprises (SMEs); Large enterprises only if their solar thermal, deep geothermal, heat storage and heating network measures are particularly deserving	Project companies

²⁹ The Market Incentive Program for Renewable Energies (Marktanreizprogramm-MAP) first went into effect in September 1999 and supports the use of renewable energy sources for heat in existing buildings (residential and non-residential buildings). The program encompasses two support schemes: a partial repayment grant/bonus by KfW, and a partial investment grant/allowance by the Federal Government. (ADEME 2012)

³⁰ Includes specific variants depending on the renewable energy source (e.g. “KfW Renewable Energy - Standard - Photovoltaic (274)”).

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			of support; Municipalities, municipally owned enterprises and municipal special-purpose associations; Energy service providers	
Phases of involvement	Development: no activity identified Construction: long-term below-market rate loans through on-lending Operation: refinancing for local commercial banks providing long-term loan			Operation: Construction: long-term market-rate loans
Financial instruments and conditions	- Long-term, low-interest loan through on-lending system (Municipalities can apply directly to KfW) - Repayment-free start-up period - Up to 100% of the investment costs eligible for financing			Loans at market conditions: A – a direct loan under banking consortia; private commercial banks contribute on the same terms and conditions and, in total, at least in the same amount as KfW B – a financing package (a loan from KfW on-lent through a bank and a direct loan from KfW) C – an additional direct loan under banking consortia to finance unforeseen cost overruns for the facility - Up to 50% of the total debt capital requirements, not more than EUR 400 million per project (plus an additional EUR 100 million possible for unforeseen cost overruns) - Repayment-free start-up period
	- Up to EUR 25 million - Interest rate fixed for ten years, or even longer for the entire term of 20 years	- Repayment bonus of 30% of the financeable costs of the battery storage system - Interest rate fixed for up to 20 years	- Up to EUR 10 million - Attractive repayment bonuses: since 15 August 2012, the repayment grants of the Premium component of the RE program were modified in the frame of the MAP. For instance, the repayment grants for large solar collectors (at least 40 m²) will now cover up to 50% of the investment compared to 30% in the past. ³¹	
Risk sharing	No dedicated program identified			

³¹ (BMUB 2012)

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Capacity support	<i>No dedicated program identified</i>	
Current levels of investment	<ul style="list-style-type: none"> - In 2011 KfW provided a total credit volume of around 7 billion for Standard. - In 2011, KfW provided a total credit volume of around EUR500 million for Premium. - In 2011, KfW had already signed two financing agreements for a total of just under EUR 544 million through KfW Offshore Wind Energy program.³² 	

³² p.14 of (KfW 2012a)

2.4 Energy efficiency

KfW offers a number of programs specifically targeting energy efficiency in the housing sector, enterprises as well as municipalities. These programs typically use KfW on-lending model leveraging the capacity and involvement of local finance institutions. In some cases, KfW provides direct loans for large projects or through commercial bank consortia. From 2010 to 2012, KfW domestic business volume related to energy efficiency totalled EUR 33.7 billion, or 20% of all KfW domestic business volume over this period. This does not include commitments to the transversal Energy Turnaround financing Initiative presented in section 2.5.(KfW 2012b; KfW 2013b)

2.4.1 Energy efficiency in the housing sector

In Germany, the housing sector is a principal focus assessed to offer a large potential for reducing CO₂ emissions. The Federal Government aims at increasing the refurbishment rate of older buildings in Germany from the current 1 % to 2 % per annum. This sector is an important element of the German Federal Government's autumn 2010 Energy Concept. The decision to exit nuclear energy has further increased the importance of the building sector's contribution to energy efficiency and climate protection. KfW energy-efficient construction and refurbishment programs provide incentives and play a key role in implementing the German Federal Government's climate targets.

KfW's activities in this sector focus on the added-cost of building energy-efficient homes as well as renovation projects.

The principal program targeting energy efficiency in the housing sector is the **Energy Efficient Construction and Rehabilitation program (EECR)**. The EECR is a financing offer based on the ambition of the energy efficient renovation as well as an ex-post evaluation of energy performance. (See Table 9) For all eligible rehabilitation works (comprehensive or incremental), KfW offers a long-term loan with subsidized interest rates combined with a repayment bonus indexed to the level of ambition of the project.

- **New construction:** EUR 50,000 per housing unit available at favourable conditions.
- **Rehabilitation:** EUR 75,000 per housing unit available at favourable conditions

Depending on the ambition and provided that the commitment on the energy efficiency level is fulfilled after completion of the work, KfW grants a **partial debt relief** ranging from 2.5% to 17.5% of the original loan principle. In case the owners neither need nor desire a loan, KfW can deliver a **grant**, calculated as a percentage of the investment sum. It ranges from 2.5% to 17.5% of total retrofitting costs, dependent on the achieved efficiency standard and the type of retrofitting (comprehensive or individual measures).

KfW equally provides support for the hiring of a professional technical expert to oversee energy-efficiency renovations and construction. KfW provides grants for up to 50% of costs up to EUR 4,000.

Box 1: KfW efficiency label: a widely recognized standard on the real estate market

Due to the alignment of the "KfW Effizienzhaus" or "KfW-Efficiency House" label with the German Federal standards, KfW contributes to the comparability of energy-efficiency information across the whole real estate market. This label thus contributes to raise awareness of environmental issues

among both private individuals and financiers. As such, the “KfW Efficiency House” label has become a wide-spread mark of added-value on the German real estate markets. As a clear and trusted index for energy efficiency, this label contributes to include a “green value” in real estate pricing.

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Table 9: Energy efficiency programs in the housing sector

Program	Energy efficient construction (residential buildings)	Energy efficient refurbishment (residential buildings)
Government mandate / policy	<ul style="list-style-type: none"> - Roll out of energy standards with a very low energy demand which can be supplied by renewable energies - Reducing heating demand by 20% (compared with 2008) - Reducing primary energy demand by 80% / climate neutral building stock 	<ul style="list-style-type: none"> - Increase renovation of building stock from the current rate of 1 % to 2 % per annum and in compliance with the EnEV requirements.
Identified need	<ul style="list-style-type: none"> - Foster the construction of energy efficient homes and renovation equal to or exceeding current national energy requirements (or 115% for renovations) - Provide financing for the additional cost - Provide incentive through efficiency-ambition indexed repayment bonus 	
Recipient	All homeowners, developers	
Phases of involvement	Development: grants for external technical assistance for renovation projects Construction: long-term fixed-interest loan financing with partial repayment bonus (debt relief) indexed to ambition / grants for renovation projects Operation: <i>no activity identified</i>	
Financial instruments	<ul style="list-style-type: none"> - Concessional Intermediated loan (on-lending): up to EUR 50,000 per housing unit; long-term maturity (up to 30 years); - Up to 5-year repayment-free period - Partial debt relief: repayment bonus upon successful achievement of the "KfW Efficient House" standard indexed to national energy efficiency standards (KfW 55: 5% of the loan, up to EUR 2,500; KfW 40: 10% of the loan, up to EUR 5,000). - 3 levels of support for building a "KfW Efficiency House": 70, 55, 40 	<ul style="list-style-type: none"> - Concessional Intermediated Loan (on-lending): up to EUR 75,000 per housing unit - Up to 5-year repayment-free period - Partial debt relief calculated bonus and shortened running time upon successful achievement of the standard (from 17.5% for a KfW 55 to 2.5% for a KfW 115 or Monument). - For individual measures: loan up to EUR 50,000 per housing unit with no debt relief - Direct grant from KfW: up to 25% of costs limited at EUR 18,750 for KfW 55; and decreases until 10% of costs limited at EUR 5,000 for individual measures. - Five levels of support for total renovation towards a "KfW Efficient House": 55, 70, 85, 100, 115 or Monument.
Risk sharing	No activity identified	
Capacity support		Energy-efficient renovation – construction supervision - grants for external technical assistance
Current level of investments	In 2011, KfW provided over EUR 6.6 billion in low-interest loans and investment grants for residential property owners and municipalities. ³³	

³³ See (KfW 2012c)

2.4.2 Energy efficiency – enterprises

KfW tackles energy efficiency needs for enterprises KfW has identified that while enterprises are aware of the benefits of energy efficiency, they are subject to a number of barriers. Particularly for small and medium enterprises (SMEs),³⁴ these include a lack of funds or financing facilities, relatively long pay-back periods of the energy efficiency measures, and lack of technical know-how to identify and implement energy efficiency measures, or energy may also account for a minor part of overall costs.

KfW's programs thus focus on energy efficiency technical advice for SMEs and funding of energy efficiency works for buildings. The initiative "**Energy Efficiency in SMEs**" was launched by the Federal Ministry of Economics and Energy (BMWE) and KfW. It includes two components:

- **The Energy Advice program for SMEs:** recommended prior to any work, this is a joint initiative with the BMWE. Grants are provided to cover the costs of an independent energy expert who is accredited for the program to provide initial advice (i.e. detection of possible sources of energy savings) and/or detailed advice (i.e. building an energy saving concept). This helps tackling lack of in-house expertise and attempts to limit inefficient renovations. This expert, however, does not have a role in measure ex-post and ex-ante improvements in energy efficiency.
- **KfW Energy Efficiency program:** this program provides long-term concessional loan for enterprises through an on-lending arrangement.³⁵ KfW offers maturity options of 5, 10 and 20 years. This funding can be used both for equipment³⁶ as well as rehabilitation of buildings.³⁷ Proper use of the funds must be proven to the bank after completion of the measure.

Expenses for the planning and implementation support of operational savings investments may also be eligible for support.

Table 10: Energy efficiency programs for enterprises

Program	Energy Efficiency Program
Identified need	Lack of funds or financing facilities, relatively long pay-back periods of the energy

³⁴ KfW definition of SMEs is consistent with the EU definition, that is, enterprises with less than 250 employees and a turnover of less than EUR 50 million or total assets of less than EUR 43 million.

³⁵ The companies concerned by this program have an annual group turnover of usually up to EUR 2 billion. Exceeding up to EUR 4 billion is possible with approval of the Federal Ministry of Economics and Technology.

³⁶ The loan can be used to finance any type of measure achieving substantial energy savings: conditioning equipment, CHP, regulating and control equipment, information and communication technology, etc. For replacement investments, the energy consumption has to decrease by 20% compared to the SMEs' average over the last three years, while for new investments it has to outperform the industry average by 15% of the energy consumption.

³⁷ For an existing building, the measures should lead to meet at least the EnEV standards, whereas newly constructed buildings have to outperform the EnEV standard by 20% of the allowed energy demand. KfW finances up to 100% of eligible investment costs usually up to EUR 25 million.

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	efficiency measures, and lack of technical know-how to identify and implement energy efficiency measures, or energy may also account for a minor part of overall costs.
Type of activities covered	Investments in and outside Germany that achieve substantial energy-saving effects, including buildings, equipment, planning and implementation support of operational savings, etc. <ul style="list-style-type: none"> - Equipment: Replacement investments must lead to energy end-use savings of at least 20% on the basis of the average consumption of the previous 3 years. New investments must achieve energy savings of at least 15% compared with the industry average. - For an existing building: compliance with EnEV standard is a minimum. For newly constructed buildings: outperform the EnEV standard by 20% is a minimum.
Recipient	German and non-German enterprises , joint ventures ; Self-employed professionals ; Enterprises under an energy contracting
Phases of involvement	Development: grants for technical assistance (via the Energy Advice Program for SME; only available for SME) Construction: Below market-rate loans through on-lending Operational: no dedicated programs identified
Financial instruments	- Concessional Intermediated Loan (on-lending): up to EUR 25 million per project. - Various tenors (5, 10 or 20 years) - Up to 3 repayment-free start-up years -Optional 20 years fixed interest rate
Risk sharing	<i>No dedicated activity identified</i>
Capacity support	Energy Advice program for SMEs – grants for external technical expertise <ul style="list-style-type: none"> - Initial advice: grant of 80% of eligible advisory costs (net fee), up to EUR 1,280. - Detailed advice: grant of 60% of eligible advisory costs (net fee), up to EUR 4,800.
Current level of investments	- The ERP Environmental Protection and Energy Efficiency Programme in 2011: EUR 1,894 million. ³⁸ - KfW Energy Efficiency Programme in 2011: EUR 1,178 million, and in 2012: EUR 3,519 million. ³⁹

2.4.3 Energy efficiency promotional programs for municipalities

KfW Kommunal- und Privatkundenbank/Kreditinstitute has expanded its financing offer to projects for energy-efficient refurbishment of municipal non-residential building as well as developed integrated approaches to tap further energy savings potential in urban areas (See Table 11).

The “Energetic Urban Renewal” – Energy Efficient Refurbishment of Buildings: This program is dedicated to local and municipal authorities as well as municipally owned companies and non-profit organizations to fund investments in energy-efficient refurbishment of non-residential buildings

³⁸ The former “ERP Environmental Protection and Energy Efficiency Programme” was absorbed into the “KfW Energy Efficiency Programme” in 2012. This is why 2011 figures are presented for both programmes, and the 2012 figure is provided only for the new “KfW Energy Efficiency Programme”.

³⁹ p.56 of (KfW 2013b)

(schools, nursery schools, town halls, municipal administrative buildings or hospitals) that were built before 1995 and are owned by the applicant. This program is similar to the *Energy Efficient Renovation program* for housing: low-rate loans are provided with long-tenors as well as a repayment-bonus indexed to the level of energy efficiency achieved.

KfW equally has a number of additional programs to tap further energy-savings potential:

- **Urban renewal program – grants** for integrated neighbourhood concepts and for implementation managers: provides municipalities with grants for advisory services on how to create an urban plan that targets high energy-efficiency throughout the community. This is presented in the section on advisory programs.
- **Energetic Urban Renewal – energy efficient supply of urban neighbourhoods:** this program fosters investments in the energy efficiency of municipal heat, water and wastewater sewage systems in the district.
- **Municipal energy supply program:** targets investments in efficient distribution networks, intelligent control systems and innovative memory.
- **Energy-efficient urban lighting:** KfW Kommunal- und Privatkundenbank/Kreditinstitute introduced the new promotional “Energy efficient city lighting” program in 2011. The priority is to replace and upgrade urban lighting systems as well as the installation of new street lighting. Projects are financed through the use of low-interest loans.
- **General investment loan program:** the investment loan program finances investments in municipal and social-service infrastructures, thus addressing financial needs of both local authorities, municipally owned companies and non-profit organizations. Local authorities are eligible for a EUR 150 million loan, while the maximal amount for municipally owned companies and non-profit organizations is set to EUR 50 million. While this program is not climate and energy specific, it can be used to finance climate-relevant works on infrastructures. This is why KfW raised the maximum loan amount to EUR 50 million for municipally owned companies and non-profit organizations in the frame of the *Energy Turnaround Initiative*, due to the energy-efficiency relevance of the program.

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Table 11: Energy efficiency for municipalities: from measures on single buildings to integrated approaches

Program	Energetic Urban renewal – Energy Efficient Refurbishment of buildings	Energetic Urban renewal – energy efficient supply of urban neighbourhoods	Municipal energy supply	Energy efficient urban lighting
Program Objective	Renovation of municipal non-residential buildings built before 1995.	Finance a sustainable investment in the energy efficiency of municipal heat supply, water and sewage systems in the neighbourhood. 100% of costs are eligible.	Financing electricity generation, efficient distribution networks, such as smart grids, smart metering and decentralized energy storage. 100% of the costs are eligible.	Improving the energy efficiency of public lighting (for roads, parking lots, open spaces, traffic lights, etc.). It covers costs of planning, consulting and implementation, provided minimal energy saving threshold is met.
Recipient	Local authorities (towns, municipalities, administrative districts); and also for the first three energy programs: municipally owned companies and non-profit organizations			
Phases of involvement	Construction:, replacement, retrofitting	Construction: replacement, retrofitting	Construction: retrofitting	Development: planning & consulting costs Construction: replacement, retrofitting
Financial instruments	<ul style="list-style-type: none"> - Subsidized loan (up to EUR 500/m²) - maximum maturity of 30 years, fixed interest rate for 10 years - Repayment bonus of up to 12.5% of loan amount (indexed on KfW Efficient House level: from 100 to 55) after verification by an accredited technical expert - up to 5 repayment-free start-up years 	<ul style="list-style-type: none"> - loan with no maximum credit - term of up to 30 years - repayment-free start-up years 	<ul style="list-style-type: none"> - loan with no maximum credit - 10 years fixed interest rate - up to 30 years of maturity - repayment-free start-up years 	<ul style="list-style-type: none"> Loan (amount depending on the type of investment) - term of 10 years - 2 repayment-free start-up years
Risk sharing	<i>No dedicated instruments identified</i>			
Capacity support	Urban renewal: strategic city planning program			
Current level of investments	In 2011, KfW provided over EUR 6.6 billion in low-interest loans and investment grants for residential property owners and municipalities			

2.5 The Energy turnaround finance initiative: A transversal program for energy efficiency and renewable energies for private companies

Initiated in 2012, the *Energy Turnaround Finance Initiative* expands the range of products for private enterprises to improve operational energy efficiency, use renewable energies and finance projects to finance further innovation in technologies for energy savings, efficient energy generation, energy storage and transmission. The program finances **projects for large commercial companies** in Germany (annual group turnover between EUR 500 million and EUR 4 billion) related to the German energy turnaround. The program finances large-scale investment projects in Germany, in the area of:

- **Energy efficiency** (operational energy efficiency measures to achieve energy savings, renovation - to meet at least EnEV standards - and new construction of buildings - to outperform EnEV standards by 20% at least. An expert confirms the savings before and after renovation work is done).
- Investment in the use **of renewable energies** (construction, expansion and acquisition of equipment – onshore wind turbines, PV systems, production and use of biogas, transport networks for energy – or CHP plants, heat generation plants, heat/cold storage and networks).
- **Innovation projects** (R&D) in the areas of energy conservation. This concerns new or further development of energy-saving technologies, for more efficient electricity generation, storage and transmission.

The program allows for high financing volumes at market conditions (unsubsidized) of between EUR 25 million to EUR 100million per project, with maturity up 20 years (and with up to 3 repayment-free start-up years) and can take a number of different forms:

- **Direct loans:** KfW can provide direct loans through the consortium of banks, where KfW contributes up to 50% of the financing of the project (*pari passu* conditions).
- **Financing package:** KfW can also provide a financing package composed of a loan on-lent through a local finance institution bank and a direct loan.

KfW committed EUR 65 million to the Energy financing Initiative in 2012.

2.6 Sustainable Transport

KfW does not have special domestic program dedicated to public transport infrastructure. Nevertheless, in a number of programs low-carbon transport can be financed. For example, KfW's Environmental Program fosters different kinds of low-emission vehicles. KfW committed EUR 184 million to low-emission vehicles through the KfW-Environmental Program between 2010 and 2012.

2.7 Supporting R&D and specialized SMEs to foster offer on the market

KfW Mittelstandsbank (SME-Bank) has programs tailored to founding, expansion and consolidation of firms making use of a broad range of financial instruments (see Box 1).

Box 1: KfW Mittelstandsbank programs for each step of a company's life cycle

KfW Mittelstandsbank has developed programs to support a company's entire life cycle:

- The *ERP Start-up loan program* provides business founders and start-ups with loans to finance capital expenditure and working capital. KfW also provides grants for start-up coaching in Germany.
- The *ERP Participation program* broadens the equity capital base of SMEs with refinancing loans. Through the *ERP Start-up Fund*, KfW participates in innovative SMEs with co-investors and assistance from the BMW.
- The *Entrepreneur loan program* provides debt capital for capital expenditure, working capital and investments for companies that have been in operation for more than 3 years.
- The *ERP Regional Promotion Programs* also provides debt capital for investments in structurally weak areas of Germany (i.e. "assisted regions").
- *Advisory programs* also cover fees for counsellors working on the identification of weaknesses in companies, and the restoration of their competitiveness.

While the abovementioned programs do not target specifically climate- and energy-related companies, KfW has developed a number of programs supporting innovative technologies, including low-carbon and energy efficiency technologies:

- The **ERP Innovation Program**: this program focuses on R&D and commercialization, targeting self-employed professionals and enterprises, with preferential conditions for SMEs (i.e. an additionally reduced interest rate). It does not focus on start-ups, since eligible companies have been on the market for at least 2 years. While it does not specifically target companies focusing on energy-climate efficiency, it **includes advantageous conditions for efficient energy technologies**: the program typically provides up to EUR 5 million loans per project; but if the technology is for saving, storing, transmitting or producing energy, the maximum amount rises up to EUR 25 million per project (limited to EUR 50 million per enterprise per year).
- **BMU Environmental innovation program**: The BMU Environmental innovation program promotes pioneering, innovative environmental protection measures in German industry. Eligible industrial projects must demonstrate innovation in the use of advanced technologies to reduce environmental pollution as well as to manufacture and use ecologically sound products. The program does not target R&D phases, but rather construction, machinery and costs of commissioning and possibly monitoring the success of the action. The program targets both German and non-German enterprises, as well as local and municipal authorities. SMEs are particularly encouraged.
- **KfW Energy Turnaround Financing Initiative**: as described above, this initiative finances R&D projects of large companies operating in Germany.

3 Climate financial tools and instruments: zoom on the field of project finance

Table 12: KfW's range of tools to support low-carbon project investment

Role	Detailed functions	KfW Tools and instruments
I. Access to long-term financing: capital provider and facilitator	1. Provider	<ul style="list-style-type: none"> • Subsidized on-lending • Direct low-interest loans (non-subsidized) • Performance-indexed repayment bonuses • Grants
	2. Facilitator	<ul style="list-style-type: none"> • Repayment-free start-up period of loans • Pooling capitals: loan under a bank consortium
II. Derisking	1. Reducing financial risk (financing and re-financing across project phases)	
	2. Reducing project risks (operation, construction) between project participants	<ul style="list-style-type: none"> • On-lending system (full liability for the intermediary bank) • Loan financing unforeseen cost overruns (off-shore wind)
III. Filling the capacity gap	Expertise Capacity building and training	<ul style="list-style-type: none"> • Grants for external expert studies

3.1 Provision of and facilitating access to long-term financing

As seen above in Section 2, KfW achieves its domestic promotional programs mainly by providing concessional loans. This is done either using an on-lending or in certain cases direct lending. In certain programs, KfW provides grants when beneficiaries are not willing to or cannot contract a loan. Through the deployment of these loans, KfW is often able to leverage additional sources of financing either from local banks (on-lending) or other participating commercial finance institutions (direct loans).

3.1.1 Lower-cost concessional lending through blending multiple sources of financing

KfW is able to provide comparative low interest rates through the blending of multiple sources for its financing. For some programmes, this may include lending at rates typically below what project developers could access otherwise. KfW can provide such below-market interest rates on loans through its ability to leverage capital at low rates on the international capital markets given its high credit rating. These low rates are then passed on through either direct or intermediated lending. KfW provides the commercial bank with a low interest rate compared to market terms; local commercial banks pass these rates on to beneficiaries with a small increase to cover their credit risk and handling. KfW determines the maximum amount of this margin, in order to secure the transmission of the promotional advantage to the beneficiary.

Second, for specific programs approved by the Federal German government, low interest rate loans are combined with a subsidy (such as the repayment bonus indexed to the final level of energy efficiency achieved). In some instances, this is further enhanced through the inclusion of an initial repayment-free

period. The repayment-free start-up period allows beneficiaries to keep their cash for other uses during early phases of the project when cash inflows may be particularly scarce. This can be conceived as a tool to help beneficiaries start projects while benefiting from a capital that they could not have afforded otherwise at this stage.

3.1.2 Intermediated lending through KfW on-lending approach

Savings banks, cooperative banks and commercial banks are KfW's main distribution partners for much of KfW's lending activity. These local banks conduct the appraisal of the borrower, evaluate their plans and make the decision on whether to finance the project and to apply for a loan from KfW. This model allows neutrality in the loan business where KfW works with multiple local financial institutions – thus giving customers increased choice. Secondly, KfW believes that acting through local banks allows for a relationship to develop between the bank and the customer, thus making it easier for the local institution to accurately judge plans.

For the on-lending process to function properly, KfW must:

- Ensure that the commercial bank passes the advantageous conditions of the loan to the final beneficiary of the promotional scheme;
- Pay the commercial bank a risk premium for the risk that it is taking.

As such, KfW provides the commercial bank with a low interest rate compared to market terms; and the commercial bank charges its own remuneration by including a margin for credit risk and handling into the interest rate applied to the final beneficiary. KfW determines the maximum amount of this margin, in order to secure the transmission of the promotional advantage to the beneficiary.⁴⁰ There is a risk that commercial banks do not propose KfW promotional schemes to their client, since they may offer services that are more profitable to them. Therefore KfW has to launch information campaigns of its own (via a call centre, flyers, etc.).

The on-lending system has a number of benefits. It facilitates the loan application process for KfW, since the commercial bank takes in charge the primary credit worthiness assessment. This scheme provides KfW with a broad distribution channel, while avoiding managing the operation of a branch network. At the same time, it directly involves local banks in the process - thus avoiding crowding-out effects with private commercial banks already involved in these activities. Further, KfW uses the on-lending model to enhance the local commercial banks' capacity and readiness to provide loans for energy efficiency and renewable energies.

3.1.3 Direct lending: leveraging matching private funds through consortia

Through direct lending, KfW is able to assist in assembling the necessary volume of finance at a long-enough tenor to facilitate large-scale capital-intensive projects. Working with other private sector actors, KfW brings up to 50% of the long-term financing for projects through its participation in project consortia, providing financing at unsubsidized market rates. KfW requires that commercial banks contribute on the same terms

⁴⁰ As a rule, a 0.75% annual fixed prime-risk applies to private individuals and households. In the case of enterprises, the amount of the premium is adjusted depending on the assessments of the financial situation of the firm and the quality of its collateral. This double evaluation results in nine price categories that allow for adequate risk-adjusted margins. (Virginie Marchal and Geraldine Ang 2012)

and conditions as KfW, in total, at least in the same amount. Through direct lending, KfW is providing access to the large amounts of long-term capital needed for projects while simultaneously drawing in private finance to the projects.

3.1.4 Targeted subsidies to increase energy efficiency ambition: repayment bonuses

Within KfW's programs focusing on the energy efficiency of buildings, the level of aids is progressive. While the base rate of the loans does not vary, the repayment bonus granted by KfW after the certified completion of projects is indexed to project's overall level of ambition. For example, as seen in the Energy-efficient Construction and Refurbishment Programs for households:

- **KfW aligns its EECR offer on the Federal energy efficiency requirements for new buildings.** The program requires a higher energy efficiency standard than the German Federal government's standard energy efficiency requirements for new constructions in the Energy Saving Ordinance (EnEV).⁴¹
- **Aid is progressive:** the higher the efficiency standard met, the greater the repayment bonus. The progressive nature of the program gives incentives to increase the ambitious of projects and surpass legal standards, but also limits the risk of locking in poorly refurbished buildings in a technical and economic sense. This program aims to ensure that renovations set ambitious targets in terms of energy efficiency and use of the most efficient technologies. This helps ensure that energy efficient renovation will reduce expenditures from residents concerning their bills for heating as well as postpone the need for additional thermal renovation. In the case of the new construction, KfW provides funds only if the building will be better than the EnEV requirements for new buildings in terms of primary energy demand and transmission heat loss. For rehabilitation projects, the conditions for eligibility start at 115% of the allowed energy demand level for new construction. KfW has defined five levels of support for a "KfW Efficiency House": 55, 70, 85, 100, 115 – corresponding to the resulting energy demand after construction/renovation as a percentage of the energy demand allowed for new construction. In case the landlords cannot engage in works that lead to one of these KfW standards, KfW also funds partial rehabilitation work through the so-called "individual measures".
- **An obligation of performance:** aid is granted only when the construction or refurbishment work proved to achieve a higher energy efficiency level. To do so, one of the 4,500 accredited experts must evaluate building before and after work is performed. The combination of ex-ante and ex-post evaluation is a key factor for success of the program. Thus it provides clear information on the real efficiency improvements brought about by the work.
- **Technology-neutrality:** there is no requirement on the technological means used to reach the energy efficiency level. Thus, the program makes it more flexible for the numerous and singular cases of refurbishment projects. Moreover, by remaining opened to use any type of energy efficient

⁴¹ The EnEV assesses energy efficiency based on both primary energy demand and transmission heat loss. Primary energy demand is the leading criterion and refers to the energy input in the complete supply chain to heat the building and supply warm water.

technology, the program aims to increase the demand for new energy efficient technologies, and thus indirectly stimulates research and development for them.

Not only is it a form of incentive for beneficiaries to target the most ambitious energy efficiency measures. This is also a way to match the promotional level of interest rates consistently with the capital intensity of investments that typically rises along with the level of energy efficiency targeted.

3.1.5 Facilitating through fund structures

As mentioned before, KfW invests in equity through the Marguerite Fund (see CDC case study) in transport, energy and mature renewable energies.

3.2 Risk transfer & sharing

KfW has limited dedicated instruments for risk transfer and sharing for low-carbon projects. In general, this occurs through different exemptions for liability as part of the on-lending system.

3.2.1 Guarantees and risk sharing through the on-lending system

Through the on-lending model, KfW offers three types of risk-sharing in terms of the loans offered:

- Loans for which the local bank bears the full risk;
- Loans for which the local bank is granted partial exemption from liability which is usually 50% ;
- Loans for which the local bank is granted 100% exemption from liability (e.g. mezzanine⁴²), which finance only part of the investment as the local bank is requested to always bear part of the credit risk.

In the traditional SME lending programs offered by KfW, the on-lending banks are liable to KfW and bear the risk of customer default as described above. Under certain lending programs KfW offers the option of a partial exemption from liability to on-lending banks. If the on-lending bank applies for an exemption from liability, KfW bears the risk not retained by the bank and the risk margin is shared pro rata between KfW and the bank. This model applies amongst others to KfW Mittelstandsbank's largest and most important lending program, KfW *Unternehmerkredit*, or Entrepreneurial Loan program. In addition, mezzanine capital and equity participations offered by KfW Mittelstandsbank are designed so that KfW assumes direct exposure to the credit risk of the ultimate borrower, which is covered or compensated in different ways: by means of risk premiums included in the interest rate charged to the ultimate borrower; or by means of guarantees from the Federal Government or the European Investment Fund.⁴³

3.2.2 Sector-specific guarantees

KfW contributes to make some projects possible by taking in charge the risks inherent to certain types of activities. In the off-shore wind energy program, KfW offers loans financing unforeseen cost overruns that

⁴² KfW recognizes that there is no common definition of mezzanine capital. They use a broad definition covering a variety of hybrid, flexible financing instruments between ("mezzanino") pure equity and pure debt financing. Mezzanine financing is typically reserved for SMEs with lending by the local bank split between a senior tranche (without guarantee) and a subordinated tranche for which KfW covers the liability.

⁴³ See (Dietrich Suhlrie 2005)

reduce the risk of financial failure in case of such unforeseen event. It enhances the sustainability of the whole process, by maximizing the probability of carrying the project up to the commercial phase. In turn, this helps incentivize the involvement of project sponsors as well as other private sources of funding.

3.3 Filling the capacity gap through provision of external expertise

Given the decentralized and the large number of projects that KfW finances, it rarely provides direct advisory through its own experts to clients engaging in innovative low-carbon technologies. Rather, it fosters indirectly the employment of external expertise, typically through grant funding to procure advisory services.

- **Energy Advice program for SMEs** is a program recommended prior to any work on energy efficiency. This is a joint initiative with the Federal Ministry of Economics and Energy (BMWE). An independent energy expert who is accredited for the program provides initial advice (i.e. detection of possible sources of energy savings) and/or detailed advice (i.e. building an energy saving concept). This helps tackle lack of in-house know-how on energy efficiency works, and it prevents SMEs from moving forward with under-efficient measures. This expert, however, does not have a role in measuring ex-post and ex-ante improvements in energy efficiency. Grant, up to EUR 1,280 for initial advice: 80 % of the costs for an on-site evaluation are covered. For detailed advice: Grant, up to EUR 4,800; 60 % of the costs associated with drawing up an action plan is covered. The KfW estimates that this program stimulates demand for energy efficiency advice and implementation. Since the renewal of the former Energy Efficiency Advice program in March 2012 until December 2013, KfW provided finance for 8,000 consultations.
- Between 2008 and 2011, KfW financed 18,000 consultations. In 2010, companies implemented two-thirds of the measures recommended by independent evaluators, or had firm plans to do so in the future.⁴⁴
- **Energy efficient renovation – construction supervision** program provides grants for professional construction supervision by a technical expert. The grants cover 50% of the total supervision costs up to a maximum of EUR 4,000.
- **Energy Efficiency Evaluation Experts:** KfW also mobilizes experts in the energy efficient renovation program to perform ex-ante and ex-post analysis of energy efficiency projects. This has led to the development of a network of over 4,500 accredited experts in Germany.
- **KfW Research team:** provides public information out of the frame of any promotional advisory program. For instance, the team developed the “KfW/ZEW CO2 Panel” in cooperation with the ZEW (Centre of European Economic Research). It explores the activities and expectations of German companies and International experts in the context of the EU Emissions Trading Scheme, and publishes an annual CO2 Barometer. It is motivated by the need of a data basis concerning developments and expectations in supply and demand as well as prices of emission allowances and emission reduction certificates.

⁴⁴ The main focal points were heating systems, ventilation, air conditioning, lighting and building insulation. Investments to the tune of EUR 670 million allowed companies to reduce annual energy costs by EUR 122 million and cut carbon emissions by 600,000 tonnes. (KfW 2012a) p.19

- **Urban renewal: strategic city planning (for municipalities):** As part of the *Energy-efficient District concept* the program focuses on the development of a plan for integrated energy-efficient renovation of entire neighbourhoods. Grants are provided for municipalities to hire a redevelopment manager. This manager implements the concept plan, coordinates and controls measures, enhances financing. Grants are distributed directly by KfW with no maximum for an integrated approach, or up to EUR 120,000/neighbourhood covering 65% of eligible costs.
- At an international scale, KfW also contributes in the ELENA initiative, which is described in details in the EIB annex.

4 Mainstreaming and Integration Across activities

KfW has a role in providing financing to support the programs and policies of its shareholders: the German Federal Government and the German States (Länders). As such, a portion of KfW's activities will be tied to decisions made by the Supervisory Board and the various Ministries. These bodies play an important role in the development – and the eventual provision of financing to cover subsidies and other program costs – of the individual programs promoted by KfW. As such, the climate-related coherence of the broader KfW portfolio will be linked to external policy priorities and mandates. Nevertheless, KfW has taken steps to integrate climate and energy targets within its full range of activities.

4.1 Integrating Climate and Energy into the Broader CSR and ESG activities

KfW is a signatory to the UN Principles for Responsible Investments (PRI), in addition to the UNEP “Statement by Financial Institutions on the Environment and Sustainable Development”. The bank acts as a Social Responsible Investor (SRI). As confirmed by rating from independent SRI agencies, Oekomclassified KfW as “Prime”, that is, one of the best ratings awarded in the group of financial institutions.⁴⁵ Sustainalytics has ranked KfW third among non-listed banks worldwide and as the best development bank.⁴⁶ The commitment to the PRI means that KfW undertakes to integrate sustainability in its investment practices, to encourage other market players to make sustainable investments and to report on their sustainability related activities in an appropriate manner.

4.1.1 A sustainability management system

KfW has developed a “**sustainability management system**” as an organisational framework for implementing sustainability guidelines of the group. The CEO bears responsibility for the strategy and communication regarding sustainability issues. The Executive Board member in charge of environmental issues takes in charge the coordination of in-house environmental protection. Within this process, a group-level environment and climate steering committee facilitates internal discussions, initiates and coordinates group

⁴⁵ Oekom research AG is one of the world's leading rating agencies and provides the analysis for the segment of sustainable investments. Official website : http://www.oekom-research.com/index_en.php

⁴⁶ Sustainalytics is a global leader in sustainability research and analysis, serving investors and financial institutions around the world. Official website : <http://www.sustainalytics.com/>

activities in the field of environmental and climate protection. Further sustainability guidelines are adopted by individual business areas, according to relevance to their specific activities.

The Group's sustainability officers and the group-level environment and climate steering committee draw up a **Sustainability Program**.⁴⁷ It aims at continuously improving the range of financings and promotional programs. Among other focuses, the 2012-2014 program targets an improvement of the range of sustainable finance, which includes energy efficiency and renewable energies promotion, as well as introduction of new international promotional models for climate protection and adaptation to climate change to strengthen the Federal Government's position in UN climate negotiations, or also in-house environmental protection.

4.1.2 A portfolio-wide target for climate and environmentally friendly investment

As discussed above, KfW has set a target that one-third of all investment activities (domestic and international) are to be related to climate and environmental issues. This is evaluated through a positive list:

- Energy efficiency measures leading to absolute reductions of energy consumption or 20%/15% specific savings for brownfield/greenfield investments
- Renewable energy projects including respective grids and storage
- Public urban transport
- Production equipment for climate technologies
- Combined heat and power generation
- Programs, facilities, structured funds, initiatives and credit lines dedicated to environment & climate
- REDD & biodiversity projects
- Adaptation projects (international)
- Carbon capture and storage
- Projects improving resource efficiency by at least 15% specific savings
- Projects with direct focus on environmental and resource protection

4.2 Program & Project analysis: limited mainstreaming and quantified tracking of climate-related investment

4.2.1 An ex-post assessment including avoided emissions is performed on key domestic programs

KfW regularly commissions ex-post **evaluations of the impact** of its key promotional programs for Germany. These are macroeconomic assessments, comprising a calculation of avoided GHG emissions. For instance, independent research institutes make an evaluation of its energy-efficient construction and refurbishment programs for residential buildings and municipalities, under an agreement with the Federal Ministry of Transport and digital Infrastructure. Evaluation of KfW programs in the area of energy efficiency in the buildings over the funding years 2005 to 2010 showed positive results, not only in terms of investment stimuli, energy savings, CO₂ reduction and impact on employment, but also in their effectiveness with regard to public finance budgets (see Figure 4).

⁴⁷ See (KfW 2012c), pp. 10-11.

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Figure 4: Impact of KfW's energy-efficient construction and refurbishment programs

	2009	2010	2011
Commitment volume	EUR 9 billion	EUR 8.9 billion	EUR 6.6 billion ¹⁾
- Federal Government funds	EUR 2.04 billion	EUR 1.37 billion	EUR 0.93 billion
Investments financed	EUR 18.6 billion	EUR 21.5 billion	EUR 18.6 billion ^{1,2)}
Housing units financed	617,000	953,000	282,000
Reductions in greenhouse gas emissions (CO ₂ equivalents per annum)	1,212,000 t	1,039,000 t	576,800 t ³⁾
Jobs secured (for one year)	262,000	289,000	253,500

¹⁾ Investments and housing units promoted through global loans were included if the loans were committed and the investment figures were entered in the database. However, global loans were included in full in the commitments. As a result the commitment amounts may be higher than the recorded investments.
²⁾ In cases involving support under several programmes simultaneously figures are counted twice.
³⁾ Reduction in annual CO₂ emissions due to the measures supported during 2011
Source: KfW calculations using 2011 and 2012 figures from the Institute for Housing and Environment (IWU) and Bremen Energy Institute (BEI) (2011 only).

Source: KfW, *What we do. Facts and figures 2012 - Sustainability Report 2012*, p.6

Promotional funding for renewable energies in Germany is also reviewed extensively by an independent research institution each year. The evaluation looks at greenhouse gas emission reductions, the impact on employment and growth (see Figure 5). The report by the Centre for Solar energy and Hydrogen Research (ZSW) gives a complete explanation of the calculation of avoided emissions of eq. CO₂. The study uses standard values of GHG savings factors for the use of several renewable energies provided by the Federal Environment Agency (UBA).

Figure 5: Impact of KfW's renewable energies programmes in Germany

	2009	2010	2011 ²⁾
Commitment volume	EUR 5.3 billion	EUR 8.9 billion	EUR 6.3 billion
Investment mobilised	EUR 7.0 billion	EUR 11.0 billion	EUR 8.3 billion
Jobs created and secured (for one year)	41,000	52,000	56,800
Reductions in greenhouse gas emissions (CO ₂ equivalents per annum)	3.7 million t	4.8 million t	5.1 million t
Fossil fuel imports avoided (per annum)	EUR 310 million	EUR 350 million	EUR 430 million

¹⁾ Excluding projects financed in other countries; does not include KfW IPEX-Bank project finance in Germany
²⁾ For the purpose of comparability, the new KfW offshore wind energy programme introduced in 2011 has been omitted.
Source: Centre for Solar Energy and Hydrogen Research (ZSW), Baden-Württemberg, 2010 and 2011.

Source: KfW, *What we do. Facts and figures 2012 - Sustainability Report 2012*, p.6

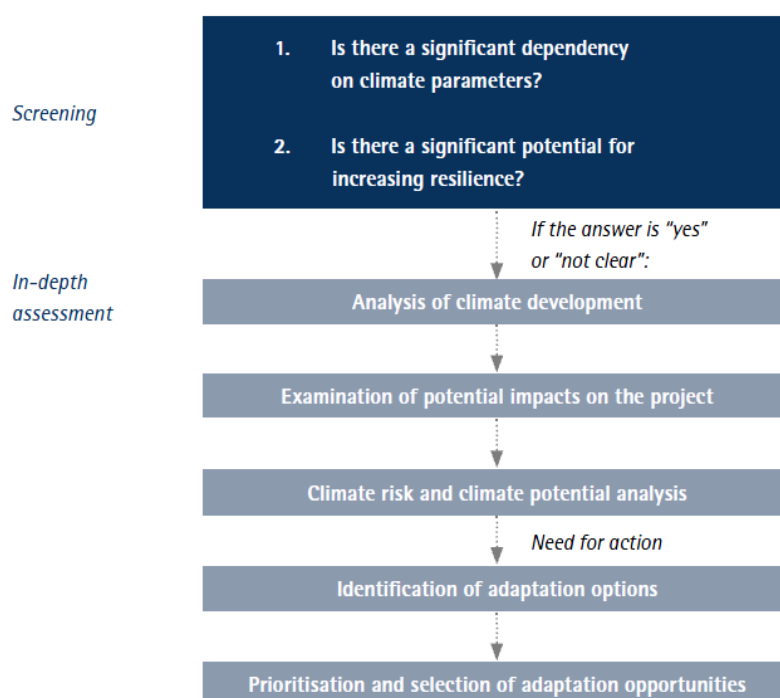
Independent of whether KfW invests directly in a project (case of municipalities) or uses the on-lending system with a commercial bank, the assessment is managed by KfW itself.

4.2.2 Integration of climate criteria in the assessment of individual projects is less homogenous

KfW Entwicklungsbank introduced a systematic climate change assessment in 2011, which looks at climate protection and adaptation risks, opportunities and solutions. Suitable measures are then implemented where necessary.

Figure 6 shows the systematic climatic impact assessment performed for each project analysed by the KfW Entwicklungsbank.

Figure 6: KfW Entwicklungsbank climate change assessment



Source: KfW Entwicklungsbank, brochure on Adaptation to climate change, Climate and Development, June 2011.

4.3 Liquidity portfolio: a comprehensive SRI approach

In the international capital markets, KfW is primarily perceived as one of the largest bond issuers in Europe. However, KfW also plays a role as an investor in these markets. KfW's securities business focuses first and foremost on managing financial investments to control liquidity across KfW Group in the form of the so-called "liquidity portfolio". This is designed to ensure that KfW remains capable of taking action even if it has reduced access to the capital markets as KfW refinances its promotional business almost solely via bond issuance in these markets.

As such, the key investment objective of the liquidity portfolio is to secure liquidity, with return targets being second order. With a nominal amount of about EUR 20 billion, the liquidity portfolio makes up more than 90% of the so-called "securities business in the narrower sense".

By signing the PRI, KfW has committed to taking responsibility as an institutional investor in the international capital market. This approach concerns the investment of KfW's own funds on the international capital market, which to a certain extent is tantamount to the liquidity portfolio (i.e. mainly bonds from sovereign or non-governmental issuers).

After signing the PRI, KfW discussed different strategies to implement a sustainable investment approach for its liquidity portfolio. Given KfW's investment guidelines, the bank decided in 2008 to integrate ESG criteria in

the investment approach. Since 2011, KfW has gone further with exclusion criteria. These two steps as described below have integrated to a certain extent some climate- and energy-related criteria.

4.3.1 KfW uses ESG criteria to optimize its liquidity portfolio

The first step is the establishment of a ranking of issuers including ESG criteria. In other words, KfW adjusts its maximal commitment volume to given asset issuers according to their ESG-based ranking.

To do so, Sustainalytics makes a ranking of the issuers according to their performance on Environment, Social and Governance criteria. The environmental part is for instance based on criteria including the quality and scope of reported programs targeting renewable energies and the reduction of GHG emissions. KfW sets a priority for environmental performance: the weighting for non-governmental issuers is 60% for environmental criteria, and 20% for both social and governance criteria. KfW uses this ESG ranking of issuers to adjust the total volume of its possible commitments. Previously, this was calculated only using financial viability assessment. For the top 20%, the maximal volume limit is maintained; for the average 60%, the limit is reduced by 10%; for the under-average 20%, the limit is reduced by 30%.

By doing so, KfW not only optimizes its portfolio, but it also stimulates issuers to integrate ESG criteria into consideration.

4.3.2 KfW uses exclusion criteria as a second filter

Concretely, this step thus applies mainly to financial service providers.⁴⁸ The exclusion criteria for financial assets aim at ensuring that none of KfW's funds are used to finance projects with unacceptable environmental, social or governance impacts. Such criteria are based on the "IFC Exclusion List" (International Finance Corporation) and include two climate-relevant criteria: "the exclusion of commercial logging operations for use in primary tropical moist forests"; the "production of wood or wood products other than from sustainably managed forests (enterprises with less than 50% FSC-certified production are excluded, FSC - Forest Stewardship Council)". KfW's exclusion is based on Sustainalytics' assessments.

For its liquidity portfolio, KfW does not purchase bonds directly issued by companies whose activity generates those products that may appear in the exclusion list. Rather, KfW invests in bonds issued by banks whose funding ultimately benefits a range of companies. Therefore, the exclusion criteria essentially can only be applied indirectly, for example by identifying banks that hold a share of 10% or more in an enterprise which, for its part, generates at least 5% of its annual turnover on the basis of one or more of the products listed as exclusion criteria.⁴⁹ As a general principle, the indirect application of the exclusion criteria only considers equity participations that account for a share of at least 0.5% of a bank's total assets.⁵⁰

⁴⁸ As KfW is held at 80% by the German Federal government, the institution does not consider itself mandated to assess other sovereign states. As such, this second step does not apply to governmental issuers of sovereign bonds.

⁴⁹ The exclusion may also be decided based on a high "controversy factor" (i.e. 4 or 5) as determined by Sustainalytics. Enterprises are assessed on controversies on a scale of 1 to 5. A controversy factor of 4 or higher means that controversies or serious violations have been repeatedly identified in an enterprise.

⁵⁰ See (KfW 2013c)

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