



»»» The challenge of climate change.  
How KfW Development Bank  
is promoting climate change  
mitigation and adaptation.

# Supporting the transition.

## Making the economies of developing countries resistant to climate change.

Climate change is among the greatest challenges currently facing humanity. As an international promotional bank, KfW takes responsibility – and takes action.

Even though a substantial portion of the effects of climate change still lie ahead of us, we are already starting to feel the changes all over the world: droughts, floods, heat waves. Developing countries are the most hard-hit by these effects, even though these nations have contributed least to climate change up to now. So we need to take swift and definitive countermeasures in all areas of life. Organising development in a manner that is climate-friendly is not just a matter of responsibility and equity – it also makes sense economically.

The Intergovernmental Panel on Climate Change (IPCC) recently reminded us about what will happen if we do not act. If the temperature “only” rises by 1.5 degrees, the effects will already be drastic: heat waves would become the norm; the coral reefs would recede by 70 to 90%, thus causing dramatic losses in fish stocks, which in turn would influence food availability. However, we are currently on course for temperature increases up to four degrees, and have already nearly reached the one-degree mark.

“Business as usual” is no longer an option. It has become all the more important that we restructure our national economies as quickly as possible to make them sustainable: this includes taking measures like replacing fossil fuels and generally reducing emissions of climate-damaging greenhouse gases and resource consumption. The Paris Agreement and the United Nations’ 17 Sustainable Development Goals (SDGs) make up the universal framework for these changes – now uniting all countries on Earth as equals, which is a different approach than the one taken for the previous Kyoto Protocol and the Millennium Development



10 billion  
people could live on  
Earth by the middle of  
the 21<sup>st</sup> century



4.8 t  
of CO<sub>2</sub> are emitted  
annually per capita  
throughout the world

ment Goals. Over the next few years, it is imperative that the world implements both agreements and closes the gap between knowledge and action. As an international promotional bank, KfW is committed to these aspirations. We view ourselves as progressive thinkers and as a catalyst for positive change. In this respect, we are acting on behalf of the German Federal Government, in particular the Federal Ministry for Economic Cooperation and Development (BMZ).

In addition to our domestic programmes, KfW helps (poorer) countries all over the world to transform their social and economic systems in ways that are climate-friendly and to exploit and tap into the great potential that results from those changes. On the one hand, this means generating economic growth in

ways that facilitate more goods and services being produced without detrimental effects on the climate. On the other hand, it also means actively making adjustments to higher global temperatures and softening their impacts.

### KfW's strengths in this process are threefold:

- our expertise in financial markets that need to become greener (see “Investing in climate change mitigation” section)
- our ability to organise progress in ways that are environmentally safe (see “Driving climate-friendly development” section)
- our experience converting energy systems (see “Designing the energy turnaround” section)

Nobel Peace Prize laureate Al Gore once very aptly said: “People need to stop financing denial of climate change” – and focus consistently on sustainability. This is precisely KfW's concern.



## “We are tackling the problems and taking action” >>>

Dr Joachim Nagel, Member of the KfW Executive Board, on climate change mitigation as a major global effort

**Many young people in particular are demanding greater climate action today; they do not think the measures taken against global warming to date have been adequate. What would you say to them? Where do we stand four years after the passage of the Paris Agreement?**

**Dr Joachim Nagel:** The international climate agreement is still intact, despite scepticism in some capital cities, particularly in Washington. What’s more: we are seeing a growing commitment to climate change mitigation in all areas of the world, for example in countries like Costa Rica, Colombia, Morocco or Ethiopia, all countries that have set ambitious climate goals. The issue is currently experiencing welcome momentum. Still, we need to accelerate our efforts considerably. We ultimately need to sustainably change the global economy. We cannot and must not leave the brunt of climate change mitigation to the next generation.

**Does this acceleration also apply to KfW?**

Definitely. We will further expand our commitment domestically and abroad.

**What have you done up to this point? Judging by the problem, apparently not enough...**

When you put it that way, you might be right. But we have been strongly promoting climate change mitigation and environmental protection for years, and are one of the largest financiers of climate measures in the world. This is even true if you compare us to large multilateral organisations like the World Bank. KfW has invested a total of about EUR 155 billion in environmental protection and climate change mitigation as well as adjustment to climate change over the past five years; EUR 23 billion of that is from KfW Development Bank. We are expanding the use of renewable energy sources all over the world. In Germany we are financing the energy turnaround. That is a good deal for a national promotional bank.

**In what ways do you want to expand your commitment?**

We want to provide even more funds for climate-related issues. But it is not just a question of higher amounts, although we also need those. At the same time we need intelligent approaches and new ideas for how to build a green economy. We have often proven throughout our 70-year history that KfW can be innovative: Whether dealing with efficiency standards, microfinancing, climate risk insurance or green bonds – we have always had good and innovative ideas, often taking a pioneering role. We will keep doing that. We are also working towards making KfW a model of a sustainability bank for the future.

**That sounds good, but what exactly does it mean?**

That we are facing a real challenge: we are aligning all of our promotional business with the agenda of the Paris Agreement and the UN Sustainable Development Goals (SDGs). For this, we are evaluating our projects in sustainability terms. We also want to disclose the risks that climate change poses for us, for our promotional business, and for our customers.

**What steps need to be taken in order to achieve this?**

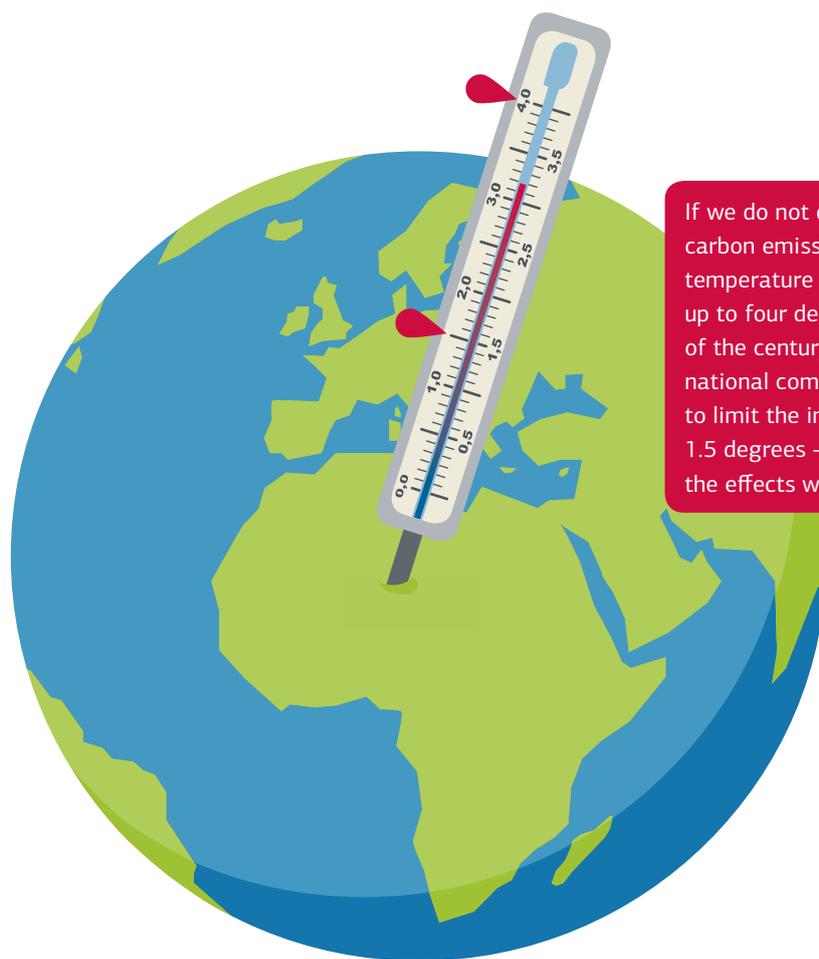
As one of the very first promotional banks, we joined an international initiative called TCFD – the Task Force on Climate-related Financial Disclosures – in 2018. And at KfW Development Bank level, we are planning to systematically record the greenhouse gas effects our financings have – both on the carbon footprint and the amount of CO<sub>2</sub> saved. Using an SDG mapping approach we are currently setting up, we will ultimately be able to specify our contributions to the respective SDGs. In short, we too are currently experiencing a phase of radical change as a bank.

**One major problem is the transport sector, where climate-friendly solutions have only been achieved in part so far. Will KfW promote the transport turnaround as ambitiously as it does the energy turnaround?**

That is our plan. Sustainable mobility is one of our major fields of action for the future, because the transport sector is undergoing fundamental changes, too - especially in developing countries. Even if it’s just a small contribution: my new company car is an electric car.

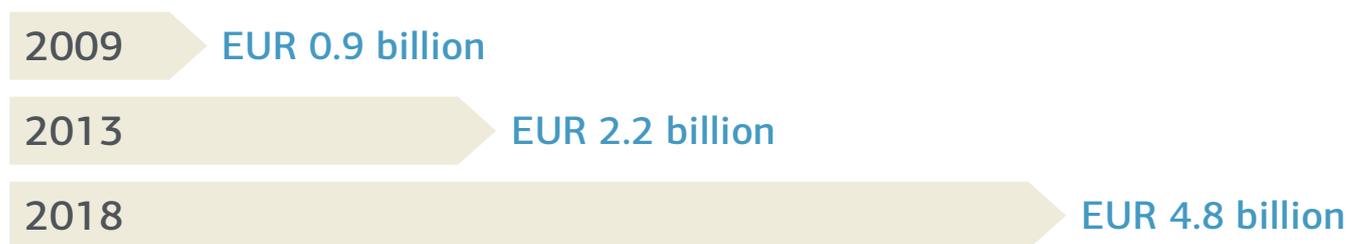
# Climate change mitigation comes at a cost. KfW provides funding.

Stopping global warming and alleviating its most severe effects is a global challenge. It affects virtually every area of life, requires fundamental changes in thinking and creates high costs. So KfW has already significantly increased its international commitment – and is staying on the ball.



If we do not drastically reduce carbon emissions, the global temperature will increase by up to four degrees by the end of the century. The international community is striving to limit the increase to 1.5 degrees – and even then, the effects will be severe.

## KfW Development Bank investments in climate projects

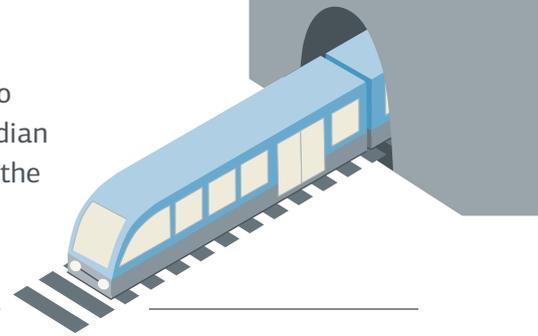


KfW Development Bank provides financing on behalf of and using budget funds from the German Federal Government, mainly the Federal Ministry for Economic Cooperation and Development (BMZ), as well as other donors such as the Green Climate Fund.

## Mobility

The transport sector is responsible for approximately one quarter of all global energy-related carbon emissions.

**42 km:** the length of a new metro system KfW is cofinancing in the Indian city of Nagpur. About two thirds of the power for the train is generated by photovoltaic systems.



## Green financing

According to estimates, around USD 2.4 trillion is needed in the energy sector alone to achieve the international climate targets.

**EUR 22.6 billion** is the sum of new green bonds issued by KfW to date, making KfW the largest issuer in the world.

## Grids and storage

New infrastructure is needed in order to guarantee supply security and integrate use of renewable energy sources.

**EUR 1.4 billion** is the amount KfW is contributing for the “green corridors” in India, for example. New grids and storage integrate electricity from renewable energy sources.



## Renewables & energy efficiency

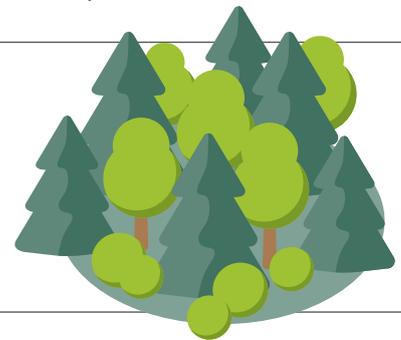
The plan is to reduce carbon emissions to zero in net terms by 2050 to prevent the worst effects of climate change. This means rapidly replacing fossil fuels with renewable energy sources and enhancing energy efficiency.

**EUR 3 billion** in funds were committed to renewable energy sources and energy efficiency by KfW Development Bank in 2018 alone. This corresponds to 35% of the total portfolio.

## Forest conservation

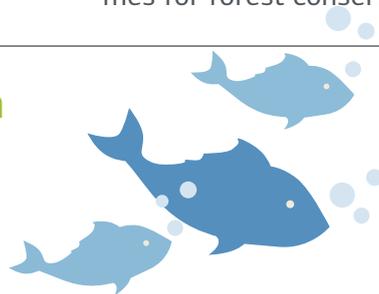
Over 20% of global carbon emissions can be attributed to deforestation.

**20 million cars:** KfW has already conserved as much CO<sub>2</sub> as these cars emit in a year with special compensation programmes for forest conservation.



## Marine conservation

The world's oceans are the largest carbon sinks and generate around half of our oxygen.



**EUR 2 billion** is the sum that KfW has earmarked together with the French development agency AFD and the EIB by 2023 within the scope of the Clean Oceans Initiative for marine conservation.

## Agriculture

By 2050 the global population will grow to around 10 billion people. Food production will have to increase by 60% in order to support this.

**EUR 450 million** was the amount that KfW used to support farmers in developing countries over the last five years so that they could adjust their production methods to climate change – and continue producing enough food for themselves and others.



# Investing in climate change mitigation. KfW is changing the financial markets with new, green products.

The financial sector needs to become greener so that investments increase in environmentally and climate-friendly technologies and decrease in backward-oriented solutions. KfW promotes this process by consistently developing and applying innovative financial products.

One central task over the next few years is: transforming the economy as quickly as possible. This applies to power generation and housing construction, to mobility and agriculture – to nearly every area of life. It will require major investments in green technologies. For the energy sector alone, some USD 2.4 trillion will be needed each year according to estimates by the Intergovernmental Panel on Climate Change. Other sources have presumed in more general terms that we have to go from “billions to trillions”, meaning the need to mobilise enormous sums to achieve the UN Sustainable Development Goals.

## Expanding green instruments

This process is already under way. All promotional and development banks have now created climate portfolios. This also applies to KfW Development Bank, which has continually increased its investments in this area over the past several years and most recently contributed EUR 4.8 billion. In 2009 the sum was around EUR 0.9 billion.

In addition to direct investments in green infrastructure like renewable energy sources or public transport, it is also necessary to expand the range of green instruments so the scarce public resources can have the greatest possible effect. This includes, among the more traditional products with which KfW has a lot of experience, credit lines that can be used to create incentives for purposes such as energy-efficient construction. But it also includes funds like the eco.Business Fund in Latin America, which supports green business practices. It promotes

companies that use sustainable methods to make their products, for example in forestry, coffee farming, or within the scope of sustainable tourism.

The fund has become so successful in Latin America that it is currently opening an additional branch in Africa. Acting on behalf of the BMZ, KfW is also one of the founders of the Caribbean Biodiversity Fund (CBF), which promotes conservation in the Caribbean, a region particularly hard-hit by climate change.

In addition, KfW is a forerunner in insurance schemes as they are now available in Africa or in small island nations in the Pacific. For example, these insurances can help nations affected by extreme weather events to quickly access funds after a catastrophe and thus limit economic damages or accelerate the rebuilding process.

KfW was among the initiators of the African Risk Capacity (ARC), which helps African Union member countries hedge against the effects of droughts. The intention is to lessen African countries' vulnerability to climate risks.

## Mobilising private capital

KfW also does an innovative job in the field of green bonds, playing a dual role as an issuer and an investor. These are bonds whose revenue is used for climate change mitigation and environmental protection projects. They help to mobilise private capital, making it possible to finance an increasing portion of



+0.2° C

is the current rate of global warming per decade as a result of climate change



30 million hectares of forest area are cleared globally every year according to the NGO Global Forest Watch

the necessary climate investments. They are still niche products, but the market is growing: the annual amount of new emissions has quadrupled since 2014 and was EUR 110 billion in 2018. So far KfW has issued green bonds amounting to over EUR 22 billion and is thus among the largest issuers on the global market. The ability to combine investments in sustainability and climate change mitigation with the liquidity and security of KfW bonds is being very well received. Furthermore, KfW has already invested EUR 1.5 billion in green bonds from other market participants as part of its own green bond portfolio.

The fact that financial markets are on the move is also shown by diverse associations and committees like the International

Development Finance Club (IDFC). 24 development banks have since joined this club, including KfW. The members share the vision of a sustainable future while simultaneously reducing poverty. Together they provided a total volume of USD 670 billion for green financing between 2015 and 2018.

KfW is committed to making financial markets greener in two ways: as a promotional bank that supports green projects throughout the world, and as a financial institution that has put itself on a clear course towards sustainability in its own banking operations. In light of the enormous sums that need to be raised to overcome global warming, the issue is at the very top of KfW's agenda.



KfW invests in sustainable agriculture – coffee farming, for instance



### Thinking further ahead: Making sustainability a strategic focus of KfW

In future, KfW will focus on sustainability even more consistently than it has in the past. We are currently working on solutions within the scope of a Group-wide "Roadmap Sustainable Finance" to rigorously manage our operations by sustainability criteria and systematically evaluate climate risks. Specific implementation steps should be defined by mid-2020. These measures will not only further advance KfW, they will also facilitate our role as a pioneer among financial institutions with a clear commitment to setting standards. As a promotional bank, KfW considers it part of its mission to enhance equity and justice when coping with the burden of global climate change and to constantly adapt its own products, standards and processes to achieve this goal. So starting in 2020, for example, it is planning a new fund that enables countries in Latin America to issue green bonds.

# »»» Driving climate-friendly development. KfW reconciles ecological, economic and social objectives.

Whether air, water, or land, and whether food, raw materials or biodiversity – humanity is straining the limits of the Earth's capacity. It is all the more important that we make development progress in environmentally and climate-friendly ways. This is KfW's commitment.

The numbers are alarming: one million species threatened by extinction, 150 million tonnes of plastic waste in the world's oceans, deforestation covering areas as large as England every year, 80% of wastewater is untreated, the majority of all city residents suffer from bad air quality. Meanwhile, the sea level is rising, agricultural areas are shrinking and extreme weather events are on the rise due to global warming.

At the same time, one in every ten people still lives in extreme poverty. Consumption requirements and pent-up demand are considerable in many areas of the world. This increases the pressure on natural resources. Especially because the world population continues to increase: there will probably be around 10 billion people on Earth by 2050.

## Reconciling economies with environmental protection and climate change mitigation

It will not be possible to meet the increasing demand for food, water, goods, places to live and mobility with previous models without endangering humanity's survival and destroying existing ecosystems. So the only remaining solution is to reconcile economies with environmental protection and climate change mitigation. This combination was also codified in the United Nations' Sustainable Development Goals (SDGs) from 2015 and provides a clear framework for all activities of German development cooperation including those of KfW Development Bank.

So, for example, forest conservation is a matter of particular importance for KfW. Deforestation is one of the largest sources of greenhouse gases at 20%. Forest area equivalent to the size of a football pitch is destroyed every two seconds. So its protection plays a key role in climate change mitigation. KfW is taking countermeasures in the form of reforestation programmes like the ones in Madagascar or Vietnam. But these programmes do more than just plant trees; they also help to restore entire forest landscapes. Reforesting deforested areas is supplemented with agriculture and management of existing forests. Agroforestry systems used for things like cocoa or coffee farming play a special role here.

KfW also supports compensation programmes that reward conservation so that forests are not destroyed in the first place, emitting CO<sub>2</sub>. It is nearly impossible to stop logging and natural resource depletion without providing alternative income, especially in poor areas. So the local population receives funds if they clear less forest in their region and thus protect the climate. This is an approach KfW has been using in Brazil, Ecuador and Colombia.

KfW is also concerned with protecting the world's oceans. The oceans absorb over a third of the carbon dioxide humanity emits and are an important carbon sink that needs to remain intact. And given the fact that nearly half of humanity lives on or near the coast and is financially or nutritionally dependent on



1 million  
animal and plant species  
are threatened by  
extinction worldwide



150 million  
tonnes of plastic waste  
are currently floating in  
the world's oceans  
according to estimates



Climate change is threatening the habitats of many animal and plant species (above), but also natural reservoirs like these glaciers in Peru (left)

fishing, KfW is committed to marine conservation at a global level. In 2017, we founded a trust together with the German Federal Ministry for Economic Cooperation and Development (BMZ) for international marine conservation. The Blue Action Fund (BAF) promotes new conservation areas, sustainable fishing and environmentally friendly tourism, among other things. Sweden and France have since also joined the BAF.

### Dealing with the effects of climate change

Reducing emissions of climate-damaging gasses or sequestering them in forests and oceans is important but is not enough. Because today, we already know that the Earth's temperature will rise despite all efforts, which will have far-reaching effects, primarily on many developing countries: whether droughts or floods, heavy rains or record temperatures, poor countries are the ones most affected by climate change – and they rely on international support.

So KfW is also promoting adjustment measures all over the world, for example in Peru. The glaciers in the high mountain regions there function as the service reservoir for the majority of the Peruvian population, which primarily lives in dry coastal

regions. The problem is that these glaciers are already melting at drastic rates. So KfW is helping local suppliers to use water more efficiently so that they will also be able to manage the supply in the age of climate change. On the other hand, KfW promotes coastal preservation with walls and embankments in Tunisia so the country does not lose land to rising sea levels.

Those are just a few of the measures included in the many adjustment activities. One thing is clear: organising progress in a way that is climate-friendly is one of KfW's overarching objectives – and is thus also one of the main issues its mission will focus on in the years and decades to come.



### Thinking further ahead: Protecting the oceans together with international partners

In order to take action about battling waste and protecting the oceans, KfW launched the Clean Oceans Initiative at the end of 2018 together with the French development agency AFD and the European Investment Bank (EIB). Together, the three promotional institutions will provide EUR 2 billion by 2023 to ensure that waste, primarily plastic waste, does not make it into the oceans in the first place: by building treatment plants and waste dumps, introducing recycling systems and developing new, biodegradable plastics. The Clean Oceans Initiative is already operational and intends to bring the private sector on board in the medium term.

# »»» Designing the energy turnaround. KfW acts as a driver through its role as a financier of renewables.

Apart from digitalisation, the transition to sustainable forms of energy and the elimination of the combustion engine are probably the greatest watersheds since the Industrial Revolution. KfW actively supports this transition, always keeping its eye on the next steps.

Whether in schools or hospitals, companies or shops, for lighting, cooling or heating – and recently increasingly for mobile phones and computers – energy has become an essential part of our lives. This applies to wealthier developed countries in any case, but also increasingly holds true for poorer nations that can only drive their economic development with more energy.

To ensure that global temperatures do not simultaneously rise to an uncontrollable level, growing energy demands need to be covered with climate-friendly sources: wind, solar, hydro, geothermal, or biomass. So nearly all countries in the world have set concrete targets for expanding renewable energy sources within the scope of the Paris Agreement. And developing countries in particular have especially good conditions to do this. The African continent, for instance, has enormous potential to use solar, wind, hydro and geothermal power, but has only tapped into a fraction of this potential to date.

## The world is energised: from Brazil to Morocco to Indonesia

However, because initial investments in energy infrastructure are very high, developing countries in particular need support when introducing or transitioning to renewable energy sources. As a promotional bank, KfW is driving this transition at a global level and has committed nearly EUR 6 billion to it in the past five years alone.

One example is the largest solar power plant in Africa, which is currently being built in the Moroccan city of Ouarzazate and is already producing green electricity for 400,000 people. When the entire complex is completed one day, the amount of power

will triple again and will then meet the needs of more than 1.3 million people. But KfW is also promoting solar energy in Brazil and El Salvador; wind farms have been built in Egypt, and geothermal plants have been established in Kenya and Indonesia. And those are just a few examples from KfW Development Bank's extensive portfolio in the energy sector.

However, the energy supply from renewable sources fluctuates because the wind does not always blow and the sun does not always shine with the same intensity. And power can often not be generated where it is needed most. So suitable storage and grids are needed at the same time to help supply electricity in the necessary amount and quality, at the desired location and at the right time. KfW also participates in expanding and modernising grid infrastructure and management, for example by providing EUR 1.4 billion on behalf of the BMZ for co-financing the so-called "green corridors" in India designed to transport sustainable energy to the country's economic centres.

## Energy efficiency as the key

Energy that is not consumed in the first place cannot damage the climate. This fact means that the issue of energy efficiency is also of major importance. The International Energy Agency (IEA) views it as one of the most underestimated resources too, and designates energy efficiency as the world's "first fuel". Energy can be used more wisely nearly everywhere in the world: the potential for increasing efficiency in developed countries is estimated at 20%. In developing countries and emerging economies, the potential savings are estimated at up to 85% due to the



40 %

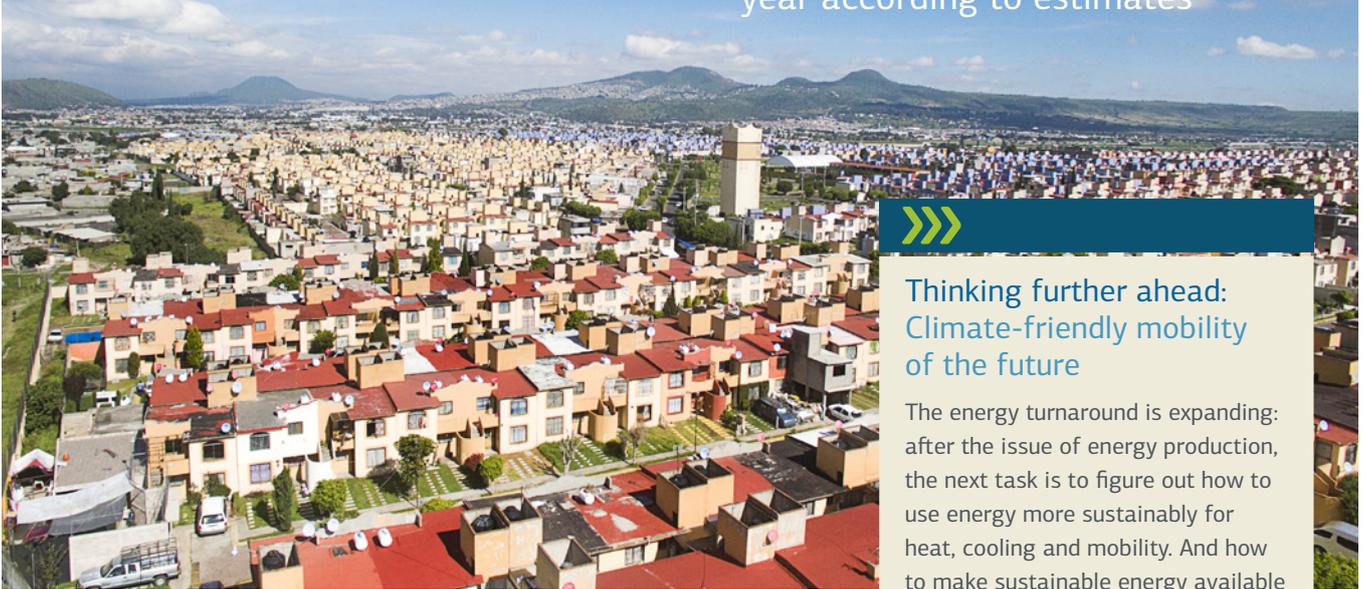
fewer greenhouse gas  
emissions is the reduction  
EU countries want to  
make by 2030

(Reference year: 1990)

To date, KfW has provided loans amounting to about EUR 130 million on behalf of the BMZ for the EcoCasa programme – for projects like this residential area in Mexico



21 trillion kWh is the amount of energy consumed worldwide per year according to estimates



### Thinking further ahead: Climate-friendly mobility of the future

The energy turnaround is expanding: after the issue of energy production, the next task is to figure out how to use energy more sustainably for heat, cooling and mobility. And how to make sustainable energy available for other applications, like for e-mobility or synthetic fuels (power-to-x). The traffic turnaround is happening alongside the energy turnaround, or rather, both of them are connected: so KfW promotes environmentally friendly electric mass transportation like underground and overground trains, for example in Brazil, Tunisia or India, but also non-motorised transport, like in the form of bicycle paths in South Africa. For KfW, the creation of sustainable mobility systems in which the various means of transport are fully coordinated with one another and part of targeted urban planning is one of the most urgent tasks in the years to come. A task which will gain importance within KfW's commitment to advancing the mobility of the future .



KfW Development Bank invests in the expansion of renewable energy sources at a global level – e.g. at this wind farm in Egypt

higher energy intensity depending on the sector and stage of development.

Similar to the situation in Germany where KfW's efficiency programmes have set standards, KfW also promotes more efficient use of energy abroad: in buildings, power plants and grids. One example is a programme in Mexico called EcoCasa which is being used to help build eco-homes for poorer families. Since the programme's inception, environmentally friendly homes

have been built for over 100,000 people in all of Mexico's climate zones.

KfW has been one of the largest financiers in the area of renewable energy sources and energy efficiency around the world for many years. And in doing so, it does more than simply invest large sums: KfW also develops ideas, concepts and approaches and realises them together with its partners, usually on behalf of the German Federal Government.

## Responsible banking

KfW is one of the world's leading promotional banks. On behalf of the Federal Republic and the federal states of Germany, it applies its decades of experience to improving economic, social and ecological living conditions at home and abroad.

In addition to KfW Development Bank, the two Group subsidiaries DEG and KfW IPEX-Bank are active in KfW Group's international business. While KfW Development Bank as the implementing organisation of the German Government's Financial Cooperation, supports projects and programmes involving mainly public actors in developing countries and emerging economies, DEG provides financing and consulting to private companies investing there. KfW IPEX-Bank supports the German and European economy in the field of project and export finance.



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