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Shaping a sustainable and fair global energy transition

Rapid further expansion of renewable energy

Good news from the International Energy Agency (IEA): renewable energy capacity will increase by a record amount in 2023. That involves a lot of work, in which KfW is playing its part.

Russia's invasion of Ukraine and its consequences have made it quite clear to us in Europe how important it is to have a reliable supply of energy and how alarming it can be when energy is not available in the usual quantities. This is the norm in many developing countries, however. Nearly a billion people still have no access to energy. The countries are therefore trying to build up their production capacities, relying increasingly on renewable rather than fossil energy sources. The IEA's forecasts confirm that a shift in mindset is beginning to take place. It believes that 2024 could see even more global growth, with the amount of additional renewable energy capacity increasing from 440 to 550 gigawatts in just one year.

What was still just a tentative shift two decades ago has now become an irreversible global trend. The benefits offered by renewables are unrivalled: they are environmentally friendly, locally available and now even competitive in terms of price – not to mention their independence from energy imports in an increasingly volatile geopolitical environment. In all parts of the world, it has become impossible to imagine life without renewable energy.

At KfW we have been supporting this worldwide transformation for many years. We resolved early on to kick-start and accelerate a "global energy transition", always giving due consideration to social justice and balance. The projects we support include the Olkaria geothermal power plant in Kenya and the Ouarzazate solar power complex in Morocco. Power grids in India, wind farms in the Balkans and solar panels on Brazilian football stadiums, among other examples, also bear the KfW logo.

Christiane Laibach, member of the KfW Executive Board.

At present we are helping to bring Georgia closer to Turkey and the EU in terms of energy with new electric grids and substations so that the country can become less dependent on Russian energy. In South Africa we are funding the Just Energy Transition programme. Together with the international donor community, KfW is supporting the transition towards a sustainable supply of energy and making sure that the switch happens in a socially compatible manner. These are just two examples from a long list. And we are looking even further ahead – funding more future-oriented technologies such as green hydrogen as one way of helping to decarbonise industry; in Morocco, for example, by building a reference facility for the production of green hydrogen. This can be used as a basic chemical in fertiliser production and to manufacture green steel.

Developing countries often have great potential for renewable energies. This applies particularly, though not exclusively, to Africa, which some people are already calling the "green continent". African countries now want to take increasing and targeted advantage of this potential, and drew up plans at Africa's first climate summit in Kenya to become more sustainable and more independent. In future, Africa also wants to export the green energy that it doesn't need to meet its own demand. We at KfW will continue to support this transformation process, accompanying Africa on its path to becoming a "renewable energy superpower" (UN Secretary-General António Guterres). ■

Christiane Laibach

“Expansion of renewables offers enormous employment potential”

Development Minister Svenja Schulze on the need to ensure a socially just transition for a sustainable energy transformation.

In its support for partner countries, the Federal Ministry for Economic Cooperation and Development (BMZ) focuses on sustainable energy sources such as solar, wind, hydro and geothermal energy. Do you think the expansion of renewables is sufficient to meet the rising tide of energy demand in the “Global South”?

The countries of the Global South have enormous potential for harnessing renewable energy – significantly more than any foreseeable increase in energy demand. What is more, many developing countries and emerging economies have the critical mineral resources that are essential for the sustainable transformation of the energy system, for batteries, for wind turbines and photovoltaic systems.
This means that Africa could become a global leader in renewable energy use and embark directly on a green development path. To pave the way for that, however, we need to intensify our international efforts considerably to sustainably meet the growing energy needs of the Global South.

BMZ policy is geared to the UN’s Sustainable Development Goals (SDGs). SDG7 states that by 2030 – i.e. in seven years’ time – everyone should have access to affordable, reliable, sustainable and modern energy services. How realistic is that goal?

Development Minister Svenja Schulze.

Unfortunately, the latest figures show we are not on track. If expansion continues at the present pace, 660 million people will still have no access to electricity by 2030. Investment in the energy sector clearly needs to be significantly stepped up worldwide. And it is particularly important that more attention should be paid to Africa. Our neighbouring continent must no longer remain underrepresented in international financial flows to the energy sector. The first African Climate Summit showed that Africa has a great deal to offer when it comes to concrete solutions for more climate protection and sustainable energy supply. If Europe and Africa join forces, we can both benefit from the climate-friendly transformation of the global economy.
That mammoth task cannot be accomplished by state support alone, so it is crucial that markets should become attractive for private capital. Our development cooperation programmes are thus also focused on helping partner countries shape regional energy market environments.

What role do you think digitalisation can play in securing energy supply in partner countries?

The challenge of global energy security is always to bring energy supply and demand into line. That challenge is not diminished by renewables’ growing share of global power supply and, in some cases, fluctuations in output depending on weather and time of day. Digital solutions, such as smart metering systems and innovative communication technologies, are therefore a key factor in modernising electricity grids or integrating electricity markets across borders.
The BMZ helps developing countries and emerging economies create the conditions needed for investment in modern energy systems, especially in the development and expansion of power grids. It also helps facilitate cross-border electricity trade and make electricity systems more flexible, for example by promoting

Development Minister Schulze with (from right) Oleksandr Kubrakov, Deputy Prime Minister for the Reconstruction of Ukraine and Minister of Infrastructure and Municipalities, and Maksym Marchenko, Odessa Regional Governor, in front of a bombed-out substation near Odessa.

storage technologies and the digitalisation of demand and grid control.

Green hydrogen is seen today as an innovative source of energy that could be key to decarbonisation. What role does it play in cooperation between BMZ and partner countries?

Green hydrogen will play a role especially in sectors where it is not possible to decarbonise by direct use of renewable electricity. That is the case, for example, in the steel industry, parts of the chemical industry and parts of the transport sector. Many of our partner countries have massive potential for the production of green hydrogen and its derivatives. In addition, the development of a hydrogen market offers opportunities for local value creation, training and skilled jobs. Production of green hydrogen could also play an important role in helping partner countries achieve climate neutrality, global development goals and a socially just transition.
In light of those impacts, the BMZ attaches major importance to facilitating technology transfers that will help developing countries and emerging countries create a local green hydrogen economy, develop local and regional value chains and establish their own hydrogen-based industries.

Energy transition can also give rise to social disruption, for example where jobs in the mining sector are lost. How do you intend to ensure that a "just transition" is possible when energy sectors are restructured?

As Development Minister, I am committed to a climate and energy transition that is socially fair and equitable. Wherever possible, the negative impacts that structural shifts in production and employment can have on local communities need to be avoided, or at least cushioned, by labour market and social policy measures. Above all, of course, the large-scale expansion of renewables itself offers enormous employment potential and jobs for a growing, very young and increasingly skilled population. My ministry supports such change processes with vocational training programmes, demand-based training models and the development of social security systems.
Our multilateral Just Energy Transition Partnerships (JETPs) – which are supported by the German government and forged with countries implementing ambitious climate policy strategies – are a particularly important instrument for pursuing the goal of a socially just coal phase-out and the implementation of the global energy transition. ■

Michael Ruffert asked the questions.

Reach climate goals with Power-to-X

Morocco is focusing on renewable energies. Germany has been its partner from the outset, co-funding Ouarzazate – the world's largest solar complex. Construction of a reference facility for green hydrogen (Power-to-X) that is to be developed by the Moroccan Agency for Sustainable Energy MASEN is the first project resulting from the hydrogen alliance between the two countries.

The facility, which will comprise a hybrid wind-solar power plant, a sea-water desalination plant, transmission lines and an electrolytic synthesis unit (at least 100 megawatts), is to go into operation by 2026. It will cost approx. EUR 320 to 350 million. To this end, KfW will make available up to EUR 300 million in the form of grants and loans, while the private sector will contribute mainly equity capital. Before the end of this year, the project is to be put out to tender in three-stage processes as a public private partnership (PPP). Though MASEN will issue the concessions, it will not itself run the project or operate the facility. If all goes according to plan, the first components of the reference facility could go into operation in early 2026.

"The facility's location, in the province of Guelmim, couldn't be better," believes Florian Ziegler, the KfW portfolio manager responsible for energy projects in Northern Africa.

The rocky plateau is one square kilometre in size and bordered by a mountain ridge on which wind turbines will stand. The ridge offers excellent wind conditions, and the plateau on which solar panels will be installed boasts outstanding solar irradiance. From here, a road will lead to the port of Tantan, where the sea-water desalination plant and electrolyser are to be in place from 2026.

Ziegler has no doubt that the call for tenders will be of great interest to German and international firms. This is chiefly because MASEN, the state agency responsible for the project, intends to offer a one-stop-shop approach, relieving the consortium of investors, project developers and general contractors of as much of the bureaucratic burden as possible. This means that MASEN will take care of all the preparatory steps, and especially the approval processes, which the private sector would find difficult if not impossible to undertake. In addition, MASEN will assume responsibility for developing the land and installing the basic infrastructure, such as water supply, power transmission, access roads etc. Everything else is the job of the private sector: investments, design, technology, planning, expertise. This is an internationally tried and tested method for tackling large-scale projects. MASEN has also used this approach successfully for ongoing and completed solar and wind projects.

Since the end of 2022, KfW's Power-to-X (PtX) platform has provided information about various opportunities for supporting and financing major PtX projects in other European countries. The different types of support and funding on offer from the German government and KfW can be found here, with funding packages being tailored to specific needs.

Wind power is one of the key components in the construction of the Power-to-X reference facility.

Germany has committed itself to achieving climate neutrality by 2045 and to supporting other countries with their climate targets. Besides renewable energies and energy efficiency, green hydrogen is the energy carrier that constitutes the third component of the energy transition. It requires PtX, the conversion of energy from renewable sources (such as hydroelectric, solar and wind power) into the gaseous energy carrier that is hydrogen. ■

Elisabeth Ehrhorn

Solar modules gleam in the bright African sun

The first solar power station in Côte d'Ivoire delivers electricity to 35,000 households.

During the rainy season, the green of mango trees, shrubs and fields extends as far as the eye can see. Amidst the lush vegetation of West Africa, there is also a flash of silver in the sunlight: almost 70,000 solar modules are producing sustainable energy over a large area. In Boundiali in northern Côte d'Ivoire, the country's first solar power plant has been providing up to 37 megawatts of electricity since June 2023. This clean energy can supply 35,000 households. Around 150,000 people are benefiting. The new plant will save 35,000 tonnes of greenhouse gas emissions per year – an important contribution to climate protection.

The solar plant in Boundiali is considered a lighthouse project in West Africa and promotes the ambitious climate goals of Côte d'Ivoire.

The solar power plant is considered a pilot project for the expansion of solar energy in Côte d'Ivoire. The project is an important contribution to the fight against climate change and a decisive step towards raising the share of renewable energy in the country's power supply to 45 % by 2030. KfW Development Bank is providing EUR 37 million in financing, of which EUR 27 million is being given on behalf of Germany's federal government and EUR 10 million on behalf of the European Union. Côte d'Ivoire is contributing an additional EUR 5 million from its own budget. To date, gas is still Côte d'Ivoire's most important energy source, making up over 60 % of its power supply. Hydropower already delivers over 30 % of the country's electricity. Expanding solar power should help increase its share of the power mix. "There are already plans to expand the power plant," emphasises KfW project manager Clara Winkler-Tomety. Germany's federal government has already committed another EUR 30 million via KfW in order to increase capacity to 83 megawatts. The "just transition" principle is being strictly adhered to during implementation of the project in order to avoid social hardships for local people. For example, landowners who own property and cropland on the project site were compensated. Some farmers were able to use the money to acquire equipment to better cultivate their remaining fields. There was a complaint office that people could turn to if they felt they had been treated unfairly, but it received only four appeals, which were amicably resolved. "We also made an effort to create jobs for local people," Winkler-Tomety stresses. During the construction phase, 75 % of the labour force came from the region.

The new solar power plant in Côte d'Ivoire is helping to achieve the goals of German development cooperation with regard to expanding renewable energy. "The idea is to promote a climate-friendly power grid in West Africa," explains Winkler-Tomety. According to her, the programme's goal for the region is to enable private households, public institutions and corporations to purchase electricity under environmentally and climate-friendly, secure and cost-effective conditions. Cooperation with Côte d'Ivoire should be strengthened further within a "climate and development partnership". The aim is to support the transition to more renewables in the West African country and to expand its role as a net electricity exporter to improve supply security in the region. ■

Michael Ruffert

Green energy corridors deliver electricity

In India, KfW Development Bank is financing the construction of transmission lines and substations to bring green energy from remote regions to consumers.

India's economy and population are growing quickly, and the demand for electricity in the country of 1.4 billion is rising too. Demand is expected to increase threefold by 2047. Given the climate crisis, some of this demand must be met with renewable energy.

India's electricity still comes primarily from coal and gas-fired power plants. Renewables accounted for about 20% of power generation in 2022. In eight years, that number should be around 50%, which will require investments in the triple-digit billion range.

"India has ambitious construction goals and has already made considerable progress," says Stefan Lindemann, senior portfolio manager at KfW. "At the same time, the Indian network has too little capacity to connect more solar and wind energy." Moreover, the few areas that are suited to the construction of new solar and wind power stations are almost all far away from economic centres.

Large and long power lines are needed to deliver "green" energy to where it is needed most. With support from the government, Indian network operators are building "green energy corridors" (GEC). Solar and wind energy cannot be produced constantly, however, given fluctuations in weather. As a result, the power lines do not always work at full capacity, which makes them less profitable. Affordable loans are therefore needed for their construction.

Transmission lines and substations feed sustainably generated electricity into the Indian power grid to transport it to where it is needed most.

On behalf of Germany's Federal Ministry for Economic Cooperation and Development (BMZ), KfW has helped India construct GECs since 2013 by co-financing transmission lines and substations. In fact, it has issued one of the largest loans in its history, worth over EUR 1.4 billion. The national grid operator, Power Grid Corporation of India, received EUR 500 million. KfW also concluded loan agreements with network operators in nine Indian states.

The results are impressive: during the first phase of the project, KfW co-financed 7,800 kilometres of power lines and 97 substations. The second phase will add 2,800 kilometres of power lines and 35 substations. A total of over 40 gigawatts of renewable energy capacity will be connected to the Indian power grid. For comparison, in Germany, solar and wind power plants with a capacity of around 70 gigawatts have been built over the past ten years.

Challenges couldn't always be avoided: the land on which such construction is to take place usually belongs to someone, Lindemann says. "However, these are often uninhabited areas, and we work diligently with our partners to minimize disruptions or even relocations. Furthermore, landowners are adequately compensated." In addition, the operation of the substations creates approximately 1500 new jobs.

Prior to starting any construction project, KfW conducts environmental and social impact studies on site. Extensive analyses and action plans determine the standards that must be upheld, reports KfW expert Lindemann. For example, measures might be needed to protect birds if power lines cross the territories of endangered species.

The green energy corridors play a decisive role in India's energy transition. In all, the electricity delivered through KfW-financed networks meets the needs of around 60 million people. The project will save almost 900,000 tonnes of CO_2 per year. ■

Katharina Wilhelm Otieno

Funding a just coal phase-out

Indonesia wants to reform its energy sector. We explain how this can be done in a fair manner with JETP and PBL – and what the letters stand for.

Just Energy Transition Partnerships (JETP) are a model for international cooperation in the energy and climate sectors that aims to bring about a sustainable and socially just energy transition, especially in high-emission countries.
Indonesia uses coal and is therefore one of these countries. The Indonesian JETP was agreed at the G20 summit in November 2022 and will make it possible to keep the 1.5°C target within reach and to implement the Paris Climate Agreement. International donors in the form of the International Partner Group (IPG) have raised the prospect of around USD 10 billion. EUR 1.6 billion of this total is to be provided by the German government. A further USD 10 billion is to come from the private sector. Indonesia is facing major challenges: the country's growing demand needs to be met so as not to choke its economic development. And it must successfully transition from coal-fired power to renewable energy. At present, subsidies still make coal-fired power artificially cheap, making investments in renewables appear unprofitable. Furthermore, the coal industry creates a large number of jobs and

Geothermal power plants are also being promoted through policy reforms.

therefore tax revenues for municipalities. Regulatory reforms are needed to make investments in renewables worthwhile. To reduce the additional financial burden on the national budget in this context, policy-based loans (PBL) come into play – financial reform instruments that make money available for political reform processes rather than for projects. On behalf of Germany's federal government, KfW has been active in this area for some years, with the Asian and other development banks leading the way. With the third phase of the Sustainable and Inclusive Energy Programme, a presidential decree was for example initiated in Indonesia thanks to which electricity generated from renewables can be sold to the state-owned utility at agreed prices, thus creating security for private investors. "PBL," explains André Degenkolb, lead energy sector coordinator at KfW in Jakarta, "create the conditions to implement reforms for which we previously worked with Indonesian partners to find the best solutions. Our joint goal is to overcome the technical challenges of the energy transition and make sure that it is just." Indonesia and the IPG have now drawn up an investment and action plan that includes expanding transmission and distribution grids on the island of Sulawesi. "Without these investments it will be impossible to switch to renewables," stresses Degenkolb. "Infrastructure development is also important for the hydropower plants being built in Sulawesi, which are supported by the German government. This is essential to ensure that the electricity from renewable energies is actually delivered to consumers." ■

Carmen Sorgler

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