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# EU-China cooperation in third countries in the context of tripling renewable energy capacity by 2030

**Elizabeth Carey (independent consultant), Hélène van Rossum (IDDRI), Marta Torres Gunfaus (IDDRI)**

In a year marked by geopolitical turbulence, challenges to the rules-based multilateral system and increasing economic competition, beneficial cooperation between the European Union (EU) and China is becoming increasingly critical to ensure economic stability and sustained efforts towards a net-zero and climate-resilient future. This *Study* aims to identify and examine concrete options for enhanced coordination and cooperation between China and the EU to scale up the deployment of renewable energy in third countries, building on their respective flagship initiatives, i.e. the Global Gateway and the Belt and Road Initiative. The goal of tripling renewable energy capacity by 2030 is especially critical for supplying the large increase in affordable and flexible energy needed by developing countries, who face unique barriers and challenges to unlock their vast renewable energy potential, from financing, policy and regulatory, to grids and infrastructure, technical capacity and socio-political challenges. Enhanced EU-China coordination and cooperation have the potential to make their respective investments in renewable energy greater than the sum of their parts and provide a blueprint for enhanced cooperation in other areas such as trade, technology and policies. It also represents an opportunity to build mutual trust between both partners and contribute to a stable international order in the context of current tensions.

## KEY MESSAGES

China and the EU have led the rapid surge in renewable energy deployment domestically and have published new Nationally Determined Contributions and renewables targets ahead of COP30 in Brazil. However, despite great progress and an unprecedented surge in solar PVs in particular, the world is not on track to meet the 2030 tripling of renewable energy targets and concerns linked to the economic security of renewables supply chains are rising.

Investment in clean energy and renewables in developing countries lags well behind those in developed countries and China, with the EU and China having a key role to play in helping these countries deploy renewables at scale, in support of sustainable development and to improve levels of access to energy.

This can be achieved by China and the EU harnessing their respective toolkits, identifying synergies and using their comparative advantages to add value and create positive outcomes for all participants involved. While China can contribute its large-scale engineering and construction capabilities combined with unique rapidity of execution, the EU can contribute its technology, expertise in market design and in climate-oriented policies. For projects to be bankable, Chinese supply chains aligned on international standards are needed, combined with a necessary shift from ad hoc projects to international partnerships centered around recipient country ownership.

Areas for enhanced EU-China cooperation include: establishing equitable partnerships with developing countries; developing domestic renewables supply chains, local content and demand certainty; scaling-up climate-aligned finance, including through greater multilateral financing, the use of innovative financial tools and of joint guarantees to de-risk investment in fragile countries; enhancing technological transfer and regional cooperation; developing international technical and ESG standards as well as interconnecting green taxonomies.

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*This Study was prepared to inform dialogues in 2025 between European and Chinese academics and experts on concrete avenues for climate cooperation, including in the trade, finance and energy sectors, and in relation to third countries.*

## INTRODUCTION

The European Union (EU) and China reaffirmed on 24 July, 2025, on the occasion of the 50th anniversary of the establishment of diplomatic relations and to mark the 10th anniversary of the Paris Agreement, the importance of their cooperation on climate change to implement the goals and principles of the UN Framework Agreement on Climate Change (UNFCCC) and the Paris Climate Agreement (European Council 2025).

In a year marked by geopolitical turbulence, challenges to the rules-based multilateral system and increasing economic competition and trade wars, cooperation between both partners is critical to ensure the world accelerate economic transformation towards a net-zero and climate resilient future. Domestically, China and the EU are the first and third largest emitters of greenhouse gases (GHG). With China's dominance in green technologies and the EU's long-standing commitment to climate policies, the two are well placed to lead implementation of the Paris Agreement's goals.

In addition, as recognized in their joint declaration, green development is at the heart of their cooperation, while both are committed to "accelerating the global renewable energy deployment and facilitating access to quality green technologies, so that they can be available, affordable and beneficial for all countries, including the developing countries",[1] building on their respective flagship initiatives, the Global Gateway and the Belt and Road Initiative.

The purpose of this paper is to identify and examine concrete options for enhanced coordination and cooperation between China and the European Union to scale-up the deployment of renewable energy in developing countries, in the context of the United Arab Emirates Consensus (UAE Consensus) agreed at COP28 and which includes a commitment for countries to transition from fossil fuels, triple renewable energy capacity and double the rate of energy efficiency improvements by 2030 (UNFCCC 2024).

While the goal of tripling renewable energy capacity by 2030 relates to all countries, the lion's share of progress lies with China and the EU, particularly in the context of recent US retreat from renewables. China, in its submission of its 2035 NDC, has committed to expand its installed capacity of wind and solar power to over six times the 2020 level by 2035 (i.e. a goal which is past the country's proposed peak for the first time), bringing the total to 3,600 GW. The EU currently has a renewable target for 2030 of at least 42.5% of the EU energy mix (at 24.5% in 2023) and submitted its 2035 NDC with a net reduction of 66.25% to 72.5% in greenhouse gas emissions by 2035 on the path towards carbon neutrality by 2050.[2]

[1] Other key elements of the joint EU-China press statement on climate include: a commitment to demonstrate joint leadership to drive a just transition in the context of sustainable development and poverty eradication; upholding the central role of the UNFCCC and the Paris Agreement; submission of their respective 2035 NDCs before COP30 ; highlighting the China-EU green partnership; enhancing bilateral cooperation in such areas as the energy transition, adaptation, methane emissions management and control, carbon market and green and low carbon technologies.

[2] China's 2035 NDC includes the following commitments: China will, by 2035, reduce economy-wide net greenhouse gas emissions by 7% to 10% from peak levels, striving to do better; increase the share of non-fossil fuels in total energy consumption to over 30%; expand the installed capacity of wind and solar power to over six times the 2020 levels, striving to bring the total to 3,600 gigawatts; scale up the total forest stock volume to over 24 billion $m^3$; make new energy vehicles the mainstream in the sales of new vehicles, expand the National Carbon Emissions Trading Market to cover major high-emission sectors; and basically establish a climate adaptive society (The State Council the People's Republic of China, 2025). The share of renewables in EU energy consumption in 2022 was 23%. Sweden, Finland and Denmark have the highest share of renewables in their energy mix amongst EU members (European Commission, 2024).

The goal of tripling renewable energy capacity by 2030 is especially critical for supplying the large increase in affordable and flexible energy needed by developing countries. The latter face unique barriers and challenges to unlock their vast renewable energy potential, particularly in Africa, from financing, policy and regulatory, to grids and infrastructure, technical capacity and socio-political challenges. Enhanced coordination and cooperation from the EU and China have the potential to make their respective investments in renewable energy greater than the sum of their parts and provide a blueprint for enhanced cooperation in other areas such as trade, technology and policies. It also represents an opportunity to build mutual trust between both partners and contribute to a multilateral global order in the context of current tensions.

This technical paper will present an overview of progress towards achieving the goal of tripling renewable energy capacity by 2030; zoom in on the enabling conditions and barriers to the deployment of renewable energy in developing countries; present China and EU's respective modalities for cooperation; outline some case studies on the deployment of renewable energy and finally propose recommendations for enhanced coordination and cooperation between China and the EU to scale-up renewable energy in developing countries. This paper is predominantly focused on developing countries in Africa but will also give relevant insights for other regions including South-East Asia and Latin America.

# 1. THE GLOBAL PICTURE: WHERE ARE WE ON THE GOAL TO TRIPLE RENEWABLE ENERGY BY 2030?

## 1.1. Global progress towards tripling Renewable Energy Capacity by 2030 to align with a 1.5 degrees trajectory

The UAE Consensus at COP28 comes at a time when the window is rapidly closing to limit the rise in temperatures to 1.5°C and 2°C above pre-industrial levels, in line with the findings of the International Panel on Climate Change (IPCC)

The carbon budget available to limit global warming to 1.5°C, 1.7°C and 2°C is rapidly shrinking, currently representing 65 GtC, 160 GtC and 305 GtC respectively (with 735 Gt already consumed) for a 50% likelihood, which is equivalent to 6, 14 and 27 years from 2025 (Global Carbon Project, 2024; Friedlingstein *et al.*, 2025.

In this context, it is estimated that 11.2 TWh of renewable power capacity are required by 2030 to align with the 1.5°C trajectory, compared with cumulative renewable power capacity of 4.45 TW at the end of 2024 (IRENA, 2025b). Tripling renewable power capacity to 11.2 TW requires average annual additions of 1,044 GW in 2024-2030, or 16.4% compound annual growth, up from 16.1% in 2023-30 (**Figure 1**) (IRENA, 2024; IRENA, 2025a).

An unprecedented 585 GW of new renewable power capacity was added in 2024 (+15.1% compared to 2023), accounting for 87% of newly installed capacity. This included 452 GW of solar PV (+32.2%), 113 GW of wind (11.1%), 15 GW of hydropower (+1.2%), 4.6 GW of bioenergy (+3.2 %) and 0.4 GW of geothermal (+2.5%). Solar and wind dominate renewable capacity expansion, jointly accounting for 96.6% of all net renewable additions in 2024 (IRENA, 2025b).

The deployment of clean energy is thus considered to have reached an irreversible tipping-point, with the sale of EVs having increased by 3,300% from 0.5 million (1% of all car sales) in 2015 to over 17 million (over 20% of all car sales) in 2024. Electrification and key technologies are also progressing rapidly. For example, heat pumps now represent the most deployed home heating solution globally (WEF, 2024), while battery storage in the power sector is the fastest growing energy technology in 2023, with 42 GW added globally, compared to 3.3 GW in 2018 (IEA, 2024).

Furthermore, renewable energy adoption has increased, as seen in changes in energy mix, installed capacity of renewables and grid decarbonization. In 2024, renewables accounted for the largest share of the growth in total energy supply (38%) (IEA, 2025). The deployment of clean energy is thus considered to have reached an irreversible tipping-point, with the sale of EVs has increased by 3,300% from 0.5 million (1% of all car sales) in 2015 to over 17 million (over 20% of all car sales) in 2024 (United Nations, 2025).

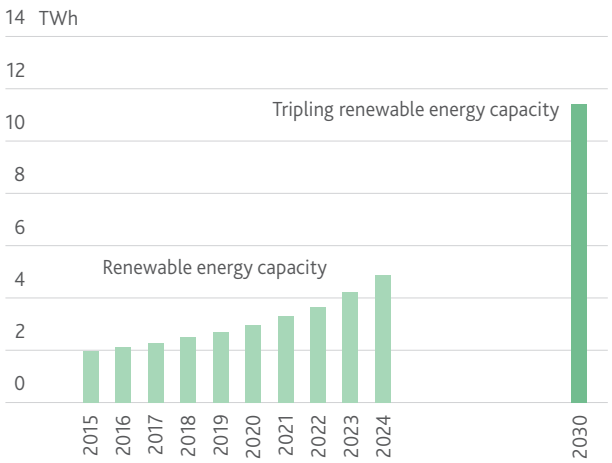
However, except for solar PV, capacity additions for all renewable energy technologies are below the level required to meet the tripling target. Compared to 2023 capacity, the world needs 3x onshore wind, 6x offshore wind and bioenergy and 35x geothermal. Current national plans and targets will deliver only half the required growth in renewable power by 2030 (IRENA, 2024).

Alongside the goal of tripling renewable capacity by 2030, the UAE Consensus moreover includes a commitment to double the rate of energy efficiency improvements by 2030. While this paper focuses on renewables only, both goals are closely related.

Energy efficiency lowers overall demand for energy, with renewables thus able to cover demand more easily. By reducing peak demand, energy efficiency also lowers the need for expensive storage and backup sources of energy (such as gas or nuclear) and supports grid stability, thereby facilitating the process of deploying new renewables. Energy efficiency moreover reduces the required level of new renewables power capacity as a percentage of energy mix targets.

Additional investments in energy efficiency thus also represent a critical aspect of renewables deployment. A tripling in the current annual rate of spending on efficiency and electrification to about USD1.9 trillion in 2030, is needed in order to double the rate of energy efficiency improvements (IEA, 2024b). The deployment of renewable and other clean sources of energy should be accelerated in conjunction with a transition from fossil fuels as included in the UAE Consensus, with this requiring a displacement of emissions intensive sources of energy on which many developing countries are historically dependent as a main source of energy.[3]

**FIGURE 1. Global renewable energy capacity and tripling renewable energy capacity by 2030**




Source: IEA Data and Statistics, CC.BY.O Licence.

[3] Countries such as China for instance, which is leading in terms of renewables deployment and which has ceased its overseas investments in new coal fired plants, is the world's largest coal producer, with the share of coal in China's energy supply standing at 60.9% in 2023. Coal is still one of the most widely used fuels for power generation because of its availability and low-cost. It remains the dominant backup for renewables, due to the scale and speed of renewable deployment (see https://www.iea.org/countries/china/coal). Other countries that are historically dependent on fossil fuels such as oil and gas, are undergoing a rapid transformation towards renewable energy, with a view to diversifying their economies. The Middle East is thus becoming the fastest growing renewables market outside China. See https://www.ft.com/content/f3c69a7d-0db1-4882-8d35-02ec4c57ea53 and Section 2.2.

## 1.2. Addressing the geographical imbalance in renewable energy investment and deployment

China, the European Union and the United States have led the rapid surge in renewable energy deployment (**Figure 1**). China alone is set to account for 60% of the expansion in global renewables capacity by 2030, followed by the US and the EU, and to a lesser extent India. Since it ended feed-in-tariffs in 2020, China's cumulative solar PV capacity has quadrupled and its wind capacity has doubled, driven by falling costs and supportive policies (IEA, 2024; IEA, 2024a).

The European Union has also experienced unprecedented growth in renewable energy deployment, driven by falling costs, climate-oriented policies and concerns over energy security. In the United States, investment in renewable energy was strongly incentivized by the tax credits offered by the 2022 Inflation Reduction Act, with this being however set to be negatively impacted by the current White House administration, particularly in the medium to long term (*The Economist,* 2025), with this highlighting the importance of China-EU leadership in preserving a positive momentum for global renewables deployment.

Renewable electricity capacity deployment is characterized by a large gap between developed countries and developing countries (**Figures 2 and 3**). The geographic deployment of renewable power is in effect highly imbalanced, with Asia, Europe and North America accounting for almost 85% of global end-2023 installed capacity, and Africa accounting for just 1.6% (IRENA, 2024)

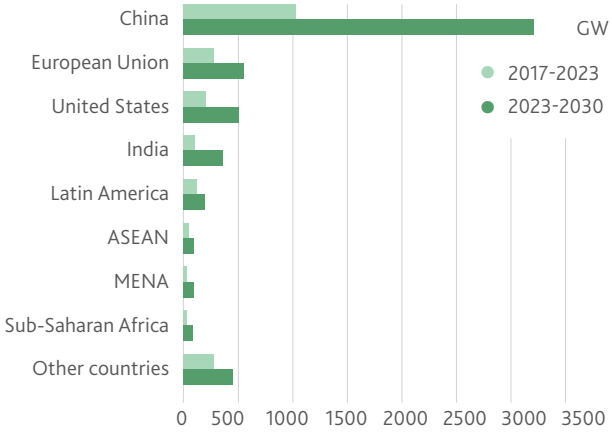
Nowhere is this imbalance more pronounced than in terms of investment in renewable energy capacity: in 2023, 84% of renewable capacity investments were in China, the EU and the US, while Brazil and India accounted for just over 6% and investments in Africa fell by 47% in 2022-2023.

Investments in renewable capacity globally reached a record high of USD570 billion in 2023, which is still well short of the USD1.5 trillion needed each year between 2024 and 2030. Annual investments in solar PV are however on track to meet the USD397 billion required each year until 2030, all other technologies remaining underfunded (IRENA, 2024). Clean energy is underfunded across Africa, South-East Asia and Latin America compared with advanced economies and China, with only marginal progress over the past ten years (**Figure 4**).

Much of the additional capacity to achieve the tripling renewables energy goal will need to come from the G20 countries, foremost amongst which China, the EU and India, according to projected investments and installations.

However, in order for systemic imbalance to be addressed and for global climate goals and the Sustainable Development Goals (SDGs) to be met, all countries will need to participate (UNFCCC, 1992) in deploying new renewables. Scaling-up renewables deployment in developing countries that benefit from abundant, still largely untapped supplies of natural sources of energy, including hydropower, geothermal, solar and wind, is also critical to creating a low-carbon future and reaching carbon neutrality globally.

**FIGURE 2.** Renewable electricity capacity growth by country/region, main case, 2017-2030



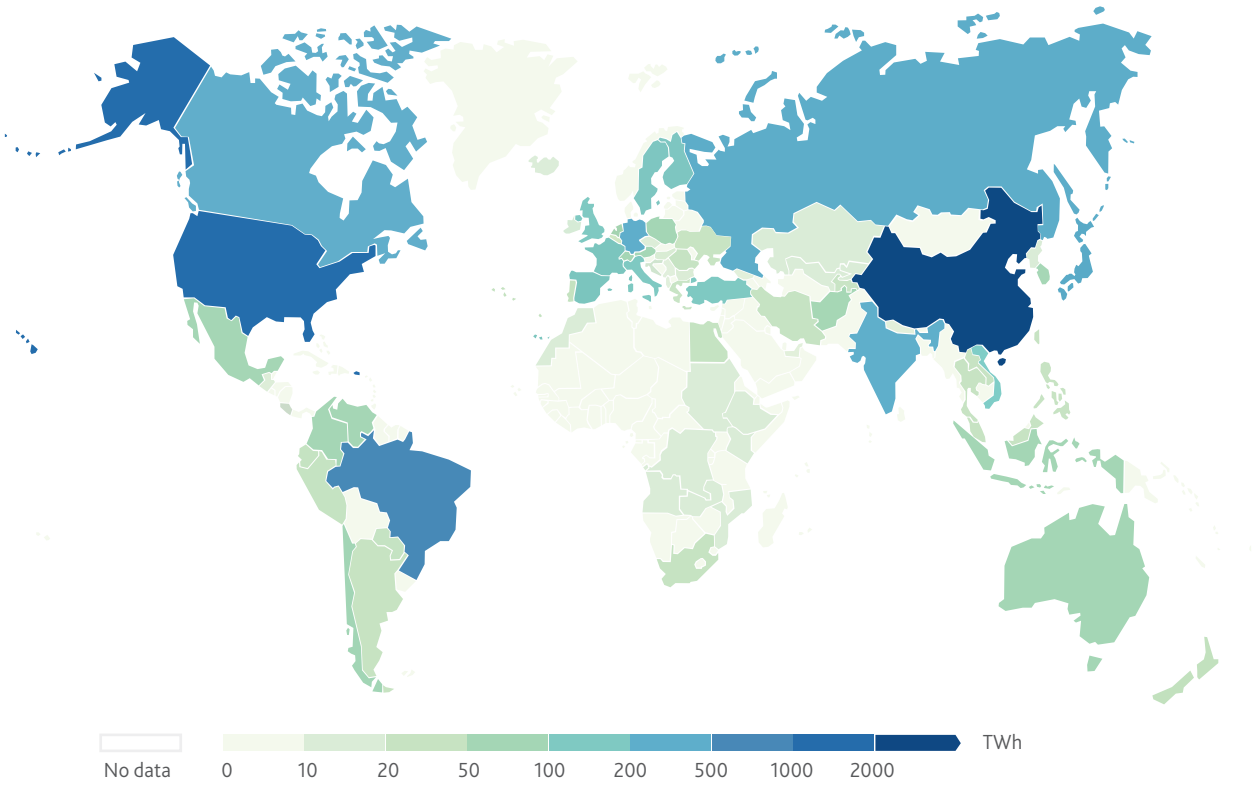

Source: https://www.iea.org/data-and-statistics/charts/renewable-electricity-capacity-growth-by-country-region-main-case-2017-2030, CC BY 4.0 Licence.

Moreover, the global market for renewables has been valued at USD 954 billion in 2023 and is expected to grow from USD1.021 trillion in 2024 to USD1.574 trillion by 2032, highlighting its importance as a driver of trade and economic development (Fortune Business Insights, 2025). A just and equitable transition would see the benefits of this global market extend to all developing countries. Demand for renewables in developing countries is moreover expected to grow exponentially, in response to demographic growth projections, urbanization and rising incomes leading to higher demand for energy, particularly in Africa (OECD, 2025a; Africapolis, 2025; Institut d'Etudes Démographiques [INED], 2025).[4]

Improving access to energy and reducing poverty in developing countries in line with SDG7 moreover requires the deployment of affordable and decentralized renewable technologies (such as solar mini-grids and off the grid systems), with the ability to leap-frog to these types of smart, flexible systems, including through Artificial Intelligence (AI) (IEA, 2025b). Investment in grid infrastructure improvements and in energy storage technologies are a central aspect of providing secure, reliable and affordable renewable energy in these countries, with the deployment of renewables thus requiring a holistic approach to energy systems and infrastructure (**Figure 5**).

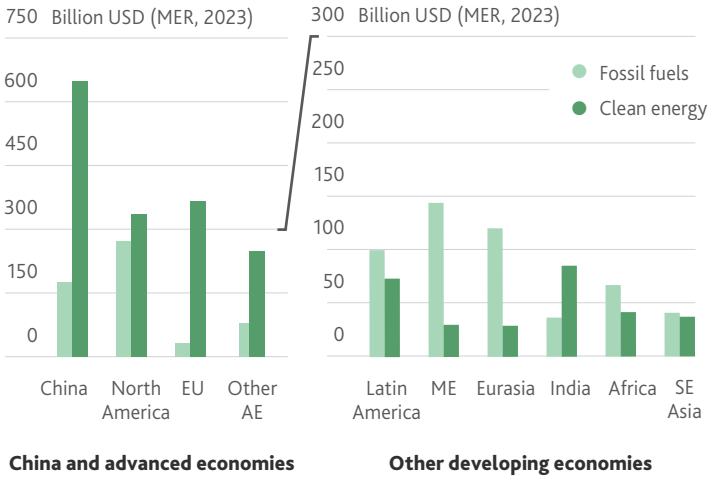
[4] According to data from the Institut National d'Etudes Démographiques, Africa's population in 2025 is 1.55 billion people and is expected to reach 2.47 billion people by 2050: https://www.ined.fr/fr/tout-savoir-population/graphiques-cartes/population_graphiques/
According to data from Africapolis, by 2050, Africa's urban population will have grown from 704 million to 1.4 billion and 2 out of 3 Africans will live in an urban area: www.africapolis.org and https://www.oecd.org/content/dam/oecd/en/publications/reports/2025/03/africa-s-urbanisation-dynamics-2025_005a8aa0/2a47845c-en.pdf

**FIGURE 3.** Electricity generation from renewables, 2024



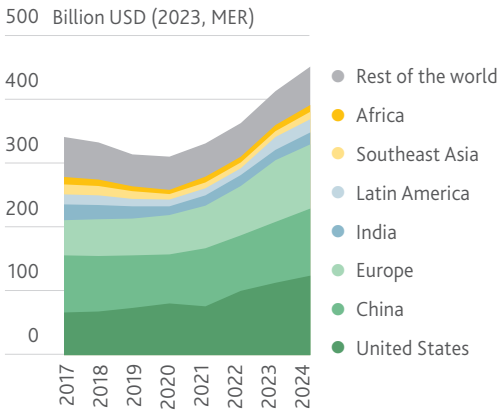

Data source: Ember (2025); Energy Institute – Statistical Review of World Energy (2025). OurWorldinData.org/energy, CC BY Licence.

**FIGURE 4.** Estimated energy investment by type in selected regions 2024




Source: IEA World Energy Outlook 2024, CC BY 4.0 Licence.

**FIGURE 5.** Investment in power grids and storage by region 2017-2024

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# 2. UNLOCKING THE POTENTIAL OF DEVELOPING COUNTRIES: ENABLING FACTORS AND EXISTING BARRIERS

## 2.1. Enabling factors and barriers in the deployment of renewables in developing countries

The low-cost of renewables technology for wind and solar (as well as low-cost battery storage) from China is currently a major driver of the deployment of renewables worldwide. China's clean power capacity means that it is capable of producing a megawatt-hour of electricity 11-64% cheaper than in other countries (BNEF, 2025).

In 2024, solar PVS were thus on average 41% cheaper than the lowest cost fossil fuel alternatives, while onshore wind projects were 53% cheaper (IRENA, 2025d). The cost of clean power technologies is expected to fall further by 2-11% over the year 2025, with new wind and solar farms undercutting new coal and gas plants on production cost in almost every country globally. The levelized cost of electricity for clean technologies is expected to fall 22-49% by 2035 (BNEF, 2025).

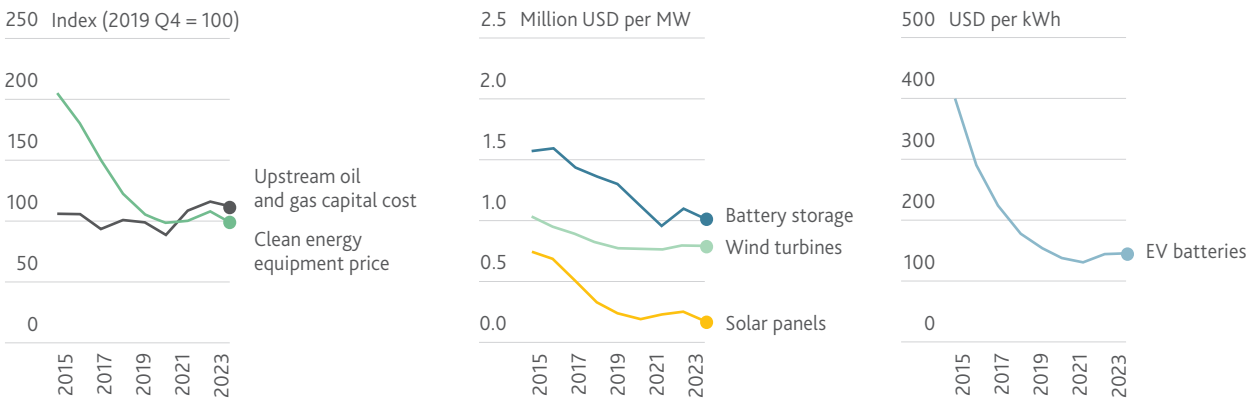
Avoided fossil fuel costs in 2024 reached USD467 billion, given total renewable capacity in operation worldwide. Countries with the highest levels of renewable electricity production captured the largest absolute benefits in terms of fossil fuel savings. These included China, the US, Brazil, Japan, Germany and India, with developing countries such as South Africa, the Philippines or Indonesia at the lower end of the spectrum (IRENA, 2025d).

91% of new renewable power projects commissioned in 2024 were more cost-effective than any new fossil fuel alternatives in 2024 (IRENA, 2025b).[5] The price of clean energy equipment, particularly for battery storage, EV batteries and solar panels, has fallen rapidly, especially in comparison to the capital cost of upstream oil and gas (**Figure 6**).

Between 2015 and 2024, global annual electricity capacity of renewables thus increased by around 2,600 GW (+140%) while that of fossil fuels increased by around 640 GW (+16%)(United Nations, 2025). Not only do renewables outperform fossil fuels in terms of LCOE, but they also do so in terms of avoided environmental damage and damage to health through pollution.

Many developing countries have in effect made great progress in deploying renewable energy in the last two decades, thanks to the plummeting cost of renewable technologies: in Africa, Morocco has massively invested in developing a solar industry (with the Noor Ouarzazate solar complex) and wind projects (European Investment Bank *et al.*, 2017), South Africa has been expanding wind and solar power (through its Renewable Energy Independent Power Power Producer Procurement Program, see Case Study), while over 90% of Kenya's grid electricity is renewable, up from 50% in 2000 (Nakweya, 2025). In Asia, India has been developing one of the largest renewable energy programs in the world (Jaganath, Sushma *et al.* 2025), while Bangladesh is deploying solar home systems in off-grid rural areas (Hutt, Rosamund, 2020). The Philippines are investing heavily in geothermal, solar and small hydropower (Asian Insiders, 2025). In Latin America, Brazil is a leader in hydropower and one of the world's leading producers of wind and solar power (Rangelova, Kostantsa, 2024), while both Chile and Uruguay have been experiencing massive growth in solar and wind power (Ember, 2025; Markert, 2024).

**FIGURE 6.** Indices for clean energy and upstream oil and gas




Source: IEA World Energy Outlook, CC BY 4.0 Licence.

[5] Onshore wind remains the most affordable source of new renewable electricty at USD0.034/KWh, followed by solar PV at USD0.043/KWh.

Alongside low-cost wind and solar PV technology from China, elements that contribute to the deployment of renewable energy in developing countries include:

- Clear low-carbon policies and objectives (NDC commitments, net zero goals, renewable energy targets) integrated into national development plans and domestic policy frameworks;
- Effective regulatory frameworks for renewables (feed-in-tariffs, auctions and tenders, tax incentives and subsidies);
- Good governance (well-run domestic utilities, effective regulators, market readiness);
- A pipeline of credible projects (credible sponsor/owners, the required permits, environmental impact assessment, a credible business plan);
- Strategies for economic diversification and for export of renewable energy (creation of new revenue streams) if applicable;The development of interconnections (national, regional and international);
- Industrial strategies for local procurement and domestic manufacturing of renewables equipment and services (see Case Study on South Africa).

## The role of liberalization in enabling the deployment of renewables in developing countries

In addition, an open and liberalized market can be observed to play a critical role, whether it be by attracting higher levels of foreign investment or by correcting domestic market distortions.

Such has been the case for the Philippines, which is ranked as the second most promising emerging market for clean energy, with a liberalized investment environment, despite its situation as a geographically distant island country (Asian Insiders, 2025). A 40% equity cap on foreign investment participation was removed in 2023, with foreign investors now able to own 100% equity, with this attracting much higher levels of investment in large-scale infrastructure (Rowena Guevara, Undersecretary, Philippines Department of Energy [DOE], 2023).

In Saudi Arabia, the rapid and massive deployment of solar power capitalizes on the low-cost of standardized solar PVs from China, together with the ability of the Kingdom to use its revenues from oil and gas to subsidize the large-scale deployment of renewables, in the context of vast resources in solar radiation and a long-term strategy of economic diversification. As part of this strategy, the partial and progressive deregulation of fuel prices also plays a very significant role in the deployment of renewable energy by correcting market distortions and allowing renewables to compete with fossil fuels, thus freeing up resources for reinvestment in grid infrastructure or other major projects (Apeaning *et al.*, 2025).[6]

In Vietnam, a non-liberalized system with very low electricity prices heavily subsidized by the government for decades, had the effect of crowding-out investment in clean energy. State-utility EVN lacked the financial space to absorb renewable energy as a result of premium pricing offered under feed-in-tariffs, with cheap coal and gas imports being preferred. The new 2025 Electricity Law seeks to reverse this by introducing market-based pricing, allowing direct power purchase agreements (DPPAs) and restructuring subsidies (World Bank, 2022).

In Zimbabwe, the power sector is largely state controlled (Zimbabwe Power Electricity Supply Authority) with tariff structures that have been heavily regulated and few incentives for Independent Power Producers (IPPs). Subsidies for diesel and coal generation make renewables uncompetitive, in a context of insufficient infrastructure and macroeconomic instability. Energy tariffs did not reflect the efficient costs of electricity services provision, with electricity subsidies in 2015 equivalent to 20.5% of GDP (post tax), making Zimbabwe an outlier in Southern Africa and in the world. Nor did low electricity tariffs benefit the majority of the extremely poor, with most subsidies benefiting the non-poor. The government has recently introduced legislative changes to support IPP agreements for renewable energy to grid (in 2022), without however including similar incentives to off-grid investments. It also raised energy tariffs in line with regional average, in 2023 (World Bank, 2023b).

Deregulating fuel prices and liberalizing the power sector are thus critical aspects of the energy transition from fossil fuels to renewable energy. Fossil fuels and in particular coal, represent incumbent sources of energy on which many developing countries have historically depended for their energy consumption, as well as for export revenue. Deregulating prices to allow for investment in renewable energy, including in off-grid renewables to improve access to energy, is key to meeting growing demand for electricity in developing countries in an economically sustainable manner.[7] The availability of inexpensive renewable alternatives has moreover been shown to be an enabler of fuel price reform (Matar, Walid, 2025).

Similarly, designing and operationalizing innovative financial mechanisms to leverage the opportunity afforded by the development of carbon markets, such as under Article 6 of the Paris Agreement, can assist in this transition. A concept for a new financial asset class, a "coal transition credit" is for instance currently being developed that would incentivize the early decommissioning of coal fired plants and facilitate their replacement with renewable sources of energy, thus creating a "business case" for the transition from coal to renewables (see Case Study on Chile). In this manner, the emergence of new international carbon market frameworks such as Article 6 can be leveraged to support both public and private sector

[6] For interactive data regarding renewables deployment in Saudi Arabia (solar and wind), see the Interactive Geospatial Dashboard for Renewable Projects in Saudi Arabia, sourced from the Ministry of Energy. https://apps.kapsarc.org/appboard/renewableprojects

[7] The availability of inexpensive renewable alternatives is also an enabler of fuel price reform.

investment in renewables in developing countries, helping de-risk transformational investments (Michaelowa, Axel *et al.*, 2019).[8] However, it is important to note that carbon credits need an enabling environment in order to function, including strong domestic laws and regulations to ensure the integrity of the credits, as well as institutional readiness and technical capacities, with least developed countries in particular being marginalized (UNCTAD, 2024).

### Barriers to the deployment of renewable energy in developing countries

While some developing countries have made great progress in their deployment of renewables, very significant barriers however exist that hinder the deployment of renewables in many developing countries, affecting particularly middle and lower income developing countries.

These barriers include:

- Policy and regulatory barriers;
- financing barriers (high upfront costs, limited local finance and currency risks, absence of guarantees);
- grid and infrastructure barriers;
- technical and human capacity barriers, particularly for long-term planning;
- local social and political challenges.
- Fields of action to address these issues effectively include:
- Promoting access to energy;
- De-risking and promoting private sector investments;
- Strengthening and modernizing the grid;
- Supporting systemic innovation such as innovative power generating technologies;
- Fostering transformative decarbonization for a just energy transition and building institutional capacity as well as human resource capabilities (KWF, GIZ, IRENA, 2020; IRENA, 2024).

The role of governments is critical in addressing these barriers, with governments responsible for developing and implementing policies and strategies that enable the crowding-in of finance and investment for the deployment of renewables, grid infrastructure and storage. A strong narrative and commitment to clean energy, for instance in the context of the submission of NDCS under the Paris Agreement, is fundamental to sending a clear message regarding government policy and to fostering investor confidence (see Case Study on Chile). Strong governmental commitment is a precondition to creating a virtuous cycle to scale up financing for the power sector (World Bank, 2023), while an international cooperation ecosystem that contributes to address structural barriers, including bottlenecks, is also critical (Dechezleprêtre, A. *et al.*, 2024).

## 2.2. Challenges to renewables deployment in fossil fuel dependent developing countries

### The challenge of adjusting to a decarbonized world economy

Scaling up the deployment of renewables and an equitable transition from fossil fuels are closely interlinked challenges.

The production of oil, gas and coal indeed pervades the whole economic, political and social structure of developing countries that are dependent on hydrocarbons as their primary source of affordable, secure and easily available energy. In addition, many of these countries, particularly developing countries that have historical oil and gas production (HOGP), also rely on the export of fossil fuel for revenue.

In these circumstances, transitioning to clean energy and scaling-up the deployment of renewables represents a particularly complex challenge. Yet net-zero targets adopted worldwide and the COP28 call to transition away from fossil fuels indicate an increased likelihood that a tipping point in global demand for each of the fossil fuels will be reached by 2030 (IEA, 2025c), thus raising the risk of stranded fossil fuel assets in the absence of a transition to cleaner sources of energy (Hoffart and Holz, 2024; Mercure *et al.*, 2018).[9]

New mechanisms such as the EU's Carbon Border Adjustment Mechanism (CBAM) moreover place additional pressure on developing countries that wish to trade with the EU bloc to limit the carbon content of their products. Policy developments such as these further illustrate the challenge that developing countries face in having to reshape their industrialization strategies and trade policies over the long run, in order to adapt to a world economy that is decarbonizing (ECDPM, 2024).

Carbon mitigation technologies do exist that could assist developing countries in their transition to cleaner energy. Technologies such as Carbon Capture and Storage (CCS) can and should be used to phase out unabated fossil fuel production and are indeed considered to be critical in all major net-zero pathway scenarios (IEA, 2020; Shell Global, 2024). However, CCS technologies still lack a coherent "business case", with their deployment remaining limited in the case of a majority of developing countries (Dominic Rassool, Ian Havercroft, 2021).[10]

[8] This underlines the importance of Article 6 readiness and needs assessments for developing countries, as supported by the UNFCCC and the Global Green Growth Institute. See https://gggi.org/tag/article-6/

[9] In June 2025, the World Bank lifted its long-standing ban on providing funding for nuclear power, including for small modular reactors (SMRs) in developing countries, in the context of rising electricity needs. See https://www.world-nuclear-news.org/articles/world-bank-agrees-to-end-ban-on-funding-nuclear-energy

[10] The EU has a target of 50 million tonnes of annual operational $CO_2$ injection capacity by 2030 in storage sites, with the capture, storage and utilization of $CO_2$ considered to be an inevitable part of the Union's decarbonized future, as stated in the EU's Net-Zero Industry Act. See https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L_202401735
CCS technologies are being developed predominantly in the Northern Hemisphere (Norway, the UK, Canada, the US) and in high-income HOGP countries in the Middle East (UAE, Saudi Arabia, Qatar) primarily in the form of CCUS. Some developing countries such as South Africa, have great potential for geological storage of $CO_2$ and are exploring the potential to develop CCUS, with South Africa launching its first CCUS research center in September 2024. See https://www.esi-africa.com/news/south-africa-launches-its-first-ccus-research-site/

## The challenge for developing countries dependent on oil and gas

Developing countries dependent on oil and gas are a highly heterogenous group. High-income HOGP countries, such as the UAE, Saudia Arabia, Qatar or Oman, are currently rapidly deploying renewable sources of energy at scale (particularly solar), in the context of strategies of economic diversification. while phasing-out unabated fossil fuels by investing in Carbon Capture, Utilization and Storage (CCUS).[11] High-income developing countries such as these use their oil and gas revenue to navigate a smoother though still complex transition towards decarbonization and diversification.

Other categories of oil and gas producers may have large amounts of historical hydropower, thus facilitating the integration of new renewables, including solar and wind, onto the grid. Such is the case for Brazil, an upper middle-income developing country and the largest oil and gas producer in Latin America, that has hydropower plants accounting for around 80% of domestic electricity generation (IEA, 2023).

However, around half of the world's oil and gas is produced by middle-income developing countries that have fewer financial and economic resources to support the effective deployment of clean energy and renewables (WRI, 2023), while their state energy utilities and grid infrastructure are more fragile than those of high-income and upper-middle income developing countries.[12] Lower middle-income oil producing countries, particularly in Africa, such as Angola, Egypt or Nigeria thus require, concessional loans and international partnerships, including from the EU and China, to help deploy renewables, in the context of fragile macro-economic conditions, with weak grid infrastructure, fragile state utilities and low rates of electrification (see Section 3). Political challenges and transparency issues in many of these countries moreover add to the complexity of deploying new renewables, in the context of oil and gas incumbents and complex rentier state dynamics.

## The challenge for developing countries dependent on coal

The successful deployment of renewables is closely related to the ability of countries to reduce their dependence on coal, with international concessional finance, just transition partnerships and community support being required to assist in this transition.

Developing countries (excl. China) that are reliant on coal for their economic development include India, South Africa, Indonesia, Vietnam, Bangladesh, Colombia, Chile, Mozambique, Zimbabwe or Botswana (Energy Institute, 2025; African Energy Commission, 2024). Coal dependency is growing rapidly in countries that rely on it to meet growing electricity demand, with this illustrating the danger of even greater carbon lock-in as rates of electrification increase. In both the Philippines and Indonesia, the share of coal in the electricity mix thus surpassed that of both China and Poland in 2023 (Rangelova and Setyawati, 2024).[13]

While transitioning from coal to renewables is challenging for all countries, this is particularly the case for developing countries. The fleet of coal-fired power plants (CFPPs) in developing countries is bigger and younger than that of developed countries. Moreover, it is insulated from market forces, through subsidies and power purchase agreements. As in the case of oil and gas dependent countries, entire sectors of developing country economies are dependent on the coal sector, with this extending far beyond coal power plants, for instance to include critical transport infrastructure and hubs such as railways and ports.

Moreover, state owned enterprises (SOEs), particularly across Africa, experience inefficiency, governance issues and debt burdens that limit their ability to effectively support the deployment of renewables, especially in the presence of local and national vested interests. Phasing down high coal dependency in favor of clean energy represents a particularly complex and costly transition that can undermine the fragile investment environment of many developing countries, with the risk that this may also impact the sovereign's (the state) own credit rating.

Such a transition thus requires challenging structural changes that cut across multiple sectors and that call for massive levels of investment to cover potential stranded costs associated with the early retirement of coal power plants. It should preserve affordability, with renewables projects requiring high upfront capital investment compared with coal projects that can often be locally financed. It should also preserve security of supply, with coal being easily available domestically in a large share of developing countries across continents (compared to oil and gas resources that are present in a more limited number of countries), with this arguing in favor of keeping at least some CFPPS operational (World Bank, 2024).

However, despite these barriers to a transition from coal to renewables, the cost of inaction is high: inefficient, inexpensive CFPPs lead to higher $CO_2$ emissions as well as to public health impacts due to local pollution. while distortive, expensive fossil fuel subsidies limit these countries' ability to invest in clean energy or in other types of productive investment. Moreover, as in the case of oil and gas assets, coal assets run the risk of becoming stranded, particularly in the

[11] For an overview of CCUS technology, see "Technology Brief, Carbon Capture, Usage and Storage (CCUS)", United Nations Economic Commission for Europe, March 2021. https://unece.org/sites/default/files/2021-03/CCUS%20brochure_EN_final.pdf

[12] Reference to high-income, middle-income and low-income developing countries in this paper follows the World Bank's country classification by income level, available at https://datahelpdesk.worldbank.org/knowledgebase/articles/906519
For a country classification world map, see https://blogs.worldbank.org/en/opendata/world-bank-country-classifications-by-income-level-for-2024-2025

[13] In order to achieve a net-zero pathway, unabated global coal use must be reduced by more than half by 2030 and be entirely phased-out by 2040, with coal representing the most carbon intensive fossil fuel (EIA, 2024; MIT Climate Portal, 2022). China is by a very wide margin the world's leading producer and consumer of coal (56% of global coal consumption in 2024) (IEA, 2025a). Transitioning from coal to mitigate global GHG emissions therefore falls first and foremost to the top emitters, that include China, followed by India, Indonesia, the US, Russia and Australia (Source: US Energy Information Administration).

context of new carbon related border adjustment mechanisms and stricter reporting and disclosure requirements on financial transactions (Caldecott, Ben *et al.*, 2016).

Strategies for phasing-down coal in developing countries focus on the critical role of governments in creating an enabling environment in terms of policy, institutions and the development of credible projects. A series of interventions across three pillars that include institutional governance, people and communities, and reclamation or repurposing of land and assets have been identified (World Bank, 2023a). A framework that involves Reduce, Reuse and Reconcile has also been developed that involves cutting new coal investments and accelerating the retirement of existing power plants while scaling up renewables; repurposing coal assets to convert them into renewable power plants; reconciling by supporting workers and communities through a just transition (World Bank, 2024).

Such a transition will require the participation of local, national and international actors, including multilateral development banks, multinational companies, as well as partners such as China and the EU. It may also require innovative financial mechanisms to incentivize the early retirement of coal fired power plants in favor or new renewables projects that have high upfront capital costs, where existing coal power plants already have sunk costs and provide a revenue stream (see Case Study on Chile).

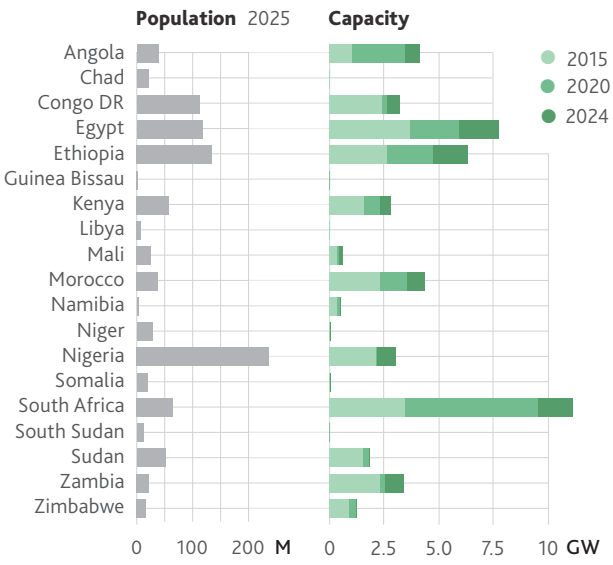
## 2.5. Challenges of renewable energy deployment in Africa

Transitioning from fossil fuels and scaling-up renewable deployment is a particular challenge in Africa where installed renewable energy capacity is minimal compared to other continent and regions (except for the Middle East), representing only 1.6% of the world's installed renewable energy capacity in 2024, in the context of a population of 1.5 billion people and given the continent's vast solar, wind and hydro resources.[14] This is reflected in much lower levels of energy access and socio-economic development.

Very important disparities exist between African countries in terms of levels of renewables deployment, dependent on their geographical position, available natural resources, levels of political and economic stability, institutional capacities and historical ties to developed countries (**Figure 7**). North African countries that are more advanced in terms of economic development and that benefit from closer geographical proximity to Europe, are thus able to put in place enabling policies for renewables and build interconnections with Europe, such as Morocco or Algeria.

Others are endowed with significant amounts hydropower resources, such as Ghana, Ethiopia, South Africa, Mozambique, Egypt, Zambia, Uganda, or DR Congo, that can supply renewable energy while acting as vast storage reservoirs (IRENA, 2025c).

**FIGURE 7.** Renewable energy capacity and population in Africa




Moreover, while these hydropower resources are subjected to the impacts of climate change, such as droughts, some of these impacts can in fact be positive over the long run, with hydropower production in the Kwanza Basin in Angola expected to increase by 10% over the course of the twenty first century, as a result of temperature changes and increased precipitations (Hamududu and Kilingtveit, 2016).

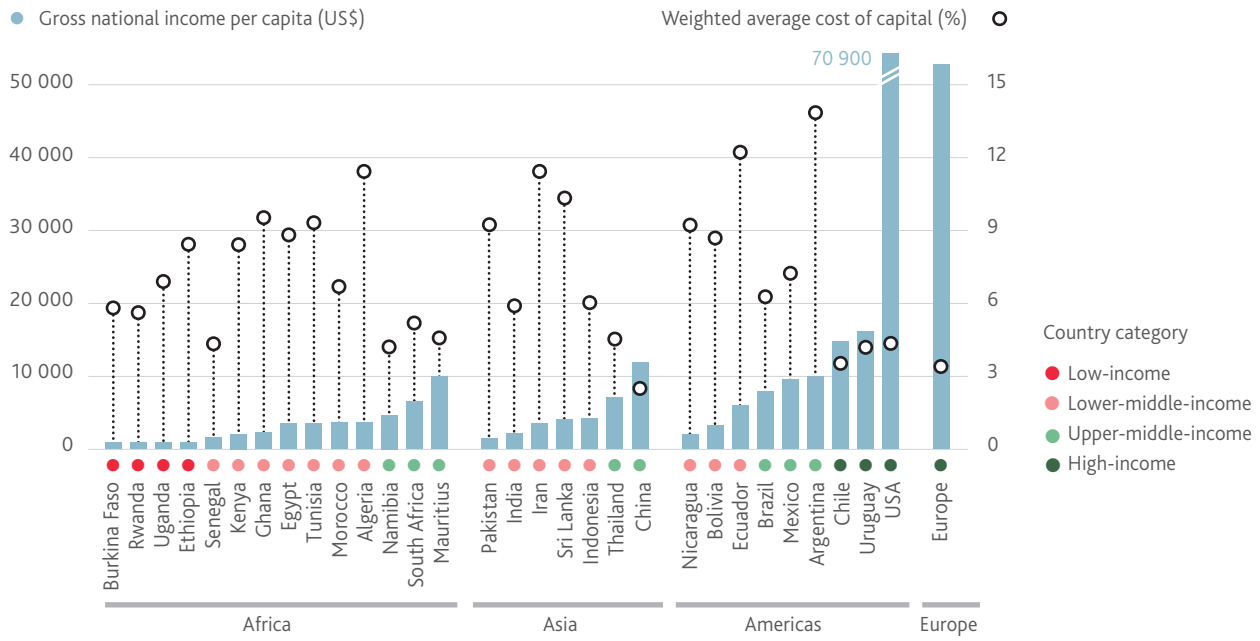
These situations contrast with that of other countries, particularly in the arid Sahel and other parts of Sub-Saharan Africa, such as Guinea Bissau, Mali, Mauritania, Somalia, Chad, Sudan, that have low levels of access to energy, with very limited installed renewable energy capacity (**Figure 8**) Finally, while South Africa, an upper-middle income developing country, is ahead of all other African countries in terms of installed renewable energy capacity, with the share of renewable energy in its power generation mix currently standing at 11%, the deployment of renewables remains hampered by the very heavy reliance of the country on coal together with underinvestment in the grid, with regular periods of loadshedding by state utility Eskom (Rystad Energy, 2023)(see Case Study on South Africa).

The existence of these disparities between countries across the African continent mean that international support for the deployment of clean energy, such as through financing the construction and operation of renewable generation capacity such as hydropower plants or solar PVs, financing grid extension and upgrade (including constructing mini-grids and regional interconnections), contributing to climate funds or providing loans and debt financing, is highly context dependent.[15]

[14] IRENA Renewable Energy Statistics 2025; World Population Review; Eurostat (https://ec.europa.eu/eurostat/web/products-eurostat-news/w/ddn-20250711-1), UN World Population Prospects 2024 (https://population.un.org/wpp/downloads); Worldometer (https://www.worldometers.info/geography/countries-of-the-world/)

[15] The deployment of clean technology is a highly context-sensitive process which is also part of a process of economic development or "catching-up" for developing countries and of the development of firms and industries worldwide (Watson, Jim *et al.*, 2015).

**FIGURE 8.** Weighted average cost of capital for solar PV projects against per capita GNI in 2021




Source: Emissions Gap Report, 2023 (UNEP).

However, several common challenges can be identified that will impact the nature and effectiveness of international support for the deployment of renewables. These include the multiple challenges associated with historical dependence on fossil fuels, in particular coal in the case of Africa (see Section 2.2), as well as debt-burdened state utilities and aging grid infrastructure that requires upgrading and extension, with this necessitating very large amounts of investment, from both the public and private sectors. While the availability of low-cost solar PV technology from China provides a unique opportunity to deploy affordable, off-grid solar power to rural or isolated communities in African countries, greater investment in large-scale renewable power will be required over the long run (Harris, 2024).

## The high cost of capital in African countries

A critical challenge common to all developing countries but that impacts particularly those in sub-Saharan Africa, is the high cost of capital. While the availability of low-cost solar and wind technology from China lowers the cost of deploying new renewable energy capacity, real and perceived risks vastly increase the cost of financing these projects in many developing countries (World Bank, 2025).

The base rate of the cost of capital (reflecting country-level risks) thus accounts for 60 to 90% of the Weighted Average Cost of Capital (WACC) for solar PV plants in Africa, compared with 35% in China and 10% in advanced economies (Stedile and Gordon, 2025) (**Figure 8**). Macro-economic and political risks (such as geopolitical shocks, violence and conflict, the rule of law or the sanctity of contracts) in effect greatly increase the cost of capital. Peace, stability and good governance are fundamental prerequisites for lowering the cost of capital in Africa.

Payment reliability of off-takers (with often only one off-taker) represents a very significant issue, given the high levels of debt of state-owned utilities, together with the health of transmission networks and regulatory environments (such as issues with auction systems and their design), with this translating into higher risk premiums.[16] These premiums (linked to sector and technology) will be lower in those countries that have more mature renewables sectors, such as in South Africa.

Moreover, current approaches to financing, involving a high proportion of foreign currency, mean that the cost of any domestic currency devaluation will be passed on to utilities, thereby increasing their debt servicing costs and further weakening their overall financial health (such as when the Kenyan shilling depreciated against the US dollar between 2018 and 2022). In addition to exchange rate volatilities risks, difficulties accessing foreign currencies can also result in delayed payments by off-takers (Stedile and Gordon, 2025). Shifting project finance to local currency financing, with complimentary policies and de-risking tool, is a critical step that has the potential to reduce capital cost by up to 31% in African countries and provide electricity cost savings up to 29% (Baldé and Tesfaye Meron, 2025).

A critical element for attracting investment in Africa are adequate guarantees, with nascent energy intermediaries, local lending institutions and pension funds playing a progressively more important role, in the context of increasingly unsustainable

[16] At the level of communities and individuals, for instance in the context of the deployment of off-grid solar power, payment systems such as pay-as-you-go or pay-as-you-harvest, together with support from international sponsors (such as UNDP), provide a form of payment reliability.

government guarantees (Challa 2023). Indeed, only two (Mauritius and Botswana) out of Africa's 54 countries have investment grade ratings of BB or higher, most being rated B and CCC, which is too low for most debt investors, with this resulting in very high interest rates for climate finance projects (between 12.8% to 29.5% for high-emission African countries) (Ben Yahmed and Peres, 2024).

Identifying pipelines of bankable projects, as opposed to accepting unsolicited projects, also increases investor confidence as well as the rate of success of new projects, thereby creating positive feedback loops. Improving the financial health and governance of utilities, cutting red-tape (for instance, simplifying the delivery of permits or establishing a "one-shop-stop" for all permits and authorizations), developing a skilled workforce and establishing new communities around the development of new renewables projects, can contribute to accelerating the successful deployment of new projects, attracting further investment (World Bank, 2023; World Bank, 2025).[17]

[17] For instance, Senegal shortened the set-up time for new businesses from two months to just 48 hours, by streamlining administrative processes and reducing transaction costs. This greatly enhanced its attractiveness to investors, with net Foreign Direct Investment inflows rising from 1.6% of GDP in 2012 to 9.3% in 2022. See "Regional Economic Outlook, Sub-Saharan Africa, a tepid and pricey recovery", International Monetary Fund, 2024 APR.

# 3. CHINA AND EU CURRENT CAPACITY AND INVESTMENT FLOWS

## 3.1. China's overseas energy investments: greening the Belt and Road Initiative

In his keynote address to the United Nations General Assembly in September 2021, President Xi Jinping announced that China would stop building new energy projects abroad that use coal, pledging to step up support for other developing countries in developing green and low-carbon energy instead. He restated China's climate ambition to strive to peak carbon emissions before 2030 and achieve carbon neutrality before 2060 ("China Headed towards Carbon Neutrality by 2060; President Xi Jinping Vows to Halt New Coal Plants Abroad | UN News", 2021).

The decision to end China's involvement in new coal-fired plants represented an important shift in China's overseas energy strategy, resulting in a "greening" of the Belt and Road initiative first launched in 2013.[18] This shift has been reflected in overseas energy investment capacity from China. Figures 1 and 2 from China's Global Power Database (Boston University Global Development Policy Center) include power plants outside of China that are financed by foreign direct investment (FDI) and/or lending from China's two development finance institutions (DFIs) or policy banks, the Export-Import Bank of China (CHEXIM) and the China Development Bank (CDB).

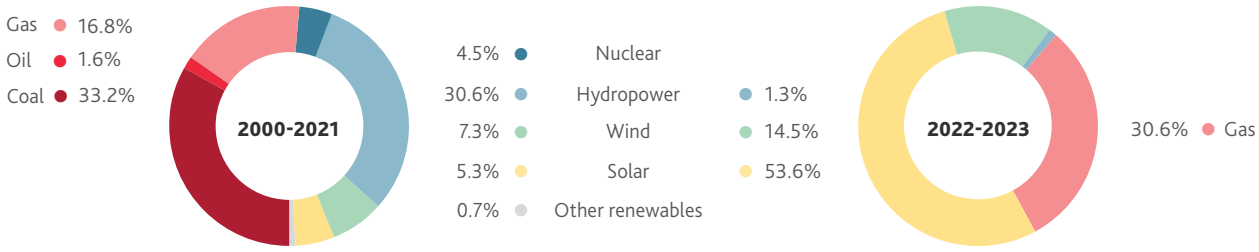
The data shows that nearly 13% of overseas generation capacity funded in 2000-2021 was directed to solar, wind and hydropower, with this figure increasing to nearly 69% in 2022-2023 (**Figures 9 and 10**) following President Xi's announcement.

However, this masks an overall decrease in involvement in overseas energy markets by both DFIs and investors, following a peak in 2016. During the period 2013-2019, Chinese investments averaged an annual capacity of around 16 GW, with this falling to 4 GW in 2020-2023. This retreat can be explained by the COVID pandemic which led to travel limitations and great macro-economic uncertainty, by China's own economic difficulties, as well as by loan recipients' increased indebtedness and interest rates (Global Development Policy Center Boston University, Diego Morro, 2025).

Since 2023, China has cautiously renewed with overseas investments, while shifting from large-scale energy infrastructure investment to a "small and beautiful" strategy, focusing on deploying smaller, more flexible power solutions that are able to reach isolated or off-the-grid communities, at a lower cost and with less local pollution. These include distributed rooftop solar, small wind turbines, rural microgrids that combine solar, wind and batteries, as well as small hydropower stations and biogas/biomass units for villages (Liu, 2024). In October 2023, during the 3rd Belt and Road Forum for International Cooperation, President XI allocated nearly USD48 billion each to CBD and CHEXIM to these types of "small and beautiful" projects, while replenishing the Silk Road Fund, the main investment platform for the BRI, with an additional USD11 billion (Haneul Kim, 2024).

The extent to which the slowdown in the global economy and current trade wars will affect China's overseas energy investments going forward remains to be seen, with the IMF expecting China's economy to grow at a slower rate of 4% in 2025 (April forecast) in the current context (down from a 4.6% forecast in January).[19] Chinese investments are moreover becoming more commercially driven, with policy banks (CHEXIM and CDB) and state-owned-enterprises (SOEs) ceding ground to commercial banks and private sector investors (Haneul Kim, 2024) that are gaining in experience.

**FIGURE 9 and 10.** Chinese FDI and DFI Capacity by Energy Source

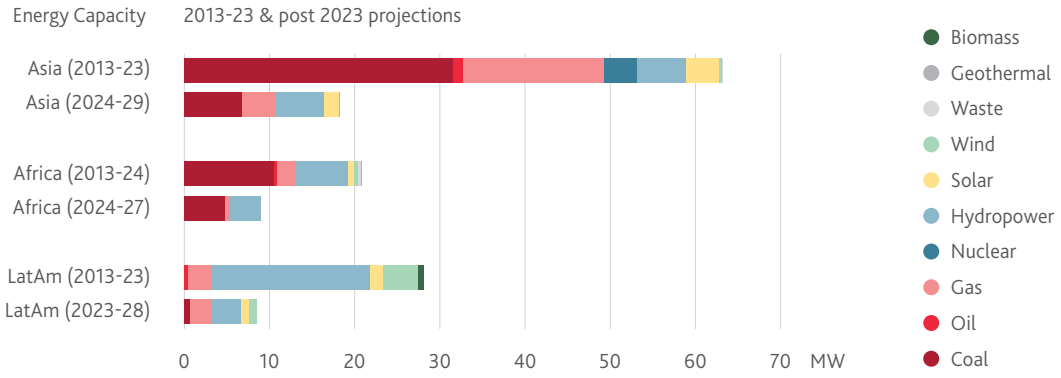



Source: China's Global Power Database, Boston University Global Development Policy Center, 2025.

[18] For a description and analysis of the Belt and Road Initiative from an energy perspective, see "China's energy investment through the lens of the Belt and Road Initiative", Dongmei Chen and Philipp Galkin, Chapter 5 in *A Research Agenda for Energy Politics*, Elgar Ed. 2022

[19] China's economy posted stronger than expected growth in Q1 of 2025 due to a surge in exports, holding steady at 5.4% in spite of the tariff wars (Watson, Jim *et al.*, 2015). The IMF has slashed its forecast for China's real GDP projected growth rate to 4%, down from 5%. See https://www.imf.org/en/Countries/CHN

**FIGURE 11.** Chinese funded Power Plant Capacity in Developing Nations




Source: Compiled from China's Global Power database (CGP). Boston University GDP Conter. Retrieved from https: www.bu.edu/cap/

However, the long-term fundamentals that underpin the deployment of renewable energy worldwide (with the current exception of the United States) remain unchanged, with over 100 countries having adopted or made a pledge to adopt net-zero targets as of June 2024, with this clear sense of direction providing certainty for investors in clean energy over the long run.[20]

This is particularly the case for emerging markets and developing countries whose key priorities include improving energy access (Mission Africa 300) in the context of rapid population growth and urbanization, relying heavily on Chinese technology such as solar PV. China reiterated its support for clean energy deployment in Africa at the FOCAC Summit of September 2024. Contracted clean energy projects in Africa by Chinese enterprises thus reached RMN21.18 billion yuan (nearly USD3 billion) between the end of the Summit and March 2025 while Memorandums of Understanding (MoUs) on green development were signed at the FOCAC Summit with countries including Guinea-Bissau, Ethiopia and the Republic of Congo.[21]

The key role that China has been playing in the financing of capacity in emerging markets and developing economies over the past decade can be seen in the power plant capacity (MW) financed through Chinese FDI and/or loans from the Export Bank of China (CHEXIM) and China Development Bank (CDB) which is estimated to be as follows (in MW units), by region:[22]

## 3.2. EU investment patterns in renewable energy in developing countries in the context of the Global Gateway

The European Commission launched the Global Gateway in December 2021, with a total planned investment of up to 300 billion euros by 2027, with priority sectors that include climate and energy, in particular renewable energy generation, developing hydrogen corridors, and developing electricity grids (**Figure 11**).

The Global Gateway focuses on Africa in particular, to which €150 billion euros have been allocated in total. Team Europe "Africa-Europe Green Energy Initiative" aims at ensuring the deployment of at least 50 GW of new renewable electricity generation capacity and providing at least 100 million people in Africa with access to electricity by 2030. Team Europe and the World Bank Group in Africa jointly support projects in Cameroon, Zambia, Zimbabwe, Malawi and Zambia-Tanzania-Kenya (regional interconnector; European Commission. Joint Research Centre, 2025).

[20] As of June 2024, 107 countries, responsible for approximately 82% of global greenhouse gas emissions, had adopted net-zero pledges either in law, in a policy document such as an national climate action plan or a long-term strategy, or in an announcement by a high-level government official. More than 9,000 companies, over 1,000 cities, more than 1,000 educational institutions, and over 600 financial institutions have joined the Race to Zero to halve global emissions by 2030. See https://www.un.org/en/climatechange/net-zero-coalition

[21] For a list of outcomes of the FOCAC summit, see

[22] Types of deals include DFI only, greenfields, mergers & acquisitions and FDI+DFI with a minimum of 10% Chinese ownership.
China's Global Power interactive database exhibits public financing for global energy projects by CHEXIM and CBD to public entities, public majority-owned or private entities with a sovereign guarantee on a loan. It does not track power plant loans committed by Chinese commercial Banks.
It tracks and displays deal types, Chinese investors and/or lenders, percentage of ownership by investor, amount of capacity in megawatts (MW), type of technology, operating status and the estimated annual $CO_2$ emissions of Chinese financed overseas power plants, by country and by region. For the guidebook to the data collection methodology, see https://www.bu.edu/gdp/2021/03/23/gdp-center-database-methodology-guidebook/

## BOX 1. GLOBAL GATEWAY IN AFRICA: €545 MILLION PACKAGE TO EXPAND RENEWABLES IN AFRICA

A new funding package was announced by the European Commission (October 2025) as part of its Team Europe initiative to accelerate Africa's renewable energy transition. This includes support for hydropower projects as well as solar, wind, and geothermal. It will finance projects in transmission, electrification and renewable generation across several countries.

This package includes:

- Côte d'Ivoire (€359.4 million): A high-voltage transmission line ('Dorsale Est') to boost regional energy distribution;
- Cameroon (€ 59.1 million): Rural electrification for 687 communities, reaching more than 2.5 million people;
- Republic of Congo (€ 3.5 million): Expanding access to renewable energy sources, including solar, wind and hydropower;
- Lesotho (€25.9 million): Unlocking wind and hydro energy through the *Renewable Lesotho* programme;
- Ghana (€2 million): Laying the groundwork for a large-scale solar park and regional energy trade;
- Central Africa (€3.3 million);
- A technical assistance mission to the Central African Power Pool (CAPP) (€1.6 million);
- A facility for funding research and infrastructure for the Central African Power Pool (CAPP) (€0.5 million);
- A feasibility study for the *Friendship Loop* ('Boucle de l'Amitié'), a cross-border transmission line linking Pointe Noire, Brazzaville and Kinshasa (€1.2 million);
- Madagascar (€ 33.2 million): Expanding electrification with mini grids in rural areas;
- Mozambique (€13 million): Supporting a low-emission energy transition and encouraging private sector involvement;
- Somalia (€45.5 million): Increasing access to affordable renewable energy, advancing circular economy practices, and building climate-resilient agri-food systems.

The financing package is part of the Scaling Up Renewables in Africa, which is a year-long pledging campaign initiated by the European Commission and the Republic of South Africa together with the international advocacy organization Global Citizen. It aims to drive new commitments on policy and finance from governments, financial institutions, the private sector and philanthropists (European Commission, 2025c).

The objective of the Global Gateway is to support sustainable development in partner countries, while promoting European values that include good governance, transparency and environmental sustainability.[23] The Global Gateway also provides the EU with a framework and strategy for investing in projects in emerging markets and developing countries, in the context of similar large-scale initiatives being developed by other countries, foremost of which China's Belt and Road Initiative.

EU investment in the deployment of renewable energies in developing economies largely predates the Global Gateway, with support for these technologies beginning to be scaled up from 2010 onwards. Regional patterns of investment over time are apparent, which also indicate where the Global Gateway might focus its investments in terms of geography and in terms of technology. The impact of the Global Gateway in its initial stages can be observed, as well as which renewable energy technologies have been experiencing an increase or a decrease in levels of regional investment over time (Tables 6,7,8).

Concessional finance flows for renewable energy from the EU to developing countries between 2010 and 2023 can be measured using Official Development Assistance (ODA) as reported by the OECD's Creditor Reporting Services (reported in USD), with EU Institutions comprising the Commission, the EBRD and the EIB:[24]

While ODA flows from the EU calculated in USD are not directly comparable to generation capacity investments by China measured in MW, both provide an overview of EU and Chinese patterns of investment in renewable energy in developing countries over time.[25]

ODA disbursements through EU institutions are estimated as follows, by region and by technology:[26]

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[23] Other key priorities of the Global Gateway include digital projects (eg. data infrastructure, digital skills, submarine cables), transport (the development of rail, ports, or roads that integrate sustainability standards), health (the production of vaccines in Africa, pandemic preparedness), and education and research (university networks and partnerships, learning skills development). See https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/stronger-europe-world/global-gateway_en

[24] Official Development Assistance (ODA) is government aid that promotes and specifically targets the economic welfare and development of developing countries. ODA has been the main source of financing for development aid since it was adopted by the OECD's Development Assistance Committee (DAC) as the "gold standard" of foreign aid in 1969. See https://www.oecd.org/en/topics/policy-issues/official-development-assistance-oda.html

[25] Data for both China and the EU with regard to concessional and non-concessional investment flows to developing countries is scattered and fragmented, requiring triangulation between different types of data over different time frames (power capacity deployment in MW, financial flows in USD, as well as lists of projects from development banks). Data from Boston University for China and from the OECD Creditor Services for the EU are used in this paper as providing the best degree of accuracy, timeliness and granularity.
The problem of data that is fragmented and scattered across sectors and jurisdictions, creating issues in terms of comparability and thus in terms of policy implementation, is being addressed by the OECD's flagship initiative Inclusive Forum on Carbon Mitigation Approaches (IFCMA) which aims to strengthen data collection and interoperability. See https://www.oecd.org/en/publications/towards-interoperable-carbon-intensity-metrics_a9cdb1ba-en.html

[26] For the purpose of this paper, only ODA disbursements (and not commitments) are used, as representing actual payments of development aid.

The EIB's commercial loans to developing countries, separate from its concessional financing as accounted for under ODA, are in comparison much larger, with the total thus amounting to €5.624 billion for investments in energy projects, over the period 2020-2025.[27]

EIB operations recently signed (in 2024/2025) include an investment loan for the construction of two solar PV projects (€174 million) and a project to finance investments in sustainable electricity distribution and generation from renewable energy sources (€274 million), both in Colombia, as well as an EIB framework loan to finance hydro power plants (expected in the range of 25-75 MW) and solar PV plants in Bhutan (€150 million). Mini grids are being financed in Madagascar and Nigeria, while the EIB is providing a framework loan (FL) with the national government of Chile, to be integrated in the Team Europe Green Hydrogen Fund for Chile (58 million euros), a platform to finance the green hydrogen market, foster local supply and strengthen the potential for green hydrogen exports to Europe.[28]

While its activities are principally focused on Eastern Europe and Eurasia (Russia, Ukraine, Turkey), the EBRD is also active in developing countries in Africa, co-financing Africa's largest onshore wind project in Egypt (for 1.1 GW of installed capacity) with a USD200 million loan.[29] The Bank has also been a key partner in the development of Tunisia's renewable energy sector, recently financing the construction of a 10 MW solar power plant with a financing package that entails a €3.9 million EBRD loan and up to €1 million in concessional funding from Finland under the EBRD's High Impact Partnership on Climate Action.[30]

European development banks have thus been playing a key role in financing or co-financing the development of clean energy and infrastructure projects in developing countries with a wide range of partners, from both the public and private sectors.[31]

## 3.3. Case Study 1: Scaling-up renewable energy capacity in South Africa: creating a partnership of equals with the EU and China

### South Africa's energy challenges in perspective: addressing the challenges of poverty and unemployment

South Africa has been experiencing a shortage of electricity generation capacity with recurrent blackouts for the past fifteen years, with profound implications in terms of the critical challenges that the country faces (**Figure 13**).

These include very high levels of unemployment–with the current official level of unemployment standing at 33%, the real level being considerably higher, around 45%, together with a poverty rate that stands at around 50%, with 25% of South Africans living in extreme poverty. According to the World Bank, South Africa is the most unequal country in the world, with little progress made in reducing inequality in recent years.

Against this background, energy policy in South Africa is to be considered in terms of its ability to deliver progress on these critical social and economic fronts.

South Africa's economy is historically energy intensive, with high GHG emissions, built around critical sectors such as the mining industry, with the export of minerals such as gold, iron-ore, ferro-alloys and coal representing a key part of South Africa's economy. The electricity sector was thus originally designed to serve this sector, with the creation of a large central electricity system reliant on coal and nuclear power plants that however excluded the majority of the population in the apartheid era. One of the signature achievements of the democratic government was to extend the electricity grid from a level of 25% to most households.

While Eskom, the state-owned utility, was able to generate ample electricity from the late 1990s through the early 2000s, rising electricity demand combined with a failure to construct new coal fired plants under the Mbeki administration as well as over reliance on coal as a source of energy, led to insufficient generation capacity by 2006. A first blackout occurred in 2007, with regular load shedding by Eskom occurring thereafter (six periods between 2007 and 2025), creating a situation of recurrent energy crises. Eskom has also been in a deepening financial crisis since 2007 necessitating massive state bailouts (**Figures 14 et 15**).

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27 See EIB data by project, country and by date for clean energy investment, retrieved from www.eib.org (accessed 11/07/2025), "financed projects", "2020-2025", "Sub-Saharan Africa + Latin America and the Caribbean + Asia and the Pacific" exported to Excel. The EIB often blends EU grants with its own loans to offer concessional finance. The types of investments and projects that the EIB has been financing include the construction of hydropower plants and financing of mini-grids, construction schemes for power transmissions, investment programs to increase access to electricity of rural communities, framework loans to national public banks to finance energy efficiency and renewable energy, equity participation in climate transition funds or debt funds targeting SMEs active in the generation and provision of clean energy.

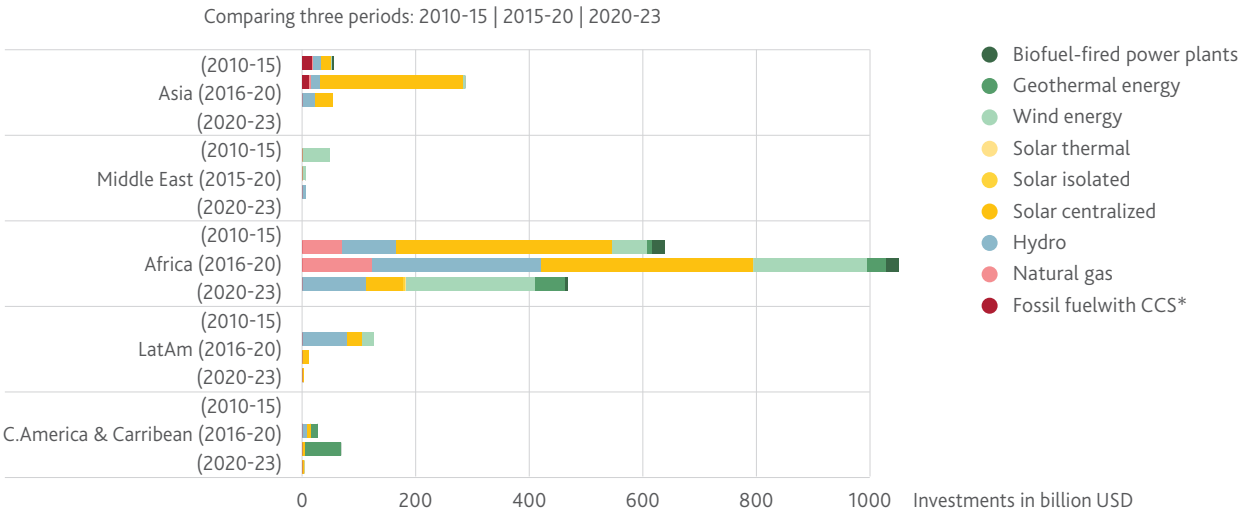
28 Ibid. for an exhaustive list and description of EIB's signed investment projects for renewable energy in emerging markets and developing countries in 2020-2025. See also the EIB Group Climate Finance Roadmap 2021-2025, European Investment Bank Group, 2020. https://www.eib.org/files/publications/thematic/eib_group_climate_bank_roadmap_en.pdf

29 With additional financing from the African Development Bank, British International Investment (BII), German development finance institution DEG, the OPEC Fund and APICORP. The loan is extended to Suez Wind. See https://www.ebrd.com/home/news-and-events/news/2024/ebrd-supports-the-largest-onshore-wind-project-in-africa.html

30 The loan is being extended to Qair, a European renewable energy company. It is one of the first projects to be developed under Tunisia's regulatory framework for renewable projects. The project will moreover encourage gender equality by promoting the inclusion of women in the Tunisian renewable energy sector. See https://www.ebrd.com/home/news-and-events/news/2024/ebrd-promotes-solar-energy-in-tunisia.html

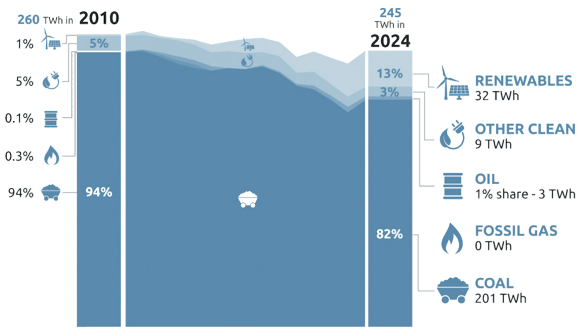
31 See the EIB Group Climate Finance Roadmap 2021-2025, European Investment Bank Group, 2020. https://www.eib.org/files/publications/thematic/eib_group_climate_bank_roadmap_en.pdf, and the EBRD Global Finance's Climate Partnerships, Accelerating the response to climate change, https://www.cif.org/sites/cif_enc/files/knowledge-documents/ebrd_534_sei_eecc_12p_final_lores_0.pdf

**FIGURE 13.** EU ODA Flows for Renewable Energy Capacity Development in Developing Nations



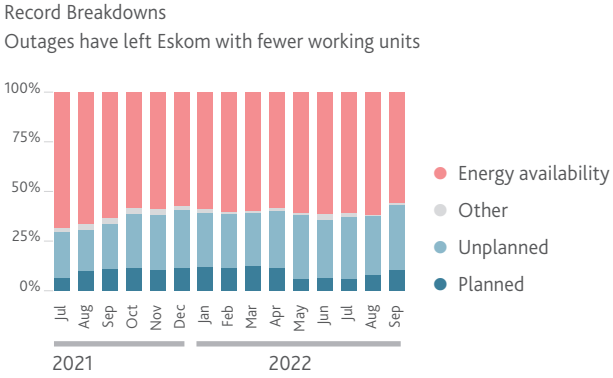

Source: compiled from the OECD Creditor Reporting Services (CRS), OECD Data Explorer

**FIGURE 14.** Power generation in South Africa




Source: climateactiontracker.org

**FIGURE 15.** Eskom available capacity




*Note: Data is for energy generated by Eskom; power from renewables, independent producers and imports is not included.*

**Source: Eskom.**

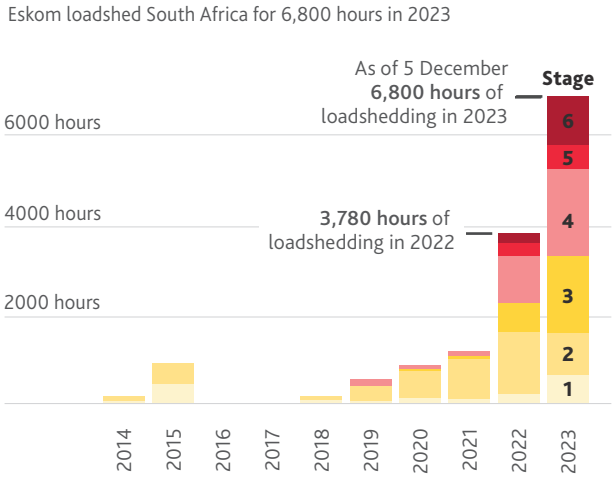
## Bringing renewables into the system: the REIPP and third-party wheeling

In 2010 there was a major government policy shift that included a plan to include 17.8 GW of renewable sources of energy in the Resource Plan (IRP 2010-2030), a total of 42.6 GW required to address these challenges or 42% of all new build generation. The government used new legislation to procure the renewable energy from private producers, resulting in 6 GW of utility scale PV and wind power plants built through Renewable Energy Independent Power Producer Programme (REIPPP). This innovative and internationally acclaimed competitive procurement program, via bidding rounds, for wind, solar PV and Concentrated Solar Power (CSP) projects launched in 2011 and attracted high levels of investment. After procurement, government required Eskom to sign 20-year power purchase agreements (PPAs) with IPPs.

In 2015 the REIPPP programme stalled. Eskom refused to sign power purchase agreements (PPAs) already procured by government and bidding rounds ceased. Senior executives that refused to sign the PPAs were also involved in corrupt coal contracts part of the broader state capture. With a new president and energy minister progress resumed slowly in 2018 with the frozen PPAs being signed and resumption of REIPPP bidding rounds, with installed renewable capacity standing at 6.1 GW or 4.9% of total electricity generation in 2019.

This however proved to be insufficient to prevent subsequent load shedding. Since 2018 bid rounds have been infrequent and only partially successful, falling far short of plans and what is required to meet the chronic supply shortage. Since 2020, 14,800 MW of capacity has been put out to

**FIGURE 16.** Eskom loadshed 2014-2023




Source: The Outlier loadshed.theoutlier.co.za.

tender, but only about half (7,343 MW) has actually been awarded to bidders. Of those awarded projects, fewer than one in five has reached financial close. Regulations have been relaxed to allow private sector initiated IPPs but now a new most important challenge has been the capacity of the grid to connect additional renewable energy IPPs. The Independent Power Producer Office (IPPO) has announced a review of the IPP programme.

Policies favoring the deployment of renewables by opening up the energy market to private sector participation and allowing open access moreover failed to be socially inclusive. Third party wheeling, introduced in 2008 with Eskom allowing Independent Power Producers (IPPS) to export energy onto the national grid, has mostly benefited large businesses, wealthy property owners and organizations. Recently updated rules (May 2025) that include open access to the grid, transparent cost-reflective tariffs and greater regulatory certainty, still largely benefit large commercial and industrial users.

### Key areas of partnership with the EU and China: grid transmission upgrade and the development of a domestic renewables industry

The fundamental issue of how to enable the deployment of renewables in a way that also creates a more just, prosperous and inclusive society, thus remains open ended.

Two key areas that are critical to enabling the deployment of renewables in a manner that is sustainable in the long term and that can help build a more just and prosperous society, lie in the upgrading of the grid together with the development of a domestic renewable energy manufacturing sector. The EU and China have the capacity to actively assist South Africa in both these areas in the context of a partnership of equals provided that an enabling policy and regulatory environment is present.

#### *1. Ambitious procurement targets and demand certainty to create an enabling environment*

A precondition to developing a domestic renewables manufacturing industry is the existence of a secure, long-term and predictable framework to guarantee levels of procurement for new capacity from renewable energy, both by government, Eskom and the private sector. The development of a domestic renewables manufacturing industry, together with expansion of the grid, would in these conditions then further strengthen demand, creating a virtuous cycle, with support from gas imports, gas to power technologies and nuclear power.

The revised integrated resource plan (IRP) 2024, which anticipates a "committed capacity" of 38.5 GW new generation coming only by 2030, thus includes a marked increase in the allocation for onshore wind energy generation. From a minimal allocation in IRP 2023, a total of 76.4 GW of wind energy is now provided for in the revised plan. It is now anticipated that wind energy will contribute between 69 GW and 76 GW across all the planned scenarios of IRP 2024, making it the most prominent technology in the energy mix. As noted by the South Africa Wind Energy Association (SAWEA), this allows the industry to respond with plans to build capacity in the long term to accelerate the development of wind energy.

However, the IRP 2024 was not officially promulgated and since the first IRP in 2011, IRPs have been politically contended, and then also not fully implemented. The overall conflict between fossil-power and renewable energy at the overarching policy level is still not resolved and is crucial to create policy predictability and stability as foundations for secure-enough demand as a basis for investments in the equipment manufacturing industries.

#### *2. An independent grid transmission and a strategy for domestic renewable energy manufacturing*

South Africa's current grid problems however signify that renewable capacity additions will inevitably be capped regardless of commitments. Multiple factors are involved, such as location mismatches, with wind and solar resources located in the Cape region while largest demand is in Gauteng, while key provinces will need major grid upgrades for new utility scale projects to be able to connect. Other factors include ageing infrastructure and maintenance backlogs, fragile public finances and slow transmission build rates.

A transmission license was however granted to the National Transmission Company South Africa (NTCSA) that was officially incorporated in 2021 as a wholly owned subsidiary of Eskom and became operational in July 2024. The purpose of the NTCSA is to act as an independent transmissions operator (ITSO) to provide neutral grid access for all power producers as well as increase the transparency of capacity allocation, thus increasing investor confidence. A new independent grid company is thus in place that can focus on the planning, financing and construction of high voltage grid transmission.

The effective integration of new renewable generation capacity in a sustainable manner is a precondition to the development of a domestic component manufacturing industry across the value chain (excepting solar panels, manufactured in

China). The potential for such an industry to develop in South Africa is very significant, with the South African Renewable Energy Masterplan (SAREM) launched in June 2025 expected to be the "ignition of an economy".

SAREM is designed to anchor industrial development in the local renewable energy and storage value chains, including balance of system components, mounting structures, cabling, control systems, storage solutions and hybrid integration. Strategies such as SAREM can be transformational in terms of creating permanent, long-term local jobs and local revenue in South Africa, as well as in terms of encouraging innovation, technological spillovers, capacity building and local empowerment.

The success of a South African renewable energy component manufacturing industry will moreover depend on the ability to build competitive advantage over the long run, given the price premia associated with localization. Indeed, while the effect of all localization strategies (moderate and ambitious) are estimated to be positive in the short and medium term in terms of job creation and GDP, the effect of the price premium associated with localization is amplified over time, with long term ambitious localization strategies running the risk of leading to job losses and a GDP reduction if they remain highly uncompetitive. It is therefore essential for South Africa to identify and focus on component manufacturing sub-sectors where it can develop a competitive advantage.

### *3. The EU, China and South Africa: establishing a partnership of equals*

Both China and the European Union are South Africa's main trading partners. Loans and grants are delivered through the Just Energy Transition Partnership (JETP), entered into in 2021 at COP26 in Glasgow. Through the Global Gateway and associated clean trade and investment partnerships (CTIP), an investment package of €4.7 billion announced in March 2025, the EU is actively funding renewable energy projects, green hydrogen production, and upgrades to the grid in South Africa. China, under the Belt and Road Initiative, is funding power infrastructure and transmission lines, as well as cooperating in solar, wind, nuclear technology exchanges and energy equipment manufacturing.

In addition to this, investment by China and the EU in grid transmission upgrades and extensions and the development of a renewables manufacturing industry can have a transformational impact on South Africa's energy system and help alleviate unemployment, poverty and inequalities. Building factories, facilitating technological transfers and providing skills training to build much needed capacity to manufacture grid equipment and localize renewables value chains, are essential in the context of a just energy transition in South Africa, as well as to mitigate GHG emissions.

However, for success to be met, China and EU involvement in these essential areas would need to be based on a partnership of equals that would create a level playing field, allowing for the development of a manufacturing sector in South Africa, an emerging economy with vast sources of renewable energy and a BRICS country. The upcoming G2O summit to be hosted in Johannesburg in November 2025 will provide an opportunity to examine priorities proposed by South Africa, including just, affordable and inclusive energy transitions, interconnectivity, and affordable, secure and reliable access to energy.

# 4. CHINA AND EU: INVESTMENT STRATEGIES, FINANCIAL TOOLKITS AND POTENTIAL FOR COOPERATION

## 4.1. Chinese investment strategies and toolkit: South-South cooperation and green finance

### China's Policy Banks (CDB and CHEXIM): facilitating Chinese exports and creating win-win, mutually beneficial processes for green development

China's policy banks, that implement China's national strategy and foreign policy, are a major source of energy finance flows to developing countries (see section 3.1). Energy lending by CDB and EXIM in effect dwarfs that offered by any other lender, including the World Bank (see section 3.1). From 2000 to 2023, CDB and EXIM provided 267 loans, totaling USD209 billion to 118 public borrowers in 68 countries. Levels of overseas energy investment by the policy banks have fallen steeply since 2017, coming to a complete halt in 2022 (Jiaqi Liu, Diego Morro, Shenghen Li, Thang Ha, 2024).

CBD and EXIM are currently cautiously renewing with overseas lending in favor of smaller scale hydro and wind projects, in line with the government strategy of investing in "small and beautiful" projects and green development. In 2023, the average loan amount was USD167 million, compared with USD 574 million average loan amount for all energy loans committed from 2000 to 2022.

While lending for solar and wind represented only 2% of CBD and EXIM's USD52 billion in energy loans from 2000 to 2022, 2023 was thus the "greenest" year so far, with USD502 million committed by EXIM to three new renewable energy projects in Africa (for solar and hydropower projects in Madagascar, Burkina Faso and Uganda) (Jiaqi Liu, Diego Morro, Shenghen Li, Thang Ha, 2024).

China's announcement in 2021 to forgo any new investment in coal overseas has heralded a re-orientation of CBD and EXIM's overseas investment strategies and financial resources towards renewables, particularly in developing countries. While this shift has not yet fully materialized, China's policy banks are poised to become major players in this field in coming years, helping Chinese private sector renewables companies find new overseas markets for their equipment. The Chinese government and the policy banks have a role to play in creating the conditions for the successful export of low-cost Chinese renewables technology, with this requiring in particular investment in modernizing and expanding grid infrastructure (see Case Study on South Africa).

China's investment strategy is intended to create a mutually beneficial and win-win process for all partners and stakeholders involved, in the context of South-South cooperation and of the implementation of a green development strategy, as set out in the CCICED Special Policy Report on Green Opening-Up and South-South Cooperation (2024) and in EXIM's White Paper on Green Finance (2016).

In the case of China-Africa renewable energy cooperation, this strategy includes:

- Continued use of key platforms, including FOCAC, the Belt and Road International Alliance for Green Development and the China-Africa Environmental Cooperation Center to expand cooperation on renewables, while setting more pragmatic actions plans and specific goals in terms of installation and investment;Make full use of existing funds such as the China South-South Cooperation Fund on Climate Change and China's donation to the Global Environment Fund;
- Support regional green infrastructure construction and improve logistics networks;
- Create a North-South-South trilateral cooperation paradigm and project pilot;
- Encourage the establishment of joint ventures with African companies to cultivate a local green industrial environment in Africa, strengthening skills training and promoting local employment such as through programs such as the "Green Silk Road Envoy" plan and the "Belt and Road" ecological talent exchange plan;Build renewable energy industrial parks with the "renewables-driven-renewables" model and invite international investors to jointly develop these with Chinese investors;Assist African countries in formulating correct investment policies to attract investors (China Council for International Cooperation on Environment and Development 2024)

### EXIM's green credit standards and promotion of China's green philosophy

China's green development and green finance strategy as developed by EXIM (which began issuing green bonds in 2016), embeds environmental and social criteria into investment and financing decisions, by developing and implementing rigorous green credit standards focused on the environmental and social risk profile of clients. These green credit standards cover all procedures in the Bank's overseas lending process, from project admission to risk assessment and credit approval, through to loan extension and disbursement and post-loan management and credit exit. Renewables, considered "green", fall under the category of projects that qualify for green credits (The Export Import Bank of China, 2016).

China's commitment to green finance principles and standards moreover has a strong international partnership dimension, including:

- Green investment principles (GIP) for the BRI, co-launched in 2019 by China's Green Finance Committee and the City of London's Green Finance Initiative, to encourage BRI financiers to integrate sustainability into risk assessment, disclosure and governance, and that now counts 50 signatories from over 20 countries (Green Finance and Development Center, 2019; GIP, 2025);
- China-UK Green Finance Working Group, a bilateral platform to encourage cooperation on ESG disclosure and alignment around the GIP (International Institute of Green Finance, 2023);

— PBOC-EIB Green Finance Initiative, a collaboration between China's Central Bank and the EIB to harmonize frameworks and standards in green finance (European Investment Bank, 2017)

EXIM's strategy is aimed at reinforcing international economic transformation in support of China's green philosophy, standards and practices internationally, while promoting the BRI. EXIM has an all-inclusive and multilateral cooperation and exchange mechanism with international institutions, including the World Bank, Asian Development Bank and KfW, supporting a large number of projects through policy-based financing, including in the areas of wind power, biomass generation, solar power and small hydropower stations (including helping finance the Adama Wind Power Project in Ethiopia, sponsoring the development of geothermal area drilling in Kenya or the Houay Kalphan Gnai Hydropower Plant in Laos) (The Export Import Bank of China, 2016).

### China's commercial banks' global sustainable finance strategy and green bonds (green taxonomy)

China's commercial banks, particularly the Industrial and Commercial Bank of China (ICBC), the world's largest bank by assets, are becoming increasingly involved in renewables financing in developing countries, through joint ventures and special purpose vehicles (SPVs), either independently, alongside the policy banks or in partnership with major international institutions. In 2020, the ICBC thus became the first Chinese commercial bank to co-finance a renewables project (a wind farm in Kazakhstan) alongside international partners including the EBRD, AIIB and the Green Climate Fund (EBRD, 2020).

The ICBC has been increasing the proportion of renewable energy projects in its energy financing portfolios, while integrating ESG criteria in all its operations through the ESG Green Finance Rating (ICBC, 2021). It moreover issues ICBC Green Bonds, the proceeds of which are used to finance or refinance Eligible Green Assets from its business units, with renewable energy included as a Green Asset category. ICBC has been actively engaged in global low-carbon development platforms such as the Belt and Road Inter-bank Regular Cooperation (BRBR), the UNEP Finance Initiative (UNEP FI) and the BRI's Green Investment Principles (GIP).

Most notably, in 2025, ICBC Financial Leasing (wholly owned by ICBC) issued the first international green bond aligned with the updated Common Ground Taxonomy 2024 (see Section 4.3), in the form of a USD400 million 3-year floating-rate green bond offering. This landmark offering sets a new benchmark in international green bond issuance, with the development of common ground taxonomy (CGT) broadening the financial channels through which green energy projects, including renewables, can be developed, thereby enhancing the credibility of market participants (Crédit Agricole CIB, 2025; Monetary Authority of Singapore, 2024). ICBC also issued in 2025 multi-currency "carbon neutrality" themed overseas green bonds (ICBC, 2025).

### BOX 2. THE SILK ROAD FUND AND CHINESE EQUITY INVESTMENTS IN RENEWABLES

Established in 2014 under the Company Law of the People's Republic of China, the Silk Road Fund is a major equity investment vehicle for greening China's BRI.

The Fund has a total capital of USD40 billion and RMB100 billion. The State Administration of Foreign Exchange contributes 65% of capital, EXIM 15%, China Investment Corporation 15% and CDB 5%.

The SRF's flagship investments include:

— In 2025, SRF invested in Skyline, a Brazilian electricity transmission platform launched by Actis. Skyline currently owns and operates two transmission line assets totally 857 km and is in the process of acquiring further assets. This investment in Brazil's core infrastructure facilitates the transmission of green power from generation sites to load centers through the national grid. It facilitates Brazil's renewable energy integration and energy transition while promoting regional interconnectivity;

— In 2023, SRF partnered with French private investment firm Ardian to co-invest in GreenYellow, a global developer of distributed solar PV and energy efficiency projects;

— SRF invested in private equity fund African Infrastructure Investment Fund 4 (AIIF4). AIIF primarily targets investments in South Africa, Kenya, Morocco and Nigeria. Its portfolio focuses on essential infrastructure critical to energy transition (as well as other socially impactful sectors such as digital infrastructure and transportation logistics). AIIF4 strives to improve local livelihoods, foster local employment and enhance women's status through its investments. In 2023, Silk Road Fund committed USD50 million to AIIF4 as a limited partner, introducing relevant provision of the Green Investment Principle (GIP) for the Belt and Road.

— During the Third Belt and Road Forum for International Cooperation held in October 2023, the SRF signed a cooperation framework with the Hong Kong Monetary Authority (HKMA) to establish a Belt and Road investment platform. The two parties committed a total investment of up to RMB15 billion (or equivalent in foreign currency) to explore ESG-thematic investment opportunities. Under the platform, both parties established the BNR HK Flagship Impact Fund, with SFR as general partner. The initial fund size is up to USD1 billion (or equivalent in RMB). It includes investments in renewable energy and related sectors. The fund promotes global decarbonization and positive environmental impacts. Geographically focusing on Belt and Road countries and regions (particularly Asia and the Middle East), it facilitates job creation and local growth in emerging markets. (Silk Road Fund, 2025).

Each stakeholder in China's financial eco-system plays a different role in financing renewable energy projects in developing countries: while CDB issues long-term concessional loans to the host government or utility, EXIM provides export credits tied to Chinese equipment suppliers, ICBC provides syndicated commercial loans, while the Silk Road Fund invests equity alongside Chinese developers and Sinosure provides guarantees and insurance that enable these investments (commercial and political de-risking).

Co-financing with international financial institutions, such as the World Bank, International Finance Corporation, African Development Bank, the Clean Technology Fund or the Asia Infrastructure Investment Bank, enables the mobilization of larger volumes of capital, spreads risk-sharing and is beneficial as an endorsement of Chinese financing.

## 4.2. The EU's financial toolkit and regional partnerships

While China has a state-driven model, with its policy banks mandated to implement China's national strategy and foreign policy, the European Union (Team Europe) operates within a framework that includes a greater variety of actors whose objectives include implementing Global Gateway Climate Action objectives, UN SDGs and EU policy priorities.

The nature of the EU's financial toolkit diverges from China's in terms of the multiplicity of actors and stakeholders due to both partners having very different governance models, the EU being a supranational union of 27 countries whereas China operates according to a much more centralized, state-driven governance model. Both these models offer comparative advantages that can be complementary, in terms of size and modalities of financing for renewables projects in developing countries.

While China's policy banks have historically provided high volume state financing primarily for large-scale projects (with this generally bundled with construction and operation of projects by Chinese companies), in particular big hydropower projects, EU stakeholders tended to provide financing for both large-scale projects and for small and medium-scale projects, with a view to catalyzing private sector investment. Both China and the EU are investing equity in funds for the deployment of clean energy and in power infrastructure, such as through the Silk Road Fund for China and through the EIB, DFIs and theme-specific initiatives for the EU.

### The EU's financial toolkit and partnership framework includes:

— **The Global Gateway Initiative (Team Europe): the EU's framework for investment in infrastructure and connectivity projects worldwide (grants, concessional loans, guarantees to de-risk private sector investments)**

The Global Gateway (see Section 3.2) is the EU's framework for investing in infrastructure and connectivity projects worldwide, with the aim to mobilize 300 billion euros over the period 2021-2027 (Tagliapietra, 2024). This includes projects that improve global and regional connectivity in the digital, climate, transport, health and energy sectors.

#### BOX 3. THE GLOBAL GATEWAY AND CLEAN ENERGY DEPLOYMENT: KEY REGIONAL PARTNERSHIPS

The Global Gateway coordinates EU budget instruments, including the Neighbourhood, Development and International Cooperation Instrument (NDICI), the European Investment Bank (EIB), the European Bank for Reconstruction and Development (EBRD), national development banks (such as KfW) and private sector partners.

Key partnerships include the EU-Africa Green Energy Initiative with €3.4 billion committed to support solar, wind, hydropower, grid infrastructure and mini grids, with the deployment of 50 GW targeted by 2030, providing at least 100 million people with access to electricity. In October 2025, the European Commission announced a €545 million package to scale-up renewables in Africa (European Commission, 2025a; European Commission 2025c).

The EU's Global Gateway strategy in Latin America aims to support renewable energy deployment, the development of green hydrogen with production for export to Europe as well as local use, grid upgrades and the development of storage projects (European Commission, 2025).

Key Global Gateway partnerships in Asia include the EU-ASEAN dialogue on energy, EU-ASEAN Sustainable Connectivity Partnership, the Just Energy Transition Partnerships (JETPs) to support coal phasing-out (Indonesia and Vietnam), the EU-India Clean Energy Partnership, as well as Pacific Island partnerships and cooperation on green hydrogen with Central Asia (in Kazakhstan) (European Commission, 2022c; European Commission Global Gateway, 2025; Kemelova, 2025; European Commission, 2022b). The EU also provides technical assistance for the development of renewable energy regulatory frameworks or for cross-border power trading. A new Partnership and Cooperation Agreement (CPA) with Bangladesh is currently being negotiated (PubAffairs Bruxelles, 2023).

Approximately half of the anticipated €300 billion objective is to be raised by crowding-in private investment through a system of financial guarantees. The Global Gateway has a strong focus on technical assistance and expertise, alongside finance.

The Global Gateway was developed on the basic premise that the world needs major investment in infrastructure (World Bank, 2019). Its objective is to narrow the global investment gap and scale-up economic and social development in EU partner countries, as well as promote EU values and a vision of sustainable development that delivers concrete, durable results. It also aims to help EU industry better position itself in the global race for infrastructure and connectivity, and access new, growing markets (Tagliapietra, 2024).

Its key regional priority is Africa (see Section 3.2). A significant achievement of the Global Gateway is the Africa-Europe Investment Package, which allocated around €150 billion to partnerships with African nations (European Investment Bank, 2024).
Finance allocated to Climate Action, clean energy and connectivity in Europe's partner countries around the world include €18 billion under the Global Gateway, through joint financing by the European Commission and the EIB.
Individual project allocations for renewable energy under the Global Gateway include:

- €400 million earmarked for renewable energy projects in Bangladesh, with the EU launching negotiations for a new Partnership and Cooperation Agreement (PCA) with Bangladesh (Team Europe, EIB, EU; European Commission, 2023a);
- a €500 million package (Team Europe, EIB) in support of the Just Energy Transition Partnership (JETP) in Vietnam, partly for energy transition (financing of renewables and decarbonization projects) (European External Action Service, 2023);
- €24 million to accelerate implementation of the Gambia Renewable Energy project (EIB, EU), bringing the total to €100 million (European Commission, 2023c)

— **European Fund for Sustainable Development Plus (EFSD+): blended finance, technical assistance and guarantees**

The EFSD+ sits under the Neighbourhood, Development and International Cooperation Instruments (NDICI-Global Europe), which is the EU' s funding instrument for external relations, cooperation and development aid for the period 2021-2027. Africa is the single largest recipient of NDICI funds, through its geographic programme (over €29 billion for Sub-Saharan Africa).
The EFSD + is the financing arm of Global Europe. It operates within a blended finance, risk-sharing guarantee model to leverage additional investments. It can combine EU grants with loans, equity and guarantees from the EIB and other financial institutions. The risks covered by the EFSD+ include political instability, currency inconvertibility and project default. The EFSD +is managed by the EIB and the European Commission.

Its objective is to support European DFIs and their co-investors address the energy access gap in developing countries (emerging markets) by de-risking and catalyzing private and public investment in renewable energy, energy access and green infrastructure. It supports both utility-scale renewables and decentralized energy access projects.

It proposes Open Architecture Guarantees and technical assistance (for example, partnering with AFD or with KfW to de-risk their investments), such as through its EDFI Renewable Energy Transition (RET) Initiative in partnership with EDFI MC (guarantee volume of up to 164 million euros and €8 million in technical assistance) focusing on Sub-Saharan Africa, Latin America and the Caribbean, Asia and the Pacific. EFSD+ helps local non-sovereign companies issue currency bonds and supports private enterprises through the construction and implementation phase of projects (European Commission, 2025d).

— **European Investment Bank: direct long-term loans, guarantees and risk-sharing, blended/concessional finance, intermediary financing (local banks, development banks, DFIs), climate funds.**

The EIB is the EU's development and climate bank. It supports EU policy priorities in the context of climate action, clean energy, infrastructure and sustainable development in developing countries. In 2O22 and 2023, the EIB provided 60 billion euros as part of the Global Gateway initiative.

It provides long-term financing for projects that are alignment with these strategic objectives, through a variety of financial instruments. These include direct, long-term loans to projects (EIB Global); lending through local banks or intermediaries; guarantees and risk-sharing grants, technical assistance and advisory services; blended finance (grants, concessional loans, guarantees); partnerships with other development banks and institutions; support for innovation in clean technologies (www.eib.org).

— **Development Finance Institutions: mobilization of private capital**

DFIs that mobilize private capital in developing countries include Proparco (AFD) in France, DEG (KfW) in Germany), FMO in the Netherlands (state-owned), FinnFund in Finland (state-owned) or IFU in Denmark. These institutions provide risk capital, long-term investment loans, mezzanine financing and expertise on how to invest in developing markets, with investments in projects and businesses that drive sustainable development (European Development Finance Institutions 2023).

AFD and Proparco, with support from the EU, have set up the African Renewable Energy Scale-up Facility (ARE Scale Up) to boost private sector investment in on-grid and off-grid renewable energy production in Africa, including a Guarantee Facility and a Technical Assistance component.[32] A first investment of USD3 million in equity was made in Rensource (Holdings), a key player in the renewable energy sector in Nigeria (Hirsch, 2020).

— **Global Energy Efficiency and Renewable Energy Fund (GEEREF): blended finance and early-stage equity**

GEEREF is a public-private equity fund of funds launched in 20028 by the European Commission, Germany and Norway, and managed by the EIB. It proposes a blended finance model, with public financing from the EU and donor states used to attract private investors. It focuses on renewable energy generation in Sub-Saharan Africa, Latin America and the Caribbean, including solar, wind, hydro, biomass and energy efficiency, targeting projects below utility scale (10-200 MW). It provides early-stage equity, with priority given to investment in countries with appropriate policies and regulatory frameworks. It invests in private equity funds to support projects that are inclusive, off-grid and SDG oriented (Global Energy Efficiency and Renewable Energy Fund, 2025).

[32] ARE Scale-up has two objectives: to increase access to energy for people far from electricity grids and to deploy renewable energies connected to the grids. See https://www.afd.fr/en/are-scale-deploying-renewable-energy-africa

— **Electrification Financing Initiative (ElectriFI): blended finance, EU grants for impact investment in less developed economies**

ElectriFi is an EU-funded impact investment facility launched in 2015 that offers a unique investment model for investment in less-developed economies, combining technical assistance with risk capital. This blending facility enables private investors and DFIs to deploy capital in countries and projects in fragile situations. It finances early-stage and small-sized projects focusing on electricity access and generation from sustainable energy sources, with a particular focus on sub-Saharan Africa, with Country Windows (dedicated funding for selected countries).

The total size of the fund is €254 million, with 40% of its portfolio for renewable energy markets co-invested with other DFIs. ElectriFI is managed by the EIB through a dedicated facility, EDFIs Management Company (EDFI MC, 2025).

— **Africa Energy Guarantee Facility (AEGF): de-risking investment In Sub-Saharan Africa**

The AEGF is a guarantee to support reinsurers in the provision of investment and trade insurance services for the African energy sector through local partners. The operation is initiated by the EIB and forms part of the Bank's response under the UN Sustainable Energy for All (SE4ALL) initiative. Eligible investment projects covered by the guarantee include renewable energy, energy efficiency, small-scale hybrid energy systems, electricity transmission and distribution. Partners include Munich Re and the African Trade Insurance Agency (ATI) (EIB ,2017).

## 4.3. EU-China financing, Common Ground Taxonomy (CGT) and an EU-China joint platform

### Joint guarantees for capital mobilization in support of renewables projects in fragile economies

The EU and China have complementary financial and technical toolkits which, used in a coordinated manner, can have a transformative impact on finance mobilization and technical capacity-building.

This is particularly the case for fragile economies that require greater risk-sharing and stronger guarantees to lower the cost of capital and mobilize finance flows. For these poorest and most fragile developing countries, grants and highly concessional loans remain critical in a context of poverty, food insecurity, debt distress and slower post- COVID-19 recovery.

Joint EU-China guarantees, combined with technical assistance, can unlock additional sources of financing for renewables or grid infrastructure that would normally avoid this type of more limited, high-risk market, such as commercial banks, climate funds, private institutional investors, or philanthropists (Chabert, Guillaume and Robert Powell, 2025).

This is particularly important in the case of the poorest and most fragile countries in Sub-Saharan Africa that are being left behind in the clean energy transition compared with their more advanced counterparts, for instance in the Maghreb

**BOX 4. THE EIB'S ROLE IN CLEAN ENERGY AND INFRASTRUCTURE FINANCING IN DEVELOPING COUNTRIES**

Between 2020 and 2025, the EIB committed to provide financing for projects in developing countries across Africa, Latin America and Asia that include, *inter alia*:

— In Bhutan, renewable energy framework loan to finance hydropower plants (expected in the range of 25-75 MW) and solar PV plants, for an estimated total of 310 MW. The thirty-year €150 million loan will increase renewable energy generation throughout the year and support Bhutan's efforts to meet its NDC of permanent carbon neutrality;
— In Madagascar, investment in interconnections between Antananrivo Toamasina Prirtem 1 (€81,3 million). This project concerns the construction of a 220 Kvn 270 km long overhead transmission line and related substations that will interconnect the currently isolated power systems of Antantanarivo and Toamasina, thereby supporting the integration of large-hydro power plants being developed in both systems. The EIB has also financed mini grids in Madagascar (€15 million);
— Investment in electricity distribution scheme in Rwanda consisting of the financing of low and medium voltage networks and rehabilitation and upgrade of distribution networks. The new network investments will give access to electricity to approximately 190, 000 new connections and the rehabilitation and upgrade of distribution networks will contribute to the increase of capacity, improvement of grid reliability and enhancement of operational efficiency (€100 million);
— Emerging market climate action fund (EMCAF), which will be a fund of funds targeting €500 million to invest in funds providing funding to climate mitigation and climate adaptation, as well as environmental sustainability projects in developing countries. Will be managed by Allianz Global Investors, to which the EIB will act as investment advisor;
— Equity participation in Leapfrog Asia and Africa Climate Transition Fund, a growth equity fund focusing on companies supporting climate action and environmental sustainability solutions in Asia and Africa and supporting the Climate and Energy pillar of the Global Gateway strategy (€17 million);
— Investment in Africa Finance Corporation for the financing of a USD750 million Infrastructure Climate Resilient Fund (ICRF)

Source: www.EIB.org

or in South Africa, that benefit from a higher-income, varied exports, as well as better access to capital market (Chabert, Guillaume and Robert Powell, 2025), as reflected in their strategies that envision the export of renewables through regional interconnections, or the building of a domestic renewables industry (see Case Study on South Africa).

China's large-scale financing/EPC turnkey toolkit, backed by Sinosure, China's large state-owned insurer, combined with the EU's financial toolkit that acts as a catalyst for the private sector, with multiple de-risking instruments including EFSD+ Guarantees, EIB guarantees or AEGF guarantees, can accelerate investment in green industrialization and enhance clean energy access in the least developed countries, alongside measures such institutional capacity-building or debt restructuring as necessary.[33] This can help ensure a more just and equitable clean energy transition, inclusive of all developing countries.

### EU-China joint financing with multilateral development banks

Developing countries can benefit most from EU-China financing and technical assistance that also brings together multilateral development banks, regional development banks (RDBs), national development banks (NDBs), DFIs as well as local energy utilities and SMEs (whether domestic or foreign) that have both technical expertise and a deep understanding of local contexts (Ocampo and González, 2024).

In such a context, co-financing between China and the EU together with multilateral financing can lower the cost of capital by increasing the volume and diversity of financing available and by spreading the risk amongst a greater number of parties and stakeholders, particularly in African countries that face a high cost of capital (WACC) such as Ghana, Nigeria, Zambia or Ethiopia, together with an elevated cost of equity (Prudence Dato *et al.*, 2024). In the context of joint financing, multilateral development banks can act as neutral conveners between the EU and China in terms of internationally recognized environmental and social standards, as well as for harmonizing EU technical assistance funding with Chinese contractors' delivery capacity, while providing an additional layer of guarantee (for instance through the World Bank's Multilateral Investment Guarantee Agency, www.miga.org). Partnering with MDBs can help attract higher levels of blended finance, as well as enhance the credibility of the participants as investors and of the project itself.

EU-China joint financing, together with multilateral partners where needed, can help attract the higher levels of foreign investment and international private finance required for wealthier developing countries in particular (Chabert, Guillaume and Robert Powell, 2025). Joint EU-China investment in renewables and clean energy projects in higher-income developing countries that have a more enabling investment environment, brings the additional advantage of facilitating the design and pilot-testing of innovative financial mechanisms in support of the transition from fossil fuels to renewables, and that can be replicated elsewhere (see Case Study on Chile).

### EU-China Common Ground Taxonomy (CGT) and the development of interoperable taxonomies

An essential aspect of EU-China green finance cooperation that can benefit the deployment of clean energy in developing countries, is the EU-China Common Ground Taxonomy (CGT) developed under the International Platform on Sustainable Finance (IPSF) (See Box).

The CGT (first published in 2022, updated in 2024) is an exercise in mapping out areas of overlap and commonalities between the EU and China's current green taxonomies and their corresponding "substantial contribution" to the climate change mitigation objective. It is a living, technical tool that is designed to enhance the comparability and interoperability between the EU and China's green activities, with energy identified as one of the Priority Sectors (IPSF, 2024).

The EU-China CGT has an important role to play as a reference document and classification system that can be used by a wide range of market participants. These include financial institutions, corporates, investors and external reviewers that are thereby able to assess what can be considered green across both the EU and Chinese jurisdictions in terms of the "substantial contribution" scope (European Commission, 2022a).

This can help reduce transaction costs by avoiding unnecessary duplication of verifications, thereby facilitating cross-border movement of green capital flows for renewables projects, especially to developing countries. Further work on developing the EU-China CGT is required to improve comparability and to extend to a wider range of activities for clean energy, including renewables. The EU and China both have different granularity and activity boundaries and use thresholds, metrics and life-cycle approaches that are divergent. Finding common or neutral ground on metrics and methodologies closes these gaps, helping to include a greater number of shared activities under the CGT.

The OECD's Inclusive Forum on Carbon Mitigation Approaches (FCMA) can provide a useful reference point for methodological principles, science-based benchmarks and governance tools that could bring together the EU's detailed technical metrics with China's more flexible approach in those areas where gaps exist, while avoiding the risk of agreement on a lowest common denominator (OECD, 2025c). On the same basis, future versions of the CGT could include the EU's Do No Significant Harm (DNSH) to other environmental objectives principle and the EU Minimum Safeguard principle (European Commission 2025b). The G20 Sustainable Finance Working Group SFWG) can help frame these principles in globally relevant terms on which both the EU and China could agree, for inclusion in future versions of both the CGT and of the M-CGT (G20 SFWP South Africa, 2025) (See Box).

The CGT can be used as a methodology for the development of other taxonomies, in line with the work of the G20 Sustainable Finance Working Group (G20 Italian Presidency,

[33] See the UN list of least developed countries, https://unctad.org/topic/least-developed-countries/list

2021). It provides the foundation for the 2024 Multi-Jurisdiction CGT (M-CGT) that includes the Singapore-Asia taxonomy, while it can also be adopted as an existing methodology in the context of other smaller markets.

Developing countries are thus developing their own national and regional taxonomies at a rapid pace, such as ASEAN Member States (Indonesia, Malaysia, the Philippines, Thailand and Singapore have national taxonomies, as well as South Korea, an ASEAN partner country) that are currently taking steps towards regional harmonization of their taxonomies (UNEP Finance Initiative, 2025). In Africa, the first continent-wide Sustainable Finance Taxonomy was recently endorsed by the financial sector, through an initiative led by the African Development Bank and that addresses a key gap in Africa's sustainable finance architecture (ADB, 2025). In Latin America, Colombia and Mexico have national taxonomies, with work currently ongoing to develop a common framework of sustainable finance taxonomies in Latin America and the Caribbean as a guidance document (UNDP, 2023).

The EU and China could in the future link up their CGT with the national and/or regional taxonomy frameworks of developing countries that would thereby be able to "plug-in" to the CGT. This would further facilitate cross-border financial flows in support of clean energy and renewables deployment, while also contributing to the development of an increasingly inter-connected common taxonomy framework at a global level (G20 SFWP South Africa, 2025). Further developing and extending the EU China CGT can thus support reform of the international financial architecture, following the 4th UN Finance for Development Conference held in Seville in July 2025 (UN Foundation, 2025).

### Identifying a common EU-China strategy and shared priorities

Coordinating the EU and China's financial toolkits effectively, by providing greater guarantees and risk-sharing, partnering with multiple stakeholders or by enhancing the interoperability of taxonomies, rests on identifying common EU-China interests and priorities.

EU-China strategy rests on their shared commitment to green development and to helping developing countries increase their level of access to clean energy in the context of rising demand for electricity and the objectives of the SDGs. It also rests on the EU and China's shared interest in positioning themselves in the race for clean energy and green industrialization by entering new, emerging markets in developing countries. In the case of the EU, this can help it achieve its own Green Deal through the import of renewables (green hydrogen, renewable electricity) or supply diversification. Joint cooperation can reinforce the EU and China's commitment to investing in new projects for clean energy and renewables in new, higher-risk markets, based on creating win-win situations for all partners involved.

The complementary nature of their capabilities, based on their own economic development pathways and experience with energy system design, with the EU having expertise in regulatory, legal and policy advisory such as renewables market

### BOX 5. THE CGT AND M-CGT: THE DEVELOPMENT OF EU-CHINA COMMON GROUND TAXONOMY

A key aspect of EU-China cooperation for the development of green finance and green activities is the EU-China Common Ground Taxonomy (CGT) developed under the International Platform on Sustainable Finance (ISPF).

The CGT covers the "EU Taxonomy for Sustainable Activities" and the People's Bank of China (PBOC) "Green Bond Endorsed Project Catalogue" (GBEPC) or "2021 Project Catalogue". A first version of the EU-China CGT was published in 2021, with an updated version in 2022 (European Commission ,2022a; IPSF Taxonomy Working Group Co-Chaired by the EU and China, 2022).

A third version was included in the Multi-Jurisdiction CGT (M-CGT) that extends to the Singapore-Asia Taxonomy (Monetary Authority of Singapore, 2024), with a greater number of sectors and a wider range of shared activities.

The EU-China CGT is a comparison of the sustainable finance taxonomies of China and the EU, identifying areas of overlap between the two (where no overlap exists, the activity is not included). It is a reference tool that represents an in-depth comparison exercise that maps out areas of commonality and differences in the EU and China's sustainable finance activities.

The CGT involves the mapping of all common environmentally sustainable activities that are at present included in both taxonomies to a neutral code, the International Standard Industrial Classification of All Economic Activities (ISIC) to improve comparability and interoperability between the EU and China taxonomies.

The 2022 CGT currently includes 72 climate change mitigation activities that share common ground between the EU and China taxonomies, under the scope of "substantial contribution to climate change mitigation". Energy is included as an identified priority sector, with ten activities related to the manufacturing of clean energy technology, including for electric power generation, transmission and distribution, electricity storage and the manufacturing of equipment.

The EU's taxonomy is the most sophisticated and innovative in its design, establishing detailed eligibility criteria and requiring that significant trade-offs between environmental objectives are avoided or at least minimized. China's 2021 Project Catalogue stipulates an exhaustive list of eligible projects for green bonds. It removes clean utilization of coal and oil from the list of eligible projects, reflecting China's determination to converge with international standards and enhance the credibility of its green finance market (International Capital Market Association, 2021).

design and China having exceptional large-scale engineering and construction capabilities, combined with rapidity of execution, can form the basis for an effective joint strategy. Global tensions over tariffs, geopolitical uncertainty combined with significant economic challenges -including in both the EU and China- as well as uncertainty over future levels of international aid (falling for the first time in six years in 2024), require a coordinated EU-China leadership to support the clean energy transition in developing countries (OECD, 2025b).

EU-China leadership rests on identifying and working on the basis of common priorities. Both China and the EU have identified the development of local content and the building of domestic renewables manufacturing industries in developing countries as a priority, with this including the development of local skills and talents through partnerships, with a focus on job creation. China is thus proposing a "renewables-driven-renewables" industrial hub model for developing countries (i.e. hubs powered by renewables), while the EU has a strategy for developing Net-Zero Acceleration Valleys within the EU that could be used as a model for building domestic renewables industry hubs in developing countries, or that could form the basis of external cooperation in this area (The Export Import Bank of China, 2016; Official Journal of the European Union, 2024).

This cooperation can be developed in the context of EU-China commercial interests that are already deeply intertwined on the ground in certain areas, such as in the context of the Lobito corridor that connects Angola's Lobito port to the copper belt of the DRC and Zambia (Poorva Karkare and Bruce Byiers, 2025). Moreover, certain countries and regions can provide a template for trilateral cooperation, such as Morocco, where both the EU and China have established partnerships, in particular in green transition minerals (GTMs) (Stephen Duah Agyeman and Hermas Abudu, 2025).

### Developing cooperation on the ground for renewables deployment

Effective EU-China cooperation rests on developing a concrete common action plan, based on their respective toolkits. China and the EU can coordinate their actions in developing countries by mobilizing their diplomatic and economic presence (EU Embassies, China Chambers of Commerce) as well as their numerous agreements and partnerships at both national and regional levels (Memorandums of Understanding [MoUs] signed by China, forums such as FOCAC, partnerships such as EU-ASEAN). This can raise the visibility and impact of their action as well as better promote renewables in developing countries. Existing partnerships could moreover be replicated in the context of EU-China cooperation.

The Just Energy Transition Partnership (JETP) for South Africa, for instance, is a partnership between South Africa, France, Germany, the United Kingdom and the EU to help South Africa transition from coal to clean energy and decarbonize its economy, including an USD8.5 billion package. JETPs have been subsequently concluded with Vietnam, Indonesia and Senegal. JETPs are multi-partner platforms that combine concessional finance, technical assistance and policy support to help developing countries implement policy reform, grid integration and pathways to phase-out coal (Ordonez *et al.*, 2024).

This type of partnership, with a clear governance model, could be replicated by the EU and China with a view to coordinating their actions and avoiding duplication. Such a joint EU-China platform or partnership for the deployment of renewables could work in conjunction with other key multilateral forums and organizations, such as the G20, the UN and development banks, using the CGT as a common EU-China reference for green investment.

Joint EU-China cooperation would also include other stakeholders within the EU or Chinese eco-system present in developing countries. Both China and the EU have large energy companies or state-owned enterprises that have an established local presence in many developing countries and that play a critical role in identifying and developing new projects on the ground (Engie, Total, PowerChina, Sinohydro, China Energy Engineering Corporation, etc.). These represent key stakeholders in the transition to clean energy.

Small, locally established companies from the EU or China also have a significant role to play in developing projects and as a source of information and feedback on the practicalities and challenges of operationalizing local projects, such as EGE Energy Solutions in Cambodia that imports French solar panels and participates in building sustainable local agricultural communities in Cambodia. These types of local stakeholders also contribute to identifying and building up bankable pipelines of renewables projects in developing countries, with support from external partners such as UNDP (EGE Energy Solutions, 2024).

## 4.4. Case Study 2: The Calama Wind Project in Chile: de-risking investment and piloting decarbonization instruments

### Overview

The Calama Wind Farm is a 151 MW onshore wind project that is primarily aimed at replacing the generation capacity lost from the accelerated closure of two coal fired power plants at Tocopilla owned by Engie Energia Chile (EECL) (a subsidiary of French utility Engie) by a new renewable energy asset.[34] It is located near the city of Calama in the Antofagasta region of Chile. It comprises 36 wind turbines, each with a 4.5 MW nameplate capacity. Electricity generated from the wind farm is supplied to Chile's national grid, the Sistema Electrico Nacional (SEN). Construction for the Calama Wind Farm began in 2019 and was completed in 2021 (Zelenczuk, Nick and Weinstein-Wright, Ilsa, 2025).

[34] As of 31 March, 2025, EECL is controlled directly by French energy group Engie Group, which owns 60% of EECL shares, with the remaining 40% traded on the Chilean stock exchanges. See Engie Energia Chile S.A. Consolidated Financial Statements for the period ending 31 March, 2025. https://www.engie.cl/wp-content/uploads/2025/05/Consolidated-FS-March-2025-Engie-Energia-Chile.pdf

### Financing structure

The total construction cost for the Calama Wind Farm was $152.9 million. The project was financed by a $125 million loan package provided by IDB Invest, the private sector arm of the Inter-American Development Bank. The IBD Invest loan package consisted of a $74 million senior loan from IDB invest, $15 million of blended financing from the Clean Technology Fund (CTF)[1] and $36 million from the People's Bank of China (PBOC) *via* the IDB Invest-managed China Co-Financing Fund for Latin America and the Caribbean (CHC). The loan carried 12-year maturities. Remaining project costs were funded by EECL sponsor equity of $27.9 million (IDB Invest, 2021).

### Blended finance in the form of a compensation scheme embedded in debt structure

In the context of this project, IBD Invest and Engie piloted a new decarbonization instrument that would accelerate the closure of two coal power plants owned by Engie to achieve a greater reduction in emissions. This decarbonization instrument took the form of a compensation scheme embedded in debt structure.

Concessional funds from the CTF were used with commercial financing to incentivize the expedited closure of two coal power plants by Engie, by creating an alternative revenue stream in the form of the construction of a new renewable energy asset, the Calama wind power farm. The reduced emissions from the closure of the power plants earlier than originally targeted, would be monetized and used to lower the borrowing costs associated with the construction of the wind farm. This is equivalent to embedding a temporary subsidy to incentivize the owner of a coal power plant to forfeit revenue from a net profitable business.

### A pilot scheme for a new high integrity carbon asset class to provide a new revenue line

In this context, a new, high integrity carbon asset class was also piloted by IDB Invest. The resulting monetization of the enhanced emissions reduction provides Engie with an alternative source of revenue that can replace the blended financing in the event that a carbon market compliant with Article 6 of the Paris Climate Agreement materializes during the term of the decarbonization instrument (within the 12-year term of loans).

This decarbonization instrument would in this case establish a new revenue line (with the same company owning both the retired coal power plant and the new renewable energy asset). As a result, two coal fired units at Tocopilla were retired two years ahead of schedule.

As a first-of-kind transaction, IDB Invest devised a new methodology to quantify the actual emissions avoided from the accelerated retirement of the coal units. IDB invest is currently in discussion with other governments and coal owners in the region to duplicate this instrument, most notably in the Dominican Republic (Zelenczuk, Nick and Weinstein-Wright, Ilsa, 2025).

### Replicability: the role of an enabling environment for decarbonization instruments

The case of the Calama wind power plant is an example of co-financing by a European majority-owned company, a multilateral development bank and China that provides a template that may be replicated elsewhere, in the context of an expedited transition from a coal asset to a renewable energy asset and provided a positive enabling environment is present.

The presence of an enabling environment, at the level of both governments and corporations, is a pre-condition for successful replication. IDB Invest was in effect able to set up a compensation scheme and pilot a new high integrity carbon asset class in the context of the government of Chile's clear commitment to phase out all coal assets by 2040 and increase the share of renewable energy to at least 70% by 2050. The Chilean government convened a multistakeholder roundtable, which included public and private companies as well as coal asset owners, for a voluntary coal phase-out plan which established a clear phase-out timeline. This created a regulatory environment that was no longer conducive to coal assets, with the risk of stranded assets, thus offering a clear pathway to transitioning to renewables and creating certainty at the level of investors.

Engie's own corporate commitment to the phase-out of coal with actual target dates represented another enabling factor, given that coal asset decommissioning eliminates a profit-making activity. The presence of a well-established European company with knowledge of the local context and the ability to support retraining of workers and communities, was another enabling factor in the context of the expedited closure of the coal power plants, together with Engie's ability to provide the required expertise to set up the decarbonization instrument with IDB Invest (definition of a "high integrity" asset for example).

Piloting a new high integrity carbon asset class in a closed, enabling environment to begin with, provides a model for future replication in larger or more complex contexts (Zelenczuk, Nick and Weinstein-Wright, Ilsa, 2025). However, while wealthier developing countries can benefit from these types of innovative financial tools, it should be noted that lower-income developing countries require assistance in creating enabling environments for carbon credits and to access the new market mechanisms of Article 6. EU countries are thus actively participating in capacity-building for developing countries to participate in Article 6.[35]

[35] The German Federal Ministry for Economic Affairs and Climate Action (BMWK) is funding a five-year program, SPAR6C (Supporting Preparedness for Article 6 Cooperation), through its International Climate Initiative (IKI). The program supports stakeholders in Colombia, Pakistan, Thailand, and Zambia to come prepared to engage in carbon transactions under Article 6 of the Paris Agreement. See https://gggi.org/sub-saharan-africa-unites-for-carbon-market-development-high-level-policy-dialogue-in-zambia/

## Relevance for EU China collaboration: co-financing with MDBs to de-risk investment and meet ESG standards

**Insight 1. Aligning to country priorities**: The case of the Calama wind power plant in Chile thus highlights the critical role played first and foremost by governments and key stakeholders in setting up the conditions that will enable the crowding-in of investment, in line with the conclusions of the World Bank in its report Scaling up for Phasing Down. Clear low-carbon or net-zero targets and pathways create a stable economic, political and thus regulatory environment that create the conditions for successful co-financing of renewables projects by governments, multilateral development banks, climate funds and other public and private sector partners.

China and the European Union, together with Chinese and European companies, can reinforce this process by participating in stakeholder consultations in third countries to gain clarity in terms of policies, modalities and specific time frames for the transition from coal to renewables. This can help build investor confidence and de-risk investments, thus contributing to lowering the cost of capital for the construction of renewables projects, alongside compensation schemes to lower borrowing costs on the model of the financing of the Calama Wind farm. This can also help ensure successful replication of innovative high integrity carbon assets in the context of the development of carbon markets and Article 6, that have the potential to replace blended finance over the long run as a new revenue stream.

The case of the Calama Wind power moreover highlights the vital importance of continued joint EU China climate leadership at a global level, as illustrated in the recent joint EU-China declaration on climate. EU and China continued support for the Paris Agreement and the COP process, in particular the strengthening of countries' NDCs in the context of the Global Stocktake, can encourage all countries to set ambitious and clear decarbonization targets and pathways, with trickle-down effects in terms of creating enabling environments that can crowd-in investment in local projects such as the Calama Wind farm in Chile.

**Insight 2.** MDB model: Co-financing by EU and Chinese stakeholders alongside multilateral banks such as the Interamerican development bank (IDB), moreover represents an ideal format for EU-China investment in renewable energy projects in developing countries that can be scaled up. Multilateral platforms can act as neutral conveners for co-financing by the EU and China, helping de-risk investment for Chinese investors while meeting EU ESG standards. Endorsement by MDBs can thus increase the political, economic and social acceptability of projects. Regional MDBs moreover possess local knowledge and expertise that increase the likelihood of successful completion of these types of projects, with clean technology deployment being highly context sensitive and impacted by the historical presence of incumbent sources of energy.

In this context, it has been suggested that joint EU-China action could further scale-up investment in clean energy in developing countries, by launching a common agenda for MDB and IMF reform to increase climate financing, address debt sustainability issues and create fiscal space for low-carbon development, including through "country platforms". Further progress could thus be made by scaling innovative tools, such as refinancing mechanisms, sustainability-linked bonds, hybrid capital and the use of Special Drawing Rights (SDRs) (E3G, 2025). The Bridgetown initiative, for instance, envisages the establishment of a new global climate mitigation trust to be filled with new or unneeded SDRs (USD 500 billion) to serve as collateral for new, low-interest loans for the global South (Kroll, 2023). This type of reform could help alleviate the problem of foreign exchange shortages for the import of equipment for renewable energy deployment (bridgetown-initiative.org).

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# EU-China cooperation in developing countries in the context of tripling renewable energy capacity by 2030

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