

China's Official Energy Finance in Emerging and Developing Economies

Evolving institutions, instruments and implications for clean energy transitions

International
Energy Agency



INTERNATIONAL ENERGY AGENCY

The IEA examines the full spectrum of energy issues including oil, gas and coal supply and demand, renewable energy technologies, electricity markets, energy efficiency, access to energy, demand side management and much more. Through its work, the IEA advocates policies that will enhance the reliability, affordability and sustainability of energy in its 32 Member countries, 13 Association countries and beyond.

This publication and any map included herein are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

IEA Member countries:

Australia
Austria
Belgium
Canada
Czech Republic
Denmark
Estonia
Finland
France
Germany
Greece
Hungary
Ireland
Italy
Japan
Korea
Latvia
Lithuania
Luxembourg
Mexico
Netherlands
New Zealand
Norway
Poland
Portugal
Slovak Republic
Spain
Sweden
Switzerland
Republic of Türkiye
United Kingdom
United States

IEA Association countries:

Argentina
Brazil
China
Egypt
India
Indonesia
Kenya
Morocco
Senegal
Singapore
South Africa
Thailand
Ukraine

The European Commission also participates in the work of the IEA

About this report

Global energy investment exceeded USD 3.3 trillion in 2025, but capital flows remain uneven. Emerging market and developing economies (EMDE) outside China attracted just 27% of total energy investment and 18% of clean energy spending, despite accounting for nearly two-thirds of the global population and the bulk of future demand. Addressing this imbalance requires mobilising more capital from diverse sources into EMDE energy systems.

China continues to play a central role in global energy investment flows because of its large domestic investments and its large external capital spending on energy. Since 2015, its official-sector institutions have committed on average over USD 55 billion annually to energy-related projects in EMDE – equivalent to around 8% of all tracked clean energy investment directed to these economies. Historically, this financing was driven by state-owned policy banks and sovereign actors providing debt and, in some cases, grants. In recent years, however, the composition has shifted. While financing commitments are slowly rising again, following a drop during the COVID pandemic, policy-bank lending has significantly contracted and focused almost entirely on clean technologies. Meanwhile, state-owned enterprises, state-owned commercial banks and export credit agencies have taken on a larger role, increasingly through equity investments or guarantees. This shift suggests a move towards a more competitive – yet still state-directed – model of international energy engagement.

These changes reflect a financing system adapting to new domestic and global circumstances rather than a withdrawal from China's overseas energy activity. For clean energy deployment in particular, the evolving pattern presents both opportunities – including expanded equity participation and greater risk-sharing – and challenges linked to uneven availability of concessional or long-tenor finance.

This report maps and analyses these changes through an energy sector-level dataset covering 2015 to 2024. It explores how China's evolving financing model is reshaping instruments, institutions and regional allocation patterns, and also considers the strategic and practical implications for EMDE energy transitions.

The analysis is complemented by case studies covering a range of technologies and financial structures – from large-scale renewables and electricity distribution to green industrial projects, waste-to-energy and upstream developments – which show how China's official actors operate in practice across contrasting markets.

Acknowledgements, contributors and credits

This report was prepared by the Energy Investment Unit (EIU) in the Office of the Chief Energy Economist Division (OCEE) of the Directorate of Sustainability, Technology and Outlooks. It was designed and led by Haneul Kim, under the guidance of Cecilia Tam, Head of EIU and Chief Energy Economist, Tim Gould.

Other main authors include Qi Wang (external, Johns Hopkins University).

Other IEA colleagues contributed valuable inputs and feedback with regards to the data collection and analysis in this report: Rebecca McKimm, Aloys Nghiem and Celeste Del Vecchio.

This report was produced under the IEA's Clean Energy Transitions Programme (CETP).

The authors would like to express their gratitude to the IEA's China Desk for their valuable contributions, inputs and support in the formulation of the report, as well as to the Strategic Initiatives Office for making this study possible.

The authors would like to thank Elspeth Thomson for editing the manuscript. Thanks go to the IEA's Communications and Digital Office and the Information Systems Unit for their help in producing the report and website materials, particularly Astrid Dumond, Liv Gaunt, Jon Custer, Anthony Pietromartire and Ivo Letra.

This work reflects the views of the IEA Secretariat but does not necessarily reflect those of IEA's individual member countries or any particular contributor.

Comments and questions on this report are welcome and can be addressed to Haneul.Kim@iea.org.

Table of contents

Setting the scene	7
Regional imbalances in energy investment	7
Inside China's official financing system	8
Dashboard	11
Overview	11
Trends in China's outbound energy finance	15
Overall financing trends	15
The changing role of China's traditional official financiers	17
The rise of other official providers	19
The expanding role of Sinosure	21
Implications for EMDE energy transitions	22
Case studies	24
Case 1. Uzbekistan 1-GW solar PV project	25
Project overview and impact	25
Financing model and China's role	26
Insights and implications	27
Case 2. Southern power grid's acquisition of Enel Peru distribution assets	28
Project overview and impact	28
Financing model and China's role	29
Insights and implications	30
Case 3. Saudi Arabia's first green full-process heavy plate mill project	32
Project overview and impact	32
Financing model and China's role	33
Insights and implications	33
Case 4. TFC Solar PV project in South Africa	35
Project overview and impact	35
Financing model and China's role	36
Insights and implications	36
Case 5. Silk Road fund commitment in African Infrastructure Investment Fund IV	38
Project overview and impact	38
Financing model and China's role	39
Insights and implications	40

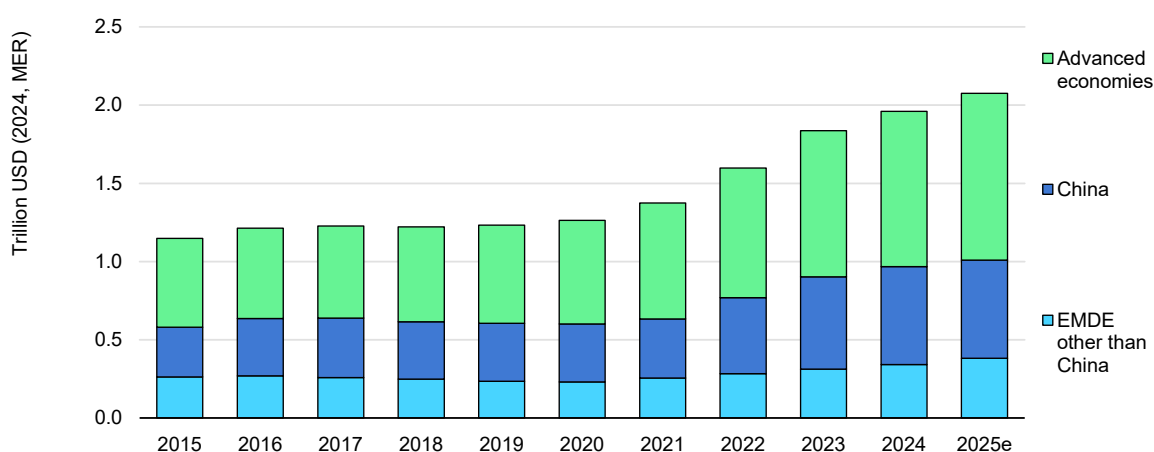
Case 6. CNOOC investment in Guyana: Whiptail Oil Field	41
Project overview and impact.....	41
Financing model and China's role	41
Insights and implications	42
Case 7. Palembang waste-to-energy plant	44
Project overview and impact.....	44
Financing model and China's role	44
Insights and implications	46
Annex	47
Methodology	47
Exchange rates and deflators.....	49
IEA scenarios	49
Abbreviations and acronyms	50
Definitions	50
Regional and country groupings.....	54

Setting the scene

Regional imbalances in energy investment

Global energy investment has steadily risen over the past decade and reached over USD 3.3 trillion for the first time in 2025. Clean energy investment trends are especially notable – with investments in a range of clean energy technologies and infrastructure, taken together, accounting for nearly two-thirds of global investments today. However, these headline numbers often mask a persistent trend: a gaping regional imbalance in global energy investment. After removing the share of investment going towards advanced economies and People's Republic of China (hereafter, “China”), emerging market and developing economies (EMDE) other than China account for around 27% of total energy investment and 18% of clean energy investment. With the [bulk of future energy and electricity demand expected to be driven by EMDE](#), this disparity influences their ability to deliver secure, affordable energy transitions aligned with their development objectives.

Global clean energy investment by income group, 2015-2024



IEA. CC BY 4.0.

Note: See Annex for specific regional groupings. Some advanced economies as defined by the IEA's [Global Energy and Climate Model](#) are still recipients of outbound international public finance or development finance and are included in IEA's modelling of international public finance and development finance needs.

Source: IEA (2025), [World Energy Investment 2025](#).

From around USD 875 billion today, energy investment in EMDE other than China needs to rise substantially in all scenarios. In the Net Zero Emissions by 2050 Scenario (NZE Scenario), energy investment in these countries, taken together, reaches nearly USD 2 trillion by 2035. Such a substantial scale-up requires taking

careful stock of what the available sources of finance are, where they are going, and how they are being utilised to ultimately understand the future course of action.

IEA analysis reveals that much of the financing for energy today in EMDE other than China [derives from domestic capital](#). However, given the limitations of fiscal budgets and domestic markets, it is crucial for EMDE to mobilise international capital. Therefore, international public finance (IPF) – concessional or non-concessional funding coming from development finance institutions (DFIs), multilateral climate funds, export credit agencies, governments and philanthropies often directed to higher-risk regions or nascent technologies – plays a critical role. While the absolute size of their financing is small, making up less than 10% of investment in EMDE other than China, this capital can be allocated to mobilise even more private investment.

China has become a major provider of international public finance. Its outbound financing expanded rapidly in the years leading up to 2010 as part of broader economic and industrial strategies, with the China Development Bank (CDB) and the Export–Import Bank of China (CEXIM) emerging as two of the world's largest DFIs. The launch of the Belt and Road Initiative (BRI) in 2013 further accelerated this outward push, formalising China's ambition to strengthen cross-border infrastructure, energy access and economic ties. While China is not a traditional donor represented in fora such as the Organisation for Economic Co-operation and Development's (OECD's) development assistance committee, its official-sector institutions have become highly active abroad, particularly in energy. Their overseas engagement responds not only to domestic priorities – such as securing supply chains and supporting the global expansion of Chinese developers and equipment manufacturers – but also to strong demand from partner countries for investment that can help advance their own development and transition goals. This combination has positioned China as one of the largest sources of official financing for energy projects in EMDE.

This report builds on [previous IEA work](#) by taking a closer look at the composition of China's outbound energy finance. By identifying the main official-sector institutions and the instruments they use, it provides a clearer view of how Chinese capital is deployed abroad. The next section outlines this institutional architecture.

Inside China's official financing system

China's official financing sector refers to state-owned or state-directed institutions that provide financing or investment abroad in support of national economic, industrial and diplomatic objectives. Although their mandates and operating models differ, these institutions share two features, public ownership and policy alignment, including the support for domestic industrial competitiveness, advancing energy security, increasing international connectivity and promoting

low-carbon development pathways in partner countries. In the context of this report, the official financing sector includes five groups of institutions active in outbound energy financing: government agencies, state-owned policy banks, state-owned funds, state-owned commercial banks and state-owned enterprises (SOEs).

Chinese official outbound finance providers

Provider type	Characteristics	Examples ¹
Government agencies	- Play a relatively small role in outbound energy financing, mainly providing grants, feasibility studies or technical support. - Form part of China's broader development engagement but represent only a minor share of total energy-related flows.	Ministry of Foreign Affairs, People's Bank of China, Provincial governments
State-owned policy banks	- Are traditionally core providers of Chinese overseas finance in energy. - Offer large, long-tenor loans and support strategic energy, infrastructure and industrial projects in partner countries. - Operate as development-oriented lenders with the mandate and capacity to extend loans.	China Development Bank, Export-Import Bank of China ²
State-owned funds	- Primarily provide equity or quasi-equity capital, often through minor stakes in generation assets, grid companies or regional energy platforms. - Also extend debt or hybrid instruments when needed to support project structuring.	China Investment Corporation, Silk Road Fund
State-owned commercial banks	- Operate as profit-oriented financial institutions but remain majority state-owned and strategically aligned with national priorities. - Increasingly support outbound activity through syndicated loans, bridge financing and refinancing linked to Chinese companies operating abroad.	Industrial and Commercial Bank of China, Bank of China
State-owned enterprises	- Include project developers, grid companies and engineering conglomerates that are majority owned by the state. - Participate in outbound energy finance through equity stakes, joint ventures, project development and EPC (engineering, procurement, and construction)-linked investment structures. - While their financing is fully commercial, they are state-owned companies whose outward activity is encouraged and guided by industrial policy.	State Grid Corporation of China, China Southern Power Grid, China Petroleum & Chemical Corporation

¹ The examples listed for each provider type are indicative of the institutions active in energy financing specifically, and is not an exhaustive list of entities present in the data used for this report or of China's official finance sector.

² The Export-Import Bank of China (CEXIM) is an export credit agency (ECA), but unlike insurance-based ECAs, it provides sovereign and corporate loans as a core part of its mandate. For this reason, CEXIM is treated as a state-owned policy bank in this report. Insurance-based export credit agencies, such as Sinosure (introduced in later parts of this report), do not provide loans and therefore fall into a separate category.

Taken together, these institutions span a spectrum from traditional public financiers to more commercially-oriented ones but are still state-directed actors. Government agencies and state-owned policy banks anchor the traditional end, providing grants or debt with clear public policy mandates. State-owned funds, state-owned commercial banks and SOEs sit towards the commercial end, offering a wider mix of instruments – from equity and hybrid capital to guarantees – and often investing directly in project companies or joint ventures. Although these institutions operate with differing degrees of commercial autonomy, they are all publicly owned and strategically aligned, and their overseas activity forms a central pillar of China's official financial engagement abroad.

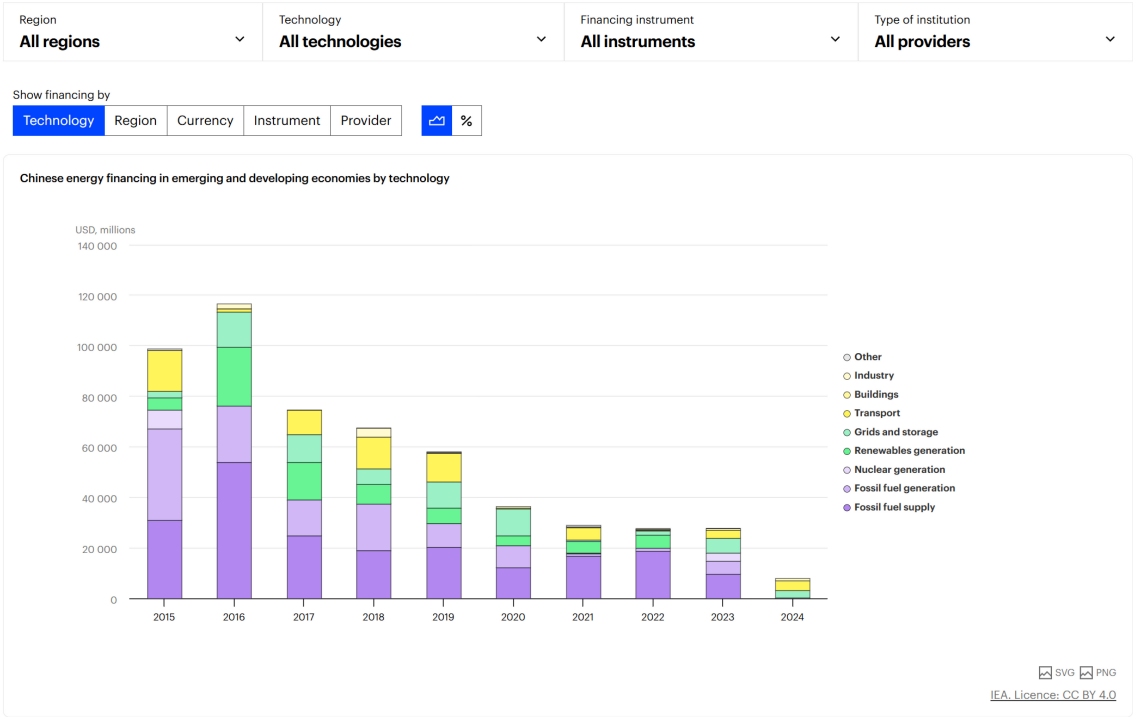
Dashboard

Overview

The dashboard provides an interactive view of Chinese official-sector financing for energy across EMDE, enabling users to explore project-level data by year, recipient country or region, technology, instrument, provider type and currency (when applicable). Developed to bring greater understanding of China's diverse financing channels, the dashboard allows users to filter and compare flows in either USD (2024, MER) or by project count. It is designed to complement the analysis in this report and to support deeper understanding of how different institutions and instruments shape China's role in EMDE energy finance.

Use the filters to explore how Chinese energy finance is distributed around the world.

Data dashboard



IEA. CC BY 4.0.

Definition of the fields

Technology

Specifies the type of technology the provided financing supports. When a specific project spans multiple technologies, they are split proportionally.

- **Fossil fuel supply:** Activities related to the extraction, processing and transport of fossil fuels, including coal mining, oil and gas production, liquefaction, refining, pipelines and associated infrastructure. This category covers upstream and midstream supply rather than electricity generation.
- **Fossil fuel generation:** Electricity and heat generation using fossil fuels, including coal-, oil- and natural gas-fired power plants. It excludes fossil fuel supply activities and focuses only on power and heat production. Fossil fuel generation projects in this dashboard do not explicitly include carbon capture, utilisation and storage technologies.
- **Grids and storage:** Infrastructure for transmitting, distributing and managing electricity, including transmission and distribution networks, substations, grid reinforcement and battery energy storage systems. Storage refers primarily to grid-connected battery storage used to balance supply and demand.
- **Renewable generation:** Electricity generation from renewable energy sources, including solar photovoltaics, wind, hydropower, geothermal, modern bioenergy and renewable waste. It covers utility-scale and distributed renewable power projects.
- **Transport:** Energy-related infrastructure and assets linked to the transport of people and goods, including railways, urban transit systems, ports and fuel or electricity supply for transport. It includes transport electrification and efficiency-related investments where applicable.
- **Nuclear generation:** Electricity generation from nuclear power plants, including new reactor construction, life extensions and major refurbishments of existing nuclear facilities.
- **Industry:** Energy use and energy-related infrastructure in industrial activities, including manufacturing, construction and processing industries such as steel, cement, chemicals and aluminium. It includes projects related to industrial energy supply, efficiency improvements and low-emissions industrial processes.
- **Buildings:** Energy use and energy-related investments in residential and services buildings, including space heating and cooling, water heating, lighting, appliances and building electrification. Services buildings include commercial and institutional buildings such as schools, hospitals and offices.
- **Other:** Energy-related projects that either (i) fall into smaller categories not shown separately in the dashboard — including non-renewable waste generation and low-emissions fuels — or (ii) are multi-sector / integrated transactions where the underlying technologies cannot be reliably attributed to a single category with the

available information. These activities are grouped here because their volumes are small and/or the technology split is not identifiable at the project level.

Region

Please refer to the Annex of the report (insert hyperlink of the report) for specific regional groupings for this dashboard.

Instrument

- **Debt:** Capital provided in the form of loans or bonds that must be repaid over an agreed period (tenor), typically with interest. In this report, debt includes short- and long-tenor lending by policy banks, commercial banks and other financial institutions to finance energy-related projects.
- **Equity:** Capital invested in exchange for an ownership stake in an asset, company or project, with returns linked to future profits, dividends or asset value rather than fixed repayments. In this report, equity includes direct investments in energy assets or project companies, joint ventures, acquisitions, as well as commitments to equity funds and fund-of-fund structures that invest in energy-related infrastructure.
- **Grant:** The transfer of funds by development finance institutions or donors, usually with an obligation to spend the money on a contractually defined project or set of eligible expenses. Grant payments do not need to be repaid with money or equity as long as the contractual conditions are met.

Provider

- **State-owned policy bank:** A state-owned financial institution established to support national economic and development objectives through long-term financing. State-owned policy banks typically provide loans and, in some cases, grants or equity to large-scale infrastructure and strategic projects, operating with a policy mandate rather than purely commercial return requirements.
- **State-owned enterprise:** A company owned or controlled by the state that operates on a commercial basis. State-owned enterprises invest in overseas energy projects primarily through equity participation, joint ventures, acquisitions and build-operate arrangements, often combining financing with engineering, procurement, construction and operational capabilities.
- **State-owned commercial bank:** A commercially oriented bank majority-owned by the state and operating under market-based principles. State-owned commercial banks provide financing through instruments such as corporate loans, project finance and syndicated lending, while remaining aligned with national regulatory and strategic frameworks.
- **Government agency:** A public institution that provides financial support using government budgetary resources rather than commercial banking operations.

Government agencies typically support overseas projects through grants, concessional funding or capital contributions to dedicated programmes and funds.

- State-owned fund: A public institution that provides financial support using government budgetary resources rather than commercial banking operations. Government agencies typically support overseas projects through grants, concessional funding or capital contributions to dedicated programmes and funds.

Currency

- USD: United States dollar
- EUR: Euro
- CNY: Chinese yuan (renminbi)
- Other: This dataset includes examples of financing denominated in Botswana pula (BWP), West African CFA franc (XOF), Nepalese rupee (NPR), Mauritian rupee (MUR), Argentine peso (ARS), Comorian franc (KMF), Central African CFA franc (XAF), Cuban peso (CUP), Seychellois rupee (SCR), Philippine peso (PHP), Sri Lankan rupee (LKR), Tongan pa'anga (TOP), Brazilian real (BRL), Pakistani rupee (PKR), Hong Kong dollar (HKD), South African rand (ZAR), Turkish lira (TRY), Indonesian rupiah (IDR), Malaysian ringgit (MYR), Russian rouble (RUB), Saudi riyal (SAR), Bangladeshi taka (BDT), Costa Rican colón (CRC), Fijian dollar (FJD), Thai baht (THB) and Maldivian rufiyaa (MVR).

Trends in China's outbound energy finance

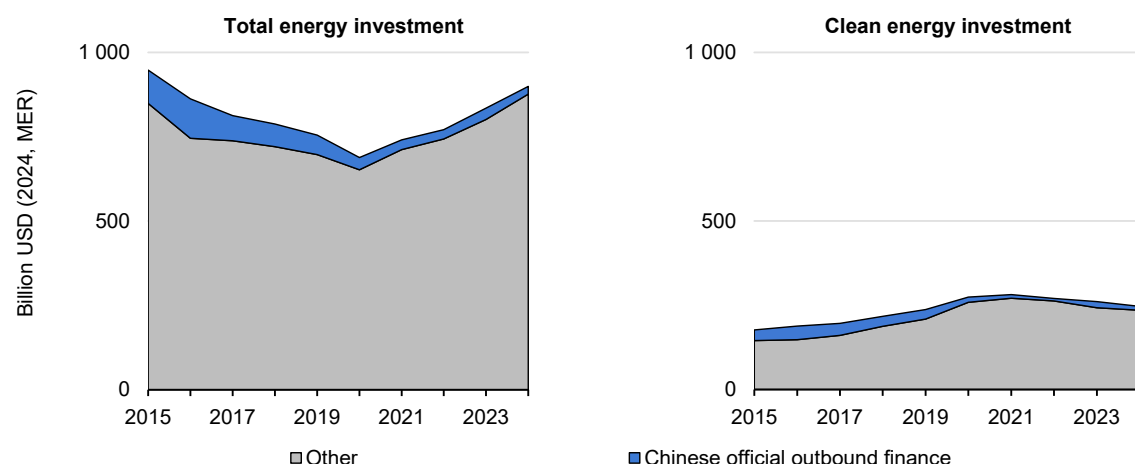
This section examines the major shifts in China's outbound energy finance over the past decade, with a particular focus on developments since 2022. Drawing on publicly available project information and systematically compiled datasets, the analysis highlights structural changes in the scale, composition and institutional drivers of official financing, with aggregate figures presented up to 2024. Together, these trends reveal how China's role as an energy financier is evolving – from a gradual decline of traditional policy-bank lending to the rise of more commercial-oriented official providers – and what this means for investment patterns across EMDE.

Overall financing trends

China's official outbound financing for energy is a visible part of the investment landscape in EMDE. Between 2015 and 2024, Chinese official institutions committed around USD 565 billion cumulatively to energy projects in EMDE abroad: USD 335 billion to fossil fuels and USD 230 billion to clean energy technologies and infrastructure. Annual commitments peaked around the mid-2010s, exceeding over USD 115 billion a year before moderating through the late 2010s and falling to around USD 28 billion per year from 2022 to 2024.

In relative terms, these flows accounted for about 7% of all energy investment in EMDE other than China between 2015 and 2024, and around 8% of clean energy spending during the same period. Their share has declined in recent years – averaging roughly 4% of clean energy investment from 2022 to 2024.

Share of China's official outbound finance commitments in energy investment in emerging market and developing economies, 2015-2024



IEA. CC BY 4.0.

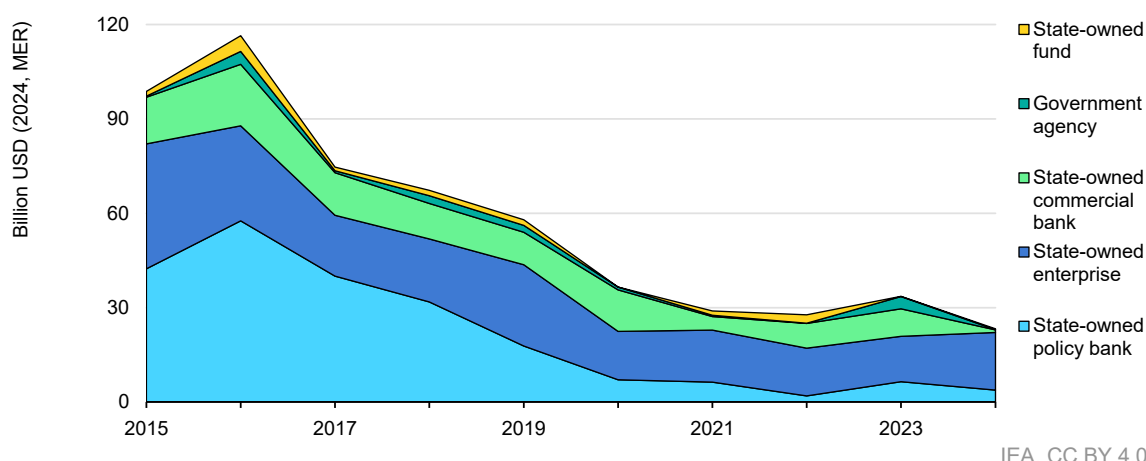
Note: Total investment in this figure includes investments in Mexico and parts of Central and South America that are advanced economies but are still international public finance recipients.

Most of this decline stems from the sharp contraction of state-owned policy bank lending, which previously drove the bulk of activity, reflecting a genuine reduction in large sovereign-linked lending rather than a shift into other official institutions. Other official actors – particularly state-owned commercial banks and state-owned enterprises – have maintained more stable levels of engagement, becoming proportionally more important as policy-bank volumes fell. Smaller but noticeable contributions from state-owned funds and the China Export & Credit Insurance Corporation (Sinosure), specialising in providing cover for Chinese exports and investments, also emerge in recent years.

These shifts reflect a financing system adapting to changing circumstances rather than a withdrawal from overseas energy engagement. Policy banks have placed a greater emphasis on project selectivity, risk management and alignment with host-country plans, especially after the COVID pandemic. At the same time, China's broader official sector has expanded its international role in line with industrial competitiveness, global supply-chain integration and the overseas growth of Chinese developers and equipment suppliers. As a result, outbound finance increasingly flows through a more diverse mix of institutions and instruments, particularly in markets where host-country demand for energy infrastructure remains strong.

Even with the decline, China remains one of the largest single-country providers of official outbound finance for EMDE energy systems. When viewed against the much broader base of domestic public, international public and private capital captured in EMDE investment totals, the sustained contribution of a single official system underscores both its scale and ongoing relevance.

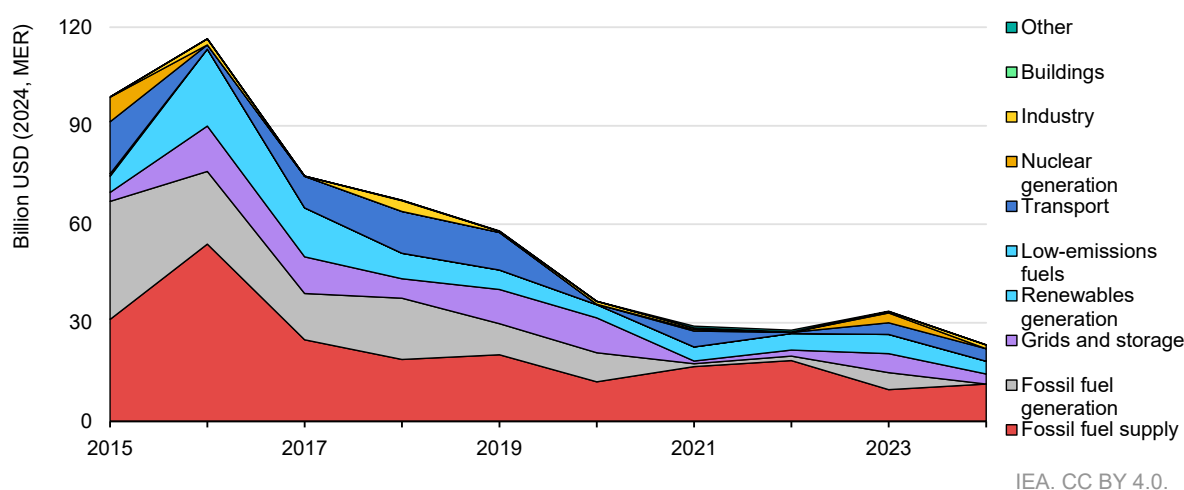
China's official outbound financing commitments by provider type, 2015- 2024



Note: Collection and curation of data from the Belt and Road Portal were performed using the IEA Energy Data Centre's web-scraping system.

Sources: IEA based on data from AidData (2023), [Global Chinese Development Finance Dataset, Version 3.0](#); AidData (2025), [China's Global Loans and Grants Dataset, Version 1.0](#); the American Enterprise Institute (2025), [China Global Investment Tracker](#); and the [Belt and Road Portal](#) (2025).

China's official outbound financing commitments by technology, 2015-2024



Note: Collection and curation of data from the Belt and Road Portal were performed using the IEA Energy Data Centre's web-scraping system.

Sources: IEA based on data from AidData (2023), [Global Chinese Development Finance Dataset, Version 3.0](#); AidData (2025), [China's Global Loans and Grants Dataset, Version 1.0](#); the American Enterprise Institute (2025), [China Global Investment Tracker](#); and the [Belt and Road Portal](#) (2025).

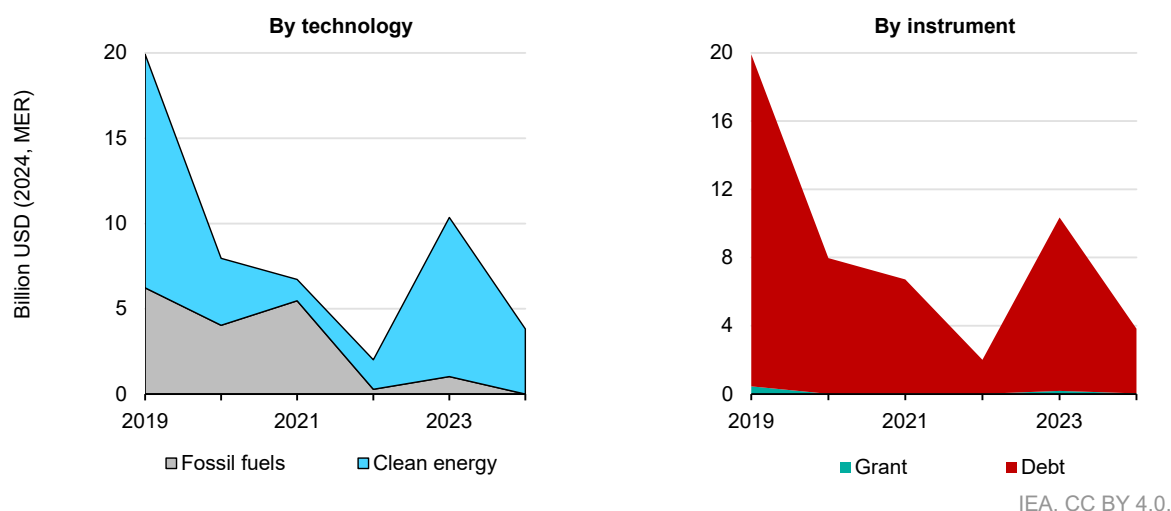
The changing role of China's traditional official financiers

China's traditional official financiers – state-owned policy banks and government agencies – once formed the backbone of the country's outbound energy finance.

However, these institutions have undergone a marked shift in both scale and composition over the past decade. Through the mid-2010s, the CDB and CEXIM accounted for the majority of annual commitments, supporting large-scale generation, transmission and fuel-supply projects across EMDE. Their financing was typically delivered through long-tenor loans to governments, state utilities or sovereign-linked developers, which aligned with the high demand for major infrastructure at the height of the early Belt and Road Initiative period.

Since then, the profile of their activity has changed significantly. Annual commitments from policy banks declined steadily after the 2016 peak and fell to their lowest levels in 2022 and 2023. At the same time, the sectoral focus of their financing has shifted, with recent operations concentrating on renewables, grid infrastructure and other clean-energy technologies, such as rail transport, while lending for fossil-fuel projects has largely tapered off. Policy-bank financing remains dominated by debt instruments, complemented by small volumes of grant-based support from government agencies and equity commitments to dedicated climate or infrastructure funds. Close to 80% of flows continue to be denominated in US dollars, with smaller shares in euros and Chinese yuan (CNY). This pattern reflects preferences for hard-currency stability and the established use of US dollars in cross-border project finance, even as CNY-denominated lending gradually gains visibility.

State-owned policy bank and government agency commitments by technology and instrument type, 2019-2024



Note: Collection and curation of data from the Belt and Road Portal were performed using the IEA Energy Data Centre's web-scraping system.

Sources: IEA based on data from AidData (2023), [Global Chinese Development Finance Dataset, Version 3.0](#); AidData (2025), [China's Global Loans and Grants Dataset, Version 1.0](#); the American Enterprise Institute (2025), [China Global Investment Tracker](#); and the [Belt and Road Portal](#) (2025).

These adjustments reflect an evolution in both the supply of, and demand for, China's official finance. On the supply side, recent policy guidance has placed

greater emphasis on project selectivity, prudent risk management and support for green and low-carbon development, which naturally reduces the number of large sovereign loans while directing resources towards low-emissions and system-strengthening assets. On the demand side, many EMDE partners are increasingly seeking more flexible financing structures and stronger private-sector participation, reducing the reliance on large, fully sovereign-backed lending typical of the previous decade.

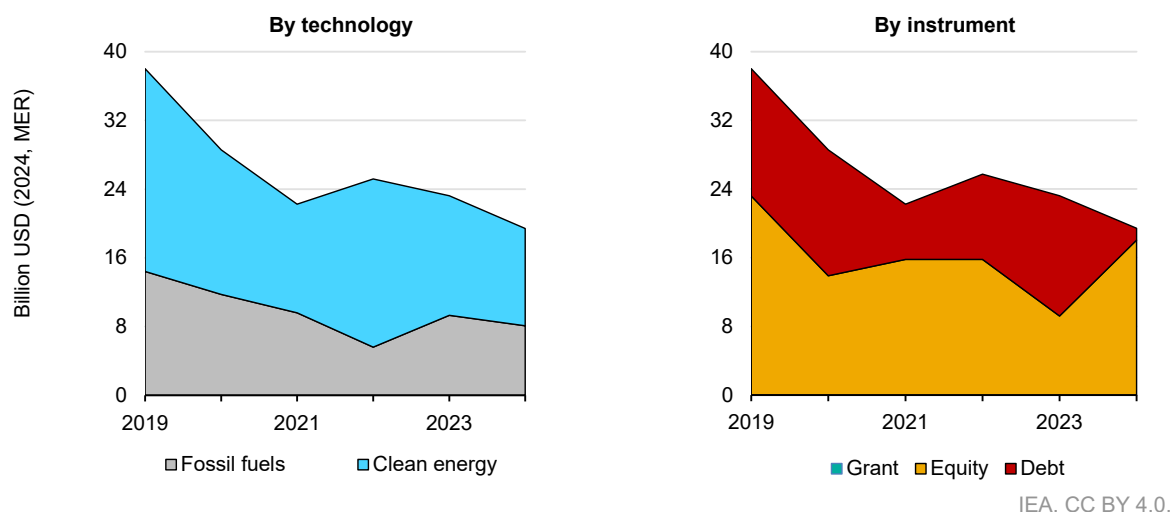
Looking ahead, recent announcements – including new commitments to expand South-South co-operation, stronger support for green infrastructure and the prospective development of new financing platforms such as [the Shanghai Co-operation Organisation \(SCO\) Development Bank](#) (the to-be launched development finance consortium led by China and other members of SCO) – suggest that China's traditional financiers may continue to operate with a more targeted mandate, focusing on clean energy and grid projects while contributing to a wider ecosystem of outbound financing instruments and institutions.

The rise of other official providers

China's outbound energy engagement is increasingly being shaped by state-owned enterprises (SOEs), state-owned commercial banks and state-owned funds. These actors sit at the intersection of public ownership and commercial operation: they follow market-based models, often take equity positions and operate with stronger corporate autonomy than traditional policy banks, yet they remain aligned with national strategic and industrial objectives. This combination positions them to play an important role in EMDE energy systems, where project structures increasingly favour equity co-investment, risk sharing and long-term operational partnerships.

Within this group, SOEs have been the most consistently active providers, and their profile has shifted over time. In the early 2010s, investment was led by national oil companies, whose acquisitions centred on fossil resources and upstream assets. Since the mid-2010s, however, state-owned power and utility companies have become the main overseas investors, with capital flowing into power generation, including renewables, transmission and distribution. As a result, the technology mix of commercially-oriented official finance is more balanced than that of traditional lenders: still containing fossil-related investments but reflecting a meaningful expansion into clean energy as Chinese utilities and developers globalise. Their activity is predominantly in equity, including joint ventures, acquisitions, capital injections and in some cases, build-operate-transfer arrangements.

State-owned enterprises, state-owned funds and state-owned commercial bank commitments by technology and instrument type, 2019-2024



Notes: Some grants have been provided in 2019 but is not visible due to the small scale of the financing. Collection and curation of data from the Belt and Road Portal were performed using the IEA Energy Data Centre's web-scraping system. Sources: IEA based on data from AidData (2023), [Global Chinese Development Finance Dataset, Version 3.0](#); AidData (2025), [China's Global Loans and Grants Dataset, Version 1.0](#); the American Enterprise Institute (2025), [China Global Investment Tracker](#); and the [Belt and Road Portal](#) (2025).

State-owned funds – such as the China Investment Corporation (CIC) and the Silk Road Fund (SRF) – add a distinct layer to this landscape. Unlike SOEs or commercial banks, these funds operate with explicit development and policy mandates, supporting cross-border infrastructure, connectivity and sustainable development while deploying capital through equity and fund-of-fund structures. While they are within the non-traditional category, given that their operational tools and risk profiles are equity-based and market-facing, their strategic role is much closer to that of a DFI. Their ability to provide long-tenor equity, anchor positions in development funds and provide early-stage capital for projects makes them particularly important for EMDE energy transitions, where private equity markets remain thin and many clean-energy projects cannot proceed on debt financing alone.

Taken together, these other official actors now form a critical complement to China's traditional lending institutions. Their model responds directly to the needs of EMDE: equity to crowd in private investment, corporate partnerships that bring technology, and equipment and operational capacity. As many EMDE shift towards co-development and joint ownership of projects, these sources of official capital are becoming increasingly central to enabling large-scale clean energy investment where sovereign borrowing alone is insufficient.

The expanding role of Sinosure

A striking shift in China's outbound energy engagement is that capital is no longer coming only as loans and equity. Alongside banks and SOEs, a growing share of support now is provided through the use of risk-mitigation tools, such as guarantees, insurance and credit cover, that make projects bankable in higher-risk markets. For EMDE, where balance-sheet constraints and political and regulatory uncertainty can be as binding as project-level challenges, these instruments can be just as important as the underlying debt or equity in getting energy projects built.

Within this landscape, Sinosure plays a central role. As China's official export credit agency, it does not lend directly; it insures exporters, banks and investors against commercial and political risks linked to overseas contracts and projects. This distinguishes it from the CEXIM, which provides loans and buyer's credits as a financial institution; such credits are granted as a loan extended to overseas buyers to finance the purchase of Chinese goods or services. CEXIM acts as a lender, while Sinosure acts as a credit insurer, and the two often operate in parallel on the same project but play fundamentally different roles.

Between 2019 and 2024, Sinosure's total insured and guaranteed business rose from about USD 610 billion to more than USD 1 trillion per year – with medium- and long-term project insurance and overseas investment insurance providing cover for large infrastructure – including power generation, transmission and industrial energy projects. While only a portion of Sinosure's portfolio relates to energy in EMDE, Sinosure is often the piece that allows Chinese and local financiers to proceed in markets that would otherwise be considered too risky.

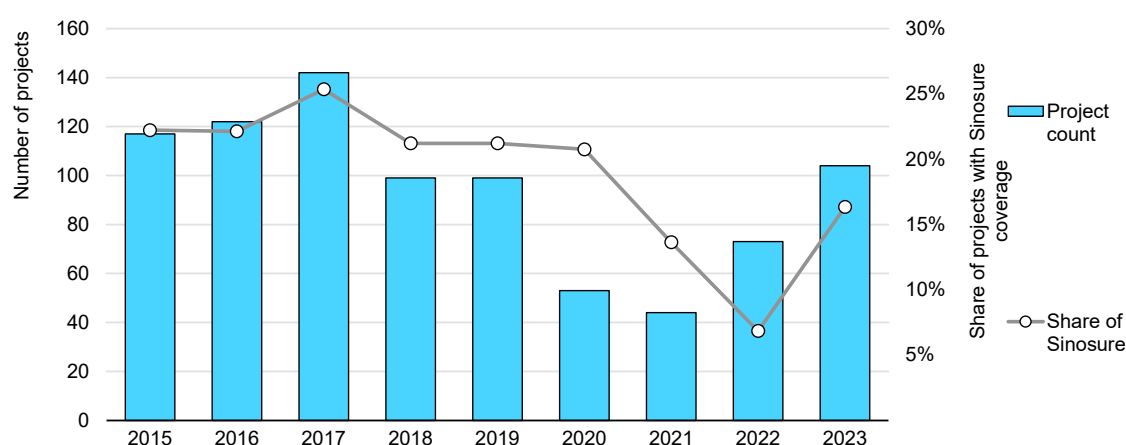
Since 2022, Sinosure has also begun to track and disclose “green” activity explicitly, reflecting China's dual-carbon goals and emerging green finance standards. Its reported support for green trade and projects increased from around USD 39 billion in 2022 to over USD 60 billion in 2024, with energy-related cases spanning utility-scale solar plants in the Middle East, wind and grid projects in Europe and Latin America and waste-to-energy and storage projects in Asia and Africa. These figures are larger than the outbound energy finance volumes tracked elsewhere in this analysis because they capture insured transaction values across the whole low-carbon supply chain – including equipment exports – rather than only capital committed to overseas energy assets.

The decline in the share of Sinosure-covered energy projects in 2020-21 and the gradual recovery from 2022 reflect both cyclical and structural factors. Pandemic-related disruptions slowed China's overseas activity, while the demand for large fossil projects – historically those most reliant on Sinosure's medium- to long-term cover – also fell. The post-2022 rebound aligns with Sinosure's green finance framework, which has broadened the types of transactions it records and supports.

Overall, the pattern points to an evolution from insuring large, high-risk fossil deals to a more diversified set of cleaner and supply chain-linked activities.

For EMDE energy transitions, the significance of Sinosure therefore lies less in the amount of money it puts “on the table” and more in its ability to de-risk and unlock other official and private finance. By standing behind banks, SOEs and host-country project companies, it helps shift projects from concept to financial close in markets where long tenors, regulatory uncertainty and currency volatility might otherwise stall investment.

Total number of China's officially funded energy-related projects and the share of Sinosure coverage, 2015-2023



IEA. CC BY 4.0.

Notes: Project data for 2015-21 are from the IEA's historical dataset, while figures from 2022 onwards were compiled and supplemented manually from publicly available sources. Collection and curation of data from the Belt and Road Portal were performed using the IEA Energy Data Centre's web-scraping system.

Sources: IEA based on data from AidData (2023), [Global Chinese Development Finance Dataset, Version 3.0](#); AidData (2025), [China's Global Loans and Grants Dataset, Version 1.0](#); the American Enterprise Institute (2025), [China Global Investment Tracker](#); the [Belt and Road Portal](#) (2025); and [Sinosure](#).

Implications for EMDE energy transitions

China's outbound financing landscape is becoming more diversified, shifting from a system anchored in sovereign lending to one where a broader mix of state-owned enterprises, commercial banks, funds and insurers play a growing role. This diversification means that a larger set of financial instruments – equity, guarantees and selective long-tenor debt – can now support EMDE energy systems. For recipient governments and developers, this translates into more options for structuring capital, particularly for projects that require a combination of corporate finance, engineering, procurement, and construction (EPC) contracting, and balance-sheet support rather than sovereign borrowing.

For clean energy deployment specifically, the evolving pattern suggests opportunities as well as challenges. The stronger presence of SOEs and state-

owned funds brings substantial technical capabilities and appetite for more complex renewable and grid projects, while Sinosure's increasingly targeted green underwriting helps de-risk project finance structures. At the same time, the decline in large-scale policy bank lending means fewer fully financed packages for emerging markets, placing greater importance on co-financing local-currency solutions and host-country readiness. EMDE that can offer clearer procurement pipelines, faster permitting and stronger off-taker frameworks that provide predictable revenues and credible counterparties are therefore better positioned to benefit from these new modes of engagement.

Looking ahead, China's official financing system is likely to continue evolving towards cleaner, more competitive models that place greater emphasis on project viability, risk allocation and credit quality. This could support EMDE transitions in various ways, by expanding access to equity for early-stage clean energy infrastructure developers and local partners, mobilising more private capital into grids, storage and hybrid systems, or by channelling China's manufacturing strength into cost-effective decarbonisation technologies. These opportunities also underscore the need for EMDE governments and international partners to build stronger enabling environments that can match this changing supply of finance with bankable, climate-aligned demand in the form of investable projects with clear revenue models and risk allocation. Recent project examples also illustrate how China's evolving financing model is supporting EMDE energy transitions. Large-scale renewables are now being enabled through blended structures that combine SOE equity, long-tenor lending and export credit guarantees (Case 1), while distribution-sector acquisitions show how on balance-sheet investment, where the sponsor finances and owns the asset directly, can modernise critical grid infrastructure (Case 2). Industrial projects are increasingly financed through joint-venture models that share risk between Chinese SOEs and strong local partners (Case 3), and mining–power or captive-supply structures are emerging where reliability concerns limit conventional project finance (Case 4). Participation in multilateral private-equity platforms demonstrates how sovereign funds can channel capital into diversified regional pipelines rather than single assets (Case 5). Commercial upstream investments continue to rely on equity-based joint ventures where revenues are recovered through production sharing (Case 6). And risk-mitigated project finance supported by credit insurance is helping unlock first-of-a-kind waste-to-energy projects in challenging markets (Case 7). Together, these cases highlight the use of a more diverse set of financial instruments.

Case studies

China's outbound energy engagement spans a wide range of technologies, financing structures and institutional actors. While aggregate trends reveal a system that is becoming more diversified, risk-sensitive and commercially oriented, the specific pathways through which Chinese capital supports energy transitions in EMDE become clearer when examined at the project level.

The following case studies illustrate this diversity in practice, from large-scale renewable deployment and grid modernisation to industrial decarbonisation, equity participation in regional infrastructure platforms and upstream resource development. Together, they show how different parts of China's official financing system interact with local conditions, how technical capabilities are deployed across markets, and how risk-mitigation tools, co-investment structures and SOE balance-sheets shape outcomes on the ground.

These case studies also demonstrate that China's overseas energy engagement is not merely a response to market opportunities, but also an interaction with host countries' conditions. These financing practices typically align with host governments' national targets such as expanding renewable capacity, improving grid reliability, or strengthening industry value chains. Each financing practice is constrained by the local regulatory system but also driven by a supportive policy environment. These examples provide concrete insights into how China's evolving approach is influencing real projects and the broader financing landscape in EMDE.

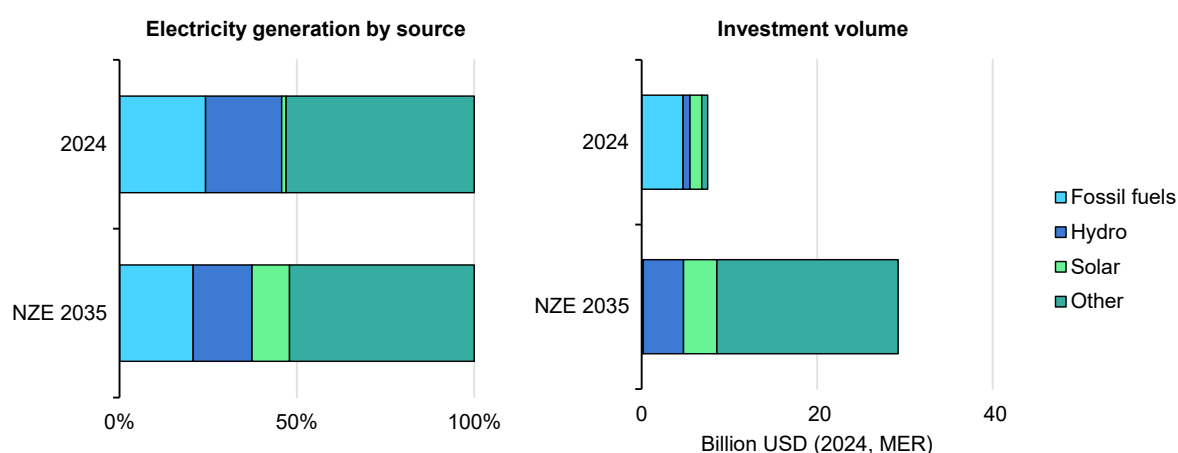
Case 1. Uzbekistan 1-GW solar PV project

Project overview and impact

Uzbekistan is beginning a rapid scale-up of renewable power, and large solar projects are essential for meeting its target to increase the share of renewables to [40% of total electricity generation by 2030](#). This is a strikingly ambitious objective given today's starting point: in 2023, [around 90%](#) of Uzbekistan's electricity was produced from fossil fuels, mainly in the form of natural gas, while solar and wind together accounted for less than 1%, and renewables more broadly reached only about 10%, almost all of which came from hydropower. At the same time, electricity demand is rising, natural gas supplies are tightening, and the country faces seasonal shortages.

Energy China (CEEC), the developer of this project, is one of the world's largest energy engineering groups. Historically known for large thermal and hydropower EPC projects, the company has, over the past decade, shifted towards an integrated "EPC + own + operate" model, particularly for renewables. This strategic shift aligns with China's dual-carbon goals, its pledge to stop building new coal plants overseas and the growing demand for invest-and-operate models in EMDE markets.

Electricity generation mix and investment volume in the Caspian region, 2024 and NZE Scenario 2035



IEA. CC BY 4.0.

Note: NZE = Net Zero Emissions by 2050 Scenario.

Sources: IEA (2025), [World Energy Outlook 2025](#) and IEA (2025), [World Energy Investment](#).

In February 2023, CEEC signed [a memorandum of understanding](#) with the Uzbekistan Energy Ministry and committed to developing a total of 2-GW of solar power in Uzbekistan. As part of its commitment, a 1-GW solar photovoltaic (PV) complex project, consisting of two 500-MW solar farms, was built in the Bukhara and Kashkadarya regions, with two farms developed largely in parallel. The first 400 MW entered commercial operation in December 2023, and the remaining 600 MW was commissioned in June 2024. Energy China acted as developer and sponsor, implementing the project through a fully owned local project company and coordinating design, engineering, procurement and construction across both sites.

Led by Energy China, this project is one of the country's first large-scale solar projects and plays a meaningful role in bridging the investment gap. Once fully operational, the two sites will generate an estimated [2 400 GWh](#) of solar electricity annually – about 32% of Uzbekistan's 2023 consumption – while avoiding 2.4 Mt CO₂ and reducing natural gas use by roughly 520 million cubic metres per year. These savings directly support Uzbekistan's goals to diversify generation, strengthen winter reliability and reduce dependence on domestic gas.

Financing model and China's role

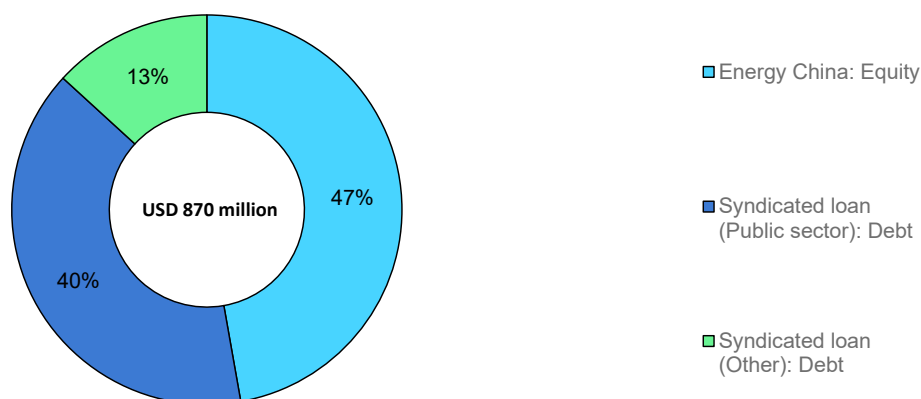
The project is notable as the first overseas renewable energy investment to use RMB-denominated lending backed by full Sinasure credit guarantees. Energy China provided USD 410 million in equity – higher than typical project-finance structures – helping lower leverage to levels acceptable for lenders in a nascent market.

Debt financing came from an RMB 3.3 billion [15-year syndicated loan](#) including China Construction Bank, Bank of China and CEXIM, as well as China's commercial bank, China Minsheng Bank. The independent power producer (IPP) project revenues and loan repayment in Uzbekistan are usually underpinned by a [25-year power purchase agreement](#) (PPA) with JSC Uzenergosotish, a fully state-owned power company in Uzbekistan. The fixed-tariff structure of the PPA provides predictable cash flows required for non-recourse project finance. This allows lenders to rely on project performance – rather than sponsor or sovereign guarantees – for repayment, a particularly important feature in EMDE markets working to expand renewables while managing public-debt constraints.

The facility is insured through Sinasure's medium- to long-term export buyer's credit insurance, which covers 95% of political and commercial risks. This guarantee was the central enabler of the transaction, lowering risk premiums and allowing both commercial and policy banks to offer long-tenor financing despite limited precedent for large-scale PV in the country.

Using RMB rather than USD borrowing further reduced exposure to elevated US interest rates in 2022 and 2023, improving cost stability for the sponsor. Together, these elements created a financing structure that is bankable, replicable and well suited to Uzbekistan's evolving market.

Financing Structure of Uzbekistan's 1-GW Solar Project



IEA. CC BY 4.0.

Notes: The syndicate that provided the debt financing for this project consisted of a consortium of Chinese banks. The "public sector" portion includes the state-owned policy bank and state-owned commercial bank category. The "other" portion refers to China's commercial sector participation. Collection and curation of data from the Belt and Road Portal were performed using the IEA Energy Data Centre's web-scraping system.

Sources: American Enterprise Institute (2025), [China Global Investment Tracker](#); Belt and Road Portal (2024), ["Sinosure provides insurance coverage for the largest photovoltaic project by a Chinese enterprise in Central Asia"](#) (in Chinese).

Insights and implications

This project illustrates how China's evolving outbound financing model – combining SOE equity, long-tenor lending and risk-mitigation instruments – can unlock large-scale renewable investment in EMDE. The structure is replicable for markets with limited sovereign borrowing room, volatile currencies or thin domestic banking sectors. It also shows how CNY-based financing can create alternative channels for clean-energy investment where USD funding is costly or scarce.

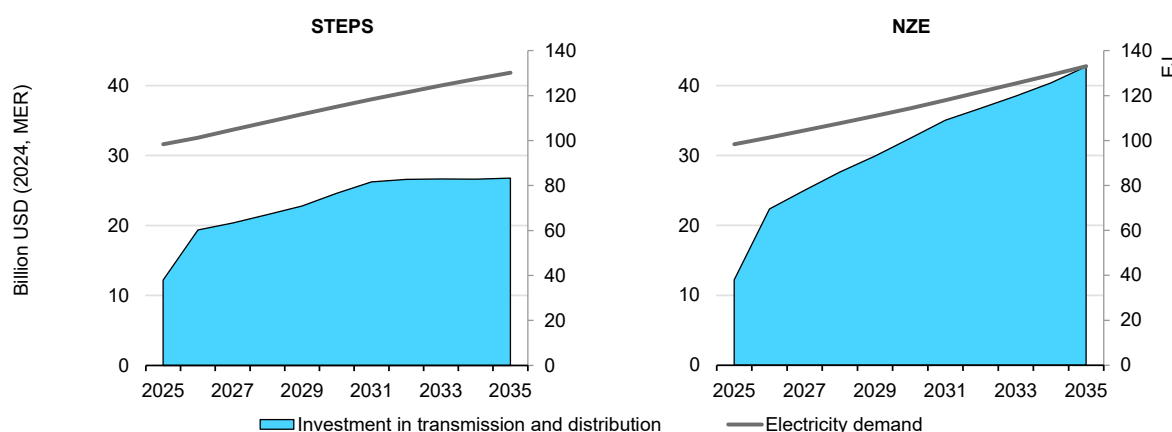
More broadly, the case reflects a shift among Chinese SOEs from EPC-only roles towards integrated invest-build-operate models that support long-term system transformation. For Uzbekistan, it provides a major early step towards achieving its 2030 renewable targets while strengthening energy security and diversifying away from natural gas.

Case 2. Southern power grid's acquisition of Enel Peru distribution assets

Project overview and impact

Latin America's power systems face a growing need to modernise their electricity networks as clean energy deployment accelerates. While the region has seen a 25% increase in clean energy investment since 2015, [grid spending has not kept pace](#), with less than USD 0.5 invested in networks and storage for every dollar spent on new generation. Strengthening distribution systems, especially in rapidly expanding urban areas, is essential to integrate more renewables.

Investment in transmission and distribution and electricity demand in Latin America in the STEPS and NZE Scenario, 2025-2035



IEA. CC BY 4.0.

Note: STEPS = Stated Policies Scenario. NZE = Net Zero Emissions by 2050 Scenario.

Sources: IEA (2025), [World Energy Outlook 2025](#) and IEA (2025), [World Energy Investment](#).

Peru is no exception. Although its electricity demand has grown steadily, network modernisation has lagged behind regional leaders, and the expansion of renewable capacity will require more robust and flexible distribution systems. Enel Distribución Perú, [the country's largest distributor](#), has played a central role in supplying Lima and Callao since the 1990s. When Enel announced in 2022 that it would divest from several international markets, including Peru, as part of a broader debt-reduction strategy, the sale opened an opportunity for a long-term investor with strong operational expertise.

Against this backdrop, China Southern Power Grid International (CSGI) – a subsidiary of China Southern Power Grid (CSG), one of China's two national grid SOEs – [acquired an 83.15% stake](#) in Enel Distribución Perú in April 2023, adding the remaining public shares by the end of 2024. The transaction was subject to [strict antitrust scrutiny](#) by Peru's Competition Authority INDECOPI, and was finally approved in June 2024. The company, now renamed Pluz Energía Perú, is the country's largest electricity distributor, serving around 1.6 million customers in Lima and Callao. CSGI's entry represents one of the largest grid-sector transactions in Peru in recent years (USD 2.92 billion). Its entry [introduced advanced system-operation practices](#), outage-management tools and experience in digitalising large distribution networks, which are all critical enablers of Peru's future grid evolution and clean energy transition.

Operational improvements have already been visible. According to Peru's energy regulator, Osinergmin, in 2024 Pluz Energía Perú became the most reliable distribution company in the country, with the lowest system-average interruption duration and frequency. By applying CSGI's reliability management systems, the company has improved fault-response efficiency by 40% and significantly reduced the duration and frequency of outages. These early results demonstrate how the transfer of operational know-how – not only capital – can accelerate system upgrades, improve service quality and support the integration of more clean energy into Peru's power system.

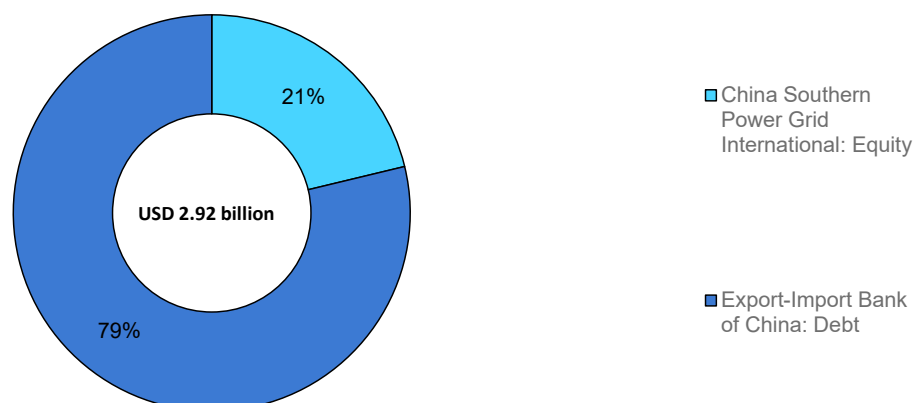
Financing model and China's role

The acquisition was financed through a USD 2.3 billion [loan from CEXIM](#), with CSGI providing roughly USD 620 million in equity. This structure reflects the scale and time sensitivity of the transaction: delays in approvals compressed the closing window, and the availability of large, long-tenor facility from CEXIM was understood to be the critical component for completing the purchase.

CEXIM's buyer-credit model, where the bank lends to the Chinese acquirer backed by the target company's future cashflows, differs from Sinosure's risk-insurance approach and is designed for large cross-border M&As. The remaining equity contribution from CSGI ensured balance-sheet capacity to manage integration and subsequent capital expenditure programmes. Once completed, CSGI also acquired 100% of Enel X Perú, expanding into energy services and e-mobility markets.

The acquisition thus combines long-tenor debt from a policy bank with strategic SOE ownership, placing a major Peruvian distributor under an operator with deep technical experience in grid digitalisation and loss-reduction, both of which are essential for Latin America's evolving power-system needs.

Financing Structure of CSGI's Acquisition of Enel Peru Distribution Assets



IEA. CC BY 4.0.

Note: The buyer's credit debt provided by CEXIM was used by the China Southern Power Grid to acquire equity stakes in Enel Peru.

Sources: Enel Group (2023), "[Enel Perú signs agreement to sell its distribution, supply and advanced energy services' assets to CSGI](#)" and Philippi Prietocarrizosa Ferrero DU & Uria (2024), "[PPU in CEXIM financing Enel Distribución Perú acquisition](#)".

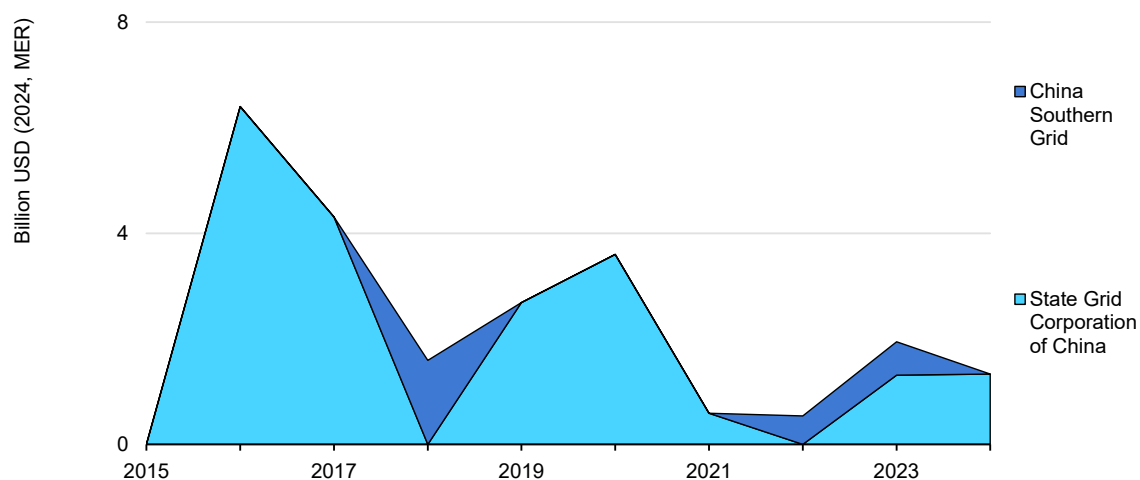
Insights and implications

The transaction reflects a broader trend: Chinese grid SOEs are increasingly important investors in Latin America's power networks. Since 2015, the State Grid Corporation of China and China Southern Power Grid have committed around USD 23 billion to transmission and distribution assets across the region, representing more than 80% of their global grid investment outside China. Their portfolios now include high-voltage transmission concessions in Brazil and major distribution utilities in Chile, as well as acquisitions like in Peru.

A second trend is a shift from long-distance transmission assets towards distribution-level investment, where modernisation needs are greatest and where operational improvements can most directly support renewables integration, electric mobility and demand-side flexibility. Peru's case, where rapid reliability gains were achieved after the takeover, illustrates how technical expertise from large grid SOEs can accelerate system upgrading.

For Latin America, transmission and distribution investment must rise sharply to nearly USD 50 billion annually to meet the energy transition goals of the IEA's Announced Pledges Scenario. Foreign investment can play a valuable role in providing such capital. The Pluz Energía Perú example demonstrates how foreign investment, paired with expertise, can strengthen system reliability and prepare networks for higher shares of variable renewables.

Chinese State-Owned Grid Enterprises' Commitment in Latin America, 2015-2024



IEA. CC BY 4.0.

Note: "Chinese State-Owned Grid Enterprises" means the State Grid Corporation of China and China Southern Power Grid. Note: Collection and curation of data from the Belt and Road Portal were performed using the IEA Energy Data Centre's web-scraping system.

Sources: IEA based on data from AidData (2023), [Global Chinese Development Finance Dataset, Version 3.0](#); AidData (2025), [China's Global Loans and Grants Dataset, Version 1.0](#); the American Enterprise Institute (2025), [China Global Investment Tracker](#); and the [Belt and Road Portal](#) (2025).

Case 3. Saudi Arabia's first green full-process heavy plate mill project

Project overview and impact

Saudi Arabia is pursuing an ambitious industrial transformation under Vision 2030, including efforts to localise heavy industries, expand low-carbon manufacturing and diversify export capacity. Steel demand is expected to grow steadily due to investment in hydrogen, ammonia, shipbuilding, offshore engineering and large-scale infrastructure. However, the country [currently imports nearly all of its heavy plate](#) steel, and domestic production has lagged the needs of an economy shifting towards more capital-intensive sectors and cleaner industrial processes.

A new heavy-plate complex developed jointly by China Baowu Steel Group, Saudi Aramco and the Public Investment Fund (PIF) of Saudi Arabia addresses this gap. [Announced in May 2023](#), the facility, which will be Saudi Arabia's first full process steel plate production plant, will be located in Ras al-Khair Industrial City and is scheduled to begin operations by the end of 2026. With an annual capacity of up to 1.5 million tonnes, the plant will supply domestic industries and export to the wider Gulf and Middle East and North Africa (MENA) region.

A key feature of the project is its low-carbon production route. The plant will use a natural gas-based direct reduced iron (DRI) furnace and an electric arc furnace (EAF), targeting up to 60% lower CO₂ emissions compared with the traditional blast furnace route. The DRI unit is designed to be hydrogen-ready without major equipment changes, enabling emission reductions of up to 90% once low-emissions hydrogen becomes available at scale. This makes the facility one of the region's earliest examples of hydrogen-compatible industrial development, supporting Saudi Arabia's ambitions to become a global leader in low emissions hydrogen and sustainable industrial value chains. By localising heavy-plate supply, the project is expected to reduce import dependence, strengthen domestic industrial capabilities and create a platform for exporting low-carbon steel products from the Gulf.

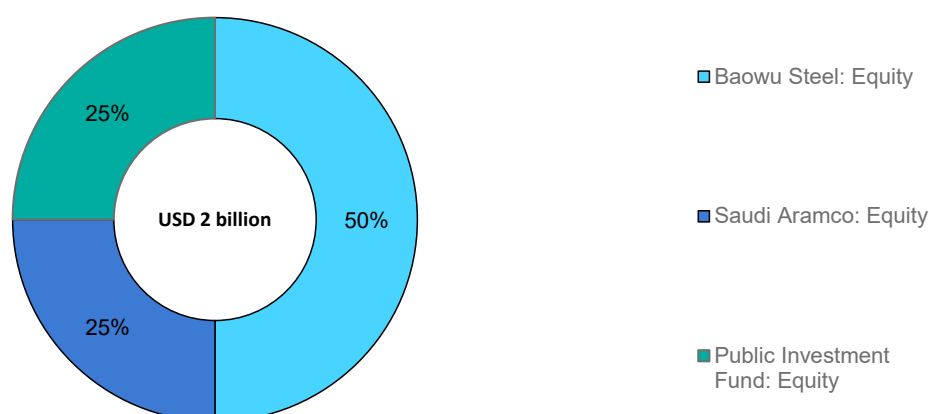
This complex is supported by [Saudi Arabia's Shareek program](#) for large enterprises, which supports large industrial investment projects through financing, expedited approvals, and procurement support.

Financing model and China's role

The project is structured through a joint venture. BAP Al-Khair Steel Company was established in 2024 with a 50:25:25 shareholding split between Baowu Steel Group, Saudi Aramco and PIF. Baowu initially committed USD 437.5 million for its equity share but later [increased its commitment to USD 1 billion](#), reflecting both the size of the investment and its importance within the company's international decarbonisation strategy. Aramco and PIF each committed about USD 500 million.

The estimated project cost is around USD 4 billion, with the joint venture expected to pursue a combination of equity and long-tenor project debt. Baowu has already announced plans to [provide a financing guarantee of up to over USD 1 billion](#) to support potential loans for the joint venture, signalling strong sponsor backing for what is, in effect, a first-of-its-kind project in the region. Likely lenders include the Saudi Industrial Development Fund (SIDF), CEXIM and other financial institutions. However, details on these arrangements have not been disclosed.

Equity Structure of Saudi Arabia's Green Full-Process Heavy Plate Mill



IEA. CC BY 4.0.

Note: As the debt financing of this project remains unknown, this chart represents the equity structure.

Source: Bao Steel (2024), "[Announcement on adjustment of capital contribution for investment in Saudi heavy plate company](#)" (in Chinese).

Insights and implications

This project marks a significant milestone in the globalisation of China's low-carbon industrial expertise. China Baowu Steel Group is the world's largest steel producer with a substantial presence in the industry for low emissions steel technologies. In addition to developing [new pilot projects](#) for hydrogen-based DRI in China, it has also [committed to cutting its CO₂ emissions](#) by 30% by 2035 from

2020 levels and achieving carbon neutrality by 2050, in line with China's dual-carbon targets. Extending these technologies abroad demonstrates how Chinese SOEs are beginning to support industrial decarbonisation beyond the power sector, particularly in markets that are building new industrial capacity from the ground up.

The case also highlights a wider shift in China's outbound investment: from resource-oriented, emissions-intensive international projects towards low emissions, technology-driven industrial assets. Rather than traditional EPC contracting, Baowu is investing as a full equity partner, embedding technical know-how and long-term operational involvement. Partnering with Aramco and PIF reduces early-stage uncertainty and aligns the project with national industrial plans, increasing the likelihood that hydrogen-ready capacity will be deployed at scale.

For EMDE more broadly, the project demonstrates how joint-venture models combining domestic sovereign investors, foreign industrial expertise and policy-aligned financing can help build new low-carbon industrial value chains. Near zero emissions steel, hydrogen-DRI and advanced EAF technologies require large upfront capital and carry technology-transition risks, both of which often deter purely commercial finance. In this case, the ability to blend Chinese SOE capability, Gulf sovereign co-investment and potential policy-bank lending created a pathway that typical private financing would struggle to deliver.

Case 4. TFC Solar PV project in South Africa

Project overview and impact

South Africa faces significant challenges regarding electricity reliability. The lack of investment, coupled with increasing demand have led to chronic load shedding, with household and industrial consumers affected. Energy-intensive sectors, such as ferrochrome smelting, face rising operational costs, production losses and growing pressure to reduce emissions in line with national and international climate objectives. To address power shortages, the South African government, since 2023, has [allowed independent power producers](#) to build power plants above 100 MW and sell electricity directly to private customers without an issued generation license.

The Tubaste Ferrochrome (TFC) solar PV power plant in South Africa's Limpopo province responds directly to this context. Developed near the TFC smelter in the Burgersfort area, the project will deliver 100 MW of solar PV capacity in two phases: 60 MW in phase I and 40 MW in phase II over two years. It is jointly developed by the China General Nuclear Power Group (CGN)'s Africa platform, the China-Africa Development Fund (CADFund) and local partner KONA Holdings Limited. The plant is designed as a captive power facility supplying electricity directly to the TFC smelter, which has long been owned by Samancor Chrome; Chinese SOE, Sinosteel, acquired a controlling stake in Samancor Chrome in 2022.

Through a long-term PPA between the CGN's project company and Samancor Chrome, the solar plant will provide dedicated clean electricity to the smelter, reducing dependence on the national grid and exposure to load shedding. The project will [use solar PV modules and inverters](#) from Chinese manufacturers. Northern International, a subsidiary of China's Northern Industrial Group, will serve as the EPC contractor. After completion, CGN will assume full operational responsibility for the solar plant.

Once fully operational, it is expected to generate about 147 GWh of solar electricity per year, contributing to South Africa's broader efforts to decarbonise heavy industry. The project also demonstrates how foreign capital, coupled with industrial demand, can support both energy security and lower-carbon production in one of Africa's most important mining economies.

The project was announced during the [2024 China-South Africa Economic and Trade Forum](#), receiving support from both countries.

Financing model and China's role

The TFC project is financed through a joint equity and debt structure, with CGN as the majority shareholder. Total project costs are estimated at [more than RMB 500 million](#) (about USD 70 million), with equity contributions from the CGN, CADFund and KONA Holdings. The exact equity split has not been disclosed.

In September 2024, the CGN and CADFund [signed a financing agreement](#) with the Johannesburg branch of the China Construction Bank (CCB) for the project. While detailed terms on the tenor, pricing and security have not been made public, the structure is consistent with limited- or non-recourse project finance, in which lenders rely primarily on project assets and contracted cash flows for repayment. The long-term PPA with Samancor Chrome underpins revenue, providing predictable cash flows that support the bankability of the financing in a higher-risk market.

CADFund's role is particularly important. As a state-backed equity fund focused on Africa, fully funded and initially managed by CDB, it helps absorb part of the early-stage risk, strengthens due diligence and signals policy support, which in turn facilitate participation by Chinese commercial banks such as CCB. The involvement of a Chinese-controlled off-taker (Sinosteel-owned Samancor Chrome), Chinese EPC and Chinese equipment suppliers further reduces co-ordination risk and allows the financing structure to be tailored to the needs of the mining-power partnership.

Insights and implications

The TFC solar PV project shows how industrial demand can anchor clean energy investment in EMDE. Rather than competing for scarce grid capacity or public funding, the project is structured around a single, creditworthy off-taker with a clear need for reliable, affordable energy. This model can be replicated in other industrial facilities across Africa, especially in countries where grid constraints and high wholesale electricity prices are constraining growth and delaying decarbonisation.

This case also illustrates China's "SOEs going out as a group (抱团出海)" strategy. Chinese state-linked entities appear in almost every key role of this project: the CGN as a developer and operator, CADFund as the equity co-investor, Chinese manufacturers as equipment suppliers, Northern International as the EPC contractor and Sinosteel-linked Samancor Chrome as the industrial off-taker. This approach allows China to export capital, management and technology as an

integrated package which lowers transaction costs, accelerates execution and improves perceived bankability in environments where institutional capacity or co-ordination can be challenging.

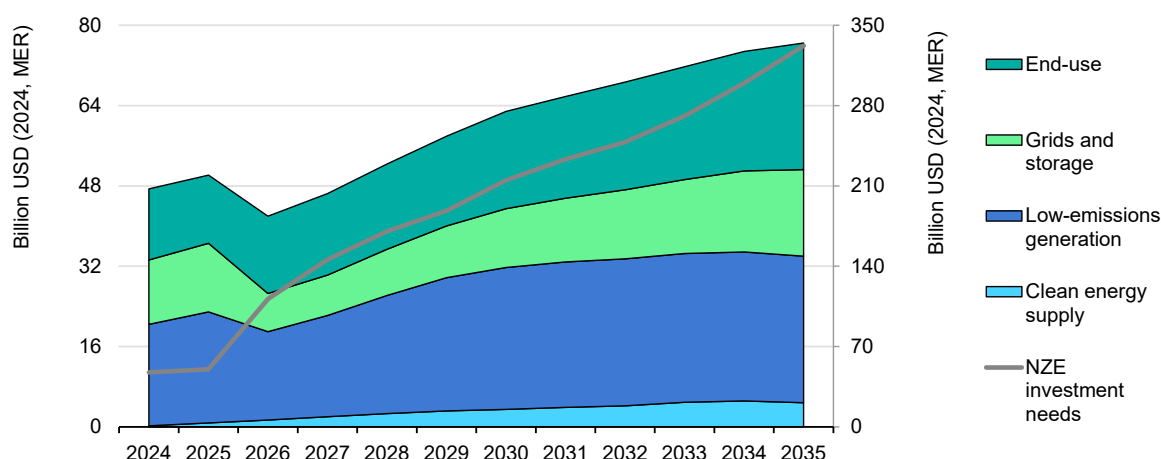
For South Africa and the wider region, the project signals a growing opportunity to pair industrial decarbonisation with energy security. By reducing the TFC smelter's exposure to load shedding and fossil-based electricity, the project supports more stable output of ferrochrome, a key export commodity, while cutting emissions. If replicated at scale, similar captive renewables and storage projects could help unlock a pipeline of low-carbon industrial investments across the continent, especially where international partners can provide risk-tolerant capital aligned with domestic regulatory reforms.

Case 5. Silk Road fund commitment in African Infrastructure Investment Fund IV

Project overview and impact

Africa's energy sector faces a persistent investment shortfall, with annual clean energy spending needing to grow more than six times by 2035 to achieve net zero emissions by 2050. Equity funds have become an important channel for mobilising capital into markets where project-level financing remains constrained by high costs of capital, currency risk and a shortage of scalable, investable project structures.

Clean energy investment needs in Africa in the STEPS and NZE Scenario, 2025- 2035



IEA. CC BY 4.0.

Notes: STEPS = State Policies Scenario. NZE = Net Zero Emissions by 2050 Scenario.

Sources: IEA (2025), [World Energy Outlook 2025](#) and IEA (2025), [World Energy Investment](#).

Against this backdrop, the Silk Road Fund (SRF) committed USD 50 million to the African Infrastructure Investment Fund IV (AIIF4) in 2023. The AIIF4 is a pan-African infrastructure fund managed by African Infrastructure Investment Managers (AIIM). It focuses on sustainable infrastructure and targets 75% of committed capital to be invested in Paris-aligned assets, while 20% is reserved for climate-related transactions through a dedicated climate-focused vehicle.

The AIIF4 invests across a portfolio of energy-transition, logistics and digital infrastructure companies, mainly in the private sector, in energy transition, digital infrastructure and logistics. The fund has invested in 12 companies to date. Key

energy-related financing projects include the [NOA Group](#), a renewable energy platform in South Africa focused on renewable generation and storage; the [N+One Data Centers](#) in Morocco and Senegal, which are expanding digital infrastructure in lower-carbon electricity and greater renewable energy sourcing; and the [acquisition of the Logistics Group \(TLG\)](#), which operates rail and port assets and is working to cut corridor emissions through improved operational efficiency.

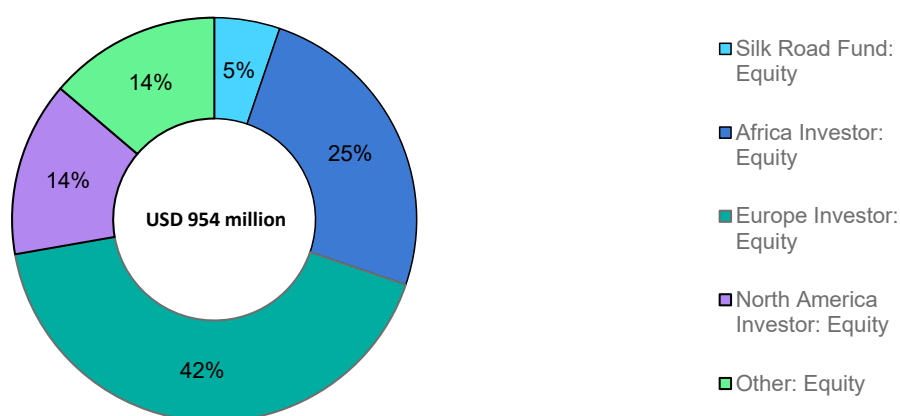
Through its participation, the SRF gains exposure to a diversified portfolio of sustainable assets across multiple African markets rather than through single-asset project finance. It has also appointed a representative to AIIF's ESG Advisory Committee, strengthening the fund's environmental and governance approach.

Financing model and China's role

AIIF4 reached financial close in August 2024 at USD 748 million, with an additional USD 206 million approved for co-investment. Its investor base [comprises 29 institutions](#), including DFIs, pension funds, insurance companies, sovereign wealth funds, asset managers and family offices. DFIs account for around half of total the commitments.

The SRF's USD 50 million contribution represents over 5% of the fund's total size, positioning it as a sizeable sovereign investor among a largely commercial-developmental consortium. The SRF does not take operational control but participates as a limited partner, relying on AIIM's regional expertise to select and manage assets. This structure reduces project-level concentration risk for the SRF while ensuring alignment with Africa's growing infrastructure and climate priorities.

Financing structure of the African Infrastructure Investment Fund IV



IEA. CC BY 4.0.

Note: This chart represents the total amount of investments in AIIF4 by investor region. "North America investor" refers to those from Canada and the United States, and Europe investors refer to those from the European Union and the United Kingdom. Other investors refer to those from regions outside North America, Africa, Europe and the Silk Road Fund.

Source: African Private Capital Association, "[African Infrastructure Investment Managers \(AIIM\) reach final close for African Infrastructure Investment Fund 4](#)".

The model is emblematic of the SRF's broader approach as a state-owned investment fund. Backed by the State Administration of Foreign Exchange (65%), China Investment Corporation (15%), the Export-Import Bank of China (15%), and China Development Bank (5%), the SRF deploys equity into overseas projects and funds rather than extending debt, enabling longer-term, risk-tolerant capital mobilisation. By 2023, the SRF had [supported 86 projects](#) in nearly 70 countries, with cumulative pledged investment of USD 23.6 billion and a green-asset portfolio of USD 1.5 billion.

Insights and implications

The SRF's participation in AIIF4 reflects the growing role of state-owned funds in China's outbound clean energy and infrastructure financing. Unlike policy-bank lending or SOE-led project development, sovereign fund equity investment can be deployed flexibly across geographies and sectors, enabling China to contribute to Africa's energy transition through diversified, market-based channels. This aligns with observed geographic shifts in Chinese outbound finance since 2020, where smaller but more targeted equity investments have become increasingly common.

The partnership also signals a broader trend towards China's multilateral co-investment models. By investing alongside African and global DFIs, including IFC and several European development funds, the SRF positions Chinese capital within international governance. This reduces reputational risk, increases market confidence and demonstrates alignment with international sustainable finance principles.

For African markets, the AIIF4 provides a vehicle that can scale capital into segments that are often underserved: distributed renewables, digital infrastructure with lower emissions intensity and systems critical for regional growth. China's participation through the SRF helps expand the pool of long-term capital available for such transactions. It also contributes indirectly to technology transfer and market creation, given that many AIIM portfolio companies integrate renewable generation, energy efficiency and low-carbon logistics solutions.

Overall, the case illustrates an increasingly institutional and partnership-oriented model of Chinese outbound finance that complements, rather than substitutes for, project-level lending and SOE-driven infrastructure delivery. This diversified ecosystem can support the development of sustainable infrastructure pipelines across Africa, where financing gaps remain significant and where equity participation plays a key role in unlocking follow-on capital.

Case 6. CNOOC investment in Guyana: Whiptail Oil Field

Project overview and impact

Guyana has become a dynamic upstream oil market, transforming from a non-producer to an emerging oil exporter within the decade. Since the first discovery of oil in the Stabroek Block in 2015, six large-scale developments have been approved, turning the area into a central pillar of the country's economic strategy. Production is expected to exceed 1.3 million barrels per day by 2027, making Guyana one of the largest per-capita oil producers globally. The government's [production sharing contract](#) allocates 14.5% of total crude output to the state, with the remainder used to cover costs and remunerate contractors.

The Whiptail project is the [sixth development in the Stabroek Block](#) and contains more than 850 million barrels, accounting for roughly 8% of its total recoverable resources. Once production starts in 2027, Whiptail will add up to 250 000 barrels per day of new capacity, expanding output by almost 40% from today's levels, further consolidating Guyana's rapidly expanding offshore sector. As with the preceding developments (Liza Phases I–II, Payara, Yellowtail and Uaru), Whiptail is developed under a long-term partnership between ExxonMobil (45%, operator), Hess (30%) and CNOOC (25%).

For China, this project represents the continuation of a significant upstream presence in the region. With Stabroek resources now estimated above 11 million barrels, CNOOC's 25% interest gives it exposure to one of the world's most commercially attractive new oil provinces, with around one-quarter of total resources attributable to the company.

Guyana in 2021 passed [the Local Content Act](#) to protect local interests in oil development. The Act requires oil companies, including CNOOC, to use local labour and suppliers in 40 specific categories, such as catering, transportation and manufacturing. In 2024, around 70% of the workforce on the Stabroek oil field project was local.

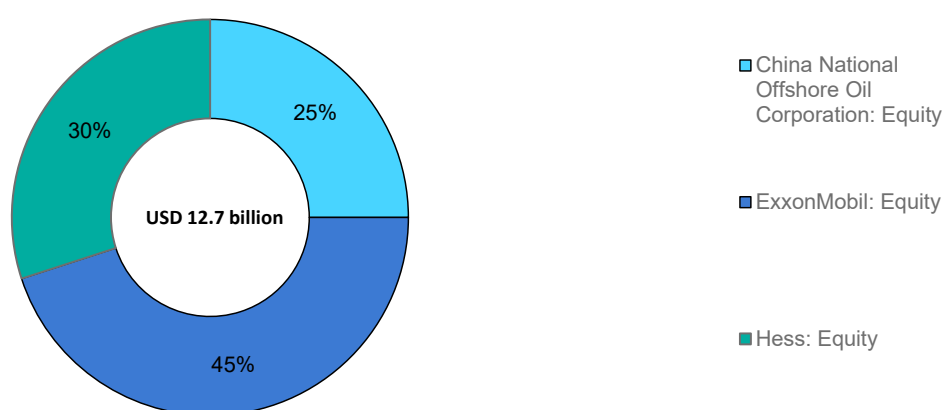
Financing model and China's role

Whiptails' total development cost is estimated at USD 12.7 billion, of which CNOOC is responsible for roughly USD 3.18 billion in proportion to its 25% stake. This covers both capital expenditure and operating costs consistent with the

production sharing contract. CNOOC's cumulative investment across all six Stabroek projects has now reached around USD 17.7 billion, making the Guyana basin the company's largest overseas upstream commitment.

While ExxonMobil retains operatorship, CNOOC participates fully in investment decision-making and bears its proportional share of capital and operating costs. Since the developments in the Stabroek Block are financed directly from the partners' balance sheets rather than through non-recourse project debt, CNOOC's exposure moves in line with changes in project costs, oil-price dynamics and future operating performance. This differs from many clean energy projects, where high shares of project-finance debt and fixed offtake arrangements can insulate sponsors from part of the underlying risk.

Equity ownership structure of the Whiptail Upstream Project



IEA. CC BY 4.0.

Note: Publicly available information confirms the division of equity interests among ExxonMobil, Hess and CNOOC under the Stabroek Block Production Sharing Contract. The project's capital structure is not fully disclosed; no public evidence confirms whether external debt is used in individual field developments.

Source: ExxonMobil (2024), [ExxonMobil Guyana moves forward with sixth offshore development](#).

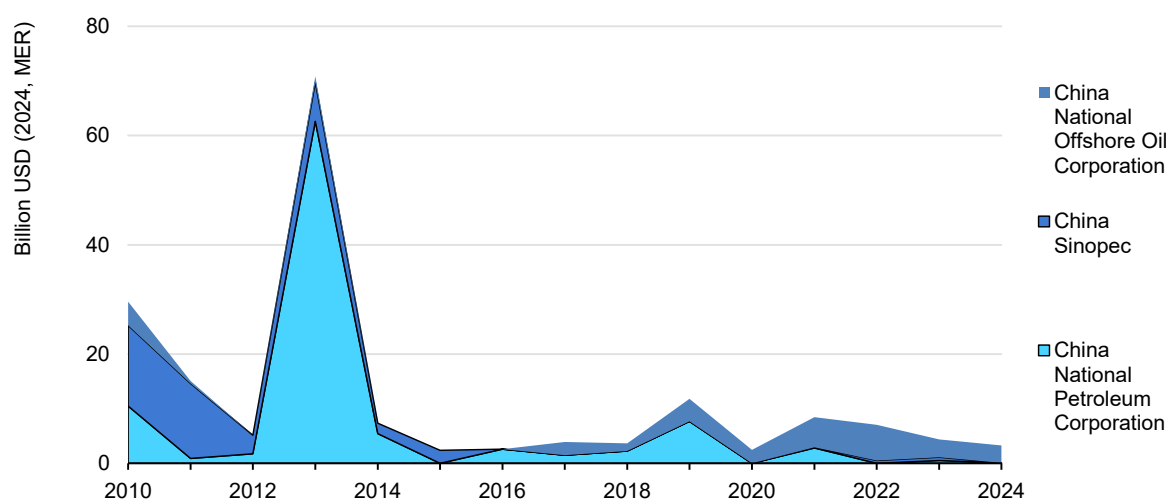
Insights and implications

CNOOC's continued expansion in Guyana reflects a broader shift in the composition of China's outbound energy investment. Historically, China's overseas upstream spending was led by China National Petroleum Company (CNPC) and China Petroleum and Chemical Corporation (Sinopec), whose activity peaked around 2013 before declining sharply. Since 2018, however, CNOOC has steadily increased its international commitments, acquiring stakes in major fields in Brazil, Abu Dhabi, Iraq and Uganda, and emerging as China's largest overseas upstream investor in EMDE since the COVID pandemic.

The company's strategy emphasises participation in high-quality, low-cost basins operated by international majors, often alongside long-term production sharing agreements. The Stabroek Block epitomises this approach: it offers some of the lowest breakeven costs among new global oil developments, rapid project cycles, and a strong operator track record. CNOOC's role therefore strengthens China's access to diversified energy supply while embedding the company in multi-partner arrangements in key emerging markets.

At the same time, the case highlights how China's outbound finance spans the full energy spectrum, including upstream projects that help secure access to global oil supply chains as domestic energy transition unfolds. These upstream projects do not directly support energy transitions in EMDE, but they shape the global supply landscape and demonstrate how different categories of Chinese official actors – SOEs, sovereign funds and banks – engage with host countries across the full energy spectrum.

Upstream Commitment of major Chinese national oil companies, 2010-2024



IEA. CC BY 4.0.

Note: Collection and curation of data from the Belt and Road Portal were performed using the IEA Energy Data Centre's web-scraping system.

Sources: IEA based on data from the American Enterprise Institute (2025), [China Global Investment Tracker](#); and the [Belt and Road Portal](#) (2025).

Case 7. Palembang waste-to-energy plant

Project overview and impact

Indonesia faces a dual challenge of rapidly growing waste volumes and persistent electricity supply constraints. The country generates around [65 million tonnes of waste](#) annually, yet only about 20% is formally treated, and most cities rely heavily on landfills. In 2017, the government designated 12 priority cities for accelerated waste-to-energy (WTE) development, including Palembang, and introduced preferential feed-in tariffs and guaranteed waste-tipping fees to attract private investment. Despite this, only two WTE plants, [Surabaya's Benowo PLTSa and Surakarta's Putri Cempo PLTSa](#), both on Java island, were operational before 2024, highlighting a significant gap between policy ambition and actual delivery.

The Palembang Waste-to-Energy Project is the city's first planned large-scale WTE facility and among Indonesia's most advanced PPP-based WTE developments to date. [Initiated by Zheneng Jinjiang Environment Holding Company Limited](#), a Chinese SOE and leading WTE operator, the project will treat 1 000 tonnes of municipal waste per day and generate 20 MW of electricity. Over a year, it will process nearly 300 000 tonnes of waste, reducing the city's reliance on landfill disposal, cutting methane emissions, and improving local environmental conditions. The project broke ground in September 2024 with China Power Engineering Consulting Group as the EPC contractor, [with operations expected to start in 2026](#). It contributes directly to Indonesia's plan to [deploy 30 WTE plants nationwide by 2029](#) and support the country's broader low-carbon and circular-economy goals.

Financing model and China's role

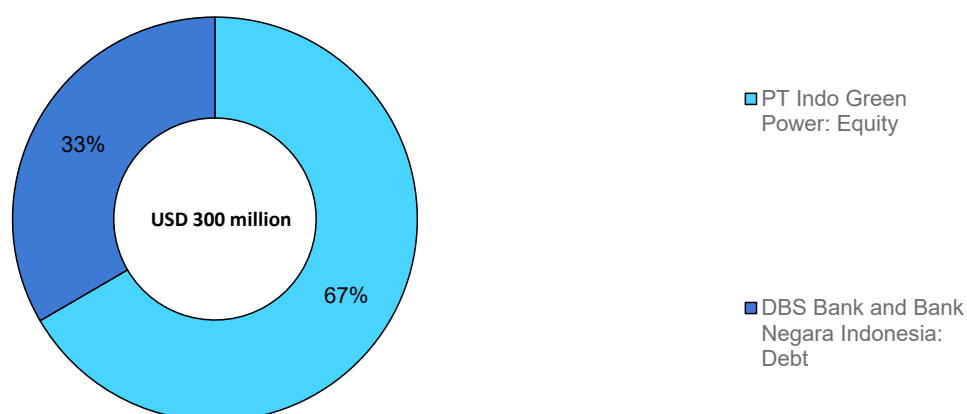
The project is structured as a build–own–operate public–private partnership under a 30-year concession. The Palembang municipal government guarantees waste supply and pays a [regulated waste-treatment fee](#) – capped at IDR 500 000 per tonne (about USD 33) – which anchors a stable revenue stream alongside power sales. In December 2023, state-owned power company [Perusahaan Listrik Negara \(PLN\) signed a long-term PPA](#) to purchase all electricity generated at a feed-in tariff of USD 0.1335/kWh, one of the highest renewable tariffs in Indonesia and designed specifically to support WTE deployment.

The project's total cost is about USD 300 million. Debt financing was arranged through a syndicate led by Singapore's DBS Bank and Bank Negara Indonesia (BNI), which provided an eight-year non-recourse loan composed of USD 85 million and IDR 243 billion (about USD 15.3 million). The dual-currency structure reflects the project's revenue profile: electricity sales under the PPA are denominated in USD, while waste-treatment fees from the municipal government are paid in IDR. Aligning part of the debt service with local-currency income reduces exposure to foreign-exchange risk, an important consideration for infrastructure projects in EMDE.

The remaining roughly USD 200 million was provided as equity by Zheneng Jinjiang Environment through its local subsidiary, PT Indo Green Power (IGP). The financing is fully project-based, with lenders relying on future cash flows and securing their position through pledges over project assets and revenue accounts, allowing the sponsor to proceed without a full corporate guarantee.

Sinosure provided medium- to long-term buyer's credit insurance that covers up to 95% of political and commercial risks, marking its first "double-95%" insurance package in the WTE sector. This guarantee was crucial for enabling long-tenor bank financing in a market where regulatory risk, municipal payment risk and project-execution risks have historically constrained private capital. Chinese firms – including the EPC contractor (China Power Engineering Consulting Group) and equipment suppliers – also form part of the delivery chain.

Financing Structure of the Palembang Waste-to-Energy Project



IEA. CC BY 4.0.

Sources: American Enterprise Institute (2025), [China Global Investment Tracker](https://www.nasdaq.com/articles/zheneng-jinjiangs-subsiary-secures-major-project-financing); and Nasdaq (2024), <https://www.nasdaq.com/articles/zheneng-jinjiangs-subsiary-secures-major-project-financing>.

Insights and implications

The Palembang WTE project shows how China's [increasing domestic competition](#) within the WTE industry is driving leading firms to seek opportunities overseas, especially in EMDE where waste and energy challenges intersect. Zhejiang Energy Jinjiang Environment alone operates 27 WTE plants in China and is among several SOEs now seeking opportunities abroad. A [2024 State Council directive](#) encouraged domestic waste-treatment companies to “go global”, aligning industrial capabilities with green-development priorities in BRI countries.

By mid-2025, Chinese companies were involved in 43 overseas WTE projects across 13 countries – with 16 new projects launched in the first half of 2025 – demonstrating accelerating outbound interest. Southeast Asia is a key focus due to supportive tariff structures and urgent landfill constraints, while additional growth is emerging in Central Asia and the Middle East.

For EMDE, the Palembang project highlights how waste-to-energy can serve as a practical complement to renewables in markets where grids are constrained and landfill dependence is rising, offering both firm generation and improved waste management outcomes. It also demonstrates that combining long-tenor commercial bank lending with Sinasure-backed risk-mitigation can produce a bankable PPP structure in markets with limited precedent for large WTE assets. More broadly, the case reflects how integrated Chinese participation – spanning investment, EPC delivery, equipment supply and credit insurance – can reduce co-ordination challenges and enable complex, first-of-a-kind projects to move from planning to financial close, providing a replicable model for cities facing similar waste and energy pressures.

Annex

Methodology

This report draws on the substantial publicly-available information to construct a consolidated database of Chinese official outbound financing for energy. As no single official source provides a comprehensive or sectorally-disaggregated record of China's overseas financing, the analysis relies on triangulating data across several complementary sources and applying consistent filtering and classification rules.

The following sources underpin the analysis:

- AidData's [Global Chinese Development Finance Dataset, Version 3.0](#) and [China's Global Loans and Grants Dataset, Version 1.0](#), apply an OECD-Common Reporting Standard (CRS)-aligned methodology to track official-sector loans and grants. These sources provide the majority of debt and grant transactions. AidData datasets do not cover transactions beyond 2023, and additional resources were used in this report to fill the gap in 2024.
- The American Enterprise Institute's [China Global Investment Tracker](#) (2025), was used to identify equity transactions – primarily from state-owned enterprises (SOEs) – that are energy-related and within scope. The AEI tracker only reports on the investing company or entity, recipient region, year and transaction amount, without specifying the underlying financing details. For accurate categorisation of technology type, each transaction was manually matched with its corresponding financing commitment through supplemental research. Only verified, energy-relevant transactions were retained. The dataset only reports on transactions with volumes higher than USD 100 million.
- Chinese enterprises' overseas weekly project reports (中企海外项目周报) shared via the [Belt and Road Portal](#), provide narrative descriptions of overseas activities by Chinese enterprises. From 2021, every weekly post was systematically collected, reviewed, and organised into a structured internal database. Only transactions that (i) had reached a signed or formally approved stage, (ii) involved official Chinese financing beyond EPC contracting, and (iii) fell within the scope of this report were included. The collection and curation of the data were performed using the IEA Energy Data Centre's web-scraping system.

In addition, all sources were supplemented through verification of the identified projects, using official government or embassy announcements, Chinese and international news reporting, company disclosures and annual reports or project

documents where publicly accessible. This additional verification also allowed the inclusion of projects not captured in the datasets above and identified through our own research.

The scope of this report covers both overseas project-level greenfield financing and overseas project-level or corporate-level acquisitions by Chinese official actors.

Not all transactions reported through these channels are connected to the Belt and Road Initiative (BRI). Many originate from commercial, corporate or bilateral channels outside any formal BRI framework, and this report therefore treats them neutrally as outbound official financing rather than categorising them by initiative labels.

Energy-related transactions were classified following the IEA's legacy methodology for international public finance. This includes:

- direct energy-sector activities as defined under the OECD-Development Assistance Committee (DAC) Creditor Reporting System.
- relevant components of transport and storage, buildings and construction, and mining, where these form part of essential energy supply chains or end-use infrastructure.
- projects or transactions related to manufacturing operations were not included in the analysis.

Each transaction was reviewed individually. Where available, subsector allocations followed project-level information; where not, they were approximated using IEA investment spending profiles for the relevant year and region.

Two types of figures appear in the report:

- Commitments reflect formal pledges or signed financing agreements. These indicate total project scale but do not represent disbursements in any given year.
- Investment spending captures the amount invested – or required to be invested – in any given year, according to typical project construction timelines. These come from IEA investment tracking and scenario frameworks.

Commitments reflect intent and project size, while investment spending indicates actual annual flows. [Previous IEA publications](#) illustrate how Chinese outbound commitments translate into annual investment once disbursement profiles are applied.

Exchange rates and deflators

Exchange rates (2024 annual average)

Currency	1 US dollar (USD) equals
BRL	5.39
CNY	7.20
EUR	0.92
IDR	15 855.45
ZAR	18.33

Source: Organisation for Economic Co-operation and Development: [exchange rates \(national currency per US dollar, annual average\)](#), accessed October 2025.

By default, investment data are given in year 2024 US dollars, adjusted using country-level gross domestic product deflators and 2024 exchange rates. Unless otherwise stated, all time series and historical comparisons are presented in real 2024 US dollar terms, adjusted for inflation.

IEA scenarios

This report refers to three IEA scenarios when referencing to future investment needs.

- The Net Zero Emissions by 2050 (NZE) Scenario maps out a pragmatic but ambitious global pathway for the energy sector to achieve net zero CO₂ emissions by 2050 and is consistent with a long-term goal of limiting the rise in global average temperatures to 1.5 °C (with a 50% probability).
- The Announced Pledges Scenario (APS) models a future for the energy system in which all national energy and climate targets, such as countries' Nationally Determined Contributions (NDCs) and long-term, low-emissions development strategies, are achieved in full and on time. The IEA's recent World Energy Outlook does not include APS, but shares values shared in a recent IEA publication on [investment needs of Latin America](#).
- The Stated Policies Scenario (STEPS) is a exploratory scenario, designed to reflect the prevailing direction of travel for energy system based on a detailed reading of country-specific energy, climate and related industrial policies that have been adopted or put forward, even if not yet codified in law. It reflects the state of technology and market conditions but does not include aspirational goals.

Abbreviations and acronyms

AIIF4	Infrastructure Investment Fund IV
AIIM	African Infrastructure Investment Managers
BNI	Bank Negara Indonesia
BRI	Belt and Road Initiative
BRL	Brazilian Real
CAD	Fund China-Africa Development Fund
CCB	China Construction Bank
CDB	China Development Bank
CEEC	China Energy Engineering Corporation, or Energy China
CEXIM	Export-Import Bank of China
CGN	China General Nuclear Power Group
CIC	China Investment Corporation
CNOOC	China National Offshore Oil Co-operation
CNPC	China National Petroleum Corporation
CNY	Chinese Yuan
CSG	China Southern Power Grid
CSGI	China Southern Power Grid International
DFI	Development Finance Institution
EPC	Engineering, Procurement and Construction
EUR	Euro
IDR	Indonesian Rupiah
IGP	Indo Green Power
IPF	International Public Finance
PIF	Public Investment Fund
SCO	Shanghai Co-operation Organisation
SIDF	Saudi Industrial Development Fund
Sinopec	China Petroleum and Chemical Corporation
Sinosure	China Export & Credit Insurance Corporation
SOE	State-Owned Enterprise
SRF	Silk Road Fund
TFC	Tubaste Ferrochrome
USD	US Dollar
ZAR	South African Rand

Definitions

Buildings: Energy use and energy-related investments in residential and services buildings, including space heating and cooling, water heating, lighting, appliances and building electrification. Services buildings include commercial and institutional buildings such as schools, hospitals and offices.

Capital structure: Capital structure is the combination of debt and equity used by a company to finance its overall operations and growth.

Clean energy: In *power*, clean energy includes: renewable energy sources; nuclear power; fossil fuels fitted with CCUS; hydrogen and ammonia; battery storage; and electricity grids. In *efficiency*, clean energy includes energy efficiency in buildings, industry and transport, excluding domestic navigation. In *end-use applications*, clean energy includes: direct use of renewables; electric vehicles; electrification in buildings, industry and international marine transport; CCUS in industry and direct air capture. In *fuel supply*, clean energy includes low-emissions fuels, direct air capture and measures to reduce the emissions intensity of fossil fuel production.

Concessional finance: Resources extended at terms more favourable than those available in the market. This can be achieved through one or a combination of the following factors: interest rates below those available on the market; maturity, grace period, security, rank or back-weighted repayment profile that would not be accepted/extended by a commercial financial institution; and/or by providing financing to the recipient otherwise not served by commercial financing.

Debt: Capital provided in the form of loans or bonds that must be repaid over an agreed period (tenor), typically with interest. In this report, debt includes short- and long-tenor lending by policy banks, commercial banks and other financial institutions to finance energy-related projects.

Equity: Capital invested in exchange for an ownership stake in an asset, company or project, with returns linked to future profits, dividends or asset value rather than fixed repayments. In this report, equity includes direct investments in energy assets or project companies, joint ventures, acquisitions, as well as commitments to equity funds and fund-of-fund structures that invest in energy-related infrastructure.

Financing: In this report, “financing” refers to the provision of capital – through debt, equity or risk-mitigation instruments – to support the development, construction or acquisition of energy-related assets. Financing can be supplied directly by institutions (e.g., loans, equity stakes) or indirectly through guarantees and insurance that enable other lenders or investors to participate. The figures presented in this report generally reflect financial commitments made in a given year rather than the full amount disbursed.

Financing commitments: Capital raised by private companies or committed by international public finance institutions. In practice, this financing will not all be spent or disbursed in the year it is committed.

Fossil fuel generation: Electricity and heat generation using fossil fuels, including coal-, oil- and natural gas-fired power plants. It excludes fossil fuel

supply activities and focuses only on power and heat production. Fossil fuel generation projects in this dashboard do not explicitly include carbon capture, utilisation and storage technologies.

Fossil fuel supply: Activities related to the extraction, processing and transport of fossil fuels, including coal mining, oil and gas production, liquefaction, refining, pipelines and associated infrastructure. This category covers upstream and midstream supply rather than electricity generation.

Government agency: A public institution that provides financial support using government budgetary resources rather than commercial banking operations. Government agencies typically support overseas projects through grants, concessional funding or capital contributions to dedicated programmes and funds.

Grant: The transfer of funds by development finance institutions or donors, usually with an obligation to spend the money on a contractually defined project or set of eligible expenses. Grant payments do not need to be repaid with money or equity as long as the contractual conditions are met.

Grids and storage: Infrastructure for transmitting, distributing and managing electricity, including transmission and distribution networks, substations, grid reinforcement and battery energy storage systems. Storage refers primarily to grid-connected battery storage used to balance supply and demand.

Guarantee: An agreement that secures the repayment of a debt to a lender by a third-party if the borrower defaults. The third-party acts as a guarantor and assumes responsibility for the repayment of the debt if the original debtor defaults.

International public finance (IPF): Cross-border financial flows provided by public institutions – such as development banks, export credit agencies, government funds or state-owned enterprises – of one country to support projects in another. In the context of this report, it captures the loans, equity investments, guarantees and insurance that Chinese official institutions extend to energy-related projects in EMDE. These flows are distinct from domestic spending and from purely private investment originating from China or elsewhere.

Industry: Energy use and energy-related infrastructure in industrial activities, including manufacturing, construction and processing industries such as steel, cement, chemicals and aluminium. It includes projects related to industrial energy supply, efficiency improvements and low-emissions industrial processes.

Investment: Investment is the capital expenditure in energy supply, infrastructure, end-use and efficiency. *Fuel supply investment* includes the production, transformation and transport of oil, gas, coal and low-emissions fuels. *Power sector investment* includes new construction and refurbishment of generation, electricity grids (transmission, distribution and public electric vehicle chargers),

and battery storage. *Energy efficiency investment* includes efficiency improvements in buildings, industry and transport. *Other end-use investment* includes the purchase of equipment for the direct use of renewables, electric vehicles, electrification in buildings, industry and international marine transport, equipment for the use of low-emissions fuels, and CCUS in industry and direct air capture. Data and projections reflect spending over the lifetime of projects and are presented in real terms in year-2024 US dollars converted at market exchange rates unless otherwise stated. Total investment reported for a year reflects the amount spent in that year.

Nuclear generation: Electricity generation from nuclear power plants, including new reactor construction, life extensions and major refurbishments of existing nuclear facilities.

Official sector finance: Financing provided by state-owned or state-directed institutions, reflecting national economic, industrial or strategic policy objectives. In this report, the term refers to the subset of such financing directed overseas, delivered through instruments such as loans, equity, guarantees and credit insurance, and provided by government agencies, state-owned policy banks, state-owned funds, state-owned commercial banks and SOEs.

Power purchase agreement (PPA): A legal contract between an electricity generator (provider) and a power purchaser (user).

Project finance: Involves external lenders – including commercial banks, development banks and infrastructure funds – sharing risks with the sponsor of the project. It can also involve fundraising from the debt capital markets with asset-backed project bonds. They often involve non-recourse or limited-recourse loans where lenders provide funding on a project's future cash flow and have no or limited recourse to liability of the project parent companies.

Renewable generation: Electricity generation from renewable energy sources, including solar photovoltaics, wind, hydropower, geothermal, modern bioenergy and renewable waste. It covers utility-scale and distributed renewable power projects.

State-owned commercial bank: A commercially oriented bank majority-owned by the state and operating under market-based principles. State-owned commercial banks provide financing through instruments such as corporate loans, project finance and syndicated lending, while remaining aligned with national regulatory and strategic frameworks.

State-owned enterprise: A company owned or controlled by the state that operates on a commercial basis. State-owned enterprises invest in overseas energy projects primarily through equity participation, joint ventures, acquisitions

and build-operate arrangements, often combining financing with engineering, procurement, construction and operational capabilities.

State-owned fund: A public institution that provides financial support using government budgetary resources rather than commercial banking operations. Government agencies typically support overseas projects through grants, concessional funding or capital contributions to dedicated programmes and funds.

State-owned policy bank: A state-owned financial institution established to support national economic and development objectives through long-term financing. State-owned policy banks typically provide loans and, in some cases, grants or equity to large-scale infrastructure and strategic projects, operating with a policy mandate rather than purely commercial return requirements.

Sovereign debt: Debt issued by a government as a form of raising capital, typically by issuing bonds, bills, debt securities, or contracting loans from other countries, multilateral organisations and development finance institutions.

Syndicated loan: A debt facility provided by a group of lenders – typically a mix of commercial banks, policy banks or other financial institutions – to a single borrower under a common set of terms. One or more banks act as lead arrangers, structuring the loan and coordinating the lender group.

Transport: Energy-related infrastructure and assets linked to the transport of people and goods, including railways, urban transit systems, ports and fuel or electricity supply for transport. It includes transport electrification and efficiency-related investments where applicable.

Regional and country groupings

Advanced economies: Organisation for Economic Co-operation and Development (OECD) regional grouping and Bulgaria, Croatia, Cyprus^{1,2}, Malta and Romania.

Africa: North Africa and sub-Saharan Africa regional groupings.

Asia Pacific: Southeast Asia regional grouping and Australia, Bangladesh, Democratic People's Republic of Korea (North Korea), India, Japan, Korea, Mongolia, Nepal, New Zealand, Pakistan, The People's Republic of China (China), Sri Lanka, Chinese Taipei, and other Asia Pacific countries and territories.³

Caspian: Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan.

Central and South America: Argentina, Plurinational State of Bolivia (Bolivia), Bolivarian Republic of Venezuela (Venezuela), Brazil, Chile, Colombia, Costa

Rica, Cuba, Curaçao, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Nicaragua, Panama, Paraguay, Peru, Suriname, Trinidad and Tobago, Uruguay and other Central and South American countries and territories.⁴

China: Includes (The People's Republic of) China and Hong Kong, China.

Developing Europe: Albania, Belarus, Bosnia and Herzegovina, Gibraltar, Republic of Kosovo, North Macedonia, Republic of Moldova, Montenegro, Serbia, Türkiye, Ukraine

Emerging market and developing economies: All countries not included in the advanced economies regional grouping, and limited to this publication, includes advanced economies that are eligible for Official Development Assistance from the OECD and are recipients of international public finance, such as Chile, Colombia, Costa Rica, Mexico and Türkiye.

Eurasia: Caspian regional grouping and the Russian Federation (Russia).

Europe: European Union regional grouping and Albania, Belarus, Bosnia and Herzegovina, Gibraltar, Iceland, Israel⁵, Kosovo, Montenegro, North Macedonia, Norway, Republic of Moldova, Serbia, Switzerland, Türkiye, Ukraine and United Kingdom.

European Union: Austria, Belgium, Bulgaria, Croatia, Cyprus^{1,2}, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovak Republic, Slovenia, Spain and Sweden.

IEA (International Energy Agency): Australia, Austria, Belgium, Canada, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Korea, Latvia, Lithuania, Luxembourg, Mexico, New Zealand, Norway, Poland, Portugal, Slovak Republic, Spain, Sweden, Switzerland, The Netherlands, Türkiye, United Kingdom and United States.

Latin America and the Caribbean (LAC): Central and South America regional grouping and Mexico.

Middle East: Bahrain, Islamic Republic of Iran (Iran), Iraq, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Syrian Arab Republic (Syria), United Arab Emirates and Yemen.

Non-OECD: All other countries not included in the OECD regional grouping.

North Africa: Algeria, Egypt, Libya, Morocco and Tunisia.

North America: Canada, Mexico and United States.

OECD (Organisation for Economic Co-operation and Development): IEA grouping plus Chile, Colombia, Costa Rica, Iceland, Israel, Latvia and Slovenia.

Other Asia: Asia Pacific regional grouping excluding Australia, Japan, Korea, New Zealand and countries within the Southeast Asia regional grouping.

Southeast Asia: Brunei Darussalam, Cambodia, Indonesia, Lao People's Democratic Republic (Lao PDR), Malaysia, Myanmar, Philippines, Singapore, Thailand, Timor Leste and Viet Nam. As of 26 October 2025, all of these countries are members of the Association of Southeast Asian Nations (ASEAN).

Sub-Saharan Africa: Angola, Benin, Botswana, Cameroon, Côte d'Ivoire, Democratic Republic of the Congo (DRC), Equatorial Guinea, Eritrea, Ethiopia, Gabon, Ghana, Kenya, Kingdom of Eswatini, Madagascar, Mauritius, Mozambique, Namibia, Niger, Nigeria, Republic of the Congo (Congo), Rwanda, Senegal, South Africa, South Sudan, Sudan, United Republic of Tanzania (Tanzania), Togo, Uganda, Zambia, Zimbabwe and other African countries and territories.⁶

¹ Note by Republic of Türkiye: The information in this document with reference to "Cyprus" relates to the southern part of the island. There is no single authority representing both Turkish and Greek Cypriot people on the island. Türkiye recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Türkiye shall preserve its position concerning the "Cyprus issue".

² Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Türkiye. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

³ Individual data are not available and are estimated in aggregate for: Afghanistan, Bhutan, Cook Islands, Fiji, French Polynesia, Kiribati, Macau (China), Maldives, New Caledonia, Palau, Papua New Guinea, Samoa, Solomon Islands, Timor-Leste, Tonga and Vanuatu.

⁴ Individual data are not available and are estimated in aggregate for: Anguilla, Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Bermuda, Bonaire, Sint Eustatius and Saba, British Virgin Islands, Cayman Islands, Dominica, Falkland Islands (Malvinas), Grenada, Montserrat, Saint Kitts and Nevis, Saint Lucia, Saint Pierre and Miquelon, Saint Vincent and the Grenadines, Saint Maarten (Dutch part), Turks and Caicos Islands.

⁵ The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD and/or the IEA is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

⁶ Individual data are not available and are estimated in aggregate for: Burkina Faso, Burundi, Cabo Verde, Central African Republic, Chad, Comoros, Djibouti, Gambia, Guinea, Guinea-Bissau, Lesotho, Liberia, Malawi, Mali, Mauritania, Sao Tome and Principe, Seychelles, Sierra Leone and Somalia.

International Energy Agency (IEA)

This work reflects the views of the IEA Secretariat but does not necessarily reflect those of the IEA's individual Member countries or of any particular funder or collaborator. The work does not constitute professional advice on any specific issue or situation. The IEA makes no representation or warranty, express or implied, in respect of the work's contents (including its completeness or accuracy) and shall not be responsible for any use of, or reliance on, the work.



Subject to the IEA's [Notice for CC-licensed Content](#), this work is licenced under a [Creative Commons Attribution 4.0 International Licence](#).

Unless otherwise indicated, all material presented in figures and tables is derived from IEA data and analysis.

IEA Publications
International Energy Agency
Website: www.iea.org
Contact information: www.iea.org/contact

Typeset in France by IEA - December 2025
Cover design: IEA
Photo credits: © Shutter stock

