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Report Greener on the other side?



Mapping China's overseas co-financing and financial innovation

Yunnan Chen and Teal Emery



Greener on the other side?

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Acronyms/Glossary

ADB	Asian Development Bank
AfDB	African Development Bank
AGTF	Africa Growing Together Fund
AI	artificial intelligence
AIIB	Asian Infrastructure Investment Bank
ASEAN	Association of Southeast Asian Nations
вос	Bank of China
BRI	Belt and Road Initiative
CAF	China-ASEAN Fund
CBIRC	China Banking and Insurance Regulatory Commission
ССВ	China Construction Bank
CDB	China Development Bank
CGIF	Credit Guarantee and Investment Facility
CPV	concentrated photovoltaic (solar power)
DFI	development finance institution
EBRD	European Bank for Reconstruction and Development
EIF	European Investment Fund
ESG	environmental, social and governance (impact, investment)
FDI	foreign direct investment
FI	financial institution
FOCAC	Forum on China-Africa Cooperation
GCDF	Global Chinese Development Finance
ICBC	Industrial and Commercial Bank of China
IDB	Inter-American Development Bank
IFC	International Finance Corporation
IRENA	International Renewable Energy Agency
MCDF	Multilateral Cooperation Center for Development Finance
MDB	multilateral development bank
MOF	Ministry of Finance (China)
MW	megawatts

NDB	New Development Bank
OECD	Organisation for Economic Co-operation and Development
РВОС	People's Bank of China
PDB	public development bank
ΡΡΙ	private participation in infrastructure
PPP	public-private partnership
PRC	People's Republic of China
PV	photovoltaics
RMB	Renminbi/Chinese yuan
SBG	Standard Bank Group (South Africa)
SNA	social network analysis
SOE	state-owned enterprise
TDB	Trade and Development Bank (East Africa)
USD	US dollar

Executive summary

China's global development finance is in a state of transformation. In the context of growing external and domestic risks, this paper analyses how modalities of financing are changing, and the prospects for Chinese overseas financing to support green investments in the Global South. This is particularly salient in Africa, where Chinese financial institutions (FIS), both policy banks and state-owned commercial banks, have been a major source of development finance, and where Chinese low-cost clean technologies can support energy transition and broader energy access in the region.

In the post-Covid era, Chinese FIs face headwinds of financial sector reforms at home and borrower debt distress overseas, meaning that they will face greater constraints in the immediate term. Chinese FIs balance between first, the need for domestic and external risk mitigation, including managing environmental, social and governance (ESG) impacts, and second, meeting an expanded mandate to support the 'going out'¹ of its cleantech industries, a greener Belt and Road, and new commitments to green investments in Africa.

Co-financed lending by Chinese FIs has emerged as a substantial modality of overseas development finance. While overall financing trends for infrastructure have been in decline, co-financing has been a rising and resilient part of the portfolio. This has been driven by syndicated lending from state-owned commercial banks such as the Industrial and Commercial Bank of China (ICBC) and Bank of China (BOC), reaching more than **\$180 billion between 2013 and 2021**, via emerging co-financing ecosystems of international commercial banks, including clusters of Japanese and European banks.

Syndicated loans have been an important mechanism for risk-sharing, allowing Chinese banks to reduce risk exposure and pool resources across international lenders, and to support greener financing through sharing and outsourcing due diligence, standards and safeguards. While there is in theory potential for this type of financing to support energy transition investments, a significant pivot to 'green' projects has yet to materialise. Many of these loan transactions remain market driven and concentrated in higher-income countries, in sectors such as mining and energy. Some of these have supported transitionoriented critical minerals, but there is still limited investment in renewable energy or in lower-income countries.

We estimate approximately \$86.5 billion in total lending committed for 'green' transition-oriented investments

¹ China's 'going out' policy, launched in the late 1990s, encouraged Chinese enterprises – particularly state-owned banks and companies – to invest overseas and expand globally, driving the internationalisation of Chinese investment and finance overseas.

between 2000 and 2021, of which \$34.6 billion (40%) was co-financed.

Using social network analysis (SNA), we find that green projects are financed by a distinct ecosystem of financial institutions, dominated by policy-oriented public development banks (PDBs) - that is, multilateral development banks (MDBs) and national development finance institutions (DFIs) with developmental mandates - and we see little overlap between green and non-green commercial financing networks. Partnerships with international partners and the creation of co-financing funds at several MDBs in the early 2010s have also been responsible for a proportion of green investments; however, existing funds have not been recapitalised. Nevertheless, multilateral partnerships remain important at a policy level for Chinese FIs, while on-lending to regional MDBs is a growing trend.

There is a mismatch between the major sources of financing being channelled

at scale, and the transition sectors and regions where needs are greatest. Several policy implications emerge. While the rise of syndication suggests that international partnerships will remain important modalities for Chinese overseas finance to de-risk and enable investments, PDBs remain essential when it comes to financing for higher-risk sectors and economies. Chinese commercial banks can play a role in bridging these financing networks, and channel commercial capital pools into development projects. Such partnerships can ameliorate the conditions of financing in terms of cost and maturity, to be better able to support the needs of long-term energy investments.

Partnerships with local financial sector actors are also an important modality for co-financing and for liquidity. Here, strategic regional partnerships between Chinese and local commercial banks have been effective to help ameliorate risk perceptions of Chinese financiers, expand their capital base and diversify their portfolio. Replicating these partnerships, and engaging with local commercial and development banks across other parts of the Global South, can be a means for Chinese financiers to establish new pipelines and reach project bankability for green investments, and for local financiers to bring in international capital and additional liquidity to support energy transition goals.

Beyond development finance, commercial financing modalities for energy transition investments are **diversifying**, through risk-sharing with other corporate investors. Trends in Africa indicate that foreign direct investment (FDI) from China in renewable energy has grown significantly since 2021, alongside emerging trends in private sector participation in infrastructure. Meanwhile, the use of green bond financing in recent years also indicates a diversification of instruments by FIs to support overseas projects in the Belt and Road Initiative (BRI). Going forward, modalities of project finance for energy transition, and the nature of Chinese development finance, will see continued diversification and adaptation in the context of changing global risks and domestic capacities.

1 Introduction

China's role as a provider of development finance in the Global South has been a dominant feature over the last two decades, contributing more than \$1 trillion globally in lending commitments from its policy banks and state-owned financial institutions since 2000. Much of this has been packaged since 2013 under the headline of the 'Belt and Road Initiative' (BRI; Parks et al., 2023). Driven in part by domestic surpluses and overcapacity, these spillovers in overseas official finance have also become a significant source of development finance. In Africa, Chinese creditors are estimated to have committed over \$180 billion in lending up to 2023, financing significant investments in infrastructure and supporting national development and transformation strategies (GPDC, 2020; Engel et al., 2024).

This model of overseas financing has been undergoing a state of retrenchment, however, raising questions over China's future capacity and risk appetite in financing for developing countries (Chen and Liu, 2023; Parks et al., 2023; Engel et al., 2024). Despite this, amid the decline, co-financing has been a rising trend in overseas lending, reflecting a turn towards stronger risk mitigation and attention to environmental, social and governance (ESG) investment and a 'greener' and more disciplined approach to the BRI (Parks et al., 2023; Lu et al., 2024; Escobar et al., 2025). Meanwhile, Chinese capital and technology carry significant potential to support ongoing green transformations in lower- and middle-income countries, (Shen, 2020; Chiyemura et al., 2021). Yet, financing for low-carbon transitions remains insufficient, particularly in Africa, where there is an estimated \$1.8 trillion financing gap (CISL, 2024).

In this context, this report examines these recent evolutions in China's overseas financing to ask: what role can **co-financing and risk-sharing financial innovations play in supporting energy transition in the Global South?**

While government and policy signals, as well as domestic financial markets, have pushed hard on a 'Green BRI', with a retrenchment in high-risk projects (such as coal power), we find this has not translated into a substantial increase in green investments.² While commercial co-financing has been an increasingly salient area of business, the rise of commercial syndication networks remains focused on traditional sectors and has not translated to a 'green' pivot. Co-financing for renewable energy and energy transition has been the domain of public development banks (PDBs), particularly multilateral development banks (MDBs).

² This aligns with analyses by other scholars of other investment modalities, including overseas funds (Nedopil, 2022).

This mismatch suggests a need for greater collaboration between concessional public development bank (PDB) financiers and commercial pools of capital, to channel financing into regional energy transition needs. Beyond development finance instruments, however, firms and financiers have turned to other means to finance green projects, including green bonds and direct investments. This indicates a greater diversification in how Chinese financiers will support future investments, including in green projects.

1.1 Why co-financing? Balancing risk and reward in overseas lending

As China's financial institutions have internationalised over the last two decades, risk mitigation and risk management have become growing pressure points for overseas lending – and risk-sharing via co-financing has become one important and strategic modality for financiers that merits greater study. This section outlines the key trends and challenges facing overseas financing, and the strategic responses of Chinese financial institutions (FIs).

Externally, project financial viability, debt sustainability, as well as environmental impacts, have been recurring critiques, with growing concerns in the late-2010s following the end of the global commodity price cycle over the debt sustainability of BRI recipient borrowers (Atkins et al., 2017; Hurley et al., 2018). Several high-profile debt restructurings, including Venezuela's major default in 2017, as well as the default in Ethiopia in 2017–18, indicated structural issues around project approval and due diligence processes (Pilling and Feng, 2018; Chen, 2019). Meanwhile, the case of the Sri Lankan town of Hanbantota and its port's concession to a Chinese state-owned enterprise (SOE) – while not a debt restructuring – spiralled into a bigger, geopolitical 'meme' around Chinese 'debt-traps', bringing reputational risks to China's global engagements (Brautigam, 2020; Jones and Hameiri, 2020).

Criticism has also been directed at Chinese financing and construction of environmentally damaging projects, particularly coal power plants, which arguably lock countries into carbonintensive development pathways (Peng et al., 2017; Sims Gallagher and Qi, 2018). Weaknesses in managing project sustainability, including environmental impacts and labour relations, also generate risks for Chinese financiers and contractors, which traditionally do not take on institutional responsibility for environmental and social impact assessment (ESIA) or impact management of projects (Kirchherr et al., 2016; Chen and Landry, 2018). Studies have also linked Chinese projects to local corruption, with implications for both project selection and reputational risks (Isaksson and Kotsadam, 2018; Xia, 2019).

Domestically, financial stability has become a priority. Following exchange rate policy shifts in 2015, which substantially reduced the People's Bank of China (PBOC) foreign exchange reserves, regulatory pressures on the financial sector increased, as part of efforts to deleverage an overheated financial and real estate sector, and support financial stability (Umehara, 2017). New measures from the China Banking and Insurance Regulatory Commission (CBIRC) increased oversight over the policy banks (State Council and CBIRC, 2017a; 2017b), while anti-corruption drives since 2018 also pulled down major figures in both the China Development Bank (CDB) and China Eximbank.³

The most recent 2023 Central Financial Work Conference signalled stronger supervision 'with teeth and thorns', emphasising quality in financial assets and risk management over expansion, and opening up financial markets by 'bringing in' international capital and 'going global' (Wang and Jia, 2023). New measures also reduced barriers for foreign bank participation in transactions (Du, 2024; Han Kun, 2024).⁴ These broad trends have manifested in changing financial performance across China's major financial institutions. For the major state-owned commercial banks and policy banks, declining profitability and increasing loan impairments indicate growing risk exposure over the decade (Figures 1a, 1b).

For the major state-owned commercial banks, this has led to a broader pullback in lending activities overseas⁵ and a reduction in the relative share of overseas lending in their portfolio. Only China Construction Bank (CCB), notably, has seen a significant increase in its overseas lending activities in the post-Covid years, while overseas lending from BOC and the Industrial and Commercial Bank of China (ICBC) have both plateaued.

³ CDB Chairman Hu Huaibang was investigated and charged with corruption in 2018–19. China Eximbank's Vice President (VP) Liu Lianke was also jailed on corruption charges. See: www.caixinglobal.com/2019-07-31/former-china-development-bank-boss-investigated-forcorruption-101446015.html; www.lloydslist.com/LL1151616/Former-Cexim-president-Liu-Liankegiven-suspended-death-sentence.

⁴ The 2024 'Administrative Measures for Syndicated Loan Business' – part of new measures that introduce stricter controls on liquidity risks – encourages greater risk-sharing through lowering the minimum loan and distribution ratios for lead banks, ensuring more balanced distribution of risks between banks, and potentially reducing barriers for foreign bank participation in transactions.

⁵ Financial statements from FIs aggregate all non-Chinese lending outside of mainland and Chinese overseas territories (Macau, Hong Kong etc.) as *'overseas'*. While this is a highly imperfect measure that likely includes significant lending to advanced economies rather than exclusively BRI countries, it remains the best available disclosure and provides an indicative trend of Chinese banks' overseas activities.



Figure 1 Financial performance of major state-owned banks (2011–23)⁶

Source: Authors' elaboration, Refinitiv/Bloomberg data





Source: Authors' elaboration, Bloomberg data. Geographic data is available only for commercial banks, not policy banks

⁶ Banks featured: Export-Import bank of China (China Eximbank); China Development Bank (CDB); Industrial and Commercial Bank of China (ICBC); China Construction Bank (CCB); Agricultural Development Bank (AgDB). China Eximbank, CDB and AgDB are the three main policy banks.

In response to these risks, Chinese FIs and financial authorities have responded in several ways.

First, lending has been significantly cut back, reflecting a reduced risk appetite and reduction of risk exposure, particularly for higher-risk or carbon-intensive sectors following the announcement of 'no new coal' in 2021. The boom in overseas lending that followed the global financial crisis was partly driven via capital from policy banks

and the sovereign wealth fund, mobilised

to help offshore Chinese industrial capacity and surplus capital to higher returns overseas (Chin and Gallagher, 2019; Liu, 2023; Franz et al., 2024). This lending for infrastructure has retrenched since 2016, stalled further by the shock of the Covid-19 pandemic in 2020–21. Meanwhile, the rise of emergency lending, in the form of short-term refinancing, foreign exchange swap lines and rollovers after 2016, indicated a growing need to support borrower countries facing repayment difficulties (see Figure 3).⁷





Note: Emergency lending rises quickly in the Early BRI period. See Parks et al. (2023) for an in-depth discussion.

Source: AidData GCDF v3.0; authors' elaboration⁸

⁷ These mainly comprised a small number of countries: 45% of all swaps were targeted to Argentina, followed by 22% to Pakistan, while other major recipients included Mongolia, Egypt and Venezuela.

⁸ This chart adapts the framework developed in Parks et al. (2023), which introduced the periodisation of 'Early BRI' (2014–2017) and 'Late BRI' (2018–2021). As in their analysis, the Late BRI period reflects the significant pullback in Chinese overseas infrastructure lending that began around 2017, allowing for more meaningful comparison of lending patterns across these distinct phases of the Belt and Road Initiative.

Second, a shift to 'green' China's overseas activities reflects strengthened risk management frameworks and a broader focus on clean energy cooperation. At the Conference of the Parties (COP) 2024 in Baku, Azerbaijan, China's Vice Premier announced the country had provided \$25 billion in climate finance since 2016, signalling its political commitments to green cooperation and support for climate finance.9 Discourse around the BRI after 2020 has seen a pivot to a 'Green BRI'. Likewise, 'green' cooperation has featured in the Global Development Initiative (GDI), as well as under regional cooperation initiatives such as the Forum on China-Africa Cooperation (FOCAC, no date).

The BRI's new narrative of 'small and beautiful' and growing prioritisation of green projects also reflects a stronger focus on due diligence and the commercial viability of projects (Chen, 2022; Nedopil, 2022). The introduction of new green guidelines and green investment principles serves to raise standards for environmental protection. Guidelines for FIs, such as a 'traffic light' system for BRI projects and a green taxonomy for green bond use of proceeds, also help direct project selection and financing decisions.

Third, China's overseas finance architecture has sought to diversify its instruments and institutional

partnerships to share and

delegate risk. Since 2015, China's overseas lending has seen a growing commercialisation in terms of the participation of commercial creditors in project finance (Wu and Chen, 2024), and growing emphasis in policy discourse on commercial, marketoriented finance and third-party cooperation. The BRI Forum in 2019 encouraged 'third-market, tripartite cooperation and Public Private Partnership (PPP) cooperation', to encourage greater risk-sharing between project financiers and developers, and for Chinese enterprises to take on a greater share of project risk, but also as a means to ensure commercial viability and reduce sovereign debt risks (van Wieringen and Zajontz, 2023). Co-financing between Chinese FIs and third-party actors has emerged as one response to these pressures, becoming a prominent modality of financing in the minerals and mining sector, as well as in infrastructure (Lu et al., 2024; Escobar et al., 2025).

We use the term 'co-financing' in this paper to encompass diverse means of financial risk-sharing between two or more institutions, particularly between Chinese FIs and third-party actors. We focus particularly on co-financing via lending: syndicated lending between commercial banks and co-financing partnerships with multilaterals and other development banks, since these are the most salient channels of

⁹ Other climate finance researchers have estimated figures between \$34 and 45 billion over a 10-year period (Cichocka and Mitchell, 2024; Liu et al., 2024).

financing at scale. However, Section 5 also evaluates recent data on other non-lending instruments, including foreign direct investment (FDI) and bond financing, as potential forms of risk-sharing structures, to assess how the broader financing landscape for green investments is diversifying.

Syndicated lending structures generally entail direct co-financing between FIs to the same project (usually under the same loan terms). PPPs indicate similar risk-sharing structures through private sector investments in debt or equity; however, these entail the longer-term involvement of an investment partner (such as an enterprise) - for example, in operation of an infrastructure concession. Co-financing can involve the delegation of risk, through the transfer of funds to be managed by a third party, in the form of on-lending, or the use of co-financing funds and trust funds (for example, with an MDB). These forms of co-financing serve to reduce the volume of exposure for individual FIs, but also offload responsibility to other parties in areas such as project inception, preparation and ESG management that have contributed to the financial and reputational risks of the past (Parks et al., 2023; Cichocka and Mitchell, 2024; Escobar et al., 2025).

The growth and relative resilience of co-financed loans raises the question whether co-financing may be a potential source of future climate finance (Cichocka and Mitchell, 2024). The domestic market for green finance in China has boomed in the last five years. Meanwhile, China's thriving clean technology sectors in renewables, battery production and new energy vehicles are reaching domestic overcapacity, making overseas markets, particularly in the Global South, more strategically important. These trends are salient given the potential for Chinese technologies in enabling energy transition and supporting greener, low-carbon development pathways in the Global South (Helveston and Nahm, 2019; Shen, 2020; Chiyemura et al., 2021).

Chinese FIs now balance new competing mandates (see Figure 4): to mitigate risk, ensure profitability and financial stability, while still supporting national strategies to finance green investments in the Global South. Our analysis looks at the trends and actors driving these different financing modalities to evaluate the following:

- In an era of 'de-risking', what is the role of co-financing modalities in China's overseas finance? Who are the key driving institutions and who are they co-financing with?
- 2. What potential role can emerging financing modalities play to support energy transition investments? Where does the financing go, in sector and geography? What are the challenges and barriers to scale?



Figure 4 Chinese FIs must balance risk exposure against new expanded mandates

Source: Authors' elaboration

1.2 Methodological approach and data collection

Like the proverb of the three blind men feeling the elephant, this report explores dynamic parts in a bigger picture of China's overseas finance that is incomplete – and evolving. Our analysis draws from multiple publicly available datasets on China's overseas financing: primarily, the AidData's Global Chinese Development Finance (GCDF) v3.0 dataset, which gives a comprehensive overview of all official sector finance from 2000 to 2021, as defined by the Organisation for Economic Co-operation and Development (OECD)-Development Assistance Committee (DAC) guidelines (Custer et al., 2023), including data on syndication, on-lending and trust funds, with granular data on financing terms and conditions. The dataset includes financing from all state-owned entities, including policy banks, and commercial banks and enterprises.¹⁰

While the AidData data is comprehensive, it does not shed light on post-2021 trends. We trace some more recent trends in Section 5 using lending data

Other datasets on China's regional and global lending are available, including from Boston University Global Policy Development Center (GPDC) and the World Resources Institute's (WRI's) China overseas financing, which provide slightly more recent data and more conservative estimates of financing volumes. However, these datasets do not have granular data on co-financing and financial data. Both institutes provide transparent and comprehensive methodology documentation on how their data is collected, analysed and verified, using a mix of algorithmic, web-scraping methods, as well as official sources, and large-scale human expert verification. AidData uses the Tracking Underreported Financial Flows (TUFF) methodology, while Boston University and SAIS-CARI (John Hopkins University, School of Advanced International Studies; China-Africa Research Initiative), which built the initial China-Africa loan dataset, also provide a *Database Methodology Guide*. See: www. aiddata.org/methods/tracking-underreported-financial-flows; www.bu.edu/gdp/files/2021/03/ GCI-Database-Methodology-Guide_2023-FIN.pdf.

from Boston University (BU) China Overseas Development Finance, data on green bond issuances from Bloomberg, World Bank Private Participation in Infrastructure data, and FDI markets for Africa-only projects. As such, these analyses are supplemented by secondary academic and grey literature, as well as off-the-record interviews with sector experts and practitioners.

For overseas lending, we look at two main areas: first, the major trends in the instruments and institutions of cofinancing, and second, to what extent they go on to support green investments for energy transition. We outline the key steps of our approach below. A full methodology is provided as a separate annex to this paper.

1. Defining co-financed loan transactions

Our analysis uses AidData's GCDF v3.0 dataset, which provides specific tags for co-financing, syndicated loans, on-lending and multilateral involvement. To identify single co-financed transactions involving multiple listed lenders, we identified cases of co-financed project transactions using a heuristic method, classifying transactions using the recipient and the date of signature of the loan agreement. We conducted extensive validation of this approach by examining all transactions with multiple records and combined funding over \$1 billion, calculating string distance metrics between descriptions in multi-record transactions, and manually reviewing cases with high description divergence. This analysis confirmed that our transaction identifier approach

effectively consolidated related financing activities into coherent transactions. The few edge cases typically represented multiple government-to-government agreements likely signed during a single diplomatic engagement and would not change the substantive findings.

The data comes with caveats. First, loan commitments do not reflect disbursement of financing or debt outstanding. Second, syndicated loans do not give consistent data of the share of lending from each financier. Finally, the data on Chinese FIs and enterprises covers only lending and not broader activities, including FDI, financing to non-sovereign borrowers or other capital flows that sit outside OECD development finance definitions.

2. Network analysis of co-financing banks

Drawing from the approaches of Joosse et al. (2025) and Escobar et al. (2025), we employ a social network analysis (SNA) method to identify the clusters of cofinancing between different Chinese and non-Chinese banking institutions, which we categorise by the institution's mandate (whether commercial or a policy-oriented public development bank). We analyse how connected the financial institution is within the network through metrics of degree centrality, betweenness centrality and constraint. Our analysis treats co-financing as a binary relationship (whether institutions are co-financed or not) with edges weighted by the number of transactions rather than financial volumes, as consistent contribution data is not available across institutions. This approach, while not capturing the full financial exposure of each lender, still reveals important structural relationships between financial institutions that traditional quantitative analysis would miss, highlighting which institutions act as key connectors or bridges between distinct financing ecosystems. A detailed discussion of the SNA methodology is available in a methodological annex to this paper.

3. Identifying transition-oriented investments

We apply a specific lens on *energy transition*, a key component both for the achievement of global climate goals, as well as to support equitable lowcarbon development in lower-income countries (Simpson et al., 2023). Our analysis complements existing efforts to categorise China's climate finance, which use OECD methods and Rio Markers for mitigation or adaptation purposes (Tsang et al., 2023; Cichocka and Mitchell, 2024; Liu et al., 2024; Liu et al., 2025).

Our paper takes a narrower focus on co-financing flows only, where it supports *transition-oriented* activities. This overlaps in capturing mitigation activities (such as deployment of renewable energy) but widens the lens to look at 'grey' sectors that have significant upstream or downstream implications for energy transition, and where China has a salient role – for example, transmission infrastructure, in critical mineral mining, in sustainable transport (for example, new energy vehicles or NEVs) and in the development of natural gas.¹¹

We developed criteria for transitionoriented investments as follows, drawing from existing green taxonomies based on the International Renewable Energy Agency (IRENA), European Union (EU) taxonomies and China's green development guidelines for the BRI. A full discussion of the criteria and their mapping on existing taxonomies is included in the methodological annex to the paper.

- Green ■: clear positive impact for energy transition and climate mitigation objectives – for example, renewable energy projects, microgrid infrastructure and energy storage infrastructure.
- **Grey** : indirect positive impact for broader energy transition in the context of other investments, but do

¹¹ The consideration of natural gas as a transition fuel is a contested area; in our analysis we include this as a 'grey' category.

not directly contribute to energy transition – for example, energy transmission and energy efficiency infrastructure, electric vehicle and sustainable transport, natural gas,¹² and mining of critical minerals.¹³

- Brown : negative impact for energy transition and climate mitigation objectives

 for example, oil, coal and other fossil fuel infrastructure, non-critical mineral mining, and energy-intensive industrial projects (such as steel or glass).
- Neutral : mixed or minimal impact for energy transition – for example, non-energy sector projects, transport, social, education and health programmes.

We systematically classified nearly 18,000 AidData project descriptions using DeepSeek-V3, an advanced large-language model (LLM), following our criteria for transition-oriented investments. This efficient artificial intelligence (AI)-driven methodology allowed us to comprehensively identify green financing patterns in ways previously infeasible at scale. The LLM achieved 91.8% agreement with human classifications during validation testing. A detailed discussion of the AI-methodology is included in a separate annex to his paper, including model selection, prompt design and validation process. The taxonomy of transition investments is also expanded upon in the annex. While this analysis is subjective in classification, with a margin of error due to the AI-methodology, it gives an estimate comparable to other scholarly exercises, making it a useful analysis of recent trends.

4. Non-lending financing for green investment

To give a horizon scan of more recent trends, Section 5 includes analyses using World Bank data on private participation in infrastructure (PPI), as well as FDI markets, emerging trends in firm-level investments, and Bloomberg data on Chinese onshore and offshore green bond issuances. This provides an overview of other forms of risk-sharing and co-financing outside of development finance, in order to understand the broader shifts in China's financing architecture that may indirectly enable investments in climate and energy transition-related sectors. These give an indication of more recent firm-level and FI-level activities that may not be captured in overseas lending datasets.

1.3 Structure of the report

This report is structured as follows. Section 2 outlines the use of syndicated loans, which constitutes the bulk of co-financed transactions, and the role of commercial creditor networks within this. Section 3 then focuses on the role of multilateral co-financing and the key instruments Chinese actors have deployed, including multilateral funds. Section 4 goes on to analyse the financing of green and transition-oriented projects in co-financed loan projects. Section 5 then widens the perspective to look at emerging trends beyond development finance lending from policy and commercial bank lending, to briefly examine green investments via green bond and FDI finance. Finally, Section 6 concludes with policy implications.

¹² The consideration of natural gas as a transition fuel is a contested and literal 'grey' area. While natural gas is 12 not included as part of IRENA's transition fuel, certain natural gas projects are included in the EU taxonomy 13 in playing a role in transitioning from other more carbon-intensive fossil fuels in the context of other 14 renewables investments moreover, natural gas development remains an important part of the energy mix in 15 Africa and other developing regions (IEF, 2021; ACF, 2022; Escrig, 2022; IRENA, 2024).

¹³ We utilise International Energy Agency (IEA) definitions of critical minerals as being lithium, nickel, cobalt, copper and rare earth minerals (IEA, 2022; Escobar et al., 2025).

2 Syndicated lending and co-financing

Syndicated lending – where multiple banks jointly provide financing to a single project – represents the most dominant form of co-financing in China's overseas financing portfolio. In a classic syndication structure, structuring transactions across multiple banks, lead financiers (or *lead arrangers*) structure transactions across multiple banks to share the risk exposure for bigticket or high-risk transactions, as well as dividing technical or legal responsibilities for the transaction between other participants in the syndication.

This section analyses the landscape of syndicated lending, its trends and key players. We examine the key Chinese and international players, both by the number of transactions and by the centrality of their role within the network of lenders. We identify major co-financing partners and clusters within the financing ecosystem.

2.1 The role of syndication in China's overseas lending

Between 2013 and 2021, syndicated loans from Chinese policy banks and state-owned commercial banks reached more than \$180 billion. As shown in Figure 5, while bilateral policy bank lending saw a sharp decline starting in 2017, syndicated loan volumes have proved more resilient. Even when bilateral lending in 2021 remained at a low, syndicated lending matched nonemergency bilateral loans in volume. This marks a structural shift in how Chinese institutions deploy capital overseas.



Figure 5 The rise of syndicated lending (2000–21)

Note: In dollar terms, syndicated lending has remained steady as bilateral lending without co-financing has dropped dramatically. This excludes emergency lending. Source: Authors' chart, AidData GCDF v3.0 Compared to bilateral lending from a single bank, syndicated loans show striking differences in the terms of financing, most notably in maturity. Syndicated loans have a median tenor of 5 years, compared to 10 years for CDB loans; meanwhile, Eximbank loans are four times as long, at 20 years. Combined with median grace periods of three years for syndicated loans, this necessitates regular refinancing. While this shorter-term structure helps lenders manage risk, it transfers significant rollover risk to borrowers.

Syndicated loans carry a median interest rate of 3.78%, making them relatively lower cost compared to CDB's higher median rate of 4.80% though higher than China Eximbank's 2.00% median. However, the prevalence of variable interest rates differs markedly across the lending modalities. We find variable rates mentioned in 54% of syndicated loans (predominantly LIBOR ¹⁴ based), compared to 49% of CDB loans and only 17% of China Eximbank loans. Like the shorter maturities, variable rates protect lenders, but transfer risk to the borrowers, with substantial impacts. For a typical \$250 million LIBOR-based syndicated loan with a 3.5% spread, annual interest payments would have more than doubled from about \$9 million to over \$23 million as the 6-month LIBOR rose from 0.15% in 2021 to 5.9% in 2023.

Notably, unlike bilateral loans, which are predominantly denominated in US dollars (USD) or Chinese yuan (RMB) (for concessional loans), syndicated loans show a notably higher share of eurodenominated lending (10% versus 2% for policy bank bilateral loans), consistent with the prominent role of European banks in these transactions. This also reflects the broader global pool of capital that these cofinancing modalities can potential tap into.



Figure 6 Median loan maturity

Note: Syndicated loans have a median maturity of 5 years. The median maturity of a CDB loan is twice as long. The median maturity of China ExIm loan is four times as long. Source: Authors' chart, AidData GCDF v3.0

¹⁴ LIBOR (London Interbank Offered Rate) was a benchmark interest rate at which major global banks lent to one another, widely used to set borrowing costs for loans and financial products until its phase-out starting in 2021.

2.2 Who is financing? Commercial banks dominate syndicated lending

Drawing from the approach of Joosse et al. (2025) and Escobar et al. (2025), which pioneer an application of social network analysis (SNA) to Chinese development finance, we analyse the key actors and web of relationships between banks participating in syndicated lending. This approach allows us to identify not just the key players, but those with a central role in coordinating syndication networks and arranging deals. We find that the largest Chinese stateowned commercial banks sit at the heart of syndicated lending networks within a dense commercial core of commercial banks. Figure 7 shows the network of top 20 most active banks, according to their degree centrality and other metrics. Bank of China (BOC) and ICBC occupy a prominent central position and high centrality, while China Construction Bank (CCB) and policy banks like CDB play a more peripheral role in the network. By volume, ICBC and Bank of China participate in the highest number of transactions (see Figure 8).

Figure 7 Syndicated lending networks: top 20 banks



Notably, Japanese banks emerge as an important cluster, with Sumitomo Mitsui, Mitsubishi UFJ and Mizuho among the most active participants. These regional clusters indicate geographic patterns of collaboration and regional financing ecosystems for how banks cluster on deals. A core group of international commercial banks, including Standard Chartered, Citigroup, HSBC, BNP Paribas and Intesa Sanpaolo, also play key connecting roles. Standard Chartered ranks fourth in degree centrality, indicating its strategic position in connecting multiple financing networks in emerging markets.

In transaction count, Standard Bank Group of South Africa (SBG) stands out as the only African bank on the list with a significant number of co-financed transactions (Figure 8) and significant centrality measures.¹⁵ This corresponds with its distinct strategic relationship with shareholder ICBC (see Box 1), with whom it partners most frequently in co-financed transactions.



Figure 8 Most active banks in syndication, by number of transactions

Source: Authors' chart, AidData GCDF v3.0

¹⁵ At a regional level, we also note the prominent role of Rand Merchant Bank and a cluster of South African banks (ABSA, FirstRand, Nedbank), as well as West African institutions like Ecobank and Ghana International Bank, in the African ecosystem, while major international banks such as Commerzbank maintain a central coordinating role.

Box 1 Standard Bank Group, South Africa

Standard Bank (SBG), one of the largest banking groups in Africa, represents a singular case of how local banks co-finance and collaborate with Chinese commercial partners.

Operating across sub-Saharan Africa, with offices in London, Beijing and Dubai, Standard Bank has a strong relationship with China's state-owned commercial banks, most notably a strategic long-term partnership with ICBC going back more than 15 years.

ICBC is a major shareholder and partner of the Standard Bank Group. In 2007, it acquired a 20% stake in Standard Bank South Africa for \$5.6 billion, one of the largest FDI transactions involving China in Africa at the time. ICBC subsequently acquired an 80% share of Standard Bank Argentina in 2012, and in 2015, a 60% majority stake in Standard Bank Plc, another London subsidiary. ICBC and Standard Bank have also formed a London-based joint venture, ICBC Standard Bank, specialising in commodities and emerging markets.

According to sector experts, ICBC as a lead arranger often prefers to partner with SBG to ameliorate risk, while SBG has a mutual interest in bringing ICBC clients into its banking portfolio. In transactions with ICBC, SBG has also taken on a strong role in managing ESG impacts and has conducted training for ICBC staff on these areas.

SBG has been a major South African partner in loan syndication networks, acting as a co-financier in an estimated \$3.2 billion worth of syndicated lending from Chinese financiers. It has also been a significant *recipient* of syndicated loans involving Chinese state-owned commercial banks, including the Agricultural Bank of China, Bank of China and CDB, receiving around \$2.2 billion from Chinese commercial creditors via syndicated loan structures since 2005.

While these loans appear to be supporting its general activities rather than earmarked for specific projects, the case demonstrates the power available to locally embedded banks to access pools of international capital from Chinese commercial financiers. These financiers are well-positioned – and ambitious – in supporting energy transition projects. Standard Bank has been actively involved in South Africa's renewables financing and its Renewable Energy Independent Power Producer Procurement (REIPPP) programme, making it well positioned as a potential gateway for expanding Chinese green finance in Africa.

Sources: England, 2015; Etefe, 2023; authors' interviews (Dec 2024)

2.3 Syndicated loans skew commercial in sector and geography

There is a significant income skew for syndicated lending, where more than 60% of loans go to upper middle-income or high-income countries, compared to 40% to non-co-financed bilateral lending. Less than 5% of syndicated loans go to lowincome countries.¹⁶ This trend manifests in regional lending patterns. Asia and Europe comprised over 65% of syndicated lending in recorded data between 2000 and 2021 versus only 48% of non-co-financed lending. In contrast, syndicated lending is sharply lower in Africa: 27% of non-co-financed lending went to Africa, whereas the continent only had 12% of syndicated loans.

Figure 9 Delivery channel by income group and region



A. Delivery channel by income group

Notes: A – There is proportionally less co-financing for low-income and lower middle-income countries, and proportionally more for upper middle-income and high-income countries. B – There is proportionally much more syndicated lending to Asia, much less syndicated lending to Africa. Source: Authors' elaboration, AidData GCDF v3.0

¹⁶ This analysis likely understates the income skew, as GCDF v3.0 primarily tracks Chinese lending to low- and middle-income countries, including high-income countries only if they were middle-income during part of the 2000–21 period. Given the commercial nature of syndicated transactions, it's probable that a substantial portion of such lending goes to high-income countries not captured in our dataset, further emphasising the skew away from low- and lower middle-income economies.

By sector, traditional Belt and Road sectors dominate syndicated lending patterns. Industry, mining and construction accounts for 38.2% of lending by value, followed by energy (27.1%) and transport (8.7%). This reflects the preference of lenders to provide syndicated loans to commercial, revenue-generating projects. The next section discusses the role of public development banks (PDBs) and other multilateral agencies in co-financing, before embarking on an analysis of green investments.



Figure 10 Syndicated lending by sector

Note: The focus is on hard infrastructure. Source: Authors' elaboration, AidData GCDF v3.0

3 Multilateral partnerships and co-financing

Co-financing and partnerships with MDBs has been another branch of China's derisking strategy, as well as a part of its broader regional diplomacy. Significant amounts of co-financing have been channelled via multilateral co-financing funds, as well as on-lending.

Multilateral co-financing has been an effective means to offshore capital and delegate risk management to third-party institutions, which often have more established safeguards and standards, stronger project evaluation procedures, and longer experience in project finance. These modalities have been a central tool in enabling and co-financing existing energy transition investments.

3.1 Co-financing with MDBs: key trends

MDB involvement in co-financing is a small proportion of total co-financed lending transactions, featuring in only 7% of total transactions, amounting to \$36.3 billion from 2003 to 2021. However, over time, the proportion and salience of MDB cofinancing in broader co-financing trends has been remarkably persistent and resilient, even as overall co-financing volumes saw a steep decline after 2016 (see Figure 11).

A significant portion of these co-financing transactions with MDBs has been through on-lending, via special funds or as direct lines of credit to be on-lent to other clients (see Figure 12). MDB on-lending ramps up after 2013 (largely owing to the creation of new co-financing funds, discussed below) and totalled \$9.6 billion between 2007 and 2021.

Figure 11 Multilateral involvement in co-financing (2000–21)



Source: Authors' elaboration, AidData GCDF v3.0

These loans, sometimes extended via syndicated tranches, are not usually earmarked to specific projects, but contribute to the bank's general activities. For smaller, sub-regional banks, Chinese capital has also been a major source of capital via on-lending. Around \$1.9 billion of this on-lending has been channelled to two regional African MDBs, the East African Trade and Development Bank (TDB) and Africa Export-Import Bank (Afreximbank). While Covid-19 impacted lending patterns, Boston University data from 2023 records new loans extended to Afreximbank and the Africa Finance Corporation (AFC) totalling \$0.7 billion in that year, supporting small and mediumsized enterprises (SMEs) and trade finance (Engel et al., 2024).





3.2 Co-financing via multilateral funds

China has created several major overseas funds, with the largest being regional funds (including the Silk Road Fund, the China-Africa Development Fund and the China-ASEAN Fund), which invest (and co-invest) with a regional mandate (Larsen et al., 2023; Solheim et al., 2023). China also created around 13 funds with a multilateral structure between 2005 and 2020, where funds were co-financed with third parties, including MDBs, and in many cases, an MDB was entrusted to oversee its management (Humphrey and Chen, 2021). Confirmed contributions to these funds amount to **\$9.3 billion**, funded by China's Ministry of Finance (MOF), PBOC or the policy banks, with the total contribution to these funds estimated at **\$24.8 billion**. Over time, China's financial contributions to these multilateral funds have seen a rise and fall.

Source: Authors' elaboration, AidData GCDF v3.0

Most of the funds are modest, ranging around contributions of \$50 million. Many have a regional orientation: for example, several older funds created in the late 2000s were targeted to the Asia and Association of Southeast Asian Nations (ASEAN) region and involved the Asian Development Bank, including the Credit Guarantee and Investment Facility (CGIF) and the China-ASEAN fund (CAF). The largest of these funds, and the most prolific sources of co-financed transactions, have been the PBOCsupported funds at three MDBs, the African Development Bank (AfDB), Inter-American Development Bank (IDB) and the International Finance Corporation (IFC). The China Co-financing Fund for Latin America at IDB and the Africa Growing Together Fund (AGTF) focus more strongly on sustainable investments in the infrastructure and energy sectors (see Table 1 in the appendix).

Established between 2013 and 2014 at the IDB, IFC and AfDB, these funds amounted to \$7 billion total in contributions via the PBOC. They were part of a wider movement to offshore surplus capital, both in the multilateral system, as well as bilaterally through the BRI (Humphrey and Chen, 2021; Franz et al., 2024). Box 2 highlights the case of the AfDB fund, which has supported several energy projects across Africa. However, none of the co-financing funds have seen further replenishment from PBOC, despite coming to the end of their 10-year tenor. At the recent FOCAC 2024 forum, China announced additional support to the China-World Bank Partnership Facility, financed by the MOF, but no further commitments were made to the PBOCfunded AGTF. Given the key role that capital via these co-financed funds has played in supporting energy transition investments, there is a clear case for their expansion and replication.

Box 2 Africa Growing Together Fund (AGTF)

The Africa Growing Together Fund was established in 2014 as an AfDB-administered fund, to provide low-cost financing to sustainable infrastructure projects. The PBOC injected an initial capitalisation of \$2 billion into the fund to be deployed over a 10-year period; as of 2024, UA1.5 billion¹⁷ (\$1.9 billion) had been committed to 54 projects. Much of this has gone to sovereign projects, although a growing proportion (a total of 11%) has also gone towards supporting non-sovereign recipients. According to the AfDB, around 21% of AGTF funds have supported the banks' Light Up and Power Africa initiatives.

¹⁷ The UA (Unit of Account) is the African Development Bank's (AfDB) internal currency used for financial reporting and transactions, designed to provide a stable reference value for its operations across member countries with different national currencies.

Disbursements have been much slower, stalling since the pandemic (see Figure 13). While the AGTF was mentioned as a key achievement in the 2024 Forum on China-Africa Cooperation, future commitments or funding from China to the AGTF have not been confirmed.

Geographically, the biggest recipients have been Nigeria, Tanzania and Egypt, followed by Kenya and Angola (see Figure 14). AidData figures tracked around \$571 million in commitments to the AGTF, of which 52% (around \$300 million) went towards projects in transport, with water and sanitation, and energy projects receiving 34% and 14%, respectively. A significant part of the recorded energy projects (around \$50 million) went to supporting off-grid (mainly solar) electrification projects in Nigeria, as well as large hydroelectric plants in Tanzania.

A few projects have mobilised financing from other partners, including the Islamic Development Bank and European Investment Bank, as well as co-financing from the EU Africa Trust Fund. Small amounts of AGTF funds (up to \$30 million) have also been used to co-finance AfDB packages to national banks, including to the Economic Community of West African States (ECOWAS) Bank for Investment and Development (EBID),¹⁸ Senegal's National Bank for Economic Development (BNDE),¹⁹ the Commercial International Bank of Egypt (CIB) for trade finance,²⁰ and Egypt's Banque Misr,²¹ highlighting its small role in supporting national PDBs in Africa.

¹⁸ AfDB (2023) 'West Africa: African Development Bank, Ecowas Bank for Investment and Development sign loan agreement for \$50 million and €50 million to enhance regional food security' (www.afdb.org/en/news-and-events/press-releases/west-africa-african-developmentbank-ecowas-bank-investment-and-development-sign-loan-agreement-50-million-and-eu50million-enhance-regional-food-security-64828).

¹⁹ AfDB (2019) 'Senegal: African Development Bank approves over 22 million euros to BNDE to support SMEs and job creation in rural areas' (www.afdb.org/en/news-and-events/pressreleases/senegal-la-banque-africaine-de-developpement-approuve-plus-de-22-millions-deurosla-bnde-pour-soutenir-les-pme-et-la-creation-demplois-en-zone-rurale-30402).

²⁰ AfDB (2023) 'Egypt: African Development Bank supports Commercial International Bank with \$148 million to prop up SMEs and trade' (www.afdb.org/en/news-and-events/press-releases/ egypt-african-development-bank-supports-commercial-international-bank-148-million-propsmes-and-trade-66385).

²¹ AfDB (2022) 'Egypt: African Development Bank extends \$160 million loan to Banque Misr to strengthen private sector participation in Egypt's economy' (www.afdb.org/en/news-andevents/press-releases/egypt-african-development-bank-extends-160-million-loan-banque-misrstrengthen-private-sector-participation-egypts-economy-56328).



Figure 13 AGTF commitments and disbursements (2015–23)

Note: Converted from UA (Unit of Account) using USD (2023) rates. Source: Authors' chart, African Development Bank data

Figure 14 AGTF all commitments by country (2015–23)

Note: Converted from UA (Unit of Account) using USD (2023) rates. Source: Authors' chart, African Development Bank data While the scale of these MDB funds has diminished over time, there are strong political signals for the continued importance of MDB cooperation. The creation of the recent Multilateral **Cooperation Center for Development** Finance (MCDF) in 2020, with a modest finance facility of \$150 million commitment from China's MOF, indicates a desire to bring multilateral cooperation with MDBs into BRI and infrastructure initiatives (Calabrese and Chen, 2020; Gu, 2020). The MCDF funds support project preparation but also capacity building for implementing partners, with the goal of improving project quality, as well as accountability and safeguarding standards. To 2024, it had disbursed around \$38 million in grants, mainly for projects from CAF, the Asian Infrastructure Investment Bank (AIIB) and AfDB (MCDF, 2024).

Likewise, policy banks, and China Eximbank in particular, have been prominent in supporting regional and sub-regional development banks such as Afreximbank and TDB via on-lending. More recently, China Eximbank signed cooperation agreements with both the ADB and BRICSled New Development Bank (NDB): with ADB, the agreement emphasised knowledge sharing and exchanges for high-quality

infrastructure and green projects; with NDB, the two sides pledged cooperation via syndication, co-financing and parallel financing in sustainable infrastructure, including clean energy.²² Eximbank has also received funds from AIIB and MCDF as part of a partnership to support the enhancement of its environmental and social management systems (ESMS) for domestic projects.²³ These demonstrate the continued importance of MDB collaboration for Chinese FIs, and the prospect of growing MDB partnerships, not only as a way to mitigate financial and nonfinancial risks, but also to upgrade and build the risk management capacities of bilateral financiers for the future.

²² Asian Development Bank (ADB) (2023) 'ADB, CEXIM sign agreement to support co-financing of private sector investments in Asia and the Pacific' (www.adb.org/news/adb-cexim-sign-agreement-support-co-financing-private-sector-investments-asia-and-pacific); The Export-Import Bank of China (2023) 'A cooperation framework signed between the Export-Import Bank of China and the New Development Bank (NDB)' (http://english.eximbank.gov.cn/News/NewsR/202312/t20231211_54494.html).

²³ AIIB (2021) 'China: China EXIM Bank Enhanced Environmental and Social Management Systems (ESMS)' (www.aiib.org/en/projects/details/2021/special-fund/China-EXIM-Bank-Enhanced-Environmental-and-Social-Management-Systems.html).

4 Green co-financing networks in overseas lending

This section examines how the cofinancing networks explored in previous sections intersect with trends in loan financing for green projects. Looking at all financing trends, based on our Al-powered methodology to classify all overseas lending data, we estimate approximately **\$86.5 billion in transition-oriented 'green' investments** committed between 2000 and 2021, as captured by AidData, representing 5.8% of total lending commitments.

Large hydropower dominates this category, accounting for around \$61 billion

(71.6%) of 'green' investments, followed by nuclear projects at \$10.4 billion. 'Grey' and 'brown' investments, respectively, account for \$131 billion and \$549 billion. The most prominent 'grey' investments (which we define as projects that may not directly contribute to, but can support, broader energy transition pathways), include grid infrastructure (\$38 billion), critical minerals mining (\$51 billion) and natural gas power (\$34.6 billion).²⁴ However, across all categories, with the exception of neutral-classified loans,²⁵ we see a decline in overall lending since 2015.

Figure 15 Trends in project type lending (2000–21)

Source: Authors' chart, authors' categorisation and calculations based on AidData GCDF v3.0

²⁴ See the methodological annex for discussions relating to categorisations of project type and the classification.

²⁵ This likely reflects the relative rise of emergency lending, refinancing and foreign exchange swap lines over this period.

How much of this green lending is cofinanced? Of the \$86.5 billion committed to green projects, around **\$34.6 billion**, **or 40%**, **is co-financed**, though this differs substantially between different types of green projects. Around 48% of hydro projects involve co-financing – unsurprising given the large-ticket and high-risk nature of dam projects – while we see no observed co-financing for nuclear projects. Though solar and wind power loan volumes are smaller, they also appear to be attractive sectors for co-financing: a third of solar projects are co-financed, while for wind, this is onequarter (see Figure 16).

Figure 16 Co-financing trends across green projects

Source: Authors' chart, calculations based on AidData GCDF v3.0

4.1 Who is co-financing green investments?

In contrast to the wider commercial syndicated lending financing network, social network analysis of green projects reveals a markedly different institutional ecosystem. This involves a distinct ecosystem of clustered cofinancing, where policy-oriented public development banks, which include development finance institutions (DFIs) and multilateral development banks (MDBs), play an outsized role, compared to non-green conventional lending, where commercial banks feature more significantly. Notably, PDBs constitute approximately two-thirds (66%) of non-Chinese co-financiers for projects classified as 'green', compared to all other lending, where PDBs are around one-third (33%) of the composition of non-Chinese co-financiers. As Figure 17 shows, there is a fundamentally different lender composition for green finance, with a bifurcated network structure between commercial and PDB financing ecosystems.

Source: Authors' chart, calculations based on AidData GCDF v3.0

Social network analysis highlights ICBC and Bank of China's uniquely critical role in bridging otherwise disconnected commercial and policy-oriented financing networks. Their structural position indicates a substantial, though currently underutilised, potential to channel commercial capital towards green transition projects. ICBC and Bank of China occupy central positions with high betweenness, indicating their role as strategic bridges between commercial and policy-oriented clusters. A handful of commercial banks are extremely central and active in green co-financing, such as Societe Generale and Standard Chartered. However, policy-oriented PDBs dominate the green co-financing network, with KfW (Kreditanstalt für Wiederaufbau), French Development Agency (AFD), IFC and AfDB emerging as crucial partners in ways not visible in the overall lending network, with high representation in green transactions, though with limited participation in the number of transactions overall.

The People's Bank of China (PBOC), with centrality metrics so low it doesn't appear in our network visualisation, nevertheless participates in a significant number of green co-financed transactions, primarily through specialised co-financing funds established at multilateral development banks, as previously discussed in Section 3 of this paper. This suggests a strategic approach to green finance that operates through targeted institutional relationships rather than broad market participation.

These findings should be interpreted with appropriate caution given the relatively small sample of green financing transactions, but they point to distinct institutional pathways for different types of green investments. Detailed information on the SNA metrics and network construction is available in the methodological annex to this paper. This PDB-centric network structure likely reflects several factors: these institutions have a stronger mandate to support green projects; they can provide lowercost capital; they often enjoy de facto or de jure preferred creditor status; and they have expertise in project preparation and environmental standards. The 'butterfly' nature of the network indicates a bifurcated pattern of green financing, with a distinct ecosystem of PDB cofinancing but weak linkages to other commercial financing ecosystems.

When examining financing patterns, commercially co-financed green projects typically involve brownfield investments with existing cashflows, such as sale or refinancing of established hydropower assets, while greenfield renewable energy investments tend to be either directly financed by policy banks or co-financed with other PDBs.

Our text-based classification of green projects, while approximate and subject to methodological caveats, offers some clear implications. First, that co-financing for green projects relies on fundamentally different institutional networks than conventional project lending, with policy-oriented PDBs playing a dominant co-financing role, rather than profitmaximising commercial lenders which dominate overall syndicated lending networks. This bifurcation of networks suggests at a distinct and separate ecosystem of PDB-reliant co-financing networks for green finance. Second, rather than policy banks, it is Chinese commercial banks that play a central role both in overall syndication networks and in green financing networks. Their high measures of centrality indicate their critical role in 'bridging' between the bifurcated PDB and commercial lending ecosystems.

These observations have important implications for scaling up transition finance. Past trends suggest that Chinese co-financing for green projects requires different risk-sharing networks than traditional commercial BRI projects. It also indicates that Chinese commercial banks can 'play with both sides' in cofinancing with both PDB and commercial networks, with the potential to bridge between them and mobilise commercial capital towards green investments.

The next section outlines additional recent trends in green project finance that reflect other modalities of risksharing, going beyond lending and development finance.

5 Beyond development finance: other sources of green investment

This section widens the lens beyond development finance and lending, to track the activities of Chinese commercial financiers in more recent trends post-2021. As China's financing architecture evolves to share and mitigate risk in lending, we see growing signs of diversification in the modalities of financing. This section outlines the use of direct equity investments through FDI and other forms of public–private partnership, and notes emerging trends in green finance instruments.

5.1 Private sector participation in green infrastructure

Aside from bond finance, policy signals in recent years have encouraged greater use of PPPs and private investment in overseas infrastructure. Such investments may not be captured in existing development finance or loan data but may play a salient role. This may be the case particularly for energy transition investments, including in renewables, or in major commercial transactions in mining commodities, where financing for infrastructure can be tied to a larger investment and its income streams.

Studies in Africa find several PPPlike projects, mainly in expressways, roads and ports, with a few power sector projects, though the data is not comprehensive (van Wieringen and Zajontz, 2023). In contrast to many syndicated lending transactions, these transactions are largely driven by Chinese contractors, sometimes with support from Chinese lenders who take on a longer-term stake in the project, and do not generally entail co-financing with international partners.

World Bank PPI data estimates around \$74 billion between 2010 and 2023 in overseas infrastructure finance coming from China with private participation, often involving operation or long-term concessions with a Chinese company.²⁶ This has shown a rise and fall over time, with a small uptick in 2023 (Figure 18).

²⁶ The database records contractual arrangements for public infrastructure projects in low- and middle-income countries (as classified by the World Bank) that have reached financial closure, in which private parties assume operating risks. While this includes PPP-like models, such build-own-transfer or build-own-operate-transfer (BOT/BOOT) projects, it does not give definitive figures for equity investments.

Figure 18 Global PPI investments from China (2010-23)

Note: Excludes domestic projects within China. Source: Authors' chart, World Bank Private Participation in Infrastructure (PPI) data

PPI is concentrated in a few countries, including major BRI partners Pakistan and Lao PDR (People's Democratic Republic), as well as major middle-income countries (MICs) Indonesia and Brazil. The four of these together constitute 45%, or approximately \$40 billion, of total investment volumes, followed by Viet Nam, Nigeria, Bangladesh and Cambodia.

By sector, energy is a dominant area, with more than 60% of PPI financing between 2010 and 2023 in the electricity sector, mostly in large hydropower and coal plants, while solar, wind and non-hydro renewables have been smaller in outlay. Over that same period, solar, wind and other non-hydro renewables reached around \$8.4 billion, amounting to 21% of total PPI investment in electricity. Notably, coal projects disappear after 2020 but so does much else: while we see some PPI in solar photovoltaics (PV) after 2021, this is small in scale (Figure 19).

Data on Chinese FDI trends in Africa shows a dramatic rebound, with a strong spike in FDI investments reaching more than \$25 billion in 2023 (Figure 20). This is especially remarkable given that total sovereign lending from Chinese policy banks to Africa in 2023 was only around \$4.6 billion (Engel et al., 2024). While around \$500 million in policy bank lending went to renewable energy sectors in 2023, more than \$9 billion of the FDI goes to supported investments in renewable energy, largely to two countries, Egypt and Morocco, for clean hydrogen projects (Figure 21).

Figure 19 PPI investments in energy (2010–23)

Source: Author's chart, World Bank Private Participation in Infrastructure (PPI) data

Figure 20 Total FDI investment to Africa from China (2003-23)

Source: Authors' chart, FDI Markets (Africa only), Boston University Chinese Loans to Africa database

Figure 21 FDI investments in renewables (2008-24)

Source: Authors' chart, FDI Markets (Africa only)

While these datasets are partial pieces of the picture – and highlight the paucity of data outside of existing secondary development finance data - they indicate the rise and potential shift in how and where green finance modalities may arise in future. After 2021, other new forms of green finance, most notably green bonds, are also emerging trends that may enable increased project finance support in green infrastructure (see Box 3), and the broader diversification of financing instruments for infrastructure, particularly in support of energy transition investments. The recent 2024 FOCAC outcomes and pledges also indicate that, while debt finance appears to be diminishing in importance, investment promotion and support for Chinese firms overseas will see a greater emphasis.

Further data collection and research on both development finance and global FDI and equity investment trends is needed to examine whether this represents a broader substitution effect. In the immediate term, while state-owned FIs still favour conservatism when it comes to sovereign lending, risk-sharing through co-financing, both with other financiers as well as corporate investors via equitybased financing or via investment support, may be a more promising avenue, as FIs seek to fulfil their mandates of combining risk-balanced, high-quality projects, with support for national champions and promoting green investments.

Box 3 Green bonds for overseas project finance

Since 2021, China's domestic green bond market has boomed to become the world's largest. New green bond principles that since 2021 mandate the 100% use of proceeds for green and low-carbon expenditures, have made green bond financing an attractive means for funding green investments. While most proceeds fund domestic projects, it has become an emerging source for overseas project finance.

Post-2021, both ICBC and BOC have issued **BRI-themed green bonds** via offshore branches. BOC raised approximately \$775 million in BRI bonds in 2023 via its Dubai and Luxembourg branches (raising respectively RMB3.58 billion and RMB2 billion), dedicated to renewable PV (photovoltaics) and the installation of 1,348 megawatts (MW) of renewables capacity with use of proceeds 100% dedicated to BRI partner countries.²⁷ In 2024, BOC issued its first sustainable development bonds for the 'joint construction of the Belt and Road', via three overseas branches (Macau, Hungary and Panama), totalling \$940 million, to support projects in 13 BRI countries, including renewables, and water and waste management.

The scale of China's green bond market and strong domestic appetite have also raised the profile of green RMB 'panda' bonds, issued by overseas corporate and sovereign actors, and underwritten by Chinese FIs, as a potential financing source, given the favourable cost of capital in Chinese markets (Wang and Zhai, 2025). Several major MDBs have already raised panda bonds in the RMB market, and the first sovereign panda bond issuance by Egypt raised RMB3.5 billion (\$478 million) in 2023, guaranteed by the AIIB and AfDB.

Source: Bloomberg data (CBI and CIB Research 2023)

²⁷ For the full table, see: https://pic.bankofchina.com/bocappd/report/202404/ P020240419359701652450.pdf

Figure 22 China's onshore and offshore green bond issuances (2015-24)

Source: Authors' chart; Bloomberg data

6 Conclusions and policy implications

Chinese state-owned policy and commercial banks have been significant providers of development finance over the last two decades – but they face a dilemma. Their retrenchment in overseas lending and greater risk aversion reflect growing regulatory and policy pressures on their risk mitigation and risk management capacity. At the same time, new green policy priorities have raised the salience of green finance in their operations.

This paper evaluates how Chinese financiers have sought to juggle these dual mandates through risk-sharing mechanisms, focusing on co-financing with commercial and policy lenders, as well as non-development financial instruments.

We find significant scale and growth in co-financing over the last decade, driven in large part in the form of syndicated loans from state-owned commercial banks (ICBC and BOC) rather than official policy banks. We observe an emerging ecosystem of regional commercial banks in syndicated lending transactions.

Notably, syndicated loans have also been a source of financing for regional and national banks in middle-income economies: one key example has been Standard Bank in South Africa, which shows how strategic regional partnerships can help Chinese FIs expand into challenging regional markets. These capital pools could remain important resources for regional or national banks to tap into as they expand their support for national or regional green investments in energy transition.

To date, available data indicates that we have not yet seen a meaningful pivot of these commercial risk-sharing structures towards promoting green energy transition in lower-income countries. The reasons behind this, and the processes of commercial bank decisionmaking, warrants further investigation. However, the short-term and marketoriented nature of syndicated loans, and their concentration in higher-income countries and commercial sectors such as mining and energy, all indicate a lower appetite for higher-risk emerging markets or long-term investments in infrastructure. New regulatory developments, including the phase-in of Basel IV, may also have spillover impacts for the risk appetite of non-Chinese commercial financiers in syndication structures.

While commercial syndication networks have not been promising sources of energy transition finance, **we find strong involvement of public development banks (MDBs and DFIs) in co-financing networks for green investment projects**. This suggests their instrumental role in mobilising, and potentially softening terms for, green finance. We see distinct co-financing ecosystems between commercial and PDB networks, with low overlap between them. However, Chinese commercial banks such as ICBC appear to play a clear bridging role between these bifurcated networks, with central and strong relationships with both financing ecosystems.

We also highlight the role of multilateral funds, including PBOC-established cofinancing funds at the IDB and AfDB, in supporting energy infrastructure. Many of these funds were established in the boom period before 2014, and while they have largely been disbursed, they have not been recapitalised. No new funds have been established to the same scale. Nevertheless, there is a clear political willingness to collaborate with MDBs within the broader architecture, as seen in the establishment of the MCDF platform and growing on-lending to regional banks. There is also a clear appetite on the part of policy banks like China Eximbank to collaborate and co-finance with MDBs in projects for sustainable infrastructure and clean energy, indicating this will be a rising area going forward.

Beyond development finance and official state-backed financial institutions, risksharing is taking place through other forms. One area is in the rising trend of green investments via FDI, involving equity (usually from a commercial business) rather than debt finance from an FI. This appears to be in line with policy trends that have emphasised new financing through investment promotion rather than direct lending, where implementing firms take on a greater share of project investment risks.

Meanwhile, the modest boom in Chinese green bond markets, driven by domestic and domestic energy transition investments, may also see growing use for overseas projects. The use of BRI-branding in more recent green bond issuances by major FIs after 2021 demonstrates a model of project financing where commercial banks can channel investment capital towards green projects in BRI countries where direct lending may otherwise be unfeasible.

6.1 Policy implications

Co-financing with commercial and development finance has been an attractive modality for FIs as a means of reducing risk exposure in overseas investments. However, it has not led to a significant expansion of support for green projects to date.

Green project lending with co-financing has involved PDBs or taken place via earmarked co-financing funds. This highlights the importance of PDBs in providing long-term concessional financing, and in prioritising green sectors for project development and finance. The bulk of commercial syndicated loans have a short maturity, making it challenging for infrastructure projects, including renewables investments, which require significant capital outlays and often longterm patient capital to match their long payback periods. These issues raise several policy implications:

Chinese commercial banks play a role in bridging commercial and development co-financing ecosystems. Our network analysis shows distinct networks and clusters in how commercial banks and development banks support projects as part of co-financing clusters, with limited overlap between the two. However, major Chinese commercial banks act as a bridge, bringing PDBs into regionally concentrated commercial network transactions, and redirecting pools of commercial capital or ameliorating their risk aversion towards more developmental and green transactions. This could involve pioneering blended finance structures or leveraging PDBs' guarantees to derisk projects, provide more favourable financing terms and, crucially, extend the maturity of these commercial instruments for long-term energy investments. Successful green financing is not merely about the amount of capital deployed, but about the structure of institutional relationships that facilitate it. By strengthening the connections between policy and commercial financing ecosystems, China has the opportunity to substantially increase the scale and impact of its green overseas investments.

Collaboration with MDBs and PDBs is vital in enabling energy transition finance. Concessional development finance remains essential in supporting higher-risk sectors and economies. Major MDB co-financing funds at IDB and AfDB have been active in financing green and energy transition infrastructure projects. There is a strong case to be made for China or other donors to replenish or recapitalise these multilateral funds or on-lending facilities, some of which are coming to the end of their tenor. Meanwhile, regional development banks should prioritise and earmark on-lending facilities to green and other transitionoriented activities and infrastructure.

Regional partnerships have been a winwin for Chinese and other international southern FIs and a means for capacity building. International collaboration also brings diverse advantages for Chinese FIs, not only through risk-sharing but also via the regional depth and technical expertise that partners hold. This includes in managing ESG and climate impacts, and in establishing projects and developing project pipelines. Partnerships with regional banks such as Standard Bank South Africa have provided a successful model for other regions, as a means to channel capital and bolster domestic banking sectors in capital-scarce economies. FIs seeking to co-finance with regional banks or MDBs should also leverage their technical advantages for systematic capacity building and knowledge exchange in ESG monitoring and compliance as a part of co-financing relationships, strengthening the capacity of Chinese FIs and firms in this area.

Green financing and innovation will need to go beyond development

finance. In supporting the 'going out' of green technologies such as renewable energy, direct commercial investments in higher-risk regions such as Africa have been faster to recover than direct debt-finance. Chinese commercial FIs can help facilitate overseas FDI through credit enhancement instruments, such as investment insurance or through mezzanine structures or PPPs. Greater internationalisation of banking networks, or forming regional partnerships with local banking institutions, can help derisk overseas investments for firms and reduce information and investment costs. Finally, green finance instruments have largely targeted renewable energy and transport projects, but banks and investors can also expand the range of investments to other industrial sectors such as manufacturing in energy transition value chains. This will help foster broader green transformations in host countries.

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Appendix 1

Table 1 Major co-financing funds with Chinese contributions

Name of fund (year)	Bank/co- financiers	Size/China share (USD millions)	Details
PRC Regional Cooperation and Poverty Reduction Fund (2005)	Asian Development Bank (ADB)	90	This fund supports regional cooperation, poverty reduction and sustainable development in the Asia-Pacific region. Largely supports technical assistance and project grants. \$75 million has been approved to support 125 projects.
Credit Guarantee and Investment Facility (CGIF) (2010)	Japan, Asian Development Bank, Korea	1,158 (China 342.8)	The CGIF bond guarantee operation is aimed at supporting ASEAN+3 companies access the region's bond markets across different countries, currencies and tenors. CGIF has a AAA credit rating (Fitch), AA/A-1+ (S&P). Main issuers have been Viet Nam, Thailand and Singapore, with the biggest shares in the real estate, consumer and industrial sectors.
China-ASEAN Fund (CAF) (2013)	ASEAN	Unknown	The China-ASEAN Investment Cooperation Fund ('CAF') is a USD-denominated offshore quasi-sovereign equity fund sponsored by the Export-Import Bank of China ('Eximbank'), among other institutional investors, under the direction of the PRC State Council and the National Development and Reform Commission. The fund targets investment opportunities in infrastructure, energy and natural resources in the ASEAN countries. It was formally announced by the Chinese Premier Wen Jiabao in 2009 and further approved by the National Development and Reform Commission in 2013.
Managed Co- lending Portfolio Program (MCPP) (2013)	World Bank (IFC)	16,000 (China 3,000)	The Managed Co-Lending Portfolio Program (MCPP) is IFC's syndications platform for institutional investors. Since its launch in 2013, the MCPP has raised more than \$16 billion from 17 partners, supporting the mobilisation of institutional capital and credit insurance for direct lending to IFC's borrowers in developing countries. Participants include the State Administration for Foreign Exchange (SAFE), which supported the Trust Fund of \$3 billion over six years. They were joined by Allianz Global Investors, the HKMA, Liberty Specialty Markets, Munich Re, Eastspring Investments, Axa Group, Swiss Re, Aspen Insurance, Everest Insurance and Tokio Marine HCC, the latter four of which all provide credit insurance and joined in 2018–20. Initial funds raised \$1.6 billion for 47 projects in 30 countries.

Name of fund (year)	Bank/co- financiers	Size/China share (USD millions)	Details
China Co-financing Fund for Latin America and the Caribbean (2013)	IDB Invest, Inter-American Development Bank (IDB)	2,000	This fund supports public and private sector projects in Latin America and the Caribbean, with a focus on infrastructure, energy and sustainable development. It was established by the People's Bank of China and the IDB; funds have earmarked \$500 million for public sector loans and \$1.5 billion for private sector finance.
Africa Growing Together Fund (AGTF) (2014)	African Development Bank (AfDB)	2,000	This fund was established with the PBOC. It co-finances development projects in Africa, both sovereign and non- sovereign, focusing on infrastructure, energy, transport and industrialisation. It is managed by the AfDB, with 54 projects committed as of 2024, with UA1,464.16 million committed (approx. \$1,923 million).
China-Mexico Fund (2014)	World Bank (IFC)	1,200	Launched in 2014, the \$1.2 billion China-Mexico Fund is a country-specific fund that makes equity, equity-like and mezzanine investments along with IFC in Mexico. It focuses on infrastructure alongside other sectors, including manufacturing, agribusiness, services and banking. As of 30 June 2020, the fund had made three investment commitments totalling \$320 million. The fund does not appear to have made any active investments since 2017. Recent financial statements show 362 million in cumulative investments to around four projects as of 2022.
China-World Bank Group Partnership Facility (CWPF) (2015)	World Bank	50	The China-World Bank Group Partnership Facility (CWPF), established in July 2015, is a partnership between the People's Republic of China's Ministry of Finance (MOF) and the World Bank Group (WBG). The Facility's overall objective is to assist WBG client countries in achieving inclusive and sustainable economic growth. Through this Facility, the Government of the People's Republic of China has provided \$52.74 million from FY2016 through FY2022.
			CWPF seeks to enhance tripartite cooperation between China, recipient countries and the WBG by leveraging different pools of resources, both financial and knowledge based, to support demand-driven activities. The Facility is intended to support activities that are aligned with priorities of the recipient countries, as well as the WBG's strategy, and that are replicable.

Name of fund (year)	Bank/co- financiers	Size/China share (USD millions)	Details
China-Africa Investment and Industrialisation Programme (2016)	African Export- Import Bank (Afreximbank)	1,000	The African Export-Import Bank ('Afreximbank') and the Export-Import Bank of China have signed a cooperation agreement to create a \$1-billion China-Africa Investment and Industrialisation Programme. The fund will facilitate the construction and creation of industrial parks and special economic zones on the continent. The agreement will see the two institutions working together to provide Africa with the capacity for light manufacturing and primary processing of raw materials and commodities. It will also look at the acquisition of shipping equipment, railways and rolling stock, and trade facilitating infrastructure, such as power.
Equity Participation Fund (2016)	European Bank for Reconstruction and Development (EBRD)	380	The EBRD's Equity Participation Fund (EPF) mobilises funds from global institutional investors to take part in its own direct equity investments, with the goal of attracting long-term institutional capital into the private sector in the countries where it works. The value of joint China-EBRD investment stood at ≤ 3.47 billion as of February 2023. EBRD finance accounted for ≤ 1.93 billion and China investment accounted for ≤ 1.54 billion. The joint investment has been across the region covered by EBRD in various countries: in Türkiye, Kazakhstan, Uzbekistan and Azerbaijan. Broken down by industry, the joint investment has taken place in the following industries: sustainable infrastructure, industry, commerce and agribusiness, and financial institutions.
China-EU Co- Investment Fund (CECIF)(2018)	European Investment Bank (EIB), European Investment Fund (EIF), Bpifrance,	694 (China 500)	The China-EU Co-investment Fund (CECIF) programme was established by the EIF and Silk Road Fund (SRF) with the aim of developing synergies between the Belt and Road Initiative and the Juncker Plan. The fund will support mid-cap companies with high growth potential in Europe and China, in areas such as healthcare, high-end industries, consumer goods and business services. The fund is backed by the EIF under the Juncker Plan's European Fund for Strategic Investments (EFSI), as well as the China Development Bank, French national promotional bank Bpifrance, China's Silk Road Fund, sovereign funds, and institutional and other private investors.
Chernobyl Shelter Fund	European Bank for Reconstruction and Development (EBRD)	48	This fund promotes clean energy, sustainable infrastructure and green finance in Eastern Europe, Central Asia and the Mediterranean.

Name of fund (year)	Bank/co- financiers	Size/China share (USD millions)	Details
MCDF Finance Facility (2020)	MCDF (Egypt, Hungary, Saudi Arabia, Cambodia and the Philippines)	180.3 (China 150)	This fund supports high-quality infrastructure and connectivity, and funds project preparation and technical assistance.

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