International climate finance architecture

Enabling sectoral transitions in emerging economies?

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UNIVERSITY OF CAPE TOWN
IYUNIVESITHI YASEKAPA • UNIVERSITEIT VAN KAAPSTAD
FGV SÃO PAULO SCHOOL OF BUSINESS ADMINISTRATION
Center for Sustainability Studies
INSTITUT TEKNOLOGI BANDUNG 1920
IIKEM

About this study

Project
Strengthen National Climate Policy Implementation: Comparative Empirical Learning & Creating Linkage to Climate Finance. The project explores how international climate finance can support the implementation of NDCs in emerging economies and EU countries through comparative analyses and by providing a better understanding of the interface between international finance and domestic policies.

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Coordinating authors
The German Institute for Economic Research – DIW Berlin
Egor Trushin, Bence Marmarosi, Heiner von Lüpke, Catherine Marchewitz, Karsten Neuhoff

Contributing authors
Center for Sustainability Studies (FGVces), São Paulo School of Business Administration (FGV EAESP), Fundação Getulio Vargas (FGV), Brazil
Camila Yamahaki, Gustavo Velloso Breviglieri, Annelise Vendramini

The Energy and Resources Institute (TERI), India
Manish Kumar Shrivastava

The Climate Change Center – Institute of Technology Bandung (ITB), Indonesia
Djoko Santoso Abi Suroso, Budhi Setiawan, Pradono, Zahara Sitta, Mulia Asri Hastari

University of Cape Town (UCT), South Africa
Andrew Marquard, Samantha Keen

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List of acronyms and abbreviations

BUR	Biennial update report
CFPP	Coal-fired power plant
CO_2	Carbon dioxide
COP	Conference of the Parties to the UNFCCC
CBDR-RC	Common But Differentiated Responsibilities and Respective Capabilities
ENDC	Enhanced Nationally Determined Contribution
ETM	Energy Transition Mechanism
FOLU	Forest and Land Use
GCF	Green Climate Fund
GDP	Gross domestic product
GHG	Greenhouse gas
GNI	Gross national income
GoI	Government of Indonesia
GST	Global Stocktake
GWh	Gigawatt hour
ICF	International climate finance
IDR	Indonesian rupiah
IMF	International Monetary Fund
IPG	International Partners Group
IPP	Independent Power Producer
JETP	Just Energy Transition Partnership
JETP-IP	Just Energy Transition Partnership Investment Plan

KEN	National Energy Policy (in Indonesia)
MDB	Multilateral development bank
MSME	Micro, Small and Medium Enterprises
NCQG	New Collective Quantified Goal
NDC	Nationally Determined Contribution
NGO	Non-governmental institution
NRE	New Renewable Energy
NZE	Net Zero Emissions
ODA	Official development assistance
OECD	Organisation for Economic Cooperation and Development
PV	Photovoltaic(s)
RUEN	National Energy General Plan (in Indonesia)
TA	Technical assistance
TED	Technical Expert Dialogue
tkm	tonne-kilometre
UNFCCC	United Nations Framework Convention on Climate Change
USD	United States dollar
ZAR	South African rand

Summary

To be in line with the goal of the Paris Agreement and guided by the needs and perspectives of national stakeholders ensuring domestic support and ownership, International Climate Finance (ICF) not just needs to be channelled toward low-carbon investments and climate protection measures but also needs avoid leading to new carbon lock-ins. To finance the green transformation in developing countries, sectoral transitions require special attention.

But how does and how can the ICF architecture enable sectoral transitions in emerging economies?

Shortcomings of the ICF architecture seem to limit the value for advancing transition activities: Provided funding is not only lower than expected, but also mostly takes place in the form of loans and often not in local currency, which tends to exacerbate the economic strains of developing countries, especially increasing sovereign debt burden. Developed countries are criticized for rebranding some of their existing official development assistance (ODA) target as climate finance, instead of providing additional funding.

In this report, we explore the experiences related to the use of financial instruments and policies to support sectoral transitions in developing countries. It aims at addressing the challenges for financing transitions in energy, industry, and infrastructure sectors alongside suitable types of finance instruments to overcome these hurdles.

The research design of this reports focuses on four country case studies: Brazil, India, Indonesia, and South Africa. The multiple-case study design offers the opportunity to explore in detail specific sectors in different national contexts. All four countries are emerging economies with ripe opportunities for just energy transitions (India, Indonesia, and South Africa) and sectoral decarbonization (low-carbon transport infrastructure in Brazil and green steel in India). All country case studies rely on secondary data synthesizing on findings of previous research in the SNAPFI project. We deliberately retained the specific perspective and framing from the national perspectives to provide an authentic picture for the reader.

We find that all countries need significant investments to transform their sectors, calling for an ever more prominent role of ICF and, relatedly, for effective ICF designs. This not only means taking sectoral characteristics into account, but also, following a system approach, the consideration of cross sectoral linkages and economy wide transition needs.

Existing national policy processes for sectoral transitions do not seem to be in line with the financial instruments applied. They feature certain barriers, which discourage investments essential for just transitions. Examples of most prominent national impediments are structural barriers in Brazil, regulatory uncertainty and complex stakeholder coordination in the transition in Indonesia, high heterogeneity of steel producers and connected issues of access to finance in India, and electricity crisis and debt burden in South Africa.

As for financial instruments, grant financing is still widely considered to be a suitable type of support to address barriers so that investments are no longer discouraged. This type of work is typically

conducted by governments, considering the high risks involved and uncertainty of early transition processes, but public grant funding is normally in short supply (South Africa, Indonesia). Care must be taken in cases where international grant financing is working toward domestic policy reforms if these are identified as remedies to barriers, because of issues related to infringements of national sovereignty over national policy processes.

Another finding reveals that the mechanisms of decision-making shall be inclusive and transparent, the modalities of ICF flows shall fit the national contexts, and the action plans shall be carefully designed, considering all relevant stakeholders. Sectoral transitions imply multi sectoral cooperation, including financial, social, economic, and other sectors, alongside deliberate mechanisms of communications between international partners and domestic governance bodies. The development of national transition plans signifies domestic effort, attracting international climate finance to enable and speed up the transition.

Still, the heterogeneity of national contexts clearly shows the need for taking each national situation as individual: one size fits all and generic models for international climate finance are likely ineffective. Further, mobilizing more private climate finance is achievable only after an enabling environment for financial flows is created on a national level.

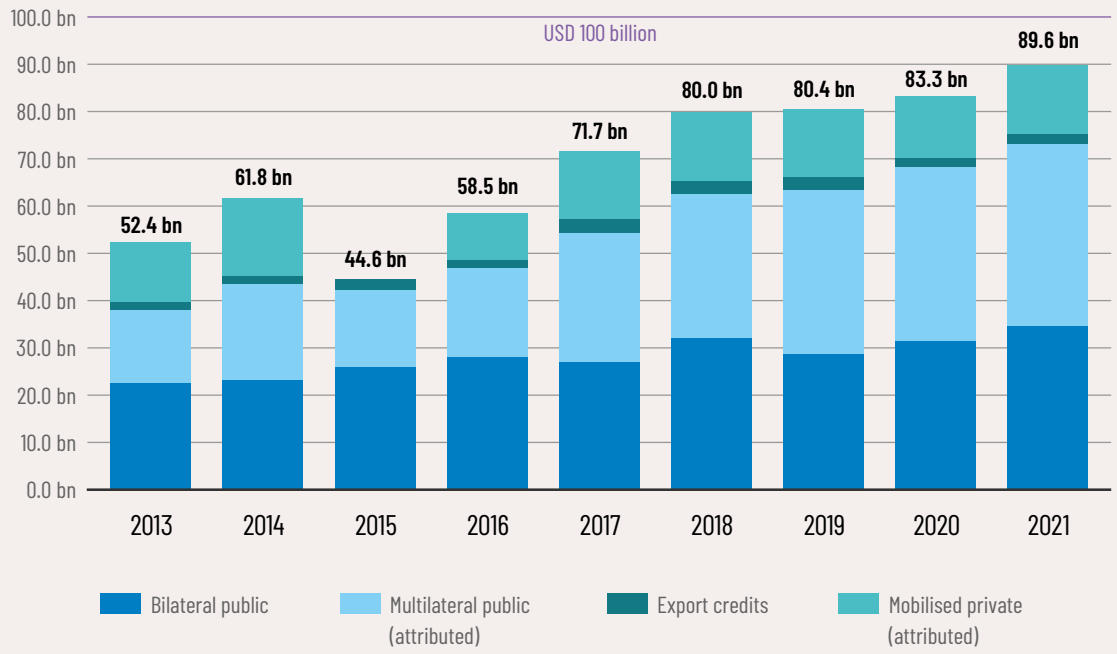
Chapter one

Introduction

1. Introduction

The UNFCCC (n.d.) defines international climate finance (ICF) as transnational financing — drawn from public, private and alternative sources in the Global North — that seeks to support climate change mitigation and adaptation actions primarily in developing countries. At COP15 in 2009, developed countries committed to a collective goal of mobilising USD 100 billion per year by 2020 for climate action in developing countries. The amount has not been updated subsequently, only reiterated and extended to 2025. Still, developed countries have been consistently falling short of mobilising their ICF target despite their commitments (see Figure 1).

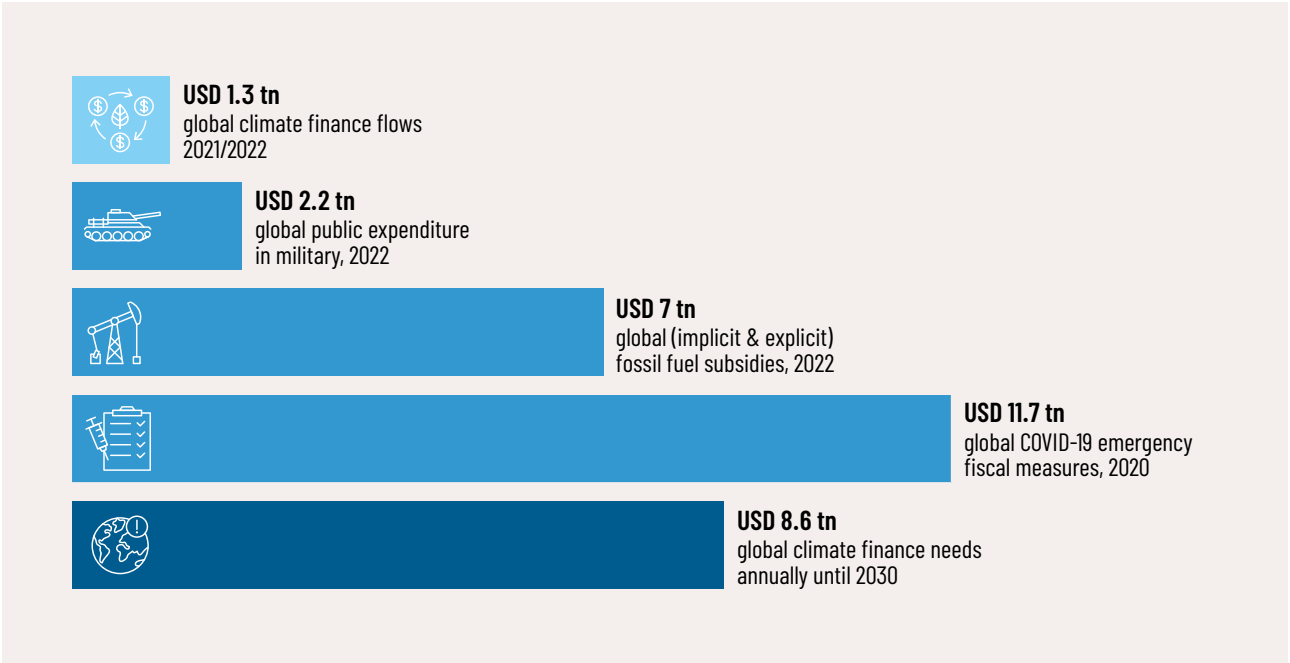
Figure 1 — Climate finance provided and mobilized by developed countries



Source: in USD bn OECD (2023)

To put things in perspective, the IMF (2021) estimated that USD 11 million was paid in subsidies per minute globally for producing and burning oil, natural gas, and coal in 2020 - or USD 100 billion every six days. According to the Climate Policy Initiative (CPI), the sums spent on international climate financing are significantly lower than the amounts spent on military purposes, on subsidizing fossil fuels, and on global spending in the context of the Covid-19 pandemic (see Figure 2).

Figure 2 — Climate finance in context



Source: Climate Policy Initiative (2023a)

These figures suggest that ICF might not only suffer from insufficient funds, but also from many issues, including general shortcomings in its architecture. Besides the fact that the ICF available is insufficient for developing countries, existing climate funds (e.g. GCF) are difficult to access, particularly for smaller and more vulnerable countries, due to the lengthy and complex application processes, high transaction costs, as well as a lack of technical capacity and resources in recipient countries (Samuwai, 2021; Voita, 2023). A low share of grants in comparison to loans is another concern for countries that are already highly indebted (Songwe, Song & Bhattacharya, 2022). Indeed, various stakeholders claim the existing ICF system is unfair and inefficient, demanding reforms to address the unjust access to climate finance for the poorest most vulnerable countries and the distribution of funds and financial instruments, such as the dominance of loans increasing the indebtedness of many developing countries as well as hard-currency debt that makes the countries vulnerable to exchange-rate risks. Proposals for improvement include a fair and effective allocation of funds, addressing the debt burden and liquidity problem by reforming institutions and initiatives as well as mobilising more public and private finance (Jensen et al. 2023; Voita 2023).

Against this background, this report aims to explore the experiences related to the use of financial instruments and policies to support sectoral transitions in Brazil, Indonesia, India, and South Africa. It aims to address aspects in financing of sectoral transitions toward climate compatible development in energy and infrastructure sectors[1], such as barriers in national circumstances and suitable types of finance instruments to overcome these hurdles.

1 The selection process followed a bottom-up logic and were suggested by the contributing authors.

Accordingly, the following research questions guide this report:

1. **What are the main challenges for financing the transitions in energy, industry, and infrastructure related sectors in emerging economies?**
2. **Which type of international climate finance is appropriate to alleviate the identified barriers as well as finance and support the different stages and sectoral situations?**

We follow a multiple-case study design (Yin, 2009), which offers the opportunity to explore in detail energy, industry, and infrastructure related sectors in different national contexts, helping to advance theoretical explanations and potentially find generalizable conclusions, drawn from observed patterns. All four countries are emerging economies with ripe opportunities for just energy transitions (India, Indonesia, and South Africa) and sectoral decarbonization (low-carbon transport infrastructure in Brazil and green steel in India). The country case studies rely on secondary data synthesizing on findings of previous research in the SNAPFI project.

The structure of the report is as follows: Section 2 summarizes the complexities and shortcomings of ICF supporting transformational change. Section 3 contains the four case studies from Brazil, India, Indonesia, and South Africa, which outline challenges for sectoral transitions and levers to remove the identified barriers and suggest the role of ICF to enable the transitions. We close with a discussion of the results and suggestions for future research in Section 4.

Chapter two

Financing sectoral transitions

2. Financing sectoral transitions

2.1. Shortcomings of ICF supporting transformational change

The root causes of the shortcomings of ICF is an area of intense contestation between the Global North and Global South. Based on the longstanding 'common but differentiated responsibilities and respected capabilities' (CBDR-RC) and 'polluters pay' principles originating from the Rio Earth Summit of 1992, the Global North has an obligation to assist the Global South in the complex task of simultaneous economic development and green transition. In this context, Colenbrander et al. (2022) measure individual country's responsibility to provide ICF based on the 'fair share' methodology developed at COP26 and find that only seven countries provided and mobilised their fair share of climate finance in 2020, with the United States appearing to be overwhelmingly responsible for the climate finance gap when it comes to bilateral and multilateral contributions. When it comes to ICF pledges of prospective contributions in 2025, the US is replaced by Canada and Australia as the countries with the least progress toward providing a fair share of international climate finance. CBDR-RC is a well-founded principle of the climate change regime intended to promote equity and fairness (Soltau 2008). Despite being still valid, questions around the selection of countries contributing to international climate finance arise. Being based on the situation of 1992, Annex II of Article 2 of the Paris Agreement might not reflect a fair classification scheme anymore. Researchers suggest a possible expansion based on per capita income and historical climate change contributions, with countries such as Brunei, Israel, Kuwait, Qatar, South Korea, Singapore, and the United Arab Emirates. However, although calculations show that expanding the contributor base may have a relatively negligible impact on the total quantity of climate finance, the symbolic value could be significant (Colenbrander et al. 2022). Further claims also exist, to open up the binary divide between Annex II countries and look at historical responsibility not only since the beginning of the industrial revolution, but more from a dynamic perspective, meaning that current emissions also represent future historical responsibility (Jolly et al. 2021; 332).

Other issues with the current ICF architecture include the fact that even though the UNFCCC calls for increased new and additional climate finance, developed countries are largely 'rebranding' some of their existing official development assistance (ODA) target of 0.7% of gross national income as climate finance, instead of providing it additionally to development assistance (Gebreyesus, 2017). The criticisms of transparency and accounting issues stem from the fact that donor countries are able to decide what part of their ODA qualifies as climate finance (Michaelowa and Michaelowa, 2010). Many find this ability to arbitrarily categorise ODA as climate-related rather concerning (Weikmans et al., 2017; Reuters, 2023).

In addition, provided funding is not only lower than expected, but also mostly takes place in the form of loans in hard currency, which tends to exacerbate the economic strains of developing countries. Between 2013 and 2018, more than ¾ of all climate-related lending by multilateral development banks (MDBs) took place at market rates with only 9 percent of ICF delivered as grants (OECD, 2020). At the same time, such financial instruments with different levels of concessionality are counted uniformly

at face value by the OECD, having caused criticism and vying methodologies by Oxfam and the Indian Ministry of Finance (Roberts et al., 2021).

On the other hand, ICF has several preconditions to achieve transformational change, including the identification of domestic support needs (Hagemann et al., 2023) and the alignment of ICF contributions and domestic policies (May et al., 2020). Furthermore, political will and transparency need to form the base of a common framework in which a shared understanding of ICF goals, mechanisms and criteria can exist, because ICF needs, as currently articulated within Nationally Determined Contributions (NDCs), differ significantly in scope and detail, rarely containing proper estimates. As of 2024, the only context in which the above preconditions seem to be improved are the Just Energy Transition Partnerships (JETPs), as seen in South Africa and Indonesia (von Lüpke et al., 2023)[2].

2.2. Taking stock after COP28 and looking ahead

In December 2023, the COP28 concluded the first ever Global Stocktake (GST)[3], assessing the global collective progress toward the targets set out in the Paris Agreement. The first annual GST dialogue will be convened at the next UNFCCC meeting in June 2024 at COP29, 'where countries will share best practice on using the GST outcome to inform their next NDCs'[4]. The 'UAE Consensus' (decision -/CMA.5) includes not only further action on the GST, but also called for just energy transitions to achieve net zero by 2050 and identified the opportune momentum for a change in the climate finance architecture. This implies increasing new and additional concessional, non-loan-based finance (e.g. grants, guarantees, interest subsidies) to support national just transitions without adding fiscal burdens; in other words, making climate finance "available, affordable and accessible" (COP28, 2023).

Among other important topics, the negotiations at COP28 also covered the New Collective Quantified Goal (NCQG) on finance and the adoption of the work programme on transitions. The NCQG, which is planned to be agreed in 2024 during the next COP, is expected to reflect the needs and priorities of developing countries more precisely and exceed the previous USD 100 billion goal, highlighting the current gap between the climate finance supply and demand.

The analysis of NDCs by the UNFCCC Standing Committee on Finance (2021) identified that developing countries require USD 5.8-5.9 trillion until 2030 to achieve the goals of the Paris Agreement. The projections of annual net-zero investment needs in 2021-2025 by GFANZ (2021) round up to USD 2.6 trillion with a 70% share of private finance. The ambitious target would require doubling the amount of climate finance from the CPI (2023a) assessments of USD 1.3 trillion as the average annual climate finance in 2021/2022[5]. To fill this financial gap, policymakers, environmentalists, and financial

2 For JETP Indonesia see: Comprehensive Investment and Policy Plan at: https://jetp-id.org/cipp

3 In 2022, the SNAPFI international thematic study outlined the role of the GST in strengthening international cooperation and national climate action (SNAPFI, 2022).

4 The UAE Consensus Negotiations Outcome - COP28 UAE

5 It is worth mentioning the difference between quantitative assessments of ICF and climate finance. Climate finance accounting methodology of CPI (2023b) includes "primary capital flows directed toward low-carbon and climate-resilient development interventions with direct or indirect greenhouse gas (mitigation or adaptation benefits" (p.3), hence also counting domestic finance, ICF, and non-ICF flows (e.g. to developing countries or from developing countries).

institutions, amongst others, are called to mobilize and scale up private climate investments, emphasizing their key role to reach net zero.

However, facing a range of barriers (financial barriers and non-financial) limiting their investment, from constrained returns to political risk and regulatory constraint, private financial actors claim public support through policy, regulation, market building, and public investment (GFANZ 2021). As for an example, the creation of a USD 30 billion private finance vehicle ALTÉRRA, aimed "to mobilise a total of USD 250 billion for global climate action" (COP28, 2023), aligns with the mobilizational role of ICF according to article 9 of the Paris Agreement, while decision -/CMA.5 acknowledges the role of private finance and the need to further develop domestic enabling environments for attracting finance (paragraph 70).

The ongoing UNFCCC discussions on the NCQG during the Technical Expert Dialogues (TED) outline the benefit of direct engagement with private sector stakeholders to identify those barriers that hinder private finance flows and the suggested solutions. During TED 2, NGOs and research institutions were considered as prominent actors, which could contribute to the identification of such barriers and ways to overcome them. Additionally, the role of public finance in enabling private finance flows has been emphasised in the TED 3 process, especially with the use of concessional finance instruments. However, the alignment of the aims of finance providers and the needs of recipient countries is arguably a delicate task. Financiers of climate projects expect project profitability or consistency with financiers' strategic goals. The presence of factors that influence the investment decision-making of private finance actors - risk-return ratio and profitability - aggravates the mobilisation of finance for projects that do not have a clear business case (WRI, 2023).

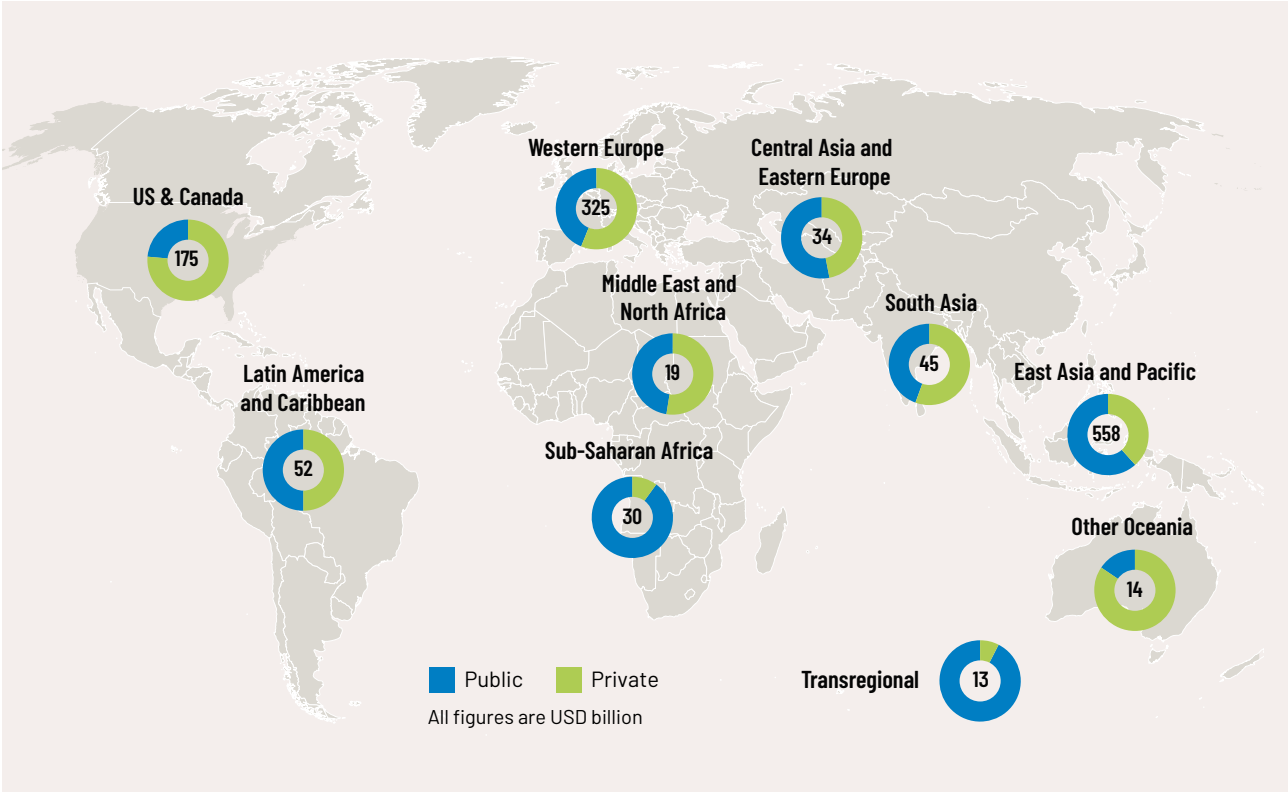
The provision mechanism of climate finance shall facilitate the access of concessional finance to countries that are most vulnerable to climate-related risks and ensure that recipient countries are not overburdened with additional debt. During the recent TED 6, considerations were given about the role of domestic financial and policy contributions towards mobilising private capital and how they could refer to the NCQG.

The relationship between domestic policies and financial flows was aptly characterised by Prasad et al. (2022, p. 1) by stating that 'global investment to achieve the Paris Agreement's temperature and adaptation goals requires immediate actions—first and foremost—on climate policies. Policies should be accompanied by commensurate financing flows to close the large financing gap globally.... Although there is no consensus that public policies would necessarily "crowd-in" private sector funds, the public funding and policies influence private sector investments'. The authors go on explaining that 'the role of public and private sector financing varies across countries depending on country-specific characteristics and the local economic and institutional context' (p. 2).

2.3. Unlocking potential and mobilizing capital at scale

Despite the major role of public finance, the role of the private sector still looms large, yet could be even larger when mobilized accordingly. Private finance is growing, providing 49% of total climate finance (USD 625 bn), but still not yet at the rate and scale required[6]. Development finance institutions continue to provide most of the public finance by channelling 57% of all public finance. However, 17% of public finance is provided in form of market-rate debt to Least Developed Countries (LDCs), increasing the aforementioned debt burden (CPI 2023). Developed economies seem to be more successful at mobilizing private finance than EMDEs (see Figure 3).

Figure 3 — Public vs. private climate finance by region



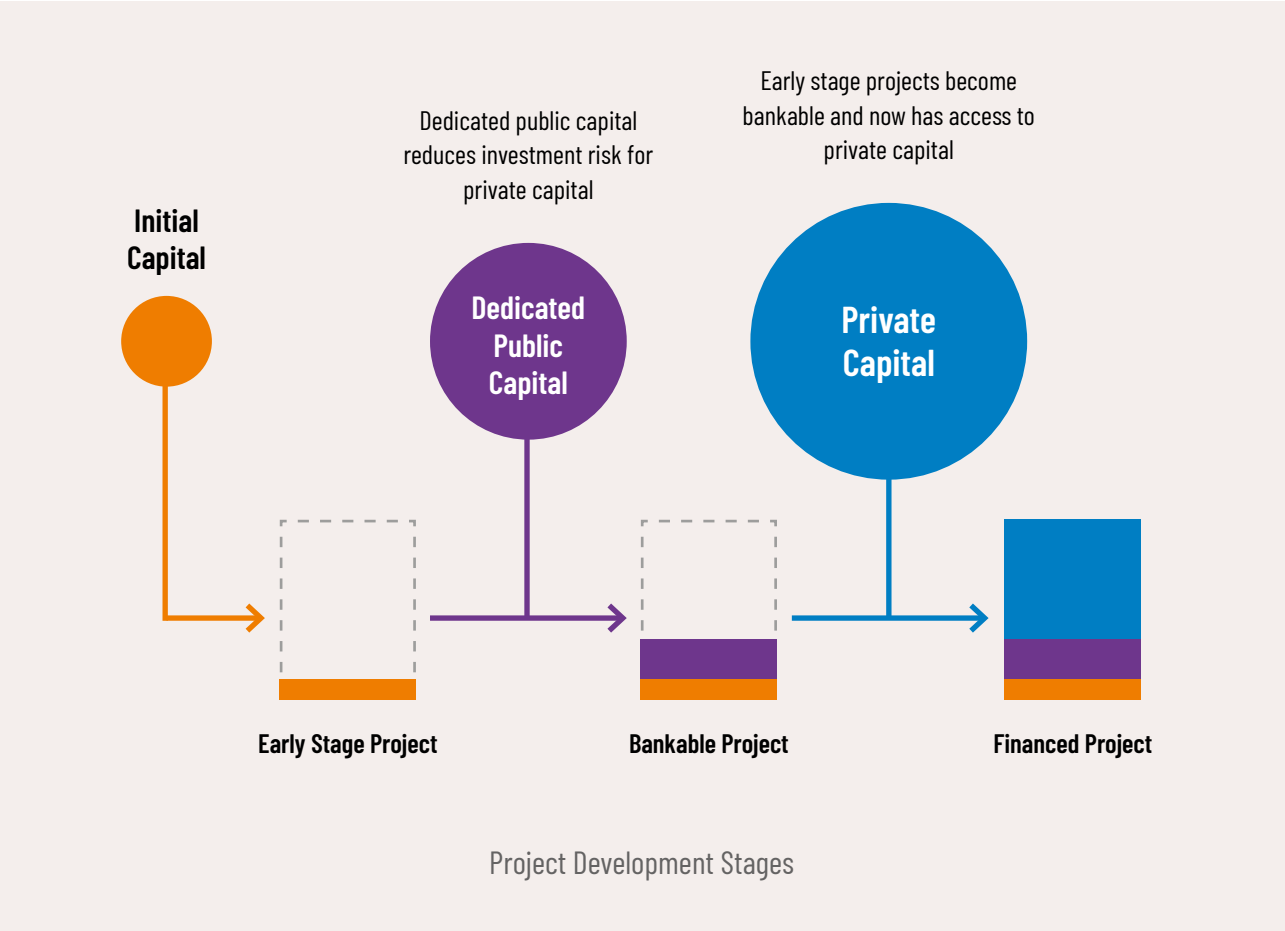
Source: CPI 2023

How to unlock potential and mobilize capital at scale in general and for industry transformation? Suggestions how to increase public funds specifically address the issue of risk, such as scaling and reforming climate action from international financial institutions by improving risk management, or providing foreign exchange guarantees by institutions such as the IMF or MDBs encouraging private investors by taking over any potential costs arising from currency fluctuations (Jensen et al. 2023). These arguments emerge, inter alia, from the observation that private finance is extremely risk-averse with respect to policy uncertainty and longer-payback periods. Many climate investments are perceived to have such political, regulatory, capital market, and/or technology risks. Public financial institutions can play a critical role as they provide the de-risking capital, instrument, or mechanism. De-risking means reallocating, sharing, or reducing the existing or potential risks associated with

6 See IKI EU Study 2022 for private capital providers and their risk/return expectation: https://bit.ly/snapfi-report-eu

climate investment (WRI 2022). In general, de-risking can be divided into two categories: policy de-risking and financial de-risking. Whereas the former includes policy measures or policy-based support like laws providing greater certainty to developers or investors, the latter achieves de-risking by spreading the risk between parties or transferring it to a third party through a range of measure like debt, equity, and guarantees. Figure 4 shows how public resources can turn a previously unbankable project into a bankable project, attracting and mobilizing capital from commercial and institutional investors by de-risking at an early project stage.

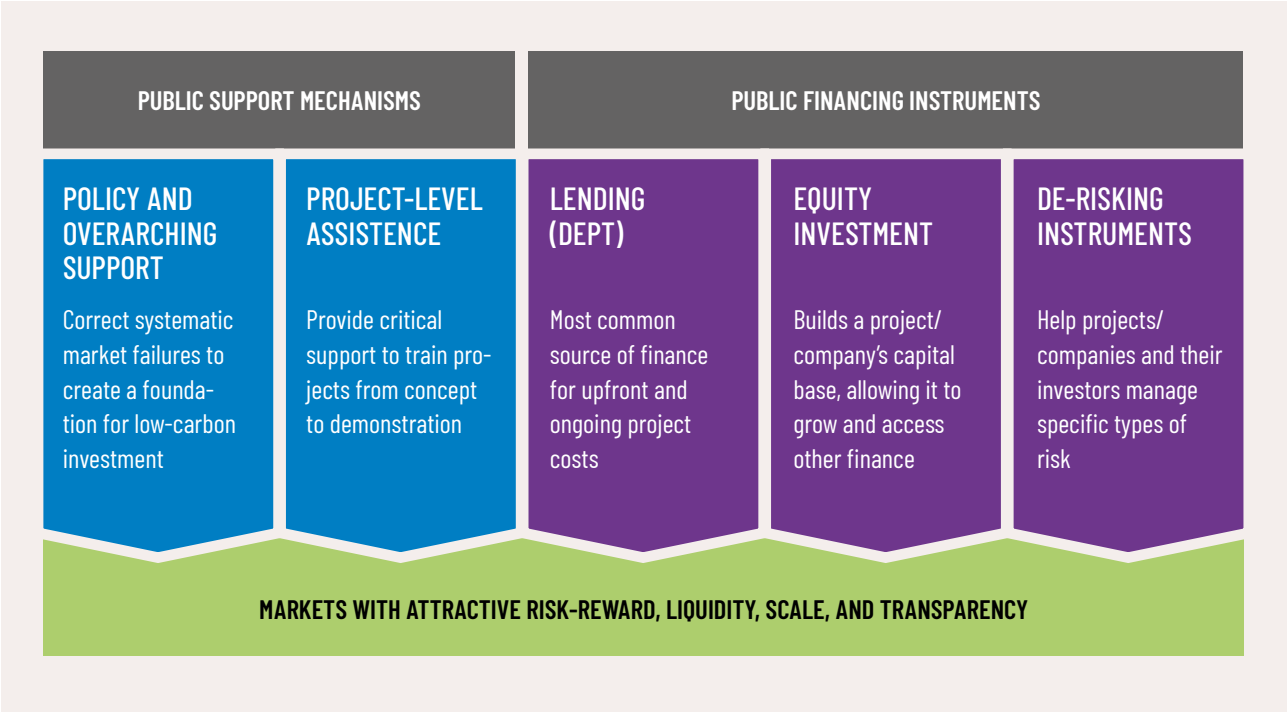
Figure 4 — De-risking in project development stage with dedicated public capital



Source: WRI 2022

Although it is argued that, to achieve GHG emission reductions at scale to stay within the global warming targets of the Paris Agreement, new and innovative finance instruments are needed, instead of established public subsidy instruments such as grants and concessional loans (see, for example, Bodnar et al., 2018), they are still considered valuable financial instruments. The conventional approach toward risk-reduction recognizes various types of instruments to attract foreign and domestic private capital (Figure 5).

Figure 5 — Public Tools available to create attractive low-carbon investment conditions



Source: WRI (2012)

The catalogue of risk-reduction instruments provided by public institutions is not limited to the types above - the rapidly evolving field of blended finance expands the arsenal of available tools. The choice of a suitable financial instrument is the crux of the matter in most cases, with plenty of influencing factors such as (1) various stakeholders involved, (2) the maturity of the project financed, (3) domestic conditions of the market where the investment is taking place and (4) the degree of the transformational change to a low-carbon industry and economy overall (von Lüpke et al. 2022). The differences between projects with defined boundaries (e.g. wind farms) and less certain energy transitions (e.g. JETP) imply different financing approaches - in the latter case, a programmatic approach might be a better fit as various complementary elements require a more sophisticated financing strategy. Achieving the objective of the Paris Agreement on financial flows would require reducing risk perceptions, altering expectations on returns, and increasing the capacity of private financial actors to mobilise and provide resources at scale.

In the following section, we present the four country case studies, following the research questions (see Introduction) to understand existing challenges in national circumstances for financing the transitions in energy, industry and infrastructure related sectors and the levers to remove barriers, as well as related implications for suitable financial instruments. We deliberately retained the specific perspective and framing from the national perspectives to provide an authentic picture for the reader.

Chapter three

Financing transitions in Brazil, India, Indonesia, and South Africa

3. Financing transitions in Brazil, India, Indonesia, and South Africa

3.1. Brazil: Low-carbon infrastructure investments

National circumstances and challenges

There is not yet a national definition of low-carbon infrastructure in Brazil. However, in 2023 the country launched an Action Plan for the Brazilian Sustainable Taxonomy, which plans to classify economic activities according to their substantial contribution to climate change mitigation and adaptation (and other environmental and social objectives). Hence, by November 2024, there will likely be technical screening criteria for the following infrastructure sectors: electricity and gas; water, sewage, waste management and decontamination; and transportation and storage (Brazil, 2023).

According to the International Energy Association (2022), Brazil's electricity mix is one of the cleanest in the world, with 65% coming from hydropower plants, 10% from biofuels and 9% from wind farms. Conversely, the transport sector is more carbon-intensive, a pattern that is explained by the overreliance of freight logistics on roads (68%) and the high carbon intensity of road transportation (101,2 g CO_2 per tonne net kilometre) compared to other modes such as rail (23.3 g CO_2) and cabotage (20 g CO_2) (EPL & Ministério da Infraestrutura, 2021; Teixeira, Rocio, Mendes, & D'Oliveira, 2018). Sanitation is also in need of investments as the country plans to increase access to sewage collection and treatment from 51% (as of 2021) to 90% of all households by 2033 (Ministério das Cidades, 2023).

To reduce obstacles to social and economic development, the Brazilian Infrastructure Association (ABDIB, 2022) estimates a need for annual investments equivalent to 4.3% of the GDP in electricity, transportation, sanitation, and telecommunications between 2024 and 2033, whereas only 1.71% of the GDP (or R$ 148,2 billion) was invested in infrastructure in 2021 (see Table 1).

Given Brazil's fiscal constraints, with general government gross debt of nearly 90% of GDP, among the highest between emerging market and middle-income economies (IMF, 2023), it is unlikely that this investment gap will be fully financed by the public sector. Banks also face constraints when funding infrastructure due to the Basel III regulation, which makes it more expensive for financial institutions to issue long-term debt, such as project financing loans, by discouraging mismatches in the maturity of assets and liabilities. In this context, the potential for mobilising additional infrastructure investments partially lies with institutional investors (Bhattacharya, Oppenheim, & Stern, 2015; Croce & Yermo, 2013). As such, emerging countries like Brazil are recommended to develop a conducive environment for private investments to help fill the infrastructure gap.

Table 1 — Infrastructure in Brazil - status, estimates/targets, and recent policies.

Type of infrastructure	Current status (%)	National estimates/targets (%)	Actual investments (% of GDP), in 2021	Required annual investments (% of GDP)	Examples of policies favouring the increase of private finance to low-carbon infrastructure[7]
Electricity	Electricity matrix (GWh), in 2020: 65% hydro*, 10% biofuels*, 9% natural gas, 9% wind*, 3% coal, 2% nuclear, 2% oil	Estimates from the National 10-Year Expansion Energy Plan (PNE) 2031[8]: 83% of the electricity installed capacity will be fuelled by renewable sources, by 2031	0.77	0.84	NA
Transportation	Freight transport matrix (tkm), in 2017 67.61% roads 21.46% railway** 7.96% cabotage** 1.48% waterway** 1.42% ducts** 0.06% air	Estimates from the National Logistics Plan, by 2035[9]: 52.91% roads 36.05% railway** 8.11% cabotage** 1.37% waterway** 1.5% ducts** 0.06% air	0.35	2.26	National Biofuel Policy (Statute No. 13,576/2017) National Cabotage Policy (Statute No. 14,301/2022) Railway Statute (Statute No. 14,273/2021)
Sanitation	84.2% of the population with access to water 55.8% access to sewage collection** 51.2% access to sewage treatment (2021)**	Targets according to the Sanitation Statute: 99% access to potable water by 31/12/2033 90% access to sewage collection and treatment** by 31/12/2033	0.20	0.45	Sanitation Statute (Statute No. 14,026/2020)
Telecommunications	90% of households with Internet access	Target according to Decree No. 10,610/2021: 100% of households with optical-fibre Internet access by 31/12/2024	0.39	0.76	NA

* renewable sources, ** low-carbon modes
Source: Casa Civil, 2022; EPE, 2022; EPL & Ministério da Infraestrutura, 2021; IEA, 2022; Ministério das Cidades, 2023; Teixeira et al., 2018

Barriers to investments in infrastructure

In previous SNAPFI studies (FGVces, 2020; FGVces, 2021), FGVces examined the obstacles that hinder an increase in direct and capital market investments in low-carbon infrastructure development in Brazil and identified three types of barriers:

- Barriers from the institutional environment.
- Specific barriers for direct investors.
- Specific barriers for capital market investors (e.g. pension funds).

7 As identified in SNAPFI National Studies.
8 The Energy Expansion Plan indicates the country's outlook for the energy sector for the next ten years.
9 This scenario foresees the completion of existing projects and the execution of planned investments by the federal government.

In the following, we present the main barriers found in the previous studies and complement the analysis by suggesting possible avenues for how ICF can contribute[10] to tackle some of these challenges. Solutions and interventions could take place at a more structural level, for instance through policy change, as well as from a more tactical perspective. In this section, the analysis of opportunities for ICF contributions on both structural and tactical levels is presented, hence without focusing on capital market investors (a thorough discussion is available at FGVces, 2021), with most opportunities found in the tactical space, given that the former is more closely related to efforts from national governments.

Barriers from the institutional environment

Institutional investors are attracted by countries that offer a conducive environment for investment, with sound policies, effective institutions, reliable contract enforcement, transparency, and clear capital market regulations (Bielenberg, Kerlin, Oppenheim, & Roberts, 2020). In contrast, in Brazil, interviewees participating in the studies of FGVces (2020, 2021) pointed out that challenges to attracting infrastructure investments issues include, among others, political interference, high interest rates, exchange rate volatility, and Brazil's speculative investment grade, in view of investments' long-term maturity and projects' capital intensity.

To tackle most of these challenges, structural reforms driven by the national government are required. For instance, for interest rates to fall and remain at low levels, it is necessary for the country to put its fiscal accounts on a sustainable trajectory, an effort that not just needs to span several administrations but also demands extensive dialogue by including subnational governments, social movements, unions, business associations, and others. Indeed, by failing to revert the trend of consistent increases on public expenditures and, consequently, public debt, which grew from close to 50% of GDP in 2012 to almost 90% in 2023, Brazil risks further suffering from rising inflation and exchange rate devaluations (IMF, 2023; World Bank, 2017). Similarly, Brazil displays low levels of trade openness, with imports plus exports equating less than 25% of its GDP, but efforts to promote greater commercial integration tend to face strong opposition from domestic interest groups and yield results in the long run (Bacha, 2022).

Nonetheless, there are a few opportunities for ICF partners. For instance, they could share best practices on policy reforms and regulations that promote private sector participation, transparency, and sustainability in infrastructure projects, and mechanisms that reduce exposure to exchange rate volatility (e.g. currency swap, hedging contracts), which represent expensive and complex operations for infrastructure investors.

Barriers to direct investments

- **Poor project development:** As for barriers hindering direct investors from investing in infrastructure, the interviewees in the studies of FGVces (2020; 2021) mentioned the lack of comprehensive studies to better understand the potential revenues associated with a new infrastructure asset. As examples, interviewees emphasised the high number of wind farms that failed to deliver the energy initially expected in feasibility studies due to unrealistic assumptions about wind speed, and that greenfield projects in the transport sector lack data on estimates about the amount of cargo/passengers transported and resulting cash flows.

10 The national and sub-national entities are primarily responsible for establishing bilateral agreements with international partners for the financing of climate transition projects and/or requesting that the competent authorities, such as the Ministry of Foreign Affairs, do so on their behalf.

To contribute to better project development, ICF partners could work in partnership with infrastructure project developers and government entities to develop improved preliminary studies on infrastructure projects, offer technical expertise and know-how to help plan, design, and execute infrastructure projects (including engineering, project management, and regulatory support) as well as facilitate knowledge exchange among similar projects in different contexts. They could also help articulate the development of an infrastructure database that would feed these studies, helping to record data to build a track record for future projects, and gathering data about large project developing companies (e.g., rate of success) and other intermediaries (e.g., law firms).

- **Insufficient knowledge of the local landscape:** According to the interviewees in the studies of FGVces (2020; 2021), a better degree of understanding of the Brazilian context may help foreign investors in identifying and enjoying opportunities that go undetected by other investors, given that they become better positioned to understand and manage the risks associated with investing in the country. However, acquiring such knowledge, for instance by establishing local teams, building partnerships, and/or developing relationships with local players are costly activities and may hinder investments. As such, ICF partners could facilitate engagement with local players on the ground, for instance, by creating platforms, hubs, or events to match foreign investors with local partners.

- **Costly due diligence of infrastructure projects:** Due diligence of infrastructure projects is deemed expensive and time-consuming, requiring the involvement of several specialised consultants and/or the establishment of partnerships with investment banks, lawyers, and local operators, as well as the analysis of extensive reports. The development of an infrastructure database would help decrease transaction costs as domestic and international investors would be able to conduct an initial screening remotely.

- **Preference for brownfield investments:** Greenfield infrastructure projects often require high volumes of up-front investments and entail greater risks stemming from uncertain demand, revenues, and time delays. Therefore, most investors tend to prefer brownfield investments, which generate revenues in the short-term. To foster greenfield investments in the country, ICF partners could articulate the different types of funding often required for long term infrastructure projects (e.g., grants, loans, guarantees) and help de-risk investments in these projects through the provision of collateral.

Concluding remarks

Although the removal of the barriers identified above could assist in increasing the pace with which greenfield low-carbon infrastructure projects are developed in Brazil, the policy changes leading to a more conducive environment for private investments, such as reverting the recent trends of deteriorating fiscal accounts and, consequently, controlling inflation and reducing interest rates, as well as increasing trade openness, are also required in supporting a shift in Brazil's transportation matrix away from road transportation. In this sense, the implications for ICF partners summarised in Table 2 are focused on areas that have the potential to increase private investor willingness to invest in low-carbon infrastructure projects in the country while broader reforms are yet to materialise and yield economy-wide results.

Table 2 — Possible roles for ICF to tackle barriers to infrastructure investments

Barriers	Possible roles for ICF	Public financial instruments
1 — Structural barriers (e.g., exchange rate volatility)	Share best practices on policy reforms and regulations that promote private sector participation, transparency, and sustainability in infrastructure projects.	Technical assistance (TA)/grants, sharing best practices for encouraging private sector participation.
2 — Poor feasibility studies of infrastructure projects	Develop feasibility studies. Offer technical expertise and know-how to help plan, design, and execute infrastructure projects. Facilitate knowledge exchange among similar projects in different contexts. Articulate the development of an infrastructure database.	TA/grants for the development of feasibility studies and infrastructure database, for example.
3 — Insufficient knowledge of the local landscape	Facilitate engagement with local players.	TA/grants for the development of matchmaking platforms.
4 — Costly due diligence of infrastructure projects	Articulate the development of an infrastructure database.	TA/grants for the development of infrastructure database.
5 — Preference for brownfield investments (aversion to greenfield investments)	Provide collateral to investments in greenfield projects. Articulate the different types of funding often required for long term infrastructure projects.	Provision of collateral to de-risk investments.

Source: FGVces, 2020; FGVces, 2021.

3.2. India: Leveraging ICF for the energy transition

National circumstances and challenges: Institutional anchors to leverage ICF for (low carbon) industrialization in India

In India, the transition dynamics of the energy sector is inevitably a dual between the scale of supply and diversity of consumption needs. While, on the one hand, India has capital-intensive large industrial projects, there are also millions of Micro, Small, and Medium Enterprises (MSMEs) in the supply chain. For example, half of the steel production comes from 20 large integrated steel plants whereas the other half comes from a value chain comprising more than 5000 smaller units (TERI, 2020). The Delhi Metro provides more than 7 million person trips every day. At the same time, there are more than 3 million private cars registered in Delhi.[11] It is unequivocally understood that energy demand in India is going to increase. The diverse economy will need diverse energy solutions. The financing needs are also bound to be large. It is estimated that the energy transition in India, consistent with its net-zero emissions target, will cost more than USD 10 trillion over coming decades[12], with a minimum annualized cost estimate being USD 160 billion. This is significant considering that India's current GDP is ~USD 3 trillion and the modelling studies estimating these costs assume a GDP growth rate of ~6%. It is inevitable that the financing of the energy sector, with or without transition to low-carbon energy systems, will be accompanied by a diversified institutional architecture.

11 https://www.statista.com/statistics/1073315/india-registered-number-of-private-cars-in-delhi/

12 Different studies by the Climate Policy Initiative, Bloomberg NEF, Council for Energy, Environment, and Water, International Energy Agency, TERI-Shell have estimated financial requirements aligned with Net-Zero goals over different timeframes. USD 10 trillion is the lowest estimate.

Financing challenge in India

India has achieved its original NDC target almost a decade ahead of schedule. It is estimated that 85% of the investments that helped India achieve this came from domestic sources, predominantly riding on sizable public finance commitments (GoI, 2023). Clearly, the role of public finance in early transitions is important. At the same time, it is also equally important that without a significant increase in private investments, the transition will not be able to attain the required acceleration and scale. It will need both domestic as well as international financial markets to be enthusiastic about green investments in India. Hence, it is important to examine what prevents private and international finance from flowing to climate investments in India. Moreover, why is domestic private finance and international finance hesitant to invest in the Indian clean energy market despite the promising observed and projected growth potential?

The consultations with industry and financial institutions during the SNAPFI studies on India between 2022 and 2023[13] reveal several insights. The Indian stakeholders tend to oscillate between certainty of financial solutions and perplexity about their future, excitement about success stories and uncertainty due to limits of the success stories. Broadly, these wide-ranging views emerge from the interplay between six aspects: (1) risk aversion, (2) cost of capital, (3) decision practices of financial institutions, (4) policy ecosystem, (5) information asymmetry, and (6) scepticism about scale. These aspects are in a mutually reinforcing ecosystem that reproduces a lower level of equilibrium and a sub-optimal pace of transition.

1) Risk aversion: Despite remarkable growth in clean energy and energy efficiency, India remains a risk-averse investment avenue for entrepreneurs as well as investors. Large companies, while open to newer ideas, such as the integration of green hydrogen[14] and carbon capture, utilization, and storage[15], remain apprehensive about being the first to take the risk of increasing the cost of production. At the same time, investors remain uncertain about large capital-intensive new ideas and prefer smaller demonstration projects. Both expect viability gap funding, preferably from the government. The perceived lack of demand for expensive green products in a highly price-sensitive market negatively affects willingness to take risks at scale.

2) Cost of Capital: High upfront capital needs combined with high capital costs pose the prime barrier for financial flows to the energy transition in India. It is estimated that commercially matured energy efficiency interventions in the existing smaller plants in steel sector alone would require more upfront capital than the size of South African JETP, excluding the R&D cost of matching the scale of technologies with the scale of plant capacities (TERI, 2023). The cost of capital, measured in terms of the lending rate, is 2 to 8% higher in India compared to the US (Shrivastava et al. 2023). The cautious approach taken by India on JETP proposals, which are primarily debt oriented, can be explained by the debt burden that high upfront capital needs combined with the imposed high cost of capital. Moreover, for smaller enterprises, the transaction cost of accessing finance is high. The same is true for investors who do not find it attractive to invest in smaller ticket size projects.

13 These consultations/engagements were held in July 2022, October 2022, and June 2023 in New Delhi. Other consultations outside the SNAPFI studies that TERI conducted, informing this analysis include a consultation jointly organized with All India Association of Industries (AIAI), in Mumbai, and with Mahratta Chamber of Commerce, Industries and Agriculture (MCCIA), in Pune, in October 2023.

14 https://www.pv-magazine.com/2023/08/02/jsw-steel-to-use-green-hydrogen-to-make-steel-in-india/#:~:text=JSW%20Energy%20says%20it%20plans,25%20MW%20of%20renewable%20energy.

15 https://www.adb.org/projects/documents/reg-52041-003-tacr

3) Decision practices of financial institutions: The clean energy investment portfolios of many Indian financial institutions have increased significantly in the last few years. These investments are predominantly in solar energy, propelled by the rapid decline in the cost of solar energy (without storage), reflected in the quick processing of project applications reducing transaction costs[16]. For other clean energy solutions, financial institutions still follow the checklist of the balance sheet, short pay-back periods, maturity of the market, asset base of clients, and so on. Thus, those projects with long payback periods and with high upfront capital costs become unattractive. For international investors, the overall higher risk grade (lower investment grade of BBB) of India, along with the cost of due diligence make them averse to investing. For example, most of the green bonds issued in India have negligible investment from international investors (Singh and Shrivastava, 2024).

4) Policy ecosystem: Financial flows are sensitive to policy certainty. The evolving policy ecosystem for green investments in India still has spots of ambiguity, such as a lack of a clear taxonomy to guide financial institutions if the project falls under the green category or not, the extent to which green investments are eligible for priority sector lending, specific green targets for different industries, and so on. In recent years, the guidelines from the Reserve Bank of India (RBI)[17] and Securities and Exchange Board of India (SEBI)[18], along with the introduction of a domestic carbon market[19] and the Green Crediting Mechanism[20] have begun to fill this gap to some extent. Yet, the industry and finance sectors expect more categorical certainty.

5) Information asymmetry: While interest and willingness among the industry and financial actors toward greener projects is increasing, asymmetrical information access is widespread, particularly among the small actors. At least four aspects can be highlighted: both industry and financial actors are not up-to-date with regard to maturity of technological solutions and their cost-benefit implications; financial institutions are not fully aware of the needs of industry hence the financial products are not appropriately designed; industry is not adequately informed about the financial products available in the market; and complementarity between policies at the federal, state, and sectoral level is less known for utilization (TERI, 2022). The financial system does not yet have adequate technical capacity to appraise greener projects and newer technologies.

6) Scepticism about scale: While the change toward greener investment is visible across sectors, the adequacy of pace and direction of change is often little understood by the actors. The discussions around the issues of a just transition, such as the need for reskilling of workforce, impact on revenue streams, regional inequalities, etc. also add to the slow progress on green transition. The fact that both in terms of volume of finance required as well as the high number of existing actors introduces an element of scepticism about the success and, hence, risk averse behaviour to become a first mover.

Financing transition in MSMEs: The case of SIDBI

India's pursuit of energy transition is not new and dates back to at least the 1980s. The progress toward energy efficiency and renewable energy seen today is a direct result of efforts made in the past. The primary method of pushing the transition has been that of creating a dedicated institutional

16 https://solarquarter.com/2023/09/13/tata-power-solar-and-sidbi-ink-mou-to-facilitate-affordable-solar-adoption-financing-for-msmes/
17 https://business.outlookindia.com/policy/rbi-brings-more-clarity-to-framework-for-green-deposits
18 https://www.sebi.gov.in/legal/circulars/feb-2023/revised-disclosure-requirements-for-issuance-and-listing-of-green-debt-securities_67837.html
19 https://beeindia.gov.in/sites/default/files/CCTS.pdf
20 https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1967476

response mechanism, including financial institutions. To finance industrialization the Industrial Development Bank of India (was set-up in 1964, the National Bank for Agriculture and Rural Development (NABARD) was set-up in 1982, and the Indian Renewable Energy Development Agency Limited (IREDA) came into existence in 1987 to facilitate penetration of renewable energy technologies in India. The Small Industries Development Bank of India (SIDBI) was set-up in 1990, specifically targeting MSMEs. Of these, the experience of SIDBI is particularly illustrative of how an institutional anchor can play a constructive role in financing transition, which is briefly described below.

Resource mobilization

The SIDBI came into existence as a subsidiary of IDBI and later became an independent entity. Being a public sector financial institution, responsible for implementing government support initiatives for the MSME sector, its primary source of operating capital is public finance through budgetary allocations. For example, the Raising and Accelerating MSME Performance (RAMP) program has a budgeted outlay of $ 750 million. Government-mediated international financial assistance to MSMEs also flows through SIDBI. One such example is the $1 billion fund with the World Bank and Asian Development Bank to finance acceleration of electric vehicle (EV) penetration in India[21]. It is also an accredited entity with the Green Climate Fund. UNIDO[22] and KfW[23] are other significant international partners of SIDBI. In recent years, SIDBI has also established partnerships with private financial institutions. For example, with the Shell Foundation, SIDBI launched a Pilot Risk Sharing Facility to facilitate EV transition. This $ 6 million initiative targets 50,000 EVs through partial credit guarantee to electric vehicles (EV) for commercial use. It is expected to leverage $81m of commercial capital for EV asset financing[24]. The initiative will be further scaled up under the EVOLVE (Electric Vehicle Operations and Lending for Vibrant Ecosystem) programme supported through multilateral partnerships (NITI Aayog, World Bank, Korean Economic Development Cooperation Fund)[25]. It is important to note that most of the international finance flowing through SIDBI is in the form of loans for specific purposes, akin to credit lines.

Fund utilization

SIDBI supports MSMEs with their financial and non-financial needs. While it began with addressing the needs of low-cost capital and operating capital management, in recent years emphasis has been on promoting energy efficiency and renewable energy solutions, including adoption of EVs by MSMEs. It deploys a wide range of financial instruments but predominantly through concessional loans and risk guarantees. Cumulatively, it has extended risk guarantees worth over $12 billion. The Credit Guarantee Fund Trust for Micro and Small Enterprises (CGTMSE) was set up jointly by SIDBI and the Ministry of Micro, Small and Medium Enterprises in 2000 with contributions in a 1:4 ratio, respectively. It covers financial, performance, and deferred payment guarantees. Most importantly, it facilitates collateral-free loans. The guarantees, however, are conditional on debt assistance from SIDBI as well as a creditworthy track record of existing and new customers.[26] The loans extended by the SIDBI include direct loans to enterprises as well as indirectly through eligible participating financial institutions.

21 https://economictimes.indiatimes.com/industry/renewables/world-bank-asian-development-bank-and-sidbi-to-fire-up-ev-finance-with-a-1-billion-fund/articleshow/101700650.cms?from=mdr

22 https://www.unido.org/sites/default/files/2015-05/DFI_Publication_0.pdf

23 microcapital.org/microcapital-brief-germanys-kreditanstalt-fur-wiederaufbau-kfw-loans-130m-to-small-industries-development-bank-of-india-sidbi-for-micro-small-and-medium-sized-enterprise-msme/

24 https://indianpsu.com/sidbi-and-shell-collaborate-to-pilot-risk-sharing-facility-to-compliment-national-ev-mission-3030/

25 https://www.financialexpress.com/business/sme-msme-fin-sidbi-launches-mission-evolve-in-association-with-niti-aayog-world-bank-others-for-loans-to-ev-msmes-3114687/

26 [1] https://msme.gov.in/sites/default/files/CredirGuranteeFundScheme_1.pdf

For example, a credit line worth $50 million from the ADB was structured to be used for direct loans (at least 30%) and indirect loans to scheduled banks, non-bank financial companies, or microfinance institutions (at most 70%)[27]. The loans outside credit-guarantee schemes typically require some degree of collateral or equity finance from the enterprises. Recently, a Green Finance Scheme was launched to facilitate the adoption of solar energy as well as energy-efficient machinery and business processes, where up to 100% loan is available at an interest rate as low as 7-8 percent. Again, this is subject to the creditworthiness of MSMEs. There are 75 million eligible MSMEs under this scheme[28]. In recent years, partnerships with large companies to support the MSMEs in their value chain have also been established. Under its 4E (End to End Energy Efficiency) Scheme, through a strategic partnership with Tata Power Solar Systems Limited (TPSSL), customized loans at competitive interest rates are provided to the TPSSL's customers for solar energy adoption.[29]

Role of international climate finance in scaling up SIDBI experience

SIDBI is the largest development finance institution in India, aiming to capture 25% of total formal investments in the MSMEs. Considering that only 16 percent of MSMEs in India are financed through formal banking systems and the credit gap for MSMEs in India is estimated to be more than USD 240 billion (IFC, 2018), even the otherwise spectacular performance of SIDBI looks bleak. The major constraints include limited operating capital, inadequate organizational capacity (even though SIDBI has regional offices in all the States), and low demand for formal credit. Substantial scale-up of SIDBI's operating capital (or any financial institution targeting MSMEs) must be prioritized. The latest budgetary infusion of additional capital for the entire MSME sector was a little over $ 1 billion. The dominantly debt route of international finance mobilization, which is still marginal compared to domestic public finance provisions, compels the Bank to continue with loans that leave out a large number of MSMEs that would otherwise be better served with more concessional products. Participation of private capital is still at a nascent stage. Even if it is assumed that, with a large infusion of operating capital, SIDBI would be able to increase its organizational capacity with its profits, increasing demand for formal credit would need a large-scale policy innovation. Together with the need for increasing operating capital and financing policy innovation, the financial requirements are substantial. This can be met only through large influx of public finance. In this context, the role of international climate finance will be important in two ways:

A. Increase grant plus grant equivalent commitments for MSMEs to reduce the cost of capital for SIDBI's resource mobilization, de-risk investments as well as encourage higher demand for formal credit and bridge the financing gap.
B. Long-term strategic partnerships with governments going beyond projects and setting up institutional platforms for capacity building, policy innovation, and implementation, thus building the organizational capacities of those institutional actors involved.

27 adb.org/projects/43158-013/main
28 https://www.businessworld.in/article/Sidbi-Extends-100-Funding-For-MSME-Green-Projects/20-09-2023-491898/
29 https://solarquarter.com/2023/09/13/tata-power-solar-and-sidbi-ink-mou-to-facilitate-affordable-solar-adoption-financing-for-msmes/

3.3. Indonesia: Financing the Energy Transition Mechanism

National circumstances and challenges

The energy sector is the second largest GHG emitter in Indonesia after the Food and Land Use (FOLU) sector, contributing 43.38% of total emissions in 2019 (Damuri et al., 2023). The energy sector is expected to become the biggest emitter by 2030 if no decarbonization initiatives are undertaken in Indonesia (IESR, 2021; MoEF, 2020). According to the ENDC of 2022, the Government of Indonesia (GoI) is committed to reducing GHG emissions in the energy sector by 358 million tons of CO_2 or 12.5% using its own resources and by up to 446 million tons of CO_2 or 15.5% with international support (Republic of Indonesia, 2022).

In the long run, Indonesia also committed to achieving Net Zero Emissions (NZE) by 2060 or sooner by submitting its Long-Term Strategy on Low Carbon and Climate Resilience to UNFCCC in July 2021. Under the Low Carbon Scenario Compatible with Paris Agreement target, the energy generation mix in 2050 will include renewables (43%), coal (38%), natural gas (10%), and BECCS (8%). The GoI has published the National Energy Policy (KEN) which should serve as a basis for formulating Indonesia's renewable energy roadmap, the National Energy General Plan (RUEN). To support the energy transition, the GoI has set a target of at least 23% share of renewable energy in 2025 as stated in the KEN (National Energy Council, 2022).

Under the Paris Agreement, the energy transition is one of the key strategies for achieving GHG emission reduction targets and building a low-carbon economy. To support the implementation of the energy transition, the GoI issued several regulations regarding carbon trading. Presidential Regulation 98/2021 on Implementing Carbon Economic Value (NEK) for Achieving NDC Targets and Control of GHG Emissions in National Development was enacted in 2021.

The enactment of NEK requires not just Indonesian government institutions, at all levels, from local to national, to contribute to the measurement of carbon emissions but also the private sector to take the opportunity to synchronise their business activities and minimise carbon emissions. However, the necessary regulation to facilitate carbon trading has not yet been developed, while regulations on clear procedures and mechanisms for adjusting the carbon baseline and carbon tax still need to be established (Resosudarmo et al., 2023). In addition, to avoid carbon-washing activities, the GoI needs to establish strong regulations and monitoring systems to ensure the credibility of the carbon market. Further, its implementation at the operational level still requires better synchronisation between all implementing agencies.

In implementing the energy transition, financing has become the biggest challenge faced by Indonesia as a developing country that heavily relies on fossil fuels, especially coal, in its energy mix (Damuri et al., 2023). A substantial amount of climate financing is required to transition from coal-fired power plants to renewable energy-based power plants. Financing and investment for renewable energy projects are still limited compared to fossil fuel (Suroso et al., 2022), even though renewable energy is intended to be the first contributor to GHG emission reduction (Suroso et al., 2020).

To accelerate the adoption of renewable energy sources, the GoI promotes several initiatives, including the JETP as a financing support in achieving the energy transition and the Energy Transition Mechanism (ETM) Country Platform as a partnership program in improving energy infrastructure and accelerating the transition towards NZE. However, the strategy for ETM Country Platform and JETP-Indonesia implementation remains uncertain and faces several challenges (Resosudarmo et al., 2023).

The challenge for the government is to coordinate the efforts of multiple agencies to facilitate the early retirement of Coal-fired Power Plants (CFPP) and secure blended funds. The coordination of private agencies and government entities remains unclear (Basri and Riefky, 2023; Resosudarmo et al., 2023). In addition, the government must address the challenges of regulatory uncertainty and low institutional quality that continue to hinder investment in Indonesia (Resosudarmo et al., 2023). Suroso et al. (2021) also find that policy uncertainty and an inadequate legal framework to support investment, especially for renewable energy-based power plants, results in low investment realisation in the renewable energy sector.

The NDC roadmap for energy still does not take sides with the renewable's investors (Suroso et al., 2020). In addition, the master plan for renewable energy development, stipulated in RUEN, has not been effective enough to increase the rate of renewable energy development, especially in power generation, due to the limited financing instruments and the absence of feed in tariff scheme arrangements. Although the mechanism and procedure of policymaking in Indonesia are clear, the process of promulgating certain regulations and policies in the energy sector is still coloured by manual and informal processes between the actors. Several findings from Suroso et al. (2020) and Suroso et al. (2021) suggest that informality practices in energy policy-making lead to policy inconsistency, an intricate situation where energy-related policies favour fossil fuel proponents and impede the energy transition. The current gap in energy policy making is caused by the inconsistency in related policy trajectories where coal is more favoured than renewable energy. This condition culminates in the situation of underinvestment in Indonesian renewable energy development (Suroso et al., 2023).

National financial gap and sources of funds

Achieving the NDC target requires substantial funds. In the 2018 Second Biennial Update Report (BUR), Indonesia stated that the estimated funding requirements to achieve the emission reduction target in 2030 reached USD 247.2 billion or around IDR 3,461 trillion. In 2018, the government allocated IDR 109.7 trillion for climate change activities, IDR 72.2 trillion for mitigation activities, and IDR 37.5 trillion for adaptation activities. When compared with the annual average estimated climate change funding needs, stated in the 2018 BUR (which is around IDR 288.4 trillion per year), it can be said that the amount of the allocated climate change budget is still below the estimated climate change funding needs (only about 38% of the estimated value).

At the sectoral level, energy is one of the leading sectors in the NDC, which has the greatest need for funds. The energy and transportation sector can potentially reduce emissions by 398 million tonnes of CO_2 with an estimated cost of USD 236.2 billion. One of the strategies implemented is to build renewable energy power plants and accelerate the energy transition.

To accelerate the energy transition, on November 15, 2022, at the G20 Leaders' Summit in Bali, the President of Indonesia and the International Partners Group (IPG), led by the United States and Japan

and including Canada, Denmark, the European Union, France, Germany, Italy, Norway, and the United Kingdom, issued a Joint Statement to formalise the landmark partnership and launched the JETP for Indonesia.

The JETP is an agreement to mobilise an initial $20 billion in public and private financing to decarbonise Indonesia's energy sector, using a mix of grants, concessional loans, market-rate loans, guarantees, and private investments. It supports a global trajectory that keeps the 1.5°C global warming limit within reach.

To support the implementation of JETP, the Ministry of Energy and Mineral Resources has unveiled the Energy and Transportation Roadmap (The Roadmap) toward Net Zero Emission until 2030. The Roadmap will be used for detailing the Indonesia NZE Roadmap outlined at COP26 in Glasgow. It has the main objective of reducing 314 million tonnes of CO_2 emissions by intensifying the use of renewable energy, accelerating the early retirement of coal-fired power plants, and accelerating the widespread deployment of energy efficiency and electrification.

Other than that, in the energy sector, the Ministry of Finance also has appointed PT SMI as the ETM Country Platform Manager, whose task is to manage various sources of energy transition funding in the country. The ETM program will be funded through a blended finance scheme. Funding comes from various sources in both the public and private sectors, such as government agencies, development banks, commercial banks, climate change funds, equity investors, insurance companies, as well as local and international philanthropic institutions. The financial sources can be accessed through various instruments, namely de-risking, TA, equity, and low-cost refinancing commercial loans. This platform was developed by the World Bank and is financially supported by GCF in the form of grants. In implementing JETP, PT PLN as Electricity National Enterprise will play a key role in deploying JETP financing, subject to agreement with the JETP Investment and Policy Plan that includes a competitively tendered pipeline of projects.

Energy transition barriers and strategies on Independent Power Producers (IPPs) projects

To identify barriers to the financing of the ETM in Indonesia, ITB conducted interviews with several private sector representatives engaged in the development and operation of geothermal energy and Solar PV. In Table 4, the barriers to implementing ETM in Indonesia are mapped and classified into three aspects (knowledge, cost of capital, and creditworthiness) from three different perspectives (private sector, domestic financial system, and international financial system). The table includes the detailed description of the identified barriers.

Table 3 — Barriers to the financing of the ETM in Indonesia

	Private Sector	Domestic Financial System	International Financial System
Knowledge-Based Barriers	• Lack of an enabling policy environment for new renewable energy (NRE) investors. For example, the NDC roadmap and the national legislation could be enhanced. The policy and political changes in the mechanism for providing incentives to geothermal companies led to a decline in investor interest in geothermal development (resource person from Geothermal Company, 2021). • Governance issues of JETP Indonesia. Low involvement of stakeholders, lack of coordination among stakeholders, and Independent JETP secretariat. • Need for capacity-building. Limited experience, knowledge, and skills in implementing entities. Projects are selected based on the capacity, knowledge, and sector-specific experience, as well as an understanding of the regulations of the implementing entities. Lack of access to new technology, procurement delays to implementation, challenges with integrating technology to local conditions, knowledge, skills, capacity gaps.	• Unclear policy signals that may result in delays in the design and implementation of key reforms, needed to offer certainty to the market and key players.	• The energy transition regulation is not attractive to international banks. Investors in renewable energy often complain about non-competitive renewable energy tariffs or prices that hinder the development of the renewable energy industry, as well as challenges from local content requirements. • The absence of a single institution that can channel all JETP funding. Each developed country has its own distribution mechanism that is then channelled through different development banks such as KfW, AFD, World Bank, and ADB. • Uncertainty regarding the flows of international climate finance. The priority of financial assistance or concessional funding provision in each developed country participating in the JETP (e.g. for U.S. politicians, Indonesia might not be a priority for the assistance in the energy transition).
Cost of capital-related barriers	• Current policies under the master plan do not facilitate access to private capital. Limited financial instruments and the absence of precise tariff scheme arrangements signal a need for a policy reform. • The investment climate for developing renewable energy sources in Indonesia is considered unfavourable for investors due to PLN's implementation of maximum electricity tariff limits. • Financing, pricing, technology factors or challenges at local construction sites delay private sector projects.	• JETP funding from the public sector is still low. • Capital deployment: the risk that access to capital can be delayed or not accessible. • Commercial financiers and private sector banks are constrained in providing long-term financing.	The proportion of grant funds that does not reach 1% of the total funding of the JETP is too small to assist the Indonesian government in initiating and promoting Indonesian energy transition programs effectively.
Creditworthiness-based barriers	• The Renewable energy sector has high risk and low return due to the regulation of NRE pricing, which is not too profitable for the IPP developer. • Funding for early retirement of coal-fired power plants is difficult to secure as the financing for CFPPs, including early retirement, falls under the "red" category in the green banking finance taxonomy. Many global investors are reluctant to add fossil fuel-based assets to their portfolios. • Inconsistent regulation provisions - i.e. PPA, licensing, procurement, tariff, across key regulators.	Risk of debt and creditworthiness, foreign exchange risk, and insufficient funding, leading to adverse impact on the country's credit rating.	International banks often view Indonesia as a region with certain investment risks, leading them to require government guarantees before investing frequently.

Source: authors' own contributions (ITB)

Systemic analysis of the identified barriers shows that private sector barriers are echoed in the domestic and international financial systems. An enabling regulatory framework and clear policy signals could make the energy transition more attractive for all three types of financiers (private, domestic and international), but at the same time the provision of additional and predictable finance could speed up the necessary reforms.

Implementing the JETP is expected to attract more private investors to support the energy transition due to the use of blended finance as a risk-reduction mechanism. For example, PT SMI (the ETM Country Platform Manager) is involved in the development of geothermal power plants, which are

considered high-risk. Through Geothermal Resource Risk Mitigation, developers (IPPs) do not fully bear exploration failures. This is expected to reduce the most significant risks developers face in geothermal development.

One example of risk materialisation comes from the interview of a Geothermal developer, where the company planned to develop geothermal power with a capacity and price agreed upon by the government. However, during exploration the produced capacity was only half of the previously estimated value, so the agreed price was not appropriate, and the company suffered losses (resource person from Geothermal Company, 2021). From the policy perspective, in the case of Geothermal, the high costs at PLN with the Domestic Component Level (TKDN) are also difficult for the NRE private sector in Indonesia (interview result from The Solar PV Enterprise). The existence of the TKDN policy in the process of converting diesel power plants to solar power plants also makes the geothermal project non-bankable because the capital expenditure becomes expensive (interview results from The Solar PV Enterprise).

An example of the ETM Country Platform implementation is the agreement on the accelerated termination of Cirebon-1, a 660-megawatt coal-fired power plant in West Java. The energy transition mechanism is a financing mechanism involving the public and private sectors for electricity supply business permits to accelerate the use of renewable energy in the electricity sector by reducing the operation of fossil-based power plants.

To attract IPPs' interest in shifting towards NRE, it is necessary to implement compensation and incentive mechanisms in the form of carbon trade and carbon tax, which would benefit the implementation of NEK. Carbon trade itself is a mechanism for carbon trading and certification as tradable securities. The carbon trade mechanism encourages the private sector to adapt towards clean energy to produce less emissions than their credits so they can sell these credits on the carbon market. Meanwhile, the carbon tax mechanism also encourages the private sector to make an energy transition to avoid carbon tax, which causes companies to become less competitive with other companies. Carbon market regulations open up opportunities for Indonesia to receive various funding alternatives in climate change management. For example, PT Pertamina has carried out carbon trading which is supported by supplies that have been certified by the Ministry of Environment and Forestry (Pertamina, 2023).

Concluding remarks

There is a gap between Indonesia's pledges in the NDC and the NZE, the national policies, financing, and the programs to achieve it, where renewable energy development and financing to support it still stagnated. To support the energy transition, the GoI has launched several initiatives to mobilise financial resources in the energy sector and accelerate renewable energy development, such as the ETM Country Platform, JETP-Indonesia, and Carbon Market and Pricing.

However, implementing these initiatives still faces several challenges and barriers due to uncertainty in energy policy and weak institutional quality. The GoI must overcome the persistent challenge that continues hindering investment in renewable energy development. This should include accelerating the ratification of the NRE Bill, updating targets in the national level energy policy (KEN and RUEN), strengthening climate commitments in NZE 2060, and incentive policies for IPPs in the renewable energy sector.

The NRE Bill plays an important role as a legal umbrella in undertaking the transition process, including climate financing to increase the proportion of renewable energy in the national energy mix. NRE Bill regulates the costs of electricity provisions and various types of fiscal support and funding sources in renewable energy development.

In addition, it is imperative for the GoI to update KEN, the highest-level energy policy, and synchronise the energy transition with reaching NZE by 2060. KEN and RUEN aggregately exemplify the roadmap for renewable energy development. However, more technical regulations are needed as a specific framework for public-private partnerships is not addressed in these strategic policies. The process of updating the targets in KEN and RUEN to accelerate the achievement of the national energy mix will arguably still be coloured by the political bargaining process, where many political parties with business interests are also involved in the energy policy-making process.
Informal practices in energy policymaking also require a response to secure support for a just energy transition either by improving transparency and accountability mechanisms or rather establishing a comprehensive monitoring and evaluation framework for the energy sector. In supporting the energy transition, the government must establish policies regarding incentive support and electricity purchase price standards for IPPS, especially small IPPs. To make renewable energy development more affordable and support the creation of an attractive market for investors, incentive and business-friendly policies are needed.

3.4. South Africa: JETP as enabler for ICF and cooperation

National circumstances and challenges to transitioning electricity infrastructure from coal to renewables
South Africa's electricity crisis has become a critical economic and developmental imperative for the country. Against a backdrop of high rates of unemployment, poverty, and inequality, sluggish economic growth is exacerbated by an ongoing electricity crisis in which power outages are frequent, often daily. The coal power station fleet is ageing and poorly maintained, while escalating costs and delays in constructing the most recently constructed coal plants (from the years 2007 and 2008) have contributed to unsustainable levels of debt for the national power utility.
South Africa's economy, with its carbon-intensive nature, necessitates a transition away from the current structure to maintain global competitiveness, and renewable energy emerges as the least costly option for new builds in the country. The President has committed the nation to tackling the electricity crisis and responding to the climate crisis by swiftly deploying renewable energy.

Large scale addition of renewables generating capacity is limited by various factors:

1) The transmission grid's capacity for new electricity supply is limited; suitable renewable electricity generating potential is located in different parts of the country to existing coal power production and the transmission grid will have to be extended at an unprecedented scale and rate to transition electricity infrastructure to renewables at the rate suggested by South Africa's NDC.
2) Renewables plant component costs have been driven up by global supply chain shocks; this has contributed to the slowing of progress in the Renewable Independent Power Producers Procurement Programme (REIPPPP), which was launched in 2011.

3) The national electricity utility, Eskom, faces capital constraints; its debt book is at maximum capacity and will have to ease before further borrowing is allowed, predicted to be not before 2026 to 2028.
4) National plans to decarbonize the economy raise valid concerns about the potential impact on jobs and the overall economy. The transformation of sectors will need to maintain an economy-wide perspective and focus on environmental goals while safeguarding future jobs and exports. In the South African context, just energy transitions are both environmentally sustainable and socially just, thereby mitigating potential adverse effects on employment and economic stability.

Scale of initial investment needs

South Africa's Just Energy Transition Partnership Investment Plan (JETP-IP) outlines the initial requirements crucial for the transformation of the electricity infrastructure – including for generation and transmission – as the country transitions from coal to renewable energy. It also indicates the preliminary investment needs for pivoting the automotive manufacturing industry toward electric vehicle production, and for strategic interventions to foster the development of South Africa's green hydrogen production, with the goal of establishing a robust export market.

Out of the total JETP-IP initial investment need of USD 98.7 billion (ZAR 1.48 trillion) for the five-year period until 2027, a substantial 92% is earmarked for infrastructure development, underscoring the primary need for investment capital. A modest 6% is allocated for economic diversification and innovation. The investment plan also highlights the necessity of financial commitments for planning and implementation capacity, skills development, and social investment and inclusion. A significant 70% of the immediate investment requirement is identified in the electricity sector, underscoring its critical role in South Africa's energy transition.

The strategic allocation in the JETP-IP aims to address the pressing needs and challenges within the electricity domain, thereby laying a solid foundation for the broader transition to a sustainable energy system. In the investment plan, government backed grants and concessional loans mitigate risks associated with early stages of transitioning sectors, especially in green hydrogen production and electric vehicle manufacturing. Government-led high-level planning and backing provides policy certainty and potential future opportunities for big private investors or aggregators of private savings.

Exploring solutions through policy-finance innovation

In the domestic context, South Africa submitted an updated NDC in September 2021, just before COP 26. This revised NDC featured an enhanced mitigation target supported by a robust knowledge base, earning acclaim from the international community and interest from global partners. At COP 26, the JETP was announced, with commitments from Germany, France, the EU, the UK, and the USA, collectively referred to as the IPG. The IPG pledged $8.5 billion to facilitate South Africa's just transition to a low-carbon economy between 2021 and 2026.

Both national and international governments are driving collaboration in the JETP to leverage existing channels for bilateral deals with South Africa, presenting a programmatic funding approach organised around three strategic focus areas. This partnership serves as a pivotal platform for countries to articulate their visions for ambitious energy transitions within their economies and to identify

concrete mitigation investment opportunities that align with the shared goals of the international community. Thus, JETP stands as a collaborative mechanism to foster sustainable transitions and strengthen South Africa's position in the global effort towards a low-carbon climate resilient future.

Progress from governance and policy perspectives

The JETP has been instrumental in drawing attention to the national discourse on South Africa's economic future within the context of a dynamically evolving global landscape, and outlining development pathways that prioritise justice in terms of leaving nobody behind and merit international backing. The JET Implementation Plan (JET IP) is instrumental in aligning the JETP with South Africa's domestically led vision of a just energy transition, detailing and costing an integrated, economy-wide plan for the five years up to 2027.

The South African Presidency, underpinning its commitment, spearheaded the negotiation and execution of the JETP. This involved assembling the Presidential Climate Finance Task Team (PCFTT), JETP Secretariat (now the Project Management Unit or PMU), and working groups to develop the comprehensive JET IP. This top-level political involvement demonstrated political will at the highest level and encouraged the participation of heads of state from the IPG members.

Furthermore, the JETP and JET IP processes have assembled an excellent set of technical expertise in the Presidency, PCFTT, JETP Secretariat (now the Project Management Unit or PMU) and drawn in expertise from local stakeholders such as universities, think tanks, research institutions, and coalitions to contribute to articulating and costing a long-term vision for South Africa, providing the necessary framework within which the JETP operates. The development of the JET IP, including consultations, was crucial in defining priorities for the immediate five-year period of the just energy transition, backed by domestically sourced knowledge and evidence-based conversations that predated and continue to shape the JETP.

While the JETP has accelerated the domestic discourse on South Africa's just energy transition it is emphasised that its impact hinges on the extensive groundwork preceding it. The National Planning Commission (NPC), the Just Transition Framework (JTF), the updated NDC, and the 2050 Low Emissions Development Strategy (LEDS) laid the foundation, supported by a wealth of technical work from local organisations. The JET IP marks a critical milestone, approved by the Cabinet, and launched before COP 27 in Egypt, as it articulates and costs strategic preliminary interventions for the broader just energy transition for South Africa. Importantly, the JET IP has become the focus in the domestic process, with the JETP serving as the foundation to facilitate its effective implementation.

Preliminary challenges for implementing the JETP

In the context of a just transition in South Africa, it is crucial to effectively communicate opportunities and proactively address risks for the wider economy and society during planning. Grant finance is a priority for South Africa due to the justice imperative and limits to sovereign debt. However, grants only make up a modest 4% of the total JETP commitments, with concessional loans comprising the predominant share at 63%. Limited information about these loans has raised concerns about their potential denomination in dollars or euros, introducing currency exchange risks, especially worrisome given South Africa's existing debt burden. Similar concerns apply to commercial loans, constituting 18% of the funding package.

Building the necessary institutional implementation capacities is critical for the JETP-IP. Integrated and coherent implementation requires governance structures that go beyond the siloed mandates of line departments, equipping both governmental and non-governmental entities for effective participation in horizontally and vertically integrated implementation.

Socio-economic concerns arise regarding potential private sector investments impacting electricity costs, particularly burdening the poor, and exacerbating energy poverty. Additionally, privatisation of electricity infrastructure introduces risks to plans for localising the renewables value chain and diversifying the economy. Labour unions advocate for guaranteed jobs for affected workers and represent diverse interests across different sectors. Furthermore, labour unions express dissatisfaction with limited opportunities to participate and contribute to the process, emphasising the importance of procedural dimensions in building country ownership amidst the inherent complexities.

Knowledge gaps persist in planning for justice elements in the energy transition. Addressing these gaps is crucial for South Africa's successful transition and the realisation of its developmental and sustainability goals.

Role of international finance

Globally, the JETP has garnered attention as a novel enabler of international climate finance and cooperation, serving as a catalyst to move beyond political announcements toward policy implementation. This Partnership stands as a policy innovation, fostering an emerging community of practice dedicated to climate policy and finance in the context of implementation.

In South Africa, the evolution of the JETP has been influenced by international factors, including geopolitics in the multilateral process and dissatisfaction with the inadequacy of multilateralism in addressing the climate crisis. Critiques of the Bretton Woods institutions have emphasised the need for global transitions that deliver justice to the Global South.

Critical to the JETP's future impact is its role in building long-term capabilities, essential for the current decade and beyond. The Partnership offered a unique opportunity for funder countries to pool resources into a coherent package organised around three focus areas to scale-up finance and streamline negotiations, transaction costs and reporting burdens associated with development finance. However, its innovation is constrained by the necessity to channel through existing bilateral channels and adhere to ODA requirements. South Africa's upper middle-income status further (limits access to grants and) shapes the financial architecture of the JETP.

Acknowledging severe public finance constraints, there is a consensus that the private sector must play a substantial role in South Africa's transition. Active in the just energy transitions discourse, the private sector emphasises the need for massive investment in skills development, support for small and medium-sized enterprises, and incentives for green industry localization, alongside calls for support and regulatory certainty particularly for emerging sectors like new energy vehicles and green hydrogen. The private sector discussions on implementation underscore the importance of transparency, clear milestones, measures to prevent mismanagement, and the broad-based ownership of the just energy transition.

Stakeholders such as government, investment aggregators, and project developers can contribute in various ways to implementation: modalities, including ESG policies, impact investing strategies, purpose-designed JET funds, transition bonds, and pay-for-performance programs. However, civil society and labour groups advocate for appropriate risk and benefit sharing between the private and public sectors. Emphasising sovereign guarantees and blended finance, they caution against potential state subsidisation[30]. Balancing these perspectives is essential for a just and effective energy transition in South Africa.

Reflections for future JETPs

The evolution of JETPs extends beyond South Africa, with countries like India, Indonesia, Nigeria, and Senegal contemplating their own versions. These experiences offer valuable insights for critical reflection, shaping the future trajectory of JETPs in the Global South.

Despite its innovative potential, South Africa's JETP has faced challenges characterised by a lack of tangible milestones, agreed-upon outcomes, and transparent reporting. While flexibility is afforded by this lack of specificity, it has also led to perceptions of limited progress, which has been hindered by a contested domestic political landscape, limited information from the IPG, and inadequate transparency and reporting, eroding trust. Scrutiny of all involved parties is essential to fulfil the promise of a new form of cooperation that the JETP offers. Interestingly, JETPs in other countries seem to feature more defined implementation milestones.

Looking ahead, South Africa can influence the evolution of JETPs, advocating for more transparency and contextual tailoring. The current innovative package, while promising, needs reform, as disbursement through existing channels has yet to show transformative impact.

This decade of implementation marks a critical juncture. While JETPs hold potential, efforts are needed to ensure they become transformative instruments in the Global South, aligned with multilateral goals and principles. This requires viewing the current round of JETPs as an initial step, pushing for their evolution to support long-term, country-led processes. The establishment of a vibrant Southern community of practice is vital for learning, evolution, and setting the agenda, with a just evolution driven from the South. Recognizing developed countries' obligation to provide climate finance to developing nations under the UNFCCC, JETPs offer a potential alternative and complementary mechanism. They enable developing countries to articulate support needs and provide a plan for commitment by developed countries, establishing accountability for climate finance.

30 For a SNAPFI policy brief proposal on an institutional arrangement that can build on existing practices, institutions, and domestic acceptance to create a global network of risk reduction instruments for climate finance, refer to Shrivastava et al.'s (2023) Framework for Enhancing International Climate Finance Flows.

3.5. Summary and discussion of country cases

We have compiled the essential information of the four country case studies into a comparative table:

Table 4 — Objectives and summary of country cases

	Challenges for financing sectoral transitions	Suitable instruments to accelerate and scale up the transition (ICF and domestic policy support)	National circumstances (unique sectoral and domestic financial context)
Brazil	1. Structural barriers (e.g., political instability, exchange rate volatility, speculative investment grade, limited trade openness) 2. Poor domestic development and costly due diligence of infrastructure projects 3. Insufficient knowledge of the local landscape by international partners 4. Preference for brownfield investments (risk aversion towards greenfield projects)	International finance: 1. TA/grants, knowledge sharing 2. TA/grants for feasibility studies, knowledge sharing via a database 3. TA/grants, development of a matchmaking platform 4. De-risking via the provision of collateral. Domestic governance arrangements to: 1. Improve monetary and fiscal policy 2. Increase trade openness	• Action Plan for the Brazilian Sustainable Taxonomy • one of the cleanest electricity mixes, but carbon-intensive transport sector due to overreliance on roads • public gross debt = 90% of GDP in 2023
India	1. Risk aversion towards large capital-intensive green projects (due to the expected lack of domestic demand for premium steel) 2. High upfront costs of green projects coupled with high cost of capital. Additional barriers for MSMEs to access capital. 3. Misalignment between expected financial performance of green projects and investment preferences of international financiers 4. Lack of a green taxonomy[31] 5. Information asymmetry between industry and finance 6. Scale scepticism due to the complexities of just transitions	International finance: 1. Increase the scale and the concessionality of finance 2. Increase the provision of re-risking instruments in developing countries by MDBs 3. Reduce the transactional costs of development projects (simplify the taxonomies, due diligence, and reporting requirements) 4. Support climate friendly (sectoral) industrial policies 5. Create multi-stakeholder platforms for capacity building and dialogue	• ½ of steel production comes from 20 large producers, ½ - from a value-chain with 5000 smaller units. • The progress on the energy transition because of past institutional (governance) developments: IDB of India, SIDBI, IREDA, NABARD and NIE. Institutions were created with enabling instruments: TA, risk guarantees, tax and duty exemptions, capacity building, etc.
Indonesia	Multiple barriers, covered in Table 3	Domestic policy: 1. Develop an enabling environment with effective compensation and incentive mechanisms (carbon trade and tax), which benefit the implementation of NEK, provide clear procedural mechanisms and address carbon-washing. More information in the "concluding remarks" on the case study. 2. Ensure agency coordination for coal phase-out and securing blended finance	• Energy is 2nd largest emitting sector with 43.5% of total emissions in 2019. • Planned emission reduction by 12.5% or 15.5% without and with international support respectively. • KEN as basic energy policy, RUEN as the RE roadmap. Target of 23% RE share by 2030 in KEN. • NEK issued in 2021 as a carbon market framework. • ETM and JETP-Indonesia as prominent governance mechanisms
South Africa	1. Large scale energy transition hindered by 4 unique domestic factors: a. logistical and capacity challenges of renewing the energy infrastructure, b. slowing of REIPPPP, in part due to supply chain shocks, c. debt book constraints on Eskom's ability to raise capital, d. potential adverse effects of the energy transition on employment and regional economic stability.	JETP as a collaborative mechanism to foster sustainable transitions and strengthen South Africa's contribution in the global effort towards a low-carbon climate resilient development pathway. International finance: 1. Increase the share and volume of grant financing to address the justice imperative and fiscal constraints. 2. Increase the transparency of used financial instruments to enhance accountability mechanisms. 3. Consider reforms for the mechanism of climate finance provision as traditional bilateral channels and ODA requirements might hinder the effectiveness of JETP – the transformative impact is yet to be seen. Domestic policy: 1. Build institutional capacities with innovative governance structures (beyond siloed approach) for effective participation in and implementation of JETP. 2. Address knowledge gaps in planning for justice elements in the energy transitions.	• JETP-IP initial investment needs of USD 98.7 billion for 2023-2027: 92% allocated for infrastructure development, 6% - for economic diversification and innovation. • 70% of the immediate investment requirement is identified in the electricity sector. • JETP and JET IP processes have assembled an excellent set of technical expertise in the Presidency, PCFTT, JETP Secretariat (now PMU), and drawn in domestic expertise to contribute to articulating and costing a long-term vision for South Africa, providing the necessary framework within which the JETP operates. • extensive preceding groundwork, including NPC, JTF, updated NDC and 2050 LEDS, laid a foundation for the JETP. • South Africa's upper middle-income status further (limits access to grants and) shapes the financial architecture of the JETP • The private sector discussions on implementation underscore the importance of transparency, clear milestones, measures to prevent mismanagement, and the broad-based ownership of the just energy transition. • the inclusion of all stakeholder interests is important for the just transition (e.g. private sector, civil society, and labour groups)

31 India has started to develop a green taxonomy, please see Shakti Sustainable Energy Foundation (https://shaktifoundation.in/indian-taxonomy-for-sustainable-activities/)

Chapter four

Conclusions: Implications for ICF architecture

4. Conclusions: Implications for ICF architecture

The current hypothesis from the international perspective (IMF, OECD, UNFCCC) is that mobilising more private climate finance is achievable only after an enabling environment for financial flows is created on a national level. The national perspectives in the SNAPFI case studies showcase how this assumption could be refined, suggesting an enabling role of ICF to accelerate sectoral transitions.

Current domestic environments feature certain barriers, which discourage investments essential for the just transitions. Examples of most prominent national impediments are structural barriers in Brazil, regulatory uncertainty and complex stakeholder coordination in the transition in Indonesia, high heterogeneity of steel producers and connected issues of access to finance in India, and electricity crisis and debt burden in South Africa. The proposed role of international public climate finance is to help overcome such barriers. The expected outcome is the increase of private finance flows due to the conducive environment, created via international cooperation.

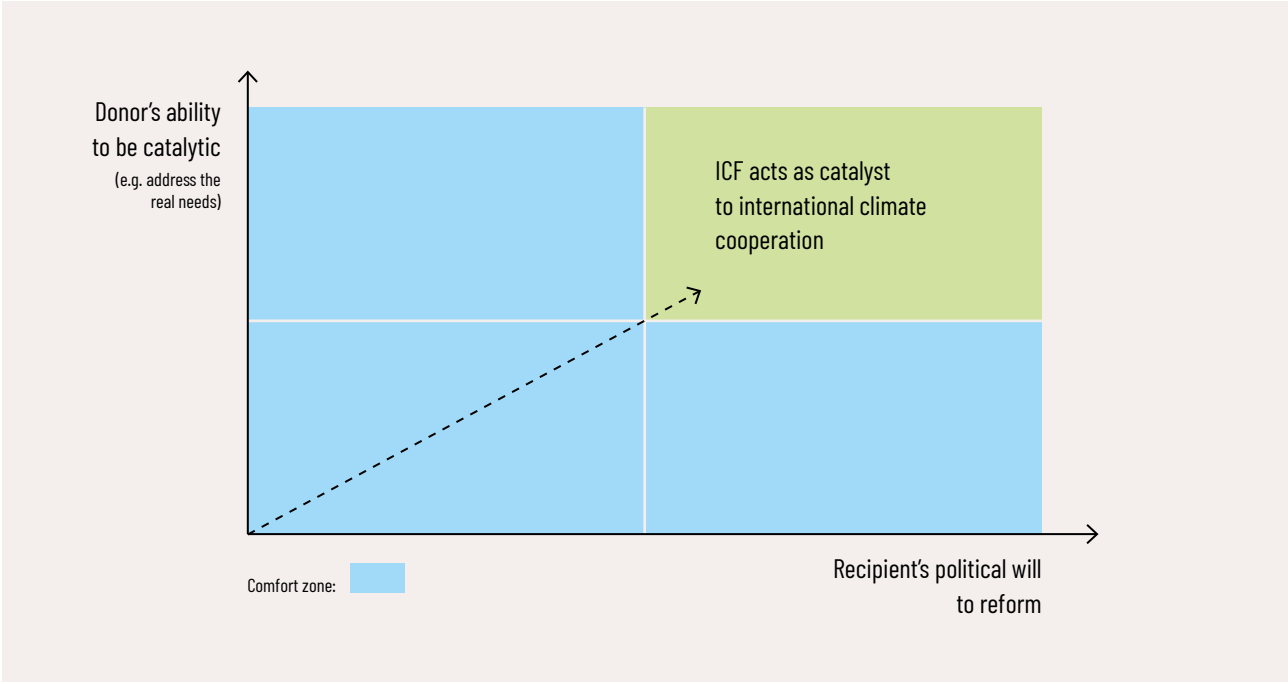
Grant financing is still widely considered to be a suitable type of support to address barriers such that investments are no longer discouraged. This type of work is typically conducted by governments, considering the high risks involved and uncertainty of early transition processes, but public grant funding is normally in short supply (South Africa, Indonesia). Care must be taken in cases, where international grant financing is working toward domestic policy reforms if these are identified as remedies to barriers, because of issues related to infringements of national sovereignty over national policy processes (von Luepke, 2023). A transparent and equitable dialogue should be held between funders and recipients to discuss options of such grant support and act solely on a real need's basis.

In the case of just energy transitions (JETP in South Africa and ETM in Indonesia), the governance of the transitions is crucial: the mechanisms of decision-making should be inclusive and transparent, the modalities of climate finance flows should fit the national contexts, and the action plans should be carefully designed, considering all relevant stakeholders. Just transitions imply multi sectoral cooperation, including financial, social, economic, and other sectors, alongside deliberate mechanisms of communications between international partners and domestic governance bodies. The development of national transition plans signifies domestic effort, attracting international climate finance to enable and speed up the transition.
The ongoing just energy transitions have captured the attention of the global climate community as they build potentially conducive precedents for more future transitions. The misalignment of expectations from international and national perspectives may lead to a deadlock of climate action and increased tensions between developed and developing countries about who shall make the first step toward the achievement of Paris Agreement goals.

The heterogeneity of national contexts clearly shows the need for taking each national situation as individual: one size fits all and generic models for international climate finance are likely ineffective. It is important to program international finance via a real needs approach, take the necessary time and resources to conduct dialogues between funders and recipients (Hageman et al. 2023). However, the apparent mismatch between what seems to be necessary and the current practices regarding

bilateral and multilateral cooperation allows us to raise the hypothesis that the status quo, although insufficient, is deemed "comfortable" by both donor and receiving countries (Figure 6).

Figure 6 — ICFs "comfort zone"



Source: Author's own contributions

From the donor's perspective, ICF providers may prefer to finance individual projects, via loans, rather than engage in time-consuming dialogue processes with uncertain outcomes. Thus, future studies should further investigate the reasons behind such preference, for instance, to what degree current ICF providers' mandates allow them to act according to a „real needs approach" and to what degree more effective ICF requires reforming the donors as much as the receivers.

From the receiver's perspective, if the political will to engage in broader reforms is missing, then receiving countries may also find it more appealing to direct cooperation efforts toward small-scale projects, which are less likely to encounter opposition from organised interest groups. Hence, further research could better investigate the conditions in which large-scale reforms become more pressing and publicly accepted in developing countries.

The gap between perceived risks by investors and the technical capability to assess actual risks has an overbearing impact on the status of availability and flow of ICF. This is further complicated by the comparatively high upfront capital requirements of climate projects and relatively longer payback periods than what investors are used to. Thus, it is important to examine if the existing governance of global financial markets is appropriate for the needs of ICF flows. What governance innovations can unlock and bridge the gap between perceived risks for investors and guaranteed outlook of a green economy for countries? Which financial instruments (e.g. grants, blending, risk guarantees, sovereign equity etc.) are effective at ensuring that governance structures are steering financial markets toward climate finance? Should ICF be used to experiment with potential innovations in governance and financial instruments?

Chapter five

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