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Equity in Climate Financing: Spotlight on the Energy Transition

Anjali Sharma, Injy Johnstone, Nur Firdaus

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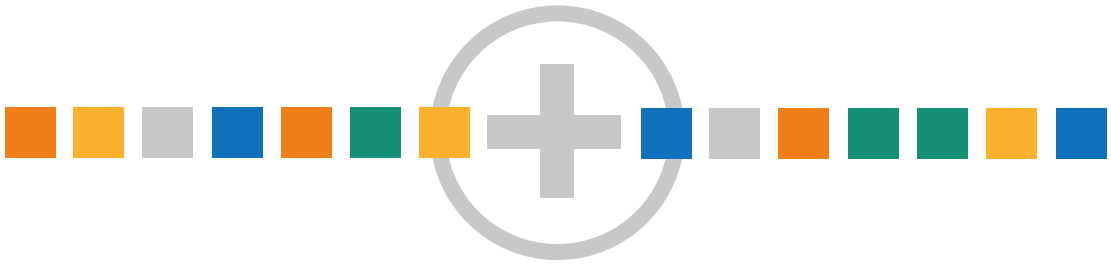

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The Independent Global Stocktake (iGST) is a consortium of civil society actors working together to support the Global Stocktake (GST), the formal process established under the Paris Agreement to periodically take stock of collective progress toward its long-term goals. The iGST aligns the independent community — from modelers and analysts, to campaigners and advocates — so we can push together for a robust GST that empowers countries to take greater climate action. www.independentgst.org

The Early Career Scholars for an Inclusive Stocktake (ECSIS) program recognizes the importance of GST research and seeks to create opportunities for its advancement by providing a supportive environment for these endeavors. Additionally, the program places a strong emphasis on promoting diversity and inclusiveness among early-career scholars. This not only enriches the research landscape but also helps to ensure that the GST reflects a broad range of perspectives and experiences, thereby improving its relevance and effectiveness.

This paper provides an equity-focused analysis of climate finance mobilisation from developed countries to developing countries for low-carbon energy transition. It also presents a case study of just energy transition partnership in South Africa that promises to be a more targeted and transparent climate financing mechanism between developed and developing countries. This working paper was supported by the independent Global Stocktake's (iGST) co-leads for the mitigation working group, Center for Global Sustainability (CGS) at the University of Maryland and the Council on Energy, Environment and Water (CEEW), through the Early Career Scholars for an Inclusive Stocktake (ECSIS) program.

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+ Executive Summary

Key findings

Climate finance mobilisation for low-carbon energy is currently inadequate and could increase the debt levels of developing countries. We found that the total volume of climate finance flows from developed to developing regions for the electricity sector is lacking, creating a barrier to the global low-carbon energy transition. On top of this, debt-based instruments are more prevalent forms of climate finance. This can increase debt levels of developing countries, which can cause negative economic consequences and, in turn, disincentivise climate action.

Equitable climate finance in future requires changes to the status quo. Our analysis shows that the responsibility of developed countries to provide climate finance increases considerably when equity is considered the guiding principle of climate finance flows.

Just Energy Transition Partnerships (JETPs) promise to accelerate low-carbon energy transition but could increase the debt burden as observed in the case of South Africa. South Africa's JETP aims to accelerate its transition away from coal. But, the finance package is overwhelmingly loan-driven, and grant-based financing makes up for less than 5% of the total package, which could increase the debt-stress of South Africa in the pursuit of just energy transition.

Learnings for the global stocktake. Three key lessons reinforce the opportunities for the global stocktake to address current deficiencies in low-carbon energy financing. The quantum and quality of climate finance flows should be based on the national circumstances of developed and developing countries as articulated by the principle of common but differentiated responsibilities and respective capabilities. Transparency is also crucial from both donor and recipient countries on what counts as climate finance, and how it will be mobilised and ultimately utilised. Finally, the finance should overwhelmingly be grant-based and targeted to regions where it is most needed, to ensure it does not lead to debt traps amongst recipient countries.

Implications for Global Stocktake

- The GST outcome should address the current gap in climate finance by recognizing the responsibility of developed countries to enhance climate finance mobilisation for developing countries as articulated in Paris Agreement's Article 9. Specifically, it should recognize that the low-carbon energy transition in developing countries with limited financial capacity requires developed countries to increase their climate finance mobilisation.

- The GST outcome should emphasise the importance of grants and other low cost instruments in effectively achieving the Paris Agreement without compromising the needs of developing countries. It should also recognize that mobilisation of climate finance should not impose conditions on developing countries that can increase their debt as they work toward low-carbon energy transition to meet the Paris Agreement targets.
- The GST outcome should recognise that emerging climate finance models like Just Energy Transition Partnerships should be designed carefully so that they do not increase the debt of developing countries as they pursue low-carbon energy transition.

+ 1. Introduction

Background

Climate finance is essential to fund the necessary mitigation and adaptation actions under the Paris Agreement. The responsibility of developed countries to provide financial resources to assist developing countries with respect to both mitigation and adaptation is enshrined in Article 9 of the Paris Agreement. It can also be considered an aspect of Article 2(1)(c): the overarching finance goal of the Paris Agreement. Despite these foundations, many experts find that climate finance has not been channelled in the equitable manner as the Paris Agreement intends (Pachauri et al., 2022; Pettinotti et al., 2022; Oxfam, 2023). This is particularly true concerning transfers from developed to developing countries. The current Global Stocktake (GST) provides an important opportunity to reflect on developments to date and make changes for the future. For these changes to be effective, specific attention has to be paid to the characteristics of bilateral climate finance, including its quantum, distribution and quality. Such discussions over bilateral climate finance, of course, happen in parallel to the ongoing efforts to reform international financial institutions at large, including the World Bank and International Monetary Fund. There has been recognition of the need to reform the bilateral and multilateral systems for climate finance through both the Technical Dialogue on the Global Stocktake, as well as the Sharm el-Sheikh Implementation Plan launched at COP27– now is the time for operationalisation.

The energy sector is the largest recipient of climate finance. The electricity sub-sector, in particular, presents an important opportunity to accelerate climate mitigation, and is thus a key focus of climate finance within the energy sector. In 2021, OECD Development Assistance Committee (DAC) members provided around US$ 5 billion of bilateral climate finance for the electricity sector. Investment in low-carbon electricity can unlock a multitude of public goods such as decreased greenhouse gas emissions, increased access to electricity, and improved public health outcomes. Given its prominent role in climate finance flows, it is also a key part of emerging financing mechanisms like the Just Energy Transition Partnerships (JETPs).

Motivation for the study

Our study investigates the meaning of equity in climate finance, specifically for low-carbon transition in the electricity sector, and the ways in which it can be better operationalised within global climate governance. We first analyse the current quantity and nature of climate finance flows from developed countries to developing countries in the electricity sector. Second, we examine differing conceptions of equity in relation to the climate finance flows. We compare how the climate financing obligations and needs of global regions differ from the business-as-usual trajectory under three equity-focused climate financing scenarios. Third, we explore

the opportunities and challenges of potential climate finance mechanisms by examining the JETP model as a case study to assess how climate finance is delivered and governed, particularly in accelerating energy transitions (i.e., low-carbon electricity generation) from the perspective of equity. We then utilise the findings of a study to draw some lessons for the first GST, in particular, to promote greater equity in climate finance flows for low-carbon energy transition.

+ 2. Methodology

Current status of climate finance in the electricity sector

Climate finance continues to be a fractious area of international climate change negotiations. Indeed, efforts to establish a common definition of climate finance under the United Nations Framework Convention on Climate Change (UNFCCC) have thus far failed. As a result, there remain several definitions of climate finance, which in turn, has led to differing assessments as to whether or not obligations under the Paris Agreement have in fact been met. These are reflective of a number of extant 'grey areas' concerning what counts as climate finance. For instance, whether private or blended climate finance that are corralled by a state, count as part of developed countries' climate finance obligations. There are also questions about whether only grants should be classified as climate finance, whether climate finance should encompass a number of concessional financing structures, or whether climate finance should not be used for fossil related power generation (e.g., efficiency improvements in existing plants, emission reduction technology - CCS). Adding to the difficulty of assessing climate finance, there is also a mismatch between the reporting cycles of the individual sources of climate finance and the timeframes in which aggregate assessments of such sources take place. Consequently, irrespective of how climate finance is defined by relevant parties, it can take years to judge the extent to which climate finance promises have been fulfilled. Finally, even if one can accurately estimate the extent of climate finance rendered under the Paris Agreement, countries still disagree starkly about how much climate finance can and should be mobilised equitably.

In this study, we focused on assessing the magnitude and nature of electricity-related finance requirements at present and into the future. To investigate the current status of the provision and mobilisation of climate finance to developing countries, we utilised the Organisation for Economic Co-operation and Development's (OECD) Official Development Assistance (ODA) database. The ODA database captures the foreign aid flowing from OECD-DAC (OECD-Development Assistance Committee) members to developing countries. As the DAC comprises the major developed countries in the world, the ODA database can be used to track the most significant flow of climate-related assistance from developed to developing countries. Since the early 2000s, the OECD has been collecting and publishing data on "official development assistance in support of the objectives of the Rio conventions on biodiversity, climate change and desertification".[1] In addition to accounting for ODA from the DAC members, the OECD also collects data on bilateral climate-related assistance received

[1] OECD (2023). *Climate-related official development assistance in 2021: A Snapshot*.

from other sources such as multilateral development banks and private donors (UNFCCC, 2022). Bilateral financial assistance is considered 'climate-related ODA' if the climate change mitigation or adaptation objective is explicitly stated as the 'principal' or 'significant' motivation for that assistance. The method of 'marking' the development assistance projects is called 'Rio marker methodology'.

While the Rio Markers help present a top-line aggregation of climate finance, researchers have highlighted several limitations in using them to track developed countries' progress in meeting their climate finance pledges to developing countries (Roberts & Weikmans, 2017; Shishlov & Censkowsky, 2022). The ODA database relies on self-reports which result in an over-statement of the actual levels of climate finance delivered by donors than is actually made available for climate purposes. Moreover, there is no standard methodology to identify the share of the 'principal' and 'significant' assistance that is actually being used for climate mitigation or adaptation. As part of the ODA database, donors do report the 'share of commitment' to identify the proportion of the assistance that is being used for the climate purpose, yet for climate-related assistance for the electricity sector in 2019, this share is listed as '100%' by all the donors for all assistance marked as 'principal' as well as 'significant'. This suggests that there are no differences in the nature of climate-related assistance marked as 'principal' and 'significant', raising the question as to why these forms of financial assistance have been marked differently in the first place, and what methodology was used to identify climate-related assistance as either 'principal' or 'significant'.

We recognize that the method used to account for climate-related assistance is fraught with challenges which makes it difficult to estimate the actual amount of climate mitigation or adaptation related finance flowing from developed and developing countries. However, we believe that the data captured in the OECD ODA database can be used at a high-level to identify the quality of climate-related finance that is being provided and mobilised to developing countries. Here, we examined the quality of climate-finance flowing from developed to developing countries for the electricity sector using two metrics: i) the share finance received for different electricity-related technologies; ii) the type of financial instrument used. We conducted this analysis both from the perspective of donor and recipient countries.

Future climate finance flows in the electricity sector

After examining the current status of climate finance flows in the electricity sector, we assessed how climate finance flows would vary if 'equity' was considered the guiding principle for climate finance flows. We did this analysis for the year 2030. We first estimated the climate finance requirement in 2030 by calculating the total investment required in the electricity sector using the scenarios assessed in IPCC's Sixth Assessment Report (AR6) (Byers et al., 2022). Out of the scenarios assessed in AR6, we assessed the investment needs of four sets of scenarios, namely C1, C2, C3, and C4. These scenarios provide cost-effective investment

needs for mitigation pathways that limit end-of-the-century warming to 1.5 deg C (in C1 and C2), and 2 deg C (in C3 and C4).

AR6 presents regional results using two ways of classification: i) high-level or R6, and ii) low-level or R10 classification. We used the R10 classification which disaggregates the world into ten major regions. We limited our assessment to scenarios that were included in the ENGAGE multi-model comparison study as these scenarios provide investment estimates for all four C1-C4 scenarios at the regional level (see Appendix B).

An important point to note here is the difference in the regional classifications in the OECD and AR6 analysis. The OECD ODA database only captures developing countries because they only account for climate finance flows to developing countries. In contrast, AR6 captures investment requirements for the electricity sector in all regions. This implies that the AR6 provides the investment amount for the electricity sector for all countries in the world. So, for example, what OECD includes in Europe is only a subset of all countries in Europe as classified by the integrated assessment models.

We assumed that these investment numbers can be considered the maximum possible climate finance required for the electricity sector. We recognize that the entire investment for the electricity sector will not be mobilised as climate finance, as a portion comes from domestic spending. But, we made this assumption here as our key focus is on examining how potential climate finance flows fare under different equity frameworks.

A wide range of indicators have been used in the past to operationalize equity in the context of climate finance. Indicators include ‘responsibility’ defined using metrics like regional share in historical cumulative CO2 emissions (since 1850, since 1990), current per capita emissions, and projected per capita emissions; ‘capacity’ defined using metrics like GDP per capita, capital stock per capita, technical potential for renewable energy and gross national income; and ‘needs’ defined using metrics like exposure to climate risk, performance of Sustainable Development Goal 7, and air pollution exposure (e.g., Egli & Stünzi, 2019; Dooley et al., 2021; Colenbrander, et al., 2022; Pachauri et al., 2022).

To examine the flow of climate finance under different ‘equity’ considerations, we identified the two principal indicators to quantify ‘responsibility’ and ‘capacity’ of different global regions to mobilise climate finance. We did so as our aim was to assess ‘equity’ with respect to the common but differentiated responsibilities and respective capabilities (CBDR-RC) as it forms the basis of operationalizing equity in the Paris Agreement. The CBDR-RC principle has been commonly interpreted as developed countries taking the lead on climate mitigation and adaptation action, and providing the requisite finance resources and technologies to developing countries. The specific obligations in the context of climate finance are laid out in Article 9 of the Paris Agreement. But, the progress of developed countries has been slow as they have thus far fallen short of collectively mobilising US$100 billion each year to developing parties that was promised at COP15 in 2009. That’s why we defined ‘responsibility’ as the cumulative GHG emissions between 1850 and 2019, and calculated the

responsibility of each of the R10 regions based on their cumulative GHG emissions since 1850. We also conducted the same analysis but for a shorter duration–1990 to 2019. Additionally, we calculated ‘capacity’ by aggregating the GDP for each of the R10 regions, and assumed that regions with higher GDP have greater capacity to provide climate finance.

It is important to note that indicators used here are highly aggregated, and so do not capture the differences among countries included within the same region. Nevertheless, the analysis still allows us to approximate climate finance flows among the different global regions and from this infer the range of outcomes.

+ 3. Results

Finance flows for low-carbon energy transition remain low currently

We found that the total volume of climate finance flows from developed to developing regions for the electricity sector amounted to approximately ~US$ 5 billion in 2019 (Figure 1). Out of this, almost 50% of the climate finance was provided for more efficient coal and gas power plants. Only about 30% of the finance flowed to renewable energy (RE) technologies, which amounted to 1.6 billion USD. These results highlight the slow progress in climate finance provision for low-carbon energy transition as the finance mobilised for RE remains low.

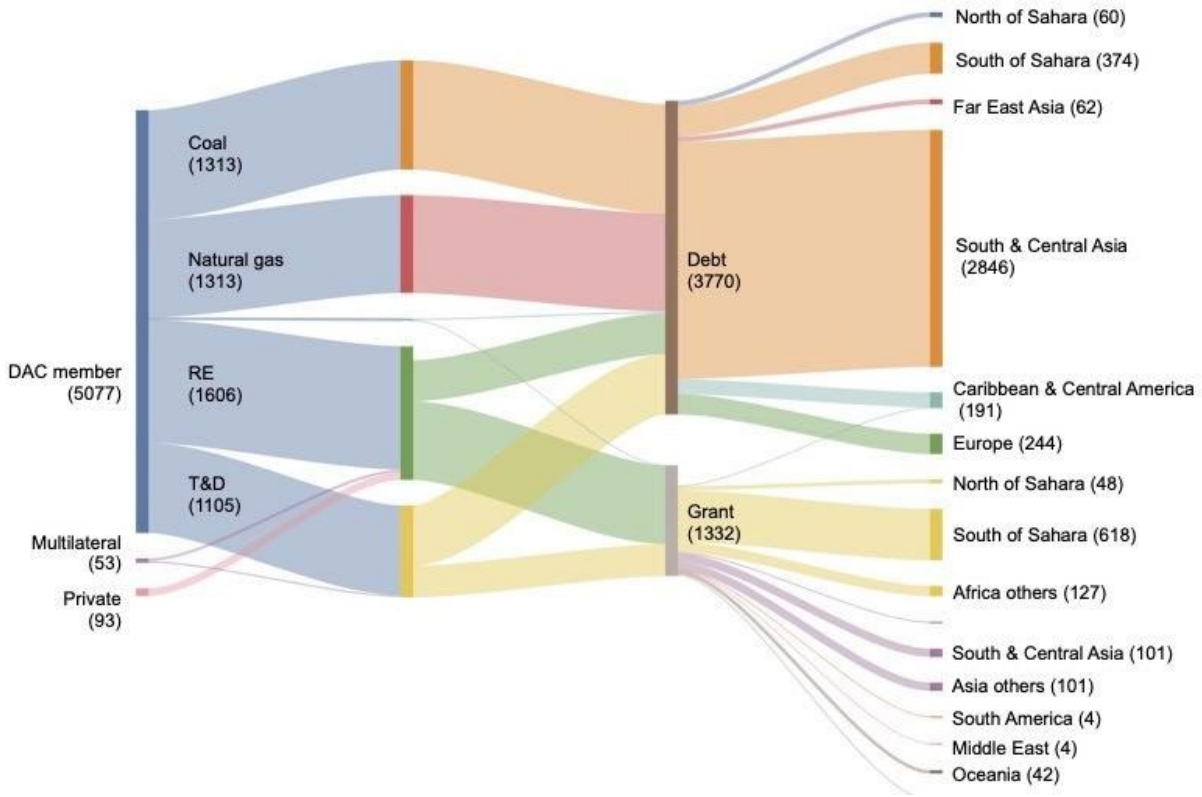

Figure 1. Climate finance flows from developed regions, multilateral institutions, and private donors to developing regions for the electricity sector in 2019. Here, the 'DAC member' category includes developed countries as developed countries who are major providers of Official Development Assistance (ODA) are included in DAC (i.e., Development Assistance Committee). The finance flows are in million USD (2020).

Debt instruments accounted for almost all the climate finance provided for fossil-based electricity technologies like coal and gas. For RE technologies and transmission & distribution, debt and grants accounted for 30% and 60% of the finance flows respectively, with the rest being met by equity finance. Non-DAC providers, such as multilateral development banks tend to offer more grants than DAC members to assist with the diffusion of RE technologies. However, the overall quantum of money provided by non-DAC members was found to be 10 times less than that of DAC members. These findings underscore the critical issue of the prevalence of debt-based financial instruments like loans as a key mechanism for providing climate finance. Such instruments can increase debt levels of developing countries, and in turn entrench already persistent economic inequalities for the recipient countries. By contrast, developed countries providing assistance in the form of debt are likely to recover a significant proportion of money that they provide as climate finance.

We also found that donor countries considered the share of climate-related assistance as 100% regardless of whether the project was Rio-marked as ‘principal’ or ‘significant’. This indicates a lack of transparency in communicating the magnitude and nature of climate finance**.**

Huge regional variations in future electricity investment estimates

We first estimated the future investments required for the electricity sector using the scenarios assessed in AR6. We found that the investment required for the electricity sector is expected to increase threefold between 2020 and 2030. Right now, the investment estimates for different warming scenarios (i.e., C1-C4) are almost the same. However, the investments needed over the decade would vary considerably depending upon the ambition for climate action by 2030 (Figure 2).

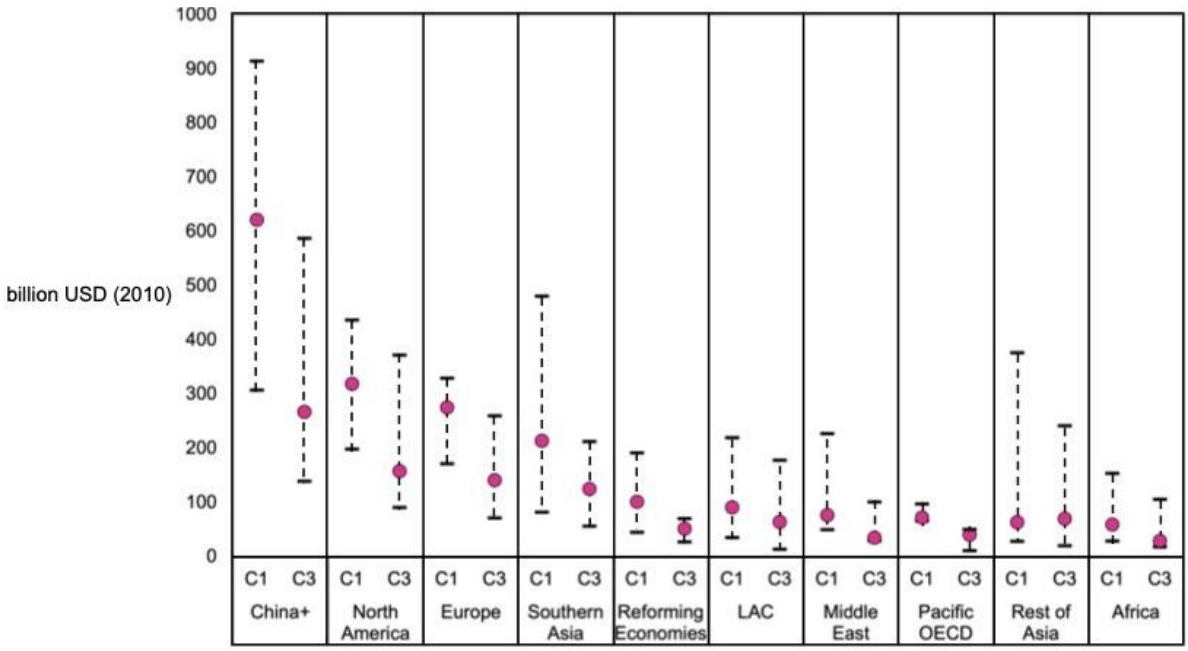

Figure 2. Range of electricity investments estimated for C1 and C3 scenarios among R10 regions for 2030. Here, we present the range of electricity investments estimates for ten regional categories that constitute the R10 regional classification. The range includes minimum, median (presented as pink dots), and maximum investments from the scenarios included in the ENGAGE inter-model comparison study. We present results for C1 and C3 warming scenarios for the year 2030.

The median level of investment estimated for C1 scenarios, which limit warming to 1.5°C with limited to no overshoot with > 50% probability is ~US$ 2 trillion. This is almost twice the investment estimated for C4 scenarios, which limit warming to 2°C with >50% probability. Though the projections for electricity investments in 2030 vary across models, we found that all the models included in the ENGAGE model-intercomparison study have similar global trends for electricity investment. Models projected the highest requirement for electricity investment in China (i.e., ~US$ 600 billion), followed by North America, Europe, and Southern Asia.

These investment amounts reflect the expected electricity capacity addition in different regions of the world in the coming decade (Figure 3). We observed that North America's electricity sector would require an average addition of US$300 billion in 2030, which is almost six times the ~US$50 billion electricity investments projected for Africa. This implies scenarios assessed in the ENGAGE study project have much lower capacity addition in Africa as compared to North America. If alternative scenarios are designed that project higher capacity regions to the least developed regions like Africa, it would raise the total investment required for the electricity sector and, in turn, would require developed countries to provide greater financial assistance.

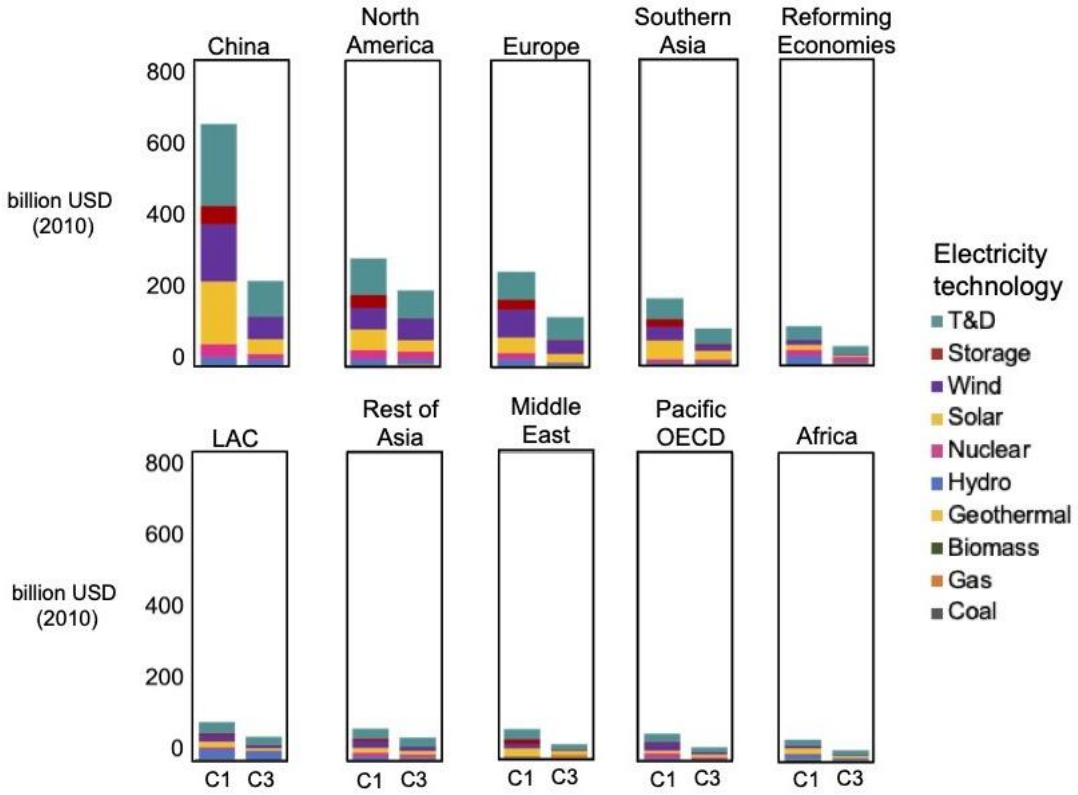

Figure 3. Electricity investments by technology for C1 and C3 scenarios among R10 regions for 2030. Here, we present the median estimates of electricity investments by technology for ten regional categories that constitute the R10 regional classification. These values have been calculated from the integrated assessment models (IAMs) included in the ENGAGE inter-model comparison study. We present results for C1 and C3 warming scenarios for the year 2030.

We also observed that all scenarios project very low electricity investments for fossil-fuel technologies like coal and gas regardless of the social and economic circumstances of different regions as depicted in Figure 3. This means that ambitious mitigation scenarios like C1 and C3 in the coming decade would require developing countries to make a rapid transition from coal and gas to RE. This would require developing regions to make significant investments into RE technologies as well as storage & transmission and distribution; support for which should flow from developed regions as per the Paris Agreement. But, the prevalent climate finance flows trends raise serious concerns about the ability of developing countries to mobilise these funds. Moreover, it is especially concerning that debt-based financial instruments like loans are the major mechanism for providing this finance right now. If such trends continue, it could put developing regions at the risk of falling into debt while trying to pursue low-carbon energy transition.

Finance responsibility of developed countries increases considerably in equity-focused scenarios

We found that the regional contributions to electricity investments can vary considerably if equity-based considerations are used to identify a region's appropriate share of investment. In Figure 4, the blue bar corresponds to the electricity investment required in a region as calculated by scenarios included in the ENGAGE study. Here, we have only presented the investments calculated for C3 scenarios, i.e., scenarios that would limit temperature rise to 2°C with > 67% probability.

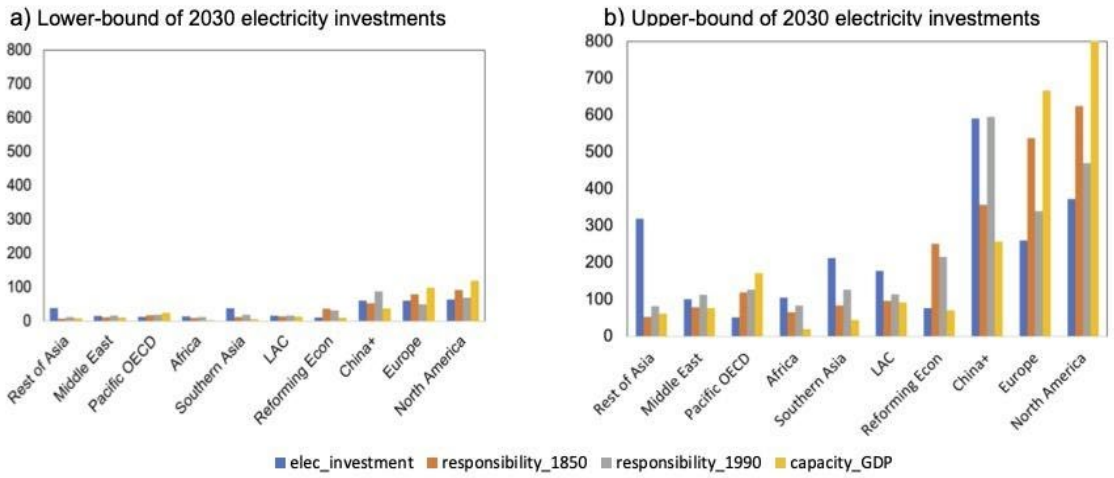

Figure 4. Amount of electricity investments by different regions for C3 scenario 2030 under different equity scenarios (in 2010 billion US$).

Our analysis highlights that the responsibility of developed countries to provide climate finance increases in all equity-focused climate finance scenarios. In particular, the responsibility of regions with the most developed countries such as North America and Europe could increase by ~1.5 times in equity-focused scenarios that take into account historical responsibility for GHG emissions, and by ~2 times in the scenario that accounts for the gross domestic product (GDP) of different regions. Moreover, we found that the responsibility of developing countries declines considerably from the business-as-usual in all scenarios. The decline is starkest when the contributions to investments are based on either historical responsibility for emissions since 1850 and GDP. We observed that the decline is not as stark in the scenario of emissions from 1990. That's because many developing countries have expanded their economic activity in the past few decades, resulting in an increase in emissions in developing regions.

The question still remains as to what an equity-focused shift to energy climate finance could mean in practice. In the next section we scrutinise a major development in this regard, i.e. the incidence of JETPs.

+ 4. Just Energy Transition Partnerships

Just Energy Transition Partnerships - An Emerging Climate Finance Mechanism for Low-Carbon Energy Transition

Climate finance can and should be tailored to the unique context of the recipient country. Such an advent not only reflects the principle of CBDR-RC, but also ensures the more effective delivery of finance as a limited resource. COP26 marked a step-change in this regard through the strong commitment to the energy transition through the emergence of the JETP model. Illustrative of this model, there were a great deal of partnerships announced: at COP26 from the bilateral Global Green Grids Initiative between the United Kingdom and India (i.e., The One Sun One World), to the more plurilateral Build Back Better World Initiative. By far the largest and most significant of these announcements was the JETP focused on South Africa, followed by similar JETPs for Indonesia and Vietnam as coal-intensive economies.

Unlike other climate financing models, such as classic overseas development aid, JETPs specifically aim to accelerate countries' energy transition. They do so by focusing on emerging economies that rely heavily on fossil fuels, especially coal, and have an integrated approach to power sector decarbonisation. In this regard, the acceleration of coal phase-out and deployment of renewable energy with minimal negative impacts is the ultimate goal of JETPs. This investment is critical as countries and their communities are likely to face numerous inevitable impacts, such as stranded assets, revenue and job losses in fossil related sectors, and increased electricity bills due to the low-carbon energy transition (Business Tech, 2023; Zhou et al., 2023). As a novel energy transition finance model, JETPs embrace the concept of "just transition", thereby recognising the direct and indirect impacts of the energy transition, and with the aim of minimising the transition costs. Thus, the long-term vision of JETP involves ensuring just, equitable and inclusive outcomes for all workers and communities affected by the global energy transition in line with the 2018 Declaration on Just Transition at COP24.

Climate finance focused on decarbonisation efforts necessarily requires a comprehensive yet tailored approach, especially for developing countries with limited financial capacity and high reliance on fossil fuels. This means that a needs-based assessment is critical to address equity in climate finance (see Klinsky, 2023). Growing recognition of many governments' fiscal limitations has revived the long-standing question of what constitutes a fair and just contribution by donor countries. In this regard, equity in climate finance is not limited to the fair amount of money that should be distributed, but also includes the mechanisms it is distributed by. The success of JETPs in overcoming these barriers will depend on the scale and availability of concessional finance, including grants from relevant sources, without

significantly burdening the recipient (see Africa's JETP case). It is worth noting that developing countries need to grow their economies, eradicate poverty, and some of them are struggling with high levels of debt. That's why it is crucial to assess if and how JETPs can support the process of just transition in developing countries.

Case: South Africa's JETP deep dive

Unlike other countries in the African region who tend to receive a greater share of financing for fossil fuels, more than 50% of climate finance received by South Africa was channelled to electric generation via renewable sources, and transmission and distribution. Within this composition, however, debt instruments were dominant, thus hampering uptake. Recently, South Africa received a new commitment in financing its energy transition in the form of its JETP.

South Africa's JETP was established through a Declaration at COP26 by the Governments of South Africa, the United Kingdom, the United States, France, Germany, in addition to the European Union. As the Declaration outlines, the JETP commits the parties to a "long-term partnership to support South Africa's pathway to low emissions and climate resilient development, to accelerate the just transition and the decarbonisation of the electricity system (dominated by coal-fired power plants, more than 80%), and to develop new economic opportunities such as green hydrogen (GH_2) and new energy vehicles (NEVs) amongst other interventions to support South Africa's shift towards a low carbon future". South Africa's JETP is delivered through a taskforce of the International Partners Group (IPG) who manages an initial US $ 8.5 billion of finance (Sguazzin & Burkhardt, 2023).

At COP27, South Africa published its Just Energy Transition Investment Plan (JET IP) for the five-year period of 2023-2027 (The Government of South Africa, 2022). The JET IP is in line with South Africa's updated Nationally Determined Contribution (NDC) and outlines a climate finance need of US$ 98.7 billion (ZAR 1,480 billion) for infrastructure, planning and implementation capacity, skills development, economic diversification and innovation, along with social investment and inclusion (see Table 1). From this amount, the outstanding funding was ZAR 650 billion or 44% of the target. With an additional fund from the JETP, South Africa still needs ZAR 700 billion for electricity (ZAR 315 billion), NEVs (ZAR 100 billion), and GH_2 (ZAR 285 billion). Thus, significant funding is required to close the financing gap for South Africa to achieve a just energy transition (Kramer, 2022).

Table C1. Financing needs of the JET IP for the period, 2023-2027.

ZAR (US$) billions	Electricity	NEVs	GH_2	Subtotal
Infrastructure	978	83	313	1,374
Planning and implementation capacity	2.14	2	5.5	9.9
Economic diversification and innovation	40.4	43	-	83.4
Social investment and inclusion	9.6	-	-	9.6
Skills development			2.7	2.7
Subtotal	1,030.4 (68.7)	128 (9)	319 (21)	
Total				**1,480 (98.7)**

Source: Just Energy Transition Investment Plan (JET IP), the Government of South Africa, 2022,

Table C2. Allocation of US $8.5 billion pledge for the period, 2023-2027.

IPG US$8.5 billion allocation, 2023-2027	Electricity	NEVs	GH_2
Infrastructure	6.9	0.2	0.5
Planning and implementation capacity	0.7		0.2
Economic diversification and innovation	0.022		
Social investment and inclusion	0.016		
Skills development	0.012		

Source: Just Energy Transition Investment Plan (JET IP), the Government of South Africa, 2022.

Under South Africa's current JETP package funds may come from various mechanisms including grants (less than 5%), concessional loans, and investments and risk sharing instruments from bilateral and multilateral development banks (MDBs) and international financial institutions (IFIs). However, with a small portion of grants, this package raises significant issues as to whether South Africa can bear the costs considering its fiscal capacity and the likely negative impacts of the clean energy transition on its economy due to the high debt ratio. Based on CPI's report in 2021, the sources of South Africa's climate finance (not limited to mitigation in the energy sector) were private (57%), public (35%), and blended (8%) (Cassim et al., 2021). According to the International Monetary Fund (IMF) (2023), for instance, South Africa has faced significant economic and social challenges as a result of an unprecedented energy crisis, increasing infrastructure and logistics bottlenecks, a less favourable external environment and climate shocks (IMF, 2023). Besides, an economic recovery after the COVID-19 pandemic remains slow with the elevated public debt and low economic growth, significantly limiting the fiscal space to meet social and developmental needs (see Figure C1) (Seiler et al., 2023). As known, South Africa's fiscal accounts are still under pressure,with the overall balance projected to

widen to a deficit of about -6.5% of GDP in the fiscal year (FY) 2023/2024 and deteriorate further through FY 2025/2026.

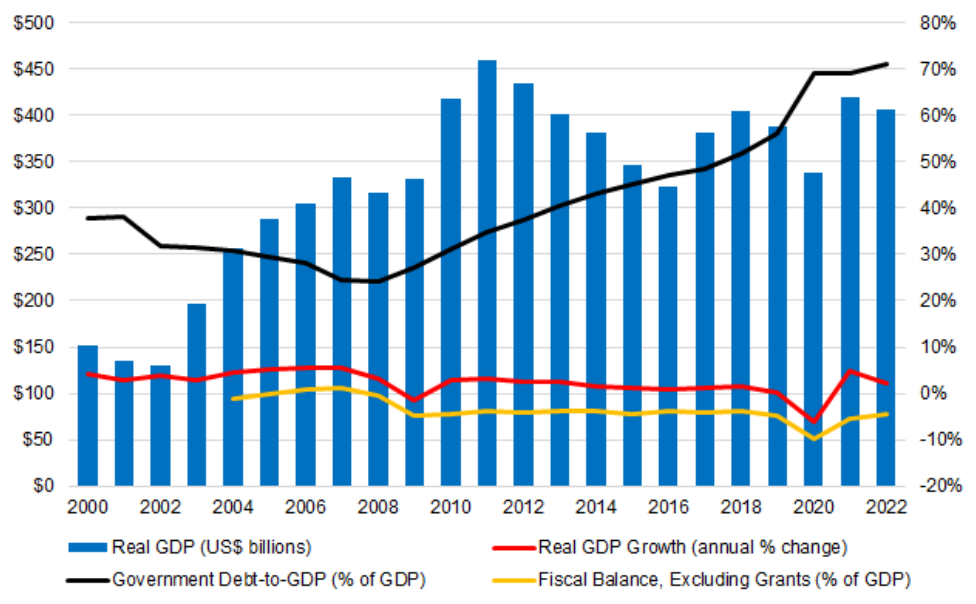

Figure C1. South Africa's GDP, growth, debt, and fiscal balance. Source: Author's compilation from IMF Database (2023)

South Africa's limited fiscal capacity may thus hinder efforts to fill the financing gap related to its energy transition. Besides, considering the need to balance the climate goals with a "just" approach and an unfinished sustainable development agenda, climate finance mechanisms should not endanger South Africa's fiscal resiliency (Seiler et al., 2023). As shown in Figure 8, the dominant instrument in South Africa's climate finance landscape was debt, and more debts will increase the financial burden on the government. In addition, South Africa's state-owned utility ESKOM, which has a vital role in its energy transition, has been facing serious problems due to corruption scandals, financial mismanagement, and insufficient investment in grid capacity, causing frequent blackouts. Such problems demand significant negotiation capacity to attract additional investments, mainly from private sector investors as they are concerned about risk (ESG Investor, 2023). This includes the current requests by South Africa to increase the IPG's contribution to the JETP through either encouraging other countries to join the JETP and/or seek new funding sources that will not put more pressure on the government budget. Thus, financial support from JETPs should be largely concessional, additional, and deployed in catalytic investments to ensure that it will not become a new burden for the people of South Africa.

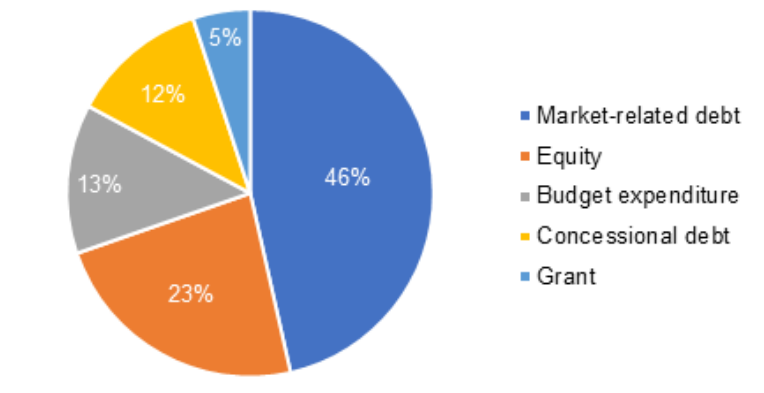

Figure C2. South African climate finance landscape instrument breakdown.
Source: Cassim et al., (2021)

Even though South Africa's JETP is an ongoing development, several key takeaways emerge from developments to date which highlight how an equity lens can improve future JETPs (Dennis, 2022; Gunfans et al., 2022; Ayas et al., 2023). Such aspects include clarity about how or when the funding will materialise, how it will be allocated (funding complexity and transparency of flows), fair share of responsibility between donors and recipients in governing the program, and a clear evaluation framework to measure the progress. Addressing these concerns would provide a better understanding of the extent to which the JETP style models can achieve climate goals, by providing effective and equitable climate finance outcomes.

At the same time, one must view JETPs in the context of a much larger commitment of developed countries to mobilise US$ 100 billion per year. As progress towards this target remains inadequate even in 2023, this commitment should be monitored to ensure it is delivered upon business as usual practices in providing finance from developed countries to developing countries need to be revisited, requiring political discussions; eligibility criteria and processes for prioritisation for funding, for instance, should be clear and transparent. This also includes the quantum of money provided by donors to the recipients (e.g., different JETP's allocation funds for each country). Besides, access to climate finance is often complicated with a number of procedures. Some require the use of accredited entities as 'middle-persons' which can impede developing countries from addressing climate change, forcing them into bilateral agreements that often favour richer countries (Maffei, 2019; Achampong, 2023). It is understandable, however, that donors or investors have financing criteria to minimise risk and waste resources. Yet if this bar is set too high, it is clear that it presents a significant barrier to developing countries accessing investment (CPI, 2023). A country with high investment readiness would receive more funding (Awuah, 2023). Thus, a thorough assessment emphasising needs, capacity, and specific conditions for each country

is critical in order to ensure climate finance is distributed in an equitable manner and prevent adverse effects.

+ 5. Lessons Learnt for the GST

The GST is an opportune moment to take stock of progress to date and developments needed in future. For this to occur the GST outcome needs to consider the varying conceptions of equity in order to arrive at a transparent and robust framework for assessing climate finance flows. Only through such a mechanism will the GST outcome effectively enable Parties to collectively meet the ambitious goals of climate action under the Paris Agreement in an equitable manner. Towards this end, this project has mapped trends in the quantum, distribution and quality of climate finance for the energy transition, and performed a deep dive into allocation possibilities that JETPs present. From this, it is evident there remain lessons to be learnt to improve the design and delivery of climate finance in future. Three key lessons reinforce the opportunities in this regard: differentiation, transparency, and conditionality.

The first lesson is the importance of differentiation of national circumstances. In section 3, we find that the developed regions like Europe and North America would be responsible for providing almost double the assistance to developing regions in equity-based finance scenarios in comparison to the situation where equity is not taken into account. Moreover, the provision of climate finance is not concentrated in select developing regions. In section 4, we highlight that until now JETPs have mainly been focused on coal-intensive economies such as South Africa, Indonesia and Vietnam. Although this makes sense from a climate perspective, adequate financing needs to also be provided to the least developed nations whose energy sectors' may not have significant carbon emissions right now due to insufficient energy infrastructure. For this, it is crucial that the finance commitments of developed regions are not only understood and assessed in the context of Article 2.1(c) of the Paris Agreement that talks about making "finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development". Instead, a holistic approach that encompasses both Articles 2 and 9 of the Paris Agreement is needed. Moreover, as Article 2.1 requires nations to act on climate change in the context of sustainable development and their efforts to eradicate poverty, the climate finance obligations from developed to developing countries should likewise take these national circumstances into account, and not interpret or apply Article 2.1(c) in isolation. This broad understanding of climate finance is important for developing regions to obtain funding for low-carbon energy transition whilst working towards their development goals.

Another cross-cutting lesson is transparency: on the part of both donor and recipient countries. Without a common-definition of climate finance, determining the quantum of climate finance becomes inordinately difficult. In section 2, we find that in 2019, almost 50% of the climate finance in electricity was provided for more efficient coal and gas power plants. Only about 30% of the finance flowed to the RE technologies, which amounted to 1.6 billion USD. We also found that donor countries considered the share of climate-related assistance as 100% regardless of whether the project was Rio-marked as 'principal' or 'significant'.

These findings indicate a lack of transparency in communicating the magnitude and nature of climate finance. Transparency is also essential in achieving long-term commitments as there is a possibility that changes in political priorities could potentially discontinue the financial flows, mainly if climate finance is initiated from a conditional partnership. In the future, donor countries should explicitly state the assumptions that they are making when estimating their climate finance delivered and projected flows in future. At the same time, it is incumbent on recipient countries to clearly communicate their exact needs for low-carbon energy transition to reduce the potential financing gap, for instance that is present in South Africa's JETP case so that the target can be achieved. Indeed, an analysis of the conditional NDCs that have been submitted under the Paris Agreement reveals that the signalled need for energy investment by developing countries is highly variable- ranging from blanket estimates in the billions of dollars through to highly quantified discretely costed projects. The latter is much more likely to attract funding than the former due to confidence on the part of donees on the viability of the projects to be funded. A growing range of entities, including the Green Climate Fund, World Bank, International Monetary Fund, and International Energy Agency are involved in assisting developing countries with such estimations.

A final lesson concerns the scope and conditionality of climate finance itself. The Paris Agreement has signified a marked shift from the Kyoto Protocol in terms of the actors that are engaged in the response to climate change. While the Kyoto Protocol was focused on countries and had a top down structure, the Paris Agreement adopts a bottom up structure which recognises that a broader range of actors, including the private-sector, are involved in the process of low-carbon energy transition. When applied to the domain of climate finance, this strategy manifests itself in a greater emphasis being placed on a wide-range of finance mechanisms being deployed, including blended finance and private capital. This option brings governments, MDBs or IFIs and the private sector together to enable the energy transition (Economist Impact, 2023). However, this should not place undue burdens on the recipient country through added conditionality of finance flows. Such an arrangement of finance flows would go against the key equity principles of CBDR that form the basis in global climate negotiations. The trend towards hybrid financing models may provide financing for some developing countries whose economies are rapidly growing. But, to ensure the provision of adequate and predictable climate finance to developing regions, grant-based financing that is provided and mobilised by developed countries is still the major way that the majority of the most vulnerable countries can undertake their low-carbon energy transition. This is critical for countries with limited fiscal capacity and less developed capital markets to minimise economic risks due to the transition. To avoid developing countries falling into debt traps while working toward ambitious climate action (Anchampong, 2022; van Staden, 2023), it is crucial that the climate finance goals articulated in Article 2.1(c) of the Paris Agreement are operationalised based on the equity considerations outlined in Article 9 of the agreement.

We suggest that both current and future GSTs can benefit from applying the lenses of differentiation, transparency, conditionality to their analyses and recommendations for Parties to the Paris Agreement.

+ 6. Conclusion

This study has mapped the present inequity in climate finance. It accords with broader findings that demand for climate finance significantly outstrips supply. It then goes deeper by illustrating through in-depth assessment how this disjunct manifests within the energy sector decarbonisation, and how this affects equitable distribution of climate finance. As it has revealed, it is important to analyse the quantum and nature of climate finance flows occurring internationally generally, as well as through specific models such as JETPs. Doing so can identify the reasons for persistent inequities in finance flows, and identify strategies that can ensure greater equity in accessing climate finance moving forward. Such insights can support both the current and future GST processes in their aim to assess the implementation of the Paris Agreement in an equitable manner.

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+ Appendix

Appendix A: OECD ODA Data Analysis

We assessed climate-related ODA for electricity sectors in the OECD database. The following table presents the different electricity-related sectors listed in the OECD and AR6 database. We have presented these two data sources together to highlight the similarities and differences in the way in which the electricity sector is characterised in the two data sources.

Table A1. Overview of Investments in the Electricity G Sector Based on IPCC and OECD's Categorisations.

IPCC Electricity Sectors (relevant for Investments)	OECD Electricity sectors (from Energy investments)
Fossil	Electric generation, non-renewable sources, unspecified
Coal - Coal w/ CCS - Coal w/o CCS	Coal-fired electric power plants
Gas - Gas w/ CCS - Gas w/o CCS	Natural gas-fired electric power plants
Oil - Oil w/ CCS - Oil w/o CCS	
Non-Fossil	Electric generation, renewable sources, multiple technologies
Biomass - Biomass w/ CCS - Biomass w/o CCS	Biofuel-fired power plants
Non-biomass renewables - Geothermal - Nuclear - Solar - Wind - Hydro	Geothermal energy Nuclear energy electric power plants and nuclear safety Solar energy for centralised grids Solar energy for standalone grids and isolated systems Wind energy Hydro-electric power plants
Transmission & Distribution	Electric power transmission and distribution (centralised grid)
Electricity storage	

Out of all the the electricity sectors listed in OECD ODA database, we consider the following sectoral categories to analyse the current status of provision and mobilisation of climate-related assistance for electricity sector:

1. Coal-fired electric power plants
2. Natural gas-fired electric power plants
3. Electric generation, renewable sources, multiple technologies
4. Electric power transmission and distribution

Appendix B: AR6 Scenarios Considered for Assessment

We assessed scenarios from ENGAGE as it analysed all four C1-C4 scenarios at the regional level. The different project studies that provided vetted scenarios are as follows:

Table B1. Studies of Climate Assessment in AR6 Scenarios.

Study	Models	Scenario type
Bauer 2020	REMIND-MAgPIE 2.0-4.1	C3
CD-LINKS	REMIND-MAgPIE 1.7-3.0	C1 C2 C4
COMMIT	REMIND-MAgPIE 1.7-3.0	C2
	COFFEE 1.1	C3 C4
	IMAGE 3.0	C3
	WITCH 5.0	C3
ENGAGE	AIM/CGE 2.2	C1 C2 C3 C4
	COFFEE 1.1	C1 C2 C3 C4
	GEM-E3_V2021	C1 C2 C3 C4
	IMAGE 3.0	C3 C4
	MESSAGEix-GLOBIOM_1.1	C1 C2 C3 C4
	REMIND-MAgPIE 2.1-4.2	C1 C2 C3 C4
	TIAM-ECN 1.1	C3 C4
	WITCH 5.0	C1 C2 C3 C4
Giannousakis (2020)	REMIND 2.1	C3
Guo (2021)	MESSAGEix-GLOBIOM_GEI 1.0	C2 C3
Kreigler (2018)	REMIND-MAgPIE 1.7-3.0	C1 C2
Levesque (2021)	REMIND-Buildings 2.0	C2
Luderer (2021)	REMIND-MAgPIE 2.1-4.3	C1 C2 C3
NGFS2	MESSAGEix-GLOBIOM_1.1	C1 C3
	REMIND-MAgPIE 2.1-4.2	C1 C3
	GCAM 5.3	C2 C3 C4
Rottoli (2021)	REMIND-Transport 2.1	C3
van Vuuren (2021)	IMAGE 3.2	C1 C2 C3
	GCAM 5.2	C4

Appendix C: Region Definition and Categorisation for A6 Data Analysis.

Category	Region	Definition	Category	Countries
R10AFRICA	Africa	Africa	AFR	Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Côte d'Ivoire, Cabo Verde, Cameroon, the Central African Republic, Chad, the Comoros, the Congo, the Democratic Republic of the Congo, Djibouti, Egypt, Equatorial Guinea, Eritrea, Eswatini, Ethiopia, Gabon, the Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Libya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, the Niger, Nigeria, Rwanda, São Tomé and Príncipe, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, the South Sudan, the Sudan, Togo, Tunisia, Uganda, the United Republic of Tanzania, Zambia, Zimbabwe
R10CHINA+	China+	Countries of centrally-planned Asia, primarily China	EAS	China, the Republic of Korea, the Democratic People's Republic of Korea, Mongolia
R10EUROPE	Europe	Eastern and Western Europe (i.e., the EU28)	EUR	Albania, Andorra, Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, Montenegro, the Netherlands, North Macedonia, Norway, Poland, Portugal, Romania, San Marino, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, the United Kingdom of Great Britain and Northern Ireland
R10INDIA+	India+	Countries in South Asia, primarily India	SAS	Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, Sri Lanka

R10LATIN_AM	Latin America and Caribbean	Countries of Latin America and the Caribbean	LAC	Anguilla, Antigua and Barbuda, Argentina, Aruba, Bahamas, The, Barbados, Belize, Bolivia, Bonaire, Sint Eustatius and Saba, Bouvet Island, Brazil, British Virgin Islands, Cayman Islands, Chile, Colombia, Costa Rica, Cuba, Curaçao, Dominica, Dominican Republic, Ecuador, El Salvador, Falkland Islands (Malvinas), French Guiana, Grenada, Guadeloupe, Guatemala, Guyana, Haiti, Honduras, Jamaica, Martinique, Mexico, Montserrat, Netherlands Antilles, Nicaragua, Panama, Paraguay, Peru, Puerto Rico, Saint Barthélemy, Sint Maarten (Dutch part), South Georgia and the South Sandwich Islands, St. Kitts and Nevis, St. Lucia, St. Martin (French part), St. Vincent and the Grenadines, Suriname, Trinidad and Tobago, Turks and Caicos Islands, Uruguay, Venezuela, RB, Virgin Islands (U.S.)
R10MIDDLE_EAST	Middle East	Countries of the Middle East: Iran, Iraq, Israel, Saudi Arabia, Qatar, etc.	MEA	Bahrain, Islamic Republic of Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, the State of Palestine, the Syrian Arab Republic, the United Arab Emirates, Yemen.
R10NORTH_AM	North America	North America, primarily the United States of America and Canada	NAM	Bermuda, Canada, Greenland, Saint Pierre and Miquelon, United States
R10PAC_OECD	Pacific OECD	Pacific OECD	APD	Australia, Christmas Island, Cocos (Keeling) Islands, Heard Island and McDonald Islands, Japan, New Zealand, Norfolk Island
R10REF_ECON	Reforming Economies (Economies in Transition)	Reforming Economies of Eastern Europe and the former Soviet Union,	EEA	Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, the Republic of Moldova, the Russian Federation, Tajikistan, Turkmenistan, Ukraine, Uzbekistan

		primarily Russia		
R10REST_ASIA	Rest of Asia	Other countries of Asia, except R10India+ (Southeast Asia and Pacific)	SAP	American Samoa, Brunei Darussalam, Cambodia, Cook Islands, Fiji, French Polynesia, Guam, Indonesia, Kiribati, Lao PDR, Malaysia, Marshall Islands, Micronesia, Fed. Sts., Myanmar, Nauru, New Caledonia, Niue, Northern Mariana Islands, Palau, Papua New Guinea, Philippines, Pitcairn, Samoa, Singapore, Solomon Islands, Thailand, Timor-Leste, Tokelau, Tonga, Tuvalu, United States Minor Outlying Islands, Vanuatu, Vietnam, Wallis and Futuna
R10ROWO	Rest of the World			

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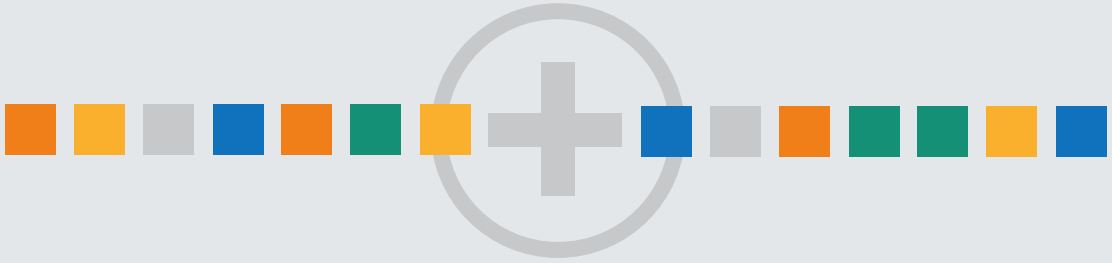

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