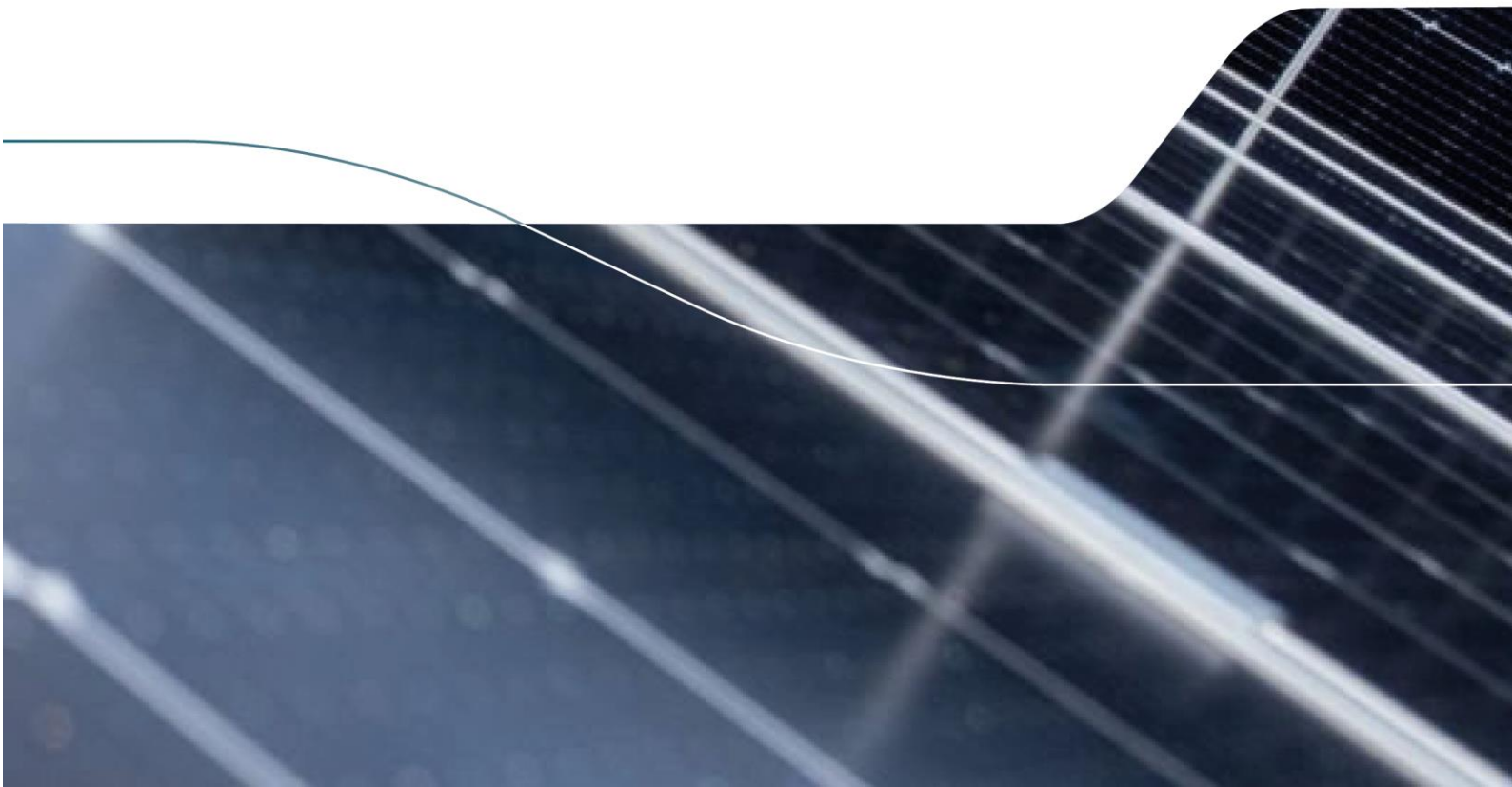
UNIVERSITY OF CAMBRIDGE
INSTITUTE FOR SUSTAINABILITY LEADERSHIP

Business Briefing

Financing Africa's Low Carbon Green Economy Transition

Africa's Climate Finance Needs



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Executive Summary

This brief is intended to provide a basis for engagement on the key question for African climate finance: how much money do African states need to meet the transition commitments required by climate science?

Necessarily, this question entails some others concerning the financing needed, the current state of play, and what the financing is needed for, which guide this brief's research:

- How much will the proposed climate transition trajectory cost?
- How is this divided by states?
- What is already being spent?
- How can domestic and international actors increase the resources available for the climate transition?
- What kinds of projects are set out in the NDCs?
- Which projects offer the greatest decarbonisation at the lowest cost?

This study addresses these questions through a combination of meta-study of existing policy and academic research on the matter, as well as aggregating information from primary sources (NDC submissions, national policies, and national-level climate initiatives such as energy transitions).

The paper finds that:

- African states will need to spend in the order of US$2.5 trillion by 2030 to meet their climate commitments.
- Emission reduction makes up close to 80% of spending, with plans for adaptation to climate change costed at US$418 billion. Of this total spending, unconditional pledges by African states – that is, the resources they intend to mobilise themselves – make up US$680 billion in spending, and roughly half of the 2GtCO_2e in emissions cuts promised.
- The largest emitters and economies account for the bulk of financing needs: South Africa, Egypt and Nigeria alone comprise over half of the total needs.
- Delivering the more ambitious mitigation and adaptation projects will require a substantial mobilisation of both domestic and international funding.
- As it stands, the best available information shows total African climate finance flows at roughly US$30 billion per year in 2019/20 – insufficient to meet even the unconditional commitments.
- This is likely due to a combination of insufficient demand for climate projects (which speaks to the necessity of preparing an investable pipeline of projects at country level) and insufficient supply of finance, or at the least finance on the right terms.
- Many African states are under substantial fiscal strain, and cannot take on new market-rate, foreign denominated debt.

- While African states will have to increase domestic resource mobilisation for climate spending, the international funding community needs to provide far more finance, and on far more concessional terms, than they are at present.
- The most recent round of NDCs presents a mitigation strategy that is highly dependent on land use change & forestry. LULUCF projects represent close to 1GtCO_2e (half) of total mitigation commitments.
- From a cost perspective, this is logical – LULUCF projects are by far the cheapest way to reduce emissions in Africa and deliver the greatest gains. However, they do not have many developmental gains, and are unlikely to be financed through private money.
- By contrast, energy sector mitigation through renewables, the second biggest source of mitigation (271MtCO_2e), is both cheap (relative to other forms of new energy) and attractive to the private sector – but necessitates sufficient technological capacity to manage the grid and install generation.
- Energy efficiency in agriculture and better waste management form the bulk of other costed projects.

Key takeaways

Arising from this analysis, we submit that:

1. International funding should be substantially more concessional, prioritising countries in debt distress.
2. African states should investigate what changes they can make to their institutional architecture to enable greater climate spending – such as: liberalisation of energy markets, subnational borrowing, centralised coordination of climate planning.
3. Greater attention needs to be paid to the 'demand side' of climate finance, ensuring that human capital is also developed to enable African countries to design credible climate finance investment plans and to deploy financial capital to optimal effect.
4. African states will need to explore new sources of domestic revenue; carbon pricing and a reduction in fossil fuel subsidies will almost certainly be necessary.
5. Certification of LULUCF projects and the emissions they mitigate should be standardised and independently assessed.
6. Climate finance tracking needs to better account for growing household climate spending and bilateral lending between developing countries.

Glossary

AfDB – African Development Bank

BAU – Business as Usual

CBAM – Carbon Border Adjustment Mechanism

CPI – Climate Policy Initiative

FDI – Foreign Direct Investment

GDP – Gross Domestic Product

GHG – Greenhouse gases

$GtCO_2e$ – Gigatonnes of carbon dioxide equivalent

IEA – International Energy Agency

IMF – International Monetary Fund

$KtCO_2e$ – Kilotonnes of carbon dioxide equivalent

L&D – loss and damage

LULUCF – Land Use, Land Use Change & Forestry

$MtCO_2e$ – Megatonnes of carbon dioxide equivalent

NDC – Nationally Determined Contribution

ODI – Overseas Development Institute

US$ – United States Dollar

Introduction

The most recent round of Nationally Determined Contributions[1] (NDCs) since the Paris Agreement has seen most African states step up their emission reduction goals even though they have historically been low carbon emitting economies, and table more detailed, costed adaptation plans.[2] In comparison to Business-as-Usual (BAU) scenarios, African states have pledged to cut their emissions by close to 2000 megatonnes of carbon dioxide equivalent ($MtCO_2e$) in 2030 when compared to a BAU. While the unconditional mitigation goals (those to be financed without new financial support) of African states are significant – they make up nearly half of the emissions mitigation pledged – the full pledge is very much dependent on commensurate financial support from the international community. The financial requirements for the more ambitious NDC scenarios require roughly US$2 trillion in new funding by 2030, in addition to the US$680 billion African states have pledged to mobilise themselves. The vast majority of this sum is intended for mitigation, while adaptation to the effects of climate change makes up roughly a fifth of costed NDC plans.

Sectorally, climate mitigation in Africa is highly reliant on the land use and forestry (LULUCF) sector, which comprises roughly half of intended emissions cuts. The energy and agriculture & waste sectors make up most of the balance, with a relatively limited contribution of industry to emission reduction. While this approach is cost-effective, excessive reliance on forests creates the risk that emissions may not be permanently mitigated and could be substantially affected by factors out of individual states' control. In addition, the LULUCF sector should not seek to add forests where they have not existed before, as this would cause water problems in grasslands and other unique environments.

A massive transition towards both renewables and electrification underpins the mitigations in Africa's energy emissions. Energy sector mitigation is the second largest contributor to NDC commitments (271 MtCO2e in 2030) and offers the most obviously bankable projects.

The actual flows of climate finance since the NDC process began have been vastly insufficient. African states should be spending in the order of US$200-250 billion per year – but they are spending less than 15% of that. While it should not be inferred that it is "too late" to bring conditional NDC commitments into effect, global financing will need to increase both substantially and quickly for African states to follow the more ambitious mitigation path they are seeking. Far greater resources will have to be mobilised by states, multilateral bodies, and the private sector – which will require a better regulatory environment and a range of mechanisms to bring down the risk of investing.

This brief explores the above themes in greater detail, through an analysis of the NDC targets African states have set themselves, the costing of these targets, and their sectoral breakdown. It also offers a look at the African energy transition, as well as the gap between the ambition and reality of climate finance in Africa.

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[1] See NDCs list at UN Climate Change.
[2] The recent agreement between the United States and China on 15 November 2023, the Sunnylands Statement on Enhancing Cooperation to Address the Climate Crisis may have a huge impact if implemented and may push forward some of the sticky areas at COP28. https://www.state.gov/sunnylands-statement-on-enhancing-cooperation-to-address-the-climate-crisis/

Climate Finance Needs in Africa

Despite comprising a relatively small proportion of global greenhouse gas emissions (9.3% in 2019), African states have generally proposed ambitious reductions in their greenhouse gas emissions, provided they can access the international funding they will require to meet them. As the fastest-growing continent in terms of both GDP and population, this is a vital commitment for the long-term path to net zero. The 53 states which have submitted an NDC[3] have pledged to make emissions cuts of 2GtCO_2e (roughly a third) by 2030 in comparison to their Business-as-Usual (BAU) scenarios, which assume no significant change from current policies and behaviour. Half of these cuts are to be funded from existing pledges and their own budgets. Nevertheless, to reach the full scope of their ambitions in mitigating emissions and adapting to climate change, African countries will require close to $2 trillion in new funding support until 2030 – far more than the $30 billion[4] currently being spent on climate investment per year.

Figure 1: African emissions in 2030 by NDC commitment scenario (GtCO_2e)

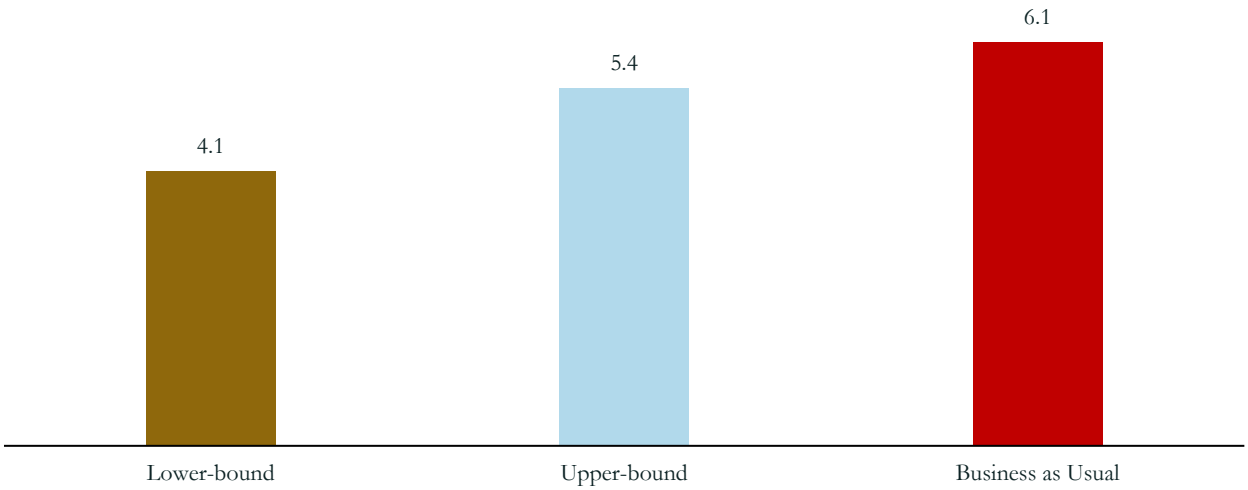


Figure 1 shows the scale of emissions mitigation committed to by African states in their Nationally Determined Contributions. To contextualise, the lower-bound scenario would effectively translate to emissions stagnating from 2022 levels despite substantial economic and demographic growth. The upper-bound scenario generally reflects the emissions mitigation that can be achieved solely through the mobilisation of domestic resources[5], wherein costed projects represent roughly US$680 billion in spending. The lower-bound scenario is contingent on financial support to the tune of a further US$510 billion excluding South Africa, whose finance needs are unspecified in its NDC but are estimated between US$500-1000 billion for the 2021-2030 period[6].

[3] Libya is yet to submit an NDC.
[4] Climate Policy Initiative, *Landscape of Climate Finance in Africa* (2022a)
[5] This is mostly, but not always, the assumption involved in "unconditional" NDC scenarios.
[6] National Business Initiative, *Financing South Africa's Just Transition* (2022), Climate Policy Initiative, *The State of Climate Finance in Africa: The Climate Finance Needs of African Countries* (2022b), United Nations Framework Convention on Climate Change Standing Committee

Many African states are particularly vulnerable to the effects of climate change. Little surprise, then, that the second round of NDCs has also seen more detailed adaptation plans advanced by many countries. African states have committed to roughly US$170 billion in adaptation spending from their own means and are seeking a further US$250 billion in new adaptation funding. Despite more detail in the latest NDCs, adaptation plans remain under-specified, with near three-quarters of financing having no specified sector according to the Climate Policy Initiative.

While a small number of NDCs do include loss & damage[7] (L&D) estimates due to climate change and inaction, the coverage is relatively limited. The African Development Bank (AfDB) estimates total L&D from climate events to range between US$290-440 billion in the 2020s[8]. In addition, the availability of this kind of funding is substantially contingent on the contributions to be made to the L&D fund that will be launched at COP28 – United Nations Climate Change Conference. Given the difficulty of making estimates on financial requirements, and the poor coverage in NDCs, this brief will focus on mitigation and adaptation.

> *Box 1: South Africa – unclear needs*
>
> Most estimates for the needs for climate finance in Africa are in the neighbourhood of $2.5 trillion. However, this estimate is substantially skewed by South Africa, which is commonly assumed to comprise up to $1 trillion of financing needs on its own (although representing only 8% of emissions cuts). The accuracy of this US$100 billion a year number (which has been cited by a number of climate research institutes) can be called into question, given South Africa does not present detailed costing in its NDC. This would amount to spending roughly 25% of South African GDP on adaptation and mitigation every year, leaving aside all other forms of investment. South Africa could quite comfortably build the 60GW of new renewable capacity by 2030 suggested by the Presidential Climate Commission with just a tenth of that amount, per the PCC (2021). The 2023 Renewable Energy Grid Survey shows that South Africa has potential for 66GW of new capacity.In addition, the recent sudden expansion in private sector renewable investment suggests that South African decarbonisation in the electricity sector specifically should require only a limited amount of external funding, generally focused on the transmission grid rather than funding for new generation capacity. Experts at the CISL Africa Symposium suggested that South Africa is currently spending in the order of ZAR120bn (US$6.6bn) per annum. Analysis of African climate finance needs should therefore keep in mind how uncertain South African transition costs can significantly alter total requirements.

Total African greenhouse gas emissions in 2022 reached 5GtCO_2e, or 9.3% of the global total[9]. The five largest emitters (South Africa, Nigeria, Egypt, Algeria & Ethiopia) make up over half of all emissions (larger than their share of Africa's population, but smaller than their share of the continent's GDP). However, the top emitters have generally tended to submit less ambitious emissions reduction plans (with the exception of Ethiopia) and have slightly lower shares of the emissions mitigation proposed by 2030 than their

on Finance, *First report on the determination of the needs of developing country parties related to implementing the convention and the Paris Agreement* (Bonn: UNFCCC, 2021)

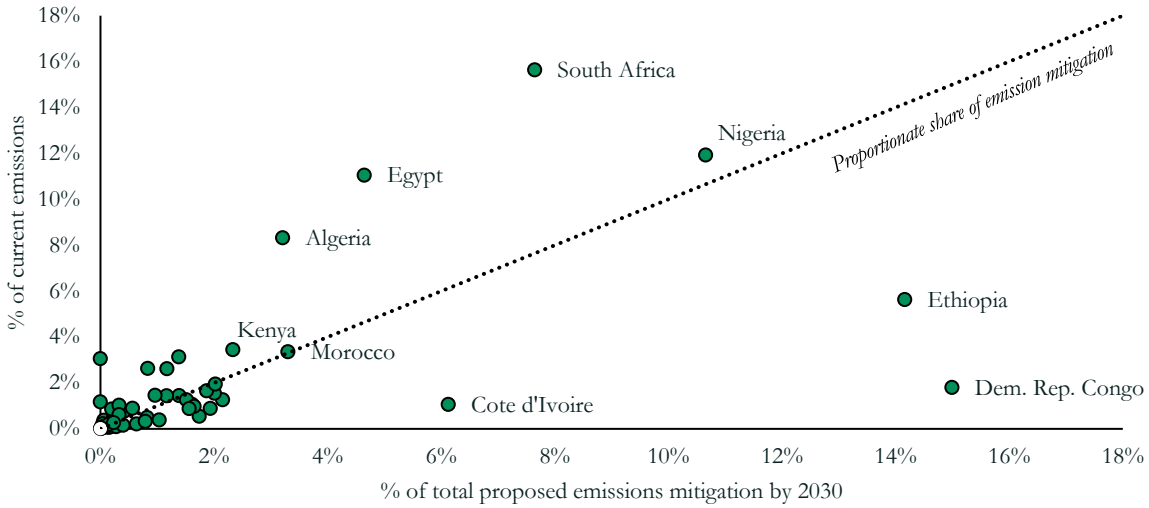
[7] Loss & Damage refers to compensation for destruction from extreme climate events.

[8] African Development Bank, *African Economic Outlook* (Abidjan: AfDB, 2022)

[9] Emissions Database for Global Atmospheric Research, *Community GHG Database,* (Brussels: European Commission, 2023)

current emissions would suggest they should (see Fig. 1.1). This is in part due to these being the more developed African states, with lower projections for emissions growth over the next 10 years.

Figure 1.1: Proportion of current emissions vs. proposed emissions mitigation (%)



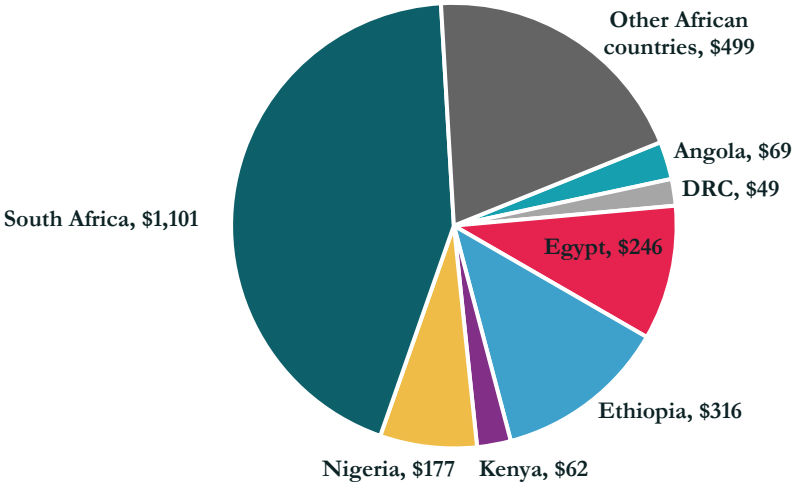
With regards to country shares of total finance needs, a similar pattern emerges. As detailed in Box 1, estimated needs for South Africa dwarf Africa as a whole, with even conservative estimates placing its needs at a minimum of US$500 billion by 2030[10]. Apart from South Africa, the two other large economies (Nigeria and Egypt) and the fastest-growing major economy (Ethiopia) account for half of African climate finance needs[11]. One major challenge for the African climate transition is that the largest emitters (and hence the most important mitigation projects) tend to be economies partly dependent on the extraction and export of fossil fuels (coal in South Africa, oil in Egypt, Nigeria and Angola, and oil and gas in Algeria). While the NDCs may make some steps in reducing emissions involved in mineral resource extraction (Angola's NDC is focused on reducing flaring emissions from its oil sector), it does not amount to reckoning with the long-term unsustainability of these sectors. Initiating a full-scale industrial transformation away from fossil fuel extraction will be a more lengthy and costly exercise.

The more recent round of Nationally Determined Contributions demonstrates greater political will and greater sophistication in the planning process compared to the 2016 set. While private funders will naturally focus on larger economies and more bankable projects, ignoring the efforts of smaller states risks undermining the will to address climate change at the continental level, and driving a wedge between those who do receive funds and those who do not. Indeed, it is precisely the smallest states who are least able to independently fund their climate adaptation and mitigation goals, whereas larger economies have a wider range of strategies available to them for mobilising funding.

The following section will focus on the current state of climate finance in Africa, which remains vastly insufficient to achieve NDC targets two years into the implementation period envisioned by most NDCs.

[10] National Business Initiative, 2022
[11] Financing needs per the estimates provided in Nationally Determined Contributions, except for South Africa

Figure 1.2: Total funding needs to 2030 under lower-bound emissions scenario (US$bn)



The Current State of African Climate Finance

It is important to recognise that the sums involved in estimates of total required climate finance do not necessarily require all the funding to be international or multilateral. Governments can marshal resources for climate finance from their domestic financial systems and budgets, and the private sector in Africa should not be overlooked as a potential source of funding for climate projects – especially those with greater economic benefits. However, the current flows of climate finance in Africa, from sources both international and domestic, do not match the ambitions states have laid out in their NDC commitments. This calls for a substantial effort to both increase the supply of finance available for climate projects in Africa, as well as the demand for climate finance through the design of a credible, costed pipeline of projects.

Assessing climate finance in Africa is rendered difficult by the multiplicity of actors and countries involved, relatively poorer data than elsewhere, and the possibility for disagreement over what to include and not. As a rule, we may consider "climate finance" any spending targeted at either adaptation to climate change or mitigation of greenhouse gases (GHG) emissions. In theory, given the project-based nature of most NDCs in Africa, it should be relatively simple to track the flows of finance and which types of projects they are going to – provided the will to do so. However, confidentiality and lack of information have rendered tracking difficult. The increased importance of households in mitigating emissions should also be considered in future attempts at tracking. Recent research by the Overseas Development Institute (ODI) suggests that bilateral climate financing by developing countries is also being undercounted to a lack of reporting[12].

[12] Colenbrander, Sarah *et al., The New Collective Quantified Funding Goal and its sources of funding,* (London: Overseas Development Institute, 2023)

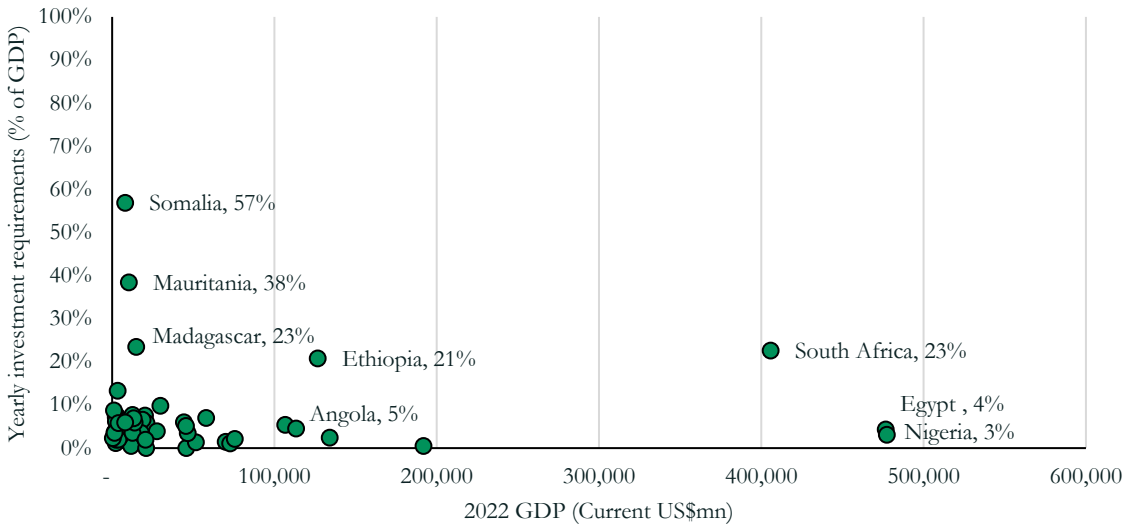
The Climate Policy Initiative (CPI) has provided the most comprehensive assessment of existing climate finance flows in Africa, which places investment in 2019 and 2020 at roughly US$30 billion per annum (NDCs suggest the required yearly amount is between US$200-250 billion). Overwhelmingly, this money is raised from public sources (domestic and international) and spent by public actors – the private sector contributed just 14% of total climate finance in the period assessed by the CPI, far below the rate in other regions[13]. Loans and grants from development finance institutions, as well as grants from foreign governments, make up over two-thirds of total financing, with domestic contributions from both public and private sources comprising just US$3.7 billion per annum. This would suggest that only 0.12% of total African GDP is being mobilised towards climate investments every year. Even the less ambitious NDC scenarios advanced suggest that African states should mobilise roughly US$68bn a year every year until 2030 from domestic resources and existing pledged support (see Fig. 1.3).

It is difficult to parse how much of the climate spending shortfall is due to insufficient demand (domestic desire to spend) versus a lack of supply (international and domestic sources of funding). On the demand side, the macroeconomic environment for investment has declined substantially in the past two years as global central bank rates look set to stay higher for longer, and African currencies face unprecedented volatility and weakness. In addition, rates for African lending denominated in foreign currency (compared to US 10-year bonds) have stayed close to 15-year highs[14]. However, it is also the case that the supply of finance has been too small and insufficiently concessional – African countries will be understandably hesitant to take on large amounts of expensive market-rate foreign-denominated debt – but grant funding is difficult to come by. One of the roadblocks in the negotiation over South Africa's energy transition package has been the very low proportion of grant funding on offer. Additionally, initiatives like the Green Climate Fund are under-resourced (the GCF failed to meet is US$100 billion funding target recently)[15].

Figure 1.3: Climate finance needs and current spending (US$ bn)

[13] Climate Policy Initiative, *Landscape,* 2022a
[14] Organisation for Economic Cooperation and Development, *Africa's Development Dynamics 2023: Investing in Sustainable Development* (Paris: OECD, 2023)
[15] Alkousaa, R. & Abnett, Kate, "Shortfall in climate change cash grows ahead of COP28" *Reuters,* October 5th 2023, https://www.reuters.com/business/environment/un-green-climate-fund-pledges-reach-93-bln-second-replenishment-round-2023-10-05/

Figure 1.4: Yearly climate finance needs as a proportion of GDP (%)



Certainly, the US$147 billion per year required to shift Africa's emissions profile to the more ambitious lower bound, is a substantial figure – three times the net foreign direct investment in Africa in 2022. However, it is a small proportion of African GDP – just under 6%. As Figure 1.4 shows, many African states' commitments do not require huge investments as a proportion of GDP, bar some notable outliers Ethiopia & South Africa. If we consider that reforming fossil fuel subsidies in Africa could deliver 2-4% of GDP annually in revenues[16], the scale of the funding challenge begins to look more manageable.

Putting a price on carbon emissions will also be an essential component of future emissions mitigation. The IMF's *Fiscal Monitor* notes that the inclusion of carbon pricing mechanisms can reduce the additional public debt needed to implement net zero in an example emerging market by 2050 from 40-50% of GDP using current policies, to 10-15% when including carbon pricing[17]. The first technical report of the Global Stocktake suggests that the carbon price need not even be particularly high for it to be effective: projects costing under US$20 per tonne of CO_2 mitigated could deliver emissions reductions of 25% of the 2019 level by 2030[18]. As carbon border taxes like the European Union's CBAM becoming increasingly prevalent, African countries without domestic carbon pricing will effectively be foregoing revenue to the benefit of developed markets.

Two important barriers to mobilising more resources for climate domestically emerge: the first is economic. The combination of the deterioration in public finances from Covid-19 and the ensuing demand shock, and recent food and commodity price increases, has placed substantial fiscal constraints on African states. Seven African states are already in debt distress, with a further 26 at high or moderate risk. New revenue raised by the state through debt or taxes is unlikely to be devoted to climate projects, except where they have obvious economic benefits. In addition, monetary policy has tightened globally, driving

[16] Black, Simon, Liu, Antung, Parry, Ian & Vernon, Nate. "IMF Fossil Fuel Subsidies Data: 2023 Update. IMF Working Paper" *IMF Working Paper* 23(169). 2023

[17] International Monetary Fund. *IMF Fiscal Monitor* (Washington: IMF, 2023)

[18] United Nations Framework Convention on Climate Change. *Technical dialogue of the first Global Stocktake – Synthesis Report FCCC/SB/2023/9* (New York: UNFCCC, 2023b), 18 *Note that this refers to global emissions, not solely Africa.*

borrowing costs higher for governments and corporates, and higher debt service costs are crowding out public investment spending.

The second is political, and rests on the issue of fairness. Most, not all African states have had little responsibility for the historical emissions causing climate change. For African states to bear the responsibility of financing their climate transitions alone, without contributions from those most responsible for historical emissions, will not sit well with their leaders or citizens.

Additionally, there are institutional capacity and design challenges that complicate mobilising and deploying finance. Some of them are technological: relying on renewable energy entails more complex grid management, as well as new engineering skills, which may not be available in some African states. Others have to do with policy design: South Africa's massive private investment in renewables in 2023 has only been rendered possible by the liberalisation of the energy regulation system – a change with minimal cost for the state, but which has unlocked substantial climate investment. Yet others have to do with the institutional architecture of the state, for example the ability of sub-national authorities (municipalities, provinces, agencies) to raise and spend their own capital, which is absent in many African states. Research on South Africa also suggests that an independent, impartial coordinating and planning body is pivotal to the design and implementation of climate policy[19].

For reasons both political and economic, then, there will have to be greater funding efforts from international partners. A first step should involve meeting the pledged US$100 billion annual climate finance goal established at COP15 - United Nations Biodiversity Conference prior to its revision in 2024. Given the debt distress common across Africa, new funding will have to be highly concessional, or preferably come in the form of grants. Bilateral lending aside, multilateral financial institutions will need to substantially expand their portfolio of climate-related lending, as is clearly the intention of the World Bank. Private sector companies operating in Africa should also be encouraged to invest in more bankable projects – renewable energy is key to meeting the NDC targets, and highly suited to private investment. As a principle, concessional finance should be targeted at climate spending in areas where the private sector is unlikely to invest.

Expert input suggests that crowding in private sector investment in the climate will require some work from African states[20]. While there are some existing bankable projects, much more attention will have to be paid to crafting high-quality investment plans. Addressing perceived and actual risks to investment through derisking mechanisms and positive regulatory frameworks for climate infrastructure is essential to attracting external private capital. Transition finance for polluting companies will also be key to allowing them to shift their business models away from emissions-intensive activities – these companies cannot simply be locked out of funding. Bhattacharya calls for a "new highway for private finance", unifying national, multilateral, and private actors to create investment opportunities, align regulatory systems and reduce the cost of capital through blended finance and greater risk-sharing[21]. This requires an expansion

[19] Calland, Richard. "South Africa's 'just' transition: A whole economy transformation" in *Keys to Climate Action*, edited by Amar Bhattacharya, Homi Kharas & John W. McArthur. 173-200. (Washington: Brookings, 2023)
[20] This paragraph includes contributions from expert participants in CISL's 2023 Africa Symposium
[21] Bhattacharya, Amar. "Remarks made to the Summit for a New Global Financial Pact". Paris, 22 June 2023. https://www.lse.ac.uk/granthaminstitute/news/the-paris-summit-agenda-to-deliver-on-a-new-global-financing-pact/

of investment guarantees, as well as addressing foreign exchange risk, which Persaud sees as a substantial contributor to the higher cost of capital for climate projects in emerging markets[22].

In short, there is a clear disconnect between climate ambitions at the local and international level, and the financial backing to meet them. Every actor involved is partially at fault: domestic governments should be making much greater efforts both to mobilise their own resources, and to encourage the domestic private sector, international corporations and financial institutions operating in Africa should increase their private investment where bankable projects are available, chiefly in the energy sector and international multilateral donors. States should at the very least meet their existing commitments on the volume of private finance they can provide and do so in a manner that does not further jeopardise debt sustainability on the continent.

NDC commitments: what kinds of projects, where?

The increased level of detail in recent NDCs allow for an analysis of where and how African states are intending to cut emissions. Figure 1.5 outlines the sectoral division of projects listed in NDCs, with the LULUCF sector making a far greater contribution than any other. Projects included in the LULUCF mitigation scenarios are generally reforestation projects or aimed at reducing the rate of deforestation.

The energy sector is second, delivering 14% of all mitigated emissions – projects in this sector generally involve major expansion of solar and wind energy generation, as well as greater use of biomass in electricity generation. The agriculture and waste sector is the third-most significant – these projects mostly consist of mitigating methane emissions from landfills and waste disposal, as well as shifting agricultural energy consumption towards renewable sources. Notably, emissions arising from industrial processes and transport form a relatively small component of total mitigation (although transport is often not disambiguated from the energy sector in submitted NDCs).

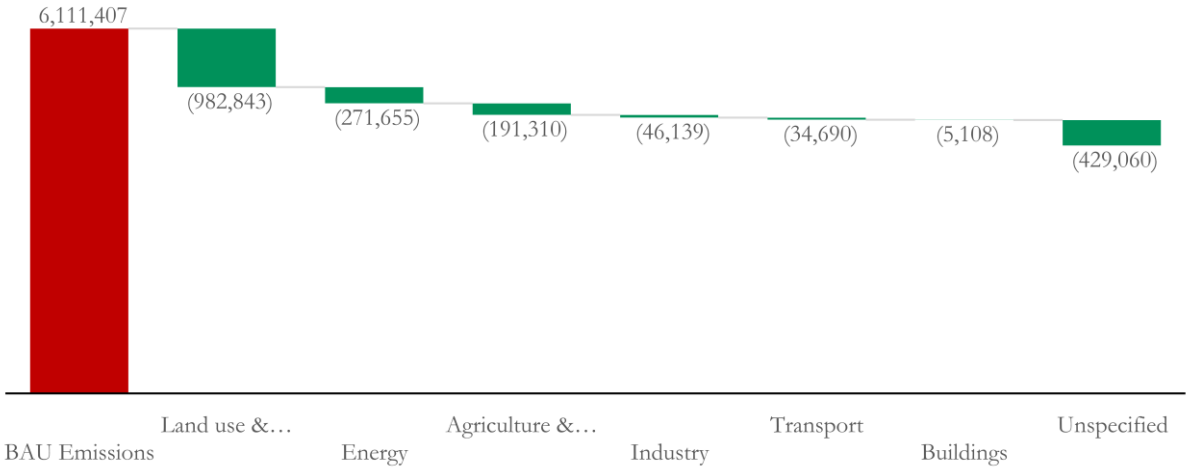
In addition, roughly a quarter of total emissions mitigation is due to come from projects not specifically outlined in NDCs, although states may have decided which sectors to mitigate, they have not included this information in their submission.

With cost and economic growth in mind, it is unsurprising that the land use sector represents such a large proportion of proposed mitigation. While the economic benefits of reforestation may be less obvious than other sectors, it is the most cost-effective way to reduce emissions and increase the absorption of CO_2, although excessive reliance for emissions reduction on a sector subject to major exogenous threats (pests, wildfires) could jeopardise the long-term viability of this strategy. While certification systems already exist, both international standardisation for the evaluation and design of LULUCF mitigation projects, and

[22] Persaud, Avinash. *Unblocking the green transformation in countries with a partial foreign exchange guarantee*. (San Francisco: CPI, 2023)

publicly available assessments of their risks and vulnerabilities by the NDCs proposing them, would improve how these projects are approached.

Figure 1.5: Mitigation targets by sector, conditional scenario ($KtCO_2e$)

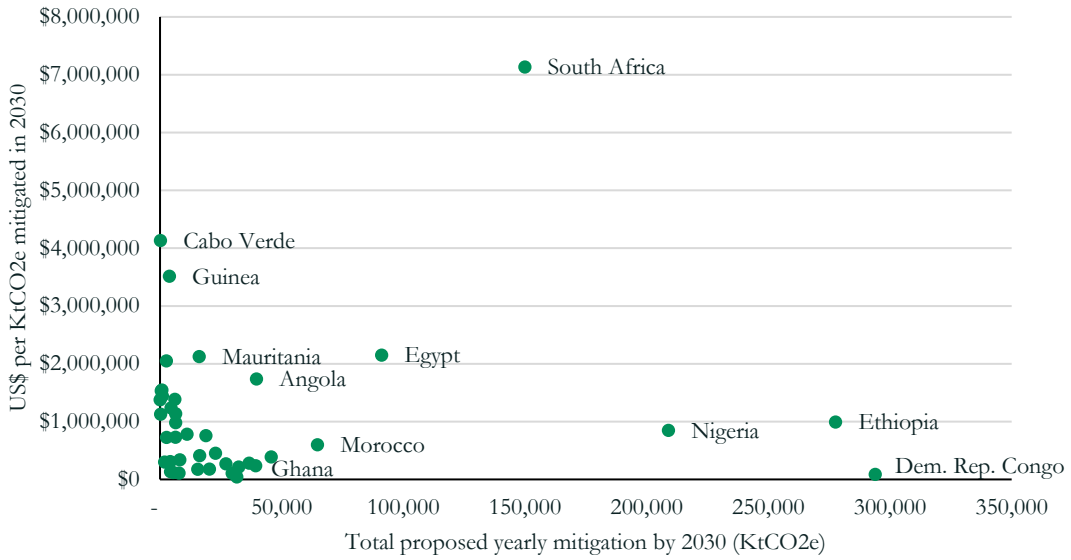


The energy sector represents a substantial opportunity for African countries to meet both their developmental goals, as well as their emissions targets. As the International Energy Agency (IEA) notes, Africa has 60% of the best solar resources in the world, but only 1% of its solar capacity[23]. 600 million Africans do not currently have access to electricity and bringing them online will require investment in both national transmission grids to carry the energy, and small-scale solar installation in isolated communities[24]. The growth and electrification of agriculture and industry will further add to this demand. This is likely to be the most capital-intensive sector for mitigation, but it is also the most attractive for private investment – in the 2010s, 40% of renewables investment in Africa came from private producers, and the quantum is likely to increase as energy markets are liberalised[25]. The AfDB estimates a total of US$40bn in investment per annum until 2030 will be necessary for a low-carbon energy system in Africa, of which the vast majority will be devoted to new solar and wind generation[26].

Figure 1.6 provides a rudimentary mechanism for evaluating the cost effectiveness of submitted NDCs, by establishing the per country cost per kilotonne of emissions mitigated in 2030. Notably, three of the largest commitments (Nigeria, Ethiopia, DRC) also come at a relatively low cost when compared with peers (South Africa has been excluded). One viable strategy for financing the transition could be to establish programmes similar to South Africa's JETP in larger economies, giving them access to long-term finance and allowing for greater economies of scale.

[23] International Energy Agency, *Africa Energy Outlook.* (Paris: IEA, 2022)
[24] International Energy Agency, 2022
[25] International Renewable Energy Agency, *Africa 2030: Roadmap for a Renwable Energy Future* (Masdar: IRENA, 2022)
[26] Multiconsult for the African Development Bank. *Roadmap to the New Deal on Energy for Africa.* 2022. https://africa-energy-portal.org/sites/default/files/2018-10/lu313516crr2.pdf

Figure 1.6: Cost of mitigation (US$/KtCO₂e)



The African climate transition is highly concentrated in three sectors: LULUCF, energy, and agriculture. There does, however, remains a large quota of unspecified emissions to be mitigated. Financing will have to respond to different incentives in each sector – whereas the energy sector presents several commercial opportunities, and could be largely privately funded, land use & forestry change does not have the same properties. Adaptation will also likely require large amounts of concessional funding, either through below-market rate loans or (preferably) grants, as it is likely to depend heavily on public investment, both outright and to derisk private sector investment.

Conclusion

African states will need to spend in the order of US$2.5 trillion by 2030 to meet their climate commitments. Emission reduction makes up close to 80% of spending, with plans for adaptation to climate change costed at US$418 billion. Of this total spending, unconditional pledges by African states – that is, the resources they intend to mobilise themselves – make up US$680 billion in spending, and roughly half of the 2GtCO_2e in emissions cuts promised. The largest emitters and economies account for the bulk of financing needs: South Africa, Egypt and Nigeria alone comprise over half of the total needs.

Delivering the more ambitious mitigation and adaptation projects will require a substantial mobilisation of both domestic and international funding. As it stands, the best available information shows total African climate finance flows at roughly US$30 billion per year in 2019/20 – insufficient to meet even the unconditional commitments. This is likely due to a combination of insufficient demand for climate projects (which speaks to the necessity of preparing an investable pipeline of projects at country level) and insufficient supply of finance, or at the least finance on the right terms. Many African states are under substantial fiscal strain, and cannot take on new market-rate, foreign denominated debt. While African states will have to increase domestic resource mobilisation for climate spending, the international funding community needs to provide far more finance, and on far more concessional terms, than at present.

The most recent round of NDCs presents a mitigation strategy that is highly dependent on land use change & forestry. LULUCF projects represent close to 1GtCO_2e (half) of total mitigation commitments. From a cost perspective, this is logical – LULUCF projects are by far the cheapest way to reduce emissions in Africa, and deliver the greatest gains. However, they do not have many developmental gains, and are unlikely to be financed through private money. By contrast, energy sector mitigation through renewables, the second biggest source of mitigation (271MtCO_2e), is both cheap (relative to other forms of new energy) and attractive to the private sector – but necessitates sufficient technological capacity to manage the grid and install generation. Energy efficiency in agriculture and better waste management form the bulk of other costed projects.

Bibliography

African Development Bank. *African Economic Outlook 2022.* Abidjan: AfDB, 2022. https://www.afdb.org/en/documents/african-economic-outlook-2022

Bhattacharya, A. 2023. "Remarks made to the Summit for a New Global Financial Pact". Paris, 22 June 2023. https://www.lse.ac.uk/granthaminstitute/news/the-paris-summit-agenda-to-deliver-on-a-new-global-financing-pact/

Black, Simon, Liu, Antung, Parry, Ian & Vernon, Nate. "IMF Fossil Fuel Subsidies Data: 2023 Update. IMF Working Paper" *IMF Working Paper* 23(169). 2023

Calland, R. "South Africa's 'Just Transition' – A Whole Energy Transformation" in *Keys to Climate Action.* Edited by A. Bhattacharya, H. Kharas & J. McArthur. 173-200. Washington: Brookings, 2023

Climate Policy Initiative. *Landscape of Climate Finance in Africa.* San Franscisco: CPI, 2022a. https://www.climatepolicyinitiative.org/wp-content/uploads/2022/09/Landscape-of-Climate-Finance-in-Africa.pdf

Climate Policy Initiative. *The State of Climate Finance in Africa: Climate Finance Needs of African Countries.* San Francisco: CPI, 2022b. https://www.climatepolicyinitiative.org/wp-content/uploads/2022/06/Climate-Finance-Needs-of-African-Countries-1.pdf

Colenbrander, Sarah *et al. The New Collective Quantified Goal and its sources of funding.* London: Overseas Development Institute (ODI), 2023

https://cdn.odi.org/media/documents/ODI_The_new_collective_quantified_goal_and_sources_of_funding.pdf

EDGAR (Emissions Database for Global Atmospheric Research). *Community GHG Database.* 2023. https://edgar.jrc.ec.europa.eu/report_2023

International Energy Agency. *Africa Energy Outlook.* Paris: IEA, 2022. https://www.iea.org/reports/africa-energy-outlook-2022

International Monetary Fund. *Fiscal Monitor: April 2023.* Washington: IMF, 2023 https://www.imf.org/en/Publications/FM/Issues/2023/04/03/fiscal-monitor-april-2023

International Renewable Energy Agency. *Africa 2030: Roadmap for a Renewable Energy Future.* Masdar: IRENA, 2022

Multiconsult for the African Development Bank. *Roadmap to the New Deal on Energy for Africa.* 2022. https://africa-energy-portal.org/sites/default/files/2018-10/lu313516crr2.pdf

National Business Initiative. *Financing South Africa's Just Transition.* 2022 *https://www.nbi.org.za/report/financing-south-africas-just-transition*

Organisation for Economic Cooperation & Development. *Africa's Development Dynamics 2023: Investing in Sustainable Development.* Paris: OECD, 2023. https://www.oecd-ilibrary.org/development/africa-s-development-dynamics-2023_3269532b-en

Persaud, A. *Unblocking the green transformation in developing countries with a partial foreign exchange guarantee.* San Franscisco: Climate Policy Initiative, 2023. https://www.climatepolicyinitiative.org/wp-content/uploads/2023/06/An-FX-Guarantee-Mechanism-for-the-Green-Transformation-in-Developing-Countries.pdf

Presidential Climate Commission. *South Africa's NDC Targets for 2025 and 2030.* Technical Report No. 2. Pretoria: PCC, 2021. https://www.climatecommission.org.za/publications/south-africas-ndc-targets-for-2025-and-2030

Alkousaa, R. & Abnett, Kate, "Shortfall in climate change cash grows ahead of COP28" *Reuters,* October 5th 2023, https://www.reuters.com/business/environment/un-green-climate-fund-pledges-reach-93-bln-second-replenishment-round-2023-10-05/

United Nations Framework Convention on Climate Change Standing Committee on Finance. *First report on the determination of the needs of developing country parties related to implementing the convention and the Paris Agreement.* Bonn: UNFCCC, 2021

https://unfccc.int/sites/default/files/resource/54307_2%20-%20UNFCCC%20First%20NDR%20technical%20report%20-%20web%20%28004%29.pdf

United Nations Framework Convention on Climate Change. *NDC Registry.* New York: UNFCCC. 2023a https://unfccc.int/NDCREG

United Nations Framework Convention on Climate Change. *Technical dialogue of the first Global Stocktake – Synthesis Report FCCC/SB/2023/9.* New York: UNFCCC, 2023b https://unfccc.int/documents/631600?gclid=Cj0KCQiA6vaqBhCbARIsACF9M6nZ80vJ0Cn1oNLJXc1KV0KKNXSs6SLlUfP4fibIPmDKmJz16XwPpUoaAjGKEALw_wcB