

# A Global Climate Alliance for Accelerated Climate Action



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**Concept and Realisation**

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# **A Global Climate Alliance for Accelerated Climate Action**

GCA Collaborative



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# Foreword

**T**he unrelenting impact of climate change poses an existential crisis for our planet. Pakistan just witnessed the worst floods in its modern history. Apart from the loss of lives and mass displacement, the receding waters also left widespread disease and destruction in their wake. The rest of the Global South also witnessed extreme weather and drastic climate events, including heatwaves in India, typhoons in the Philippines, floods in Malaysia, cyclones in southern Africa, drought in the Horn of Africa, and severe rainfall in West Africa.

Meanwhile, in the Global North, Hurricane Ian hammered Florida becoming the ‘costliest climate-induced disaster of the year’, with losses totaling over \$100 billion. Earlier in the year, Europe went through two severe heatwaves in June and July, perhaps the worst in the past half century – leading to a number of wildfires. Elsewhere, a typhoon in Japan – “one of the most powerful” storms that the country had ever seen – and sandstorms in the Middle East raged. All these climate-related events highlight the need for Global South and North countries to partner together to undertake immediate and substantial climate action.

To that end, the Global Climate Alliance (GCA) Collaborative is an independent research effort to evaluate how Global South countries can best ally with Global North countries to accelerate climate action. Over the past two years, several academic institutions and think tanks have been collaborating on these issues and pooling their individual research efforts. This report offers the Collaborative’s perspectives on how a GCA can assist the Global South’s ability to address climate change, including mitigation, adaptation, and resilience measures.

The GCA initiative builds on multiple modelling studies that indicate that net-zero is net-positive. The United Nations Environment Programme has estimated that current policies will lead to a 2.8°C increase in temperatures by 2100. Such accelerated global warming is likely to lead to disastrous economic impact around the world. On the other hand, if countries commit to the Paris Agreement’s goal of limiting temperature increases to 1.5°C, the Global South will benefit from faster GDP growth, better public health, higher job creation, and more energy security.

Accordingly, the GCA Collaborative is proposing an open and inclusive global agreement to accelerate and catalyse the Global South’s ability to undertake climate action. As GCA members, countries would:

1. commit to binding Paris Agreement-aligned transformation pathways with absolute near-term targets, both economy-wide and sectoral;
2. develop transformation roadmaps in key tradable sectors to prevent carbon leakage; and
3. implement a comprehensive climate finance package that would result in trillions of dollars of incremental climate financing from the Global North to the Global South.

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Signed,  
**Jayant Sinha**



# Executive Summary



## **Historic Highs: Unabated Climate Change**

The Paris Agreement set an ambitious target of restricting the increase in average global temperatures to 2.0°C by 2100, preferably 1.5°C. According to the Intergovernmental Panel on Climate Change (IPCC), greenhouse gases (GHG) from human activities have already resulted in about 1.1°C warming above pre-industrial levels. This global warming has triggered unrelenting climate change, leading to extreme weather events, rapid species extinction, major droughts, melting ice sheets and glaciers, unprecedented heatwaves and historic levels of flooding. Unfortunately, while countries have reiterated their decarbonisation targets, greenhouse gas emissions have continued to rise. Consequently, the United Nations Environment Programme (UNEP) is now projecting a significant rise in average global temperatures – 2.8°C by the end of the century – under current policies.



## **Reduction of GHG Emissions: Limited Impact of Previous Climate Agreements**

The United Nations Framework Convention on Climate Change (UNFCCC) processes resulted in the historic 2015 Paris Agreement. As part of this Agreement, 193 parties committed themselves to reaching the 1.5°C temperature limit, while following the principle of common but differentiated responsibilities (CBDR). However, the Paris Agreement did not provide sufficiently strong incentives for accelerated climate action, relying largely on voluntary and nationally determined commitments (NDCs). Unfortunately, NDCs have not been ambitious enough and GHG emissions have not declined as envisaged.



## **Net-zero is Net Positive: Currently Un-attainable for the Global South**

Many expert groups have conducted detailed economic modelling studies on net-zero GHG emission pathways for Global South countries. With the recent rapid reduction in the price of decarbonising technologies – such as solar and wind, electric vehicles and new sources of protein – virtually every country is considerably better off when pursuing net-zero pathways. These studies also indicate that a full economy-wide transformation will be required, with annual investment requirements in the range of 2-4% of national GDP. Such a large-scale green transformation will, in turn, increase GDP growth, create more jobs, improve air quality and public health and reinforce energy security. Thus, decarbonisation will significantly enhance the development of Global South countries.

Unfortunately, given their limited resources and fragmented financial systems, it is simply not feasible for low- and middle-income Global South countries to finance such an economy-wide transformation within the next two or three decades.

Meanwhile, even as the Global South struggles to finance mitigation measures, it is being forced to deal with the negative impact of unabated climate change. Extreme weather events such as flooding, storms and droughts require disaster management and climate insurance, along with substantial relief operations. Age-old agricultural practices must be adapted for a changing climate. Infrastructure must be made climate resilient and capable of handling greater variations in weather parameters. Power grids have to be expanded to cope with considerably higher temperatures and more-frequent heatwaves.



### **Urgently Required: A Global Climate Alliance for Accelerated Climate Action**

An open and inclusive Global Climate Alliance (GCA) needs to be established, with membership open to all countries. Such an Alliance should immediately increase decarbonisation targets for its members, with specific focus on the world's major GHG emitters. As part of the Alliance, and following the CBDR principle, Global North countries will have to bear significant accountability for providing large-scale financial and technological assistance to the Global South. The Alliance design should provide strong financial incentives for Global South and North member countries to cooperate for mutual benefit, while simultaneously preventing carbon leakage by non-members. Moreover, the Alliance should build on existing agreements toward adaptation and mitigation efforts. Finally, existing global institutions should be restructured and strengthened to deliver on the vast financing and technology flows that will be required to drive accelerated climate action.



### **A Proposed Design for the Global Climate Alliance: Two Distinct Member Groups**

The proposed GCA comprises two groups: Group A members who would commit to following net-zero pathways that lead to major GHG emission reductions starting in 2030, and to net-zero emissions by 2060 or 2070. Group B members who would commit to following net-zero pathways that lead to quantifiable and transformative results in key sectors. These could include stepping up the shares of renewable energy, public and fossil-free transport, low-carbon buildings and recycling, as well as the efficient use of materials and near-zero-emission material production.

When combined, the commitments to these decarbonisation actions will be designed to achieve major GHG reductions starting in 2025 and net-zero by 2050

or before. Since the CBDR principle is at the heart of the proposed Alliance, *Global North countries are expected to join Group B and Global South countries to join Group A*. However, all countries can pursue transformative actions based on sectoral cooperation, and both member groups will obtain and provide mutual support for such transformative activities.



### **Commitment by Global North Members: Contribute Funds to a Climate Financing Pool**

These will be administered by an existing global institution – such as the World Bank or the International Monetary Fund (IMF). Funds can be generated through various objective and well-defined methods such as carbon tax programmes, redirection of Special Drawing Rights (SDRs) or Official Development Assistance (ODA). Global South members will be the recipients of various types of financing flows and technology transfers, depending on their transformation commitments. Those Global South members committing to the more ambitious Group B transformation targets will receive significant grant capital to achieve these targets. Countries can choose to join either of the two groups – choosing the transformation pathways they would like to follow.



### **Needed: Legally-binding Commitments for Transformation Pathways**

While both groups would be required to commit to legally-binding targets, the level of commitment will differ between groups. An upfront requirement would be to commit to national decadal transformative targets and emissions reduction targets consistent with the Paris Agreement. These national commitments would need to be guaranteed through appropriate legislation passed in each member country and by establishing national emissions reduction systems.



### **Aligned Transformation: Policies for Key Tradable Sectors with Agreement on Appropriate Standards**

Countries motivated to reach climate neutrality for their core sectors – like steel, aluminium, cement, fertilisers and automotives, for example – should cooperate closely, including on reconciling transformation pathways across the GCA. It should be noted here that policy risk is one of the major concerns for climate investors, particularly in the Global South. By coordinating on joint policy initiatives, where possible, the Global South can attract significant levels of investment at a lower cost. For example, jointly-developed product standards can create market opportunities for more efficient and easily-recyclable products, based on materials from near-zero-emission production processes.

At the same time, countries could preclude the sale of products from those countries where producers fail to meet the relevant standards as a result of not

following the necessary transformation pathways. Accordingly, GCA members should collaborate on aligning policies in key tradable sectors and providing mutual support for jointly achieving the transformation pathways. The GCA will act as a forum for member countries to agree on sectoral standards. It will also provide support for national policy design and implementation – including on carbon pricing with robust carbon leakage protection, green public procurement and a sectoral policy package for transport, industry, buildings, agriculture and forestry.



### **Highly-Attractive: Financing Package for GCA Members**

Till now, the Global North has struggled to deliver on its climate finance commitments. The 2021 United Nations Climate Change Conference in Glasgow, more commonly referred to as COP26, highlighted that Global North countries were unable to provide their promised US\$100 billion per year for the Global South. Currently, various estimates indicate that Global South countries are spending around US\$400 billion per year on climate adaptation and mitigation measures. However, economic studies suggest that Global South countries will have annual climate finance requirements of more than US\$2 trillion by 2030. Much of these will have to be commercial investments to decarbonise sectors such as power, transportation, basic materials and real estate.



### **Multiple Initiatives: GCA to Address the Vast Financing Gap**

To address climate adaptation needs, the GCA is proposing substantial annual financial flows to Global South members across multiple initiatives, such as:

- [Just Energy Transition Partnerships \(JETPs\)](#), to assist Group B Global South countries to move rapidly to net-zero by 2050.
- [A Climate Innovation Foundation](#), for climate research and to fund research fellowships.
- [A Climate Resilience Fund](#), to assist in climate-related disasters and resiliency improvements.

To address climate mitigation needs, the GCA proposes the following financial standards and resources for Global South members to accelerate climate investments by institutional investors:

- [Standardised green taxonomy and reporting standards](#) to ensure global consistency and transparency for climate investments.

- **Long-term currency hedging swap lines** to be made available, as required, to swap Global South currencies into Global North currencies at fixed depreciation rates.
- **Credit guarantees** to protect against capital losses and payment risks.
- **Climate Insurance Pool** to cover catastrophic climate events.
- **Climate Fund-of-Funds** to deploy annually into Global South private equity and venture capital funds.

These initiatives will require tens of billions of dollars in annual commitments, since it is important to ensure that corporations and entrepreneurs are assured of adequate financial support. Deploying these funds in Global South countries will also increase overall commercial investments dramatically. To facilitate financial system flows from the Global North to the Global South, green-focused investment agencies, such as the Indian National Investment & Infrastructure Fund (NIIF), need to be identified in the South.



### **A Permanent GCA Secretariat: To Facilitate Implementation**

Governance and compliance support for the GCA will need to be provided by a permanent secretariat. The GCA will also have several committees, including on key sectors for policy alignment; implementation agencies to ensure monitoring, reporting and compliance; and a specific committee to facilitate the delivery of the financial package. The GCA should be initiated immediately by a core group of G20 members, with membership remaining open to all countries.

\* \* \*

The proposed GCA will be a historic, game-changing alliance. Although it builds on multiple existing climate agreements, it is designed to provide real and renewed momentum to combating climate change. It is a coalition of the willing and, hopefully all G20 countries – representing 85% of global GHG emissions – will join the Alliance. In return for binding near-term and longer-term transformation targets, GCA members from the Global South will receive a highly attractive financing package to accelerate adaptation and mitigation measures.

## CHAPTER 1

# Need for a Global Climate Alliance (GCA)

### Introduction

Over the course of the coming decades, dealing with climate change will become a key focus area for both the public and private sectors. This is gathering pace at a faster rate in the Global North, where actions against global warming are gaining public prominence. The climate change discourse in the Global South, particularly amongst the citizens, is gaining momentum. The floods and heatwaves faced by many Global South countries this year, most notably in South Asia and East Africa, have now pushed climate change matters to the top of the public agenda.



*Image 1: An Indian farmer carries wheat crop harvested from a field on the outskirts of Jammu, India. Unusually early, record-shattering heatwaves have affected agriculture. (Channi Anand/AP)*

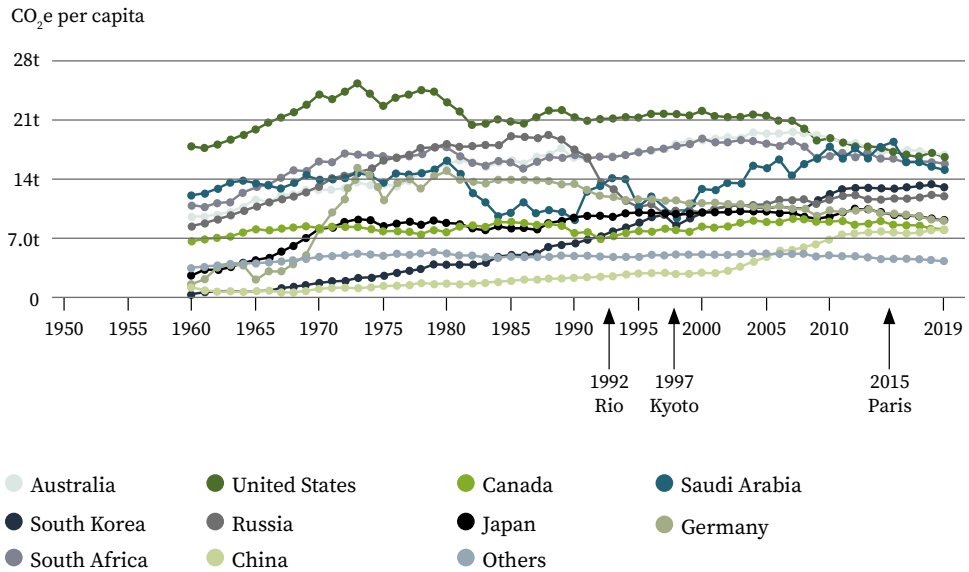
Globally, there is a consensus that previous climate agreements have not achieved their desired targets. The agreements have sought to be truly inclusive – the most recent example being the Paris Agreement with 193 parties – providing a foundation and conceptual framework to allow for transformative action. What is now required is focused action to achieve outlined targets. Taking the current baseline of climate action, it will only be possible to achieve the ambitious 1.5°C, or even the necessary 2.0°C target of the Paris Agreement, with the help of additional, focused government policies.

The global climate simulator En-ROADS<sup>1</sup> – which allows users to explore the impact of roughly 30 policies, such as electrifying transport, pricing carbon, and improving agricultural practices, on hundreds of factors like energy prices, temperature, air quality, and sea level rise – projects a 3.6°C temperature increase by 2100 if we continue to move as we are doing now. Similarly, the United Nations Framework Convention on Climate Change (UNFCCC) is now projecting a significant rise in average global temperatures (2.8°C by end of the century, based on current NDCs submitted).

Global climate action is required now to achieve the critical target of 2°C by 2100. To facilitate this, international organisations, such as the United Nations under UNFCCC, have been a forum for multiple climate discussions – resulting in the landmark agreements of Rio (1992), Kyoto (1997), and Paris (2015). Charts number 1, 2 and 3 show the per capita and absolute CO<sub>2</sub> emissions reductions over the past seven decades. In both scenarios, it is clear that the reductions were almost negligible for developed countries following both Rio and Kyoto. They were negative for developing countries, which continued to increase their emissions. For developed countries, the emissions reduction following Paris is only slightly higher, but remains slow.

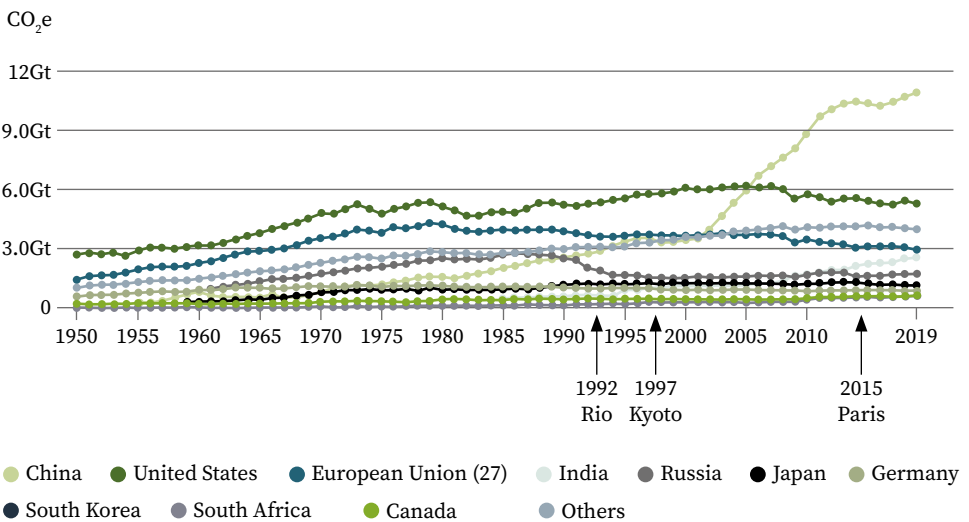
There are suggestions that the agreements under UNFCCC did not provide adequate incentives or opportunities for developing countries to reduce their emissions more rapidly. Over the years, the contribution of developing countries to total emissions has only increased, with per capita emissions and absolute emissions also reflecting this fact.

## Chart 1: Historical Per-Capita CO2 Emissions



Source: Gütschow, J.; Günther, A.; Pflüger, M. (2021): The PRIMAP-hist national historical emissions time series v2.3.1 (1850-2019) [G20 CO<sub>2</sub> per capita emissions excluding LULUCF]

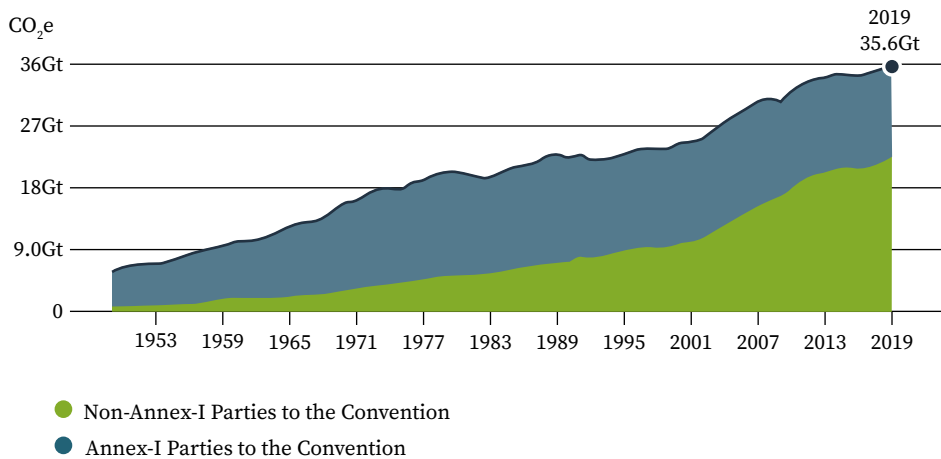
## Chart 2: Total Historical CO2 Emissions



Source: Gütschow, J.; Günther, A.; Pflüger, M. (2021): The PRIMAP-hist national historical emissions time series v2.3.1 (1850-2019) [total G20 CO<sub>2</sub> emissions excluding LULUCF]



### Chart 3: Historical CO2 Emissions: Developed vs Developing Countries



Source: Gütschow, J.; Günther, A.; Pflüger, M. (2021): *The PRIMAP-hist national historical emissions time series v2.3.1 (1850-2019) [CO<sub>2</sub> contributions of Annex I and Non-Annex I Parties]*

### Elements of the Global Climate Alliance

The GCA effort builds on the German G7 proposal of 2022 of an International Climate Club. The GCA has three major aspects: membership, incentives, and compliance. Each aspect has its own elements that together define the GCA in its entirety. They are as follows:

- **Targets:** Nationally Determined Contributions (NDCs). These include overall long-term climate targets, in line with the 1.5°C end-of-century target and sector-wise decadal transformation pathways.
- **Commitments:** Countries to enact domestic laws or policies in order to achieve the transformation pathways.
- **Common but Differentiated Responsibilities (CBDR):** They represent principles of equity, to be fulfilled through climate finance and technology support from the Global North to the Global South.
- **Financial and Technology Flows:** Instruments for implementing CBDR principles to assist transformation in the Global South.
- **Policy Cooperation:** Transformation pathways concentrating on specific high-emissions sectors, focusing on mitigation, adaptation and capacity building.
- **Funding Sources:** Dedicated climate finance pool raised from Global North countries, through various mechanisms such as a global carbon

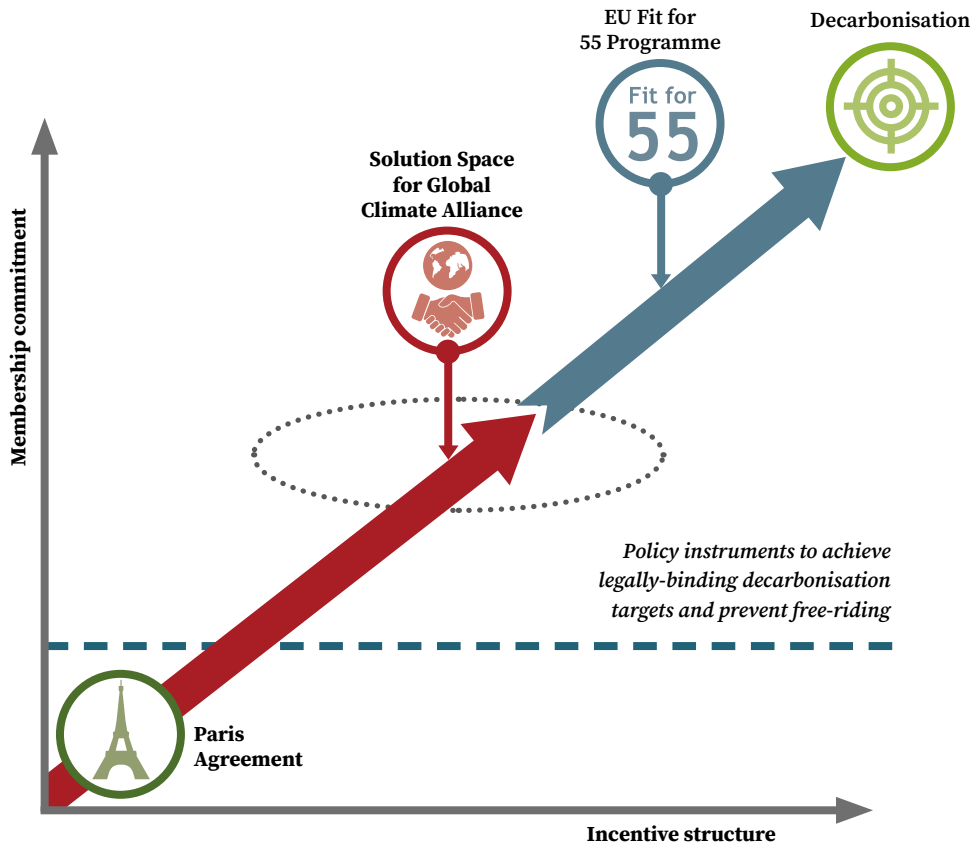
incentive programme, SDR pooling, multilateral development banks (MDBs) contributions, and ODA.

- **Climate Financing System:** Enhanced role for MDBs and private financing institutions (PFIs) in financing adaptation and mitigation measures.
- **Dedicated Funds:** Multiple climate funds to be established and scaled up to support climate solutions in Global South countries. These include Just Energy Transition Partnerships, Climate Innovation Fund, resiliency funds, long-term currency hedging instruments, credit guarantees, insurance pools, and climate fund-of-funds for various regions.
- **Monitoring, Reporting and Compliance:** Effective reporting processes to provide transparency for cooperation mechanisms, to allow for mutual learning and enhancing compliance.
- **Governance:** Translating political commitments by heads of state and countries into processes, with regional and sectoral structures capable of delivering, reviewing and refining the transformative mechanisms, policies and financing tools.

### **Towards Creating a Solution Space for GCA**

While considering the most appropriate framework for the GCA, we have understood that the level of commitment from its membership is directly related to the incentives available. The greater the incentives for a country to remain committed to the agreement, the stronger that commitment would be, and vice versa. The Paris Agreement represents a low in the commitment-incentive function, whereas the EU is extremely high. The GCA lies in the space between these two, where commitments are realistically high and so are the incentives. Green financing will drive green transitions, while incentives will drive commitments.

## Illustration 1: Solution Space for Global Climate Alliance



Source: As conceptualised and created by the authors

## CHAPTER 2

# Becoming a Member

**A**s a global challenge, climate change needs a global response, enhanced collaboration and actions that take the different needs and challenges faced by countries around the globe into account.

Reflecting the systemic approach that is required for tackling the climate change challenge, the GCA – with its structure and institutional framework – should mainly act as an enabler. It should have a strong focus on strengthening cooperation at the sectoral level, bringing all key actors, including policy makers – to sit at the same table. Together, they should cocreate and shape their transformation pathways toward net-zero.

In this way, countries entering the GCA would become part of a staged membership model, which reflects member countries' needs and challenges, their level of ambition and commitments – while setting goals, especially for decadal targets and the target-year for reaching net-zero.

The GCA aims to become an inclusive and open alliance for all countries, with differentiated membership criteria. Such an Alliance should immediately raise transformational targets for its members, focusing on the world's major GHG emitters. As part of the Alliance, and following the CBDR principle, Global North countries will have significant accountability for providing large-scale financial and technological assistance to the Global South. The Alliance design should provide strong financial incentives for Global South and North member-countries to cooperate for mutual benefit, while simultaneously preventing carbon leakage by non-members.

### Minimum Requirements for a Country to Join the GCA

1. Statutory/legally-binding, Paris Agreement-aligned<sup>2</sup>, economy-wide, GHG emissions reduction targets – starting in 2030 for Group A or 2025 for Group B. Decadal commitments to GHG emissions reduction that are based on either a statutory net-zero goal, or a fair-share estimation based on global carbon budget – both consistent with the 1.5°C goal.
2. Detailed and evidence-backed sectoral transformation plans, in line with their decadal commitments.

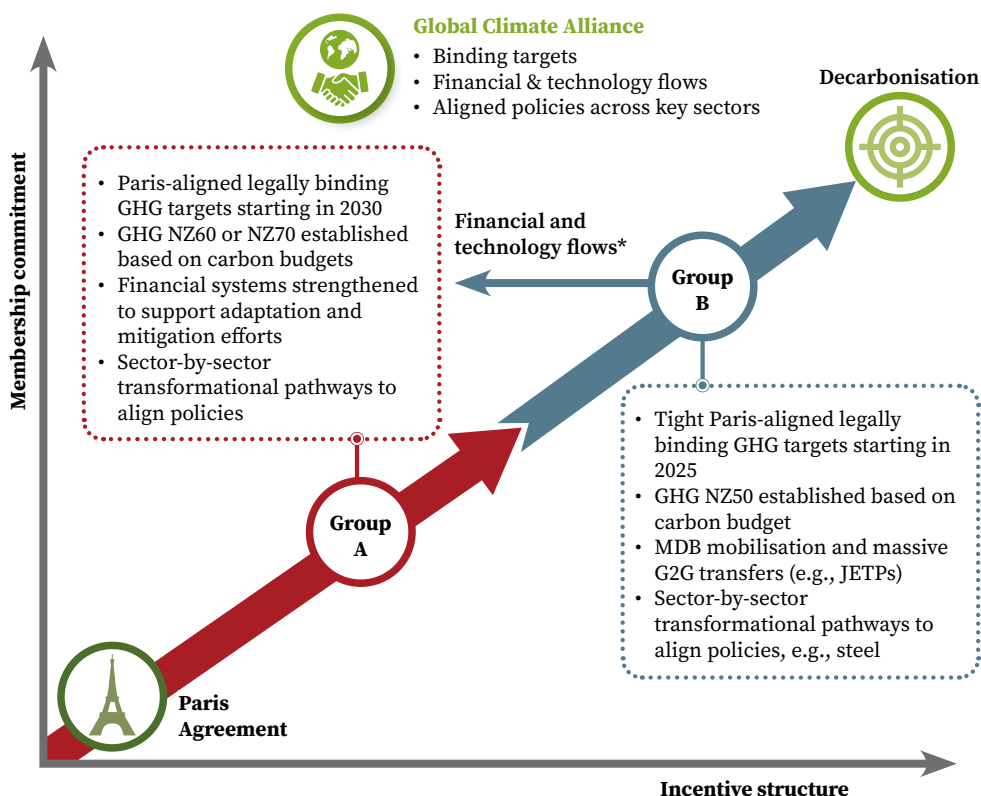
**To recap, the proposed GCA comprises two groups:**

**Group A** members would commit to following net-zero pathways leading to major GHG emission reductions by 2030 and then net-zero emissions by 2060 or 2070.

Group B members would commit to following net-zero pathways leading to quantified transformative results in key sectors. These could include the shares of renewable energy, public and fossil-free transport, low-carbon buildings and recycling, as well as the efficient use of materials and near-zero-emission material production. Combined together, the commitments to these decarbonisation actions will be designed to achieve major GHG reductions by 2030 and net-zero by 2050 or earlier.

Since the CBDR principle is at the heart of the proposed Alliance, Global North countries are expected to join Group B and Global South countries to join Group A. However, all countries can pursue transformative actions based on sectoral cooperation, while obtaining and providing mutual support for such transformative activities.

## Illustration 2: Proposed CBDR-Based Global Climate Alliance Framework



Members (such as EU countries) are free to implement carbon border adjustment mechanisms, but it is not required at GCA level. Members can also implement decarbonisation standards for key tradable sectors

\* Developing countries in Group B will also be entitled to the same financial flows as Group A developing countries/least-developed countries (LDCs). NZ stands for net-zero.

Source: As conceptualised by the authors

## Adjunct Members

Key actors who will shape the required transformation pathways, including already existing sectoral alliances. Such a GCA multi stakeholder fora would include:

- Policy makers
- Funders and investors
- Civil society organisations (CSOs)
- Industry and businesses, clustered per sector
- Capacity-building institutions
- Existing alliances, such as the International Energy Alliance (IEA), the Global Energy Alliance for People and Planet (GEAPP), the European Tech Alliance, the Global Carbon Alliance, among others.

**The GCA can support member countries in achieving their targets in two ways:**

1. Through policy and analytical modelling support on their sectoral transformation pathways; and
2. Through unlocking the investments and financing required to make such a transformation happen.

**The GCA aims to support countries to:**

### **1. Reach the larger goal – the 1.5°C of the Paris Agreement**

A large emissions gap remains between what is needed for 1.5°C and current NDCs, which are projected to lead to a temperature increase of 2.8°C by the end of the century. In its latest report, the IPCC found that to keep the 1.5°C goal alive, global emissions need to be cut by 43% below 2019 levels by 2030. This requires governments to present and set more ambitious targets. Under the GCA, members would be required to ensure that the targets are in line with the overall targets of the GCA.

### **2. Meet implementation needs – and unlock investments and financing**

Accelerated financial support from developed countries is a critical enabler for enhancing mitigation action in many developing countries and addressing inequities in access to finance, including the cost of finance, financial conditions and applicable terms. The GCA seeks to address the financing challenge by proposing substantial financial commitments through multiple initiatives. Additionally, it proposes several financial standards and resources for the Global South member-countries, in order to increase investments by institutional investors. A detailed proposal can be found in this report.

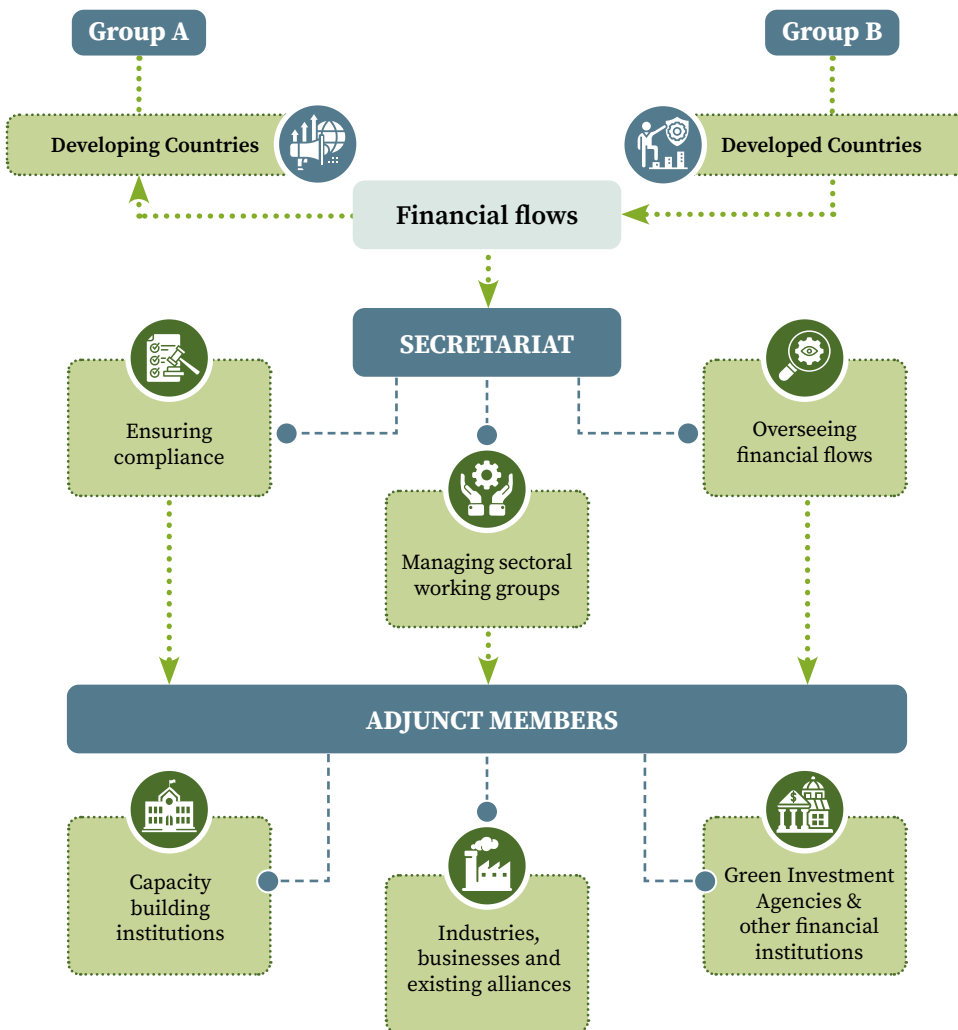
### **3. Connect key actors**

Countries themselves know which sectors are crucial for them. They also know which sectors need to pursue a transformation pathway or accelerate innovation and/or scale up innovative solutions and targets. Any measures here

need to be coordinated if they are to unlock long-term private / public strategic investments. The GCA should also support countries on those transformation pathways through analytical modelling.

Together, these will help identify what a multilateral or bilateral collaboration requires to accelerate and reach set targets, and how the GCA architecture should be set in order to assist countries and politicians in making tough decisions. Reaching goals requires strong and close cooperation, seeing the bigger picture and creating new, sustainable trade. With its sector-by-sector, step-by-step approach, the GCA should not act as a platform for signing any global GCA treaty; rather, it should be an enabler for countries to sign long-term, bilateral treaties.

### Illustration 3: Proposed Membership Structure



Source: As conceptualised by the authors

## CHAPTER 3

# Driving Transformation Pathways

An alliance is similar to a club: you pay a fee in return for enjoying the benefits of membership. However, unlike a traditional climate club, the GCA does not stress on an ‘international target carbon price’ or ‘penalties for non-participants’.<sup>3</sup> Instead, under the GCA, Global South members get guaranteed access to financial and technology flows. Meanwhile, it also needs a commitment to economy-wide GHG emission reduction targets. Relevant sectoral mandates – industrial standards, for example – act as the membership ‘fee’.

The Alliance is based on a model of positive incentives and cooperation.

### Principles of Policy Arrangements

Operationalising an alliance is guided by principles, and CBDR serves as the core principle for this Alliance. To achieve the Paris Agreement targets, the Alliance needs to ‘accelerate action’, balancing the act of ‘fostering sectoral alignment’ while ‘managing policy diversity’.<sup>4</sup> As the transformation pathways will vary among countries, flexibility in achieving the commitments underpin the recommendations here.

The statutory decadal commitments underpinning the Alliance reflect the agenda of accelerating action. Similarly, the policy arrangements do not specify what instruments the country should deploy to meet their commitments, be it command-and-control regulations or pricing. The arrangements also do not recommend the policies of Alliance members; they are free to choose the policy mix that works best under their domestic conditions. Instead, the Alliance identifies transformational, sectoral pathways that provide the requisite space and flexibility for aligning policies and standards.

### Commitments Under the GCA

Countries will need to commit to:

1. Statutory/legally binding, Paris Agreement-aligned<sup>5</sup>, economy-wide, GHG emissions reduction targets. The targets should be absolute greenhouse gas emission reduction, for example, “X” MtCO<sub>2</sub>e.



2. Long term net-zero targets, consistent with the 1.5°C goal.
3. Submitting detailed and evidence-backed sectoral transformation plans in line with their decadal commitments, with the GCA Secretariat to assist in analytical work.

## Illustrative Sectoral Transformation Pathways

While countries chart their own transformation pathways, under the Alliance, the focus will be on identifying sectoral transformational targets and then, working sector-by-sector to achieve GHG neutrality. These transformation pathways for key IPCC sectors will be aligned through deep collaboration via sectoral working groups under the Alliance. A case study outlining how such an arrangement can be implemented in the steel sector is discussed in the following chapter. In line with CBDR, sectoral targets will be consistent with the country's decadal / net-zero commitments. Countries will work on their sectors of choice – those where they can maximise emissions reductions given their capabilities and commitments.

In the following section, we outline some sectoral targets that could comprise a country's policy mix<sup>6</sup>.

1. **Industrial Emissions Policy:** Committing to industrial standards and targets in line with their net-zero/decadal targets. These could cover the share of climate-neutral (near-zero emission) technologies – such as carbon capture, utilisation and storage (CCUS) and hydrogen-based – in the primary production process as well as other material efficiency and recycling targets. This would initially cover five major industry sectors; iron and steel; cement; chemicals and petrochemicals; aluminium; and pulp and paper.<sup>7</sup> The deadline for adopting the standards may be extended based on the net-zero target of a country. Collaboration will be on an industry-by-industry basis.
2. **Low-carbon Energy Mix:** Plan B member-countries could commit to a target of a total consumption energy mix made up of x% of low-carbon sources by 2030. Such a measure, primarily aimed at the power sector, would be transformational in removing dependency on fossil fuels. Alternatively, a member committing to Plan A may commit to this renewable energy target mix by 2040, or to having renewable energy sources comprise y% of the mix by 2030.
3. **Energy Efficiency Measures:** Members may commit to improving the energy intensity of GDP by x% annually or to reducing energy consumption by y% annually. This could either be through energy efficiency measures or by reducing consumption. This sectoral target would translate, on-the-ground, to energy efficient buildings and appliances.

4. **Increased Share of Public Transport:** Countries could increase the share of public transport and rail-/water-based freight transport, in order to limit the carbon emissions from investing in, and operating, individual mobility and road-based freight transport.
5. **Zero-emission Vehicles:** In line with their net-zero targets, all new vehicles entering the market in GCA member-countries could be zero-emission, and emissions from old vehicles measured as “gCO<sub>2</sub>/km” should be progressively reduced to meet this goal.

For sectors where a transformational sector target is not viable, countries may work on an emissions reduction target instead, aligning their targets based on their decadal commitments. These could include:

6. **Non-industrial Emissions Policy:** Small, non-industrial sectors such as agriculture, small industries and waste, taken as a whole, could commit to reducing GHG emissions by x%, in line with their net-zero targets.
7. **No-debit Rule for LULUCF Sector:** Similarly, in the Land Use, Land Use Change and Forestry (LULUCF) sector - a net absorber of emissions - GCA member-countries could adhere to the ‘no-debit’ rule instead. GHG emissions from the sector will have to be compensated for with an equal amount of emissions removal. Any additional removal would then count toward the relaxation of other policies in the mix.

### **Co-Benefits of Aligning Targets**

A co-benefit of working sector-by-sector would be the alignment of standards in areas where it is mutually beneficial to do so, at a minimal additional cost.

“The justification for harmonisation is that eliminating regulatory differences among nations reduces the transaction costs associated with doing business across borders”.<sup>8</sup> Rodrik (2018)

Aligning standards provides ‘policy certainty’ to markets, allowing them to eliminate that risk from their cost calculations. The benefits will spill over to trade and investments in GCA member-countries, particularly in the tradables sector.

As an illustration, members could harmonise energy-efficiency standards for appliances. This is already happening in many parts of the world. A report from the World Energy Council (WEC) reads, “Labelling programmes introduced in developing countries are based on the experience of OECD countries and use models that have already been proven: the European label has been used as a model in Brazil, Tunisia, China, and Iran...” Likewise, mutual recognition of

tests could be a co-benefit for both trade and the environment, and could also be extended to battery standards for electric vehicles (EVs).

In conclusion, cooperation on sectoral transformation pathways anchored in strict emissions reduction commitments provides a better way for countries to cooperate and still accelerate climate action. The approach is fundamentally different from 'climate clubs', and provides a 'win-win-win' solution for the climate, countries, and markets instead.

## CHAPTER 4

# Sectoral Transformations: Steel Case Study

### Insights on the European Steel Sector

European steel production is currently an average of 153 million tonnes (2021) or about 8% of global steel production, but a much smaller contributor to the sector's global emissions at about 5% (as global steel emissions are 3.7 Gt CO<sub>2</sub> and EU steel emissions – 0.2 Gt CO<sub>2</sub>). Under the EU Green Deal and the FitFor55 policy package, the steel sector is expected to deliver a 55% emissions reduction by 2030 as compared to 1990 levels, and achieve net-zero by 2050.

The main transition pathways being adopted in Europe are (i) the circular economy with scrap used for 56% of total production, (ii) smart carbon usage through the integration of carbon capture and re-use (CCU) or storage (CCS), and (iii) carbon direct avoidance (CDA).

To deliver the full transition by 2050, total costs of production will rise by 35-100% per tonne of steel as a result of the costs of using new technologies and more energy. Funding support of upto €60 billion will be needed. Additional energy requirements will be about 400TWh of CO<sub>2</sub>-free electricity in 2050 – about seven times what the sector purchases currently. An international level playing-field for competition is crucial.

### Insights on the Indian Steel Sector

The current Indian steel production is 118 million tons, or about 6% of global production. The National Steel Policy adopted in 2017 sets a production target of 300 million tons by 2030. At the same time, per capita consumption of steel in India remains low. Of current capacity, blast furnace is 45% and is the focus of expansion, while electric arc processes are 25% of current capacity, and industrial furnaces are 30%.

India's steel decarbonisation roadmap has several phases: (i) until 2030, work on efficiency targeting an emissions intensity reduction of 20%, (ii) from 2030 to 2040, adopt new technologies and phase-out old plants, targeting an emissions intensity reduction of 40%, and (iii) achieve full decarbonisation from 2040 onwards by adopting climate-neutral technologies.

Indian steel producers are testing CCS in their pilot projects. Some production sites will also increase the share of renewable energy in their power consumption. However, the lack of a clear global definition for low-carbon steel, and the absence of supportive policy instruments are barriers. To deliver the full transition, power system investments to generate abundant CO<sub>2</sub>-free renewable electricity will be crucial, as this will also play a key role in driving green hydrogen-based technologies.

**D**ifferent sectors need specific action and support to achieve transitions in line with climate targets. The challenges are particularly high in globally-traded, hard-to-abate industrial sectors in which competition is acute. For this reason, the steel sector is a key case study for implementing the GCA via a deep collaboration process. Steel production contributes around 10% of global CO<sub>2</sub> emissions.

This chapter outlines findings from an initial set of working group discussions with steel sector representatives and policymakers from India and the European Union. The key results of the working group discussions include:

- Emphasis on the importance of identifying **ambitious and transparent transition pathways** – including establishing a standardised definition of low-carbon steel and the target share of primary low-carbon steel production and steel recycling – while recognising differentiated rates of change in the short-term for the global North and the global South;
- The importance of **credible and effective policies in national markets**, including both price-based and non-price-based climate change mitigation instruments; and
- A key role for **international climate cooperation and partnerships that can address financing challenges** to transform industries – through investments into new technologies and technology research and development, including in carbon capture and storage (CCS) and green hydrogen.

### **Ambitious and Transparent Transition Pathways**

The pathways to address the carbon emissions of steel by 2025/2030 will need to combine at least three levers:

1. **Replacing/upgrading small-scale and extremely inefficient plants** would quickly reduce emissions. Small-scale plants are currently responsible for 30% of Indian production. However, due to links to small and medium enterprises (SMEs) and local communities, this would require a clear transition strategy for funding modernisation and developing alternative economic opportunities.

2. **Increasing the share of recycled scrap reused in steel production** would reduce carbon intensity, as scrap-based steel making only requires a fraction of the energy and carbon emissions of primary production. However, although the EU, the USA and, to some extent, China, have significant sources for scrap available due to their historic steel use, it is less available in India - currently less than half of what is available in the EU, USA, and China.
3. **Shifting to near-climate-neutral steel production processes** is key to achieving climate neutrality. In the short term, this is more challenging than the other two options due to the higher costs of these technologies.

In the initial years, investments in new blast furnaces (BF) can also reduce the average carbon intensity of steel production, but this will also increase overall emission levels, and risk lock-in effects. Hence, it should not be subject to policy support measures. They should, instead, be targeted towards (i) increasing the share of near climate-neutral steel, and (ii) reducing the share of very inefficient – small-scale plants, for example - primary production capacity.

Therefore, these two effects are the priorities for policy support measures. Policies supporting these changes would not only ensure that desired carbon emissions reductions are achieved, but could also contribute to the modernisation of the industry, and reduce local environmental impacts. Focusing on international commitments and metrics on these two developments might also be warranted.

## Key National Policies

A portfolio of policy instruments will be required to enable steel companies and consumers to shift to near-climate-neutral production processes, enhance the share and quality of recycling, and enhance material efficiency. When choosing policy interventions, countries may want to consider opportunities for cooperation by aligning instruments or working together on effective implementation as part of sectoral cooperation under the Global Climate Alliance.

1. **Carbon pricing** is designed to ensure that consumers pay for incremental carbon costs and, as a result, are also prepared to pay alternatively for the incremental costs of clean processes. However, a carbon pricing mechanism will only be effective if carbon leakage concerns are addressed. Ensuring effective carbon pricing while avoiding carbon leakage risks can be achieved by:
  - A mandatory carbon tax or an emissions trading system (ETS) with full auctioning, combined with an effective carbon border mechanism; and
  - A tax or ETS system with rebates at the benchmark of the best available technology, in combination with a climate contribution, levied on all domestic and imported materials and waived on exports (the standard WTO-approved border adjustments).

2. **Green public procurement rules** can create lead markets for green steel by requiring the use of climate-neutral materials. However, different designs of green public procurement rules will have different results. With a limited fraction of the overall demand, climate-neutral public procurement may trigger a resource shuffling to allocate steel scrap-based production towards publicly-procured projects, like construction. This would ensure the usage of steel scrap to meet requirements, rather than allocate scarce scrap to all BF processes, where a 20% scrap share enhances energy efficiency. Alternately, green public procurement could also be designed to encourage a reduction in the volume of high-carbon or high-energy footprint materials used with steel, cement, or plastics. This is to encourage supply chains, especially in construction, to collaborate to unlock material-saving potential.
3. **Carbon Contracts for Difference (CCfDs)** can be issued by governments while investing to cover incremental production costs and/or in the operation of near-climate-neutral production processes, as well as providing insurance investors against uncertainties from future policy developments in green technologies.
4. **Enabling environment**, including near-climate-neutral production processes; renewables at large-scale and competitive costs; and both policies and infrastructure for enhanced recycling and material efficiency.

## **International Climate Cooperation and Partnerships**

The high cost of capital for new technology investment is a crucial barrier to transition. Carbon border measures, as discussed above, will not impact inefficient plants from which steel is unlikely to be exported. Therefore, international financing solutions to reduce the cost of capital are a top priority.

1. **International financial support** could be provided through a variety of mechanisms to support countries or companies to make the transition to a near-climate-neutral steel sector.
2. **Concessional finance and risk-sharing instruments** can, in principle, be made directly available to companies. To ensure alignment with the climate objective, access to this finance would need to be restricted to only some qualified projects that commit to disclosure.
3. **International Carbon Contracts for Difference** could potentially be jointly designed by a Global South host country, with the support of a Global North country or an International Financial Institution. Sharing risk and costs in this way would allow the public partners to provide an attractive and credible investment framework for near-climate-neutral production processes.
4. **An enabling environment that includes** financial commitments will only be feasible in the context of ambitious and transparent commitments and credible national policy frameworks. Alignment of partner countries' steel sector roadmaps and implementation of suitable policies would likely help facilitate financing.

## CHAPTER 5

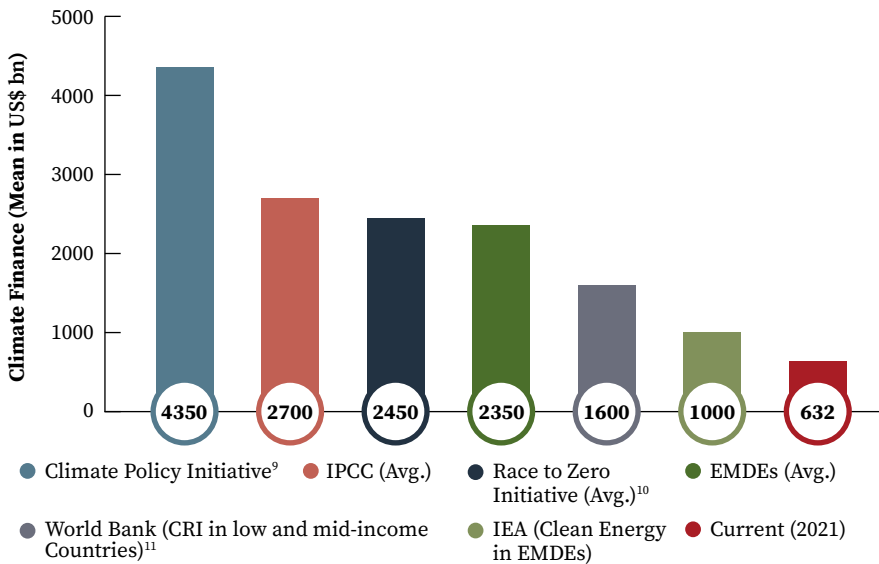
# Adaptation and Mitigation Financing Solutions

“India expects developed countries to provide climate finance of US\$1 trillion at the earliest...I consider it my duty to raise the voice of developing countries.”

PRIME MINISTER OF INDIA,  
NARENDRA MODI, AT COP26, 2021

The Indian Prime Minister's above statement reflects the trillions of dollars of climate finance that the Global South immediately needs to achieve the Paris Agreement targets.

**Chart 4: Climate Finance Requirement in 2030**

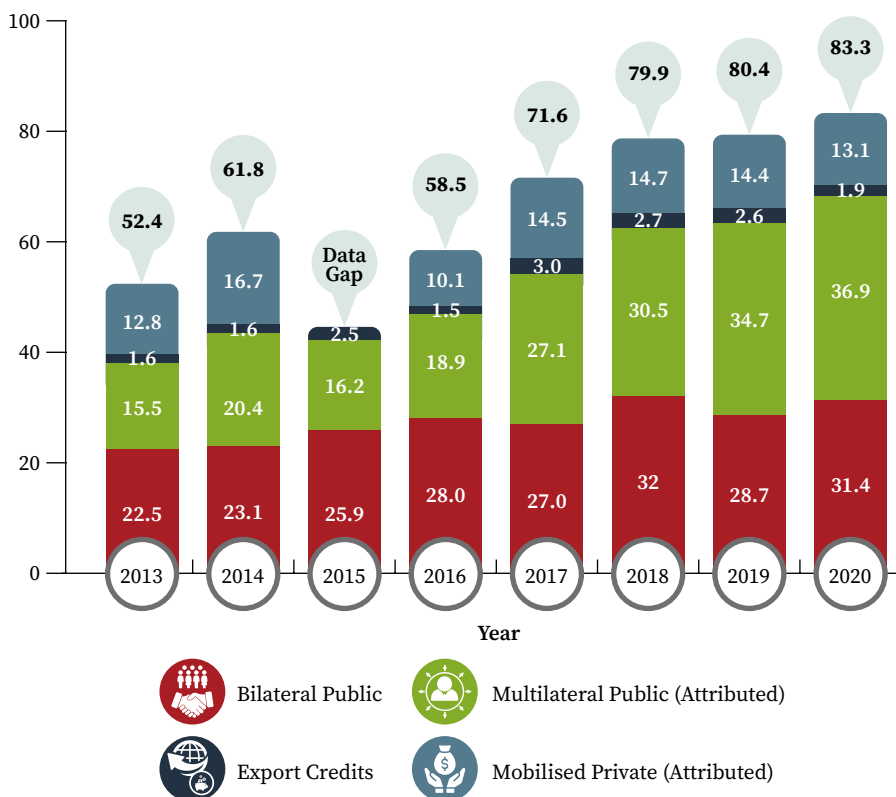


Source: Different Reports from the respective, above mentioned Institutions



Studies in both private and public institutions echo the same message – climate investments need to be scaled to the trillions of dollars, rather than the billions that were pledged and are currently flowing. Janet Yellen, US Treasury Secretary, has also acknowledged that “while wealthy countries have promised billions of dollars to tackle climate change, the real cost is in the trillions”.<sup>12</sup> According to a news article in *Nature*, “Compared with the investment required to avoid dangerous levels of climate change, the US\$100 billion pledge is minuscule.”<sup>13</sup> Even with the US\$100 billion pledge, data from the OECD shows that just US\$83.3 billion of climate finance from developed nations to developing countries was actually mobilised and provided during 2020.

**Chart 5: Climate Finance Provided and Mobilised in US\$ Billion (2013-20)**



Source: *Aggregate trends of Climate Finance Provided and Mobilised by Developed Countries, OECD (2022)*

Currently, climate-related investments in emerging economies are critically insufficient, in relation to the trillion-dollar targets. In 2021, emerging economies invested only around US\$380 billion in energy transition sectors such as renewable energy, electrified transport, hydrogen and sustainable materials, among others.

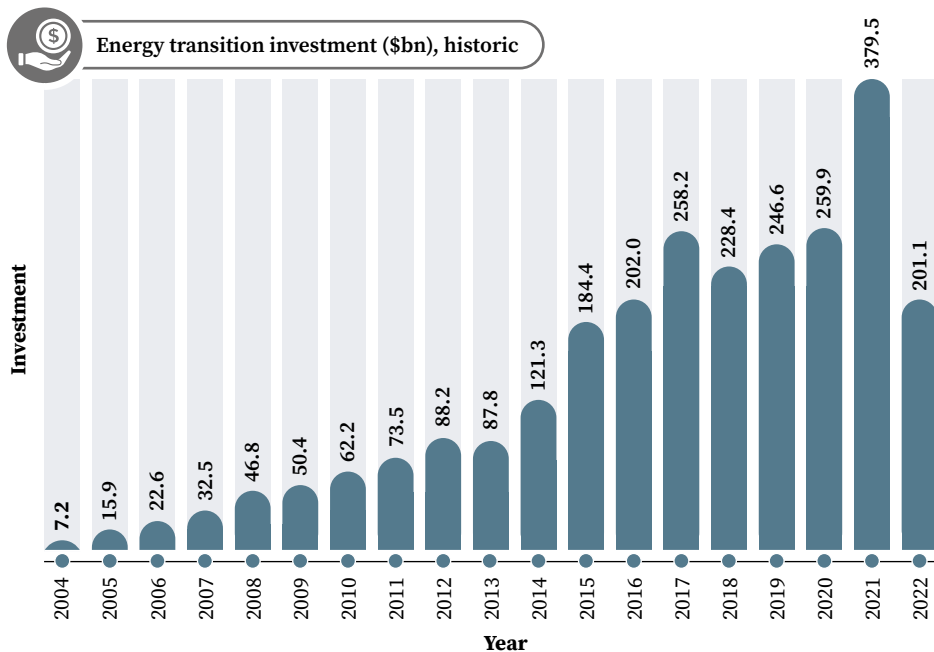
According to the US-based independent non-profit research group, Climate Policy Initiative, Africa accounted for just 5.5% of global climate investments. Three-quarters of global climate investments were concentrated in East Asia and the Pacific, Western Europe and North America, while the remaining regions received less than a quarter. Moreover, in 2021, about 90% of global climate finance was directed toward mitigation.

The Global South needs support for scaling climate finance across both mitigation and adaptation to ramp up climate action to Paris Agreement levels. The bulk of this expected investment will have to be market-driven since key economic sectors such as power, transportation, industries, real estate, and mining must switch over to climate-neutral technologies. However, the Global South neither has sufficient investable capital nor sufficient financing capabilities to achieve this rapid transformation. In fact, market forces are grossly inadequate for addressing the climate finance challenge. The global financial system will have to be reengineered to mobilise sufficient movement of capital for adaptation and mitigation needs, from the Global North to the Global South.

### GCA to Deliver Climate Adaptation Funds

Climate finance for adaptation will have to largely be grant money or government-to-government (G2G) transfers, through specifically targeted funds. As of 2020,

**Chart 6: Energy Transition Investment in Emerging Market Economies (US\$ Billion)**



Source: Bloomberg NEF Portal

around US\$30 billion of climate finance provided by the Global North went toward adaptation activities, whereas the annual requirement in 2030 is estimated to be around US\$160-340 billion, an increase on the earlier estimate of US\$140-300 billion.<sup>14</sup>

The London-based International Institute for Environment and Development (IIED) has reported that the UN's 46 'least-developed countries' (LDCs) received only US\$5.9 billion in adaptation projects between 2014-18.<sup>15</sup> The underperformance of adaptation funding calls for specifically-targeted funds built on models that have worked so far.

Global South countries under the GCA could benefit from [Just Energy Transition Partnerships](#), modelled along the lines of the one in South Africa. More recently, the G7 under the German presidency affirmed their intent to work on the JETPs with partner countries such as Indonesia, India, Vietnam, and Senegal. These programmes could be targeted at Global South countries willing to join as Group B members in the GCA, for taking on more demanding transformation targets.

The JETPs would fund actions such as prematurely decommissioning coal-fired power plants. Plans for decommissioning coal plants, for instance, would also need to help upskill the children of plant employees and relocate existing employees to other sectors. As needs for decarbonisation vary between countries, the JETPs must be country-led and country-owned. Substantial grant money from GCA resources, as well as concessional loans based on commitments from countries, could be provided annually. The GCA Secretariat can assist development of the JETPs and monitor their implementation.

[A Climate Innovation Foundation](#) to strengthen research capabilities for climate change solutions – both for adaptation and mitigation – has also been proposed. Universities and research institutions within the GCA can apply for climate research funds to set up research studies and labs. The GCA would award multi-year research grants to understand climate adaptation challenges and solutions. Finally, to sustain such research, the GCA would establish a prestigious Research Fellows programme to fund two-year research programmes at selected leading institutions.

[A Climate Resilience Fund](#) can help countries face and respond to climate disasters. The Africa Adaptation Acceleration Programme (AAAP) offers a template for this. A large proportion of these funds would be devoted to developing climate resilient infrastructure in those countries that lose millions of dollars to power outages caused by extreme rains, drought-induced power shortages and transport disruptions due to flooding. The New Delhi-headquartered Coalition for Disaster-Resilient Infrastructure (CDRI) has estimated that around 66% of public sector losses in recent climate-related disasters are related to infrastructure damage.<sup>16</sup> Building resilient infrastructure also generates high social returns.<sup>17</sup> The rapid deployment of this fund – via existing agencies such as United Nations High

Commissioner for Refugees (UNHCR), Doctors without Borders and existing Disaster Management Authorities in each country – would significantly improve climate response. Finally, providing these funds through the GCA Secretariat would help streamline the process.

## **Reengineering the Global Financial System for Finance Mitigation**

Addressing the trillion-dollar climate mitigation challenge will require enormous amounts of private climate finance for the Global South. The global financial system must be reengineered to get commercial, return-seeking capital to flow from the Global North.

The Global North already has vast and diverse financial systems in place, with trillions of dollars of assets under management (AUM). These are invested on the basis of deep financial expertise spread across capital markets, institutional investors, sovereign wealth funds and insurance companies. As of 2020, pension funds in the OECD countries alone had assets worth US\$34.2 trillion.<sup>18</sup> The Norwegian sovereign wealth fund also has assets worth \$1.3 trillion under management. Data from Bloomberg NEF shows that the OECD countries<sup>19</sup> have issued sustainable debt<sup>20</sup> amounting to US\$4.4 trillion since 2012, which accounted for about 84.3% of sustainable debt issued worldwide. Similarly, Bloomberg reports that Europe accounted for half of the global environmental, social, and governance (ESG) assets under management in 2018.<sup>21</sup>

During the COP26 presidency of the UK and Italy, in 2021, UN Special Envoy for Climate Action and Finance Mark Carney “gathered more than 500 large financial institutions with balance sheets worth US\$150 trillion in a voluntary pact to try to limit global heating to 1.5°C above pre-industrial levels<sup>22</sup> under the banner of the Glasgow Financial Alliance for Net Zero (GFANZ). These statistics indicate that there is a vast amount of investable capital available in the Global North. If channelled through a financial system that prices climate change externalities, Carney believes that “ambitious climate action is not just possible, but will be profitable”. Dr Fatih Birol, Executive Director at the IEA has said, “There is no shortage of money worldwide, but it is not finding its way to the countries, sectors and projects where it is most needed.”

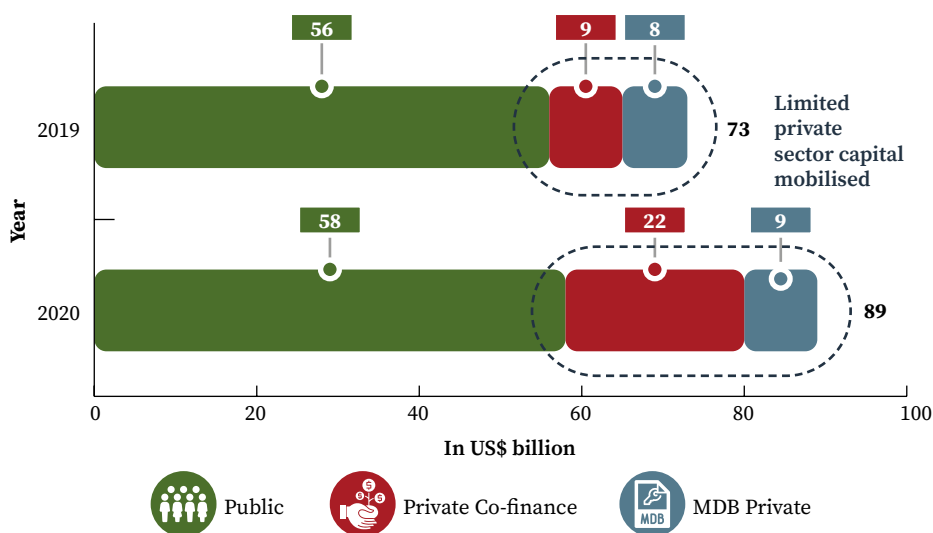
Many Global South countries need to reinforce their risk supervision and contract enforcement, ensure transparent price discovery and other financial regulations. Without such measures, the development of private financial markets will be hindered. This can be seen in measures such as the strong correlation between minimum government bond-holding mandates and concerns about derivatives depth.<sup>23</sup> Therefore, a large financing gap arises between the vast commercial capital available in the Global North and the fragmented financial systems in the Global South, with low domestic savings and capital intermediation abilities.

## MDBs Have Not Mobilised Sufficient Commercial Capital

There are multiple financial institutions from the Global North deploying capital to assist in the green transformation of the Global South. These include multilateral development banks (MDBs), existing global financial institutions, development finance institutions (DFIs) as well as a few private-sector green funds. Despite the large climate financing gap, these institutions have not mobilised a great deal of capital for climate finance. This is unfortunate, because they were created precisely to bridge this financing gap and provide financial intermediation. Climate finance mobilised by MDBs for low- and middle-income countries was around US\$38 billion in 2020.<sup>24</sup> Of this, 32% went toward adaptation and 65% towards mitigation.

Development finance, which has developed over the past 75 years or so, has largely focused on providing concessional loans to governments and public sector institutions. However, the volume of funding has been insufficient to meet the enormous climate financing needs. Of the total mitigation finance toward low- and middle-income economies in 2020, around 75% was in the form of investment loans. In adaptation finance, which should largely be grants-based, investment loans comprised 61.6% of total MDB finance.

**Chart 7: Climate Finance Mobilised by MDBs**



Source: Joint Report on MDBs Climate Finance (2015-20); MDBs include AfDB, ADB, AIIB, EIB, ERBD, IDBG, IsDB, NDB, WBG

Climate co-finance, particularly private sector co-finance, is another area where the role of MDBs in mobilisation has been limited. In 2020, public co-finance in low- and middle-income economies was around US\$32.2 billion - or about 75% of the MDB

co-finance - and around US\$11 billion was private co-finance. The World Bank's guarantee and insurance programmes have been underutilised.<sup>25</sup> As an illustration, the product mix of IFC's US\$12.4 billion mobilisation in FY2021 was 87% loans and 9% equity. Guarantees and risk-management products represent only around 4% of the mobilisation at US\$475 million and US\$40 million, respectively.

## **Regulators Must Establish Consistent Policies**

Establishing private sector investment flow requires that rules and institutions must first be defined. This entails defining policies and regulations on which financial transfers will be based, delineating how they will take place, setting the standards on climate reporting that should be adhered to and identifying the institutions that will conduct the transfer of financial flows.

### **Establishing a Consistent Green Taxonomy**

Several standards bodies are working on a consistent green taxonomy to funnel investments into genuine climate solutions. Regulators need to develop regulations that are:

- consistent and clear in how they define climate investments – at sectoral, industry and activity levels – and are forward looking toward a low-carbon future, while allowing the transition to 'green';
- objective in nature, supported by clearly defined metrics and thresholds;
- proportionate in impact;
- aligned to a low-carbon pathway and adaptable to the impact of climate change;
- green-aligned through the economic lifecycle of each activity; and
- aligned and harmonised with international standards, while ensuring alignment with local priorities.

### **Developing Effective Disclosure Policies**

The fundamental question on disclosures is whether they should cover only climate, or should also be extended to include ESG. Globally, disclosures began with climate and gradually progressed to ESG. The Basel Committee on Banking Supervision (BCBS) is looking at climate risk disclosures for financial institutions. It has issued a consultative document containing principles for the effective management and supervision of climate-related financial risks, requesting public comments. The BCBS is exploring the use of the third pillar framework to promote a common disclosure baseline for climate-related financial risks.

Firms need to receive verification or provide assurance on information they have disclosed. Such verification processes are typically implemented by appointing third-party auditors. Practices in this area vary by jurisdiction, ranging from self-certification to third-party verification. The need for such a function entails a cost

as well as technical expertise and resources. It also underscores the importance of capacity building in this area. In such a scenario, there could be a time-bound switchover to third-party certification.

Some countries require different entities to produce a separate sustainability report for disclosing ESG information. Others require the inclusion of ESG-related information in an entity's annual report or on the website. To provide adequate visibility to investors, as well as to ensure that companies take the issue seriously, it is recommended that the disclosure be a part of an integrated annual report and hosted on the entities' websites. There should be a separate chapter on climate and ESG disclosure in the financial statements, preferably, with both qualitative disclosures and greater availability of climate-related data – even quantitative disclosures. When identifying and prioritising ESG issues for disclosure, regulators and reporting, entities may apply different materiality approaches.

There are two overarching perspectives on materiality in ESG issues: the 'outside-in' and the 'inside-out' perspectives. Taking an outside-in perspective means considering the ESG items as material, which influences the value or performance of the entity. Taking an inside-out perspective implies that ESG items are material when they are impacted by the entity. This is also referred to as environmental or social materiality.

The most prevalent definitions of ESG materiality are as follows:

- **Financial materiality** – reflecting the outside-in perspective; and
- **Double materiality** – reflecting both the outside-in and inside-out perspectives.

Given the direction of travel for global disclosure standards – the European Commission having introduced double materiality as part of their disclosure guidelines, for example – it may be prudent for India to begin with financial materiality and adopt double materiality in a phased manner.

The Task Force on Climate-Related Financial Disclosures (TCFD) framework could act as the baseline for climate-related financial disclosures, with additional disclosures being prescribed on the basis of assessment by sectoral regulators. For example, the Basel Committee on Banking Supervision (BCBS) has set up a Task Force on Climate-related Financial Risks (TCFR). It issued a consultative document on climate-related financial risk on 16 November 2021 to guide regulatory and supervisory action on climate risk in future policies for banks.

## **The Role of MDBs: Strengthening them to Mobilise Private Capital Flows**

MDBs must act as catalysts in mobilising Global North capital flows to the Global South. This can be accomplished in two ways. First, by reducing risk for private financial institutions investing in the Global South, and second by increasing

investment flows to the Global South, especially for pioneering new markets – like alt-proteins, for example. Both activities will require significant changes to existing MDBs in terms of skill enhancement, management depth and balance sheet expansion.

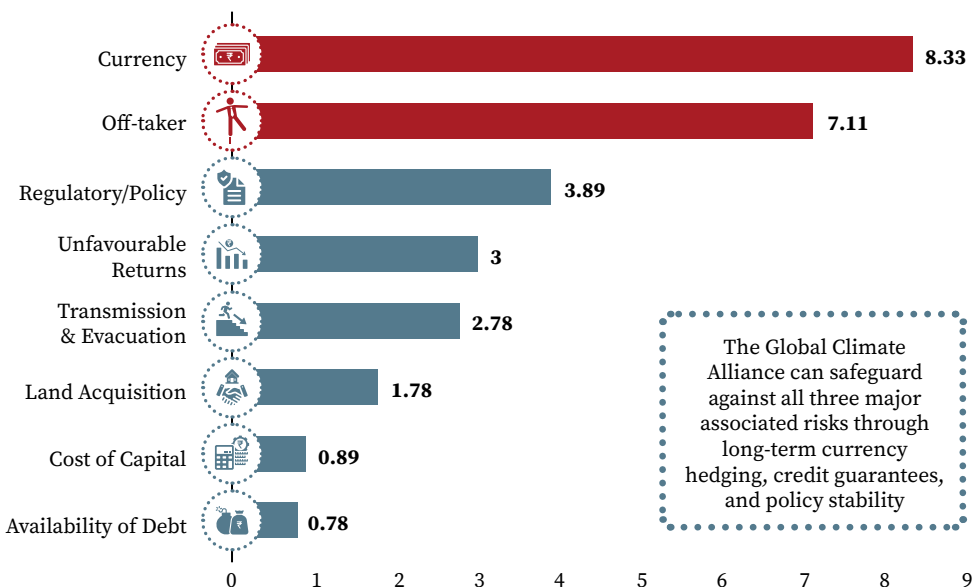
MDBs can be instrumental in reducing risk for private financial institutions in the Global South. The principal risks for these institutions include currency depreciation due to poor macroeconomic management, non-payment or delayed payment of contractual billings, extreme weather events and a range of policy-based risks.

### GCA Could Offer Risk Management Solutions via Blended Capital

Commercial investing in the Global South faces risks at various levels. This is especially the case for those transition technologies in the process of market adoption, which pose many systemic factors that can impact returns. Some of the key risks that need to be addressed are:

- Currency
- High cost of capital that increases the costs of deployment
- Policy risks;
- Billing, payments and collection risks

**Chart 8: Risk Score of Various Risks in Renewable Projects in India**



Source: (Shrimali, 2021); Score is based on discussions with foreign investors, where investors were asked to assign scores out of 10 regarding risk. The investors included: Bank of America, Blackrock, Generation Investment Management, EIG Partners, Goldman Sachs, and Morgan Stanley among others.



MDBs can play a critical role in mitigating these risks. This will not only lead to a material lowering in the cost of capital for projects, but will also – in many cases – help make projects viable for execution. MDBs have typically, and largely, focused on debt and some equity investments. Risk-management products and guarantees account for only a miniscule portion of their mobilisation. This must change materially.

There are at least four products/structures that can be aggressively scaled up by MDBs to help reduce investment risks. They are as follows:

- **Long-term Currency Hedging:** The flow of capital from the Global North to the Global South is impacted by the volatile and depreciating currencies of the latter. It has been generally observed that currencies of Global South economies, especially given inflationary pressures in their local economies, tend toward substantial depreciation in the long run. This creates a challenge for long-term private investors in the Global North who are seeking to protect their required returns in their local currencies. Given the relatively smaller sizes of Global South country economies, deep and liquid currency hedging markets do not exist for investors to offload their risks.

Providing reasonable long-term assurances that Global South currencies can be swapped into Global North currencies can help mitigate Global North investors' concerns over currency volatility and uncertainty. It must be noted here that what is being discussed is only the rate of the currency depreciation and not of the underlying investments, which may have their own trajectory.

One way that long-term currency hedges can gain credibility is if the central banks of countries have swap arrangements between themselves to assure that hard currency is made available at the time of repatriation. The value of such hard currency can be broadly agreed upfront, over time. The consequent commitment of the two central banks to honour such an arrangement can be routed through an MDB, which can aggregate and create an appropriate market. A credible counterparty, acting as an intermediary, can also help increase confidence, as well as innovation, for commercial investors.

- **Payment Guarantee Institutions:** MDBs could provide an annual sum, scaled up over time, in credit guarantees – either partial or in full – to Global South treasuries. This would protect against any potential losses that may arise. Guarantees could be provided to local financial institutions for extending credit to green companies in the country. If a country has a track record of high losses and defaults, it will automatically lead to higher pricing for guarantees. The Global South treasuries could also guarantee timely – 30 days, for example – collection from state buyers. The G2G arrangements under the GCA would ensure that working capital of guarantors is not exhausted.

- **Climate Insurance:** According to internal calculations by the Bank of England, the number of extreme weather events has trebled, causing an eightfold-increase in property destruction.<sup>26</sup> An annual sum, for a catastrophic risk pool, could be made available to Global South GCA members. The model could match Global South premium contributions with an equivalent amount in the Global North countries. All countries could participate in a global risk pool to ensure adequate capital for reinsurance companies. Insurance to be extended must be backed by continuous studies that assess the impact of climate change in business valuations, with continuous methodology updates for assessing climate risks to businesses.
- **Climate Fund-of-Funds:** Lastly, annual funds – potentially managed by the International Finance Corporation (IFC) or the European Investment Bank (EIB) – could be made available each year to anchor new Global South venture capital and private enterprise climate funds.

### **Investment-Focused MDBs Should Be Expanded**

Only around 20% of MDB financing goes into commercial investments, either through pure return-generating instruments or through blended capital instruments. Moreover, only a few institutions – such as the IFC, British International Investment (BII), Overseas Private Investment Corporation (OPIC) and the Asian Development Bank (ADB) – are investing billions of dollars of debt and equity per year into companies. As a result, MDBs have not built up the expertise in deal origination, risk assessment, investment monitoring, portfolio construction and exit generation required for successful private sector equity and debt investing in a market-driven green transformation.

Global North governments must increase the equity capital allocated to the few MDBs with private sector investment skills – also known as the ‘Investing MDBs’. These investments can be staged over time, allowing the Investing MDBs to build, over the next 5-10 years, the staff, skills and processes to upscale their annual private sector investments by at least tenfold.

Investing MDBs need to be materially larger than they currently are, both from the perspective of the balance sheet – greater assets/investments – and in their ability to channel more capital in any given year. The hundreds of billions of dollars required in investments by the private sector need to be ably supported by MDBs both through debt and equity products, and through the risk-sharing products discussed earlier. With the ability to help manage risks, MDBs will be in a far better position to channel and crowd-in private capital into green transition.

### **Local Green Investment Agencies (GIAs) are Needed**

The world requires many large green financing institutions that can significantly accelerate market-driven capital flows from the Global North to the Global South.

These new institutions can work alongside existing in-country financing institutions to catalyse their green financing activities. Such institutions could be established in each major Global South country or in clusters. For example, to cover some of the Western African countries. Collectively, these institutions, supported by significantly strengthened MDBs, would constitute a global green financing network.

### Green Investment Agencies Can Play a Vital Role

Green Investment Agencies (GIAs) should be able to undertake six important functions that are not being fulfilled adequately today. They are:

1. Most urgently, GIAs have to take an ecosystem perspective of how different sectors should be transformed in each country. This comprehensive yet practical perspective is difficult to achieve within siloed government departments, narrow financial institutions and think-tanks. For example, deploying electric buses nationally requires bus manufacturing, including battery availability, sufficient grid power, dedicated charging depots, adequate financing solutions, integration with travel portals and trained manpower for maintenance and operations. A delay in any of these could easily hinder an ecosystem development by many years. Such sectoral perspectives require industry experts, management expertise and deep financial acumen. Furthermore, these perspectives will have to be locally-developed for different countries and provinces within each country.
2. GIAs must be able to work with a wide range of stakeholders to help develop such ecosystems, including government policy makers at national and provincial levels, to ensure supportive policies. For the aforementioned electric buses example, GIAs have to be able to ensure that the bus manufacturing supply chain is adequately established and that critical investments are jumpstarted through innovative start-ups. GIAs must conduct in-depth market research to understand barriers to consumer acceptance and pricing expectations. In addition, existing bus companies will need support during such a transition, with a strong focus on existing and new workforce demands.
3. In addition to an ecosystem perspective and stakeholder engagement, GIAs will also have to mobilise a wide network of in-country financial partners. Continuing with the electric bus example, GIAs will have to assist in funding the upscaling of electric bus production among existing manufacturers. GIAs and their financial partners will have to provide leasing and financing support to operators, to allow them to adopt electric buses rapidly. Government agencies, such as the Small Industries Development Board (SIDB) or the Solar Energy Corporation in India (SECI) may be able to provide subsidies to electric bus companies or to electricity distribution companies for special tariffs. Leasing companies would require access to low-cost wholesale financing with appropriate currency hedging. Start-up financing for charging companies

may be needed to allow them to operate depots. New software solutions could probably also be developed by start-ups to manage bus batteries and develop innovative billing solutions. Thus, in the electric bus ecosystem example, GIAs will probably have to work with asset management companies, commercial banks, leasing companies, venture capital firms, electric distribution companies as well as a wide range of government financing agencies.

4. GIAs will have to work with Global North financial players to develop innovative financial instruments that are capable of reducing investment risks and, therefore, financing costs for the green transformation.
5. GIAs can also play a key role in sharing best practices, business models and financing approaches. There may be innovative companies and government programmes in Indonesia, for example, that may also work well in India. However, there is no organisation charged with tracking these innovations and facilitating their transfer from one country to another. Regular research reports, conferences and in-country experiments are needed to help cherry-pick the best innovations.
6. GIAs can help strengthen private-sector financing expertise in Global South countries. While countries such as India have a mature alternative asset industry, with multiple large global and domestic funds, most Global South countries do not have such investment firms.

There are currently many organisations – such as MDBs, investment banks and management consultancies – that fulfil some of these functions. However, few have the national reach, stakeholder credibility, large-scale investment expertise, and policy nous to be able to catalyse massive capital flows from the Global North to the Global South. Some Global South countries already have well-established investment agencies, such as the India's National Investment and Infrastructure Fund (NIIF), the Indonesia Investment Authority (IIA) and the Brazilian Development Bank (BNDES). These agencies can redirect their focus to climate finance, and similar ones can also be set up in other Global South countries.

### **Raising Funds for Climate Finance from the Global North**

Trillions of dollars of climate finance have to flow from the Global North to the Global South to accelerate climate action in the immediate future. The challenge is particularly daunting for mobilising adaptation finance. As noted by the IMF in 2022, “despite its [adaptation finance’s] significant benefits for society, it often does not generate sufficient private financial returns”. Under the various climate agreements, there has been no concrete commitment from the Global North on the share of individual contributions, while no standard or formula delineates the fair share that a country must pay. Commitments and pledges to provide finance have largely been voluntary.

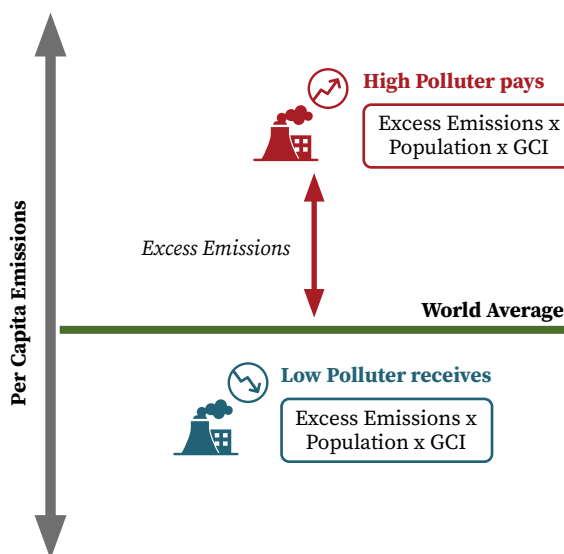
Therefore, mobilising climate finance flows for the Global South has been challenging and subject to various geopolitical constraints. Owing to a lack of clear demarcation of responsibility, climate action has been trapped in a stalemate: the Global South does not commit to stricter climate action citing lack of climate finance, while the Global North does not commit to climate finance citing absence of commitments from the Global South countries.

The GCA is designed to break this stalemate. To that end, it is necessary to outline various fair and objective methods for raising funds for climate finance, particularly from the countries of the Global North. Various mechanisms have been proposed. These include the Global Carbon Incentive (GCI) – as proposed by Professor Raghuram Rajan<sup>27</sup> – ODAs and concessional loans as well as additional financing through MDBs. All of these and other, similar mechanisms will have to be revitalised to meet the needs of climate finance.

### The Global Carbon Incentive Programme

The GCI offers a mechanism for mobilising funds through a fair and objective calculation. Through this, each country that emits more than the global average per capita emissions, which is around five tonnes, would pay annually into a global incentive fund. The amount to be paid would be calculated by multiplying the excess emissions per capita by the country’s population – above the global average – by the GCI, a predetermined ‘price’ per ton of emissions. Using the same calculation, a country that emits lesser than the per capita global average would be entitled to receive a corresponding amount of financial flows.

### Illustration 4: Global Carbon Incentive Programme



Source: Illustration based on ‘Reducing Global Emissions can be Simple and Self-financing’; Raghuram Rajan, *Financial Times*, November 2, 2021

The concept represents a simple self-financing mechanism that creates uniform incentives for all countries to take climate action. The Global North will have an incentive to reduce emissions, as they would have to commit a lower volume of funds. The Global South, meanwhile, would be de-incentivised to increase emissions, as their share of receivable funds would decrease. The emission calculations would, however, need to be adjusted for carbon emissions embedded in a country's imports.

The GCI would also be equitable, as those countries that have been historic polluters will also have high per capita emissions. The global principle of CBDR would also be respected. Meanwhile, those countries that will have to bear the costs of climate change, but have not been significant polluters, will receive compensation to help adapt to climate change. The mechanism is also consistent with the 'polluter pays' principle. In addition, the mechanism does not impinge on the sovereignty of countries – how a country raises its financing is left to its domestic laws and policies. The volume of funds to be contributed would depend on the agreed-upon GCI. A low price of US\$10 per tonne would not mobilise the trillions needed, but countries would also be wary of committing to a high GCI. However, the mechanism would be useful for mobilising funds for adaptation and scaling the balance sheets of MDBs.

### Other Proposals to Raise Climate Finance

Akin to the GCI, there are several alternative proposals for raising adaptation finance. Such finance must be mostly grants-based as, unlike certain mitigation activities that can be profitable, it does not generate any returns.

1. **ODAs and Concessional Loans:** The Official Development Assistance (ODA) target has been “the best-known international target in the aid field” since the 1970s, where economically-advanced countries have committed to meet a target of “a minimum net amount of 0.7% of its GNP at market prices”. As of 2021, net ODA flows from Development Assistance Committee (DAC) members of the OECD were at around US\$170 billion.<sup>28</sup> The United Nations Conference on Trade and Development (UNCTAD) reports that “if the G7 countries [alone] had met the 0.7% ODA target in 2020, an additional US\$155 billion would have been available to meet development goals”. The OECD reports that “no other DAC country has met the target since it was established, and the weighted average of DAC members’ ODA has never exceeded 0.4% of GNP”.
2. **Innovative financing through MDBs:** High-income countries receive 67% of the IMF's SDRs, but these lie idle because they do not need them as much as developing countries do. The global financial community mooted the idea of ‘recycling’ these SDRs, lending them back to the IMF or to MDBs, which can then repurpose it for climate change. The G20, under the Italian Presidency, pledged almost US\$45 billion from their recent SDRs allocation toward

vulnerable countries<sup>29</sup>. One report<sup>30</sup> reads, “the G7 has asked finance ministers and central bank governors to develop and review proposals for a voluntary US\$100 billion reallocation of SDRs from countries with excess reserves”. While the details are still being negotiated, the report mentions that SDR financing would open up fiscal space for countries to invest in adaptation measures. This proposal would be channelled through the IMF’s recently-approved Resilience and Sustainability Trust.

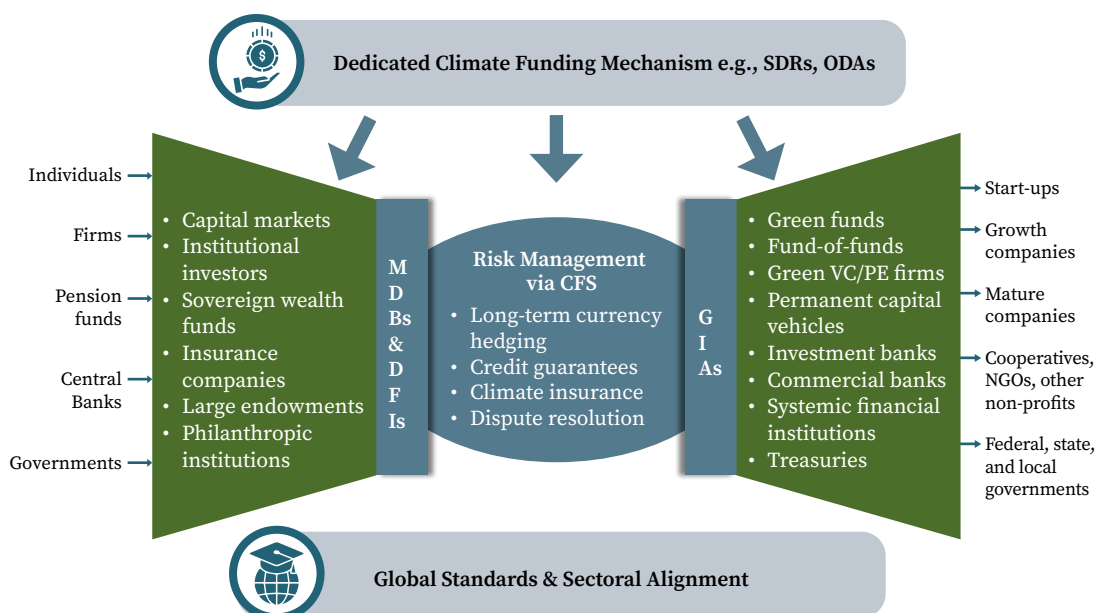
As of October 2022, the IMF reports that contributions amounting to US\$20 billion have been signed with six members while progress on contributions worth US\$37 billion is underway. The Center for Global Development instead recommends that SDRs be channelled through MDBs.<sup>31</sup> Allowing MDBs to have more lenient gearing ratios would afford them more space to make grants and concessional loans. Together with the ODA<sup>32</sup>, they estimate that multilateral finance, excluding MDB disbursements, could be increased by 50% in 2025 from 2019 levels. These would contribute about US\$96 billion or more toward development goals. Irrespective of the mechanism employed, SDR recycling appears to be a viable source for contributions toward climate finance.

Lastly, in addition to these measures, several reports also call for channelling private philanthropy<sup>33</sup> for supplementing climate adaptation through<sup>34</sup>:

1. **Sustainability-linked or Development Impact Bonds<sup>35</sup>** that are specifically targeted at projects where predetermined social outcomes are the major criteria for providing finance. The issuer receives a bonus, if the sustainability target agreed upon in advance is met, and pays a penalty if it is missed; and
2. **‘Pay-for-success’ private financing** where third-party investors – including private investors – provide the initial investment and develop a public sector project. The public sector then purchases the project for an amount commensurate with the project’s sustainability performance on pre-agreed parameters.

Climate financing for adaptation and scaling MDBs could be successfully delivered through a combination of these instruments. These methods of raising finance could also be augmented by several other financial agreements developed either bilaterally or multilaterally. It would be in the interest of developed countries to finance and lose a few billions for – in the words of Raghuram Rajan in his Per Jacobsson lecture – “If you fail on both mitigation and adaptation, what is left is migration.”

## Illustration 5: Climate Finance System (CFS) to be Supported by GCA



Source: As conceptualised by the authors

### Summing Up

Modelling studies indicate that the Global South's emissions are likely to continue growing indefinitely, reaching around 80% of global emissions by the end of the century. There are several reasons for continued emissions growth in the Global South. Firstly, negative externalities associated with global warming, air pollution and import dependency that are associated with usage of fossil fuels have not been priced in. Secondly, today's policies are inadequate for forcing industries to transition away from fossil fuels. Thirdly, global capital markets are reluctant to invest in the Global South given sovereign risks, policy instability, lack of confidence in payments and contract enforcement, along with weak dispute resolution mechanisms.

Breaking this cycle needs a comprehensive approach that addresses policy risk and financial inadequacy. The global financial system will need to be reengineered to mobilise trillions of dollars of climate finance from the Global North to the Global South. This needs substantial grant capital for climate adaptation; a new regulatory and disclosure framework for accelerating private capital flows; and revamped MDBs capable of issuing blended capital instruments and leading innovative climate finance. Lastly, it needs stable and transparent climate approaches to financing from the Global North.



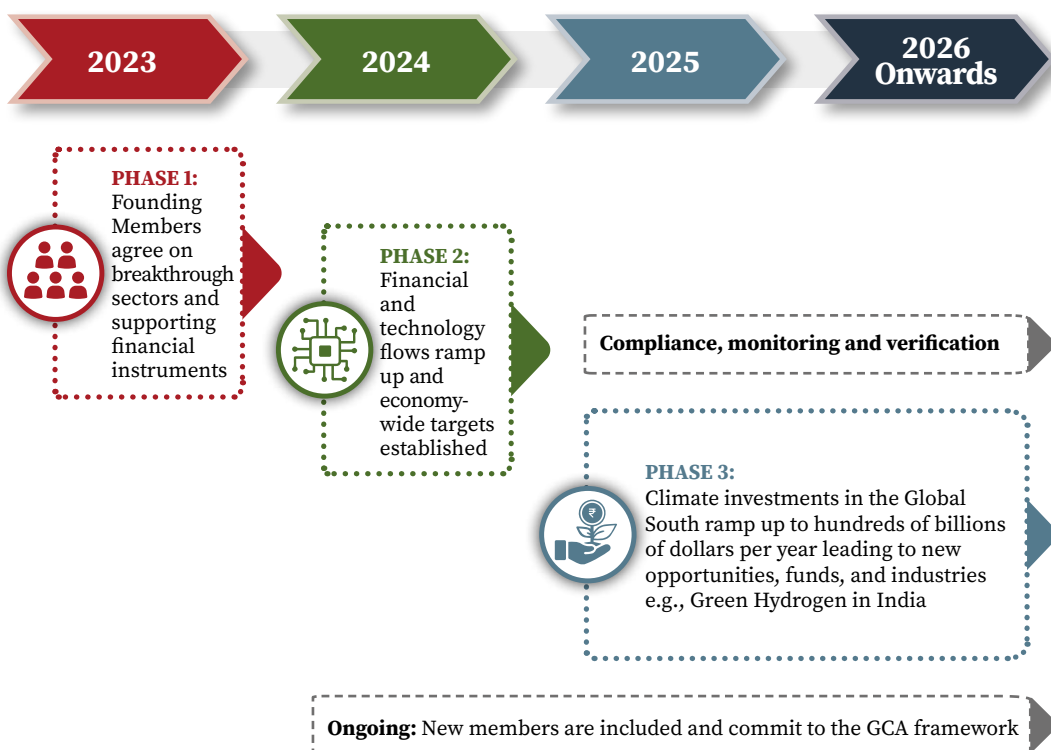
## CHAPTER 6

# Building an Institutional Framework

### Institutions and Membership

Bearing in mind the urgency of climate action, and the potential of existing structures, the GCA could be housed within a pre-existing organisation or institution, but with an independent secretariat and governing body. This is recommended in the proposal, and can be modified according to the practical requirements of the GCA. The finer details, as well as the funding of the GCA,

### Illustration 6: Proposed Timeline for Rolling Out the GCA



Source: As conceptualised by the authors

may be decided during the establishment and negotiation processes. These can be based on other externalities, including the nature of membership, interest of the countries involved, and so on.

While there are core differences between the commitment levels of the two member groups of the GCA, both will be governed by the same institutional arrangements. The GCA implementation would be largely dependent on the efficiency of the institutional arrangements. Creating new institutions solely for the GCA would be a tedious, administratively complicated and cumbersome process. It would not be politically acceptable to develop a new framework from scratch, and would considerably delay the establishment process.

Given that the GCA would be initiated by a core group of members – ideally including leading emitters such as the EU, India and US – initial governance support could be provided by a secretariat under the G20, allowing for rapid implementation of early initiatives.

The GCA should create an institutional framework using a stepwise approach. This will provide it with the required legitimacy. It will offer a platform to enable discussions between financial donors and recipients, of sensitive issues such as disagreements over what and how it should be financed, different assumptions about ambition levels, and so on.

A core component of the GCA would be agreement on the [sectoral transformation pathways](#) by the various member countries. Thus, it is imperative that the GCA is made up of working groups on various sectors to support policy alignment. These pathways would require scientific as well as political approval. Decision-making can be facilitated through creating sectoral working groups, consisting of both experts and the political leadership, ensuring the buy-in of political decision-makers from the outset.

The GCA has to ensure that the [monitoring, reporting and verification \(MRV\)](#) processes are based on CBDR principles, but are also consistent in formats, data requirements, duration and frequency. Proper MRV mechanisms will ensure that data systems are compatible, allowing the Secretariat and other countries to track members' progress. The authenticity of the data submitted is also an important issue that the GCA will have to deal with in the future. However, the solution may even emerge during negotiations. Along with strong MRV mechanisms comes the problem of capacity.

It is important that the GCA creates [capacity-building solutions](#) for developing countries that allow them to undertake continuous reporting and monitoring. The complexity of the MRV challenge requires a solution based on mutual agreement, support and the common goal of combating climate change.

## **Common Vision**

As members of the GCA, countries join a ‘coalition of the willing’. Members have to agree to the minimum objectives of the Alliance, cooperation, and knowledge sharing. These will provide the foundation for the success of the GCA. As a result, the institutional architecture of GCA should be specifically designed to fulfil its key objectives. The types of support required are not specified, as these will emerge from negotiations between member-countries based on their national interests, mutual agreement on best practices and geopolitical factors.

### **1. Reaching the larger goal: the 1.5°C of the Paris Agreement**

- receiving commitments and national legislation;
- setting decadal targets;
- ensuring commitments are in line with long-term targets;
- complying with submission of commitments, targets and methods of calculation; and
- monitoring, reporting and verifying achievement reports.

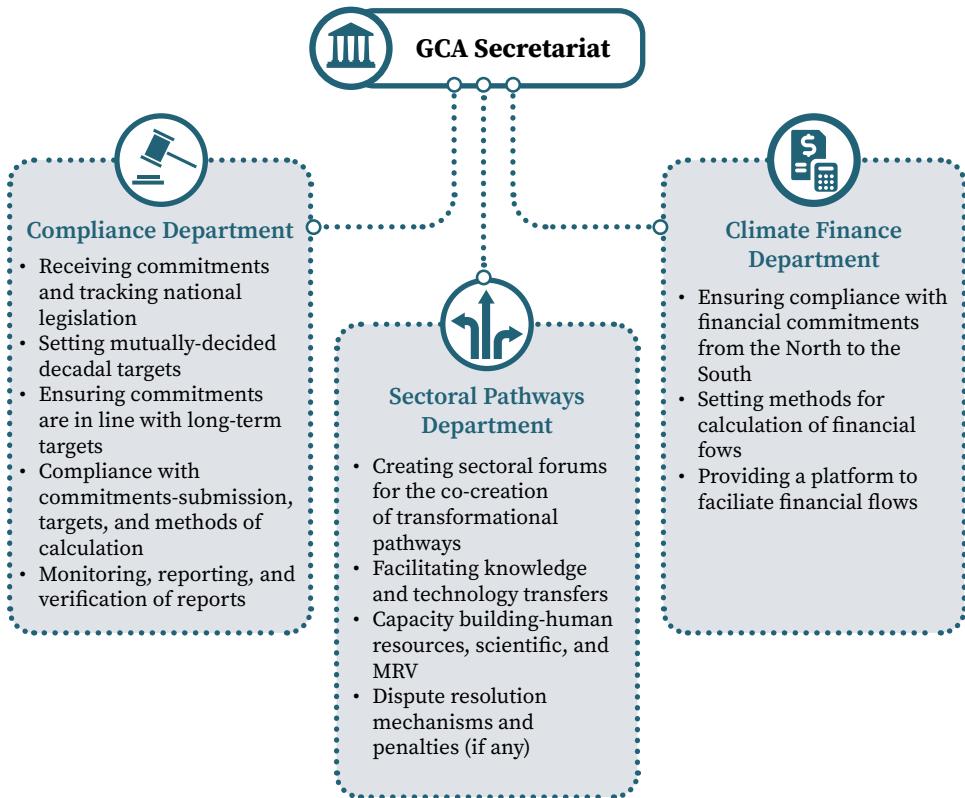
### **2. Meeting implementation needs and unlocking investments and funding**

- ensuring compliance with financial commitments from the Global North to the Global South;
- setting methods for calculating financial flows; and
- providing a platform for facilitating the flow of climate finance.

### **3. Connecting key actors on sectoral transformational pathways**

- creating sectoral forums for the co-creation of transformational pathways;
- facilitating knowledge and technology transfers;
- transferring scientific advice and modelling expertise from the Global North to the Global South;
- building capacity – human resources and scientific, as well as for MRV; and
- providing dispute resolution mechanisms and serving mutually-agreed penalties in the event of continued non-compliance.

## Illustration 7: Functional Structure of the GCA Secretariat



Source: As conceptualised by the authors

## CHAPTER 7

# India's Net-Zero Pathways: A Case Study

### Context

India announced its long-term climate target of reaching net-zero emissions by 2070 at COP26 in Glasgow in 2021.<sup>36</sup> There was an upward revision of its NDC targets for 2030 earlier in 2022.<sup>37</sup> For emerging economies such as India, the goal of decarbonisation is accompanied by the challenge of delivering economic growth, jobs and improving access to energy. Achieving the country's climate targets implies navigating away from fossil fuel use in all sectors, with corresponding impact on businesses, workers and public revenues. It also requires upfront capital to create new green energy infrastructure to allow the decoupling of emissions from growth.

At the same time, the transition presents several opportunities. These include reducing energy imports, improving public health and safeguarding the international competitiveness of national industry. All this with a dynamic backdrop of carbon-based tariffs, such as the carbon border adjustment mechanism (CBAM) proposed by the European Union.<sup>38</sup>

### About the Study

**This study by World Resources India (WRI)** explores some of these challenges and opportunities in the context of a net-zero 2070 pathway for India. It uses the Energy Policy Simulator (EPS), a systems dynamics model that enables integrated assessment of climate policy scenarios through 2050, along with their macroeconomic implications.<sup>39</sup>

WRI India analyses a Long-Term Decarbonisation (LTD) scenario that would put India on course to achieve net-zero CO<sub>2</sub> emissions by 2070. In the short-term, the LTD scenario builds upon existing policy targets for renewable energy, energy efficiency and electric mobility. It also considers the policy-supported medium-term phasing in of currently nascent technologies, such as hydrogen and battery storage, in order to reach ambitious implementation levels by 2050. The results of the LTD scenario are presented in relation to a reference scenario, which incorporates existing policies as of 2020. Table 1 summarises the key policy assumptions of the LTD scenario:

**Table 1: Key Policy Levers in the LTD Scenario**

Policy	Reference Scenario (2050)	LTD Scenario (2050) <sup>a</sup>
<b>Industrial electrification &amp; hydrogen mandate</b> (% substitution of fossil fuels in the industrial sector, starting from 2025)	0	50%
<b>Hydrogen production via electrolysis mandate</b> (Starting from 2025)	0	100%
<b>Carbon tax</b> (Per tonne of CO <sub>2</sub> in power and industry)	0	INR 3500 (US\$50)
<b>EV/H<sub>2</sub>V<sup>b</sup> sales mandate</b> (% of new vehicle sales) Cars, buses Light-freight vehicles, heavy-freight vehicles Two-wheelers, three-wheelers (H <sub>2</sub> V sales mandate starting from 2030)	35%, 23% 14%, 4% 38%, 30%	80%, 50% (+25% H <sub>2</sub> V) 70%, 25% (+45% H <sub>2</sub> V) 100%, 100%
<b>Material efficiency mandates</b> (Demand reduction for emissions intensive goods relative to reference scenario)	-	Cement: 15% Iron and steel: 20%
<b>Carbon-free electricity generation</b> (Mandated minimum percentage)	68%	93% (75%)
<b>Early retirement mandate for coal power</b> (Starting from 300MW/year in 2027)	-	7 GW/year

Notes:

- Unless otherwise noted, the policy is linearly implemented, starting from 0 in 2020 to reach the full policy setting in 2050.
- EV = electric vehicles; H<sub>2</sub>V = hydrogen vehicles.

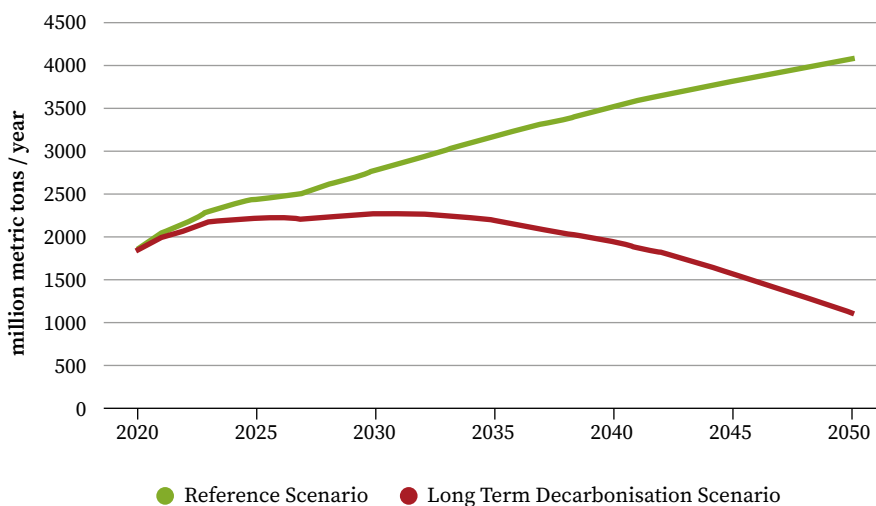
## Key Findings

The LTD Scenario significantly cuts emissions, improves human health and delivers better macroeconomic outcomes compared to the reference scenario. Achieving these outcomes, however, implies a profound structural transformation of the economy, which will require significant additional investment.

Chart 9 summarises the key outcomes.

1. **Climate and Health Benefits:** The policies in the LTD scenario reduce CO<sub>2</sub> emissions in the reference scenario by about one-fifth by 2030, and two-thirds by 2050 (Chart 9). Total GHG emissions show a similar trend. The improvement in air quality from reduced fossil fuel use helps prevent 5.8 million premature deaths over the period 2022–2050 compared to the reference scenario.

**Chart 9: Annual CO<sub>2</sub> Emissions (in million metric tonnes)**



2. **Sectoral Transitions and Costs:** In the power sector, the LTD scenario sees the share of non-fossil sources used in electricity generation fall by almost half by 2030, and by over 90% by 2050. This is in comparison to slightly less than one-quarter at present. Installed capacities of solar PV and onshore wind will increase over twenty-fold and sixteen-fold respectively, and coal will be almost completely phased out by 2050. The transformation is driven by mandates for carbon-free electricity generation and the early retirement of coal power, complemented by a phased carbon tax (see Table 1).

The decarbonisation of the power sector supports the mandates for fossil fuel substitution – with electricity and/or green hydrogen – in the industry and transport sectors, thereby achieving their emissions mitigation potential. These

fuel-switching mandates, phased in from 2025 or 2030, will serve as the main policy levers for decarbonising these sectors in the long term. Total battery storage capacity required – including for grid storage and electric vehicle deployment – will reach 8.5 terawatt-hours (TWh). Green hydrogen production – for use as fuel in industry and transport – will reach 22 million tonnes by 2050, compared to negligible levels currently.

The transition in these sectors will require significant additional capital expenditure compared to the reference scenario. The total additional expenditure in the LTD scenario (in 2018 US\$) amounts to approximately US\$100 billion within this decade, and increases to US\$790 billion and US\$1.9 trillion in the next two decades respectively, as RE infrastructure, EV deployment and green hydrogen production is ramped up. Table 2 provides the estimated capital expenditure for a few key clean technologies in the LTD scenario.

**Table 2: Capital Expenditure<sup>(a)</sup> by Technology and Decade in LTD Scenario (in 2018 US\$ billion)**

	2020–30	2030–40	2040–50
Solar PV	101.18	207.21	194.28
Onshore wind	33.06	145.43	231.24
Battery storage <sup>(b)</sup>	109.00	381.98	843.91
Hydrogen electrolyzers <sup>(c)</sup>	7.86	96.57	198.15

Notes:

- a. Does not include capital expenditure on supporting infrastructure, for example the EV charging stations and hydrogen distribution networks required for clean technology deployment. Assumes no capital depreciation or discounting of future investments
  - b. – Including for grid storage and electric vehicle deployment
  - c. Required for green hydrogen production for use as fuel. Use of green hydrogen as feedstock not included
3. **Economic Outcomes:** The LTD scenario sees a 1.2% increase in GDP in 2030 and a 2.4% increase in 2050 compared to the reference scenario, while generating an additional 4.4 million jobs – direct and indirect – by 2030, increasing to 9.2 million by 2050. Growth in green sectors, such as clean electricity generation, green hydrogen and electric vehicle production – together with productive public expenditure sustained with the help of revenues from the phased carbon tax – should more than compensate for the contraction in brown sectors such as coal mining, petroleum refining and manufacturing of internal combustion engines. Carbon tax revenues will help offset the drop in government revenue



from incumbent petroleum taxes over the course of the transition by widening the tax base to all fossil fuels.

Furthermore, the transition yields greater savings from reduced fuel expenditure in the medium to long term. For example, the reduction in India's energy import bill, driven by a reduction in crude oil imports, could amount to US\$30 billion in 2030 and US\$296 billion in 2050 compared to the reference scenario.

**Table 3: Summary of Key Outcomes for India in the LTD Scenario**

Scenario		Reference	LTD
<b>CO2 emissions</b> (billions of tonnes)	2030	2.8	2.3
	2050	4.1	1.1
<b>Emissions intensity of GDP</b> (% change from 2005)	2030	-52%	-61%
	2050	-75%	-91%
<b>Non-fossil electricity capacity (GW)</b> (percentage share of total capacity)	2030	344 (58%)	383 (63%)
	2050	1044 (76%)	1986 (96%)
<b>Additional investment relative to Reference scenario</b> (billion 2018 USD/year) (percentage of GDP)	2030	-	27.5 (0.5%)
	2050	-	247.3 (1.5%)
<b>Change in GDP relative to Reference scenario</b> (billion 2018 USD) (percentage change)	2030	-	80.4 (1.4%)
	2050	-	362.5 (2.2%)
<b>Change in jobs relative to Reference scenario</b> (including direct and indirect jobs, in million)	2030	-	4.4
	2050	-	9.2
<b>Avoided premature deaths relative to Reference scenario from improved air quality</b> (thousand deaths/year)	2030	-	69.2
	2050	-	502.8

## **Policy Implications**

**Fuel switching – to electricity and green hydrogen – in India’s rapidly growing industry and transport sectors, supported by clean electricity generation, are the main levers for long-term decarbonisation.**

Early, decisive mandates can play an important role in driving down costs through technology diffusion and by accelerating technology adoption. A phased carbon price can complement these mandates and serve as an important source of revenue to sustain productive public expenditure during the transition.

**The transition will require additional investments of nearly US\$3 trillion over the coming three decades, compared to the reference scenario.**

Internationally-supported technology partnerships and concessional financing schemes would be required to attract investment at scale, in nascent technologies such as batteries and green hydrogen production. For example, complementary public policies creating supporting infrastructure – such as EV charging stations and hydrogen distribution networks – will play a key role in stimulating private investment.

**Implementation roadmaps should consider the distributional impacts and resource implications of the low-carbon transition.**

While the transition can yield aggregate economic gains, the sectoral shifts would likely result in uneven impact on industries, regions and sections of population. Moreover, policies such as carbon pricing are likely to increase energy prices in the short term, which can disproportionately affect low-income populations. The scale of transformation also implies increased pressures on critical natural resources such as land, water and materials. A careful consideration of these elements during policy planning can ensure a just and inclusive transition to India’s low-carbon future.

# Appendix:

## Other Modelling Studies

The transition to a decarbonised world will have short-term costs but will confer significant benefits that will outweigh these costs. Chapter 7 on the Energy Policy Simulator<sup>40</sup> in India offers a case study on the macroeconomic implications of a transition to net-zero by 2070. Indeed, a number of other modelling studies have reached the same conclusion. This part of the handbook briefly presents the findings of a few other studies that have demonstrated ‘net-zero is net-positive’, both for India and the world.

### Net-Zero is Net-Positive: For India

1. The Climate Policy Lab hosted at Tufts University estimates that, if India raises ambition in its policy to tackle climate change that “maximises job creation through further deep decarbonisation policies”, it will reduce emissions by 70% by 2050 as compared to the ‘business-as-usual’ [BAU] scenario.<sup>41</sup> In addition, this ‘Raising Ambition’ scenario “generates an average 3% higher GDP than the BAU and cumulatively adds nearly 8 million new jobs by 2030, rising to a cumulative 43 million jobs over BAU by 2050”.
2. Similarly, the Asia Society Policy Institute 2022, in collaboration with Cambridge Econometrics<sup>42</sup> estimates that India’s GDP will increase between 1-7% over the baseline scenario by 2030, depending upon the ambition in climate policy. In their study, India would see an increase in investment of between 4%-22% over the baseline scenario in 2030. It would also see a positive impact on employment of between 0.9%-1.8% over the baseline by 2060 in most scenarios. This is equivalent to 12–13 million additional jobs in the Indian economy. The study also highlights that India’s trade balance would be favourable, “estimated at \$205bn and \$236bn in 2060, in the 2050 and 2070 net-zero scenarios respectively, compared to the baseline (equal to around 1.5% of GDP)” owing to the reduced dependency on fossil fuels.

### Net-Zero is Net-Positive: For the World

1. The IEA, in its flagship report (Bouckaert, et al. 2021), produced a comprehensive estimate of the effects of transitioning to a net-zero world by 2050. Among the positive effects, it highlighted an “annual GDP growth that is nearly 0.5% higher than the levels in the Stated Policies Scenario (STEPS) during the latter half of the 2020s.” Moreover, in the net-zero by 2050 scenario,

the report concludes that “there would be 30 million more people working in clean energy, efficiency and low-emissions technologies by 2030”, with job losses of around 5 million in the fossil fuel sectors.<sup>43</sup>

2. Similarly, McKinsey & Company estimates that:
  - a. “Capital spending on physical assets for energy and land-use systems in the net-zero transition between 2021 and 2050 would amount to about \$275 trillion, or \$9.2 trillion per year on average, an annual increase of as much as \$3.5 trillion from today.”
  - b. “The transition could result in a gain of about 200 million and a loss of about 185 million direct and indirect jobs globally by 2050.”
3. The IMF, in its flagship World Economic Outlook Report 2022, employs a novel Global Macroeconomic Model for the Energy Transition (GMMET) to estimate the short-term costs for output and inflation of transitioning to a decarbonised world. Using different assumptions of the rate at which electricity generation transitions to low-carbon technologies, it estimates these costs to be “somewhere between 0.15 and 0.25 percentage points of GDP growth and an additional 0.1 to 0.4 percentage points of inflation a year with respect to the baseline, if budget-neutral policies are assumed.”

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# Endnotes

1. See En-ROADS simulator, <https://bit.ly/3VR7Uf1>
2. Paris Agreement-aligned means emissions reduction targets that are 1.5°C.
3. Contrary to theory, simulations in (Devarajan, et al. 2022) show that a climate club committed to a carbon tax of US\$75/tCO<sub>2</sub>e, without punitive tariffs and even with a holdout from the USA and China, will be more effective than a similar club with a CBAM. A climate club with punitive tariffs will be more effective than one without such tariffs but will need tedious re-engineering of WTO laws.
4. Nicholas Stern and Hans Peter Lankes, 'Collaborating and Delivering on Climate Action through a Climate Club: An independent report to the G7', The London School of Economics and Political Science (LSE), October 2022
5. Paris Agreement-aligned means emissions reduction targets that are 1.5°C.
6. The figures are illustrative and have been borrowed from the EU's Fit-for-55 package.
7. IEA has already defined such standards for Steel and Cement in 'Achieving Net-Zero Heavy Industry Sectors in G7 Members', International Energy Agency, 2022.
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Until early 2021, Hans Peter was the Vice President, Economics and Private Sector Development at the IFC/World Bank Group, having previously served in various roles on the management team of the EBRD and as Chief of the Trade Policy Division at the International Monetary Fund. Earlier in his career, Hans Peter had a track record in academia and policy consulting in Central America, West Africa and Southeast Asia. Hans Peter obtained his PhD from Harvard University with a thesis on the political economy of hyperinflation, an MPA from Harvard Kennedy School, Diplom-Volkswirt from Albert-Ludwigs-Universität Freiburg and License en Sc. Economiques from Université de Grenoble.



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The unrelenting impact of climate change poses an existential crisis for our planet. Immediate and substantial climate action to address this planetary crisis is only possible if Global South and North countries partner together to tackle extreme weather events as well as long-term global warming. To that end, the Global Climate Alliance (GCA) Collaborative is an independent research effort to evaluate how Global South countries can best ally with Global North countries to accelerate climate action. Over the past two years, several academic institutions and think tanks have been collaborating on these issues and pooling their individual research efforts.

This report offers the Collaborative's perspectives on how a GCA can enhance the Global South's ability to address climate change, including mitigation, adaptation, and resilience measures. Envisioned as a historic, game-changing alliance, the GCA initiative builds on existing climate agreements and multiple modelling studies which indicate that '**net-zero is net-positive**'. The Collaborative proposes an open and inclusive global agreement to accelerate and catalyse climate action in the Global South.

The proposed GCA is a 'coalition of the willing' and it is hoped that all G20 countries – representing 85% of global GHG emissions – will join the Alliance. In return for binding near-term and longer-term transformation targets, GCA members from the Global South would receive a highly-attractive financing package to accelerate adaptation, mitigation and resilience measures.



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