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## **Towards a Low-Carbon and Climate-Resilient World: Expectations from COP26**

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# Abstract

**T**here is widespread hope that the 26th UN Climate Change Conference of the Parties (COP26) in Glasgow will deliver decisive action on the goals of the Paris Climate Agreement. This report gathers different perspectives from analysts in South Asia, Africa, the Indo-Pacific, and the UK on regional priorities and positions on key issues related to the global fight against climate change. Certain threads bind these analyses regarding what the world expects from COP26. These include: increased finance for climate action; more ambitious emissions reduction

commitments, in particular from developed economies; fiscal and policy frameworks for strengthening climate change adaptation efforts and addressing loss and damage; and enhancing international collaboration on energy transition, clean road transport, and nature, especially in relation to technology. They similarly argue that climate change and sustainable development are inextricably linked, and that low-carbon and climate-resilient growth and development requires strong political will from states across the world.

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# Four Expectations from COP26

Vikrom Mathur

**A**t the United Nations Climate Change Conference of Parties (COP26) in Glasgow, world leaders have the opportunity to shape an ambitious and collective climate action. Will the wealthy nations that reaped the benefits of industrialisation by burning fossil fuels and growing their economies for centuries, own up to the damage and lead efforts to correct it? While recognising that the only way forward is through radical and far-reaching changes to the way we live, the discussions at COP26 must go beyond the technical effort to cut global emissions and address social inequalities and the security of those who are most vulnerable to the impacts of climate change.

Amidst the Covid-19 pandemic, there is growing public demand for climate action and to align economic recovery with long-term sustainability and climate goals. Some countries—such as Germany, UK, France, Italy, Poland, and Spain—have implemented policy responses.<sup>1</sup> There is a clear emphasis on resilience, development and adaptation to climate effects; averting further impacts by curtailing fossil fuel use; and conserving

biodiversity hotspots and making room for more thorough reforestation. Given the renewed interest in collective action, COP26 offers a unique opportunity to enhance these ambitions and reiterate the global commitment to combat climate change.

Indeed, COP26 will be one of the most significant global conferences in the pandemic era. It brings together leaders from 197 countries, who are tasked to discuss collective action towards the goals of the Paris Agreement and the UN Framework Convention on Climate Change. The conference also marks six years since the landmark climate change treaty at COP21 in Paris, where countries had pledged to keep global warming well below 2°C. COP26 will assess the progress made by countries so far, and create a roadmap towards the goal of limiting global temperature rise to 1.5°C. The conference also comes just months after the report by the Intergovernmental Panel on Climate Change (IPCC) which warns, that global warming is happening at a rate faster than previously thought.<sup>2</sup>

Stating unequivocally that human actions are causing global warming, the IPCC report noted that some of the damage caused by climate change may already be irreversible. It would therefore not be an overstatement to say that expectations from COP26 are far higher than in the predecessor meetings. After all, the previous edition held in Madrid, for example, achieved little as countries failed to reach consensus in many areas of the Paris Agreement.

The COP26 summit will need to work towards four key outcomes: increased finance for climate action; more ambitious emissions reduction commitments; fiscal and policy framework for strengthening climate change adaptation efforts and addressing loss and damage; and enhancing international collaboration on energy transition, clean road transport, and nature, especially in relation to technology.<sup>3</sup> While these goals are significant, the roadmap towards achieving them will determine how effectively the international community can shift the scale on climate change.

### **Increased Finance for Climate Action**

Poor countries are unable to afford the cost of low-carbon and climate-resilient development while being extremely vulnerable to the effects of climate change. To offset this, rich countries pledged to deliver US\$100 billion annually to help poorer countries adapt to this transition. However, this promise has yet to materialise.<sup>4</sup> There seems to be little clarity on how developed countries will deliver on their commitments to scale up finance to US\$100 billion and beyond in the years to come.

Worryingly, some of the finance issued is in the form of repayable loans, rather than grants—meaning that developing nations will have to pay them back at some point.<sup>5</sup> This is going to be a contentious issue in the COP26 negotiations. There are also serious questions that remain on the matter of fixing responsibility in case financial targets are not met.

So far, public finance for climate action is showing little progress and there are palpable signs of distrust. This makes financing negotiations at COP26 extremely challenging. The discussions on a new collective finance target that begins at COP26 must be agreed upon before 2025 and should aim to go well beyond the US\$100-billion commitment.<sup>6</sup> The outcome of these negotiations must take into consideration the needs of developing and vulnerable countries for adaptation, loss and damage, and mitigation. It is vital that developed countries give clear indications on how they will set up their funding and look at restoring trust by increasing the number of pledges and replenishing the funds of the United Nations Framework Convention on Climate Change's financial mechanisms (such as the Green Climate Fund, Adaptation Fund, and the Least Developed Countries Fund).<sup>7</sup> As economies rebuild after Covid-19, compulsions to address national concerns will be high but the commitment to global climate action will need to be maintained.

## More Ambitious Emissions Reduction Commitments

The aim of the Paris Agreement is to strengthen the global response to climate change by keeping the temperature rise to less than 2°C, and preferably at around 1.5°C. If global warming is to be limited to between 1.5°C and 2°C by 2100, global emissions must peak before 2025 and then decline rapidly to near zero.<sup>8</sup> To meet these ambitious goals, enhanced capacity building and resource mobilisation needs to be put in place to support nationally appropriate decarbonisation efforts such as moving away from non-renewable energy sources and deploying clean technologies. Countries must support the decarbonisation of urban infrastructure and the transportation sector.

One of the goals for COP26 is for the developed world to give up its coal habit entirely by 2030, and the developing world, by 2040. However, this is an unrealistic target for countries like India that depend primarily on coal for their energy needs. India's reliance on coal is linked to its imperative of becoming a self-sufficient nation; a rapid transition away from coal at this stage is unlikely to be palatable to political constituencies across the country.

Developed countries need to reach net-negative emissions and front-load their decarbonisation efforts to allow some global carbon budget for emerging nations, such as India, as they move into a low-carbon development pathway.<sup>9</sup> The

financial commitments from developed countries will certainly help developing nations make the transition away from fossil fuels.<sup>10</sup> A meeting on 26 July 2021 in London between 50 countries ended without any agreement on the end of coal use, the absence of which will create a hurdle in achieving the target of limiting global heating to 1.5°C.<sup>11</sup> Another attempt failed just days prior (on 23 July) in Naples, Italy, when G20 ministers were unable to agree on the phasing out of coal power. India, China, and Russia—countries with high coal consumption—were among those who opposed the G20 commitment to phase out coal.<sup>12</sup>

Speaking at the United Nations General Assembly in September, Chinese President Xi Jinping pledged that Beijing will not build new coal-fired power projects abroad. This was touted as a landmark decision that raised hopes for reduced dependence on coal; the question is whether China can fulfill the rhetoric.<sup>13</sup> The country accounts for nearly 30 percent of the world's carbon dioxide emissions, with much of it coming from coal use. Despite its plan to become carbon neutral before 2060, its domestic dependence on coal continues to rise, and it is building new coal-fired power stations in more than 60 locations in the country.<sup>14</sup> Its coal consumption will likely grow till 2025 and will begin to go down only from 2026.

Although the roadmap to reduced domestic coal consumption is unclear, China's target of becoming carbon neutral by 2060 will put pressure on India to define its own timelines for emission cuts. India's dependence on coal as the primary domestic fossil energy resource, and having far less domestic reserves for oil and gas as compared to China, will mean that the roadmap towards abandoning coal is going to be more challenging and will justify setting deadlines beyond 2060.<sup>15</sup> While transitioning away from coal remains a challenge, India must also evaluate a reasonable net-zero pathway, and while setting a binding deadline will be challenging, a clear articulation of short-, medium- and long-term measures towards this will be critical.

### **Adaptation Efforts and Addressing Loss and Damage**

One of the most successful outcomes of the Paris Agreement was that it created a framework for global goals on adaptation efforts. By keeping climate adaptation on par with mitigation efforts, it has strengthened calls for national adaptation measures through support and international cooperation. Adaptation efforts by developing countries can be recognised and supported through various capacity-building and support programmes financed by developed nations.

The latest IPCC report painted a bleak image of the irreversible damage that has already been caused by climate change. Even if the world manages to limit global warming to 1.5°C, there will still be some long-term impacts, some of which are seen in extreme weather events such as excessive rains, cyclones, and storms. The rise in sea levels, the melting of Arctic ice, and warming and acidification of the oceans are affecting small island nations and poor countries significantly. In addition to the adaptation efforts that need to be ramped up in vulnerable areas, there must also be an effective mechanism to address loss and damage due to climate change.

A key outcome at COP25 was the establishment of the Santiago Network on Loss and Damage to spur the technical assistance that countries need to cope with unavoidable and irreversible climate damages. Developing countries are now calling for the network's effective operationalisation so it can provide climate-vulnerable countries with approaches to respond to loss and damage from climate impacts, and explore ways to implement the recommendations of the Task Force on Displacement that was created under the Paris Agreement.<sup>16</sup> Further, as the operationalisation of the Santiago Network on Loss and Damage is discussed, it must incorporate a streamlined approach for funding of loss and damage.

## Enhancing International Collaboration on Energy Transition, Clean Road Transport, and Nature

The transition to clean energy and decarbonising the key sectors of energy, transportation, and infrastructure needs collaboration at an unprecedented scale. These collaborations can be explored through the sharing of knowledge and technology, supporting programmes in developing countries through sharing best practices and resources, and adopting technological solutions.

*Reducing Emissions from Transport Sector:* The mission of COP26 is to address emissions from the road transport sector, which currently accounts for nearly 10 percent of global emissions and are rising faster than those of other sectors.<sup>17</sup> To achieve the targets set by the Paris Agreement, decarbonisation policies will have to reflect passenger cars transitioning to electric vehicles for new sales by the early 2030s, which will lead to the deep decarbonisation of the sector by 2050.<sup>18</sup> The conversation at COP26 must include not only cars, but also vans, trucks and lorries. This shift to zero emission is expected to create new jobs, bring cleaner air to cities, and decrease the costs of car ownership in the long run. This, however, will be easier for developed countries while developing nations struggle to make the transition. It is important that the summit focuses on discussions that allow for this shift towards zero-emission vehicles to be truly global, leaving no country behind.

This transition cannot be facilitated solely by technological solutions. There is a need to address a much deeper human behavioral change which can only be realised by incentivising the right choices that will ensure a quicker path to a low-carbon future. This scale of change needs a concerted effort from various sectors—government, manufacturers, businesses, and civil society. The creation of the Zero Emission Vehicle Transition Council, which includes countries with the largest and most progressive car markets, has spurred the pace of the global transition to zero-emission vehicles.

*Nature-based solutions not a panacea but a way forward:* There are extensive debates on how nature (forest, agriculture, and ecosystems) can become effective solutions for absorbing atmospheric carbon and offsetting carbon emissions. Increasingly, the term ‘nature-based solutions’ (NBS) is becoming more common in climate debates,<sup>19</sup> and COP26 will start discussions on how to integrate NBS into the Paris implementation strategy.<sup>20</sup> While recognising links between biodiversity loss and climate change, a push towards increasing forest cover in each country must take priority in the negotiations.

COP26 talks must emphasise on actions that can make positive contributions towards stopping soil degradation, restoring carbon- (and species-) rich ecosystems, increasing agriculture and forestry practices, and eliminating subsidies that encourage activities harmful to biodiversity.<sup>21</sup> This is perhaps the one area where there will be the most agreement and understanding among the participating countries. Furthermore, a few selective Negative Emissions Technologies (NETs)—which involve solutions using natural processes such as afforestation and reforestation, land management to increase and fix carbon in soils, and bioenergy production with carbon capture and storage—could be evaluated and scaled up to offset carbon emissions. However, for the wider development and adoption of NETs, appropriate institutional mechanisms at a local and global scale are essential.

## **Conclusion**

COP26 is an opportunity to secure a better future for all. It is time for the developed nations to lead the most ambitious plan towards a resilient world that will not condemn the most vulnerable countries and communities to a dangerous future. This will require action plans that are bold and ambitious, along with solidarity among all countries and a willingness to share resources.

# Mobilising Resources for a Low-Carbon, Climate-Resilient Africa

Oluwaseun J. Oguntuase

Fossil resources have enabled a revolutionary wave of innovation across societies since the beginning of the 20<sup>th</sup> century, but they come with not-so-hidden costs. Since Swedish scientist, Svante August Arrhenius, established in 1896 the contribution of carbon dioxide from the burning of fossil resources to global warming,<sup>1</sup> there has been scientific consensus that greenhouse gas emissions from human activities are primarily responsible for climate change.

In August 2021, the United Nations Intergovernmental Panel on Climate Change (IPCC) published its much-awaited report on the state of climate science, its sixth such document since 1988. The Sixth Assessment Report (AR6) by IPCC Working Group 1 underlined that human influence has incontrovertibly and significantly modified the Earth's climate at a rate that is unprecedented in at least the last 2,000 years. The report further warned that the world would face severe, pervasive, and irreversible climate impacts

even with 1.5-degree Celsius warming, and such degrees of warming would likely entail high, multiple, and interrelated climate risks for poor and vulnerable regions, including small islands and least developed countries.<sup>2</sup>

Africa, home to the majority of the world's least developed countries, is disproportionately vulnerable to the impacts of climate change despite being responsible for only a small share of global carbon dioxide emissions. In the coming decades, the continent is expected to be one of the hotspots of vulnerability to the adverse impacts of climate change.<sup>3</sup> Eight African countries are among the 10 most vulnerable countries in the world.<sup>4</sup> Some parts of sub-Saharan Africa are projected to lose between 2 and 7 percent of their GDP by the year 2100 due to rising temperatures.<sup>5</sup> The vulnerability is exacerbated by multiple biophysical, political, and socioeconomic stress factors that also constrain Africa's adaptive capacity.

The current decade is pivotal for climate action in Africa where the link between climate change and sustainable development is a two-way street. As with the 2030 Agenda for Sustainable Development, Africa's strategic and endogenous development plan, *Agenda 2063: The Africa We Want* is inextricably linked to climate action. Climate change is negatively affecting the ability of many African countries to achieve both Agendas 2030 and 2063 by impacting their GDPs, national budgets, livelihoods and communities, infrastructure, finance, and costs of adaptation.<sup>6</sup> Both Agendas 2030 and 2063 recognise climate change as a critical challenge to sustainable development. The interconnections of the two Agendas offer platforms for African countries to advance an integrated approach to achieve and sustain stability for economic growth and equitable human development—this remains the greatest and most immediate development challenge in most African countries.<sup>7</sup>

Given the obvious and increasing threat posed by unmitigated climate change impacts to Africa's development and livelihoods of millions of Africans, there is a growing call for transition to a low-carbon, climate-resilient Africa. While the concept of resiliency emerged in the 1970s in ecological research and was also widely considered from the perspective of socio-economic development, the concept of a climate-resilient economy appeared in the 2015 economic considerations in the context

of the Paris Agreement.<sup>8</sup> The concept of low-carbon, climate-resilient development (LCCRD) emerged as a key way of framing policy and action to address climate change, capturing the need for mitigation and adaptation efforts to be fully integrated into development planning and implementation.<sup>9</sup> Experts acknowledge that climate change is a pandemic enabler and accelerant.<sup>10</sup> The Covid-19 pandemic—the latest evidence of the unsustainability of human activities on planetary health—has further shifted public sentiment in favour of a more inclusive, equitable, sustainable, and climate-resilient development.<sup>11</sup>

Africa's capacity to adopt low-carbon development pathways is extremely weak and the road to building capacity for the transition is a complex and multidimensional undertaking, fraught with many difficulties. The World Economic Forum's (WEF) *Global Competitive Report* highlights the heavy lifting required in adopting low-carbon development pathways in the continent.<sup>12</sup> Sub-Saharan Africa is the least competitive region in the world, performing poorly in human capital, innovation capability, infrastructure, and institutions. These shortcomings continue to impede the continent from maximising its abundant bioenergy potential and rich solar resources to meet its energy needs.

The WEF's report showed that Africa must focus on targeted long-term public investments to support R&D activities; building efficient innovation system; improving the level of education, training, and skills of the population; and supporting market development to enhance competitiveness. Equally important for Africa to transition to a low-carbon, climate-resilient economy is improving general governance, reinforcing legal and regulatory frameworks, strengthening national institutions, and building quality infrastructure.

Building low-carbon, climate-resilient economies and societies come with heavy costs. The required investment is far beyond what can be accommodated by public finance of African countries that are already reeling under pressure. Public revenue generations are poor, debt levels are rising, and the continent—which has low revenue-to-GDP ratios—is confronting some of the most onerous debt servicing obligations in the world.<sup>13</sup> Therefore, securing a low-carbon development future without sacrificing urgently needed development remains a critical challenge for African countries. However, rather than a problem of capital generation, the key challenge in financing the transition to a low-carbon society is to redirect existing and planned capital flows from traditional high- to low-carbon climate-resilient investments.<sup>14</sup>

Estimates peg the amounts required by Africa to transition to a low-carbon, climate-resilient economy in the hundreds of billions of dollars.

These include an estimated USD 222 billion in climate resilience investments, USD 377 billion for climate mitigation investments,<sup>15</sup> and more than USD 600 billion over the next 10-20 years at the range of USD 20-30 billion per year in climate adaptation till 2030.<sup>16</sup> Together, African countries will require approximately USD 3 trillion by 2030 to implement their Nationally Determined Contributions (NDCs) under the Paris Agreement.<sup>17</sup>

The global community recognises the importance of climate finance in achieving substantial reductions of greenhouse gases (GHG) emissions and securing a low-carbon development future. As such, it has established several multilateral climate funds to disburse funding to developing countries to help meet the cost of climate change mitigation and adaptation. The funds are capitalised primarily by developed countries in recognition of their greater historical responsibility for current atmospheric greenhouse gases. However, the 2009 pledge by developed countries to jointly mobilise USD 100 billion annually in support of climate action in developing countries is insufficient to finance a global transition to clean energy and to meet the adaptation needs of the world's most vulnerable countries.<sup>18,19</sup>

Overall, investments in adaptation and resilience-building around the world still fall short of documented needs to avoid severe economic and human impacts from climate change, especially in developing countries.<sup>20</sup>

Climate finance provided and mobilised by developed countries for developing countries increased by 2 percent from USD 78.3 billion in 2018 to USD 79.6 billion in 2019, or USD 20-billion short of the 2020 target. The marginal increase was driven by a rise in public climate finance while private climate finance dropped by 4 percent.<sup>21</sup> Yet, transitioning to a low-carbon, climate-resilient Africa hinges on unlocking private climate finance which has emerged as an important source of climate finance, and is more effective than public climate finance in reducing greenhouse gas emissions.<sup>22,23</sup> Private fund and institutional capital remain the biggest and largely untapped pool of capital for climate action and resilience and will unquestionably be key in closing the funding gap of transformation to a low-carbon and climate-resilient Africa.

There is no better arena than COP26 to deepen the solidarity and diplomacy for climate action in Africa. The African Group of Negotiators need a unified voice at COP26 to build bridges with the growing global coalition committed to net-zero emissions by 2050. The other stakeholders include

the Group of 77 and the Small Island Developing States (SIDS), who are equally invested in the goals of achieving laudable wins around emission cuts, climate finance, technology transfer, and capacity building. Indeed, this conference will be the most important meeting on the climate emergency yet, since the 2015 Paris summit. Beyond extracting favourable deals at COP26, Africa must walk the talk by heeding the call by Rt Hon Alok Sharma MP, President for COP26, to submit more ambitious NDCs at the conference.

Finance will make or break Africa at COP26. It is one of the conference's four discussion points, and reinforces the other three – mitigation, adaptation, and collaboration. Africa attracted USD 18.5 billion in private climate finance over 2016-19. This was 26 percent of the total on average of climate finance over the period, following Asia with 43 percent.<sup>24</sup>

Africa is the world's fastest-growing continent and is full of opportunities for growth. In demanding and negotiating for private climate finance flows at COP26, the representatives of the continent must depart from presenting Africa as a vulnerable case.

Instead they must build an economic case, with bountiful commercial opportunities across keystone sectors such as power generation, agriculture and agro-industries, retail and commodities, metal and mineral processing, infrastructure, tourism, and relocation of goods and people. These opportunities in climate mitigation include the decarbonisation of electricity generation, renewable and clean energy technologies, afforestation and reforestation, bioenergy production, and resource-efficient technological solutions and processes. Those in climate adaptation include introduction of new crop varieties, more efficient irrigation, sustainable forest management, early warning and information sharing systems, soil and water conservation, livelihood diversification, and improvement of infrastructures.<sup>25</sup>

A record number of 587 investors with USD 46 trillion in assets under management are signatories to the 2021 Global Investor Statement to Governments on Climate Crisis urging governments to raise their climate ambitions at COP26. The priority areas where these institutional investors and asset managers demand action, are implementing mandatory climate risk disclosure, strengthened national commitments for 2030, commitment to build-back-better from the Covid-19 pandemic, ending fossil fuel subsidies, and implementing domestic policies to incentivise private investments in zero-emissions solutions and outcomes.<sup>26</sup> Africa's policymakers must observe these areas to attract private climate finance.

There are various strategic levers required to convince the COP26 Business Leaders Group to accelerate the shift in business investments for orderly climate-positive activities and outcomes in Africa. These include stronger commitments to rule of law, agreement on clear policy directions, common regulatory frameworks, specific mechanisms to implement climate targets across the Africa, active engagement with investors, and advocacy with relevant stakeholders including NGOs transnational initiatives and conservation organisations.

Africa continues to face the sharp end of climate change and evidence suggests that the countries of the continent are already committing some resources of their own to adaptation efforts. However, the Africa's Adaptation Gap 2 report has noted that implementation of climate action can only reach its full potential if complemented by comprehensive and effective national and regional policy planning, capacity-building, and governance.<sup>27</sup> More is achievable with public policy discussions and decisions around fiscal incentives, legal and regulatory reforms, human capital, technology transfer and acquisition, innovation system, and infrastructural development, amongst other supportive measures. The future is clear; the direction for Africa is away from fossil fuels towards a low-carbon, climate-resilient economy.

# Issues for Bangladesh

Fahmida Khatun

The Conference of Parties 26 (COP26) of the United Nations Framework Convention on Climate Change (UNFCCC) in Glasgow will not only be the largest global climate summit but also the most crucial global event in recent years. The Sixth Assessment Report (AR6) of the Intergovernmental Panel on Climate Change (IPCC),<sup>1</sup> published in August 2021, has reiterated, with enough scientific evidence, the certainty and severity of the impacts of climate change. The findings of the report are much bleaker than the last one, published in 2014, and show how the world has continued to emit GHGs at a higher rate. Projecting various scenarios, the AR6 highlights the world's current status with regard to the targets for reducing global warming and its implications. The intensity and frequency of extreme precipitation and the severity of droughts and heatwaves due to the Earth's increased warming will soon be insurmountable. Moreover, some of the consequences of climate change, such as melting ice sheets, rising seas, loss of species and acidic oceans, will be irreversible.

In this context, the COP26 is the last chance to reach an effective climate deal and obtain meaningful commitments from countries to avert the climate disaster. The significance of the COP26 is rooted in the commitments of the COP21 held in Paris in 2015. At the COP21, participating countries had agreed to bring down their carbon emission levels to limit global warming to below 2 degrees Celsius; adapt to the climate impacts; and make funds available to achieve the objectives of the Paris Agreement, which is a legally binding commitment. Agreeing to reduce emissions voluntarily, the countries set their emissions reduction targets in their national plans, called 'Nationally Determined Contributions' (NDCs), specifying by how much they would reduce their emissions. Further, the countries agreed to review and present their updated reduction plans every five years. As of 28 September 2021, 89 countries have submitted new NDC targets and four have proposed new NDC targets; 71 have not updated their targets.<sup>2</sup>

Bangladesh, currently a least developed country (LDC) but set to graduate from this status by 2026, has made significant economic and social progress since its independence in 1971. In FY2019, before the outbreak of the Covid-19 pandemic, it had an eight-percent growth in GDP.<sup>3</sup> Driven mainly by agricultural production, remittances and exports, Bangladesh's high economic growth has also led to improvements in socioeconomic indicators. Some of these include *reduction in poverty and mortality, better access to safe drinking water, higher life expectancy, literacy, per capita food intake, and an increase in women's participation in the labour market*. At the same time, however, its GDP growth is subject to various vulnerabilities such as inequality, low job creation, poverty, and lack of economic diversity. Additionally, Bangladesh is highly vulnerable to the impact of climate change, and regularly experiences floods, cyclones, storm surges, droughts, and other extreme climate events. It also faces the risk of sea-level rise due to global warming. Thus, the COP26 is especially significant for Bangladesh, like it is for other climate-vulnerable countries. To address the climate crisis from the perspective of such nations, Bangladesh has five specific agendas.

**First**, the highest emitting countries must commit to deeper emission cuts by 2030 to achieve the target of keeping the rise in global temperature below 1.5 degrees Celsius. Many countries have already increased their target levels through higher reduction of GHG emissions, and some have reiterated their commitments for emissions reduction. By 2030, the United States has made

commitments to reduce GHG emissions by at least 50–52 percent from its 2005 levels, Japan by 46 percent from its 2013 levels, Canada by 40–45 percent from its 2005 levels, the European Union (EU) by at least 55 percent from the 1990 levels, and the UK by 75 percent. China, too, has reiterated its commitment to achieve carbon neutrality by 2060, while South Korea plans to be carbon neutral by 2050.

**Second**, the mobilisation of climate finance should be stepped up, so that vulnerable countries can make higher investments on reducing the risk of climate change by better adaptation. Funds are also needed for investment in renewable energy and making such energy accessible to the poor at an affordable price. Unfortunately, the pledges of the developed countries to mobilise USD100 billion per year by 2020 remains unfulfilled. According to estimates of the Organisation for Economic Cooperation and Development (OECD), developed countries provided and mobilised a total of USD79.6 billion as climate finance for developing countries.<sup>4</sup> At the 76<sup>th</sup> General Assembly meeting of the UN, the US committed to increase its climate finance by 2024, and several other developed countries have also made pledges to increase their contributions. However, new pledges are required to ensure a minimum of USD500 billion during 2020–24.<sup>5</sup>

Access to climate funds is particularly challenging for Bangladesh, since a significant part of this fund comes in the form of loans and non-concessional instruments.

**Third,** Bangladesh needs more funds for adaptation. At present, climate financing is biased towards mitigation, which is an approach used largely by the developed emitting countries. Mitigation funds comprise 75 percent of the total climate finance, and are used for energy and transport sectors.<sup>6</sup> Thus, LDCs, which are the least responsible for creating the problem of climate change but the worst affected by its negative impacts, are not receiving sufficient funding to make adaptation changes. While Bangladesh has managed to successfully adapt to various climate-related challenges with limited resources and often with indigenous technologies, given the enormity of the problem, the country needs to enhance its adaptive capacity and strengthen resilience. This will require higher resources and technology transfer to make a green transition. Further, the Covid-19 pandemic has put added pressure on climate-vulnerable countries, increasing inequality not only within countries but also between them. Without enhanced financing, these countries will face difficulty in recovering from the fallout of the pandemic and rebuilding their economies better and greener.

**Fourth,** Bangladesh expects the details of the Paris Rulebook to be finalised at the COP26, to ensure the accountability of the activities of all countries. Three important components of the Rulebook are: a) the guidance to facilitate global stocktaking for assessing collective progress on the long-term goals of the Paris Agreement; b) the establishment of a five-year timeframe for NDCs, instead of a ten-year timeframe, so that the progress can be tracked more frequently and measures can be taken accordingly; and c) the finalisation of Article 6 of the Paris Agreement, which sets the rules for carbon markets in a way that financial support for adaptation is made available and human rights are safeguarded.<sup>7</sup> This is important, since credible and tangible emissions reduction is critical for environmental integrity.

**Fifth,** the mechanism of loss and damage should be established. At the COP19 in November 2013, the Warsaw International Mechanism (WIM) for Loss and Damage associated with Climate Change Impacts was established.<sup>8</sup> The objective was to address loss and damage associated with impacts of climate change in vulnerable developing countries. The demand for addressing such loss and damage has been a longstanding one, despite developed countries resisting the idea. Article 8 of the Paris Agreement reaffirmed the WIM for Loss and Damage as the main vehicle under the UNFCCC process for addressing the issue.<sup>9</sup> However, no real progress has yet to be made.

For long now, Bangladesh has been giving a voice to the needs of climate-vulnerable countries at the global level. As the chair of the Climate Vulnerable Forum (CVF), the prime minister of Bangladesh is advocating for not only emissions reduction by all nations but also more support to the climate-vulnerable countries. At the domestic level, Bangladesh has charted out various policies including the Comprehensive Climate Change Action Plan, the National Adaptation Plan, and the Delta Plan—to tackle climate-change-related challenges in the short, medium and long terms. In 2015, it made commitments for emissions reduction as part of its NDCs, to reduce GHG emissions by five percent by 2030 in three sectors—power, transport, and industry. In its new NDCs, it has included two more sectors, i.e. waste and land use. With additional finance and technology from external sources, Bangladesh will be able to reduce GHG emissions by 15 percent. In its revised NDC, Bangladesh has committed to reduce GHG emissions by 6.73 percent by 2030 in five sectors: power, transport, industry, waste, and land use. With additional finance and technology from external sources, Bangladesh aims to reduce GHG emissions

by 15.12 percent.<sup>10</sup> However, Bangladesh's CO<sub>2</sub> emissions are negligible, with only a 0.28 percent share in the annual share of global CO<sub>2</sub> emissions as of 2019.<sup>11</sup> Thus, Bangladesh cannot undertake a higher commitment of emissions reduction without an increase in financial and technological support from the international community.

Bangladesh recognises that the COP26 is the last opportunity for the international community to deliver on the commitment to keep global warming below 1.5 degrees Celsius. Failure to do so will exacerbate the climate crisis, disproportionately harming developing countries and ensuring that future generations continue to bear the brunt of the devastating consequences of climate change for no fault of their own. As a leader of vulnerable nations, Bangladesh calls for greater commitment, ambitious targets, and solidarity of the global community to make the world sustainable, just, and liveable for future generations.

## 4

# Roadmaps and Frameworks for Achieving Net-Zero Targets

Ramendra Prasad

**T**he devastating impacts of the climate crisis are already being realised by both developing and developed nations. These consequences do not discriminate by sectors, and all industries are under distress—including human health, food security, agriculture, and livelihoods. The frequency and intensity of extreme weather events such as droughts, pluvial and fluvial floods, cyclones and hurricanes, heat waves, bush fires, and ocean acidification are on the rise, as highlighted in the Sixth Assessment Report by the Intergovernmental Panel on Climate Change (IPCC-AR6) report<sup>1</sup> and other scientific literature, e.g. Moishin et al. (2021)<sup>2</sup> and Prasad et al. (2021).<sup>3</sup> These, in turn, have caused an increase in humanitarian crises including malnutrition, hunger, infectious diseases, and poverty. With salt-water intrusion and rising sea levels swallowing the coastlines, governments have resorted to building sea walls, climate-induced relocation, and migration in the small island developing states and

other coastal communities. Yet, this is not the most appropriate approach as the livelihoods of the coastal and maritime dwellers are intertwined with the ocean, and they have a strong attachment to their customary land.<sup>4</sup>

To prevent catastrophic and irreversible damages from the changing climate by curbing global GHG emissions, 196 countries made a pledge under the Paris Agreement in 2015. The document now has 189 Parties.<sup>5</sup> Realising the urgency of the crisis, countries intend to strengthen their ability and those of other countries to deal with the impacts of climate change whilst limiting the global temperature well below 2 degrees Celsius, preferably to 1.5 degrees Celsius, compared to pre-industrial levels. Under the Paris Agreement, countries are to prepare, communicate, and maintain their Nationally Determined Contributions (NDC), taking into account domestic circumstances and capabilities.<sup>6</sup>

They must formulate low emissions development strategies, mitigation measures, implementation roadmap, adaptation plans, GHG inventory, monitoring, reporting and verification of emissions supported by enabling policies and frameworks, with the aim of achieving carbon neutrality by 2050. However, some scientists believe that this goal is too ambitious and unachievable at this point. They stress that the longer it takes to curb the temperature rise, the worse the conditions will become.

The global emissions show that *energy use* is the biggest emitter (73.2 percent), of which 24.2 percent is from *energy use in industry*, 16.2 percent is *transport* (road transport – 11.9 percent; aviation – 1.9 percent; shipping – 1.7 percent), and 17.5 percent is from *energy use in buildings* (residential – 10.9 percent; commercial – 6.6 percent)<sup>7</sup>. While the scenario could vary across countries, the energy sector is often the larger emitter. Taking this into consideration, more deliberations are needed in the COP26 regarding SDG-12, i.e. responsible consumption and production, which is about “*promoting resource and energy efficiency, sustainable infrastructure, and providing access to basic services, green and decent jobs and a better quality of life for all.*”<sup>8</sup> This essentially emanates from the energy pyramid—with energy conservation at the base, energy efficiency above it, and alternative or renewable energy at the apex. The base has a larger area, showing that a large chunk of reduction in energy use and, therefore, emission reduction could be achieved through energy conservation. Further, it is critical to understand the importance of energy conservation and efficiency, to reduce unwarranted

wastages and support SDG12 as well as synergise with GHG emission reduction actions and ramp up efforts to tackle poverty around the world.

There is a lot to learn from the Covid-19 pandemic. When it began, there was significant scepticism about the gravity of the situation, similar to the phenomenon of climate change denial. However, with a massive increase in cases and the unfortunate loss of lives, the full focus of governments across the world was eventually aimed towards combatting the pandemic. Within a short period of time, humanity embraced and adapted to the “new normal”, and the accelerated development of vaccines was set in motion. Thus, the pandemic brought about a paradigm shift in the way people lived and worked, and in their everyday routines. A similar paradigm shift to enhance low-carbon innovation and investment is needed to prevent overshooting the emissions budget in maintaining temperature rise well below 1.5°C. Similarly, concerted and synchronised action from all actors, decision-makers, governments, private sectors, and stakeholders is imperative for climate change. Everyone must join hands to avert the climate calamity, from the big emitting countries to every individual.

Consequently, in COP26 discussions, an agreement on more equitable actions is required for energy efficiency, alternative energy options, and low-carbon transportation:

*Energy Efficiency (EE) and Energy Conservation:* Although these comprise largely individual choices and sense of responsibility, they are crucial. Discussions on having more stringent EE standards are essential for all countries, particularly for industries, electricity generation, demand-side management, and transportation. For developing nations, energy efficiency in buildings with climate and cyclone-resilient buildings is also important. It would not be sensible for a developing country to achieve 100-percent electricity access without having proper measures for climate-resilient and energy-efficient dwellings. For small island states, early warning and coastal-defence systems are also needed to protect the vulnerable energy, industry and transport infrastructures.

*Electricity Generation:* Gradual phasing out of coal power and a quick switching over to alternatives is critical. In addition, an increase in capacity and capability in renewable energy production and supply, with improved grid infrastructure and smart grids, should be made utmost priority by all countries.

*Transport Sector:* Accelerated transition to e-mobility (Battery Electric Vehicle and Plug-in Hybrid Electric Vehicle) and non-motorised transportation is required. Developed countries need to deliberate and cooperate towards electric-mobility developments and assist the developing countries into transitioning towards non-motorised transportations, alternative energies in the land and maritime transportations, and improving public transportation networks and infrastructure.

Developing countries will need assistance towards infrastructure development for non-motorised transport and e-mobility.

*Financing and Policy Enablers:* Funding and financing have always created a bottleneck for climate actions, and there does not exist a one-size-fits-all policy solution. Though the Covid-19 pandemic has devastated many economies, it has also provided an opportunity for countries to re-evaluate the recovery strategies to build back better with green recovery, incorporating pandemic-proof and climate-proof foresight. Targeted consumer education and behavioural change—similar to the one witnessed amidst Covid-19—is required for energy efficiency, green and alternative energy options, and low-carbon transportations. The demand created by consumers is bound to compel manufacturers and businesses to move swiftly to responsible alternatives. The process of recovery and climate-proofing will be expensive, as indicated by both developed and developing countries. However, the pandemic has shown the merits of foregoing short-term profit and risking economic losses over long-term gains, which will allow for quick adoption of measures for a new normal. Moreover, the establishment of new climate-sensitised norms and policies is expected to cushion economies from future climate shocks. It is imperative that contextualised green recovery policies are implemented to create green jobs while also empowering and strengthening communities.

Large climate financing is a prerequisite for net-zero transformation and innovations to reduce emissions. However, such financing must be recognised as *investments* rather than mere expenses. Funding for technological innovation for renewables integration, smart grids, energy storage and power-to-X storage, and conversion and reconversion pathways will be revolutionary in transforming the intermittence renewables into reliance and dispatchable energy. One such strategy for countries can be to increase investor confidence through policy frameworks and entice large petroleum companies to invest in e-mobility ventures, since these companies are important levers of change with a key allocative role in society and who have the power to accelerate investment and

transition towards a net-zero low-energy future. Developing countries, however, are dependent on donor agencies and access to climate financing is often bureaucratic and challenging. Thus, simpler climate-financing mechanisms are necessary along with capacity-building, to support propitious policies in developing countries for expeditious low-carbon transitions and developments.

Countries must now take concerted actions to combat the climate calamity with respect to technological adoptions, policies, and most certainly, financing. As the new developments take place, discussions pertaining to newer viable options need to be incorporated and climate actions revisited and rejuvenated accordingly.

## 5

# Identifying Pathways to ‘Net Zero’

Tony Wood

Wildfires, storms, floods and other natural disasters are the physical and scientific evidence that human-induced climate change is worsening. Yet, emissions continue to grow and policies across the world remain short of what is needed to address the problem. Some countries are heightening their climate action and others have announced ambitious targets; still others remain hobbled by endless debates. Australia falls into the third category and illustrates the challenges ahead.

COP26 provides hope, tempered too, by remembered disappointments from previous such meetings. The hope remains that global leaders, still battling Covid-19, will find ways to align common interests with necessary actions.

The international community has been here before. Numerous scientific reports have delivered stronger evidence on a recurring theme—“climate change is already affecting every region on earth in multiple ways.” Unless there are immediate, rapid,

and large-scale reductions in greenhouse gas emissions, limiting warming to 1.5°C—or even 2°C—will be beyond reach.<sup>1</sup> These limits require cutting global emissions to net zero by 2050 (in scenarios limiting warming to 1.5°C) or 2070 (when warming is limited to 2°C), and earlier for developed economies.

The language of ‘net zero’ has become a rallying cry in recent years. The 2015 Paris Agreement formally recognises that limiting climate change requires achieving a global balance between emissions and removal of greenhouse gases to and from the atmosphere. That means no net emissions, or ‘net zero’. The agreement is to achieve this somewhere in the second half of this century; the earlier it happens, the greater the chances of keeping global warming below 2°C.

It would be ideal if all emissions were stopped. There would be nothing to balance, and temperature increases due to human-induced activities would slow and eventually stop. The real world is far from being this perfect, as illustrated by the numbers for each of the key sectors that contribute to the global total of about 50 billion tonnes of emissions per year.<sup>2</sup>

More than 50 countries have legislated or committed to net-zero emissions by 2050, 2060 or earlier; over 70 percent of global GHG emissions are now covered by net-zero pledges;<sup>3</sup> and many corporations and industry sectors have signed up to some version of a net-zero target. Yet few of these bodies have clear plans to achieve the objectives or even a clear understanding of the meaning of 'net zero'. Real commitment to the objective will flow from such an understanding.

### **Towards Net Zero**

Electricity and heat are responsible for about 25 percent of global GHG emissions, and about 25 percent of electricity comes from renewable sources, including hydro, wind, solar, and geothermal.<sup>4</sup> The International Energy Agency envisages that in a net-zero world, almost 90 percent of electricity could come from renewable sources, mostly solar and wind, with nuclear power making up most of the rest. Additionally, most of the current transport and other stationary energy will have been electrified.<sup>5</sup>

For countries like Australia, embracing nuclear power is unlikely, so a system of 90 percent solar and wind will need to be supported by considerably more transmission than exists today, batteries for short-term storage, and backed-up natural gas for the extended renewable droughts that periodically occur.<sup>6</sup> Any remaining carbon dioxide (CO<sub>2</sub>) emissions will need to be balanced by CO<sub>2</sub> removals.

Industrial and transport emissions are responsible for about 21 percent and 14 percent of global emissions, respectively.<sup>7</sup> Shifting from gas to electricity, and from internal combustion engines to battery electric vehicles is already happening for personal and light commercial vehicles and will need to accelerate if these sectors are to contribute to reaching net-zero by 2050. Yet, in both sectors there are areas where the technology solutions look to be very hard, very expensive, or both. These include steel and cement manufacturing, longer-distance road freight, and aviation transport. Carbon capture and storage, and technologies to produce green hydrogen, feature strongly on the list of potential solutions.

Agriculture, the sector most directly threatened by a changing climate, produces about 24 percent of global emissions,<sup>8</sup> most of which is methane that comes from cattle and sheep. This is a bigger issue in countries with a dominance of grazing cattle, such as Australia, and less so when meat comes from poultry and pigs. While the agricultural industry in many countries is looking at technologies to reduce these emissions, the prospects for going close to their elimination over the next 30 years are slim.

A three-pronged approach emerges. First, we must accelerate the deployment of what we know now. Deployment policies are ideally market-based carbon prices to achieve lowest-cost outcomes. Different political imperatives or government structures may mean a preference for regulatory obligations (for instance, emissions standards for vehicles) or direct funding of low-emission technologies by governments (for instance, reverse auctions for renewable energy, or projects to reduce industrial emissions). The promised funding from developed to developing economies must be delivered.<sup>9</sup>

Second, we must mobilise investment in the research and development (R&D) of low- and zero-emission technologies across all sectors. Grant funding through a structured tendering or auction process is also likely to be the preferred approach for governments to support R&D for low-emission technologies at early stages of development. Governments and multilateral development banks should play key roles.

Third, we must offset, because the most likely outlook is that beyond what these approaches can deliver, we will still produce some billions of tonnes of emissions by mid-century. These will have to be balanced by removals to achieve net zero. Even if net zero is achieved by 2050, we will still need negative emissions after that to limit temperature rises.

The same market-based policies to drive emissions reductions can deliver CO<sub>2</sub> removals. In their absence, removals can be paid for by governments. As an example, the Australian government established a fund to pay directly for offsetting credits (Australian Carbon Credit Units) created by emissions reductions and removals. The fund,<sup>10</sup> which has a budget of \$2.55 billion (US\$1.92 billion), is on-track to reduce emissions by about 11 million tonnes in 2021, with an average contract price well under \$20 (US\$14.95) per tonne.

Carbon pricing or government payments are not the only way to deliver removals. Companies can undertake voluntary activity to meet their own net-zero objectives. The cost of voluntary offsetting varies widely across the world. Companies can find offsets for as little as US\$1.30 per tonne;<sup>11</sup> those choosing Australian government-accredited units are fetching spot prices above US\$20 per tonne.

These prices are projected to increase considerably in the future as more companies make such commitments, and demand could increase even more substantially if international action, voluntary or otherwise, makes offsetting credits with well-documented integrity an attractive proposition. Global trading in offsetting credits could grow quickly in a world increasingly connected through common objectives and where carbon border adjustment mechanisms level the playing field.

While there are many different sources of emissions across multiple sectors, there is only a small number of removal activities. The key ones are planting trees, putting carbon back into the soils, and directly removing CO<sub>2</sub> from the atmosphere and burying it. The potential for such removals and their integrity as “real” removal is subject to debate, partly because the technologies and their measurement and verification are relatively immature, and also because climate change itself threatens the permanence of carbon stored in trees or soil. Much research and development are needed across many areas of reduction and removal technologies.<sup>12</sup>

## Conclusion

Current numbers demonstrate why a net-zero framework is needed, but also show that it is unlikely that direct funding from governments and voluntary funding from companies will be enough to deliver the emissions reductions and removals that balance to zero. The scale and pace of change is daunting but necessary. Net zero will be achieved in three decades if driven by clear policies, supported by technology development, and delivered through massive finance mobilisation.

The global community is mobilising around the objective of net zero by mid-century. Actions taken now to deliver cost-effective emissions reductions, drive down the cost of low- and zero-emission technologies, and support the case for greenhouse gas removals will determine whether that target can be achieved and the existential threat to humanity, defused.

# Money Makes the World Go Round; Lack of it Could Accelerate Earth's Demise

Jean Paul Adam

**A**frican positions in climate negotiations have revolved around three indisputable truths:

- Africa is the least responsible region for climate change, yet pays the highest price for climate adaptation.
- The action of the developed world—those most responsible—to tackle climate change has not matched the rhetoric of climate diplomacy or even the commitments made in the climate agreements.
- The finance needed to invest in tackling climate change has not flowed as freely as the emblematic figure of US\$100 billion per year led us to believe it would.

These truths will be oft repeated because the action required remains outstanding.

Nevertheless, three other facts are as important and key to successful outcomes for African countries at the United Nations Climate Change Conference (COP26) in Glasgow:

- As the Covid-19 pandemic has illustrated, Africa cannot depend on the current models of economic development to achieve meaningful progress on its development goals.
- Climate resilience requires action from all, everywhere, to be effective; the action must be relative to their means.
- Climate resilience represents an investment far greater than US\$100 billion per year.

No matter how the conversation is framed, climate finance will remain at the top of the list because it is fundamental to achieving the systemic change that is required.

The power of new financing models will determine the success of COP26.

### **Finance to Drive Change**

The commitment to mobilise US\$100 billion per year from 2020 continues to highlight the gap between rhetoric and delivery that has historically affected climate negotiations.

The continued lack of fiscal space available to African countries has challenged sustained investment in climate resilience. Many African countries are running deficits of over 3 percent and the average debt-to-GDP ratio in Africa rose in 2020 to over 60 percent.<sup>1</sup> and The continent also has an extremely low tax-to-GDP ratio of below 15 percent and falling (13.4 percent in 2018).<sup>2</sup> Even more concerning is that Africa spends four times more in debt servicing than it is able to generate in revenue.<sup>3</sup>

Climate finance has remained fragmented, and overall development finance has also reduced in real terms. Official development assistance from the OECD Development Assistance Committee countries to Sub-Saharan Africa fell by 1 percent in 2020.<sup>4</sup> This is compounded by the small size of stimulus mobilisation in African countries, with few able to mobilise more than 1 percent of GDP.<sup>5</sup> In

contrast, the developed world in 2020 mobilised packages of over 20 percent of GDP.<sup>6</sup>

Against this backdrop, it is new financial flows that will change the tide and allow fresh investment to take place. Without it, the most marginalised regions, such as Africa, will be swept away either by the storm surge of the pandemic, or by the inexorable rise of the sea through the climate tsunami.

### **New Green or Blue Economy for Africa**

These fresh flows of finances must be invested in new economic models that build sustainable value chains, leveraging regional frameworks such as the African Continental Free Trade Area. The goal is to move away from dependence on extractives and volatile commodity exports in favour of production and consumption chains that allow predictable investment to flow into sectors that foster climate resilience such as climate smart agriculture.

The 2030 Agenda and Agenda 2063 of the African Union trace a path towards a green economy or a blue economy for the continent—or, in other words, the continent's industrialisation is framed by the imperative of climate resilience, and of recognising the true economic value of Africa's natural capital as the basis for the organisation of economic activity.

Recent analysis by the UN Economic Commission for Africa (ECA) in collaboration with the University of Oxford and Vivid Economics has demonstrated that investment in green sectors will deliver much higher returns than maintaining a status quo pathway based on fossil fuel investments. In South Africa, this analysis showed up to 250 percent more job years and up to 420 percent more gross value addition created through green investments compared to fossil fuel-based investments.<sup>7</sup>

In the African context, this transition starts with energy as the platform for change since the continent has the highest energy gap, with almost 600 million citizens without access. Meanwhile, less than 50 percent of the population in 24 African countries have access to electricity.<sup>8</sup>

Investing in clean energy will catalyse further transitions towards more sustainable modes of production and consumption. It will also ensure that Africa can embrace more inclusive and sustainable value chains to drive growth.

### **Mitigation and a Just Transition**

Any efforts for mitigation in Africa are more about ensuring that the continent does not become locked into stranded assets and defunct technology, rather than as being catalytic for global mitigation targets. Thus, in Africa, the goal of net zero in terms of emissions has less meaning than the goal of achieving zero poverty and zero hunger. The reality

is that with the right deployment of technology, the path to net zero emissions will also serve as the most effective path to eradicate hunger and poverty. But a successful COP26 for Africa hinges on the conflation of these mutually reinforcing goals.

The importance of a just transition is also based on the current relative lack of diversification of African economies, and therefore any successful just transition strategy must be driven by the principle of sustainable African industrialisation.

The energy mix in African countries is diverse, and there needs to be a recognition of the variety of pathways that these nations may need to follow, in particular to address the issues around base generation in countries where current infrastructures are inadequate. Renewables such as hydro and geothermal energy can serve as useful opportunities for African countries to use the plentiful resources at their disposal but will not resolve the issues for all countries. The high upfront cost of hydro is proving problematic in the context of post-pandemic investment, while climate variabilities have also affected the reliability of some hydroelectric facilities, such as the experiences in the Zambezi region in 2019-2020.

Many African countries will make the case for a role for oil and gas as part of the transition to allow them to make use of their resources and to industrialise. The use of gas as part of a transition that is less polluting than coal, for instance, may well be relevant for some countries with high solar and wind potential. A doubling of electricity generation from gas in Africa will allow a 38 times more solar and wind generation, while increasing global emissions by less than 1%.<sup>9</sup>

Critically, Africa must adopt an energy mix that is more resilient to global vagaries and that can fast-track the development gains needed to eliminate poverty.

### **Adaptation**

Africa is the most impacted by climate change. Assessments by the ECA's African Climate Policy Centre have indicated that, on average, African countries are likely to lose between 2% and 5% of GDP by 2030. In some regions, such as the Sahel, this may be as high as 15%.<sup>10</sup>

Adaptation is about redefining the economic relationship between Africans and the resources at their disposal. There are many successful examples of Africans building the natural capital around them to adapt to the challenge of climate change, and develop sustainable livelihoods.

In Ethiopia, the Green Legacy Programme has mobilised communities to plant trees. This has been linked to income earning opportunities, such as through the planting of fruit trees and fodder trees and the associated economic activities.

The programme is also linked to reducing the risk of flooding and erosion, and better management of water catchment areas.

Countries such as Gabon are aiming to increase the domestication of the value addition to raw timber exports, increasing the revenue retained in the country per hectare of planted forest and improving the protection of pristine forest areas. Island nations such as the Seychelles have created a marine protected area of 400,000 sq. km. in the Exclusive Economic Zone as a means of boosting ecotourism, but also as a long-term means of improving the yield of fisheries.

Critically, more specific goals on adaptation need to be established and reported on by all countries. These goals must also be linked to livelihoods and income-earning potential to ensure true long-term sustainability. The establishment of these goals can also be used to further monitor the aim of at least 50% of climate finance being directed towards adaptation.

### **Global Price on Carbon**

Increasing ambition is also about incentivising good behaviour and taxing emissions. For African countries, there is understandable concern that mechanisms such as the Carbon Border Adjustment Mechanism could further marginalise their ability to trade freely and effectively and hamper their efforts towards a transition.

Therefore, it is important that global rules be clearly established and implemented. A global price on carbon provides predictability for all, and creates potential assets for those countries that are guardians of outstanding natural assets.

The Peatlands of the Congo Basin, for instance, cover 145,000 sq. km. and sequester up to three years' equivalent of the world's carbon emissions, making it the second most important carbon sink globally after the Amazon. But if these wonders of nature are degraded over time, rather than absorbing carbon they can also become a significant source of emissions.

A predictable global carbon price that is aligned to the goal of limiting warming to no more than 1.5°C can help raise significant resources for regions such as Africa. ECA analysis has shown that a global price of around US\$50 per tonne (as opposed to current prices that are usually below US\$5 per tonne) will allow Africa to mobilise just below US\$30 billion per annum through interventions in clean cooking, renewable energy and climate smart agriculture.<sup>11</sup>

## **Conclusion: Back to Finance**

Finance will be the top point on the agenda in Glasgow, and will also be the key to-do item at the close. COP27, to be held on African soil (Egypt) in 2022, must seek to further set a clear schedule of financing, continuous monitoring of commitments and disbursements, and ramping up targets for mobilisation beyond 2025 based on the needs identified in the nationally determined contributions and the national adaptation plans.

COP26 can create the template for significant additional financial flows by reaffirming the willingness of the International Monetary Fund's key shareholders to provide on-lending of special drawing rights. The establishment of the proposed Resilience and Sustainability Trust to also create a new vehicle for investment in sustainability can change the narrative.

COP26 and COP27 must also mainstream some innovative aspects of the global financial architecture. Much of the developed world has successfully mobilised market-based mechanisms to channel investment towards mitigation, adaptation, and climate resilience. The global market for green bonds was worth US\$549 billion in 2020, with Africa accounting for less than 1% of these issuances.<sup>12,13</sup>

Creating a predictable market for African and other developing countries will be an opportunity to stimulate global economic growth and channel investment to where it is most needed and impactful.

Making this possible requires de-risking, which can be achieved by upscaling blended finance and the provision of partial guarantees. Additional innovations are being proposed whereby a repurchasing or 'repo' market be made available for Africa, increasing the opportunity for private-sector investment to be channelled into the developing world. The ECA has proposed a vehicle to facilitate this through a 'liquidity and sustainability facility'.<sup>14</sup>

Debt must also be addressed. For the most vulnerable, this may well mean some debt forgiveness. Debt-for-adaptation swaps have also been proven as a vehicle to reduce and restructure debts and channelling savings into adaptation, as demonstrated by the Seychelles' successful debt swap in 2015.

Climate change is already imposing an impossible toll on the world's poorest and most vulnerable. It is no surprise that the key to averting catastrophe is to invest in their resilience.

# Aligning Climate and Health Goals

**Bhavya Pandey and Oommen C Kurian**

**T**he Covid-19 pandemic has severely impacted ongoing collective efforts on climate action. These efforts underscore the need for equal access to resources, judicious use and planning, strengthening critical infrastructure, and enabling vulnerable communities in the face of adversity. The multidimensional crises facing the international community, compounded by the Covid-19 pandemic, make it more urgent for countries to adopt forward-looking policies to act faster on sustainable transitions, adaptation and resilience, and provide impetus to recalibrating health systems for greater efficiency and quality. To this end, the 2021 COP26 in Glasgow, provides an opportunity for nations to address post-pandemic recovery through the lens of sustainable development.

## **The Grave Impacts of Climate Change**

Research has shown that Asia is the continent most affected by weather-related disasters—some 2,843 of such events were recorded between 1990 and 2016, affecting 4.8 billion people and taking 505,013 lives. Deaths from natural hazard-related disasters are largely concentrated in poor countries.<sup>1</sup> Higher temperatures brought about by climate change, pose profound threats to occupational health and labour productivity, particularly for people engaged in manual, outdoor labour in hot areas. Also, labour capacity decrease due to climate change is among the highest in the Southeast Asia region. Climate information services for health—i.e., targeted or tailored climate information, products, and services that will aid the health sector—were found to be the lowest in Southeast Asia.<sup>2</sup>

By 2030, irreversible negative impacts on health because of climate change could undo much of global poverty reduction strategies and push over 100 million people into extreme poverty.<sup>3</sup> Climate change will worsen emerging health challenges like cardiovascular diseases and respiratory illnesses, which are linked to air pollution. A higher frequency of extreme weather events, rising sea levels, rising temperatures, and changing patterns of precipitation will also result in negative health outcomes.<sup>4</sup>

It is expected that climate change will increase health risks associated with extreme weather events, which are becoming more frequent, intense, of longer duration, and have greater spatial extent. Increased UV radiation; increased air pollution; increased food-borne and water-borne contamination; the introduction, expansion or re-emergence of rodent and vector-borne infectious diseases; and the exacerbation of health challenges faced by vulnerable populations are some of the additional risks from climate change.<sup>5</sup> Additionally, extreme weather associated with climate change can damage hospital buildings, cause power and water outages, and disrupt the delivery of healthcare at the frontlines as roadblocks may limit access to supplies and essential services (such as energy and water supply), and obstruct patients' access to health facilities.<sup>6</sup>

According to WHO,<sup>7</sup> between 2030 and 2050, climate change is expected to cause approximately 250,000 additional deaths per year from malnutrition, malaria, diarrhoea, and heat stress.<sup>8</sup> The direct damage cost to health is estimated to

be between US\$2 billion and US\$4 billion per year by 2030.<sup>9</sup> Communities across the globe are confronting health risks<sup>10</sup> from excessive heat, altering disease patterns, disaster events, and the potentially catastrophic impact of global warming on food and water security. The impact of climate change on human health, however, will not be uniformly spread due to the various degrees of exposure, sensitivity, and adaptation ability of different regions.

Determinants of health are impacted by multiple social and environmental effects of climate change that are manifested as degradation in air quality, extreme fluctuations in temperatures, lack of adequate and safe drinking water, food insecurity and insufficiency, and the impedance of diseases. Natural disasters and variable rainfall patterns also affect essential services and medical facilities, and destroy property and food sources.

Extreme temperatures have been directly linked to cardiovascular and respiratory diseases, particularly among the elderly, which are further exacerbated by the rising levels of ozone and other pollutants in the atmosphere. For instance, over 70,000 excess deaths were recorded in Europe during the 2003 summer heatwave;<sup>11</sup> and the long-term exposure to fine particulate matter has been linked with an increased rate of chronic bronchitis, reduced lung function, and increased mortality from lung cancer and heart disease.<sup>12</sup> Furthermore, the number of reported climate-linked natural disasters has more than tripled since the 1960s.<sup>13</sup>

With over half of the global population residing within 60 kilometers of the sea, natural disasters and warmer temperatures threaten the loss of lives and livelihoods and could lead to more frequent occurrences of communicable diseases (such as water-borne diseases like cholera and diarrhoeal diseases like giardiasis, salmonellosis, and cryptosporidiosis) and mental health disorders (such as post-traumatic stress disorder).

### **Enduring Inequities**

According to WHO, 87 percent of all Covid-19 vaccines have been administered in the world's wealthiest countries, while low-income countries have received only 0.2 percent of vaccine supplies.<sup>14</sup> Specifically, less than 1 percent of sub-Saharan Africa's population have been vaccinated.<sup>15</sup> According to the People's Vaccine Alliance, the wealthy nations are vaccinating one person every second, while the majority of the poorest nations are yet to administer a single dose.<sup>16</sup>

Equity in COP26 deliberations is even more crucial now given that many components of the landmark Paris Agreement had a 2020 deadline. COP26 is an opportunity to discuss progress on curbing climate change, focus on 'building back better' amidst the pandemic, and ensure that the interconnected inequities that mar the two-pronged agenda of resilience and recovery, are also taken into account. However, marginalised communities and civil society organisations will likely have a greater burden of adhering to visa and travel requirements imposed during the pandemic

since many countries from the Global South are on the UK's travel red-list, and many may not be vaccinated in time to attend the in-person climate deliberations. Furthermore, the pandemic's worldwide economic crisis has threatened access to climate financing that developing, vulnerable nations require.

Extreme weather events and health crises will be compounded by the cascading health, economic and social impacts of the Covid-19 pandemic. Beyond commitments to curb GHG emissions, advanced economies should also mobilise financial resources to assist vulnerable countries in meeting their climate objectives, especially during the pandemic. COP26 provides an opportunity to rebuild trust and coordination amongst nations and usher in the political attention and economic commitment required to pursue greater climate action.

### **Towards a Sustainable Future**

The COP26 summit will take stock of nations' promises to decrease emissions under the Paris Agreement. The pandemic has illustrated the importance of quick, targeted and concerted efforts in battling life-threatening crises. The lessons from this experience can be leveraged to fuel climate action, more so since both climate change and the aftermath of the global pandemic bear a common strand of interconnectedness owing to widening global inequalities and greater disparities.

The imperative is for the adoption and implementation of a worldwide Green New Deal,<sup>17</sup> along with other systemic alternatives in tandem with a new economic paradigm to rectify unsustainable development policies that threaten ecology, erode environmental protection laws, and undermine labour rights and social security systems. Solving the climate issue requires an overhaul of production, consumption and commerce systems, and human-nature ties.

In parallel, the pandemic has also impacted the renewable energy market for vehicles using solar, battery or electric sources to fuel them.<sup>18</sup> Large-scale investment to boost the development, deployment and integration of clean energy technologies, such as solar, wind, hydrogen, batteries and carbon capture, should be a central part of policy plans to address the pandemic since it will bring the twin benefits of stimulating economies and accelerating clean energy transitions.<sup>19</sup> The deliberations at COP26 offer a great deal of scope to plan and commit to encouraging sustainable development transitions for participating nations.

The Covid-19 experience has perhaps permanently impacted the ‘global solidarity’ narrative. A cursory look at the global vaccine distribution will illustrate the inherent inequities in the system and how little is being done about it. The fallout of the Covid-19 crisis has also laid blows on the building blocks of human development, including income, health, and access to resources. The magnitude of the crisis response should inspire all to address existing and new inequities to mitigate the worst effects of climate change. The sustainable development, climate action and Covid-19 recovery strands of the common agenda need to be better aligned to target the most vulnerable and enable the transition towards a healthier, safer, and sustainable world.

# Geopolitics, Geoengineering Governance, and the Role of Developing Countries

Dhanasree Jayaram

**A**s delegates gather for the 26<sup>th</sup> Conference of Parties (COP26) at Glasgow, a series of challenges stand in the way of effective decision-making with regard to achieving the Paris Agreement goals. With ‘net zero’ becoming the new norm in global climate governance, more and more national governments and other stakeholders are jumping on this bandwagon – primarily for gaining legitimacy in the international climate order, but also for bringing in long-term structural changes domestically to transition the economy towards greener path. These targets have invariably put the focus on negative emission technologies (NETs) and other geoengineering techniques such as Solar Radiation Management (SRM).

At the same time, the latest challenge is the global energy crisis that has engulfed the entire world, particularly the large emitters, including the United States (US), European Union (EU), and China.<sup>1</sup> In the past few months, the rhetoric of

“post-Covid green recovery” has been feverishly peddled by various international and regional organisations as well as national governments and corporations.<sup>2</sup> However, the ongoing global energy crisis has put the focus back on fossil fuels – more coal, oil, and gas. This has serious implications for future climate action. Under these circumstances, the reliance on geoengineering is expected to grow, as countries attempt to achieve their net-zero targets. It is imperative that at COP26, developing countries demand greater action from the developed countries in mitigation and adaptation. They should also set the agenda for discussing and implementing an equitable governance structure to regulate the use of these technologies on a large scale.

## Action Beyond Mitigation: Promises and Risks

Climate mitigation (emission reduction technologies) is the most traditional form of climate action that countries have historically made high investments for. However, the worsening of the climate crisis and the use of ‘climate emergency’ frames<sup>3</sup> have led to reinvigorated appeals for more emboldened action under the Paris Agreement. Therefore, discussions on climate engineering—for example, carbon dioxide removal (CDR) or SRM (large-scale interventions in the climate and environment)—are gaining momentum, particularly in the industrialised countries.<sup>4</sup> After all, the research and development (R&D) in this field is heavily dominated by North American and Western European institutions.<sup>5</sup> Emerging economies such as China<sup>6</sup> and India<sup>7</sup> have also begun to look into these options more seriously.

Along with the well-publicised benefits, the risks associated with the use of these technologies are numerous. For instance, bioenergy with carbon capture and storage (BECCS), a NET, if used on a large scale could have adverse repercussions on land use (including land grab and associated conflicts), and food and water security. It is also less energy efficient in comparison to fossil fuels and involve collateral emissions from transportation, land use change, and other activities.<sup>8</sup> Similarly, marine geoengineering techniques such as ocean iron fertilisation (OIF) – on which the Convention on Biological Diversity (CBD) has imposed a de facto moratorium based on the precautionary principle – could result in eutrophication, which can have long-lasting impacts on marine ecosystems.<sup>9</sup> In

another case, stratospheric aerosol injection, one of the most controversial geoengineering techniques involving reflection of sunlight back into space by reflective particles, could have uncertain, unintended effects on global and regional climates.<sup>10</sup>

## Geopolitics of Geoengineering

Whatever may be the existing risks and perceptions about the above-mentioned and other geoengineering methods and technologies, the likelihood of their deployment on a large scale is extremely high. Besides, as decisions on carbon credit mechanisms to achieve Paris Agreement goals (2°C or 1.5°C) are still being worked out by countries, some of these technologies and methods (other than the more common reforestation and afforestation) may ultimately be used to offset greenhouse gas (GHG) emissions.<sup>11</sup> The Paris Agreement provides ample scope for the use of CDR-related technologies “in order to achieve the long-term temperature goal...so as to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century, on the basis of equity.”<sup>12</sup> Nevertheless, in the past, several countries including the US, Saudi Arabia, and Brazil have thwarted efforts to introduce a resolution in the United Nations Environmental Assembly (UNEA) on geoengineering governance.<sup>13</sup>

Across the globe, concerns with regard to fairness, equity, and justice are inherent in the adoption of geoengineering technologies. Indeed, the dominance of the industrialised countries in both technological R&D and discussions on futuristic governance frameworks raises apprehensions about the fair representation of the positions of the developing and least developed countries. Some of the most vulnerable countries such as Pacific small island states have consistently called for greater focus on mitigation efforts, transparency into geoengineering R&D, and governance structures (“regulatory and enforceable”) before testing and implementation.<sup>14</sup> Indian policymakers have also expressed their concerns about potential unilateral action by the developed countries in terms of the development and deployment of these methods, which could jeopardise the interests of developing countries.<sup>15</sup>

The geoengineering methods and technologies could further widen the North-South divide, by dividing the world into haves and have-nots or winners and losers.<sup>16</sup> The existing asymmetry in the international climate order—a result of the innumerable “broken promises” of the wealthy countries on emission reduction, finance, and technology—will work to the disadvantage of the developing countries. The developing world would not be in a position to steer consultations on geoengineering due to the lack of knowledge, capacity, and legitimate multilateral forums. Interestingly, there are also cases of how geoengineering have often been showcased by a few scientists as a means of instilling equity into the international climate regime as it is purported to have the ability to reduce temperatures faster than

climate mitigation and may be relatively cheaper than adaptation over a longer period. According to this perspective, rich countries should focus on these technologies in connection with “their responsibilities to the global poor in dealing with the inequities of climate change.”<sup>17</sup>

The prospects of geoengineering are equally marred by fears around the potential militarisation of these technologies. SRM for example, has been linked with potential military use by adversarial countries. Today the Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques (ENMOD), signed in 1977 and enforced in 1978, may be in a position to prevent the use of such technologies for military purposes. However, this convention does not address “peaceful” use of environmental modification techniques. Therefore, there is no mechanism yet to enforce compliance and accountability when countries deploy geoengineering technologies within their national boundaries to tackle climate change, but may have cascading negative effects on the neighbouring countries.<sup>18</sup>

In effect, there have also been attempts to design security frameworks to govern geoengineering based on “just geoengineering theory”. This, in turn, is based on deployment of geoengineering by legitimate, competent authorities (to prevent rogue actors from using them); and outweighing of negative ecological impacts by positive ones.<sup>19</sup>

## The Future of Geoengineering Governance

In the past few years, the international community has moved from debating whether or not to conduct geoengineering research (particularly solar geoengineering) to discussing how such research can be more representative, interdisciplinary, multicultural, transparent, and legitimate. There is also a palpable shift from merely considering geoengineering as a ‘last resort’ to a technology that may be regarded as complementary to traditional pillars of climate action—i.e., mitigation and adaptation.<sup>20</sup> However, since the complexities of risk and uncertainty are yet to be resolved, ethical considerations continue to dominate the anti-geoengineering debates.

There exist a few arguments that question the role of regulations in restricting geoengineering research. These voices, mostly from the scientific community, are against politicisation of the debate, which according to them could delay genuine and effective means of preventing runaway climate change.<sup>21</sup> While one may argue that there is still not enough scientific evidence to villainise geoengineering, the international community cannot dismiss the potential risks associated with it based on incomplete information and several unknowns. Diplomacy is the best way forward for tackling these shortcomings.

Any future use of geoengineering technologies would have to take into consideration the foundation principles of the United Nations Framework Convention on Climate Change (UNFCCC)—including the Common but Differentiated Responsibilities and Respective Capabilities (CBDR-RC). A consensus-based UNFCCC can potentially aid the establishment of an equitable regulatory governance mechanism to lay down the norms, principles, and rules to guide the governance of these technologies, while countries deliberate upon their net-zero targets. So far, there has been pushback against the introduction of various geoengineering technologies under the UNFCCC, thereby opening room for other multilateral frameworks such as the CBD, International Court of Justice (ICJ), London Protocol on the Prevention of Marine Pollution, and UNEA.<sup>22</sup> Accountability, oversight, and transparency are critical to geoengineering governance. There is an urgent requirement to integrate the principles of equity and justice into multilateral and regional frameworks to address geoengineering-related concerns, as well as re-emphasise anticipatory governance with respect to certain technologies such as solar geoengineering.<sup>23</sup>

Developing countries that already have put in place a research base in this field (such as India) should be at the forefront of demanding a governance framework based on an inclusive approach. Developing and least developed countries can build a common stance on the issue through joint efforts to understand the risks and benefits associated with geoengineering, uncertainties and costs, environmental and socio-economic implications, and geopolitical repercussions. On

many issues such as long-term impacts on climate, feasibility and unintended effects, there are gaps in research that need to be filled. With sustained efforts targeted at knowledge production and capacity-building, these countries can recommend governance mechanisms, involving formal processes and instruments.

# The Enduring Challenges in Mobilising Green Finance

Nilanjan Ghosh

**I**t needs no reiteration that the planet and life on it are at their tipping point, with the forces of global warming and climate change knocking on the front doors. The key challenge that has emerged in combatting such forces is financing, referred to in this essay as “green money” or “climate cash” (or “green finance” as other analysts call it). The challenge of mobilising such “climate cash” flows becomes more acute when one considers that large parts of the developing and the underdeveloped world are still struggling to obtain the funds needed for basic developmental needs.

Opportunities on this ground were opened during the 21st Session of the Conference of Parties (COP21) to the United Nations Framework Convention on Climate Change (UNFCCC), held in Paris in 2015. The Paris Agreement ushered a new era in the domain of climate finance and markets, while treating such institutions and instruments as cornerstones to place the planet on a trajectory of limiting global warming to below 2 degrees Celsius above pre-industrial levels. Finances for climate-change mitigation and adaptation programmes were

planned to be channelled through multitiered systems in the form of national, regional and international bodies. This entailed, in addition to support mechanisms for climate change, financial aid for both mitigation and adaptation activities to promote the transition towards a low-carbon growth path.

## Existing Sources of Funding and Instruments

The funding sources can be broadly classified into four categories: (i) multilateral development banks and other similar international financial institutions; (ii) United Nations (UN) agencies, (iii) bilateral and multilateral government funding, and (iv) the private sector (private citizens, corporations, philanthropic organisations). However, since the nature of funding often overlaps, determining the source can turn out to be rather complicated. For example, multilateral development banks (MDBs) use their resources or specific trust funds created by their donors for climate financing.

However, their resources may also include their own earnings, contributions by their board-member countries; the private sector, too, can be a contributor to the funding of such organisations. Thus, it is difficult to decipher whether the source of such funds should be attributed to the private sector or the MDBs.

In the current model, climate cash is generated through largely debt-based products (green bonds, climate-policy performance bonds, debt for climate swaps, etc.), while the fund deployment occurs through debt-based, equity-based, and often insurance-based instruments—in addition to grants and loans. Capital instruments provide funds directly to the projects, and entail a) **senior debt** (loans provided to projects to reduce costs, which can be given as concessional loans provided at lower rates than the ones prevailing in the market); b) **subordinated debt** (entailing all forms of mezzanine or quasi-equity finance, which emerges as a combination of debt-based and equity-based instruments rendering the lender the right to convert to an equity interest in case of default); and c) **equity financing** (buying equity stake in climate-change mitigation projects without receiving any guarantee of repayment, and acquiring ownership of the project). Financial instruments thus cater largely to the risk appetite of the investors, and ranges from fixed-income debt instruments to risky equity capital. Additionally, there is insurance-based risk management instruments, or hedging products, which include credit guarantee. These

operate as insurances to the lenders in case of failure of loan repayment; partial credit guarantee that guarantees a portion of amount as insurance to cover the default risk; performance risk guarantee; revenue guarantee; and structured finance, which offers a mechanism that layers public guarantees, usually at concessional terms.

### Funding Biases

The problem, however, lies elsewhere. Despite the existence of various financing sources, there has been an inherent funding bias (more than 80 percent)<sup>1</sup> in favour of climate-change mitigation activities. According to a recent paper in the journal *Sustainability*, this heavy bias in favour of mitigation, and against adaptation, can largely be attributed to two reasons.<sup>2</sup> **First**, results from mitigation investment are perceptible in the short run, e.g. returns on investments in energy efficiency or in renewable energy can be perceived through the financial cost savings, as well as from the estimable break-even periods. The same is not true for adaptation projects. For instance, returns on investment in cyclone-resistant structures might not be perceptible if cyclones do not occur.

Further still, it is difficult to find funders for adaptation modes such as the “strategic retreat” of populations to safer zones from vulnerable zones,<sup>3</sup> since returns on such investments have long gestation periods and their impacts on human life and livelihoods are often difficult to predict. **Second**, adaptation projects find less traction amongst funding agencies because of the “public goods” nature of such projects. Large parts of the public-sector climate finance for climate-change mitigation leverages private-sector finance, and the private sector does not consider financing “public goods” as viable investments. In comparison, the private-sector financing of clean-energy technology is ever-increasing, given their clear linkage with investments and returns.

Under such circumstances, the Green Climate Fund (GCF) has emerged as a cornerstone of hope—the main financial vehicle after the Paris Climate Accord. Against the culture of large-scale promotion of mitigation projects, the GCF remains an exception and aims to deliver equal funding to mitigation and adaptation, while being guided by the UNFCCC’s principles and provisions. The GCF provides support in the form of grants (45 percent of allocated funds till date), loans (42 percent), equities (nine percent), and guarantees (two percent), and results-based payments. However, some amount of bias towards mitigation projects is evident in the workings of the GCF as well. Data as late as 7 October 2021 suggests that of the 190 approved projects, 43 percent are adaptation

projects, 32 percent are mitigation projects, and the remaining 25 percent are cross-cutting. However, the fund allocation towards mitigation has been as higher, at 62 percent, revealing the tacit dominance of the mitigation projects.

The low level of funding to climate-change adaptation projects may partly be driven by its status as a new activity, for which there is no real pre-existing “expertise” available. However, also part of the reason is the mindset that adaptation provides primarily *local* benefits. Biases against funding adaptation projects by the GCF have been criticised by adaptation experts, particularly those from least developed countries (LDCs) and small island developing states (SIDs). They contend that the GCF has failed to channel funding to the most vulnerable communities in the most vulnerable countries, because it has approached its mandate as a “bank” seeking returns on its investments in terms of repayment of loans. Moreover, the GCF’s emphasis on fiduciary and fund-management capacities of both recipient country governments and implementing entities have made accessing large-scale funding difficult. The GCF also insists on genuine adaptation projects and not development proposals dressed up as adaptation.

## Can Market-based Instruments Play a Role in Adaptation?

Over time, various financial instruments have emerged that can help in combating the risks of climate change through financial compensations to the affected nations and communities. These are offered in the form of weather derivatives, weather insurances, water futures, and other climate-linked financial products that monetarily compensate for losses caused by climate variability. While these instruments can help the adaptation process, such financial products are more popular in the developed world than in the developing or the underdeveloped world, since the latter do not have the wherewithal to customise, design and strategically market a product of such nature that can cater to their specific needs.

To be sure, the financial products conceptualised so far are not yet catering to the needs of the poor affected by climate change, especially at the critical interface of their livelihoods with the ecosystem services (services provided free of cost to the human community by the natural ecosystem). In his 2009 paper<sup>4</sup> published in *Nature*, Pavan Sukhdev interpreted the monetary values of the ecosystem services as the “GDP of the Poor,” with 57 percent of their incomes in India being sourced from nature.

The egregious impacts of climate change on ecosystem services have neither been sufficiently acknowledged at the negotiation tables, nor have they featured in the government’s financing programmes. Thus, due to the expected failures of market-based instruments, no financial institution has endeavoured to create products catering to the needs of the poor, whether directly or indirectly, as it is not expected that they will participate in such markets. This remains a critical gap in product conceptualisation in the context of the climate crisis. Even when such products are conceptualised, newer forms of institutions will be required to act as aggregators and help communities to access their benefits. The question that must now be addressed is this: Can governments and the private sector come together to compensate with green money?

# The New India Accelerator Proposal: Playing to India's Strengths

Mohua Mukherjee

**T**he 26<sup>th</sup> Climate Change Conference of Parties (COP26) presents India with a golden opportunity to showcase bold new thinking as well as climate leadership. India can offer to host a *decade-long large-scale global decarbonisation experiment with impact measurement*—contingent on adequate international funding and technical support. This “New India Accelerator Proposal” will be “additional” or incremental to the Indian government’s ongoing, self-funded climate-change efforts under its nationally determined contributions (NDCs) commitment to the Paris Agreement.

The proposed decarbonisation experiment, subject to external funding, would include (i) ring-fenced, rapid deployment of existing clean-energy technologies in large numbers; (ii) an R&D partnership for green technologies still at the experimental or testing stage; and (iii) a global knowledge-sharing initiative, on lessons of experience in resolving institutional and implementation challenges that arise from going

green at scale. The third component will be particularly useful for developing countries and could shorten their learning curves.

## Why India?

In the context of climate action, India’s strengths include: (i) its sheer size and headcount, which will likely enable detectable emissions reduction if a substantial percentage of the population is assisted to shift to clean energy on a “war-footing,” helping move the needle globally; (ii) a heritage of frugal innovation and low-cost, rugged and no-frills manufacturing, making it a worthy R&D partner; (iii) adequate availability of trained manpower for intensive data capture and data analysis for continuous impact evaluation, making it a reliable M&E partner;

(iv) demonstrated willingness of large cross-sections of the population to rapidly adopt modern, money-saving technologies; and (v) large populations at both ends of the energy consumption spectrum, and everything in between: those whose per capita energy use is nearly undetectable and still represent the “access” side of the story, as well as those whose annual average per capita energy use exceeds the US or Canada figures and who will help the world by going green. The future economic growth projections indicate that large, unmet needs for cooling, buildings, transport, and cooking require clean-energy solutions on priority to avoid solutions involving fossil-fuel-based electricity. India needs to be ahead of the curve and find clean solutions acceptable to consumers.

### The New India Accelerator Proposal: An Overview

As part of the decarbonisation experiment, India can offer to lead a globally supported, three-part *incremental climate-action plan for the world*.

- **Rapid deployment of existing clean technologies:** India can add a substantial number of new clean-energy users in the next five years, based on the existing, commercially available technologies—temporarily bypassing market mechanisms by moving to a war-footing and relying on large-scale public procurement, instead of treating clean-tech products as consumer goods and waiting for market mechanisms to allocate them to end-users in large numbers. To this end, existing manufacturers and vendors should be paid for supplying the hardware, but not by the consumers themselves.
- **Accelerated development and testing of “work in progress” clean technologies:** India has a vast reservoir of skilled human resources, which it can offer as “sweat-equity” for R&D, field-testing and data capture. Additionally, it can facilitate no-frills, frugal manufacturing of technologies that are yet to be commercialised (e.g. direct air capture, long-duration energy storage, green hydrogen applications in heavy industry, new battery technologies, next-generation nuclear reactors, decarbonising shipping, and aviation and heavy freight vehicles).
- **Support for sustainable clean-technology deployment in other developing countries:** India can offer low-cost software developers, remote monitoring of energy equipment, cloud-based data storage and its own data analytics capability to other developing countries willing to join in the COP26-supported clean-technology conversion initiative. India can lead regular online meetings for remote monitoring, knowledge-exchange, benchmarking of equipment performance, and solving implementation challenges (e.g. helping electricity distribution companies, or DISCOMs, with remote-monitoring, data analytics, and various reporting capabilities that developing countries need but may not have access to). Furthermore, India has 600–700 administrative districts—with vast diversity in terms of topography, population density, income, livelihood activity, temperature, micro-climate, and geographic characteristics.

Of these, many clusters have similarities with other developing countries' economic and physical characteristics and populations, based on which India can offer voluntarily participating countries the opportunity to pursue "twinning arrangements." Finally, periodic information-sharing for benchmarking and troubleshooting implementation challenges will speed up the learning curve for all participants seeking to accelerate the global adoption of clean energy.

### **Beyond Clean Energy**

A global experiment to address and resolve climate-action implementation gaps can be valuable in accelerating awareness and experience, and can create momentum by focusing the conversation on concrete issues to improve the decision-making process. India is one of the few countries with sufficient size, complexity, and diversity to credibly offer to host such an experiment. Indeed, the proposal for global decarbonisation need not be limited to clean energy alone. The clean-energy focus can be considered "Phase One" of the project, since the proposal India puts forward at the COP26 must be pragmatic, manageable, achievable, and scalable—to ensure engagement from the necessary stakeholders. Thus, a first phase focused on clean energy can test the waters to see whether the model can attract sufficient long-term international funding.

Based on the success of Phase One, the scope of the "Indian Accelerator Proposal" can be expanded to tackle other crucial, non-energy-sector aspects of climate investment. These can include new approaches to biodiversity conservation and land

management for soil-based carbon sequestration; responsible agroforestry and the avoidance of monocultures and single-crop plantations; incentives for better "land use, land use change and forestry"; next-generation farm subsidies and ecosystem service payments (which Britain is currently experimenting with); *just transition* for coal mining communities; tackling plastic pollution; and ocean and fisheries protection. Each of these actions will involve years of upfront preparatory work for understanding and tackling existing vested interests, introducing new business models and new contractual arrangements, and retraining and re-skilling people to implement new commercial arrangements. India's proposal, if funded by international partners, has the potential to initiate some of the global groundwork for these non-energy aspects, with Phase One committing to provide only insights and lessons, not measurable results, which can be incorporated in subsequent phases.

### **Executing the New India Accelerator Proposal**

1. In collaboration with willing state-owned electricity DISCOMs, identify and ring-fence a target subset of 80 million existing nationwide electricity connections (with minimum average consumption of 2,000 kWh/year in 2019), and fully convert these to clean-energy use for electricity and transport over the next five years. This initiative can rapidly convert at least 400 million individuals into first-time clean energy users, since each electricity connection has approximately five

(household) or 10 (MSME) users, more if the connection is for a water-treatment facility, school, or clinic.

2. Participation will be voluntary and offered to first-time users of solar panels, batteries, electric vehicles (EVs), electric cookers, energy-efficient appliances, and demand response through the Internet of Things (IoT).<sup>a</sup> A majority of the participants can be DISCOMs' customers, with a minimum of 4kW connected load.
3. After public procurement of the clean-tech assets, all clean-energy service delivery to end users would be done through qualified third-party operators, "as a service." Therefore, the ring-fenced set of electricity customers will not have ownership of the clean-energy assets but will instead receive "solar as a service," "battery as a service," "EVs as a service," or "electric cooking as a service," and will also be eligible for on-bill financial discounts for demonstrating energy efficiency. There will be neither upfront payment by customers for clean-energy hardware, nor installation cost, nor payment for the additional wiring required. Customers will continue to pay their monthly electricity bills to DISCOMs, with a possible discount (say, 25 percent) relative to the 2019 bill for that corresponding month. This creates an added incentive for them to sign up for the scheme and agree to be tracked. Participants will need to agree to full-time monitoring and collection of their energy-use data up to 2030, in exchange for the financial discount during the life of the experiment.
4. For Phase Two, which will be the R&D partnership, India must identify joint ventures, business organisations and domestic communities that are willing to serve as international field-testing laboratories, data collection and analysis hubs, or manufacturing sites for new climate technologies currently under development.
5. Phase Three will focus on identifying, remote-monitoring, data-capturing and resolving the implementation challenges and institutional issues that will necessarily emerge in climate-oriented investments. Such an activity, involving documentation and analysis, will require specialist think tanks and software consulting firms to observe and track the progress of India's greening efforts in diverse locations, as economic agents are required to develop new business models with new technology suppliers. This learning-by-doing experience, to be transparently undertaken in a global fishbowl, can create knowledge benefits for India and for developing countries as a group, as well as for the funding partners. The insights obtained will help other low-income and middle-income countries in leapfrogging their own learning curve on climate-action investment and accelerate their decarbonisation impacts.

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a Demand response is a crucial pillar of energy-efficiency efforts and an important climate-action tool. In this case, IoT refers to a web-based communication link of the electricity supplier directly with individual household appliances. At times of peak demand, when the grid is congested and stressed, certain large appliances may be instructed in advance by their owners to reset themselves to consume less energy when instructions are received from the utility (e.g. raising the temperature on an air-conditioner, turning off a hot water heater, or pausing the load in a dishwasher/washing machine). At other times, the grid can benefit from increased demand, since electricity supply will be more than the demand at, for example, 2 a.m. Demand response through the IoT will ensure that large appliances are intentionally run at these off-peak hours, when electricity rates are lower.

The New India Accelerator Proposal will require substantial long-term international funding commitment as well as world-class professional coordination, to be carried out by a suitably resourced “project implementation unit” located in India. Table 1 summarises the incremental nature of the proposal, relative to India’s existing activities.

As evident, the success of the Accelerator Proposal will be contingent on a decade-long commitment from the international community, both in terms of funding and collaboration.

**Table 1:**  
**The Incremental Progression of the New India Accelerator Proposal (2021–30)**

	<b>2021: Base Case with GoI Funding only</b>	<b>2030: With International Funding Only (Medium Case)</b>	<b>2030: With Funding, Technology Transfer, and Capacity-Building Support from International Partners (High Case)</b>
<b>Electricity</b>	Ramping up of utility-scale clean energy generation (target: 450 GW)	Grid Enhancement Technologies (GETs) to improve the utilisation of existing Transmission Lines while planning their expansion; increased use of power electronics, automation and energy management software for better integration of clean energy in the DISCOM network; increased Renewable Purchase Obligations (RPOs).	Integration of GETs; deployment of long-duration energy storage (LDES); complete DISCOMs modernization; full clean electrification of 80 million households with IoT; deployment of active demand response.
<b>Transport</b>	Subsidies under FAME 2 for 2W and 3W EVs, demonstration of electric buses, network of EV charging stations.	Expansion of EV market, targeting 80 million households for clean-mobility solutions; internal combustion engines (ICEs) retired.	Fuel stations and gas cylinder distributors converted to battery-swapping stations for 2W and 3W EVs; EV charging network in place; good adoption rate of EVs.
<b>Agriculture</b>	Solar pumps, feeder separation.	Better implementation of solar pump subsidy delivery; monitor water–energy nexus; experiment with agrivoltaics pilots	Diesel use by households for generators and personal transport negligible; LULUCF targets pursued through widespread agrivoltaics and agroforestry; knowledge gained and Phase Two planning commenced.

	<b>2021: Base Case with GoI Funding only</b>	<b>2030: With International Funding Only (Medium Case)</b>	<b>2030: With Funding, Technology Transfer, and Capacity-Building Support from International Partners (High Case)</b>
<b>Buildings</b>	Nascent stages of green standards definition; advocacy for sustainable housing, with implementation responsibility resting with municipalities and local governments (not Central government); in-depth engagement at local levels, requiring large resources.	Better implementation of existing green standards in Housing for All Programme; India cooling action plan improvement and better implementation; retrofitting of large stock of government buildings for increased energy efficiency.	Massive sustainable upgrade of the Housing for All Programme; focus on business model of non-ownership sustainable housing; full engagement of stakeholders; circular economy + carbon-neutral buildings commonplace; no 60-year lock-in of energy-inefficient assets.
<b>Just Transition</b>	Not yet started.	Consultations; sustainable housing for unemployed miners; access to clean energy for mining communities.	Coal miners consulted and plans in place; fuel stations converted; green housing the norm in the ring-fenced population.

# Long-term Strategies for Global Climate Action at COP26 and Beyond

Aparna Roy

**T**he global climate crisis has been the talking point at various regional and global platforms across countries. As the world embarks on this pivotal “decade of action” for climate change, there is a need to strengthen collective efforts to address the crisis by reiterating a principle-based approach for global action. The 26<sup>th</sup> Conference of Parties (COP26) to the United Nations Framework Convention on Climate Change (UNFCCC)<sup>1</sup> offers a ripe opportunity for the world to assess the progress made so far and calibrate a well-thought-out, long-term strategy for the future course of climate action.

The scientific evidence of the gravity of the climate crisis is clear, as highlighted in the 6<sup>th</sup> Assessment Report (AR6) of the Intergovernmental Panel on Climate Change (IPCC).<sup>2</sup> The current situation is a “code red” for humanity, and presents structural challenges in the environmental and socioeconomic rubric of all nations. This is further

corroborated by general observation, in the form of increasing frequency and intensity of extreme climatic conditions and weather events across the world, such as cyclones, floods, prolonged droughts, heatwaves and other climate-induced disasters. According to a report by the World Meteorological Organisation, on average, one weather or climate-related disaster has occurred every day over the past 50 years, causing daily losses amounting to US\$202 million.<sup>3</sup>

The scientific community is now urging governments to make all possible efforts to cut the global emissions to half by 2030 and to aim for global net-zero by 2050.<sup>4</sup> This is no longer a matter of ambitious targets, but one of survival. Given the global footprint of the climate crisis, it is the responsibility of the collective and representative platforms of the world to outline guiding principles and long-term strategies to shape the future of climate action.

In this context, the COP26 is a platform where the world as a collective can shape its climate-action strategy going forward and learn, un-learn and modify the same based on current imperatives.

The first step in this direction is to acknowledge the shortcomings in the efforts undertaken so far in terms of mitigating the impacts of climate change. The overall approach has largely followed the “polluter’s pay” principle, with attempts being made to ascribe responsibility to the stakeholders responsible for causing the crisis in the first place and having them proportionately contribute to financing the solutions. In the climate scenario, this approach has been termed as “common but differentiated responsibility” and is premised on the principle of assigning responsibility to various nations in a way that is commensurate to their contribution to fuelling the climate crisis, towards the shared goal of a better future for the planet.<sup>5</sup> One area where this principle has been rigorously adopted is in *mobilising finance*. As part of the Paris Agreement (2015), developed countries were asked to pledge US\$100 billion by 2020.<sup>6</sup> However, achieving these numbers has been a challenge, which, in turn, has slowed down climate action in developing and least developing countries (LDCs), particularly in small island developing states (SIDS), which are both extremely vulnerable to climate change and economically precarious.

Another layer of complexity that creates a bottleneck in effective all-round climate action is the way in which the problem is perceived and the solutions formulated. Climate change, at its core, is a global systems problem, not an isolated issue

that can be resolved through in-silos thinking, planning, and policy action. At the same time, the causes and effects of climate change are geographically, socially and demographically distributed, and are known to disproportionately impact the poor and vulnerable. Thus, given the inequity in how climate change impacts various regions and communities, the approach to formulating a solution requires local planning and implementation, in a decentralised and bottom-up manner. This does not imply that global platforms should be delinked from local actions. Instead, it is the role of global forums such as COP26 to amplify, scale-up and ensure cost-effectiveness of localised, community-centric solutions to climate change. Furthermore, while global platforms have voiced the need for ensuring “climate justice” and equitable climate action, a concrete framework of action towards a “just transition” remains largely missing.

The COP26 offers a now-or-never opportunity for nations, policymakers, and citizens to adopt value-based long-term strategies for facilitating a fair, just, effective, equitable and people-centric climate action. **First**, the world must acknowledge the complicated systems, the nature of the climate crisis, and the need to deal with it in a united, collective manner. This essentially implies reinvigorating the efforts to institutionalise the principle of *common but differentiated responsibility* in climate action, both in letter and in spirit.

Countries should adopt an equity and justice-based approach to their domestic climate efforts: while at the global stage, policymakers must push for more stringent action by the developed nations and countries of the North, the same actions must also be implemented by other countries in their national climate efforts. To ensure climate justice, it must be ensured that precarious and vulnerable communities do not face the brunt of the historical actions of comparatively well-off segments of the society or the economy. Additionally, effectively communicating and demonstrating efforts taken in this direction by different nations will become instruments for driving the world towards a more 'just' climate action.

**Second**, nations should acknowledge the science-based driving factors behind the crisis and respect the evidence-based policymaking approach. There should be transparency in acknowledging the failures or successes of all countries and responsibly communicating the lessons to the world. The official representations of countries should avoid the temptation to cover up their failures to maintain their position as global leaders of climate action or to play the victim-card to lobby for higher investment inflows domestically. This can enable a healthy environment of dialogues, discussions and knowledge-sharing amongst different countries. The COP26 can become a champion of furthering such a discourse by engaging the global scientific community to independently weigh in on any country's climate actions, climate-induced disasters, mitigation and adaptation efforts, etc. Such insight should have clear objectives and be a science-based assessment for the global good,

without hindering any nation's independent jurisdiction or autonomy. This can be done in a collaborative manner, in conjunction with the domestic scientific and civil society networks of the respective countries.

**Third**, decentralised and localised planning and implementation must be acknowledged and incorporated as a strategy in the global fight against climate change. Necessary institutional arrangements can be made in the global architecture of climate actions at the COP26 to impart more significance to local, community-driven solutions to climate mitigation and adaptation. This also connects with the social aspect of climate change, with resilience-building of vulnerable communities being a key pillar. In this context, it is best to enshrine community-based solution planning and implementation as a long-term strategy to address climate change.

**Fourth**, the global discourse needs to devote substantial consideration to climate change adaptation and building the resilience of vulnerable segments of the society, economy and ecology. There is a need to chalk out sector-wise, country-specific strategies to adapt to adverse impacts of climate change, anticipating natural physical risks and charting out a concrete plan of action for sectors to be resilient in the wake of such risks. The Covid-19 pandemic has reiterated the need to be future-ready and to stay one step ahead in risk-assessment and disaster-management.

The urgency with which countries rallied around the goal of becoming more resilient in response to the Covid-19 pandemic should be sought in the climate-action space as well.

**Finally**, for the successful execution of long-term strategies, policies, practices and ground-level climate action, a critical element is mobilising finance for technology uptake, technology transfer, and climate actions towards mitigation and adaptation. The financing system for global climate actions must acknowledge the inherent inequality in the adverse impacts faced by different nations and communities, due to the unsustainable economic actions of the comparatively richer nations. The imperative, therefore, is to mobilise global finance at an adequate scale and redistribute it in an effective, equitable and just manner. A low-hanging fruit that can effectively ensure a system to check the social, environmental and economic fairness of any proposed economic activity is a “Sustainable Finance Taxonomy.” Taxonomies are at various stages of development and implementation in many countries and regional blocs, such as the European

Union,<sup>7</sup> South Africa,<sup>8</sup> China,<sup>9</sup> Malaysia,<sup>10</sup> and India.<sup>11</sup> Such market-based frameworks can provide the yardstick by which to measure the sustainability of mitigation or adaptation methods, while giving due importance to qualitative metrics on social welfare and just transition.

This five-pronged long-term strategy can be a way forward for the global community at the COP26. The idea is to introspect, acknowledge, institutionalise, internalise and develop implementation, monitoring and feedback mechanisms by countries and the world as a collective, to undertake climate actions that are more sustainable, equitable, and effective.

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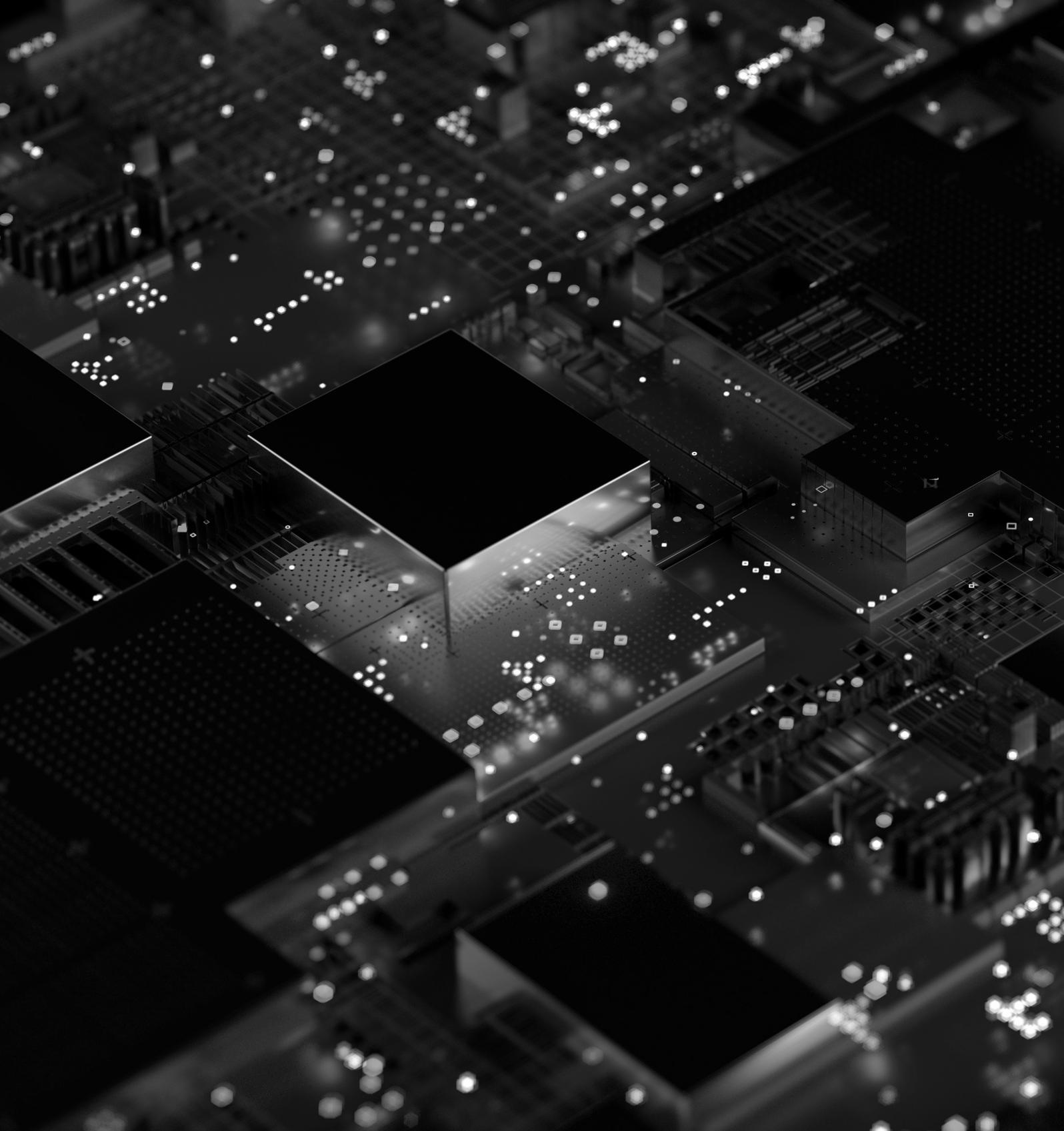
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