

BCG Executive Perspectives

AGENDA

OVERVIEW

DEEP DIVES



- Key achievements and remaining challenges
- Look ahead to next year

- Insights & outcomes from key topics at COP27
- Overview of two reports published ahead of COP



Governments agreed in Glasgow to accelerate climate action but progress has been mixed amidst global crises. COP27 began with gaps across the agenda and tempered expectations

Nonetheless, +30k delegates including c.100 Heads of State (excl. China, India, Russia) and many CEOs came for two weeks of negotiations, announcements and discussion. Six takeaways:

- COP27 elevated the concerns of the Global South including adaptation, water, food, just transition, and most importantly agreement to establish a finance facility for loss & damage
- A **shift to implementation** from pledges to pathways and projects along with calls for greater accountability from governments and corporates alike
- A more sophisticated finance discussion (incl. packages for Indonesia and Egypt) and momentum for reform of the IMF and MDBs but a +\$3Tn finance gap remains
- Engagement from business, finance and sub-national governments remained high with a determination to lead evident across sectors
- Context for negotiations was challenging, the mandate narrow, and expectations low so progress on loss & damage was an unexpected win but COP28 faces a heavy lift
- Parties failed to increase national ambition (agreed at COP26) and little was done to close the policy gap. So the goal of limiting global average temperatures to 1.5°C by 2100 remains, but it is very unlikely given emissions must fall 45% by 2030 but are set to rise 11%

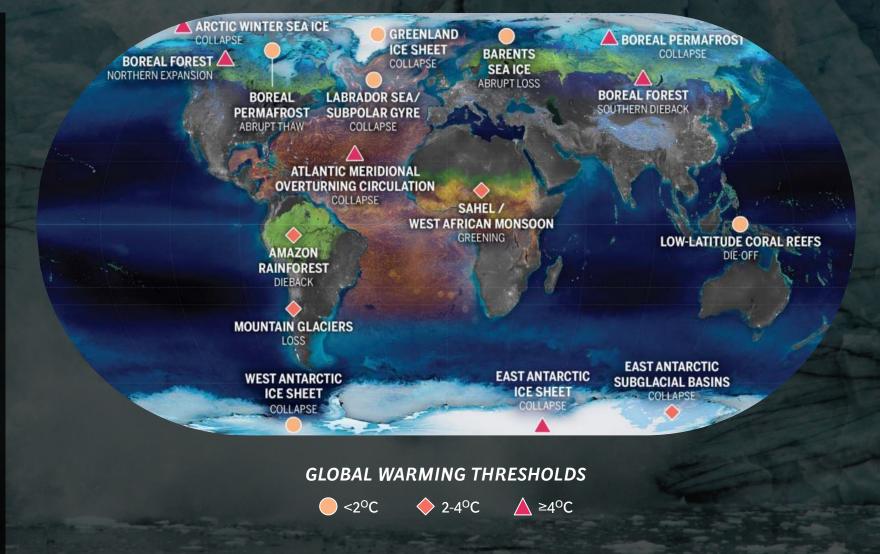
Looking ahead, the 'Biodiversity COP' in Montreal must build momentum for nature ahead of COP28 in UAE where the world will need to deliver a response to a sobering Global Stocktake

See our Topic Deep Dives for progress and challenges across the COP

CONTEXT | We are on track for 1.5°C warming by 2030 beyond which the risk of breaching critical tipping points rises significantly

Several planetary tipping points at risk before 2.0°C

- Collapse of Greenland's ice sheet accelerates warming & sea-level rise
- Die-off of the low-latitude coral reefs, which devastates fisheries
- Collapse of the boreal permafrost releases <100 GtCO₂e of methane (20% of our carbon budget)



COP27 came between the ambition-raising of '26 and the stock take due at '28

Rio Earth
Summit
established
UNFCCC¹



Parties committed to a collective temperature goal of "well below 2.0°C" and "best efforts" for 1.5°C but allowed states to set their emissions targets and raise ambition every five years

Click for our Executive Perspectives on COP26



COP26 in Glasgow focused on the targets and collaboration required to keep 1.5°C alive - and decisively broadened the COP in the process

COP28 in UAE must respond to the Global Stocktake of progress towards Paris goals



2021

Kyoto Protocol marked 1st commitment to reduce GHG emissions

Marrakech Partnership created High-Level Climate Champions (HLC) to mobilise non-Party stakeholders Sharm el-Sheikh elevated the concerns of the developing world

It has since evolved from..

Focus on negotiations, goal-setting and states

Greater private-sector engagement, broader policy coordination, more tracking and implementation

1

At COP26 in Glasgow, parties agreed to accelerate climate action but progress since has been mixed amidst compounding global crises

Some bright spots kept 1.5°C alive post Glasgow





However, compounding crises reduced political will for climate action in 2022



Russia forces launch full-scale invasion of Ukraine



Huge relief as Ukrainian grain shipped but the food crisis isn't going anywhere



World facing first truly global energy crisis



Risk of Global Recession in 2023 rises amid simultaneous rate hikes

COP27 began with substantial gaps to action across the climate agenda

Mitigation

Pledges and policies falling short of the Paris Agreement despite scientific consensus on risk

+2.6-2.8°C Current policies

+2.4°C Full implementation of 2030 NDCs

Well below 2°C, pursue 1.5°C Paris Agreement goal

Adaptation

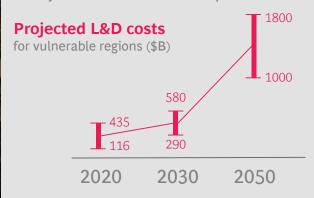
Inadequate focus and funding for adaptation with a Global Goal on Adaptation needed

90% Mitigation

<10%
 of climate funding is dedicated
to Adaptation, but need 11-15%</pre>

3 Loss & Damage

Failure to address loss and damage threatening to fatally undermine trust in the process



4

Finance

Climate finance flows have to grow +20% p.a. over the 2020s

Current annual climate finance

\$0.6Tn

\$4.0Tn

Annual climate finance required by 2030 in 1.5°C scenarios

Measurement,
Reporting & Verification

Lack of common metrics and mandatory disclosure

<10%

Businesses estimated¹ to be measuring their CO2e footprint fully

Six takeaways from COP27 with select examples

- COP27 elevated the concerns of the Global South beyond mitigation
 - Agreed to establish first-ever Loss & Damage financial facility in response to long-time demand
 - Launch of the Sharm El Sheikh Adaptation Agenda to catalyse non state actors
 - African Business Leaders Forum elevated business leadership in the Global South
 - Dedicated day for agriculture raised expectations of systemic approach to food systems
- COP27 marked a shift towards implementation and accountability
 - South Africa published Just Energy Implementation Plan endorsed by international partners
 - \$20B Just Energy Transition Partnership agreed by Indonesia and international partners, potential for additional agreements with Vietnam, Senegal, India to follow
 - Egypt announced \$15B "Nexus on Water Food and Energy (NWFE)" package of mitigation, adaptation & development projects, with novel joint approach on all three topics
 - Regional Finance Forums identified 450+ projects requiring \$600B of financing
 - UN Secretary General called for zero tolerance of greenwashing in a report on net-zero
 - Meaningful support for food systems \$15B from IFC, Gates Foundation, others; FAST initiative launch
 - Italy launched Climate fund with €4.2B/5 years; US-Egypt launched \$150m for adaptation in Africa
- COP27 saw a more sophisticated finance discussion and growing demands for reform
 - GFANZ published sector guidance for net-zero transition planning by financial institutions
 - Demands for reform of the IMF and multilateral development banks gathered pace, with French President Macron and Barbados Prime Minister Mottley collaborating on Bridgetown Initiative
- Engagement from business, finance and sub-national governments remained high
 - 33K registered for COP27 the second highest number after 38K at COP26 in Glasgow
 - Business participation was high at the conference and the fringe e.g., Terra Carta, Bloomberg
 - Business coalitions gathered pace e.g., concrete/cement added to First Movers Coalition
- Negotiations unexpectedly delivered on loss and damage but leave much to do for COP28
 - See page 8
- 6 COP27 failed to increase national ambition or close the policy gap. Whilst back-sliding on Glasgow Pact was avoided, reaching 1.5°C in warming is now all but inevitable
 - See page 9

Negotiators made unexpected progress on loss & damage and reiterated the commitment to 1.5°C but there were mixed results elsewhere

Formal negotiations require consensus amongst 197 Parties to the Convention and to the Paris Agreement

Decision text

The "decision text" represents the political consensus at the COP including progress made and the way ahead

- ✓ Goal of limiting warming to 1.5°C remains in the text despite challenges
- Decision to set up a dedicated fund and new funding arrangements for loss & damage
- Calls on the shareholders of the multilateral development banks to implement reforms to scale and improve development and climate finance
- No reference to the need to peak emissions this decade
- Glasgow text on phase-down coal remained unchanged, not extended to other fossil fuels

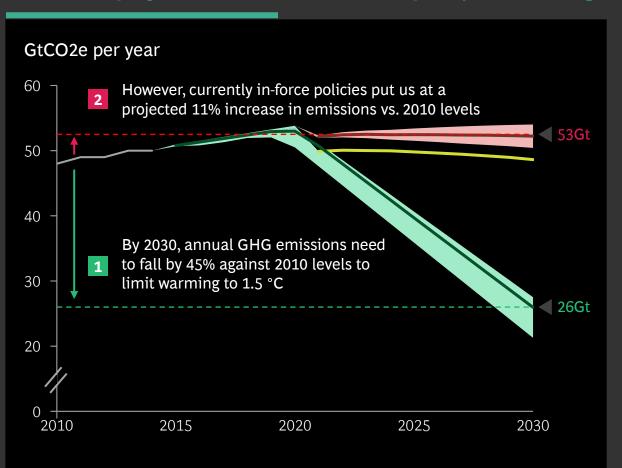
Negotiating tracks

- There were no major negotiating outcomes on the agenda at COP27 and progress was mixed across key tracks
- Agreement to develop a 'framework' for the **Global Goal on Adaptation** but lack of clarity on how developed countries will double adaptation finance by 2025
- The **Mitigation Work Programme** has not yet delivered strong outcomes to reduce emissions this decade but has launched a process
- No progress on the post-2025 collective finance goal the successor to the \$100Bn target

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Emissions are still set to rise 11% by 2030 despite incremental pledges made at COP27, and are required to fall by 45% for a chance to limit warming to 1.5°C

Emissions projections based on current policy vs 2030 targets made at Glasgow



- Emissions will increase 11% above 2010 levels based on current policies e.g., ICE phase out, fossil fuel subsidies. This puts on a path to 2.2°C-3.4°C by 2100
- Emissions will flatline based on countries' aggregate ambition for 2030 e.g., NDCs. This puts us on a path to 1.9°C-3.0°C by 2100
- Emissions must fall 45% below 2010 levels by 2030 for a 50% chance of limiting global average temperatures to 1.5° above pre-industrial levels as required under the Paris Agreement, and this includes some 'overshoot' mid-century.
- We face a huge gap in both ambition <u>and</u> policy. The world can emit a further 460 GtCO2 to have a 50% chance of limiting warming to 1.5°C. We are on course to exhaust that 'carbon budget' by 2035 based on current policy

Note: 1.5 $^{\circ}$ C refers to average global temperatures but there are regional differences, e.g. current global average is +1.1 $^{\circ}$ C but Europe is at +1.9 $^{\circ}$ C

Note: Emissions-to-temperature modelling is probabilistic. We typically refer to the P50 scenario i.e. 50% chance of achieving a given temperature goal

Looking ahead | Several topics rising up the agenda in the coming year

Non-exhaustive



Food systems

How can we increase food productivity and resilience whilst reducing its impact on climate & nature?



Water

How can we reduce the water-related impacts of climate change, and leverage it for mitigation?



Nature

How can we leverage nature for climate action, whilst protecting our planetary boundaries?



Health

How can we make our health systems more resilient to climate change and reduce their impact?



Central

question

Energy transition

How can we phase out fossil fuels in a just way? What is the role of gas?



Global stock-take

How can we respond to the global stocktake to put the world on track this decade?



Loss & damage

How should the financial mechanism be structured and who should contribute?



Accountability

How should we track progress on and ensure that pledges are kept?

Central question

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- Adaptation & Resilience | Urgency and the importance of data, planning, finance & private sector participation established but funding falling short
- Loss & Damage | Commitment to set up a financial support structure for the most vulnerable by COP28 was an unexpected win
- **Finance** | Scaling private finance will be critical to reaching the \$3.4Tn required, with public finance playing a crucial role to unlock it
- Food systems | Emerging investment made to catalyse adaptation solutions in food & agriculture, though mitigation potential remains understated
- **Energy Transition** | Strengthening country ambitions backed by concrete announcements, but commitments still far below need
- Heavy Industry | Step forward for cement decarb. but tangible action at scale yet to be seen; methane reductions roadmap builds on existing pledges
- Green Hydrogen | Strong pre-COP momentum in nascent market continues with additional targets, initiatives and funding
- Carbon markets | Strong surge in voluntary initiatives and greater scrutiny over integrity of credits
- Standards | Increasing expectations & clarity on net zero standards and climate-related disclosure; regulators expected to follow suit

A&R | Urgency of adaptation action established; call for increased planning, financing and private sector participation; funding for LMICs falling short

Key facts

- A&R financing need is expected to reach ~\$140-300B¹ p.a. by 2030 in developing countries alone
- For some 50 LMICs, annual needs cost >1% of GDP
- Only \$28.6B flowing and growing at a rate of \$500M p.a., i.e., only 10-20% of 2030 needs will be met
- Only 1/3 of nations have time-bound, quantified, adaptation targets

BCG@COP27



Charmian Caines, BCG global lead for A&R, spoke at the COP27 Presidency event on Shaping the way forward for Adaptation

Key takeaways from COP27

A&R was at forefront of COP agenda (decoupled from L&D) and given unprecedented urgency, in a year that witnessed devastation of floods in Pakistan, severe drought and heatwaves in Europe, droughts in Kenya, and catastrophic impact from Hurricane Ian

Mitigation alone acknowledged as no longer enough whichever climate pathway we are on. Government and business leaders urged to step up adaptation planning and take action now to avoid cost of inaction

Set of target outcomes for public, private and civil society actors clearly articulated through Sharm el-Sheikh Adaptation

Agenda, raising expectations for greater regional, city & private sector intervention in an area currently heavily skewed towards national actors

Call to action to business to build resilience to physical climate impacts: their physical assets, core operations and supply chain are at risk with high potential **cost of inaction**; climate risk assessment and adaptation planning is increasingly critical

However, in terms of material action, whilst some pledges were made, still need increase in financial support and potential financial system reform for LMICs to mobilise funding behind necessary adaptation actions; limited progress on the Global Goal on Adaptation

Key Announcements @ COP27

1

Launch of the <u>Sharm-el-Sheikh Adaptation Agenda</u>:

first comprehensive global plan to rally both State and non-State actors – incl. businesses – behind a shared set of 30 adaptation outcomes by 2030

2

African Climate Risk Facility formed by 85 insurers to provide \$14B of cover to help climate vulnerable communities manage the financial risk of climate shocks and increase resilience 3

Launch of the Nexus on Water, Food, and Energy (NWFE) by Egypt with \$15B committed by MDBs; \$5B will go towards food & water systems adaptation projects 4

Global Goal on Adaptation: Agreement to develop a

framework to guide delivery and track progress; additional request to Standing Committee to report on progress in doubling adaptation finance



A&R | Governments and businesses must adapt to protect against climate impacts, changes needed to accelerate private A&R funding & tech innovation

Business and Government leader implications



Essential for Governments, Cities, States to adapt to protect people, economy and ecosystems

- Develop robust adaptation plans grounded in data & analytics and quantify the cost of inaction
- Develop project portfolio against which public & private sector can mobilise funding for implementation
- Heavy engagement of private sector and civil society needed in order to fund and deliver the necessary transformations



Corporates need to integrate climate risk and adaptation planning into core business strategy Climate-related disruption to business will require companies to leverage data and advanced analytics such

as BCG's Climate Impact AI platform to:

- Map climate risks and hazards to company assets, operations and supply chains
- Quantify operational and financial impact of climate risks
- Define climate adaptation and resilience strategies to address risks and potential valuation impact



Changes needed to investment frameworks and systems to increase private capital flow

Traditional Climate financing models and structures are not fit for Adaptation & Resilience. We must:

- Define frameworks and taxonomies to facilitate investments that include socio-economic returns, recalibrate definition and profile of risk of projects to facilitate greater capital flows to A&R
- Define project archetypes to effectively target intervention by different public & private players



Radical step up of private sector adaptation finance needed

- Private sector share of global A&R flows was at 2% in 2020, and urgently needs to scale to meet the between \$140-300B annual need, especially in developing countries
- Increased role for blended finance funds to leverage concessional funding and crowd-in private sector; and scope for greater private sector participation in A&R planning, financing and implementation



Grow innovation and technology solutions market

Venture and growth stage financing needed for companies developing innovative and tech-based A&R solutions; e.g., agritech, climate monitoring systems, more resilient infrastructure materials



BCG supported **UN Climate Champions to** publish 4 technical reports on achieving the Sharm el-Sheikh Adaptation Outcomes by 2030





Read more on how corporate leaders can secure business against climate risk

BCG's AI proprietary platform enables the quantification of physical and transition risks, helps identify optimal A&R strategies



Explainer | What is Loss & Damage? The impacts of climate change which we have not or will not avoid

Climate impacts have cost \$227B YTD from extreme weather



Severe floods in Pakistan



Heatwaves in Europe

Slow on-set events intensifying

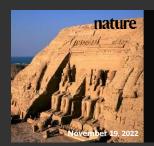


Africa droughts more frequent, intense, and widespread



Up to 40% of world's land now degraded

Loss of livelihoods and human heritage

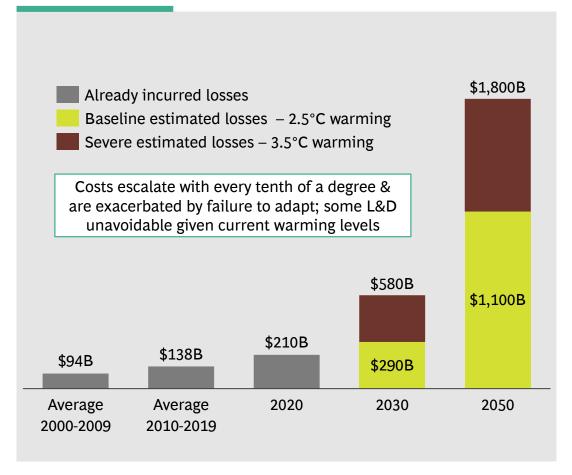


African heritage sites threatened as sea-level rise accelerates



Climate-related migration is on the rise in North America

Costs from climate impacts are rising exponentially and could incur \$1.1 - 1.8Tn in damages by 2050



B

Loss & Damage | COP27 delivered breakthrough agreement on L&D finance facility in response to long-time demand from developing nations

History of L&D @ COP



Warsaw International Mechanism for Loss and Damage created as the main forum for discussing L&D under UNFCCC



Article 8 of the Paris Agreement recognised the importance of "averting, minimising and addressing" loss and damage



Santiago Network on Loss and Damage for technical assistance was established but not operationalised



In Glasgow, developing countries proposed a Loss and Damage Financing Facility but developed countries rejected this out of concern it would render major emitters liable for uncapped losses, and instead referred to the "mosaic of solutions" e.g., early warning systems & insurance

"Glasgow Dialogue" to discuss potential funding arrangements was established

Shifting politics @ COP27

Going into COP27, observers saw **progress on Loss & Damage as critical to the UN process, North-South relations and trust** after failure to meet the \$100B finance pledge and Europe sourcing gas in the face of energy crisis despite halting funding for fossil fuel projects in developing world

The G77 + China coalition of developing countries reiterated demand for **formal funding arrangements** to be established under the **UNFCCC architecture**

Negotiations seemed stuck in a logjam as developed countries pushed to ensure big emitters like China are included as potential contributors but excluded as recipients

The EU was first to reverse their decision in the final hours of the conference and the fund was ultimately agreed, leaving important questions like contributor base to be resolved by the transitional committee

A Breakthrough Decision

- Agreement **defied expectations** of stalemate
- Long-time demand of developing countries, on a matter of climate justice, was answered in symbolic deal that can help rebuild trust
- Current wording targets "developing countries particularly vulnerable" to climate impacts – in nod to calls to consider vulnerability in funding
- Parties also agreed on arrangements to operationalize
 Santiago Network to catalyse technical assistance to developing countries

Outstanding questions

Sources of funding – i.e., which countries will pay into the fund?

Recipients of funding, which may prompt discussion on the definition of 'development'

Quantum of funding – Countries only pledged \$350M, or 0.01% of costs already incurred from climate disasters in '22; how will the proposed fund meet the need to rehabilitate losses & damages?

Public Finance Flows | More progress needed to fulfil \$100B pledge; momentum towards greening of international financial system

Key facts

- Developed countries mobilized \$83.3B of their \$100B pledge to developing countries in 2020, with \$33.2B from MDBs¹
- Public finance was ~50% (\$321B) of climate finance flows in 2020²
- Only 16% of the \$3.8Tn required annually for mitigation & adaptation is being deployed³
- Emerging markets are receiving only 27% of necessary flows

BCG@COP27



Veronica Chau emphasizes the importance of finance deployment during COP27

Key takeaways from COP27

Developed countries have made some commitments in climate finance at COP27 (incl for loss & damage, A&R, multilateral agreements for coal transition), **despite still falling short of critical long-standing pledge to deliver \$100B annually**

Growing recognition that **public finance needs to be deployed in a way that complements & unlocks private finance.**There is an increasing push for **reform of global financial institutions** (World Bank, IMF), which are no longer fit-forpurpose to respond to climate crisis

Financing need for Adaptation & Resilience is now taking central stage; however, it still faces a widening funding gap (only ~10% of \$410-560B need was funded in 2020)

Key Announcements @ COP27

- UN Expert Group
 'Songwe-Stern' report
 urges innovation to
 meet \$1Tn financing
 need for EMDEs:
 revamping MDBs,
 expand access to
 concessional finance,
 innovative debt
 repayment4
- New pledges secured:
 - Adaptation Fund \$230M
 - Least Developed
 Countries Fund and
 Special Climate Change
 Fund, housed under the
 Global Environment
 Facility- \$106M
- Bridgetown Agenda' to reform global financial institutions gaining momentum
 - Calls on IMF to issue \$650B, potentially annually, to developing countries
 - Suggests debt restructuring e.g., outstanding loan repayments to be paused after climate disasters
 - US & France aimed to help lead detailed planning by World Bank meeting in April 2023

^{1.} UN-HLEG Songwe-Stern Report, Nov 2022; 2. OECD Report "Aggregate Trends of Climate Finance Provided and Mobilised by Developed Countries in 2013-2020"; 3. 16% figure includes climate finance, transitional finance, and other financing flows to companies and investment vehicles that will have a climate impact; 4. EMDE = Emerging Markets and Developing Economies; MDBs = Multilateral Development Banks Source: What Gets Measured Gets Financed; BCG experience and analysis

Private Finance Flows | Scaling private capital deployment is critical; momentum in private sector moving from commitments to action

Key facts

- Private finance was ~50% (\$310B) of climate finance flows in 2020¹
- Private finance was \$13.1B of the \$83.3B for developing countries in 2020, but EMDEs need ~\$1Tn annually in private finance by 2030²
- Private finance only accounts for 2% of global adaptation flows
- Blended finance totaled \$160B in 2021 with annual flows at ~\$9B

BCG@COP27



Vinay Shandal spoke about grey-to-green investing and the role of capital in catalyzing emissions reductions in heavy emitters

Key takeaways from COP27

Investors and banks are increasingly stepping up efforts to pursue the multitrillion-dollar financing opportunities presented by the transition to a lower-carbon economy (\$3.8Tn will be needed annually through 2025 to attain net zero). However, for every one dollar deployed in 2020, five more were needed. Scaling private capital deployment will be critical

Noticeable shift from commitments to transition planning, as public scrutiny increases and recommendations for net-zero pledges become more stringent. Despite disassociating from UN's Road to Zero, GFANZ responded to calls to move towards implementation by issuing new guidelines on transition planning for members and portfolio companies

Key Announcements @ COP27

- Prominent private sector climate initiatives were launched, including:
 - 18 FIs in the African Business Leaders
 Coalition released joint statement with
 Paris-aligned commitments and resilience
 plans
 - 30 financial institutions (\$8.9Tn AUM)
 launched Finance Sector Deforestation
 Action (FSDA) initiative to eliminate
 deforestation by 2025 and to increase
 investments in nature-based solutions
- 2 100+ new members joined GFANZ between COP26 and COP27, and 300+ setting or operationalizing interim decarbonization targets
- GFANZ released crosssector guidance for netzero transition planning by financial institutions (for banks, asset owners, asset managers, insurers and service providers) and initiatives such as their data hub Net-Zero Data Public Utility (NZDPU)
- 4 UN High Level
 Champions and
 Regional
 Commissions, with
 support from BCG,
 announced pipeline of
 450+ projects globally,
 representing ~\$600B
 investment
 opportunity across 80+
 developing countries
 (incl. Africa) to tangibly
 advance climate impact

Finance Flows | Seek green finance deployment opportunities & focus on delivering credible & meaningful transition

Business implications

Accelerate transition and green finance deployment, focus on achieving meaningful emissions reductions in the real economy

Leading banks and investors are building capabilities around energy transition financing, but also in newer areas such as blended financing in order to capture first mover advantage. Grey to green investment theses will become even more critical as consensus grows about the imperative to finance real economy decarbonization. Partner with growing pools of concessional finance to pursue high impact opportunities in EMDEs

Develop a credible transition plan and build capabilities to deliver on them

Commitments and targets are no longer sufficient – financial institutions will be expected to have credible transition plans and associated demonstrable capabilities- notably upskilling, product and process innovation and data/IT infrastructure; GFANZ has offered guidance on how to do so with emphasis on providing clarity on exactly how FI's will engage with clients, deploy transition finance and align portfolios

Launch and scale efforts to finance adaptation and resilience across public sector and private sector clients

Climate impacts are happening now, companies and governments alike need to upgrade their operations, infrastructure and supply chains. All sectors are affected, but especially food & agriculture, commercial and residential real estate, infrastructure, and companies with extensive supply chains. Insurance will play a critical role both to close the protection gap and invest in efforts to reduce risks, such as the "Global Shield" initiative launched by G7 countries and several leading insurance companies

Build data and measurement capabilities, and support sector efforts to increase data coverage & quality

Regulators in EU, US are driving mandatory climate-related disclosures, as are major buyers e.g., US government requiring CDP disclosures for larger contractors. Major gaps in private sector climate financing data clouds the full picture on just how much money is actually flowing. Now is the time to invest in climate-related data, IT systems, & processes and disclosures. Sector level efforts such as the GFANZ NZDPU will help to drive greater coverage and quality data for the sector as a whole and enable transparency on financing flows

BCG thought leadership



Read more on: What Gets Measured Gets Financed



ASSETS TO FLOWS

UN Climate Change High-Level Champions:

Insights from the regional finance forums on climate initiatives to accelerate climate action and advance the SDGs.

BCG and HLC organized a series of regional fora to understand climate initiatives and build a mature and attractive project pipeline

BCG supported HLC in compiling 128 projects of varying maturity and deal sizes from \$10-500M

Food systems | Significant investment made to catalyse food & agriculture as adaptation solutions, though the mitigation potential understated

Key facts

- Up to 2.3B people lack access to adequate food
- · Agriculture and land use make up around one-third of global greenhouse gas emissions
- Global yields of maize, wheat, and soybeans have declined 5% from 1981 to 2010
- The agriculture sector absorbs up to c.25% of the total losses & damages from climate disasters

BCG@COP27



Shalini Unnikrishnan spoke about the importance of a food systems focus to unlock progress in climate action

COP recognized climate impact on food security, but large-scale transformation has not materialised

For the first time, COP hosted a dedicated Adaptation & Agriculture Day, which marked a significant step in recognition of the importance of food systems; though in marrying the two topics, the potential of agriculture and land use to contribute to mitigation was under-discussed

Initiatives & funding announced on agricultural R&D, trade, infrastructure suggest systems thinking taking root (e.g., Presidency initiatives **FAST** & **I-CAN** which address financing & nutrition)

There was also a strong call for addressing food security crisis and driving transformation in parallel to create resilience and relief from present emergency. However, there was a missed opportunity for major corporate players & nations to commit to substantial transformation, and key topics like diet shifts and food waste were inadequately addressed

Key Outcomes @ COP27 | ~\$15B raised but nowhere close to \$300B needed by 2030²





investment in climatepositive food tech in LMICs doubled to \$8B



launched \$6B financing facility to support sustainable food production in countries facing food instability



BILL&MELINDA GATES foundation

committed \$1.4B to support smallholder farmers in Sub-Saharan Africa and Asia²





pledged \$11M to scale regenerative agricultural practices

Food systems | Work with actors across entire value chain to implement adaptation solutions & reduce emissions

Business implications



Conduct thorough planning to adapt to climatic impacts

Extreme weather events like heatwaves and droughts are expected to continue to affect agricultural productivity. Given the current pace of action, disruptions to the supply chain and scarcity are likely to continue

Agrifood businesses need strong planning (including shifting of crop types and investing in heat and drought tolerant varieties) to achieve resilient and sustainable yields



Collaborate across value chain to enable systems transformation

Private sector collaboration across the value chain – from production to consumption – is essential to increase yield sustainably, maintain agricultural frontier, and limit increase in emissions due to land conversion

Collaborating across the full value chain can also unlock the potential of food systems as a source of sequestration and a nature-based solution



Unlock financing through innovative partnerships & policy changes

Actors in the food system can finance the transition by boldly partnering with each other to share costs (e.g., in R&D) and leveraging blended finance to direct capital to transformative ventures

Finally, policy support is needed that creates incentives for food systems transformation (e.g., the upcoming US farm bill)

Project spotlight: BCG is working with HLC on the African Food Systems Transformation Initiative (AFSTI) to implement highyielding, resilient, and adaptive farm practices



Linked: BCG presented AFSTI at the Food & Agriculture Pavilion at COP27 alongside HLC and leading African smallholderfarmer aggregation organisations



BCG thought leadership



BCG Perspectives on impact of war in Ukraine on food systems



Global Food System

The War in Ukraine and the Rush to Feed the World





Read more: **UN Climate** Champions White Paper on Food & Agriculture adaptation, codeveloped with **BCG**

Energy Transition | Strengthening country ambitions backed by concrete announcements, but commitments still far below need

Key facts

- IEA estimates we need 60% of global power generation from renewables (RES) by 2030 to achieve net-zero by 2050. In 2021, RES was 28.7%
- Need minimum \$4Tn investment p.a. (for tech and infrastructure) through 2030 to reach net-zero by 2050²
- 0.3-0.6M jobs in power sector could be lost, but net job creation positive at +2.6-7.0M

BCG@COP27



Patrick Dupoux joined panel for Africa Just & Affordable Energy Transition Initiative launch

Major wins for JET-P and implementation support, some countries scaled up NDCs, but commitments not enough to reverse the year's losses, as just transition debate for developing countries rages

Major JET-P wins for developing countries: \$18-20B for Indonesia and South Africa's JET-P plan, which details finance required to deliver low-end of NDCs and the distribution of \$8.5B JET-P commitments through 2027, was officially endorsed by IPG³

Strengthening climate commitments and calls: more ambitious NDCs from some countries, notably Vietnam; India's call for phase out of all fossil fuels drew support but was not adopted; China's new renewable capacity installation up 25% to 165 GW; US will generate 85% of energy from renewables by 2030; Munich RE to end new oil & gas investments by April 2023

However, commitments (especially funds) still far below need: Indonesia needs ~\$1.2Tn to fully replace coal with renewables; South Africa needs \$100B and funding terms which do not require sovereign guarantees; meanwhile role of fossils and nuclear in just transition unresolved with strong opposing views even as there was insufficient focus on energy efficiency

Key Outcomes @ COP27 | >\$20B raised, with gathering momentum on critical support

- Indonesia secures JET-P agreement for \$18-20B; South Africa's detailed JET-P plans officially endorsed; RMI & Lion's Head Global launch \$15M project preparation facility, and \$75M Caribbean Climate Smart Fund
- 2 Egypt launched Africa
 Just and Affordable
 Energy Transition
 Initiative (AJAETI), with
 support from Uganda,
 Ghana, Denmark,
 SEForAll & BCG
- TCG, GWEC, WRI
 convened Asia Clean
 Energy Coalition, with
 Google, Meta & Samsung,
 to accelerate corporate
 renewable electricity
 procurement in Asia in
 line with policy shifts
- 4 Coalition of philanthropic funds incl. Bloomberg Philanthropies & Sequoia Climate Foundation announced \$500M to invest in LMICs on just energy transition in 3 years

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Energy Transition | Broadening opportunity landscape, and heightening expectations of corporate citizenship especially for private capital

Business implications



Opportunities for renewables are set to increase rapidly globally

With major economies re-committing to energy transition, expect a step-change increase in deployments, although current economic challenges mean this may not be immediate as countries grapple with inflation

Corporates and financial investors should look to support deployments



JET-P and other support announcements signal more de-risked opportunities in developing world that should not be ignored

Now with >\$28B committed for South Africa and Indonesia, clear opportunity for private capital to augment capital needs for just transition, leveraging JET-P funds to de-risk participation (e.g., blended finance, etc)

Need to pay meaningful attention to and pursue opportunity pipelines in South Africa and Indonesia



Rising sense of urgency on climate action could raise expectations & scrutiny of corporate support for just transition

"There is no scenario where we reach net zero but leave 1 billion people [in Africa] behind"- Damilola Ogunbiyi, CEO, SEforALL. Scrutiny of private capital support for fossil fuels, and expectation to finance just transition in developing world (<2% today) will increase

Project spotlight: BCG supported the NBI in South Africa to define what a Just Transition could look like. The study was a key input to South Africa's Just Energy Transition Implementation Plan (JET IP). With precise & comprehensive detail about projects, timelines and funding required, this is now the 'poster child' of best practices for developing countries looking to gain international public and private support



BCG thought leadership



Read more: NBI-BUSA-BCG study on what it takes for South Africa to reach Net-Zero by 2050 and ensure a Just Transition



23

Heavy Industry | Step forward for cement decarbonization but tangible action yet to be seen, whilst oil & gas launched Methane Roadmap

Key facts

- Hard-to-abate sectors make up 28% of CO2 emissions
- Without action, these emissions will grow 32% by 2050, based on 2021 policies
- Decarbonization costs are highly variable, ranging from \$0-80+ / ton, however, some technologies more nascent

BCG@COP27



Simon Birkebaek presented on future of green Hydrogen

Industry paradigm shift as 'hard-to-abate' sectors now present bolder ambitions & actions, landmark announcements on methane from oil & gas; general concerns about scale and implementation

Breakthrough Agenda launch, a clean technology plan to help keep 1.5°C in reach, was a highlight for the Implementation COP. First Mover's Coalition left a meaningful impression: membership more than doubled to 66 companies and 9 governments (vs. 33-1 at COP26), with first concrete successes, one signal among many that heavy industry is serious about decarbonization; Notable shift towards seeing opportunities rather than risks, e.g., in cement industry (5x last year's numbers of low-carbon projects); push from downstream industries (auto, consumer goods) visibly moving up the value chain, but scale is insufficient

Oil & gas presented the Sharm El-Sheikh Methane Roadmap to reduce methane through capacity building, knowledge sharing and measuring & reporting tools standardization; East Mediterranean Gas Forum shared initiative that compiles best practices for countries to incentivize emission reductions in the natural gas supply chain; but oil & gas lobbyist numbers drew ire

\$2Tn investment needed but weak business cases have limited funding; inflation and supply chain constraints could slow transition¹

Key Outcomes @ COP27 | Limited fund commitments but expanding activity to drive progress









Breakthrough Agenda launched 28 priority actions to decarbonise power, steel, road transport, agriculture, etc





CIF launched Industry
Transition Programme to help
developing countries
decarbonize hard-to-abate
industries (with \$500M)

3

RACE TO ZERO

HLC announced carbon removals 2030 breakthrough: deploy CCUS facilities with 3Gt in CO2 removal capacity







First Movers Coalition launched cement sector; Africa Net Zero Concrete Group launched

eserved. BCG Executive Perspectives updated 15 November 2021 Version

Heavy Industry | Despite economic headwinds, industry needs to build on momentum and start implementing decarbonization solutions, with partners

Business implications



Economic headwinds notwithstanding, companies should progress decarbonization and methane reductions now, using incentives

While the economic challenges mean customers may have tighter budgets and some supply chain bottlenecks persist, industrial firms need to build partnerships and leverage existing government incentives (e.g. Inflation Reduction Act, RePowerEU, EU innovation funding, Infrastructure Investment and Jobs Act, etc) to start deploying low-carbon solutions, anticipating growing requests from their customers, delivering on their commitments. Likely scarcity for some materials (e.g., green steel) will reward early movers. Need to watch developments in regional competitiveness given skewed incentives (e.g., US vs. EU)



Consider investing in improving and/or scaling technology solutions to drive down marginal abatement costs

With technical solutions being increasingly proved as viable, companies need to rapidly work at scaling commercial solutions even within the adverse economic context, building competitive advantage for the next cycle; changes in demand are likely to occur more quickly than supply can follow

Explore opportunities to co-invest in technology solutions to move your business up the learning curve and to help bring down costs

Project spotlight:

BCG is the Knowledge Partner of the First Movers Coalition led by the US State Dept. and the World Economic Forum, bringing together >60 companies with ambitious commitments to procure low-carbon materials, covering aluminum, aviation, carbon dioxide removals. cement & concrete, shipping, steel, and trucking. Recently 8 governments have joined the initiative. More details about FMC can be found here.



BCG thought leadership



Read more:
BCG's
perspective on
how to decarbonise hardto-abate sectors
– including
setting long-term
targets based on
emerging
technologies



Read more: BCG's perspective on how to target hard-to-abate sector decarbonisation through addressing supply chain of consumer-facing industries

Low-carbon H2 | Strong pre-COP momentum in nascent market continues with additional targets, initiatives and funding

Key facts

- Low-carbon H2 is a critical decarbonization lever but is now a relatively more expensive solution & is therefore selectively applied
- Green H2 economics improving, targeting \$1.5-3/kg pre-support production cost by 2030³
- \$3-10Tn investment needed through 2050; \$1-3Tn is required for low-carbon, incl. blue H2

BCG@COP27



Patrick Herhold joined a FAB-led panel to discuss green Hydrogen

Several announcements and clear show of will to accelerate H2 transition, as more projects and support unveiled

H2's importance for net zero re-emphasised, given H2's 'last mile' ability to reduce scope 1 and 2 emissions to zero

>\$6B in commitments and some development initiatives announced for hydrogen in developing countries incl. \$0.4B Egypt, \$1.6B World Bank, >\$4B EU. Established funding in US and emerging funding in EU improving business case for commercial viability and could even spur export from developing countries like South Africa, Namibia and in MENA. However, large investment gap persists -

\$3-10Tn needed through 2050 (\$10Tn for a net-zero pathway). Also uneven progress on offtake – while Inflation Reduction Act supports production in the U.S. and RED II addresses offtake issues for the EU, offtake challenges remain unresolved in other markets

Shift to hydrogen is new opportunity for some developing countries to export to energy importing and decarbonizing economies, but pipeline still nascent: >1200 projects announced, but only 29 material projects have cleared planning stages (i.e. 2% of projects)

Key Outcomes @ COP27 | >\$6B raised as market momentum builds, but large investment gaps4





1.5°C pathways

Breakthrough Agenda

launched 2030 target to

by 850GW to align with

scale up green H2 capacity





















Germany announced additional €4B funding for H2Global fund; IFC announced Hydrogen **Development Partnership** $(H4D)^2$ with \$2-3B concessional finance to catalyse private funding

^{1,} LMICs = Low- and Medium-Income Countries 2. Hydrogen for Development Partnership (H4D) with 3 key pillars; (a) developing knowledge and data in emerging markets, (b) strategy & roadmap development (including pre-feasibility and feasibility studies for specific projects), (c) concessional finance to catalyse private sector funding 3. Green H2 pre-production costs are significantly higher than grey hydrogen although IRA reduces figure significantly in US, bringing cost to parity or better; 4) Moreover, Worldbank launched H4D, Hydrogen for Development, initiative.

Low-carbon H2 | Continued momentum in nascent market; with opportunities for companies and countries alike

Business implications



Pursue footholds in nascent market with rapidly building momentum

Hydrogen's role as a 'last mile' decarbonization lever for a net-zero future is clear and building momentum in the project pipeline suggests growing confidence in market uptake. Corporates and financial investors should look to secure footholds, e.g., partnering with upcoming hydrogen producers to start securing supply.



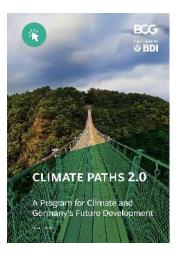
De-risk initial investments by partnering and building consortia across value chain

As technology and costs continue to improve, today companies and countries alike can look to partner / build consortia along the value-chain as a risk-sharing mechanism to ease entry into the space.

A criterion to choose partners is to look for those who understand policy & financiers' landscape and move in early. We expect early investors to reap higher returns¹; the winners will be those who invest in building up expertise and credentials early in this \$3 -10Tn cumulative-investment-by-2050 opportunity (IEA).

Project spotlight:

Developed detailed scenarios and plan through 2050 and beyond with costs and impact across industry sectors for the Federation of German Industries to identify paths to net zero





BCG thought leadership



Read more: BCG's perspective on the world's ability to meet the demand for low-carbon fuels and the associated renewable energy requirement



Read more: BCG's perspective on how to be an early adopter of low-carbon fuel technology

Carbon markets | Strong surge in voluntary initiatives and greater scrutiny over integrity of credits

Key facts

77% of emissions are not covered by carbon market mechanisms (MtCO2e)



Jurisdictions covered by regulatory regimes are concentrated in Europe and Latin America



Key: Green = existing regime; yellow = planned regime

BCG perspective

UN guidance affirms the 'mitigation hierarchy' – focus on value chain emissions reductions first, then use carbon credits for beyond value chain emissions and removals to neutralise residual emissions

Voluntary carbon markets (VCMs) are increasingly being leveraged by **developed countries to fund** transition projects in emerging markets

Increased scrutiny on **additionality & permanence** as credibility checks, as VCMs continue expansion into nature and biodiversity credits

More refined corporate appetite for carbon credits with growing focus on co-benefits e.g., people & nature

As regulated markets develop, the 'equivalence' of different pricing schemes needs to be addressed

Key Outcomes @ COP27

- UN HLEG's¹ guidance affirms credits do not count towards interim emissions reductions, but are for beyond value chain mitigation
- African Carbon Markets Initiative (ACMI) was launched with the ambition to produce 300m credits, \$6B revenue and 30M jobs by 2030
- 2 US announced the Energy Transition Accelerator (ETA) with intent to fund transition in poorer countries by offering carbon avoidance offsets to corporations details to be worked out
- LEAF Coalition announces issuance of first-ever jurisdictional REDD+2 credits, with supply commitments from Brazil, Costa Rica, Nepal and Ecuador

Carbon markets | Take steps to ensure integrity of credits and prepare for interaction between voluntary and regulated markets

Voluntary markets



Take tactical steps to ensure integrity of credits, especially for NBS credits -UN HLEG report call out additionality and permanence as minimum criteria¹

- Use credible standards based on project type
- Ensure a % (20% is seen as min.) of credits are set aside in buffer pool for insurance
- Conduct rigorous additionality tests (e.g., prior consideration, investment analysis)
- MRV²/Registration: Ensure offset projects are properly tracked



Leverage more economical, high-quality offsets issued by Global South projects

Schemes such as LEAF Coalition offer high-integrity projects at (currently) low rates on the voluntary market

Regulated carbon markets (RCMs)

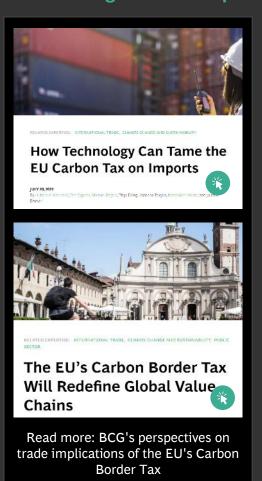


Resolve tensions between development of RCMs and the global trading system

EU CBAM levies carbon prices on imports for the first time, extending RCMs to third country producers; US IRA (while not an RCM) will impact supply chains with strong local production requirements

These regimes can have a huge impact on export-dependent LDCs – understanding & mapping

BCG thought leadership



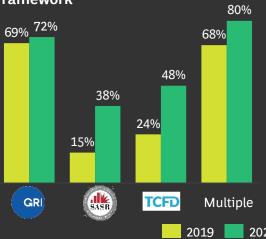
supply chain emissions will be essential for managing trade as more RCMs come online

Standards | Increasing expectations & clarity on net-zero standards and climate-related disclosure; regulators expected to follow suit

Key facts

- At the global level, 91% of GDP is covered by national net-zero targets
- More than 1/3 of large companies have set net-zero targets, but 65% of those do not meet the minimum robustness standard
- Most corporates leverage multiple reporting frameworks and standards to disclose climate risks

% of companies using reporting framework¹



Key takeaways from COP27

As Net-Zero pledges and targets become mainstream, they suffer from growing credibility issues. COP27 called for more integrity on transition plans, accountability and transparency on implementation, and harmonization across standards

While the landscape of standards remains fragmented, **consolidation is happening** to streamline effective and consistent practices in climate and sustainability target-setting, transition planning and disclosure. The **UN High Level Expert Group** (UN HLEG) on Net-Zero Emissions built a unified understanding of what the highest standards of environmental integrity entail for non-state actors, aligned with SBTi guidance which is considered best practice, on issues like carbon offsets, fossil fuels development, deforestation or lobbying

Harmonization of voluntary standards provides ground for adoption of tighter regulations, leading to mandatory standards. This trend is well underway for climate-related disclosures, for a steadily increasing scope of non-state entities, value chain emissions and sustainability indicators to cover

Key Announcements @ COP27

1

UN High Level Expert Group defined 10 recommendations for net-zero pledges of non-state actors, aligned with SBTi guidance. Highlights include setting 1.5 °C-aligned, interim, absolute emission reduction targets, covering all emissions across the value chain (Scopes 1/2/3); excluding carbon offsets from the accounting of interim targets; ending the development of new fossil fuel production capacity; eliminating deforestation from value chain; annually disclosing emissions and progress; working with MDBs to finance the just transition of EMDEs; and calling for stronger climate regulation.

2

Biden Admin to require climate disclosure through CDP: Major suppliers of the U.S. federal government will be required to publicly disclose GHG emissions, climaterelated financial risk, and set sciencebased targets 3

EU Parliament adopts Corporate Sustainability Reporting Directive (CSRD), extending its predecessor's directive (NFRD) to small mid-caps, requiring more specific quantitative KPIs incl. on Scope 3 emissions, and double-materiality

4

Incorporates
ISSB's climate
disclosure
standard: >18,700
companies currently
disclosing through
CDP, adoption
of ISSB's standard
will provide clear &
comparable data

1. Data from IFAC/AICPA & CIMA: The State of Play in Reporting and Assurance of Sustainability Information 2019-2020; GRI: Global Reporting Initiative; SASB: Sustainability Accounting Standards Board; TCFD: Task Force on Climate-Related Financial Disclosures; *N* = 1283 corporates with ESG reports. Source: Net Zero Tracker; Net Zero Commitments by Businesses, Financial Institutions, Cities and Regions; Whitehouse Factsheet; EU Parliament News; BCG analysis

Standards Implications

Business implications

Build a more comprehensive & rigorous net-zero strategy

New standards expect companies and financial institutions to go beyond GHG Protocol-aligned emissions accounting and SBTi-aligned targets to consider how all business activities effect emissions. E.g., Adherence will require:

- Aligning lobbying and advocacy to positive climate action
- More robust and transparent net-zero transition plans, governance & incentive structures

Anticipate increased accountability to investors and the public, e.g.:

- More "hard data" on how climate risks drive decision-making of portfolio managers
- Greater transparency to drive public pressure campaigns and potential lawsuits
- Increased need to demonstrate incremental progress

Position for success in net-zero execution and disclosure by:

- Enhancing climate data and governance capabilities (e.g., via BCG's CO2 AI)
- Ensuring appropriate leadership, skills and human resources, and enablement capabilities
- Anticipating expense associated with growing climate disclosure cost (e.g., if passed, U.S. SEC¹ regulation will require a form like the 10-k and must be audited)
- Advocating and shaping green policies and regulations

Prepare for an evolving regulatory landscape

- Baseline current regulatory requirements, adopt forward-looking view to "future proof" against upcoming regulations
- Assess regulatory impacts on suppliers, engage suppliers today to reduce climate and nature-related risks

BCG product spotlight



CO2 AI, co-developed by BCG and CDP, is a patented Alpowered SaaS tool that allows companies to reliably quantify and effectively reduce environmental footprint



CO2 AI by BCG is fully compliant with the GHG Protocol and supports other sustainability criteria, such as GRI and TCFD, also a CDP gold accredited provider for SBT services

BCG Executive Perspectives AGENDA

OVERVIEW

DEEP DIVES



- Context
- Key achievements and remaining challenges
- Look ahead to next year

- Insights & outcomes from key topics at COP27
- Overview of two reports published ahead of COP



Context

There has been a proliferation of net-zero campaigns for non-state actors since the Paris Agreement in 2015. This has prompted greater scrutiny around the robustness of net-zero pledges and skepticism around greenwashing

In response, the UN Secretary-General appointed a High-Level Expert Group (HLEG) to produce guidance on setting credible, accountable net-zero pledges

Key takeaways

The HLEG issued 10 recommendations for non-state actors. Highlights include: setting interim, 1.5°C aligned targets; focusing on supply chain emissions and using high-integrity carbon credits after; planning to end use & support for fossil fuels; eliminating deforestation by 2025



Read here: UN High-Level Expert Group's recommendations on how to develop more robust net-zero emissions pledges for non-state actors

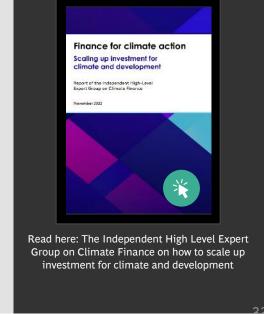
Context

Developed countries have been unable to deliver on the promise of mobilizing \$100B per year in climate finance for developing countries. Further, emerging markets, excluding China, needs \$1Tn per year in external climate finance

The COP26 and COP27 Presidencies and the HLCs launched the independent high-level expert group in July '21 to outline how to scale climate finance in an urgent and sustained manner

Key takeaways

- Close gap between investors & investment opportunities
- Revamp MDBs and triple their annual flows
- Expand concessional finance through special drawing rights, voluntary carbon markets and philanthropy etc.
- Create tailored solutions for debt-constrained countries



UN-appointed group defines new recommendations for net-zero commitments

CONTEXT

UN appointed group asked to make recommendations to address the "deficit of credibility" of net-zero targets; resulted in 10 recommendations for businesses, financial institutions, cities and regions

Recommendations



Announce a net-zero pledge with interim targets modeled to 1.5 °C



Account for all GHG emissions (incl. non-CO2) across value chain



Use carbon credits only for beyond value chain mitigation¹



Create and disclose transition plans to support a just transition



Include targets aimed at ending the use & support of fossil fuels



Align lobbying to positive climate action



Eliminating deforestation & peatland loss by 2025



Annually disclose verified emissions data, targets and progress



Scale investments in clean energy transition in developing countries



Regulators: consolidate regulatory standards around guidance

1. Mitigation action or investments outside of a company's value chain. Source: United Nation's High-Level Expert Group on the Net-Zero Emissions Commitments of Non-State Entities

Songwe-Stern report from the UN Expert Group defines a new climate finance roadmap, critically recommending institutional reform of MDBs

Four pillars to realize investments

KEY INSIGHT

\$1Tn in external finance needed annually by 2030 in EMDCs other than China

Mobilizing private finance at scale: build on GFANZ and Climate Champions' work to establish much closer interaction between investors and investment opportunities



Revamping the MDBs: Align shareholders' visions and move forward strongly at upcoming MDBs annual meetings to triple annual flows in the next 5 years (from \$60B to \$180B)



Report breaks down the primary vs secondary **financing sources** and **priority areas** to unlock \$1Tn goal e.g., \$400-500B by 2030 for low carbon transport infrastructure, with MDB being primary financier

Delivering and expanding concessional finance: Expand low-cost finance through innovative ways e.g.,

finance through innovative ways e.g., special drawing rights, voluntary carbon markets and philanthropy to double concessional finance from rich countries by 2025 from 2019 levels (from \$30B to \$60B)



Tackling
indebtedness with
tailored
solutions: Expand
access to low-cost
official liquidity
facilities; Include
systematic debtsuspension clauses in
loan contracts in the
event of a natural
disaster (pioneered by
Barbados); Expand the
use of debt-forclimate/nature swamps