

# YEARBOOK OF GLOBAL CLIMATE ACTION 2021

MARRAKECH PARTNERSHIP FOR GLOBAL CLIMATE ACTION



United Nations  
Climate Change Secretariat

Marrakech  
Partnership



Global Climate Action  
United Nations Climate Change

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# **YEARBOOK OF GLOBAL CLIMATE ACTION 2021**

MARRAKECH PARTNERSHIP FOR GLOBAL CLIMATE ACTION



# FOREWORD:

## Patricia Espinosa

### Executive Secretary of the UNFCCC

The latest report by the Intergovernmental Panel on Climate Change (IPCC) provides an alarming picture of the state of climate change: unless there are immediate, rapid, and large-scale reductions in greenhouse gas emissions, limiting global warming to below 1.5°C will no longer be possible.

The message from the scientific community is clear: in order to prevent the worst impacts of climate change, which include ever more frequent and more severe droughts, storms and floods, we must achieve a net-zero society by 2050. We must slash greenhouse gas emissions by half within the next 10 years. And we need massive efforts to build resilience and to adapt to inevitable climate impacts.

Instead of reducing emissions, the Nationally Determined Contributions (NDCs) submitted by governments to the UN Climate Change secretariat ahead of COP 26 indicate that we are way off track. This means that we need rapid systemic change – in all sectors and without delay.

Fighting the climate crisis cannot be done by governments alone. We need all hands on deck. The private sector, civil society, subnational authorities and individuals – all have a crucial role to play. The Paris Agreement clearly underscores the importance of non-Party stakeholders. And the Marrakech Partnership for Global Climate Action is a key vehicle to galvanize action. Since COP 25, the work of the Partnership has been expertly guided by two High-Level Champions nominated by the current and incoming COP 26 Presidencies – Mr. Gonzalo Muñoz of Chile and the UK's Mr. Nigel Topping.

This Yearbook of Global Climate Action provides an overview of the work undertaken under their guidance. The publication has some good news to tell – it shows there has been a significant increase in the number of actors engaging in climate action and announcing

net-zero pledges in the past year, despite the COVID-19 crisis. And it tells us that we now need to shift attention to implementation on the ground, including on how to track and measure progress accurately.

The Climate Action Pathways and the 2030 Breakthroughs published this year are important tools that provide a sectoral roadmap and spell out the concrete steps we need to take in the coming years to reach a net-zero resilient world by 2050. The tipping point towards success is now. The climate campaigns under the High-Level Champions' tutelage – the Race to Zero and the Race to Resilience – are gaining traction, showing a global preparedness by all stakeholders to accept the challenge of tackling climate change head on.

My thanks go to the High-Level Champions and everyone who contributed to the Yearbook, along with every government and non-Party stakeholder doing their utmost to fight climate change, arguably the greatest challenge of our time.





# FOREWORD:

## Gonzalo Muñoz

### High-Level Champion (Chile)

## Nigel Topping

### High-Level Champion

### (United Kingdom of Great Britain and Northern Ireland)

This Yearbook lands at a critical moment in the fight against climate change. For now, the objectives of the Paris Agreement remain within reach. But that window is closing. As we all now know, urgent action is required on all fronts if we are to keep the goal of a 1.5°C future in sight.

The good news is that society, at large, is increasingly cognizant of the stakes now at play. A dramatic shift in the public conversation has taken place over the last 12 months. The idea of a climate emergency is now commonplace. And businesses, civil society groups, educational institutions, and everyday citizens are all clamoring for tangible solutions.

They are not just shouting from the sides, either. Today, we are witnessing the largest mobilization ever of non-State actors in support of climate action. The momentum for change is extraordinary. As this report describes, the three global campaigns we have launched are helping catalyze and direct this energy in ways that promise exponential change – both for emissions mitigation and climate adaptation.

Such change is no fantasy. Yes, it takes time to get going, but, once the wheels start turning, the potential for acceleration is incredible. Excitingly, the inflexion point between theory and reality is now tantalizingly close. Take the transport sector. Five years ago, most scenarios were putting the end of the combustion engine by the 2080s. Now, thanks to the rapid uptake of electric vehicles, experts are projecting the early 2030s as a credible date.

Examples like this feed the growing conviction in society that a greener, fairer world is possible. Optimism alone is not enough. Achieving the Paris Agreement also requires a

constant ratcheting-up of ambition. Hence, the High-Level Champions decided in 2019 to put a 1.5°C goal at the heart of the Marrakech Partnership activities. Back then, it was seen as an ‘aspirational goal’; now, it’s a global norm.

Looking forwards, the momentum among non-State actors is only set to grow. That is clearly welcome given the mountain left to climb. The science is clear. We’re not transitioning nearly fast enough. Turning today’s momentum into project implementation is now absolutely the order of the day.

To realize this shift to action, in response to the mandate from Parties in Madrid, we have developed a new Five-Year Plan for the Marrakech Partnership. Based on extensive public consultation and grounded in our theory of sector-level system transformation, the Plan prioritizes the twin priorities of speed and scale.

Underpinning both is a commitment to radical collaboration. Actions by individual actors will not see us halve emissions by the end of this decade, as is required to keep in line with a 1.5°C resilient future. As non-Party stakeholders, we realize the imperative to work together towards a common goal, both among ourselves and in conjunction with Parties.

Central to our vision is the desire to work in partnership with the Parties, supporting moves for climate policies to go further and faster. Non-Party stakeholders are willing to act, but they require a clear and fair way in which to do so. We are aware that such an approach requires trust on both sides, which is why the new Five-Year Plan puts transparency front and center. We’ll show our actions – and our workings.

To repeat, this Yearbook coincides with a turning point in the journey to realizing the Paris Agreement. From pledges and commitments, the time has arrived for implementation.

As the Marrakech Partnership, we’re here to collaborate. We’re here to up the ambition. We’re here to help get the job done.



# ACKNOWLEDGEMENTS

The High-Level Champions would like to thank all contributions from many organizations and individuals that made this edition of the Yearbook of Global Climate Action possible.

Special thanks go to all Marrakech Partnership stakeholders, the Camda community, the Race to Zero and Race to Resilience Partners, Glasgow Financial Alliance for Net Zero, and the Systems Change Lab team. The High-Level Champions would also like to thank their entire team and the UNFCCC secretariat for their support.

# Executive Summary

The year of 2021 marks the beginning of the first global stocktake process, which will assess the collective progress towards the Paris Agreement goals. It also marks the release of the first part of the Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report.

The Report's findings reinforce the need to accelerate the pace of climate action in order to ensure temperature rise remains under 1.5°C by the end of the century. Impacts as we have already been experiencing in the past years will continue to happen, as many of the changes that led to them are irreversible, but by implementing the right mitigation and adaptation measures, we can ensure a safe and resilient future. This requires immediate and substantive action.

An assessment of the collective current Nationally Determined Contributions (NDCs) - including the new and updated ones - indicates that, though there has been a welcome revision in mitigation targets, we are still far off track. The NDC Synthesis report finds that the available NDCs of all Parties to the Paris Agreement actually imply an increase of about 16 per cent in global emissions in 2030 compared to 2010, which would correspond to a temperature rise of about 2.7°C by the end of the century.

Cooperation is key for governments and other stakeholders to pivot towards a net-zero resilient society, and the work under the Marrakech Partnership for Global Climate Action is set up to support that endeavor. In order to help drive the ambition loop, the High-Level Champions, Mr. Gonzalo Muñoz (Chile) and Mr. Nigel Topping (UK), have focused not only on enhancing Parties and non-Party stakeholders collaboration, but also on bringing non-Party stakeholders' action under a shared vision and providing a thorough roadmap for systems transformations.

This Yearbook of Global Climate Action reviews the state and scope of global climate action in 2021, including the work carried out by the Marrakech Partnership under the Champions' leadership, outlines key messages around what is needed to accelerate sectoral systems transformation, and presents the Champions' vision on the future of the climate action framework and agenda.

## WHERE WE ARE

There has been an increase of nearly 22 per cent in the number of actors registered in Global Climate Action Portal from what was reported in the 2020 Yearbook - and a particularly impressive rise in the number of participating business actors. The Portal has been undertaking some changes to better reflect the complexities in climate action, and it now provides a first look into some initiatives' reported progress towards goals, a work which will be gradually extended to other climate initiatives and efforts over the next few years. Not only is accurately tracking progress essential to ensuring comparability and accountability in climate action, but it has the potential to be immensely useful to inform the global stocktake process.

However, a Champions-endorsed report found that, while there has been an increase in the number of non-State actors setting post-2020 emission reductions, assessment of the targets show that the aggregate 2030 ambition of these actions has not yet changed significantly. In assessing the progress of individual non-State actors, the report also suggests that a number of companies and international cooperative initiatives analyzed seem to be on track to deliver on their short and mid-term targets, but there is a need for subnational actors to pick up the pace in order for their targets to be met in time. A forthcoming McKinsey & Partners' assessment of global exposure to climate risks also underlines the critical need to increase the resilience of exposed populations as soon as possible.

In order to mobilize non-Party stakeholders into immediate and ambitious action towards achieving a resilient, net-zero future, the Champions launched three campaigns: Race to Zero, rallying non-State actors across the world to halve global emissions by 2030 while unlocking inclusive, sustainable growth; Race to Resilience, aimed at catalyzing a step change in global ambition and action for climate resilience; and the Glasgow Finance Alliance for Net Zero (GFANZ), a global



coalition of leading financial institutions that is committed to accelerate and mainstream the decarbonization of the world economy and reach net-zero emissions by 2050. The progress of these campaigns and the increase in non-Party stakeholder participation can be seen as an impetus for enhancing national ambition. To help boost systems transformation, the Champions updated and improved the Climate Action Pathways - first launched in 2019 - and developed the 2030 Breakthroughs, which together provide sectoral roadmaps on how to accelerate action. And, finally, in order to further collaboration between Parties and non-Party stakeholders and help develop specific regional solutions, the Champions piloted Implementation Labs during the UNFCCC Regional Climate Weeks.

## **WHAT IS NEEDED TO ACCELERATE SECTORAL SYSTEMS TRANSFORMATION**

A Systems Change Lab report developed in partnership with the Champions analyzed 40 targets and associated indicators crucial to realize the systems transformation that needs to take place to reach the goal of limiting global warming to 1.5°C. The report assessed the pace of action to date across these indicators, compared it with where we need to go by 2030 and 2050, and estimated the rate of acceleration necessary to reach the targets - all of which were developed in consonance with the Climate Action Pathways and the 2030 Breakthroughs. The findings show that the transitions required to avoid the worst climate impacts are not happening fast enough - none of the indicators are on track to reach 2030 targets.

Though different in shape and form, the Pathways with their Breakthroughs and the Systems Change Lab report converge in the main message that we need to pick up pace, if we are to be on track to meeting the Paris Agreement goals. Taken together, these documents provide key messages across the nine areas of the Marrakech Partnership (Energy, Human Settlements, Industry, Land Use, Oceans and Coastal Zones, Transport, Water, plus the cross-cutting areas of resilience and finance) on how to drive systems transformation towards achieving a 1.5°C resilient world in time, by mapping out specific tipping points and opportunities in which to focus on. Coal needs to be phased out at a pace more than five times faster than today, for example, while solar and wind power and electric vehicles offer great potential for exponential change.

The International Energy Agency's World Energy Outlook 2021 presents similar findings, and stresses the need to increase investment in clean energy projects and infrastructure, with particular focus in emerging markets and developing countries. Finance, the report notes, 'is the missing link to accelerate clean energy deployment in developing economies', and clean energy transitions can not only provide a cushion from potential shocks, but also ensure the security of energy systems - including against climate change impacts.

## **LOOKING FORWARD: VISION FOR THE FUTURE**

The High-Level Champions have developed a plan for improving the work under the Marrakech Partnership for enhancing ambition, which outlines a forward-looking perspective while also acknowledging the importance of continuity. As one of the formal links between the UNFCCC process and immediate, near-term climate action from non-Party stakeholders and complementing existing processes, the High-Level Champions have a unique role to play encouraging the acceleration of immediate action and enhancing ambition among non-Party stakeholders and, in doing so, supporting national governments in the implementation of their climate action plans.

In line with the improvement of the Marrakech Partnership, the three campaigns: Race to Zero; Race to Resilience; and GFANZ will shift their gear to further mobilize and align non-Party stakeholders to maximize ambition. Supporting the global stocktake, as appropriate, will form one of the High-Level Champions' main priorities over the next two years. The High-Level Champions view their role in contributing to the global stocktake as supporting non-Party stakeholders' effective participation as and when appropriate. Central to this process is the promotion of clear methodologies for non-Party stakeholders and metrics for measuring and reporting their progress towards the Paris Agreement objectives. The Champions will seek to support non-Party stakeholders in all three components of the global stocktake to provide credible information and evidence of their enhanced action and facilitate understanding on current trends and forward-looking outlooks across various sectors.

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# PART 1

## Where we are

### INTRODUCTION

The 26<sup>th</sup> session of the Conference of the Parties (COP 26) to the United Nations Framework Convention on Climate Change (UNFCCC) takes place in October/November 2021 in Glasgow, United Kingdom (UK), after being postponed in 2020 due to the COVID-19 crisis. COP 26 is of particular importance, as 2021 marks the beginning of the first global stocktake process under the Paris Agreement. This process aims at assessing the collective progress towards achieving the Agreement's objective and its long-term goals, and its outcome will provide useful information for both national governments on updating their climate plans and targets, and international cooperation efforts towards enhancing climate action.

The timing of COP 26 coincides with the findings of the latest Intergovernmental Panel on Climate Change (IPCC) report, launched in August 2021. IPCC Working Group I contribution to the Sixth Assessment Report, Climate Change 2021: The Physical Science Basis (AR6), provides the most up-to-date physical understanding of the climate system and climate change, based on the latest advances in climate science. This edition of the report updates the findings of its predecessor (from 2013) on a number of aspects - first and foremost by stating that it is 'unequivocal that human influence has

warmed the atmosphere, ocean and land'. Notably, AR6 notes that 'each of the last four decades has been successively warmer than any decade that preceded it' and estimates that the period between 2011 and 2020 was 1.09°C warmer than 1850-1900, in comparison with last report's estimate of a 0.78°C increase from the same period to 2003-2012. Although there were updates to the datasets, this increase is principally due to further warming in the past eight years.

For the first time, the IPCC report dedicates a whole chapter to weather and climate extremes and concludes that it is an established fact that anthropogenic emissions are the cause of 'increased frequency and/or intensity of some weather and climate extremes since pre-industrial times'. It also shows that climate change is 'already affecting every inhabited region across the globe', from observed changes in hot extremes and heavy precipitation to agricultural and ecological droughts, and warns that compound events (the combination of two or more weather or climate events occurring at the same time, in close succession or concurrently in different regions) can lead to extreme impacts 'that are much larger than the sum of the impacts due to the occurrence of individual extremes alone'. It is unsurprising, therefore, that 2021 followed the pattern observed in the past few years with a number of extreme weather events taking place all over the world, from heat waves to floodings and wildfires. Although more vulnerable communities are always more susceptible to the brunt of these impacts, what these events show is that no region or group of people is safe from being affected by climate change. Many of the changes that led to these impacts, according to IPCC, are irreversible, and abrupt responses and tipping points cannot be ruled out, especially if emissions continue unreined. AR6 considers five future emissions scenarios, but notes that global temperature will continue to increase in all of them, until at least 2050, and only under the very low emissions scenar-

io will global warming remain between 1 and 1.8°C by the end of the century. IPCC also notes that, while unprecedented extreme events will still occur even at 1.5°C temperature rise, every increment of global warming will clearly cause ‘discernible increases in the intensity and frequency of hot extremes’, including heatwaves, heavy precipitation and droughts. In addition, it states that ‘any changes due to past and future greenhouse gas emissions are irreversible for centuries to millennia, especially changes in the ocean, ice sheets and global sea level’.

Finally, the report stresses that, in order to limit ‘human-induced global warming to a specific level’, not only will it be necessary to reach net-zero carbon dioxide (CO<sub>2</sub>) emissions and strongly reduce other greenhouse gas (GHG) emissions by mid-century, but also to limit cumulative emissions within a carbon budget. These findings reinforce IPCC’s previous message that it is necessary for global CO<sub>2</sub> emissions to fall by about 45 per cent from 2010 levels by 2030, and net zero to be reached around 2050 for global temperature increase to be limited to 1.5°C.

This year also saw an influx of new and updated Nationally Determined Contributions (NDCs) – the documents which embody efforts by each country to reduce national emissions and adapt to the impacts of climate change. In order to enhance ambition over time, the Paris Agreement provided that successive NDCs should represent a progression compared to the previous one to reflect their highest possible ambition and, as such, Parties are requested to submit new or updated NDCs every five years.

The NDC Synthesis report published by the UNFCCC secretariat in September 2021<sup>1</sup> indicates that, while there is a clear trend of emissions being reduced over time, climate efforts should be urgently redoubled for the

Paris Agreement’s goal of limiting warming to well below 2°C – ideally 1.5°C – by the end of the century to be reached. The synthesis report finds that the new set of revised NDCs (113 new or updated), covering about 59 per cent of Parties and accounting for about 49 per cent of global GHG emissions, show a projected decrease of 12 per cent in emissions in 2030 compared to 2010. Moreover, the carbon neutrality goals indicated by 70 of these countries could lead to emissions reductions of about 26 per cent by 2030 compared to 2010. NDCs are also elaborating more on adaptation information – according to the report, the new or updated NDCs ‘include more information on time-bound quantitative adaptation targets and the associated indicator frameworks, more specific links between adaptation efforts and efforts towards the Sustainable Development Goals (SDGs), and more specific information on synergies and co-benefits between adaptation and mitigation’ in comparison with previous ones.

However, the report finds that, taken together, the available NDCs of all Parties to the Paris Agreement actually imply an increase of about 16 per cent in global emissions in 2030 compared to 2010, which would correspond to a temperature rise of about 2.7°C by the end of the century, according to the latest IPCC emission scenarios mentioned above. Immediate and tangible action is needed in order to pivot, and cooperation is key for governments and other stakeholders to achieve both the Paris Agreement and the SDGs, especially in the wake of the combined challenges of the climate and COVID-19 crises.

The Marrakech Partnership for Global Climate Action was established as a response to the need to mobilize stronger and more ambitious climate action by strengthening collaboration between governments and

1 An update to the report including the NDCs submitted between 31 July – 12 October was published in late October, representing all 192 Parties to the Paris Agreement, including the 116 new or updated NDCs communicated by 143 Parties as on 12 October 2021. See: <https://unfccc.int/documents/307628>.



key stakeholders such as cities, regions, businesses and investors in order to lower emissions and increase resilience against climate impacts. Throughout 2020 and 2021, the High-Level Champions, Mr. Gonzalo Muñoz (Chile) and Mr. Nigel Topping (UK), focused on providing a thorough roadmap for how non-Party stakeholders can bolster the complete environmental, economic and social system transformation necessary to achieve a net-zero resilient future.

This Yearbook of Global Climate Action - the fifth of its series - reviews the work carried out under the Marrakech Partnership and the High-Level Champions since the last publication, by: (1) summarizing the state and scope of global climate action in 2021 and the challenges and opportunities around how to track and reflect these efforts, as well as the progress of the global action tools launched in the past year; (2) outlining the key messages around what is needed to accelerate sectoral systems transformation; and (3) presenting the Champions' vision on the future of the climate action framework and agenda, and how the work feeds into the global stocktake.

## STATE OF GLOBAL CLIMATE ACTION 2021

The 2020 edition of the Yearbook showcased the range of individual and cooperative actions registered on the [Global Climate Action Portal](#) (GCAP, formerly NAZCA) from both governmental and non-governmental actors. It noted the multi-actor and multi-sectoral characteristics of many of these efforts, which often address multiple goals under the 2030 Agenda for Sustainable Development, and highlighted the impressive increase in the number of climate actions in comparison to when the Portal was launched in 2014 (as the NAZCA portal).

In order to better reflect this complex web of interlinkages in a clearer fashion, the Portal redesigned its focus so as to highlight the actors, as well as to showcase the type of engagement. Users now can browse climate actions through four different types of engagement: commitments, plans, actions undertaken and initiative participation, as well as by the thematic areas of the Marrakech Partnership and climate focus (adaptation, mitigation and finance). Separating commitments from other types of engagement allows the Portal to include the necessary metrics to track their progress and provide contextual information that better informs their level of ambition, including their coverage, scope and timeframe (short, mid- or long-term). The Portal will continue to refine its design and search tools in order to present the best available information and to provide a clearer picture of the climate efforts currently underway.

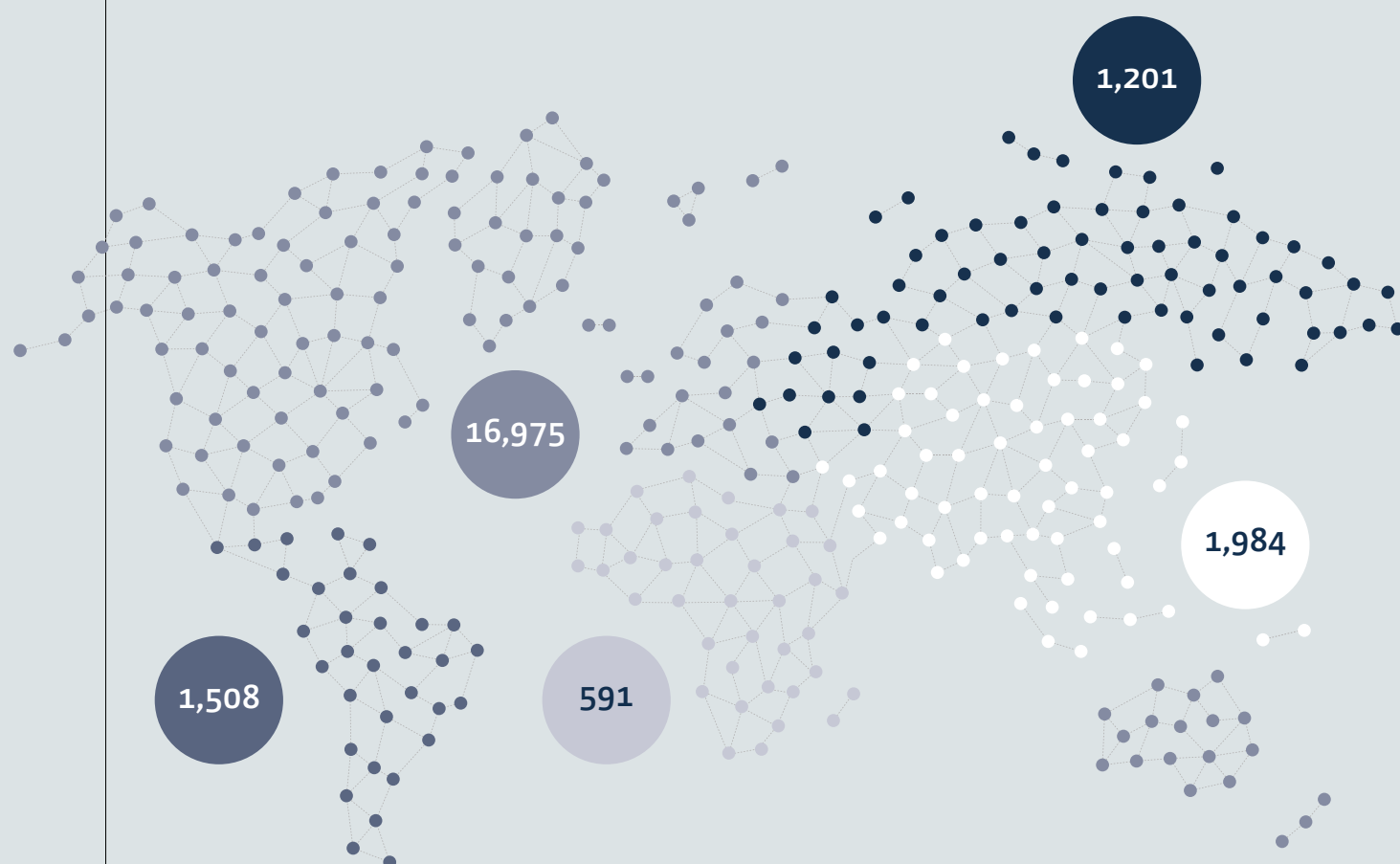
As of October 2021, the Portal registered 22,259 actors all around the world, an increase of nearly 22 per cent from what was reported in the 2020 Yearbook. The nearly 82 per cent increase in the number of participating business actors is particularly impressive, totaling 7,370 companies reportedly engaged in climate action. This significant growth in the number of non-Party stakeholders - as can be seen in the map below - is expected to increase even further by COP 26, reflecting the success of the campaigns under the Champions' tutelage (further information in the next section) and also the efforts made by the Portal and its data partners<sup>2</sup> in mapping out and showcasing the broad range of climate action taking place in the world.

An example of such efforts is the [Climate Progress News Barrel](#), hosted and maintained by the Camda community, for credible climate action (a community of experts focused on climate action methodologies, data, and analysis).

<sup>2</sup> Global Climate Action Portal data partners: CDP, Carbons Climate Registry, The Climate Group, Global Investor Coalition on Climate Change, UN Global Compact, Global Covenant of Mayors, Climate Bonds Initiative and the UN Environment's Climate Initiatives Platform.

**FIGURE 1**

Actors per United Nations Region in the Global Climate Action Portal (As of October 2021)



| ASIA-PACIFIC GROUP | EASTERN EUROPE GROUP | AFRICAN GROUP     | WESTERN EUROPEAN AND OTHERS GROUP | LATIN AMERICA AND CARIBBEAN GROUP | TOTAL               |
|--------------------|----------------------|-------------------|-----------------------------------|-----------------------------------|---------------------|
| Cities 372         | Cities 1,054         | Cities 226        | Cities 8,700                      | Cities 553                        | Cities 10,905       |
| Regions 23         | Regions 2            | Regions 18        | Regions 125                       | Regions 77                        | Regions 245         |
| Companies 1,169    | Companies 63         | Companies 152     | Companies 5,314                   | Companies 672                     | Companies 7,370     |
| Organizations 179  | Organizations 17     | Organizations 107 | Organizations 1,848               | Organizations 132                 | Organizations 2,283 |
| Investors 185      | Investors 42         | Investors 34      | Investors 959                     | Investors 41                      | Investors 1,261     |
| Countries 56       | Countries 23         | Countries 54      | Countries 29                      | Countries 33                      | Countries 195       |
| <b>Total 1,984</b> | <b>Total 1,201</b>   | <b>Total 591</b>  | <b>Total 16,975</b>               | <b>Total 1,508</b>                | <b>Total 22,259</b> |

This open-access database pulls together news stories on climate action and impacts in fields such as energy, cities, transport, finance and resilience, providing a useful resource to track real-world examples of progress on climate action.

Although the total number of international cooperative initiatives<sup>3</sup> (ICIs) has not changed significantly (there are now 151 ICIs, up from 149 reported last year), the Portal's [dedicated page](#) to the ICIs launched at the [2019 UN Climate Action Summit](#) is now tracking the reported progress of these voluntary climate actions. From the 42 ICIs announced at the Summit, currently covering 7,200 participants (including 187 national governments and over 7,000 non-Party stakeholders), 35 have reported progress (30 of which on targets), and 26 indicated an increase in ambition in 2021. The progress information available at the Portal provides details about the level of ambition (goals), robustness of the initiative (e.g. participation criteria and monitoring arrangements), and delivery (outputs, challenges and opportunities).

The Portal, along with its data partners, is addressing a request by Parties and other stakeholders to improve upon climate action data so that progress can be adequately and successfully tracked. While it remains crucial to recognize climate action across all sectors – that is, registering the number and nature of climate actions –, the information around them should gradually progress from tracking the pledges to measuring the actual implementation and outcomes. There are, however, a number of challenges associated with harmonizing and refining the granularity of the information, from issues around comparability of data to standardization of taxonomies and methodologies, and the climate data community has been working on how to best solve them.

The approach taken by the Portal to track progress is based on work carried out in cooperation with members of the Camda community, and uses indicators to provide information both on the progress towards individual commitments as well as an overview of the progress of an actor or initiative. The tracking of initiatives from the 2019 United Nations Climate Action Summit mentioned above, launched in September 2021, formed the first phase of the implementation of this work, which will be gradually extended to the Portal's other initiatives and individual actors. Engagement into this process will be inclusive, transparent and holistic. Over the next three years, the objective is to develop quantifiable metrics that will guide the global stocktake process and help raise national climate ambition.

While there are some particular challenges in developing specific metrics to track the progress around adaptation and finance measures, accurately assessing success in mitigation action also requires attention. Although there are clearer and more commonly accepted indicators to measure progress against mitigation targets, some issues remain around how to address potential complexities that may interfere with the final outcomes (e.g. issues around net-zero pledges, such as limitations in the role of offsetting and carbon removals).

Keeping track of climate action progress is crucial as pledges gain traction. One of the GCAP's data partners, CDP<sup>4</sup>, experienced a 35 per cent growth in environmental disclosures from 2020 to 2021 – the highest number of new disclosers since its inception over two decades ago. In 2021, over 13,000 businesses worth over 64 per cent of global market capitalization disclosed their environmental data through CDP, representing a 125 per cent increase since 2016. City disclosers grew to over

<sup>3</sup> ICIs are arrangements between non-State, subnational actors and/or national governments that collaborate across borders to achieve climate goals, and may focus on mitigation, adaptation/ resilience or a mix of both. All of these actors are reflected in the Portal as participants of the cooperative initiatives.

<sup>4</sup> CDP is one of the longest running global disclosure platforms for investors, companies, cities, states and regions to manage their environmental impacts.



1,000 cities, an increase of more than 70 per cent since 2016. In total, over 14,000 companies, cities, states and regions reported data through CDP on climate change, water security and deforestation.

In 2021, more than 6,300 companies (representing 50 per cent of those that disclosed on climate change) declared that they have an emissions reduction, renewable energy, net-zero, or other climate-related target, with 5,600 companies providing information specifically about emissions reduction targets. Of those, over 1,900 companies indicated they plan to set a science based target in the next two years, over 900 reported their target already approved by the Science Based Targets initiative (SBTi), and over 780 disclosed information about net-zero targets. Nearly six years after the Paris Agreement, and the launch of the

SBTi, over 1,800 companies spanning nearly 70 countries and over 50 sectors, and with a combined market capitalization of over USD 21.3 trillion – including one-third of the Global Fortune 500 – are working with the SBTi to reduce their emissions at the pace and scale necessary.

These actors are also providing information beyond mitigation targets and actions. Over 3,800 companies disclosed physical (acute and/or chronic) risks through CDP's climate change questionnaire this year, and 77 per cent of them identified physical risks as being relevant enough to be included in the organization's climate-related risk assessment.

The third edition of a Champions-endorsed Data-Driven EnviroLab and NewClimate Institute [report](#), launched

in June 2021, sought to provide an up-to-date assessment of the landscape and potential impact of mitigation actions by cities, regions and businesses globally and, for the first time, assess progress toward these pledges. The report focused on ten major economies (Brazil, Canada, China, the European Union plus the United Kingdom, India, Indonesia, Japan, Mexico, South Africa and the United States), which together accounted for 60 per cent of global emissions and 58 per cent of the world population in 2019. The report noted an increase in the number of non-State actors setting post-2020 emission reduction targets – a total of 1,929 cities and 125 regions have made quantifiable commitments in the 10 economies covered in the report, up from 1,500 cities and 70 regions registered in their 2019 report. These subnational actors collectively represent 11 per cent of the global population and are responsible for 12 per cent of global GHG emissions. As for corporate pledges, the report states over 800 firms with a combined revenue of around USD 13 trillion operating within these major economies also have made quantifiable post-2020 absolute emissions reduction targets.

While the number of actors has increased, assessment of the targets show that the aggregate 2030 ambition of these actions has not yet changed significantly since the 2019 report. Partly, this is due to a combination of changes in baseline emissions projections and the number of actors with targets, but the report also observes that ‘some recently-set 2030 targets may not have been considerably more ambitious than emissions projections under current national policies’.

In addition to analyzing individual actor pledges, the report also revised the collective 2030 ambition of 20 major ICIs, and the updated results show that, if fully implemented, the ICIs emission reduction goals could lead to ‘total emission levels close to the range for a

2°C emissions pathway’. The analysis also shows that ‘international efforts toward global net-zero emissions are strengthening and broadening in all sectors, including “hard-to-abate” sectors such as heavy industries, international aviation and shipping, freight transport and buildings and construction’.

Given limited GHG inventory data, the report notes there are difficulties in assessing progress of individual non-State actors towards fulfilling the pledges’ ambition, but evidence from some emission inventories from 2020 ‘indicates that half of individual subnational governments and 80 per cent of individual companies are on track to deliver on their 2020 emission reduction targets’. According to the report, as for the mid-term targets (post-2020 to 2035), 48 per cent of cities and 51 per cent of regions are on track to achieve or exceed it, while 18 per cent of cities and 11 per cent of regions ‘showed negative target achievement rate, meaning that their emissions in the latest inventory year were higher than their target base year emissions’, showing a need for these subnational actors to strengthen their efforts.

Two-thirds of the companies assessed in the report, on the other hand, seem to be on track to meet or exceed their 2030 reduction targets, although it is unclear to what degree this is solely due to the companies individual efforts, if governmental policy measures played a part in it, or whether targets were actually ambitious in comparison with business-as-usual trajectories.

As for ICIs, the complex nature of the initiatives (e.g. multiple actors and different types of targets, many of which are relatively new) make it challenging to assess the progress of the emission reductions, but it looks like several are on track to meet 80 per cent of targets. The report’s assessment also shows that 60 per cent of mitigation initiatives are producing partial or high outputs (consistency between the initiatives plan and



annual performance, indicating likelihood of meeting the desired social and environmental impacts). Though mitigation ICLs 'have demonstrated stable annual performance through the COVID-19 pandemic', adaptation-focused ICLs 'have experienced performance decreases' due to mobility restrictions and other financial and technical constraints.

The report also provides a series of recommendations with regard to improving the quality of data and monitoring and ensuring the credibility of global climate action. First, it notes that there is a need for greater transparency and reporting to close the 'accountability gap' in non-State and subnational climate-related efforts in order to enable regular assessments of progress and implementation of both near-term and long-term goals. Second, progress assessments would greatly benefit from the provision of publicly available and consistent time series of historical GHG emissions in order to examine trends and ensure comparability. Third and lastly, for a better understanding of achievements and gaps in the progress of climate action towards their goals, a more holistic and comprehensive set of data should be made available, covering multiple aspects of these efforts (from reporting of inputs such as policies and strategies to outputs such as activities and products).

Finally, the report also recommends alignment between non-State actors' mid-term targets and governments' long-term net-zero goals so as to strengthen ambition, and notes that these actors can also make use of COVID-19 recovery measures as an opportunity to 'lay a solid foundation for transition towards net-zero emissions' and 'play a crucial role in materialising sustainable and resilient recovery'.

In addition to supporting the work around tracking individual commitments, the Champions are also partnering with the Systems Change Lab to track progress towards broader systems transformation. The State of Climate

Action is a Systems Change Lab flagship report, which will be updated annually and accompanied by a data dashboard that illustrates progress and gaps in action related to 2030 and 2050 benchmarks. Indicators related to high-level outcomes, as well as the enabling environment, will be shown for each transformation. Part 2 of this Yearbook provides a summary of this year's report key messages.

In order to provide a more accurate overview of climate impacts and better address the need to build global resilience, McKinsey & Company carried out an analysis in 2021 assessing the exposure of lives and livelihoods globally to both chronic and acute climate risks. Results will be formally published in 2022 and built on McKinsey & Company's Extreme Climate & Resilience Assessment Tool. Key findings show that even if warming is limited to 1.5°C by 2050, at least 2.2 billion people globally are likely to be exposed to severe climate hazards. If warming reaches 2°C by 2050, challenges will pile up: 1.3 billion people could be exposed to severe heat stress and unable to work outside at least 25 per cent of the time; 800 million additional people could be living with severe urban water stress; one in 7 people to be employed in the agricultural sector could experience an average of 7-8 drought years per decade; and 400 million people could be exposed to severe flooding leading to damage of property, crops, transportation and supply chain disruption, contamination of water supplies and loss of life, either directly or indirectly. The analysis finds that two thirds of the people likely to be exposed are concentrated in just 10 countries and many are highly vulnerable to the effects of these climate hazards. Increasing the resilience of exposed populations as soon as possible is, therefore, critical.

## GLOBAL CLIMATE ACTION TOOLS

As mentioned above, the High-Level Champions' work in 2020-2021 sought to mobilize non-Party stakeholders into immediate and ambitious action towards achieving a resilient, zero carbon future, and at the center of this plan are three campaigns: Race to Zero, Race to Resilience, and the Glasgow Financial Alliance for Net Zero (GFANZ). Also, the Champions seek to drive systems transformation in every sector of the global economy using the Climate Action Pathways - which will be discussed in the next part - and the 2030 Breakthroughs, and work to develop specific regional solutions through Implementation Labs during the Regional Climate Weeks.

### Global Campaigns

#### RACE TO ZERO

The Race to Zero campaign, launched in 2020 under the umbrella of the Climate Ambition Alliance, an initiative set at the 2019 UN Climate Action Summit, rallies non-State actors across the world to halve global emissions by 2030 while unlocking inclusive, sustainable growth. About 7,800 member from across about 110 countries are now part of the Race, including 67 regions, 1,049 cities, 5,235 businesses, 441 financial institutions, 1,039 educational institutions and 52 healthcare institutions (as of November 2021).

In order to ensure that actors are credibly committed to playing their part in the transition to a zero-carbon economy, all participants making commitments under the campaign are required to comply with a minimum set of criteria. These include: (1) **Pledge**: committing to a high-level pledge to reach net-zero emissions as soon as possible, and setting an interim target reflecting their fair share of halving global CO<sub>2</sub> reduction by 2030; (2) **Plan**: presenting a plan within 12 months of joining, explaining what actions will be taken for achieving

both interim and longer-term pledges; (3) **Proceed**: proceeding towards immediate, meaningful action consistent with the short and long term targets specified; and (4) **Publish**: reporting on progress against set targets on a public platform on an annual basis.

In April 2021, the High-Level Champions published the Get Net Zero Right Toolkit to address concerns on how to design credible net-zero commitments.

The impressive growth in participation between the 2020 and the 2021 New York City Climate Weeks, representing a total increase in members of 190 per cent, showed a global willingness to respond to the challenge, despite the pandemic. Race to Zero featured prominently in major 2021 events addressing climate change, such as the US Leaders Summit on Climate (April), the UN Global Compact Leaders' Summit and the London Climate Action Week (June), and was mentioned in both the G7 and the G20 Communiqués this year.

#### RACE TO RESILIENCE

The Race to Resilience, launched at the Climate Adaptation Summit in January 2021, aims at catalyzing a step change in global ambition and action for climate resilience, by mobilizing action from non-Party stakeholders towards building the resilience of four billion people and ensuring that the voices of front-line communities and practitioners are heard. In order to join the campaign, non-State actors are invited to fill in an expression of interest as a partner initiative, committing to (1) taking forward actions that directly contribute to the achievement of the campaign's goal of making four billion people more resilient by 2030; and/or (2) advancing a resilience transformation that will help achieve the campaign's goal.

As eligibility criteria, partner initiatives should be committed to delivering inclusive and equitable actions to people from vulnerable and marginalized groups and

communities to climate risks, not take actions which harm nature and ecosystem, and also be willing to raise ambitions on targets, to share knowledge and collaborate with other initiatives and partners to drive ambition, and to make new commitments and report on its targets at COP 26 and beyond.

The Race to Resilience announced its first round of Partners in March 2021. These Partners' initiatives combined have a global reach of over a billion people, focusing on a wide-range of issues, from water resilience to Nature-based Solutions, disaster risk reduction, agricultural resilience, and finance and insurance. Four new initiatives joined the campaign at the opening session of Climate Week NYC in September 2021, bringing the total number of Partners to 24, representing over 2,500 non-State actor organizations from across society in over 100 countries - collectively they will reduce the vulnerability of 2.3 billion people by 2030. Also in September, the Race to Resilience launched its Resilience Transformations, aimed at local governments, businesses, investors and civil society to advance the campaign's 2030 goal, including increasing the quantity and quality of finance and investment, capacity building, governance systems, infrastructure and technological innovations. The campaign announced the first group of Partners delivering on Transformations at COP 26.

#### **GLASGOW FINANCIAL ALLIANCE FOR NET ZERO**

GFANZ was launched on the eve of President Joe Biden's climate summit in April 2021 by Mark Carney, UN Special Envoy for Climate Action and Finance and the UK Prime Minister's Finance Advisor for COP 26, in collaboration with the Race to Zero campaign and the COP 26 Presidency. It is a global coalition of leading financial institutions that is committed to accelerating and mainstreaming the decarbonization of the world economy and reaching net-zero emissions by 2050. It provides a practitioner-led forum for financial firms to collaborate

on substantive, cross-cutting issues that will accelerate the alignment of financing activities with net zero and to support efforts by all companies, organizations, and countries to achieve the goals of the Paris Agreement. The coalition brings together existing and new net-zero finance initiatives into one sector-wide strategic forum. Over 450 leading financial enterprises are now part of the Alliance, representing all key levers of the financial sector, including banks, asset managers, asset owners, insurers, and financial service providers, such as stock exchanges, data providers, investment consultants, and auditors. Together, they represent over USD 130 trillion in assets in over 45 countries (as of November 2021).

To ensure credibility and consistency, access to GFANZ is grounded in the Race to Zero campaign, and entry requirements are tailored to the activities of the diverse firms represented. The Race to Zero campaign has an independent academic-led Expert Peer Review Group tasked with reviewing applications to join the Race to Zero and ensuring they meet the ambitious criteria for participation. This means all GFANZ members must align with the Race to Zero criteria, as described above.

GFANZ is led by a Principals Group of CEOs from member firms representing diverse geographies and business models. This group sets GFANZ's strategic direction and priorities and also monitors progress against them. These priorities are implemented through a Steering Group comprising senior staff from each firm represented on the Principals Group and from the NGOs that convene GFANZ sub-sector alliances. GFANZ has also established an Advisory Panel to maximize the robustness of its work. Panel members are from NGOs representing a variety of technical climate expertise with a focus on financial-sector applications. The panel's role is to provide strategic and technical advice to GFANZ and facilitate ecosystem-wide collaboration between GFANZ and other climate finance experts. In addition to

these formal mechanisms for involving climate experts in the GFANZ structures, it collaborates closely with other mission-aligned organizations – including the Financial Stability Board’s Task Force on Climate-Related Financial Disclosures (TCFD), the Sustainable Markets Initiative, the World Economic Forum (WEF), and One Planet – to accelerate progress toward achieving common goals.

Since the launch of GFANZ in April 2021, the GFANZ Principals Group has set out an ambitious programme of work across seven workstreams. The workstreams are organized so as to drive the **commitment, engagement, investment**, and, ultimately, the **alignment** required to transition the financial system and global economy to net zero. Each GFANZ workstream is sponsored by one or more Principals Group CEOs and led by a taskforce of leading industry practitioners. Taskforce members represent 40 institutions from 15 countries. Advised by expert NGOs from the Advisory Panel and the Steering Group, the workstreams aim to elevate and build on the rich body of work that has already been accomplished by the scientific community, NGOs, industry groups, and other alliances. The CEOs Principal Group has already met three times (in June, September and October) to discuss the progress being made on the Alliance priorities, workstreams and deliverables for COP 26 and beyond.

The workstreams are centered around: (1) **Building commitment**, focusing on broadening the nature and number of financial firms that are credibly working towards net zero; (2) **Mobilizing private capital**, aimed at supporting the mobilization of private capital in emerging market and developing countries; (3) **Sectoral pathways**, aimed at catalyzing alignment between financiers and major global industries on sector-specific pathways to reach net zero emissions; (4) **Real-economy transition plans**, aimed at accelerating decarbonization in the real economy by describing financial

sector expectations of transition plans from the companies they invest in and finance; (5) **Financial-institution transition plans**, focusing on driving convergence around sector-wide best practices for financial institutions in designing and implementing credible net-zero transition plans; (6) **Portfolio alignment measurement**, which seeks to support the development and effective implementation of portfolio alignment metrics for financial institutions and drive convergence in the way portfolio alignment is measured and disclosed; and (7) **Policy Call to Action**, focusing on advocating for the public policy needed to accelerate investment in net-zero aligned activities and organizations.

## 2030 Breakthroughs

The 2030 Breakthroughs were launched in January, in partnership with the UK Presidency at the WEF’s Davos Agenda 2021, with a challenge for non-Party stakeholder leaders to step up action in delivering the necessary breakthroughs to accelerate progress in addressing climate change and activate a positive ambition loop between state and non-State actors. The 2030 Breakthroughs build upon the Climate Action Pathways and pinpoint specific tipping points or outcomes for 2030 in order to help catalyze action, by articulating what key actors across over 30 sectors must do, and by when, to deliver the systems change necessary to achieve the exponential growth that will result in a resilient, zero carbon world in time.

In the first instance the challenge was for at least 20 per cent of key players across sectors to commit to playing their part to transform the sector consistent with the Climate Action Pathways by the global stocktake in 2023. The biggest companies within each sector were targeted to join Race to Zero, thus demonstrating sectoral support for the necessary transformation. The idea is that, by generating enough momentum among

a critical mass of actors within a sector, the pace of systemic change picks up to a point of no return. Since the Breakthroughs' launch, actors across 18 designated sectors have risen to the challenge, and reached or surpassed the 20 per cent mark. By September 2021, 21 per cent of major power utilities, 39 per cent of major heavy goods vehicles manufacturers, 28 per cent of major food suppliers, 49 per cent of major fashion companies, 28 per cent of major cement/concrete producers and major water and wastewater utilities responsible for 23 per cent of global water supply, for example, had joined the Race to Zero and committed to the campaign goals towards systemic transformation (UNFCCC 2021b).

The next iteration of the High-Level Champions' 2030 Breakthrough initiative is the Glasgow Breakthroughs Agenda, launched at COP 26 – a collaborative project with the UK Presidency designed to drive the rapid delivery of a 1.5°C future across selected major emitting sectors. At its core lies a conviction that working together at a sector-by-sector level is fundamental to delivering the global transition to a clean, inclusive, and equitable economy. Such cooperation accelerates the technological, political, and structural breakthroughs that are needed to meet the Paris Agreement goals.

The Glasgow Breakthroughs will provide a vehicle for Parties to support and accelerate the sector transformation efforts currently being advanced by non-State actors (building on the 2030 Breakthrough initiative). A central focus of this unique public-private partnership is to encourage cross-sector dialogue and strategic alignment. It will also serve to mobilize finance at scale for ambitious and high-impact solutions for realizing the Paris Agreement.

The benefits of this Agenda go beyond tackling climate change alone. The ambition is to catalyze the growth of markets, jobs, and economic development globally for

clean technologies and sustainable solutions. In doing so, it will spur progress towards the achievement of the SDGs and strengthen the climate resilience of our societies. Co-benefits such as cleaner air, water, and better health will also mark an important outcome.

All Parties are invited to join the Glasgow Breakthroughs and the wider Agenda that it represents. The High-Level Champions intend to discuss this Agenda in the future at relevant leader level events and consider how it could further support global efforts to meet the goals of the Paris Agreement.

## Regional Climate Weeks

Throughout 2021, the Champions also piloted Implementation Labs as part of the [Regional Climate Weeks](#), providing a space for national government representatives and non-Party stakeholders in the regions to have an open and solution-oriented dialogue on priorities and needs of countries with options for policies, technologies and solutions based on the Climate Action Pathways.

The first Implementation Lab took place during the Latin America and the Caribbean Regional Climate Week, on 13 May 2021, and focused on two topics: energy transition in the Caribbean Small Island Developing States and financing Nature-based Solutions in Latin America. Bringing together 20 speakers representing national governments and non-Party stakeholders from the region, the event explored opportunities to help accelerate renewable energy deployment, considering the region's huge renewable energy uptake potential and willingness to explore innovative ideas. As agriculture is both the main economic sector and one of the highest-emitting in the region, the importance of the food value-chain was highlighted, as well as of measuring Nature-based Solutions impact with



high-quality assessment tools and data in order to unlock available finance, reduce investments risks, lower transaction costs and facilitate upscaling.

The second Implementation Lab took place on 7 July, during the Asia-Pacific Climate Week. The lab brought together leading figures from national governments, private sector, academia and civil society to discuss accelerating the industry transition through the establishment of net-zero, resilient cement and steel plants and increasing the resilience of smallholder farmers in the Pacific with smart-agriculture innovations. Stakeholders underlined the crucial role of agriculture as the main source of subsistence and the impact caused by climate change to food security in the region, and the existing opportunities to accelerate the transition to net zero, such as utilizing green hydrogen and Carbon Capture, Use and Storage (CCUS) technology, introducing cost subsidies, strengthening public-private partnerships, and setting standards across sectors, as well as the key role of investors in steering production towards decarbonization.

The third Implementation Lab took place on 29 September, during the Africa Climate Week, and focused around transitioning Africa's transport and mobility sectors to net zero and enhancing the resilience of Africa's transport systems to adapt to major disruptive events. The event focused on concrete solutions and transformational opportunities that non-Party stakeholders and national governments can collaborate on to accelerate solutions, and concluded with a general consensus that systems efficiency and the application of digitalization as a sustainable and resilient transport tool are critical in Africa, as well as green climate financing and the need for greater collaboration among different stakeholder groups. Challenges are faced on different scales but accompanied by opportunities. For example, COVID-19 has deeply affected the transport

sector, but also brought a great opportunity to rethink how to reduce GHG emissions in the continent while building back. The African Union has developed different taskforces to bring countries together to promote transport decarbonization. On the other hand, policy incentives to facilitate the adoption of electric vehicles (EV) are still lacking in many African countries, but the potential for EV adoption is significant in the continent. There is also opportunity to leapfrog to sustainable transport with the help of innovation and technology, and innovative and adequate financial investments remain key for Africa to scale up and replicate emission reduction actions.

It is the Champions' hope that these discussions at the Regional Climate Weeks in 2021 help strengthen the collaboration between stakeholders towards driving implementation and bring in regional contexts and perspectives to adapt and refine the Pathways and the Breakthroughs. They look forward to engaging with more regional stakeholders in the future - especially in the first-ever Middle East and North Africa Climate Week, scheduled for 2-3 March 2022, where they can use the Implementation Labs as a platform to take forward the post-COP 26 outcomes and build towards COP 27.









# PART 2

## What is needed to accelerate sectoral systems transformation

The Climate Action Pathways, first launched in 2019, set out sectoral visions for achieving a 1.5°C resilient world in 2050, with overarching transformational milestones, and key impacts that need to be achieved to realize them. The Pathways cover all of the Marrakech Partnership thematic areas<sup>5</sup>, plus the cross-cutting areas of resilience and finance, while focusing on the synergies and interlinkages across them in order to assist all actors to take an integrated approach. As they aim to provide a roadmap to help Parties and non-Party stakeholders alike to identify actions needed by 2021, 2025, 2030 and 2040 as steps to get to the 2050 vision, the Pathways are intended as living documents to be updated periodically with the latest information and lessons learned as the state of climate action evolves. In 2021, the key aim was to further strengthen the aspects of just transition, gender-responsiveness, resilience and

circular economy, deepening the alignment of actions across the Pathways.

The 2030 Breakthroughs, as mentioned in the last chapter, pinpoint specific tipping points across a range of sectors within the thematic areas that are necessary to achieve by 2030 in order to keep on track with the Pathways' vision. So, where the Pathways envision a future in which 'the energy we use is primarily electric and at least 90 per cent of our electricity is being generated from renewable energy sources', for example, the Breakthroughs pinpoint the need for all renewables to make up at least 60 per cent of global electricity generation by 2030 (with solar and wind power making up at least 40 per cent) so that the global electricity system can be fully decarbonized by 2040.

At the moment, we are at a crossroads - while significant change is already underway, evidence shows that it must accelerate in all areas of the economy and society in order to deliver on the ambition. A Systems Change Lab report launched in October 2021 by the High-Level Champions, the Climate Action Tracker consortium<sup>6</sup>, the ClimateWorks Foundation, the Bezos Earth Fund and the World Resources Institute (WRI), examines how the world is currently doing in addressing the climate crisis, and what is needed to turn up the necessary level of ambition.

The report, State of Climate Action 2021: Systems Transformations Required to Limit Global Warming to 1.5°C, analyzes 40 targets and associated indicators crucial to realize the systems transformation that needs to take place to reach the goal of limiting global warming to 1.5°C. These include mitigation transitions across power generation, buildings, industry, transport, land use, coastal zone management, and agricul-

<sup>5</sup> Energy, Human Settlements, Industry, Land Use, Oceans and Coastal Zones, Transport and Water.

<sup>6</sup> Climate Action Tracker (CAT) is an independent analytic group comprising Climate Analytics and the NewClimate Institute.

ture, and the immediate scale-up of technological carbon removal and climate finance. The report assesses the pace of action to date across these indicators, compares it with where we need to go by 2030 and 2050, and estimates the rate of acceleration necessary to reach the targets - all of which were developed in consonance with the Climate Action Pathways and the 2030 Breakthroughs.

The report examines the progress of indicators at the global level, noting that national progress varies, and also stresses that these necessary shifts across sectors should unfold within broader social, political and economic systems transformations that are not addressed in the report, such as redefining economic prosperity, shifting to a new decision-making model with community leadership at the center, resetting the social contract between governments, corporations and citizens, and dramatically reducing consumption - all of which have to be considered if we are to succeed in realizing the Paris Agreement goals.

The report identifies, however, key enablers of change across five categories to help translate targets into action: innovations in technology, practices and approaches; regulations and incentives; strong institutions (e.g. establishment of international agreements and national agencies); leadership from change agents (e.g. policymakers, private sector, multi-stakeholder coalitions and civil society movements); and behavior change and shifts in social norms.

The findings show that transitions required to avoid the worst climate impacts are not happening fast enough - of the 40 indicators assessed, none are on track to reach 2030 targets. Coal needs to be phased out at a pace more than five times faster than today, for example. On the upside, the report notes that transformations - particularly those driven by new technology adoption -



often unfold slowly before accelerating after crossing a tipping point. Nearly a quarter of indicators assess new technology adoption, with some already growing exponentially. Solar and wind power, as well as EVs, for example, have grown at a rapid pace in several countries already, and offer great potential for exponential change.

Finally, the report also notes that there are apparent gaps in publicly accessible data (especially in land, agriculture and buildings), which reinforces last chapter's observation that, in order to adequately track and monitor gaps and achievements in the progress of climate action towards their goals, more comprehensive and consistent sets of data need to be made publicly available.

The table below summarizes the report's key findings, showing which targets are on track and which are not.

**FIGURE 2**

State of Climate Action 2021: Progress Towards 2030 Benchmarks

**ON TRACK:** Change is occurring at or above the pace required to achieve the 2030 targets

None

**OFF TRACK:** Change is heading in the right direction at a promising, but insufficient pace

- Share of renewables in electricity generation
- Share of electricity in the industry sector's final energy demand
- Share of electric vehicles in light duty vehicle sales
- Share of battery and fuel cell electric vehicles in bus sales
- Crop yields
- Ruminant meat productivity
- Ruminant meat consumption in the Americas, Europe, and Oceania
- Total public financing for fossil fuels

**WELL OFF TRACK:** Change is heading in the right direction, but well below the required pace

- Share of unabated coal in electricity generation
- Carbon intensity of electricity generation
- Energy intensity of building operations
- Low-carbon steel facilities in operation
- Green hydrogen production
- Share of electric vehicles in the light duty vehicle fleet
- Share of battery and fuel cell electric vehicles in medium- and heavy-duty vehicles sales
- Share of low-emissions fuels in the transport sector
- Share of sustainable aviation fuel in global aviation fuel supply
- Share of zero-emissions fuel in international shipping fuel supply
- Rate of technological carbon removal rate
- Reforestation
- Rate of carbon removal from reforestation
- Coastal wetlands restoration
- Total climate finance
- Public climate finance
- Private climate finance

**STAGNANT:** Change is stagnating, and a step change in action is needed

- Carbon intensity of global cement production
- Carbon intensity of global steel production
- Share of global emissions covered by a carbon price of at least \$135/tCO<sub>2</sub>e

**WRONG DIRECTION:** Change is heading in the wrong direction, and a U-turn is needed

- Share of trips made by private light duty vehicles
- Deforestation rate
- Agricultural production GHG emissions

**INSUFFICIENT DATA:** Data are insufficient to assess the gap in action required for 2030

- Retrofitting rate of buildings
- Carbon intensity of building operations
- Carbon intensity of land-based transport
- Peatlands conversion rate
- Peatlands restoration
- Coastal wetlands conversion rate
- Share of food production lost
- Food waste
- Corporate climate risk disclosure

To learn more, read the State of Climate Action 2021 report



Though different in shape and form, the Pathways with their Breakthroughs and the State of Climate Action report's targets converge in the main message that we need to pick up pace towards systemic transformation, if we are to be on track to meeting the Paris Agreement goals. These documents provide an overview of where we are now - still lagging behind - and where we need to be - accelerating action - as well as insights on how to get there.

A summary of the key messages encompassed in all three documents is presented below within each of the Marrakech Partnership areas, color-coded as follows to clarify where the information is derived from:

## CLIMATE ACTION PATHWAYS

## 2030 BREAKTHROUGHS

## STATE OF CLIMATE ACTION 2021 (SOCA 2021)

# ENERGY

The Energy **Pathway** vision for 2050 is a world where energy systems are decarbonized, resilient and efficient, and where there is universal access to energy services, enabled by affordable, reliable, sustainable and modern energy sources. The energy we use is primarily electric and at least 90 per cent of our electricity is being generated from renewable energy sources, and the remaining 10 per cent from carbon neutral sources. Energy demand and intensity has been dramatically reduced, and the infrastructure now in place is more resilient to market shocks and the impacts of climate change.

The **Breakthroughs** to achieve such vision include for solar and wind power to make up at least 40 per cent, and all renewables to make up at least 60 per cent of global electricity generation by 2030 so that the global electricity system is fully decarbonized by 2040; and for 25 GW green hydrogen capacity to be deployed to realize price below USD 2/kg by 2026, so that 500–800 MMT production capacity is deployed by 2050<sup>7</sup>.

## WHERE WE ARE AND WHERE WE NEED TO BE TO REACH THAT GOAL:

- Electricity and heat production account for roughly a third of global GHG emissions (ClimateWatch 2021). Decarbonization in the sector can be achieved by increasing the share of renewables (particularly wind and solar) in electricity generation, as well as the complete phase-out of coal-fired power and significant reduction of gas-fired supply. In addition, power grids and storage will need to be extended and adapted to sustain the high supply of variable power generation.
- Of the three indicators examined by **SoCA 2021** in this sector, only the share of renewables in electricity generation is heading in the right direction, though at a promising but insufficient pace. While also heading in the right direction, the carbon intensity of electricity generation and the share of unabated coal in electricity generation are well off track (well below the required pace for 2030).
- Renewable sources accounted for 82 per cent of new capacity installed in 2020. The share of global electricity generation from solar and wind, in particular, has grown at a rate of 15 per cent per year over the last five years, and building new solar and wind energy capacity is now more cost-effective than generating electricity from existing coal-fired power plants in most places (IRENA 2021). Despite very promising signs (165 countries with renewable-related targets and 161 countries with policies in place), growth in renewables must still accelerate - the share of renewables in electricity generation is currently about 29 per cent, and it needs to grow to 55–90 per cent by 2030 and 98–100 per cent by 2050. Also, integrating a large share of variable renewables requires a highly flexible grid – this will be critical to meeting 2030 and 2050 renewable electricity generation targets.
- Many countries, particularly advanced economies, have already made progress in reducing the carbon intensity of electricity generation, but the rate of decline is still far from what is needed to achieve the 2030 target - about three times what we currently see.

<sup>7</sup> Please see the **Industry** section for more information on green hydrogen.

- The share of unabated coal in electricity generation is currently at 38 per cent, which puts us well off track. Despite progress in some developed countries and new commitments to reduce coal capacity, worldwide coal build-out has not sufficiently slowed in recent years, and newly installed coal capacity still outpaced retirements in 2020 (Global Energy Monitor 2021). Even as governments, businesses, and banks are committing to accelerating the transition to clean energy, coal plants continue to receive finance – to the tune of USD 332 billion since 2015 (BankTrack 2021).
- Structural change is needed in the fossil fuel sector, including development and deployment of alternative technologies to meet demand, and retirement/avoidance of fossil fuel infrastructure. Policy must support weaning off the sector, by halting investment in new fossil fuel exploration and development, setting carbon pricing, phasing out fossil fuel subsidies, reducing fossil fuel demand (e.g coal power and international combustion engine phase out dates), restricting fossil fuel infrastructure, planning for and supporting economic diversification in producing countries and supporting a just transition for workers and communities, while reducing impact on biodiversity.

# TRANSPORT

The Transport **Pathway** vision for 2050 is that passenger and freight transport is completely decarbonized by shifting to a more sustainable, diverse and resilient range of modes and vehicle technologies. Light-duty vehicles and railway trains are completely electrified, whereas heavy-duty vehicles use a mix of batteries and liquid zero-emission fuels. For shipping and aviation, electrification is employed on short routes, whereas liquid fuels are used on longer routes. Society is thriving due to the improved efficiency and inclusivity of transport systems and the challenges of the first and last mile of transport have been resolved with affordable and accessible door-to-door mobility services for both freight and passenger transport. New and existing transport infrastructures have been made resilient to the impacts of climate change, and maintenance is prioritized to maximize the operational resilience of critical infrastructure.

The **Breakthroughs** in this sector include: battery electric vehicles (BEV) and fuel cell electric vehicles (FCEV) making up 8 per cent of global heavy goods vehicles sales by 2025 so as to reach 100 per cent in leading markets (China, EU, Japan, US) by 2040; zero-emission vehicles making up 15 per cent of total global passenger vehicles and vans sales by 2025 so as to reach 100 per cent in leading markets by 2035; sustainable aviation fuels (SAF) making up 10 per cent of fuels globally by 2030, so as to reach 100 per cent by 2050; and zero emission fuels (ZEF) making up five per cent of international shipping fuels and 15 per cent of domestic shipping fuels by 2030, so as to reach 100 per cent by 2050.

## WHERE WE ARE AND WHERE WE NEED TO BE TO REACH THAT GOAL:

- It is estimated that 85 per cent of CO<sub>2</sub> emission reductions needed to meet the 1.5°C target can already be achieved with existing and emerging transport policies and technologies, and the remaining 15 per cent can be met with changes in behavior, especially for urban passenger transport, so the road to zero carbon will require a smart combination of these strategies. In shipping, feasible fuel pathways exist, but accelerated action and cross-industry collaboration are needed to accelerate research and development (R&D) and realize large-scale system demonstrations by 2025.
- Transport accounts for nearly 17 per cent of global GHG emissions (Climate Watch 2021), and is the fastest growing source of emissions after industry (Ge and Friedrich 2020), with road transport being responsible for the lion's share of emissions. Decarbonizing the sector will require modal shifts toward more efficient, less carbon-intensive modes of travel and improving the carbon-intensity of the remaining travel modes by means of technologies such as EVs and cleaner fuels.
- Of the nine indicators examined by **SoCA 2021** in this sector, seven are headed in the right direction, though still off track (BEV/FCEV share of bus sales; EV share of light duty vehicles (LDV); EV share of LDV fleets; BEV/FCEV share of medium and heavy-duty vehicle (MHDV) sales; share of low emission fuels in the transport sector; SAF share of global aviation fuel supply; and ZEF share of international shipping fuel), while one is headed in the wrong direction entirely (share of trips made by private LDVs), and for one, data is insufficient (carbon intensity of land-based transport).

- The percentage of people who use private vehicles as their primary mode of transportation has historically increased worldwide, and trips by private LDVs need to be reduced by up to 8 per cent from current levels by 2030.
- The carbon intensity of land-based transport needs to fall considerably by 2030 and reach near zero by 2050. Achieving this benchmark will require different approaches fit for purpose in individual countries and their existing transport mix.
- EV sales have been growing rapidly (reaching 4.3 per cent of global LDV sales in 2020) and over 20 countries have committed to completely phasing out the sale of internal combustion engine (ICE) passenger vehicles by or before 2040. Several companies have committed to launching new EV models, investing in battery R&D, and limiting or eliminating ICE production entirely. However promising, the growth in EV sales must accelerate, EV share of LDV reaching 75-90 per cent by 2030 and 100 per cent by 2035. Key actions for increasing sales of EVs include decreasing battery price, developing charging infrastructure, and implementing supply and demand side policies to incentivize EV adoption. Setting ICE phase-out dates, electrifying corporate and government fleets, managing electricity demand to support increasing numbers of EVs, and coordinating the pre-owned ICE vehicle market will be key to shifting the overall vehicle stock.
- Regarding electric buses, in 2020, the share of BEVs and FCEVs in global bus sales was 39 per cent, with the strongest level of demand coming primarily from China (BloombergNEF 2020). The share of BEVs and FCEVs in global bus sales needs to reach 75 per cent by 2025, and 100 per cent in leading markets (EU, Japan and US) by 2030.
- In 2020, the share of BEVs and FCEVs in global sales of MHDV was 0.3 per cent (BloombergNEF 2021), with the bulk of global demand in 2019 also coming from China (60 per cent of total sales, followed by Europe, with 23 per cent). The share of BEVs and FCEVs in global MHDV sales needs to reach 8 per cent by 2025, and 100 per cent by 2040 in leading markets. With BEVs constituting such a small percentage of total current sales, there is an urgent need to bring these technologies to commercial maturity and stimulate their adoption across the world if this transport sub-sector is to achieve 1.5°C compatibility.
- In addition to modal shifts and EVs, low emission fuels will need to start rapidly displacing fossil fuels to reach a 15 per cent share by 2030, climbing to 70-95 per cent by 2050. Low-carbon electricity, which is considered a low emission fuel, will play a critical role in decarbonizing newly purchased passenger vehicles, while there is also potential for advanced biofuels to reduce emissions from the existing stock of fossil fuel vehicles. Over the medium and long term, hydrogen and synthetic fuels made with hydrogen are likely to be required to decarbonize harder-to-abate transport emissions from the shipping, aviation, and long-distance land freight sectors.
- SAF – a well-researched, partially developed low-carbon solution – offers a viable mid-term contribution to a decarbonization pathway for aviation. Today, SAF comprises under 0.1 per cent of global aviation fuel supply. However, experts project that global SAF uptake will need to reach 10 per cent by 2030 and 100 per cent by 2050 to drive decarbonization of the aviation sector (Race to Zero 2021). A diverse portfolio of both supply and demand-side measures will also be necessary to lower costs, accelerate development, and promote widespread uptake of this technology.

# LAND USE

The Land Use **Pathway** vision is for emissions from loss and degradation of remaining primary forests and other natural terrestrial ecosystems to have dropped by at least 70 per cent by 2030 from 2020 levels, in order to become a net sink by 2050. By 2030, at least 350 million hectares of degraded lands are brought under restoration, including by improving the resilience and productivity of farmland; and emissions from agriculture and food systems are reduced thanks to the expansion of regenerative and resilience practices in food and agriculture systems. Sustainable land management is the norm, with adequate action and support for adaptation outcomes, maintaining habitats for biodiversity and ensuring climate resilience, particularly for vulnerable populations, and the provision of goods and services from key ecosystems that support water and food security. In 2050, food systems are economically sustainable and profitable, they have broad-based benefits for society, and have positive or neutral impact on the natural environment. Food loss and waste have reduced to 50 per cent by 2030 and up to 75 per cent by 2050, compared to 2020, through a set of measures targeting both the supply and demand sides while ensuring that future generations are well-nourished and food-secure. Consumption has shifted toward plant-based diets of 50 per cent of the global population by 2050.

The **Breakthrough** in this sector is for 50 GtCO<sub>2</sub>e to be mitigated by land use, food & agriculture practices and for inputs and waste to be reduced by 2030, so that the entire forestry, food & agriculture industry is nature positive by 2030 and carbon negative by 2050.

## WHERE WE ARE AND WHERE WE NEED TO BE TO REACH THAT GOAL:

- The Agriculture, Forestry and other Land Use sector represents 20–24 per cent of total GHG emissions generated by agriculture and deforestation, and forest and terrestrial ecosystems loss, reinforcing the current biodiversity crisis and decreasing their capacity to adapt to climate change. It is critical to transform the sector to maximize its potential contribution to the global mitigation goal as well as being at the center of adaptive responses, combat desertification and land degradation, and enhancing food security, biodiversity and prosperity for farmers and dependent communities. For that, it is essential to address the drivers of emissions in the sector – such as global trade, production and consumption patterns, regulatory and governance mechanisms and the values and behaviors of society (WEF 2020).
- **SoCA 2021** presents separate indicators for Land Use and Coastal Zone Management and Agriculture, but out of the 13 combined indicators examined by the report in this sector, roughly half are heading in the right direction: while three are at a promising but insufficient pace (crop yields and ruminant meat productivity and ruminant meat consumption in the Americas, Europe, Oceania), three are well below the required pace (reforestation, rate of carbon removal from reforestation, and coastal wetlands restoration). Two indicators are headed in the wrong direction entirely (deforestation rate and agricultural production emissions), and for five, data is insufficient (peatlands conversion rate, peatland restoration, coastal wetland conversion rate, share of food production lost, and food waste).
- To be aligned with the Paris Agreement, the rate of deforestation needs to decline 70 per cent by 2030 and 95 per cent by 2050, relative to 2018. Instead, it has been heading in the wrong direction: annual deforestation and associated emissions have risen since 2010. More than



96 per cent of deforestation since 2001 has occurred in the tropics, where the vast majority of forest loss is driven by conversion to agriculture, with much of the production destined for international markets (WRI 2021a). The rate of losses within humid tropical primary forests, specifically, has remained around 3 Mha per year since record keeping began in 2002, and increased by 12 per cent between 2019 and 2020 (WRI 2021b).

- Global reforestation efforts are also falling short. On average, just 6.7 Mha of gross tree cover gain occurred annually from 2000 to 2012, a rate that will need to more than triple in the coming decade. Failure to change course this decade would put limiting global warming to 1.5°C out of reach.
- Similarly, recent evidence suggests that efforts to protect and restore the world's carbon-rich peatlands are also off track. An estimated 15 per cent of peatlands have been drained for agriculture, plantation forestry, and other uses, with the most recent conversion occurring in tropical regions (Griscom et al. 2017), and limiting warming would require reducing annual rates of peatland degradation 70 per cent by 2030 and 95 per cent by 2050. Additionally, peatlands restoration across 22 cumulative Mha is estimated to be needed by 2030 to align with global climate goals (Griscom et al. 2017; Roe et al. 2019).
- The world loses an estimated 0.63 Mha of coastal wetlands annually (Griscom et al. 2017), but achieving Paris-compatible targets will require this historical rate of loss to drop sharply. Restoration of these highly productive, carbon-rich ecosystems is also needed to limit global warming, as they sequester more soil carbon per hectare than terrestrial forests (McLeod et al. 2011). Protecting and restoring mangrove forests, salt marshes, and seagrass meadows would also generate a wide range of co-benefits: improving water quality, protecting shorelines from erosion, safeguarding coastal communities from sea level rise and storm surges, and providing nursery grounds for fisheries.
- As for agriculture, limiting global warming will depend, in large part, on peaking and then reducing its global land footprint, even as food demand continues to grow. Doing so entails sustainably intensifying agricultural production through boosting both crop and livestock productivity per hectare, as well as changing food consumption patterns, including reducing food loss and waste and shifting diets high in ruminant meat toward plant-based foods. The sector will also need to peak and then lower agricultural production emissions - including those from livestock, fertilizers, rice production, and energy use - by 22 per cent by 2030 and 39 per cent by 2050. While the emissions intensity of agricultural production is steadily falling, absolute agricultural production emissions continue to rise, pointing to a need to increase funding for emissions mitigation in agriculture.
- Crop yields per hectare need to increase by 18 per cent by 2030 and 45 per cent by 2050 to avoid further cropland expansion, necessitating a near-doubling of the recent rate of yield growth. Yet, recent global yield growth masks wide variation among regions, and yields in sub-Saharan Africa remain very low, warranting particular attention. Similarly, ruminant meat production per hectare of pasture also needs to rise - by 27 per cent by 2030 and 58 per cent by 2050 - and while productivity is growing, progress between now and 2030 needs to be 1.6 times faster than in recent years. Programs to support productivity improvements - whether of cropland or pastureland - should be linked whenever possible to policies that support forest or other ecosystem protection.
- The world's rate of food loss and waste needs to be halved by 2030. Recent estimates suggest that 14 per cent of global food produced was lost between the farm and the retail stage of the supply chain in 2016, while 17 per cent of the food available at the retail level was wasted (in retail, households, or food service) in 2019.
- Production of ruminant meats, such as beef, goat, and sheep meat, is both land- and GHG-intensive and the rate of decline in consumption across high-consuming countries (Americas, Europe and Oceania) needs to accelerate by 1.5 times to reach 2030 and 2050 targets, while also allowing room for modest growth in countries where meat consumption is currently low.

# WATER

The **Pathway** vision for 2050 is a world where the contribution of the water sector to the global mitigation goal of the Paris Agreement has been attained through the protection and restoration of freshwater resources for ecosystems and people; the sustainable use and distribution of water for agriculture, energy, industry, and human settlements; and the reuse of freshwater and wastewater at a global scale. All activities to extract, store, deliver, use, treat and reuse water have been fully decarbonized in environmentally sustainable ways, and these activities have transitioned from being largely non-renewable to becoming a source of net-positive renewable energy.

The **Breakthrough** in this sector is for water and wastewater services to be fully decarbonized in 20 countries by 2030 so that they are fully decarbonized globally by 2050.

## WHERE WE ARE AND WHERE WE NEED TO BE TO REACH THAT GOAL:

- The use, storage, distribution and treatment of water and wastewater together contribute to about 10 per cent of global GHG emissions. It has been estimated that the water sector worldwide could reduce its energy use by 15 per cent by 2040 (IEA 2016).
- Wetlands accommodate the largest carbon stocks among terrestrial ecosystems and yet their loss rate is three times higher than that of forests, rendering water management and the protection of freshwater ecosystems vital elements of global climate mitigation activities and strategies. A study suggests that around a third of GHG mitigation by 2030 can be attained through nature-based mitigation (Griscom et al. 2017), to which wetlands can contribute a share of 14 per cent. Taking into account that wetlands offer multiple co-benefits – including flood and drought mitigation, water purification and biodiversity – conservation of wetlands is an important mitigating measure.
- Climate change manifests itself primarily through changes in the water cycle (floods, droughts etc). Projections suggest that a failure to limit the global temperature increase to 1.5°C will have catastrophic consequences on the availability and quality of water for basic human needs, including food and energy provision, jeopardizing the human right to water and sanitation for billions of people as well as the preservation of vital ecosystems and indeed, life itself.
- Approximately 1.8 billion people have gained access to basic drinking water services since 2000, but there are vast inequalities in the accessibility, availability and quality of these services. It is estimated that one in 10 people (785 million) still lack basic drinking water services, including 144 million who drink untreated surface water. Some 2.2 billion people around the world do not have safely managed drinking water services, 4.2 billion people do not have safely managed sanitation services, and 3 billion lack basic hand washing facilities (UNICEF & WHO 2019). Approximately 2.1 billion people have gained access to basic sanitation services since 2000, but in many parts of the world the waste produced is not safely managed. Some two billion people still lack basic sanitation, of whom 7 out of 10 live in rural areas and one third in the least developed countries (UNICEF & WHO 2019).

- A number of countries are building climate risk into management and infrastructure plans, working to ensure that investors in new or retrofitted water infrastructure – including natural infrastructure – can adequately evaluate risks and trade-offs and withstand a range of climate impacts. A total of 515 financial institutions with USD 106 trillion in assets are requesting thousands of the world's most water-impactful companies to report the actions they are taking to halt the global water crisis -almost 3,000 responded in 2020, up from 150 a decade ago.
- The International Union for Conservation of Nature projects that when natural infrastructure is combined with engineered or built infrastructure, performance can be optimized and financial benefits accrued. For water infrastructure this amounts to an added value of USD 29 trillion per year in services, such as filtering contaminated water and storm protection (IUCN 2020).
- Although water is receiving a growing share of adaptation finance (32 per cent in 2018), it attracts a small share of climate finance overall (less than three per cent) owing to the overall focus on mitigation. Only 18 per cent of international public climate finance for water in 2018 went to low-income countries; more than half of this was loans (WaterAid and ODI 2020).
- Milestones towards the 2050 vision include:
  - By 2021, to have all NDCs and national adaptation plans (NAPs), updated to include resilient water management approaches and tools for GHG mitigation; stakeholders to make a concerted effort to further unlock climate finance for water-related projects prioritizing the world's most vulnerable communities and populations; and for social accountability and water stewardship pilot programmes to be developed with the participation of civil society organizations and communities.
  - By 2025, to ensure all NDCs and NAPs are accompanied by a specific water plan and budget that addresses the climate-water interactions across all sectors; and to double the share of sustainable renewable energy used in water extraction, supply, treatment, and reuse, all the while ensuring that the level of water extraction and consumption in energy generation does not increase.
  - By 2030, to ensure water and wastewater utilities reach complete decarbonization and improved climate resilience through climate risk management; to protect and restore 30 per cent of the Earth's water-related natural ecosystems; to achieve universal and equitable access to safe, affordable and climate-resilient drinking water and sanitation services and enshrining the human right to water in policy and law, especially servicing the most vulnerable populations who are first to be affected by the impacts of climate change.
  - By 2040, to phase out industrial activities that jeopardize climate and water so that a just transition to a net-zero, climate resilient future can be achieved; to ensure the global water sector is a net-positive provider of renewable energy and nutrients, and that 100 per cent of all municipal, industrial and agricultural wastewater is treated for reuse or discharge into the environment; to double the area of protected water-based ecosystems and the number of free-flowing rivers since 2020; and to ensure 100 water-insecure cities around the world achieve net-zero emissions and are no longer water-stressed.

# OCEANS AND COASTAL ZONES

The **Pathway** vision for 2050 in this sector is for all fish stocks to have been recovered and to be fished sustainably, for coastal and marine ecosystems to have been restored, and a massive loss of coastal and open ocean ecosystems (coral reefs, mangroves, seagrass, deep seas, etc.) reversed. The pace of ocean warming, acidification and deoxygenation have been dramatically slowed, and sustainable ocean-based activities have been leveraged to provide employment, food and energy security for the world's growing population. Crucially, coastal communities have been protected from and have been provided the means to adapt to the worst consequences of climate change. The ocean is now 100 per cent sustainably managed, ocean renewable energy is a major source of clean energy and the aquatic food industry adopted sustainable and climate-smart practices while increasing its production to feed a population of 10 billion.

The **Breakthrough** in this sector is for 20 per cent of the largest companies in each ocean economy sector to be publicly reporting on actions taken to reverse Blue Carbon Ecosystems loss by 2030, so as to reach 100 per cent conservation and restoration of these ecosystems by 2050.

## WHERE WE ARE AND WHERE WE NEED TO BE TO REACH THAT GOAL:

- The ocean covers 71 per cent of the Earth's surface and plays a fundamental role in regulating global temperatures - not only does it absorb 93 per cent of the additional heat from rising anthropogenic CO<sub>2</sub> emissions, but it also absorbs approximately 25 to 30 per cent of anthropogenic CO<sub>2</sub> emissions that would otherwise remain in the atmosphere and increase global warming. However, it is also impacted negatively from climate change.
- Live coral cover on reefs has nearly halved since the 1870s, with the rate of decline most pronounced over the past two to three decades due to increased ocean acidification and water temperature, while seagrass meadows decreased in extent by over 10 per cent per decade from 1970 to 2000.
- Coastal areas are suffering too - global coverage of mangroves has declined by roughly 40 per cent, while saltmarsh coverage has declined an estimated 60 per cent. Climate change is also putting at risk 40 per cent of the world's population who live in coastal areas and/or rely on the ocean for their livelihood and food security, particularly in developing countries where coastal communities are recognized to be among the most vulnerable to climate change.
- In order to achieve a system transformation for the ocean and coastal zones, four change levers must be activated: (1) Nature-based Solutions; (2) Aquatic Food production; (3) Zero-emission shipping; and (4) Ocean Renewable Energy.
- Nature-based Solutions provided by coastal ecosystems hold great potential for mitigation and adaptation to climate change - protecting and restoring three coastal blue carbon ecosystems

(seagrass, tidal marshes and mangroves) globally, alongside seaweed farming, could reduce emissions by as much as 1.4 billion tonnes of CO<sub>2</sub> equivalent annually by 2050. Research also shows that ocean-based mitigation options could help to reduce the emissions gap by up to 21 per cent on a 1.5°C pathway by 2050 (Hoegh-Guldberg, O., et al. 2019). Coastal ecosystems in their entirety are also critical ‘natural infrastructure’ – restored ocean and riparian ecosystems can help mitigate the impact of storms and sea-level rise, thus saving lives and livelihoods, and would reduce the economic costs of damage and recovery. According to the Global Commission on Adaptation, protecting and restoring mangroves globally, at a cost of less than USD 100 billion, could create USD 1 trillion in net benefits by 2030.

- Globally, aquatic food systems make substantial contributions to food and nutrition security and the livelihoods of billions of people (10 per cent of the world’s population rely on the fisheries and aquaculture sector for their livelihoods, mostly small producers). Fish consumption has been growing at twice the rate of population growth, outpacing other animal protein consumption, and is projected to become a bigger portion of future diets. Fish derived from sustainable fisheries and aquaculture is known to have one of the lowest carbon footprints among all food commodities (FAO 2018), providing more than 3.3 billion people with at least 20 per cent of their average per capita intake of animal protein (FAO 2020). Changes of fuel sources in vessels and technological advances in production techniques can reduce the emissions associated with seafood from both wild-caught fisheries and ocean-based aquaculture. Combining approaches would result in a reduction of 21 per cent in CO<sub>2</sub> emissions per tonne of fish produced.
- As for deep-sea shipping, there is growing evidence that green ammonia produced from green hydrogen is the most feasible candidate. However, the industry has yet to reach consensus on the decarbonization pathway, and zero-carbon vessel technology is still in early stages of development. By 2030, the industry should aim to achieve five per cent of propulsion energy from zero-carbon fuels for international shipping through a combination of container routes, niche vessel types (e.g. green ammonia and liquefied petroleum gas tankers) and niche routes. For domestic shipping, the target should be 15 per cent, which can be reached by 32 developed nations (which account for 50 per cent of domestic emissions), thus achieving 30 per cent decarbonization. A critical step on this path is to have industrial-scale zero-carbon ship demonstration projects implemented by 2025, with each project consisting of at least two ports with the necessary bunkering and refuelling infrastructure and at least one zero-carbon vessel in operation between the ports. Further to transitioning to zero-emission energy, the shipping sector must assess, reduce and avoid its negative impacts on marine biodiversity.
- Many technologies are currently being assessed for their ability to harvest renewable energy from the ocean. As of today, bottom-fixed offshore wind represents the largest part of the renewable energy production from the Ocean, with 35.3 GW of installed capacity as of 2020 (GWEC 2021), due to its mature technology, scalability and rapid cost reduction over the last decade. Floating offshore wind is expected to reach wide scale commercialization closer to 2030. In addition, technologies to extract energy from waves and tides are progressing. Energy within the ocean can also be extracted from salinity and temperature gradients. Lastly, floating solar photovoltaic (PV) systems are beginning to emerge in marine environments. In the process of scaling up ocean energy production, especially to deeper waters and new sites, all actors must consider their impacts on marine ecosystems, such as noise pollution, heat production and other effects on the marine environment.

# HUMAN SETTLEMENTS

The **Pathway** vision for 2050 is for all human settlements to be decarbonized, healthy places that are affordable, accessible and inclusive, where people lead lives compatible with a 1.5°C world and have radically changed their consumption patterns. Buildings and construction have net-zero emissions across the whole life cycle, cities conserve resources, are zero waste, and have social equity at the heart of climate action. Human settlements now protect their citizens and economies by implementing climate-resilience strategies and facilitating adaptation efforts in all activities. All policy and investment decisions are considered under a climate change mitigation, adaptation and resilience lens holistically, and cities adopt a cross-sectoral and integrated approach when undertaking upgrades to and/or new developments in city infrastructure.

The **Breakthroughs** in this sector include: for 20 per cent of global air-conditioner (AC) manufacturers to bring to market affordable residential AC units that have 5x lower climate impact than today's units by 2025 so that all residential AC units are net zero by 2050; and for 100 per cent of built environment projects due to be completed in 2030 or after to be net-zero carbon in operation (with at least 40 per cent less embodied carbon compared to current practice) so that 100 per cent of projects (new and existing) are net-zero carbon across the whole life cycle by 2050.

## WHERE WE ARE AND WHERE WE NEED TO BE TO REACH THAT GOAL:

- Currently the buildings and construction sector accounts for 38 per cent of total global energy-related CO<sub>2</sub> emissions (GlobalABC 2020). There is also a critical need to improve the adaptation and resilience of the built environment to protect communities from the natural hazards in the future caused by projected climate change. In 2019 alone, natural disasters affected 95 million people, claimed over 11,000 lives, and caused USD 103 billion in economic losses, much of which may have been mitigated by more resilient infrastructure and buildings.
- To decarbonize the built environment, whole-life carbon emissions (operational and embodied) must be assessed and tracked on all new and existing developments to determine how best to minimize emissions while ensuring resilience for the future. System decarbonization requires demanding less material, minimizing energy use, and implementing low-carbon and renewable heating, cooling, material and construction technologies at scale, while promoting the decarbonization of the energy, transportation, and material manufacturing sectors (e.g. steel and cement) in parallel. The technology solutions to transition to a net-zero built environment exist. Estimates suggest that around 70 per cent of cumulative CO<sub>2</sub> emission reductions could be achieved from the deployment of solutions that are available on the market today (IEA 2020a). However, innovation is still required to fully integrate across the diversity of climates and building types, and these solutions are not being adopted at sufficient scale and pace.



- About 80 per cent of economically viable energy savings in buildings remain untapped. A major source of energy use and emissions from buildings is electricity, the use of which has increased more than 19 per cent since 2010, generated mainly from coal and natural gas.
- Energy demand for cooling systems and air conditioning is rising sharply. Space-cooling energy use has increased by 25 per cent since 2010 and is growing in energy intensity per unit floor area. Over the coming 30 years, energy needs for space cooling could triple, especially in hot and tropical countries, and residential buildings are responsible for over two thirds of this increase (GlobalABC 2020). There is an opportunity to quickly influence the growth of cooling related energy demand through policies to improve efficiency.
- Buildings, specifically, are responsible for nearly 6 per cent of global GHG emissions (Climate-Watch 2021). The building sector is highly diverse, though - decarbonization trends vary greatly among regions and so do the required actions to reduce the sector's emissions.
- Of the three indicators examined by **SoCA 2021** in the buildings sector, one is heading in the right direction but well below the required pace (energy intensity of building operations) and for two, there is insufficient data (retrofitting rate of buildings and carbon intensity of building operations).
- Through a transition to zero-carbon energy sources and highly efficient building envelopes, the carbon intensity of residential and commercial building operations in select regions needs to decrease quickly - by 65-75 per cent (commercial) and by 45-65 per cent below 2015 (residential) by 2030 and to zero by 2050 in order to be aligned with a 1.5°C-compatible pathway.
- Globally, energy intensity of buildings decreased by 19 per cent from 2000 to 2015 and another two per cent by 2019 (IEA 2020b). But declines in energy intensity have slowed in recent years and need to accelerate again to fully meet the targets. Reductions in energy demand of new buildings can be achieved by improving the efficiency of appliances and equipment (e.g. cooking stoves, electrical equipment, lighting, and equipment for heating and cooling) and by reducing the heating and cooling demand of buildings by improving the building design and envelope. Smart controls further limit energy demand and alleviate the risk of wasteful user behavior.
- Directly related to energy and emissions intensity improvements, retrofitting the building stock is a major requirement to enable the building sector to get on a 1.5°C-compatible pathway. By 2050, all buildings should be energy efficient and designed to meet zero-carbon standards. To that end, the retrofitting rate needs to increase from about 1-2 per cent today to 2.5-3.5 per cent per year in 2030, and 3.5 per cent in 2040. Retrofitting is more important where most of the building stock that will exist in 2050 has already been built; this includes most European countries, the United States, Canada, Japan, and Australia, but also and increasingly China (Liu et al. 2020).

# INDUSTRY

The **Pathway** vision is for industries to generate emissions in line with what the natural world can safely process by 2050, while providing dramatically improved quality of life for citizens, and for communities and industries to have become more resilient to climate impacts and other natural disasters, due mostly to local renewable electrification and supply chain redundancies.

Due to the complexity of this sector, this Pathway is divided into two main sections: Heavy Industry (including aluminium, cement, chemicals, plastics, steel, and metals and mining sectors); and Light Industry (retail, consumer goods, fashion, mobile and information and communications technology).

The **Breakthroughs** in this sector include:

- For zero carbon **aluminium** to represent 20 per cent of total global production by 2035 so as to reach 100 per cent by 2050; for carbon neutral **concrete** to make up 25 per cent of global production by 2035 so as to reach 100 per cent by 2050;
- For 60 per cent of global **mining** sector electricity use to be decarbonized by 2030 so as to be fully decarbonized by 2040; and for 20 zero-carbon, commercial-scale facilities in the **steel** sector to be operational by 2030 so that the entire sector is net zero by 2050;
- For 60 per cent of global **chemicals** sector electricity use to come from renewable sources by 2030 so that it is fully decarbonized by 2040; and for 100 per cent of **plastic** packaging to be reusable, recyclable, or compostable by 2025 so that 100 per cent of industry electricity use is decarbonized by 2040;
- For 30 per cent of **consumer goods** and **retail** suppliers to set Science Based Targets by 2025 so that the entire consumer goods supply chain and retail sector are net zero by 2050;
- For at least 25 per cent of raw materials used in the **fashion** industry to come from lower climate impact sources by 2025 so that reductions in GHG emissions related to textile fiber and materials production are consistent with net zero industry emissions by 2050;
- For 70 per cent of **mobile** and 80 per cent of Information and Communications Technology industry electricity use to be decarbonized by 2030 so that it is fully decarbonized by 2040;
- For over 50 new Carbon Capture, Storage and/or Utilization networks serving heavy industry to reach Final Investment Decision by 2026, totaling 400 Mtpa in new capacity, so that heavy industries achieve net-zero emissions by 2050 and the global electricity system is fully decarbonized by 2040.

## WHERE WE ARE AND WHERE WE NEED TO BE TO REACH THAT GOAL:

- Decarbonizing the sectors listed under the Industry Pathway is technically and economically feasible through three pathways: (1) reducing materials and energy use; (2) increasing the productivity of materials and energy use; and (3) decarbonizing production processes, including climate damaging f-gases, while implementing transitional solutions such as natural climate solutions where direct emissions reduction cannot be reduced (Oxford University 2020).

- Of the five indicators examined by **SoCA 2021** in this sector, three are headed in the right direction; one at a promising but insufficient pace (share of electricity in the industry sector's final energy demand) and two well below the required pace (low-carbon steel facilities in operation and green hydrogen production). Two, however, are stagnant and need a step change (carbon intensity of global cement production and carbon intensity of global steel production).
- GHG emissions from industry have grown the fastest of any sector since 1990 (Ge and Friedrich 2020), and direct emissions from industrial processes account for 5.9 per cent of global GHG emissions (ClimateWatch 2021). Heavy industry is often characterized as "hard-to-abate", but some solutions are readily available and can lead to cost savings.
- As the largest energy-consuming sector, industry requires high temperatures for many of its processes and so is highly dependent on fossil fuels for its energy consumption. For some applications, this dependence can be reduced through a shift to electric technologies coupled with a decarbonization of the power sector.
- Over the last five decades, the share of electricity in the industry sector's final energy demand has slowly increased through the introduction of electricity-dependent technologies, including digitalization, automation, and machine drive (McMillan 2018; IEA 2017). Electricity demand rose from 15 per cent of industry's energy demand in 1971 to about 28 per cent in 2018. To follow a 1.5°C-compatible pathway, industry needs to adopt electric technologies that can push this share to 35 per cent in 2030, 40-45 per cent in 2040, and 50-55 per cent in 2050.
- Two heavy industries - steel and cement production - account for more than half of direct GHG emissions from the industry sector (ClimateWatch 2021). Although the cement industry has made improvements over time, the carbon intensity of cement has declined very slowly over the last decade. There are about 9 categories of novel cements under development, with various emissions reduction potentials and limitations. Some could only marginally reduce carbon intensity, while others actively sequester carbon (Material Economics 2019; Lehne and Preston 2018). But without investments or large-scale demonstration projects, most novel cement technologies have yet to enter the market. And even when they do, carbon capture and storage will likely still be needed to decarbonize cement production. For this industry to follow a 1.5°C-compatible pathway, the carbon intensity of cement needs to decrease 40 per cent below 2015 levels by 2030 and 85-91 per cent (with an aspiration to reach 100 per cent) by 2050 (Jeffery et al. 2020).
- For a 1.5°C-compatible pathway, the carbon intensity of steel will need to decline 25-30 per cent below 2015 levels by 2030 and 93-100 per cent by 2050. Over the past three years, the number of announced low- and zero-carbon steel projects has increased rapidly, and by 2030, 18 full-scale projects are planned to be operational. Although still uncertain, a maintained pace in low- and zero-carbon steel announcements could indicate the emergence of a nonlinear trend.
- In addition to electrification, green hydrogen - a zero-carbon fuel produced through water electrolysis powered by renewable energy - can help decarbonize hard-to-abate industrial sectors by replacing fossil fuels. Still in its early phases of development, green hydrogen accounts for less than 0.1 per cent of current production (IEA 2019). Scenarios aligned with limiting global temperature rise to 1.5°C suggest that hydrogen will supply 15-20 per cent of the world's final energy demand by 2050. Large-scale demonstration projects are being developed, and multis-takeholder partnerships, such as HyDeal Ambition and the Green Hydrogen Catapult, are also helping to create an enabling environment for green hydrogen.

## THE STATE OF CLIMATE ACTION 2021 REPORT ALSO ANALYZED THE NEED FOR IMMEDIATE SCALE-UP OF TECHNOLOGICAL CARBON REMOVAL, AND, AS SUCH, THE KEY MESSAGES IN THIS AREA ARE:

- Reducing GHG emissions is essential and should be a top priority, but it is not enough to avoid the worst impacts of climate change. We will also need to pull CO<sub>2</sub> out of the air to deal with excess CO<sub>2</sub> already in the atmosphere and to counterbalance emissions that will be very difficult to mitigate in coming decades (e.g. long-haul aviation).
- Carbon removal includes natural approaches, like tree planting or restoring wetlands, as well as technological solutions like direct air capture; both will play critical roles in a broader carbon removal portfolio.
- The amount of technological carbon removal needed by 2050 depends on the level of decarbonization reached by midcentury, as well as the amount of carbon removed through natural solutions, among others. Considering the Paris-compatible scenarios assessed by the IPCC that meet sustainability criteria set out in Fuss et al. (2018), removal of around 4.5 GtCO<sub>2</sub> per year by technological methods may be needed by 2050, with an interim target of 75 MtCO<sub>2</sub> per year in 2030 (IPCC 2018; ClimateWatch 2021). The amount of CO<sub>2</sub> removed and stored through these approaches today is a fraction of a per cent of what will be needed, but recent project announcements and federal and private investment point to growing momentum.
- Government investment in research, development, and demonstration is needed to develop entirely new carbon removal approaches and refine proposed and existing ones to help optimize technologies and bring down costs. Additionally, supportive policies can incentivize deployment in a variety of ways: reducing investment or operating costs, creating regulation that enhances certainty for project development, reducing financing costs, or providing incentives to procure certain products, among others.
- Corporate commitments and investments in carbon removal technology have increased in the past few years. Some companies have pledged to reduce their own emissions and have also invested in carbon removal projects to help them reach net-zero and even net-negative emissions, while others not only have pledged to purchase tonnes of carbon removal but also have provided upfront investments to support project development.
- Enabling infrastructure, such as CO<sub>2</sub> pipelines, geological storage, and abundant renewable and zero-carbon energy to power carbon removal projects is also critical to scaling up carbon removal technology.
- While dedicated storage in underground geologic formations maximizes net carbon removal, building up the market for products made with captured CO<sub>2</sub> can help compensate for high capture costs in the near term.
- As a nascent suite of approaches, carbon removal technologies must be developed in a way that acknowledges and minimizes environmental and social risks and uncertainties.

There is a **Breakthrough** contemplating carbon removal, and its target is for 100 Mtpa of capacity to be operational across a portfolio of technological solutions, so that over 5 Gtpa of CO<sub>2</sub> removal and storage capacity is operational by 2050.

# FINANCE

The **Pathway** vision for this sector is that, by 2050, financial markets, institutions and systems are in place to support and fund a resilient zero-carbon economy and society, ensuring that temperature rise remains limited to 1.5°C. Price signals have been adjusted so that the true cost of negative externalities is now reflected on balance sheets, and the financial system is based on the embedded understanding of double materiality, so the impact of investments on sustainability is a consideration as much as the impact of sustainability factors on the value of those investments.

There is already growing ambition and action from leading financial institutions, but unlocking systemic change will require further scaling of these commitments and enhancing coordination between all finance sub sectors. Therefore, the **Breakthroughs** in this sector include:

- For major **asset managers** to set and achieve targets for assets under management aligned with net zero by 2050, with commitment to interim targets and at least halve emissions by 2030, so that all client portfolios are fully net zero by 2050;
- For major **asset owners** to set and achieve five-year (2025 and 2030) targets for net zero aligned portfolios covering emissions reduction, engagement on sector transition, policy advocacy and financing transition, so that all portfolios are fully net zero-aligned by 2050;
- For systemically important **banks** to set and achieve 2030 targets for net-zero emissions from all activities and portfolios by 2050, so that all activities are net zero by 2050; and
- For major **insurers** to set and achieve five-year (2025 and 2030) targets for net zero aligned investment, insurance and reinsurance underwriting portfolios, so that all investment, insurance and reinsurance underwriting portfolios are net zero by 2050.

## WHERE WE ARE AND WHERE WE NEED TO BE TO REACH THAT GOAL:

- At a conceptual level, two of the biggest levers that can deliver this change are (1) the internalization of externalities to correct pricing and close valuation gaps; and (2) the lengthening of investment horizons to avoid the 'tragedy of the horizon' and the harms of short-termism. Correcting market failures and unpriced externalities will be needed across all of the Climate Action Pathways and will include (but not be limited to) focus on carbon pricing, ending fossil fuel subsidies and addressing stranded assets. To lengthen time horizons and boost alignment of finance with climate resilience over the long term, we must build on progress made by the TCFD.
- Four indicators in finance examined by **SoCA 2021** are heading in the right direction, although one at a promising but insufficient pace (total public financing for fossil fuels) and three well below the required pace (total climate finance, public climate finance and private climate finance). One has stagnated and needs a step change (share of global emissions covered by a carbon price of at least USD 135/tCO<sub>2</sub>e) and one has insufficient data (corporate climate risk disclosure).

- Underlying all of the necessary system transitions mentioned above is the availability of sufficient finance from both public and private sources.
- Total global flows of climate finance reached USD 640 billion in 2020, an average increase of USD 33.6 billion per year over the previous five years (CPI 2021). By comparison, total global investment in fossil fuels was estimated at USD 726 billion in 2020 (IEA 2021a), 13 per cent more than all tracked climate finance.
- Annual increases in global climate finance would need to be 13 times faster to reach the target of at least USD 5 trillion per year by 2030, an average increase of USD 436 billion a year between 2020 and 2030. To meet such goals, based on available data, yearly gains in public climate finance would need to accelerate fivefold and private climate finance would need to grow more than 23 times faster by 2030 to meet their respective shares of the total climate finance needed.
- Finance must also be aligned with Paris temperature goals by phasing out public financing for fossil fuels, pricing carbon, and disclosing and managing climate-related finance risks.
- Many companies and financial institutions have endorsed or adopted recommendations related to disclosure, but data are currently insufficient to assess the extent to which governments' and companies' risk reporting meets the indicator target.
- In 2021, carbon pricing through a carbon tax or an emissions trading scheme covered 21.5 per cent of global GHG emissions, a significant increase from the 2020 coverage of 15.1 per cent (World Bank 2021). However, prices in the majority of schemes remain insufficient to fully account for the costs associated with rising GHG emissions; nor do they provide the right price signal for a 1.5°C pathway. If carbon pricing is to make a meaningful contribution to climate action, both its scope and level would need to be significantly increased.



# RESILIENCE

The **Pathway** vision is that, by 2050, we all live in a 1.5°C warmer world where all regions, countries, cities, businesses communities and individuals thrive in the face of multiple risks, uncertainty and threats posed by climate change. Where cities, industrial communities and informal settlements have become healthy, safe and thriving spaces that support resilient livelihoods, having achieved urban resilience; where smallholder farmers, rural entrepreneurs, and industries across food and agriculture supply chains are adaptive, equitable, and equipped to thrive in the face of climate change whilst protecting nature, having achieved rural resilience; and where coastal and riverine cities, communities and businesses through increased investment in adaptation and resilience and protection of natural ecosystems safeguard and support those livelihoods and economies, having achieved coastal resilience.

## WHERE WE ARE AND WHERE WE NEED TO BE TO REACH THAT GOAL:

- The impacts of climate change are being felt everywhere, with the increase of extreme events and its consequences taking place all around the world, from unprecedented cyclones and hurricanes to deadly heatwaves, wildfires and floods, affecting people's lives in a myriad of ways. The compelling scientific evidence of the growing impacts from climate change across all sectors mean that business-as-usual is no longer an option for any country, city, community, individual, business or financial institution.
- Without climate change adaptation and resilience actions, coupled with mitigation measures, the impacts of climate change are predicted to impact 80 per cent of the world's poorest who will be living in fragile contexts by 2030 (OECD 2018), and put an extra 100 million people at risk of being pushed into extreme poverty by 2030, and 720 million by 2050 (Hallegatte et al. 2015). They are also expected to reduce agriculture yields by up to 30 per cent by 2050, affecting smallholder farmers the most (Porter et al. 2014), increase the number of people who lack sufficient water from 3.6 billion today to 5.0 billion by 2050 (UN Water 2018), force hundreds of millions of people in coastal cities to move away from their homes, with a total cost to coastal urban areas of more than USD 1 trillion each year by 2050 (Hallegatte et al. 2013), and raise sea level by 2.5 meters as a result of melting Antarctic ice – even if the Paris climate goals are met (Garbe et al. 2020). The cost of climate-related disasters is predicted to rise to a total of USD 2.7 trillion over the next 20 years, even though the cost of making infrastructure resilient is about three per cent of this (Global Commission on Adaptation 2019).
- On the other hand, a suite of risk management actions can make a just and resilient transition possible. It is estimated that investing USD 1.8 trillion in adaptation and resilience from 2020 to 2030 can generate USD 7.1 trillion in total global net benefits (Global Commission on Adaptation 2019). In addition, implementing effective climate risk management actions would result in a 90 per cent decrease in people needing international humanitarian assistance by 2050 following climate-related disasters (IFRC 2019).
- Currently, we are not on track to take the actions required to reduce emission, to manage multiple climate risks and impacts and to adapt and transform for building climate resilient societies. Where there is sufficient awareness, there is still insufficient knowledge and finance on what to actually do, resulting in limited action, or at worst inappropriate action.

- This is changing as the increasing climate-related impacts become more self-evident. This is resulting in an increased focus on building climate resilience and it is urgent to build on this momentum to accelerate a common understanding, innovations and investments into climate risk management actions across systems and territories. It also means accelerating support and engagement with rural, urban and coastal communities at the front line of climate change impacts and risks.
- The COVID-19 crisis in particular has revealed the fragility of our social, economic and environmental systems with poor comprehensive risk management capacities. Today, we are still not equipped to manage multiple risks across all sectors. In addition, COVID-19 has exacerbated existing shocks and stresses, including those resulting from climate change. The pandemic has also augmented stresses which communities have suffered, threatening to erode many of the development gains of past decades. To cope with this disruption, we are seeing many examples of community networks self-organizing to combat the spread of the virus and support the most vulnerable within their communities. This spontaneous, self-organizing community resilience is proving to be a crucial element in navigating this public health crisis which brings important lessons for the unfolding climate emergency in advancing people-centered actions to build climate resilience.
- Building climate resilience involves all actors having the capacity to prevent, anticipate, and absorb climate extremes and slow-onset events (shocks and stresses), as well as adapt and transform development pathways in the longer term. Sectors and actors need to take six steps for building climate resilience across systems: (1) raise awareness and advocate for collective and individual action to tackle the climate emergency; (2) carry out climate risk assessments at national, local (city/region), sectoral or organizational level and use a systems approach; (3) develop and implement appropriate and context specific climate risk management actions; (4) mobilize financial resources for implementation and climate risk management capacity building; (5) monitor and track progress across and within sectors or systems; and (6) learn and share knowledge, experiences and solutions.
- Milestones towards the 2050 vision include:
  - By 2025, to ensure 50 per cent of the countries integrate climate risk management actions in cross-sectoral and sectoral plans, policies, investments and actions in an inclusive, people-centered manner; 75 per cent of building codes for hybrid blue, green, and grey infrastructures related water sectors integrate the main climate risks in a given location, ensuring they are nature-positive, resilient and low-carbon; provide risk finance and insurance mechanisms to 500 million poor and vulnerable people against disaster and climate shocks; ensure insurance industry provides USD 5 billion to support risk finance and insurance mechanisms; and ensure the public and private sectors make USD 6 trillion/year available for climate-smart infrastructure, among other actions;
  - By 2030, to ensure all relevant actors have climate risk informed policies, plans, strategies and regulations at all levels and sectors, including early warning systems and contingency plans/emergency response plans; universal and equitable access to safe, affordable and climate-resilient drinking water and sanitation services for 100 per cent of urban population, especially servicing the most vulnerable populations, including those from informal settlements; 100 per cent of most vulnerable people are covered against climate-related extreme events through climate risk insurance mechanisms in food and agriculture systems and nutrition- and risk- sensitive and shock-responsive social protection mechanisms, among other actions;

- By 2040, to ensure four billion people are more resilient to climate risks; 100 per cent of countries have integrated climate risk management actions for critical infrastructure into the implementation of their emergency preparedness, anticipatory action and response strategies at all levels; all actors have mainstreamed the suite of climate-risk management actions in their NAPs and sectoral plans, policies, and investments including successors of NDCs and SDGs; ensure at least USD 97 trillion total investment in infrastructure that is climate resilient and that integrates Nature-based Solutions; provide technology and related capacity-building to support the climate-resilience of all critical transport, energy and other infrastructure and system; have corporate boards rigorously ensure the value of climate-related risks and opportunities are taken into account across value chains, and that executive compensation is calibrated accordingly; to have financial markets, institutions and systems aligned with a resilient future and ensuring that temperature rise remains limited to 1.5°C, and asset owners' portfolios aligned with achieving net zero emissions and with supporting resilience to climate-related impacts.



The International Energy Agency launched its World Energy Outlook 2021 in October. Most of the report's main findings and takeaways are in consonance with the key messages outlined in this chapter. It stresses that clean energy technology - such as solar and wind - continued to grow rapidly this year and is becoming a 'major new area for investment and employment', but it also notes that '2021 is seeing a large rebound in coal and oil use' - and CO<sub>2</sub> emissions, consequently -, driven by the strains in some energy systems as a result of the 'rapid but uneven recovery from last year's COVID-induced recession'. The report maps out countries' clean energy transitions so far, their gaps in reaching the 1.5°C goal, and offers key decision points that can help governments 'move the energy sector onto safer ground'.

The report welcomes the new NDC commitments, especially the ones pledging net zero, and acknowledges the rapid growth in EV sales and competitive prices in solar PV and wind electricity generation, but it also notes that these trends are not enough to fulfill the Paris Agreement goals, stating that current pledges cover less than 20 per cent 'of the gap in emissions reductions that needs to be closed by 2030 to keep a 1.5°C path within reach'. It does, however, show that solutions to close this gap are available, and many are cost-effective. The four measures recommended by the report are: (1) a massive push for clean electrification, which includes doubling solar PV and wind, a rapid phase-out of coal, and expanding electricity use for transport and heating; (2) a strong focus on energy efficiency, aligned with measures to temper energy service demand through materials efficiency and behavioral change; (3) cutting methane emissions from oil and gas operations; and (4) boosting clean energy innovation, such as the deployment of hydrogen-based and other low-carbon fuels, as well as CCUS.

Finally, the report stresses that investment in clean energy projects and infrastructure needs to increase to nearly USD 4 trillion/year by 2030 to reach the 1.5°C goal, with particular focus in emerging markets and developing countries. Despite successful examples of capital mobilization for clean energy projects in some of these countries, the COVID-19 crisis has exacerbated a number of challenges faced by the developing world, such as universal access to electricity and clean cooking. Finance, the report notes, 'is the missing link to accelerate clean energy deployment in developing economies'. Investing correctly in meeting the world's future energy needs, the report warns, is essential to avoid a volatile period ahead for energy markets. Clean energy transitions not only can provide a cushion from the potential shock of commodity price spikes, but also ensure the security of energy systems - including from climate change impacts.





# PART 3

## Looking forward: vision for the future

### IMPROVING THE MARRAKECH PARTNERSHIP FOR GLOBAL CLIMATE ACTION

#### Five-Year Plan

In 2019, at COP 25 in Madrid, Parties acknowledged the important role of non-Party stakeholders in contributing to the goals of the Paris Agreement and decided to keep appointing High-Level Champions for the period 2021-2025.

This new five-year cycle comes at a time when Parties are entering a critical period of implementing their NDCs, NAPs, and long-term low greenhouse gas emission development strategies.

It continues to be the High-Level Champions' strong conviction that exponential change can only be delivered by aligning non-Party stakeholders under a shared vision. With such alignment in place, it is possible to

accelerate system transformations that are informed by science and are backed by all key actors across sectors and value-chains. This collaborative, streamlined process will also serve to support the increased cooperation between non-Party stakeholders and national governments.

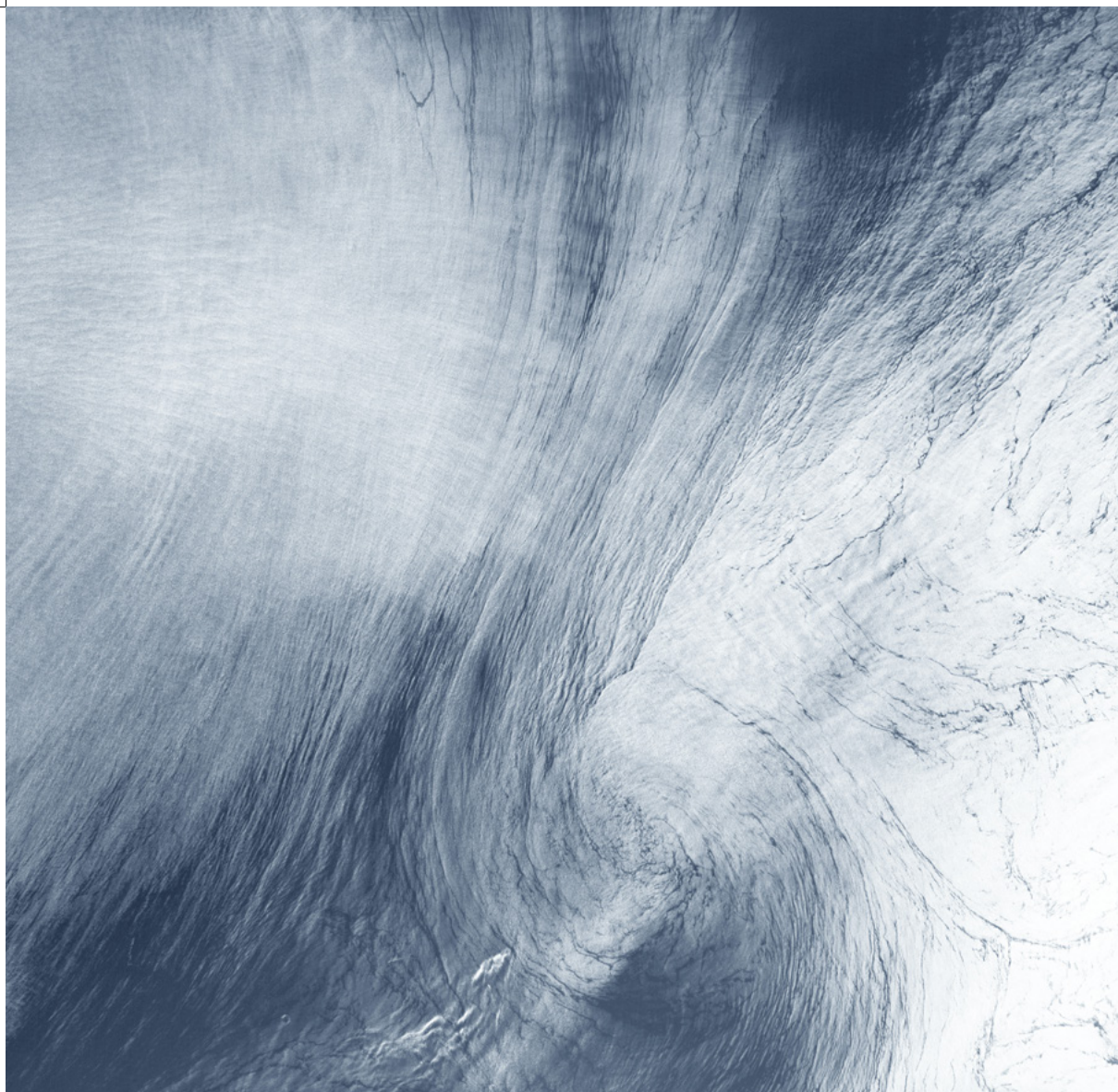
In line with this vision and through a thorough process to gather feedback, the High-Level Champions have developed a plan for improving the work under the Marrakech Partnership for enhancing ambition, which outlines a forward-looking perspective while also acknowledging the importance of continuity. In this respect, it builds on recent innovations that have been put in place but draws heavily on past achievements as well as on the strong foundations laid by previous High-Level Champions and Marrakech Partnership stakeholders over the years.

### Strengthening the Marrakech Partnership and the Champions' Unique Role

As one of the formal links between the UNFCCC process and immediate, near-term climate action from non-Party stakeholders and complementing existing processes, the High-Level Champions have a unique role to play encouraging the acceleration of immediate action and enhancing ambition among non-Party stakeholders and, in doing so, supporting national governments in the implementation of their climate action plans.

To this end, the High-Level Champions are organizing the work of the Marrakech Partnership under six core functions, collectively aiming to enhance ambition and urgency, converge non-Party stakeholders, and strengthen the bridge between Parties and non-Party stakeholders. Each of the following functions will be delivered through a suite of supporting tools. The six functions are the following:

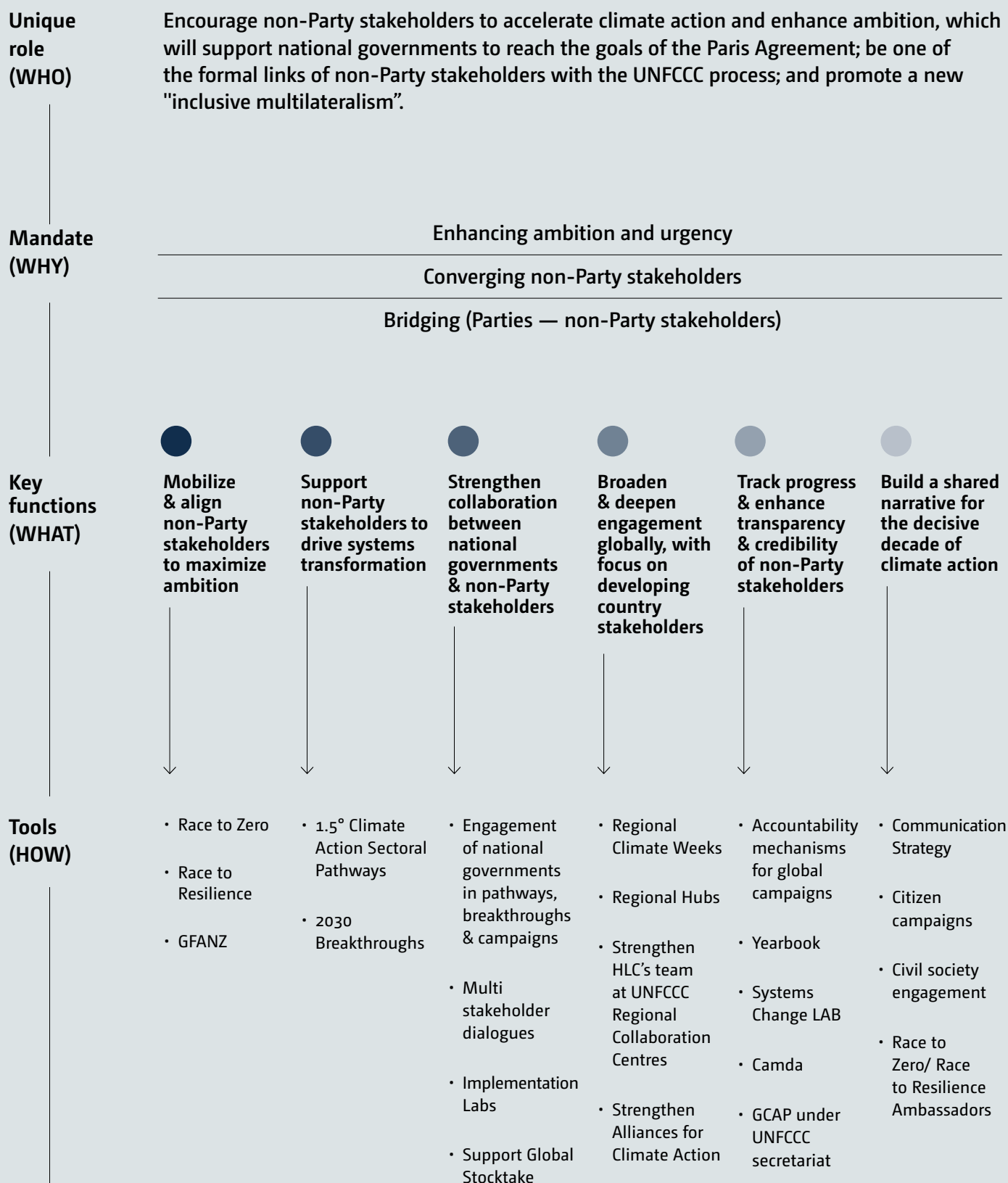




1. Mobilizing and aligning non-Party stakeholders towards credible, transparent, science-based goals that maximize ambition;
2. Supporting non-Party stakeholders to drive systems transformation around sector pathways with actionable short-, medium- and long-term milestones that facilitate all stakeholders working collaboratively across sectors and value-chains towards a shared vision;
3. Strengthening collaboration between national governments and non-Party stakeholders by identifying opportunities where climate action from non-Party stakeholders helps to create the conditions for enhancing ambition and accelerating implementation;
4. Broadening and deepening engagement globally, with a particular focus on helping developing country stakeholders to identify opportunities and the solutions most appropriate for their context;
5. Tracking progress and enhancing the transparency and credibility of non-Party stakeholders' action to build confidence and a shared understanding of the overall state of systems transformation and game-changing solutions to inform and accelerate action;
6. Building a shared narrative to collectively understand the overall direction of climate action and inspire further action.

**FIGURE 3**

Unique role - key functions &amp; tools



A number of different tools employed across these different functions, applied in a dynamic and crosscutting way, will help the Champions and the Marrakech Partnership to achieve their goals. The High-Level Champions, in close collaboration with the UNFCCC secretariat, have developed an enhanced architecture that aims to be even more effective in accelerating near-term action, highlighting transformational solutions and opportunities to enhance ambition across all regions and enabling the global climate action community to deliver at the scale and pace that is required by science and in support of the intergovernmental process and complement existing links to the process for non-Party stakeholders.

## FUTURE OF THE TOOLS: SHIFTING GEAR

### Race to Zero: Priorities for the Future

The improvement of the Marrakech Partnership towards greater activity fits within the Race to Zero's priorities moving beyond COP to continue strengthening its existing criteria, with a particular focus on the planning, proceeding, and publishing components.

Recognizing the dire scientific warnings and real-life evidence of growing, more severe climate impacts that demand an immediate and resolute response to limit warming to 1.5°C, Race to Zero now shifts its focus from building momentum to translating these commitments into action. Key components of this new focus must include clarifying expectations of members' plans, enhancing transparency and accountability in the campaign, thus ensuring Race to Zero members are committed to accelerating climate action.

**'Ps' for Progress: Pledge, Plan, Proceed, Publish . . . and Persuade**

Moving forwards, the campaign therefore looks to consolidate each of the tenets of the minimum four 'Ps' criteria (**Pledge, Plan, Proceed** and **Publish**) and will explore introducing a fifth 'P' for members to leverage their ability to **Persuade** others with a view to accelerating action. In consolidating each of these elements of the criteria, Race to Zero will seek to clarify expectations of members; provide further guidance to support members; and explore the introduction of explicit new requirements from members joining the Race.

Race to Zero's future commitments around the expanded five 'Ps' framework are described in detail below. These priorities arise from extensive internal strategic discussions following feedback from a recent public consultation. It also reflects expert inputs from key Partners, the UNFCCC, and the Expert Peer Review Group. The driving goal of all these commitments is to accelerate climate action by non-State actors in order to keep the 1.5°C goal alive.

#### ***PLEDGE: expanding diversity***

Each participant in the Race to Zero is required to issue a pledge at the head-of-organization level to reach (net) zero GHG emissions as soon as possible, and by mid-century at the latest. This must be in line with global efforts to limit warming to 1.5°C. As well as establishing a robust minimum floor, the pledge serves to establish consistency across actor types, sectors, and regions – critical for driving convergence across the real economy.

Going forward, it is the campaign's goal to exponentially accelerate growth in membership in order to ultimately align all real-economy actors with the Race to Zero criteria. This will involve incorporating actors from regions and sectors who are either currently not included in the campaign or who are under-represented. To encourage greater diversification, the campaign will



work with existing Partner initiatives and other relevant entities to extend the membership to new regions (especially outside Europe) and new sectors (especially heavy industry).

Another move to strengthen the Pledge phase of the Race to Zero focuses on the notion of 'fair share'. At present, members are required to contribute 'their fair share' of halving emissions by 2030. This is then reviewed and approved by Partner initiatives. Going forward, Race to Zero will explore how to define this 'fair share' in as clear and consistent manner as possible for all regions and sectors.

***PLAN: increasing specificity***

At present, the Race to Zero requires all new members to draw up a plan to explain the intended actions that will take to meet their interim and longer-term pledges. This must be done within the first 12 months of joining. This is an important step as fewer than one per cent of companies currently have a climate action plan. Furthermore, among those that do have plans, levels of credibility and quality vary greatly. Ensuring that all members produce satisfactory plans is essential as it underpins the credibility of Race to Zero as an action-oriented, science-based campaign.

**Setting expectations:** Going forward, the campaign will work with members to clarify expectations of what their plans should incorporate. Plans will vary according to region, sector, and actor type, but all members will be expected to increase the level of specificity of their plans. For example, new members will be encouraged to outline their timeframe for the phase-out of fossil fuels as well as the capital expenditures necessary to meet their commitments. Other areas where clarity will be sought from members include how leadership and responsibility will be allocated to meet the plan and how their levers of influence are aligned to support it.

In light of the fourth 'P' (Publish), the requirement to explicitly commit to report performance on an annual basis is currently under consideration.

**Achieving alignment:** A critical component of a satisfactory plan for relevant entities will also include its alignment, where relevant, with the 2030 Breakthroughs and the Climate Action Pathways. For instance, relevant members may be required to outline how they will address decarbonization across their most material operations to help drive systemic change.

**Providing guidance:** Race to Zero will look to develop tools and methods to guide members in drawing up their plans of action, as well as exploring effective ways to support members whose plans are deemed insufficient for meeting their targets. To this end, Race to Zero will explore how to foster deeper collaboration between its Partner initiatives, and between Partners and other organizations with relevant expertise. Where plans are not submitted within the mandatory 12 months, Race to Zero will ask Partner initiatives to remove relevant members.

**Predicting impact:** To provide additional confidence to governments and society, members will be required in future to publish a holistic summary of the content of their plans, including the predicted impact that these will have. The campaign will work with members to explore how to best present this information.

***PROCEED: unlocking collaborative action***

Under the existing rubric of the Race to Zero campaign, all members are expected to take immediate action towards achieving (net) zero, as laid out in their action plan. The campaign seeks to support members in this implementation phase by sharing best-practice examples from among the campaign's wide ecosystem of



members. To unlock the systemic change that is necessary, it is important that members act in concert with others and not in isolation. To further this collaborative approach, the campaign will look for ways to deepen collaboration between Partner initiatives, on the one hand, and between Race to Zero members and the 2030 Breakthroughs, on the other.

**Spotlighting leadership:** Race to Zero is all about promoting ambition and driving climate action. Demonstrating inspiring examples of leadership and illustrating the ‘art of the possible’ is one of the most effective means of achieving these twin goals. The intention is therefore to identify and spotlight leaders in each of the five ‘P’ areas of the campaign who can act as a benchmark for other members to emulate. In addition, the example of these leaders will increase the confidence

of national governments and civil society that Race to Zero is driving meaningful change in emissions reduction. The expectation is for these leaders to take an active role in speaking publicly under the banner of Race to Zero, thus increasing the visibility of the campaign as well as its commitment to transparency. The system to select these leaders will recognize the variety in leadership styles across the campaign membership, as well as taking on board measures of climate leadership developed by external organizations. Given the pace at which expectations and practice of climate leadership are developing, Race to Zero anticipates working with Partner initiatives and other independent organizations to continually monitor and, if necessary, update the criteria for selecting leaders.

**CASE BOX:****Helping Small and Medium-sized Enterprises Proceed towards Net Zero**

A good example of the kind of innovations the Champions hope to help foment in the future is the free, simple, and actionable training programme introduced in support of the UK Business Climate Hub. The goal of the UK Government-backed Hub, which is affiliated with the Race to Zero, is to help businesses of all sizes deliver on the UK's ambition of becoming net zero by 2050. The training programme was developed by a voluntary coalition comprising tech company Google UK, telecoms firm O2, and certification group Planet Mark. Designed particularly with small businesses in mind, the programme has a strong emphasis on practical, digitally focused ways firms can decarbonize. Measuring carbon emissions accurately is recognized as an essential piece of the puzzle. To that end, Google has committed to provide 11 full-time employees for six months to support and improve the Normative software platform that provides the measurement framework for the SME Climate Hub (part of the Business Climate Hub). The AI-based, free-to-access enables businesses to track and account for their carbon emissions, making climate mitigation easier and actionable.

***PUBLISH: providing assurance***

Transparency and accountability are central to ensuring robust climate action, and the avoidance of greenwashing. While Race to Zero currently requires its members to publish their progress annually on a public platform, there is an ever-growing need for even more transparency, as well as clarity in what is being published.

**Tracking progress:** Race to Zero is looking to develop a clearer understanding of member progress against Race's core objectives. With regards to campaign members from the financial sector specifically, Race to Zero will continue working closely with GFANZ to strengthen reporting expectations. Having a robust disclosure process will enable Partner initiatives and the campaign as a whole to better target support to members where needed. In the spirit of pushing the boundaries of leadership in climate action, it will also serve to hold members accountable to their commitments. An additional benefit is the public clarity it will bring to the fact that the campaign establishes a minimum floor. Finally, the aggregation of members' progress reports will also provide an invaluable resource to the global stocktake.

**Ensuring transparency:** To ensure the reporting process is both robust and accurate, the Race to Zero will encourage its members to undertake regular independent audits of their performance. This will help verify that they are complying with the campaign criteria. As a further level of assurance, the campaign will also actively welcome structured, public enquiries on any member of the Race to Zero. In light of discrepancies between a member's pledges and performance, the campaign will look for a way to facilitate or provide targeted support. A protocol will also be developed to remove members that have shown themselves unable to meet the Race to Zero requirements within a certain grace period.

***PERSUADE: driving ambition***

The art of persuasion marks a new addition to Race to Zero's action-oriented framework. It grows out of a recognition that voluntary actions by non-Party stakeholders to reduce emissions have the greatest impact when combined with public policies, regulations, and wider behavior changes. Race to Zero is therefore committed to exploring how it can best support its members in making climate policy lobbying, positive advocacy, and proactive communication integral components of its members' work.



**Introducing new guidance:** As a first step to incorporating this proposed fifth 'P' (Persuade) into the campaign's criteria, Race to Zero will convene a working group with relevant experts in the fields of policy, advocacy and behavior change. The purpose of the group will be to provide practical guidance for members. While such guidance will no doubt include generic principles, it also needs to be tailored to the specific realities and challenges of different actors. Business is a case in point. The area of business lobbying, for instance, is a complex field to measure and manage. In the first instance, Race to Zero anticipates providing guidance on what it expects its members **not** to do. In this regard, the working group will consider requiring business members to withdraw their membership from industry associations that are shown (by an independent audit) not to support the ambitions of the Paris Agreement. As part of this requirement, it may well be necessary to oblige business members to disclose their trade association affiliations as well as a holistic picture of their lobbying activities. Similarly, with the support of relevant Partner initiatives and other entities, thought will be given to guidance for cities, regions, and subnational governments in the Race to Zero, as well as for participating financial institutions.

#### **Accelerating Action towards a 1.5°C World**

Race to Zero and the Expert Peer Review Group continue to strive to be forces that together drive the climate action community toward best practice. The campaign will look to continue engaging the Expert Peer Review Group to progress discussions with relevant stakeholders around key themes that still require more detailed understanding. Such themes may include (but would not be limited to): enhancing a global, common understanding of net zero; defining high quality offsetting principles; and defining scope 3 emissions for different industries (e.g. service providers).



The realm of climate action is an increasingly dynamic field. It is therefore important to ensure that Race to Zero keeps abreast of emerging trends and practices, and that it reorientates its activities and guidance to remain at the cutting edge. In this respect, the Expert Peer Review Group will also be called on to repeat its criteria revision process on an annual basis. Incorporated into this revision will be a consideration of the proposed leadership principles. Particular attention will be given to how these fit in with the SDGs. More generally, Race to Zero will continue to actively seek out dialogue with entities at the forefront of climate action, particularly those identified through the public consultation. To ensure such discussions are as participative and productive as possible, the campaign is considering arranging them on a region-specific or sector-specific basis. Race to Zero fully intends to use the outcomes of these discussions to inform its future guidance and advice to Partners and their members.

## Future of Race to Resilience

COP 26 will signal a definitive move from planning to impact for the Race to Resilience campaign. The mission of this lead adaptation initiative of the High-Level Champions is to enable non-State actors to build a resilient world that thrives despite a projected increase in climate shocks and stresses.

Looking ahead, all the evidence suggests that the probability of extreme weather events and slow onset changes will only continue to rise, at least in the near term as climate action efforts build up towards full effectiveness. This makes the Campaign's target goal of increasing the resilience of four billion vulnerable people by 2030 ever more relevant.

### Key Message: Building Momentum

The High-Level Champions are pleased with the energy that the Race to Resilience has created in a short space of time. The ability to convene 30 Partner organizations, which collectively represent more than 2,500 organizations, marks a considerable success. The campaign remains open to the possibility of accepting new Partners. Recent months have seen a number of new additions, for instance, including the likes of the Climate Heritage Network, the International Coalition for Sustainable Infrastructure, Resilience First, and the Urban Sustainability Directors Network.

Going forward, however, the focus of the Race to Resilience will be building on its network of existing Partners and supporting their efforts to drive radical impact among their membership. The focus here will continue to accelerate action to build the resilience of people and regions that are most vulnerable to climate change.

The Executive Team of the Race to Resilience will look to support Partners in a variety of practical ways.<sup>8</sup> Special focus will be given to helping develop and popularize reliable metrics for measuring impact and designing robust accountability standards. Given the fast pace of change and the need for urgent action, every effort will be made to ensure the campaign's governance mechanisms allow for agile decision-making.

The onus of all the campaign's efforts from COP 26 onwards will center on delivering real-world impact. This requires a rapid transition from the important foundational work of planning and coalition-building to the next stage in the campaign's evolution; namely, effective action that delivers tangible, systemic change at scale.

### Future priorities: Shift from Planning to Delivery

In the run-up to COP 26, the focus of the Race to Resilience team was to ensure all campaign participants were able to provide a clear articulation of their commitment to improving climate resilience in their respective spheres. This included the provision of a bold, public pledge of action, backed up by a credible and impact-focused plan of action for both the near and medium-term future.

Post COP 26, the campaign's focus will shift from this statement-of-intent phase to one that is preoccupied with the delivery of tangible action. In this regard, the campaign co-ordinators will focus their resources towards instructing Partners how to implement the recently developed metrics framework. Based on the results this provides, attention will also be given to how they can best report on the impacts and outcomes achieved, as well as being transparent about the challenges that are still outstanding.

<sup>8</sup> The Executive Team of the Race to Resilience comprises three main entities: the Technical Secretariat, the Expert Review Group, and the Methodological Advisory Group. More details can be found here: <https://racetozero.unfccc.int/governance/>.



To ensure the maximum utility and credibility of this impact data, Race to Resilience will focus on the importance of prioritizing the communication of on-the-ground achievements that are shown to tangibly enhance resilience. By way of illustration, a relevant indicator might include the number of vulnerable people in a particular region or demographic that are now equipped to succeed in the face of a changing climate. Another example would be the extent of natural systems that have been made more resilient as a result of participants' actions, calculated in hectares.

The campaign will also ensure that all future indicators are aligned with the Race to Resilience metrics framework, thus ensuring comparability and consistency across all Partners and members. This will facilitate internal benchmarking and the sharing of experience, as well as building trust and awareness among external stakeholders. Naturally, it will also help inform Parties about the progress made by non-State actors with regards to resilience-building.

Not all future priorities mark fresh developments by any means. The campaign has made great strides to place Nature-based Solutions at the heart of its resilience strategy. Likewise, considerable progress has been made to raise the profile of micro-level adaptation approaches that prioritize the knowledge and involvement of local populations. Both these themes will remain top of the campaign's agenda going forwards.

#### **Strengthen the Foundations for Transformational Change**

Collaboration and knowledge-sharing is key to enacting transformational change. The bridging role of the High-Level Champions is vital here. Through the campaign, they link into the work of the Race to Resilience Partners and their respective members. And through the Marrakech Partnership, they connect up to the

Parties. Together, these two bridging relationships ensure the campaign remains firmly in line with the Paris Agreement and the evolving strategies to achieve its end objectives of a low-carbon, resilient world.

The High-Level Champions see considerable potential to both extend and deepen their bridging function. The field of resilience building is hugely dynamic, with new players and movements emerging all the time. The opportunities to create mutually beneficial connections with other expert entities are hugely exciting. Given their action-now agenda, the Champions have expressed particular interest in forging links with high-potential systems innovators and technology providers. A second stated objective is to draw cutting-edge experts in impact measurement into the campaign's network.

The High-Level Champions also have a vision for helping introduce Race to Resilience Partners to finance providers that have a shared ambition to build resilience. To increase the possibility of these relationships moving forwards to the investment stage, it is necessary to provide financiers in both the public and private sectors with credible projections of project impacts and outcomes. Race to Resilience will continue to promote and improve its new metrics framework so that Partners can meet this understandable demand from investors for hard figures. Another focus area for the Champions going forward will be the facilitation of public-private partnerships that unlock opportunities for collaborative financing of resilience initiatives.

Good governance is another vital component of transformational change. The High-Level Champions hold a strong belief in the role of local communities in resilience-building. They have the greatest incentive to protect their land and livelihoods, and put in place the structures for future prosperity and wellbeing. They also have the best understanding of how this can be achieved.

Establishing governance structures that accommodate their voices is therefore a top priority for the campaign. Participative decision-making and inclusive management of resilience-building initiatives are important for good governance. This is never truer than for migrant groups and other vulnerable sectors of society.

### Continuing to Make People and Nature More Resilient

Resilience comprises a range of attributes. A foundational tenet of the campaign's past and future work is building the capacity of social, economic and environmental systems to cope with a hazardous event or trend or disturbance. A second attribute that remains at the forefront of the campaign's work is the ability to respond or reorganize in ways that maintain a system's essential function, identity, and structure. Another important attribute is the capacity to continue learning how to adapt and to transform accordingly. How resilience is built and how it equips people to pursue resilience in the future is also a critical attribute. The ability of people to have free choice in responding to environmental and other changes is a case in point. Another is the capacity for flexibility. Providing opportunities to switch between coping and adaptation strategies or actions is an illustrative example of such flexibility in action.

Race to Resilience has an ongoing commitment to drive these attributes forward in all that it does. Ideally, all initiatives undertaken under the banner of the campaign will result in the seven cross-cutting outcomes highlighted below:

1. **Preparedness:** the ability to anticipate and plan for change and uncertainty by shaping responses, strategic planning initiatives and warning systems, and mitigation and prevention actions;
2. **Learning:** People's capacity to generate, absorb, and process new information and knowledge about cli-



mate change adaptation options, and ways to live with uncertainty and manage it;

3. **Agency:** the ability of people - individually or collectively - to have free choice in responding to environmental and other changes;
4. **Social Collaboration:** The ability to organize and act collectively. This includes partnership initiatives and collaborative approaches that bring people together in a mutually beneficial relationship;
5. **Equity and Inclusivity:** A just and equitable distribution and access to resource, and respect of equal basic rights in decision-making, including and integrating all affected actors and discourses;
6. **Flexibility, diversity, and redundancy:** Flexibility reflects having opportunities to switch between coping and adaptation strategies and actions. It also captures the diversity, robustness, and redundancy

of alternative strategies available to ensure short and long-term adaptation;

7. **Assets:** The natural, financial, technological, and service resources that people have access to in times of need.

To ensure that the activities of campaign participants are robust and impactful, all Race to Resilience participants adhere to a common metrics framework. This serves as a reality check on participants' pledges and corresponding outcomes, helping both to mobilize action and to identify gaps in new and existing initiatives.

Going forward, the Technical Secretariat of Race to Resilience will continue to consult widely with experts to improve the metrics framework. This is essential to accurately assessing the impact of current and future initiatives undertaken as part of the campaign. It is also central to enabling resilience actors to identify what specific attributes make an intervention impactful, thereby contributing to the wider knowledge base and increasing the probability of projects meeting with success in the future. Insights provided by the existing metrics framework will also continue to inform the campaign's approach and any modifications that may prove appropriate. This mode of continuous improvement will ensure that the campaign remains agile and flexible in its goal to promote radical and rapid transformation, adapting to challenges as they arise and seizing opportunities as they emerge. The campaign's goal remains to keep a spirit of experimentation and innovation at the heart of all it does.

Another priority theme for Race to Resilience going forward is to draw attention to the wide divergence between the beneficiaries of current resilience measures (which run into millions of people) and the proportion of the world's population who remain

vulnerable to the negative impacts of climate change (which can be counted in the billions of people). This gap clearly needs to be fixed and done so urgently. In this respect, Race to Resilience will undertake analysis to understand core contributors to the gap by geography and focus hazard. It will also work with campaign Partners to close these gaps through new projects or by expanding existing projects.

## Glasgow Financial Alliance for Net Zero: The Road Ahead

GFANZ has been working to rapidly mobilize a programme of work since its launch in April 2021, collaborating across the climate action ecosystem. Yet, there is more to do. Its ultimate goal is to transform the financial system so that every decision takes climate change into account.

As such, its future plans are built around encouraging the convergence and institutionalization of net-zero transition approaches and toolkits. It intends to advance this agenda in close collaboration with voluntary sector organizations, industry bodies, alliances, and governments.

### Seven Workstreams

The GFANZ Principals Group of CEOs has set out an ambitious programme of work across seven practitioner-led workstreams. These will generate the commitment, engagement, investment, and — ultimately — the alignment required to drive the financial system and global economy transition to net-zero.

#### 1. Building commitment

While GFANZ represents many of the leading financial institutions, there are many more that need to get involved. Increasing its membership must be a priority if it



is to get governments and major industries from around the world to work with it at the pace the planet needs. In particular, GFANZ will look to expand the breadth of its members across geographies and subsectors.

Establishing a net-zero commitment is just a first step. GFANZ therefore recognizes that institutions also need strategies to fulfill their commitments over the short, medium, and long terms, including interim targets for 2025 or 2030. To support these efforts, GFANZ will continue assisting the financial sector to translate its net-zero ambitions into near-term actions.

## **2. Mobilizing Private Capital**

Transitioning the entire world economy to a net zero pathway in time to avoid dangerous warming will require massive investment in emerging markets and developing countries.

Going forward, the goal of GFANZ is to help close this gap. With this goal in mind, it will seek to mobilize public and private capital in four principal ways:

1. Identifying and scaling existing catalytic initiatives that demonstrate strong potential for impact;
2. Supporting the development of country platforms that will accelerate the enabling conditions for structuring bankable projects;
3. Structuring a program of engagement with the multilateral development banks and development finance institutions that are key to blended finance projects;
4. Setting out a replicable and standardized reporting framework specific to emerging markets and developing countries that can reliably track the movement of GFANZ member assets into them.



## **3. Facilitating Net Zero Pathways Across Major Global Industries**

GFANZ intends to continue engaging with the aviation, steel, and oil and gas sectors with the ultimate aim of facilitating the development of sectoral net-zero pathways. The purpose of these pathways is to assist financial institutions that have set net-zero goals and are seeking to drive capital towards lower emissions solutions. Specifically, the taskforce will work closely with organizations and initiatives developing pathways to provide robust, actionable feedback on, and input into, their work. The taskforce plans to engage with additional sectors, potentially starting with automotive or construction.

## **4. Driving the adoption and convergence of transition plans for corporates**

GFANZ intends to advance work on best practice guidance for corporate transition plans through continued consul-

tation with advisers, industry organizations, corporates, and financial institutions. As well as developing clearer definitions of ‘best practice’, it will seek sector-specific examples of ‘what good looks like’ for individual elements of transition plans. Through its work on developing transition paths, GFANZ will seek to constructively contribute to other market-specific initiatives with a view to helping corporations better understand and navigate the needs of the financial sector. By the same token, it intends to deliver recommendations for how financial institutions should assess corporate transition plans.

#### **5. Supporting ambitious, credible net-zero transition plans for financial institutions**

A wide variety of transition plans for financial institutions have been developed over recent years. While these enjoy a considerable degree of common ground, important areas of divergence also exist. To harmonize these different approaches, GFANZ intends to develop and promote the adoption of best practices on crosscutting technical issues that financial institutions face as they work on their own transition plans, including the use of internal carbon pricing, the role of carbon credits and managing issues of double-counting financed emissions. In parallel, it plans to build out a comprehensive roadmap to address key cross-cutting technical challenges. These challenges include the creation of common technical standards for how plans handle components, such as data, methodologies, and scenarios.

#### **6. Pushing forward portfolio alignment metrics for financial institutions**

GFANZ is in the process of developing portfolio-alignment metrics for financial institutions and seeks to drive convergence in the way portfolio alignment is measured and disclosed. It will consider: coverage of asset and financial activities; use of portfolio-alignment metrics by retail finance

customers; and key challenges in the portfolio-alignment metrics ecosystem identified by the portfolio alignment team, such as emissions data, fit-for-purpose scenarios, methodological transparency, and testing.

#### **7. Advancing the GFANZ Policy Call to Action**

This workstream advocates for the public policy needed to help build a net-zero economy and meet the goals of the Paris Agreement. [GFANZ Call to Action](#), announced in October 2021, includes specific policies including economy-wide net-zero targets aligned to 1.5°C, reform of financial regulations to support the net-zero transition, phaseout of fossil fuel subsidies, pricing carbon emissions, mandatory net-zero transition plans, and climate reporting for public and private enterprises by 2024. It aims to unlock the trillions of dollars of climate finance required to support developing economies’ efforts to transition to net zero, which include working with farmers and businesses to stop illegal deforestation, providing viable alternatives and promoting sustainable regenerative agricultural practices, and supporting a just transition. The core of the financial system is ready to mobilize for net zero, and the Call to Action lays out the policy action needed to accelerate that transition.

### **2030 Breakthroughs**

#### **Strengthening the Systems Change Approach**

##### **1. Driving Momentum Ever Upwards**

From the outset, the High-Level Champions have contended that breakthroughs occur when state and non-State actors synchronize change together. This mutual coordination activates a positive ambition loop that benefits all. The more actors in a system that support the push for change, the faster the inevitable transformation. With a critical mass, however, early progress is possible.



The evidence indicates that the active involvement of 20 per cent of any given sector's key actors is enough to kickstart a system breakthrough. As is already being seen, once this threshold has been passed, the systems-wide changes that unlock a transition to a 1.5°C future begin to occur.

However, the supply side (producing and manufacturing) companies cannot achieve a tipping point alone, especially when it relates to a technology transfer that risks the valley of death. The systems-change approach adopted by the High-Level Champions focuses on five groups: supply-side companies; demand-side companies; finance actors; policy makers and civil society to transition a system successfully. To continue to build momentum behind this strategy for radical change, the Champions' intention is to work with each of these groups of actors for each sector. In many instances the demand-supply dynamic will involve cross-sector collaboration.

The Champions will continue to pursue this benchmark of 20-per cent of key actors within each sector to commit to playing their part to transform the sector. They have set the global stocktake in 2023 as their target date for achieving this objective. The fact that the number of sectors with sufficient level of ambition exceeded the original goal for COP 26 gives confidence that the 2030 Breakthroughs have already built up a good head of steam that can be carried forwards.

## **2. Delivering Ongoing Clarity**

Non-State actors are increasingly serious about taking action to decarbonize as they realize the urgency of the climate emergency as well as the advantages of getting ahead of the curve. Many remain unclear about the steps that they need to take. The 2030 Breakthroughs are designed to provide a clear roadmap for immediate and medium-term action. The high level of uptake for

the 2030 Breakthroughs evidences the huge appetite for guidance of this nature. In a number of cases, the 2030 outcomes have proved to be a useful target adopted for company-level commitments or key sectoral initiatives.

The objective of the High-Level Champions is to continue shining a light on what actions are required for non-State actors and in what timeframe. This will involve ongoing efforts to clarify for all Race to Zero members how the Breakthroughs work and how they can be applied in practice. In addition, to maintain the alignment and convergence on individual sector Breakthroughs, the Champions will also continue to maintain communication with the key climate action initiatives and alliances working at a sector level. A key challenge in this respect will be to clarify the intersections not just within the sector pathways, but also between them. The meta level of systems change remains very much a work in progress, so approaching the challenge with an open mind and a spirit of experimentation will be essential.

## **3. Making the Case for Exponential Change**

Fundamental to the founding rationale of the 2030 Breakthroughs is the belief that system-level strategies are the most effective way of driving exponential change. The urgency of the climate emergency is too great to respond with only incremental progress. Unleashing a process of radical transformation within the real economy through disruptive sector-level breakthroughs is crucial.

As the High-Level Champions move forwards with the 2030 Breakthroughs, therefore, it is important that the case be built for this exponential approach. To this end, it is important to identify tangible examples of where rapid transformation is unfolding, and look in depth at the specific actions and policy interventions that have set such change in motion. Having this information and



insights to hand will enable the 2030 Breakthroughs to engage critical decision-makers in the climate community, and increase understanding of, and support for, a systems-based approach to radical decarbonization.

One of the ultimate goals of the High-Level Champions is to create the opportunity for Parties and non-Party stakeholders to use the Breakthroughs as a platform for working in tandem to deliver tangible results. The champions acknowledge that climate action is, by its nature, a highly iterative and dynamic phenomenon. Ensuring non-State actors are aligned among themselves as well as with the policy agenda put forward by Parties is therefore an ongoing task that the High-Level Champions need to anticipate and be prepared for.

#### ***4. Tracking progress of the 2030 Breakthroughs***

The Systems Change Lab will continue to track the state of climate action and the global status of the 2030 Breakthroughs. This analysis will be incorporated into the wider Breakthrough Agenda tracking and

will be reviewed through high-level political forums and reporting.

It will work closely with those climate action initiatives and alliances leading the separate Breakthrough pathways, as well as participating organizations, to ensure that the data-collection and evidence-gathering and analysis process is as efficient and accurate as possible. This will involve a stronger focus on the demand side of the 2030 Breakthroughs: working closely with private-sector and public-sector buyers of low-carbon solutions from heavy-industry players in sectors such as steel, cement, shipping, aviation and so forth.

In this way, it will be able to build the reputation of the Breakthroughs as a vehicle for exponential change and confirm the initiative's position as a valuable contributor to government discussions on climate policy. The ability to provide a powerful narrative around progress will also raise the visibility of the systems-based approach to decarbonization, thus encouraging fuller and more meaningful participation from across all sectors of the economy.

## THE GLOBAL STOCKTAKE: SUPPORTING NON-PARTY STAKEHOLDERS TO MAKE A VALUABLE CONTRIBUTION

Work is starting to get underway for the first global stocktake. With discussions due to take place from next year, ending in 2023, this process will provide a comprehensive assessment of progress towards achieving the purpose and long-term goals of the Paris Agreement.

To make it as inclusive as possible, opportunities exist for cities, regions, businesses, investors and civil society to feed into the process. The Champions will encourage non-Party stakeholders to work together to provide consolidated inputs that are concise, yet also comprehensive and impactful.

With this in mind, supporting the global stocktake, as appropriate, will form one of the High-Level Champions' main priorities over the next two years. Inputs for the first technical dialogue will be open until February 2022 but the portal will remain open for inputs to the technical dialogues to follow.

The High-Level Champions view their role in contributing to the global stocktake as supporting non-Party stakeholders' effective participation as and when appropriate. Central to this process is the promotion of clear methodologies for non-Party stakeholders and metrics for measuring and reporting their progress towards the Paris Agreement objectives. This includes exploring how best to enable coalitions, initiatives and non-Party stakeholders in developing countries and at the regional level to provide inputs and participate, as part of the efforts of the High-Level Champions to regionalize the Marrakech Partnership.

The Champions will seek to support non-Party stakeholders in all three components of the global stocktake to provide credible information and evidence of their enhanced action and facilitate understanding on current trends and forward-looking outlooks across various sectors. Efforts will be made in the near-term to synchro-

nize the reporting rhythms of the various tools under the Marrakech Partnership with the timelines for the global stocktake. The Champions see value in using the run-up to the consideration of the outputs of the global stocktake to report on the global campaigns (such as the Race to Resilience, Race to Zero and GFANZ), the Climate Action Pathways and the 2030 Breakthroughs and showing how solutions are converging and action by non-State actors are supporting delivery of the goals of the Paris Agreement, all of which will be reflected in future iterations of the Yearbook. In doing so, they can help establish a picture of global climate action so far, drawing on past activity, as well as contribute to establishing forward-looking perspectives to inform future action.

Marrakech Partnership stakeholders could, for instance, share their experience of climate action with regards to barriers and challenges, as well as good practices, experiences and potential opportunities to enhance international cooperation. Expertise linked to the campaigns could also contribute to informing Parties on the state of private finance flows and adaptation efforts.

The High-Level Champions have been engaging with the Chairs of the Subsidiary Bodies and seeking feedback from Parties on how best to support the Marrakech Partnership and wider non-Party stakeholders inputs into the global stocktake.

The High-Level Champions strongly align themselves with the desire of the Parties that the global stocktake informs the enhancement action. For this reason, the High-Level Champions will consider how they can best support this future-oriented opportunity, including by disseminating the conclusions and outcomes of the global stocktake across non-Party stakeholders. For each of the workstreams and tools developed by the Marrakech Partnership, the output of the global stocktake is not viewed as a finishing line. Incorporating insights that arise from the global stocktake into the future direction and strategy of these workstreams will be one of the keys to their success going forward and to support the UNFCCC process most effectively.

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