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The Climate Paradox: Why We Need to Reset Action on Climate Change

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01

Foreword

People know that the current state of debate over climate change is riven with irrationality. As a result, though most people will accept that climate change is a reality caused by human activity, they're turning away from the politics of the issue because they believe the proposed solutions are not founded on good policy.

So, in developed countries, voters feel they're being asked to make financial sacrifices and changes in lifestyle when they know that their impact on global emissions is minimal. Whatever the historical responsibility of the developed world for climate change, those with even a cursory knowledge of the facts understand that in the future the major sources of pollution will come principally from the developing world.

But for that developing world, there is an equal resentment when they're told the investment is not available for the energy necessary for their development because it is not "green". They believe, correctly, that they have a right to develop and that those who have already developed using fossil fuels do not have the right to inhibit them from whatever is the most effective way of developing.

Therefore, there has been a period where climate-change action and global agreements, notably the Paris Agreement in 2015, seemed to herald a new era; but that momentum has been followed – exacerbated by external shocks like Covid and the Ukraine war – by a backlash against such action, which threatens to derail the whole agenda.

Activists shifted the political centre of gravity on climate change, bringing the issue into the mainstream. And as a consequence, huge strides were made in renewables, energy efficiency and commitment by countries to climate action.

However, because of the levels of growth and development, present policy solutions are inadequate and, worse, are distorting the debate into a quest for a climate platform that is unrealistic and therefore unworkable.

So, the movement now needs a public mandate, attainable only through a shift from protest to pragmatic policy. Too often, political leaders fear saying what many know to be true: the current approach isn't working. But they mustn't be silent – there's a new coalition to build; one that unites disillusioned activists with technologists and policymakers ready to act.

The following are facts that stand out in contradiction of the present policy approach.

Despite the past 15 years seeing an explosion in renewable energy and despite electric vehicles becoming the fastest-growing sector of the vehicle market, with China leading the way in both, production of fossil fuels and demand for them has risen, not fallen, and is set to rise further up to 2030. Leaving aside oil and gas, in 2024 China initiated construction on 95 gigawatts of *new* coal-fired energy, which is almost as much as the total current energy output from coal of all of Europe put together. Meanwhile, India recently announced they had reached the milestone of 1 billion tonnes of coal production in a single year.

Airline travel is set to double over the next 20 years.

By 2050, urbanisation is expected to drive a 40 per cent increase in demand for steel and a 50 per cent increase in demand for cement – core inputs to development, but materials with a significant emissions footprint.

Africa – at present responsible for just 4 per cent of global emissions – will see its population double in the next thirty years. This growth will demand energy, infrastructure and resources.

And though action by the developed world is still vital, by 2030 almost two-thirds of global emissions will come from China, India and South-East Asia. Yet the global financial flows for renewable energy in the developing world have fallen and not risen in the past few years.

These are the inconvenient facts, which mean that any strategy based on either "phasing out" fossil fuels in the short term or limiting consumption is a strategy doomed to fail.

It is important to be clear where this argument leads.

None of this invalidates the inconvenient truth that the climate is changing, and to our detriment – or that this is one of the fundamental challenges of our time.

Nor does it mean we shouldn't continue to deploy renewable energy, which is both necessary and cost effective.

But it does mean we need to alter where we put our focus and resources.

We need to recognise that without turning some of the emerging technologies into financially viable options, the world will choose the cheapest option. This applies to everything from nuclear fusion to sustainable aviation fuel, to green steel and low-emissions cement.

We should put carbon capture – directly removing carbon as well as capturing it at source – at the centre of the battle. At present, carbon capture is not commercially viable despite being technologically feasible – but policy, finance and innovation would change this. The disdain for this technology in favour of the purist solution of stopping fossil-fuel production is totally misguided.

Nature-based solutions – principally afforestation – are the easiest way to capture carbon, but there is no comprehensive plan as to how to encourage them or invest in them. (Though these do not offer a permanent solution, especially as floods, fires and pests, all exacerbated by warming, can turn forests from carbon sinks into carbon sources.)

Nuclear power is going to be an essential part of the answer. The confusion of this with nuclear weapons and consequently the irrational fear of it, intensified by hyperbolic campaigning, has led the world to an egregious policy error with many countries turning their back on it from the 1980s onwards, when embracing it would have significantly changed the trajectory of global emissions. The new generation of small modular reactors offers hope for the renaissance of nuclear power, but it needs integrating into nations' energy policy.

AI, applied to energy efficiency and the better use of the energy grid, is itself potentially revolutionary in reducing energy use. Yet there is little time devoted at climate conferences to it.

Planning restrictions are a colossal inhibitor of clean energy growth. Yet measures to change them and make the whole planning process simpler, faster and more efficient are much less highlighted than the polarising and largely fruitless attempts to shame people for their consumption habits.

Philanthropy has a huge role to play, but much of it appears to be centred around placating campaigners through “green” initiatives that don’t move the needle, rather than directed towards the technological innovations that really could.

We need a much greater emphasis on how we finance climate-change action, including engaging politically to create the markets into which finance for proven renewable solutions can flow. The carbon market will help here but has yet to fulfil its promise. But it cannot be beyond the vast array of financial talent the world has at its disposal to devise that system so that it can deliver its full potential.

And adaptation to climate change must also move up the agenda because the impacts that are already locked in cannot all be mitigated in the time available. But adaptation has always been the poor relation of climate action because it seems to accept that some climate change is inevitable.

Which brings us to the way the politics of the climate-change issue has played out over the years. Political leaders by and large know that the debate has become irrational. But they’re terrified of saying so, for fear of being accused of being “climate deniers”. As ever, when sensible people don’t speak up about the way a campaign is being conducted, the campaign stays in the hands of those who end up alienating the very opinion on which consent for action depends.

This reaches its apogee in the COP summits. Political leaders argue for days in public about wording like “ending”, “phasing out”, “reducing” fossil fuels, proclaiming that we can still meet the 1.5 degrees target on limiting global

warming, about who bears “responsibility” for climate change, and “loss and damage” compensation, in a forum that frankly doesn’t have the heft to drive action and impact.

Because – agree with it or not – most political leaders are decent people who do want to do the right thing, in recent times the COPs have become uncomfortable for many leaders. They would like to start taking some of the hysteria out of the climate debate but are reluctant to be the first to do so.

The COP process will not deliver change at the speed required. The great gathering of all the nations has its place though probably not every year. But the reality is that it is the decisions of the large countries, and the policy direction they give towards the technology and the financial flows, which can in truth solve the climate issue. This is what will decide whether we begin to match our noble ambitions to protect the planet with the necessary actions to achieve them.

Yet there is no proper process in place that allows the detailed and complex policy work to be done, mandated by the few nations that can make a real difference to climate change. If COP scaled global ambition on climate action, we now need a new process that scales global solutions. A new cooperative approach to technological solutions could be a galvanising next chapter – focusing political and real capital on alternative fuels and carbon-capture technology, including financing, deployment and R&D.

This paper is a chance to reset the debate, not by denying the urgency of climate action, but by updating the strategy. We need solutions that match the scale of the challenge and a new politics to get them done. Both are well overdue.

Tony Blair

02

Executive Summary

Climate action has reached an impasse. Past optimism assumed that green growth, political will and public engagement would drive decarbonisation. Yet today, we are experiencing the greatest loss of climate momentum in recent history, just as the crisis escalates.

Last year was the warmest on record,[1] bringing with it devastating wildfires, hurricanes and widespread flooding around the world. Rising emissions, record-breaking temperatures and worsening climate impacts demand urgent action, yet political momentum is fading.

Net-zero policies, once seen as the pathway to economic transformation, are increasingly viewed as unaffordable, ineffective, or politically toxic.

In many economies, the promise of green jobs has not materialised at the scale expected. Meanwhile, industries in many developed economies face rising costs and are losing competitive ground to countries like China. And despite net-zero pledges and a global deal to phase out fossil fuels, demand for coal, oil and gas keeps hitting new highs.

The current climate debate is broken. Public confidence in policies to reduce emissions and spark green growth is waning, exacerbated by the fact that many of the promised benefits of past climate policies have failed to materialise. Proposed green policies that suggest limiting meat consumption or reducing air travel have alienated many people rather than bringing them along.

This failure to deliver has created an opening for populists who exploit public scepticism and frame climate action as an elite-driven agenda. The result? Political will is receding just as the crisis accelerates. Governments are backtracking, businesses are dropping climate targets and voters are electing leaders who deprioritise the planet's future. The crisis is here, but action is stalling.

We are living in the climate paradox: awareness of the climate crisis has never been higher, yet meaningful action is in decline.

How do we solve this? The old climate playbook isn't working. We need a political strategy that wins, and that ends the net-zero culture war. We need to rebuild public trust in climate policy, and for that, politicians need to start with showing the public they are listening – and delivering.

The debate needs to be taken out of the hands of campaigners and put in the hands of policymakers. A realistic voice in the climate debate is required, neither ideological nor alarmist but pragmatic, solutions-driven and outcome-oriented. We need to move away from the continued sounding of the alarm and shift to the pragmatic delivery of solutions – pushing back on unrealistic demands that don't deliver impact while rejecting fossil-fuel driven status quo arguments.

The global reality is that no country can afford to pay the price of decarbonisation as well as the cost of climate disasters caused by others' inaction. The worst of all worlds for any country is to invest heavily in domestic decarbonisation but also be faced with the high costs of adapting to climate impacts due to the failure of others to similarly decarbonise.

However, climate change is not an issue that can be solved by action from any country in isolation. We need international cooperation far beyond the current frameworks and a collective commitment to fast decisive action, especially from the leaders of major emitting economies.

Continuing on the same path and relying on outdated, ineffective policies will not cut emissions fast enough. Doing so is a recipe for global disorder driven by the catastrophic impacts of climate change. Instead, the world must embrace new disruptive solutions and act collectively and decisively. It's time to redefine climate leadership and move into an age of delivery – an era of bold action, technological breakthroughs and transformative shifts in policy.

The choice is clear: innovate and cooperate or face a future of escalating climate chaos. That means:

1. **Accelerating and scaling technologies that capture carbon**. Cutting emissions incrementally is not enough. We need to invest in solutions that capture emissions at source before they reach the atmosphere, together with breakthrough technologies that permanently remove carbon from the atmosphere, pulling it straight out of the air and storing it permanently. Both technologies need to be deployed at scale and at speed.
2. **Harnessing the power of technology, including AI**. We must use artificial intelligence and other innovations to decarbonise smarter and faster. From AI-enhanced energy grids to new materials that support energy efficiency, technology must turbocharge our path to net zero. These technologies help cut emissions faster, more cheaply and more intelligently than ever before. This is about making the green choice the easier choice, with smarter tech delivering lower bills, better systems and faster progress.
3. **Investing in breakthrough and frontier energy solutions**. We need to power everything with clean energy, and ensure all new generation is zero emissions. New solutions, including a new generation of nuclear and fusion technologies, have the potential to transform our ability to do this. Clean energy is cheaper and healthier – and scaling it faster means less pollution, more jobs and new abundant energy sources that don't fuel the climate crisis.
4. **Scaling nature-based solutions**. From planting forests to developing carbon-sequestering crops, we must harness the power of nature and science together. Nature is one of our best allies in this fight, and we need to back it with smart science and innovation. Forests, wetlands and smart farms can absorb carbon and protect food systems as well as buy the planet time to develop and deploy new engineered solutions.
5. **Adapting to what is coming**. From flood defences to green cities, we must prioritise adaptation efforts and invest in resilience to prepare communities for the climate impacts they are already experiencing. Climate action must include domestic and global resilience and security – keeping people safe, today and tomorrow.
6. **Simplifying global efforts to deliver collective action**. While the multilateral process, characterised by the United Nations Framework Convention on Climate Change's Conference of Parties (COP), has been

an integral part of achieving global consensus on the problem of climate change, this process is moving too slowly to deliver the outcomes needed. The world now needs a laser focus on the key issues driving rising emissions, and targeted, high-impact agreements that drive real change where it matters most. This includes an imperative for China and India – two of the countries that hold the keys to the world's climate future. As such, the creation of new plurilateral solutions co-designed by these countries are needed to sit alongside any wider multilateral process. And as global trade fragments, we have a generational opportunity to realign trade and climate objectives as countries focus on retaining key markets for exports.

7. **Rethinking the role of finance, including philanthropy**. From green bonds to climate-risk pricing, money must flow to where it can make the most difference. If we want a green future, we need to make the money work towards solutions. This includes philanthropic giving, which could push frontier solutions over the finish line, reducing their costs and allowing for faster deployment.

We need to create momentum for innovative solutions, not get stuck in the past, and we need to go further and faster. We need to depoliticise the climate debate, shift from climate rhetoric to climate results and focus on the future of humanity. By embracing disruption and prioritising impact over rhetoric, we can still halt global warming and secure a liveable future.

03

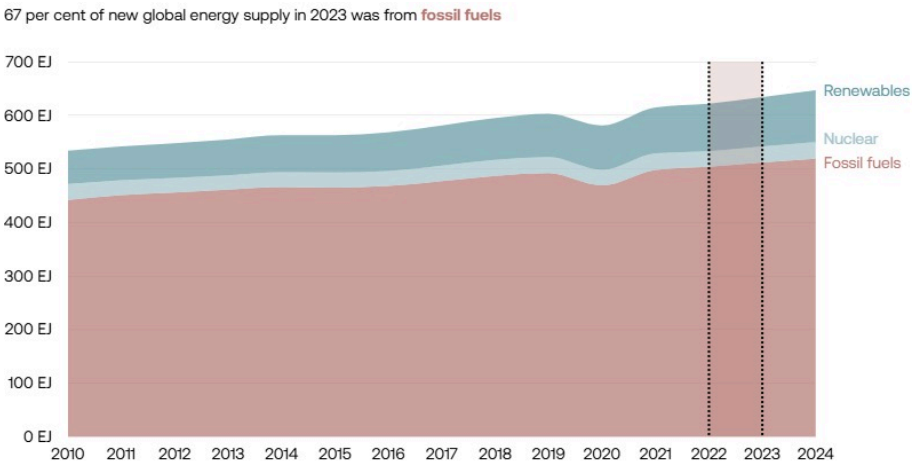
The Facts About Emissions and Their Sources

Global emissions of carbon dioxide are currently higher than they have ever been. While many economies, including the United Kingdom, have managed to reduce domestic emissions, policies have not been able to stem the rise in total global emissions. As a result, global temperatures continue to rapidly climb.

Despite significant investment in renewable-energy technologies, oil and gas demand is currently at record levels and forecasted to increase as countries prioritise energy security and economic activities that rely on abundant and cheap energy production. As Figure 1 shows, 2023 brought a significant increase in new renewable-energy generation, but two-thirds of the overall increase in energy demand that year was still met by fossil fuels.

FIGURE 1

There is a continued reliance on fossil fuels to meet energy demand

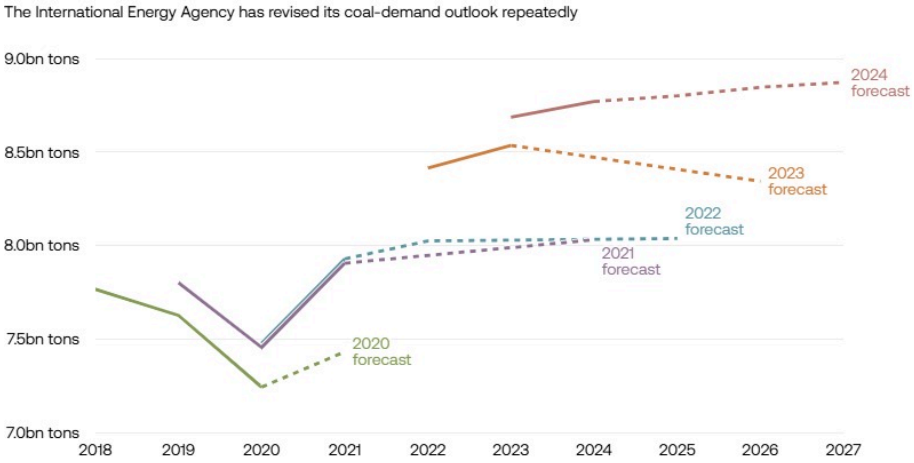


Source: IEA World Energy Outlook 2024

The same trend can be seen in coal demand, with projections of "peak coal" being repeatedly pushed out to the future with each year's forecast.

FIGURE 2

Continued reliance on fossil fuels means the estimated date of "peak coal" continues to shift into the future



Source: IEA

Excluding electricity generation, emissions from other sources are also rising, with an upward trajectory that shows no signs of slowing down in the foreseeable future. For example, global airline traffic, one of the most carbon-intensive activities, is forecast to more than double over coming decades as the middle classes in countries such as China and India expand.[2] By 2050, urbanisation is expected to drive a 40 per cent increase in demand for steel and a 50 per cent increase in demand for cement – products that together contribute about 15 per cent of current global emissions.[3] While there are green alternatives for airline fuels, steel and cement, the higher costs of these and the logistical difficulties of producing

them (sustainable airline fuels in particular) means that without transformative solutions, emissions from all three sectors are forecast to rise over coming decades.

In part, the rise in emissions is due to the changing geographical profile of emitters. Up until the year 2000, North America and Europe were responsible for more than 70 per cent of the world's cumulative carbon dioxide (CO_2) emissions. At the end of 2023, this share had dropped to 56 per cent, indicating a shifting geographic trend.

In 1990, Europe and North America together accounted for 61 per cent of the world's annual emissions. By 2023, their combined share of annual emissions had declined to just 30 per cent, while the bulk of emissions – and emissions growth – were coming from emerging markets and developing economies (EMDEs). Between 1990 and 2022, CO_2 emissions in the European Union fell by 29 per cent, but surged in Asia by 231 per cent. While much of this growth was fuelled by China and India (where total greenhouse gas emissions rose 232 per cent and 174 per cent, respectively), countries such as Indonesia and the Philippines also saw rapid emissions growth, with annual CO_2 emissions in these countries rising 370 per cent and 280 per cent, respectively, between 1990 and 2023, albeit from a relatively low base.[4]

Currently, the six largest emitters globally are China, the United States, India, the European Union, the Russian Federation and Brazil. Emissions in 2023 increased in China, India and the Russian Federation and decreased in the European Union and the United States[5] while remaining steady in Brazil.[6] China has been the top emitter for almost 20 years, surpassing the United States in 2006. However, cumulatively, the United States remains the largest contributor to warming, emitting around 24 per cent of all CO_2 entering the atmosphere since 1750, compared to China's 15 per cent.

Emissions from China, India and the United States continue to fuel the bulk of global warming, contributing 49 per cent of global emissions in 2023. China has committed to peaking emissions by 2030, yet in 2024 approved the large-scale expansion of coal power, authorising 67 gigawatts of new

coal-fired power capacity and initiating construction on new coal-power projects totalling 95 gigawatts (the equivalent of around 190 “average” coal-fired power stations) – the highest in nearly a decade.[7]

Emissions from many other parts of the developing world are also likely to continue to grow. Historically, emissions have been closely tied to the energy demands of economic growth. As populations in developing countries expand and more people enter the middle class, energy consumption and fossil-fuel use will inevitably rise further. For example, India, the world’s most populous country, currently has an energy consumption per capita that is just one-third of the global average, one-fifth of China’s and one-tenth of the United States’. If energy use in India and other emerging economies rises only to meet the global average without a shift to cleaner energy sources, meeting the 2-degree climate target will be virtually impossible.

Developing countries have a right to grow and will naturally prioritise their own economic interests. Restricting development and energy consumption is neither a moral, political nor practical solution to climate change. Instead, given the shifting geography of emissions and their link to development, the approach to addressing climate change must also evolve.

Reducing energy demand is not possible. Instead, we must focus on where emissions are being produced today – and where emissions growth is likely to come from in the future if current trajectories remain unchanged.

In addition to energy demand fuelled by economic development, energy consumption is rising to support expanding AI systems and computational infrastructure. This growing demand, beyond what is needed for developing countries, will further accelerate emissions growth unless these new energy requirements are met through clean-energy sources.

As such, the global challenge now is to address the current sources of emissions and to ensure that the increasing energy demands of both populations and technologies are met through clean and energy-efficient sources. While developed countries relied on fossil fuels to fuel their

progress, it is now imperative that future economic growth – together with meeting the demand of new technologies – is powered by accessible, sustainable energy solutions.

04

The Evolution of Climate Solutions

Despite growing awareness of the risks of a warming climate, global consensus about the policy solutions needed to reduce emissions has never been achieved – and nor has there been concerted global action. Rather, the evolution of climate action reveals shifting political drivers and policy paradigms, which can be categorised into overlapping narrative eras. Over these eras, domestic policies were prioritised, often constrained by economic and political realities and accompanied by constant concerns that action by individual economies focused on their own climate ambition wouldn't produce the aggregate impact needed. The early years of global consensus – where arguably the most progress could be easily made – were slowed down by debates over the science and the ethical choices of investing for the future rather than addressing more immediate problems.

The "Activism Era", beginning in the 1980s, saw the issue of climate change gain prominence as scientific warnings about the greenhouse effect and rising temperatures caused by fossil fuels started to reach the public. Awareness grew with the establishment of the Intergovernmental Panel on Climate Change (IPCC) in 1988 and the 1992 Rio Earth Summit, which brought together world leaders, set the stage for action and created the United Nations Framework Convention on Climate Change (UNFCCC).

As the Activism Era gathered pace, climate change became a rallying point for global campaigns, from grassroots protests to high-level diplomatic lobbying. Global agreements such as the Kyoto Protocol set the stage for coordinated global action, introducing legally binding emissions targets. However, opposition, particularly from the United States, highlighted ongoing disputes over the economic impacts of climate policies.

During this era, climate action focused on systemic policy solutions within domestic economies, such as the rise of emissions-trading schemes and green subsidies. However, the debate became increasingly polarised

between urgent action and economic scepticism, with stark divides between activists advocating for climate action on moral grounds and those who viewed such measures as economically harmful or politically motivated.

The release of former US Vice President Al Gore's documentary *An Inconvenient Truth* in 2006 marked a pivotal moment, catapulting climate change into mainstream consciousness and amplifying public engagement to its peak in the Activism Era. This presentation of the facts, delivered by a mainstream, establishment politician, galvanised public awareness and inspired widespread dialogue, cementing the role of activism and advocacy in driving change. However, the characterisation of decarbonisation as a moral obligation was increasingly met with opposition, particularly from vested interests such as the fossil-fuel industry. This resistance laid the groundwork for subsequent efforts to integrate climate action into broader economic and political frameworks.

By the 2010s, climate policy was shifting towards aligning economic growth with environmental action. The "Optimism Era" promised mutually supporting economic policy and climate win-wins, and offered a work-around to leaders who didn't want to trade growth for environmental objectives. This economic focus increasingly displaced the moral-imperative arguments of the previous eras.

The Optimism Era was ushered into the mainstream of climate policy in part by the influential efforts of Sir Nicholas Stern, a British economist who was commissioned to report to Tony Blair, then prime minister of Britain, on the economics of moving to a low-carbon economy. Released in late 2006, the Stern Review brought climate economics to the attention of policymakers at the highest level. Stern's report highlighted the economic risks of climate change, arguing that the economic costs of inaction would be significantly higher than the cost of taking early and decisive action to reduce greenhouse gas emissions.

The Stern Review was a catalyst that helped to shift the focus of the climate-policy debate from one centred on the moral and environmental imperative to act to one emphasising the economic necessity of climate action and, critically, the substantial associated growth potential.

However, the broader economic narrative of this time, dominated by the global economic and European sovereign-debt crises, was far from one of confidence and broader economic optimism, with many countries reeling from the economic shocks that characterised this period. These crises meant that many countries were seeking new engines of growth that aligned with their values. Green growth appeared to offer that opportunity.

The shift paved the way for leaders to embrace climate action as a strategic economic opportunity rather than a burden, and an investment that could drive growth instead of just a cost. This positive framing was coupled with concerns about economic stability and the financial-system risks posed by climate change, and these together began to shape further policy interventions, reinforcing the idea that green growth could offer a pathway to economic resilience. By linking environmental sustainability to financial security, policymakers positioned climate action as a means to drive long-term prosperity and economic competitiveness while attempting to balance the immediate financial burdens on households and businesses.

The signing of the Paris Agreement in 2015 was a key moment in the Optimism Era, as nearly every country[8] committed to limiting global temperature rise to well below 2 degrees Celsius while pursuing efforts to cap it at 1.5 degrees. This represented a historic consensus, with both developed and developing countries facing obligations to reduce emissions, and reinforced the belief that economic development and climate action could go hand in hand.

As a result, this era saw governments continuing to invest in renewables, energy efficiency and other domestic emission-reduction strategies. The political narrative stressed innovation, job creation, sustainable development and technological advancement. For a time, this optimistic vision aligned governments, businesses and citizens under a shared goal.

The Optimism Era saw many developed economies, such as the UK and EU, continue the trend of domestic decarbonisation. Other countries, notably China, invested heavily in green technology while continuing to burn fossil fuels, allowing it to capture market shares in many clean technologies in the future.

However, critiques emerged over whether green growth could truly decouple domestic economic expansion from emissions, particularly when trade partners and economic competitors continued to capitalise on cheaper fossil fuels. Furthermore, geopolitical uncertainties (including the Brexit vote in 2016 and the US-China trade war) and stagnant economic momentum started to make it harder for governments and businesses to deliver on the ambitious domestic commitments made in previous years, and regional fragmentation started to undermine the potential of export-driven green growth.

As such, the signing of the Paris Agreement was perhaps the last moment when the politics of the climate transition aligned with the economic conditions that would enable the "easy" delivery of decarbonisation, and the peak of global alignment on the necessity of the transition ahead. Following the signing of the Agreement, the commitment to the transition and the political consensus around it started to erode.

Changing economic conditions also highlighted the difficulties that many economies would face in the years ahead. Climate progress during the Optimism Era was, in part, made possible by low or negative borrowing costs in many economies, which reduced the price of climate investment and made achieving ambitious climate target commitments appear more feasible. For a time, this allowed governments and businesses to advance ambitious domestic climate policies with relatively few financial trade-offs. However, as the global economic conditions that had enabled progress began to shift and financial constraints tightened, the enthusiasm that had defined the Optimism Era started to wane.

This shift in economic conditions also brought attention to the costs borne by individuals, as the costs of carbon pricing started to have impacts, and policies aimed at sustainability necessitated upfront investments or changes in consumption patterns. To mitigate these burdens, many governments prioritised regulatory interventions, such as energy-efficiency standards and product labelling. These measures sought to encourage sustainable consumption while minimising immediate financial strain on households and

businesses. However, none of the domestically focused policies were able to deliver the key goal – namely a halt to the constant rise in global emissions.

The Covid-19 pandemic in 2019–20 marked a dramatic end to the Optimism Era, starkly highlighting growing tensions between short-term domestic recovery efforts and long-term global climate goals.

The pandemic caused a severe global economic contraction, reversing growth trends and forcing governments to reallocate resources to urgent economic-stabilisation measures. This effectively ended the dominance of the Optimism Era and green growth as priorities shifted towards domestic economic recovery. Despite massive stimulus packages being agreed and attempts to integrate either climate action or investment in clean technologies into recovery strategies, many governments ultimately deprioritised climate targets in the face of immediate economic concerns, ushering in the “Apathy Era”.

Political shifts also impacted progress. The EU’s Green Deal faced pushback, the US temporarily exited the Paris Agreement and resistance to carbon pricing grew. Public opposition to costly climate policies, as seen in the resistance to carbon taxes that triggered France’s *gilets jaunes* protests, underscored the challenge of balancing climate goals with economic costs. Governments increasingly moved to favouring subsidies over market-pricing mechanisms, potentially straining public finances.

Russia’s 2022 invasion of Ukraine further disrupted energy markets and global recovery efforts, reinforcing a shift away from ambitious climate action.

The economic shocks of the Covid-19 pandemic and the Ukraine crisis laid bare a fundamental reality: when faced with financial hardship, domestic economic stability and living costs take precedence over climate action, whether or not there is a longer-term economic imperative or benefit to taking action in the short term. This underscored the necessity of designing the climate transition in a way that does not disproportionately impact individual livelihoods.

During the Apathy Era, global narratives critical of climate policies, including the framing of climate action as “woke”, gained traction in a number of political spheres, further challenging the momentum of the climate agenda. Questions about the effectiveness of the climate policy agenda also came to the fore as climate disasters accumulated and emissions continued to rise, leading to questions about whether the policies selected would actually lead to lower emissions and the achievement of climate targets – and whether countries would still bear the costs of a warming future regardless of their domestic decarbonisation agenda.

05

Why Traditional Policy Solutions Won't Deliver

The confidence of the Optimism Era is gone. Global emissions have hit record highs[9] despite progress in some developed economies, and current policies put us on track for a 3.1 degree temperature rise.[10]

As highlighted above, population growth and accelerating development in the Global South is driving rapid increases in energy demand. This surge has significant implications for future emissions, as clean energy alternatives aren't being deployed quickly enough to meet either existing or new demand, or to displace the polluting energy generation that is currently driving emissions. Financing for clean solutions remains woefully inadequate. And simultaneously, growing computational infrastructure and AI technologies are creating additional pressure on energy resources, further complicating the demographic transition. As such, demand for energy will continue to rise.

At the same time, climate policies aimed at reducing emissions have largely been unable to harness the growth potential promised in the Optimism Era for either developed or developing economies, and as a result, the economic potential of green industries is increasingly met with scepticism. Economic stagnation, rising living costs and social concerns have shifted public focus away from long-term climate goals.

While awareness of climate risks is at an all-time high, willingness to bear costs for solutions that don't appear to deliver is declining, leading us to the climate paradox. Individuals hesitate to invest in green technologies due to high upfront costs, while governments, facing fiscal pressures, cut subsidies and backtrack on policies.

Many of the easy wins of decarbonisation in developed economies have been exhausted, and much of the "low-hanging fruit" of climate action, such as the widespread deployment of solar and wind energy in the Global North and the near-global phase-out of ozone-depleting substances, has already

been harvested. Much of what remains is complex, costly, or politically sensitive. At the same time, rising emissions in China and India make domestic action in smaller economies seem futile, even though these economies collectively match China's emissions.

Clean energy solutions for developing economies offer major opportunities for sustainable growth, but investment is stymied by financial barriers and political inertia. Wealthy nations, facing debt and economic constraints, are scaling back climate finance instead of ramping it up. Meanwhile, capital markets remain fixated on short-term gains, even in declining industries.

As economic and geopolitical pressures mount, governments are retreating from climate commitments and effective policies like carbon pricing are under threat. Without a fundamental shift in strategy, climate action risks stalling – just when global coordination is needed most.

Scepticism is undermining climate action in this, the Apathy Era. Citizens question whether domestic policies will meaningfully reduce emissions or if businesses and other nations will honour their commitments – making them unwilling to bear extra costs.[11] Businesses, in turn, doubt government consistency on climate policy, stalling investment in clean technologies. This widespread uncertainty fuels resistance to decarbonisation efforts and erodes political consensus.

Doubt is also deepening polarisation, reviving debates once considered settled and shifting political strategies, as seen in the UK's opposition retreat from net-zero commitments. To move forward, we must confront these contradictions. The climate transition is not self-sustaining: it relies on policy, economics, capital and a political narrative to drive action. If these falter, the transition stalls. The climate paradox and the Apathy Era thus demand a bold rethinking of **how** the world reduces emissions across the globe.

No single country – aside from major emitters like China, India, the US, or Russia – can deliver real global impact through domestic decarbonisation alone. National net-zero targets remain crucial for giving businesses the certainty they need to invest in the development of new clean solutions and drive the innovation and competition that will bring their costs down.

However, isolated efforts without global action risk economic strain, adding economic near-term costs while still leaving nations fully exposed to future climate adaptation costs. Just as the world must adapt to inevitable climate impacts already baked into the future, climate action itself must evolve – shifting from a strategy of stifling demand for energy to focus on systemic, global solutions that directly tackle the sources of emissions driving the crisis.

06

The Future Is Disruption

We are entering the Era of Disruption. Whether it's an era of negative disruption or positive disruption will depend on the decisions that leaders take. Down the path of negative disruption, humanity will suffer the physical impacts and economic costs of a rapidly warming planet. But on the path of positive disruption, bold leadership and disruptive innovation can deliver the decarbonisation we need.

We have the ability to change the path of climate change by disrupting traditional policy and harnessing new solutions.

Positive disruption in climate action will come from leaders seizing the narrative of technology and its potential to address the climate challenge, harnessing the transformative potential of bold innovation and systemic changes to reshape the world's approach to decarbonisation. This approach envisions leaders leveraging ingenuity to mitigate climate change and adapt to its impacts. Positive disruption encompasses a range of approaches, from pragmatic near-term solutions to bold, high-risk innovations with the potential to reshape the planet's future.

Applying positive disruption to the climate narrative requires re-examining core principles, pinpointing the primary sources of emissions and developing innovative, decisive strategies to eliminate them. This means targeting major emitters and focusing on the sources of emissions as a priority, regardless of where these occur. For example, actions to remove coal from the global energy system will have significantly greater impact than investment in last-mile decarbonisation in economies where renewable energy already provides the bulk of generation. Achieving this positive disruption thus calls for visionary leadership and coordinated international efforts to drive transformative action.

This does not imply the abandonment of ongoing domestic decarbonisation efforts – indeed, these remain vital for reducing emissions and ensuring a sustainable future. Harnessing economic growth and employment from the green transition remains a key opportunity for those countries who target

the right sectors and think critically about the role of green industrial strategy. Similarly, capital providers focused on long-term results will continue to bet on clean energy sources. However, the current trajectory of business-as-usual climate policy is not delivering results quickly enough to avert catastrophic warming, or to secure political support for additional – or in many cases, existing – climate policies. To accelerate progress, our approach must evolve, blending traditional strategies with bold, disruptive policies that challenge the status quo.

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Actions for Positive Disruption

Harnessing positive disruption for the climate challenge requires transformative solutions that go beyond the incrementalism of current policies. The traditional mechanisms guiding climate action – slow-moving multilateral institutions, complex and fragmented rigid international agreements, the prioritisation of domestic decarbonisation, and cautious financing – are insufficient for the pace and scale of change required to both reduce emissions and renew political support for climate action.

Disruption is needed that harnesses accelerated technological innovation, reimagines global cooperation and unlocks climate finance in novel ways. These elements are necessary to drive decarbonisation at the scale needed, and to counteract the fatigue, disillusionment and doubt of voters.

Actions to address the climate-change challenge must include:

1. **Accelerating and scaling technologies that capture carbon**, together with significant investment and acceleration of engineered permanent carbon-dioxide-removal technologies, including direct air capture (DAC) solutions.
2. **Harnessing the power of technologies, including AI**, to streamline and speed up both climate mitigation and adaptation.
3. **Investing in breakthrough and frontier energy solutions** to ensure future generation can be clean.
4. **Scaling nature-based solutions** in order to buy time for more systemic solutions.

In addition to prioritising these actions, leaders must also:

1. **Adapt to what is coming**, acknowledging that this is a priority under any future scenario.
2. **Simplify global efforts to deliver collective action**, including a shift away from a focus solely on domestic decarbonisation to target the key sources of current and future emissions.

3. **Rethink the role of finance, including philanthropy**, to drive both emissions reductions and adaptation efforts, including harnessing the power of philanthropic funding.

1. Accelerating and Scaling Technologies That Capture Carbon

Leaders must acknowledge that the coming decade is likely to see rising demand for fossil fuels, driven by increases in energy demand from populations in developing economies together with new technologies such as AI. As such, even a net-zero future is likely to include continued emissions from fossil fuels, especially in electricity generation in developing economies, as well as increased forecast demand in sectors such as aviation.

Given this reality, solutions must include the rapid scaling of carbon capture and storage (CCS) technologies that capture emissions at source. While this technology is already being deployed, it is not yet at the scale required or fully utilised across the sites of major emitters. Governments should collectively agree to shift towards a goal of capturing and permanently storing every tonne of CO_2 generated by the coal, oil and gas industries – or removing an equivalent amount via other methods – making this part of these industries' licenses to operate.[12] Fossil-fuel companies should be required to invest in and scale this technology, and are well-positioned to do so, having the infrastructure, expertise and capital to develop this solution.

However, even with aggressive deployment of CCS in the coming years, the world faces significant warming from historical emissions already in the atmosphere and the inevitable continued emissions in the near term. With fossil-fuel use persisting and demand increasing, we need a dual approach: CCS to minimise new emissions and engineered carbon-dioxide-removal (CDR) solutions to address existing atmospheric carbon. Both technologies must become urgent priorities in climate policy if we are to address the climate impacts already locked in and prevent further warming.

While CCS prevents new emissions from entering the atmosphere, engineered CDR solutions actively remove existing CO_2 from the atmosphere and can potentially store it permanently – or at least for thousands of years. DAC, an engineered CDR approach, uses chemical processes to extract CO_2 directly from the air and then store it permanently underground or utilise it in various applications, including the production of synthetic fuels or sustainable plastics. Currently, engineered CDR and DAC are prohibitively expensive, often costing hundreds of dollars per tonne of CO_2 removed. This high cost reflects their status as relatively new technologies that require significant innovation and scaling to become economically viable. With increased investment in research, development and deployment, these costs could decrease substantially – similar to the magnitude of cost reductions seen with solar panels and wind turbines over time.[13] Despite these current challenges, engineered CDR generally and DAC specifically offer an essential solution for addressing historical emissions and for sectors where emissions are extremely hard to eliminate at source, such as aviation and agriculture.

Current CDR policies have focused heavily on nature-based solutions as the primary method for removing carbon emissions from the atmosphere. However, not only are there constraints on the land and water needed to deliver these at scale, but nature-based solutions that accumulate carbon, such as forestry, are not permanent and do not sequester carbon indefinitely. For example, trees only absorb carbon as they grow, but once they reach maturity, their carbon uptake slows. In mature forests, the rate of new growth eventually becomes similar to the rate of decomposition, reaching a carbon-neutral state. If these forests are disturbed, through pest outbreaks, fires, floods, or landslides, they can release stored CO_2 suddenly back into the atmosphere, exacerbating climate warming.

This creates a fundamental temporal misalignment:[14] forest sinks are being used as an emissions offset for fossil-fuel CO_2 emissions that remain in the atmosphere for thousands of years. Furthermore, as climate change accelerates, rising temperatures, droughts, increased pestilence and wildfire frequency heighten the risk of forests becoming net carbon emitters rather

than carbon sinks. For example, the IPCC has noted that in the long term, vegetation and soils currently removing carbon risk becoming sources of future emissions.[15]

Investment and innovation in permanent engineered CDR technologies, including DAC, is thus urgently needed, particularly as global efforts to reduce emissions stagnate and fossil-fuel demand continues to rise.[16] This investment should be supported by government policies that create demand for engineered permanent removals, such as requiring even a very small initial proportion of obligations under domestic emissions trading schemes to be met using credits generated from permanent removal technologies.

Critics of CDR and CCS technologies point to their high costs, significant energy requirements, and the risk that carbon capture might be used to justify even greater fossil-fuel consumption. These critiques have merit. However, limiting warming to 2 degrees or less without CCS would require substantial reductions in fossil-fuel consumption, including a near elimination of coal use by 2050 and a 67 to 82 per cent reduction in coal by 2030 in scenarios limiting warming to 1.5 degrees.[17] The IPCC's Sixth Assessment Report indicates that without CCS, coal and gas power plants worldwide would need to retire about 23 years earlier than expected to limit global warming to 1.5 degrees and 17 years earlier than expected to limit global warming to 2 degrees.[18] Given that global demand for both fossil fuels and energy is currently rising rather than falling, the political and economic feasibility of rapid phaseouts is highly questionable, making both CCS technologies and engineered CDR critical components of realistic climate solutions. The IPCC has reinforced this, noting that carbon-dioxide removals are "an essential element of scenarios that limit warming to 1.5 degrees or below 2 degrees … by 2100, regardless of whether global emissions reach near zero, net zero or net negative levels".[19]

While investment in CCS technologies is slowly expanding, these solutions need to be scaled as rapidly as possible. CDR solutions are less developed and require not only investment to drive innovation and reduce costs but also the development of markets and financial mechanisms needed for

deployment (for example risk-transfer mechanisms, insurance, standards and regulations). They also require investment in frontier clean-energy solutions that will power this technology at scale.

Finally, government support for these technologies would have the additional benefit of shifting the incentives for deepening the deployment of renewable energy, particularly in developing economies. At the moment, rejecting renewable options in the pursuit of fossil-fuel generation comes with little consequence. A focus on DAC would not only drive innovation in this technology but would have the added benefit of highlighting to developed countries the true costs – and savings – associated with supporting renewable-energy deployment in other jurisdictions. Compared with the costs of DAC to remove emissions in the future, the deployment of renewables in developing economies in the short term may be the more economical choice.

2. Harnessing the Power of Technology, Including AI

Governments need to prioritise the deployment of new technologies, including AI, to streamline and speed up both climate mitigation and adaptation. Technological innovations must be urgently integrated into climate policy, allowing them to drive progress across the value chain and translate into real-world impacts, including a reduction in emissions.

The use of AI will lead to better climate modelling, infrastructure deployment (including grid design and improved resilience), energy-cost optimisation and innovation for decarbonisation. For instance, end-to-end integration of AI into the energy system offers significant opportunities for delivering clean power more quickly and at lower cost. This could involve utilising AI to more effectively identify sites and prioritise connections, and to accelerate permitting procedures to reduce the time it takes to identify and permit new sites.

Similarly, AI and other frontier technologies are revolutionising energy efficiency, important not only for its potential to reduce emissions (the IEA estimates that doubling energy efficiency could provide larger emissions

reductions by 2030 than any other intervention[20]) but also for its role in enhancing energy security and affordability. For example, buildings typically waste a significant proportion of the energy they demand. AI-powered building-management systems can continuously optimise heating, cooling and lighting in real time, reducing energy consumption by up to 30 per cent.[21] Such savings are supported by the use of next-generation building materials, including "super-cool" and smart materials, which enable dramatic efficiency improvements in both new building and retrofits.[22,23] In manufacturing, digital twins can create virtual replicas of production processes, allowing the identification and elimination of energy waste without disrupting operations.[24]

Integrating AI into energy-system operations could improve weather forecasting, optimise grid operations, enhance energy-storage management and improve demand-response mechanisms. These improvements would in turn make energy systems more efficient and lower cost, helping to address the challenges of integrating intermittent and decentralised renewable sources efficiently. Smart-grid technologies leverage machine learning to balance electricity supply and demand precisely, reducing transmission losses and integrating intermittent renewable sources more effectively. Meanwhile, new thermal-energy-storage solutions are enabling buildings and industrial facilities to shift energy demand to times when renewable generation is abundant.

In transportation, solid-state batteries promise to extend electric vehicle (EV) ranges while reducing charging times and improving safety. Furthermore, EVs can serve as distributed energy storage, stabilising grids and maximising renewable integration. For transport modes where conventional batteries are insufficient, new fuel-cell technologies offer viable solutions including for heavy transport like shipping and aviation.[25] Advanced lightweight composites and aerodynamic designs are also drastically reducing energy requirements across all transport modes.[26]

Satellite and remote-sensing technologies also offer a wealth of applications to assist in addressing climate change. For example, satellites have revolutionised the detection of methane leaks by enabling global,

continuous monitoring of emissions that were previously difficult to identify. Advanced sensors aboard satellites can detect methane's unique "spectral signature", pinpointing leaks with increasing precision including at the facility level.[27] This remote-sensing capability is particularly crucial because methane is a substantially more potent greenhouse gas than CO_2, with more than 80 times the warming power of CO_2 during its first 20 years in the atmosphere.[28,29]

Companies and regulatory agencies now use satellite data to create time-series analyses that show emission patterns, helping prioritise maintenance and repairs where leaks are most severe. The technology also provides accountability by making emissions data more transparent and accessible, encouraging industry to address these highly damaging emissions promptly. Fixing identified leaks also makes strong business sense, as methane is the primary component of natural gas – a commodity that companies would rather sell than lose to the atmosphere. Many companies find that leak-detection and repair programmes quickly pay for themselves through recovered product, making satellite monitoring a win-win solution for both corporate bottom lines and climate protection. As satellite resolution and methane-detecting capabilities continue to improve, this technology promises to be a critical tool in reducing potent greenhouse gas emissions across multiple sectors, delivering outsized climate benefits compared to equivalent reductions in carbon dioxide.

These technological innovations collectively address critical opportunities for climate action. However, government efforts are needed in order to capitalise on their full potential. A number of these technologies have existed for half a decade or more – yet there are many circumstances in which they have not been adopted. Policies are needed to change the incentives to implement these solutions, and to align institutions, markets and systems that are not currently delivering and deploying the full potential of many technologies at the speed required. Bureaucratic inertia, risk aversion, political concerns and outdated financial models create bottlenecks that delay essential investments and innovation. Global

institutions remain slow-moving, reluctant to adapt investment strategies or invest in new solutions at the scale and urgency needed for a climate-resilient future, or to accept the risks that faster action will inevitably bring.

3. Investing in Breakthrough and Frontier Energy Solutions

In addition to deploying existing renewables, we need to invest in frontier and breakthrough energy solutions and accelerate their deployment – particularly in developing countries. These new solutions, together with traditional renewable sources, have the potential to ensure that all new energy generation is zero carbon. Investment is needed to deliver fusion energy, new nuclear and enhanced geothermal solutions, and space-based solar generation.

Energy has always driven human progress, and the future of global health, security and prosperity depends on reliable access to clean, affordable energy. As highlighted above, energy demand in developing countries is only growing, and consumption in all countries will be accelerated by the growing needs of AI, data centres and compute capacity. The IEA projects that global energy demand from data centres could double by 2026, with some estimates suggesting they may account for 4.5 per cent of total energy consumption by 2030.

As such, we need new zero-emissions energy solutions that, together with traditional renewable solutions, can provide reliable, abundant and uninterrupted access to power. Both will require advanced infrastructure such as long-distance inter-connectors that are capable of shifting energy where it is needed most. While at different stages of development, solutions such as geothermal energy, small modular reactors (SMRs), fusion energy and long-duration battery storage each have the potential to complement existing solar and wind infrastructure while addressing intermittency challenges.

Large-scale AI companies are pouring vast sums of money into these next-generation energy solutions as they look to power the data centres of the future. However, accelerating the development – and deployment – of these energy solutions also requires leaders to take proactive steps. This includes increasing public investment in research, development and technology demonstration, closing the gap between early-stage innovation and commercial-scale viability, and introducing financial incentives – such as tax credits, loan guarantees and direct subsidies – to encourage private-sector participation. Regulatory modernisation is also essential to streamline approval and permitting processes, particularly for nuclear and geothermal projects, where lengthy bureaucratic delays have historically hindered progress. In parallel, strategic international cooperation can facilitate knowledge-sharing, drive down costs and build public confidence in emerging energy technologies. Stronger carbon-pricing mechanisms and government procurement policies can further incentivise investment in new solutions for zero-emissions energy, ensuring that these are brought to market at the scale and pace required to meet growing global energy needs.

However, while AI and clean-energy solutions will drive transformative change, including meeting much of rising energy demand, simply adding clean-energy generation has not displaced the fossil-fuel-driven generation responsible for ongoing emissions, at least not at the pace that is required to limit temperature rise. New energy solutions are thus only part of the answer. We must also tackle current emissions to curb rising temperatures.

4. Scaling Nature-Based Solutions

As well as new technological solutions, some of the best near-term returns on investment will be through nature-based solutions that will need support to accelerate. These are especially important to “buy time” for both decarbonisation and for engineered CDR technologies to be scaled and deployed.

As noted in the discussion on engineered removals, the impermanence of many nature-based solutions reinforces the need for a focus on engineered CDR technologies including DAC, despite these being contentious. However, despite its impermanence, what nature-based solutions do offer is significant near-term potential at a relatively low cost. The IPCC has estimated that forests and other managed ecosystems can provide 20 to 30 per cent of the global mitigation needed to limit temperature rise to 2 degrees, although this is not sufficient to compensate for delayed reductions in emissions in other sectors. The protection, improved management and restoration of forests, peatlands, coastal wetlands, savannas and grasslands has significant potential that technological solutions can accelerate and advance.

Solutions here should include:

- Expanding bio-engineered carbon-sequestering crops to enhance soil and forest carbon storage. For example, DNA editing allows crops to sequester more CO_2 and store it more durably,[30] including creating new crop varieties that photosynthesise more efficiently and funnel more carbon into the soil.[31] Similar approaches are also being explored with bio-engineered trees designed to accumulate more biomass and absorb more carbon.[32] Policy should help to accelerate these solutions.
- Scaling agroecological and regenerative-agriculture practices. Practices like cover cropping and reduced tillage can increase soil organic matter and carbon storage. These practices require few inputs so are relatively low cost and can be adopted easily, having an immediate impact on emissions.
- Utilising smart or precision agriculture, including using internet-of-things sensor networks and machine-learning algorithms to optimise fertiliser application, reducing nitrogen emissions while improving crop yields. These systems can reduce fertiliser use by up to 30 per cent while maintaining or increasing production, directly cutting agriculture's substantial nitrous-oxide emissions.
- Enhancing coastal "blue carbon" solutions, which collectively represent some of the most efficient carbon sinks on the planet. These ecosystems grow faster than terrestrial forests, meaning that they can absorb CO_2

from the atmosphere at a faster pace.[33] For example, mangrove forests sequester carbon up to four times faster than tropical rainforests and store up to ten times more carbon per equivalent area than traditional land-based forests.[34] They also provide critical coastal protection against storms and erosion while supporting marine biodiversity. Similarly, seagrass meadows capture carbon 35 times faster than tropical rainforests and can store carbon for millennia in their sediments. Though they cover less than 0.2 per cent of the ocean floor, they store approximately 10 per cent of the ocean's carbon.

The underlying infrastructure to support these nature-based solutions will also be enhanced by a range of technologies, including, for example:

- AI and drone-powered reforestation.
- Underwater drones/robots for seagrass and mangrove seeding, with autonomous vehicles capable of planting thousands of seedlings per day.
- Advanced monitoring systems for tracking blue carbon ecosystem health and sequestration rates.
- Novel restoration techniques including lab-cultured coral fragments for reef rehabilitation.
- AI and satellites to assess baselines and provide monitoring, reporting and verification.

5. Adapting to What Is Coming

In addition to the above solutions, we also need a renewed focus on adaptation. Under any future scenario, adaptation will become vital to managing future environmental, economic and migration shocks. Each country will need to invest to upgrade and modernise its flood defences, urban cooling, fire identification systems and so on, as well as determine how to fund action both pre- and post-event. Without investment in resilience, climate risks could impose steep economic costs, with studies showing that every $1 invested in adaptation can yield $4 to $10 in avoided losses. Failing to act could result in GDP losses of up to 18 per cent by 2050,

making adaptation an essential economic strategy that must be embedded into national planning, financial decision-making and investment frameworks.

Technological solutions in both disaster prediction and risk reduction, and in climate resilience and adaptation, will be critical to efforts here, including the contribution of AI. For instance, AI-powered systems can model climate-risk scenarios, optimise resource allocation and support more effective disaster response, enabling faster and better-informed decision-making. Digital tools such as geospatial mapping, IoT-enabled monitoring and predictive analytics allow governments to better quantify climate threats and direct funding towards high-impact adaptation measures. These kinds of technologies are essential in helping governments and businesses anticipate risks and develop data-driven, cost-effective resilience strategies – and will require well-structured financial markets and targeted policies to help them scale.

However, adaptation is not just a national issue. Climate risks cut across borders, creating global economic interdependencies that demand coordinated international action. The creation of new insurance products and risk-sharing mechanisms will be essential to managing climate risks that affect multiple industries and nations. At the same time, the deployment of innovative financing models – such as resilience bonds, blended finance and sovereign risk pools – must be accelerated to ensure adaptation efforts receive adequate funding without placing excessive strain on public budgets. Countries that take the lead in climate-adaptation finance and risk-management solutions will be well-positioned to shape emerging markets for climate resilience.

6. Simplifying Global Efforts to Deliver Collective Action

The current process for harnessing global cooperation, centred around the UNFCCC and the COP process, is not delivering progress fast enough. Leaders need a laser focus on the key issues driving growing emissions,

rather than the current slow-moving negotiation system, which is characterised by fragmentation across a plethora of initiatives, platforms, commitments and actions. However, international cooperation is still vital.

This is especially true given the significant role of China, India and a handful of other key economies where emissions are rising and are expected to continue increasing. The world cannot meet its climate targets without action from these nations.

For example, China is the world's largest carbon emitter and continues to invest in new coal-fired power generation. At the same time, it is also the leading producer of renewable energy and dominates many clean-technology markets, capturing the majority of economic benefits from sectors such as solar, batteries and EVs. Similarly, India's emissions are growing rapidly as the country industrialises, making its clean-energy transition critical for global decarbonisation efforts.

The world needs a new approach to multilateralism that either sits beside or replaces the UNFCCC/COP process, and China and India need to be the focus of this approach – not only because of their role in emissions both now and in the future, but also because they will drive many of the technological solutions that can solve the climate crisis.

The solution thus may lie in smaller plurilateral groups, co-designed with China and India at their heart. Leaders should look to convene smaller groups to agree a handful of priority actions, targeted at the key sources of emissions. For example:

- Coal phase-out: Developing economies need finance and aid to replace coal generation while richer economies need a blueprint to self-manage the phase-out of coal at home.
- Industrial change: A significant proportion of emissions come from state-owned oil and gas producers. Targeted policy interventions and financial support are needed to reduce production over time, and to support economies to transition away from the revenue and growth these firms currently contribute.

- Capital-market reforms: Cooperative approaches are needed for capital-market reforms targeted at transitioning private investment away from key emissions sources.

The future might see more progress in these smaller plurilateral groups that commit to funding high-impact climate action in exchange for significantly enhanced trade or supply-chain access (for instance in critical minerals), access to new technology, and geopolitical alliances (for example, sharing progress on fusion developments while committing to removing coal from national energy systems).

Given the recent upending of global trade, these plurilateral groups have the potential to capitalise on the current opportunity to align the trade system with climate action. For example, a coalition of like-minded progressive countries with shared interests in retaining key trading partners and markets represents a generational opportunity to realign trade and decarbonisation objectives. Such alliances would also create incentives and opportunities for the greater deployment of technologies that can assist with the climate challenge.

A SHIFT TO TARGETING THE GREATEST IMPACT

Underpinning positive disruption in global cooperation is a shift away from a sole focus on domestic decarbonisation, particularly in developed economies where decarbonisation is already well progressed. While high-income countries must continue working to reduce their emissions, a key challenge lies in supporting the transition to cleaner energy systems in low- and middle-income countries. Actions to enable this include creating both global and national markets that facilitate the development of clean-energy projects, incentivising investment and catalysing flows of private capital; fully utilising international carbon markets; accelerating technology; and restructuring international financial and governance frameworks to address rising emissions among developing countries.

As part of these solutions, high-income countries should include, as part of plans to meet their own climate targets, a commitment to meet a portion of their own climate targets through investment in decarbonisation in low- and

middle-income regions. The use of Article 6, the global mechanism that allows countries to trade emissions reductions to meet climate targets, can play a key role in these investment commitments, allowing countries to drive global decarbonisation in a way that fosters sustainable development and secures the greatest reduction in global emissions as quickly as possible.

7. Rethinking the Role of Finance, Including Philanthropy

Underpinning all of these solutions is the need for new forms of finance that can unlock trillions of dollars in investments in technological innovation and deployment, sustainable development, and climate adaptation. However, despite the urgency, current financial flows remain significantly misaligned with climate priorities, with high-impact and potentially cost-effective interventions receiving insufficient funding.

Mitigating emissions – and preventing future emissions growth – in developing economies has been largely reliant on either aid funding or "blended finance" approaches which rely on public funding to attract private investment. However, confidence in both of these mechanisms is rapidly eroding, and growing emissions figures highlight the failure of either to deliver at the scale provided. There are currently significant cuts in the aid budgets of developed countries and scepticism about the impact of blended finance in developing economies, given the failure to deliver investment at the scale promised and at terms populations can afford.

As such, new approaches are needed to support necessary investments to accelerate action. Solutions include:

- Harnessing the power of philanthropic funding to supercharge the technology solutions that will assist in the climate challenge.
- Optimising international carbon markets by addressing demand and supply-side barriers, to channel more finance to the Global South from the Global North.
- Implementing innovative ways to finance nature-based solutions.

At a time when governments are prioritising defence spending, targeted philanthropic funding represents a critical opportunity to advance frontier climate technologies that would otherwise struggle to secure early-stage capital. Unlike traditional investment, philanthropy can tolerate higher risks and longer time horizons, making it uniquely positioned to support new climate solutions during their pre-commercial phases. Climate-focused philanthropic capital should thus strategically target innovation gaps by funding high-risk research and development, supporting demonstration projects, and facilitating market-entry for emerging technologies that are assessed as holding the most potential to reduce emissions or extract carbon from the atmosphere.

One good example of the power of philanthropic investment is the Bill & Melinda Gates Foundation's investment in mRNA vaccine technology – years before the Covid-19 pandemic. Their early funding helped establish the foundational platform that enabled the unprecedented rapid development and deployment of Covid-19 vaccines when urgently needed, demonstrating how philanthropic capital can create technological readiness for critical global challenges.

A similar focus on climate solutions could now accelerate the further innovation DAC, as well as other critical technologies like long-duration energy storage, green hydrogen applications and advanced geothermal systems – all essential components of a net-zero transition that remain too costly or unproven for mainstream investment.

In the climate sector, Form Energy provides a further illustration of how philanthropy-backed investment can advance frontier decarbonisation technologies.[35] The company, which develops ultra-low-cost, long-duration energy storage using iron-air battery technology, received early-stage funding from Breakthrough Energy Ventures. This early support enabled Form Energy to pursue an innovative approach to grid-scale storage that can deliver electricity for 100+ hours at system costs competitive with conventional power plants, thus addressing a critical barrier to renewable energy integration.[36] Traditional financial-market mechanisms had failed to solve this issue, as conventional investors were reluctant to fund the extended R&D phase needed to commercialise novel battery chemistry. By

2023, following this philanthropy-backed development period, Form Energy had secured major utility deployment agreements and substantial follow-on investment, demonstrating how strategic philanthropic capital can de-risk promising climate technologies and accelerate their path to commercial viability. A similar approach could now accelerate development of critical technologies like DAC, driving the innovation and cost reductions that could make this solution truly transformative.

Optimising international carbon markets represents another promising avenue for redirecting financial flows towards climate priorities. Current carbon markets face significant challenges that limit their effectiveness in channelling finance from the Global North to the Global South. On the demand side, fragmented standards, concerns about additionality and lack of transparency have undermined buyer confidence. Supply-side barriers include high transaction costs, complex verification processes, and limited capacity in developing countries to develop and implement high-quality carbon projects.

However, addressing these barriers could unlock substantial new finance for emission-reduction projects in developing countries. Integrating carbon markets with national climate policies and national climate targets under the Paris Agreement would further strengthen their legitimacy and effectiveness. Recent initiatives to develop global implementation frameworks through Article 6, the Paris Agreement article that sets out carbon-market trading, demonstrate growing momentum to overcome these barriers and establish robust international carbon-market mechanisms that could mobilise billions in investment for developing countries while bringing down the costs of emissions reductions globally.

Novel solutions should also be used to channel finance into nature-based climate action. For example, the Tony Blair Institute is currently exploring an end-to-end solution that uses technology to create trust and enable the commodification and preservation of the world's forests. The solution, CanopyX, aims to assist in the protection of forests – which currently store around 15.6 billion tonnes of CO_2 per year[37] – by incentivising finance flows to countries with forests through new market mechanisms. CanopyX

capitalises on new technologies, such as improved satellite technology and AI, to establish robust baselines and projections of growth under different scenarios, and new financial assets such as digital tokens, distributed ledger technologies and smart contracts to allow trading of forest assets, including transactions based on their real-time status, thus creating new revenue streams for countries, and new incentives for enhancing existing forests. CanopyX then aims to link these transactions to country-level digital inventories, allowing the potential of corresponding adjustments of country-level target accounting to occur as transactions are executed. The combination of these technologies can help overcome the current challenges that can prevent finance flows to preserve forests, including poor transparency and monitoring, reporting and verification (MRV), and issues around double counting and double claiming.

08

Advancing High-Risk, High-Impact Solutions

In the most extreme case, in which we fail to make significant progress on decarbonisation, the world may need to seriously consider solar radiation management (SRM), a technology generally considered a last resort for addressing global warming. One of the most radical and controversial forms of disruption, SRM involves the direct manipulation of the Earth's climate system to counteract global warming through techniques aiming to reflect sunlight away or limit the radiation that reaches the Earth. While highly controversial, such technologies may become necessary if mitigation efforts fail to prevent catastrophic climate shifts.

The range of impacts of solutions like SRM is currently highly uncertain. Furthermore, while these technologies could provide temporary relief by slowing temperature rises, they are not a permanent solution, and would need to be implemented alongside significant reductions in emissions or DAC at scale to address the root causes of warming. Together, these approaches represent the most extreme of bold and disruptive strategies that, if governed wisely, may be needed to supplement traditional mitigation efforts and accelerate global climate action.

Because the impacts of SRM are likely to be global and unequally felt, the world needs a robust governance framework to ensure its equitable and ethical use. This framework could mirror past efforts at limiting the proliferation of nuclear weapons.

There is currently significant risk that a single country could move ahead unilaterally with this technology at scale, resulting in extreme weather effects that transcend national borders. As such, political leaders globally should progress with urgency a governance framework. The potential for unintended consequences such as regional climate disruptions or unforeseen ecological impacts, including risks from sudden temperature rise

on the ceasing of SRM activities, underscores the importance of international cooperation and oversight, and makes this intervention the most disruptive of technological options.

As such, this solution requires, in the near term:

- Robust international governance to prevent unilateral action by individual nations.
- Ethical and scientific research and oversight to understand and minimise unintended consequences.
- Integration with emissions-reduction strategies to ensure that as they develop, high-risk solutions remain a complement to rather than a replacement for decarbonisation efforts. Marginalising these solutions raises the risks that may occur if these solutions are used in unilateral action.

09

Conclusion

The profile of current emissions, and the forecast demand for products and services that produce emissions, shows that without a fundamental change in our approach, we don't have a chance of limiting temperature rise to 1.5 degrees. In order to meet the climate challenge, we need positive disruption that harnesses new technological solutions, together with the financial mechanisms and global cooperation that will enable change.

The path of positive disruption is not without its challenges. Innovations such as fusion energy or direct air capture may hold transformative potential, with the power to reshape global energy systems, redefine economic structures and foster unprecedented international collaboration. However, these advancements require substantial financial investment, cross-border cooperation, and careful oversight and governance to ensure equitable implementation and reduce unforeseen consequences. And perhaps more than anything, the path of positive disruption demands bold and pragmatic political leadership at a time when traditional constituencies are fragmenting. This leadership must be focused on the policies that will deliver the impact needed and accompanied by a pragmatic approach that avoids reverting to the activism and moral drivers of climate action in the past.

However, this path also offers immense opportunities. By embracing innovation, humanity can create new industries and new sources of economic value while building resilience against future disruptions – delivering on the optimism of earlier eras. Positive disruption fosters hope, empowering communities to envision and work towards a more sustainable and equitable world.

The climate paradox presents global leaders with a stark choice: allow climate disruption to dictate our future and open the door to the most extreme of solutions, or embrace transformative positive disruption that accelerates decarbonisation and restores optimism.

The decisions made today will determine whether disruption leads to collapse or to a thriving, sustainable world.

Leaders must prioritise bold, systemic change – balancing near-term solutions with long-term innovation – to ensure the Apathy Era becomes the Progress Era. By embracing the path of positive disruption and the potential of new technology, leaders can turn the climate crisis into an opportunity to build a sustainable, resilient and thriving world.

Endnotes

1 https://library.wmo.int/records/item/69455-state-of-the-global-climate-2024

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