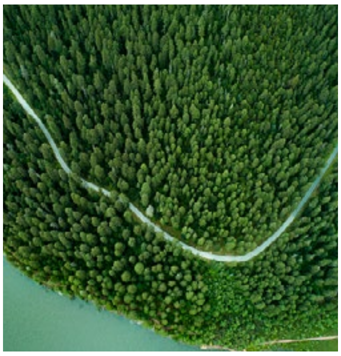
COP26 and the energy transition
Grasping opportunity from grim reality

The global drive to transition to zero-emissions energy is at the heart of tackling climate change. We assess the tough choices dominating the COP agenda

The numbers are sobering. The 2018 Special Report on Global Warming of 1.5 °C by the Intergovernmental Panel on Climate Change (the IPCC 1.5°C Report) considered the Paris Agreement's core target of limiting global temperature increase above pre-industrial levels to 1.5°C, concluding:

- the 1.5°C warming limit can be met if net zero CO_2 emissions and declining non-CO_2 greenhouse gases are achieved by 2050 (Net Zero by 2050);
- this requires "rapid and far-reaching transitions in energy, land, urban and infrastructure..., and industrial systems";
- that "exposure to multiple and compound climate-related risks is projected to increase between 1.5°C and 2°C of global warming with greater proportions of people both exposed and susceptible to poverty in Africa and Asia"; and
- meeting Net Zero by 2050 is feasible but immensely challenging.



Global warming above 1.5°C – A grim forecast

Consensus scientific predictions are increasing pressure on governments and businesses for a Net Zero by 2050 energy transition. The IPCC 1.5°C Report considered how risk levels changed with rising temperatures. These examples of their high and medium confidence predictions provide a flavour:

- the likelihood of an Arctic Ocean free of sea ice in summer would be a once-per-century event with global warming of 1.5°C, compared with a roughly once-per-decade event with a 2°C increase;
- the percentage of species' extinction within insects, vertebrates and plants doubles or triples with 2°C warming compared to 1.5°C;
- coral reefs would decline 70-90% with warming of 1.5°C, whereas virtually all (more than 99%) would be lost with a 2°C rise.

Existing impacts – The evidence mounts

The first instalment of the IPCC's Sixth Assessment Report (AR6) (IPCC AR6) published in August 2021 provides another troubling perspective. Its assessments include:

- there has already been 1.1°C of global warming since 1850-1900;
- 1.5°C of global warming could be reached as soon as 2040;
- CO_2 concentrations are now higher than at any time in at least 2 million years.

The report, moreover, found strong evidence of serious negative impacts of climate change from the existing 1.1°C of global warming, including:

- late summer Arctic sea ice area being now smaller than at any time in at least 1,000 years;
- mean sea level has risen faster since 1900 than over any preceding century in at least 3,000 years;
- human-caused CO_2 emissions are the main driver of current global acidification of the surface open ocean;
- hot extremes and heavy rain events have become more frequent and more intense across most regions since 1950.

Net Zero by 2050 – The challenge for the energy sector

Comprising 76% of the world's human-caused greenhouse gas emissions, the energy sector towers over all others in its importance to achieving Net Zero by 2050. The base assumption in meeting this milestone must be that the energy sector does too. This is the basis of the International Energy Agency (IEA) 'net zero emissions by 2050 scenario' (IEA NZ 2050 Scenario) in its May 2021 report.

The challenging context for the energy sector to achieve Net Zero by 2050 includes meeting enormous extra demand pressure over the next 30 years. Key forecasts include:

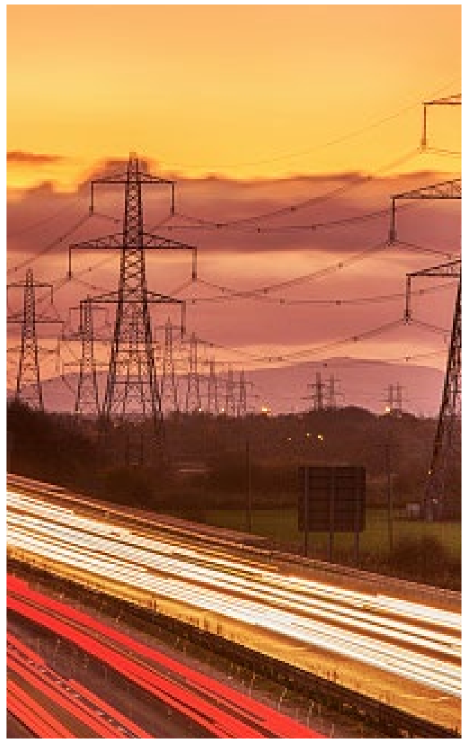
- as of 2019, 770 million people still have no access to electricity;
- the world's population is projected to grow by 750 million by 2030 and nearly 2 billion by 2050, and nearly all the increase is expected in emerging market and developing economies where demand for energy is increasing;
- by 2030 the world's economy is due to be around 45% larger than in 2020 and by 2050 more than twice the size;

Added to which the report makes clear that currently proposed climate action falls far short of tackling rising temperatures. According to the IEA, even if all pre-COP26 governmental commitments were successfully met, Net Zero by 2050 would be missed and the trend would be consistent with a rise of 2.1°C.

Net Zero by 2050 – What it means for the energy transition

A global energy transition of transformational scale in how we produce, transport and consume energy will be necessary to meet Net Zero by 2050, including (under most scenarios):

- **energy efficiency** – energy use must be *lower* in 2050 than now with sustained efficiency improvements to more than offset extra demand. For example, the IEA NZ 2050 Scenario assumes global energy use in 2050 at 8% lower than now;
- **electrification** – replacement of direct fossil fuel use with low-emissions electricity in transport, industry and other sectors. For example, the IEA NZ 2050 Scenario assumes global electricity demand more than doubles between 2020 and 2050 and accounts for almost 50% of total energy consumption;
- **renewables** – a rapid switch from fossil fuel to renewables generation as well as direct use renewables such as biofuels and solar thermal. For example, the IEA NZ 2050 Scenario assumes renewables share of generation increases from 29% in 2020 to 88% of a much higher total;
- **nuclear** – a key role for nuclear generation to add large-scale, small carbon footprint power. The IEA NZ 2050 Scenario assumes energy supply from nuclear nearly doubles between 2020 and 2050;
- **hydrogen** – converting current fossil fuel use to low-emission hydrogen particularly in industry, shipping and fuel cell vehicles and mixed with natural gas for end user distribution. It can also be used to balance supply issues caused by renewables intermittency and to allow nuclear to flex its contribution to the grid;
- **carbon capture, utilisation and storage (CCUS)** – by enabling continued use of some existing fossil fuel assets, including many built recently in emerging and developing economies, CCUS should mitigate stranded assets and provide a more cost-effective path to rapidly scale up low-emission hydrogen;
- **technological advances** – initially the transition can occur via the accelerated rollout of existing technology. Beyond 2030 we need rapid clean energy innovation and deployment, for example, for batteries, hydrogen electrolysers and direct air capture and storage.



COP26
What should we expect for the energy transition?

The IPCC 1.5°C Report was clear that "pathways consistent with 1.5°C of warming above pre-industrial levels can be identified under a range of assumptions" before noting "lack of global cooperation [and] lack of governance" as among the "key impediments" to the goal. COP26 is the latest in the series of UN-backed forums making increasingly urgent attempts to remove these obstacles. So what can we expect?

Crucially, COP26 is the first conference to discuss the new and/or updated Nationally Determined Contributions (NDCs), the binding, five-year action plans to tackle climate change that states make under the Paris Agreement. NDCs are integral to achieving the aims of the accord. However, as COP26 President Alok Sharma noted in his official statement, "countries' 2030 emissions targets…are nowhere near enough to keep global warming below 2C, let alone the 1.5C needed to avoid the most disastrous effects of climate change".

COP26 therefore provides a key moment to pressure any countries that have not yet submitted new or updated NDCs or have not committed to sufficiently ambitious targets.

COP26 is also an opportunity to agree more widespread implementation of robust carbon reporting regimes and the adoption of stricter national legislation. In particular, there is the chance to achieve further substantive agreements finalising the rulebook that sets out detailed implementation of Paris Agreement goals. Key issues include clarifications on the workings of NDCs, particularly around the timeframes the commitments should cover, and reporting and transparency obligations involved.

We also expect talks on the structure of the international carbon market. This involves thorny technical issues such as price variations between different mechanisms, eliminating double-counting of emission reductions, distribution of emission trading proceeds and transferability of carbon credits. Underlying such dense topics, remains the controversial question of the extent to which highly industrialised nations should compensate less economically developed equivalents for their vast historic contribution to climate change.

Climate finance could also be in the spotlight and we hope discussions will advance development of a common regime for climate-related disclosures and a core framework to measure and manage climate-related financial risks. Last, but not least, the reliance on so-called Nature-based Solutions (NbS) may be considered, potentially giving a further push to efforts to establish a credible global framework and marketplace for NbS credits. Such projects typically aim to address climate change by working with the grain of ecosystems, while the resulting NbS credits produced are touted as a practical means for high-emitting firms to buy offsets.

As Valérie Masson-Delmotte, co-chair of the working group that authored IPCC AR6, said: "The good news is that some of the kinds of actions that would be needed to limit global warming to 1.5°C are already underway around the world, but they would need to accelerate."

COP26 is a crucial opportunity to do this. Policymakers have had some success undermining investor confidence in greenfield fossil fuel projects. They have, however, been much less successful at offering the crucial mix of incentives and certainty to entice investors to back the zero-emissions alternatives required to ensure energy security.

These are difficult issues but enormous progress has been made. COP26 now offers a chance for politicians to commit to concrete steps that will provide the investment framework that moves us from energy limbo to energy transition.

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