



Climate Change

Climate change is a subject that is high on most people's agenda and we are no different. Over the past year we've written a variety of blogs on the issues.

Climate change mitigation



Image by [Gerd Altmann](#) from [Pixabay](#)

The IPCC Working Group 3 report, published in June 2022, is a definitive base case analysis of the position on climate change. It makes a clarion call for action NOW to reduce emissions:

“Without a strengthening of policies beyond those that are implemented by the end of 2020, GHG emissions are projected to rise beyond 2025, leading to a median global warming” (Para C1)

“Deep GHG emissions reductions by 2030 and 2040, particularly reductions of methane emissions, lower peak warming, reduce the likelihood of overshooting warming limits and lead to less reliance on net negative CO₂”.

(Para C2)

“All global modelled pathways that limit warming to 1.5°C (>50%) with no or limited overshoot, and those that limit warming to 2°C (>67%), involve rapid and deep and in most cases immediate GHG emission reductions in all sectors.

(Para C3 – our emphasis).



But it also takes a positive view that these actions are possible, addressing particular sectors where reductions are important: the industrial sector (para C5), urban areas (para C6), buildings (para C7). It also identifies carbon dioxide removal as “unavoidable” (para C11).

A vital final message is contained in paragraph C12:

“The global economic benefit of limiting warming to 2°C is reported to exceed the cost of mitigation in most of the assessed literature.”

Respondents to the World Economic Forum Global Risk Survey identified “climate action failure” as the risk with potential to inflict the most damage at a global scale over the next decade.

Climate-vulnerable countries said disasters and weather patterns driven by global warming have wiped out around a fifth of their economic growth according to research, by a consortium of 55 developing nations across Africa, Asia, the Americas and the Pacific.

Unfortunately progress is patchy:

- No new pledges have been forthcoming since COP26, despite what was agreed
- The Bonn conference “ended in acrimony over compensation”.
- In a significant U-turn BlackRock, which had been at the forefront of the push to focus on ESG investing, is shying away from green activism. BlackRock will vote against most shareholder resolutions on climate change this year as they are too extreme.
- The Bank of England says that UK banks and insurers have made progress but still need to do much more to understand and manage their exposure to climate risks.
- Global CO₂ emissions in 2021 were only 1% less than the record levels of 2019, driven by increases in power- and industry-related emissions from China and India and a return of the carbon intensity of electricity to pre-pandemic levels, according to a paper in Nature Climate Change.
- Climate Action Tracker suggests that there is a 50% chance that warming associated with our pledges and targets scenario exceeds 2.1°C in 2100.

There are POLITICAL actions that Governments can take:

- Economic instruments have been effective in reducing emissions, complemented by regulatory instruments mainly at the national and also sub-national and regional level (IPPC WG3 report – para C11).



2022 Blogs

- The UK Government announced that it is considering taxing imports from countries that don't match the UK's carbon emissions standards – a measure known as a Carbon Border Adjustment Mechanism (CBAM).
- The government accelerated the introducing of targeted business rates exemptions for eligible plant and machinery used in onsite renewable energy generation and storage, and a 100% relief for eligible low-carbon heat networks with their own rates bill.
- President Biden has triggered the Defense Production Act, a cold war-era law used to compel businesses to ramp up production of certain materials to aid national security, to boost the output of solar panels, building insulation, transformers for power grids and heat pumps, which are used to efficiently heat and cool homes.
- He also provided a two-year exemption to solar panel companies from tariffs on imported parts, easing the flow of technology from China and other countries for use in the US
- New Zealand has unveiled a plan to tax methane emissions from sheep and cattle in a bid to tackle one of the country's biggest sources of greenhouse gases.

But there are suggestions that Governments are not doing enough:

- No new, more ambitious 2030 climate targets have been announced and participation in sectoral initiatives has stalled since COP26 in Glasgow. This goes against the clear agreement of the Glasgow Pact to update national 2030 climate targets in 2022. The world is heading to a warming of 2.4°C with 2030 targets and even higher, 2.7°C, with current policies.
- Three campaign groups – Friends of the Earth, ClientEarth and the Good Law Project – have been given permission to bring a legal challenge in the High Court over the UK Government's Net Zero and Heat and Buildings Strategies on the basis that they do not comply with the Climate Change Act 2008. The case is expected to be heard towards the end of 2022.
- It is alleged that the government knew its policies to reduce greenhouse gas emissions would not add up to meet a key stepping stone on the path to Net Zero but kept it secret,
- The amount of methane leaking from Australian coal mines is twice the official estimates. Australia's new government has pledged to cut emissions faster than its predecessor, but it has not ruled out supporting new coal mines.
- And the Ukraine war has led to several governments re-thinking plans to reduce the use of fossil fuels.

SOCIETY's attitude to reducing emissions is not yet strong enough:

- A little over half of U.S. adults (54%) perceive global climate change as a major threat to the U.S., down from 58% in March 2020.
- The majority of UK households (57%) are not planning to spend anything improving their home's energy efficiency, while those that are will only spend an average of £148.



2022 Blogs

- Just 12% of consumers would replace their current heating system with a heat pump and 60% were unaware of the government's Heat and Building Strategy £5,000 heat pump installation grant.
- People around the world are not very likely to make environmentally-friendly changes that would have the most impact on cutting carbon emissions. Less than half say they are likely to make changes such as eating fewer dairy products (41%), eating less meat (44%), changing their household heating system to a low carbon system (44%), despite these being some of the most effective ways in cutting carbon emissions (IPSOS Mori).

One thing people are prepared to take action on is moving to electric vehicles. For the first time more than half of those surveyed in 18 countries (52%) say they intend to choose either a fully electric, plug-in hybrid or hybrid vehicle. Consumers continue to avoid public transport when they can.

There is a surge in youth climate activism with young people striking from school and taking to the streets or social media to galvanise action against climate injustice. Children's environmental learning, occurs through observation and role modelling family, teachers, peers, admired celebrities or public figures – and being exposed to nature – shapes how children grow up to treat the environment.

TECHNOLOGY can help:

- Renewable energy is already the cheapest power option in most parts of the world today. Prices for renewable energy technologies are dropping rapidly. The cost of electricity from solar power fell by 85 percent between 2010 and 2020. Costs of onshore and offshore wind energy fell by 56 percent and 48 percent respectively.
- Digital technology could deliver one-fifth of the emission cuts needed to hit net-zero by 2050. Digital twins, AI, IoT, drones and automation can all help
- Carbon capture, use, and storage technologies can capture more than 90 percent of carbon dioxide (CO₂) emissions from power plants and industrial facilities. Twenty-six commercial-scale carbon capture projects are operating around the world with 21 more in early development and 13 in advanced development reaching front end engineering design (FEED). Carbon capture can achieve 14 percent of the global greenhouse gas emissions reductions needed by 2050 and is viewed as the only practical way to achieve deep decarbonization in the industrial sector.

Climate futures remain one of the most critical yet uncertain issues affecting the world. Probable outcomes range from:

- Controlled: an increase in temperature between now and the end of the century of no more than 1.5°C. Current estimates are that this is at the optimistic end of possibility, and it therefore forms a good extreme for this



axis. Extreme weather events would be only slightly worse than they are today.

- Runaway: an increase in temperature between now and the end of the century of up to or more than 4°C. Currently, this is the average worst case of the Intergovernmental Panel on Climate Change (the A1FI scenario, which gives a range of +2.4°C to +6.4°C). This would lead to dramatic environmental change where irreversible tipping points are passed.

Written by Huw Williams, SAMI Principal , published 24 June 2022



Looking to the future of ESG



Image by Gerd Altmann from Pixabay

The Natural Resources Forum, which is chaired by Director and Fellow Jonathan Blanchard Smith, held its third Annual ESG Week recently. ESG stands for Environmental, Social and Governance – the three key issues which have an increasingly greater importance in all aspects of a business' life – whether improving its investment value or ensuring it can attract good candidates into the company.

This year, the Week was extensively futures-focussed. Panels included discussions on decarbonisation, getting to net zero, battery technology, as well as on “The Future of Energy and Mining” and “ESG, Energy Transition and the Long View”.

The future focus this year was interesting and perhaps instructive. Whilst sessions of course covered current issues within ESG, including welcome panels on issues such as diversity and modern slavery, it was clear that new technologies and new approaches were foremost in the minds of attendees.

Some takeaways:

Net Zero is now mainstream. The UK's Net Zero 2050 strategy seems to have been really successful in introducing both the idea of Net Zero, and the target date of 2050. Whilst the strategy itself may be light on detail, it is high in ambition, and by



2022 Blogs

giving both a name and a date, has moved the discussion on from hypothetical “we would like to” conversations to “what do we do by when” ones. There was far more practicality in this year’s discussions than before.

There is real concern about the availability of rare earths – the metals needed to power the transition. This is a market dominated at present by China, which controls up to 80% of the world’s supply – a leadership once owned by America. Whilst the US government has recently begun to take steps to develop its own rare earth resources, and the EU is making steps to compete with China in Africa, it is not just a supply bottleneck that threatens the transition to net zero. We may run out of them entirely. Whilst this is contested, it is clear that both extraction and the 3-Rs (reduce, reuse and recycle) are both going to be vitally important in the future.

Resource nationalism is a growing concern. Russia’s invasion of Ukraine, as well as Covid-related supply chain disruptions, have shown how vulnerable industry is to the easy availability of raw materials – especially hydrocarbons, metals and basic foodstuffs. The development of resource sub-nationalism, where countries demand a greater share of the value of extraction on their land; and resource supra-nationalism, as countries seek to secure greater access to scarce resources, are complicating both politics and industry. In Europe, it is adding to pressures, especially in France and Germany, for the development of strategic autonomy.

Technology – carbon capture, energy storage, hydrogen and decarbonisation – continues to develop at pace. However, **the promise of technology is often stymied** by the time it takes to deploy it at scale, and whilst there are new and innovative approaches, many are still in the development stage. The bargain between a technology that currently exists and – whilst not ideal – at least meets some decarbonisation targets, versus a better technology in the future, seems still in debate, as companies and governments weigh up the benefits of investing now in a technology that can be deployed now, versus investing in new technologies in the hope they will be deployable in the future. There needs to be an increased focus on acting now, even if the technology is not ideal, rather than waiting.

Extractive industries understand ESG because they understand the need for a social licence to operate. Their operations frequently take place in developing countries, but their products are used in the developed world. In a year mercifully absent the egregious examples of ESG failures of the past, the focus is now on ensuring that the values embodied in ESG are fully realised at the point of extraction, not just in the boardroom. There is a problem here – industries based in heavily regulated countries will have good ESG functions – but they have to compete with companies based in less regulated countries, which are able to produce products more cheaply because they are able to get away with working practices that the West would find unacceptable.



And this leads to a problem for the entire industry, one perhaps best summed up as **“No-one loves us and we do care”**. Many extractives companies – certainly those based in the developed world – have excellent ESG programmes, but continue to suffer from being considered as dirty and exploitative. Demonstrators picket their offices. Their share prices can be depressed through the actions of activists. Companies can find themselves in newspapers and law courts on a regular basis. But the transition to net zero will not happen without metals, and metals come from the ground. Plastics come from oil. Europe is heated by gas. Companies would like to be recognised for the part they play, and for the efforts they are making.

Understanding the importance of the extractives industries, solving the issues of supply whilst avoiding resource nationalism, developing technologies both for the now and the future: just a flavour of the issues that the extractives industries will have to address now and into the future.

Written by Jonathan Blanchard Smith, SAMI Fellow and Director, published 21 Oct 2022



Introducing the Sustainability Innovation Pathway Framework

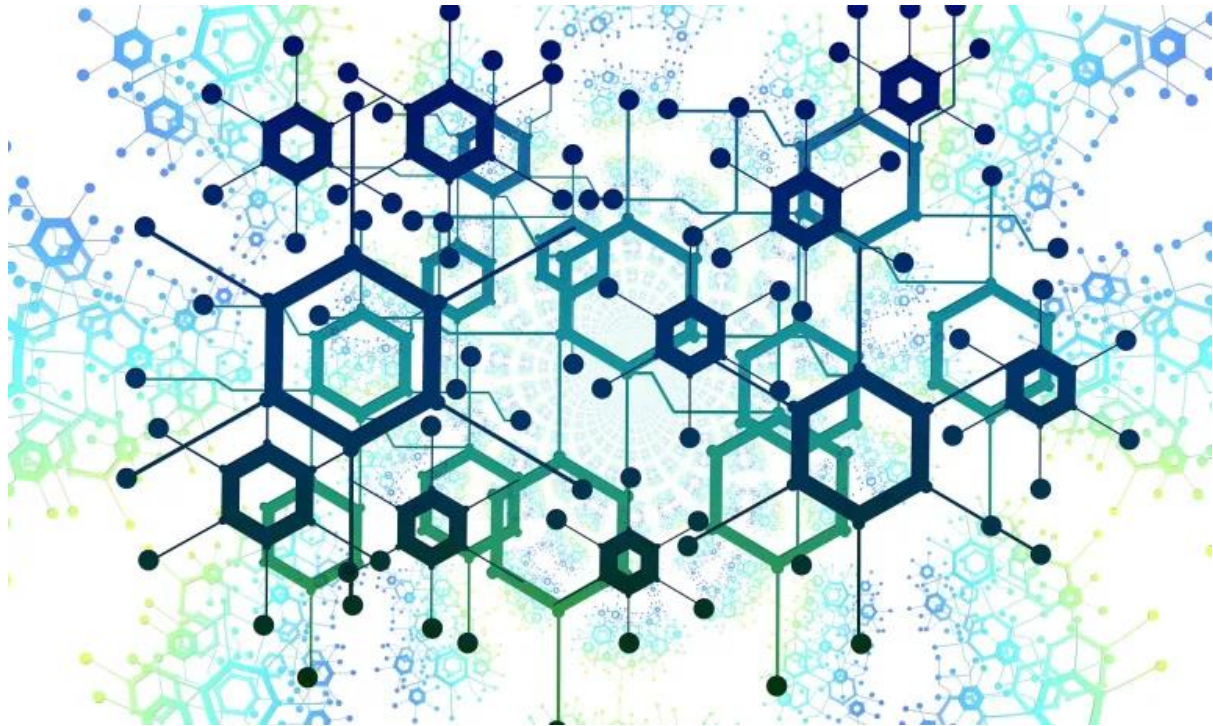


Image by Gerd Altmann from Pixabay

Those of you who get our monthly newsletter, “Foresight and Strategy”, will have seen our announcement of the launch of our Sustainability Innovation Pathway Framework. This week’s blog is more about the Framework – what follows is an edited version of the Executive Summary of the published Proof of Concept document. If it piques your interest, let us know and we’ll be sure to get you a copy.

Sustainability, and ESG, are important components of the world’s move to Net Zero. They impact everywhere – from government policies to private sector action to consumer behaviour. As COP27 is making clear, they are both vital and complex. We hope that the Framework is a way of making action easier and more impactful.

The world is warming. We are already on course to miss the IPCC target of +1.5 degrees. More has to be done – and it will be done through innovation, powered by the actions of governments, industries and companies, and the funds of investors, public and private.



2022 Blogs

How can these players know what innovations to fund? Or how to report, in a clear and standardised fashion, what progress is already being made? How can they know, in an increasingly uncertain world, whether investments are robust and secure?

Traditional financial models do not encompass the richness of our potential shared future, and the risks and opportunities it contains. Models that combine views of the future and financial metrics are often complex and hard to explain. Early-stage technology investments run the risk that the technologies will be in place too late to make an impact on what is becoming an urgent problem.

The Sustainability Innovation Pathway (SIP) Framework aims to address – and solve – these issues in a comprehensive, robust and swift fashion. The Framework is based on an intimate understanding of three disciplines:

- Technology readiness and adoption velocity
- Futures and foresight thinking
- Financial modelling

and combines all three to deliver usable, appropriate and timely outputs which can guide investment decisions across government, the private sector and industry. The project itself has been developed by leading international management and technology consulting company Eraneos Group, foresight experts SAMI Consulting and sustainability automators Sustainaccount.

The Proof of Concept document is a detailed description of the Framework, and describes

- An overview of the SIP Framework
- The strategy objectives of the framework.
- The two analytical – qualitative and quantitative – elements of the framework and how they work together
- The future developments of the SIP Framework.

Our aim is that, using the framework, companies, investors or governments will better understand their options in facilitating, and more importantly, accelerating decarbonisation. They will be able to, for instance:

- Identify the technological innovation(s) with the highest and fastest decarbonisation potential
- Determine the technological innovation(s) that unlock resilience and market leadership
- Quantify the risk and return of specific decarbonisation innovation projects
- Quantify the mitigation effect of innovation investments on the potential value of stranded assets



2022 Blogs

- Determine the effect of the mass deployment of innovative decarbonisation technologies in one sector on another sector or industry.

We know that there are many models for sustainability measurement, and ESG reporting. We believe that the framework is both novel and useful because it:

- Works well to meet investment and reporting needs across the full spectrum of public and private sector
- Benefits from a clear outcome focus
- Is comprehensible and explicable within the boardroom or around a minister's desk as well as it is on a (trading floor).
- Is extremely flexible – from different possible futures to varying inputs
- Has outputs that are clear, and meet industry standard metrics as well as having the ability to generate client-specific metrics on demand.

Industry specific use cases will be prepared over the coming months.

Do let us know (by emailing Jonathan at jbs@samiconsulting.co.uk) if you'd like a copy of the Framework, if you'd like to be kept up to date as we publish case studies, and if you'd like us to introduce you to the Framework for your organisation.

Written by Jonathan Blanchard Smith, SAMI Fellow and Director, 17 Nov 2022



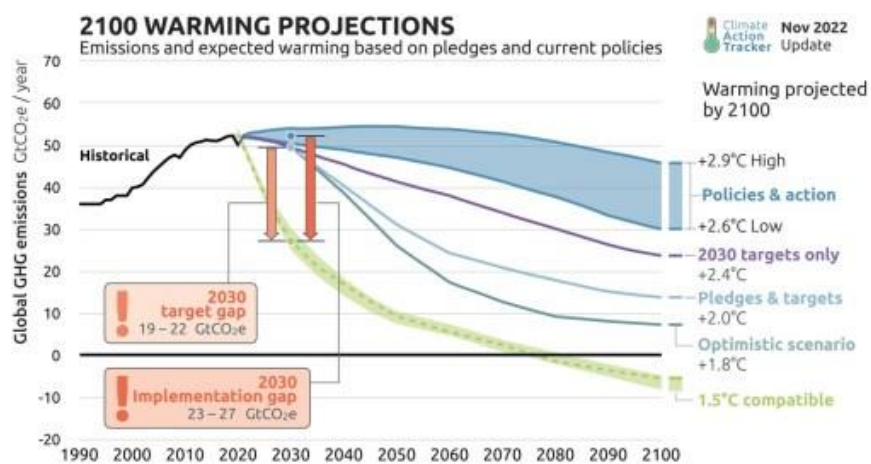
COP 27 – the road to disaster



Image by Enrique from Pixabay

As COP27 has staggered to a halt, it's time to revise your climate change scenarios. Keeping the increase in global temperature to **1.5°C now seems to be an unlikely outcome**, with 2°C to 2.5°C looking far more probable and worse still possible. COP26 chairman Alok Sharma described the outcome as “1.5°C on life support”; António Guterres, secretary general of the UN, warned: “Our planet is still in the emergency room”.

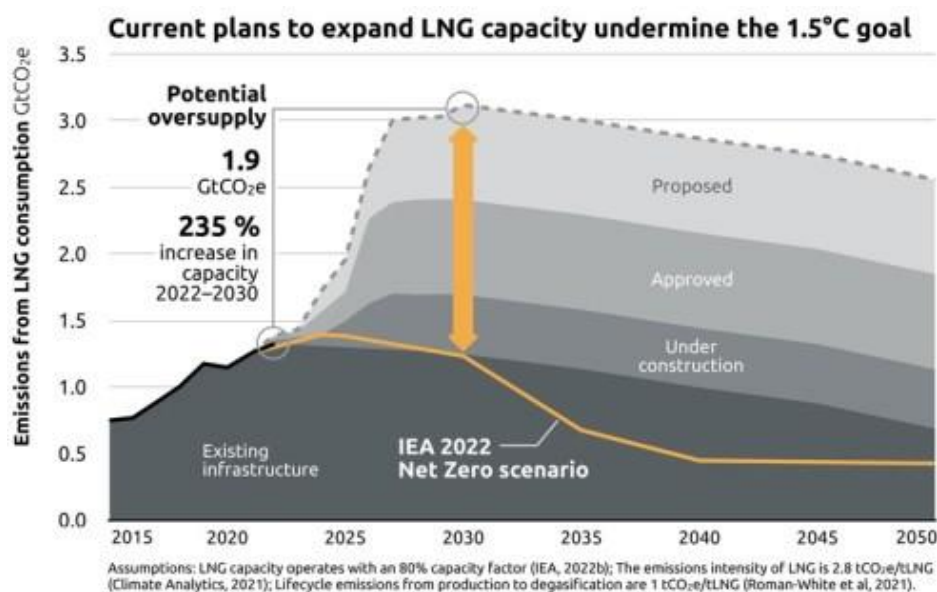
Climate Action Tracker's most recent projections suggest 1.8°C as the “optimistic” scenario.





At COP26 in Glasgow last year, countries agreed to return each year to strengthen their carbon emission commitments, a process known as the ratchet. At COP27, some countries tried to renege on the 1.5°C goal, and to abolish the ratchet. A resolution to cause emissions to peak by 2025 was taken out. The new UK PM's initial intention not to attend COP27 was met with a chorus of disapproval, so he did feel it necessary to at least do the basic minimum and show up.

Instead, the over-production of fossil fuel continues. In 2030, oversupply of liquefied natural gas (LNG) could reach 500 megatonnes equivalent to almost five times the EU's 2021 Russian gas imports, and double total global Russian exports. This oversupply of fossil gas could lead to excess emissions of at just under two gigatonnes of CO₂ a year in 2030, well above emission levels consistent with the IEA Net Zero by 2050 scenario (2022).



The impacts of climate change were very apparent in 2022. The floods in Pakistan affected 33 million people, one in 7 of the population; they killed over 1,600 people and 800,000 livestock.

According to World Bank recent research, climate change could drive 216 million people to migrate within their own countries by 2050, with hotspots of internal migration emerging as soon as 2030. Climate change will cut crop yields, especially in the world's most food-insecure regions. At the same time, agriculture, forestry, and land use change are responsible for about 25% of greenhouse gas emissions.

An Imperial College study showed that coastal erosion is increasing. Some rock cliffs are already crumbling, and within the next century, rock coast erosion rates could



2022 Blogs

increase tenfold. At sites in Yorkshire and Devon, this will cause rock coast cliffs to retreat by at least 10-22 metres inland.

There is a danger of a fatalistic view taking over – “it’s all going so badly we won’t be able to do anything”. This view must be continually challenged, as every 0.1°C change makes a difference.

The one achievement of COP27 was the establishment of the principle of a “**Loss and Damage**” fund to help developing countries deal with the impacts of climate change. However, none of the developed countries committed to a specific sum of money for this fund, and that will be subject to continued negotiations. Some research suggests that by 2030, climate-related losses could reach \$580bn per year. There was nothing in the Chancellor’s “Autumn Statement” to contribute to that. An innovation here was to look to the private sector to contribute, either voluntarily or more likely through various levies on polluting industries.

So what might the various **scenarios mean financially?**

In over 2°C cases, more extreme weather events, droughts, fires, floods, storms will lead to:

- Migration increasing, with massive economic dislocation
- Increased insurance claims with some properties uninsurable
- The abandonment of some areas – not just in Africa, but along rivers and coastlines (the Welsh village of Fairbourne is already due to be wiped off the map)
- Funding “Loss and Damage” – governments, taxing carbon emissions from certain industries – the potential for demands on this fund to escalate dramatically is huge.

But even the most optimistic scenarios have financial implications. As well as many weather impacts already “baked in” by previous emissions, there will be “transition” costs:

- Re-engineering the national grid
- Insulation costs, heat-pump installation
- “Stranded” fossil fuel assets – oil and gas assets sitting on companies’ books, but unusable
- Opportunities in new technologies.

So whatever your current assumptions about climate change, it’s very likely that the outcome could be different. Your planning should start now.

Written by Huw Williams, SAMI Principal, 23 Nov 2022