Policy Brief

November 2022 Grace Waugh

Technological Innovation and Implementation

SUPPORTING INNOVATION IS CRUCIAL TO ACHIEVING THE PARIS AGREEMENT GOALS

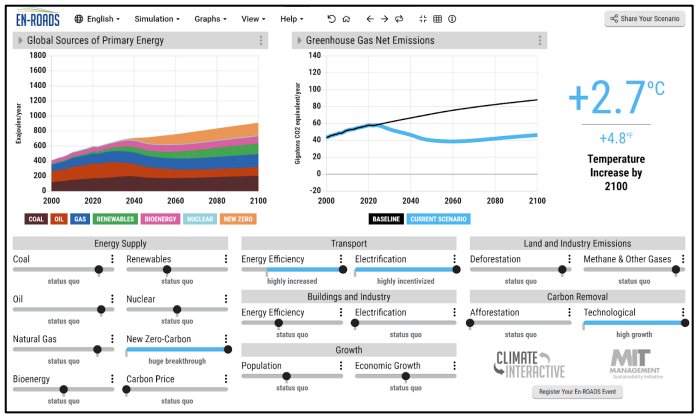
- **Focus must be put on innovation** in the fields encompassed by sustainable technology
- **Investment in development and implementation** is crucial to supporting technological growth
- **Technology transfer must be supported** to allow not only developing nations to achieve their climate goals but to support developed nations in their move towards climate stability as well as their efforts to further develop technologies
- **Fossil fuel use must be phased out in favor of renewable energy sources** in contrast to the official language of phasing down only coal
- **Waste management technology, nature-based solutions** have a major role to play in reducing global emissions

What's the issue?

Article 10 of the Paris Agreement outlines a commitment to encouraging and facilitating the development, implementation, and transfer of new technologies related to achieving its goals set out in Article 2, the highlight of which being to keep the global temperature rise "well below 2°C above pre-industrial levels" and limit it to 1.5°C.

As a part of the Paris Agreement, each participating party is required to commit to a Nationally Determined Contribution (NDC), in other words a commitment to reducing their country's emissions by a certain amount based on not only their overall emissions, but also their development status. A part of most if not all parties' NDCs involved the growth of renewable energy production/consumption as well as additional technological implementations such as carbon capture and electrification.

A change in technology is necessary in order to move away from our current model of overall high dependence on fossil fuels and their emissions. Technological advancements as well as further implementation of current available advancements are necessary – something that requires not only investment and communication, but also genuine creativity.



Source: Climate Interactive, 2022

Why is this important?

The image to the left displays a scenario from the En-Roads climate simulator by the Climate Initiative with the dark line representing the projection for global warming given "Business as Usual" (BAE). The blue line represents projected warming given all possible technological advancements allowed by the model – specifically carbon capture and removal, electrification, and zero-carbon energy production – which drops the rise from 3.6°C to 2.7°C. Within this simulation, carbon capture accounts for most of this change but also represents the largest investment.

While these innovations do not bring the overall projection down to <2°C of warming, this improvement is significant coming from a single sector. That said, this is just one side of the story: it doesn't matter if we have the technology to solve the problem if there is no policy to support it. The phase out of fossil fuels as a primary energy source is necessary for the implementation of clean energy alternatives, and carbon pricing – a means of putting a price on emissions to shift responsibility back on those who emit it – is one such policy possibility. It is difficult to project innovation, which is why it is crucial we not only dedicate time and money to increase the odds of a breakthrough, but also work to foster an environment friendly to the implementation of climate-smart technology.

What happened at COP 27 on this issue?

COP 27 featured a focus on implementation as the world approaches the 2023 global stocktake for Paris Agreement commitments, with Sharm el-Sheikh being tag lined "Together for Implementation." Talks about technology and innovation included extensive mentions of increased implementation of renewable energy options as well as encouraging additional financial contributions to assist developing nations in implementing adaptation technology, in particular. In one side event regarding "Fostering Technological Innovation", a representative of an island nation voiced the concern that there has been so much focus on technology for mitigation in attempting to meet the 1.5°C target that technology for adapting to the adverse effects of climate change already occurring have not come nearly as far.

In addition to official events, many countries took the opportunity provided by the pavilion space to showcase their national contributions to innovation, technology, and technology transfer. Japan, for example, highlighted their advancements in green hydrogen fuel cells – which, if commercialized, have the potential to provide a clean source of combustion energy – and a group from Indonesia presented on their projects involving using the country's abundant palm oil as an input for biofuel.

In a plenary, Al Gore and the Climate TRACE Coalition revealed an innovation of their own. A problem often encountered in relation to Paris Agreement NDCs is accurately tracking emissions. Countries typically rely on local governments and companies to report their own emissions data and collate on a national level, running into issues of honesty and technical capability. At COP 27, Gore unveiled a new software that utilizes satellite data and artificial intelligence to accurately determine emissions levels, in particular methane, from specific locations without input from emitters themselves. This technology provides the opportunity for countries without the means to accurately record their emissions and close the data gap, as well as to keep parties accountable for the emissions they are actually responsible for. As Gore put it: using unconventional ways of determining when plants are emitting makes it fundamentally impossible to cheat.

Even more widely displayed and discussed than mechanical or otherwise technical measures were nature-based solutions, or techniques based on natural processes and their interactions that allow for minimal human interference. Nature-based solutions can be as simple as mangrove restoration or as complex as inclusive design of offshore wind. Support for these systems as a primary response to climate change echoed throughout the pavilions, as the idea of returning to nature is one of wide appeal to indigenous communities and one that is accessible to most of the world. One such example was the focus of the Oceans Pavilion on "Blue Carbon", or the intake and storage of carbon dioxide by natural processes throughout the ocean biome. The ocean itself is a natural carbon sink, while its mangroves and other marine vegetation provide additional storage capacity. Even in the Innovation Hub, where a group called ICLEI (Local Governments for Sustainability from over 125 countries) spoke on innovation in city development for a climate-smart future, there was talk of systems thinking and working with natural processes to develop urban environments that worked with nature rather than in opposition to it. The phrase "innovation in crisis" rang true as people from every sector discussed the need for new ideas that work with existing systems.

Nearing the end of COP, the UNFCCC began drafting their summary text for review. Highlights from this draft text surrounding technology and innovation include an acknowledgement of the urgency needed "to rapidly transform energy systems to be more reliable, and resilient" and "the importance of enhancing the share of renewable energy in the energy mix", implying an encouragement to countries to increase their transfer to renewable sources. This transition requires continued and increased technology transfer to lesser developed nations as is noted in the text, alongside notes of concern regarding "the existing gaps in the global climate observing system".

Policy recommendations

1) Incentivise innovation through a dedicated climate science research fund

Innovation requires creativity, and as such breakthroughs take time and dedication. Research is an essential and often underfunded process to acquire new technologies. Providing research funding on a global level would incentivise international collaboration and technological strides could be made on a shorter timeline.

2) Provide a mechanism for direct collaboration between countries

The Climate Technology Centre and Network (CTCN) is the current mechanism through which technology transfer between nations is achieved. While a useful resource, requests take time to process and waste precious time. Providing working/associated groups of countries with mitigation means and the willingness to assist would allow countries to act between themselves more fluidly than through the official oversight of the UNFCCC.

3) Consider waste management as a means of reducing emissions

Production, consumption, and disposal of plastics and other wasted materials is an industry with climbing emissions. Many countries struggle with management of domestic waste in addition to incurring material from neighbouring nations with problems of their own. A side event entitled "How Combatting Plastic Pollution and Illegal Traffic in Plastic Waste Can Help Reduce Carbon Emissions" revealed struggles of coastal nations with garbage washed up onto shores, forcing them in incur additional emissions simply to clean their homes while additionally losing land to rising sea levels. Proper waste management and a move towards reducing overall waste would be a major single-sector improvement in our global climate position.

4) Require that NDCs have specific timeline for goal completion, require Annex I nations to contribute to technology transfer

Much of what is written in the language of the UNFCCC is weak wording related to nations' emissions commitments and simple encouragements related to more developed nations assisting in technology transfer to those who need it. Stronger pushes by the governing documents to require specific procedures for countries reaching their targets as well as to contribute to the success of other nations in their goals would lead to a more cohesive effort in the fight against climate change.

References

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