

Decarbonisation: Using Urgency to Create Action

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In November 2021, the United Nations put on a global climate summit in Glasgow known as COP26. When the conference opened, the United Nations (UN) Secretary General, Antonio Guterres, said the top priority must be to limit the rise in global temperatures to just 1.5 degrees Celsius above preindustrial levels. To note, the world has already warmed roughly 1.1 degrees Celsius above these levels, meaning it could be just about 0.4 degrees Celsius to go¹.

A fundamental tension exists between 1) the distribution of global population 2) the distribution of past emissions and 3) the general acceleration toward cleaner-burning fuels. Richer countries, like the United States, Canada, Japan and much of western Europe, account for roughly 12% of the global population today but are responsible for 50% of all the greenhouse gases released from fossil fuels and industry over the past 170 years².

Even if things are far from perfect, it is possible to see actions being taken in such areas as:

- Carbon extraction directly from the air.
- Countries making pronouncements of future actions.
- Disclosure towards greater transparency of emission actions.
- Focus on continual improvements in energy storage.

What is a Carbon Removal Factory³?

In September 2021, Climeworks began operation of its Orca plant, the largest to date that is designed to remove carbon dioxide from the air. The plant is located outside of Reykjavik, Iceland, and it has capacity to capture 4,000 metric tonnes of carbon dioxide annually.

Air is sucked through a filter where materials bind with carbon dioxide molecules. Climeworks' partner, Carbfix, then mixes the carbon dioxide with water which allows it to be pumped underground. Through a reaction with basalt rock, the carbon dioxide is ultimately turned to stone. The whole system is powered by a nearby geothermal power plant, meaning that the electricity usage comes from a completely carbon-free process.

4,000 tonnes annually is more a proof-of-concept than a meaningful impact, as this is equal to the emissions from about 900 cars. There are plans for facilities that could remove up to 1 million tonnes per year.

What are Countries Proposing4?

At the COP 26 summit, China and the US announced a joint agreement to cut emissions between now and 2030. It was also notable that China agree to phase down coal burning starting in 2026. As is often the case in such agreements and announcements, specific details were light.

More than 100 countries agreed to cut emissions of methane 30% by 2030.

India joined the countries pledging to reach 'net zero' emissions with a 2070 deadline. The country is seeking to have more than half its energy from renewable sources by 2030.

How can Companies better Understand their Carbon Footprint5?

Watershed Technology Inc. sells software that allows companies to more easily quantify their environmental impact. In March 2022, it achieved a \$1 billion valuation. The global market for carbon-accounting software attracted \$356 million of venture-capital funding during 2021. During the first 3-months of 2022, the figure is already at \$71.5 million, although \$70 million was raised by Watershed in February.

Regulators are contemplating further required disclosures of carbon emissions. The Securities and Exchange Commission (SEC) is looking at certain proposals. In Japan, more than 1,800 companies listed on the Tokyo Stock Exchange will soon be required to either disclose climate information or explain why they are not doing so.

It is all a response to an investor desire to hold companies to account on their different climate pledges.

What Will Allow Widespread Adoption of Solar and Wind Power6?

Solar power and Wind power are frequently cited as interesting sources of renewable energy. They are both intermittent, meaning that the sun is not constantly shining and the wind is not constantly blowing. Downstream, people want energy regardless of weather conditions.

New types of iron-based batteries may offer a solution to the need of storing energy, cheaply for hours or even days. The company, Energy Storage System (ESS), has been operating grid scale projects since 2021 and has batteries that can store energy from 4 to 12 ours. Form Energy, another company, has batteries that can store energy up to 100 hours.

The use of iron is important, in that it may lead to less expensive solutions than lithium-ion or vanadium flow solutions. For Energy has indicated that its batteries could cost just \$20 per kilowatt -hour, lower than the most optimistic projections for lithium-ion batteries in the coming decades.

Conclusion: Decarbonisation Requires the Interaction of Many Distinct Activities

This piece is only a short, high level summary of the situation, and it is already clear that the concept of 'decarbonisation' requires efforts across many different areas. Today, countries and companies are

seeking to signal the virtues of paying attention to the climate. Start-ups are rushing in to find ways to hold different actors to account and more accurately measure climate impacts. Other start-ups are exploring the possibility and feasibility of simply removing carbon from the air. Finally, a lot of efforts rest on the effectiveness of better energy storage, in that without effective energy storage the menu of possible options would be significantly less. One thing is certain—it will be important to track the progress of this megatrend over the coming decades.

1 Source: “6 takeaways from the U.N. climate conference.” The New York Times. 13 November 2021.

2 Source: “6 takeaways from the U.N. climate conference.” 2021.

3 “Carbon Removal Factory.” MIT Technology Review. Volume 125, Number 2, March/April 2022.

4 Source: “6 takeaways from the U.N. climate conference.” 2021.

5 Eaglesham, Jean. “Startups Rush to Count Company Carbon Emissions.” Wall Street Journal. 18 March 2022.

6 Crownhart, Casey. “Long-lasting grid batteries.” MIT Technology Review. Volume 125, Number 2, March/April 2022.

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