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FT Climate Capital Council

Roundtable: how AI tools can help industry to decarbonise

Post Event Summary

In the latest meeting of the FT Climate Capital Council, Emiliya Mychasuk, the Financial Times climate editor, moderated a roundtable discussion on how AI tools can help industry to decarbonise. Sleman Saliba, global product manager for energy management and optimisation at ABB Energy Industries, gave the introduction.

The discussion took place under the Chatham House rule. Here are the highlights.

The challenge posed by AI duality

The Climate Capital Council heard that "according to the International Energy Agency, a quarter of all global energy-related CO2 emissions come from industry".

Can AI tools help industry to decarbonise? The short answer is yes – but it is complicated. As one speaker said, the central challenge is tackling AI duality or contradiction.

On the face of it, AI tools should be able to optimise the use of energy and so help us become more energy-efficient. Duality arises because these tools themselves consume enormous amounts of energy. One speaker reported that "a ChatGPT query is said to use 10 times as much energy as a regular Google search".

Since we expect to use AI more, it is speculated that this could drive up energy usage and so make achieving net zero harder not easier. Some experts believe that energy consumption will increase by 250 per cent in the next five years.

What companies need to do to make the best use of their AI tools

AI tools are only as good as the data fed into them. As a result, said one speaker, companies need to make better use of their data by improving the transparency – the visibility – of their data. With an improved data set, companies can expect to make decisions that are better-informed.

Working out how much energy will be needed

AI tools can help with forecasting energy usage. The Climate Capital Council heard about Optimax 6.4, an energy-management tool created by ABB, the Swiss conglomerate. This system "provides coordinated control of multiple industrial assets and processes, for improved energy efficiency, to reduce emissions and support decarbonisation".

Optimax is in use at a steam and electricity power plant in Germany that serves several companies in an industrial complex. One speaker said it had already "reduced prediction errors to almost zero", resulting in a 1.5 per cent fall in energy use. The person said: "One and a half per cent may not sound much but for an industrial complex that spends millions of euros on energy a year, it is significant."

AI technology could save the planet from climate change

One speaker said that Elon Musk and John Ketchum, the chief executive of NextEra Energy, are among the businesspeople to warn that the demands of AI and data centres will lead to severe energy shortages in five to 10 years' time.

Another speaker reinforced the point about AI growth. They said one US insurer receives 30 million dental claims a year and 80 per cent of these are decided by AI. This is expected to rise to 90 per cent, leaving very few claims requiring human intervention. The same insurer is also looking to apply AI to underwriting to see how good it is at assessing whether individuals can receive specific cover.

Ironically it could be the surging demand for AI that finally persuades companies to deliver on their net zero promises. As one speaker said: "Power, and the growing need for it, will be the big driver of change."

Banks believe digital groups will hit net-zero targets

Last month Climate Week NYC, held on the sidelines of the UN General Assembly, was given evidence that "power-hungry AI is consuming increasingly vast amounts of energy from the creaking US grid and threatening efforts to tackle climate change".

At the Climate Capital Council, however, one speaker, representing a bank, said: "We are confident that [big digital companies] will stay on course to reach their [net zero] target." That is because they have the resources, and the commercial need, to meet them.

Why the take-up of AI tools is not as quick as it could be

Another speaker said that while there is demand for AI technology, AI tools are not being deployed as quickly as they might be because of data security concerns, especially among banks. AI tools require enormous amounts of data but is that data safe if the AI tool has been provided by a supplier? It is not only fear of data theft that causes some companies to consider whether to rely on AI. They also worry that rivals will learn how they think by analysing the questions companies ask of their data.

The challenge of tackling Scope 3 emissions

Often a company's biggest challenge in trying to meet its net-zero target comes from its supply chain, which produces Scope 3 (third party) emissions. One speaker said: "We have to understand the supply chain better but how do we do this and then make a difference?"

One of the practical problems is capturing the latest information from the many thousands of suppliers that typically serve major companies. Asking a large supplier for data on net zero is straightforward because they are likely to have systems in place to deliver that information. It is different for small suppliers. One speaker from a financial services company said: "A big challenge for us is how realistic we are in terms of the data requests we make of suppliers."

What comes next

Asked about the future, one speaker predicted that there will be "more and more, and smaller and smaller, energy producers" including solar rooftops, solar parks and wind farms. Eventually these will all be connected to a complex grid optimised using AI.

Another speaker said the future was represented by the kind of partnership forged between Duke Energy and SAP, a provider of the tools to optimise energy usage. Duke is working on a new generation of heating and ventilation systems that will have inbuilt batteries. A building with these systems "would be a micro grid of its own for several hours a day". Such a system would be optimised by SAP software.

Striking an optimistic note, a third speaker said the world has "everything we need for sustainable industrial production by 2050". This includes cheaper renewable technology, digitalisation and democratisation (AI tools that can be used by any country and any organisation).

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Use of AI for decarbonisation scenarios

Ali Inal, Alper Serçe

The use of AI by companies has a long history. The invention of generative AI means that enterprises will use artificial intelligence more than ever, although traditional AI has been in charge for tens of years.

Generative AI will remain in an exploratory phase in many sectors, especially those that run critical infrastructure. This is mainly because of concerns over biases, hallucinating outputs and ethics.

Utility company Enerjisa Üretim sits in the upstream part of the energy value chain, where AI applications are used in power generation and grid integration.

As off-grid energy applications and distributed generation continue to grow, optimisation problems have become clear. These range from straightforward snags with investment to sophisticated generation and grid integration issues.

Increasing renewable energy in production creates a higher value in decarbonisation. Given the volatile characteristics of renewables generation, unless it is planned and optimally operated, the need for fossil fuels and other generation technologies will increase accordingly.

Enerjisa Üretim uses AI models to forecast and optimise power generation in favour of renewables. The company also uses AI models to analyse and address problems. More than 50,000 signals are processed each second to feed these models and generate a greater understanding of each operation.

Preventive and predictive maintenance insights help to maximise generation by renewables. As a consequence, the need for carbon-heavy generation methods decreases.

All AI techniques start with straightforward and simple optimisations and move on to larger-scope models. Using AI for only one power plant is not enough – multiple power plants have to be considered and this will eventually extend around the globe. If the sector acts together, the impact on decarbonisation will grow exponentially.

Besides using AI on its own assets, Enerjisa Üretim contributes to the sector's efforts. For this purpose, it established Senkron Energy Digital Services, which works with Rems (Renewable Energy Management System) and critical infrastructure cybersecurity services called Onepact and Cyberpact.

Onepact aims to optimise the production of renewable energy plants while Cyberpact tries to prevent downtime caused by cybersecurity issues or other outages. Both technologies rely on AI to achieve the most positive results.

Players in the renewables sector need to collaborate, cooperate and co-innovate. Enerjisa Üretim is a leader in this area and aims to promote the sharing of techniques that will help the world meet the decarbonisation targets set by the UN.

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