



Copenhagen grid modernization

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What will it really take to decarbonize the global economy?

As companies across industries push towards net-zero, one thing is certain: to reach their targets, new utilities partnerships, ecosystems and marketplaces will be essential. Utility companies can support practical enterprise sustainability by increasing the amount of clean, renewable energy in the grid, enabling rapid and cost-effective electrification of industries, and moving from managing the grid to orchestrating all its complex inputs. In the coming years, utilities will continue to play a central role in the energy transition by accelerating global decarbonization through clean electrification — the process of replacing fossil fuels with electricity produced from renewable sources, like wind, solar and hydro.

The good news is that about 70% of today's global greenhouse gas emissions can be addressed by clean electrification. High-emitting sectors, like power generation and transportation, are investing heavily in the process. US automakers, for example, committed to invest \$250B in vehicle electrification by 2023. And despite the pandemic, 2020 was a record year for green energy, with more than 80% of all new electricity capacity coming from renewable sources.

But, enabling clean electrification at scale for consumers and businesses will require leaders to come together in new ways to rethink how electrical systems operate. As more parts of our global economy rely on electricity to run, electricity ecosystems will become more complex and diversified. The number and scale of non-utility owned-and-operated resources connected to the grid will increase exponentially. And more interconnected functions will generate increasingly complex information flows.

Going forward, digital transformation will be key to decarbonization and helping electricity ecosystems deliver clean energy to connected consumers in safe and reliable ways. Digital solutions that apply AI, IoT and blockchain will support new energy marketplaces, while enabling more resilient physical infrastructure, more efficient and reliable utility operations, and better customer service. For example:

Here are a few examples of how utility companies and their ecosystem partners are teaming up with IBM to fuel the future more sustainably:

Hydro One: When severe storms disrupt electricity service, customers expect power to be restored quickly. Hydro One, one of North America's largest utility companies, shifted from reacting to weather-induced power interruptions to proactively preparing for storms using The Weather Company's Outage Prediction solution. Outage Prediction helps the utility predict the impact of future storms by combining a customer's historical outage data with past weather events and engineered weather forecasts. Now, it can proactively prepare for incoming weather by mobilizing personnel and equipment in advance of storms — in some cases cutting power restoration time in half.



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Omega Energia: Wind and solar energy will account for more than 55% of the world's electricity by 2050, making renewable energy forecasts increasingly critical. Fully committed to sustainability, Brazil's renewable energy leader, Omega Energia, and IBM collaborated to build a cost-effective, scalable, cloud-based wind forecasting platform. High-accuracy forecasts using best-in-class weather data and advanced analytics, including AI and machine learning, are powering benefits in maintenance planning, generation forecasting, and strategic planning to help Omega meet growing demand and deliver service reliably – today, next month and for years to come.

TenneT and Equigy: As Europe pursues a wide-scale energy transition to renewables, smaller and more distributed providers are joining the grid, introducing volatility. TenneT, a leading electricity transmission systems operator (TSO), needed a new way to control the volatility in a highly weather-dependent electricity system. Using IBM Blockchain, leading European TSOs launched the Equigy platform to crowd-balance supply. The ecosystem's joint effort with blockchain can better integrate renewables into the grid to help securely and intelligently manage flows of electricity in networks with decentralized, distributed energy sources. The reduction of power redispatch measures could save millions of euros as the crowd-balancing network expands.

Wherever you are on your sustainability journey, IBM can help. With our deep domain and industry expertise, we can work with you to develop and implement the right strategies, operating models, intelligent workflows and technology innovation to achieve your sustainability goals.

To learn more about decarbonization, sustainable energy and clean electrification – and find out how recent government measures could spark a reinvention of the power grid – read "Electricity is infrastructure: Why the grid matters more than ever."

You can also learn more about IBM sustainability solutions, and read the other blogs in our enterprise sustainability series:

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