Achieving a low-carbon world

December 14, 2023

Ahead of COP 28, we launched a sustainability series with some of IBM's thought leaders.

Lylia Djait-Paulien is associate partner of IBM sustainability practice. In this series, Lylia discusses decarbonization and how achieving a low-carbon world requires electrification, more efficient energy infrastructures, and physical operations.

How is IBM poised to help companies manage their infrastructure and operations to enable more energy production and better energy management?

It's important to understand the problem businesses face when it comes to managing their infrastructure.

When we talk about infrastructure in the context of electricity, we're talking about transmission and distribution-level equipment – including transmission lines – that contain assets like power transformers, circuit breakers, or an electric vehicle (EV) charger that a utility needs to manage. Utilities need to be able to distribute power from these assets to their end-users. As more businesses and assets are turning to electrification, the more power is required. Additionally, we need this power to be generated and distributed effectively to end-customers and we want it to be renewable.

As a result, we need to look for more effective and 'smart' ways of tightly managing the grid. This includes helping businesses manage their operations so they can provide their end-users with electricity at the right time and at the right cost, while helping people effectively tap into electricity to manage their overall capacity.

Over the years, IBM has been working with Canadian utilities that have invested in meters and grid technology to capture data to effectively manage their grid. With digital technologies, like the Internet of Things (IoT) and artificial intelligence (AI), we can

capture data that tells us where electricity is coming from; how to manage forecasts; where the demand is, and whether there is enough electricity supply to manage consumers' needs.

AI plays a big role in predicting energy demand and ensuring businesses are managing their operations effectively. Data that needs to be predicted includes the time of day, the cost based on a demand, and growth and population concentrations. It's also important for weather and outage predictions.

For instance, IBM collaborated with New Brunswick Powerto use AI models for forecasting storms. With this information, New Brunswick Power was able to predict when to deploy its personnel and mobilize its teams to quickly restore power.

We also need to ensure the right safety controls are in place. AI can predict data such as the best environmental conditions to perform maintenance on a specific piece of machinery. It can also help educate or train workers to perform remote maintenance on machinery. The use of AI in this space is significant and can make a big difference in how businesses manage their infrastructure and operations, while achieving better – and cleaner – energy production.

What advice can you share to companies that are looking to decarbonize their supply chains?

Decarbonizing essentially means removing the use of carbon. In the context of utilities, this action refers to using more renewables to generate more energy from renewable resources. Distributed energy resources (DERs) allow energy grids to be powered by different sources of energy, including wind, solar, and battery storage rather than using natural gas or more carbon-intensive energy.

A challenge with renewable energy is its intermittency. For companies to be successful in decarbonizing their supply chains, they need to ensure they provide a consistent source of energy – and that this energy can be turned up, down or off to help balance the grid.

Technologies including AI can help companies achieve this grid balance.

IBM and the City of Copenhagen developed the IBM Utility Flexibility Platform, that looks at IoT AI, and Blockchain technologies to dynamically adjust heat and power consumption based on available renewable energy supply. The result is a reduction in cost and carbon dioxide.

How can companies successfully transition to better energy production and management?

There are two important steps that companies need to make to successfully transition their energy production:

1. **Have a solid governance plan.** A big challenge that companies face is getting the right stakeholders involved. Creating and managing a strong strategy is essential for success.
2. **Accurately pull and embed metrics.** Once a company has a strategy in place, it must ensure metrics are embedded in its systems and are properly tracked and accounted for across its operations.

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