A DIGITAL APPROACH TO ORCHESTRATE THE ENERGY TRANSITION

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It is 10 p.m. and you are in charge of power supply management in a metropolis. Suddenly, there is a surge in demand - most households have just turned on their television sets to watch an important broadcast on lockdown restrictions. But despite the spike in power consumption, there is no outage. It's because you used energy forecast modeling to predict just such a situation. You've done your part in improving operational efficiency, contributed to increase profitability, and reduced energy wastage.

All of this was possible due to the digitalization of energy infrastructure via the Internet of Energy (IoE).

While the physical drivers of energy transition will range from increasing renewable energy share, reducing fossil-based dependency, introducing newer and innovative technologies such as green hydrogen and new generation energy storage technologies, digitalization will be the key enabler.

Significantly, the Internet of Energy will play a key role in climate change mitigation.

The World Energy Outlook Report 2021 reveals that a clean energy transition is possible only after the power sector is completely transformed. Remember, power generation itself accounts for 40% of the total carbon emissions in the power sector.

If you divide electricity into two categories - energy generation/ sourcing, and energy consumption, it provides utilities with an opportunity to pivot toward clean energy by implementing digital technologies.

Energy management is no cakewalk, but with digital technology to support you, the process is seamless. Cloud computing, predictive asset maintenance and management, digital twins ,energy forecast modelling, and financial dashboarding are empowering energy managers to enhance operations.

For instance, if you have access to energy data at the source - grid, solar rooftops - and consumption level via building energy management systems, you can transform how energy is managed, meaningfully and profitably. Digitalization of energy infrastructure helps reduce energy wastage, improve operational efficiency, reduce the carbon footprint, and enhance profitability. For instance, on the energy generation and grid management side, the Internet of Energy enables peak demand shifting. The digital capability can help you manage energy generation at the source and simultaneously balance energy consumption through smart storage devices.

If you can manage peak demand at the city level, imagine how easily you can avoid situations such as blackouts, while also optimizing energy operational costs.

The world is investing heavily in renewable energy infrastructure and associated components such as energy storage and electric vehicles. The International Energy Agency's latest market update (May 2021) states that despite the pandemic, renewable capacity addition in 2020 rose by 45% to 280 gigawatts. This is the largest year-on-year increase since 1999. According to McKinsey's Global Energy Perspective 2021 report, half of the global power supply will originate from renewable energy sources by 2036.

With a significant increase in the share of renewable energy sources in energy transition, it is beyond the scope of the current grid. What is required is a digital layer built on physical components. In the future, digitalization in the energy ecosystem will not mean merely deploying monitoring platforms and supervisory control and data acquisition (SCADA) systems. Technology will play a pivotal role in managing energy smartly.

The Internet of Energy will be a catalyst of energy transition in the future. Digitalizing the energy ecosystem requires , active collaboration among policymakers, energy domain experts, energy infrastructure developers, equipment manufacturers, and software service/products providers.

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