Succeeding in a World Where the Future of Energy Disrupts Everything

Table of Contents

Introduction

The energy industry is undergoing a tectonic shift in its structure, composition, and operations. Demarcations that once separated utilities from oil and gas companies and consumers from energy generators are dissolving. Entities across the value chain—utilities, oil and gas companies, cities, end users, and the private sector—are adding renewable energy assets in response to government mandates and increasing customer demand for environmental accountability. These forces are also helping to transform the power grid from a mono-directional, hub-and-spoke system to a matrix that blurs the lines among those generating, using, and monetizing energy and its related services.

While advances in technology and data usage are helping create novel solutions and business models that enable these changes, they also add complexity. Data storage, utilization, and security loom large in the minds of energy ecosystem participants. Likewise, cultural shifts within organizations—how to balance operational technology (OT) and information technology (IT) priorities (i.e., the IT/OT divide) and manage workforce challenges (remote work, high rate of retirement, and shortage of cybersecurity experts)—further stress market participants.

To understand these challenges and how to address them, Frost & Sullivan and Red Hat collaborated on a recent webinar: *Succeeding in a World Where the Future of Energy Disrupts Everything*.

E.G. Nadhan, chief architect and strategist for Red Hat, spoke with Roberta Gamble, a partner and vice president at Frost & Sullivan, about the evolution of the energy industry and the role of data. The webinar in its entirety is available here: https://bit.ly/3w9gjiR.

Confronting New Challenges with a Collaborative Mindset

In the recent past, the energy industry was more defined. "[Companies would] tend to think 'Oh, we are oil and gas' and 'they are power grid,' or 'they are working on renewables,'" Nadhan told Gamble during the webinar. New market disruptions include encroachment from third-party players, oil and gas companies, and prosumers, end users that own and operate their on-site power sources (typically renewable) and sell excess power back to the grid or other users. These changes make it harder for utilities to predict and address demand curves.

Sensors across infrastructure, and the data they generate, have played a crucial role in improving utility strategies and allowing companies to respond to issues in real time. Data and advanced analytics have become fundamental for utilities and other energy providers striving to optimize operational efficiency and provide advanced, responsive services to their customers. However, energy companies often find the volume of information and insights flooding in difficult to manage and secure, and their increased reliance on information and connected devices also expands the cybersecurity threat landscape.

> According to Gamble, these changing dynamics mean that "utilities are having to create new roles, new departments, develop new services, expand to the value chain partners, expand the number of companies they're working with, and also grow their data and storage, which can come with costs and risks as well. And they need to deal with legacy and unstructured data."

However, these challenges are not unique to utilities, Nadhan noted. "It's not very different for oil and gas versus renewable sources," he said. "Even though the energy sources are different and disparate...the challenges, the cyberthreats, the IT/OT divide, are pretty agnostic."

•   www.frost.com   4

For example, a reigning challenge for digital transformation relates to skillsets. Frost & Sullivan research indicates that companies feel less prepared to manage technological change than they did a few years ago. Gamble said, "Many companies in 2020 [were] saying that they don't have the internal expertise to, for example, overcome cloud hurdles. Twice as many companies are saying this than they did two years ago, and I think that's probably a combination of acknowledging how difficult it is, but also [acknowledging that] technology is moving faster than any of us can keep up with." Many of the root issues—data integrity, interoperability, and security—reverberate across the ecosystem. So what should utilities and other energy companies prioritize to manage these challenges?

Energy-related organizations can address these difficulties by learning to work more closely with their value chains. According to Nadhan, the most successful businesses he had seen through his work at Red Hat had the tools and mentality that fostered innovative collaboration. "I have seen it personally," he said, "with the adoption of open-source software. It impacts how you think, how you work with others." Nadhan continued:

> "Real innovation and collaboration happen when you extend the collaborative mindset beyond the firewalls."

Also, the need to modernize infrastructure and incorporate sensors and edge devices into the equation is critical to success. "I look at edge devices as just an extension of the hybrid cloud environment and having that type of flexibility with all the sensors," Nadhan said. "It's also vital to leverage the data that is collected, but more importantly, apply analytics and AI/ML [artificial intelligence and machine learning] and data science." Nadhan continued, "All kinds of data need to be processed, integrated, analyzed, and to do that as well, you need open platforms and modernized types of integration."

Nadhan emphasized the role partners play in successful operations: "There are many subsystems. We talk about the ecosystems, but there are subsystems of partners." He continued, "It is not just about the right partners, it is the right subsystems of partners." An open platform is critical to allowing innovative collaboration across these partners and ensuring that an organization can evolve as technology progresses. "Open means it can run anywhere. It can actually be agnostic to the underlying technology environment, but I will say it better be an open, secure platform,"

> Nadhan said. "Data security should not be an afterthought, whether you are talking about the edge device, whether you're talking about the sensor, whether you're talking about your smart meters, whether it is the servers, the cloud, and any of the above."

Furthermore, automation is critical for software patching at the most basic level, and leveraging it will ensure regulatory compliance. The importance of energy in a nation's infrastructure and economy means that several entities involved in the market are highly regulated. Nadhan noted that compliance and data security extend beyond the organization to all its partners. He said, "It is not just compliance within the enterprise; it is the third party, the fourth party, the fifth party, whether it's who you're working with as an enterprise."

As the energy industry morphs into an amalgamation of new and different entities, the entire ecosystem will need to remain vigilant about security and compliance and evolve with technology. As Gamble summarized, "Open and secure platforms across value chains and internal processes need to be as flexible and as 'future-proof' as they can be."

Nadhan expounded on this point:

> [Energy] companies should position themselves to be able to deal with change. The change is what we have seen the last 20 months or so that we have been subject to globally, so the ability to deal with change and be dynamic both from a business standpoint as well as a technology standpoint. A critical next step is to make sure that not only do they have a platform where they can innovate today. …The technology investments that they make should not only be open, but they should be future-proof. Transformation is not a one-time thing, it is continuous. Today, as you're modernizing, you should be cognizant of how can you continue that on a sustained basis so that it is more amenable to the changing markets, the changing consumer demands.

Next Steps for the Energy Industry

How do these strategies manifest into actionable steps that industry players can undertake?

> "Number one, take stock of what infrastructure is in place today," said Nadhan, "both renewable and conventional sources. He continued, "Second is to identify what customers and consumers expect from your organization, today and in the future. Does your environmental footprint pass muster? Are you effectively leveraging data for secure and efficient operations?"

After defining the current state and identifying future needs, the next step is to flesh out and plan for the gaps. "Number three," Nadhan said, is to "take a look at what your core competencies are. What are you known for? What sells?... And then revisit the partnerships that you have so that it all brings together the ability to change overall. And remember, the right partners are those who can change at the same pace, if not faster than you can." The end goal, according to Nadhan, is to "make sure that you are on an open transformation journey as needed and change in a timely manner." Nadhan concluded, "Collaboration is key, and having that type of open hardware is fundamental."

Learn more—Read the Frost & Sullivan Brief: Tectonic Shifts in the Energy Industry

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