

EMERGING TRENDS IN UTILITIES. WHERE TECHNOLOGY MEETS HUMANITY.

Every industry experiences change and disruption if it's around long enough. The utility industry is no exception.

And when compared to other sectors of the economy, it may actually be experiencing a disproportionate amount of change driven by a wide range of factors—environmental, societal and technological. The primary paradigm shifts that are the source of disruption tend to fall into four different categories:

- Grid modernization
- Environmental, Social and Governance reporting (ESG)
- Preparation for electric vehicle growth
- Battery storage to empower grid flexibility

But there are two additional areas that don't get a lot of attention, the growth of smart cities and the role of edge computing.

There is certainly overlap amongst all of these areas in terms of the challenges and opportunities they represent. You could also argue that the promise and phenomenon of smart cities and edge computing have a direct impact on each of these other areas as enabling solutions to help overcome some of the headwinds the industry is facing. To understand the roles of smart cities and edge computing, it may be helpful to take a quick look at the other foundational challenges that they can help solve.

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GRID MODERNIZATION

It's no secret that the power grid is aging, the resources of utilities are stretched, cyber attacks are an area of vulnerability, renewable energy needs to be integrated into the grid and first-generation "smart" meters that were installed in the early 2000s are also showing their age and need to be replaced and upgraded. A big part of the solution to these challenges is the installation of advanced metering infrastructure (AMI), of which the next generation of smart meters plays a huge role as they act as edge computing devices that deliver real-time, actionable intelligence to utilities so they can operate more efficiently, sustainably and profitably.

ESG

Increasingly, publicly traded companies are under greater scrutiny by stakeholders and regulators when it comes to their commitments to people and the planet, with much of that focus being on decarbonization efforts. But given the prominence that sustainability and global warming have achieved in the zeitgeist of society, attention goes beyond just publicly traded companies and includes government and the private sector as well. Grid modernization, the installation of smart meters, advanced metering intelligence, integration of renewable energy and battery storage can all help the public and private sector address ESG concerns by delivering operational efficiency and more eco-conscious solutions.

EV GROWTH

The growth in electric vehicles offers both promise and problems as utilities grapple with how to integrate them into the power infrastructure and manage the increased demand they create for electricity. While contributing to a reduction in the use of fossil fuels and helping the world move toward a net zero environment, they will exponentially impact the electricity infrastructure two-fold via at-home charging and the build-out of charging station networks. Again, the edge computing capabilities provided by smart meters and AMI will be critical in helping manage demand and load requirements placed on the grid.

BATTERY STORAGE

The interconnectedness across each of these areas is on full display when the subject of battery storage is considered. As renewables such as wind and solar become a more prevalent energy source as part of the power grid for sustainability reasons, and as we see increases in incremental climate events and extreme weather, battery storage becomes increasingly important in providing resiliency for our energy infrastructure and as a hedge against power outages. In addition, in the U.S. and Europe, with the recent passage of legislation to encourage energy innovation, significant incentives have been allocated to encourage the proliferation and use of battery storage across the energy ecosystem. New technologies, such as edge computing, will be required to help maximize the contribution that battery storage can make to grid modernization and global sustainability efforts.





SMART CITIES

Perhaps one of the least talked about but most interesting developments in the energy space is the advent of smart cities. But beyond just the more efficient, resilient and sustainable management of energy, smart cities leverage the Internet of Things (IoT) to create a network of various devices, machines and objects connected via the internet that share information and intelligence with each other. This information is used by municipalities to manage traffic, waste management, public transportation and other services. Smart cities are able to leverage real-time data and analytics to improve the speed and quality of decision-making, which helps improve the quality of life for residents, improve sustainability efforts and make the most of available resources. Devices like smart meters and edge computing are the brains and backbone of smart city infrastructure, empowering physical and digital assets to create a highly intelligent urban ecosystem.

EDGE COMPUTING

Think of edge computing as the central nervous system of an enterprise ecosystem. As mentioned earlier, in an AMI, smart meters represent edge computing—monitoring, managing and collecting energy data in real-time behind the meter. Edge computing occurs at the site of activity, collecting and streaming data from equipment, machines, devices, sensors, etc., that is run through an algorithm at the "edge" of a corporate network. This is as opposed to sending everything to a physical, centralized data storage location or to the cloud. Edge analytics, or computing, creates smart, intuitive devices and networks that can react quickly to real-time, on-site data and make decisions. This includes shutting down equipment for safety reasons, identifying in advance a part's end of life to avoid downtime, taking some kind of corrective action autonomously or providing personnel with instructions and information that will help them solve a problem. Edge computing is also highly scalable. When individual machines or devices have the capability to analyze their own data, this allows the analysis workload to be distributed across the enterprise. In addition, when data is analyzed at the source, the chance of security breaches is greatly reduced because the information is not housed in a centralized location. In the aggregate, edge computing and analytics reduce downtime, lower maintenance costs, identify and predict failures, increase security and, ultimately, make better use of physical assets and resources.

WHAT'S NEXT?

At the core of our DNA at Honeywell is connecting curiosity with ingenuity and experience. We're combining all three to tackle the challenges faced by our customers across a range of industries. Our R&D is at the forefront of finding solutions that address the economy and humanity. We're developing new technologies that improve the efficiency, resiliency, sustainability and profitability of customers while also improving the quality of life for people around the world. From smart cities to edge computing and beyond, we believe that connectivity creates opportunities for all.

For more information
https://pmt.honeywell.com/us/en/businesses/smart-energy

Honeywell Smart Energy
2101 CityWest Blvd
Houston, TX 77042

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