Enabling customers starts with a smarter, more flexible grid

Raiford Smith

The U.S. electric power grid has been referred to as the world's largest machine. Designed more than a century ago for electricity to flow reliably and economically from fossil-fueled plants to cities, towns, and customers, the grid is vast and complex; but it wasn't built for the modern world's demands – clean, reliable, and affordable energy for everyone. As a leader in clean energy and innovation, AES is ideally positioned to recharge this indispensable engineering marvel that enables our lives and essential workplace operations.

AES Indiana is proactively enabling these new capabilities through our Integrated Resource Plan (IRP), fast-tracking a carbon-free future that makes great business sense for everyone. Revitalizing the grid as two-way, interactive, and intelligent is part of the same revolutionary effort we're undertaking to economically convert our power plants to clean alternatives like solar, wind, and battery storage. In fact, AES is currently investing in climate-friendly approaches to eliminate carbon-based supply, leading to a greener energy future.

For example, we accelerated by five years our commitment to reduce coal-fired generation to less than 10% of our portfolio by 2025. And by 2040, we've set a new target to achieve net zero carbon emissions from electricity sales, one of the most ambitious announcements by any utility in the United States.

Our 2022 IRP is our boldest move toward sustainable energy supply. Under this plan, we will:

- → Source over 85% of our energy from wind, solar and other carbon-free technologies by 2042.
- → Add up to 1,300 megawatts (MW) of wind, solar and battery energy storage, bringing our total renewable and energy storage capacity from 400 MW to 2,200 MW by 2027.
- → Finish converting our Petersburg facility from coal to natural gas.

This overall "decarbonization approach" lines up with the need to enable tomorrow's grid as transformation of energy supply relies on transformation of the power grid.

Creating the smart grid

Beyond making Indiana's energy supply more sustainable, we're also enhancing the power grid. But what is a smart grid? Simply put, it's a power grid that has been upgraded with additional automation and intelligence to improve reliable operations. Collectively, these are the necessary, baseline improvements to creating an economic, reliable, and sustainable energy future. Without it, the sustainable energy resources we're planning for can't be fully utilized. Today, AES Indiana is already upgrading the grid to help us rapidly spot power outages and power quality issues, automatically manage infrastructure to reduce outage times, and improve system resilience. But this is just the beginning.

Optimizing the smart grid with data and analytics

Optimizing the smart grid beyond today's capabilities starts with using analytics to improve our understanding of customers – residential and businesses - as power is critical to their lives and success.

Predicting what customers want from energy, when they want it, and where they want it, allows us to anticipate and better design future grid upgrades to meet their needs. But foresight is never perfect, so we are augmenting our capabilities by improving analytics-driven, predictive asset operations and designing flexibility into the grid for those down-the-road technologies we know are coming. Analytics helps us get ahead of challenges by identifying troublesome assets before they fail, enhancing the quality of our data, and improving infrastructure operations to reduce the impact of an outage.

> We've only just scratched the surface at the possibilities here.

Better outcomes from digitally-enabled infrastructure

To get the most out of new analytical capabilities, we also need to invest in enhanced telecommunications, security, and physical grid infrastructure. Historically, the grid was managed with analog, mechanical assets that were never designed for the precise, rapid operations of tomorrow's smart grid. AI-based, distributed optimization of the grid can make millions of decisions to manage grid performance quickly and seamlessly, dramatically improving grid reliability, power quality, and flexibility. Yet, if we don't upgrade the physical infrastructure to operate at the same frequency and time-scale of the analytics, the grid won't be able to meet its potential. Similarly, investments in security and telecommunications infrastructure are necessary to make all of these digital assets work safely, securely, and collaboratively.

A smart grid enables a cleaner, more reliable, and economic future for everyone, and we're charged up about all the possibilities that can make business' dreams a reality in ways we could never have imagined over a century ago. AES will continue to lead transformation of our energy supply and the power grid to help residential and commercial customers get the most from their energy.

***Raiford Smith**, AES chief utility innovation officer, is a recognized innovator, leader, and technologist in the energy domain having helped develop sustainable solutions in tech, energy efficiency, and renewables. His 30-year career includes various customer, technology, and grid-related executive roles at Google and several large utilities, overseeing complex, cross-functional transformation initiatives.*

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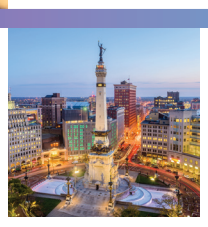

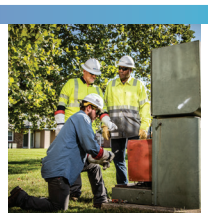

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