



The Role of "Smart Communities" During a Global Pandemic

June 2, 2020

By Barbara Tyran

Technology changes are enabling a global electricity transformation. As the system shifts from centralized power plants and uni-directional power flow to a dynamic, bi-directional power supply and delivery infrastructure of generators and "pro-sumers," new factors emerge for valuing both the technologies and their capacity to serve customers.

Smarter energy infrastructure is a key platform for smart communities. As noted in the Edison Electric Institute's Feb. 2019 publication, "[Smart Communities are Powered by Smart Connections](#)," smart communities use data and technology to help drive efficiencies, improve sustainability, spur economic development, and enhance the quality of life for their citizens.

The relevance of smart communities to achieve paradigm shift thinking becomes even more significant, given the prospects for continuing and/or return of COVID-19 during the 2020-21 winter flu season.

Smart Communities and Utilities

With the distribution grid already changing, and many citizens restricted at home and teleworking, utility load factors are shifting. Residential load is now relatively equivalent to typical weekend demand levels, while commercial/industrial loads are operating at reduced levels. A "Smart Community" can adapt to and mitigate its response to these challenges through a number of measures. Responding to these new conditions, utilities and system operators are reevaluating their business continuity strategies and contingency plans. Different and/or unexpected consumer demands can result in electric utilities and system operators experiencing shortages of critical parts, due to constrained supply production or supply chain disruption.

The electricity sector's public service mission has always guided its clear understanding that delivering reliable and affordable electric power is an essential service. Especially during a pandemic, when electronic communications bind the ultimate social fabric, interruptions would have a hugely disruptive societal impact. The sector has taken important steps to protect

employees' health, while ensuring reliable service, resulting in few major reported outages. Despite nearly 70% of the utility workforce working remotely, system operations remain successfully focused on the immediate challenges to maintain customer service. Although longer-term financial impacts may be anticipated for both income levels--most utilities have stopped customer disconnects and are experiencing lost revenue--and capital expenditure projects, the direct O&M cost consequences are not yet known.

As noted in the recent IEEE PES (Institute of Electrical and Electronics Engineers Power & Energy Society) report, "[Sharing Knowledge on the Electrical Energy Industry's First Response to COVID-19](#)," the growing availability of Advanced Metering Infrastructure (AMI) enables more granular reliability performance, which is particularly critical during stay-at-home conditions. With the approach of other physical limitations, such as hurricane, wildfire, flood and other natural disaster-related incidents looming, the need for a reliable grid may only increase. If these other events were to occur during the continuing health crisis, their need for "search and rescue operations" based on accurate communications and available mutual assistance support could be compromised. Furthermore, potentially restricted equipment and materials could impact power restoration.

In addition to physical safety, cyber security threats have emerged as new challenges for reliable, safe delivery of electricity, as well as IT functionality. According to [Dentons Flashpoint 5.8.20](#), Maze ransomware is one of the most prolific cyber threats worldwide today and poses such a danger that the FBI recently issued a warning for U.S. companies. The Maze group demands Bitcoin ransom to unlock corporate accounts.

Smart Communities and Customers

During this period of self-isolation, information technology can promote a "smarter community" through a number of services, including: medical care (tele-health), child care/educational support, online exercise, entertainment; philanthropy, volunteer options, "track and trace" apps, and stay-at-home tips. Personal resilience and secure communications become extremely significant for successful quarantining and the subsequent easing of restrictions. With millions of workers and students sequestered at home, the electric infrastructure becomes even more vital. Emerging virtual conference platforms (Zoom, Google Meet, etc.) are increasingly used for business meetings and briefings, conferences, distance learning, and even family and social gatherings. These new technologies create "Smart Community" during a time of remote access, providing the societal fabric to achieve a civil society.

Smart Communities and Regulators

The actual financial impact of COVID-19 is complex to evaluate since utility business models vary according to regulatory framework, and generation and customer mix. In many geographic areas, the load demand is now spread over a longer period during the day, with typically the morning peak shifted by an hour or two. This overall flattening in peak demands and reduced energy consumption can have immediate implications for load dispatch, utility revenue and capital investment, including sometimes impacting the availability and use of renewable energy. Although these conditions may offer the opportunity to study future grid modernization concepts, the current empirical data does not reveal enough information for meaningful conclusions.

Smart Communities During a Time of Return

Risk management underpins our response to the uncertainties associated with the pandemic, often with conflicting motives. New threats have also emerged during these unprecedented times. Essential service providers may experience shortages of critical parts, due to constrained supply production or supply chain disruption. Re-purposed near-by manufacturing facilities can help meet the new demand for critical items such as personal protective equipment (PPE) or ventilators.

Home/business delivery systems may utilize new technology platforms going forward. As noted, the "Smart Community" has adopted ways to mitigate supply chain disruptions, such as deployment of currently under-utilized taxi and Uber/Lyft services, as well as Amazon delivery systems.

Pondering the disease spreading impact of the "Smart Community" on the sharing economy in workplaces, vehicles, hotels, airports, bikeshares, and public transit, risk mitigation measures could include:

- * Continued partial telecommuting
- * No physical contact during business meals, meetings, and greetings
- * Spacing in all closed, containment areas (elevators, public transit, airplanes)
- * Regular environmental cleaning and disinfection of all surfaces

As Smart Communities continue to grow, their integration of advanced technologies will reveal new opportunities to provide the foundation for a future economy and better quality of life in the years ahead.

About the Author

Barbara Tyran is President of the Board of Directors of the Women's Council on Energy & the Environment (WCEE). She is also General Chair of the IEEE Power & Energy Society 2021 General Meeting Local Organizing Committee, with over 38,000 members world-wide. For two decades, she was Director, Washington & State Relations, at the Electric Power Research Institute. Her prior background includes federal advocacy for utilities and management consulting for public / private sector clients, with engagements involving strategic planning, policy analysis, and financial / economic analysis.

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