awesense

Building a Reliable and Resilient Grid

The recognized need to build a reliable grid stems from the NERC Reliability Standards. These outline the need to maintain grid reliability (meet demand) and grid security (ensure the capacity to resist unforeseen adversity). In recent years following their establishment, the concepts of reliability and resiliency are becoming increasingly intertwined.

Utilities are now inspired by the viability to decarbonize and decentralize energy generation for their customers. However, this requires the utilities to remodel entire distribution strategies and, if grid operators are to ensure uninterrupted delivery of service in the future, a reliable grid must be built through a resilient approach.

Increased Uncertainty

Until now, consumers have had relatively little involvement in grid operations. With the advent of affordable renewables/DERs and evolving public opinion, however, consumers are becoming increasingly engaged, looking to grid operators for greater control and transparency.

This change not only requires a shift in utility business model, but a complete shift in operational capabilities for network operators. Many utilities are turning to DERMS and ADMS providers as a means of increasing control over DERs entering the grid, but often lack tools providing greater sensing and analysis capabilities. It is essential to understand real-time energy flow in the grid so as to manage these resources effectively.

Additionally, several dramatic events damaging billions of dollars worth of utility assets in previous years augment the need to increase visibility into grid dynamics. Particularly during extreme hazards, such as wildfires and storms, understanding energy flow throughout the distribution grid is key to maintaining stable operations and resolving major issues quickly.

[1] North American Electric Reliablity Corporation
[2] Energy.gov - Driving Grid Resilience

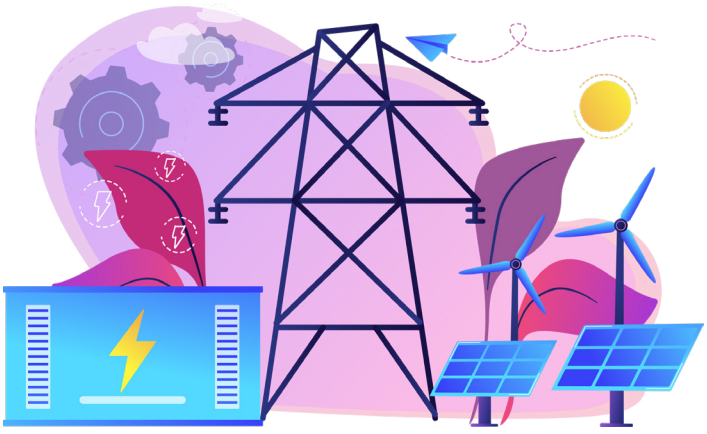
Necessary technical steps

The US DOE states that a resilient distribution grid requires advanced distribution systems, dynamic controls & communications and high fidelity, low-cost sensors. Various areas require development in order to achieve these guidelines. Among these are: system operations, power flow and control; and measurement and analytical capabilities.

Within system operations, utilities must assess technologies which will increase their control over devices active in the grid. Tools with the ability to interact with and activate both utility and prosumer assets will give operators the ability to ensure a stable flow of energy in the network. Among these tools are DERMS and ADMS solutions. When undesirable fluctuations occur in network energy flow, operators have the ability to control the DERs and maintain a balanced system. Additionally, there is the potential to enable control over curtailment initiatives, such that excess generation is not wasted and potentially stored for later use.

Furthermore, measurement and analytical capabilities require evolution. Specifically in sensing, utilities can now invest in low-cost, dynamic sensors which are self-powering. They must measure various important metrics such as current, VAR, power factor and be capable of four quadrature measurement to understand energy flow. Additionally it is crucial that these devices measure geographically specific data, linked to an accurate digital representation of the power grid.

The data collected must be ingested and stored in a platform for holistic grid visualization, and which enables automated analytics.



These provide essential visibility into real-time energy flow in the network and which confirm the contribution of active DERs. It's also important to allow this wealth of data to be accessed across the organization by the right teams, without being too restrictive.

Once established, constant monitoring of the system should be maintained through advanced analytics platforms, aggregating all data available to the operators (SCADA, AMI, third-party sensors, etc.).

Moving towards a resilient grid

Awesense provides not only the advanced analytics software capable of grid-wide monitoring, but also easily deployable, cost-effective hardware sensors giving grid operators and planners unparalleled insight into the dynamics of their network.

Awesense aggregates data from all sensors and data acquisition devices available to distribution operators which populate in its powerful TGI (True Grid Intelligence) geospatial engine. Through Awesense's connectivity and GIS correction algorithms, utilities benefit from optimization of DERMS and ADMS solutions, which require an accurate digital grid representation to function optimally. TGI's Grid Alerts module provides a flexible means of controlling and responding to issues which may be occurring in the network, improving SAIDI / SAIFI metrics. Furthermore, through the use of Awesense Raptor sensors, operators are notified instantaneously of outages, contributing to improved SAIDI benchmarks. With the ability to visualize grid-wide energy flow, network operators and reliability planners can ensure the long-term stability of the network.

If you'd like to learn more, please get in touch at sales@awesense.com for a quick demo.

CORPORATE HQ
66 East 4th Ave
Vancouver, BC, Canada, V5T 1E8
1-888-868-4607 | info@awesense.com