Grid Connectivity

A Smart Grid is a Balanced Grid

THE OPPORTUNITY

Demands of the modern electric grid are increasing faster than ever. Integrating solar power and other distributed energy resources, such as electric vehicles, while meeting increasing customer expectations is becoming more challenging. Achieving an accurate grid topology and balanced grid to support these demands has historically been challenging until now.

Utilities are relying more on analytics to resolve this challenge and get the most out of their distribution network. In order for these systems to be effective, an accurate, detailed analysis with up-to-date knowledge of how these key grid components are connected is required.

Operationally, an electric grid that has balanced power flow through every phase enables longer asset life of critical components, increased levels of customer satisfaction and improved grid reliability. Maintaining a grid where power is flowing evenly through every phase—where every transformer has the optimal load—results in a balanced system. As the grid evolves, the opportunity to capitalize on advancements in connectivity allow you to improve outage response, enhance grid resiliency and improve asset life.

THE CHALLENGE

Maintaining accurate records of your distribution grid can prove challenging. New construction, storm restoration or removal, and replacement of aging equipment all contribute to an accumulation of deviations maintained in GIS systems. On average, 5-35% of meter electrical connectivity mapping has been shown to be inaccurate. Maintaining accurate records can be an onerous manual process which often gets lost in day-to-day operations of higher priority. These factors lead to diminished confidence in phase and transformer connectivity.

Impact of Poor Grid Connectivity

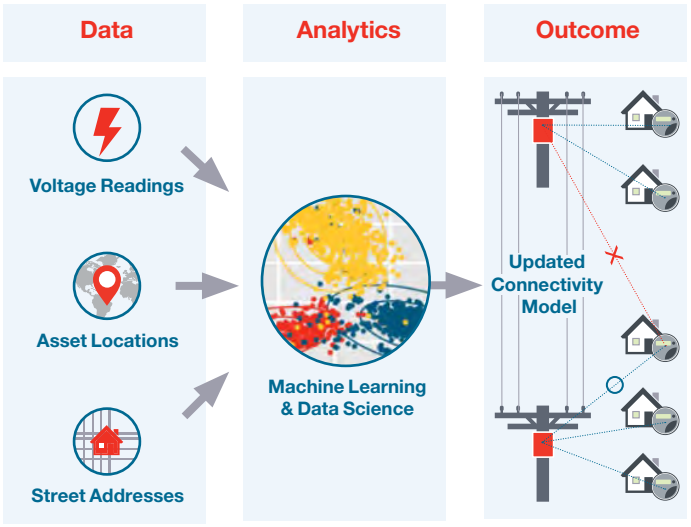
ACHIEVING BALANCE

Achieving a balanced grid just got easier. Grid Connectivity, a component of grid management, uses an artificial intelligence (AI) approach that leverages meter voltage data (in the back office) to identify inaccurate connectivity information on your distribution grid. This enhanced analysis runs seamlessly in the background to help detect errors and exceptions, and provide immediate resolution using insightful connectivity models.

Grid Connectivity is comprised of Phase Identification and Meter-Transformer Connectivity. *Phase Identification* provides fast, automated and up-to-date connectivity data for power distribution, system planning, outage restoration and other grid management operations. *Meter-Transformer Connectivity* delivers end-to-end monitoring and communication to determine precise and timely connectivity information of meter locations in relation to the transformers by which they are served.

Grid Connectivity is an entirely data-driven, AMI system-agnostic application consisting of a set of robust machine-learning techniques to accurately predict correct phase and transformer connectivity with AMI interval or SCADA voltage measurements. These algorithms power a solution that continuously updates the connectivity map. Automated workflows update the system of record, mapping every meter to a phase and transformer with up to 99% accuracy. This provides the ability to take corrective actions and balance your distribution grid.

Accurate Phase and Transformer Connectivity



Our patent-pending algorithms harness hourly voltage readings, asset locations and street addresses to verify and update your connectivity model, while providing confidence metrics to help you understand the accuracy. This analysis enables you to verify and update information in your GIS systems as well as enhance the accuracy of other back-office applications that reference this data.

With Grid Connectivity, you can:

- Realize millions of dollars in savings per year in added business case value, depending on utility size
- Improve your load forecasting capabilities with an accurate connectivity model
- Optimize asset utilization and extend asset life
- Reduce outage response time management errors and improve SAIFI/CAIFI rates
- Improve many outcomes, such as outage and theft detection
- Reduce technical loss by phase balancing

Want to learn how Grid Connectivity can help optimize your distribution grid, ensure network reliability and improve transformer utilization in your distribution network? Contact us today to learn more and/or set up a connectivity pilot.

Itron

Join us in creating a more **resourceful world**.
To learn more visit **itron.com**

CORPORATE HQ
2111 North Molter Road
Liberty Lake, WA 99019 USA
Phone: 1.800.635.5461
Fax: 1.509.891.3355