Key trends occurring in power utilities are already causing disruption and challenges to the industry. The increase in more agile, decentralized, and distributed energy resources, such as solar panels, wind farms, community solar, electric cars, and more, have a huge impact on the infrastructure. Modeling the grid for decentralized energy requires a new and reliable system to effectively manage complexity and modernize assets to support distributed energy resources (DER). Utilities need to address the question of how to maintain reliability and resilience within the grid, considering how DER interconnections affect network performance, and without disrupting current operations.

**OpenUtilities Analysis (Powered by Siemens’ PSS®SINCAL)**

Power planning engineers need the capacity to work in an environment that integrates power systems analysis capabilities with geographic information system (GIS) capabilities. The Siemens/Bentley collaboration creates a complete solution, enabling power planning engineers to work directly within the GIS for rapid assessments and validations tailored to power planning workflows for the modern grid accommodating DER in a constantly changing environment. The solution operates within a connected data environment, a common platform that uniquely converges engineering disciplines, asset types, and lifecycle processes.

**Utilities need to address the question of how to maintain reliability and resilience within the grid, considering how DER interconnections affect network performance, and without disrupting current operations.**

**Perform simulations to evaluate DER integration**

Extensive growth of DER on the power system has fundamentally changed the operation and planning of the power grid. OpenUtilities Analysis addresses DER integration challenges. The OpenUtilities Analysis framework enables planning engineers to perform simulations to investigate DER integration and provide solutions in terms of capacity, connections, compliance, load, and even security. Using network models, DER loading can be added and calculations can be run to determine success in each workflow. This results in cost savings from automated assessments and creates complete and qualitative documentation.
OpenUtilities Analysis (Powered by Siemens’ PSS®SINCAL) At-A-Glance

Siemens’ PSS®SINCAL Integration
- Off-the-shelf solution that provides an electric network data model
- Configurable to local and company standards
- Multiple sets of characteristics can be configured to support multiple standards
- Fully configurable and customizable with .NET languages and VBA
- Simple user interface

Basic Calculations
- Static load flow
- Time-series (balanced and unbalanced)
- Short circuit

GIS Capabilities
- Supports a wide range of geospatial coordinate systems
- Buffers and overlays
- Joins
- Thematic resymbolization
- Dynamic labeling
- Query builder (search by)

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Integration of GIS and Spatial Databases
- Interoperability with various GIS data stores supports network information within a common data environment
- Supports ESRI, GE Smallworld, etc.
- Oracle Spatial/Locator and SQL Server Spatial compliant

Engineering-precision Edits
- MicroStation® (Power Platform) for a precision engineering environment
- Raster management
- Display priority and transparency
- Smart, quick drawing and editing of utility network data

Support for 3D Reality Models
- Displays reality meshes created by ContextCapture
- Snap, measure, render, and interact with the model to help improve design
- Edit 3D reality models with MicroStation mesh elements

Reporting
- WYSIWYG plot generation with user-defined templates and legends
- Publishing to intelligent PDF, PostScript, and other output formats
- Tabular views and graphical views

Interoperability
- Support for Bing Maps
- MapInfo (TAB, MID/MIF), SHP files, Oracle Spatial and Graph, CSV, GML, ESRI File Geodatabase, SQL Server Spatial, and ODBC sources
- Publish iModels with RDBMS properties
- Web feature service client - read (query) access

The Siemens / Bentley Advantage for Intelligent T&D within DER
OpenUtilities Analysis Powered by Siemens’ PSS®SINCAL accelerates the digitalization of power utilities and industrial power facilities. A single unified application combines Bentley’s exceptional technology in infrastructure design and engineering with Siemens’ for the economical, reliable, and intelligent transmission and distribution of electrical power. The solution will aid utilities to reduce costs, improve reliability, and build-in resilience in response to global marketplace changes.

Figure 2. Network simulation with 3D reality model.