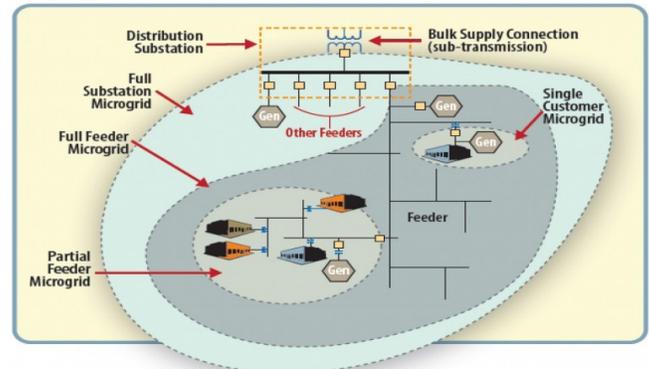


Microgrids are localized energy grids that provide flexibility through their ability to operate independently from the bulk power grid. Well-designed microgrids support resiliency, security, efficiency, local control, and increased access to renewable resources. Sandia's Microgrid Design Toolkit (MDT) is a decision support software toolkit that aids designers in creating optimal microgrids.

Employing powerful algorithms and simulation capabilities, MDT searches the trade space of alternative microgrid designs based on user-defined objectives (e.g., cost, performance, and reliability) and produces a set of efficient microgrid solutions. MDT allows designers to investigate the simultaneous impacts of several design decisions and gain a quantitative understanding of the relationships between design objectives and trade-offs associated with alternative technological design decisions. MDT can account for grid-connected and islanded performance, power and component reliability in islanded mode, and dozens of parameters as part of the trade space search, and presents designers with an entire trade space of information from which to base final design decisions.

Without MDT, designers rely on engineering judgment and perhaps a quantitative analysis of relatively few candidate designs. MDT allows designers to explore a larger field of options and provides defensible, quantitative evidence for design decisions.

Without MDT, designers rely on engineering judgment and perhaps a quantitative analysis of relatively few candidate designs. MDT allows designers to explore a larger field of options and provides defensible, quantitative evidence for design decisions.



Simulated microgrid design created in Sandia's Microgrid Design Toolkit

## TECHNICAL BENEFITS

- Provides ability to perform topology optimization
- Illuminates large trade space of design alternatives
- Provides a variety of performance, reliability, and cost-related insights for candidate microgrid designs
- Provides microgrid designers a full understanding of trade-offs associated with certain design decisions
- Provides many result views and graphs to help interpret results

