What is a Microgrid?

Microgrid

The United State Department of Energy (USDOE) Microgrid Exchange Group in 2012 developed a generally accepted definition of a microgrid as

A microgrid is a group of interconnected loads and distributed energy resources (DER) within clearly defined electrical boundaries that acts as a single controllable entity with respect to the grid. A microgrid can connect and disconnect from the grid to enable it to operate in both grid-connected or island-mode.

The above definition for microgrids covers a broad array of systems, technologies, customer types and interconnection types. Currently, there is no definitive or universally accepted classification system for the different types of microgrid configurations. A microgrid can be categorized in several different manners. Below is one classification of microgrids based on interconnection to the grid.

1. Level 1 or single customer microgrid. This is a single DER system such as a photovoltaic solar (PV) system, combined heat and power (CHP) or fuel cell (FC) system that is serving one customer through a single meter. This microgrid class is connected to and can island from the distribution grid.

   Examples of this classification of microgrids in New Jersey are a single owner PV system with either a backup generator or an off-grid inverter that can isolate from the grid, or a CHP that serves just a single building load such as a hospital, office building, restaurant, school or multifamily public housing building. (See list in Section 6.1).

2. Level 2 or single customer / campus setting; also referred to as the partial feeder microgrid. This classification includes either a single or multiple DER systems connecting multiple buildings, but controlled by one meter at the point of common coupling. This microgrid class is connected to and can island from the distribution grid.

   Examples of this classification of microgrids in New Jersey includes several DER systems that serve a campus setting such as a college or university, healthcare/hospital campus, pharmaceutical complex or military base. (See list in Appendix E).

3. Level 3 or multiple customers / advanced microgrid; also referred to as the full feeder microgrid. This is a single or multiple DER system that serves several different buildings/customers that are not on the same meter or on the same site as the DER. An advanced microgrid has one point of common coupling (PCC). The individual buildings/customers may be independently connected to the larger distribution grid and through the microgrid PCC.