



EE3035 GRID INTEGRATING TECHNIQUES AND CHALLENGES

Unit III

Modeling of Converters in Power Grid Distributed Generation Systems

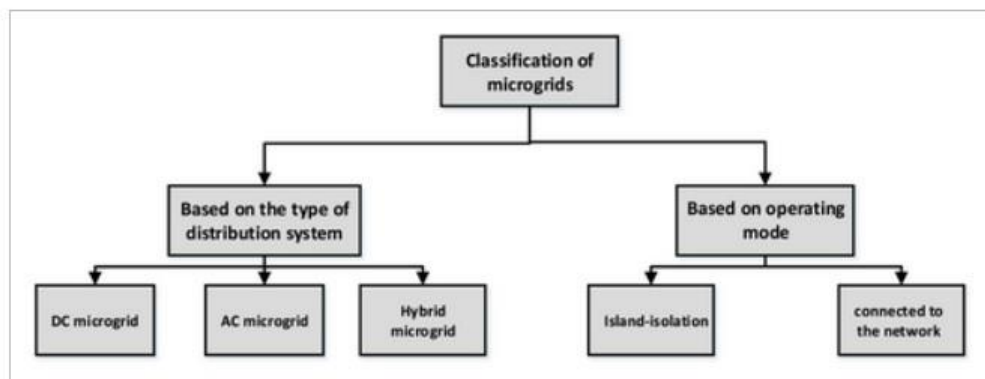
Microgrids with large-scale photovoltaic systems constitute a large part of distributed renewable generation in many grids around the world. Managing the performance of such microgrids and especially their interaction with the main power grid is a challenging task, because it requires the control of renewable resources. This paper presents a comprehensive overview of DC-DC converter structures used in microgrids and presents a new classification for converters.

. Recent technological advances and increasing concerns about global warming have prompted engineers to seek clean energy sources. The microgrid can tackle the current energy crisis by reducing transmission losses. Microgrids often include technologies such as photovoltaic PV systems or microturbines that require power electronic converters to connect to the electrical grid.

A DC microgrid based on renewable energy has the following components

1. A microgrid DC bus.
2. Photovoltaic (PV) panel.
3. Wind turbine.
4. Power electronic converters.
5. Hybrid energy storage system (ESS) is applied to provide the required energy in case of lack of energy.
6. DC load.

Figure 1 shows the different classifications of microgrids.



DC microgrid can provide multiple voltage levels and high efficiency. A DC microgrid is shown in Figure

