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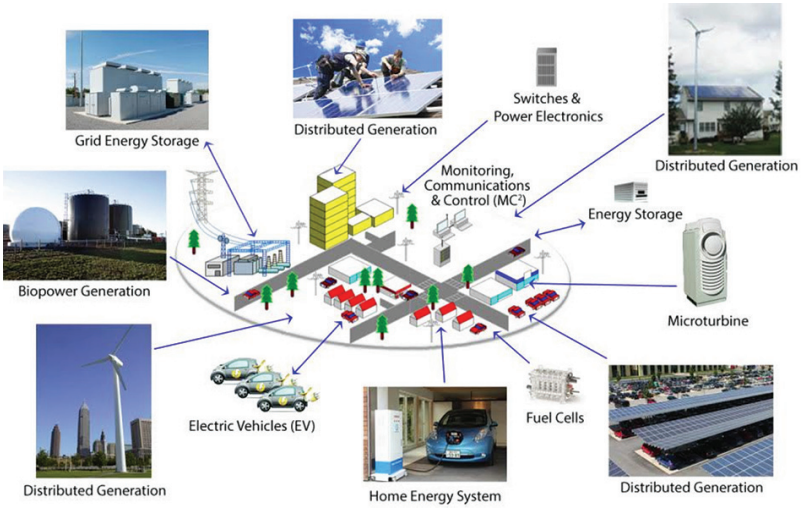
INDUSTRY DIRECTIONS

How will micro-grids sustain the renewable energy systems of the future

With the energy requirement per capita in developing countries such as India, Brazil and South Africa continuously increasing with time, giving a perspective that solutions to energy sustainable goals will need to be expandable in terms of capacity. The current situation strongly relates to the development of reliable, renewable-integrated micro energy systems that can be easily deployed in various parts of the world while having flexibility on capacity. On top of this, deployed micro energy systems must also maintain economic feasibility to make implementation sustainable for operators. Such integrated energy systems must be able to bring improvements in terms of social, economic and environmental aspects of the sustainable development project. There is global thinking, acceptance and progress on the concept of microgrid. A microgrid is an interconnected load that is usually connected to and well synchronised with the traditional centralized grid. However, it can disconnect and still function autonomously as physical and economic conditions dictate. Microgrids are created for improved reliability in places where main grid reliability is not adequate, or when the utility is providing attractive price incentives for load sharing.

Today's electricity grids are getting larger and smaller at the same time. The U.S. Plains & Eastern Clean Line, now in planning, will carry wind-generated electricity more than 700 miles, from Oklahoma to Memphis, Tennessee, when it starts operating. High-voltage direct current (HVDC) transmission technology is enabling its astounding 4,000-megawatt capacity. At the same time, microgrids are now coming online to link on-site distributed energy resource systems (DERs) to local facilities on campuses, military bases and in housing and apartment developments. At certain times, these systems can be "islanded" from the main grid and supply themselves with their own energy. In the event of main grid supply failure, for example, they can maintain supply internally by carrying out load shedding of specific resources to maintain their balance.Some examples are high-availability, single commercial buildings, corporate research or business campuses, hospitals and data centers. Benefits of these installations include lower energy bills, an ability to integrate more renewable sources, and improved resiliency.



The concept of a microgrid

The energy manager aims to optimize microgrid assets with assistance from the microgrid provider and a commercial aggregator to:

a. Utilize all practical and cost-effective means of local production (DERs) and optimize self-consumption.
b. Improve energy flexibility of the facility using a battery energy storage system.
c. Monetize energy flexibility through a commercial aggregator.
d. Benefit from advanced microgrid control that manages DER flexibility and reduces energy bills through tariff management optimization.