Microgrid Institute

# Microgrid Multi-Play

## Creative solutions for energy access, resilience, and sustainability

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:: B A C K G R O U N D ::

Microgrid Institute

Microgrid Institute is a collaborative think tank that focuses on key issues affecting the development of microgrids and distributed energy resources (DER) around the world. Our efforts address:

- *Market development and analysis*
- *Regulatory and financial models*
- *Project feasibility and structuring*

*definition*:*

# Microgrid

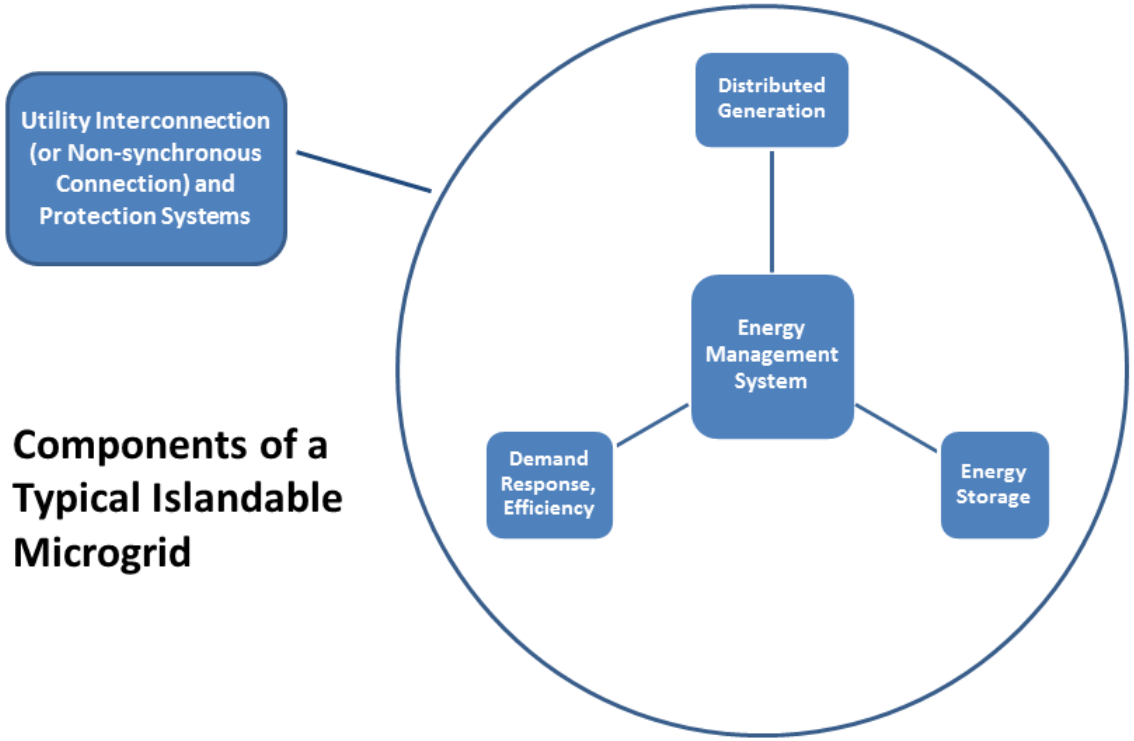
A local energy system capable of balancing captive supply and demand resources to meet customers' service requirements within a defined boundary.

Microgrids are **defined by their function**, not their size.

Microgrids combine various DERs to form a whole system that's greater than its parts.

Most microgrids can be further described by one of three categories:

- **Isolated microgrids,** including those on **islands** and at **remote inland sites**, *not connected* to a local utility.
- **Islandable microgrids** that are fully interconnected and capable of both consuming and supplying grid power, but can also maintain some level of service during a utility outage.
- **Non-synchronous microgrids** are connected to utility power supplies, but they aren't *inter*connected or synchronized to the grid. Such non-synchronized microgrids are capable of consuming power from the grid, but they aren't capable of supplying it.




**Components of a Typical Islandable Microgrid**

*Source: Microgrid Institute www.microgridinstitute.org

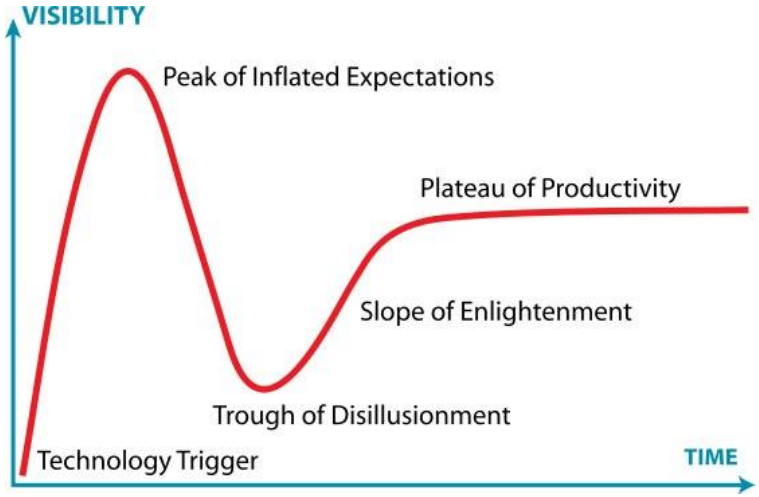
# Some Current Trends We're Tracking

■ Utilities and lawmakers are increasingly aware of the potential of microgrids and DERs, and are focusing on resolving dilemmas.
***Question**: What regulatory approaches favor the most efficient and fair deployment?*

■ Microgrid hype remains high, with frequent coverage and recent exposure in consumer media.
***Question**: Are expectations still rising, or have they peaked?*

# Gartner Group "Hype Cycle" Illustration

**As of late 2013, the microgrid solution is near or past its peak of inflated expectations.**




HOWEVER, the long-term potential remains very interesting and many manufacturers, software companies, engineering companies, and finance firms are eager to establish a presence in this market.

# Some Current Trends We're Tracking

*Continued …*

■ Regulators are questioning volumetric pricing and considering alternatives that might more appropriately value benefits and costs of DERs.

■ Investor-owned utilities have initiated a campaign against rooftop solar incentives perceived as shifting costs from DG hosts to non-DG customers. *See* Edison Electric Institute TV commercial, "We all rely on the electric grid": http://www.youtube.com/watch?v=Ut1_PosSLtk

# Some Current Trends We're Tracking

■ Traditional utilities are increasingly interested in prospects for developing community/cluster microgrids using islandable segments of existing utility infrastructure.
***Question**: Will utilities corner the market on microgrid development? Would it be a bad thing if they did?*

■ The term "dynamic microgrid" is entering the lexicon as part of an automatic-reconfiguring ("self-healing") smart grid architecture.
***Question**: How are costs apportioned for bringing higher service levels to microgrid customers?*

# Some Current Trends We're Tracking

*Continued …*

**Increasingly creative microgrid approaches**

Some microgrid sponsors are exploring what might be called "multi-play" projects.

Microgrid multi-play projects would combine related infrastructure and services – addressing the specific needs of microgrid customers.

# *definition:* "Multi-Play"

- The term "multi-play" derives from the telecom industry term "triple-play," generally referring to a business model in which a single provider delivers landline telephone, high-speed Internet, and TV service.
- Multi-play telecom packages include mobile telecom and perhaps other services.
- Some energy companies have offered multi-play services including electricity and broadband over power-line (BPL) telecom service.

# Microgrid multi-play drivers

- Energy access ushers in connectivity and service options, serving economic growth and quality of life. (Phone and Internet logically accompany electricity service.)
- Multiple value streams bring quicker payback on system investments.
- A larger investment package can attract lower-cost commercial financing.
- A multi-play project can be flexible and complementary with any of several infrastructure and service needs – extending the potential market for microgrids.

# Potential value streams for microgrid multi-play projects

Some known examples of microgrids being developed in Latin America and the U.S. illustrate aspects of a multi-play project approach to produce complementary value streams.

- Affordable, reliable, resilient electricity service
- Clean and sustainable energy supplies
- Conservation and efficiency savings
- CHP / Hot or chilled water, space heating, process steam
- Water pumping and purification
- Mortgage finance
- Network connectivity / broadband Internet and mobile
- Television service
- Carbon offsets

# Microgrid multi-plays in real-estate and community planning projects

Some multi-play concepts include microgrids designed and financed as part of real estate development, community renewal, and urban planning projects:

- New commercial and community facility developments
- Smart buildings / smart communities
- New low-income housing
- Mixed clusters of customer groups (residential, commercial, industrial, institutional)
- Real estate mortgages and lease financing
- Clean and sustainable transportation
- High-tech business and industrial integration

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