COMMUNITY CHANGE GRANTS
Environmental and Climate Justice
U.S. Environmental Protection Agency

ENDYNA

Climate Action Strategy 4: Microgrid Installation for Community Energy Resilience

Microgrids 101

Microgrids are small energy systems that generate electricity for a user or set of users. These systems—which can be powered by solar panels, wind turbines, and landfill or agricultural methane—can be standalone or connected to a local electric grid. A standalone system can meet electricity needs in remote locations. Grid-connected systems can supply energy back to the grid at specific times, such as when the grid is at peak demand or when the system is producing more energy than users need. Microgrids can use low or zero-emission renewable energy resources. They can also increase reliability and improve the quality of electricity service.

Microgrid designs vary widely but generally contain the following components:

- **Energy generation resources:** These can be traditional energy sources, such as diesel; renewable sources, such as solar, wind, hydro, biofuel, or waste; or a combination.
- **Load:** This is the end user of the electricity generated by a microgrid. It can be a single building, a set of buildings, or an entire community.
- **Energy storage:** Batteries or other energy storage devices store excess energy for later use. For example, solar energy generated during the day can be used at night.
- **Microgrid controller or load management infrastructure:** This may include a centralized system that manages the distribution of energy or other specialized equipment to manage and monitor generation and demand.

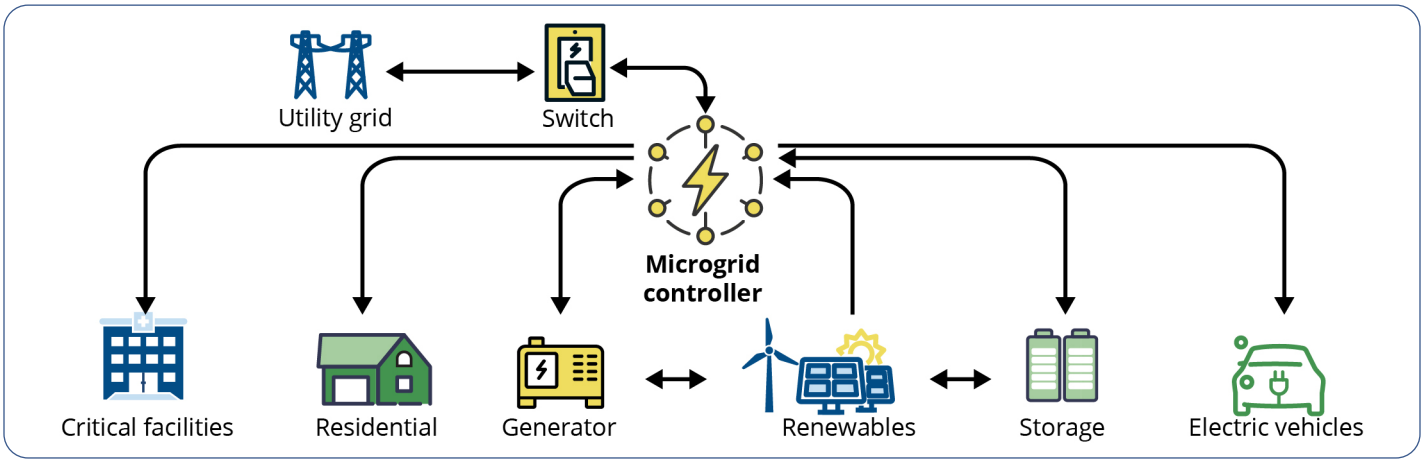

Diagram of a microgrid

Microgrid Installation for Community Energy Resilience

Microgrid Solutions for Community Challenges

Power Outages and Extreme Weather Events

Community Challenges	Possible Solutions
• Extreme weather events such as big storms, wildfires, and heat waves can cause power disruptions. • Members of disadvantaged communities and priority populations are more likely to be dependent on community services that may have power outages during extreme weather events.	• Microgrids can provide backup power when the grid is disrupted. • Microgrids can support critical facilities that need continuous power. Critical facilities may include hospitals and emergency community centers.

High Energy Costs

Community Challenges	Possible Solutions
• In remote areas, communities can be dependent on generators run by costly transportable fuel sources, like diesel. • Urban areas with little tree cover have higher temperatures, which leads to greater use of energy-intensive air conditioners during demand peaks, when electricity can be more expensive. • Energy costs are often a large portion of monthly expenses in disadvantaged communities.	• A microgrid system can lessen a community's dependence on grid-supplied electricity. • If the microgrid produces more energy than the community needs, some utility companies will "buy" the excess energy. • Communities can use CCG funding to offset design and installation costs. This can significantly reduce the overall cost of a microgrid and may result in cost savings per kilowatt-hour, especially when using renewable energy resources.

Lack of Availability of Utility Grids

Community Challenges	Possible Solutions
• Some disadvantaged and remote rural communities are not connected to utility grids. • Utility companies often do not connect these remote communities to their traditional grids because of complex logistics and high costs.	• Microgrids can provide an independent source of energy for isolated or underserved communities not connected to utility grids. • Communities using microgrids can manage their own energy resources, making sure the resources are responsive to the community's needs.

Microgrid Installation for Community Energy Resilience

Microgrid Solutions for Community Challenges

Dependence on Fossil Fuels

Community Challenges	Possible Solutions
• Disadvantaged communities often do not have access to alternative energy resources, or those resources are too expensive. For example, people living in an apartment building may not have room or permission to install their own generators. • Alternative energy can be more expensive than fossil fuel. For example, installing solar panels requires a big, up-front cost. • Alternative energy may not reduce emissions at the customer location.	• Microgrids can be designed to help communities reach low or net-zero greenhouse gas emissions goals by using resources that pollute less, such as renewables; using energy more efficiently, and tailoring the system to meet the specific needs. • Microgrids can be designed around communal or shared spaces.

Disclaimer: This document was created to help Community Change Grant applicants think through various potential solutions to the problems their community may be facing. All the listed "Community Challenges" and "Possible Solutions" are only examples. We did not attempt to list all possible challenges or solutions.

For more information on the Microgrid Installation for Community Energy Resilience Climate Action Strategy, read Section I.G and Appendices C and F of the Notice of Funding Opportunity (NOFO).

For further questions regarding technical assistance, please contact EJ_TechAssist@epa.gov or call 1(800) 540-8123.

For questions regarding the Notice of Funding Opportunity (NOFO), please contact CCGP@epa.gov.

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