

## Facility Questionnaire

This questionnaire requests information needed to estimate the impact that a microgrid might have in protecting the facilities it serves from the effects of a major power outage (i.e., an outage lasting at least 24 hours). For each facility, we are interested in information on:

- I. Current backup generation capabilities.
- II. The costs that would be incurred to maintain service during a power outage, both when operating on its backup power system (if any) and when backup power is down or not available.
- III. The types of services the facility provides.

### I. Backup Generation Capabilities

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1. Do any of the facilities that would be served by the microgrid currently have backup generation capabilities?
  - a.  No - proceed to [Question 4](#)
  - b.  Yes - proceed to [Question 2](#)
2. For each facility that is equipped with a backup generator, please complete the table below, following the example provided. Please include the following information:
  - a. **Facility name:** For example, "Main Street Apartments."
  - b. **Identity of backup generator:** For example, "Unit 1."
  - c. **Energy source:** Select the fuel/energy source used by each backup generator from the dropdown list. If you select "other," please type in the energy source used.
  - d. **Nameplate capacity:** Specify the nameplate capacity (in MW) of each backup generator.
  - e. **Standard operating capacity:** Specify the percentage of nameplate capacity at which the backup generator is likely to operate during an extended power outage.
  - f. **Average electricity production per day in the event of a major power outage:** Estimate the average daily electricity production (MWh per day) for the generator in the event of a major power outage. In developing the estimate, please consider the unit's capacity, the daily demand at the facility it serves, and the hours of service the facility requires.

- g. **Fuel consumption per day:** Estimate the amount of fuel required per day (e.g., MMBtu per day) to generate the amount of electricity specified above. This question does not apply to renewable energy resources, such as wind and solar.
- h. **One-time operating costs:** Please identify any one-time costs (e.g., labor or contract service costs) associated with connecting and starting the backup generator.
- i. **Ongoing operating costs:** Estimate the costs (\$/day) (e.g., maintenance costs) associated with operating the backup generator, excluding fuel costs.

Note that backup generators may also serve as distributed energy resources in the microgrid. Therefore, there may be some overlap between the information provided in the table below and the information provided for the distributed energy resource table (Question 2) in the general Microgrid Data Collection Questionnaire.

Facility Name	Generator ID	Energy Source	Nameplate Capacity (MW)	Standard Operating Capacity (%)	Avg. Daily Production During Power Outage (MWh/ Day)	Fuel Consumption per Day		One-Time Operating Costs (\$)	Ongoing Operating Costs (\$/day)
						Quantity	Unit		
Main Street Apartments	Unit 1	Diesel	1.5	100	0.03	9.99	MMBtu/Day	1,000	500
		Choose an item.							
		Choose an item.							
		Choose an item.							
		Choose an item.							
		Choose an item.							

## II. Costs of Emergency Measures Necessary to Maintain Service

We understand that facilities may have to take emergency measures during a power outage in order to maintain operations, preserve property, and/or protect the health and safety of workers, residents, or the general public. These measures may impose extraordinary costs, including both one-time expenditures (e.g., the cost of evacuating and relocating residents) and ongoing costs (e.g., the daily expense of renting a portable generator). The questions below address these costs. We begin by requesting information on the costs facilities would be likely to incur when operating on backup power. We then request information on the costs facilities would be likely to incur when backup power is not available.

**A. Cost of Maintaining Service while Operating on Backup Power**

3. Please provide information in the table below for each facility the microgrid would serve which is currently equipped with some form of backup power (e.g., an emergency generator). For each facility, please describe the costs of any emergency measures that would be necessary in the event of a widespread power outage (i.e., a total loss of power in the area surrounding the facility lasting at least 24 hours). In completing the table, please assume that the facility’s backup power system is fully operational. In your response, please describe and estimate the costs for:

- a. One-time emergency measures (total costs)
- b. Ongoing emergency measures (costs per day)

Note that these measures do not include the costs associated with running the facility’s existing backup power system, as estimated in the previous question.

In addition, for each emergency measure, please provide additional information related to when the measure would be required. For example, measures undertaken for heating purposes may only be required during winter months. As another example, some commercial facilities may undertake emergency measures during the work week only.

As a guide, see the examples the table provides.

Facility Name	Type of Measure (One-Time or Ongoing)	Description	Costs	Units	When would these measures be required?
Main Street Nursing Home	One-Time Measures	Evacuating and moving residents	1,500	\$	Only necessary during winter months (October through March) because existing backup generator is not able to provide sufficient heating
Main Street Nursing Home	Ongoing Measures	Housing residents at alternative facilities	5,000	\$/day	Only necessary during winter months (October through March) because existing backup generator is not able to provide sufficient heating
	Choose an item.				
	Choose an item.				
	Choose an item.				

**B. Cost of Maintaining Service while Backup Power is Not Available**

4. Please provide information in the table below for each facility the microgrid would serve. For each facility, please describe the costs of any emergency measures that would be necessary in the event of a widespread power outage (i.e., a total loss of power in the area surrounding the facility lasting at least 24 hours). In completing the table, please assume that service from any backup generators currently on-site is not available. In your response, please describe and estimate the costs for:
- a. One-time emergency measures (total costs)
  - b. Ongoing emergency measures (costs per day)

In addition, for each emergency measure, please provide additional information related to when the measure would be required. For example, measures undertaken for heating purposes may only be required during winter months. As another example, some commercial facilities may undertake emergency measures during the work week only.

As a guide, see the examples the table provides.

Facility Name	Type of Measure (One-Time or Ongoing)	Description	Costs	Units	When would these measures be required?
Main Street Office Park	One-Time Measures	Hooking up additional portable generator	500	\$	Year-round, but only necessary five days per week
Main Street Office Park	Ongoing Measures	Renting additional portable generator	1,000	\$/day	Year-round, but only necessary five days per week
	Choose an item.				
	Choose an item.				
	Choose an item.				

**III. Services Provided**

We are interested in the types of services provided by the facilities the microgrid would serve, as well as the potential impact of a major power outage on these services. As specified below, the information of interest includes some general information on all facilities, as well as more detailed information on residential facilities and critical service providers (i.e., facilities that provide fire, police, hospital, water, wastewater treatment, or emergency medical services (EMS)).

**A. Questions for: All Facilities**

5. During a power outage, is each facility able to provide the same level of service when using backup generation as under normal operations? If not, please estimate the percent loss in the services for each facility (e.g., 20% loss in services provided during outage while on backup power). As a guide, see the example the table provides.

Facility Name	Percent Loss in Services When Using Backup Gen.
Main Street Apartments	20%

6. During a power outage, if backup generation is not available, is each facility able to provide the same level of service as under normal operations? If not, please estimate the percent loss in the services for each facility (e.g., 40% loss in services provided during outage when backup power is not available). As a guide, see the example the table provides.

Facility Name	Percent Loss in Services When Backup Gen. is Not Available
Main Street Apartments	40%

**B. Questions for facilities that provide: Fire Services**

7. What is the total population served by the facility?

Click here to enter text.

8. Please estimate the percent increase in average response time for this facility during a power outage:

Click here to enter text.

9. What is the distance (in miles) to the nearest backup fire station or alternative fire service provider?

Click here to enter text.

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**C. Questions for facilities that provide: *Emergency Medical Services (EMS)***

10. What is the total population served by the facility?

Click here to enter text.

11. Is the area served by the facility primarily:

- Urban  
 Suburban  
 Rural  
 Wilderness

12. Please estimate the percent increase in average response time for this facility during a power outage:

Click here to enter text.

13. What is the distance (in miles) to the next nearest alternative EMS provider?

Click here to enter text.

**D. Questions for facilities that provide: *Hospital Services***

14. What is the total population served by the facility?

Click here to enter text.

15. What is the distance (in miles) to the nearest alternative hospital?

Click here to enter text.

16. What is the population served by the nearest alternative hospital?

Click here to enter text.

**E. Questions for facilities that provide: *Police Services***

17. What is the total population served by the facility?

Click here to enter text.

18. Is the facility located in a:
- Metropolitan Statistical Area
  - Non-Metropolitan City
  - Non-Metropolitan County
19. Please estimate:
- a. The number of police officers working at the station under normal operations.
- Click here to enter text.
- b. The number of police officers working at the station during a power outage.
- Click here to enter text.
- c. The percent reduction in service effectiveness during an outage.
- Click here to enter text.

***F. Questions for facilities that provide: Wastewater Services***

20. What is the total population served by the facility?
- Click here to enter text.
21. Does the facility support:
- Residential customers
  - Businesses
  - Both

***G. Questions for facilities that provide: Water Services***

22. What is the total population served by the facility?
- Click here to enter text.
23. Does the facility support:
- Residential customers
  - Businesses
  - Both

**H.** *Questions for: **Residential Facilities***

24. What types of housing does the facility provide (e.g., group housing, apartments, nursing homes, assisted living facilities, etc.)?

Click here to enter text.

25. Please estimate the number of residents that would be left without power during a complete loss of power (i.e., when backup generators fail or are otherwise not available).

Click here to enter text.