NY Prize Community Microgrid Data Collection Questionnaire

This questionnaire solicits information on the community microgrid you are proposing for the NY Prize competition. The information in this questionnaire will be used to develop a preliminary benefit-cost analysis of the proposed microgrid. Please provide as much detail as possible. The questionnaire is organized into the following sections:

- A. Project Overview, Energy Production, and Fuel Use
- B. <u>Capacity Impacts</u>
- C. <u>Project Costs</u>
- D. Environmental Impacts
- E. <u>Ancillary Services</u>
- F. Other Information

If you have any questions regarding the information requested, please contact Claire Santoro at Industrial Economics, Incorporated, either by email (<u>csantoro@indecon.com</u>) or phone (617-528-1137).

Location of the microgrid (municipality and/or county): Click here to enter text.

Point of contact for this questionnaire:

Name:

Address:

Telephone:

Email:

A. Project Overview, Energy Production, and Fuel Use

- 1. The table below is designed to gather background information on the facilities your microgrid would serve. It includes two examples: one for Main Street Apartments, a residential facility with multiple utility customers; and another for Main Street Grocery, a commercial facility. Please follow these examples in providing the information specified for each facility. Additional guidance is provided below.
 - Facility name: Please enter the name of each facility the microgrid would serve. Note that a single facility may include multiple customers (e.g., individuallymetered apartments within a multi-family apartment building). When this is the case, you do not need to list each customer individually; simply identify the facility as a whole (see Table 1, "Main Street Apartments," for an example).

- Rate class: Select the appropriate rate class for the facility from the dropdown list. Rate class options are residential, small commercial/industrial (defined as a facility using less than 50 MWh of electricity per year), or large commercial/industrial (defined as a facility using 50 or more MWh of electricity per year).
- Facility/customer description: Provide a brief description of the facility, including the number of individual customers at the facility if it includes more than one (e.g., individually-metered apartments within a multi-family apartment building). For commercial and industrial facilities, please describe the type of commercial/industrial activity conducted at the facility.
- **Economic sector:** Select the appropriate economic sector for the facility from the dropdown list.
- Average annual usage: Specify the average annual electricity usage (in MWh) per customer. Note that in the case of facilities with multiple, similar customers, such as multi-family apartment buildings, this value will be different from average annual usage for the facility as a whole.
- Peak demand: Specify the peak electricity demand (in MW) per customer. Note that in the case of facilities with multiple, similar customers, such as multifamily apartment buildings, this value will be different from peak demand for the facility as a whole.
- Percent of average usage the microgrid could support in the event of a major power outage: Specify the percent of each facility's typical usage that the microgrid would be designed to support in the event of a major power outage (i.e., an outage lasting at least 24 hours that necessitates that the microgrid operate in islanded mode). In many cases, this will be 100%. In some cases, however, the microgrid may be designed to provide only enough energy to support critical services (e.g., elevators but not lighting). In these cases, the value you report should be less than 100%.
- Hours of electricity supply required per day in the event of a major power outage: Please indicate the number of hours per day that service to each facility would be maintained by the microgrid in the event of a major outage. Note that this value may be less than 24 hours for some facilities; for example, some commercial facilities may only require electricity during business hours.

Facility Name	Rate Class	Facility/Customer Description (Specify Number of Customers if More Than One)	Economic Sector Code	Average Annual Electricity Usage Per Customer (MWh)	Peak Electricity Demand Per Customer (MW)	Percent of Average Usage Microgrid Could Support During Major Power Outage	Hours of Electricity Supply Required Per Day During Major Power Outage
Main Street Apartments	Residential	50-unit multi-family apartment building; each unit metered separately	Residential	5	0.2	50%	24
Main Street Grocery	Large Commercial/Industrial (>50 annual MWh)	Grocery store	Wholesale and Retail Trade	12,000	3.0	100%	24
	Choose an item.		Choose an item.				
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- 2. In the table below, please provide information on the distributed energy resources the microgrid will incorporate. Use the two examples included in the table as a guide.
 - Distributed energy resource name: Please identify each distributed energy resource with a brief description. In the event that a single facility has multiple distributed energy resources of the same type (e.g., two diesel generators), please use numbers to uniquely identify each (e.g., "Diesel generator 1" and "Diesel generator 2").
 - Facility name: Please specify the facility at which each distributed energy resource is or would be based.
 - Energy source: Select the fuel/energy source used by each distributed energy resource from the dropdown list. If you select "other," please type in the energy source used.
 - Nameplate capacity: Specify the total nameplate capacity (in MW) of each distributed energy resource included in the microgrid.
 - Average annual production: Please estimate the amount of electricity (in MWh) that each distributed energy resource is likely to produce each year, on average, under normal operating conditions. The benefit-cost analysis will separately estimate production in islanded mode in the event of an extended power outage. If the distributed energy resource will operate only in the event of an outage, please enter zero.
 - Average daily production in the event of a major power outage: Please estimate the amount of electricity (in MWh per day) that each distributed energy resource is likely to produce, on average, in the event of a major power outage. In developing your estimate for each distributed energy resource, you should consider the electricity requirements of the facilities the microgrid would serve, as specified in your response to <u>Question 1</u>.
 - Fuel consumption per MWh: For each distributed energy resource, please estimate the amount of fuel required to generate one MWh of energy. This question does not apply to renewable energy resources, such as wind and solar.

Distributed	Facility Name En	Nameplat Capacity Energy Source (MW)	Namoniato	pacity Normal Conditions	Average Daily Production During Major Power Outage (MWh)	Fuel Consumption per MWh	
Energy Resource Name			Capacity			Quantity	Unit
Backup Generator	Main Street Grocery	Diesel	1.5	20	0.03	9.99	MMBtu/MWh
Wind Turbine	Main Street Grocery	Wind	.25	8	0.01	N/A	Choose an item.
		Choose an item.					Choose an item.
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B. Capacity Impacts

- 3. Is development of the microgrid expected to reduce the need for bulk energy suppliers to expand generating capacity, either by directly providing peak load support or by enabling the microgrid's customers to participate in a demand response program?
 - \Box No proceed to <u>Question 6</u>
 - □ Yes, both by providing peak load support and by enabling participation in a demand response program proceed to <u>Question 4</u>
 - □ Yes, by providing peak load support only proceed to <u>Question 4</u>
 - □ Yes, by enabling participation in a demand response program only proceed to <u>Ouestion 5</u>

Provision of Peak Load Support

- 4. Please provide the following information for all distributed energy resources that would be available to provide peak load support:
 - **Available capacity:** Please indicate the capacity of each distributed energy resource that would be available to provide peak load support (in MW/year).
 - Current provision of peak load support, if any: Please indicate whether the distributed energy resource currently provides peak load support.

Distributed Energy Resource Name	Facility Name	Available Capacity (MW/year)	Does distributed energy resource currently provide peak load support?
			□ Yes
			Yes
			□ Yes
			□ Yes
			□ Yes
			□ Yes

Please use the same distributed energy resource and facility names from <u>Question 2</u>.

If development of the microgrid is also expected to enable the microgrid's customers to participate in a demand response program, please proceed to <u>Question 5</u>. Otherwise, please proceed to <u>Question 6</u>.

Participation in a Demand Response Program

- 5. Please provide the following information for each facility that is likely to participate in a demand response program following development of the microgrid:
 - Available capacity: Please estimate the capacity that would be available to participate in a demand response program (in MW/year) following development of the microgrid.
 - Capacity currently participating in a demand response program, if any: Please indicate the capacity (in MW/year), if any, that currently participates in a demand response program.

	Capacity Participating in Demand Response Program (MW/year)	
Facility Name	Following Development of Microgrid	Currently

6. Is development of the microgrid expected to enable utilities to avoid or defer expansion of their transmission or distribution networks?

 \Box Yes – proceed to <u>Question 7</u>

 \Box No – proceed to <u>Section C</u>

7. Please estimate the impact of the microgrid on utilities' **transmission** capacity requirements. The following question will ask about the impact on distribution capacity.

Impact of Microgrid on Utility Transmission Capacity	Unit
	MW/year

8. Please estimate the impact of the microgrid on utilities' **distribution** capacity requirements.

Impact of Microgrid on Utility Distribution Capacity	Unit
	MW/year

C. Project Costs

We are interested in developing a year-by-year profile of project costs over a 20-year operating period. The following questions ask for information on specific categories of costs.

Capital Costs

9. In the table below, please estimate the fully installed cost and lifespan of all equipment associated with the microgrid, including equipment or infrastructure associated with power generation (including combined heat and power systems), energy storage, energy distribution, and interconnection with the local utility.

Capital Component	Installed Cost (\$)	Component Lifespan (round to nearest year)	Description of Component

Initial Planning and Design Costs

10. Please estimate initial planning and design costs. These costs should include costs associated with project design, building and development permits, efforts to secure financing, marketing the project, and negotiating contracts. Include only upfront costs. Do not include costs associated with operation of the microgrid.

Initial Planning and Design	What cost components are
Costs (\$)	included in this figure?

Fixed O&M Costs

- 11. Fixed O&M costs are costs associated with operating and maintaining the microgrid that are unlikely to vary with the amount of energy the system produces each year (e.g., software licenses, technical support). Will there be any year-to-year variation in these costs for other reasons (e.g., due to maintenance cycles)?
 - \Box No proceed to <u>Question 12</u>

 \Box Yes – proceed to <u>Question 13</u>

12. Please estimate any costs associated with operating and maintaining the microgrid that are unlikely to vary with the amount of energy the system produces each year.

Fixed O&M Costs (\$/year)	What cost components are included in this figure?

Please proceed to <u>Question 14</u>.

13. For each year over an assumed 20-year operating life, please estimate any costs associated with operating and maintaining the microgrid that are unlikely to vary with the amount of energy the system produces.

Year	Fixed O&M Cost (\$)	What cost components are included in this figure?
1		
2		
3		
4		
5		
6		
7		
8		
9		

Year	Fixed O&M Cost (\$)	What cost components are included in this figure?
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Variable O&M Costs (Excluding Fuel Costs)

 Please estimate any costs associated with operating and maintaining the microgrid (excluding fuel costs) that are likely to vary with the amount of energy the system produces each year. Please estimate these costs per unit of energy produced (e.g., \$/MWh).

Variable O&M Costs (\$/Unit of Energy Produced)	Unit	What cost components are included in this figure?
	Choose an item.	

Fuel Costs

- 15. In the table below, please provide information on the fuel use for each distributed energy resource the microgrid will incorporate. Please use the same distributed energy resource and facility names from <u>Question 2</u>.
 - Duration of design event: For each distributed energy resource, please indicate the maximum period of time the distributed energy resource would be able to operate in islanded mode without replenishing its fuel supply (i.e., the duration of the maximum power outage event for which the system is designed). For renewable energy resources, your answer may be "indefinitely."

• **Fuel consumption:** For each distributed energy resource, please specify the quantity of fuel each distributed energy resource would consume if it operated in islanded mode for the assumed duration of the design event.

Distributed Energy Resource Name	Facility Name	Duration of Design Event	Quantity of Fuel Needed to Operate in Islanded Mode for Duration of Design Event	Unit
				Choose an item.
				Choose an item.
				Choose an item.
				Choose an item.
				Choose an item.

16. Will the project include development of a combined heat and power (CHP) system?

 \Box Yes – proceed to <u>Question 17</u>

 \Box No – proceed to <u>Question 18</u>

17. If the microgrid will include development of a CHP system, please indicate the type of fuel that will be offset by use of the new CHP system and the annual energy savings (relative to the current heating system) that the new system is expected to provide.

Type of Fuel Offset by New CHP System	Annual Energy Savings Relative to Current Heating System	Unit
Choose an item.		Choose an item.
Choose an item.		Choose an item.
Choose an item.		Choose an item.
Choose an item.		Choose an item.
Choose an item.		Choose an item.

Emissions Control Costs

18. We anticipate that the costs of installing and operating emissions control equipment will be incorporated into the capital and O&M cost estimates you provided in response to the questions above. If this is not the case, please estimate these costs, noting what cost components are included in these estimates. For capital costs, please also estimate the engineering lifespan of each component.

Cost Category	Costs (\$)	Description of Component(s)	Component Lifespan(s)
Capital Costs			
Annual O&M Costs			
Other Annual Costs			

19. Will environmental regulations mandate the purchase of emissions allowances for the microgrid (for example, due to system size thresholds)?

□ Yes

🗆 No

D. Environmental Impacts

20. For each pollutant listed below, what is the estimated emissions rate (e.g., tons/MWh) for the microgrid?

Emissions Type	Emissions per MWh	Unit
CO ₂		Choose an item.
SO ₂		Choose an item.
NO _x		Choose an item.
PM		Choose an item.

E. Ancillary Services

21. Will the microgrid be designed to provide any of the following ancillary services? If so, we may contact you for additional information.

Ancillary Service	Yes	No
Frequency or Real Power Support		
Voltage or Reactive Power Support		
Black Start or System Restoration Support		

F. Other Information

22. If you would like to include any other information on the proposed microgrid, please provide it here.

Click here to enter text.