SGIP ENERGY STORAGE INCENTIVE EXAMPLES

Energy Storage Incentive Calculation

Storage incentives based on:

- **Energy capacity (kWh) – Incentive rate based on kWh**
- **Hours duration of the system**
- **Power capacity (kW) – Determines budget category and PBI**
- **Currently active step – declining rate per step**

(proposed) 2017 SGIP Handbook Sections 5.1.1 and 5.1.2 explain how to calculate kW and kWh

(proposed) 2017 SGIP Handbook Sections 5.2.1 and 5.2.2 describe incentive limitations based on hours duration and kWh capacity

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Energy Storage Incentive Calculation

Storage incentives based on:

- **Energy capacity (kWh) – Incentive rate based on kWh**
- **Hours duration of the system**
- **Power capacity (kW) – Determines budget category and PBI**
- **Currently active step – declining rate per step**

The inputs for the incentive calculation will be taken from the manufacturer specifications for the energy storage system and any relevant power electronics (i.e. inverter)

Manufacturer specification sheets must be provided for the energy storage system and relevant power electronics to verify that the kW, kWh, and hours duration have been accurately calculated

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Energy Storage Incentive Calculation

Calculating kWh:

kWh (AC/DC systems): nominal voltage * amp-hours * applicable efficiency

- Nominal Voltage in DC
- Amp-hours associated with the duration of discharge specified
- Applicable Efficiency - accounts for conversion, transformation, or other efficiency losses (Inverter CEC weighted efficiency, DC-DC converter efficiency)

Example:
Nominal Voltage:12
Amp-Hours:1000 (at 4 hour duration)
CEC Weighted Inverter Efficiency: 95%

12 * 1000 * .95 = 11,400 Wh or **11.4 kWh**

Energy Storage Incentive Calculation

Calculating kW:

kW (AC/DC systems): kWh/hours duration

- The average power output over the specified duration
- Not necessarily the “nameplate capacity” of the system
- If there is a limiting factor, such as a smaller inverter, then this reduces the kW capacity

Example:
Nominal Voltage: 12
Amp-Hours: 1000
Hours Duration: 4
Inverter Efficiency: 95%

(12 * 1000 * .95)/4 **OR** 11,400/4 = 2,850 w or **2.850 kW**

Energy Storage Incentive Calculation

Incentive Limitation – Hours Duration

Energy storage incentives are reduced as the duration and energy capacity increase:

Hours Duration	Incentive Rate (Pct of Base)
0-2 hours	100%
>2-4 hours	50%
>4-6 hours	25%
>6 hours	0%

Energy Capacity (kWh)	Incentive Rate (Pct of Base)
0-2 MWh	100%
>2-4 MWh	50%
>4-6 MWh	25%
>6 MWh	0%

Energy Storage Incentive Calculation

Combining both incentive reductions produces:

>4-6 hours	25%	12.5%	6.25%
>2-4 hours	50%	25%	12.5%
0-2 hours	100%	50%	25%
	0-2 MWh	>2-4 MWh	>4-6 MWh

Both types of incentive reductions apply if the project has a duration longer than two hours AND an energy capacity greater than 2 MWh.

Energy Storage Incentive Calculation

Calculating the Incentive:

>4-6 hours	25%	12.5%	6.25%
>2-4 hours	50%	25%	12.5%
0-2 hours	100%	50%	25%
	0-2 MWh	>2-4 MWh	>4-6 MWh

Example:

10 kW, 20 kWh, 2 hour duration, step 1 ($.50/Wh)

20,000 Wh * $.50/Wh = $10,000

*No reduction from hour duration or energy capacity

Energy Storage Incentive Calculation

Calculating the Incentive:

>4-6 hours	25%	12.5%	6.25%
>2-4 hours	50%	25%	12.5%
0-2 hours	100%	50%	25%
	0-2 MWh	>2-4 MWh	>4-6 MWh

Example:

5 kW, 20 kWh, 4 hour duration, step 1 ($.50/Wh)

First two hours: 10,000 Wh * $.50/Wh = $5,000

Second two hours: 10,000 Wh * $.50/Wh * 50% = $2,500

Total Incentive: $5,000 + $2,500 = **$7,500**

*First two hours funded at 100%, second two hours funded at 50%

Energy Storage Incentive Calculation

Calculating the Incentive:

>4-6 hours	25%	12.5%	6.25%
>2-4 hours	50%	25%	12.5%
0-2 hours	100%	50%	25%
	0-2 MWh	>2-4 MWh	>4-6 MWh

Example:

2 MW, 4 MWh, 2 hour duration, step 1 ($.50/Wh)

First two MWhs: 2,000,000 Wh * $.50/Wh = $1,000,000

Second two MWhs: 2,000,000 Wh * $.50/Wh * 50% = $500,000

Total Incentive: $1,000,000 + $500,000 = **$1,500,000**

*First two MWhs funded at 100%, second two MWhs funded at 50%

Energy Storage Incentive Calculation

Calculating the Incentive:

>4-6 hours	25%	12.5%	6.25%
>2-4 hours	50%	25%	12.5%
0-2 hours	100%	50%	25%
	0-2 MWh	>2-4 MWh	>4-6 MWh

Example:

1 MW, 4 MWh, 4 hour duration, step 1 ($.50/Wh)

First two hours and MWhs: 2,000,000 Wh * $.50/Wh = $1,000,000

Second two hours and MWhs: 2,000,000 Wh * $.50/Wh * 25% = $250,000

Total Incentive: $1,000,000 + $250,000 = **$1,250,000**

*First two hours and MWhs funded at 100%, second two hours and MWhs funded at 25%

SGIP BIOGAS INCENTIVE EXAMPLES

Biogas Incentive Calculations

Incentives will be calculated according to system size, fuel type, and amount of renewable fuel.

Projects Using The Minimum Blending Requirement

Projects using only the minimum renewable fuel requirement will only receive an incentive for the generation capacity. In this case, the incentive is calculated by multiplying the rated capacity of the system by the incentive rate for the appropriate technology type.

Incentive = rated capacity * incentive rate

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Biogas Incentive Calculations

Example 1: A 100 kW fuel cell project applying in 2017, fueled with 10% renewable fuel in Step 1.

Assumptions:

- 2017 projects are required to use 10% minimum renewable fuel
- Step 1 fuel cell funding receives $.60/watt

Incentive calculation:

- 100,000 watts (rated capacity) * $.60/watt = $60,000.00

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Biogas Incentive Calculations

Projects Using Above The Minimum Blending Requirement (Up To 100% Renewable)

Incentives are calculated by multiplying the rated capacity of the system by the technology incentive rate, plus the rated capacity of the system, multiplied by the percentage of renewable fuel above the minimum, multiplied by the renewable fuel adder rate ($.60/watt).

Incentive = (rated capacity * incentive rate) + (rated capacity * % above min RN Fuel * RN incentive)

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Biogas Incentive Calculations

Example 2: A 100 kW fuel cell on-site project applying in 2019, using 100% renewable fuel in Step 1.

Assumptions:

- 2019 projects are required to use 50% minimum renewable fuel
- 2019 projects using 100% renewable fuel would only be paid for the additional 50%
- Step 1 fuel cell funding receives $.60/watt

Incentive calculation:

- 100 kW fuel cell = (100,000 watts* $.60/watt) + [(100,000 watts*.50)*$.60/watt] = ($60,000 technology incentive) + ($30,000 renewable adder) = $90,000.00