OP 6: Clean and Renewable Energy

4 points available

A. Credit Rationale

This credit recognizes institutions that support the development and use of energy from clean and renewable sources.

B. Criteria

Institution supports the development and use of clean and renewable energy sources, using any one or combination of the following options.

Option 1: Generating electricity from clean and renewable energy sources on campus and retaining or retiring the rights to the environmental attributes of such electricity. (In other words, if the institution has sold Renewable Energy Credits for the clean and renewable energy it generated, it may not claim such energy here.) The on-site renewable energy generating devices may be owned and/or maintained by another party as long as the institution has contractual rights to the associated environmental attributes.

Option 2: Using renewable sources on-site to generate energy other than electricity, e.g. using biomass for heating.

Option 3: Catalyzing the development of off-site clean and renewable energy sources (e.g., an off-campus wind farm that was designed and built to supply electricity to the institution) and retaining the environmental attributes of that energy.

Option 4: Purchasing the environmental attributes of electricity in the form of Renewable Energy Certificates (RECs), Guarantees of Origin (GOs) or similar renewable energy products that are either Green-e Energy certified or meet Green-e Energy's technical requirements (or local equivalents) and are verified as such by a third party, or purchasing renewable electricity through the institution's electric utility through a certified green power purchasing option.

Since this credit is intended to recognize institutions that are actively supporting the development and use of clean and renewable energy, neither the electric grid mix for the region in which the institution is located nor the grid mix reported by the electric utility that serves the institution (i.e., the utility's standard or default product) count for this credit.

The following renewable systems are eligible for this credit:

- Concentrated solar thermal
- Geothermal systems that generate electricity
- Low-impact hydroelectric power
- Solar photovoltaic
- Wave and tidal power
- Wind

Biofuels from the following sources are eligible:

- Agricultural crops
- Agricultural waste
- Animal waste
- Landfill gas
- Untreated wood waste
- Other organic waste

Technologies that reduce the amount of energy used but do not generate renewable energy do not count for this credit (e.g., daylighting, passive solar design, ground-source heat pumps). The benefits of such strategies, as well as the improved efficiencies achieved through using cogeneration technologies, are captured by the *Greenhouse Gas Emissions* and *Building Energy Consumption* credits.

Transportation fuels, which are covered by the *Greenhouse Gas Emissions* and *Campus Fleet* credits, are not included.

C. Applicability

This credit applies to institutions.

D. Scoring

Institutions earn the maximum of 4 points for this credit by obtaining energy from clean and/or renewable sources (Options 1-3) and/or by purchasing RECs/GOs or green power from the electric utility (Option 4) equivalent to 100 percent of total campus energy consumption. Incremental points are awarded based on the amount of clean and renewable energy generated or purchased compared to total campus energy consumption. For example, an institution that obtained an amount of energy from clean and renewable sources equivalent to half of its total energy consumption would earn 2 points (half of the points available for this credit).

Points for this credit are calculated automatically in the STARS Reporting Tool as follows:

Clean and renewable energy option (see Criteria)	**Factor**		**Energy generated or purchased that meets criteria (MMBtu)**		**Total energy consumption (MMBtu)**		**Points earned**
Option 1	4	×	_____	÷	_____	=	
Option 2			_____				
Option 3			_____				
Option 4			_____				
Total points earned →							**Up to 4**

E. Reporting Fields

Required

- □ Total energy consumption (all sources, excluding transportation fuels), performance year (MMBtu)
- □ Total clean and renewable electricity generated on-site during the performance year and for which the institution retains or has retired the associated environmental attributes (MMBtu)

  If greater than zero provide:

  - A brief description of on-site renewable electricity generating devices
- □ Non-electric renewable energy generated on-site, performance year (MMBtu)

  If greater than zero provide:

  - A brief description of on-site renewable non-electric energy devices
- □ Total clean and renewable electricity generated by off-site projects that the institution catalyzed and for which the institution retains or has retired the associated environmental attributes, performance year (MMBtu)

  If greater than zero provide:

  - A brief description of off-site, institution-catalyzed, renewable electricity generating devices
- □ Total third-party certified RECs, GOs and/or similar renewable energy products (including renewable electricity purchased through a utility-provided certified green power option) purchased during the performance year (MMBtu)

  If greater than zero provide:

  - A brief description of the RECs, GOs and/or similar renewable energy products, including contract timeframes

Optional

- □ The website URL where information about the programs or initiatives is available
- □ Additional documentation to support the submission (upload)
- □ Data source(s) and notes about the submission
- □ Contact information for a responsible party (a staff member, faculty member, or administrator who can respond to questions regarding the data once it is submitted and available to the public)

Sierra magazine requests the following information from U.S. and Canadian institutions that wish to share data with that organization:

- □ Electricity use, by source (percentage of total, 0-100). Report the institution's best estimate of the source of all electricity used, including the institution's regional grid mix (e.g., US eGRID subregion).
  - Biomass
  - Coal
  - Geothermal
  - Hydro
  - Natural gas
  - Nuclear
  - Solar photovoltaic
  - Wind

    - Other (please specify and explain)
- □ Energy used for heating buildings, by source (percentage of total, 0-100):
    - Biomass
    - Coal
    - Electricity
    - Fuel oil
    - Geothermal
    - Natural gas
    - Other (please specify and explain)

F. Measurement

Timeframe

Report the most recent data available from within the three years prior to the anticipated date of submission. Institutions may choose the annual start and end dates that work best with the data they have (e.g., fiscal or calendar year), as long as data are reported from a consecutive 12-month period.

Sampling and Data Standards

Report all on-site, stationary energy that was consumed by the institution (as the institution is defined in the overall STARS institutional boundary). Transportation fuels are excluded. Reporting on a sample or subset of energy generation and consumption is not allowed for this credit.

All reported energy figures should be based on site energy (the amount of energy consumed on campus) rather than source energy (the amount of energy consumed on campus plus the energy used off-site to generate and transport the energy to the institution).

Institutions that convert fuel on-site (e.g., on-campus cogeneration facilities and boilers) should report only the amount of fuel purchased/converted toward the total energy consumption figure, not the resulting heat, steam, hot/chilled water or electricity.

To aggregate energy consumption data from multiple sources, figures should be converted into MMBtu (one million British thermal units—a standard measure of energy) using the following equivalents:

Energy Unit	MMBtu Equivalent
1 kWh	0.003412
1 MWh	3.412
1 therm	0.1
1 kBtu	0.001
1 ton-hour	0.012

1 MJ	0.000948

A unit conversion tool that includes more detailed conversion factors (e.g., for liquid fuels) is available in the online STARS Reporting Tool (.xls).

G. Standards and Terms

Green-e

Green-e, a program of the Center for Resource Solutions, is an independent certification and verification program for renewable energy and greenhouse gas emission reductions in the retail market. Green-e Climate is a voluntary certification program launched in 2008 that sets consumer-protection and environmental-integrity standards for greenhouse gas (GHG) emission reductions sold in the voluntary market. Green-e Energy is an independent certification and verification program for renewable energy.

Guarantees of origin

A Guarantee of Origin (GO) is a certificate issued by European energy authorities to certify that electricity was produced from renewable energy sources.

Renewable energy certificates

Green-e provides the following definition of Renewable Energy Certificates (RECs) (also known as green tags, renewable energy credits, renewable electricity certificates, and tradable renewable certificates):

> When a renewable energy facility operates, it creates electricity that is delivered into a vast network of transmission wires, often referred to as “the grid.” The grid is segmented into regional power networks called pools. To help facilitate the sale of renewable electricity nationally, a system was established that separates renewable electricity generation into two parts: the electricity or electrical energy produced by a renewable generator and the renewable “attributes” of that generation. (These attributes include the tons of greenhouse gas that were avoided by generating electricity from renewable resources instead of conventional fuels, such as coal, nuclear, oil, or gas.) These renewable (“green”) attributes are sold separately as renewable energy certificates (RECs). One REC is issued for each megawatt-hour (MWh) unit of renewable electricity produced. The electricity that was split from the REC is no longer considered "renewable" and cannot be counted as renewable or zero-emissions by whoever buys it.

RECs contain specific information about the renewable energy generated, including where, when, at what facility, and with what type of generation. Purchasers of RECs are buying the renewable attributes of those specific units of renewable energy, which helps offset conventional electricity generation in the region where the renewable generator is located. In Europe, the equivalent of a REC is a Guarantee of Origin (GO). There are equivalents available in other regions as well.

Scoring Example: Clean and Renewable Energy

Step 1: Gather Required Data

Example College uses electricity and natural gas. During the past year, the college consumed:

A. Total electricity: 1,000,000 kWh
B. Total natural gas: 10,000 therms

Example College generated or purchased the following during the past year.

C. Electricity from an on-site solar photovoltaic installation (Option 1): 250,000 kWh
D. Renewable Energy Certificates (Option 4): 300 MWh

Step 2: Convert Energy Figures into Common Units (MMBtu)

- Total electricity consumed: 1,000,000 kWh × 0.003412 MMBtu/kWh = 3,412 MMBtu
- Total natural gas consumed: 10,000 Therms × 0.1 MMBtu/Therm = 1,000 MMBtu
- Total energy consumed = 3,412 + 1,000 = 4,412 MMBtu
- Electricity from an on-site solar photovoltaic installation (Option 1): 250,000 kWh × 0.003412 MMBtu/kWh = 853 MMBtu
- Renewable Energy Certificates (Option 4): 300 MWh × 3.412 MMBtu/MWh = 1,023 MMBtu

Step 3: Calculate Points Earned Using MMBtu

Clean and renewable energy option (see Criteria)	**Factor**		**Energy generated or purchased that meets criteria (MMBtu)**		**Total energy consumption (MMBtu)**		**Points earned**
Option 1	4	×	853	÷	4,412	=	0.77
Option 2			0				0
Option 3			0				0
Option 4			1,023				0.93
Total points earned →							**1.7**