

Renewable Energy 101 Glossary

Additionality

Additionality means that a renewable energy or carbon offset project is beyond business as usual. It is a concept that is intended to determine which projects would have been built anyway without the added incentive of a functioning carbon or renewable energy market, which can bring additional sources of revenue to (and thus, greater incentive to build) a project. Additionality is the cornerstone of any carbon offset project, since it proves to consumers that their purchases are making a difference.

Attribute

The term 'attribute' refers to the descriptive or performance characteristics of a particular generation resource. The characteristics of renewables and other generating types (both positive and negative) not reflected in the price of power are referred to as externalities and include environmental, economic, and social characteristics. As detailed below:

- **Physical Attributes:** Physical characteristics such as size, location, fuel type, time of generation, etc. The value of these characteristics tends to be captured in the price of power.
- **Environmental Attributes:** Environmental attributes include the environmental benefits and costs associated with the construction and operation of specific types of power generation facilities. Environmental attributes of renewable energy facilities might include the benefits of such things as emissions offsets or avoidance, as say from wind-generated electricity.
- **Economic Attributes:** Economic attributes might include such things as the development of local jobs and businesses, as well as reductions in the costs of having a secure domestic supply of electricity.
- **Social Attributes:** Examples of social attributes include health and quality of life factors, the introduction of innovative technologies and technology applications, as well as social equity considerations related to the location and siting of power plants.

The economic and social attributes are not generally quantified in today's marketplace.

Carbon Dioxide (CO₂)

Burning fossil fuels releases carbon that has been stored underground for millions of years into the atmosphere. During the combustion process, the carbon in these fossil fuels is transformed into carbon dioxide, the predominant gas contributing to the greenhouse effect. While carbon dioxide is absorbed and released at nearly equal rates by natural processes on the Earth, this equilibrium may be disrupted when large amounts of carbon dioxide are released to the atmosphere by human activities, such as the burning of fossil fuels.

Carbon Offset

A greenhouse gas emission reduction (offset) represents the reduction of a specific quantity of greenhouse gases. When you purchase an offset, you alone have the right to all associated claims about the environmental benefits it embodies. An offset is to be regarded as real environmental commodity, not a donation or investment in a future project.

Certificate Retirement

Retirement occurs when a Renewable Energy Certificate (REC) is used by the owner of the REC. Use of the REC may include, but is not limited to, (1) use of the REC by an end-use customer, marketer, generator, or utility to comply with a statutory or regulatory requirement, (2) a public claim associated with a purchase of RECs by an end-use customer, or (3) the sale of any component attributes of a REC for any purpose. Once a REC is retired, it may not be sold, donated, or transferred to any other party. No party other than the owner may make claims associated with retired RECs.

Competition

Allowing two or more entities to sell similar goods and services in the same market. Electric competition means that consumers have a choice of which company they may purchase their electricity from.

Conventional Power

Conventional power is produced from non-renewable fuels such as coal, oil, nuclear and gas, also known as traditional power.

Competitive Power Supplier

Also known as an Electric Service Provider or power marketer, a competitive power supplier sells electricity in the retail market. Some suppliers own generation units, while others buy power from outside generators and then resell it. In any case, the distribution company (in most cases the local electric utility) delivers the electricity sold by an electric service provider to homes and businesses in their service territory.

Default Service

In a deregulated electricity market, electricity service available to consumers who choose not to select an alternative electricity service provider.

Deregulation

The process of changing the laws and regulations that control the electric industry to allow competition of electricity service and retail sales. This results in customer choice of an electricity provider.

Disaggregation

Separation of the renewable attributes of RECs from each other, usually to permit independent sale of the component attributes (e.g., of CO₂ as carbon offset).

Double Counting

When the bundled attributes associated with a single MWh of generation are ultimately sold to or can be legitimately claimed by more than one consumer. Double counting may include, but is not limited to, any of the following:

- When the same RECs are sold to more than one party,
- When the same RECs are claimed by more than one party, including any expressed or implied environmental claims made pursuant to electricity coming from a renewable energy resource, environmental labeling or disclosure requirements,
- When a REC is simultaneously sold to represent “renewable electricity” to one party, and one or more attributes are also sold, (such as CO₂) associated with the same MWh of generation, to another party,
- When the same REC is used by an electricity provider or utility to meet an environmental mandate, such as an RPS, and is also used to satisfy customer sales.

Electric Service Provider (ESP)

Also known as competitive power supplier or power marketer, an ESP sells electricity in the retail market. Some suppliers own generation units, while others buy power from outside generators and then resell it. In any case, the distribution company (in most cases the local electric utility) delivers the electricity sold by an electric service provider to homes and businesses.

Electric Utility

In a regulated electric market, the entity that owns and/or operates facilities for the generation, transmission, and/or distribution of electricity. In a restructured market, this entity becomes an electric distribution company responsible for transmission and distribution only, and provides default electrical service to consumers that elect not to switch to an ESP.

Emissions Category (Scope)

The World Resources Institute has developed guidelines for determining the boundaries of direct and indirect greenhouse gas emissions when developing a carbon inventory (the calculation of how much carbon you or your company, for example, are responsible for). That is, what emissions do you produce, and which do you cause to be produced. For example, an electricity generator at your office is a source of direct emissions. Indirect emissions include commuting to work. They are organized according to "scope:"

- Scope 1 emissions are direct greenhouse gas emissions from sources owned or controlled by the entity.
- Scope 2 emissions are indirect, and associated with the generation of electricity, heating/cooling, or steam purchased for the entity’s own consumption.
- Scope 3 are other indirect emissions not covered in Scope 2, including employee business travel; transportation of products, materials, and waste; outsourced activities; and production of imported materials.

Energy Efficiency

Energy Efficiency occurs when you use less energy to accomplish the same task, for example heating your home or washing clothes. Using less energy means less air pollution and lower costs. To save energy in your home, you can use weather stripping, a water heater blanket or compact fluorescent light bulbs. Also when shopping for household appliances, look for the Energy Star to find appliances that use less energy and lower your electricity costs.

Environmental Attributes

An environmental attribute is an instrument used to represent the environmental costs or benefits associated with a fixed amount of electricity generation, usually from a specific generating plant. For renewable facilities, environmental attributes represent the general environmental benefits of renewable generation such as air pollution avoidance. The exact quantity of the environmental benefit (e.g. pounds of emission reductions of a given pollutant) is not indicated by an environmental attribute, though it can be quantified separately in pollution trading markets and through engineering estimates. The environmental attribute represents all environmental benefits, whether or not trading markets for such pollutants or benefits exist.

Fossil Resources

Electric generation using natural gas, oil, coal, or petroleum coke or other petroleum-based fuels.

Fuel Mix

The proportions of each fuel type (e.g. nuclear, coal, solar electric, oil, wind, hydro, etc.) used by a power plant to generate electricity.

Greenhouse Gases (GHG)

Gases in the Earth's atmosphere that produce the greenhouse effect. Changes in the concentration of certain greenhouse gases, due to human activity such as fossil fuel burning, increase the risk of global climate change. Greenhouse gases include water vapor, carbon dioxide, methane, nitrous oxide, halogenated fluorocarbons, ozone, perfluorinated carbons, and hydrofluorocarbons.

Green Pricing

Green pricing refers to an optional utility service that enables customers of traditional utilities to support a greater level of utility investment in renewable energy by paying a premium on their electric bill to cover any above-market costs of acquiring renewable energy resources.

Grid

The grid is a term used to describe the network of wires and cables which transport electricity from a power plant to your home.

Kilowatt-Hour

A kilowatt-hour (kWh) is the standard unit of measure for electricity. One kilowatt-hour is equal to 1,000 watt-hours. The total number of kilowatt-hours charged to your bill is determined by your electricity use. For example, if you used a 100-watt light bulb for 10 hours, you would be billed for one kilowatt-hour (100 watts x 10 hours = 1,000 watt-hours). The average home in the United States uses 750 kwh/ month.

Megawatt

One thousand kilowatts, or 1 million watts; standard measure of electric power plant generating capacity.

Megawatt-hour

One thousand kilowatt-hours or 1 million watt-hours.

Null Electricity

Electricity that is stripped of its attributes and undifferentiated. No specific rights to claim fuel source or environmental impacts are allowed for null electricity. Also referred to as commodity or system electricity.

Power Marketer

An electricity service provider - an electric company.

Renewable Energy Certificates (RECs)

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 is 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. Green-e Energy Certified RECs are not sold more than once or claimed by more than one party, and since they are sold on the voluntary market, they cannot count towards a state’s renewable-energy mandate.

Buying RECs helps build a market for renewable electricity. It also has other local and global environmental benefits including reducing greenhouse gas emissions and air pollution; stabilizing energy costs by reducing price volatility in the energy markets; improving energy reliability from distributed generation; strengthening America's energy independence and diversity; creating jobs in rural areas; and promoting sources of unlimited, emissions-free domestic energy.

Renewable Portfolio Standards (RPS)

A state or federal level policy that requires that a minimum amount (usually a percentage) of electricity supply provided by each supply company is to come from renewable energy.

Renewable Resources

Sources of electricity, such as solar electric, wind, geothermal, biomass and hydroelectric. A resource is called renewable if it can be naturally replenished. In general, renewables have lower environmental impacts than non-renewables. For a list of Green-e eligible resources, please refer to the Green-e Energy National Standard.

System Power

The mix of electricity fuel sources consumed in the state or region that are not disclosed or marketed as specific purchases or as defined by the relevant state agency.

Tracking Systems

Renewable energy generation ownership can be accounted for in two different ways: through contract-path auditing and through tracking systems. Tracking systems are becoming the preferable method because they can be highly automated, contain specific information about each MWh, and are accessible over the internet to market participants. Tracking systems are databases, typically electronic, with basic information about each MWh of renewable power generated in the region. Electronic tracking systems allow RECs to be transferred among account holders much as in online banking. Renewable energy tracking systems assign a unique identification number for each megawatt hour of renewable electricity generated in a particular region. The database tracks certain information for each megawatt hour, including facility location, generation technology, facility owner, fuel type, nameplate capacity, the year the facility began operating, and the month/year the MWh was generated. Since each MWh has a unique identification number and can only be in one account at any time, this reduces ownership disputes.

A tracking system can be used by regulators as a registry of generating facilities, as a means of verifying compliance with a Renewable Portfolio Standard, for aiding in the creation of disclosure labels, and for other purposes such as verifying wholesale supply for green power products. Tracking systems are not substitutes for certification and verification, as tracking systems only monitor wholesale transactions—individual retail green power customers do not hold accounts on tracking systems. That is why certification such as Green-e is so important for voluntary purchasers.

There are several regional tracking systems in operation in the U.S., and more under development. Fully operational tracking systems include the New England Generation Information System, ERCOT's Texas Renewables, WECC's Western Renewable Energy Generation Information System, the Midwest Renewable Energy Tracking System and PJM's Generation Attribute Tracking System.

Transmission

The towers and high voltage lines that transport energy from power plants to the distribution company.

Utility Regulatory Authority

Any utility regulatory authority or governing board having jurisdiction over the allocation of costs from the electricity generating facility.

Vintage

The vintage of a REC is the date that the electric generation associated with the REC was measured by the system operator or utility meter at the generator site. The vintage of a generator or generating facility is the date that the facility was placed into service.