

# **GLOSSARY**

## **AEE**

Association of Energy Engineers

## **ASHRAE**

The American Society of Heating, Refrigerating and Air-Conditioning Engineers advances technology to serve humanity and promote a sustainable world.

## **Annual Consumption**

Refers to the amount of electric energy used by a consumer in one year's time. This is typically measured in kilowatt-hours (kWh).

## **Ballast**

A device intended to limit the amount of current in an electric circuit.

## **Baseline Period**

The period of time that defines the Baseline Usage and is representative of the facilities operations, consumption, and usage that is used as the benchmark for determining cost avoidance.

## **Baseline Usage**

The calculated energy usage of the Facilities prior to the implementation of the ECMs.

## **Baseline Demand**

The calculated energy demand of a piece of equipment or a site prior to the implementation of the ECMs. Baseline physical conditions, such as equipment counts, nameplate data, and control strategies will typically be determined through building occupancy, energy end-use survey and plug load surveys of the Facilities.

## **British Thermal Unit (BTU)**

A traditional unit of energy equal to about 1.06 kilojoules. The term "BTU" is used to describe the heat value (energy content) of fuels, and also to describe the power of heating and cooling systems, such as furnaces, stoves, barbecue grills, and air conditioners.

## **Capital**

The money paid to purchase a capital asset or a fixed asset.

## **Carbon Dioxide (CO<sub>2</sub>)**

A chemical compound composed of two oxygen atoms covalently bonded to a single carbon atom. It is a gas at standard temperature and pressure and exists in Earth's atmosphere in this state.

## **Commissioning**

The process formalizing review and integration of all project expectations during planning, design, construction, and occupancy phases by inspection and functional performance testing, and oversight of operator training and record documentation.

**Compact Fluorescent Lamp (CFL)**

Also known as a compact fluorescent light or energy saving light is a type of fluorescent lamp. Many CFLs are designed to replace an incandescent lamp and can fit into most existing light fixtures formerly used for incandescent. The average rated life of a CFL is between 8 and 15 times that of an incandescent.

**Cost Avoidance**

Benefits realized by avoiding a relatively certain future expenditure, although the projected expenditure has not been budgeted or obligated. Cost avoidance is more speculative than cost savings and requires more rigorous justification

**Decommissioning**

The process of removing a power plant, apparatus, equipment, building, or facility from operation.

**Demand**

The rate at which electricity is delivered to or by a system, part of a system, or piece of equipment expressed in kilowatts or other suitable unit, at a given instant or averaged over a specified period of time.

**Demand Charge**

A charge for the maximum rate at which energy is used during peak hours of a billing period. That part of a power provider service charged for on the basis of the possible demand as distinguished from the energy actually consumed.

**Demand Factor**

The ratio of the maximum demand on an electricity generating and distribution system to the total connected load on the system; usually expressed as a percentage.

**Demand-Side Management (DSM)**

The process of managing the consumption of energy, generally to optimize available and planned generation resources.

**Deregulation**

The process by which governments remove, reduce, or simplify restrictions on business and individuals encouraging the efficient operation of markets. The general purpose of deregulation is to create a raised level of competitiveness which encourages higher productivity, usually resulting in greater efficiency and lower prices for consumers.

**Distributed Generation**

Small, modular, decentralized, grid-connected or off-grid energy systems located in or near where energy is used.

**Emission**

Substance or pollutant emitted as a result of a process.

**Emission Factor**

A measure of the average amount of a specified pollutant or material emitted for a specific type of fuel or process.

**End Use**

The purpose for which useful energy or work is consumed.

**Energy Life Cycle Cost Analysis (ELCCA)**

ELCCA provides a method to evaluate different energy using system options and to select the most cost-effective measures. The completed ELCCA report recommends the alternatives that make the most economic sense while providing for the comfort, health, and the productivity of the building occupants.

**Energy Policy Act of 1992 (EPAct)**

Comprehensive legislative package that mandates and encourages energy efficiency standards, alternative fuel use, and the development of renewable energy technologies. Public Law 102-486, October 24th, 1992. Also authorized the Federal Energy Regulatory Commission (FERC) to order the owners of electric power transmission lines to transmit or "wheel" power for power generators including electric power providers, federal power marketing authorities, and exempt wholesale generators.

**EPC (Energy Performance Contract)**

Energy Performance Contracts (EPC) are an arrangement for energy-efficiency where an EPC contractor takes responsibility for achieving the outcomes. This is the only form of energy management consultancy where it is possible to obtain a guarantee that energy savings will be achieved. EPCs can be arranged on a single savings measure, a whole building, or a whole organization. The larger the contracts are, the more cost-effective the project will be.

**ESCO (Energy Services Company)**

A professional business providing a broad range of comprehensive energy solutions including designs and implementation of energy projects, energy efficiency and conservation, energy infrastructure outsourcing, power generation, and energy supply and risk management. The ESCO performs an in-depth analysis of the property, designs an energy efficient solution, installs the required elements, and maintains the system to ensure energy savings during the payback period. The savings in energy costs is often used to pay back the capital investment of the project over a five- to twenty-year period, or reinvested into the building to allow for capital upgrades that may otherwise be unfeasible. If the project does not provide returns on the investment, the ESCO is often responsible to pay the difference.

**Energy Audit**

A thorough reviewing and scrutinizing energy flows in a facility, to understand energy dynamics, prioritizing energy usage and finding energy savings opportunities.

**Energy Awareness Program**

A program designed to lower operating costs through no cost or low cost awareness initiatives which can include, establishing or enhancing a corporate-wide energy conservation program, communicating program initiatives through enhanced visibility measures and driving awareness among employees and personnel.

**Energy Costs**

May include, but is not limited to, the cost of electricity, fossil fuels, water, sewer and district utility supply to operate the Facilities, as applicable.

**Energy Efficiency**

Refers to products or systems using less energy to do the same or better job than conventional products or systems. Energy efficiency saves energy, saves money on utility bills, and helps protect the environment by reducing the demand for electricity.

**Energy Conservation Measure (ECM)**

The installation of equipment or systems, or modification of equipment or systems.

**Excess Verified Savings**

The amount of Verified Savings minus Guaranteed Savings in a Guaranty Period.

**Facilities**

Any/all buildings impacted by the project and described in the scope of work.

**Feasibility Study**

During the initial period of research and investigation, an energy auditor from the ESCO tours the site and reviews the project's systems to determine areas where cost savings are feasible, usually free of charge to the client. This is also referred to as an energy audit.

**Federal Energy Management Program (FEMP)**

A program of the U.S. Department of Energy (DOE) that implements energy legislation and presidential directives. FEMP provides project financing, technical guidance and assistance, coordination and reporting, and new initiatives for the federal government. It also helps federal agencies identify the best technologies and technology demonstrations for their use.

**Federal Energy Regulatory Commission (FERC)**

This is an independent regulatory agency within the U.S. DOE that has jurisdiction over interstate electricity sales, wholesale electric rates, natural gas pricing, oil pipeline rates, and gas pipeline certification. It also licenses and inspects private, municipal, and state hydroelectric projects and oversees related environmental matters.

**Federal Power Marketing Administrations (PMA)**

These are separate and distinct organizational agencies within the U.S. DOE that market power at federal multipurpose water projects at lowest possible rates to consumers consistent with sound business principles. There are five PMA's: Alaska Power Administration, Bonneville Power Administration, Southeastern Power Administration, Southwestern Power Administration, Western Area Power Administration.

**First Guaranty Period**

The period beginning on the date of execution of the Final Acceptance document and ending in one (1) calendar year.

**Fossil Fuels**

Fuels formed by natural resources such as anaerobic decomposition of buried dead organisms. The fossil fuels include coal, petroleum, and natural gas which contain high percentages of carbon. Fossil fuels are non-renewable resources because they take millions of years to form, and reserves are being depleted much faster than new ones are being formed. The production and use of fossil fuels raise environmental concerns. A global movement toward the generation of renewable energy is therefore under way to help meet increased energy needs.

**Fuel**

Material that can be burned to make energy.

**Fuel Cell**

An electrochemical device that converts chemical energy directly into electricity.

**Fuel Efficiency**

The ratio of heat produced by a fuel for doing work to the available heat in the fuel.

**Gallon**

Measure of volume approximately equal to four liters.

**Geothermal Energy**

Energy produced by the internal heat of the earth; geothermal heat sources include: hydrothermal convective systems; pressurized water reservoirs; hot dry rocks; manual gradients; and magma. Geothermal energy can be used directly for heating or to produce electric power.

**Geothermal Heat Pump**

A type of heat pump that uses the ground, ground water, or ponds as a heat source and heat sink, rather than outside air. Ground or water temperatures are more constant and are warmer in winter and cooler in summer than air temperatures. Geothermal heat pumps operate more efficiently than "conventional" or "air source" heat pumps.

**Geothermal Power Station**

An electricity generating facility that uses geothermal energy.

**Gigawatt (GW)**

A unit of power equal to 1 billion Watts; 1 million kilowatts, or 1,000 megawatts.

**Green Building (Green Construction or Sustainable Building)**

The practice of creating structures and using processes that are environmentally responsible and resource-efficient throughout a building's life-cycle

**Ground Source Heat Pumps (GSHP)**

Ground source heat pumps can be even more energy efficient and cost effective. These systems use pumps and compressors to move refrigerant fluid around a thermodynamic cycle in order to "pump" heat against its natural flow from hot to cold, for the purpose of transferring heat into a building from the large thermal reservoir contained within the nearby ground.

**Guaranty Period**

Defined as the First Guaranty Period and each of the successive periods commencing on the anniversary of the commencement of the First Guaranty Period throughout the Term of the Agreement.

**Guaranteed Savings**

The amount of avoided Energy Costs and Operations and Maintenance Costs guaranteed to the Customer in each Guaranty Period.

**HVAC**

Heating, Ventilation, Air Conditioning - the technology of indoor or environmental comfort.

**HUD**

Department of Housing and Urban Development: the United States federal department that administers federal programs dealing with better housing and urban renewal; created in 1965.

**Indoor Air Quality (IAQ)**

Term referring to the air quality within and around buildings and structures, especially as it relates to the health and comfort of building occupants.

**International Performance Measurement and Verification Protocol (IPMVP)**

The IPMVP guidelines classify measurement & verification approaches as Option A, Option B, Option C, and Option D.

**Inverter**

A device that converts direct current electricity (from for example a solar photovoltaic module or array) to alternating current for use directly to operate appliances or to supply power to a electricity grid.

**Kilowatt**

Equal to one thousand watts. This unit is typically used to express the output power of engines and the power consumption of tools and machines. It is also a common unit used to express the electromagnetic power output of radio transmitters.

**Kilowatt-hour (kWh)**

Unit of energy equal to 1000 watt hours or 3.6 mega joules. This unit is used to indicate power or energy capacity of a consumer.

**Leadership in Energy & Environmental Design (LEED)**

An internationally recognized green building certification system, providing third-party verification that a building or community was designed and built using strategies aimed at improving performance across all the metrics that matter most: energy savings, water efficiency, CO2 emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impacts.

**Life Cycle Cost Analysis (LCCA)**

LCCA is a decision-making tool that aids consumers in comparing the owning and operating costs for energy using systems. The analysis accounts for the initial cost of construction or renovating a facility, as well as the cost of owning and operating a facility over its useful life. These costs make up the total cost of ownership for a building.

**Load Forecast**

An estimate of power demand at some future period.

**Load Leveling**

The deferment of certain loads to limit electrical power demand, or the production of energy during off-peak periods for storage and use during peak demand periods.

**Load Management**

To influence the demand on a power source.

**Load Profile or Shape**

A curve on a chart showing power (kW) supplied (on the horizontal axis) plotted against time of occurrence (on the vertical axis) to illustrate the variance in a load in a specified time period.

**Load Shedding**

Turning off or disconnecting loads to limit peak demand.

**Load Shifting**

A load management objective that moves loads from on-peak periods to off-peak periods.

**MCF**

An abbreviation for one thousand cubic feet of natural gas with a heat content of 1,000,000 Btus, or 10 therms.

**Measurement and Verification (M&V) Plan**

Details how the Guaranteed Savings will be verified.

**Megawatt (MW)**

Equals one million watts or one thousand kilowatts. It is a standard unit measure of electric power plant generating capacity that is used to express the output of power from electric generators and large motors, as well as the energy consumption of residential or commercial buildings.

**Megawatt-hour**

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

**Municipal Waste**

As defined in the Energy Security Act (P.L. 96-294; 1980) as "any organic matter, including sewage, sewage sludge, and industrial or commercial waste, and mixtures of such matter and inorganic refuse from any publicly or privately operated municipal waste collection or similar disposal system, or from similar waste flows (other than such flows which constitute agricultural wastes or residues, or wood wastes or residues from wood harvesting activities or production of forest products)."

**NAESCO (National Association of Energy Service Companies)**

The premier trade association for ESCOs.

**Off Peak**

The period of low energy demand, as opposed to maximum, or peak, demand.

**OSHA (Occupational Safety and Health Administration)**

The main federal agency charged with the enforcement of safety and health legislation.

**Operations and Maintenance (O&M) Costs**

Includes the cost of operating and maintaining facilities.

**Optimization**

The procedure or procedures used to make a system or design most effective or functional.

**Peak Demand/Load**

Maximum energy demand or load in a specified time period.

**Peaking Capacity**

Power generation equipment or system capacity to meet peak power demands.

**Peak Power**

Power generated that operates at a very low capacity factor; typically used to meet short-lived, variable high demand periods.

**Peak Shifting**

The process of moving existing loads to off-peak periods.

**Peak Watt**

A unit used to rate the performance of a solar photovoltaic (PV) cells, modules, or arrays; the maximum nominal output of a PV device, in Watts (Wp) under standardized test conditions, usually 1000 Watts per square meter of sunlight with other conditions, such as temperature specified.

**Photovoltaic (Conversion) Efficiency**

Ratio of the electric power produced by a photovoltaic device to the power of the sunlight incident on the device.

**Photovoltaic (PV; Solar) Array**

A group of connected solar photovoltaic modules.

**Photovoltaic (Solar) Cell**

Treated semiconductor material that converts solar irradiance to electricity.

**Photovoltaic Device**

A solid-state electrical device that converts light directly into direct current electricity of voltage-current characteristics that are a function of the characteristics of the light source and the materials in and design of the device. Solar photovoltaic devices are made of various semiconductor materials including silicon, cadmium sulfide, cadmium telluride, and gallium arsenide, and in single crystalline, multi-crystalline, or amorphous forms.

**Photovoltaic (Solar) Module or Panel**

A solar photovoltaic product that generally consists of groups of PV cells electrically connected together to produce a specified power output under standard test conditions, mounted on a substrate, sealed with an encapsulant, and covered with a protective glazing. Maybe further mounted on an aluminum frame. A junction box, on the back or underside of the module is used to allow for connecting the module circuit conductors to external conductors.

**Photovoltaic (Solar) System**

A complete PV power system composed of the module (or array), and balance-of-system (BOS) components including the array supports, electrical conductors/wiring, fuses, safety disconnects, and grounds, charge controllers, inverters, battery storage, and the like.

**Procurement**

The acquisition of goods and/or services to meet the needs of the purchaser in terms of quality and quantity, time, and location.



**Renewable Energy**

An energy source replenished by natural processes at a rate comparable or faster than its rate of consumption. Examples include solar radiation, tides, winds, and hydroelectricity.

**Request for Qualification (RFQ)**

Interested ESCO's submit their corporate resumes, business profiles, experience, and initial plan. A request for qualifications (RFQ) is a document often distributed before initiation of the RFP process. It is used to gather vendor information from multiple companies to generate a pool of prospects. This eases the RFP review process by preemptively short-listing candidates which meet the desired qualifications.

**Request for Proposal (RFP)**

A detailed explanation and outline of a project for response. This document contains all cost savings measures, products, M & V plans, and the performance contract.

**Request for Information (RFI)**

A proposal requested from a potential seller or a service provider to determine what products and services are potentially available in the marketplace to meet a buyer's needs and to know the capability of a seller in terms of offerings and strengths of the seller. RFIs are commonly used on major procurements, where a requirement could potentially be met through several alternate means.

**Retro-Commissioning**

The Commissioning Process applied to an existing facility that was not previously commissioned.

**Retrofit**

The improving of existing buildings with energy efficiency equipment

**Solar Panel**

See Photovoltaic Module.

**Solar Thermal Electric Systems**

Solar energy conversion technologies that convert solar energy to electricity, by heating a working fluid to power a turbine that drives a generator. Examples of these systems include central receiver systems, parabolic dish, and solar trough.

**Solar Thermal Systems**

Solar energy systems that collect or absorb solar energy for useful purposes. Can be used to generate high temperature heat (for electricity production and/or process heat), medium temperature heat (for process and space/water heating and electricity generation), and low temperature heat (for water and space heating and cooling).

**Solid Fuels**

Any fuel that is in solid form, such as wood, peat, lignite, coal, and manufactured fuels such as pulverized coal, coke, charcoal, briquettes, pellets, etc.

**Stand-Alone Generator**

A power source/generator that operates independently of or is not connected to an electric transmission and distribution network; used to meet a load(s) physically close to the generator.

**Stand-Alone Inverter**

An inverter that operates independent of or is not connected to an electric transmission and distribution network.

**Storage Capacity**

The amount of energy an energy storage device or system can store.

**Supply Side**

Technologies that pertain to the generation of electricity.

**Sustainability**

The capacity to endure.

**Term of Agreement**

The Installation Period and, consecutively, the Guaranty Period.

**Therm**

A non-SI unit of heat energy equal to 100,000 British thermal units (BTU). It is approximately the energy equivalent of burning 100 cubic feet (often referred to as 1 Ccf) of natural gas.

**Thermal Efficiency**

A measure of the efficiency of converting a fuel to energy and useful work; useful work and energy output divided by higher heating value of input fuel times 100 (for percent).

**Thermal Energy**

The energy developed through the use of heat energy.

**Thermal Energy Storage**

The storage of heat energy during power provider off-peak times at night, for use during the next day without incurring daytime peak electric rates.

**Time-of-Use (TOU) Rates**

The pricing of electricity based on the estimated cost of electricity during a particular time block. Time-of-use rates are usually divided into three or four time blocks per twenty-four hour period (on-peak, mid-peak, off-peak and sometimes super off-peak) and by seasons of the year (summer and winter). Real-time pricing differs from TOU rates in that it is based on actual (as opposed to forecasted) prices which may fluctuate many times a day and are weather-sensitive, rather than varying with a fixed schedule.

**Tracking Solar Array**

A solar energy array that follows the path of the sun to maximize the solar radiation incident on the PV surface. The two most common orientations are (1) one axis where the array tracks the sun east to west and (2) two-axis tracking where the array points directly at the sun at all times. Tracking arrays use both the direct and diffuse sunlight. Two-axis tracking arrays capture the maximum possible daily energy.

**Transformer**

An electromagnetic device that changes the voltage of alternating current electricity. It consists of an induction coil having a primary and secondary winding and a closed iron core.

**Transmission**

The process of sending or moving electricity from one point to another; usually defines that part of an electric power provider's electric power lines from the power plant buss to the last transformer before the customer's connection.

**Transmission Lines**

Transmit high-voltage electricity from the transformer to the electric distribution system.

**Turbine**

A device for converting the flow of a fluid (air, steam, water, or hot gases) into mechanical motion.

**Turnkey**

A product or service that is designed, supplied, built, or installed fully complete and ready to operate.

**U.S. Green Building Council (USGBC)**

A 501(c)(3) nonprofit organization committed to a prosperous and sustainable future for our nation through cost-efficient and energy-saving green buildings

**Utility**

A regulated entity which exhibits the characteristics of a natural monopoly (also referred to as a power provider). For the purposes of electric industry restructuring, "utility" refers to the regulated, vertically-integrated electric company. "Transmission utility" refers to the regulated owner/operator of the transmission system only. "Distribution utility" refers to the regulated owner/operator of the distribution system which serves retail customers.

**Verified Savings**

is defined as the summation of the avoided Energy Costs and Operations and Maintenance Costs as determined by the Measurement and Verification Plan for the Facilities in each Guaranty Period as a result of the ECMs.

**Warranty**

A warranty is an assurance by one party to the other party that certain facts or conditions are true or will happen; the other party is permitted to rely on that assurance and seek some type of remedy if it is not true or followed.

**Water Conservation**

Refers to reducing the usage of water and recycling of waste water for different purposes.