



Glossary

GREEN GOES MAINSTREAM:

How to Profit from Green Market Opportunities

Alternative Energy – Any energy source other than those deriving from fossil fuels (such as coal, oil or natural gas) or nuclear power; typically alternative energy encompasses all renewable energy sources, plus such hybrids as geothermal heat pumps, using lake water for cooling, etc.

Building Automation Systems – A computerized network of electronic devices designed to monitor and control various elements in a building, including mechanical, lighting, and information systems. Communications and Internet connectivity are critical to building automation systems.

Carbon Footprint – In general, the term “footprint” refers to a measure of the impact human activities have on the environment. In this case, carbon-dioxide (CO₂) emissions are specifically measured, usually in metric tons (2,200 pounds, or 1,000 kilograms) per year, due to their contribution to climate change. The total carbon footprint of a company is the sum of all energy used during the year.

Carbon Neutral – Describes an approach to building design, construction and operation, as well as to corporate operations, that has as its goal to offset carbon-dioxide emissions from conventional energy sources.

Carbon Offset – Describes the process of reducing the net carbon emissions of a company. For instance, an organization that plants trees and finances other carbon offsets, thereby reducing the amount of carbon dioxide it emits as a result of its activities (travel, electricity use, etc.), might call itself carbon-neutral.

Cogeneration – The simultaneous generation of electricity and heat. Power plants generating electricity typically emit waste heat through cooling towers. Cogeneration captures the heat by-product for use in domestic or industrial heating. Small cogeneration systems depend on specific arrangements to use the excess heat from power generation and to sell excess power back to the local utility during times when the electricity production exceeds the need of a building or factory.

(Building) Commissioning – A process by which the operating systems of a building are tested and adjusted prior to occupancy. The intent of commissioning a new building or major retrofit is to ensure all systems are operating according to design intent. Commissioning typically reduces the energy use of a building by 10 to 15 percent.

Compact Fluorescent Lamps (CFLs) – A type of fluorescent lamp approximately three times as energy-efficient as a standard incandescent lamp. All fluorescent lamps contain mercury, which is why many people consider CFLs to be a transitional technology between incandescent lamps and LEDs.

Continuous Commissioning – An ongoing program of structured commissioning throughout the lifetime of a building, measuring energy use and the field performance of major energy-using systems.

Daylighting – The controlled admission of natural light through windows or skylights. Admission of natural light reduces the need for electric lighting and increases productivity. Daylighting is typically used in conjunction with electric lighting in order to provide a constant lighting level, usually 30 foot-candles at the desktop.

Demand-Side Management – Term applied to all methods and means for reducing energy use in a building or facility, including lighting retrofits, computer controls, lighting controls, etc. These methods focus on minimizing energy demand by influencing the quantity and use-patterns of energy consumption by end users.

Demand Response – At times of peak energy use, utilities attempt to reduce customer energy usage in order to address such concerns as system reliability and market conditions, and to support infrastructure optimization or deferral. Demand response programs may include peak and off-peak pricing, contractually obligated and voluntary curtailment, and direct load control (also known as “peak shaving”).

Embodied Energy – A calculation of the energy used to produce and distribute a product. For example, the embodied energy of photovoltaic cells might be equivalent to 3 to 7 years of their total energy production.

Energy Efficiency – A broad term used to describe products, systems and technologies that reduce the source energy required to produce a given service or result, such as 30 foot-candles of light at the desktop.

ENERGY STAR® - A joint program of the U.S. Environmental Protection Agency and the U.S. Department of Energy helping businesses and individuals protect the environment by rewarding superior energy efficiency. Energy Star® seals and ratings apply to appliances and buildings, respectively. A building earns a rating using the Energy Star® Portfolio Manager to compare building energy performance to similar buildings in similar climates. Only the top 25 percent of high-performing buildings receive the ENERGY STAR® rating.

Energy Service Performance Contracting – A financing technique typically used by Energy Service Companies (ESCOs, see below) that uses cost savings from reduced energy consumption to pay for the cost of designing and implementing energy conservation projects.

Environmentally Preferable Products (and Purchasing) – Under the provisions of Federal Executive Order 13423 (2007), federal agencies are currently supposed to give purchasing preference to products identified as having a reduced impact on public health or the environment compared with similar products serving the same purpose. High-recycled-content copy paper is an example of an environmentally preferable product.

(EPACT) Energy Policy Act – A national law directing U.S. energy policy, first passed in 1992. Major revisions were passed in 2005 and 2007.

(ESCOs) Energy Service Companies – An organization providing energy-related services such as energy audits, measures to reduce energy consumption, and financial assistance to a client firm. In general, ESCOs design and implement energy savings projects.

(FEMP) Federal Energy Management Program – A program of the U.S. Department of Energy “working to reduce the cost and environmental impact of the Federal government by advancing energy-efficiency and water conservation, promoting the use of distributed and renewable energy, and improving utility management decisions at Federal sites”⁸⁹

Financing Energy Efficiency – Energy retrofits are often financed entirely or in part with utility incentive money or indirectly with tax incentives from state and federal governments. See also Energy Service Performance Contracting above.

Fuel Cells – An electrochemical conversion device that converts the energy of a fuel directly to electricity and heat without combustion. Hydrogen gas or methane can be used as fuels. When combined with oxygen in a fuel cell, they produce electricity and very little heat with no emissions. Unlike a battery, which eventually runs out, a fuel cell will run as long as fuel is provided. Fuel cells are in limited use at present, owing primarily to the cost of producing energy.

Green Buildings – in the U.S. and Canada, a term used to denote commercial buildings certified by the U.S. or Canada Green Building Councils, respectively, under the Leadership in Energy and Environmental Design (LEED) standard. In residential buildings, there are multiple green building standards, including LEED and the National Home Building Program of the National Association of Home Builders (NAHB).

Green Grid - The Green Grid is a global consortium dedicated to advancing energy efficiency in data centers and business computing ecosystems. In furtherance of its mission, the Green Grid is focused on defining meaningful, user-centric models and metrics; developing standards, measurement methods, processes and new technologies to improve data center performance against the defined metrics; and promoting the adoption of energy-efficient standards, processes, measurements and technologies.⁹⁰

(GHGs) – Greenhouse Gas Emissions – All air emissions that contribute to increasing the concentration of infrared-trapping gases in the atmosphere. Of these gases, carbon dioxide is the most prevalent and the most clearly caused by human activity such as burning fossil fuels. Other greenhouse gases include methane from anaerobic digestion of plant material, nitrous oxide, ozone and chlorinated fluorocarbons such as Freon®.

Greenwashing – A term used to describe making claims about environmental (“green”) benefits that do not stand up to scrutiny, typically used by marketing and PR people.

(SSL) – LED/Solid State Lighting – Light-emitting diodes (LEDs) use significantly less energy, produce far less heat, and last much longer than incandescent or fluorescent light bulbs. Because they are chip-based, they easily integrate with control systems.

LEED® Green Building Rating System – Leadership in Energy and Environmental Design (LEED) is the leading green building rating system in the U.S. for commercial, institutional, and mid-rise to high-rise residential buildings. The U.S. Green Building Council developed the system and owns the trademark. The Council is continuously developing and expanding the reach of the LEED rating system. LEED evaluates whole-building environmental performance over a building's life cycle, providing a method for evaluating more than just the energy use of a building.

Life-Cycle Assessment (of Electrical Products) – A comprehensive evaluation of the environmental impacts of a process, product or material over its lifetime (from “cradle to grave”). Compiling information about a material's inputs and outputs throughout its life cycle allows for strategic decision-making by manufacturers and buyers of such products. A life-cycle assessment makes it easier to choose a particular material.

LCC – Life-Cycle Costing – A method of analyzing whether or not a particular product saves money in the long term relative to its initial cost. LCC encompasses the cost of acquisition, maintenance costs and any savings resulting from a product's use. If LCC is positive (benefits outweigh costs), then it's economically advantageous to use the product.

Light Pollution – Excess light from a building, facility, or factory that escapes into the night sky. Dark skies at night help people and critters. The LEED rating system offers a point for reducing excess night-sky illumination through the use of lower-lumen lamps and cutoff fixtures, for example.

Lighting Systems – Systems that incorporate controls and dimmers in order to provide efficient yet useful illumination levels. Occupancy sensors help reduce energy use when a space is vacant. Dimmers can reduce electric lighting levels when daylight is sufficient.

Lighting Controls – Occupancy or motion sensors that control lighting by turning lights on or off depending on room occupancy. Lighting controls can also operate with photosensors, turning lights off or on depending on ambient light levels.

Measurement and Verification Systems – Sensors monitoring the ongoing performance of a green building. Building energy performance can degrade over time as systems wear out. Measurement/verification systems are meant to counteract this tendency.

Mercury – A toxic heavy metal found in fluorescent lamps. Mercury causes central nervous system damage with repeated or prolonged exposure. Mercury is considered a hazardous waste and must be handled as such.

Microturbines – Use natural gas (also diesel or propane) to generate electricity and hot water simultaneously. They are very efficient because 80 percent of the energy value in the fuel is converted to useful work. Microturbines tend to be much smaller than cogeneration systems, about 60-kW to 300-kW.

Net Metering – Arrangements by which electric utilities give credit for power fed back into the grid from on-site sources, effectively “running the meter backwards.”

Payback Period – A term referring to how long it takes to recover a product's initial cost through annual savings. This is one way to assess the risk of using a new product. A shorter payback period is better.

Photovoltaics – Technology that converts sunlight into electricity, usually using solar panels containing silicon. With today's worldwide shortage of solar-grade silicon, some new photovoltaic (PV) technologies are using other materials, such as thin films of cadmium-telluride or copper-indium-gallium-selenide.⁹¹

Recycled Content – The percentage of a material, typically by weight, that comes from either post-consumer waste (aluminum cans, for example) or post-industrial/pre-consumer waste (such as fly ash from coal power plants used in place of cement in concrete). LEED awards points for recycled content in building materials.

Renewable Energy – Any energy source that can be replenished essentially forever by natural forces on a daily, annual or periodic basis. For example, solar energy is replaced daily; wind might be daily or seasonally; hydroelectric power is seasonal; biomass energy (for example, ethanol from corn or energy from burning wood) is replenished annually or over multiple years; and geothermal energy (the heat of the earth) is always available.

Return on Investment (ROI) – The present value of all net benefits of using a product compared with its initial cost, expressed as a percentage. When selling to corporations, it's useful to use ROI to describe the benefits of making an investment.

Site Energy – The end use energy at a building, warehouse or factory, expressed in kilowatt-hours of electricity and therms (100,000 BTU) of gas or oil. Outside suppliers are paid for site energy.

Solar Investment Partnerships – Long-term agreements between a company installing solar energy facilities and customers providing sites (typically rooftops) for the installed solar systems. The installing company provides its own funds for the installation and maintenance of the PV panels. It provides the capital investment and generates solar power. The customer purchases it, reaping the benefits of predictable rates and reducing greenhouse gas emissions.

Source Energy (also called Primary Energy) – This is the energy required to make and deliver site energy. For example, the electric power grid typically burns three or four energy units of coal to deliver one energy unit to an end-user. In terms of greenhouse gas emissions, source energy is the more important consideration. In the case of solar power systems, of course, the source energy is zero.

Sustainability – The quality of a state or process that enables it to be indefinitely maintained. In order to achieve sustainability, environmental, economic, and social issues must be considered in a balanced manner. In 1987, the United Nation's Brundtland World Commission on the Environment and Development defined sustainable development as meeting "the needs of the present without compromising the ability of future generations to meet their own needs."

Take-back Legislation – A law or regulation requiring manufacturers to 'take back' all products for recycling. Typically, the distributor will be the collection point. This type of law or regulation is being applied increasingly to electronics and appliances of all types.

Tax Incentives – Tax codes stimulating investment in or development of a socially, environmentally or economically desirable objective. Incentives can take the form of exemptions, rebates, deductions, or credits.

Time-of-Day Metering – A measurement that splits electricity rates into two segments, peak and off-peak. Peak hours usually occur during the day and off-peak hours usually occur in the evenings. Utilities offer significantly lower rates during off-peak hours to promote load shifting of demand.

Triple Bottom Line – A method of describing an approach emphasizing the equal importance of Economics, the Environment and (social) Equity in decision-making, often referred to as the "Three E's." Another version of this term talks about the "Three P's": People, Planet and Profit.

Utility Energy Efficiency Programs – Investor-owned utilities and some municipal utilities offer cash incentives and technical assistance as incentives for installing energy-efficient equipment and appliances. Most of these programs are ordered by state utility or public service commissions or by local governments (in the case of municipal utilities).

Wind Power Systems – Systems that convert the kinetic energy of wind into the mechanical energy of a rotating shaft and ultimately into electrical energy via a generator. Turbines atop a tower collect wind energy, turning the rotor of a generator, and create electricity.

Zero-Net-Energy Buildings – Buildings that provide all their own energy on an annual basis from onsite renewable power generation and/or offsite renewable energy purchases. Typically these buildings feature passive solar design, natural ventilation, high insulation levels, and significant levels of sensors and controls, along with purchase of efficient lamps, fixtures and appliances.