

Solar Lingo

“Install a 4KW grid-tied BIPV system and, with the current Fed ITC, expect an ROI of 12%. It's a great investment!”

“**WHAT?!** I just wanted to know what a solar system will cost. What does ‘grid-tied’ mean? What’s a BIPV? Is that one of those dangerous chemicals? **Where can I get some straight answers?**”

As with any industry, we greenies sometimes tend to talk in a shorthand language nobody else can understand. We’re not trying to keep secrets from you, we just work with this so much every day, we sometimes think our audience understands the lingo as well as we do. We hope the list of terms, abbreviations, and acronyms below will help you to translate our tech talk into plain English.

Find a word/phrase. . . Ctrl + F

Term	Meaning
Absolute temperature	The temperature above the theoretical level of absolute zero, the temperature in which all molecular activity ceases. Zero degrees on the Rankine scale is very close to absolute zero. Water would freeze at about 459°R and boil at about 703°R.
Absorb	Process in which one or more chemicals dissolve into another. Paper towels do not absorb water from the kitchen counter. See also <u>adsorb</u> .
Absorptance	The ratio of the amount of radiation absorbed by a surface to the amount of radiation incident upon it
Absorptivity	The capacity of a material to absorb radiant energy
AC	Alternating Current, electricity that reverses direction in a conductor, in the US typical household current reverses direction 60 times per second, see "hertz." Note: May also indicate Air Conditioning.
Active	A reaction requiring input of energy from an outside source, such as photovoltaic cells converting light radiation to electricity
ADECA	Alabama Department of Economic and Community Affairs, www.adeca.alabama.gov/Energy/
Adsorb	Process in which one or more chemicals temporarily attach themselves to the exterior surface of another chemical or material. Paper towels can adsorb water from a kitchen counter. See also <u>absorb</u>
Amp, Ampere	Electrical power required to flow one volt through a resistance of one ohm
Angle of incidence	The angle between incoming sun radiation and the collector plate.
Array	Two or more solar collectors working together in parallel or series
ASA	The Alabama Solar Association, www.AL-Solar.org
ASES	The American Solar Energy Society, www.ASES.org
ASHRAE	The American Association of Heating and Refrigeration Engineers www.ashrae.org
AWEA	The American Wind Energy Association, www.awea.org
BIPV	Building Integrated Photovoltaic’s, photovoltaic systems integrated with an

Term	Meaning
	object's building phase so that they are built or constructed along with the structure. This significantly reduces system costs.
Boyle's Law	The absolute temperature of an ideal gas rises in direct proportion to a decrease in volume and to an increase in pressure. Sometimes stated as pressure times volume divided by temperature equals a constant. Most gasses act very closely to an "ideal gas."
Brand names	Specific brand names are intended as an example and not a recommendation. Our industry is changing so rapidly, that any recommendation made today might be obsolete tomorrow. Get the very latest recommendation from a Solarite or a solar pro before designing a system.
Btu	A British Thermal Unit, the heat energy needed to raise one pound of water one degree Fahrenheit
Btu/hr	British Thermal Units per hour, the power equal to 0.293 watts
Building Envelope	The portion of a building that separates conditioned from unconditioned space. See ASHRAE Standard 90.1 .
Carbon Dioxide	CO ₂ , a greenhouse gas (GHG) , a chemical compound composed of two oxygen atoms bonded to a single carbon atom. It is a gas at standard temperature and pressure and exists in Earth's atmosphere in this state. CO ₂ is a trace gas comprising 0.039% of the atmosphere. Carbon dioxide is expelled by animals and used by plants to make sugars and allow plant growth.
Carbon Footprint	The total set of greenhouse gases (GHG) emissions caused by an organization, event or product including direct and indirect processes
CH ₄	See Methane
Climate Change	Change in the statistical distribution of weather over periods of time that range from decades to millions of years. In recent usage, especially in the context of environmental policy, climate change usually refers to changes in modern climate due to Greenhouse Gas or Carbon emissions. See "global warming."
Closed Loop Indirect SHW	A Solar Hot Water system in which a water-glycol mixture is pumped through the solar collectors, through a heat exchanger, and back to the collectors. Potable water is heated by the heat exchanger and is never in direct contact with the fluid circulated through the solar collectors. This system works well even in weather below freezing.
CO ₂	See Carbon Dioxide .
Collector	A device to receive solar radiation and convert it into electricity or heat energy
Compression	Reducing the volume of a gas, a process that also raises its temperature. See also Boyle's Law
Condensation	Converting a gas to a liquid
Conditioned space	Space within a building that is heated, cooled, or both
Cooling	Removal of heat, or moving heat from a place that is too hot to an area where temperature is not so important. Removing heat from a building and expelling it to the outside air or ground.

Term	Meaning
Conductor	A substance that conducts electricity or heat, such as a wire
Convection	A reaction in which warm portions of a liquid or gas rise above cooler portions of the same fluid
CSP	Concentrated Solar Power, using a system of lenses or mirrors to concentrate a large area of sunlight onto a relatively small area to amplify the power. CSP may be used for creating high-temperature water, for amplified photovoltaic collection, or other uses.
DC	Direct Current, electricity flowing in one direction, the electricity generated by photovoltaic (PV) cells
DG	Distributed Generation, also known as on-site generation, DG is when electricity is generated close to where it is used, such as your roof. Generally, DG reduces the amount of energy lost, size and number of power lines and power plants necessary to transmit energy from generating stations.
DoE	The US Department of Energy, www.energy.gov
Electricity	Energy used to move electrons through a conductor
Emissivity	The ability of a material surface to give off radiant energy
Emittance	The ratio of the radiant energy emitted by a body to the energy emitted by a black body at the same temperature
EnergyStar®	Appliances, equipment, or buildings that are certified by DoE and EPA to consume less energy and to have a lower carbon footprint than at least 75 percent of similar products
Environment	Our surroundings to include our air, water soil, and other natural elements
EPA	The US Environmental Protection Agency, www.energy.gov , the agency designated to enforce US standards for clean air and water
Evaporation	Converting a liquid to a gas either by reducing pressure, by increasing temperature, or by doing both
Fenestration	Windows including their frames, hardware, shades, etc.
FEMP	The Federal Energy Management Program of the US Department of Energy, www1.eere.energy.gov/femp
FSEC	The Florida Solar Energy Center, www.fsec.ucf.edu
FiT	Feed-in Tariff, a premium price paid for renewable energy during early year to help the technology develop
Geothermal	Of or pertaining to the internal heat of the earth including heat stored near the surface from sunshine striking the earth's surface daily, heat from decay of radioactive materials deep below the surface, and heat left over from the creation of the earth.
Generation of energy	Energy can neither be created nor destroyed. Generation refers to converting energy from one form to another.
GHG	An air pollutant Greenhouse gases absorb and emit radiation within the thermal infrared range, mainly <u>carbon dioxide</u> , <u>methane</u> , <u>nitrous oxide</u> , and <u>ozone</u>
Global Warming	See " <u>Climate Change</u> ."

Term	Meaning
Green	Good for the environment and future generations of life on earth, sustainable
Grid	The power network bringing electricity from a central generating plant to individual homes and businesses
Grid-tied	Household or business electrical power connected to the power grid
GSREIA	Gulf States Renewable Energy Industry Association, www.gsreia.org
Head	Pressure, usually measured in feet of water, i.e., the pressure exerted by a column of water "H" feet high. To convert head to pounds per square inch (psi), take the weight of water (62.4 pounds per ft ³) divided by the number of square inches per square foot (144 in ² per ft ²), or 62.4/144 = 0.43333 psi per foot of head.
Heat	Energy needed to raise or lower the temperature of a substance
Heat pump	A mechanical device which moves heat from one location to another using compression and expansion cycles. It may be used to heat an interior area or reversed to remove heat from it.
Hertz	Frequency with which <u>alternating current (AC)</u> reverses direction within a conductor per second. Most US household current is 60 hertz.
HTF	Heat Transfer Fluid, the liquid circulating through solar thermal collectors, associated piping, and heat exchangers in a closed-loop or indirect Solar Hot Water (SHW) system.
HVAC	Heating, Ventilation, and Air Conditioning systems.
Hydronic	Of or pertaining to a heating system for a building in which the medium for carrying heat throughout the structure is circulating water, esp. when the circulation is aided by a pump.
IAPMO	The International Association of Plumbing and Mechanical Officials, www.iapmo.org
ICC	International Code Council, a membership association dedicated to building safety and fire prevention. ICC develops the codes and standards used to construct residential and commercial buildings, including homes and schools. www.iccsafe.org
ICS solar water heater	The ICS (Integrated Collector Storage) or Batch Solar technology is much less used than solar flat-plate and solar evacuated-tube technology, but in their essence it is an old, tested and... very, very simple technology.
Incident Angle	See <u>Angle of incidence</u> .
Insolation	The total amount of solar energy reaching a surface per unit of time
ISES	The International Solar Energy Society, www.ISES.org
Kw	One kilowatt or 1,000 <u>watts</u>
Latent heat of fusion	Heat needed to convert a solid into a liquid. 144 Btu/Lb are needed to convert ice to water.
Latent heat of vaporization	Heat needed to convert a liquid into a vapor. 971 Btu/Lb are needed to convert water to steam.
LEED	Leadership in Energy and Environmental Design, an internationally

Term	Meaning
	recognized green building certification system, providing third-party verification that a building or community was designed and built using strategies aimed at improving performance including energy savings, water efficiency, CO ² emissions reduction, improved indoor environmental quality, and stewardship of resources. See also the US Green Building Council, USGBC .
Life-Cycle Cost Analysis	An analysis of the total cost of two or more options considering all costs over the expected life of the option from acquisition to disposal or recycling of components. Costs to consider might include purchase price, operating costs, maintenance costs, energy costs, etc. "Green" options usually have a higher initial cost but can save significantly on maintenance and energy costs. "Green" options are usually life-cycle cost effective.
Methane	CH ₄ , a greenhouse gas (GHG) composed of four Hydrogen atom bonded to one Carbon atom and the principal component of natural gas
Microgrid	A localized grouping of electricity generation, energy storage, and loads that normally operates connected to a traditional centralized grid
MW	A Megawatt, 1,000 kilowatts (Kw) or one million <u>watts</u>
NABCEP	The National Board of Certified Energy Practitioners, www.nabcep.org , offers certifications to renewable energy professionals throughout North America. To avoid any conflict of interest, NABCEP offers no training. NABCEP is a voluntary program widely accepted and even required for some tax credits.
Net Metering	A system that allows utility meters to run backwards when the on-site generation system is generating more electricity than the building is using, or a separate meter showing power generated to be deducted from overall utility bill. NOTE: Some utilities, such as TVA, pay more for "Green" energy than they charge to sell it to customers. Most utilities charge more for the sale of electricity than they pay customers to generate "Green" energy. "Net Metering" does not mean that customers who generate more electricity than they use will have a net zero electric bill.
N ₂ O	See " Nitrous Oxide ."
Nitrous Oxide	N ₂ O, Commonly known as laughing gas, at room temperature, it is a colorless non-flammable gas, with a pleasant, slightly sweet odor and taste, but at elevated temperatures, nitrous oxide is a powerful oxidizer. Nitrous oxide reacts with ozone and depletes the Earth's protective ozone layer. Nitrous oxide is a greenhouse gas .
Nocturnal Radiation	Loss of energy by radiation to the night sky
O ₃	See " Ozone ."
Off-grid	Completely isolated from the grid. All power used is generated onsite.
Open-loop Direct SHW	A Solar Hot Water system in which potable water is pumped through the solar collectors, through the storage tank, and then distributed directly to outlets in the home or business. This system offers no freeze protection.
Ozone	A highly unstable compound consisting of three oxygen atoms bonded together. An air pollutant in the lower atmosphere, a greenhouse gas (GHG) , Ozone forms a protective layer at higher altitudes preventing potentially damaging ultraviolet light from reaching the Earth's surface.

Term	Meaning
PACE	Property Assessed Clean Energy, allows people to borrow money from municipalities for energy efficiency upgrades and pay it back through their property taxes. Available in 19 states, but not in Alabama.
Passive	Reactions occurring naturally with little or no action by people. Passive solar would include convection and shading.
Payback	Period of time needed to recover an initial investment through projected or actual savings. Download an Excel spreadsheet designed by the Alabama Solar Association to help you calculate Payback and other financial indicators at www.al-solar.org/tech/ROI.xls or use a RETScreen analysis .
PPA	Power Purchase Agreement, a long-term contract between a renewable energy company and you by which the company will serve as your renewable energy provider.
PV	Photovoltaic's, conversion of light energy into electricity
R, R-value	Resistance to heat flow. Designers and code writers may specify a minimum R-value for various parts of the building envelope. "R" is the reciprocal of "U", $R = 1/U$. See also " U-value "
Radiation	The complete process in which energy is emitted by one body, transmitted through an intervening medium or space, and absorbed by another body. Also the decay of unstable atoms.
Refrigeration	Reducing the temperature of a space or substance. See " Cooling ."
Renewable energy	A naturally occurring, theoretically inexhaustible source of energy, such as solar, wind, tidal, wave, hydroelectric, and biomass, that is not derived from fossil or nuclear fuel.
RETScreen	A Canadian suite of software allowing engineers to accurately estimate costs and payback of energy projects almost anywhere in the world. See www.retscreen.net
ROI	The rate of profit or return, is the ratio of money gained or lost on an investment relative to the amount of money invested. Solar energy may have a long payback but an attractive ROI. Download an Excel spreadsheet designed by the Alabama Solar Association to help you calculate ROI and other financial indicators at www.al-solar.org/tech/ROI.xls or use a RETScreen analysis .
RPS	Renewable Portfolio Standard, a regulation that requires the increased production of energy from renewable energy sources such as solar, geothermal, wind, and biomass
SDHW	Solar Domestic Hot Water, water heated by solar collectors and used for cleaning but not for pools or spas
SEER	Season Energy Efficiency Ratio, a rating system used by the US Government to establish the efficiency level of cooling equipment. The higher the SEER rating, the less electricity the equipment uses and the more efficient it is. SEER is determined by dividing the cooling capacity, measured in BTU/h, of a continuously operating air conditioner by the electric power input, measured in WATTS, of power consumed. The current standard for equipment in the United States is that they must function at a minimum of 10 SEER.
SEIA	The Solar Energy Industries Association, www.seia.org .

Term	Meaning
SHW	Solar Hot Water, water heated by solar collectors and used for any purpose
Shading loss	The loss of collector efficiency caused by the shading of the absorber plate by collector edges, other components, or adjacent trees and structures. The shading loss usually varies with the angle of incidence of insolation.
Si	Silicon, see below.
Silicon	Si, the eighth most common element on earth with the atomic number 14, a semiconducting material found in most solar cells. It absorbs photons in sunlight and converts the energy to electricity.
SMACNA	The Sheet Metal and Air Conditioning Contractors National Association, www.smacna.org/
Solar Collector	An assembly of components intended to capture solar energy
Solar farm	A large collection of PV panels, usually grid-tied and usually 1 MW or larger, intended to convert sunlight to electricity for regional or area homes and businesses
Solar garden	A collection of PV panels intended to convert sunlight to electricity for neighborhood homes and businesses, often tied to a microgrid
Solarite	A solar professional that supports the Alabama Solar Association and solves your energy problems, See our our Solarite page for names, websites, and contact information
Solar power	Energy derived from the sun as either light, heat, or electricity.
SRCC	Solar Rating and Certification Corporation, an independent certifier of solar water and swimming pool heating collectors, www.solar-rating.org
Sustainability	The capacity of the system being designed to provide vital goods and services to humans and other organisms. This may include reducing negative human impact and enhancing ecosystem services. A sustainable project will no more non-renewable energy than it produces and will consume at least as much carbon dioxide and other greenhouse gases as it produces. A sustainable design will have no long-term adverse impact on the quality of life for organisms living on earth.
Ton (of air conditioning)	Cooling needed to convert 2,000 pounds of water into ice, or 12,000 Btu/h
Transmission	Movement of energy, usually electricity, from the source of generation to the point of use.
U, U-value	Ease with heat is transmitted through a material. The U-Value is the reciprocal of the R-Value. $U = 1/R$. See also " R-Value ."
Unconditioned space	Space within a building envelope that is neither heated nor cooled.
USEC	The Uniform Solar Energy Code
USGBC	The US Green Building Council, a non-profit community of leaders working to make green buildings available to everyone within a generation, www.usgbc.org/

Term	Meaning
Watt	Power needed to transmit one ampere of electricity across a voltage drop of one volt.
Xeriscaping	Conserving water through creative, appropriate plant selection and water management, includes plants, irrigation, soil preparation, and maintenance.
Zero-Energy Building	A building that generates more energy onsite than it consumes from the grid, also known as a "Net-zero energy building"

Still don't understand a term, or can't find what you are looking for? Try [Acronym Finder](#) or [Ask "Solar Sam"](#).