



Community Solar Projects: Glossary of Terms

What is Community Solar?

It is a method for individuals from within a community to come together and generate electricity from PV solar and distribute that power for use at their homes or businesses. The benefits of community solar are that it allows for renewable energy development to be conducted in a small-scale manner, limiting impacts, and still capturing some economies of scale. It also allows for individuals with a less than desirable residential site to utilize PV solar as a energy source. Common models for community solar are the business-sponsored model, the community-powered model and the private-equity model.

Key Terms:

Module: Low Voltage Solar Cells combined together to make up a model or panel. For example, a 150kw project would include 600 x 250 watt modules that make up one array once connected.

PV Array: The total collection of solar panels that make up the PV system. A possible community-scale solar system can range from 5kw to 500kw, with many of them around 150kw.

Inverter: A device that converts electricity from direct current (DC) to alternating current (AC) power, or vice versa depending on electrical demand.

Watt Hours (Wh): a unit of energy equivalent to one watt of power expended for one hour of time.

Kilowatt-Hour (Kwh): Is a unit of energy equivalent to one kilowatt of power expended for one hour. There are 1,000 watts in one kilowatt.

Megawatt-Hour (Mwh): A megawatt is a unit for measuring power that is equivalent to one million watts. When 1,000 kilowatts run for an hour it is equivalent to one megawatt-hour.

Peak Demand: The point when consumers demand the most amount of electricity. During this time electrical power must be sustained for long periods at a higher supply level. This provides and opportunity for net metered solar photovoltaic

systems to supply energy to the grid during peak demand. Solar electricity generally produces more electricity during times of peak demand because those times are usually in the middle of the day when the sun is shining the most.

Group Net Metering: Is the process in which ratepayers can join together to build a renewable energy project and receive monetary credits on their utility bill for the electricity their project generates. In Vermont, group-net metered systems can be up to 500kw in size and have an unlimited number of members. The utilities have a cap on how many net-metered systems they can accept (4% of supply), but otherwise are required to accept the power and provide credits to the customers. In addition, a net-metered renewable energy system is exempt from the state's 5% sales tax.

Self-Generation (distributed generation): when someone wants to produce his or her own power to supplement the electricity purchased from the utility. A few benefits to generating your own power is that you get to choose your generation source, can use the grid as your battery-backup, and can receive a credit on your utility bill. Many systems can also be set up to prevent the need of being connected to the grid all together.

3 Phase Power: a method for the generation, transmission, and distribution of alternating-current electric power. This technology uses three circuit conductors that carry the alternating currents, which reach their peaks at different times. The delay gives the effects of having constant power over each cycle of the current. Additionally, the neutral wire within a three-phase power system enables high voltage to support lower-voltage single-phase applications. On some systems, 3-phase power is required at the interconnection point.

Solar Adder: Is an additional monetary credit provided for the generation of solar electricity on an individual or businesses utility-bill. Currently, this additional credit is set to .20-cents, or roughly .06-cents above normal residential rates. By Vermont law the current solar adder will exist until 2021.

Certificate of Public Good (CPG): Is a document that is granted by the Vermont Public Service Board after the application process that enables the construction of a proposed project and indicates the PSB's approval of the project is in the interest of the public, (or in the "Public Good.")

Public Service Board (PSB): Is a three-member quasi-judicial board charged with licensing and regulatory responsibilities over electric utilities. The Board is made up of three individuals appointed to 6-year terms by the Governor. Renewable energy project owners apply to the PSB for Certificate of Public Good in order to build their project. Systems under 150kw in size go through an expedited process.

Financing Programs and Incentives:

Property Assessed Clean Energy (PACE): Is a financing program that allows homeowners access to funding for renewable energy or efficiency projects through property tax reductions rather than loans. PACE enables a town to set aside a certain area to provide funds for homeowners to convert to renewable energy and efficiency and participants must repay the municipality over a period up to 20 years. Currently, legislation has been introduced in Vermont so that the Federal Housing Finance Agency (FHFA) cannot demand that homeowners pay their mortgages upfront. Instead, it would make the assessment of PACE secondary to the primary mortgage.

Sustainably Priced Energy Development Program (SPEED): Is a piece of Vermont legislation that encourages new small-scale renewable energy development in the state. The goal of the SPEED legislation is to generate 20% of Vermont's load with small-scale (below 2.2mw) resources by 2017. If this goal is not met then Vermont's utilities must meet additional retail electric sales through the use of renewables with the attributes of Renewable Energy Credits, or with a compliance payment to the Vermont Clean Energy Development Fund. Incentives for the SPEED program are performance-based and require a 25-year contract for PV technology. The program is currently full, but is still accepting applications.

American Recovery and Redevelopment Act (ARRA): Is a Federal stimulus package enacted by Congress in February 2009 to invest nearly \$787 billion in green energy, infrastructure, education, health, and energy among other things. This is the source of federal incentives that make it possible to finance many community solar project and other residential systems.

Clean Energy Development Fund (CEDF): A public benefit fund in Vermont that intends to promote the development and deployment of cost-effective and environmentally sustainable electricity resources. The Vermont Energy and Reinvestment Act mandated all funding received from the State Energy Program (SEP) and the Energy Efficiency and Conservation Block Grant (EECBG) programs be included in CEDF (approximately \$31 million).

Investment Tax Credit (ITC): Is a corporate tax credit that is equal to 30% of the expenditures towards any new renewable energy project, with no maximum credit granted on a federal level. Benefits created by this credit are accelerated depreciation and cash flow over a 6-8 year period.

Business Tax Investment Credit: Is a Vermont tax credit at 7.2% to incentivize businesses to invest in renewable energy development projects. This credit is equal to the 24% of the Vermont-property portion of the federal business energy tax credit for solar.

Production Tax Credit: Is a per-kW-hour based federal tax credit for electricity generated by renewable energy systems that can be sold by taxpayers to others. This credit is different depending on the technology currently being used.

Performance Based Incentive (PBI): An incentive provided by the utility to net-metered systems to produce renewable electricity. CVPS provides a credit of \$.06 per kWh of electricity generated on a 500kw system or less.

Clean Renewable Energy Bonds (CREBs): Are used mainly by the public sector to finance renewable energy projects. They are issued with a 0% interest rate, while the borrower pays back the principal and the bondholder receives that federal tax credit. Currently, the IRS is not accepting applications for CREBs.

Power Purchase Agreement (PPA): Is an agreement between the renewable energy system owner and the purchaser of electricity produced by that system. Usually, the rates for electricity are agreed upon in the contract between parties to provide economic incentive to initiate the PPA. Most PPAs are for a long time period, generally even up to 25 years.

Contractual Agreement: Is an agreement that meets legal requirements, competence of both parties, proper lawful subject matter, mutuality of the agreement and obligation, and consideration of exchange.

Solar Services Agreement (SSA): Is an agreement that enables the renewable energy system services company to design, finance, and install the system while the site host ensures continually production and maintenance of the PV system.

Independent Power Producer (IPP): Is a power generation system developed and owned by a single entity that sells electricity at a price negotiated. For an example, an IPP would be an installation that is not owned by a utility, or provide electricity to the grid at set rates.

Business Models:

Utility-Sponsored Model: Is when a renewable energy system is owned and/or operated by the utility and they encourage opt-in participation from the ratepayer.

Special Purpose Entity (SPE) Model: Is a model for financing renewable-energy projects where investors establish a business (most likely an LLC), and individuals can purchase “membership units” or shares of the business to receive credit for a share of generation from the project.

Non-profit Model: Is a model for owning and operating a community renewable energy project where CVPS members contribute to the production of a system that is owned by a non-profit corporation.

Business-Sponsored Community Solar Model: Is a legal structure that utilizes both the tax appetite and cash flow of a business to help finance the construction of a renewable energy project that also includes ownership opportunities for individuals in the community.

Community-Powered Solar Model: Is a legal structure (most likely an LLC) that requires individuals to raise money upfront in exchange for ownership shares of a renewable energy project. Through group-net metering the participants could receive credits on their utility bill proportionally to the share of the output from the project they own. This model requires significant upfront investment, but provides the highest level of community involvement.

Private-Equity Model: Is a method for financing and owning a renewable energy project that utilizes money from individuals that have a high tax appetite to construct the project. They then own the project, and can choose to sell the output of the project via group-net metering by leasing shares to individuals or businesses in the community.

Limited Liability Company (LLC): An LLC is a legal business structure that can be used to pass all costs, profits, and tax credits through to the individuals who own a share of the company. It also provides a ‘limited’ amount of protection of ‘liability’ caused by the business.

Resources:

Database of State Incentives for Renewables and Efficiency (DSIRE): Is an on-going project between North Carolina Solar Center (NCSC) and the Interstate Renewable Energy Council (IREC) that's funded by the Department of Energy's Office of Energy efficiency and renewable energy (EERE) and is administered by the National Renewable Energy Laboratory (NREL). This is a great resource for up-to-date state and federal incentive programs. It can be found at <http://www.dsireusa.org/>.

Department of Energy (DOE): The department of the United States government concerned with policies regarding energy and safety. The Energy Policy Act of 05' authorizes the DOE to issue loan guarantees to eligible projects that reduce environmental pollution and implement the use of renewable technologies, but requires an equity commitment. Additionally, DOE sponsors more scientific research regarding solar technologies than any other agency.

National Renewable Energy Laboratory (NREL): A laboratory responsible for investigating renewable energy and energy efficiency research and development, which is funded by the DOE. In addition, NREL performs research, development, testing, and deployment of photovoltaic technologies.

Solar Advisor Model (SAM): A modeling tool developed by NREL for determining performance estimations and the cost of energy based on install and operation costs. This tool is extremely helpful with determining the financial projections of various project types.

Energy Information System (EIS): A performance monitoring software, data acquisition hardware, and communication systems used to store, analyze, and display buildings energy data or in this case the productiveness of the PV array.

Solar Energy Industry Association (SEIA): A non-profit national trade association of the U.S. solar energy industry. SEIA works through advocacy and education to build a strong solar industry to power America.

Vermont Department of Public Service (DPS): An agency that represents the public interest in matters regarding energy, telecommunications, and water management. Specifically, VDPS represents public interest in utility cases before the Public Service Board, federal regulatory agencies, and state or federal courts.

CVPS Service Area: Is the geographic territory of Central Vermont Public Service. It covers most of Rutland County and much of southern Vermont.

Renewable Energy Resource Center (RERC): Is an organization that provides consumers with information about solar hot water and electric renewable energy systems and incentives that are offered through the state.

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