

# **RENEWABLES GLOBAL FUTURES REPORT**

**Online Supplement**

## **GLOSSARY AND BASIC ENERGY CONCEPTS**

**Draft January 16, 2013**

**REN21 Renewable Energy Policy Network for the 21<sup>st</sup> Century**

**Institute for Sustainable Energy Policies**



## GLOSSARY

**Biodiesel.** A fuel for diesel engines installed in cars, trucks, buses, and other vehicles, and for stationary heat and power applications. Biodiesel is produced from oilseed crops such as soy, rapeseed (canola), palm oil and mustard, and from other vegetable oil sources such as waste cooking oil and animal fats.

**Biofuel.** A wide range of liquid and gaseous fuels derived from biomass, including ethanol, biodiesel, and biogas, which can be burned as transport fuels and used for heating, cooking and electricity generation.

**Biogas digester.** Converts animal and plant organic material into a gas mixture, predominantly bio-methane that, like natural gas, can be used as fuel for lighting, cooking, heating, electricity generation and transport.

**Biomass energy/bioenergy.** Power and/or heat generation from solid biomass, which includes forest product wastes, agricultural residues and waste, energy crops, and the organic component of municipal solid waste and industrial waste. Also includes power and process heat from biogas and combined heat and power plants.

**Concentrating solar thermal power (CSP).** Systems that use mirrors or lenses to concentrate solar thermal energy into a smaller area, thereby converting the sun's incoming light energy into heat. The heat is then transported via some conducting fluid to a heat exchanger and steam turbine or Sterling engine, where it is used to generate electricity. The three main types of CSP are parabolic trough, solar power towers, and dish systems.

**Energy Units (MW/GW/kWh/MWh/GWh/MWth/GWth).** A megawatt (MW) or gigawatt (GW) is a common unit of electric power capacity – a measure of how large a power plant or renewable power generator is. One GW is roughly the size of a large coal or nuclear power plant. MW and GW are also “flow rate” indicators, reflecting an instantaneous flow of electricity. A kilowatt-hour (kWh), megawatt-hour (MWh) or gigawatt-hour (GWh) is a common unit of electricity generation – how much electricity is produced or consumed over some time period such as a day or year. A megawatt-thermal (MWth) or gigawatt-thermal (GWth) is a common unit of heating capacity for heat-production plants.

**Ethanol.** A liquid fuel made from biomass (typically corn, sugar cane, or grains) that can replace ordinary gasoline in modest percentages for ordinary spark-ignition engines (stationary or in vehicles), or can be used at higher blend levels (usually up to 85 percent ethanol - or 100 percent in Brazil) in slightly modified engines such as those used in “flexi-fuel vehicles” that can run on various ethanol blends or on 100 percent gasoline.

**Feed-in tariff (FIT).** A policy that (a) guarantees grid access to renewable electricity producers; and (b) sets a fixed guaranteed price at which power producers can sell renewable power into the electric power network. Some policies provide a fixed tariff while others provide fixed premiums (premium payments) that are added to market- or cost-related tariffs. Other variations exist.

**Geothermal.** Heat energy emitted from within the Earth's crust, usually in the form of hot water or steam, which can be used to produce electricity or as direct heat for buildings, industry, and agriculture. Ground-source heat pumps use shallow geothermal heat for water and space heating.

**Green power.** Voluntary purchases of renewable energy, usually electricity, by residential, commercial, government, or industrial consumers, either directly from a utility company, from a third-party renewable energy generator, or through the trading of renewable energy certificates (RECs).

**Hydropower.** Electricity derived from the energy of water moving from higher to lower elevations. Categories of hydropower include “run-of-river”, storage (reservoir) capacity behind a dam, pumped

storage, or in-stream technology. Pumped storage plants are not energy sources but means for energy storage. Large hydropower is usually defined as more than 10 MW capacity but the definition can vary by country. Other capacity scales of installations are called small-, mini-, micro-, or pico-hydropower.

**Independent Power Producer (IPP).** A company or any end-user that produces power and sells that power to a utility or to other end users under specific contractual conditions, or through competitive power market trades.

**Modern biomass energy.** Energy from biomass-fuelled technologies other than those defined for traditional biomass. They include cogeneration of power and heat, combustion, gasification, pyrolysis, anaerobic digestion to produce biogas, and production of liquid biofuels.

**Net metering.** Allows a two-way flow of electricity between the electricity distribution grid and customers with their own generation system. The customer pays only for the net electricity delivered from the utility (total consumption minus self-production). A variation that employs two meters with differing tariffs for purchasing electricity or exporting excess electricity off site is called “net billing.”

**Policy target.** An official commitment, plan, or goal by a country to achieve a certain level of renewable energy by a future date. Some targets are legislated while others are set by regulatory agencies or ministries.

**Power purchase agreement (PPA).** A contract between a renewable energy generator (typically called an “Independent Power Producer” or IPP) and a utility company or end-user, for the utility or end-user to purchase the electricity output of that generator at specified rates over a specified time period (typically 5-20 years). Generally PPAs require that all generation be purchased, but clauses may limit such guaranteed up-take based on utility grid technical conditions and power demand.

**Production tax credit (PTC).** Provides the investor or owner of a qualifying property or facility with an annual tax credit based on the amount of renewable energy / fuel (electricity, heat or biofuels) generated by that facility.

**Renewable portfolio standard (RPS).** Also called renewable obligation or quota policy, it requires that a minimum percentage of total electricity or heat sold or generation capacity installed be provided using renewable energy sources. Obligated utilities are required to ensure that the target is met or if not, then usually pay a fine.

**Solar thermal (heating and cooling).** Solar collectors, usually rooftop mounted, that heat water and store it in a tank for later use as hot water or for circulation to provide space or process heating. The solar heat can also be used in chillers for space cooling.

**Solar photovoltaic (PV).** A PV cell is the basic building block that converts sunlight into electricity. Cells are typically combined and manufactured into modules and panels suitable for installation on buildings. Thin-film solar PV materials can also be applied as films over existing surfaces or integrated with building components such as roof tiles. Such building-integrated PV (BIPV) materials can be used to replace conventional materials in parts of a building envelope, such as the roof or façade.

**Renewable energy certificate (REC).** A certificate that is awarded to certify the generation of one unit of renewable energy (typically 1 MWh of electricity but also less commonly of heat). Certificates can be accumulated to meet renewable energy obligations and also provide a tool for trading among consumers and/or producers. They are also a means of enabling purchases of voluntary green energy.

**Traditional biomass.** Unprocessed solid biomass, including agricultural residues, animal dung, forest products and gathered fuel wood, that is combusted in stoves, furnaces or open fires to provide heat energy for cooking, comfort, and small-scale agricultural and industrial processing, typically in rural areas of developing countries.