Abkhazia photovoltaic pv systems

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In urban and suburban areas, photovoltaic arrays are often used on rooftops to supplement power use; often the building will have a connection to the power grid, in which case the energy produced by the PV array can be sold back to the utility in some sort of net metering agreement. Some utilities use the rooftops of commercial customers and telephone poles to support their use of PV panels.[24] Solar trees are arrays that, as the name implies, mimic the look of trees, provide shade, and at night can function as street lights.

A photovoltaic system for residential, commercial, or industrial energy supply consists of the solar array and a number of components often summarized as the balance of system (BOS). This term is synonymous with "Balance of plant" q.v. BOS-components include power-conditioning equipment and structures for mounting, typically one or more DC to AC power converters, also known as inverters, an energy storage device, a racking system that supports the solar array, electrical wiring and interconnections, and mounting for other components.

Optionally, a balance of system may include any or all of the following: renewable energy credit revenue-grade meter, maximum power point tracker (MPPT), battery system and charger, GNSS solar tracker, energy management software, solar irradiance sensors, anemometer, or task-specific accessories designed to meet specialized requirements for a system owner. In addition, a CPV system requires optical lenses or mirrors and sometimes a cooling system.

The terms "solar array" and "PV system" are often incorrectly used interchangeably, despite the fact that the solar array does not encompass the entire system. Moreover, "solar panel" is often used as a synonym for "solar module", although a panel consists of a string of several modules. The term "solar system" is also an often used misnomer for a PV system.

The building blocks of a photovoltaic system are solar cells. A solar cell is the electrical device that can directly convert photons energy into electricity. There are three technological generations of solar cells: the first generation (1G) of crystalline silicon cells (c-Si), the second generation (2G) of thin-film cells (such as CdTe, CIGS, Amorphous Silicon, and GaAs), and the third generation (3G) of organic, dye-sensitized, Perovskite and multijunction cells.[30][31]

Effective module lives are typically 25 years or more.[36] The payback period for an investment in a PV solar installation varies greatly and is typically less useful than a calculation of return on investment.[37] While it is typically calculated to be between 10 and 20 years, the financial payback period can be far shorter with incentives.[38]

The temperature effect on photovoltaic modules is usually quantified by means of some coefficients relating

the variations of the open-circuit voltage, of the short-circuit current, and of the maximum power to temperature changes. In this paper, comprehensive experimental guidelines to estimate the temperature coefficients.[39]