

Regulations regarding solar legislations in ghana

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Simply put, this is the process of turning sunlight directly into electricity using photovoltaic cells. These cells are made of semiconductor materials, like silicon, which exhibit the photovoltaic effect. The magic of solar power happens when these materials generate an electric current upon exposure to light.

Solar energy itself is not a new concept. It dates back centuries, with ancient civilisations harnessing the sun's energy. Modern advancements, such as increased efficiency and large-scale solar parks, highlight its potential. Understanding the physics behind photovoltaic energy, from solar irradiance to the photovoltaic effect, reveals the intricate process of generating clean electricity. Despite challenges like seasonal variability, innovative solutions are paving the way for a sustainable future.

The photovoltaic effect, a phenomenon where sunlight generates electricity, was discovered by 19-year-old French scientist Edmond Becquerel in 1839. This discovery marked a pivotal moment in the development of solar energy.

Advancements in solar technology were gradual until the 20th century. The first practical solar cell was developed in 1954 using silicon wafers. By 1958, solar cells were employed to power satellites with the Vanguard I satellite utilising a small one-watt panel installed to operate its radios.

Over the past few decades, significant progress has been made in the photovoltaic (PV) technology rendering it far more efficient and cost-effective. Solar power now stands as the third-largest renewable electricity source, following hydropower and wind energy. In 2016, the efficiency of solar cells reached 34.5%, a dramatic improvement from the 6% efficiency achieved in 1954.

Solar power, or more scientifically, photovoltaic energy, is energy generated from the sun. To understand this process, it is essential to grasp the concept of solar irradiance. Irradiance measures the amount of solar radiation that reaches the Earth's surface, commonly known as sunlight. It is quantified in watts per square metre, with a total value of approximately 1367 W/m², known as the solar constant.

In a solar photovoltaic power plant, solar panels convert solar irradiance into electricity through a fascinating process. Here's how it works: sunlight hits the solar cells in the panel, which are made of silicon. This light contains tiny particles called photons. When photons strike the cell's silicon, they dislodge electrons, creating an electric current. This entire process is known as the photovoltaic effect.



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Contrary to what many might think solar panels and photovoltaics are not the same thing. While panels use solar irradiance to generate energy, photovoltaics convert heat or thermal energy into electricity.

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