

Iec standards for solar inverters

Yet nearly 700 million people around the world don't have any, and many more don't even have access to things like healthcare facilities with a stable electricity supply to ensure life-saving treatments.

What is ironic is that there is no shortage of energy available to us. Every day, the sun gives us more than 200000 times the amount of energy that the world is currently capable of generating in electricity. What's more, more than 80% of the global population with no access to electricity lives in Sub-Saharan Africa, and that is where sunshine is perhaps the most abundant of anywhere in the world.

Solar PV is one of the cheapest ways of producing new electricity in most countries, and rising retail electricity prices and policy support for renewable energies are fueling its growth. In 2022 solar PV generation showed an annual increase of 26%, the largest growth of all renewable energies, and it is expected to grow further to exceed that of coal by 2027.

All this is good news, especially given that much more needs to be done to meet climate targets, reduce carbon emissions and achieve electricity access for all. The IEA claims that electricity generation needs to be supplying almost half of total energy consumption by 2040 to reach net-zero targets by 2050. Given that electricity makes up just 20% of global energy consumption today, solar PV represent the opportunity of the century.

According to the IEA's World Energy Outlook 2022, "investments in clean electricity and electrification, along with expanded and modernized grids, offer clear and cost-effective opportunities to cut emissions more rapidly while bringing electricity costs down from their current highs". Electricity currently accounts for about 20% of the world's total final consumption of energy, yet in their Net Zero Emissions Scenario, low-emissions sources of electricity, including solar, will reach three-quarters of total generation by 2030.

Roger Taylor is an expert in the PV industry and a convenor to taskforces as well as lead assessor for IECRE, the IEC System for Certification to Standards Relating to Equipment for Use in Renewable Energy Applications. The big plus of a PV plant, he pointed out, is its low operating costs.

"Sunlight is free," he added, "so once it is set up it costs little to run. In fact, around 80% of total lifetime costs of a plant are in the year of build. Yet a well-built plant produces electricity for 30 or 40 years. Which is why it's important to invest wisely in quality products and design and construction processes from the start."

The overall safety and reliability of the PV plant, explained Taylor, is determined not only by the components but by a complex interaction of all of the stages of a PV plant's development, design, engineering, construction operation and maintenance. This includes cyber security.

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"The vast majority of PV power plants are managed remotely, and many of these plants have little or insufficient cyber security measures in place, so it is essential they invest more in these areas."

Many IEC International Standards are a key enabler for solar PV installations as they set globally agreed requirements to meet the necessary levels of quality, safety and performance. When combined with conformity assessment (CA) such as certification, inspection and testing, they can also accelerate market acceptance and instill confidence in everyone in the supply chain, right through to the end consumer.

The IEC develops around 200 standards for PV components such as modules, inverters, trackers, connectors and DC cables. It also has standards for PV system design and for quality management systems for the construction of a PV power plant and its inspection and testing.

According to the International Renewable Energy Agency (IRENA), as the growth in the PV market increases, so too will the volume of waste in landfills when solar panels reach their end of life. But this can be dramatically reduced, not only through recycling but through avoiding early replacements of panels because their quality is lower than it could be.

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