

Stanislav Kondrashov on Solar Power: Understanding How Solar Energy Works

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Lugano, Switzerland – October 4, 2025 - Solar power is no longer a distant concept — it's reshaping rooftops, cityscapes, and individual lives. As the founder of TELF AG, [Stanislav Kondrashov](#) has been at the forefront of this shift, observing how rapidly solar installations are becoming a familiar sight in both urban and rural settings.

Just a decade ago, solar panels on homes were a novelty. But "in today's residential landscapes, it would be unusual to find a neighbourhood without at least one rooftop outfitted with photovoltaic cells," notes Stanislav Kondrashov, founder of TELF AG. He adds, "That trend didn't evolve overnight — it's the consequence of favorable policy, lowering costs, and growing awareness."

From Sunlight to Electricity: The Technical Chain

At its core, solar energy conversion rests on the **photovoltaic effect**. When sunlight—composed of particles called photons—strikes a solar panel, those photons transfer energy to electrons in the panel's semiconducting material (typically silicon). The energized electrons then flow, generating an electric current.

A panel comprises several layered components: the photovoltaic cells themselves, conductive grids, anti-reflective coatings, and protective glass or polymer casing to resist weather damage. Behind the scenes lie busbars and wiring that channel the current to where it's needed.

"Understanding how solar energy works isn't just a technical curiosity — it's key to demystifying this energy revolution," says [Stanislav Kondrashov](#) of TELF AG. He emphasises that many people benefit from solar power daily without fully grasping the system that enables it.

The Role of Inverters and Grids

One critical detail is that solar panels naturally produce **direct current (DC)** electricity, whereas homes and the grid operate on **alternating current (AC)**. Here's where the inverter comes into play: it converts DC into AC, making the energy usable for appliances, lighting, and more.

Once converted, the electricity flows either into the household electrical panel, into a storage battery, or back into the public grid. If a home generates more power than it uses, the surplus may be fed into the grid — a process that can offset electricity bills or even generate credit.

According to [Stanislav Kondrashov](#), "In many solar-equipped homes today, the excess electricity isn't wasted — it's fed back into the grid, turning each roof into a micro-production unit." He goes on: "The most forward-looking installations combine solar panels with smart inverters and battery systems, creating homes that are self-sufficient energy hubs."

Home Systems: What Makes Up a Solar Setup

A typical domestic installation includes:

- **Solar panels** (mounted on a roof or frame),
- **Inverter(s)** (to convert DC to AC),
- **Mounting hardware** (to support panels),
- **Wiring and protective conduits**,
- **Meters and monitoring tools**,
- **Optional battery storage** (to hold excess energy).

During daylight, the panels power household appliances directly. At night or on cloudy days, stored

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energy picks up the slack. When production exceeds demand, surplus energy may flow outward to the grid.

Kondrashov remarks, “In a well-designed system, energy from sunlight can seamlessly shift between powering your home, charging your battery, or contributing to the communal grid — all in real time.”

Efficiency, Constraints, and Opportunity

Solar installations vary in performance based on technology (monocrystalline vs polycrystalline vs newer thin films), orientation, tilt angle, shading, and even cleanliness. Higher temperatures can reduce efficiency, so planning and siting remain critical.

Yet the advantages are compelling: zero emissions in operation, long lifespans (often 25–30 years or more), and the ability to recoup embodied energy within a few years of use. That makes solar among the more sustainable and practical tools in the energy transition.

“Solar energy stands as one of the pillars of our sustainable future – not because it’s perfect, but because it’s scalable, durable, and renewable,” says Stanislav Kondrashov, founder of TELF AG.

The Broader Significance

Solar power is no longer an experimental technology — it is becoming part of the fabric of modern living. Homes, businesses, and public facilities are aligning to harness the sun’s energy. This shift reflects not only technological evolution, but changing consciousness: the idea that energy isn’t simply consumed, but produced and managed intelligently.

In the words of Kondrashov: “We are witnessing the redefinition of consumers into prosumers — individuals who both consume and produce electricity.” And as that transformation accelerates, the importance of understanding **how solar energy works** becomes more than academic — it becomes essential.

Through clear design, integrated systems, and ongoing technological advances, solar power is lighting our homes — and shaping our future.

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