

THIN-FILM PHOTOVOLTAICS



WHAT IS THIN-FILM PV?

Thin-film solar cells convert light into electricity utilising one or multiple ultra-thin layers of semiconductors on glass, plastic or metal substrates. Thin-film PV can also enhance the performance of conventional solar PV technology in tandem structures.

Why does it matter?

Environmental benefits



BETTER ENERGY RETURN ON INVESTMENT

Thin-film PV technologies **require much less energy during production** and can **generate more electricity** than other PV technologies in real world conditions. This allows for a **faster Energy Payback Time (EPBT)** and **higher Energy Return on Energy Invested (EROI)**.



SMALLER ENVIRONMENTAL FOOTPRINT

Once installed, electricity production using thin-film PV **creates zero greenhouse gases**. Thanks to production technology that is **highly resource and energy efficient**, electricity produced using thin-film PV technologies has a **lower environmental impact**, on a lifecycle basis, than any electricity generated with any other PV technology.



EASIER RECYCLING

At the end of their lifetime, thin-film PV modules and components **are easily recycled** to recover substrate materials and semiconductors for reuse in new thin-film PV panels and other products.

Unique Versatility



VEHICLE INTEGRATED PV (VIPV)

Thin-film PV can also **be easily integrated into vehicles** - powering hybrid and fully electric drivetrains.

BUILDING INTEGRATED PV (BIPV)

The **flexibility, great aesthetic appeal and ease of application** of thin-film PV enable a **ubiquitous presence in the build environment**. Integration into the actual design and building materials such as walls, roof tiles, windows, and smart appliances allow for **more renewable electricity generation**.

Performance advantages and low costs



LOWER COSTS

Thin-film PV achieves **lower electricity production costs** when compared with other PV technologies. This is as it uses integrated manufacturing technologies, that are highly energy efficient, as well as possessing superior intrinsic advantages, leading to higher energy yields under real world conditions.



DURABILITY

With their monolithic design and direct deposition to substrates, thin-film PV is **less prone to mechanical damage and related performance losses**, i.e. from hail.



HIGHER EFFICIENCY POTENTIAL

Thin-film PV technologies have the **fastest innovation rate** in the industry. The next cutting-edge step looks set to be **tandem applications** which will allow thin-film PV technologies to **overcome conventional efficiency limitations, improve performance and further decrease the cost of electricity generation**.

Thin-film PV - a sustainable, versatile and aesthetically pleasing solution!