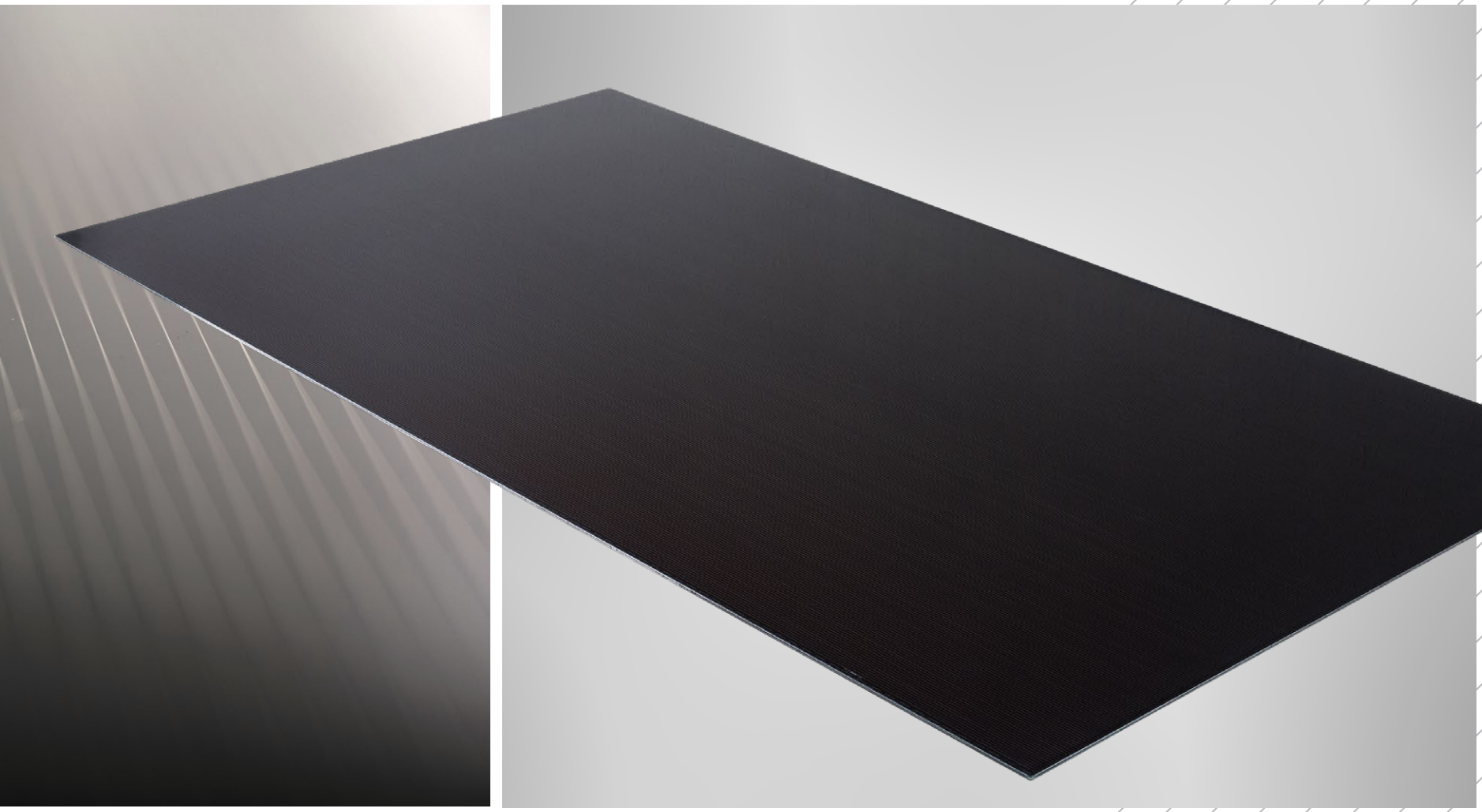
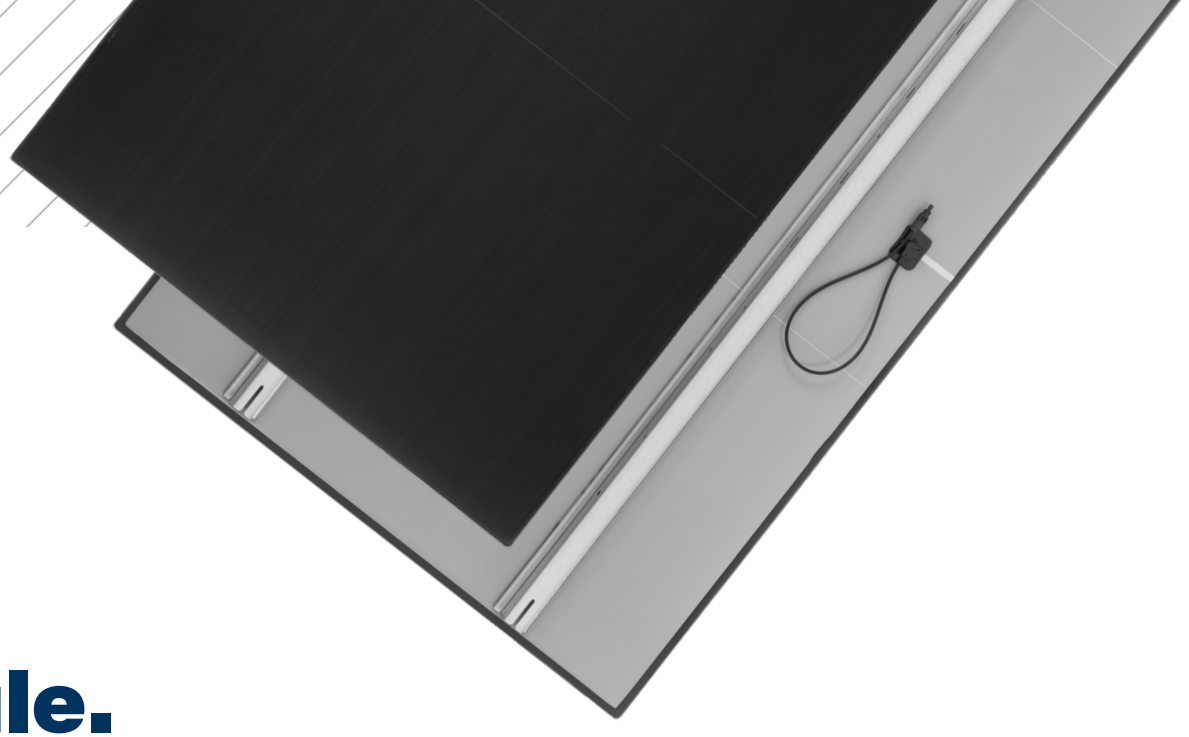


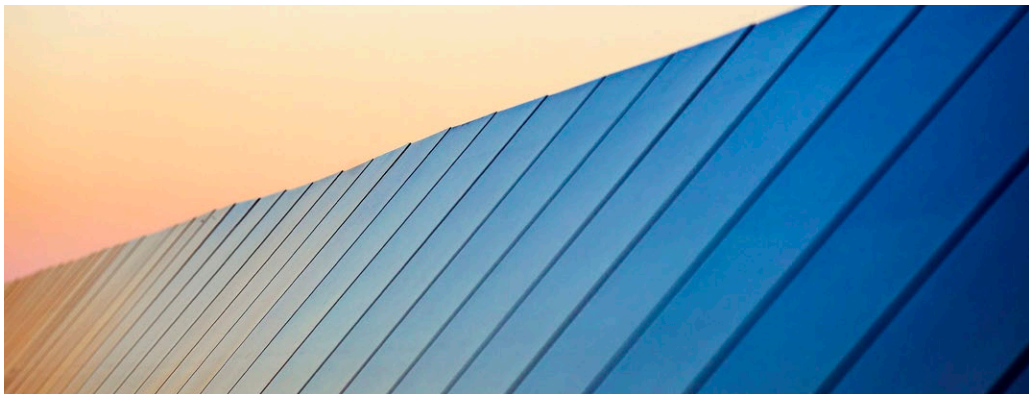
SERIES 7 *TR1*
THIN FILM PV MODULE.

First Solar



A High-Quality Thin Film PV Module. Made in America, for America.

First Solar's Series 7 *TR1* CadTel photovoltaic (PV) modules combine the technological advances of Series 6 and Series 6 *Plus* PV modules with a larger form factor and innovative design features to create a next generation thin film module. Series 7 *TR1* has been created specifically for the US utility-scale market to speed installation and reduce the levelized cost of electricity (LCOE) of your PV project. Designed and manufactured in America, Series 7 *TR1* modules are truly made in America, for America.



Collaboration in Action

To develop a next generation thin film PV module, First Solar's product engineering team worked closely with leading engineering, procurement and construction (EPC) companies, and structure and component providers. By listening to feedback on common installation pain points and sharing conceptual product designs, First Solar engineers created a new back rail mounting design that works seamlessly with clips and clamps engineered by industry-leading component suppliers. The synergistic design speeds up and facilitates installation, resulting in lower balance of system (BOS) costs.

The collaboration doesn't stop there. By incorporating feedback from our customers and their EPCs, First Solar is working diligently to build Series 7 compatibility with a growing list of structures and components to ensure they are optimized for form, function, and cost.

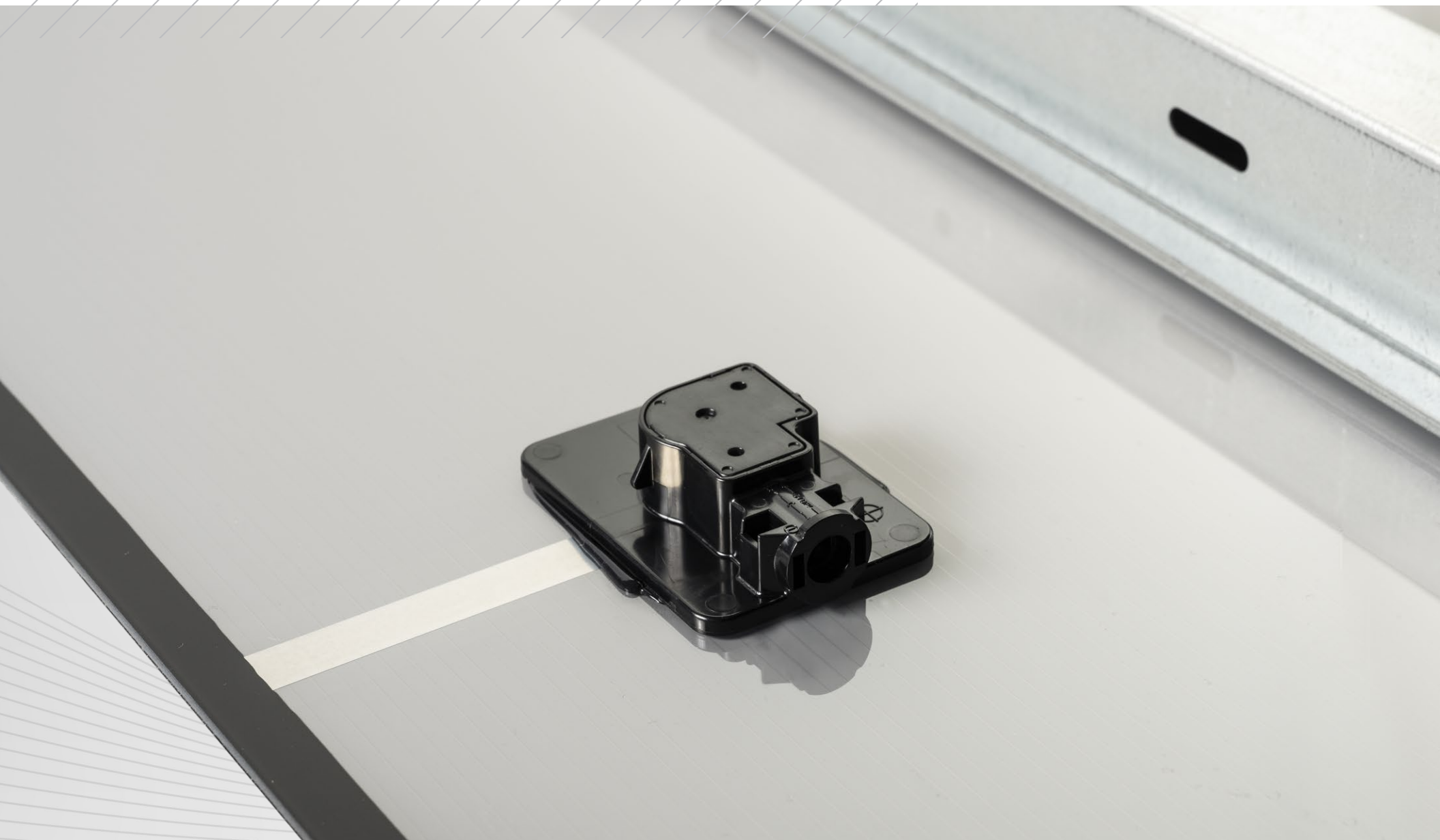
Clamp design by Array Technologies, Inc.
Clip design by ARaymond.

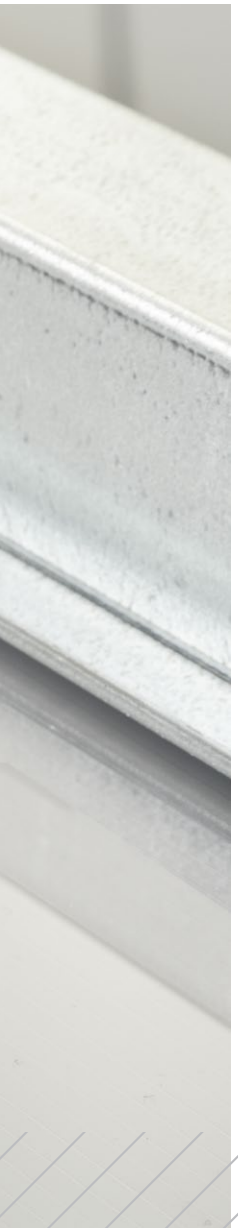
"Array Technologies takes pride in our industry collaborations, where we can leverage our highly innovative design approach to provide simple, reliable, and easy-to-install products. Working with First Solar on the development of the Series 7 module, is a perfect example. Our early and deep collaboration will result in a system integration between the Series 7 module and the Duratrack HZ v3 tracker, that is unprecedented on many levels. "

Jim Sorensen
Director of Product Management,
Array Technologies

Innovative Design, Optimized Function.

The Series 7 *TR1* module builds upon the advantages of the Series 6 family of products and leverages over 20 years of product design experience to create an optimized product that delivers improved efficiency, enhanced installation velocity, and unmatched lifetime energy performance.

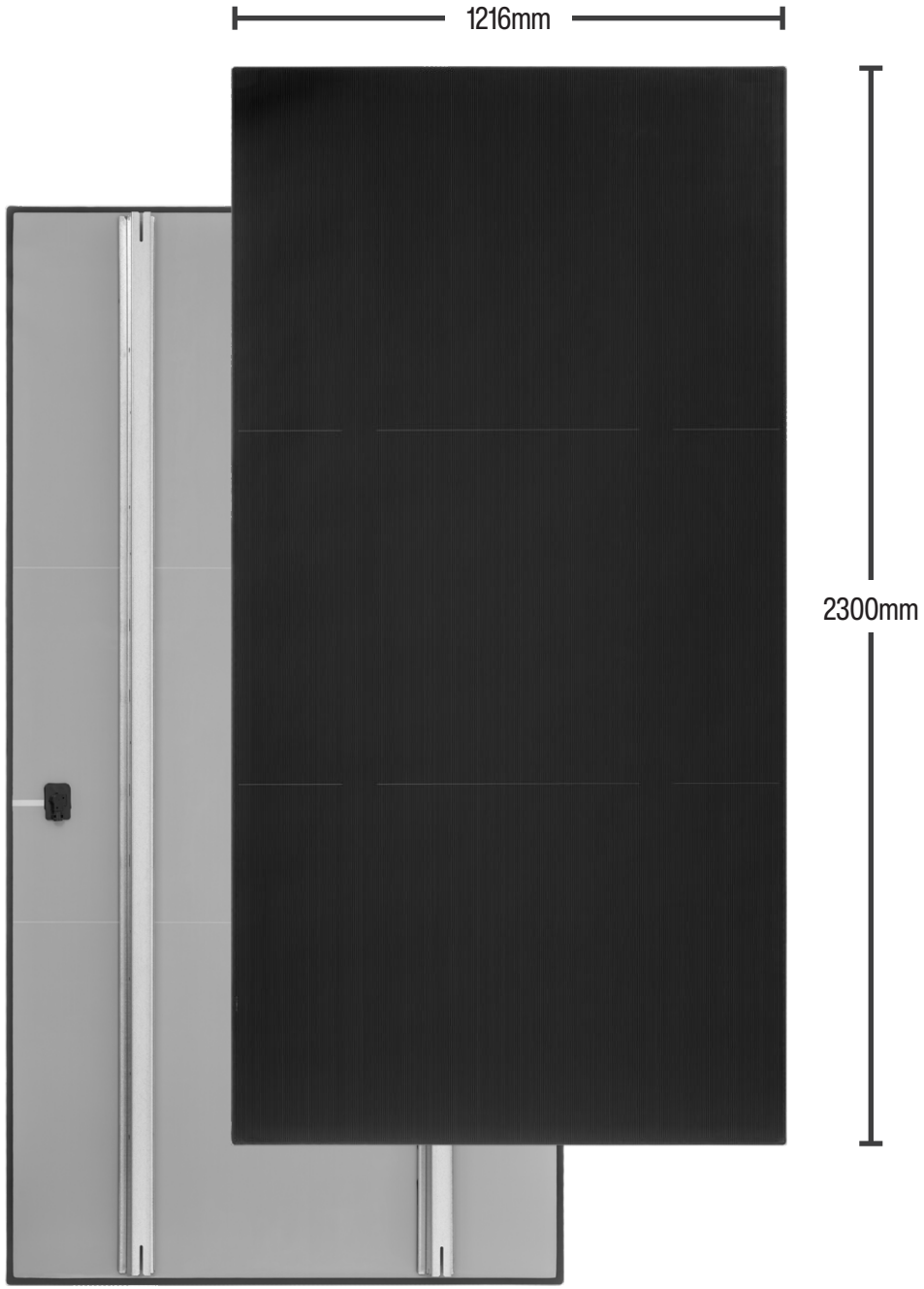




Larger Form Factor = More Watts per Install Operation

With a proprietary manufacturing process and CadTel technology, First Solar's Series 7 PV modules are not constrained by industry-standard cell or wafer sizes. Combined with the added strength of galvanized steel back rails, we are able to increase module size to optimize form and function while maximizing watts per install operation.

This increased size comes without fear of power loss from cell cracking or other performance-related issues prevalent in crystalline silicon modules.



Unique Back Rail Mounting Design.

Series 7 *TR1* modules incorporate galvanized steel back rails that work seamlessly with next generation, third-party mounting methods and hardware to provide a faster and easier installation in the field. This novel back rail design requires fewer parts and steps compared to traditional bolt and clamp systems.

First Solar's engineers continuously work with ecosystem partners and the Series 7 platform to enhance digitization and automation that will further reduce BOS and installation costs.

American steel forms the backbone of First Solar's Series 7 *TR1* panels. The transformation of iron ore to steel rolls to finished back rails, all happens within a 100-mile radius of First Solar's Ohio factories. Utilizing galvanized steel rails instead of aluminum frames allows for larger form factors with added strength and rigidity, and increases the percentage of domestically-sourced materials.

It allows Series 7 *TR1* modules to be mounted closer to the center of rotation on tracker systems, improving the mechanical efficiency of motors and dampeners. This can significantly reduce BOS costs by enabling longer tracker rows for more watts per component.

Delivering Unmatched Value and Innovation.

Returnable Packaging

Taking a page from the automotive industry playbook, First Solar is the first PV module manufacturer to offer returnable and reuseable packaging for delivery of solar modules to project sites. This revolutionary change is expected to dramatically reduce the amount of landfill waste produced by solar module packaging, and the number of trees utilized for pallets and cardboard.

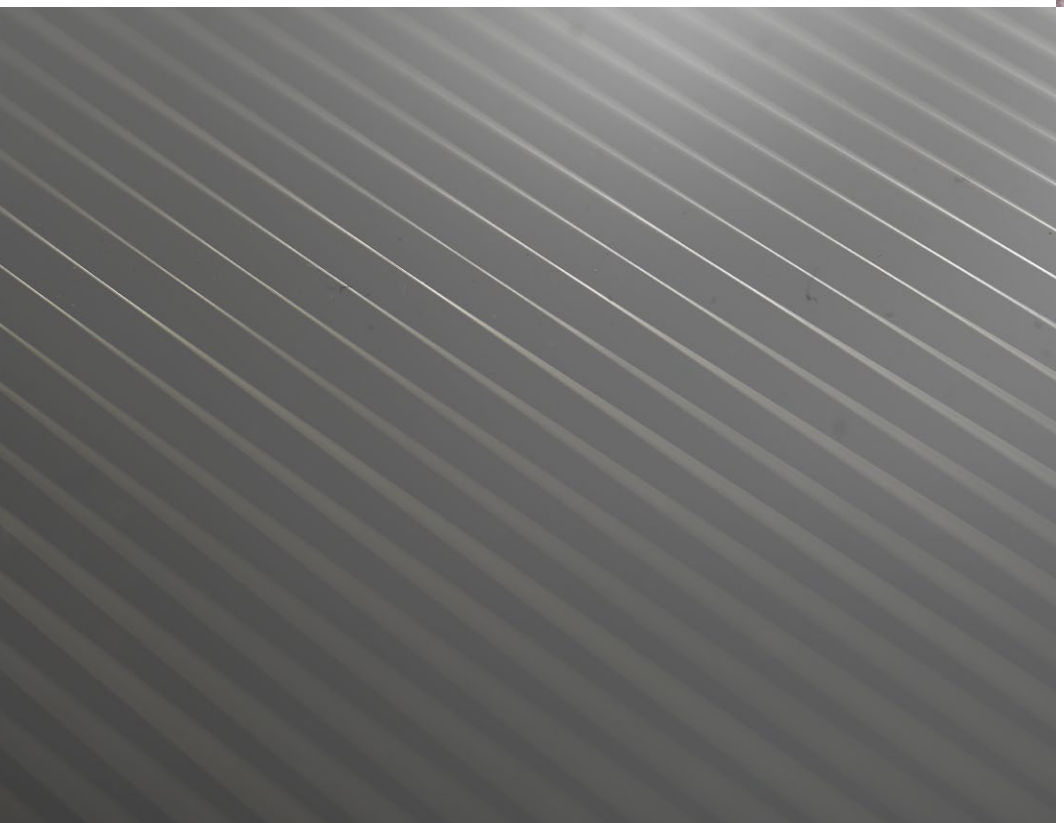
Once the returnable packaging is unloaded on site, it can be broken down for return shipment to the factory, where it will be reused for future module deliveries.

Superior Temperature Coefficient & Spectral Response

Series 7 *TR1* modules feature an exceptional temperature coefficient of -0.32%/˚C. In hot climates, that means they can produce up to 2% more annual energy compared to c-Si panels. In humid climates, the modules are less sensitive to the reductions of specific wavelengths of available light. The result? Superior spectral response and up to 4% more annual energy in high humidity conditions compared to c-Si panels.

Superior Shading Response

A distinct cell design renders Series 7 *TR1* modules less sensitive to power loss from row-to-row and other shading conditions. When standard c-Si panels are exposed to shading, disproportionately large sections of the panels (both shaded and non-shaded) shut off due to their electrical design. In Series 7 *TR1* modules, only the shaded area is impacted.



Inherent Immunity to Cell-Cracking, LID and LeTID

Extreme weather events are on the rise due to climate change. Hail, and other high-wind events can cause power loss from hidden cell cracks in c-Si panels, that can get progressively worse over time.

First Solar's thin film modules utilize a semi-conductor that is just a few microns thick, which conforms to substrate surfaces and does not fracture under stress or impact. Unlike c-Si modules, this unique property of First Solar's thin film technology makes them inherently immune to cell cracking. This is backed by the industry's first and only product warranty that specifically covers power loss from cell cracking when the module glass is intact. Plus, our advanced thin-film technology has inherent immunity to Light Induced Degradation (LID) and Light and Elevated Temperature Induced Degradation (LeTID) failure modes that affect c-Si modules.

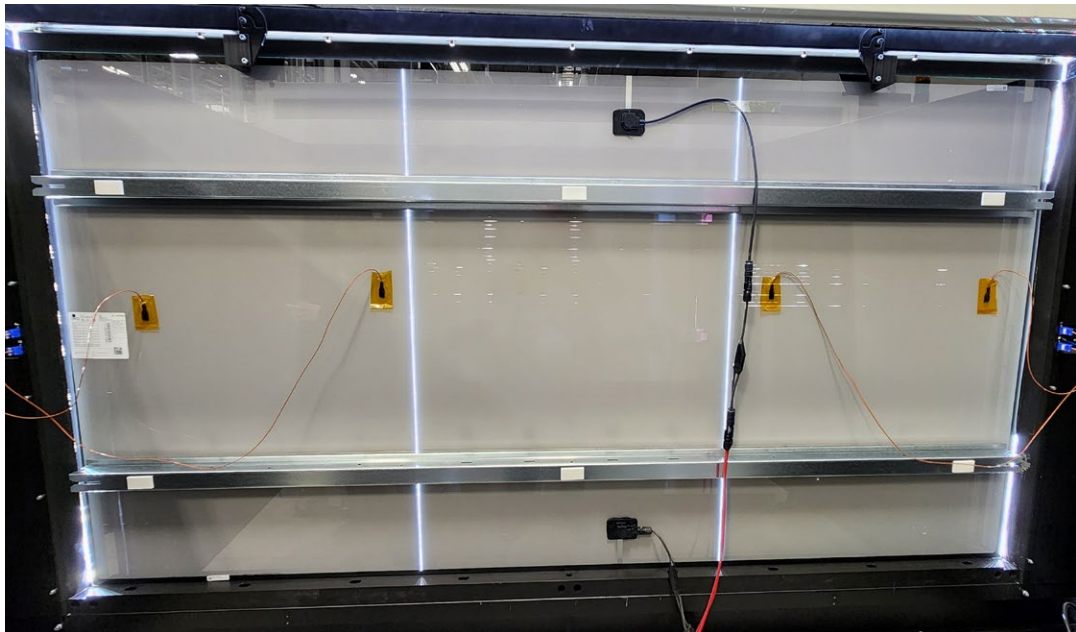
These important differences provide First Solar customers with added peace of mind, lower financial risk exposure and enhanced insurance risk profiles - especially for projects in regions prone to extreme weather.

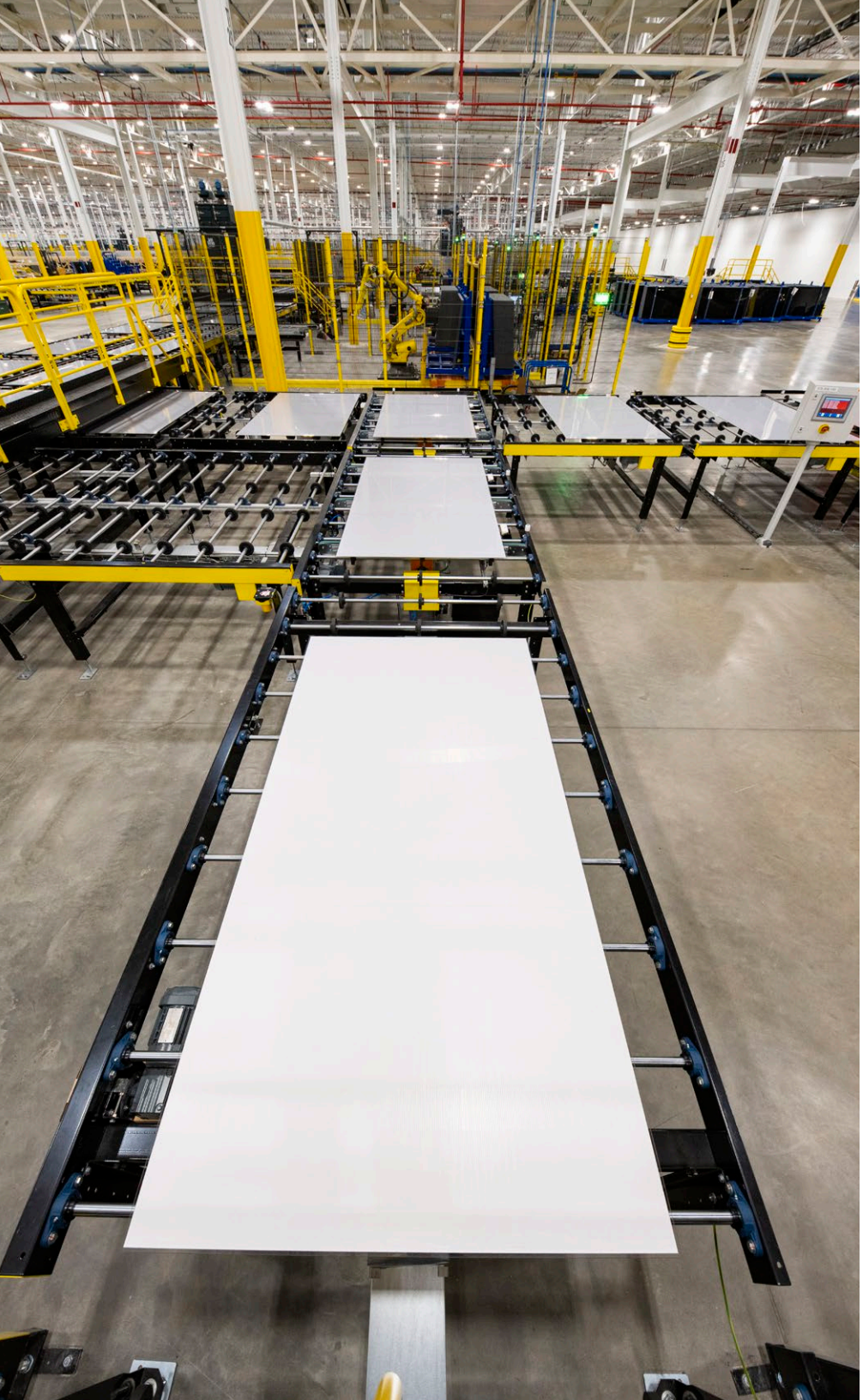
Industry-Leading Long-Term Reliability.

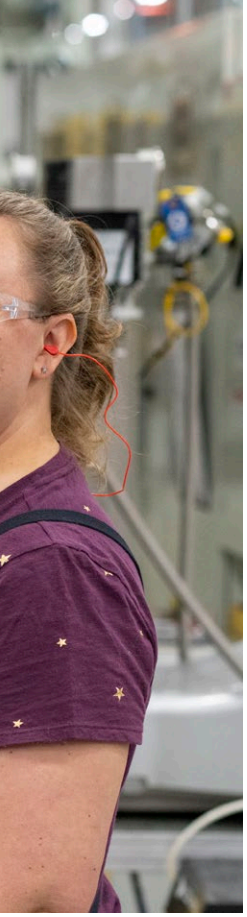
First Solar's manufacturing architecture is controlled by a single set of global specifications for Bill of Materials (BoM) components. A highly automated manufacturing process produces 100 percent of our modules, end-to-end, under one roof. The outcome is a tightly controlled, consistently manufactured, high-quality product.

100% Traceable QA/QC Program

First Solar's Product Reliability Monitoring program sets the benchmark for quality and reliability and Series 7 *TR1* modules follow the same thorough testing as the Series 6 family of modules. As part of the program, random module samples are pulled from each factory and are subject to a full range of extended durability tests, including Thermal Cycling, Humidity-Freeze Open Circuit, Damp Heat, Long Sequential testing, and more. Series 7 *TR1* is tested and certified to IEC standards and beyond to deliver reliable lifetime performance.







Built in America, for America.

Series 7 *TR1* modules are designed specifically for the US utility-scale market. They are manufactured at First Solar's newest and most advanced US factory, located in Lake Township, Ohio. This new factory accelerates delivery times for domestic projects and utilizes a responsibly managed supply chain that is not dependent on silicon - virtually eliminating the risks of forced labor and supply chain interruptions.

Plus, First Solar is constructing additional factories, located in Lawrence County, Alabama and Iberia Parish, Louisiana, which will expand its American manufacturing footprint to more than 14 gigawatts annually in 2026. For the specific components identified in the US Treasury's domestic content guidance, Series 7 TR1 is 100% sourced from the US.

By strategically building and sustaining US supply chains, First Solar is investing in America and enabling growth not just for the solar industry, but for other American industries such as glass, steel, and mining.

Uniquely American Solar Technology

For 25 years, First Solar has been committed to delivering a high quality, responsibly-produced American solar product to a global marketplace. First Solar's thin film PV solar technology is uniquely American, developed and designed in Ohio and California, with over $1.5 billion in cumulative R&D investment.

Utilizing our differentiated manufacturing process, First Solar is able to transform a sheet of glass into a fully functional PV module in about four hours. In contrast, most c-Si panels manufactured in China take several days across several locations to produce their panels using conventional processes.

Responsible Solar for More Peace of Mind.

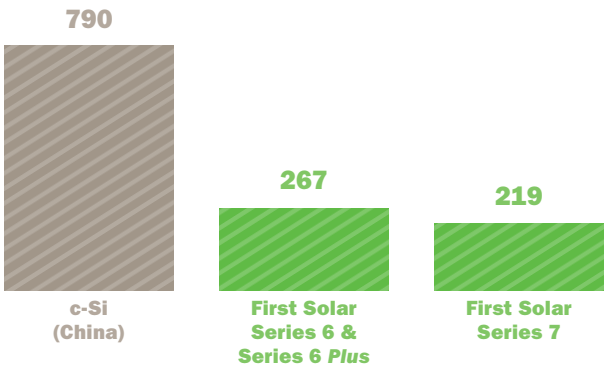
From raw material sourcing and manufacturing through end-of-life module recycling, First Solar's approach to technology embodies sustainability and a responsibility towards people and the planet. This is why First Solar has a long history of establishing benchmarks in recycling, responsible supply chain management, transparency, and the carbon and water footprint of its technology.

Lowest Environmental Footprint in the Industry

Due to our resource-efficient manufacturing process, First Solar modules have the lowest carbon and water footprint and fastest energy payback time in the industry. Our Series 7 modules have an even lower environmental footprint with a carbon and water footprint that is nearly 4X lower than conventional crystalline silicon panels manufactured in China and an energy payback time that is approximately 5X faster.

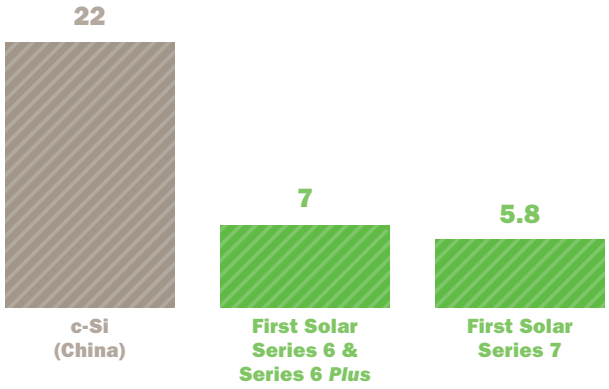
LOWEST CARBON FOOTPRINT

(gCO_{2eq}/Wp)



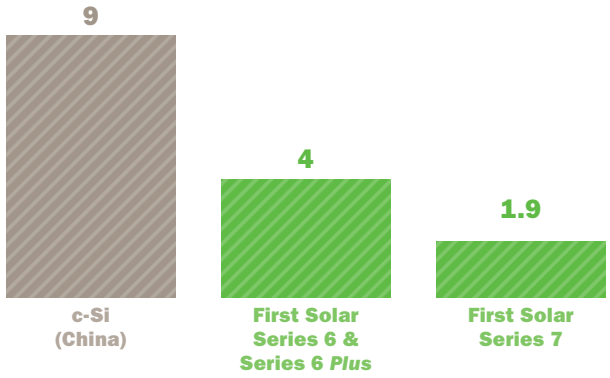
LOWEST WATER FOOTPRINT

(Liters/Wp)



FASTEST ENERGY PAYBACK TIME

(Months)



Responsible Sourcing with Zero Tolerance for Forced Labor

Since allegations of forced labor in the Chinese solar supply chain emerged in 2020, customers increasingly value our comprehensive approach to responsible sourcing and supply chain due diligence. Our integrated manufacturing process and tightly controlled supply chain helps eliminate risks associated with outsourcing and the multiple supply tiers of conventional crystalline silicon solar manufacturing.

First Solar's US supply chain sets the benchmark for responsible sourcing. It is the only one of the world's 10 largest solar manufacturers to be a member of the Responsible Business Alliance (RBA), the world's largest industry coalition dedicated to supporting the rights and well-being of workers and communities in the global supply chain.

High-Value Recycling Services

First Solar has a unique and long-standing leadership position in PV recycling as the only solar manufacturer with global in-house PV recycling capabilities and experience operating high-value PV recycling facilities on a worldwide and industrial scale going back to 2007.

Our proven recycling process achieves high reuse rates of more than 90 percent of glass and allows for closed-loop semiconductor recovery for use in new modules.

First Solar is Your Proven Energy Partner.

Founded in 1999, First Solar is a leading American solar technology company and global provider of responsibly produced eco-efficient solar modules advancing the fight against climate change. First Solar is unique among the world's ten largest solar manufacturers for being the only US-headquartered company and for having no manufacturing footprint in China.

First Solar's Series 7 *TR1* thin film PV modules represent the next generation of solar technologies, providing a competitive, high-performance, lower-carbon alternative to conventional crystalline silicon PV panels.

Let's Connect

Contact us to see how First Solar Series 7 *TR1* modules can deliver more return on your energy investment.

firstsolar.com/S7 | modulesales@firstsolar.com

First Solar

LEADING THE WORLD'S
SUSTAINABLE ENERGY FUTURE