

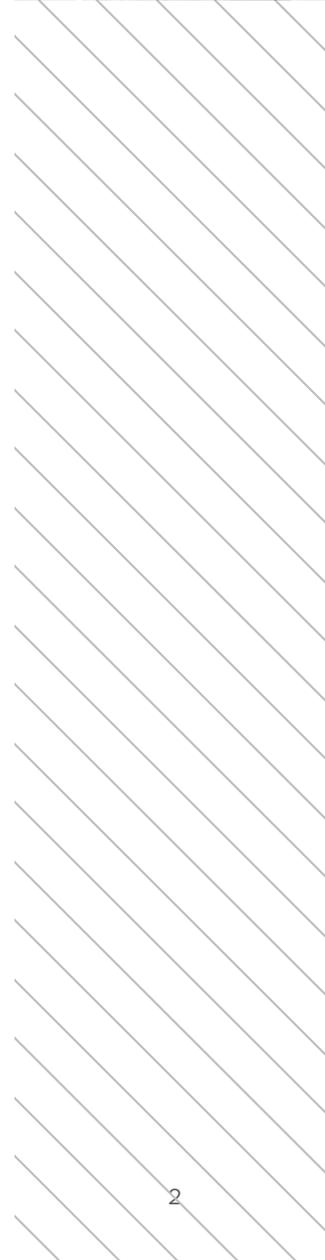
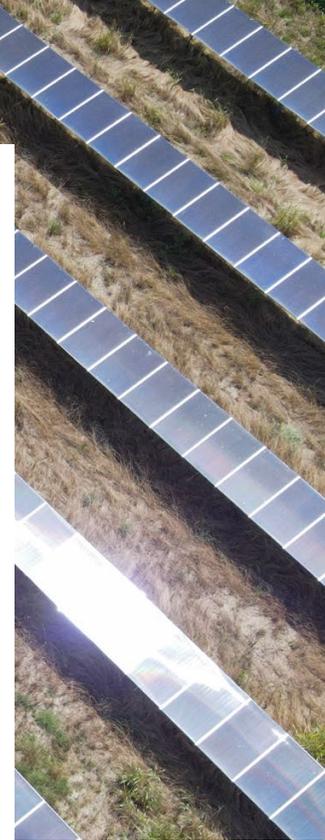
SUSTAINABILITY REPORT 2023.



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Note Regarding Forward-Looking Statements.

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All financial numbers in this report are based on U.S. Generally Accepted Accounting Principles. This report contains forward-looking statements within the meaning of the United States federal securities laws. These forward-looking statements are often characterized by the use of words such as “estimate,” “expect,” “anticipate,” “project,” “plan,” “intend,” “seek,” “believe,” “forecast,” “foresee,” “likely,” “may,” “should,” “goal,” “target,” “might,” “will,” “could,” “predict,” “continue” and the negative or plural of these words and other comparable terminology. Forward-looking statements are only predictions based on our current expectations and our projections about future events and therefore speak only as of the date of this report. You should not place undue reliance on these forward-looking statements. We undertake no obligation to update any of these forward-looking statements for any reason, whether as a result of new information, future developments or otherwise. These forward-looking statements involve known and unknown risks, uncertainties, and other factors that may cause our actual results, levels of activity, performance, or achievements to differ materially from those expressed or implied by these statements. These factors include, but are not limited to, the matters discussed under the captions “Risk Factors” and “Management’s Discussion and Analysis of Financial Condition and Results of Operations” of our most recent Annual Report on Form 10-K and our subsequently filed Quarterly Reports on Form 10-Q, as supplemented by our other filings with the Securities and Exchange Commission.

Message From the CEO.



MARK WIDMAR
Chief Executive Officer

The next decade will be critical in the fight against climate change.

Avoiding the most devastating impacts of climate change by limiting global temperatures to 1.5° Celsius will require changing the way we power our manufacturing facilities and consume natural resources. That is why we have developed a roadmap to reduce our absolute scope 1 and 2 greenhouse gas (GHG) emissions by 34% by 2028 and achieve Net-Zero emissions by 2050, relative to 2020.

Crucially, we also recognize that we cannot get to Net-Zero without a circular economy, and we continue to make progress on building circularity into our next-generation photovoltaic (PV) modules and manufacturing processes - from raw material sourcing to high-value recycling with closed loop semiconductor recovery.

Innovation drives every aspect of our business at First Solar, including our efforts to ensure that our products and facilities embody our commitment to sustainability and Responsible Solar.

For instance, our new Series 7 module is designed with sustainability in mind, featuring as much as 16% recycled content, including semiconductor materials, glass, steel, busbar, and ribbon. The module is our most eco-efficient product to date, featuring a carbon and water footprint nearly four times lower than conventional crystalline silicon modules manufactured in China and an energy payback time approximately five times faster. Furthermore, Series 7 modules take just two months to produce more energy than was required to create them, corresponding to a 180-fold energy return on investment (EROI) over a 30-year project lifetime.

We are also designing our new manufacturing facilities with sustainability in mind.

Our new facility in India, which will achieve commercial production in the second half of 2023, is in a region of high baseline water stress. To minimize its impact on local water resources, the facility has been designed to be a net-zero water withdrawal PV manufacturing facility, believed to be the world's first, and will rely entirely on tertiary treated reverse osmosis water from the city's sewage treatment plant and have zero wastewater discharge. Additionally, the factory will feature what is believed to be India's first high-value PV module recycling facility, the fifth of its kind to join our global recycling network.



While the solar industry continues to come under intense scrutiny due to the crystalline silicon supply chain's exposure to forced labor in Xinjiang, we have doubled down on our commitment to Responsible Solar, with a particular emphasis on zero tolerance for forced labor.

This included joining the Responsible Business Alliance (RBA) and commissioning its in-depth Validated Assessment Program (VAP) audits at our operational manufacturing facilities in the United States, Malaysia, and Vietnam.

We are already starting to see the results. While our manufacturing facilities in the United States and Vietnam achieved platinum status, the highest possible VAP rating, the audits also uncovered the fact that four service providers at our Malaysia facility fell short of our standards.

The audits found that the four onsite service providers in Malaysia employed foreign migrant workers who were subjected to unethical recruitment including the payment of recruitment fees in their home countries, passport retention,



and the unlawful retention of wages. As a result of the findings and our corrective actions, the service providers have since returned all passports and unlawfully retained wages to the workers, and we have updated our site service agreements to prevent any recurrence of the issue. Furthermore, after developing a reimbursement plan with a third party, we are now working with our onsite service providers to ensure the recruitment fees are reimbursed to their current and former employees.

We highlight this information openly, not only because of our commitment to transparency and Responsible Solar, but also to raise awareness of modern slavery risks that hide in plain sight and to illustrate the value of an independent third-party social audit conducted in a credible, comprehensive manner. The intent behind investing in these audits is not to rubber-stamp compliance with our policies but to identify and remedy existing and potential issues and ensure that we continuously improve on our commitment to Responsible Solar.

We have deliberately chosen a credible independent third-party audit program with a track record of being applied across various industries rather than endorsing initiatives often developed in a vacuum by trade associations purporting to represent the solar industry and supported by the very manufacturers reported as having ties to the persecution of Uyghurs in Xinjiang.

As pioneers of the solar industry, we are concerned that efforts to reinvent the wheel and lower the bar could undermine the industry's growth and its social license to operate. The fact is that symbolic pledges and self-defined and -governed 'protocols' and 'initiatives' lack real accountability. Furthermore, they have shown that they cannot withstand the scrutiny caused by legislation such as the Uyghur Forced Labor Prevention Act (UFLPA) and only serve to undermine our industry's reputation and credibility.

While the protocols developed by the solar industry trade associations may benefit certain manufacturers by allowing the bifurcation of supply chains and avoiding crucial aspects, such as credible onsite social audits and grievance mechanisms, working with the RBA gives First Solar access to a robust assessment methodology that can withstand the highest levels of scrutiny.

First Solar's 2023 Sustainability Report sets a new benchmark for the industry by including a new section detailing the VAP audits' findings and the corrective actions we have taken to remedy these. We encourage other solar manufacturers to follow suit.

The solar industry must hold itself to a higher standard. Quite simply, our industry's work to power the energy transition and enable the fight against climate change does not serve as credits to offset its social and human rights obligations.

Nor, for that matter, does it offset our environmental obligations, which is also something we have long understood. We are unwavering in our commitment to minimizing our environmental footprint. We proudly report that First Solar's GHG emissions-, energy-, water- and waste intensity per watt produced reduced substantially in 2022, building on previous years' successes.

At First Solar, sustainability, transparency, and Responsible Solar are not taglines. They represent our way of doing business. As a purpose-driven company, we are holding ourselves to a higher standard and proudly setting new benchmarks in the hope that by leading by example, others in the solar industry will follow. The solar industry will anchor the global transition to a sustainable energy future. We believe that it must do so responsibly.

Mark Widmar
Chief Executive Officer



2022 Highlights.

9.1 GW

Produced



↓ 11%

Lower GHG Emissions Intensity



vs. 2021

↓ 8%



Lower Manufacturing Energy Intensity

vs. 2021

↓ 28%

Lower Manufacturing Waste Intensity



vs. 2021



Lower Manufacturing Water Intensity

+ 4%

Women In Management
vs. 2021



1st

EPEAT-Rated PV Products



Prime

ISS ESG Rating



AA

MSCI ESG RATING



About First Solar.

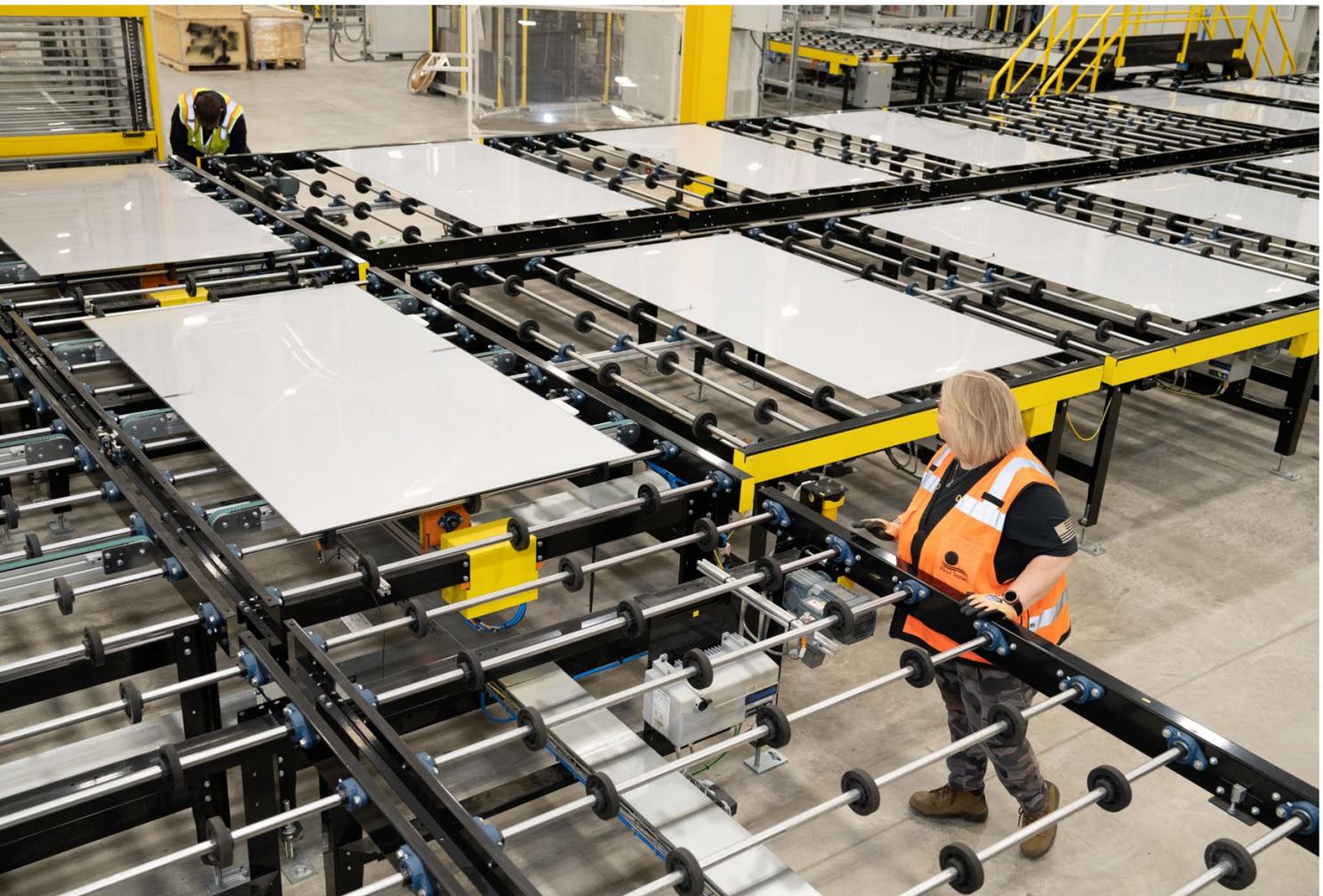
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First Solar is a leading American solar technology company and global provider of responsibly-produced eco-efficient solar modules advancing the fight against climate change.

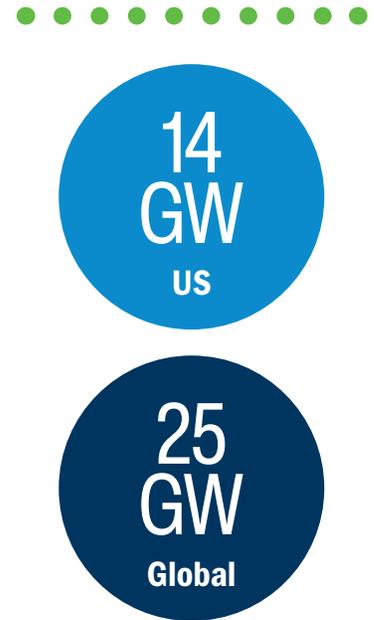


We are unique among the world's ten largest solar manufacturers for being the only US-headquartered company and for not using a crystalline silicon (c-Si) semiconductor. Developed at research and development (R&D) labs in California and Ohio, First Solar's advanced thin film photovoltaic (PV) modules represent the next generation of solar technologies, providing a competitive, high-performance, lower-carbon alternative to conventional c-Si PV panels. 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.



First Solar is headquartered in Tempe, Arizona, with regional offices around the world and manufacturing facilities in Perrysburg and Lake Township, Ohio; Kulim, Malaysia; and Ho Chi Minh City, Vietnam. Our annual manufacturing capacity has grown from 15 megawatts (MW) in 2002 to 9.8 gigawatts (GW) as of December 31, 2022. We are in the process of expanding our manufacturing capacity to reach approximately 25 GW DC globally in 2026. Our third manufacturing facility in the United States commenced commercial production of modules in early 2023 and our first manufacturing facility in India is expected to commence operations in the second half of 2023. In 2022, we announced a 0.9 GW increase in nameplate capacity at our Ohio factories and a new 3.5 GW Series 7 factory in Alabama which is expected to be operational in 2025. In July 2023, we announced our intention to build a fifth manufacturing facility in Louisiana. First Solar already operates the Western Hemisphere’s largest solar manufacturing footprint and the planned fully vertically integrated facility is expected to grow the company’s US nameplate manufacturing capacity by 3.5 GW to reach approximately 14 GW in 2026. Over the past year and including this announcement, First Solar has committed to over \$2.8 billion in capital investment and 7.9 GW of additional manufacturing capacity in the US. With more than 50 GW DC of modules shipped worldwide, we have a demonstrated history of manufacturing success and innovation.

Nameplate Capacity in 2026



Responsible Solar

At First Solar, we have long understood that we have a responsibility towards our planet, our communities, and our customers. This responsibility drives our sense of purpose — “the why” that inspires every one of our thousands of associates (our term for full and part-time employees) worldwide who have committed themselves to our journey to lead the world’s sustainable energy future.

Our commitment to ‘Responsible Solar’ is underpinned by the belief that solar should never come at the price of people or the planet and drives our company’s environmental, social, governance (ESG) strategy and differentiation.

Environmental



- Lowest environmental footprint in the industry
- Resource-efficient and RE100-committed operations
- Industry leading high-value PV recycling services

Social

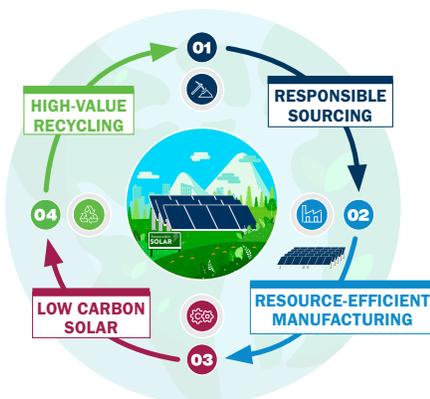


- Promote a safe, inclusive and diverse workplace
- Engage in local communities and contribute to a just transition
- Responsible sourcing with zero tolerance for forced labor

Governance



- ESG oversight at Board level
- Transparent reporting and disclosure
- EPEAT Silver Rated
- Member of the Responsible Business Alliance (RBA)



Our approach to Responsible Solar is interwoven into every aspect of our business and product life cycle- from raw material sourcing and manufacturing to end-of-life recycling.

- Operating a responsible supply chain with zero tolerance for forced labor
- Manufacturing using less energy, water and semiconductor material
- Enabling faster decarbonization through lower embodied carbon
- Maximizing resource recovery to enhance circularity

Ensuring a just and sustainable clean energy transition ●

Embedding Circularity to Get to Net-Zero.





Material Sourcing: Transforming Waste into Resource

Circularity is embedded from the very beginning of our product's life cycle. Our semiconductor material is sourced from byproducts of the zinc and copper industries, providing a sustainable use for materials that would otherwise be disposed of. Cadmium (Cd), a waste byproduct of zinc refining, is generated regardless of its use in PV. Combining cadmium with tellurium (Te), a byproduct of copper refining, transforms it into a stable CadTel (CdTe) compound and a leading eco-efficient PV technology.

CadTel PV is a uniquely American solar technology, first developed in R&D labs in Ohio and California. From its inception, thin film CadTel PV technology demonstrated a number of qualities that led First Solar to select it over conventional technologies, like crystalline silicon, including a lower manufacturing cost profile, superior scalability and a higher theoretical efficiency limit.

CdTe PV offers numerous other benefits to our customers, society and the environment:

- **Higher lifetime energy yield:** superior degradation rate, less sensitive to shaded conditions, up to 4% more annual energy in hot climates and up to an additional 4% more annual energy in high humidity conditions.
- **Supply chain and energy security advantages:** Not dependent on crystalline silicon wafers controlled by China, no module components sourced from Xinjiang or suppliers connected to entities on the Uyghur Forced Labor Prevention Act (UFLPA) entity list, vertically integrated manufacturing process enables rapid scaling in just 18 months.
- **Superior environmental profile:** lowest carbon and water footprint, fastest energy payback time, designed for high-value recycling and closed loop semiconductor recovery.

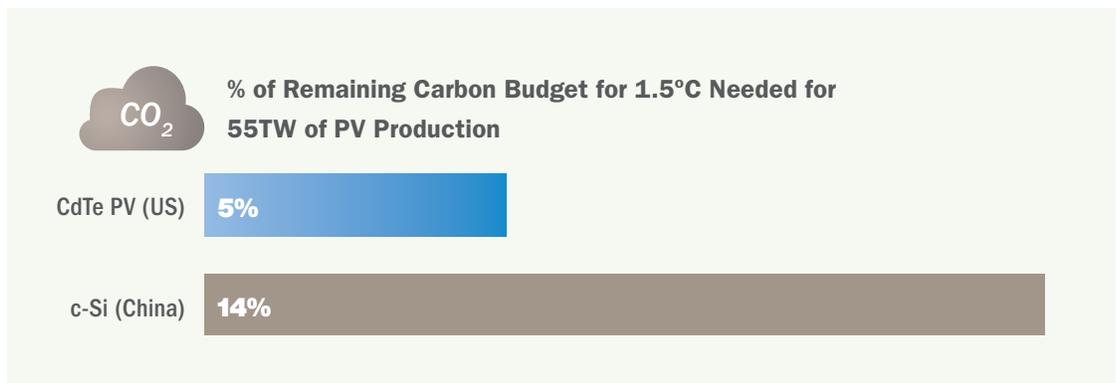




Roadmap to Net-Zero: Ultra Low-Carbon Solar

Climate change poses one of society’s greatest challenges. The next decade will critically define how climate change will evolve over the next century. The Intergovernmental Panel on Climate Change (IPCC) warns that global temperatures must be limited to 1.5 degrees Celsius above preindustrial levels to avoid the worst impacts of climate change. In the context of the fight against climate change, all PV technologies are not created equal. Where and how a PV module and its components are manufactured significantly impacts its environmental profile and determines how many greenhouse gas emissions they will be able to avoid and displace.

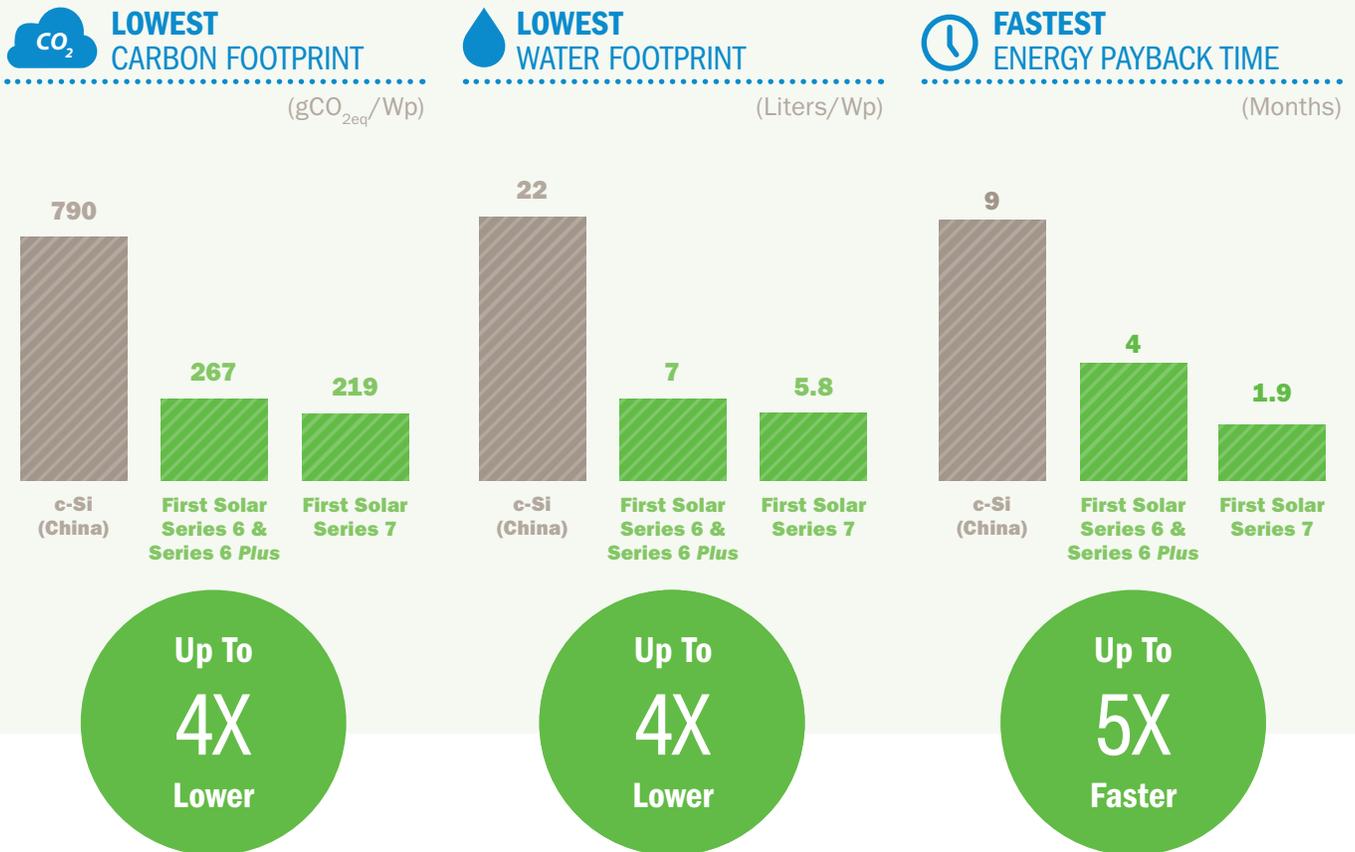
According to a [2022 study by the National Renewable Energy Laboratory](#) (NREL), CdTe PV modules manufactured in the U.S. have a carbon footprint that is more than 2.5X lower than crystalline silicon modules manufactured in China, which translates into a value of \$0.04-\$0.08 per Watt, assuming a carbon cost of \$50-\$100 per metric ton of CO₂. Relying on crystalline silicon modules produced in coal-intensive grids could consume as much as 14% of the remaining carbon budget for a 1.5°C world, resulting in 68 billion metric tons of CO₂. For perspective, the world emits approximately 50 billion metric tons of CO₂ per year.



First Solar’s advanced thin film modules are manufactured in a high-throughput, automated environment that integrates all manufacturing steps into a continuous flow operation, using less energy, water and semiconductor material than conventional crystalline silicon PV manufacturing. In less than 4.5 hours, a sheet of glass is transformed into a complete PV module — flash tested, packaged and ready for shipment. We own and operate the facilities that manufacture our modules under one roof. This not only results in a quality product with a lower carbon footprint and superior traceability but it ensures our products are manufactured to the highest labor, environmental, health and safety standards.



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 module has an even lower environmental footprint- with a carbon and water footprint that is nearly 4X lower than conventional crystalline silicon modules manufactured in China and an energy payback time that is approximately 5X faster. In just two months under high irradiation conditions, First Solar Series 7 PV modules produce more energy than was required to create them. This corresponds to a 180-fold energy return on investment (EROI) over a 30-year project lifetime, providing an abundant net energy gain to the electricity grid.



1. Crystalline silicon data: R. Frischknecht, [Environmental Life Cycle Assessment of Electricity from PV systems \(2022 Update\)](#). International Energy Agency (IEA) PVPS Task 12, 2022.

2. First Solar data: [NEPD-2993-1671-EN Series 6 Photovoltaic Module](#); Sinha et al., Net Zero Water Strategies and Impacts for PV Manufacturing, IEEE Journal of Photovoltaics, 2023.

Since 2002 and through 2022, we have sold approximately 50 GW of PV solar modules and have an additional backlog of approximately 77.8 GW as of the end of July 2023. Assuming average worldwide irradiance and grid electricity emissions, our products will be used to displace 83 million metric tons of CO₂eq per year during their 30+ year product life. This is equivalent to powering more than 66 million average homes, planting 1.4 billion trees and saving over 225 billion liters of water (or 96,000 Olympic swimming pools) per year based on worldwide averages. Every year, 50GW of First Solar products are displacing 32 million metric tons of CO₂eq, which is approximately 10 times the amount of greenhouse gas emissions we emit through our global operations and supply chain. Assuming worldwide average irradiance and grid electricity emissions, we estimate that the 9.1GWdc of products produced in 2022 alone are being used to displace 5.8 million metric tons CO₂e per year, or 174 million metric tons of CO₂eq over their 30+ year product life.



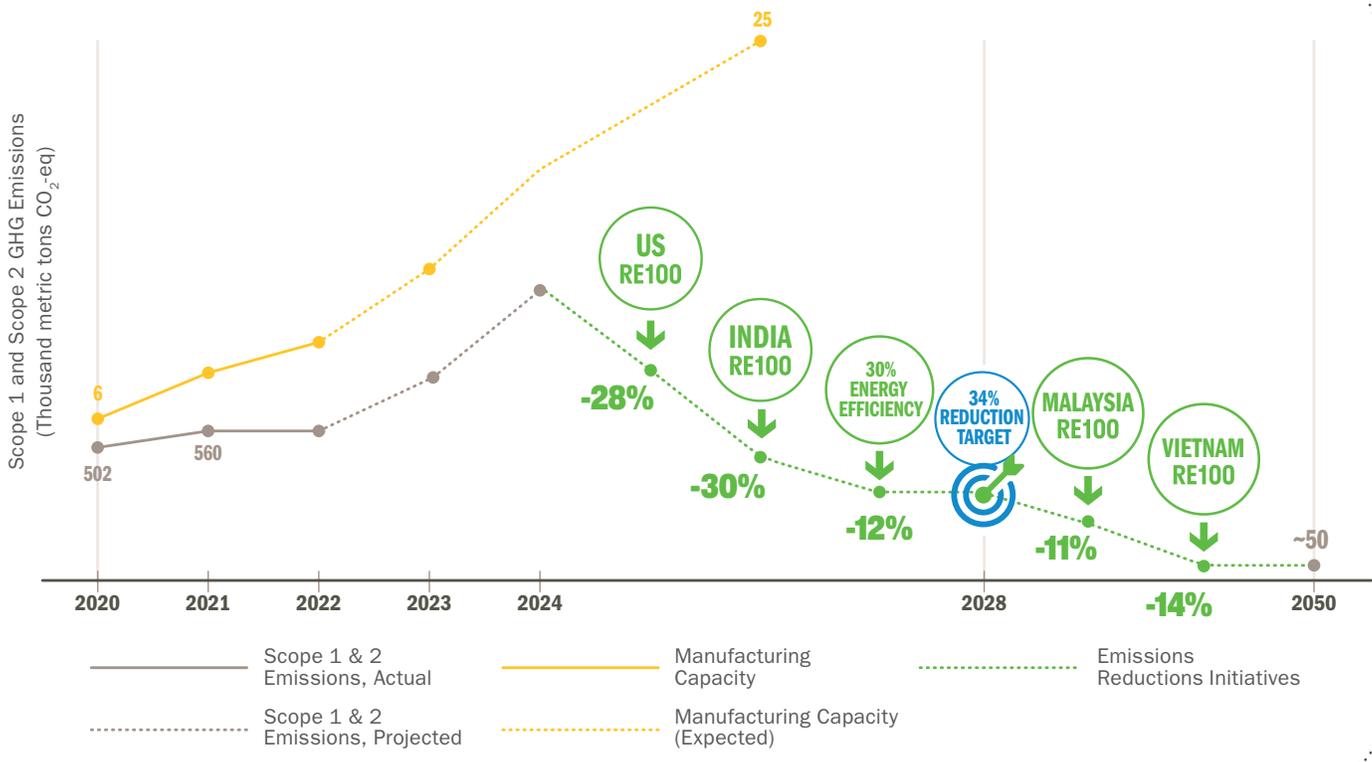
83M CO₂eq displaced is equivalent to:



In addition to manufacturing PV modules with the lowest environmental footprint in the industry, we are committed to reducing our operational impact. We have set science-based targets to reduce our absolute scope 1 and scope 2 greenhouse gas (GHG) emissions by 34% by 2028 and achieve Net-Zero GHG emissions by 2050, relative to 2020. Our near-term science-based emissions reduction target and net-zero target are in line with limiting the global temperature rise to 1.5 degrees Celsius above pre-industrial levels and have been approved by the Science Based Targets initiative (SBTi).



Path to Net Zero



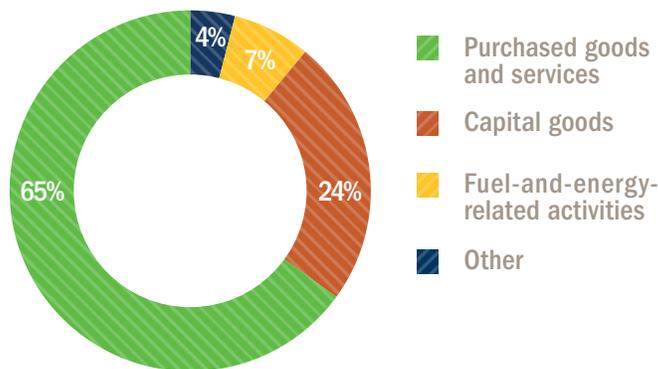
In 2020, we joined RE100 and set an ambitious target to achieve 100% renewable energy across our global operations by 2028. Since 2020, we have approximately doubled our manufacturing capacity, resulting in an increase in our absolute GHG emissions. With the addition of new manufacturing plants in India and the United States, we expect our global manufacturing capacity to more than triple through 2026, compared to 2020.

Although we have identified onsite and offsite solar opportunities that could power our Malaysian operations with up to 38% renewable electricity, achieving the 100% renewable energy goal in Malaysia and Vietnam by 2028 will remain a challenge due to the lack of offsite renewable energy options. While we remain committed to our global renewable energy goals and continue to work on enabling the offsite renewable energy market in Malaysia and Vietnam, we also continue to explore ways to achieve our near-term science-based target. One pathway to achieve the 34% absolute emissions reduction target is by powering our operations in the U.S. and India with 100% renewable energy, and by identifying and implementing solutions to increase our energy efficiency by 30%. This is illustrated in our net-zero roadmap. In the long-term, we aim to reduce our scope 1 and scope 2 emissions by 95% by increasing our energy efficiency by 30% and going 100% renewable across our global operations. The residual 5% scope 1 emissions can be neutralized with high quality carbon offsets to get to net-zero, in accordance with the SBTi's Net-Zero Standards.

As part of our renewable energy strategy, we are investigating opportunities to procure offsite solar electricity, install PV rooftop and carport arrays, and purchase bundled renewable energy credits (RECs). We are installing a 300kW PV carport array, which is expected to begin operating in 2023 at our second manufacturing facility in Ohio. We have installed onsite PV installations at our production sites in Ohio and Malaysia and at our recycling facility in Frankfurt Oder, Germany.

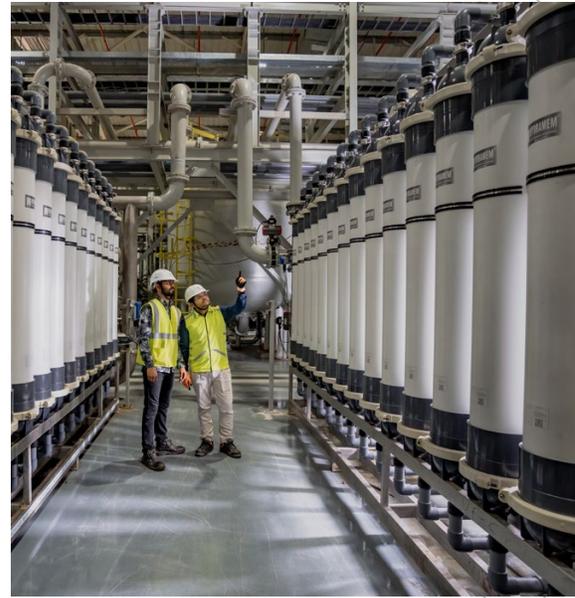
In 2022, we set a target to reduce our scope 3 GHG emissions intensity from purchased goods and services by 45% per MW produced by 2028, relative to 2020. By 2050, we aim to reduce our scope 3 GHG emissions from purchased goods and services, capital goods, and fuel- and energy-related activities by 97% per MW produced, relative to 2020. In 2022, purchased goods and services, capital goods, and upstream fuel- and energy-related activities accounted for more than 95% of our scope 3 emissions. We aim to achieve our science-based net-zero target by increasing the recycled content of our glass and aluminum materials, switching to lower carbon materials such as steel, leveraging our suppliers' science based targets and executing on our RE100 targets. Scope 3 emissions from capital goods will decrease as our manufacturing capacity growth stabilizes in the long-term. Implementing our near-term scope 1, 2 and 3 targets will enable us to reduce the carbon footprint of our ultra-low carbon solar panels by up to ~70% by 2028 relative to 2020.

2022 Scope 3 Emissions

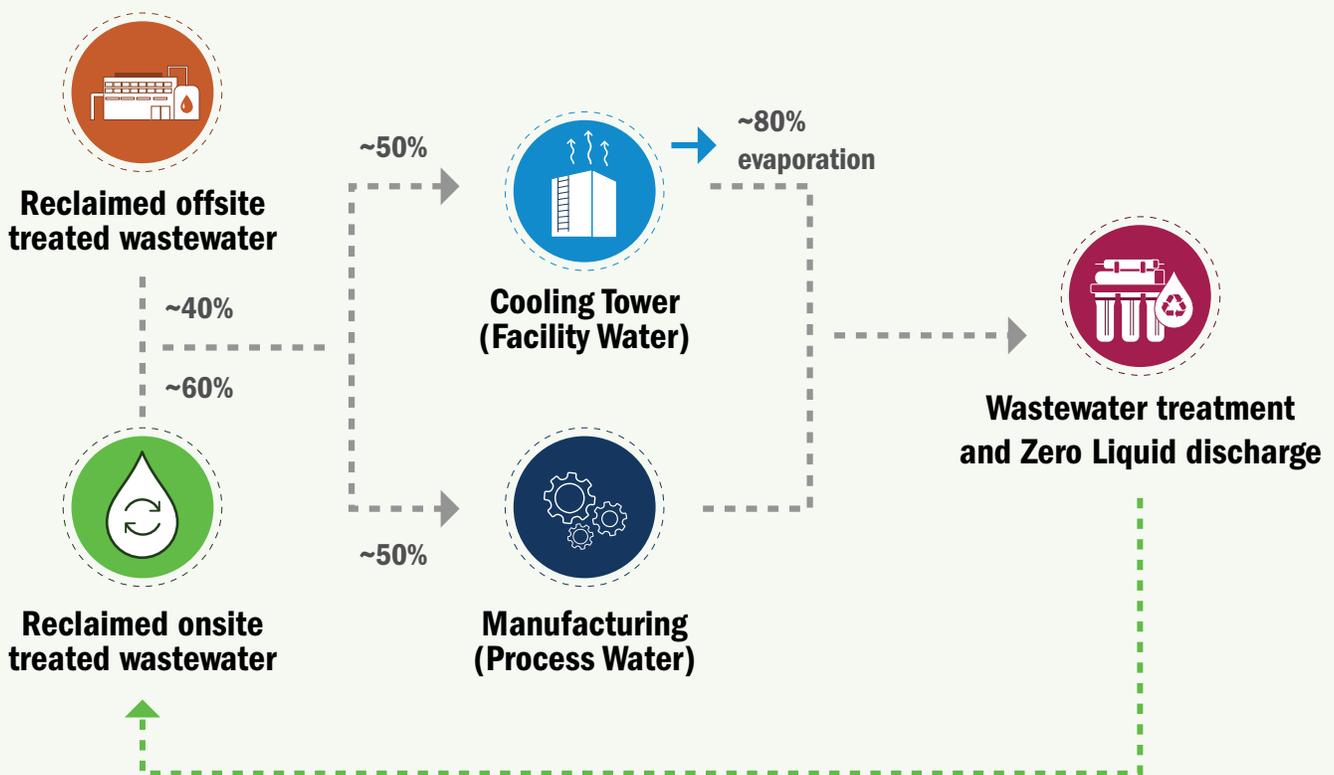


Net-Zero Water Withdrawal Manufacturing in India

According to the World Resources Institute, one in four people globally face extremely high water stress. Although our PV manufacturing facilities in the U.S., Malaysia and Vietnam operate in areas with low to very low baseline water stress, our first manufacturing facility near Chennai in Tamil Nadu, India which will become operational in 2023, faces high baseline water stress. To minimize impacts on local water resources, we are designing a net-zero water withdrawal PV manufacturing facility that will rely entirely on tertiary treated reverse osmosis water from the city's sewage treatment plant and have zero wastewater discharge. Instead of being discharged, the wastewater will be treated onsite and converted into freshwater so it can be reused in our operations. In addition to maximizing alternative water usage, i.e. water that is not derived from fresh surface water or ground water sources, we are also driving continuous improvement in water conservation through internal monitoring, benchmarking, and optimization of our process tool designs.



Net-Zero Water Withdrawal Design





Design for Sustainability

We are continuously working to drive down the environmental footprint of our modules. We aim to reduce the carbon footprint of our ultra-low carbon solar panels by more than 65% by 2028 by going 100% renewable and engaging with key suppliers to minimize the embodied carbon of our module components. By using lower-carbon materials and enhancing our resource-efficient manufacturing process, our Series 7 module’s carbon footprint is 18% lower than our Series 6 module and nearly 30% lower than our Series 4 module. Our Series 7 modules are also made of 16% recycled content.

Component	% Recycled Content
Semiconductor (CdTe)	7%
Glass	13%
Frame material (galvanized steel)	30%
Transparent conductive material	0%
Metal plates and contacts (busbar)	15%
Ribbon	60%
Solder	n/a
Encapsulant	0%
Total Series 7 PV module recycled content	16%

As of December 31, 2022, First Solar Series 6 and Series 6 *Plus* modules are the first and only PV products to be included in the [EPEAT registry for sustainable electronics](#). EPEAT is a globally recognized and independently validated ecolabel that allows for the easy identification of environmentally preferable products from socially responsible companies. EPEAT addresses the full product life cycle, including managing substances in the product, manufacturing energy and water use, product packaging, end-of-life recycling, corporate responsibility and human rights. Our Series 6 and Series 6 *Plus* products were awarded an EPEAT Silver rating, certifying that they exceeded the basic but stringent environmental and social criteria of a Bronze rating. We are currently working towards meeting the new Ultra Low-Carbon Solar Criteria and plan to register our Series 7 modules in EPEAT in 2023.



In addition to being designed for sustainability, First Solar modules are designed for safety. Our technology’s safety track record is based on the use of stable materials and thorough testing. First Solar modules have a durable glass-glass construction and undergo rigorous reliability and durability testing beyond national and international UL and IEC requirements. Our PV modules consistently rank as “Top Performer” in PVEL’s reliability scorecard which evaluates long-term durability and performance. Our modules are tested for safety during breakage, fire and hailstorms to ensure their durability in the field and are the only module in the industry warranted against cell cracking and micro-cracking, which can be caused by excessive mechanical stress.



First Solar’s Quality and Reliability labs are over 94,000 ft² (8,800 m²) in size globally and test approximately 20,000 PV modules per year for light-induced degradation, resilience to extreme weather, wind, snow and ice loads, fire resistance under reverse current fault conditions, material adhesion, and long-term field performance.



[More than 50 researchers from leading international institutions](#) have confirmed the environmental benefits and safety of First Solar’s thin film PV technology over its entire life cycle; during normal operation, foreseeable accidents such as fire or breakage, and through end-of-life recycling and disposal. With more than 50GW sold worldwide, First Solar modules have a proven record of safe and reliable performance.

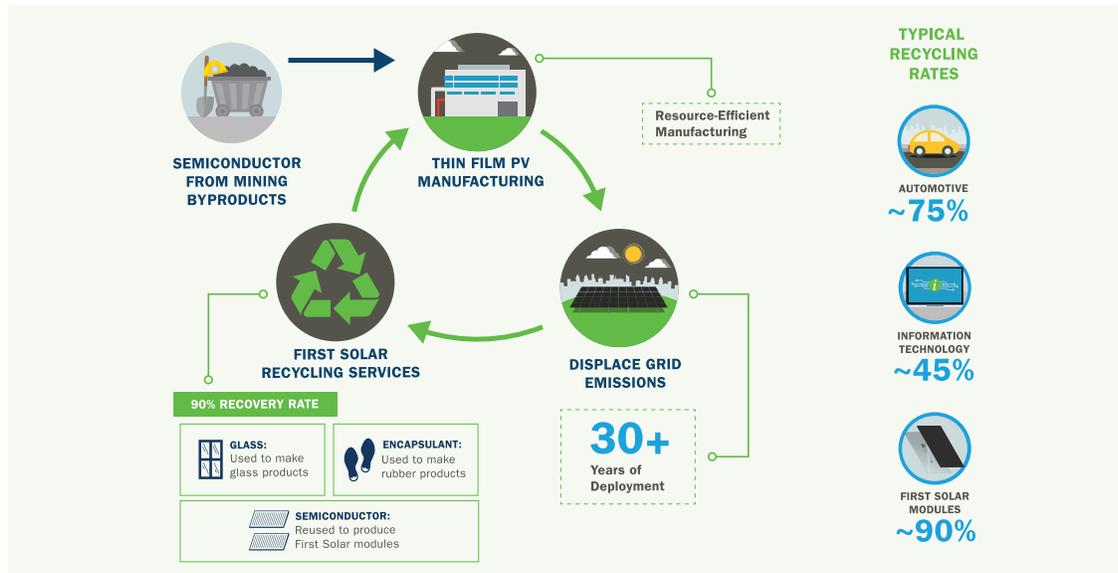
First Solar implements a robust change management system (CMS) to ensure product changes do not negatively impact product safety, reliability, environmental footprint or recyclability. Process changes and module design improvements undergo several test and validation runs before receiving final approval and being implemented across manufacturing facilities. Life cycle analysis is performed for significant product and manufacturing process modifications to assess environmental, health and safety impacts before any changes are implemented. First Solar Series 6, Series 6 *Plus* and Series 7 PV modules consist of four articles: glass module, junction box, cable, and frame/rail. These articles do not contain substances on the Candidate List of Substances of Very High Concern (SVHC) as defined by EU REACH regulation (revision date: June 10, 2022) above 0.1% by weight per article.



Closing the Loop

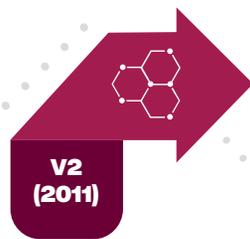
Once solar modules reach the end of their useful life, high-value recycling helps recover materials so they can re-enter the solar supply chain to enable sustainable growth. First Solar modules are designed for high-value recycling to maximize material recovery at end-of-life and recover more than 90% of module materials for reuse, providing high quality secondary resources for new solar panels, glass, rubber and aluminum products.

The Value Loop



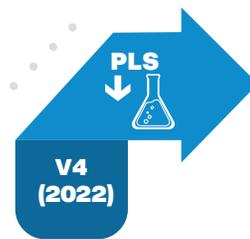
First Solar has a unique and long-standing leadership position in PV recycling, having established the industry’s first global recycling program in 2005 and recycled over 300,000 metric tons of PV modules to date- **more than any other PV recycler or PV recycling scheme**. We currently operate high-value PV recycling facilities in Vietnam, Malaysia, Germany and the U.S. (Ohio). We will add additional recycling facilities at our manufacturing plants that are under construction in India and the US, as part of our standard site replication process. For more than 15 years, we have been investing in PV recycling technology improvements to increase recycling efficiency and drive down recycling prices for our customers. To learn more about First Solar’s global recycling services, please see our [recycling brochure](#).

Batch process based on mining industry



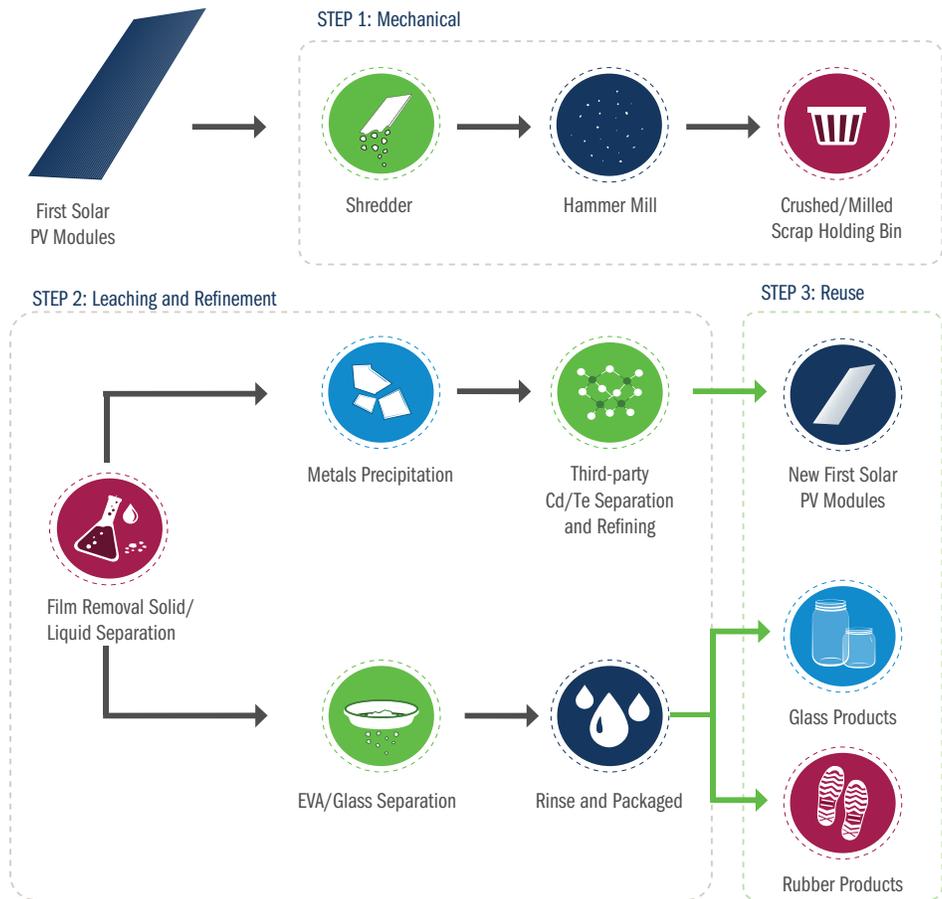
Batch process based on chemical industry

Continuous process with 30% less capital, chemicals and waste



Higher leaching efficiency with reduced chemical consumption

First Solar Module Recycling Process Overview



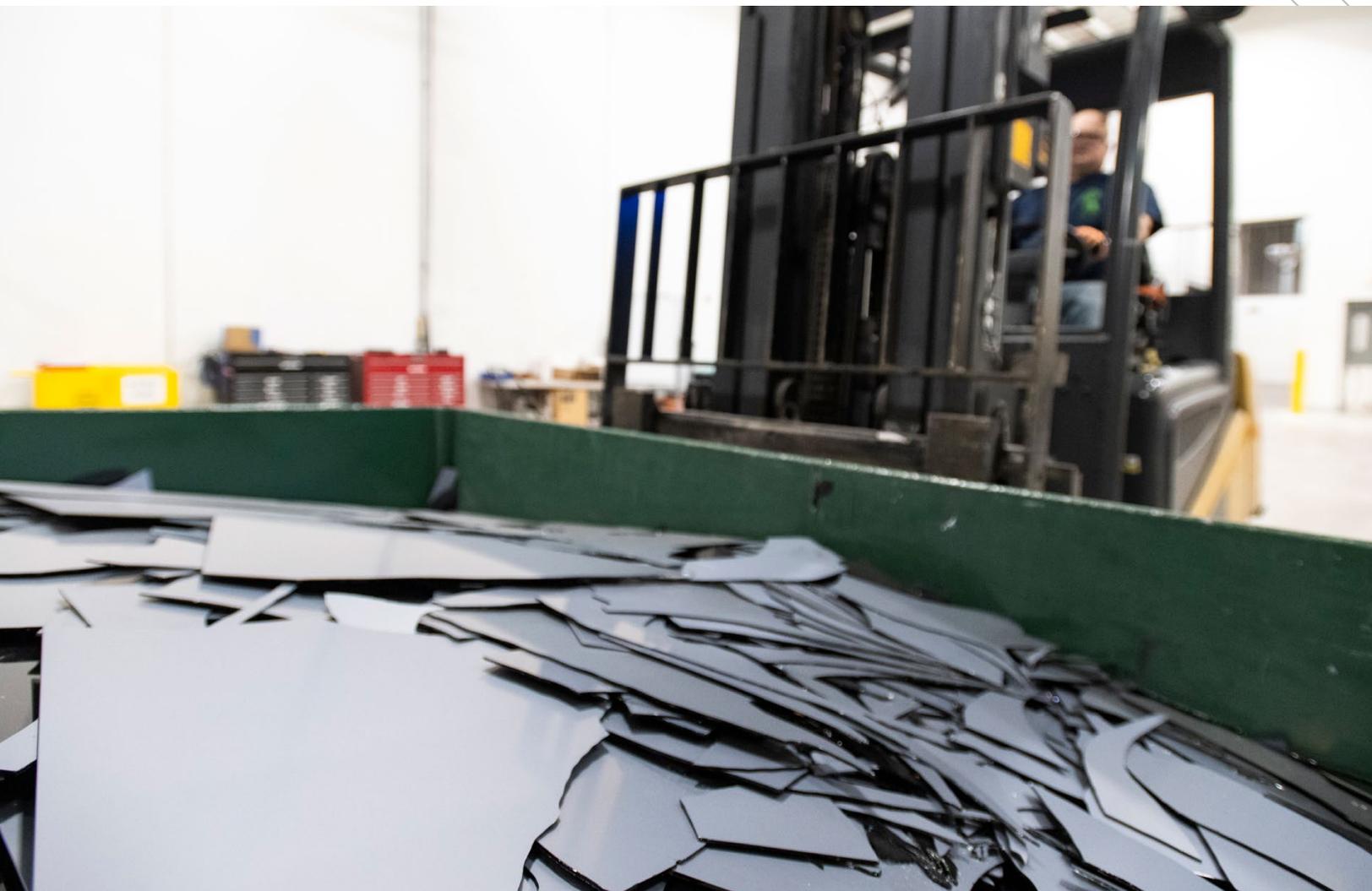
While most PV recycling processes focus only on recovering high-mass fraction materials such as glass and frames (i.e. bulk recycling), First Solar’s high-value recycling process goes further by recovering more than 90% of the semiconductor material for reuse in new First Solar modules and 90% of the glass for use in new glass container products. The module frame is removed and recycled for reuse in aluminum products. In Malaysia, the recovered laminate material is reused in rubber products. The remainder of the recycled module scrap (approximately 5 -10%) consists of glass fines which cannot be used in secondary raw materials and are handled using other responsible waste treatment techniques. Due to the shredding and crushing involved in the recycling process, material losses are inevitable, and the recovery ratio is always less than 100%.



Did You Know?

One kilogram of First Solar’s semiconductor material can be recycled 41 times over, which translates into a use time of more than 1,200 years.

First Solar modules do not have unique end-of-life management requirements as highlighted by a [study](#) by the International Energy Agency PV Power Systems Programme. High-value recycling is important for all PV technologies to reduce the embodied carbon of solar modules, bolster domestic supply chains, and enable the industry to scale sustainably. First Solar is [partnering with the REMADE Institute on high-value recycling R&D projects](#) to develop high-value recycling technologies for crystalline silicon modules and to help close the loop on glass and aluminum. Our ultimate goal is to be able to feed all our recycled materials back into the solar supply chain like we already do with our semiconductor material. First Solar is among 380 companies to sign the [America Recycles pledge](#), which aims to address the challenges facing the nation's recycling system and create a more resilient materials economy while protecting the environment.



Environmental Metrics & Targets.

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Environmental Metrics and Targets



ENERGY



Targets

- Power global operations with 100% renewable energy by 2028 and 100% of our U.S. operations by 2026
- Achieve 74% reduction in global energy usage per watt produced by 2028, from a 2009 baseline (or 30% relative to 2020)



EMISSIONS



Targets

- Reduce absolute scope 1 and scope 2 GHG emissions by 34% by 2028 and 95% by 2050, from a 2020 baseline
- Reduce Scope 3 GHG emissions from purchased goods and services by 45% per MW by 2028
- Reduce Scope 3 GHG emissions from purchased goods and services, capital goods, and fuel- and energy-related activities by 97% per MW produced by 2050, relative to 2020
- Achieve net-zero GHG emissions by 2050, relative to 2020



WASTE



Targets

- Achieve >90% waste diversion from landfills globally by 2028
- Maintain >90% PV recycling material recovery rate



WATER



Targets

- Achieve 87% reduction in global water usage per watt produced by 2028, from a 2009 baseline

Measuring Progress

Since 2009, we've successfully reduced our greenhouse gas (GHG) emissions, energy, water and waste intensity per watt produced by implementing resource conservation and low carbon projects at our facilities and through improvements in module efficiency, manufacturing throughput, manufacturing yield and capacity utilization.

In 2022, we produced 9.1 GWDC of solar modules, which represented a 15% increase compared to 2021. The increase in production was primarily driven by higher throughput at our manufacturing facilities. We expect to produce between 11.5 GWDC and 12.2 GWDC of solar modules during 2023. The increase in our production capacity and throughput, along with the implementation of resource conservation measures, helped significantly reduce our GHG emissions-, energy-, water-, and waste intensity in 2022.

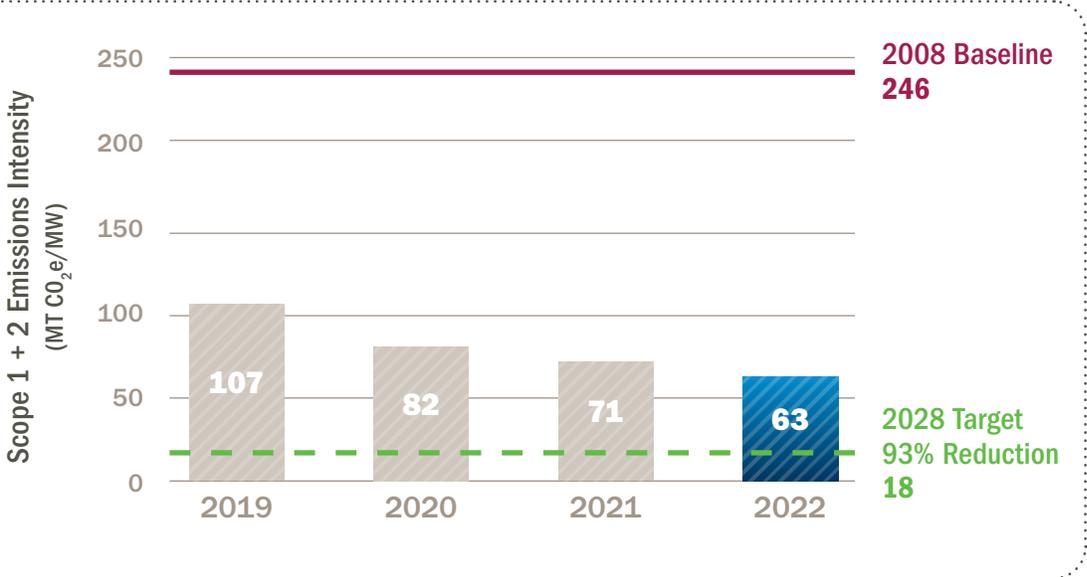
All operating First Solar manufacturing sites are certified to globally recognized standards: [ISO 14001 for Environmental Management, ISO 9001 for Quality Management, and ISO 45001 for Occupational Health and Safety](#). We foster a culture where environmental, health and safety (EHS) is an integral part of our associates' work and require our contractors and suppliers to adhere to our standards and commitments. Since 2022, First Solar's annual bonus plan includes a metric that encourages Good Catch reporting to record any unsafe behaviors, conditions, or opportunities for safety improvement. [First Solar's Environmental, Health and Safety Policy is available on our website](#). The policy is communicated to all associates through internal communication channels, associate meetings and notice boards throughout the facilities.

We have received global recognition for our state-of-the-art environmental controls, performance and manufacturing excellence. Our facilities in Perrysburg and Lake Township have received the Ohio EPA's Encouraging Environmental Excellence Platinum Level Award in recognition of the company's accomplishments in waste reduction, community engagement and eco-efficient manufacturing. In 2021, First Solar Vietnam won third place in the Ho Chi Minh City (HCMC) Environment Award, which recognizes individuals, organizations and communities who contribute significantly to environmental protection. In 2020, First Solar Malaysia received the prestigious State Environmental Excellence Award from the Kedah Department of Environment in recognition of our leadership and continuous efforts to demonstrate full environmental compliance in our manufacturing operations. First Solar's Santa Clara office Green Business Program certification for efforts to ensure that our business operates in an environmentally friendly manner.



GREENHOUSE GAS EMISSIONS INTENSITY GOAL

First Solar is committed to driving down our carbon footprint even as we continue to increase our manufacturing capacity and module throughput. In line with our absolute GHG emissions reduction goals, we have set a GHG emissions intensity goal to reduce scope 1 and scope 2 GHG emissions per watt produced by 93% by 2028, from a 2008 baseline. Since 2008, our company-wide carbon intensity decreased by approximately 74% as a result of increased module efficiency, manufacturing throughput and capacity utilization, along with energy conservation and low carbon initiatives. In 2022, our GHG emissions intensity decreased by 11% primarily due to the greater throughput and enhanced energy efficiency of our Series 6 manufacturing process. In 2022, our energy conservation projects in Malaysia and Vietnam resulted in annual savings of 2,254 metrics tons of CO₂.



The chart depicts direct (scope 1) and indirect (scope 2) emissions of all manufacturing and recycling plants, R&D and testing facilities, EPC-owned construction equipment, company-owned operational solar projects, and company-owned vehicle fleet on a carbon intensity basis measured per MW produced.

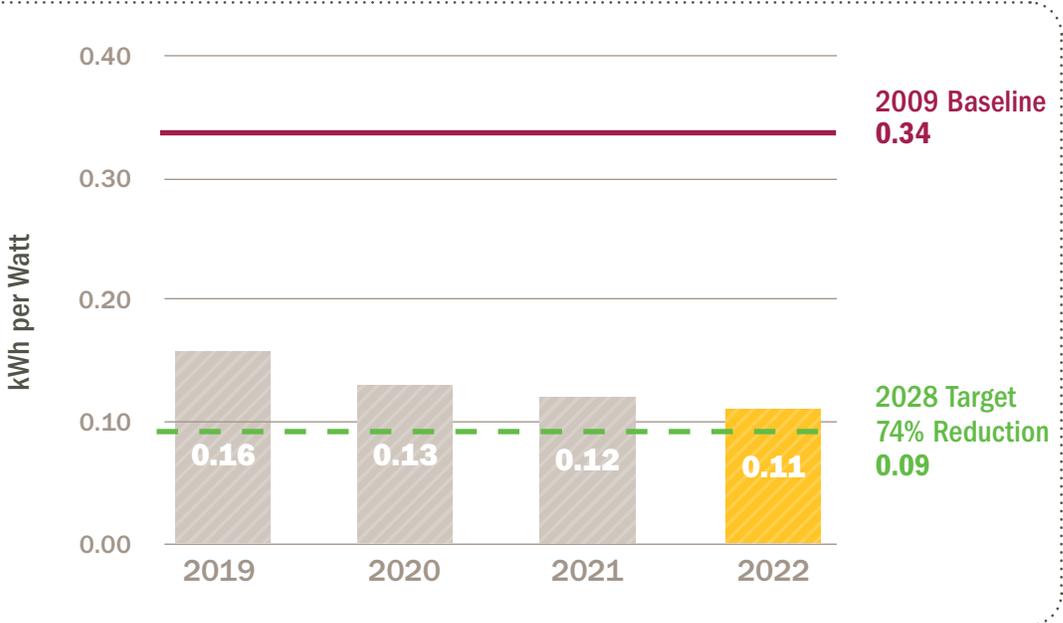




MANUFACTURING ENERGY INTENSITY

In 2022, our manufacturing energy intensity (energy consumption per watt produced) decreased by approximately 8% compared to 2021 primarily due to the greater throughput and enhanced energy efficiency of our Series 6 manufacturing process. In 2021, we set a target to improve global energy efficiency per watt produced by 74% by 2028, from a 2009 baseline (or by 30% relative to 2020). We are halfway towards meeting our 2028 energy efficiency target.

First Solar’s manufacturing energy intensity includes total energy (electricity and fuel) consumed by global manufacturing operations on a per watt produced basis and includes all processes, from the beginning of our manufacturing process to finished module. Increased manufacturing throughput combined with module efficiency improvements and energy conservation initiatives have enabled us to cut our manufacturing energy intensity per watt by more than 65% since 2009. In 2022, our energy conservation projects in Malaysia and Vietnam resulted in annual savings of 3,405 MWh.



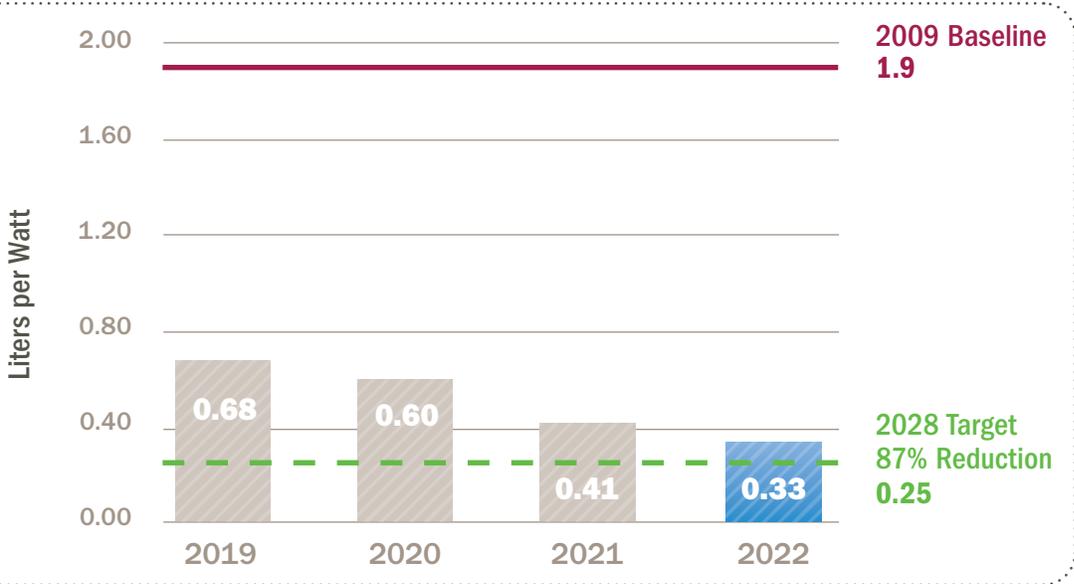


MANUFACTURING WATER INTENSITY

Since 2009, First Solar’s manufacturing water intensity (water consumption per watt produced) decreased by approximately 83% due to significant improvements in module efficiency, manufacturing throughput, and the implementation of water conservation and recycling projects in our manufacturing and recycling operations. In 2021, we set a new water intensity target of 0.25 liters per watt by 2028, which is equivalent to an 87% reduction compared to our 2009 baseline.

While our production increased by nearly 15% in 2022, our absolute water withdrawals decreased by approximately 7% and our manufacturing water intensity decreased by approximately 20% due to the increased throughput and efficiency of our Series 6 manufacturing process as well as water recycling initiatives. In total, we recycled more than 169 million liters of water in 2022, equivalent to approximately 5% of our absolute water use. We continue to review water consumption patterns down to the unit-operation level in our manufacturing process and are challenging our process engineers to deliver additional water savings.

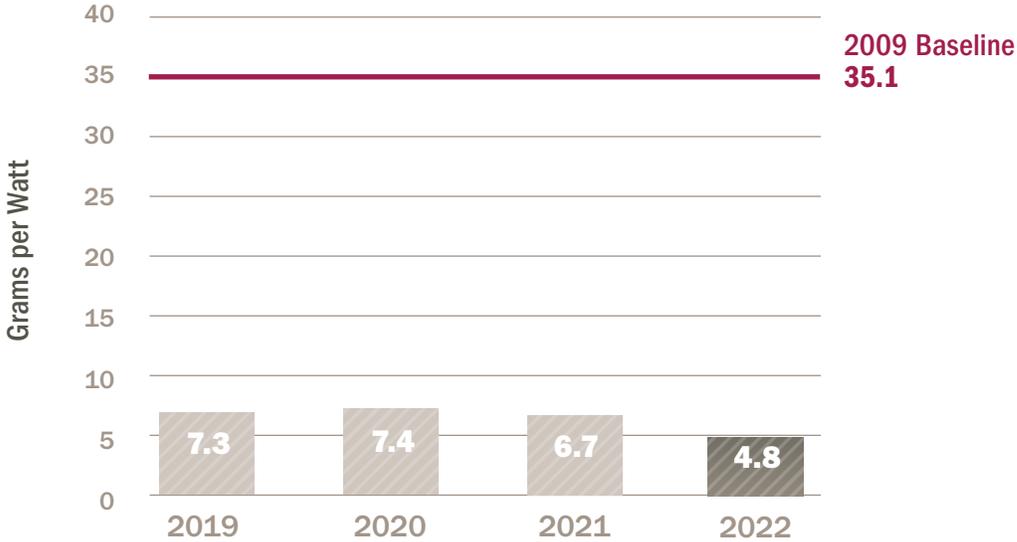
We monitor and measure 100% of the water discharges from our manufacturing, recycling, and research and development facilities. First Solar recycling plants are designed to generate zero wastewater discharge. In 2022, approximately 44% (or 1,373 megaliters) of First Solar’s total water withdrawn from water utilities (3,149 megaliters) was discharged as wastewater from our industrial wastewater treatment systems. Approximately 69% of our wastewater was sent to a third-party (municipal wastewater facility) and approximately 31% was discharged directly to fresh surface water (river). First Solar treats wastewater at our manufacturing and recycling facilities using a batch discharge system. Once treated, the water is collected in holding tanks, which are sampled and tested to confirm compliance with regulatory limits before being discharged. No industrial wastewater leaves our site unless we have tested and approved it for discharge, even if it is being discharged to a municipal wastewater treatment plant. If the water contaminant levels are above the permitted discharge limit, the wastewater is sent for re-treatment internally.





MANUFACTURING WASTE INTENSITY

First Solar’s manufacturing waste generation intensity (grams per watt produced) has decreased by 86% since 2009 as a result of increased module and manufacturing efficiency combined with recycling and waste minimization projects. In 2022, our manufacturing waste intensity decreased by approximately 28% primarily due to increased throughput, manufacturing yield improvements and less waste generated per watt produced.





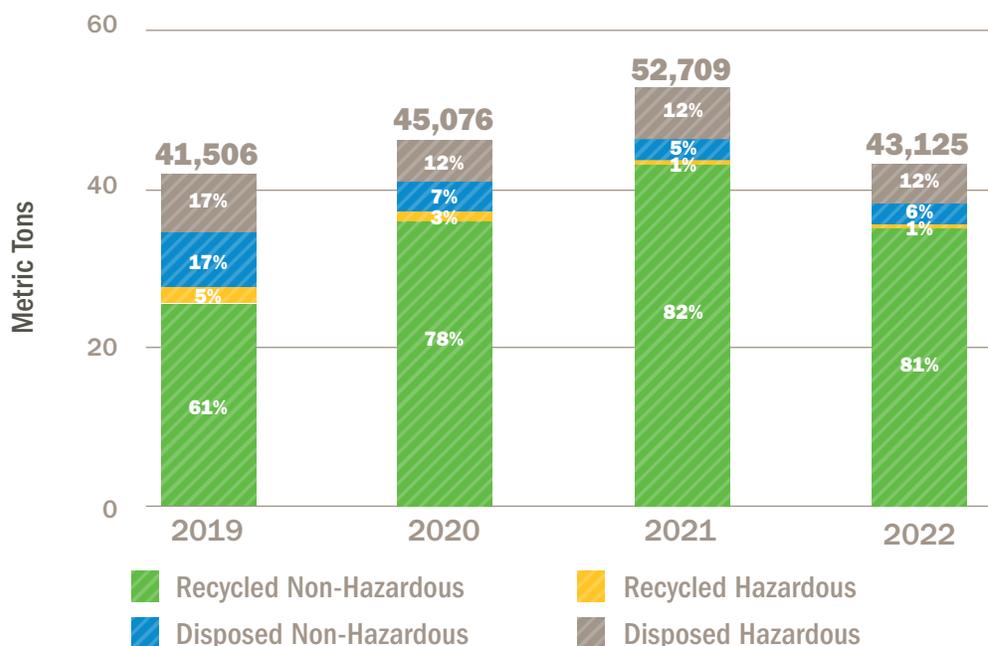
WASTE BY TYPE AND DISPOSAL

This graph depicts First Solar’s absolute manufacturing waste produced in metric tons with a percentage breakdown by type and destination. While our production increased by 15% in 2022, our absolute waste generation decreased by approximately 18% as a result of higher throughput, manufacturing yield improvements and waste reduction initiatives such as wooden pallet mulching. The amount of clean glass cullet shipped offsite decreased in 2022 due to recycling downtime in Ohio to install our fourth generation recycling tools.

First Solar is committed to reducing and recycling hazardous waste in line with our environmental management system objectives of minimizing waste and preventing pollution. Since 2012, we have reduced our hazardous waste generation per watt produced by 68%. In 2022, we decreased the amount of hazardous waste disposed by 22% compared to 2021 due to increased recycling of hazardous waste.

Hazardous waste is classified according to the definition used by the countries in which we operate, e.g. under the Environmental Quality (Scheduled Wastes) Regulations in Malaysia, Law No. 55/2014/QH13 on Environmental Protection in Vietnam, and the Resource Conservation and Recovery Act in the U.S.

We are committed to having zero electronic waste end up in landfill. We accomplish this by repurposing IT equipment through donations (e.g. to schools), and working with local partners in each of our locations who certify that the equipment is either repurposed or disposed of properly. Our e-waste management partners in the U.S., Vietnam and Malaysia are either R2 certified or ISO 14001 certified. We follow and regularly exceed the standards provided by ISO and local regulations.

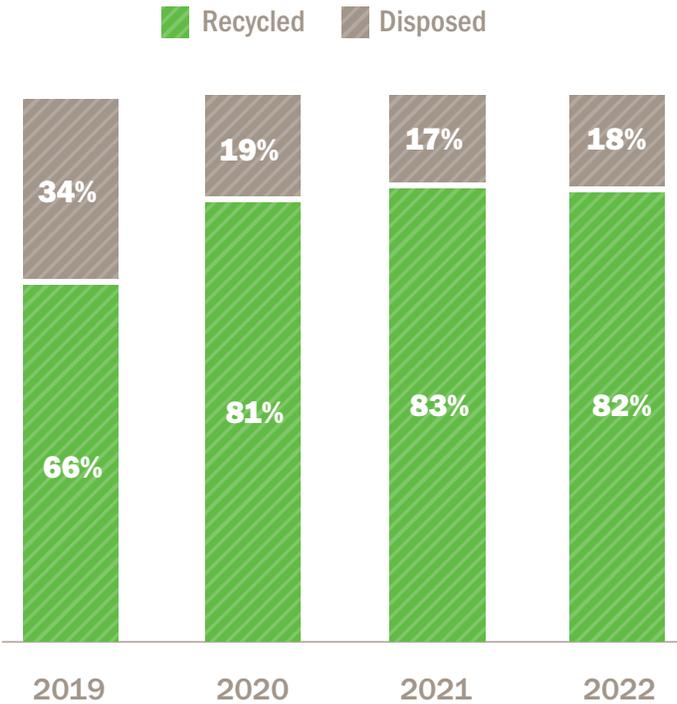




MANUFACTURING WASTE RECYCLED VS. DISPOSED ●●●●●●●●●●

This graph depicts waste recycled and disposed by First Solar’s manufacturing and recycling facilities in Ohio, Malaysia, and Vietnam. The data includes modules that we recycle onsite; both manufacturing line scrap and modules returned from the field, along with many other manufacturing byproducts that are recycled. The data does not include modules that are being recycled at our recycling facility in Germany.

The amount of waste recycled decreased in 2022 due to recycling downtime in Ohio to install our fourth generation recycling tools. Overall, of the total material First Solar sends off-site, 82% is sent for beneficial reuse and not to landfill.



2022 RECYCLING AND RECOVERY ACHIEVEMENT

Metric	Unit	Global
Total collected (metric tons)	Metric tons	35,994
Total recycled - metals (not including semiconductor materials)	%	0.9
Total recycled - semiconductor materials	%	0.4
Total recycled - glass	%	92
Total recycled - other materials	%	0.3
Total disposed - sent to a thermal with energy recovery facility	%	0
Total disposed - sent to a thermal or landfill facility for disposal	%	4
Products or components prepared for reuse**	%	0
Recycling Rate	%	~90
*Recycling rate is the quotient of total recycled and total collected.		
**Refers to products or components that are used again for the same purpose for which they were conceived without any pre-processing, e.g. refurbishment.		

First Solar PV Module Recycling Material Recovery Achievements	
Glass	= 90 mass-%
Metals (not including semiconductor materials)	≥ 90 mass-%
Semiconductor Materials	≥ 90 mass-%

Responsible Supply Chain Management.

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Responsible Sourcing

SCREENING

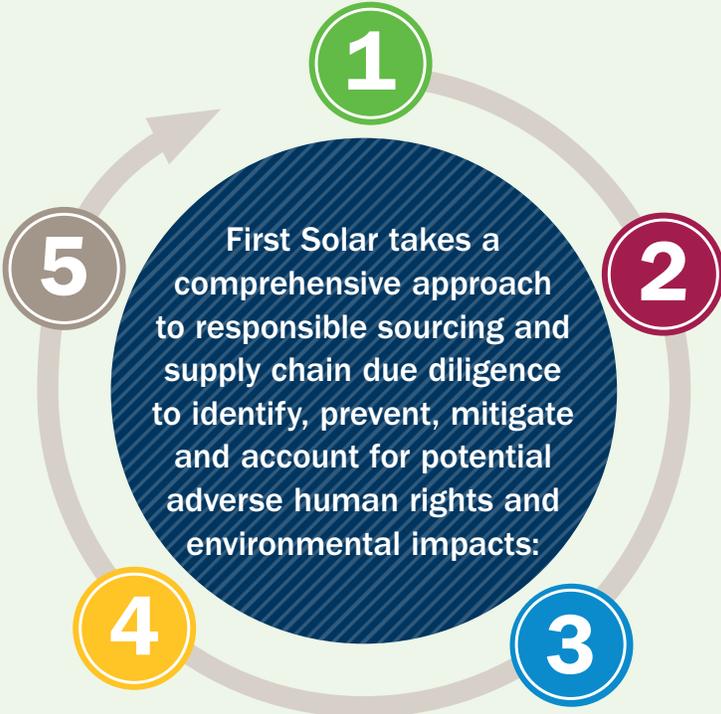
All new suppliers undergo a rigorous qualification process using a balanced scorecard which focuses on Quality, Cost, Flexibility, Service, Technology and Sustainability. We regularly map our supply base and conduct an annual risk assessment to identify potential high-risk suppliers. We leverage third-party tools and indexes on global slavery, forced labor and other environmental, social, governance (ESG) aspects to identify high-risk suppliers based on industry, geography and spend.

CERTIFICATION

First Solar’s supplier agreements require compliance with applicable laws and regulations in addition to First Solar requirements, which may exceed local legal requirements. Under the terms of First Solar’s supplier agreements, suppliers must commit to comply with the [Responsible Business Alliance \(RBA\) Code of Conduct](#) and require their suppliers to do the same. Suppliers must also represent, warrant and covenant that they will not use child, slave, prisoner or any other form of forced or involuntary labor, or engage in abusive employment in the supply of goods or provision of services. Violation of any labor standards may result in the termination of First Solar’s business relationship with such party.

REPORTING

First Solar has established a third-party operated [Ethics Hotline](#) to provide an anonymous and confidential solution to communicate serious legal, financial, ethical or human rights concerns. No human rights concerns were reported in 2022. The Ethics Hotline ensures that serious concerns are heard and are acted upon immediately. Any associate of First Solar, supplier and other external stakeholder can report concerns toll-free via our Ethics Hotline, free of any retaliation, discrimination, or harassment.



TRAINING

We provide Transparency across Supply Chain training to all First Solar associates involved in procurement. The training includes the following objectives: recognizing and communicating awareness of human trafficking risks relevant to First Solar’s business; ensuring compliance with the California Transparency in Supply Chains Act (SB 657) and global human rights regulations; and identifying and avoiding trafficked labor in each specific business unit at First Solar. Following our VAP audit in Malaysia, we organized an RBA briefing session for our onsite service providers and a full day of training on RBA labor standards for relevant First Solar teams. In early 2023, First Solar provided a global internal training on forced labor, the Uyghur Forced Labor Prevention Act, the company’s commitment to Responsible Solar and approach to responsible sourcing to associates involved in procurement, legal and global trade compliance.

AUDITS

First Solar audits new and high-risk suppliers annually on quality as well as environmental management, health and safety, labor, human rights, and ethics by leveraging the RBA Code as a framework. In 2022, First Solar assessed 100% of its new suppliers using social and environmental criteria and conducted three onsite audits at supplier sites. We work with suppliers to drive improvements and to remedy adverse impacts through Corrective Action Plans. As part of our commitment to transparency, First Solar accounts for actual and potential adverse impacts on an annual basis in our [Modern Slavery Statement](#) and sustainability report.

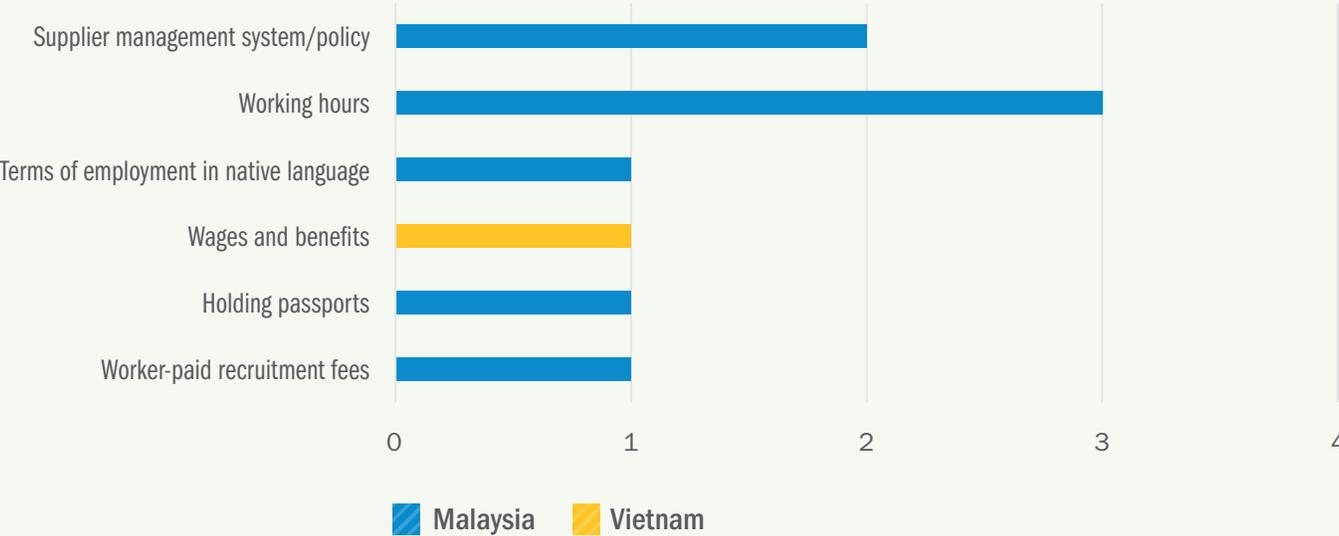
In 2022, First Solar conducted three onsite third-party RBA Validated Assessment Program (VAP) audits at our manufacturing facilities in the United States, Malaysia, and Vietnam. Our manufacturing facilities in Ohio achieved platinum status, the highest possible rating, on their first RBA VAP audit. In May 2023, First Solar Vietnam completed an onsite third-party closure VAP audit and successfully closed their single finding, earning a perfect score and achieving a platinum rating. Through the third-party RBA VAP audit at our manufacturing facility in Malaysia, we identified four onsite service providers with foreign migrant workers subjected to unethical recruitment including the payment of recruitment fees in their home countries, passport retention, and the unlawful retention of wages.

Our decision to join the Responsible Business Alliance in 2021 was driven by our commitment to continuous improvement and recognition that not all audit programs are created equal. Our experience with the RBA’s Validated Assessment Program in 2022 further affirms our belief that it is one of the most robust and credible social auditing protocols available. We will continue to work with our suppliers to ensure they conduct their business in line with First Solar values to help improve the lives of workers across our supply chain.



Summary of First Solar RBA VAP Audit Findings

The single finding at our manufacturing facility in Vietnam related to subsidies not being paid correctly. As part of our corrective action plan, we promptly adjusted the subsidies and established a regulatory monitoring tool to address the root cause.



Of the eight findings at our manufacturing facility in Malaysia:

- Five findings (three priority and two major) including worker-paid recruitment fees and unlawful retention of wages, passport retention for safekeeping, employment terms not communicated in native language, inadequate management system and policy, were related to our onsite service providers (janitorial and security).

Corrective action: Our onsite service providers have since returned all passports and unlawful wage detentions to the workers and updated their policies to prevent future fees. In addition to organizing an RBA briefing session for our onsite service providers, First Solar contracted a third-party to conduct an investigation and develop a reimbursement plan. We are working with our onsite service providers to ensure the recruitment fees are paid back to both current and recent workers in accordance with RBA guidelines and best practices.

- Three findings (one major and two minor) were related to working hours exceeding 60 hours per week due to voluntary overtime.

Corrective action: First Solar scheduled a monitoring report to track weekly hours of work to ensure hours worked in a workweek do not exceed 60 hours and to ensure at least one day off in every seven days of work.

- We plan to have a VAP closure audit at our manufacturing facility in Malaysia in Q4 2023.

Supply Chain Overview

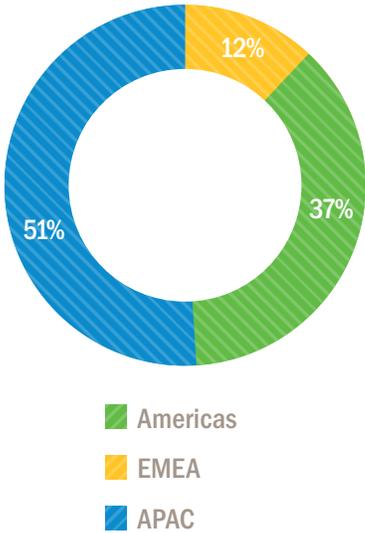
Our thin film module manufacturing process uses approximately 30 types of raw materials and components to produce a solar module. Critical raw materials and components in our manufacturing process include CdTe, front glass coated with transparent conductive oxide, organics such as photo resist, tempered back glass, frames, packaging components such as interlayer, cord plate/cord plate cap, cables and solar connectors. As part of our sourcing strategy, we are enabling suppliers that are near to our manufacturing locations, thereby reducing the transportation costs, environmental footprint as well as the lead times for such materials.

First Solar has a global set of specifications for the materials used in our products which results in a tightly controlled supply chain, superior traceability and quality products. We also own and operate the facilities which manufacture our modules- turning a sheet of glass into a completed module all under one roof. In contrast, many traditional tier one crystalline silicon PV manufacturers have multiple products, processes and bill of materials with a sprawling supply chain, which includes multiple process steps (polysilicon/ingots/wafers/cells/modules) often across multiple continents, resulting in increased risks relating to variability, quality, reliability and traceability.

The true value of the clean energy transition goes well beyond the direct investment and creation of module manufacturing jobs. In 2022, First Solar spent more than \$3.3 billion on our global supply chain. Our data includes our manufacturing bill of materials, project spend, capital spend and indirect expenses. The data is based on the region to which purchase orders are issued. Over 36% of our global spend was spent on local suppliers in the U.S. to support our module manufacturing operations in 2022. More than \$183 million was awarded to women-, minority-, and disabled veteran-business enterprises (WMDVBE) in 2022, based on actual spend.

First Solar has invested in a largely American supply chain for our U.S. manufactured PV modules allowing us to produce our Series 7 modules with more than 90% domestic content, including 100% American-made glass and steel subcomponents. In 2022, First Solar spent over \$1 billion on American materials and services per year, supporting jobs in industries such as glass producers, steel producers, silica miners, soda ash miners, copper miners, crate and pallet makers, automated manufacturing toolmakers, research scientists, truck drivers, logistics workers and more. These industries that have historically been the lifeblood of the American economy are finding new purpose in the American Solar supply chain.

2022 Supplier Spend by Region (%)



GRI Indicator	Title	2022 Disclosure	Social impacts Used for Screening
414-1	New suppliers that were screened using social criteria	100%	Suppliers are screened on the following social criteria: <ul style="list-style-type: none"> • Clean and safe facilities • Minimum wages • Working hours (allowing at least one day off per week) • Health and safety practices • Non discrimination • Freedom of association and collective bargaining • Humane treatment and prevention of harassment or abuse • Prohibition of child labor • Prohibition of forced or compulsory labor • Collective bargaining • Business ethics (including corruption, extortion, embezzlement, conflict of interest, bribery, excessive gift giving, disclosure of information, intellectual property, fair business advertising and competition, privacy and non-retaliation.) • Conflict minerals
414-2	Negative impacts on social impacts in supply chain and actions taken	3	In 2022, First Solar conducted three onsite audits which included environmental and social criteria based on the RBA Code of Conduct and one supplier completed a third-party VAP closure audit. Out of the four audits, there were zero priority non-conformances and only one (or 25%) of the suppliers were identified as having significant actual or potential negative social impacts. Three major non-conformances were identified in the areas of health and safety relating to inadequate risk assessment and safety action plans. We are working with the supplier to put corrective action plans in place. The five major findings reported in last year's sustainability report were closed during our supplier's RBA VAP closure audit
308-1	New suppliers that were screened using environmental criteria	100%	Suppliers are screened on the following environmental criteria: <ul style="list-style-type: none"> • Environmental management systems • Pollution prevention and resource reduction • Solid waste management • Hazardous substances management • Environmental permits • Air emissions monitoring and management • Water management • Energy consumption and GHG emissions
308-2	Negative environmental impacts in the supply chain and actions taken	5	In 2022, First Solar conducted three onsite audits which included environmental and social criteria based on the RBA Code of Conduct and one supplier completed a third-party VAP closure audit. Out of the four audits, there were zero priority non-conformances and two (or 50%) of the suppliers were identified as having significant actual or potential negative environmental impacts. One supplier had one major non-conformance for not having a GHG emissions target. A corrective action has been put in place. Another supplier had four major environmental non-conformances relating to the lack of environmental targets and an inadequate permit management process. We are working with the supplier to put corrective action plans in place.

Human Rights Standards and Practices

First Solar is committed to protecting human rights, enforcing fair labor practices and addressing the potential risks of forced labor, child labor, human trafficking and slavery across our operations and supply chain. As part of this commitment, we stand against all forms of modern slavery and have zero tolerance for forced labor, human trafficking and child labor. Our [2022 Transparency in Supply Chains and Modern Slavery Statement](#) describes our efforts to address the risks of modern slavery across our operations and supply chain. The statement was published in accordance with the California Transparency in Supply Chains Act of 2010 (SB 657) and the UK Modern Slavery Act 2015, and is publicly available on our website. In accordance with the OECD Guidelines for Multinational Enterprises and the UN Guiding Principles on Business and Human Rights, we are committed to identifying, preventing and mitigating potential adverse human rights and environmental impacts.

Our [Labor and Human Rights Policy](#), which references international human rights declarations and due diligence guidelines, applies to everyone at First Solar and its affiliates, including all associates, officers, and directors. As a member of the Responsible Business Alliance, we implement the [RBA Code of Conduct](#) within our operations and our supply chain. Under the terms of First Solar's supplier agreements, suppliers must commit to comply with the RBA Code of Conduct and require their suppliers to do the same. Suppliers must also represent, warrant and covenant that they will not use child, slave, prisoner or any other form of forced or involuntary labor, or engage in abusive employment in the supply of goods or provision of services.

Our Chief Compliance Officer manages First Solar's Global Compliance Organization which oversees our ethics and compliance program. The goal of this organization is to implement policies, processes, training, monitoring and general awareness programs to promote ethics and compliance with applicable legal and regulatory standards. Subject to the requirements of local law, and after due diligence and full and fair investigation, any employee found to have directly engaged in or knowingly engaged suppliers engaged in slave labor or human trafficking will be subject to immediate termination of employment.

Conflict Minerals

First Solar is committed to operating a supply chain free of conflict minerals, which include gold, tin, tantalum, and tungsten and their derivatives (or any other mineral or its derivative determined by the Secretary of State) whose extraction and trade are financing conflict in the eastern Democratic Republic of the Congo or an adjoining country (together, the “covered countries”). To the extent we source minerals from the covered countries, we are dedicated to protecting and respecting human rights by responsibly sourcing such minerals.

We have a long-standing commitment to conducting our business in compliance with applicable laws and regulations and condemn human rights abuses associated with the extraction, transport, or trade of minerals. Similarly, we have a no-tolerance policy with respect to corruption, money laundering, and/or bribery. We require all direct suppliers to agree to follow such principles. First Solar’s [Conflict Mineral Policy](#) is communicated to our suppliers and is publicly available on our website. We have an operating, cross-functional internal governance team with representatives from our supply chain, compliance, and legal departments to ensure policy statements and control processes are followed.

We support sourcing from the covered countries when performed in accordance with accepted international standards, specifically within the guidance from the Organization for Economic Cooperation and Development (“OECD”). Suppliers with minerals not found to be conflict free in their sourcing will be given a reasonable amount of time to begin sourcing minerals responsibly and in a manner consistent with the principles of responsible sourcing from conflict-affected areas. First Solar reserves the right to take appropriate actions up to and including identifying an alternate source of supply or discontinuing purchases from a supplier should a supplier’s efforts to comply with this policy be deficient.

As we do not source directly from smelter or refiner processing facilities, we rely on the Responsible Minerals Initiative’s Responsible Minerals Assurance Program (RMAP), previously known as Conflict-Free Smelter Program, to oversee and coordinate third-party audits of these facilities. The RMAP audit protocols and procedures require the smelters or refiners to engage specially trained third-party auditors to independently verify that these smelters and refiners can be considered conflict free. Our conflict minerals risk mitigation plan defines supplier-risk management strategies, including (i) continued procurement, (ii) assistance in identifying alternate sources of supply, and (iii) disengagement, the severity of which is at the discretion of our executive management. We aim to advance the effectiveness of our due diligence efforts and further enhance our compliance processes by, among other things, encouraging non-RMAP validated processing facilities to become validated either through the RMAP or a RMAP-recognized third-party audit program.

First Solar is committed to complying with the reporting obligations required under Section 1502 of the Dodd-Frank Act and the SEC’s rules on conflict minerals, including the requirement to conduct inquiries and, if necessary, due diligence into the source and chain of custody of any conflict minerals included in our products. 100% of the smelter and refiner facilities that may have processed the necessary conflict minerals used in our products during 2022 were RMAP-compliant. First Solar’s Specialized Disclosure and Conflict Minerals reports are available on our public website (see [“Specialized Disclosure”](#) tab in SEC Filings).

Social Responsibility.



Our Culture

At First Solar, innovative and passionate people, working ethically and safely, form the foundation of our success. We generate results through a culture of agility, collaboration and accountability. Our internal Vision, Mission and Culture includes behaviors that support safety first, mutual respect for all associates, empowered collaboration between functions and individuals, and personal ownership of decisions, performance and results. As a global culture, we value multiple voices and perspectives. This diverse tapestry of different viewpoints, approaches and needs helps us to produce better products and services.

Agility



We are creative and resilient.

Collaboration

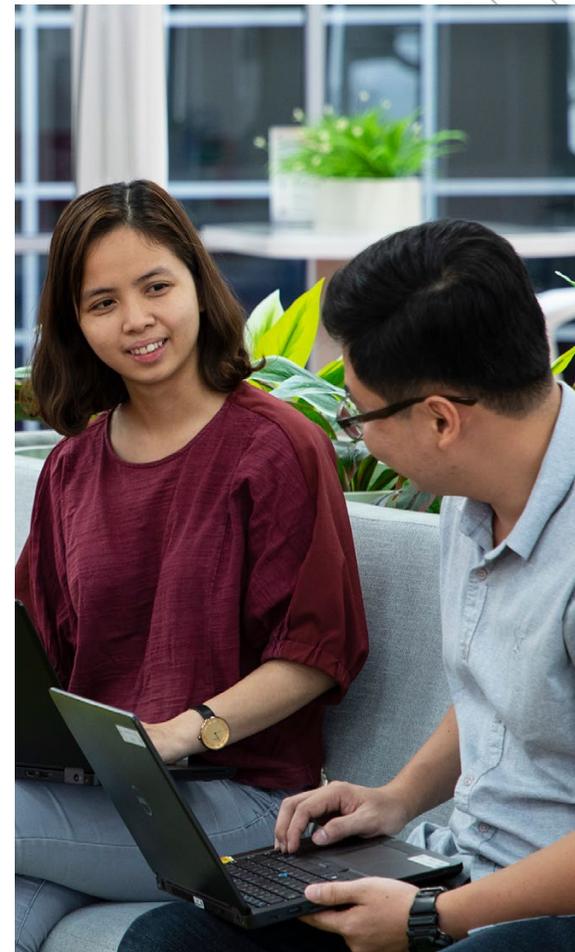


We help each other succeed.

Accountability



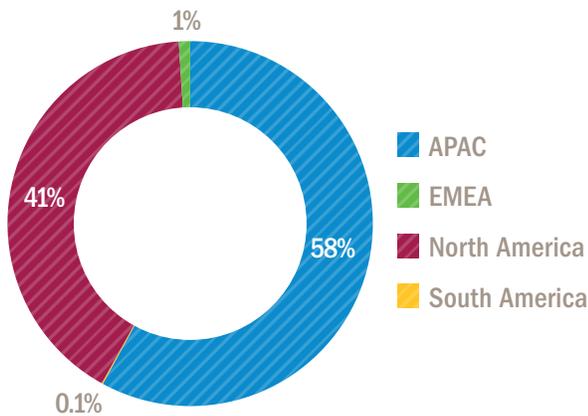
We own the results of our actions.



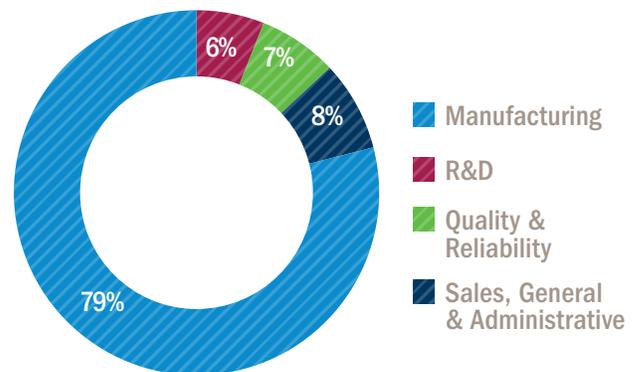
Working at First Solar

As of 31 December 2022, we had approximately 5,500 associates (our term for full and part-time employees), compared to approximately 4,800 associates in 2021. The change in the number of associates was primarily attributed to our manufacturing expansion in Ohio. Our third U.S. manufacturing facility commenced commercial production of modules in early 2023. Approximately 79% of our associates work in manufacturing, and the remainder of our associates are in research and development, quality and reliability, sales, and general and administrative positions. In 2022, eight associates (or approximately 0.15%) were part-time while the rest were full-time.

Associates by Region in 2022



Associates by Function in 2022



First Solar’s people strategy represents an inclusive, integrated approach, connecting talent, performance and learning on a foundational global total rewards program. All associates have the opportunity to learn, grow and succeed. We believe in direct engagement and dialogue with our associates. We are one, global, diverse community serving a common purpose. Meeting net-zero ambitions will require automation and upskilling of the labor force, which provides opportunities for meaningful career growth and wealth creation. In 2022, First Solar Malaysia received the Productivity-Linked Wages System Human Resources Minister Award. This award recognizes employers’ best practices in implementing various additional incentives linked to productivity and profitability to enhance associates’ total income.

First Solar’s Global Career Framework gives associates control over their own futures and provides career pathways for all associates by transparently describing the job and critical skill requirements needed to facilitate talent movement, from entry-level to executive leadership-level positions. Our Training Academy is available to all our associates to ensure training is equitably distributed. First Solar has Training Advocates on the manufacturing floor who encourage associates to leverage all of the learning opportunities available to them. We have many examples of associates who started as hourly production operators and successfully became manufacturing managers and plant managers.

Inclusion, Diversity & Belonging

At First Solar, inclusion, diversity and belonging is more than a program or an initiative, it is a transformation. We recognize that diversity and inclusion (D&I) is a driving force in the success of our company and believe in creating an environment where different voices are encouraged, heard and valued including, gender, race, ethnicity, sexual orientation, military status, generation, abilities, perspectives, backgrounds and personalities.



First Solar has integrated inclusion, diversity and belonging goals and measures throughout, translating our global strategy into local action. We believe in comprehensive actions at every level to drive foundational change in the culture and promote a diverse and inclusive workplace.

LEADERSHIP: Over the past year, we increased the racial and ethnic diversity of our Board of Directors. First Solar’s Board of Directors is 33% diverse, with 25% of seats occupied by women and 17% occupied by ethnic or racially diverse Directors. Today, each Board committee has at least one diverse representative. We are proud to be recognized as a “3+ company” by [50/50 Women on Boards](#) for having at least three women serve on our Board. Our first lead independent director and Chair of the Audit Committee are women. In 2021, we published a [Board of Directors Diversity & Inclusion Transparency Report](#) which highlights our journey and ongoing commitment to enhance diversity at the Board level. A diverse Board and Executive Leadership Team, nearly half of whom consist of first-generation Americans, sets the tone from the top, helping the company drive diversity and inclusion throughout our organization. We are committed to including one or more qualified diverse candidate in each search process for new Board members and new members of the Executive Leadership Team. We are also committed to using a search firm to broaden our Board recruiting pipeline in instances where one or more qualified diverse candidates have not been identified among our Directors’ or Executive Leadership Team’s personal networks. We disclosed the gender and racial composition of our Board in our [2023 proxy statement](#).



TALENT ACQUISITION: At First Solar, we seek to hire outstanding, qualified talent globally to further our mission. Consistent with this, we take a consciously inclusive approach in our hiring practices to build globally diverse, high performing teams. We post our open jobs on more than 25 diversity and veteran-focused recruitment sites and we strive to have every external candidate search include diverse individuals. Our Talent Acquisition team reviews applicant and new hire metrics quarterly, including metrics related to diversity. First Solar is an Equal Opportunity Employer (EOE), and we prohibit discrimination based on race, color, religion, sex, age, national origin, veteran status, disability, sexual orientation, or gender identity. First Solar makes good faith efforts to improve year over year our representation in those areas. First Solar's [EOE policy](#) is available online. In India, we are committed to supporting women in rural areas by providing female graduates with three months of specialized training at Nettur Technical Training Foundation (NTTF), a public-private partnership initiative. Through this initiative, we have hired several hundred women to date.



PAY AND PROMOTIONS: First Solar continuously monitors the market to ensure we are paying a fair living wage to all our associates. In 2021, we raised our minimum hourly wages in line with prevailing wage levels to ensure that every one of our U.S. associates on hourly wages would take home more than \$15 an hour. We review every pay (salaries, merit increases, bonuses) to check for internal and external equity, including gender pay gap and living wage assessments. First Solar provides a Global Career Framework for our associates' growth and development and a Pay-for-Performance model, which rewards our associates for achieving goals and associated metrics. Promotions are managed within our Global Career Framework which provides a common language to describe career pathways, job and skill requirements and facilitates talent movement. Within the Framework, we use a Global Grading System, a rigorous process for job leveling and a consistent and systematic approach to evaluate individual positions in the context of the entire company. We completed a global gender pay gap assessment in 2022, which showed no pay gap across all regions. In the future, we intend to expand this to formally assess racial equity. Our Bonus Plan includes D&I goals and metrics for all associates.

BENEFIT PROGRAMS AND POLICIES: First Solar associates have comprehensive medical coverage, and access to a host of benefits, including tuition reimbursement for higher education, internal career progression, a wellness program and paid parental leave. First Solar is committed to helping associates face the demands of balancing work, family and life-related issues by offering a number of possible alternative work options. First Solar provides a hybrid virtual working model called FLEX. Through First Solar's FLEX program, associates may work on premises, at home or both depending on current circumstances and the need of the business. First Solar's alternative work schedules enable women to work part-time while transitioning back into the workforce. First Solar also offers four-week paid parental leave to all U.S. associates who meet basic employment requirements to enable associates and their families to care for and bond with a newborn child, a newly adopted child, or a newly placed foster child. We also provide various rewards and recognition programs for all associates including gift cards, Lifemart discounts, auto and home insurance financing, Excellence in Action awards, and other financial rewards.

ENGAGEMENT AND INCLUSION: We conduct a global inclusion and engagement survey on an annual basis. Our response rate in 2022 increased to 83%, compared to 73% in 2021. The global inclusion index for 2022 was 78%, compared to 81% for 2021. However, engagement and inclusion scores among women increased by 3% and 1% respectively in 2022, compared to 2021. Women inclusion scores for feeling comfortable sharing a different perspective increased by nearly 6% in 2022. 84% of First Solar associates are proud to work for First Solar.

EXTERNAL PARTNERSHIPS: First Solar works closely with local communities to provide employment opportunities to disadvantaged and underserved populations. We collaborate with Toledo high schools in Ohio to offer low-income students part-time work to finish their studies and then offer them full time employment with paid higher education. We plan to replicate this successful model at the manufacturing facility we are constructing in Alabama. We recently signed an agreement with the U.S. Army to expand our Veteran Connector Program which helps ensure a flawless transition from military to civilian life by connecting new veterans with others in our organization who have successfully transitioned. First Solar is committed to supporting and encouraging girls and women in science, technology, engineering, and mathematics (STEM) fields by participating in initiatives such as The University of Toledo College of Engineering's Introduce a Girl to Engineering Day, Bowling Green State University Women in Technology and Women in Black Leadership, Leadership, and contributing to the Santa Clara Valley Section of the Society of Women Engineers. In addition to working with local universities, First Solar is also partnering with external organizations such as Women in Cleantech and Sustainability, to foster an industry network of professionals with a mission to further the roles of women in growing the green economy and making a positive impact on the environment.

COMMUNITY IMPACT: In 2021, First Solar invested \$11 million in efforts to revitalize American communities and bridge racial gaps in health, wealth, and opportunity. As part of the initiative, First Solar purchased \$10 million in Impact Notes, or fixed-income debt securities, issued by the Local Initiatives Support Corporation ([LISC](#)) which help fund community and economic development projects across 36 cities and 2,100 rural counties in 45 states. In 2023, First Solar made a \$1 million deposit with [OneUnited Bank](#), the largest Black-owned bank in the U.S., which aims to close the racial wealth gap by enhancing financial literacy, alleviating personal financial challenges, and creating affordable access products and services to historically underserved minority populations nationwide.

REPORTING: At the time of writing this report, we are unable to include First Solar's 2022 Employer Information Report (EEO-1) data as the U.S. Equal Employment Opportunity Commission has delayed the collection and certification process to the fall of 2023. We remain committed to publicly disclosing our EEO-1 data as part of our commitment to increasing transparency around diversity and inclusion at First Solar. Once certified, we intend to publish our EEO-1 data in the [sustainability documents library](#) on our website. Although the EEO-1 data is solely U.S.-focused, our diversity and inclusion initiatives are global.

GLOBAL AND REGIONAL DIVERSITY NETWORKS: We are in the process of broadening our global and regional diversity networks and affinity groups consistent with First Solar’s culture and philosophy. Sponsored by our CEO and supported by a quarterly Executive Advisory Group, these Networks aim to support the recruitment of diverse and qualified candidates, enhance professional and personal development, and promote an inclusive and supportive work environment.



The Global Women’s Network (GLOW): Launched in 2019, GLOW’s aim is to attract and develop future leaders through mentoring, sponsorship, networking, and a collaborative learning culture and enriching dialogue across the business. GLOW’s membership has more than doubled to over 100 members since 2021. In 2022, GLOW participated in the Women in Cleantech & Sustainability Talks, launched a mentorship pilot, engaged with local universities and participated in career fairs, and enhanced women’s professional and personal development through inspiring discussions and webinars with thought leaders from across the company, including the company’s female Board members.



First Solar GLOW hosted over 40 graduate and undergraduate students from Ohio-based Universities’ Women in Tech and Women in Business Leadership Chapters.



RenewABLE Employee Resource Group: RenewABLE is a voluntary, employee-led group with a broad representation of abilities and backgrounds. RenewABLE focuses on collaborating, educating, and empowering employees to make First Solar a disability-friendly accessible workplace. RenewABLE’s goal is to provide cultural support to associates who are born with or have acquired a disability, who have child(ren) with disabilities, or serve as a caregiver to adults with disabilities. In 2022, RenewABLE launched an annual disability etiquette training, shared tips on accessibility in technology, raised awareness about Autism, gathered quarterly to collaborate and celebrate Global Accessibility Awareness Day in May, National Disability Employment Awareness Month in October, and International Day of Persons with Disabilities in December.



First Solar India is collaborating with the Nettur Technical Training Foundation to hire and train female graduates.



First Solar's Thuyen Nguyen joined a panel to discuss "The Role of Female Graduates in STEM Industries" at the Women in STEM Forum in Vietnam

First Solar's women and minority networking and affinity groups such as Tempe's Curie Club, the Perrysburg Women's Networking Group, and Kulim's Women@FirstSolar, contribute to both formal and informal efforts to promote D&I across the company.

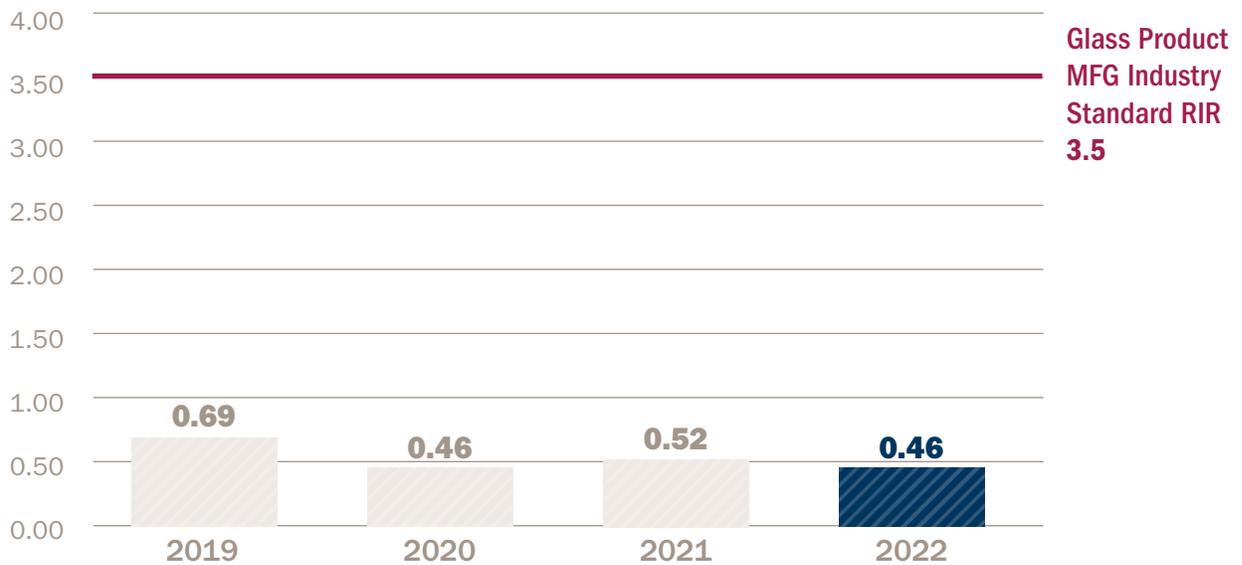
First Solar champions a culture of belonging for our LGBTQ+ associates every day. We frequently sponsor the pride parades in Tempe, Arizona, and Toledo, Ohio to show our support and be allies for our LGBTQ+ community. Here is what some of our LGBTQ+ associates have to say about why they choose to work at First Solar: https://www.youtube.com/watch?v=Z9I5uSf_2rY



Occupational Health and Safety

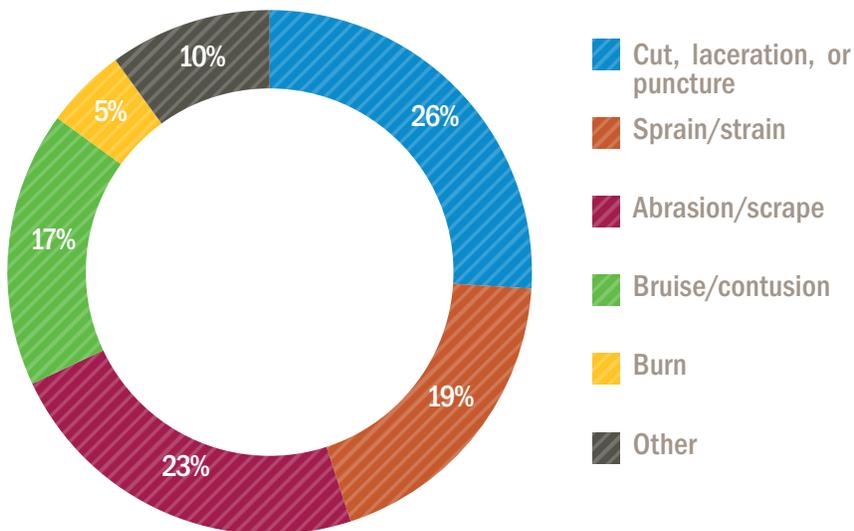
First Solar associates work in a clean and safe hi-tech environment and our goal is to achieve an injury-free workplace. Since 2008, our recordable injury rate (RIR) has decreased by 82% (from 2.6) by establishing a strong safety culture throughout the company and ensuring an understanding of First Solar’s Safety Policies and Procedures. Our company-wide recordable injury rate is nearly eight times lower than the glass product manufacturing industry average. First Solar’s RIR includes all manufacturing, R&D, and office locations, calculated per 200,000 hours. An injury is considered recordable if it requires medical attention beyond first aid. First Solar’s manufacturing safety data covers all processes from the beginning of the manufacturing process to the finished module and includes all of the company’s manufacturing facilities in the U.S., Malaysia and Vietnam. We had no high-consequence work-related injuries in 2022. First Solar added a safety metric to the Annual Bonus Plan in 2022 that measures the company’s Good Catch Reporting. A Good Catch is an observation for a safety improvement, either an unsafe act or condition. All associates are encouraged to report Good Catches to enhance our safety culture and provide an opportunity to proactively identify and reduce risk.

Recordable Injury Rate (per 200,000 hours)



All First Solar associates receive legally required health and safety training as well as routine refreshers on health and safety topics pertinent to their job requirements. First Solar requires all contractors to work under our safety policies, programs and procedures. 100% of First Solar’s workforce and management team are represented by formal joint management-worker health and safety committees. Associates from all levels and functions can participate in the cross-functional safety committees which meet on a regular basis to review incidents and implement corrective actions. The site safety committees report to the EHS Steering Committee on a quarterly or more frequent basis.

Injuries by Type (2022)



Safety data includes all global manufacturing and offices.

First Solar’s safety management system hazard identification and risk assessment process identified the following hazards that have the potential for serious injury or fatality: confined space entry, electrical exposure and arc flash, line of fire, lock out/tag out, machine guards, vehicle collision, working with a suspended load, and working at heights. First Solar has developed EHS Design Requirements for new equipment that includes equipment and machine safety requirements. Training and procedures are in place to identify and control potential hazards.

Sustainability Ambassadors Program

As part of our efforts to “think globally and act locally,” we launched a global internal Sustainability Ambassadors program in 2018. The program enables First Solar associates at various sites to identify and implement local sustainability initiatives such as resource efficiency and reduce-reuse-recycle (3R) projects, educational and awareness-building workshops, site clean-ups, and local community outreach and volunteering.

In 2022, our Sustainability Ambassadors helped identify opportunities to save energy and water at our global manufacturing locations, reduced waste and single use plastic, participated in site clean-ups and turned used coffee grounds into fertilizer, organized a local blood drive in Vietnam, and diverted glass fines from landfill by recycling and transforming them into bricks. Our Sustainability Ambassadors celebrated Earth Day in 2022 by collecting over 1,000 pounds of litter in Ohio and California, sharing an environmental education video in Vietnam, and hosting an upcycling competition in Malaysia. We currently have approximately 100 Sustainability Ambassadors across the company.



Global Charitable Giving Program

First Solar makes three kinds of donations as part of our Global Charitable Giving Program: corporate donations (i.e., donations made through the First Solar Corporate Charitable Fund), site donations (i.e., donations made through First Solar local offices and manufacturing sites), and business development donations (i.e., donations related to First Solar sales activities). First Solar donated more than \$619,000 in 2022 in total cash and in-kind contributions.

Global Charitable Giving Program	Type	2022
Manufacturing and Office Site Donations	Community	\$236,836
Business Development Donations	Community	\$287,553
Corporate Charitable Fund Donations	Charitable	\$95,000
	Total	\$619,389

Beyond the Megawatt

First Solar is a proud foundational funder of the Clean Energy Buyers Institute’s (CEBI) [Beyond the Megawatt Initiative](#), which aims to create a resilient, equitable, and environmentally sustainable energy system by leveraging energy customer demands for clean energy. The initiative is developing procurement guidance to help energy buyers embed environmental sustainability, social equity and resilience in energy buyers’ clean energy procurement process. In June 2023, First Solar joined more than 18 other leading companies representing over \$498 billion in annual revenues to become a signatory of the [Principles for Purpose Driven Energy Procurement](#).



All renewable energy is not created equal, and there’s an opportunity for purpose-driven procurement, when embedded into energy buying processes, to create a powerful demand signal for more sustainable, just, and resilient renewable energy projects. These principles are fundamentally aligned with our approach to Responsible Solar. We are not just committed to responsible manufacturing but powering our global operations with clean energy that aligns with our values ●

Samantha Sloan | Vice President of Global Policy, Sustainability and Marketing | First Solar.

Trekking Across Patagonia for Modern Slavery Awareness

In 2022, a First Solar associate joined a global team on a 7-day trek across the Patagonia region of Argentina to raise awareness and funds for Hope for Justice, a charity fighting to bring an end to modern slavery and to help victims and survivors of human trafficking. Together, they trekked over 80 miles (128 km), slept in bare accommodations in remote areas without connectivity to the outside world, and faced extreme weather conditions including intense winds, snow, ice and rain.



“During the challenge, I had ample opportunity to reflect on how fortunate I am to have freedoms that victims of modern-day slavery do not — the freedom of movement and to work at a company of my choosing. I'm proud to spend my time and work for a company that leads the world's sustainable energy future and lives by its Responsible Solar principles.”

Jennifer Lee | Assistant General Counsel | First Solar.

Local Community Initiatives

First Solar Ohio donated more than \$150,000 to local community, health, environment and education initiatives including The Ohio Foundation of Independent Colleges' scholarship fund, the Sylvania STEM Center, Toledo Pride, Habitat for Humanity of Wood County, and Partners for Clean Streams, among others. First Solar proudly sponsored Toledo Imagination Station's Elements of Style: Glass City Chic event which highlights local women in STEM careers as models in the fashion show segment. A First Solar associate graced the runway, sharing information about her role at First Solar and how our company connects to their glass-related theme.



First Solar Malaysia donated approximately \$43,000 in 2022 to local community and environmental education initiatives, including the Kedah STEM fair and the [Junior Achievement Waste Smart Kids Program](#) which teaches children the importance of reduce, reuse and recycle to protect the environment. First Solar also provided food aid to support local underserved communities and flood victims in the Klang Valley area and other states impacted by the torrential rains.



In accordance with the Companies Act 2013, First Solar’s subsidiary in India (First Solar Power India) donated more than \$24,000 for local education and job placement initiatives, including a contribution to Nettur Technical Training Foundation (NTTF) to advance the promotion of education and vocational skills in electronics for underprivileged students.



First Solar Vietnam donated 200 beds and household equipment to local rural schools, supported underserved students at two primary schools in the Cu Chi district, and provided scholarships to underprivileged university students.



We partner with NGOs to improve the quality of life in communities around the world to:

- Empower the next generation through education for sustainable development
- Ensure access to clean energy and water
- Reduce inequality through economic inclusion, diversity and equal opportunity
- Promote a circular economy through sustainable production and responsible consumption

Corporate Giving Initiatives

SDG



NGO/PARTNER

Black Girls Do Engineer Corporation

YEAR

2022

\$10,000 grant to support the Carbon Footprint Reduction program, which allows girls to develop innovative solutions to everyday challenges the environment is facing. Nine program high schools participated in the Carbon Footprint Reduction Project Symposium held in Houston, Texas. The top three presentations received a college scholarship.



NGO/PARTNER

Lott Industries

YEAR

2022

\$15,000 grant to support a Styrofoam recycling workforce development program in Toledo, Ohio.



NGO/PARTNER

Girl Scouts of Western Ohio

YEAR

2022

\$10,000 grant to support membership scholarships and program supplies for seven-day camps including Camp Libbey, Ottawa Wildlife Refuge, Maumee Bay State Park, Wintergarden Park and Deveaux Elementary. The camps served 143 girls and focused on animal observations, food chain education, composting and recycling lessons.



NGO/PARTNER

National Park Trust

YEAR

2022

\$15,000 grant to support Kids to Park Day 2022 program in Rockville, Maryland, which helps underserved schools learn about nature, park stewardship, outdoor recreation, STEM and history by experiencing their local, state and national parks and public lands.



NGO/PARTNER

The University of Toledo Foundation

YEAR

2022

Module donation to expand the current student-led Tech Park located on the campus in Toledo, Ohio.



NGO/PARTNER

The 577 Foundation

YEAR

2022

\$15,000 grant to purchase art supplies, display equipment and support personnel costs for the Curiosity Shop in Toledo, Ohio, which seeks to improve the environment by diverting books and crafts from landfill.



NGO/PARTNER

Vietnam Children Fund

YEAR

2022

\$30,000 grant to support the construction of an energy efficient school in Vietnam.

Governance.

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ESG Oversight at First Solar

At First Solar we define sustainability as our “capacity to endure and scale.” Our sustainability approach enables us to achieve long-term growth while following environmentally and socially responsible practices. First Solar’s sustainability program drives our commitment to the triple bottom line of “people, planet and profit” through our approach to responsible life cycle management, environmental footprint analysis, resource efficiency and greenhouse gas emissions reduction, waste management, global charitable giving, operational cost reduction, responsible sourcing and human rights, as well as our global PV module recycling services. We are committed to minimizing the environmental impacts and enhancing the social and economic benefits of our products across their life cycle. First Solar’s [Corporate Sustainability Policy](#) is available on our website.

First Solar’s Board of Directors’ Nominating and Governance committee has overall oversight of the company’s environmental, social, governance (ESG) strategy and policies, as defined in their [charter](#). First Solar’s ESG Steering Committee, led by our Chief Executive Officer and consisting of our Executive Leadership Team, has the highest level of direct responsibility for ESG matters and reports into the Board of Directors on a biannual or more frequent basis. The Board’s Nominating and Governance committee takes an active role in reviewing and overseeing the company’s climate change goals and strategy, monitoring progress on environmental targets, as well as reviewing and overseeing the company’s human rights due diligence efforts. The full Board of Directors approves the Company’s Modern Slavery Statement on an annual basis. First Solar’s ESG and Sustainability team coordinates the cross-functional taskforce of ESG focus leaders responsible for defining, measuring and reporting on progress to the ESG Steering Committee on a quarterly basis. First Solar’s ESG focus leaders help advance the company’s approach to Responsible Solar by driving progress on key strategic ESG areas including:

- Energy, Emissions & Resource Efficiency
- Circular Economy
- Inclusion, Diversity & Belonging
- Innovative Products
- Public Policy and Public Sentiment
- Reliable Products
- Responsible Sourcing and Human Rights



Board of Directors

First Solar's business is conducted under the oversight of our Board of Directors. The primary responsibility of the Board is to oversee and review senior management's performance of First Solar's business operations. Our Board of Directors is composed of 12 directors, including ten independent directors and two non-independent directors, our Chair of the Board and our CEO. Each of the chairs of our Board committees are held by an independent director. In 2021, the Board of Directors established the position of Lead Independent Director and adopted a Lead Independent Director Charter setting forth the duties and responsibilities of the position. Molly E. Joseph continues to serve as the Company's first Lead Independent Director after being re-elected in 2022.

In 2020, we revised our Nominating and Governance Committee Charter to underscore that we are "actively seeking highly qualified women and minority candidates as part of the search process for new Board members," and better defined diversity to include background, gender, race and ethnicity. In 2021, we further revised our Nominating and Governance Committee Charter and Corporate Governance Guidelines to state that "the search process for new Board members ... shall include one or more racially or ethnically diverse candidate in each search process for new Board members."

For more information, please visit our website:

<http://www.firstsolar.com/en/About-Us/Leadership>

Executive Management

First Solar's CEO and executive management team are responsible for managing the company's day-to-day business operations, including the preparation of financial statements and short- and long-term strategic planning. In 2020, we added gender, racial and multicultural diversity into the Executive Leadership team as a reflection of our commitment to diversity.

For more information, please visit our website:

<http://www.firstsolar.com/en/About-Us/Leadership>

Ethical Business Conduct

First Solar holds ethical business conduct as a core principle and we are committed to operating at the highest ethical standards in every area of our business, everywhere we do business. First Solar's [Code of Conduct, Relentless Integrity: How We Conduct Business Ethically](#), demonstrates our commitment to this principle and guides the company's business conduct. Our Code of Conduct applies to everyone, from members of the Board of Directors to our officers, associates and our valued partners. We have a long-standing commitment to conducting our business in compliance with applicable laws and regulations. This commitment, along with our culture of agility, collaboration and accountability, defines our accepted behaviors and enables us to advance our mission to provide cost-advantaged solar technology through rigorous safety practices, innovation, customer engagement, industry leadership and operational excellence. First Solar has a Chief Compliance Officer, who reports regularly to the Board of Directors and the Executive Leadership Team on the status of our ethical culture and develops processes and procedure to further monitor and advance our ethics and compliance programs. First Solar has an existing mechanism for reporting any misconduct or policy violations via various channels, including our Ethics Hotline. Any First Solar associate, supplier and other external stakeholder can report concerns free of any retaliation, discrimination, or harassments via our third-party operated [Ethics Hotline](#) which provides an anonymous and confidential solution to communicate any concerns on conduct.

Collective Bargaining and Freedom of Association

First Solar recognizes that in the locations where we operate, employees have the right to freely associate or not associate with third-party labor organizations, along with the right to bargain or not bargain collectively in accordance with local laws. First Solar respects those rights and is committed to creating an environment of open two-way communication where employees can speak with their managers about their ideas, concerns or problems, and work together to address workplace issues.

Anti-Corruption

First Solar performs risk assessments that consider the possibility of fraud and related indicators. We currently operate in, and may expand into, many parts of the world that have experienced governmental corruption to some degree and, in certain circumstances, strict compliance with anti-bribery laws may conflict with local customs and practices. First Solar's Global Anti-Corruption Policy requires all associates to comply with the U.S. Foreign Corrupt Practices Act (FCPA) and all other applicable local anti-corruption laws. The Global Anti-Corruption Policy prohibits bribery, kickbacks, and the giving of other improper payments to obtain or retain business and covers any person engaged to perform work on behalf of First Solar including freelancers, independent contractors, temporary contractors, independent professionals, agents and consultants. We communicate our anti-corruption and anti-bribery policies in our customer and service contracts. FCPA training is provided to associates in higher risk profile jobs and tailored according to the region. First Solar has implemented processes and procedures to help ensure compliance with all applicable anti-corruption laws. These processes and procedures are monitored and audited on an ongoing basis.

Data Security and Privacy

First Solar is committed to complying with all data protection and privacy laws applicable to our business. First Solar's global data protection compliance program operates as part of our global compliance program. First Solar's Global Data Protection Policy establishes minimum standards that First Solar and our subsidiaries must apply to personal data on a company-wide basis. All First Solar associates are required to comply with our Global Data Protection Policy, including by ensuring that they have completed the requisite training to enable them to do so. First Solar conducts periodic and as-needed training regarding the lawful and intended purposes of processing personal data, the need to protect and keep information accurate and up-to-date, and the need to maintain the confidentiality of the data to which associates have access. As needed, First Solar functions, departments or divisions may conduct more specific training related to such functions, departments or divisions processing of Personal Data. In addition, annual Cyber Security training is required for First Solar associates, and a formal cyber communication cadence provides topical awareness on a monthly or more frequent basis. Non-compliance with the policy may lead to disciplinary action, up to and including dismissal or contract termination. First Solar adheres to the NIST Cybersecurity Framework, and conducts annual audits and testing of its information security and data privacy programs, engaging external partners periodically. First Solar has not experienced an information security breach in the last three years.



ESG Recognition and Awards

- 2023: FTSE4Good Index Series**
 In recognition of the company’s strong ESG practices
- 2022: Best ESG Companies of 2022- Investor’s Business Daily**
 #6 in the Energy category and #6 Overall Leader for commitment to sustainable and ethical business practices
- 2022: America’s Most Responsible Companies- Newsweek and Statista**
 Top 10 in the Energy and Utilities industry
- 2022: “Low Risk” ESG Rating - Sustainalytics**
 In recognition of company's strong overall management of material ESG issues
- 2022: AA (Leader) Rating- MSCI ESG Research**
 Highest ESG rating in the solar industry
- 2022: “Prime” Rating - ISS ESG**
 Demonstrating best-in-class environmental, social, governance performance
- 2022: Global Challenges Index**
 Among 50 companies making pioneering contributions to overcome global challenges such as climate change, the provision of clean drinking water, deforestation, biodiversity, population development, poverty and global governance
- 2022: Productivity-Linked Wage Systems Award- Malaysia Human Resources Minister**
 Winner of the large company category
- 2022: CDP Climate Change A- rating**
 For leadership on climate change and disclosure and management of climate-related risks
- 2021: Department of Natural Resources and Environment HCMH Environment Award**
 First Solar Vietnam achieved 3rd place in recognition of its efforts to protect the environment
- 2021: Fast Company’s World Changing Ideas Award Finalist**
 First Solar’s approach to Responsible Solar
- 2021: Ohio EPA Encouraging Environmental Excellence PLATINUM Award**
 Most prestigious environmental recognition in Ohio
- 2021: EPEAT Silver Rating**
 1st PV products in the EPEAT registry for sustainable electronics (Series 6 and Series 6 Plus)
- 2020: Kedah Department of Environment State Environmental Excellence Award**
 In recognition of First Solar Malaysia’s leadership and manufacturing operations



FTSE4Good



External Sustainability Initiatives

- **Carbon Disclosure Project (CDP):** First Solar has participated in and publicly reported to CDP since 2011.
- **Climate Leadership Council:** As a founding member, First Solar supports the Climate Leadership Council's mission and carbon dividends plan as a cost-effective, equitable and politically-viable climate solution. The plan calls for a substantial, gradually rising, revenue-neutral carbon tax with the revenue distributed to citizens.
- **EPEAT:** First Solar is a member of the EPEAT Advisory Council, a non-fiduciary body formed to provide input and advice to EPEAT management. EPEAT is a globally recognized Type 1 Ecolabel which enables public and private purchasers to identify environmentally leading products from socially responsible companies. The EPEAT PV modules and inverters category launched in October 2020.
- **International Energy Agency (IEA) Photovoltaic Power Systems Program Task Committees 12:** As a member of Task 12, First Solar promotes international collaboration on PV safety and sustainability.
- **NSF 457 Photovoltaic Module Sustainability Leadership Standard (NSF/ANSI 457- 2019):** First Solar is part of the Joint Committee which developed NSF 457, the industry's first Sustainability Leadership Standard for PV modules and inverters. PV modules and inverters conforming to NSF 457 will be added to the EPEAT registry for sustainable electronics.
- **RE100:** First Solar joined RE100 in 2020 and committed to powering our global operations with 100% renewable energy by 2028. RE100 is a global initiative dedicated to accelerating the shift to zero-carbon grids, led by The Climate Group in partnership with CDP.
- **Science Based Targets initiative (SBTi) Business Ambition for 1.5°C:** First Solar is a member of the Business Ambition for 1.5°C campaign and set science-based targets to reduce our absolute scope 1 and scope 2 GHG emissions by 34% by 2028 and achieve Net-Zero emissions by 2050, relative to 2020.
- **Responsible Business Alliance (RBA):** First Solar joined the RBA in 2021 as a regular member to build on our track record of responsible sourcing. The RBA is the world's largest industry coalition dedicated to supporting the rights and well-being of workers and communities in the global supply chain. First Solar is the first of the world's largest top ten PV manufacturers to join the RBA.
- **Ultra Low-Carbon Solar Alliance (ULCSA):** First Solar is a founding member of the ULCSA, an alliance of companies across the solar PV value chain committed to expanding market awareness and deployment of ultra low-carbon PV to accelerate reductions in solar supply chain GHG emissions.
- **Beyond the Megawatt:** First Solar is a foundational funder of the Clean Energy Buyers Institute's Beyond the Megawatt initiative, which aims to decarbonize the economy by driving resilient, equitable, and environmentally sustainable energy systems for the benefit of all.

About this Report.



About this Report

First Solar's Sustainability Report was developed in accordance with the Global Reporting Initiative's (GRI) Core Sustainability Reporting Standards. This report covers significant economic, social and environmental impacts associated with our global manufacturing, R&D and recycling operations. Unless otherwise specified, this report includes environmental performance data from all of First Solar's manufacturing plants and our major R&D facility. First Solar's manufacturing data covers all processes (from the beginning of the manufacturing process to the finished module) and includes all of the company's manufacturing facilities in the U.S., Malaysia and Vietnam. First Solar's advanced thin film modules are manufactured in a high-throughput, automated environment that integrates all manufacturing steps into a continuous flow operation under one roof. The reporting period spans 1 January 2022 up to and including 31 December 2022. We have not sought third-party verification for this report; however, our greenhouse gas emissions inventories of Scope 1 and Scope 2 sources were externally verified in 2023 with limited assurance. First Solar's GHG emissions inventory is externally verified on an annual basis with the International Standard ISO 14064 Part 3 (ISO 14064-3) as well as the WRI/WBCSD GHG Protocol.

To provide feedback on our Sustainability Report, please contact:

Sustainability@firstsolar.com



Sustainability Materiality Assessment

As part of our stakeholder mapping and materiality assessment process, First Solar conducts a survey with our external-facing departments including business development, government affairs, and investor relations, to identify key aspects that significantly impact our company and our stakeholders, both within and outside our organization. First Solar’s stakeholders were prioritized according to their ability to significantly influence or be significantly impacted by our company.

Our 2022 sustainability materiality assessment builds on the results from our 2020 survey and interviews with internal and external stakeholders including associates, management, customers and investors. In addition to the survey results and interviews, we leverage the PV industry’s sustainability leadership standard (NSF/ANSI 457 – 2019) which identified relevant corporate reporting criteria for the PV industry through a multi-stakeholder process led by NSF International and the Global Electronics Council.

As part of our efforts to move towards more dynamic materiality assessments, First Solar’s ESG focus leaders and other internal experts review and refresh the company’s materiality map on a biannual basis. This cross-functional ESG taskforce is also responsible for identifying strategic ESG risks, opportunities, gaps and challenges, anticipating ESG trends that could impact the company, and proposing new ESG policies, practices, targets, metrics and disclosures.

The material topics were mapped out based on their importance to First Solar’s business objectives and their impact on stakeholders’ decisions. The material topics included in the upper right quadrant represent First Solar’s approach to Responsible Solar which helps to competitively differentiate the company and create long-term value.



Stakeholder Engagement

First Solar engages with various stakeholder groups including employees, customers, industry associations, NGOs, local communities, scientific organizations, media, investors and shareholders. The following chart depicts First Solar’s approach to stakeholder engagement; including frequency of engagement by type and stakeholder group, along with key topics and concerns raised:

Stakeholder Groups	How we Engage	Engagement Frequency	Key Topics and Concerns
Employees	Training Sessions, Meetings, Newsletters, Surveys, Global Webcasts and Town Halls, Sustainability Ambassador program	Daily, ongoing basis	<ul style="list-style-type: none"> • Circular economy • Community impact • Energy & emissions • Environmental compliance & eco-efficiency • Labor practices • Talent attraction & retention • Training & education
Customers/ Technical Advisors	Meetings, Seminars & Conferences, Technical Workshops, Product Presentations	Ongoing basis	<ul style="list-style-type: none"> • Circular economy • Data security & privacy • Economic performance • Energy & emissions • Environmental compliance & eco-efficiency • Hazardous materials • Public policy • Quality & reliability • Responsible sourcing & human rights • Sustainable products & innovation
Investors/ Shareholders	Meetings, Earnings Calls, Analyst Days, ESG engagement calls	Quarterly/ annually, ongoing basis	<ul style="list-style-type: none"> • Economic performance • Energy & emissions • Inclusion, diversity & belonging • Governance & accountability • Labor practices • Responsible sourcing & human rights
Local Communities	Meetings & Town Councils, Presentations to Community Organizations, School Visits, Local Tours, Training Programs	Ongoing basis	<ul style="list-style-type: none"> • Circular economy • Community Impact • Environmental compliance & eco-efficiency • Health & safety • Job creation • Quality & Reliability

<p>Government/ Regulators</p>	<p>Meetings & Hearings, Conference Presentations, Seminars & Workshops, Committees, Tax Audits</p>	<p>Ongoing basis</p>	<ul style="list-style-type: none"> • Circular economy • Community impact • Economic performance • Energy & emissions • Environmental compliance & eco-efficiency • Ethics & compliance • Hazardous materials • Public policy • Quality & reliability
<p>NGOs</p>	<p>External Surveys, Partnerships, Group Meetings, Workshops, standards development</p>	<p>Ongoing basis, annually</p>	<ul style="list-style-type: none"> • Circular economy • Community impact • Environmental compliance & eco-efficiency • Hazardous materials • Health & safety • Job creation • Labor practices • Responsible sourcing & human rights • Sustainable products & innovation
<p>Scientific Community</p>	<p>Conferences, Workshops, Meetings, Working Groups, Technical Seminars, Collaboration, Peer Reviews, standards development</p>	<p>Ongoing basis, annually</p>	<ul style="list-style-type: none"> • Circular economy • Energy & emissions • Environmental compliance & eco-efficiency • Health & safety • Raw material availability • Responsible sourcing & human rights

Key Performance Indicators

Key Performance Indicators	2021	2022	Boundary	GRI	SASB	NSF 457
Net Sales (\$ Billion)	2.923	2.619	Global (Equity Share)	102-7		
Total Modules Produced (Millions)	17.6	19.6	Manufacturing	102-7		11.2.1
Total Gigawatts Produced (GW)	7.9	9.1	Manufacturing	102-7	RR-ST-000.A	11.2.1
Current/Future Revenue from Activities Aligned with EU Taxonomy (%)	100%	100%	Global	--		
Total Scope 1 and 2 GHG Emissions (Metric Tons CO ₂ eq)	560,210	571,343	Global (Equity Share)	305-1 & 2		
Scope 1 GHG Emissions (Metric Tons CO ₂ eq)	8,536	7,690	Global (Equity Share)	305-1		11.2.1
Scope 2 GHG Emissions (Metric Tons CO ₂ eq)	551,674	563,652	Global (Equity Share)	305-2		11.2.1
Scope 3 GHG Emissions (Metric Tons CO ₂ eq)	2,143,435	2,679,637	Supply Chain	305-3		
Reduction of Scope 1 GHG emissions (metric tons CO ₂ eq)	0	0	Global Manufacturing	305-5		11.2.2
Reduction of Scope 2 GHG emissions (metric tons CO ₂ eq)	1,584	2,254	Global Manufacturing	305-5		11.2.2
GHG Emissions Intensity (Scope 1 and Scope 2 Metric Tons CO ₂ per Megawatt Produced)	71	83	Global (Equity Share)	305-4		11.2.2
Total Electricity Consumption (MWh)	959,672	1,039,836	Global (Equity Share)	302-1		
Consumption of Purchased Non-Renewable Electricity (MWh)	952,500	1,032,664	Global (Equity Share)	302-1		
Consumption of Self-Generated Renewable Electricity- Solar (MWh)	7,172	7,172	Manufacturing and Recycling	302-1	RR-ST-130a.1	
Grid electricity consumed (%)	96%	96%	Global (Equity Share)		RR-ST130a.1	11.2.1
Renewable energy consumed - onsite solar (%)	1%	1%	Global (Equity Share)		RR-ST130a.1	11.2.1
Total Fuel Consumption From Non-Renewable Sources (MWh)	30,426	32,827	Global (Equity Share)	302-1		
Natural Gas	30,131	29,749	Global (Equity Share)	302-1		
Diesel/Gas oil	255	482	Global (Equity Share)	302-1		
Motor Gasoline	40	2,596	Global (Equity Share)	302-1		
Total Energy Consumption (MWh)	990,098	1,072,663	Global (Equity Share)	302-1		
Manufacturing Energy Consumption (MWh)	940,514	1,016,560	Manufacturing	--	RR-ST-130a.1	11.2.1
Reduction of Energy Consumption (MWh)	1,602	3,405	Manufacturing	302-4		11.2.1
Manufacturing Energy Intensity (kWh per Watt Produced)	0.12	0.11	Manufacturing	302-3		11.2.1
Total Waste Generation (Metric Tons)	52,709	43,125	Manufacturing	306-3		11.2.1
Non-Hazardous Waste Generated (Metric Tons)	45,983	37,674	Manufacturing	306-3		

Hazardous Waste Generated (Metric Tons)	6,726	5,451	Manufacturing	306-3		
Waste Diverted from Disposal	43,591	35,507	Manufacturing	306-4		
<i>Recycled Non-Hazardous (Metric Tons)</i>	43,220	34,987	Manufacturing	306-4		11.2.1
<i>Recycled Hazardous (Metric Tons)</i>	371	520	Manufacturing	306-4	RR-ST-150a.1	11.2.1
Waste Directed to Disposal	9,118	7,618	Manufacturing	306-5		
<i>Disposed Non-Hazardous (Metric Tons)</i>	2,763	2,687	Manufacturing	306-5		11.2.1
<i>Disposed Hazardous (Metric Tons)</i>	6,355	4,931	Manufacturing	306-5	RR-ST-150a.1	11.2.1
Manufacturing Waste Intensity (Grams per Watt Produced)	6.7	4.8	Manufacturing	--		
Total Water Withdrawals (Megaliters)	3,392	3,149	Manufacturing, Recycling and R&D	303-3	RR-ST-140a.1	11.2.1
Manufacturing Water Intensity (Liters per Watt Produced)	0.41	0.33	Manufacturing	--		
Total Water Recycled or Reused (Megaliters)	268	167	Manufacturing, Recycling and R&D	--		11.2.2
Water withdrawn in water stressed areas (%)	0.01%	0.02%	Manufacturing, Recycling and R&D	303-3	RR-ST-140a.1	11.2.2
Total Wastewater Discharge (Megaliters)	1,629	1,373	Manufacturing, Recycling and R&D	303-4		
Wastewater Generation Intensity (Liters per Watt produced)	0.21	0.12	Manufacturing, Recycling and R&D	--		
Recycled input materials used (%)	4-10.5%	7%	Semiconductor material	301-2	RR0102-10	11.2.1
Total Number of Associates	4,833	5,532	Global	102-7		
First Solar Global Recordable Injury Rate (per 200,000 hours)	0.52	0.46	Global	403-9		11.2.1
First Solar Manufacturing Recordable Injury Rate (per 200,000 hours)	0.56	0.45	Global			
First Solar Global Lost Time Injury Rate (per 200,000 hours)	0.15	0.14	Global	403-9		
Number and Rate of Work-Related Fatalities	0	0	Global	403-9		11.2.1
Number and Rate of High-Consequence Work-Related Injuries	0	0	Global	403-9		
Total hours worked	10,849,505	11,633,177	Global	403-9		
% Male Workforce	81%	79%	Global	405-1		
% Female Workforce	19%	21%	Global	405-1		
% Male Management*	77%	73%	Global	405-1		
% Female Management*	23%	27%	Global	405-1		
% Women in US Workforce	26%	27%	US	405-1		
% Women on th Board	25%	25%	Global	405-1		
ISO 14001 Certification of Mfg. %	100%	100%	Global	--		
ISO 45001 Certification of Mfg. %	100%	100%	Global	--		
PV panel recycling program in place	Yes	Yes	Global	--		11.2.2

Notes:

* Defined as manager-level and above.

GRI Content Index

Disclosure Number	General Disclosures	Cross-Reference
102-01	Name of the organization	First Solar Inc.
102-02	Products and services and activities	Annual Report and 10-K
102-03	Location of headquarters	350 W Washington St #600, Tempe, AZ 85288, United States
102-04	Location of operations	About First Solar
102-05	Ownership and legal form	Annual Report and 10-K
102-06	Markets served	Annual Report and 10-K
102-07	Scale of the organization	Working at First Solar
102-08	Information on employees and workers	Working at First Solar
102-09	Description of supply chain	Supply Chain Overview
102-10	Significant changes to organization and its supply chain	Annual Report and 10-K
102-11	Precautionary principle or approach	Change Management System and EHS Peer Reviews
102-12	External initiatives	External Sustainability Initiatives
102-13	Membership of Associations	CDP Climate Change Response
102-14	Statement from senior decision-maker	Message from the CEO
102-15	Key impacts, risks and opportunities	Annual Report and 10-K
102-16	Values, principles, standards and norms of behavior	Our Culture and Ethical Business Conduct
102-17	Mechanisms for advice and concerns about ethics	Ethics Hotline
102-18	Governance structure	Governance
102-40	List of stakeholder groups	Stakeholder Engagement
102-41	Collective bargaining agreements	Collective Bargaining and Freedom of Association
102-42	Identifying and selecting stakeholders	Stakeholder Engagement
102-43	Approach to stakeholder engagement	Stakeholder Engagement
102-44	Key topics and concerns raised	Stakeholder Engagement
102-45	Entities included in the organization's consolidated financial statements	Annual Report and 10K
102-46	Defining report content and topic boundaries	About this Report
102-47	List of material topics	Sustainability Materiality Assessment
102-48	Restatements of information	<p>First Solar's 2021 Scope 3 GHG emissions inventory was updated to include purchased services and upstream fuel extraction emissions from purchased fuel and energy-related activities.</p> <p>We made a correction to water withdrawals from water stressed regions in 2021 which was 0.01% rather than 0.03%.</p>
102-49	Changes in reporting	About this Report
102-50	Reporting period	January 1, 2022- December 31, 2022

102-51	Date of most recent report (if any)	July 21, 2022
102-52	Reporting cycle	Annual
102-53	Contact	sustainability@firstsolar.com
102-54	“In accordance” option	Core
102-55	GRI Content Index	GRI Content Index
102-56	External assurance	About this Report

Material Topic	GRI Standards	Description	Cross-reference	NSF 457 Standard
Economic Performance	201-01	Direct economic value generated and distributed	Annual report and 10K	
Economic Performance	201-02	Risks and opportunities due to climate change	CDP Climate Change Response	
Procurement Practices	204-01	Proportion of spending on local suppliers	Supply Chain Overview	
Materials	301-02	Recycled input materials used	KPI Chart; Design for Sustainability	Required
Energy	302-01	Energy consumption within the organization	KPI Chart: Energy data is based on electricity bills. Solar generation is estimated based on size of the PV installations at our production sites in Ohio and Malaysia and at our recycling facility in Frankfurt Oder, Germany. Conversion factors from WRI GHG protocol. Heating, steam and cooling from non-renewable and renewable sources are not applicable, and fuel from renewable sources are not applicable. Electricity, heating, cooling, and steam was not sold.	Required
Energy	302-03	Energy intensity	KPI Chart; Environmental metrics	Required
Energy	302-04	Reduction of energy consumption	CDP Climate Change Response	Optional
Water	303-3	Total water withdrawal	KPI Chart: All water withdrawals came from local municipal suppliers (third-party/freshwater). Data is based on water bills. In 2022, 0.02% of our water withdrawals came from water stressed areas, compared to 0.01% in 2021. We used the WWF Risk Filter Tool and defined stressed areas as having baseline water stress that is equal to/greater than 'High': 40-80%. In 2021 and 2022, our Mesa, Arizona test site was the only one classed as water stressed. For information on our water management approach, please see our CDP water response.	Required
Water		Percentage of water recycled and reused	KPI Chart; Environmental metrics; CDP Water response	Optional
Effluents	303-04	Total water discharge by quality and destination	CDP Water response	
Emissions	305-01 & 305-02	Direct and indirect GHG emissions (Scope 1 and Scope)	KPI Chart; Environmental metrics: Data includes all greenhouse gases. Calculations are based on published criteria, such as emission factors and Global Warming Potential (GWP) rates from WRI GHG protocol and IPCC Fifth Assessment Report (AR5 – 100 year), respectively. For comparison purposes, the base year scope 1 and scope 2 emissions in 2008 were 1,020 MT CO ₂ eq and 123,046 MT CO ₂ eq respectively. The 2008 base year is the earliest year when First Solar international facilities started operating. Biogenic emissions are not applicable. Consolidation approach is based on equity share.	Required

Emissions	305-04	GHG emissions intensity	KPI Chart; Environmental metrics	
Emissions	305-05	Reduction of GHG emissions	KPI Chart; Environmental metrics	Optional
Waste	306-03, 306-04, 306-05	Waste generated	KPI Chart; Environmental metrics: Data includes waste disposed (landfill or incineration) and recycled by type (hazardous or non-hazardous).	Optional
Waste	306-04	Waste diverted from disposal	KPI Chart; Environmental metrics	Optional
Emissions	306-05	Waste directed to disposal	KPI Chart; Environmental metrics: Approximately 43% of waste disposed (~3,273 metric tons) in 2022 and 48% (~4,370 metric tons) in 2021 was incinerated and the rest was sent to landfill. Waste disposal method is determined based on information provided by the waste disposal contractor.	Optional
Environmental Compliance	307-01	Non-compliance with environmental laws and regulations	In 2022, we received a Notice of Violation in Ohio for having an open drum of hazardous waste. The issue was fixed immediately by putting a cap on the drum.	Required
Supplier Environmental Assessment	308-01	New suppliers that were screened using environmental criteria	Supply Chain Overview	Optional
Supplier Environmental Assessment	308-02	Negative environmental impacts in the supply chain and actions taken	Supply Chain Overview	Optional
Occupational Health and Safety	403-01	Workers representation in formal joint management-worker health and safety committees	Occupational Health and Safety	Optional
Occupational Health and Safety	403-09	Work-related injuries	Occupational Health and Safety	Required
Supplier Social Assessment	414-01	New suppliers that were screened using social criteria	Occupational Health and Safety	Optional
Supplier Social Assessment	414-02	Negative social impacts in the supply chain and actions taken	Supply Chain Overview	Optional



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