Welcome to your CDP Water Security Questionnaire 2023

W0. Introduction

W0.1

(W0.1) Give a general description of and introduction to your organization.

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 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. Our vision is to lead the world's sustainable energy future and our mission is to provide cost-advantaged solar technology through innovation, customer engagement, industry leadership, and operational excellence.

First Solar's proven solar solutions diversify the energy portfolio and reduce the risk of fuel-price volatility while delivering a levelized cost of electricity (LCOE) that is cost competitive with fossil fuels today. First Solar has set the benchmark for environmentally responsible product life cycle management by introducing the industry's first global and comprehensive recycling program for solar modules. We are committed to minimizing the environmental impacts and enhancing the social and economic benefits of our products and projects across their life cycle, from raw material sourcing through product end-of-life. For more information about First Solar, please visit www.firstsolar.com

First Solar was founded in 1999 and began commercial production in 2002. Since 2002 and through 2022, we have sold approximately 50 gigawatts (GW) of PV solar modules and have an additional backlog of ~70 GW. Assuming average worldwide irradiance and grid electricity emissions, our products will be used to displace 78 million metric tons of CO2e per year during their 30+ year product life. This is equivalent to powering more than 60 million average homes, planting 1.3 billion trees and saving over 225 billion liters of water (or 90,000 Olympic swimming pools) per year based on worldwide averages. Every year, First Solar products are

displacing more than 10 times the amount of greenhouse gas emissions we emit through our global operations and supply chain.

W0.2

(W0.2) State the start and end date of the year for which you are reporting data.

	Start date	End date
Reporting year	January 1, 2022	December 31, 2022

W0.3

(W0.3) Select the countries/areas in which you operate.

Germany
Malaysia
United States of America
Viet Nam

W0.4

(W0.4) Select the currency used for all financial information disclosed throughout your response.

USD

W0.5

(W0.5) Select the option that best describes the reporting boundary for companies, entities, or groups for which water impacts on your business are being reported.

Other, please specify
Global manufacturing, recycling and R&D

W0.6

(W0.6) Within this boundary, are there any geographies, facilities, water aspects, or other exclusions from your disclosure?

No

W0.7

(W0.7) Does your organization have an ISIN code or another unique identifier (e.g., Ticker, CUSIP, etc.)?

Indicate whether you are able to provide a unique identifier for your organization.	Provide your unique identifier
Yes, a Ticker symbol	FSLR

W1. Current state

W1.1

(W1.1) Rate the importance (current and future) of water quality and water quantity to the success of your business.

	Direct use importance rating	Indirect use importance rating	Please explain
Sufficient amounts of good quality freshwater available for use	Vital	Important	Water quality is vital for our operations (direct use) as our thin film solar photovoltaic manufacturing process relies on ultra-pure water production. As we expand our manufacturing footprint, dependency on freshwater availability will increase. The indirect use of water is important as our supply chain relies on sufficient amounts of water to be available for use. However, by switching to less water-intensive electricity generation, this dependence could be reduced. First Solar conducted a lifecycle water assessment of our thin film PV technology which concluded that the life cycle water withdrawal of cadmium telluride (CdTe) PV ranges from approximately 382– 425 L/MWh. (Source: Sinha, Meader and de Wild-Scholten, Life Cycle Water Usage in CdTe Photovoltaics, IEEE, Journal of Photovoltaics, 2012) Direct onsite water use represents only ~12% of CdTe PV's lifecycle water withdrawal. The remainder is related to indirect water withdrawal from the use of grid electricity and raw materials throughout the product life cycle. Primary contributors to life cycle water withdrawal in our supply chain include the use of grid electricity, glass, steel and copper production, chemical use, and transport during take-back and recycling. Future water dependency is expected to increase as we increase production and add new solar module manufacturing facilities. As of December 31, 2022, we had 9.8 GWDC of total installed nameplate module production capacity across all our facilities. We are in the process of expanding our manufacturing nameplate capacity to reach approximately 14 GW in the US and 25 GW globally in 2026.

Sufficient amounts of recycled, brackish and/or produced water available for use	Vital	Important	Although our direct and indirect operations do not currently depend on having sufficient amounts of brackish or produced water, we are currently constructing our first manufacturing facility in India which will rely entirely on Tertiary Treated Reverse Osmosis water supply from the city's sewage treatment plant in Chennai. Our operations in India will have zero wastewater discharge. Instead the wastewater will be recycled and reused in our operations. First Solar recycling plants are also designed to generate zero wastewater discharge. This will enable us to operate mobile recycling plants in water scarce regions in the future and in areas where water utilities or wastewater treatment facilities are not available. Our direct and indirect dependency on brackish or produced water availability is expected to increase in 2023 when our manufacturing plant in India becomes operational. First Solar implements water conservation and recycling initiatives at our manufacturing facilities to reduce our absolute water withdrawals. In 2022, we recycled more than 169 million liters of water, equivalent to approximately 5% of our absolute water use. Recycling water will remain vital as our manufacturing footprint and water demand increases. We are in the process of expanding our manufacturing capacity to reach approximately 25 GW by 2026. Our supply chain does not currently rely on recycled, brackish or produced water however this is expected to change as we begin working with more suppliers in India which is why the "important" rating was selected.

W1.2

(W1.2) Across all your operations, what proportion of the following water aspects are regularly measured and monitored?

	% of sites/facilities/operations	Frequency of measurement	Method of measurement	Please explain
Water withdrawals – total volumes	100%	Monthly	We measure water withdrawals on a monthly basis using water	We measure and monitor 100% of our total withdrawals from our manufacturing, recycling, and

			meters and/or water utility bills.	research and development facilities on a monthly basis based on water meters and/or water utility bills. Our property manager estimates water usage at the Mesa testing facility based on square footage since water bills are not broken down by tenants. Our Mesa test site accounts for less than 1% of our total water withdrawals.
Water withdrawals – volumes by source	100%	Monthly	We measure water withdrawals by source on a monthly basis using water meters/or water utility bills.	We regularly monitor and measure 100% of the total water withdrawals of our manufacturing, recycling, and research and development facilities based on monthly water utility bills. All withdrawals come from the local municipal supplier (third-party/ freshwater).
Water withdrawals quality	100%	Monthly	We measure the water quality using the vendor testing results on a monthly basis. In Malaysia, we send our samples to a third-party accredited laboratory for	We regularly monitor and measure 100% of our water quality by standard parameters as well as for heavy metals. First Solar factories are equipped with state-of-the-art analytical capabilities for in-

			analysis, yearly and/or as often as needed.	house wastewater testing.
Water discharges – total volumes	100%	Continuously	We measure water discharges by total volumes continuously using water meters. The destination of the wastewater is known for all sites.	We regularly monitor and measure 100% of the water discharges of our manufacturing, recycling, and research and development facilities.
Water discharges – volumes by destination	100%	Continuously	We measure water discharge volumes by destination continuously using water meters.	We regularly monitor and measure 100% of the water discharges by destination of our manufacturing, recycling, and research and development facilities. In 2022, 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).
Water discharges – volumes by treatment method	100%	Continuously	We measure water discharges by treatment method continuously using water meters.	We regularly monitor and measure 100% of our total water discharge volumes by treatment method. 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.
Water discharge quality – by standard effluent parameters	100%	Continuously	We measure our water discharge quality by standard effluent parameters continuously though our in-house lab/ or weekly through a third-party party accredited laboratory.	We regularly monitor and measure 100% of our water discharge quality by standard effluent parameters as well as for heavy metals from our manufacturing sites which represent 99.9% of our total wastewater discharge in 2022. First Solar factories are equipped with state-of-the-art analytical capabilities for in-house wastewater testing.
Water discharge quality – emissions to water (nitrates, phosphates, pesticides, and/or other priority substances)	100%	Continuously	We measure our water discharge quality for any emissions to water continuously though our in-house lab/ or weekly through a third-party party accredited laboratory.	We regularly monitor and measure 100% of our water discharge quality by standard effluent parameters as well as for heavy metals from our manufacturing sites which represent 99.9% of our total wastewater discharge in 2022. First Solar factories are equipped with state-of-the-art analytical capabilities for in-

				house wastewater testing.
Water discharge quality – temperature	Not relevant			We do not have any high temperature inducing processes in wastewater. This is not anticipated to change or be relevant in the future. However, we still monitor our water discharge quality for temperature on a weekly basis through a third-party accredited laboratory.
Water consumption – total volume	100%	Continuously	We measure our water consumption volumes continuously using water meters.	Approximately 56% of our total water withdrawals (~3,149megaliters) was consumed during operation and used for irrigation, cooling towers, sanitary purposes, or recycled in 2022. We are able to estimate water consumption by subtracting total water discharges from total water withdrawals: 3,149 megaliters-1,373 megaliters= 1,776 megaliters consumed.
Water recycled/reused	100%	Continuously	We measure our recycled/reused water continuously using water meters.	We measure the amount of water recycled at our manufacturing and recycling facilities in Malaysia, Ohio,

				Vietnam and Germany, which represented 99.9% of our water withdrawals in 2022. We recycled approximately 169 megaliters (or approximately 5% of our total water withdrawals) across our operations in 2022.
The provision of fully-functioning, safely managed WASH services to all workers	100%	Continuously	Our drinking water dispensers are quality-tested and maintained by a third-party.	100% of our facilities provide fully functioning, safely managed WASH services to all workers. Our total water withdrawal data includes sanitary water use at our manufacturing and recycling facilities.

W1.2b

(W1.2b) What are the total volumes of water withdrawn, discharged, and consumed across all your operations, how do they compare to the previous reporting year, and how are they forecasted to change?

	Volume (megaliters/year)	Comparison with previous reporting year	Primary reason for comparison with previous reporting year	Five-year forecast	Primary reason for forecast	Please explain
Total withdrawals	3,149	Lower	Increase/decrease in efficiency	Lower	Investment in water-smart technology/process	While our production increased by nearly 15% in 2022, our absolute water withdrawals decreased

						by approximately 7% due to the increased throughput and water efficiency of our Series 6 manufacturing process as well as water recycling initiatives. Our threshold for "lower" is defined as any decrease up to 20%. Total water withdrawals are expected to increase in 2023 due to increased production and the addition of new manufacturing facilities.
Total discharges	1,373	Lower	Investment in water-smart technology/process	Lower	Investment in water-smart technology/process	In 2022, our wastewater discharges decreased by approximately 16% due to a 7% reduction in absolute water withdrawals as well as

						the implementation of water conservation and recycling projects in our manufacturing and recycling operations. First Solar recycling plants are designed to generate zero wastewater discharge. Our threshold for "lower" is defined as any decrease up to 20%. Total water discharges are expected to increase in 2023 due to increased production.
Total consumption	1,776	About the same	Increase/decrease in business activity	Higher	Increase/decrease in business activity	Total water consumption remained about the same in 2022 with a slight increase from 1,763 megaliters in 2021 to 1,776 megaliters in

						2022. Total water consumption is expected to increase over the next five years due to increased production and the addition of new manufacturing facilities. As of December 31, 2022, we had 9.8 GW of total installed nameplate module production capacity across all our facilities. We are in the process of expanding our manufacturing nameplate capacity to reach approximately 14 GW in the US and 25 GW globally in 2026. Total water consumption is based on a company-wide

						calculation using withdrawals minus discharges: 3,149 megaliters-1,373 megaliters= 1,776 megaliters consumed.

W1.2d

(W1.2d) Indicate whether water is withdrawn from areas with water stress, provide the proportion, how it compares with the previous reporting year, and how it is forecasted to change.

	Withdrawals are from areas with water stress	% withdrawn from areas with water stress	Comparison with previous reporting year	Primary reason for comparison with previous reporting year	Five-year forecast	Primary reason for forecast	Identification tool	Please explain
Row 1	Yes	Less than 1%	Much higher	Change in accounting methodology	About the same	Investment in water-smart technology/process	WWF Water Risk Filter	In 2022, 0.02% of our water withdrawals came from water stressed areas, compared to 0.03% 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 2022 and 2021, our Mesa, Arizona test site was the only one classed as water stressed. Water withdrawals at our Mesa facility were much higher (approximately 2.5X) in 2022 due to a change in accounting methodology. Our threshold for "much higher" is defined as any increase of more than 20%. Water withdrawals for the Mesa facility are now estimated by the building management company based on

								the size of our office footprint. Our water withdrawal volumes in Mesa are not expected to change significantly in the next five years. Although 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. Since the water for this facility will not be derived from fresh surface water or ground water sources, selected "about the same". We evaluate the percentage of sites operating in water stressed areas

								based on the baseline water stress of our site locations.

W1.2h

(W1.2h) Provide total water withdrawal data by source.

	Relevance	Volume (megaliters/year)	Comparison with previous reporting year	Primary reason for comparison with previous reporting year	Please explain
Fresh surface water, including rainwater, water from wetlands, rivers, and lakes	Not relevant				Not relevant. All withdrawals come from local municipal suppliers (third-party/freshwater). No change from last year. No changes are expected in the future.
Brackish surface water/Seawater	Not relevant				Not relevant. All withdrawals come from local municipal suppliers (third-party/freshwater). No change from last year. No changes are expected in the future.
Groundwater – renewable	Not relevant				Not relevant. All withdrawals come from local municipal suppliers (third-party/freshwater). No change

					from last year. No changes are expected in the future.
Groundwater – non-renewable	Not relevant				Not relevant. All withdrawals come from local municipal suppliers (third-party/freshwater). No change from last year. No changes are expected in the future.
Produced/Entrained water	Not relevant				Not relevant. All withdrawals come from local municipal suppliers (third-party/freshwater). No change from last year. No changes are expected in the future.
Third party sources	Relevant	3,149	Lower	Investment in water-smart technology/process	All withdrawals for our manufacturing, recycling and research and development sites come from local municipal suppliers (third-party/freshwater). Our water withdrawals decreased by 7.15% from 3,392 megaliters in 2021 to 3,149 megaliters in 2022. While our production

					increased by nearly 14% in 2022, our absolute water withdrawals decreased by approximately 7% due to the enhanced throughput and water efficiency of our Series 6 manufacturing process as well as water recycling initiatives. Our threshold for "lower" is defined as any decrease up to 20%. Total water withdrawals are expected to increase in 2023 due to increased production. During 2023, we expect to produce between 11.7 GW and 12.1 GW. Our water withdrawals will continue to come from third-party sources in the future including Tertiary Treated water from the city sewage treatment plant in India and municipal

					suppliers (freshwater) for the rest of our sites.

W1.2i

(W1.2i) Provide total water discharge data by destination.

	Relevance	Volume (megaliters/year)	Comparison with previous reporting year	Primary reason for comparison with previous reporting year	Please explain
Fresh surface water	Relevant	419	Lower	Increase/decrease in efficiency	Total water discharges to fresh surface water (river) amounted to approximately 419 megaliters in 2022, which is 2% lower than in 2021 (429 megaliters). This was due to increased production from the addition of our second Series 6 factory in Malaysia. Our threshold for "lower" is defined as any decrease up to 20%. Total water discharges to fresh surface water are expected to be higher in 2023 due to the expansion in our production capacity. During 2023, we expect to produce

					between 11.7 GW and 12.1 GW.
Brackish surface water/seawater	Not relevant				On-site treated industrial wastewater is either indirectly discharged to sanitary sewer in the United States and Vietnam, or directly discharged to river in Malaysia. Our operations do not discharge wastewater to brackish surface water or seawater. No change from 2021 and no change is expected in the future.
Groundwater	Not relevant				On-site treated industrial wastewater is either indirectly discharged to sanitary sewer in the United States and Vietnam, or directly discharged to river in Malaysia. Our operations do not discharge wastewater to brackish surface water or seawater. No change from 2021 and no change is

					expected in the future.
Third-party destinations	Relevant	954	Lower	Increase/decrease in efficiency	Total water discharges to third-party destinations (municipal wastewater facility) amounted to 954 megaliters in 2022, which was a 20% decrease from 2021 (1,200 megaliters). The decrease in 2022 was due to a 7% reduction in our absolute water withdrawal and the implementation of water conservation and recycling projects. Our threshold for "lower" is defined as any decrease up to 20%. We expect wastewater discharges to third-party destinations to be higher in 2023 due to the expansion in our production capacity. During 2023, we expect to produce between 11.7 GW and 12.1 GW.

W1.2j

(W1.2j) Within your direct operations, indicate the highest level(s) to which you treat your discharge.

	Relevance of treatment level to discharge	Volume (megaliters/year)	Comparison of treated volume with previous reporting year	Primary reason for comparison with previous reporting year	% of your sites/facilities/operations this volume applies to	Please explain
Tertiary treatment	Relevant	1,373	Lower	Increase/decrease in efficiency	100%	100% of our wastewater goes through tertiary treatment. We treat 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 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, it is sent for re-treatment internally. The amount of wastewater treated in 2022 was approximately 16% lower than in 2021 due to a 7% decrease in absolute water withdrawal and a 16% decrease

						in wastewater discharge. Our threshold for "lower" is defined as any decrease up to 20%. We expect the amount of wastewater we treat to be higher in 2023 and beyond as our wastewater generation increases due to our growing production capacity. During 2023, we expect to produce between 11.7 GW and 12.1 GW.
Secondary treatment	Not relevant					100% of our wastewater goes through tertiary treatment.
Primary treatment only	Not relevant					100% of our wastewater goes

						through tertiary treatment.
Discharge to the natural environment without treatment	Not relevant					100% of our wastewater goes through tertiary treatment. No industrial wastewater leaves our site unless we have tested and approved it for discharge.
Discharge to a third party without treatment	Not relevant					100% of our wastewater goes through tertiary treatment. 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. We expect the amount of wastewater we treat to be higher in 2023 and beyond as our wastewater generation increases due to our growing production capacity. During 2023, we

						expect to produce between 11.7 GW and 12.1 GW.
Other	Not relevant					100% of our wastewater goes through tertiary treatment.

W1.2k

(W1.2k) Provide details of your organization's emissions of nitrates, phosphates, pesticides, and other priority substances to water in the reporting year.

	Emissions to water in the reporting year (metric tonnes)	Category(ies) of substances included	List the specific substances included	Please explain
Row 1	0.01	Priority substances listed under the EU Water Framework Directive	Cadmium	Wastewater is treated on-site and tested to confirm compliance to permit limits before discharging. First Solar's wastewater treatment process flow includes operations like metals precipitation, filtration and ion exchange polishing. A continuous checking is performed of the Cd content in the water before it is approved for discharge. If the wastewater is out of specifications, it is re-circulated through the wastewater treatment system. These processes reduce Cd levels in wastewater at all First Solar manufacturing facilities. 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.

W1.3

(W1.3) Provide a figure for your organization's total water withdrawal efficiency.

	Revenue	Total water withdrawal volume (megaliters)	Total water withdrawal efficiency	Anticipated forward trend
Row 1	2,619,319,000	3,149	831,793.902826294	Our total water withdrawal efficiency is expected to improve in 2023 with increased throughput and manufacturing efficiency improvements.

W1.4

(W1.4) Do any of your products contain substances classified as hazardous by a regulatory authority?

	Products contain hazardous substances
Row 1	Yes

W1.4a

(W1.4a) What percentage of your company's revenue is associated with products containing substances classified as hazardous by a regulatory authority?

Regulatory classification of hazardous substances	% of revenue associated with products containing substances in this list	Please explain
Other, please specify GHS Classification	More than 80%	Our solar modules contain CdTe and other semiconductor materials. Elemental cadmium and certain of its compounds are regulated as hazardous materials due to the adverse health effects that may arise from human exposure. Based on existing research, the risks of exposure to CdTe are not believed to be as serious as those relating to exposure to elemental cadmium due to CdTe's limited bioavailability. As of 2022, over 100% of our revenue is associated with products containing CdTe. 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.

W1.5

(W1.5) Do you engage with your value chain on water-related issues?

	Engagement
Suppliers	Yes
Other value chain partners (e.g., customers)	Yes

W1.5a

(W1.5a) Do you assess your suppliers according to their impact on water security?

Row 1

Assessment of supplier impact

Yes, we assess the impact of our suppliers

Considered in assessment

Basin status (e.g., water stress or access to WASH services)
Procurement spend

Number of suppliers identified as having a substantive impact

24

% of total suppliers identified as having a substantive impact

1-25

Please explain

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 indices on global slavery, forced labor and other environmental, social, governance (ESG) aspects to identify high-risk suppliers based on industry, geography and spend. The water-related aspects evaluated as part of the environmental assessment are based on indices relating to flood risk, water stress, wastewater management, and drinking water and sanitation. These factors are included in the overall environmental score of the risk assessment. The threshold for substantive impact on water security is a high spend supplier with a "high" or "extremely high" score on the World Resources Institute's Water Stress Index.

W1.5b

(W1.5b) Do your suppliers have to meet water-related requirements as part of your organization’s purchasing process?

	Suppliers have to meet specific water-related requirements

Row 1	Yes, water-related requirements are included in our supplier contracts

W1.5c

(W1.5c) Provide details of the water-related requirements that suppliers have to meet as part of your organization's purchasing process, and the compliance measures in place.

Water-related requirement

Providing fully-functioning, safely managed WASH services to all workers

% of suppliers with a substantive impact required to comply with this water-related requirement

100%

% of suppliers with a substantive impact in compliance with this water-related requirement

100%

Mechanisms for monitoring compliance with this water-related requirement

Grievance mechanism/Whistleblowing hotline
On-site third-party audit
Supplier self-assessment
Supplier scorecard or rating

Response to supplier non-compliance with this water-related requirement

Retain and engage

Comment

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. The RBA code of conduct includes water-related criteria including providing workers with ready access to clean toilet facilities, potable water and sanitary food preparation, water conservation and monitoring, and wastewater management.

W1.5d

(W1.5d) Provide details of any other water-related supplier engagement activity.

Type of engagement

Information collection

Details of engagement

Collect water management information at least annually from suppliers

Collect WASH information at least annually from suppliers

Other, please specify

Requirement to adhere to our code of conduct regarding water stewardship and management.

% of suppliers by number

1-25

% of suppliers with a substantive impact

100%

Rationale for your engagement

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. The RBA code of conduct includes climate-related criteria including air emissions management, energy and GHG emissions reduction, and water management among other topics.

Impact of the engagement and measures of success

The impact of the engagement is to drive awareness of First Solar's environmental, health and safety (EHS) requirements and conformance with the RBA code of conduct. Verification is conducted through onsite audits and self-assessments. Measures of success include overall low risk scores on audits and supplier improvements such as creating or improving recycling programs, EHS objectives and targets. First Solar works with suppliers to drive supplier improvement in Quality and EHS including water-related performance e.g. by setting targets or improving wastewater management.

Comment

W1.5e

(W1.5e) Provide details of any water-related engagement activity with customers or other value chain partners.

Type of stakeholder

Customers

Type of engagement

Education / information sharing

Details of engagement

Share information about your products and relevant certification schemes

Rationale for your engagement

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. 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 water footprint advantage is included in our sustainability collateral and presentations to customers to help raise awareness about the sustainability advantage of our products. Customers with their own sustainability goals are particularly interested in understanding how much carbon a First Solar PV plant displaces as well as how much water is saved by avoiding the use of grid electricity. The wholesale commercial and industrial market continues to represent a promising opportunity for the widespread adoption of PV solar technology as corporations undertake certain sustainability commitments.

Impact of the engagement and measures of success

Success is measured in terms of customer interest in the environmental attributes of our technology, the inclusion of water or carbon footprint questions in RFPs, and megawatts (MW) sold. Other measures of success include raising awareness about EPEAT, a globally recognized and independently validated ecolabel for sustainable electronics which 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.

Type of stakeholder

Investors & shareholders

Type of engagement

Education / information sharing

Details of engagement

Run an engagement campaign to educate stakeholders about your water-related performance and strategy

Rationale for your engagement

First Solar engages with investors and shareholders on ESG topics through engagement calls, surveys and our annual sustainability report to provide updates on our ESG performance. This includes improvements in the water footprint of our products, water recycling initiatives and manufacturing water intensity reductions.

Impact of the engagement and measures of success

Success is measured in terms of investor interest in the environmental attributes of our technology and First Solar's ESG performance. Other measures of success include raising awareness about EPEAT, a globally recognized and independently validated ecolabel for sustainable electronics which 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.

W2. Business impacts

W2.1

(W2.1) Has your organization experienced any detrimental water-related impacts?

No

W2.2

(W2.2) In the reporting year, was your organization subject to any fines, enforcement orders, and/or other penalties for water-related regulatory violations?

	Water-related regulatory violations	Comment
Row 1	No	

W3. Procedures

W3.1

(W3.1) Does your organization identify and classify potential water pollutants associated with its activities that could have a detrimental impact on water ecosystems or human health?

	Identification and classification of potential water pollutants	How potential water pollutants are identified and classified
Row 1	Yes, we identify and classify our potential water pollutants	We identify and classify water pollutants based on permit limits. 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.

W3.1a

(W3.1a) Describe how your organization minimizes the adverse impacts of potential water pollutants on water ecosystems or human health associated with your activities.

Water pollutant category

Inorganic pollutants

Description of water pollutant and potential impacts

We identify and classify water pollutants based on permit limits. We test wastewater for the presence of metals such as cadmium, copper, and iron. 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.

Value chain stage

Direct operations

Actions and procedures to minimize adverse impacts

Beyond compliance with regulatory requirements
Industrial and chemical accidents prevention, preparedness, and response
Water recycling
Upgrading of process equipment/methods

Please explain

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.

Water pollutant category

Other nutrients and oxygen demanding pollutants

Description of water pollutant and potential impacts

We identify and classify water pollutants based on permit limits. We test wastewater for Chemical Oxygen Demand and Total Suspended Solids at all our manufacturing facilities. We also test for Biological Oxygen Demand in Malaysia where treated wastewater is directly discharged to 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.

Value chain stage

Direct operations

Actions and procedures to minimize adverse impacts

Beyond compliance with regulatory requirements

Please explain

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.

W3.3

(W3.3) Does your organization undertake a water-related risk assessment?

Yes, water-related risks are assessed

W3.3a

(W3.3a) Select the options that best describe your procedures for identifying and assessing water-related risks.

Value chain stage

Direct operations
Supply chain

Coverage

Full

Risk assessment procedure

Water risks are assessed as part of an established enterprise risk management framework

Frequency of assessment

More than once a year

How far into the future are risks considered?

3 to 6 years

Type of tools and methods used

Tools on the market
Enterprise risk management

Tools and methods used

RBA Country Risk Assessment Tool
WWF Water Risk Filter
Enterprise Risk Management
Other, please specify
Life cycle assessment

Contextual issues considered

Water availability at a basin/catchment level
Implications of water on your key commodities/raw materials
Water regulatory frameworks
Access to fully-functioning, safely managed WASH services for all employees

Stakeholders considered

Customers
Employees
Investors
Local communities
NGOs
Regulators
Suppliers
Water utilities at a local level

Comment

Value chain stage

Direct operations
Supply chain
Product use phase

Coverage

Full

Risk assessment procedure

Water risks are assessed in an environmental risk assessment

Frequency of assessment

Not defined

How far into the future are risks considered?

Up to 1 year

Type of tools and methods used

International methodologies and standards

Tools and methods used

Life Cycle Assessment

Contextual issues considered

Water availability at a basin/catchment level
Water quality at a basin/catchment level
Impact on human health
Implications of water on your key commodities/raw materials
Status of ecosystems and habitats

Stakeholders considered

Customers
Investors
NGOs
Regulators
Suppliers

Comment

W3.3b

(W3.3b) Describe your organization's process for identifying, assessing, and responding to water-related risks within your direct operations and other stages of your value chain.

	Rationale for approach to risk assessment	Explanation of contextual issues considered	Explanation of stakeholders considered	Decision-making process for risk response
Row 1	As part of its Enterprise Risk Management approach, First Solar has identified various risk areas across the company with specific risk owners and risk domains. The risk owners review risk scorecards for each risk area on a semi-annual basis with certain members of the executive leadership team including the Chief Executive Officer (CEO). The risk scorecards capture the company leadership's view of enterprise risks and risk trends over an up to 3-5 years horizon. Medium-term and long- term risks may be identified where relevant.	Sufficient water availability is taken into account when siting new manufacturing facilities as our manufacturing process relies on ultrapure water production. Our manufacturing risk scorecards assess potential risks to water availability at our current manufacturing sites. The WWF water risk filter tool is used to assess water stress levels of countries where our manufacturing, recycling and Research and Development facilities are located. Water-related regulatory frameworks are included in our enterprise risk management process.	First Solar's ERM process leverages existing functional operating systems and embedded risk management activities to manage risks within each domain. A cross-functional ESG taskforce, consisting of ESG focus leaders and other internal experts, is responsible for identifying strategic ESG (including water) risks and opportunities, gaps and challenges, anticipating ESG trends that could impact the company, and proposing new ESG policies, practices, targets, metrics and disclosures.	Enterprise risks are grouped by Perceived Organizational Priority (Priority 1, 2 and 3). Priority 1 risks are defined as having potential for significant negative consequences to the business, e.g. disruptions to production which result in loss of sales, loss of market share and/or reputational damage. Our facility risk scorecards assess water risks to our manufacturing facilities in the context of operational and/or business continuity on an annual or more frequent basis. Potential asset-level water risks include natural disasters,

	Enterprise-impacting, emerging, transient and cross-functional risks are assessed on their trend and risk priority, which considers mitigation efforts. Key risk domains include but are not limited to regulatory, operational, financial, reputational, market, technology, supply chain, organizational adaptability, and environmental, social governance (ESG) risks. First Solar conducts an annual risk assessment of its suppliers leveraging third-party tools such as the RBA country risk assessment to identify high-risk suppliers based on industry, geography and spend. We conduct life cycle assessments on our products in accordance with the Environmental Product Declaration standard (EN 15804) which is third-party validated.	We are subject to various federal, state, local, and international laws and regulations relating to the protection of the environment, including those governing the discharge of pollutants into water. We believe we are currently in substantial compliance with applicable environmental and do not expect to incur material expenditures for environmental controls in the foreseeable future. First Solar provides access to fully functioning WASH services for all our associates. Hygienic conditions and a safe water supply is a requirement at all First Solar sites. Access to reliable utility water supply is included in our facility risk scorecards. First Solar conducted a life cycle assessment to understand the water impacts of our commodities and raw materials considering water resource depletion, freshwater ecotoxicity, marine and freshwater euthrophication to measure water dependence in supply	Our ESG materiality materiality assessment considers various stakeholders including customers, suppliers, employees, local communities, NGOs such as the Global Electronics Council which manages the EPEAT ecolabel for solar. Socially responsible investors are interested in understanding our water risks and management strategy. First Solar's ESG focus leaders help advance the company's approach to Responsible Solar by driving progress on key strategic ESG areas. The Energy, Emissions & Resource Efficiency working group review water consumption patterns down to the unit-operation level in our manufacturing process, implement water reduction and recycling projects and set water targets. The ESG Steering Committee, consisting of the Executive Leadership Team, meets on a quarterly basis to review ESG	utility supply and supply chain disruption, as well as the inability to operate wastewater treatment plant or ultra-pure water production. The level of coverage selected is prioritized according to a facility or supplier's ability to impact operations and business continuity. The WWF Water Risk Filter Tool is used to assess the baseline water stress levels of countries where our manufacturing, recycling and Research and Development facilities are located and potential future manufacturing locations. Our first manufacturing facility in 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. To drive down our product water footprint, we focus on LCA water withdrawal hotspots: embodied water in grid electricity as well as water intensive product

		chain, local water impacts, and water scarcity impacts.	progress and capitalize on water-related and other ESG opportunities. LCAs on our products are conducted for various stakeholders including customers, investors and regulators.	components (glass, steel frame, encapsulant, and junction box).

W4. Risks and opportunities

W4.1

(W4.1) Have you identified any inherent water-related risks with the potential to have a substantive financial or strategic impact on your business?

Yes, both in direct operations and the rest of our value chain

W4.1a

(W4.1a) How does your organization define substantive financial or strategic impact on your business?

Our definition for a substantive financial impact is a major impact on business, strategy, reputation, operational milestones, talent loss, or financial loss e.g. direct loss or opportunity cost of more than $50 million (medium-high impact) to more than $100 million (high impact). Our definition of substantive risk applies to both direct operations and our supply chain.

Natural disasters or disruption to utility water supply that affect a plant's ability to produce and perform process development activities are physical water risks that could generate substantive change to our business. These risks would likely result in us losing some production for a while, until we are able to bring the affected buildings back to production. In this case, substantive risk is defined in terms of its impact on our overall production. Our annual manufacturing capacity has grown from 15 megawatts (MW) in 2002 to 9.8 gigawatts (GW) as of December 31, 2022.

W4.1b

(W4.1b) What is the total number of facilities exposed to water risks with the potential to have a substantive financial or strategic impact on your business, and what proportion of your company-wide facilities does this represent?

	Total number of facilities exposed to water risk	% company-wide facilities this represents	Comment

Row 1	3	26-50	First Solar's PV modules are currently produced at our facilities in Ohio, Malaysia, and Vietnam. These three locations are exposed to water risks with the potential to have a substantive financial impact on our business. First Solar has an additional recycling facility in Germany and two research and development facilities in the U.S. However, water risks at these facilities would not pose a substantive financial impact. Damage to or disruption of our manufacturing facilities could interrupt our business and adversely affect our ability to generate net sales. These three facilities make up a substantial portion of our net sales. Our 2022 nameplate capacity was 2.8 GWDC in Ohio, 3.5 GWDC in Malaysia, and 3.5 GWDC in Vietnam.

W4.1c

(W4.1c) By river basin, what is the number and proportion of facilities exposed to water risks that could have a substantive financial or strategic impact on your business, and what is the potential business impact associated with those facilities?

Country/Area & River basin

United States of America

St. Lawrence

Number of facilities exposed to water risk

1

% company-wide facilities this represents

1-25

% company's total global revenue that could be affected

21-30

Comment

Our facilities in Ohio represented approximately 29% of our 2022 manufacturing capacity. Although we have two manufacturing facilities in Ohio (Perrysburg and Lake Township), they have been aggregated and are referred to as one facility in this response since they share the same river basin.

Country/Area & River basin

Malaysia

Other, please specify

Muda River

Number of facilities exposed to water risk

1

% company-wide facilities this represents

1-25

% company's total global revenue that could be affected

31-40

Comment

Our manufacturing operations in Malaysia represented approximately 36% of our 2022 manufacturing capacity.

Country/Area & River basin

Viet Nam
Saigon

Number of facilities exposed to water risk

1

% company-wide facilities this represents

1-25

% company's total global revenue that could be affected

31-40

Comment

Our manufacturing operations in Vietnam represented approximately 36% of our 2022 manufacturing capacity.

W4.2

(W4.2) Provide details of identified risks in your direct operations with the potential to have a substantive financial or strategic impact on your business, and your response to those risks.

Country/Area & River basin

United States of America
St. Lawrence

Type of risk & Primary risk driver

Acute physical
Flood (coastal, fluvial, pluvial, groundwater)

Primary potential impact

Reduction or disruption in production capacity

Company-specific description

Our manufacturing risk scorecard for Ohio identified natural disasters, such as earthquake, tornado, hurricane, building collapse, and flood, that affects our manufacturing facility's ability to produce as a potential high risk. Any damage to or disruption of our facilities would result in an inability to maintain maximum production levels. Our facilities in Ohio represented approximately 29% of our 2022 manufacturing capacity. In 2022, we produced 9.1 GWDC of solar modules, which represented a 15% increase compared to 2021. Our 2022 nameplate capacity in Ohio was 2.8 GW.

Timeframe

Current up to one year

Magnitude of potential impact

Medium-high

Likelihood

Unlikely

Are you able to provide a potential financial impact figure?

Yes, an estimated range

Potential financial impact figure (currency)

Potential financial impact figure - minimum (currency)

0

Potential financial impact figure - maximum (currency)

67,000,000

Explanation of financial impact

Assuming a contracted module backlog of 61.4 GW for an aggregate transaction price of $17.7 billion as of December 31, 2022, and a nameplate capacity in Ohio of 2.8 GW, the maximum potential revenue impact if our production in Ohio was down for an entire month would be approximately $67 million. Such a worst-case scenario however is unlikely. We would likely lose some production for a while in the event of water-related impacts such as flooding until we are able to bring the affected buildings back into production.

Primary response to risk

Increase geographic diversity of facilities

Description of response

To mitigate the impacts of a natural disaster on our operations in Ohio, we separate our manufacturing capability across several buildings and purchase insurance to cover such losses. We have implemented our management method to reduce and minimize this risk.

Cost of response

3,000,000

Explanation of cost of response

The cost of the response is based on our approximate annual insurance costs in Ohio (~$3 million). These cover us in case there is a natural catastrophe. The increase in our insurance costs compared to 2021 is primarily due to the addition of our third manufacturing facility in Ohio. We have implemented our management method (i.e. separating manufacturing capabilities across several buildings) to reduce and minimize this risk.

Country/Area & River basin

Viet Nam
Saigon

Type of risk & Primary risk driver

Chronic physical
Rationing of municipal water supply

Primary potential impact

Reduction or disruption in production capacity

Company-specific description

A water outage at our utility supplier would disrupt the supply of water to our manufacturing plant in Vietnam, as identified by our manufacturing facility risk scorecard. Disruption to our utility water supply would result in an inability to maintain maximum production levels. Our manufacturing operations in Vietnam represented approximately 36% of our 2022 manufacturing capacity. In 2022, we produced 9.1 GWDC of solar modules, which represented a 15% increase compared to 2021. Our 2022 nameplate capacity in Vietnam was 3.5 GW.

Timeframe

Current up to one year

Magnitude of potential impact

Medium-high

Likelihood

Unlikely

Are you able to provide a potential financial impact figure?

Yes, an estimated range

Potential financial impact figure (currency)

Potential financial impact figure - minimum (currency)

0

Potential financial impact figure - maximum (currency)

84,000,000

Explanation of financial impact

Assuming a contracted module backlog of 61.4 GW for an aggregate transaction price of $17.7 billion as of December 31, 2022, and a nameplate capacity in Vietnam of 3.5 GW, the maximum potential revenue impact would be approximately $84 million assuming the water outage lasted for one month. While we would likely experience some supply disruption in the event of a water outage, it is unlikely to last for more than a month.

Primary response to risk

Secure alternative water supply

Description of response

Our facility in Vietnam has a water storage tank that can supply 8 hours of production. We also identified a secondary source which can supply water in the event of a water outage to help eliminate the risk of disruption to our production.

Cost of response

0

Explanation of cost of response

Cost of response are part of our normal plant operational expenditures and would be a one-off cost.

Country/Area & River basin

Malaysia

Other, please specify

Muda River

Type of risk & Primary risk driver

Chronic physical

Rationing of municipal water supply

Primary potential impact

Closure of operations

Company-specific description

A water outage at our utility supplier would disrupt the supply of water to our manufacturing plant in Malaysia, as identified by our manufacturing facility risk scorecard. Disruption to our utility water supply would result in an inability to maintain maximum production levels. Our manufacturing operations in Malaysia represented approximately 36% of our 2022 manufacturing capacity. In 2022, we produced 9.1 GWDC of solar modules, which represented a 15% increase compared to 2021. Our 2022 nameplate capacity in Malaysia was 3.5 GW.

Timeframe

Current up to one year

Magnitude of potential impact

Medium-high

Likelihood

Unlikely

Are you able to provide a potential financial impact figure?

Yes, an estimated range

Potential financial impact figure (currency)

Potential financial impact figure - minimum (currency)

0

Potential financial impact figure - maximum (currency)

84,000,000

Explanation of financial impact

Assuming a contracted module backlog of 61.4 GW for an aggregate transaction price of $17.7 billion as of December 31, 2022, and a nameplate capacity in Malaysia of 3.5 GW, the maximum potential revenue impact would be approximately $84 million assuming the supply disruption lasted for one month. While we would likely experience some supply disruption in the event of a natural disaster, it is unlikely to last for more than a month. We have had no historical issues with water supply and the water utility's repair cycle times are typically short so our 3 day storage is enough to cover for it.

Primary response to risk

Secure alternative water supply

Description of response

Our facility in Malaysia has a water storage tank that holds 1 day of water supply. We also have a second storage source which can supply water for another 2 days in the event of a water outage. We have had no historical issues with water supply and the water utility's repair cycle times are typically short so our 3 day storage is enough to cover for it and help eliminate the risk.

Cost of response

0

Explanation of cost of response

Cost of response are part of our normal plant operational expenditures and would be a one-off cost.

Country/Area & River basin

Viet Nam

Saigon

Type of risk & Primary risk driver

Acute physical

Flood (coastal, fluvial, pluvial, groundwater)

Primary potential impact

Reduction or disruption in production capacity

Company-specific description

Our manufacturing facility in Vietnam has a high exposure risk to flooding based on the WWF water risk filter tool and the World Resources Institute's Flood Risk Index. Our manufacturing facility risk scorecard has identified flooding at our warehouse's loading bays as a potential risk with a low likelihood because it is being mitigated with the current drainage system that safely carries stormwater away from built-up areas. Our manufacturing operations in Vietnam represented approximately 36% of our 2022 manufacturing capacity. In 2022, we produced 9.1 GWDC of solar modules, which represented a 15% increase compared to 2021. Our 2022 nameplate capacity in Vietnam was 3.5 GW. There is no history of a flood event since the site was built so the potential impact is considered "medium".

Timeframe

Current up to one year

Magnitude of potential impact

Medium

Likelihood

Unlikely

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

84,000,000

Potential financial impact figure - minimum (currency)

Potential financial impact figure - maximum (currency)

Explanation of financial impact

Assuming a contracted module backlog of 61.4 GW for an aggregate transaction price of $17.7 billion as of December 31, 2022, and a nameplate capacity in Vietnam of 3.5 GW, the maximum potential revenue impact would be approximately $84 million assuming the water outage lasted for one month. While we would likely experience some supply disruption in the event of a water outage, it is unlikely to last for more than a month. There is no history of a flood event since the site was built so the potential impact is considered "medium".

Primary response to risk

Improve maintenance of infrastructure

Description of response

We are mitigating the risk with a drainage system that safely carries storm-water away from built-up areas. An ongoing mitigation activity is to ensure the drainage system is in good condition through annual cleaning and maintenance. Our insurance carriers imposes sublimits on the flood coverage of certain locations that are labeled medium or high risk per flood mapping.

Cost of response

1,100,000

Explanation of cost of response

Since the annual cleaning and maintenance of the drainage system is part of our normal operating expenditures, the cost of response are part of our normal plant operational expenditures on an annual basis. The cost of the response is based on our approximate annual insurance costs in Vietnam (~$1.1 million).

W4.2a

(W4.2a) Provide details of risks identified within your value chain (beyond direct operations) with the potential to have a substantive financial or strategic impact on your business, and your response to those risks.

Country/Area & River basin

United States of America
St. Lawrence

Stage of value chain

Supply chain

Type of risk & Primary risk driver

Acute physical
Cyclone, hurricane, typhoon

Primary potential impact

Supply chain disruption

Company-specific description

Our manufacturing risk scorecard for Ohio identified extreme weather which could disrupt material supply to our manufacturing facility as a potential high risk. Any disruption to our supply would result in an inability to maintain maximum production levels. Our facilities in Ohio represented approximately 29% of our 2022 manufacturing capacity.

Timeframe

Current up to one year

Magnitude of potential impact

Medium-high

Likelihood

More likely than not

Are you able to provide a potential financial impact figure?

Yes, an estimated range

Potential financial impact figure (currency)

Potential financial impact figure - minimum (currency)

0

Potential financial impact figure - maximum (currency)

67,000,000

Explanation of financial impact

Assuming a contracted module backlog of 61.4 GW for an aggregate transaction price of $17.7 billion as of December 31, 2022, and a nameplate capacity in Ohio of 2.8 GW, the maximum potential revenue impact if our production in Ohio was down for an entire year would be approximately $67 million assuming the material supply disruption lasted for one month. While we would likely experience some supply disruption in the event of extreme weather impacting one or several of our suppliers, it is unlikely to last for more than a month.

Primary response to risk

Upstream

Increase supplier diversification

Description of response

We have worked on increasing the geographic diversity of our key component suppliers to reduce and minimize this risk.

Cost of response

0

Explanation of cost of response

Cost of response are part of our normal plant operational expenditures and would be a one-off cost.

W4.3

(W4.3) Have you identified any water-related opportunities with the potential to have a substantive financial or strategic impact on your business?

Yes, we have identified opportunities, and some/all are being realized

W4.3a

(W4.3a) Provide details of opportunities currently being realized that could have a substantive financial or strategic impact on your business.

Type of opportunity

Efficiency

Primary water-related opportunity

Water recovery from sewage management

Company-specific description & strategy to realize opportunity

First Solar is reducing water consumption during manufacturing and recycling through the implementation of water conservation and recycling projects. In 2022, we saved approximately 169 million liters of water (equivalent to 5% of our absolute water use) by recycling rejected water from our purification system back into our raw water tank in Malaysia and recycling and reusing wastewater in our recycling process. First Solar recycling plants are designed to generate zero wastewater discharge. Instead, the wastewater is recycled and converted into freshwater, which can then be reused in the recycling process.

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.

Estimated timeframe for realization

Current - up to 1 year

Magnitude of potential financial impact

High

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

980,000,000

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact

By recycling and reusing 169 megaliters of water in 2022, we saved approximately $430,000. As the price of water increases, we expect the financial benefits of water recycling and reduction efforts to increase. The more substantial financial impact is

expected to come from the ability to expand our manufacturing capacity by an additional 3.4 GWDC by constructing our first manufacturing facility in India, which is expected to commence operations in the second half of 2023. We generally price and sell our solar modules on a per watt basis. As of December 31, 2022, we had entered into contracts with customers for the future sale of 61.4 GWDC of solar modules for an aggregate transaction price of $17.7 billion, which we expect to recognize as revenue through 2029 as we transfer control of the modules to the customers. Assuming a contracted module backlog of 61.4 GWDC for an aggregate transaction price of $17.7 billion as of December 31, 2022, and an anticipated nameplate capacity in India of 3.4 GW, the potential annual financial opportunity would amount to up to $980 million.

Type of opportunity

Products and services

Primary water-related opportunity

Increased sales of existing products/services

Company-specific description & strategy to realize opportunity

While energy security and climate change have been important drivers for renewable energy adoption, water security provides an additional driver. The energy-water nexus associated with traditional energy sources is a growing concern particularly in water-stressed regions. Unlike thermal electric power plants and CSP, solar PV does not require any water to generate electricity during operation and is therefore ideally suited to meet the growing energy and water needs of arid, water-limited regions. In addition, First Solar's fully integrated thin film solar module manufacturing process requires less energy, water and semiconductor material than conventional crystalline silicon PV's batch manufacturing process. On a life cycle basis, First Solar's Series 7 thin film modules use nearly 4 times less water than conventional crystalline silicon modules manufactured in carbon-intensive grids such as China. Customers with their own sustainability goals are particularly interested in understanding how much carbon a First Solar PV plant displaces as well as how much water is saved by avoiding the use of grid electricity. With a record 48.3 GW of net bookings in 2022, and an end-of-year backlog of 61.4 GW, we had an excellent year from a commercial perspective. The bookings momentum has continued in 2023, with 113 GW of the total 113 GW bookings opportunities in mid-to-late stage as stated in our Q1 2023 Earnings call. Since the beginning of 2022, large developers such as Intersect Power, Lightsource bp, National Grid, Origis Energy, Savion, Silicon Ranch, and Swift Current, among others, have placed orders of at least 2 GW. As of December 31, 2022, we had entered into contracts with customers for the future sale of 61.4 GW of solar modules for an aggregate transaction price of $17.7 billion, which we expect to recognize as revenue through 2029 as we transfer control of the modules to the customers. As of December 31, 2022, we had 9.8 GWDC of total installed nameplate module production capacity across all our facilities. We are in the process of expanding our manufacturing nameplate capacity to reach approximately 14 GW in the US and 25 GW globally in 2026.

Estimated timeframe for realization

4 to 6 years

Magnitude of potential financial impact

High

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

17,700,000,000

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact

100% of our revenue comes from the sale of clean energy products. As of December 31, 2022, we had entered into contracts with customers for the future sale of 61.4 GWDC of solar modules for an aggregate transaction price of $17.7 billion, which we expect to recognize as revenue through 2029 as we transfer control of the PV modules to the customers.

Type of opportunity

Markets

Primary water-related opportunity

Stronger competitive advantage

Company-specific description & strategy to realize opportunity

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. 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. 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. We are continuously working to drive down the environmental footprint of our modules. Our next generation Series 7 solar modules have 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.

Estimated timeframe for realization

Current - up to 1 year

Magnitude of potential financial impact

High

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

2,400,000,000

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact

100% of our revenue comes from the sale of clean energy products. Our primary segment is our modules business, which involves the design, manufacture, and sale of CdTe solar modules, which convert sunlight into electricity. Third-party customers of our modules segment include developers and operators of systems, utilities, independent power producers, commercial and industrial companies, and other system owners. Net sales from our solar modules business amounted to approximately $2.4 billion in 2022. Net sales from our modules segment increased by $96.9 million in 2022 primarily due to a 20% increase in the volume of watts sold, partially offset by a 13% decrease in the average selling price per watt.

Type of opportunity

Markets

Primary water-related opportunity

Expansion into new markets

Company-specific description & strategy to realize opportunity

India continues to represent one of the largest and fastest growing markets for PV solar energy with an installed generation capacity of approximately 63 GWAC, approximately 30 GWAC of projects under various stages of construction, and over 19 GWAC of new projects being contracted under active procurement programs. In addition, the government has established aggressive renewable energy targets, which include increasing the country's overall renewable energy capacity to 500 GWAC by 2030 and establishing a net-zero carbon emissions target by 2070. Based on these targets, it is projected that the installed solar energy generation capacity will be 350 GWAC by 2030. The government has also announced a series of policy and regulatory measures to incentivize domestic manufacturing of PV solar modules. These targets, policies, and regulatory measures are expected to help create significant and sustained demand for PV solar energy. our modules provide an ecologically leading solution to climate change, energy security, and water scarcity. In addition to these factors, our CdTe solar technology is well suited for the India market given its hot and humid climate conditions. As a result of such market opportunities, we are in the process of expanding our manufacturing capacity by an additional 3.4 GWDC by constructing our first

manufacturing facility in India, which is expected to commence operations in the second half of 2023.

Estimated timeframe for realization

Current - up to 1 year

Magnitude of potential financial impact

High

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

980,000,000

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact

We generally price and sell our solar modules on a per watt basis. As of December 31, 2022, we had entered into contracts with customers for the future sale of 61.4 GWDC of solar modules for an aggregate transaction price of $17.7 billion, which we expect to recognize as revenue through 2029 as we transfer control of the modules to the customers. Assuming a contracted module backlog of 61.4 GWDC for an aggregate transaction price of $17.7 billion as of December 31, 2022, and an anticipated nameplate capacity in India of 3.4 GW, the potential annual financial opportunity would amount to up to $980 million.

W5. Facility-level water accounting

W5.1

(W5.1) For each facility referenced in W4.1c, provide coordinates, water accounting data, and a comparison with the previous reporting year.

Facility reference number

Facility 1

Facility name (optional)

Perrysburg

Country/Area & River basin

United States of America

St. Lawrence

Latitude

41.557058

Longitude

-83.552515

Located in area with water stress

No

Total water withdrawals at this facility (megaliters/year)

811

Comparison of total withdrawals with previous reporting year

About the same

Withdrawals from fresh surface water, including rainwater, water from wetlands, rivers and lakes

0

Withdrawals from brackish surface water/seawater

0

Withdrawals from groundwater - renewable

0

Withdrawals from groundwater - non-renewable

0

Withdrawals from produced/entrained water

0

Withdrawals from third party sources

811

Total water discharges at this facility (megaliters/year)

364

Comparison of total discharges with previous reporting year

Higher

Discharges to fresh surface water

0

Discharges to brackish surface water/seawater

0

Discharges to groundwater

0

Discharges to third party destinations

364

Total water consumption at this facility (megaliters/year)

447

Comparison of total consumption with previous reporting year

Lower

Please explain

As a result of an increase in production, our water discharge increased by 7% in 2022 as compared to 2021. Our threshold for "higher" is for increases of up to 20%. Our total water consumption in 2022 was 4% lower than 2021 as water withdrawals remained about the same (increased by less than 1%) while the wastewater discharged increased by 7% in 2022 as compared to 2021.

Facility reference number

Facility 2

Facility name (optional)

Kulim

Country/Area & River basin

Malaysia

Other, please specify

Muda River

Latitude

5.428624

Longitude

100.572598

Located in area with water stress

No

Total water withdrawals at this facility (megaliters/year)

1,298

Comparison of total withdrawals with previous reporting year

Lower

Withdrawals from fresh surface water, including rainwater, water from wetlands, rivers and lakes

0

Withdrawals from brackish surface water/seawater

0

Withdrawals from groundwater - renewable

0

Withdrawals from groundwater - non-renewable

0

Withdrawals from produced/entrained water

0

Withdrawals from third party sources

1,298

Total water discharges at this facility (megaliters/year)

419

Comparison of total discharges with previous reporting year

Lower

Discharges to fresh surface water

419

Discharges to brackish surface water/seawater

0

Discharges to groundwater

0

Discharges to third party destinations

0

Total water consumption at this facility (megaliters/year)

879

Comparison of total consumption with previous reporting year

Lower

Please explain

Total water discharge decreased in 2022 offsetting the increase in 2021 due to the ramping of a production line in our Malaysian manufacturing facility. While production increased in 2022 relative to 2021, total water withdrawals and consumption decreased due to the increased throughput and efficiency of our Series 6 manufacturing process as well as water recycling initiatives.

Facility reference number

Facility 3

Facility name (optional)

Dong Nam

Country/Area & River basin

Viet Nam
Saigon

Latitude

10.77653

Longitude

106.70098

Located in area with water stress

No

Total water withdrawals at this facility (megaliters/year)

1,036

Comparison of total withdrawals with previous reporting year

Lower

Withdrawals from fresh surface water, including rainwater, water from wetlands, rivers and lakes

0

Withdrawals from brackish surface water/seawater

0

Withdrawals from groundwater - renewable

0

Withdrawals from groundwater - non-renewable

0

Withdrawals from produced/entrained water

0

Withdrawals from third party sources

1,036

Total water discharges at this facility (megaliters/year)

590

Comparison of total discharges with previous reporting year

Much lower

Discharges to fresh surface water

0

Discharges to brackish surface water/seawater

0

Discharges to groundwater

0

Discharges to third party destinations

590

Total water consumption at this facility (megaliters/year)

446

Comparison of total consumption with previous reporting year

Much higher

Please explain

While production increased in 2022 relative to 2021, total water withdrawals and wastewater discharge decreased due to the increased throughput and efficiency of our Series 6 manufacturing process as well as water recycling initiatives. The total water consumed nearly doubled as a result of the large decrease in wastewater discharged in 2022 as compared to 2021.

W5.1a

(W5.1a) For the facilities referenced in W5.1, what proportion of water accounting data has been third party verified?

Water withdrawals – total volumes

% verified

Not verified

Please explain

We have not verified our water accounting data for cost reasons but may plan do so within the next two years.

Water withdrawals – volume by source

% verified

Not verified

Please explain

We have not verified our water accounting data for cost reasons but may plan do so within the next two years.

Water withdrawals – quality by standard water quality parameters

% verified

Not verified

Please explain

We have not verified our water accounting data for cost reasons but may plan do so within the next two years.

Water discharges – total volumes

% verified

Not verified

Please explain

We have not verified our water accounting data for cost reasons but may plan do so within the next two years.

Water discharges – volume by destination

% verified

Not verified

Please explain

We have not verified our water accounting data for cost reasons but may plan do so within the next two years.

Water discharges – volume by final treatment level

% verified

Not verified

Please explain

We have not verified our water accounting data for cost reasons but may plan do so within the next two years.

Water discharges – quality by standard water quality parameters

% verified

Not verified

Please explain

We have not verified our water accounting data for cost reasons but may plan do so within the next two years.

Water consumption – total volume

% verified

Not verified

Please explain

We have not verified our water accounting data for cost reasons but may plan do so within the next two years.

W6. Governance

W6.1

(W6.1) Does your organization have a water policy?

Yes, we have a documented water policy that is publicly available

W6.1a

(W6.1a) Select the options that best describe the scope and content of your water policy.

	Scope	Content	Please explain
Row 1	Company-wide	Description of business dependency on water Description of business impact on water Commitment to align with international frameworks, standards, and widely-recognized water initiatives Commitment to prevent, minimize, and control pollution Commitment to reduce water withdrawal and/or consumption volumes in direct operations Commitment to reduce water withdrawal and/or consumption volumes in supply chain Commitment to safely managed Water, Sanitation and Hygiene (WASH) in the workplace Commitment to safely managed Water, Sanitation and Hygiene (WASH) in local communities Commitment to stakeholder education and capacity building on water security Commitment to water stewardship and/or collective action Reference to company water-related targets Acknowledgement of the human right to water and sanitation	First Solar's water policy is company-wide because providing an ecologically leading solution to climate change, water scarcity and the unsustainable growing consumption of natural resources is part of our vision to lead the world's sustainable energy future. The energy-water nexus associated with traditional energy sources is a growing concern particularly in water-stressed regions. By generating clean electricity with no emissions, water use, or waste generation, First Solar modules enable customers to decouple their own business growth from environmental impacts associated with conventional electricity generation and consumption. Water is also vital to our global manufacturing operations. Our water policy lays out our water goals, targets and priorities including: Improving the water efficiency of our operations by conserving, recycling and reusing water; Publishing water metrics as part of our commitment to transparency; Supporting community projects focused on delivering access to clean energy and water in alignment with UN Sustainable Development Goals 6 and 7; and Raising awareness of the energy-water nexus and partnering on innovative solutions to water challenges. In our policy, First Solar recognizes that access to clean water is a fundamental human right, in line with Goal 6 of the United Nations' 2030 Agenda for Sustainable Development, and is committed to transparency on water usage, partnering on innovative solutions to water challenges and supporting community projects which deliver access to clean energy and water. In accordance with our policy, we disclose our company water goals, targets and metrics in our annual sustainability report. First Solar's EHS policy focuses on conserving natural resources and preventing pollution. In addition, as a member of the Responsible Business Alliance (RBA), we implement the RBA

		Recognition of environmental linkages, for example, due to climate change	Code of Conduct within our operations and our supply chain. Water-related requirements in the code of conduct include: Providing workers with ready access to clean toilet facilities and potable water, conserving water and other natural resources, implementing a water management program, monitoring and treating wastewater before discharge. The RBA code of conduct helps set water standards for our suppliers. 1

[1]First Solar Water Policy.pdf

W6.2

(W6.2) Is there board level oversight of water-related issues within your organization?

Yes

W6.2a

(W6.2a) Identify the position(s) (do not include any names) of the individual(s) on the board with responsibility for water-related issues.

Position of individual or committee	Responsibilities for water-related issues
Board-level committee	Pursuant to its charter, the Nominating and Governance Committee, one of the four committees of the Board of Directors, reviews the Company's environmental, social, and governance (ESG) strategy, policies and initiatives (other than initiatives delegated to other committees), which include climate-related and water-related issues. First Solar's ESG Steering Committee, led by our Chief Executive Officer and consisting of our Executive Leadership Team, reports into the Nominating and Governance Committee on a biannual or more frequent basis. Recent updates included reviewing progress on our manufacturing water efficiency target, water conservation initiatives and the design of a Net Zero Water Withdrawal PV manufacturing facility in India.
Board-level committee	The Audit Committee, one of the four committees of the Board of Directors, oversees financial risks, legal and compliance risks, information security risks (including cybersecurity), and other risk management functions. First Solar's annual enterprise risk assessment process includes identifying risks that would impact the company's achievement of strategic objectives which includes considering climate-related physical and transition risks and opportunities. The Audit committee of the Board receives enterprise risk management updates and reviews risks on a biannual or more frequent basis. Climate- and water-related risk include potential disruption of our manufacturing process or facilities, facility outages and infrastructure breakdown, environmental laws and regulations, ESG disclosure requirements and investor expectations, changes in market incentives

	and demand for our low carbon solar products, insurance coverage, and the carbon intensity of our operations and supply chain.

W6.2b

(W6.2b) Provide further details on the board's oversight of water-related issues.

	Frequency that water-related issues are a scheduled agenda item	Governance mechanisms into which water-related issues are integrated	Please explain
Row 1	Scheduled - some meetings	Monitoring implementation and performance Monitoring progress towards corporate targets Overseeing and guiding public policy engagement Overseeing the setting of corporate targets Overseeing value chain engagement Reviewing and guiding corporate responsibility strategy Reviewing and guiding major plans of action Reviewing and guiding risk management policies Reviewing and guiding strategy Reviewing innovation/R&D priorities	The Board's Nominating and Governance Committee reviews and guides the company's ESG strategy, goals and targets which include manufacturing water efficiency targets and manufacturing strategy in water-stressed regions. In 2022, the Nominating and Governance committee reviewed progress against our water intensity target of 0.25 liters per watt by 2028, which is equivalent to an 87% reduction compared to our 2009 baseline. First Solar's ESG Steering Committee, led by our Chief Executive Officer and consisting of our Executive Leadership Team, reports into the Nominating and Governance Committee on a biannual or more frequent basis. Updates to the Nominating and Governance Committee include reviewing the ESG dashboard to monitor progress on targets and our energy, water and greenhouse gas emissions intensity. The ESG Steering Committee also provides updates on opportunities related to our approach Responsible Solar. 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. 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 The Board's Audit Committee oversees financial risks, legal and compliance risks, information security risks (including cybersecurity), and other risk management functions. The Audit committee of the Board receives enterprise risk management updates on a biannual or more frequent basis and reviews climate-related risks and key mitigation approaches for potential disruption of our manufacturing process or facilities, facility outages and infrastructure breakdown, environmental laws and regulations, ESG disclosure requirements and investor expectations, changes in market incentives and demand for our low carbon solar products, insurance coverage, and the carbon intensity of our operations and supply chain.

W6.2d

(W6.2d) Does your organization have at least one board member with competence on water-related issues?

	Board member(s) have competence on water-related issues	Criteria used to assess competence of board member(s) on water-related issues
Row 1	Yes	Criteria used to assess board members, including incumbent board members, include "relevant knowledge and diversity of perspective and experience in such areas as business, technology, finance and accounting, marketing, international business, government and other disciplines relevant to the Company's business." This includes experience in the renewable energy industry, low carbon energy technology, sustainability, climate finance and infrastructure and infrastructure, or with companies in the water sector. Based on these criteria, four Directors on our Board have competence on climate-related issues including our Chairman, Chief Executive Officer, and two independent Directors including the Chair of the Board's Technology Committee and a Director who is a member the Technology Committee.

W6.3

(W6.3) Provide the highest management-level position(s) or committee(s) with responsibility for water-related issues (do not include the names of individuals).

Name of the position(s) and/or committee(s)

Chief Executive Officer (CEO)

Water-related responsibilities of this position

Assessing future trends in water demand
Assessing water-related risks and opportunities
Managing water-related risks and opportunities
Setting water-related corporate targets
Monitoring progress against water-related corporate targets
Integrating water-related issues into business strategy
Managing annual budgets relating to water security
Managing major capital and/or operational expenditures related to low water impact products or services (including R&D)

Frequency of reporting to the board on water-related issues

Half-yearly

Please explain

First Solar has fully integrated environmental, social, governance (ESG) oversight, which includes water-related issues, at the executive and board level. First Solar's Chief Executive Officer (CEO) has overall responsibility for water-related issues within the company as the top owner of enterprise risk and head of the ESG Steering Committee which consists of the company's Executive Leadership Team. ESG updates are provided to the Board's Nominating and Governance Committee and enterprise risk updates (which can include water risks) are provided to the Audit Committee on a biannual or more frequent basis. Biannual ESG board updates include reviewing progress on company targets relating to manufacturing water intensity and opportunities relating to the company's approach to Responsible Solar. Members of the ESG Steering Committee hold operational responsibility for water management and other ESG priorities which are driven by a cross-functional taskforce of ESG focus leaders.

W6.4

(W6.4) Do you provide incentives to C-suite employees or board members for the management of water-related issues?

	Provide incentives for management of water-related issues	Comment
Row 1	Yes	Certain members of the ESG Steering Committee hold operational responsibility for water and resource efficiency targets and other ESG priorities which are driven by a cross-functional taskforce of ESG focus leaders. Bonus payouts for all associates, including the executive leadership team, are based on the achievement of their operational goals and objectives.

W6.4a

(W6.4a) What incentives are provided to C-suite employees or board members for the management of water-related issues (do not include the names of individuals)?

	Role(s) entitled to incentive	Performance indicator	Contribution of incentives to the achievement of your organization's water commitments	Please explain
Monetary reward	Corporate executive team	Improvements in water efficiency – direct operations Other, please specify reducing operational costs	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 2022, our manufacturing water intensity per watt produced decreased by approximately 20% as compared to 2021. While our production increased by nearly 15% in 2022 as compared to 2021, 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.	Certain members of the ESG Steering Committee hold operational responsibility for manufacturing water and resource efficiency targets and other ESG priorities which are driven by a cross-functional taskforce of ESG focus leaders. Bonus payouts for all associates, including the executive leadership team, are based on the achievement of their operational goals and objectives.
Non-monetary reward	Corporate executive team	Improvements in water efficiency – direct operations	Since 2009, First Solar's manufacturing water intensity (water consumption per watt produced) decreased by approximately 83% due to significant improvements in module efficiency,	Certain members of the ESG Steering Committee hold operational responsibility for manufacturing water and resource efficiency targets and other ESG priorities which are driven by a cross-

			manufacturing throughput, and the implementation of water conservation and recycling projects in our manufacturing and recycling operations. In 2022, our manufacturing water intensity per watt produced decreased by approximately 20%. 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.	functional taskforce of ESG focus leaders. Bonus payouts for all associates, including the executive leadership team, are based on the achievement of their operational goals and objectives.

W6.5

(W6.5) Do you engage in activities that could either directly or indirectly influence public policy on water through any of the following?

Yes, direct engagement with policy makers

Yes, trade associations

Yes, other

W6.5a

(W6.5a) What processes do you have in place to ensure that all of your direct and indirect activities seeking to influence policy are consistent with your water policy/water commitments?

First Solar's VP of Global Policy, Marketing and Sustainability is part of the cross-functional environmental, social, and governance (ESG) taskforce that is 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. First Solar's ESG focus leaders help advance the company's approach to Responsible Solar by driving progress on key strategic ESG areas including Resource Efficiency and Public Policy and Public Sentiment among other topics. Our commitment to 'Responsible Solar' is interwoven into every aspect of our business and product life cycle- from raw material sourcing to end-of-life recycling. This includes manufacturing using less energy, water and semiconductor and providing solar modules with the lowest water footprint in the industry. Our direct and indirect activities to influence policy are aligned with our commitment to Responsible Solar and vision to lead the world's sustainable energy future. Our corporate

policies, e.g. our water policy, EHS policy, and the RBA code of conduct, provide guidance on our commitment to reducing operational impacts to ensure alignment across the company. We foster a culture where EHS is an integral part of our associates' work and require our contractors and suppliers to adhere to our standards and commitments. Any inconsistency is addressed with a corrective action.

W6.6

(W6.6) Did your organization include information about its response to water-related risks in its most recent mainstream financial report?

Yes (you may attach the report - this is optional)

First-Solar-Inc-2022-Annual-Report-FINAL.pdf

W7. Business strategy

W7.1

(W7.1) Are water-related issues integrated into any aspects of your long-term strategic business plan, and if so how?

	Are water-related issues integrated?	Long-term time horizon (years)	Please explain
Long-term business objectives	Yes, water-related issues are integrated	5-10	Water-related issues such as water availability and costs are integrated into our long-term business objectives of maintaining low manufacturing costs as well as the lowest environmental footprint in the industry. Access to sufficient water availability and quality is taken into account when siting new manufacturing facilities as our manufacturing process relies on ultra-pure water production and is key to scaling our manufacturing capacity over the next few years. We are in the process of expanding our manufacturing nameplate capacity to reach 25GW globally in 2026. 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 in 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 driving continuous improvement in water conservation through internal monitoring, benchmarking, and optimization of our process tool designs.
Strategy for achieving long-term objectives	Yes, water-related issues are integrated	5-10	Resource conservation and water recycling projects are part of our strategy to manage manufacturing costs, maintain the lowest environmental footprint in the industry and expand our manufacturing capacity to reach approximately 25GW in 2026 . 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. After surpassing our 71% water intensity reduction target seven years early, we set a new water intensity target of 0.25 liters per watt by 2028 or an 87% reduction compared to our 2009 baseline. First Solar recycling plants are designed to generate zero wastewater discharge, which could enable the roll-out of mobile PV recycling solutions in areas where water utilities or wastewater treatment facilities are not available. We are also designing our new manufacturing facilities with sustainability in mind. Our first 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.
Financial planning	Yes, water-related issues are integrated	5-10	Water-related issues are integrated into our long-term 5-year financial planning process since water indirectly impacts our manufacturing and recycling costs. Our facility and recycling teams include resource efficiency projects, as well as wastewater treatment plant and recycling upgrades into their budget plans. To minimize impacts on local water resources, our new manufacturing facility in India 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.

W7.2

(W7.2) What is the trend in your organization's water-related capital expenditure (CAPEX) and operating expenditure (OPEX) for the reporting year, and the anticipated trend for the next reporting year?

Row 1

Water-related CAPEX (+/- % change)

-3

Anticipated forward trend for CAPEX (+/- % change)

33

Water-related OPEX (+/- % change)

15

Anticipated forward trend for OPEX (+/- % change)

227

Please explain

Our water-related CAPEX was about the same in 2022 compared to 2021 due to expenses incurred to install wastewater treatment systems at our second and third facilities in Ohio in 2021 and 2022. Our water related OPEX increased by approximately 15% as our production increased by nearly 15% in 2022. Water OPEX and CAPEX is expected to increase in 2023 due to the increase in production and expansion of our manufacturing capacity, including a new PV manufacturing facility in India which will become operational in 2023. We expect to produce between 11.7 GW and 12.1 GW during 2023, compared to 9.1GW in 2022.

W7.3

(W7.3) Does your organization use scenario analysis to inform its business strategy?

	Use of scenario analysis	Comment
Row 1	Yes	We used forward-looking scenario analyses in considering potential climate-related and water-related risks and opportunities. For assessing physical climate-related risks, we used IPCC's assessment of 1.5°C global warming (consistent with RCP 2.6), as well as the U.S. National Climate Assessment evaluation of RCP 4.5 and RCP 8.5. To evaluate water risks, we used the WWF Water Risk Filter tool to identify water risks using optimistic (1.5 degrees C),

		current trend (2 degrees C), and pessimistic warming scenarios (3.5 degrees C or higher) for 2030 and 2050 where our manufacturing, recycling and research and development facilities are located, including our new manufacturing location in India which is expected to commence operations in the second half of 2023. Our manufacturing facility in India faces high baseline water stress. To minimize impacts on local water resources, we are designing a Net-Zero Water Withdrawal PV manufacturing facility.

W7.3a

(W7.3a) Provide details of the scenario analysis, what water-related outcomes were identified, and how they have influenced your organization's business strategy.

	Type of scenario analysis used	Parameters, assumptions, analytical choices	Description of possible water-related outcomes	Influence on business strategy
Row 1	Water-related Climate-related	To evaluate physical climate-related risks, we used IPCC's assessment of a 1.5°C scenario (consistent with RCP 2.6), a 2°C scenario (consistent with RCP 4.5), and a 3°C or higher scenario (consistent with RCP 8.5) to conduct a quantitative analysis of potential impacts on our manufacturing, recycling, R&D and testing facilities over a 2030-2050 time horizon. We leveraged the Shared Socioeconomic Pathway scenarios including SSP1-2.6 (low emissions), SSP2-4.5 (intermediate emissions), and SSP.5-8.5 (very high emissions) to cover a broad range of emissions pathways to assess physical risks at our facilities in the U.S., Malaysia, Vietnam, and our new manufacturing facility which is under construction in India. To evaluate water risks, we	Possible water-related outcomes include very high to extreme flood risks and low to moderately low water scarcity risks at all three of our manufacturing facility locations in Ohio, Vietnam and Malaysia by 2030. 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. Our manufacturing facility in Vietnam faces high to extreme water quality risks by 2050.	As a result of the climate scenario analysis, First Solar updated its near-term and long- term science-based climate targets to reduce scope 1 and scope 2 emissions by 34% by 2028 and achieve Net Zero by 2050, in line with a 1.5 degree C world. We are also exploring renewable energy sourcing options in Ohio and our future manufacturing location in India to help meet our science-based targets. Water considerations have influenced the strategy for our new manufacturing operations in India.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

		used the WWF Water Risk Filter tool to identify water risks using optimistic (1.5 degrees C), current trend (2 degrees C), and pessimistic warming scenarios (3.5 degrees C or higher) for 2030 and 2050 where our manufacturing, recycling and research and development facilities are located, including ournew manufacturing location in India. The optimistic scenario pathway represents a world with sustainable socio-economic development (SSP1) and moderate reduction of GHG emissions (RCP2.6 /RCP4.5), and leads to an increase of global mean surface temperature of approximately 1.5°C by 2100. It assumes moderate mitigation measures halving GHG emissions by 2050, more stringent environmental regulations, rapid technological change and improved resource efficiency. The current trend pathway represents a world similar to current socio-economic development trends (SSP2) and intermediate GHG emission levels (RCP4.5 /RCP6.0), and leads to an increase of global mean surface temperature of approximately 2°C by 2100. It assumes intermediate mitigation measures with GHG emissions peaking by 2050, weak environmental	Our future manufacturing site in India currently faces high baseline water stress and continues to in all three scenarios (optimistic, current trend and pessimistic) in 2030 and 2050.	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.

		regulation and enforcement trigger slow technological progress in water use efficiencies, growing population and intensity of resource aggravates degradation of water resources. The pessimistic scenario represents a world with unequal and unstable socio-economic development (SSP3) and high GHG emission levels (RCP6.0 /RCP8.5), and leads to an increase of global mean surface temperature of approximately 3.5/4°C by 2100. It assumes GHG emissions continuing to rise, weak environmental regulation and enforcement hampers technological progress in water use efficiency, and growing population with limited access to safe water.		

W7.4

(W7.4) Does your company use an internal price on water?

Row 1

Does your company use an internal price on water?

No, and we do not anticipate doing so within the next two years

Please explain

We do not anticipate setting an internal price on water within the next two years.

W7.5

(W7.5) Do you classify any of your current products and/or services as low water impact?

	Products and/or services	Definition used to classify low water impact	Please explain

	classified as low water impact		
Row 1	Yes	Unlike thermal electric power plants and concentrated solar power, solar PV does not require any water to generate electricity during operation and is ideally suited to meet the growing energy and water needs of arid, water-limited regions. The definition used to classify low water impact is based on the life cycle water use compared to conventional energy sources and other solar technologies. 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. We are continuously working to drive down the environmental footprint of our modules. First Solar's next generation Series 7 modules have a water footprint that is nearly 4 times lower than conventional crystalline silicon solar panels on a life cycle basis. First Solar conducted a lifecycle water assessment of our thin film PV technology which concluded that the life cycle water withdrawal of cadmium telluride (CdTe) PV ranges from approximately 382– 425 L/MWh. (Source: Sinha, Meader and de Wild-Scholten, Life Cycle Water Usage in CdTe Photovoltaics, IEEE, Journal of Photovoltaics, 2012) Direct onsite water use represents only ~12% of CdTe PV's lifecycle water withdrawal. The remainder is related to indirect water withdrawal from the use of grid electricity and raw materials throughout the product life cycle. Primary contributors to life cycle water withdrawal in our supply chain include	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, 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. Due to our resource-efficient manufacturing process, First Solar modules have a water footprint that is up to three times lower than conventional crystalline silicon solar panels on a life cycle basis.

		the use of grid electricity, glass, steel and copper production, chemical use, and transport during take-back and recycling.	

W8. Targets

W8.1

(W8.1) Do you have any water-related targets?

Yes

W8.1a

(W8.1a) Indicate whether you have targets relating to water pollution, water withdrawals, WASH, or other water-related categories.

	Target set in this category	Please explain
Water pollution	Yes	
Water withdrawals	Yes	
Water, Sanitation, and Hygiene (WASH) services	No, and we do not plan to within the next two years	First Solar already provides access to clean drinking water at all of our manufacturing, recycling, R&D and office locations
Other	Yes	

W8.1b

(W8.1b) Provide details of your water-related targets and the progress made.

Target reference number

Target 1

Category of target

Product water intensity

Target coverage

Company-wide (direct operations only)

Quantitative metric

Reduction per unit of production

Year target was set

2017

Base year

2009

Base year figure

1.9

Target year

2028

Target year figure

1.57

Reporting year figure

0.33

% of target achieved relative to base year

475.7575757576

Target status in reporting year

Achieved

Please explain

In 2022 First Solar's manufacturing water intensity decreased by approximately 20% as compared to 2021 due to the increased throughput and efficiency of our Series 6 and Series 7 manufacturing process as well as water recycling initiatives. Our threshold for success is achieving an average 1% year on year reduction in total water withdrawal per unit of production (Watt produced) from the inventory baseline and through 2028, in conformance with the manufacturing water efficiency criterion of the EPEAT ecolabel for PV modules and inverters. Since this is an annual target to reduce our manufacturing water intensity by 1% year over year from the 2009 baseline (1.9) and we reduced our manufacturing intensity by approximately 20%, we successfully achieved this target and fulfilled the EPEAT criterion. In 2022, our manufacturing water intensity was 0.33 liters per watt produced.

Target reference number

Target 2

Category of target

Product water intensity

Target coverage

Company-wide (direct operations only)

Quantitative metric

Reduction per unit of production

Year target was set

2021

Base year

2009

Base year figure

1.9

Target year

2028

Target year figure

0.25

Reporting year figure

0.33

% of target achieved relative to base year

95.1515151515

Target status in reporting year

Underway

Please explain

After surpassing our 71% water intensity reduction target seven years early, we set a new water intensity target of 0.25 liters per watt by 2028 or an 87% reduction compared to our 2009 baseline.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. (or 0.33 liters per watt from a 2009 baseline of 1.9 liters per watt) due to significant improvements in module efficiency, manufacturing throughput, and the implementation of water conservation and recycling projects in our manufacturing and recycling operations.

W9. Verification

W9.1

(W9.1) Do you verify any other water information reported in your CDP disclosure (not already covered by W5.1a)?

No, but we are actively considering verifying within the next two years

W10. Plastics

W10.1

(W10.1) Have you mapped where in your value chain plastics are used and/or produced?

	Plastics mapping	Value chain stage	Please explain

Row 1	Yes	Direct operations Supply chain Product use phase	Product life cycle inventory and assessment

W10.2

(W10.2) Across your value chain, have you assessed the potential environmental and human health impacts of your use and/or production of plastics?

	Impact assessment	Value chain stage	Please explain
Row 1	Yes	Direct operations Supply chain Product use phase	Product life cycle inventory and assessment

W10.3

(W10.3) Across your value chain, are you exposed to plastics-related risks with the potential to have a substantive financial or strategic impact on your business? If so, provide details.

	Risk exposure	Please explain
Row 1	Not assessed – and we do not plan to within the next two years	

W10.4

(W10.4) Do you have plastics-related targets, and if so what type?

	Targets in place	Please explain
Row 1	No – and we do not plan to within the next two years	

W10.5

(W10.5) Indicate whether your organization engages in the following activities.

	Activity applies	Comment
Production of plastic polymers	No	
Production of durable plastic components	No	
Production / commercialization of durable plastic goods (including mixed materials)	No	
Production / commercialization of plastic packaging	No	
Production of goods packaged in plastics	No	
Provision / commercialization of services or goods that use plastic packaging (e.g., retail and food services)	No	

W11. Sign off

W-FI

(W-FI) Use this field to provide any additional information or context that you feel is relevant to your organization's response. Please note that this field is optional and is not scored.

W11.1

(W11.1) Provide details for the person that has signed off (approved) your CDP water response.

	Job title	Corresponding job category
Row 1	Chief Product Officer	Other C-Suite Officer

Submit your response

In which language are you submitting your response?

English

Please confirm how your response should be handled by CDP

	I understand that my response will be shared with all requesting stakeholders	Response permission
Please select your submission options	Yes	Public

Please indicate your consent for CDP to share contact details with the Pacific Institute to support content for its Water Action Hub website.

Yes, CDP may share our Main User contact details with the Pacific Institute

Please confirm below

I have read and accept the applicable Terms