Welcome to your CDP Climate Change Questionnaire 2021

C0. Introduction

C0.1

(C0.1) Give a general description 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 2020, we have sold over 30 gigawatts (GW) of PV solar modules. Assuming average worldwide irradiance and grid electricity emissions, our products are being used to displace over 21 million metric tons of CO2e per year during their 30+ year product life. This is equivalent to powering more than 15 million average homes, planting over 350 million trees and saving over 54 billion liters of water (or 21,000 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.

C0.2

(C0.2) State the start and end date of the year for which you are reporting data.

	Start date	End date	Indicate if you are providing emissions data for past reporting years
Reporting year	January 1, 2020	December 31, 2020	No

C0.3

(C0.3) Select the countries/areas for which you will be supplying data.

Chile
Germany
India
Japan
Malaysia
Samoa
United States of America
Viet Nam

C0.4

(C0.4) Select the currency used for all financial information disclosed throughout your response.

USD

C0.5

(C0.5) Select the option that describes the reporting boundary for which climate-related impacts on your business are being reported. Note that this option should align with your chosen approach for consolidating your GHG inventory.

Equity share

C1. Governance

C1.1

(C1.1) Is there board-level oversight of climate-related issues within your organization?

Yes

C1.1a

(C1.1a) Identify the position(s) (do not include any names) of the individual(s) on the board with responsibility for climate-related issues.

Position of individual(s)	Please explain
Board-level committee	The Nominating and Governance Committee of the Board of Directors has overall oversight of ESG strategy and policies, which include climate-related issues. The Nominating and Governance Committee periodically reviews the Company's ESG strategy, policies and initiatives, other than initiatives delegated to other committees, and receives updates from the Company's management committee responsible for significant ESG activities. The Audit Committee of the Board of Directors has oversight over risk management for the company. The annual enterprise risk assessment process includes identifying risks that would impact the company's achievement of strategic objectives which includes considering climate-related risks.

C1.1b

(C1.1b) Provide further details on the board's oversight of climate-related issues.

Frequency with which climate-related issues are a scheduled agenda item	Governance mechanisms into which climate-related issues are integrated	Please explain
Scheduled – some meetings	Reviewing and guiding strategy Reviewing and guiding risk management policies Monitoring implementation and performance of objectives Monitoring and overseeing progress against goals and targets for addressing climate-related issues	ESG updates to the Board are scheduled on a biannual or more frequent basis. Enterprise risk management updates are provided to the Board's Audit Committee at least annually or more frequently. Impacts, risks, mitigation efforts, and opportunities related to Climate Change may be included in these updates if they have a significant impact on the company's business and operations.

C1.2

(C1.2) Provide the highest management-level position(s) or committee(s) with responsibility for climate-related issues.

Name of the position(s) and/or committee(s)	Responsibility	Frequency of reporting to the board on climate-related issues

Chief Executive Officer (CEO)	Both assessing and managing climate-related risks and opportunities	Annually

C1.2a

(C1.2a) Describe where in the organizational structure this/these position(s) and/or committees lie, what their associated responsibilities are, and how climate-related issues are monitored (do not include the names of individuals).

First Solar's Chief Executive Officer (CEO) has the highest level of direct responsibility for climate change within the company and is the top owner of enterprise risk. In 2020, First Solar identified seven key environmental, social and governance (ESG) focus areas based on our latest materiality assessment: Circular Economy; Energy, Emissions & Resource Efficiency; Inclusion, Diversity & Belonging; Innovative Products; Public Policy & Public Sentiment; Responsible Sourcing and Human Rights; and Reliable Products, and formally established ESG oversight at the board and executive levels. Each key focus area is managed by ESG focus leaders who define, measure and report on progress to the ESG Steering Committee on a quarterly basis. Led by the CEO, the ESG Steering Committee consists of First Solar's Executive Leadership Team, which has the highest level of direct responsibility for ESG matters (which includes our climate change strategy) within the company. The ESG Steering Committee and focus leaders report into the Board of Directors on a biannual or more frequent basis.

First Solar's Sustainability and ESG teams coordinate the ESG focus groups and work cross-functionally to identify climate-related and other ESG risks as part of the company's enterprise risk management process. This includes modelling climate scenarios to identify potential future risks and opportunities.

The Energy, Emissions, and Resource Efficiency working group is responsible for measuring and monitoring progress of First Solar's resource efficiency and climate change strategy. This includes monitoring the implementation of our RE100 goal, setting science-based greenhouse gas emissions targets as well as energy and water targets.

C1.3

(C1.3) Do you provide incentives for the management of climate-related issues, including the attainment of targets?

	Provide incentives for the management of climate-related issues	Comment
Row 1	Yes	

C1.3a

(C1.3a) Provide further details on the incentives provided for the management of climate-related issues (do not include the names of individuals).

Entitled to incentive	Type of incentive	Activity inventivized	Comment
All employees	Monetary reward	Other (please specify) Renewable energy products	Expansion of PV solar module production which enables more PV solar modules to be provided to customers and therefore to displace more electricity generation by fossil fuels. Our annual manufacturing capacity has grown from 25 megawatts (MW) in 2005 to to 7.9 gigawatts (GW) as of March 31, 2021, with a path to increase to 13 GW based on our recently announced expansion plan.
All employees	Monetary reward	Other (please specify) Renewable energy cost	First Solar incentivizes initiatives which drive reductions in PV solar module manufacturing costs and in turn reduce the costs of PV solar, enabling PV solar to be cost competitive with conventional technologies and become more widely deployed and accepted.
All employees	Monetary reward	Efficiency target	First Solar provides incentives to encourage our associates to drive the company's environmental strategy and continuous improvement. Improvements in PV solar module efficiency drive reductions in the costs of PV solar thereby expanding PV markets and displacing electricity generated by fossil fuels. We currently hold two world records for CdTe PV cell efficiency, achieving an independently certified research cell efficiency of 22.1% and an aperture area module efficiency of 19.0%. We believe that our record cells demonstrate a potential long-term module efficiency entitlement of over 25% that is achievable using our commercial-scale manufacturing equipment. Improvements in efficiency also reduce the overall lifecycle carbon footprint of our product. Through continued operational improvement, and execution of our efficiency roadmap, we increased our average watts per module to 439 watts with a top production bin of 445 watts at the end of 2020.
All employees	Monetary reward	Other (please specify) Expansion of renewable energy	Expanded PV markets and/or market segments (which help to develop emerging geographic markets for PV solar) and provide these markets with a cost-competitive alternative to electricity generated by fossil fuels.
Management group	Non-monetary reward	Behavior change related indicator	Participation in leadership development programs, such as Leadership Essentials, that focus on driving product improvements which helps to lower the

			carbon intensity of our products and also include other sustainability-related projects. In 2019, a leadership essentials team evaluated the business case for going 100% renewable in Ohio and found that it was not only feasible, but also cost-effective. In 2020, First Solar joined RE100 and committed to powering 100% of our global operations with renewable energy by 2028 with an interim goal of powering our U.S. facilities with carbon-free electricity by 2026. Leadership Essentials is a learning experience program designed for First Solar's mid-level managers to develop critical leadership and business acumen skills. Participants are placed in teams that are assigned to find solutions to critical challenges, giving them an opportunity to develop and present recommendations to the company's executive leadership. These programs are some of the many ways that we invest in our people so they can continue to drive innovation and change, bringing us closer to our vision of leading the world's sustainable energy future.
Facilities manager	Monetary reward	Energy reduction target	Energy saving targets are included in the performance goals of our facilities team. In 2020, our manufacturing energy intensity (energy consumption per watt produced) decreased by approximately 19% compared to 2019 primarily due to the greater throughput and enhanced energy efficiency of our Series 6 manufacturing process. First Solar's manufacturing energy intensity includes all processes, from the beginning of our manufacturing process to finished module. In 2021, we set a target to improve global energy efficiency per watt produced by 74% by 2028, from a 2009 baseline (or by 30% relative to 2020).
Chief Executive Officer (CEO)	Monetary reward	Other (please specify) Executive sustainability goal	Leveraging sustainability as a business enabler is one of the CEO's executive goals which includes managing risks and identifying opportunities for growth e.g. operation cost reduction through reduced resource consumption and emissions. Executives are rewarded for achieving their operational goals and objectives.
All employees	Non-monetary reward	Behavior change related indicator	First Solar's internal Sustainability Ambassadors Program enables First Solar associates at various sites to identify and implement local sustainability initiatives while encouraging sustainable behavior

			change across the organization. First Solar Sustainability Ambassadors are recognized for their efforts to recycle and reduce waste as part of the company's global reduce-reuse-recycle campaign, conserve natural resources, engage in local communities, and minimize both the company's and their personal environmental footprints.

C2. Risks and opportunities

C2.1

(C2.1) Does your organization have a process for identifying, assessing, and responding to climate-related risks and opportunities?

Yes

C2.1a

(C2.1a) How does your organization define short-, medium- and long-term time horizons?

	From (years)	To (years)	Comment
Short-term	0	5	As part of our Enterprise Risk Management (ERM) approach, on a semi-annual basis risk scorecards capture the company leadership's view of enterprise risks and risk trends over an up to 5 year horizon. Time horizon for assessing climate-related risks and opportunities in our manufacturing risk scorecards is aligned with other business practice time horizons.
Medium-term	5	10	We evaluate medium and long term horizons as well, with regard to our module warranties. We provide a limited PV solar module warranty covering defects in materials and workmanship under normal use and service conditions for up to 12 years. We also typically warrant that modules installed in accordance with agreed-upon specifications will produce at least 98% of their labelled power output rating during the first year, with the warranty coverage reducing by a degradation factor every year thereafter throughout the limited power output warranty period of up to 30 years. These warranties are influenced by climatic conditions, which we need to anticipate in our product design cycles and evaluations.
Long-term	10	30	We evaluate long term horizons with regard to our module warranties and climate change risks and opportunities. We provide a limited PV solar module warranty covering defects in materials and workmanship under normal use and service conditions for up to 12 years. We also typically warrant that modules installed in accordance with agreed-

			upon specifications will produce at least 98% of their labelled power output rating during the first year, with the warranty coverage reducing by a degradation factor every year thereafter throughout the limited power output warranty period of up to 30 years. These warranties are influenced by climatic conditions, which we need to anticipate in our product design cycles and evaluations. We have also used forward-looking scenario analyses in considering climate-related risks and opportunities. For physical 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. For transition risks, we used evaluations by IEA and Princeton University of net zero pathways by 2050 globally and for the U.S., respectively. These transition pathways are consistent with RCP 2.6. We started with the company's targets to define the time horizon of ~2030-2050 for the scenario analysis. These time horizons are relevant to our organization since First Solar has committed to RE100 and has set a target to purchase all electricity from renewables by 2028. First Solar has also committed to science-based climate targets for 2028 and 2050. The scenario analysis considered First Solar-owned facilities and assets - specifically manufacturing, recycling, and R&D facilities. However, some aspects, such as future policy or market changes were considered in terms of their impact on the company as a whole.

C2.1b

(C2.1b) 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).

C2.2

(C2.2) Describe your process(es) for identifying, assessing and responding to climate-related risks and opportunities.

Value chain stage(s) covered

Direct operations
Upstream
Downstream

Risk management process

Integrated into multi-disciplinary company-wide risk management process

Frequency of assessment

Annually

Time horizon(s) covered

Short-term
Medium-term
Long-term

Description of process

As part of its Enterprise Risk Management (ERM) approach, First Solar has identified various risk areas across the company with specific risk owners and risk domains. The risk owners review the 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 5 year horizon. Longer term risks may be identified where relevant. Enterprise-impacting, emerging, transient and cross-functional risks are assessed on their trend and net risk exposure considering 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. These include climate change related risks and opportunities such as regulatory and other market drivers, uncertainty in market signals, commodity price risks, corporate sustainability, and physical risks relating to natural disasters. 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. The results are reviewed and analyzed by the executive leadership team and the Board's Audit Committee to guide the company's risk mitigation efforts. Updates are provided to the Board's Audit Committee on an annual basis. Impacts, risks, and opportunities related to Climate Change may be included in these updates if they could have a significant potential impact on the company’s business and operations. Risks associated with individual assets (including risks due to weather and other extreme events) are assessed in the context of operational and/or business continuity risks. Asset level risks (e.g. natural disasters that affect individual facilities) and opportunities are assessed through annual scorecards for our manufacturing sites, or more frequently if needed.

C2.2a

(C2.2a) Which risk types are considered in your organization's climate-related risk assessments?

	Relevance & inclusion	Please explain
Current regulation	Relevant, always included	Climate change related risks associated with current regulations (e.g. the reduction or removal of clean energy programs and incentives which could result in decreased demand for our products) are captured

		through market risk reviews and are always included for evaluation in the company's ERM process.
Emerging regulation	Relevant, always included	Risks associated with emerging regulations (e.g. new government regulations or utility policies pertaining to our modules, systems, and operation and maintenance services which could result in significant additional expenses or reduced product demand) are captured under regulatory risks and are always included for evaluation in the company's ERM process.
Technology	Relevant, always included	Technology risks (e.g. failing to enhance our technology and reduce costs could render our solar modules or systems uncompetitive) are always included for evaluation in the company's ERM process.
Legal	Relevant, always included	Legal and compliance risks (e.g. failure to comply with legal or regulatory requirements including but not limited to Foreign Corrupt Practices Act, environmental, health and safety, anti-trust, misappropriating or infringing on intellectual property rights of third parties which could adversely impact our financial position or damage our reputation) are always included for evaluation in the company's ERM process.
Market	Relevant, always included	Market risks (e.g. if utility-scale PV solar technology proves unsuitable for widespread adoption at economically attractive rate of return or if additional demand for solar modules takes longer to develop than we anticipate), market-specific barriers (such as tariffs, local content requirements, etc.), and incentives are captured through market risk reviews and always included for evaluation in the company's ERM process.
Reputation	Relevant, always included	All ERM risks are evaluated for their potential impact on the company's reputation. A specific example of potential reputational risks would be problems with product quality and performance which could cause us to incur significant and/or unexpected contractual damages and/or warranty and related expenses, damage our market reputation, and prevent us from maintaining or increasing our market share.
Acute physical	Relevant, always included	Risks associated with individual assets (including risks due to weather and other extreme events which could disrupt operations or the supply of raw materials) are assessed in the context of operational and/or business continuity risks as part of our ERM process. Asset level risks (e.g. natural disasters that affect individual manufacturing facilities) are assessed through annual scorecards for our manufacturing sites.
Chronic physical	Relevant, always included	Chronic physical climate change risks such as water shortages and widespread extreme climates are included for evaluation in the company's ERM process and the annual scorecards for our manufacturing sites which assess operational and/or business continuity risks. If we increase the number of installations in extreme climates, we may experience increased failure rates due to deployment

		into such field conditions. Any widespread product failures may damage our market reputation, cause our net sales to decline, require us to repair or replace the defective modules or provide financial remuneration, and result in us taking voluntary remedial measures beyond those required by our standard warranty terms to enhance customer satisfaction, which could have a material adverse effect on our operating results.

C2.3

(C2.3) Have you identified any inherent climate-related risks with the potential to have a substantive financial or strategic impact on your business?

Yes

C2.3a

(C2.3a) Provide details of risks identified with the potential to have a substantive financial or strategic impact on your business.

Identifier

Risk 1

Where in the value chain does the risk driver occur?

Direct operations

Risk type & Primary climate-related risk driver

Current regulation

Other, please specify

reduction, elimination, or expiration of government subsidies, economic incentives, tax incentives, renewable energy targets, policies and other support for on-grid solar electricity applications

Primary potential financial impact

Decreased revenues due to reduced demand for products and services

Company-specific description

Although we compete in many markets that do not require solar-specific government subsidies or support programs, our net sales and profits remain subject, in the near term, to variability based on the availability and size of government subsidies and economic incentives (e.g. quotas, renewable portfolio standards, and tendering systems) and financial incentives (e.g. tax and production incentives). To the extent these support programs are reduced earlier than previously expected or are changed retroactively, such changes could negatively impact demand and/or price levels for our solar modules and systems, lead to a reduction in our net sales, and adversely impact our operating results. Existing regulations and policies, changes thereto, and new regulations and policies may present technical, regulatory, and economic barriers to the

purchase and use of PV solar products or systems, which may significantly reduce demand for our modules, systems, or services. Although we expect to become less impacted by and less dependent on these forms of government support over time, such programs continue to influence the demand for PV solar energy around the world. The Investment Tax Credit (ITC) has been an important economic driver of solar installations and qualifying procurement activities in the U.S. and its extension has contributed to greater medium-term demand. The positive impact of the ITC depends to a large degree on the availability of tax equity for project financing, and any significant reduction in the availability of tax equity in the future could make it more difficult to develop and construct projects requiring financing. Any limitations on the value or availability to potential investors of tax incentives that benefit solar energy projects such as the ITC and accelerated depreciation deductions could result in reducing such investors' economic returns, causing a reduction in the availability of affordable financing, thereby reducing demand for PV solar modules.

Time horizon

Short-term

Likelihood

Likely

Magnitude of impact

High

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)

107,000,000

Explanation of financial impact figure

The Investment Tax Credit (ITC) has been an important economic driver of solar installations in the U.S. which represented approximately 68% of our net sales in 2020. Under a worst case scenario, if we assumed 68% of our gross profit (~$681 million) or ~$463 million was impacted by a change in support policies in the U.S. and assume a 30% reduction in the value on goods and services sold (that would have otherwise qualified for the ITC), the maximum potential financial impact is estimated to be ~107 million. The more likely impact to our results would be much lower than this worst case scenario. Electricity load growth driven by EVs and green hydrogen, customer demand for renewables and the competitiveness of solar's unsubsidized levelized cost of electricity (LCOE) relative to other sources of generation also impact market demand.

Cost of response to risk

94,000,000

Description of response and explanation of cost calculation

We continue to devote substantial resources to our R&D efforts, which generally focus on continually improving the wattage and energy yield of our solar modules. In 2020, we spent approximately $94 million on research and development (or 3.5% of our net sales of $2.7 billion) as stated in our FY20 Form 10-K. We also focus our R&D activities on continuously improving module durability and manufacturing efficiencies, including throughput improvement, volume ramp, and material cost reduction. Based on publicly available information, we are one of the leaders in R&D investment among PV solar module manufacturers, maintaining a rate of innovation that enables rapid wattage gains and cost reductions. Our PV solar energy solutions compete favorably on an economic basis with traditional forms of energy generation in multiple markets in the U.S. In addition to investing in research and development, we focus on developing long-lasting partnerships with strategic customers and becoming the partner of choice for utilities, corporate customers, and independent power producers.

Comment

Identifier

Risk 2

Where in the value chain does the risk driver occur?

Upstream

Risk type & Primary climate-related risk driver

Market

Increased cost of raw materials

Primary potential financial impact

Increased direct costs

Company-specific description

First Solar is exposed to price risks for the raw materials, components, services, and energy costs used in the manufacturing and transportation of our solar modules. Additionally, some of our raw materials and components are sourced from a limited number of suppliers or a single supplier. In some cases, we also enter into long-term supply contracts for raw materials and components. Accordingly, we are exposed to price changes in the raw materials and components used in our solar modules. For example, the imposition of carbon taxes could lead to increases in the costs of raw materials, such as glass, which have relatively high energy requirements for production. In addition, the failure of a key supplier could disrupt our supply chain, which could result in higher costs and/or a disruption in our manufacturing or construction processes. We may be unable to pass along changes in the costs of the raw materials and components for our modules to our customers and may be in default of our delivery obligations if we experience a manufacturing disruption.

Time horizon

Long-term

Likelihood

About as likely as not

Magnitude of impact

Medium-high

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

63,000,000

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

To estimate the financial implications of a carbon tax, we used the Interagency Working Group on Social Cost of Carbon's central estimate for a ton of CO2 emitted ($51). Assuming a carbon price of $51/ metric ton applied to our 2020 scope 3 emissions for purchased goods and services (1,227,987 metric tons CO2-eq), the cost of our purchased goods and services could increase by approximately $63 million (medium-high impact).

Cost of response to risk

1,500,000

Description of response and explanation of cost calculation

To mitigate supply chain price risks, we strive to qualify multiple suppliers using a robust qualification process and diversify the geographic diversity of our suppliers. When possible we attempt to use suppliers that can provide a raw material supply source that is near our manufacturing locations, reducing the cost and lead times for such materials. Sourcing raw materials from nearby suppliers also helps to reduce transport- and shipping-related energy use and carbon emissions. We also stock a supply of raw materials onsite in the event of supply disruption at one of our facilities. From time to time, we may utilize derivative hedging instruments to mitigate raw material price changes. As of December 31, 2020, the fair value of derivatives designated as hedging instruments for purchases of raw materials was approximately $1.5 million.
In addition, First Solar's recycling team developed a high-value recycling process that recovers over 90% of our semiconductor material for reuse in new modules and approximately 90% of the glass for use in new glass products. First Solar is proactively investing in recycling technology improvements with the ultimate aim of refining the quality of the recovered glass so it may be reused in new solar modules. Supplier qualification and recycling operations are included in our normal operating costs. In

2020, we began engaging with key suppliers to assess their ability to increase the recycled content of the materials we use in our products and reduce their carbon intensity.

Comment

Identifier

Risk 3

Where in the value chain does the risk driver occur?

Direct operations

Risk type & Primary climate-related risk driver

Acute physical

Increased severity and frequency of extreme weather events such as cyclones and floods

Primary potential financial impact

Decreased revenues due to reduced production capacity

Company-specific description

Our solar modules are currently produced at our facilities in Perrysburg, Ohio; Lake Township, Ohio; Kulim, Malaysia; and Ho Chi Minh City, Vietnam. Damage to or disruption of these facilities could interrupt our business and adversely affect our ability to generate net sales. Our asset-level (manufacturing plants) scorecards have identified natural disasters (such as earthquakes, tornadoes, hurricane, building collapse, flood, etc.) as a key risk driver that can impact our manufacturing plant's abilities to operate in Ohio. Any damage to or disruption of our facilities would result in an inability to maintain maximum production levels.

Time horizon

Short-term

Likelihood

Unlikely

Magnitude of impact

High

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)

698,000,000

Explanation of financial impact figure

Assuming a contracted module backlog of 14.1 GW for an aggregate transaction price of $4.1 billion as of March 31, 2021, and 2021 nameplate capacity in Ohio of 2.4 gigawatts (GW)DC as of 31 March 2021, the maximum potential revenue impact if our production in Ohio was down for an entire year would be approximately $698 million. This worst-case scenario however is unlikely. We would likely lose some production for a while in the event of a natural disaster until we are able to bring the affected buildings back into production.

Cost of response to risk

1,700,000

Description of response and explanation of cost calculation

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. The cost of the response is based on our approximate annual insurance costs in Ohio. We have implemented our management method to reduce and minimize this risk.

Comment

Identifier

Risk 4

Where in the value chain does the risk driver occur?

Upstream

Risk type & Primary climate-related risk driver

Acute physical

Increased severity and frequency of extreme weather events such as cyclones and floods

Primary potential financial impact

Decreased revenues due to reduced production capacity

Company-specific description

Our solar modules are currently produced at our facilities in Perrysburg, Ohio; Lake Township, Ohio; Kulim, Malaysia; and Ho Chi Minh City, Vietnam. Damage to or disruption of these facilities could interrupt our business and adversely affect our ability to generate net sales. Our asset-level (manufacturing plants) scorecards have identified natural disasters at a supplier's site as a key risk driver for their ability to disrupt supply and shipment channels at our manufacturing facility in Malaysia and Vietnam. Shortages of essential components could occur due to interruptions of supply and could impair our

ability to meet customer demand for our products and interrupt our business. This would result in an inability to maintain maximum production levels.

Time horizon

Short-term

Likelihood

Likely

Magnitude of impact

High

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)

815,000,000

Explanation of financial impact figure

Interruption of supply to our manufacturing facilities in Malaysia and Vietnam caused by physical climate drivers could significantly affect the company's production levels. Assuming a contracted module backlog of 14.1 GW for an aggregate transaction price of $4.1 billion as of March 31, 2021, and 2021 nameplate capacity in Malaysia of 2.7 GW and Vietnam of 2.8 GWDC as of 31 March 2021, the maximum potential revenue impact if our production in either Malaysia or Vietnam was down for an entire year would be approximately $785 million and $815 million respectively. Such a worst case scenario however is unlikely. We would likely lose some production for a while in the event of a natural disaster interrupting our supply.

Cost of response to risk

0

Description of response and explanation of cost calculation

To mitigate supply chain price risks, we strive to qualify multiple suppliers using a robust qualification process. As part of our sourcing strategy, we are enabling suppliers that are near to our manufacturing locations, thereby reducing the transportation costs, environmental footprint as well as the lead times for such materials. As part of our sourcing strategy, we are actively working on regionalizing supply at our manufacturing facilities. We also stock a supply of raw materials onsite in the event of supply disruption at one of our facilities. The cost of response to this risk is $0 since supplier qualification is included in our normal operating costs.

Comment

C2.4

(C2.4) Have you identified any climate-related opportunities with the potential to have a substantive financial or strategic impact on your business?

Yes

C2.4a

(C2.4a) Provide details of opportunities identified with the potential to have a substantive financial or strategic impact on your business.

Identifier

Opp1

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Products and services

Primary climate-related opportunity driver

Shift in consumer preferences

Primary potential financial impact

Increased revenues resulting from increased demand for products and services

Company-specific description

2020 was a strong year with shipments of 5.5GW and bookings of 5.5GW. The bookings momentum has continued in 2021, with 1.9GW of additional net bookings between January 1 and February 25, 2021. We believe the strong bookings in 2020 are evidence of the demand for renewable energy in general and our Series 6 PV modules in particular driven by our customers' need for certainty, regarding the technology they are investing in, and their supplier's integrity and ethics. We continue to focus on key geographic markets, particularly in areas with abundant solar resources and sizable electricity demand, and additional customer relationships to diversify our customer base. We also collaborate with providers of community solar solutions, which address the residential and small business sectors to provide a broad range of customers with access to competitively priced solar energy regardless of the suitability of their rooftops. The wholesale commercial and industrial market also represents a promising opportunity for the widespread adoption of PV solar technology as corporations undertake certain sustainability commitments. The demand for corporate renewables continues to accelerate, with corporations worldwide committing to the RE100 campaign, a collaborative, global initiative of influential businesses committed to 100% renewable electricity. We believe we also have a competitive advantage in the commercial and industrial market due to many customers' sensitivity to the sustainability, experience, bankability, and financial viability of their suppliers and

geographically diverse operating locations. With our sustainability advantage, strong development expertise, financial strength, and global footprint, we are well positioned to meet these needs.

Time horizon

Short-term

Likelihood

Very likely

Magnitude of impact

High

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

2,700,000,000

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

100% of our revenue comes from the sale of clean energy products. Net sales for 2020 amounted to $2.7 billion. Our gross profit increased 7.2 percentage points to 25.1% during 2020 from 17.9% during 2019 primarily due to higher gross profit on third-party module sales and improved throughput of our manufacturing facilities from the successful ramp of various Series 6 manufacturing lines. During late 2020, we completed the capacity expansion of our manufacturing facility in Perrysburg, Ohio. As of December 31, 2020 we had 6.3 GWDC of total installed Series 6 nameplate production capacity across all our facilities. We produced 6.1 GWDC of solar modules during 2020, which represented a 59% increase in Series 6 module production from 2019. The increase in Series 6 production was primarily driven by the production capacity added in 2019 at our second facility in Ho Chi Minh City, Vietnam and our facility in Lake Township, Ohio as well as higher throughput at various facilities. Our annual manufacturing capacity has grown from 25 MW in 2005 to 7.9 GW as of March 31, 2021, with a path to increase to 13 GW based on our recently announced expansion plan.

Cost to realize opportunity

2,000,000,000

Strategy to realize opportunity and explanation of cost calculation

We continually evaluate forecasted global demand, competition, and our addressable market and seek to effectively balance manufacturing capacity with market demand and

the nature and extent of our competition. We continue to increase the nameplate production capacity of our existing manufacturing facilities by improving our production throughput, increasing module wattage (or conversion efficiency), and improving manufacturing yield losses. In June 2021, we announced plans to invest $680 million to expand our American solar manufacturing capacity by 3.3 GW. Our Ohio manufacturing footprint makes us the largest solar manufacturer in the United States and the Western Hemisphere. In 2020, our total cost of sales amounted to approximately $2 billion. Our modules business cost of sales includes the cost of raw materials and components for manufacturing solar modules, direct labor for the manufacturing of solar modules, manufacturing overhead, depreciation of manufacturing plant and equipment, facility-related expenses, environmental health and safety costs, and costs associated with shipping, warranties, and solar module collection and recycling (excluding accretion). For our systems business, project-related costs include development costs (legal, consulting, transmission upgrade, interconnection, permitting, and other similar costs), EPC costs (consisting primarily of solar modules, inverters, electrical and mounting hardware, project management and engineering, and construction labor), and site specific costs.

Comment

Identifier

Opp2

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Products and services

Primary climate-related opportunity driver

Development and/or expansion of low emission goods and services

Primary potential financial impact

Increased revenues resulting from increased demand for products and services

Company-specific description

In Europe, renewable energy targets, in conjunction with tenders for utility-scale PV solar and other support measures, have contributed to growth in PV solar markets. Renewable energy targets prescribe how much energy consumption must come from renewable sources, while incentive policies and competitive tender policies are intended to support new supply development by providing certainty to investors. Various European Union (“EU”) directives on renewable energy have set targets for all EU member states in support of the recently revised goal of a 55% share of energy from renewable sources in the EU by 2030. Our lower-carbon solar technology not only has positive environmental benefits, but also provides a competitive advantage in commercial discussions. Solar PV tenders in France require an official carbon footprint

assessment of solar modules to be eligible for participating in government auctions. After module price, carbon footprint is the most important criteria. As a result of our resource-efficient thin film PV manufacturing process, the carbon footprint of our solar modules is 2.5X lower than conventional crystalline silicon modules manufactured in China and a fraction of the carbon footprint of conventional energy sources. During 2020, our third-party solar module net sales were predominantly in the United States and France. In 2020, France represented our third largest market after the U.S. and Japan.

Time horizon

Short-term

Likelihood

Very likely

Magnitude of impact

High

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

127,000,000

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

In 2020, France accounted for nearly 5% of our net sales or $127 million, up from approximately 3% of our net sales in 2019, or $89 million. Since 2018, our solar modules' carbon footprint advantage resulted in nearly $250 million in sales in France. Due to our resource-efficient manufacturing process, First Solar modules have a carbon footprint that is up to 2.5 times lower, a water footprint that is up to 3 times lower and an energy payback time that is up to 2 times faster than conventional crystalline silicon solar panels on a life cycle basis.

Cost to realize opportunity

2,200,000

Strategy to realize opportunity and explanation of cost calculation

We continue to pursue module sales activities in France, which is running tenders where utility-scale PV solar projects can bid for capacity. Cost to realize the opportunity are associated with our government affairs and business development activities which are part of our global Sales, General and Administration costs which amounted to approximately $223 million is 2020. Since the EMEA region represented ~1% of our global workforce in 2020, we estimate the cost to realize this opportunity to be

approximately $2.2 million. One of our key points of differentiation is our sustainability advantage which has further improved with our Series 6 technology. As a result of our resource-efficient manufacturing process, the carbon footprint of our modules is up to 2.5 times lower than conventional crystalline silicon modules and a fraction of the carbon footprint of conventional energy sources. On a lifecycle basis, our thin film module technology inherently has the smallest carbon footprint, fastest energy payback time, and lowest water use of any PV solar technology on the market.

Comment

Identifier

Opp3

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Products and services

Primary climate-related opportunity driver

Shift in consumer preferences

Primary potential financial impact

Increased revenues resulting from increased demand for products and services

Company-specific description

In addressing the overall global demand for electricity, our advanced thin film modules, which leverage our Series 6 module technology, compete favorably on an economic basis with traditional forms of electricity generation and provide low cost electricity to end users. Our diverse capabilities facilitate the sale of these solutions and the adoption of our technology in key markets around the world. We believe our strategies and points of differentiation provide the foundation for our competitive position and enable us to remain one of the preferred providers of PV solar modules. Our Series 6 module technology, with its combination of high wattage, low manufacturing costs, a larger form factor, and balance of systems (“BoS”) component compatibility, has further enhanced our competitive position since the launch of such technology in 2018. We are focusing on markets and energy applications in which solar power can be a least-cost, best-fit energy solution, particularly in regions with high solar resources, significant current or projected electricity demand, and/or relatively high existing electricity prices. We differentiate our product offerings by geographic market and localize the solution, as needed.

Time horizon

Short-term

Likelihood

Virtually certain

Magnitude of impact

High

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

1,700,000,000

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

Net sales from our solar modules business amounted to approximately $1.7 billion in 2020, which represented a $275.9 million increase compared to $1.46 billion in 2019, primarily due to a 21% increase in the volume of watts sold, partially offset by a 2% decrease in the average selling price per watt. At our core, we are a technology and module manufacturing company. Over time we have added to this core competency in order to address unmet needs within the market, optimize around and enable the delivery of our product, and capture an incremental profit pool. These capabilities have included, among others, project development, EPC, and O&M. As we look across the next decade, we are challenging our business strategy to assess if each product offering continues to allow us to leverage points of differentiation, while creating value for our customers and an attractive profit pool. These factors ultimately led to the decision to sell our U.S. Project Development and North American O&M businesses. The sale was completed in 2021.

Cost to realize opportunity

1,300,000,000

Strategy to realize opportunity and explanation of cost calculation

The cost of sales of our modules segment amounted to approximately $1.3 billion in 2020 as stated in our annual report. In 2020, our modules segment costs of sales increased by $136.9M from 2019 to 2020. The main driver of that was a $247.4M increase from a higher volume of modules sold. Our modules business cost of sales includes the cost of raw materials and components for manufacturing solar modules, direct labor for the manufacturing of solar modules, manufacturing overhead, depreciation of manufacturing plant and equipment, facility-related expenses, environmental health and safety costs, and costs associated with shipping, warranties, and solar module collection and recycling (excluding accretion). We have dedicated, and intend to continue to dedicate, significant capital and human resources to reduce the total installed cost of PV solar energy and to ensure that our solutions integrate well into the overall electricity ecosystem of each specific market. We continually evaluate forecasted global demand, competition, and our addressable market and seek to

effectively balance manufacturing capacity with market demand and the nature and extent of our competition. During late 2020, we completed the capacity expansion of our manufacturing facility in Perrysburg, Ohio. As of December 31, 2020 we had 6.3 GWDC of total installed Series 6 nameplate production capacity across all our facilities. We produced 6.1 GWDC of solar modules during 2020, which represented a 59% increase in Series 6 module production from 2019. The increase in Series 6 production was primarily driven by the production capacity added in 2019 at our second facility in Ho Chi Minh City, Vietnam and our facility in Lake Township, Ohio as well as higher throughput at various facilities. We expect to produce between 7.4 GWDC and 7.6 GWDC of Series 6 modules during 2021.

Comment

Identifier

Opp4

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Products and services

Primary climate-related opportunity driver

Shift in consumer preferences

Primary potential financial impact

Increased revenues resulting from increased demand for products and services

Company-specific description

Multiple markets within the United States, which accounted for 68% of our 2020 net sales, exemplify favorable characteristics for a solar market, including (i) sizeable electricity demand, particularly around growing population centers and industrial areas; (ii) strong demand for renewable energy generation; and (iii) abundant solar resources. In those areas and applications in which these factors are more pronounced, our PV solar energy solutions compete favorably on an economic basis with traditional forms of energy generation. Tax incentive programs exist in the United States at both the federal and state level and can take the form of investment and production tax credits, accelerated depreciation, and sales and property tax exemptions and abatements. The majority of states in the United States have also enacted legislation adopting Renewable Portfolio Standard (“RPS”) mechanisms. Under an RPS, regulated utilities and other load serving entities are required to procure a specified percentage of their total retail electricity sales to end-user customers from eligible renewable resources, such as solar energy generation facilities, by a specified date. Measured in terms of the volume of renewable electricity required to meet its RPS mandate, California’s RPS program is one of the most significant in the United States. In addition to serving as a template for other states, the California market for renewable energy has historically been a key

region for First Solar and has led the western United States in renewable energy demand for the past several years. Pursuant to the passage of SB100 by the California legislature in 2018, the California
RPS program requires utilities and other obligated load serving entities to procure 60% of their total retail electricity demand from eligible renewable resources by 2030 and 100% of such electricity demand from carbon-free resources by 2045.

Time horizon

Short-term

Likelihood

Very likely

Magnitude of impact

High

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

1,800,000,000

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

In 2020, our third-party solar module net sales were predominantly in the United States and France and our solar power system net sales were predominantly in the United States and Japan. Overall, the United States accounted for 68% of our 2020 net sales, or approximately $1.8 billion.

Cost to realize opportunity

87,000,000

Strategy to realize opportunity and explanation of cost calculation

Cost to realize the opportunity are associated with our government affairs and business development activities which are part of our global selling, general and administration costs which amounted to approximately $223 million in 2020. Since the North America region represented 39% of our global workforce in 2020, we estimate the cost to realize this opportunity to be approximately $87 million. Selling, general and administrative expense consists primarily of salaries and other personnel-related costs, professional fees, insurance costs, and other business development and selling expenses.

Comment

C3. Business Strategy

C3.1

(C3.1) Have climate-related risks and opportunities influenced your organization's strategy and/or financial planning?

Yes, and we have developed a low-carbon transition plan

C3.1a

(C3.1a) Is your organization's low-carbon transition plan a scheduled resolution item at Annual General Meetings (AGMs)?

	Is your low-carbon transition plan a scheduled resolution item at AGMs?	Comment
Row 1	No, and we do not intend it to become a scheduled resolution item within the next two years	

C3.2

(C3.2) Does your organization use climate-related scenario analysis to inform its strategy?

Yes, quantitative

C3.2a

(C3.2a) Provide details of your organization's use of climate-related scenario analysis.

Climate-related scenarios and models applied	Details
2DS RCP 2.6 RCP 4.5 RCP 8.5 Other, please specify 1.5DS	We used forward-looking scenario analyses 2°C scenario, when considering the company's new greenhouse gas emissions target. We have set new science-based targets to reduce our absolute scope 1 and scope 2 GHG emissions by 20% by 2028, relative to 2020, which corresponds to a target emissions intensity of 16 metric tons CO2-eq/MW. This target is in line with science-based climate goals to limit the global temperature rise to well below 2 degrees Celsius (WB2C) above pre-industrial levels. Our 2028 absolute emissions reduction target is based on the Science Based Targets SBT-Tool-v.1.2.1 "Absolute contraction | W2BC" scenario. We have also committed to achieving net zero emissions by 2050 across scopes 1 and 2, in line with a 1.5°C warming scenario. Our 2050 net zero target is based on the CSO Carbon Metric "SSP1-1.9 w-Global Pathway" scenario. Inputs include historical Scope 1 and 2 GHG emissions, gross margins, and total units of production.. Areas of the organization considered as part of the scenario analysis include Scope 1 and 2 emissions sources (manufacturing and R&D facilities, owned and operational PV projects, vehicle fleet, purchased electricity). Achieving this goal would require implementing a

	strategy of increasing module efficiency, reducing energy consumption and procuring offsite solar electricity. In 2020, we joined RE100 and committed to going 100% renewable across our global operations by 2028. The RE100 target of achieving 100% renewable operations would reduce our GHG emissions intensity to 5 metric tons CO2-eq/MW or well below a 2 degree Celsius scenario. We have also used forward-looking scenario analyses in considering climate-related risks and opportunities. For physical 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. For transition risks, we used evaluations by IEA and Princeton University of net zero pathways by 2050 globally and for the U.S., respectively. These transition pathways are consistent with RCP 2.6. We started with the company's targets to define the time horizon of ~2030-2050 for the scenario analysis. These time horizons are relevant to our organization since First Solar has committed to RE100 and has set a target to purchase all electricity from renewables by 2028. First Solar has also committed to science-based climate targets for 2028 and 2050. The scenario analysis considered First Solar-owned facilities and assets - specifically manufacturing, recycling, and R&D facilities. However, some aspects, such as future policy or market changes were considered in terms of their impact on the company as a whole. We have created SWOT analysis and heat maps (matrices of impact versus likelihood) which will be used to prioritize physical and transition risks that require strategic mitigation. The results of the scenario analysis and related case studies will be documented in a TCFD report planned for 2021.

C3.3

(C3.3) Describe where and how climate-related risks and opportunities have influenced your strategy.

	Have climate-related risks and opportunities influenced your strategy in this area?	Description of influence
Products and services	Yes	As a leading American solar technology company and global provider of responsibly-produced eco-efficient solar modules advancing the fight against climate change, First Solar derives 100% of its revenues from clean energy products. The adoption of environmental performance criteria in tender schemes, such as the French carbon footprint criteria, is creating a market pull for more sustainable PV products. By increasing the efficiency of our

		modules and manufacturing process, we have successfully reduced our product carbon footprint which directly translates into business opportunities in France as well as with commercial and industrial customers.
Supply chain and/or value chain	Yes	Climate-related risks such as natural disasters that disrupt the utility and raw material supply to our manufacturing facilities, as identified in our facility risk scorecards, influence our supply chain management strategy. Supply chain risk management examples include geographic diversification of our supply base, critical raw material inventory, and strategic sourcing agreements. For example, we entered into long-term supply agreements for the purchase of certain specified minimum volumes of substrate glass and cover glass for our PV solar modules.
Investment in R&D	Yes	Our R&D model differentiates us from much of our competition due to its vertical integration, from advanced research to product development, manufacturing, and applications. We continue to devote substantial resources to continually improving the wattage and energy yield of our solar modules. Improvements in PV solar module efficiency drive reductions in the costs of PV solar thereby expanding PV markets and displacing electricity generated by fossil fuels. We also focus our R&D activities on continuously improving module durability and manufacturing efficiencies, including throughput improvement, volume ramp, and material cost reduction. Based on publicly available information, we are one of the leaders in R&D investment among PV solar module manufacturers, maintaining a rate of innovation that enables rapid wattage gains and cost reductions.
Operations	Yes	Climate-related risks e.g. natural disasters that affect our manufacturing operations are assessed through semi-annual scorecards for our manufacturing sites. We mitigate such risks by distributing our manufacturing capability across several sites. Stable access to electricity and water, are also taken into account when siting new manufacturing facilities. First Solar implements energy efficiency and low carbon initiatives as part of our standard manufacturing system design. We have installed onsite PV installations at our production sites in Ohio and Malaysia and at our recycling facility in Frankfurt Oder, Germany. In 2020, we joined RE100 and committed to powering our global operations with 100% renewable energy by 2028. By relying on long-term, fixed-price renewable energy, we're not only investing in reducing our exposure to energy price volatility,

		but we're also investing in a sustainable energy future. In 2021, we set new science-based targets to reduce our absolute scope 1 and scope 2 GHG emissions by 20% by 2028 and achieve net zero emissions by 2050, relative to 2020. These targets are in line with science-based climate goals to limit the global temperature rise to well below 2 degrees Celsius (WB2C) above pre-industrial levels. We aim to achieve this through increased energy efficiency, going 100% renewable across our U.S. operations by 2026, working on enabling the offsite solar market in Malaysia and Vietnam, and purchasing bundled renewable energy credits (RECs) and offsets as a last resort.

C3.4

(C3.4) Describe where and how climate-related risks and opportunities have influenced your financial planning.

	Financial planning elements that have been influenced	Description of influence
Row 1	Revenues Capital expenditures	Both climate change risks and opportunities have influenced our financial planning. We are focused on minimizing risks for our factory locations and supply chain as it relates to the dollars that we are putting to work in manufacturing capex. As climate risks worsen, this increases awareness on the speed in which climate initiatives need to be implemented and in turn increases the overall demand for solar. The growing demand for renewable energy and our products directly influences our revenues. Net sales for 2020 amounted to $2.7 billion. Our gross profit increased 7.2 percentage points to 25.1% during 2020 from 17.9% during 2019 primarily due to higher gross profit on third-party module sales and improved throughput of our manufacturing facilities from the successful ramp of various Series 6 manufacturing lines. We continue to see strong demand for our Series 6 technology with 4.8 gigawatts of net bookings in Q1 of 2021. We are largely sold out for 2021 and have 6.4 gigawatts of potential deliveries in 2022 and 3 gigawatts across 2023 and 2024, as of March 31, 2021.

C3.4a

(C3.4a) Provide any additional information on how climate-related risks and opportunities have influenced your strategy and financial planning (optional).

In 2020, we joined RE100 and committed to powering our global operations with 100% renewable energy by 2028. By relying on long-term, fixed-price renewable energy, we're not only investing in reducing our exposure to energy price volatility, but we're also investing in a sustainable energy future.

In 2021, we set new science-based targets to reduce our absolute scope 1 and scope 2 GHG emissions by 20% by 2028 and achieve net zero emissions by 2050, relative to 2020. These targets are in line with science-based climate goals to limit the global temperature rise to well below 2 degrees Celsius (WB2C) above pre-industrial levels. We aim to achieve this through increased energy efficiency, going 100% renewable across our U.S. operations by 2026, working on enabling the offsite solar market in Malaysia and Vietnam, and purchasing bundled renewable energy credits (RECs) and offsets as a last resort.

C4. Targets and performance

C4.1

(C4.1) Did you have an emissions target that was active in the reporting year?

Both absolute and intensity targets

C4.1a

(C4.1a) Provide details of your absolute emissions target(s) and progress made against those targets.

Target reference number

Abs 1

Year target was set

2021

Target coverage

Company-wide

Scope(s) (or Scope 3 category)

Scope 1+2 (market-based)

Base year

2020

Covered emissions in base year (metric tons CO2e)

351,734

Covered emissions in base year as % of total base year emissions in selected Scope(s) (or Scope 3 category)

100

Target year

2028

Targeted reduction from base year (%)

20

Covered emissions in target year (metric tons CO2e) [auto-calculated]

281,387.2

Covered emissions in reporting year (metric tons CO2e)

351,734

% of target achieved [auto-calculated]

0

Target status in reporting year

New

Is this a science-based target?

Yes, we consider this a science-based target, but it has not been approved by the Science-Based Targets initiative

Target ambition

Well-below 2°C aligned

Please explain (including target coverage)

After surpassing our 2021 intensity-based target three years early, we have set new science-based targets to reduce our absolute scope 1 and scope 2 GHG emissions by 20% by 2028, relative to 2020. This target is in line with science-based climate goals to limit the global temperature rise to well below 2 degrees Celsius (WB2C) above pre-industrial levels. Our 2028 absolute emissions reduction target is based on the Science Based Targets SBT-Tool-v.1.2.1 “Absolute contraction | W2BC” scenario.

Target reference number

Abs 2

Year target was set

2021

Target coverage

Company-wide

Scope(s) (or Scope 3 category)

Scope 1+2 (market-based)

Base year

2020

Covered emissions in base year (metric tons CO2e)

351,734

Covered emissions in base year as % of total base year emissions in selected Scope(s) (or Scope 3 category)

100

Target year

2050

Targeted reduction from base year (%)

100

Covered emissions in target year (metric tons CO2e) [auto-calculated]

0

Covered emissions in reporting year (metric tons CO2e)

351,734

% of target achieved [auto-calculated]

0

Target status in reporting year

New

Is this a science-based target?

Yes, we consider this a science-based target, but it has not been approved by the Science-Based Targets initiative

Target ambition

1.5°C aligned

Please explain (including target coverage)

In 2021, we committed to achieving net zero emissions by 2050 across scopes 1 and 2, in line with a 1.5°C warming scenario. Our 2050 net zero target is based on the CSO Carbon Metric “SSP1-1.9 w-Global Pathway” scenario.

C4.1b

(C4.1b) Provide details of your emissions intensity target(s) and progress made against those target(s).

Target reference number

Int 1

Year target was set

2016

Target coverage

Company-wide

Scope(s) (or Scope 3 category)

Scope 1+2 (market-based)

Intensity metric

Other, please specify

Metric Tons CO2e per megawatt (MW) produced

Base year

2008

Intensity figure in base year (metric tons CO2e per unit of activity)

246

% of total base year emissions in selected Scope(s) (or Scope 3 category) covered by this intensity figure

100

Target year

2021

Targeted reduction from base year (%)

45

Intensity figure in target year (metric tons CO2e per unit of activity) [auto-calculated]

135.3

% change anticipated in absolute Scope 1+2 emissions

652

% change anticipated in absolute Scope 3 emissions

0

Intensity figure in reporting year (metric tons CO2e per unit of activity)

57

% of target achieved [auto-calculated]

170.7317073171

Target status in reporting year

Achieved

Is this a science-based target?

No, but we anticipate setting one in the next 2 years

Target ambition

Please explain (including target coverage)

In 2016, we set a five-year goal for 2021 to reduce our GHG emissions intensity per watt produced by 45% compared to our 2008 baseline. Since 2008, our company-wide carbon intensity decreased by approximately 77% as a result of increased module efficiency, manufacturing throughput, and capacity utilization, decreased emissions

intensity of purchased grid electricity, along with energy conservation and low carbon initiatives.
In 2021, we set new science-based targets to reduce our absolute scope 1 and scope 2 GHG emissions by 20% by 2028 and achieve net zero emissions by 2050, relative to 2020. We also aim to reduce our GHG emissions intensity by 93% by 2028, from a 2008 baseline. These targets are in line with science-based climate goals to limit the global temperature rise to well below 2 degrees Celsius (WB2C) above pre-industrial levels.

Target reference number

Int 2

Year target was set

2021

Target coverage

Company-wide

Scope(s) (or Scope 3 category)

Scope 1+2 (market-based)

Intensity metric

Other, please specify

Metric Tons CO2e per megawatt (MW) produced

Base year

2008

Intensity figure in base year (metric tons CO2e per unit of activity)

246

% of total base year emissions in selected Scope(s) (or Scope 3 category) covered by this intensity figure

100

Target year

2028

Targeted reduction from base year (%)

93

Intensity figure in target year (metric tons CO2e per unit of activity) [auto-calculated]

17.22

% change anticipated in absolute Scope 1+2 emissions

-20

% change anticipated in absolute Scope 3 emissions

0

Intensity figure in reporting year (metric tons CO2e per unit of activity)

57

% of target achieved [auto-calculated]

82.6121164437

Target status in reporting year

New

Is this a science-based target?

Yes, we consider this a science-based target, but it has not been approved by the Science Based Targets initiative

Target ambition

Well-below 2°C aligned

Please explain (including target coverage)

In 2021, we set new science-based targets to reduce our absolute scope 1 and scope 2 GHG emissions by 20% by 2028 from a 2020 baseline, and reduce our scope 1 and scope 2 GHG emissions intensity by 93% by 2028, from a 2008 baseline. Our 2028 emissions intensity reduction target is adapted from the Science Based Targets SBT-Tool-v.1.2.1 “Absolute contraction | W2BC” scenario.

C4.2

(C4.2) Did you have any other climate-related targets that were active in the reporting year?

Target(s) to increase low-carbon energy consumption or production

C4.2a

(C4.2a) Provide details of your target(s) to increase low-carbon energy consumption or production.

Target reference number

Low 1

Year target was set

2020

Target coverage

Company-wide

Target type: absolute or intensity

Absolute

Target type: energy carrier

Electricity

Target type: activity

Consumption

Target type: energy source

Renewable energy source(s) only

Metric (target numerator if reporting an intensity target)

Percentage

Target denominator (intensity targets only)

Base year

2020

Figure or percentage in base year

1

Target year

2028

Figure or percentage in target year

100

Figure or percentage in reporting year

1

% of target achieved [auto-calculated]

0

Target status in reporting year

New

Is this target part of an emissions target?

Yes. In 2021, we set new science-based targets to reduce our absolute scope 1 and scope 2 GHG emissions by 20% by 2028 and achieve net zero emissions by 2050, relative to 2020. These targets are in line with science-based climate goals to limit the global temperature rise to well below 2 degrees Celsius (WB2C) above pre-industrial levels. We aim to achieve this through increased energy efficiency, purchasing 100% renewable electricity across our U.S. operations by 2026, and purchasing 100% renewable electricity across our global operations by 2028 by working on enabling the offsite solar market in Malaysia and Vietnam, and purchasing bundled renewable energy credits (RECs) and offsets as a last resort.

Is this target part of an overarching initiative?

RE100

Please explain (including target coverage)

In 2020, we joined RE100 and committed to powering our global operations with 100% renewable electricity by 2028. We have installed onsite PV installations at our production sites in Ohio and Malaysia and at our recycling facility in Frankfurt Oder, Germany. We are now investigating opportunities to procure offsite solar electricity as part of our renewable energy strategy.

Target reference number

Low 2

Year target was set

2020

Target coverage

Country/region

Target type: absolute or intensity

Absolute

Target type: energy carrier

Electricity

Target type: activity

Consumption

Target type: energy source

Renewable energy source(s) only

Metric (target numerator if reporting an intensity target)

Percentage

Target denominator (intensity targets only)

Base year

2020

Figure or percentage in base year

2

Target year

2026

Figure or percentage in target year

100

Figure or percentage in reporting year

2

% of target achieved [auto-calculated]

0

Target status in reporting year

New

Is this target part of an emissions target?

Yes. In 2021, we set new science-based targets to reduce our absolute scope 1 and scope 2 GHG emissions by 20% by 2028 and achieve net zero emissions by 2050, relative to 2020. These targets are in line with science-based climate goals to limit the global temperature rise to well below 2 degrees Celsius (WB2C) above pre-industrial levels. We aim to achieve this through increased energy efficiency, purchasing 100% renewable electricity across our U.S. operations by 2026, and purchasing 100% renewable electricity across our global operations by 2028 by working on enabling the offsite solar market in Malaysia and Vietnam, and purchasing bundled renewable energy credits (RECs) and offsets as a last resort.

Is this target part of an overarching initiative?

Please explain (including target coverage)

In 2020, we joined RE100 and committed to powering our global operations with 100% renewable electricity by 2028, with an interim goal of transitioning our facilities in the United States to 100% renewable electricity by 2026.

C4.3

(C4.3) Did you have emissions reduction initiatives that were active within the reporting year? Note that this can include those in the planning and/or implementation phases.

Yes

C4.3a

(C4.3a) Identify the total number of initiatives at each stage of development, and for those in the implementation stages, the estimated CO2e savings.

	Number of initiatives	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation	0	0
To be implemented*	0	0
Implementation commenced*	0	0
Implemented*	14	1,233
Not to be implemented	3	0

C4.3b

(C4.3b) Provide details on the initiatives implemented in the reporting year in the table below.

Initiative category & Initiative type

Energy efficiency in buildings

Lighting

Estimated annual CO2e savings (metric tonnes CO2e)

131

Scope(s)

Scope 2 (market-based)

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

26,367

Investment required (unit currency – as specified in C0.4)

3,300

Payback period

<1 year

Estimated lifetime of the initiative

6-10 years

Comment

Lighting optimization in Malaysia manufacturing facility.

Initiative category & Initiative type

Energy efficiency in buildings

Heating, Ventilation and Air Conditioning (HVAC)

Estimated annual CO2e savings (metric tonnes CO2e)

504

Scope(s)

Scope 2 (market-based)

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

100,910

Investment required (unit currency – as specified in C0.4)

0

Payback period

<1 year

Estimated lifetime of the initiative

6-10 years

Comment

Chiller optimization in Malaysia manufacturing facility

Initiative category & Initiative type

Energy efficiency in buildings

Lighting

Estimated annual CO2e savings (metric tonnes CO2e)

12

Scope(s)

Scope 2 (market-based)

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

2,658

Investment required (unit currency – as specified in C0.4)

0

Payback period

<1 year

Estimated lifetime of the initiative

3-5 years

Comment

Lighting timer in Vietnam manufacturing facility

Initiative category & Initiative type

Energy efficiency in buildings

Lighting

Estimated annual CO2e savings (metric tonnes CO2e)

7

Scope(s)

Scope 2 (market-based)

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

1,605

Investment required (unit currency – as specified in C0.4)

350

Payback period

<1 year

Estimated lifetime of the initiative

3-5 years

Comment

Lighting sensor in Vietnam manufacturing facility

Initiative category & Initiative type

Energy efficiency in buildings

Heating, Ventilation and Air Conditioning (HVAC)

Estimated annual CO2e savings (metric tonnes CO2e)

265

Scope(s)

Scope 2 (market-based)

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

60,000

Investment required (unit currency – as specified in C0.4)

0

Payback period

<1 year

Estimated lifetime of the initiative

3-5 years

Comment

Chiller optimization in in Vietnam manufacturing facility

Initiative category & Initiative type

Energy efficiency in buildings

Heating, Ventilation and Air Conditioning (HVAC)

Estimated annual CO2e savings (metric tonnes CO2e)

20

Scope(s)

Scope 2 (market-based)

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

4,500

Investment required (unit currency – as specified in C0.4)

0

Payback period

<1 year

Estimated lifetime of the initiative

3-5 years

Comment

HVAC settings in Vietnam manufacturing facility

Initiative category & Initiative type

Energy efficiency in buildings

Lighting

Estimated annual CO2e savings (metric tonnes CO2e)

3

Scope(s)

Scope 2 (market-based)

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

651

Investment required (unit currency – as specified in C0.4)

0

Payback period

<1 year

Estimated lifetime of the initiative

3-5 years

Comment

Lighting conservation in Vietnam manufacturing facility

Initiative category & Initiative type

Energy efficiency in buildings
Lighting

Estimated annual CO2e savings (metric tonnes CO2e)

4

Scope(s)

Scope 2 (market-based)

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

807

Investment required (unit currency – as specified in C0.4)

0

Payback period

<1 year

Estimated lifetime of the initiative

3-5 years

Comment

Lighting controls in Vietnam manufacturing facility

Initiative category & Initiative type

Energy efficiency in buildings
Lighting

Estimated annual CO2e savings (metric tonnes CO2e)

1

Scope(s)

Scope 2 (market-based)

Voluntary/Mandatory
Voluntary

Annual monetary savings (unit currency – as specified in C0.4)
336

Investment required (unit currency – as specified in C0.4)
80

Payback period
<1 year

Estimated lifetime of the initiative
3-5 years

Comment
Lighting timers in Vietnam manufacturing facility

Initiative category & Initiative type
Energy efficiency in buildings
Lighting

Estimated annual CO2e savings (metric tonnes CO2e)
13

Scope(s)
Scope 2 (market-based)

Voluntary/Mandatory
Voluntary

Annual monetary savings (unit currency – as specified in C0.4)
4,500

Investment required (unit currency – as specified in C0.4)
0

Payback period
<1 year

Estimated lifetime of the initiative
3-5 years

Comment
Lighting timers in Vietnam manufacturing facility

Initiative category & Initiative type

Energy efficiency in buildings
Lighting

Estimated annual CO2e savings (metric tonnes CO2e)
17

Scope(s)
Scope 2 (market-based)

Voluntary/Mandatory
Voluntary

Annual monetary savings (unit currency – as specified in C0.4)
3,928

Investment required (unit currency – as specified in C0.4)
0

Payback period
<1 year

Estimated lifetime of the initiative
3-5 years

Comment
Lighting programming in Vietnam manufacturing facility

Initiative category & Initiative type
Energy efficiency in buildings
Heating, Ventilation and Air Conditioning (HVAC)

Estimated annual CO2e savings (metric tonnes CO2e)
219

Scope(s)
Scope 2 (market-based)

Voluntary/Mandatory
Voluntary

Annual monetary savings (unit currency – as specified in C0.4)
50,000

Investment required (unit currency – as specified in C0.4)
0

Payback period
<1 year

Estimated lifetime of the initiative

3-5 years

Comment

Chiller optimization in Vietnam manufacturing facility

Initiative category & Initiative type

Energy efficiency in buildings
Lighting

Estimated annual CO2e savings (metric tonnes CO2e)

15

Scope(s)

Scope 2 (market-based)

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

3,364

Investment required (unit currency – as specified in C0.4)

0

Payback period

<1 year

Estimated lifetime of the initiative

3-5 years

Comment

Lighting replacement in Vietnam manufacturing facility

Initiative category & Initiative type

Energy efficiency in buildings
Lighting

Estimated annual CO2e savings (metric tonnes CO2e)

22

Scope(s)

Scope 2 (market-based)

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

5,095

Investment required (unit currency – as specified in C0.4)

7,085

Payback period

1-3 years

Estimated lifetime of the initiative

3-5 years

Comment

LED lighting in Vietnam manufacturing facility

C4.3c

(C4.3c) What methods do you use to drive investment in emissions reduction activities?

Method	Comment
Dedicated budget for low-carbon product R&D	Our product causes the greatest impact on GHG reduction. We have a dedicated Research and Development function whose sole purpose is to enhance the efficiency of our product and lower the cost of making it. These projects get a significant amount of First Solar's overall R&D spending.
Employee engagement	We have engaged employees at the site and global level. We have a global facilities team working on defining priorities, identifying opportunities, and implementing energy conservation projects. This is also done at the site level in our manufacturing and research locations, where we have dedicated local teams. Our facilities teams are also rewarded for achieving our energy savings targets.
Financial optimization calculations	Each project opportunity is evaluated for its payback, and external incentives are considered when calculating payback. Energy saving targets are established to reduce manufacturing costs.
Lower return on investment (ROI) specification	Although we do not have a specific ROI for energy conservation projects, we recognize that energy projects are low risk and this understanding of risk is integrated into our regular capital planning decisions.
Partnering with governments on technology development	We have worked with local utilities to find and implement energy conservation projects. For example, we worked with Silicon Valley Power to identify opportunities to reduce our GHG emissions, energy consumption and energy costs at our Santa Clara office building.

C4.5

(C4.5) Do you classify any of your existing goods and/or services as low-carbon products or do they enable a third party to avoid GHG emissions?

Yes

C4.5a

(C4.5a) Provide details of your products and/or services that you classify as low-carbon products or that enable a third party to avoid GHG emissions.

Level of aggregation

Company-wide

Description of product/Group of products

Our solar PV modules produced in 2020 are helping displace more than 10 times the emissions we emit through our global operations. In 2020, First Solar produced 6.1GW of PV solar modules and our company-wide scope 1 and scope 2 greenhouse gas emissions amounted to approximately 0.35 million metric tons of CO2 equivalent. Assuming worldwide average irradiance and grid electricity emissions, we conservatively estimate that our 2020 products are being used to displace more than 4 million metric tons CO2e per year for the 30+ year product life. Since First Solar began commercial operations in 2002 and through 2019, we have sold over 30 GW of PV solar modules. Assuming average worldwide irradiance and grid electricity emissions, our products are being used to displace 21 million metric tons of CO2e per year for their 30+ year product life. This is equivalent to powering 15 million average homes and saving over 54 billion liters of water (21,000+ Olympic swimming pools) per year based on worldwide averages.

Are these low-carbon product(s) or do they enable avoided emissions?

Low-carbon product and avoided emissions

Taxonomy, project or methodology used to classify product(s) as low-carbon or to calculate avoided emissions

Other, please specify

Worldwide average carbon displacement

% revenue from low carbon product(s) in the reporting year

100

Comment

First Solar's eco-efficient PV modules are cumulatively displacing more than 60 times the amount of greenhouse gas emissions we emit through our global operations. In 2020, First Solar's company-wide scope 1 and scope 2 greenhouse gas emissions amounted to approximately 0.35 million metric tons of CO2 equivalent. With over 30GW of modules sold worldwide, First Solar PV solutions are displacing over 21 million metric tons of CO2 equivalent per year, resulting in a net beneficial carbon impact of over 20 million metrics tons CO2e per year, assuming average worldwide irradiance and grid electricity emissions. More information on the worldwide average solar carbon displacement methodology is provided in our technical report: P. Sinha and L. Jenkins, 2011, Estimating Carbon Displacement by Solar Deployment, First Solar Technical Report. (Available at: http://www.firstsolar.com/-/media/First-Solar/Sustainability-

Documents/Sustainability-Studies/TechnicalReportCarbonDisplacement_02761_NA.ashx?dl=1)

C5. Emissions methodology

C5.1

(C5.1) Provide your base year and base year emissions (Scopes 1 and 2).

Scope 1

Base year start

January 1, 2008

Base year end

December 31, 2008

Base year emissions (metric tons CO2e)

1,020

Comment

Scope 2 (location-based)

Base year start

January 1, 2008

Base year end

December 31, 2008

Base year emissions (metric tons CO2e)

123,046

Comment

Scope 2 (market-based)

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

C5.2

(C5.2) Select the name of the standard, protocol, or methodology you have used to collect activity data and calculate emissions.

The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)

C6. Emissions data

C6.1

(C6.1) What were your organization's gross global Scope 1 emissions in metric tons CO2e?

Reporting year

Gross global Scope 1 emissions (metric tons CO2e)

7,037

Comment

C6.2

(C6.2) Describe your organization's approach to reporting Scope 2 emissions.

Row 1

Scope 2, location-based

We are reporting a Scope 2, location-based figure

Scope 2, market-based

We are reporting a Scope 2, market-based figure

Comment

C6.3

(C6.3) What were your organization's gross global Scope 2 emissions in metric tons CO2e?

Reporting year

Scope 2, location-based

463,918

Scope 2, market-based (if applicable)

344,697

Comment

C6.4

(C6.4) Are there any sources (e.g. facilities, specific GHGs, activities, geographies, etc.) of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure?

No

C6.5

(C6.5) Account for your organization's gross global Scope 3 emissions, disclosing and explaining any exclusions.

Purchased goods and services

Evaluation status

Relevant, calculated

Metric tonnes CO2e

1,227,987

Emissions calculation methodology

Based on life cycle assessment of First Solar PV module production (Table III; DOI: 10.1002/pip.1068) and total modules produced in 2020, and subtracting 2020 Scope 1 and 2 emissions

Percentage of emissions calculated using data obtained from suppliers or value chain partners

25

Please explain

Bill of materials for PV module manufacturing from a previous year were the basis for the life cycle assessment combined with modules produced in 2020

Capital goods

Evaluation status

Relevant, calculated

Metric tonnes CO2e

295,327

Emissions calculation methodology

Our capital expenditures are disclosed as 'purchases of property, plant, and equipment' in our annual report's consolidated cash flow statement. In alignment with the

WRI/WBCSD GHG Protocol, we used the Quantis Scope 3 Evaluator tool to calculate scope 3 emissions associated with capital goods purchased based on spend. The emissions are calculated by multiplying our 2020 capital goods spend by a CO2 emission factor based on the broad sector of purchase.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

25

Please explain

Capital expenditures on purchases of property, plant, and equipment were the basis for the estimate.

Fuel-and-energy-related activities (not included in Scope 1 or 2)

Evaluation status

Relevant, calculated

Metric tonnes CO2e

17,235

Emissions calculation methodology

GHG emissions from transmission and distribution losses were estimated from market-based Scope 2 GHG emissions from purchased electricity (presented earlier) in conjunction with a transmission and distribution loss factor of 5%.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

25

Please explain

Quantities of purchased electricity were the basis for the estimate.

Upstream transportation and distribution

Evaluation status

Relevant, calculated

Metric tonnes CO2e

12,558

Emissions calculation methodology

Glass and aluminum supply distances to First Solar's manufacturing facilities used in conjunction with transoceanic freight ship fuel consumption factor of 0.0025 kg heavy fuel oil per tonne-km and a residual fuel oil emission factor from WRI GHG Protocol stationary combustion tool (V. 4.1).

Percentage of emissions calculated using data obtained from suppliers or value chain partners

75

Please explain

GHG Emissions were extrapolated from glass and aluminum supply distances and transport methods combined with data on modules produced in 2020.

Waste generated in operations

Evaluation status

Relevant, calculated

Metric tonnes CO2e

5,108

Emissions calculation methodology

In 2020, we disposed of 10.5 million kilograms of waste (or 11,610 Tons). Quantity of disposed waste from manufacturing facilities was used in conjunction with U.S. EPA mixed waste landfilling emission factor of 0.12 Metric Ton Carbon Equivalent /Ton. The mass conversion factor of mass carbon to mass CO2 generated during combustion processes is 44/12

Percentage of emissions calculated using data obtained from suppliers or value chain partners

100

Please explain

Quantities of disposed non-hazardous and hazardous waste were the basis for the estimate. In 2020, we disposed of 10.5 million kilograms of waste (or 11610 Tons). Note that approximately 37 million kilograms of waste (or 77% of the 48 million kilograms of total waste generated) were recycled in 2020.

Business travel

Evaluation status

Relevant, calculated

Metric tonnes CO2e

573

Emissions calculation methodology

Short, medium, and long haul passenger air miles recorded by corporate travel agent were used in conjunction with air travel emission factors of 0.53, 0.43, and 0.39 lb CO2 per passenger mile, respectively

Percentage of emissions calculated using data obtained from suppliers or value chain partners

100

Please explain

Short, medium, and long haul passenger air miles recorded by corporate travel agent were the basis for the estimate

Employee commuting

Evaluation status

Relevant, calculated

Metric tonnes CO2e

3,389

Emissions calculation methodology

Number of full-time equivalent employees in 2020 was the basis for this estimate combined with assumptions regarding average employee commuting GHG emissions from the Quantis Scope 3 evaluator tool. A scaling factor of 0.25 was also applied to account for work-from-home mandates imposed in Q2-Q4 2020 due to the COVID-19 pandemic.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

25

Please explain

Number of full-time equivalent employees in 2020 was the basis for this estimate

Upstream leased assets

Evaluation status

Not relevant, explanation provided

Please explain

Leased vehicles had previously been accounted for as part of First Solar's operations and maintenance (O&M) business unit. With the sale of the O&M business unit, leased vehicles are no longer relevant.

Downstream transportation and distribution

Evaluation status

Relevant, calculated

Metric tonnes CO2e

47,250

Emissions calculation methodology

Finished product (PV module) transport distances and transport methods (ship) from our manufacturing facilities to our largest market (U.S.; Long Beach, CA used as representative port) were used in conjunction with a transoceanic freight ship fuel consumption factor of 0.0025 kg heavy fuel oil per tonne-km and a residual fuel oil emission factor from WRI GHG Protocol stationary combustion tool (V. 4.1).

Percentage of emissions calculated using data obtained from suppliers or value chain partners

25

Please explain

GHG Emissions were estimated from quantity of PV modules produced in 2020 in conjunction with port to port distance.

Processing of sold products

Evaluation status

Not relevant, explanation provided

Please explain

Our products are not further processed. In less than 4 hours, First Solar's fully integrated manufacturing process transforms a sheet of glass into a completed thin film solar PV module, which is flash tested, boxed, and ready for shipment. All processes from the beginning of our manufacturing process to completed module are covered in our scope 1 and 2 emissions

Use of sold products

Evaluation status

Relevant, calculated

Metric tonnes CO2e

0

Emissions calculation methodology

Our products (PV modules) are electricity producing rather than energy consuming products.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

100

Please explain

Our products are classified as zero-emission electricity generation technologies. First Solar PV solar modules generate clean reliable electricity with no air emissions, waste production, and minimal water use. In 2020, First Solar produced 6.1 GWdc of PV solar modules. Assuming world-wide average irradiance and grid electricity emissions, we estimate that our 2020 products are being used to displace over 4 million metric tons CO2e per year for the 30+ year product life.

End of life treatment of sold products

Evaluation status

Relevant, calculated

Metric tonnes CO2e

1,290

Emissions calculation methodology

Electricity consumption per square meter of PV module recycled (DOI: 10.4229/27thEUPVSEC2012-6CV.4.9) was used in conjunction with quantities of end of life PV modules recycled at First Solar's recycling facilities in U.S., Germany, Vietnam, and Malaysia and market-specific GHG electricity emission factors.

Percentage of emissions calculated using data obtained from suppliers or value chain partners

25

Please explain

GHG emissions were estimated from quantity of end of life PV modules recycled in 2020 in conjunction with an electricity consumption factor from a previous year. First Solar, as part of its commitment to extended producer responsibility, has voluntarily established and implemented the industry's first global module recycling program. Note that since these recycling facilities are owned and operated by First Solar, their greenhouse gas emissions are already accounted for within Scope 1 and 2.

Downstream leased assets

Evaluation status

Relevant, calculated

Metric tonnes CO2e

463

Emissions calculation methodology

Electricity consumption per square foot for warehouse facilities from EIA CBECS database was used in conjunction with square footage from leased warehouse facilities and WRI GHG Protocol tool for purchased electricity (V. 4.7).

Percentage of emissions calculated using data obtained from suppliers or value chain partners

25

Please explain

GHG emissions were estimated based on square footage of leased warehouse facilities.

Franchises

Evaluation status

Not relevant, explanation provided

Please explain

We do not have franchises therefore this is not relevant and there are no scope 3 emissions to report.

Investments

Evaluation status

Not relevant, explanation provided

Please explain

We had previously accounted for Scope 3 emissions from solar projects in the construction phase. With the sale of the engineering, procurement, and construction (EPC) business unit, these emissions are no longer relevant.

Other (upstream)

Evaluation status

Not relevant, explanation provided

Please explain

There are no other relevant Scope 3 GHG emissions from upstream sources

Other (downstream)

Evaluation status

Not relevant, explanation provided

Please explain

There are no other relevant Scope 3 GHG emissions from downstream sources

C-CG6.6

(C-CG6.6) Does your organization assess the life cycle emissions of any of its products or services?

	Assessment of life cycle emissions	Comment
Row 1	Yes	

C-CG6.6a

(C-CG6.6a) Provide details of how your organization assesses the life cycle emissions of its products or services.

	Products/services assessed	Life cycle stage(s) most commonly covered	Methodologies/standards/tools applied	Comment
Row 1	All existing and new products/services	Cradle-to-grave	EU Product Environmental Footprint (EUPEF) French Product Environmental Footprint ISO 14025 ISO 14040 & 14044	

C6.7

(C6.7) Are carbon dioxide emissions from biogenic carbon relevant to your organization?

No

C6.10

(C6.10) Describe your gross global combined Scope 1 and 2 emissions for the reporting year in metric tons CO2e per unit currency total revenue and provide any additional intensity metrics that are appropriate to your business operations.

Intensity figure

0.00013

Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO2e)

351,734

Metric denominator

unit total revenue

Metric denominator: Unit total

2,711,332,000

Scope 2 figure used

Market-based

% change from previous year

15

Direction of change

Decreased

Reason for change

In 2020, our absolute Scope 1 and 2 GHG emissions (351,734 MT CO2e) decreased by 25% relative to 2019 (468,212 CO2e) due to increased energy efficiency with conversion from Series 4 to Series 6 PV module production. Total revenue decreased by a lesser rate of 11% in 2020 ($2.711 billion) compared to 2019 ($3.063 billion).

Intensity figure

69

Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO2e)

351,734

Metric denominator

full time equivalent (FTE) employee

Metric denominator: Unit total

5,100

Scope 2 figure used

Market-based

% change from previous year

3

Direction of change

Decreased

Reason for change

In 2020, our absolute Scope 1 and 2 GHG emissions (351,734 MT CO2e) decreased by 25% relative to 2019 (468,212 CO2e) due to increased energy efficiency with conversion from Series 4 to Series 6 PV module production. FTE decreased by a slightly lesser rate of 23% from 6600 in 2019 to 5100 in 2020.

Intensity figure

57

Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO2e)

351,734

Metric denominator

Other, please specify

MW of PV modules produced

Metric denominator: Unit total

6,124

Scope 2 figure used

Market-based

% change from previous year

31

Direction of change

Decreased

Reason for change

In 2020, our absolute Scope 1 and 2 GHG emissions (351,734 MT CO2e) decreased by 25% relative to 2019 (468,212 CO2e) due to increased energy efficiency with conversion from Series 4 to Series 6 PV module production. In addition, production volume increased 8% from 5662 MW in 2019 to 6124 MW in 2020.

C7. Emissions breakdowns

C7.1

(C7.1) Does your organization break down its Scope 1 emissions by greenhouse gas type?

Yes

C7.1a

(C7.1a) Break down your total gross global Scope 1 emissions by greenhouse gas type and provide the source of each used greenhouse warming potential (GWP).

Greenhouse gas	Scope 1 emissions (metric tons of CO2e)	GWP Reference
CO2	5,815	IPCC Fifth Assessment Report (AR5 – 100 year)
CH4	3	IPCC Fifth Assessment Report (AR5 – 100 year)
N2O	3	IPCC Fifth Assessment Report (AR5 – 100 year)
HFCs	1,216	IPCC Fourth Assessment Report (AR4 - 100 year)
PFCs	0	IPCC Fifth Assessment Report (AR5 – 100 year)
SF6	0	IPCC Fifth Assessment Report (AR5 – 100 year)
NF3	0	IPCC Fifth Assessment Report (AR5 – 100 year)

C7.2

(C7.2) Break down your total gross global Scope 1 emissions by country/region.

Country/Region	Scope 1 emissions (metric tons CO2e)
Germany	653
Malaysia	498
United States of America	4,722
Japan	0
Samoa	0
Chile	0
India	0

Viet Nam	1,164

C7.3

(C7.3) Indicate which gross global Scope 1 emissions breakdowns you are able to provide.

By business division
By facility
By activity

C7.3a

(C7.3a) Break down your total gross global Scope 1 emissions by business division.

Business division	Scope 1 emissions (metric ton CO2e)
Manufacturing and Recycling	6,762
Research and Development	245
Vehicle Fleet	30

C7.3b

(C7.3b) Break down your total gross global Scope 1 emissions by business facility.

Facility	Scope 1 emissions (metric tons CO2e)	Latitude	Longitude
Perrysburg, Ohio, USA	4,447	41.557058	-83.552515
Frankfurt-Oder, Germany	653	52.312919	14.481102
Kulim, Malaysia	498	5.428624	100.572598
Santa Clara, California, USA	245	37.371053	-121.951931
Vehicle Fleet	30	39.766959	-86.164956
Ho Chi Minh City, Viet Nam	1,164	10.77653	106.70098

C7.3c

(C7.3c) Break down your total gross global Scope 1 emissions by business activity.

Activity	Scope 1 emissions (metric tons CO2e)
Stationary Combustion	5,509
Mobile Source Emissions	30
Fugitive Emissions	1,217
Process Emissions	282

C7.5

(C7.5) Break down your total gross global Scope 2 emissions by country/region.

Country/Region	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)	Purchased and consumed electricity, heat, steam or cooling (MWh)	Purchased and consumed low-carbon electricity, heat, steam or cooling accounted for in Scope 2 market-based approach (MWh)
Chile	1,075	1,075	0	0
Germany	1,115	1,115	0	0
India	474	474	0	0
Japan	390	390	0	0
Malaysia	171,457	130,247	0	0
Samoa	19	19	0	0
United States of America	182,487	104,476	0	0
Viet Nam	106,899	106,899	0	0

C7.6

(C7.6) Indicate which gross global Scope 2 emissions breakdowns you are able to provide.

By business division
By facility
By activity

C7.6a

(C7.6a) Break down your total gross global Scope 2 emissions by business division.

Business division	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)
Manufacturing and Recycling	460,074	340,853
Research and Development	1,622	1,622
Owned Operational Solar Projects	2,222	2,222

C7.6b

(C7.6b) Break down your total gross global Scope 2 emissions by business facility.

Facility	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)
Perrysburg, Ohio, USA	180,603	102,592

Frankfurt-Oder, Germany	1,115	1,115
Kulim, Malaysia	171,457	130,247
Santa Clara, California, USA	1,217	1,217
Mesa, Arizona, USA	405	405
Owned Operational Solar Projects	2,222	2,222
Ho Chi Minh City, Viet Nam	106,899	106,899

C7.6c

(C7.6c) Break down your total gross global Scope 2 emissions by business activity.

Activity	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)
Purchased Electricity	463,918	344,697

C7.9

(C7.9) How do your gross global emissions (Scope 1 and 2 combined) for the reporting year compare to those of the previous reporting year?

Decreased

C7.9a

(C7.9a) Identify the reasons for any change in your gross global emissions (Scope 1 and 2 combined), and for each of them specify how your emissions compare to the previous year.

	Change in emissions (metric tons CO2e)	Direction of change	Emissions value (percentage)	Please explain calculation
Change in renewable energy consumption	0	No change	0	First Solar's on-site PV installations at its manufacturing and recycling facilities in Kulim, Malaysia (750 kW), Frankfurt-Oder, Germany (2.9 MW), and Perrysburg, Ohio, USA (2.75 MW) continue to generate about 7 GWh/yr of electricity for self-consumption
Other emissions	1,233	Decreased	0.26	First Solar implemented a re-lighting and chiller optimization project at its manufacturing facility in Malaysia, and

reduction activities				various lighting, HVAC, and chiller optimization projects at its manufacturing facility in Vietnam . These measures resulted in savings of 1233 metric tons CO2e from avoided electricity consumption in 2020. Our scope 1 and 2 emissions in the previous year (2019) amounted to 468,212 metric tons CO2e. We arrived at a 0.34% decrease in our gross global emissions through (1233/ 468,212) *100 = 0.26%
Divestment	16,345	Decreased	3.5	Sale of the EPC and O&M business units resulted in a decrease of 137 metric tons CO2-eq from O&M owned vehicles and 16,208 metric tons CO2-eq from EPC owned equipment. In total, the divestments correspond to a decrease of 16,345 metric tons CO2e of emissions, or 3.5% of the previous year's emissions through (16,345 / 468,212)*100 = 3.5%.
Acquisitions	0	No change	0	There were no acquisitions in 2020.
Mergers	0	No change	0	There were no mergers in 2020.
Change in output	38,205	Increased	8.2	From 2019 to 2020, First Solar increased its production of PV solar modules by 8% from 5.662GW to 6.124GW. This increased output corresponds to a increase of 38,205 metric tons CO2e of emissions, or 8% of the previous year's emissions through (38,205 / 468,212)*100 = 8.2%.
Change in methodology	11,240	Decreased	2.4	In 2020, First Solar changed the grid electricity emission factor for its Kulim, Malaysia facility from a supplier specific factor of 0.54 kg CO2e/kWh in 2019 to a supplier-specific factor of 0.51 kg CO2e/kWh in 2020. Use of the updated supplier specific factor resulted in a decrease of 7,662 metric tons CO2e of emissions compared with using the 2019 factor. Also In 2020, First Solar changed the grid electricity emission factor for its

				Perrysburg, Ohio facility from a supplier specific factor of 0.403 kg CO2e/kWh in 2019 to a supplier-specific factor of 0.386 kg CO2e/kWh in 2020. Use of the updated supplier specific factor resulted in a decrease of 3,579 metric tons CO2e of emissions compared with using the 2019 factor. The updated emissions factors for the two facilities account for a net decrease of 11,240 metric tons CO2e or 2.4% of the previous year's emissions through (-11,240) / 468,212)*100 = -2.4%
Change in boundary	0	No change	0	There were no changes in boundary in 2019.
Change in physical operating conditions	0	No change	0	There no changes in physical operating conditions in 2020.
Unidentified	0	No change	0	There were no unidentified changes in 2019.
Other	125,865	Decreased	26.9	In 2020, higher Series 6 manufacturing throughput led to a reduction of manufacturing electricity usage, as Series 6 modules require less electricity per m2 of PV module production than Series 4 modules. In 2020, an increased proportion of manufacturing occurred in Vietnam, which has a lower grid carbon intensity than the U.S. and Malaysia. The combination of these changes led to a decrease of 275,666 metric tons CO2e of emissions, or 26.9% of the previous year's emissions through (-125,865/468,212)*100=-26.9%

C7.9b

(C7.9b) Are your emissions performance calculations in C7.9 and C7.9a based on a location-based Scope 2 emissions figure or a market-based Scope 2 emissions figure?

Market-based

C-CG7.10

(C-CG7.10) How do your total Scope 3 emissions for the reporting year compare to those of the previous reporting year?

Decreased

C-CG7.10a

(C-CG7.10a) For each Scope 3 category calculated in C6.5, specify how your emissions compare to the previous year and identify the reason for any change.

Purchased goods and services

Direction of change

Increased

Primary reason for change

Change in output

Change in emissions in this category (metric tons CO2e)

184,841

% change in emissions in this category

18

Please explain

Emissions were calculated based on life cycle assessment of First Solar PV module production and total modules produced in 2020, and subtracting 2020 Scope 1 and 2 emissions. Since manufacturing output increased by 8% in 2020 compared to 2019, emissions from purchased goods and services increased approximately proportionally.

Capital goods

Direction of change

Decreased

Primary reason for change

Change in physical operating conditions

Change in emissions in this category (metric tons CO2e)

178,686

% change in emissions in this category

38

Please explain

Capital expenditures on purchases of property, plant, and equipment were the basis for the estimate. These capital expenditures were 38% lower in 2020 than 2019 as ramping of Series 6 manufacturing and associated capital expenditures were partially completed.

Fuel and energy-related activities (not included in Scopes 1 or 2)

Direction of change

Decreased

Primary reason for change

Change in product efficiency

Change in emissions in this category (metric tons CO2e)

4,850

% change in emissions in this category

22

Please explain

GHG emissions from transmission and distribution losses were estimated from market-based Scope 2 GHG emissions from purchased electricity in conjunction with a transmission and distribution loss factor of 5%. In 2020, Scope 2 GHG emissions decreased by 22% relative to 2019 due to higher Series 6 manufacturing throughput , as Series 6 modules require less electricity per m2 of PV module production than Series 4 modules.

Upstream transportation and distribution

Direction of change

Increased

Primary reason for change

Change in methodology

Change in emissions in this category (metric tons CO2e)

3,407

% change in emissions in this category

37

Please explain

For 2020, upstream transportation and distribution emissions were estimated based on glass and aluminum supply distances to First Solar's manufacturing facilities, whereas 2019 emissions were based only on glass supply distances. Glass and aluminum account for >95% of the Series 6 PV module by weight whereas the prior Series 4 PV module was frameless and therefore did not contain aluminum.

Waste generated in operations

Direction of change

Decreased

Primary reason for change

Change in material efficiency

Change in emissions in this category (metric tons CO2e)

1,682

% change in emissions in this category

25

Please explain

In 2020, 77% of total waste generated was recycled, compared with 61% in 2019, resulting in reduced waste sent for disposal.

Business travel

Direction of change

Decreased

Primary reason for change

Change in physical operating conditions

Change in emissions in this category (metric tons CO2e)

4,265

% change in emissions in this category

88

Please explain

In 2020, travel restrictions due to the COVID-19 pandemic limited business travel in comparison with 2019.

Employee commuting

Direction of change

Decreased

Primary reason for change

Change in physical operating conditions

Change in emissions in this category (metric tons CO2e)

14,607

% change in emissions in this category

81

Please explain

In 2020, telecommuting requirements due to the COVID-19 pandemic limited employee commuting in comparison with 2019.

Downstream transportation and distribution

Direction of change

Decreased

Primary reason for change

Change in physical operating conditions

Change in emissions in this category (metric tons CO2e)

14,450

% change in emissions in this category

23

Please explain

In 2020, the proportion of U.S. production increased relative to 2019, resulting in decreased downstream transportation to the primary market (U.S.).

Use of sold products

Direction of change

No change

Please explain

Our products are classified as zero-emission electricity generation technologies.

End-of-life treatment of sold products

Direction of change

Increased

Primary reason for change

Change in output

Change in emissions in this category (metric tons CO2e)

351

% change in emissions in this category

37

Please explain

GHG emissions were estimated from quantity of end of life PV modules recycled in 2020, which were proportionally higher in 2020 compared with 2019.

Downstream leased assets

Direction of change

No change

Please explain

GHG emissions were estimated based on square footage of leased warehouse facilities, which did not change from 2019 to 2020.

C8. Energy

C8.1

(C8.1) What percentage of your total operational spend in the reporting year was on energy?

More than 0% but less than or equal to 5%

C8.2

(C8.2) Select which energy-related activities your organization has undertaken.

	Indicate whether your organization undertook this energy-related activity in the reporting year
Consumption of fuel (excluding feedstocks)	Yes
Consumption of purchased or acquired electricity	Yes
Consumption of purchased or acquired heat	No
Consumption of purchased or acquired steam	No
Consumption of purchased or acquired cooling	No
Generation of electricity, heat, steam, or cooling	Yes

C8.2a

(C8.2a) Report your organization's energy consumption totals (excluding feedstocks) in MWh.

	Heating value	MWh from renewable sources	MWh from non-renewable sources	Total (renewable and non-renewable) MWh
Consumption of fuel (excluding feedstock)	HHV (higher heating value)	0	26,084	26,084
Consumption of purchased or acquired electricity		0	834,804	834,804

Consumption of self-generated non-fuel renewable energy		7,172		7,172
Total energy consumption		7,172	860,888	868,060

C8.2b

(C8.2b) Select the applications of your organization's consumption of fuel.

	Indicate whether your organization undertakes this fuel application
Consumption of fuel for the generation of electricity	Yes
Consumption of fuel for the generation of heat	Yes
Consumption of fuel for the generation of steam	No
Consumption of fuel for the generation of cooling	No
Consumption of fuel for co-generation or tri-generation	No

C8.2c

(C8.2c) State how much fuel in MWh your organization has consumed (excluding feedstocks) by fuel type.

Fuels (excluding feedstocks)

Natural Gas

Heating value

HHV (higher heating value)

Total fuel MWh consumed by the organization

25,798

MWh fuel consumed for self-generation of electricity

0

MWh fuel consumed for self-generation of heat

25,798

Emission factor

1.887

Unit

kg CO2e per m3

Emissions factor source

WRI GHG protocol Stationary Combustion Tool V. 4.1

Comment

Fuels (excluding feedstocks)

Diesel

Heating value

HHV (higher heating value)

Total fuel MWh consumed by the organization

156

MWh fuel consumed for self-generation of electricity

156

MWh fuel consumed for self-generation of heat

0

Emission factor

2.685

Unit

kg CO2 per liter

Emissions factor source

WRI GHG protocol Stationary Combustion Tool V. 4.1

Comment

Fuels (excluding feedstocks)

Motor Gasoline

Heating value

HHV (higher heating value)

Total fuel MWh consumed by the organization

130

MWh fuel consumed for self-generation of electricity

0

MWh fuel consumed for self-generation of heat

130

Emission factor

8.87

Unit

kg CO2 per gallon

Emissions factor source

WRI GHG protocol Transport Tool V. 2.5.1

Comment

C8.2d

(C8.2d) Provide details on the electricity, heat, steam, and cooling your organization has generated and consumed in the reporting year.

	Total Gross generation (MWh)	Generation that is consumed by the organization (MWh)	Gross generation from renewable sources (MWh)	Generation from renewable sources that is consumed by the organization (MWh)
Electricity	7,172	7,172	7,172	7,172
Heat				
Steam				
Cooling				

C8.2e

(C8.2e) Provide details on the electricity, heat, steam, and/or cooling amounts that were accounted for at a zero emission factor in the market-based Scope 2 figure reported in C6.3.

Sourcing method

None (no purchases of low-carbon electricity, heat, steam or cooling)

Low-carbon technology type

Country/area of consumption of low-carbon electricity, heat, steam or cooling

MWh consumed accounted for at a zero emission factor

Comment

In 2020, First Solar consumed 7172 MWh of self-generated renewable electricity which are not reported here as they were not purchases of low-carbon electricity.

C-CG8.5

(C-CG8.5) Does your organization measure the efficiency of any of its products or services?

	Measurement of product/service efficiency	Comment
Row 1	Yes	While PV modules are electricity generating (not energy-consuming) devices, the module conversion efficiency is a standard measurement of product efficiency.

C-CG8.5a

(C-CG8.5a) Provide details of the metrics used to measure the efficiency of your organization's products or services.

Category of product or service

Solar energy equipment

Product or service (optional)

Photovoltaic module

% of revenue from this product or service in the reporting year

64

Efficiency figure in the reporting year

0.176

Metric numerator

Other, please specify

kilowatt

Metric denominator

square meter

Comment

In 2020, First Solar Series 6 PV modules ranged from 17.0-18.2% module conversion efficiency, corresponding to 0.170-0.182 kilowatt per m2, or 420-450 watt per module, given 2.47 m2 per module.

C9. Additional metrics

C9.1

(C9.1) Provide any additional climate-related metrics relevant to your business.

Description

Waste

Metric value

7.4

Metric numerator

grams

Metric denominator (intensity metric only)

Watt produced

% change from previous year

1

Direction of change

Increased

Please explain

In 2020, our manufacturing waste intensity increased slightly by 1% due to production downtime for retooling at our facility in Malaysia.

Description

Energy usage

Metric value

0.13

Metric numerator

kilowatt hours

Metric denominator (intensity metric only)

Watt produced

% change from previous year

19

Direction of change

Decreased

Please explain

In 2020, our manufacturing energy intensity (energy consumption per watt produced) decreased by approximately 19% compared to 2019 primarily due to the greater throughput and enhanced energy efficiency of our Series 6 manufacturing process.

Description

Other, please specify

Water

Metric value

0.6

Metric numerator

Liters

Metric denominator (intensity metric only)

Watt produced

% change from previous year

12

Direction of change

Decreased

Please explain

In 2020, First Solar's manufacturing water intensity decreased by approximately 12% due to the increased throughput and efficiency of our Series 6 manufacturing process as well as water recycling initiatives.

C-CE9.6/C-CG9.6/C-CH9.6/C-CN9.6/C-CO9.6/C-EU9.6/C-MM9.6/C-OG9.6/C-RE9.6/C-ST9.6/C-TO9.6/C-TS9.6

(C-CE9.6/C-CG9.6/C-CH9.6/C-CN9.6/C-CO9.6/C-EU9.6/C-MM9.6/C-OG9.6/C-RE9.6/C-ST9.6/C-TO9.6/C-TS9.6) Does your organization invest in research and development (R&D) of low-carbon products or services related to your sector activities?

	Investment in low-carbon R&D	Comment
Row 1	Yes	Our R&D model differentiates us from much of our competition due to its vertical integration, from advanced research to product development, manufacturing, and applications. We continue to devote substantial resources to our R&D efforts, which generally focus on continually improving the wattage and energy yield of our solar modules. We also focus our R&D activities on continuously improving module durability and manufacturing

		efficiencies, including throughput improvement, volume ramp, and material cost reduction. Based on publicly available information, we are one of the leaders in R&D investment among PV solar module manufacturers, maintaining a rate of innovation that enables rapid wattage gains and cost reductions.

C-CG9.6a

(C-CG9.6a) Provide details of your organization's investments in low-carbon R&D for capital goods products and services over the last three years.

Technology area

Renewable energy

Stage of development in the reporting year

Large scale commercial deployment

Average % of total R&D investment over the last 3 years

81 - 100%

R&D investment figure in the reporting year (optional)

93,738,000

Comment

Our R&D model differentiates us from much of our competition due to its vertical integration, from advanced research to product development, manufacturing, and applications. We continue to devote substantial resources to our R&D efforts, which generally focus on continually improving the wattage and energy yield of our solar modules. We also focus our R&D activities on continuously improving module durability and manufacturing efficiencies, including throughput improvement, volume ramp, and material cost reduction.

C10. Verification

C10.1

(C10.1) Indicate the verification/assurance status that applies to your reported emissions.

	Verification/assurance status
Scope 1	Third-party verification or assurance process in place
Scope 2 (location-based or market-based)	Third-party verification or assurance process in place
Scope 3	No third-party verification or assurance

C10.1a

(C10.1a) Provide further details of the verification/assurance undertaken for your Scope 1 emissions, and attach the relevant statements.

Verification or assurance cycle in place

Triennial process

Status in the current reporting year

No verification or assurance of current reporting year

Type of verification or assurance

Limited assurance

Attach the statement

11435 FSI 2018 WRI GHG Statement 2019-06-15 signed (1).pdf

Page/ section reference

Pages 1-3

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100

C10.1b

(C10.1b) Provide further details of the verification/assurance undertaken for your Scope 2 emissions and attach the relevant statements.

Scope 2 approach

Scope 2 market-based

Verification or assurance cycle in place

Triennial process

Status in the current reporting year

No verification or assurance of current reporting year

Type of verification or assurance

Limited assurance

Attach the statement

11435 FSI 2018 WRI GHG Statement 2019-06-15 signed (1).pdf

Page/ section reference

Pages 1-3

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

100

C10.2

(C10.2) Do you verify any climate-related information reported in your CDP disclosure other than the emissions figures reported in C6.1, C6.3, and C6.5?

No, we do not verify any other climate-related information reported in our CDP disclosure

C11. Carbon pricing

C11.1

(C11.1) Are any of your operations or activities regulated by a carbon pricing system (i.e. ETS, Cap & Trade or Carbon Tax)?

No, and we do not anticipate being regulated in the next three years

C11.2

(C11.2) Has your organization originated or purchased any project-based carbon credits within the reporting period?

No

C11.3

(C11.3) Does your organization use an internal price on carbon?

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

C12. Engagement

C12.1

(C12.1) Do you engage with your value chain on climate-related issues?

Yes, our suppliers

Yes, our customers

Yes, other partners in the value chain

C12.1a

(C12.1a) Provide details of your climate-related supplier engagement strategy.

Type of engagement

Information collection (understanding supplier behavior)

Details of engagement

Collect climate change and carbon information at least annually from suppliers

% of suppliers by number

1

% total procurement spend (direct and indirect)

35

% of supplier-related Scope 3 emissions as reported in C6.5

27

Rationale for the coverage of your engagement

In 2020, we began engaging with key suppliers that account for more than 50% of our product's carbon footprint to gather energy and emissions data. The suppliers we engaged represented 35% of our total procurement spend and 27 % of our total scope 3 emissions in 2020. This was estimated based on 35% of our 2020 Scope 3 emissions from purchased goods and services (1,227,987 metric tons CO2-eq) which amounts to 429,725 metric tons CO2-eq, divided by total 2020 scope 3 emissions (1,611,180) = 27% of total scope 3 emissions.

Impact of engagement, including measures of success

The impact of the engagement and measures of success included getting a better understanding of the carbon intensity of key suppliers, identifying opportunities to reduce our scope 3 emissions, and assessing our suppliers' ability to increase the recycled content of the materials we use in our products.

Comment

C12.1b

(C12.1b) Give details of your climate-related engagement strategy with your customers.

Type of engagement

Education/information sharing

Details of engagement

Share information about your products and relevant certification schemes (i.e. Energy STAR)

% of customers by number

100

% of customer - related Scope 3 emissions as reported in C6.5

0

Please explain the rationale for selecting this group of customers and scope of engagement

We share information about the sustainability advantage and carbon footprint of our product with all our customers whether it is to help them meet government mandated renewable portfolio standards, their own carbon mitigation/neutrality goals, or carbon footprint criteria in solar tenders e.g. in France. We also educate our customers on the importance of considering the embodied carbon of solar PV modules to enable greater decarbonization. All PV technologies are not created equal. Where and how a PV module and its components are manufactured significantly impacts its environmental profile. 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. Due to our resource-efficient manufacturing process, First Solar modules have a carbon footprint that is up to 2.5 times lower, a water footprint that is up to three times lower and an energy payback time that is up to two times faster than conventional crystalline silicon solar panels on a life cycle basis. Since our products (solar PV modules) are clean energy producing rather than energy consuming products, they represent 0% of our scope 3 emissions.

Impact of engagement, including measures of success

One of the impacts of engagement is that we see customers driving demand for responsible solar, even in markets without carbon footprint requirements. Corporate renewable energy buyers in particular are increasingly looking to go "Beyond the Megawatt" of renewables that they are purchasing to ensure their projects are as environmentally and socially responsible as possible. Measures of success include customers requesting lower-carbon solar or EPEAT-registered PV modules in their RFPs. These engagements receive high priority as they are commercial opportunities.

C12.1d

(C12.1d) Give details of your climate-related engagement strategy with other partners in the value chain.

Over the past few years, we participated in a multi-stakeholder process led by the Green Electronics Council and NSF international to develop the industry's first sustainability leadership standard for PV modules and inverters (NSF/ANSI 457- 2019) which includes criteria on energy and water efficiency, GHG emissions, and corporate sustainability reporting. PV modules and inverters conforming to NSF 457 are added to the EPEAT registry for sustainable electronics.

In 2020, First Solar Series 6 modules became the first PV product to be included in the EPEAT registry for sustainable electronics. EPEAT is a
globally recognized and independently validated ecolabel that allows for the easy identification of environmentally preferable products from socially responsible companies. EPEAT addresses the full product life cycle, including managing substances in the product, manufacturing energy and water use, product packaging, end-of-life recycling, corporate responsibility and human rights. Our Series 6 product was awarded an EPEAT Silver rating, certifying that it has exceeded the basic but stringent environmental and social criteria of a Bronze rating. To learn more, please visit: https://www.epeat.net/

In 2020, we joined the Ultra Low-Carbon Solar Alliance (ULCSA) as a founding member. The ULCSA consists of companies across the solar PV value chain and other stakeholders committed to expanded market awareness and deployment of ultra low-carbon PV to accelerate reductions in solar supply chain GHG emissions. The Alliance runs campaigns to educate renewable energy buyers on the importance of taking into account the GHG emissions in the solar supply chain and selecting low-carbon solar solutions. To learn more, please visit: https://ultralowcarbonsolar.org/

C12.3

(C12.3) Do you engage in activities that could either directly or indirectly influence public policy on climate-related issues through any of the following?

Direct engagement with policy makers
Trade associations
Funding research organizations
Other

C12.3a

(C12.3a) On what issues have you been engaging directly with policy makers?

Focus of legislation	Corporate position	Details of engagement	Proposed legislative solution
Clean energy generation	Support	First Solar actively supported clean energy generation policies in state legislatures and regulatory proceedings in a large number of states including CA, NV, UT, CO, AZ, NC, SC, VA IN, PA. First Solar engages directly by providing comments, testimony, and meeting with legislators, regulators and staff. First Solar also engages indirectly through trade associations.	First Solar has advocated for expanded Renewable Portfolio Standards (RPSs) and clean energy procurement requirements for utilities in states that don't have existing RPS policies. We supported clean energy generation policies in line with our business objectives of promoting large-scale solar. First Solar's work supported successful legislative efforts in

			VA (HB656, SB875, HB1526, SB 851), CA (SB 364), and SC (H4940) in 2020 while setting the stage for success in other states in 2021.
Other, please specify Integrated resource planning	Support	First Solar engages directly and indirectly through trade associations with utilities and regulators to improve integrated resource planning for clean energy generation, specifically for utility scale PV. First Solar regularly provides utilities with updated pricing and technology information to ensure that their integrated resource planning processes have the most up to date (often the most competitive) pricing information available.	This is a regulatory matter that directly influences procurement strategy for conventional, vertically integrated utilities and their regulators. First Solar has engaged in IRP proceedings in the following states with the end goal of increasing carbon-free electric generation: CA, NV, AZ, NC, GA, IN.
Clean energy generation 1	Support	Active outreach in favor of increased renewable energy targets, and for removing administrative obstacles to the widespread deployment of solar PV installations. Engaged EU and national regulators both directly and through trade association to increase and further the ambitions of the EU Green Deal & 'Fit for 55' draft legislation	First Solar is supportive of the EU's ambition to be climate neutral by 2050. It has shared expertise on the EU Green Deal, and will continue to drive advocacy so the COVID recovery funding is allocated to low carbon infrastructure projects and technologies, including the mass deployment of solar PV installations.
Other, please specify European Commission Product Environmental Footprint Pilot Phase	Support	First Solar is leading the Joint Mission Group on Eco-Design and Energy Labeling for PV Modules, Inverters and Systems to develop recommendations on the criteria for Eco-Design and Energy Labeling for these product groups under the European Commission Circular Economy Package initiatives. Building on the experience from the Product Environmental Footprint Pilot Phase, the Joint Mission Group brings together over 40 experts	First Solar supported the development of the Product environmental Footprint category rules for PV. The PEF pilot phase results for photovoltaic electricity generation were subsequently introduced in EU policy discussions on potential sustainable product policy instruments (Eco-Design, Eco-Labeling, Energy Labeling) for photovoltaic modules, inverters and systems. The preparatory

		from Science, Industry and Society to work on these proposals.	study on these policy instruments was concluded in 2019 and resulted in a regulatory proposal to develop Eco-Design and Energy Labelling criteria for PV Modules, Inverters and PV systems, from 2020 through 2024.

[1]EU Green Deal and Green Recovery

C12.3b

(C12.3b) Are you on the board of any trade associations or do you provide funding beyond membership?

Yes

C12.3c

(C12.3c) Enter the details of those trade associations that are likely to take a position on climate change legislation.

Trade association

American Council on Renewable Energy (ACORE)

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

ACORE, a 501(c)(3) non-profit membership organization, is dedicated to building a secure and prosperous America with clean, renewable energy. ACORE convenes thought leadership forums and creates energy industry partnerships to communicate the economic, security and environmental benefits of renewable energy. ACORE's policy work focuses on key tax, finance, grid modernization and other issues that are important for renewable energy expansion. ACORE is focused on the accelerated transition to a renewable energy economy to reduce emissions and mitigate risks associated with climate change. ACORE's analysis suggests that the U.S. federal government's prior climate goals for 2025 remain achievable, despite reduced regulation of greenhouse emissions through a 50 percent reduction in power sector emissions. To achieve a 50 percent reduction in power sector greenhouse emissions by 2025, ACORE focuses on strategically promoting the most viable measures that facilitate growth and investment for renewables and enabling technologies, including carbon pricing or other stable long-term policies that incentivize innovation and investment in carbon-free electricity generation.

How have you influenced, or are you attempting to influence their position?

As a board member, First Solar contributes to and supports position papers on tax and energy policies that affect the financing, development, and procurement of renewable energy. First Solar supported and contributed to ACORE's comments on the Proposed Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units. First Solar and ACORE proposed suggestions to give states the tools and incentives necessary to deploy low-cost renewable solutions e.g. state-specific renewable energy goals.

Trade association

Interwest Energy Alliance

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

The Interwest Energy Alliance is a non-profit trade association that brings the nation's renewable energy industry together with the West's advocacy community in a consensus-based, collaborative approach to market development in the West (AZ, CO, NV, NM, UT & WY). Interwest is a regional partner of the American Wind Energy Association and Advanced Energy Economy, and has played a key role in legislation expanding opportunities for renewable energy resources in the inter-mountain West.

How have you influenced, or are you attempting to influence their position?

As a board member, First Solar participates in and is supportive of the association's overall mission and programs to advance the clean energy agenda.

Trade association

Texas Solar Power Association

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

TSPA works with its member companies to represent the solar industry in important policy discussions in Texas, furthering solar development at the Legislature, Public Utilities Commission and the Electric Reliability Council of Texas. Key policy areas of focus include recognition of the economic benefits of solar development including reducing greenhouse gas emissions; the need for regulatory certainty, including developing a state based CPP compliance plan; transmission expansion; and leveraging competitive market forces to increase the deployment of solar in the state.

How have you influenced, or are you attempting to influence their position?

As a member of TSPA's Board, First Solar participates in developing TSPA's advocacy positions with respect to legislation and regulatory matters concerning climate change, clean energy policy and related infrastructure issues.

Trade association

Georgia Large Scale Solar Association (GLSSA)

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

Georgia Large Scale Solar Association (GLSSA), is a non-profit trade association consisting of businesses that promote the economic and environmental benefits of solar energy generation in Georgia. First Solar formed GLSSA along with other solar developers active in Georgia to intervene in Georgia Power's IRP with a goal of expanding utility-scale solar markets in the state. GLSSA promotes low carbon energy generation like utility-scale solar as a means of tackling climate change.

How have you influenced, or are you attempting to influence their position?

As a member of GLSSA's Executive Committee, First Solar participates in developing GLSSA's advocacy positions with respect to legislation and regulatory matters concerning climate change, clean energy policy and related infrastructure issues.

Trade association

Solar Power Europe

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

SolarPower Europe (formerly known as EPIA or the European Photovoltaic Industry Association) aims to shape the regulatory environment and enhance business opportunities for solar power in Europe. SolarPower Europe supports policies that advance an energy system based on renewable energy and energy efficiency to remain below a 2°C temperature increase.

How have you influenced, or are you attempting to influence their position?

As a board member and Vice-Chair of the Strategy Committee, and Chair of its Sustainability Working Group, First Solar contributes to PV industry position papers to promote further renewable energy deployment in Europe through ambitious targets and consistent PV energy policies.

Trade association

International Thin Film Solar Industry Association PVThin a.i.s.b.l.

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

PVthin is an international, not-for-profit coalition representing global leaders in the thin-film solar industry. Its objective is to strengthen global energy security and support the transition to a low carbon economy by promoting the social, economic and environmental benefits of thin-film solar photovoltaic technologies. The activities of the coalition currently focus on: • Advocating thin film PV as a solution for energy security, climate change and water scarcity • Promoting policies that reward sustainable business practices such as resource efficiency and advanced closed-loop recycling schemes • Sharing and promoting best practices in environment, health and safety management • Advancing a recycling standard for PV modules under the EU WEEE Directive • Participating in the development of the European Commission's Product Environmental Footprint Category Rules for PV electricity generation • Supporting the development of regulatory measures in the context of Eco-Design and Energy Labelling Advocacy on raw materials and resource policy discussions.

How have you influenced, or are you attempting to influence their position?

As Board Member and President of the Association, First Solar supports and drives the engagement of the Association in relevant policy discussions related to solar energy.

Trade association

Climate Leadership Council

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

The Climate Leadership Council promotes a carbon dividends framework as the most cost-effective, equitable and politically-viable climate solution. The plan calls for a substantial, gradually rising, revenue-neutral carbon tax with the revenue distributed to citizens.

How have you influenced, or are you attempting to influence their position?

As a founding member, First Solar supports the Climate Leadership Council's mission and carbon dividends plan. "First Solar is uniquely positioned as a leader in the world's sustainable energy future. Our commitment to enabling national energy grids, corporate procurement groups and local communities worldwide to incorporate clean, renewable energy is squarely aligned with the Climate Leadership Council's mission. We see this effort as a crucial forum for informed advocacy of realistic climate protection solutions that make sense for global environmental and economic interests." — Mark Widmar, Chief Executive Officer

Trade association

Utah Clean Energy Association

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

Utah Clean Energy leads and accelerates the clean energy transformation with vision and expertise. They are committed to creating a future that ensures healthy, thriving communities for all, empowered and sustained by clean energy. Through advocacy, education, and diverse partnerships, Utah Clean Energy continues to advance renewable energy and energy efficiency in Utah and the Western Region. Today, Utah Clean Energy has become Utah's independent resource for clean energy policy, regulatory, and consumer information.

How have you influenced, or are you attempting to influence their position?

As a board member, First Solar participates in and is supportive of the association's overall mission and programs to advance the clean energy agenda.

Trade association

North Carolina Clean Energy Business Association (Note: In early 2021, this group rebranded to become the Carolinas Clean Energy Business Association)

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

The NC Clean Energy Business Alliance strengthens the political voice for clean energy through education, outreach, and direct lobbying of decision-makers. NCCEBA advocates for a business-friendly environment for clean energy businesses at all levels, from the North Carolina Utilities Commission, Public Staff, and other agencies, to Federal, County, and local levels. NCCEBA's team of lobbyists work with legislators and government officials to make sure clean energy business interests are well represented at the North Carolina General Assembly and with the Governor's Office.

How have you influenced, or are you attempting to influence their position?

As a board member, First Solar participates in and is supportive of the association's overall mission and programs to advance the clean energy agenda.

Trade association

Renewable Energy Buyers Association (REBA)

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

REBA is an alliance of large clean energy buyers, energy providers, and service providers that, together with NGO partners, are unlocking the marketplace for all nonresidential energy buyers to lead a rapid transition to a cleaner, prosperous, zero-carbon energy future.
REBA's theory of change: Large energy consumers have the buying power and collective voice to change markets. Energy buyers have a unique, critical role in driving a zero-carbon energy future.

How have you influenced, or are you attempting to influence their position?

As a governing board member, we provide fiscal oversight and guidance on strategy.

Trade association

American Chamber of Commerce to the EU

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

The American Chamber of Commerce to the EU is the voice of American companies invested in Europe. It is a horizontal association, regrouping companies of all sectors, but very effective at making the voice of American FDI heard in Brussels. It has over 150 company members, and its policy work is organized in committees on specific policy areas. AmCham EU has always advocated for a stable and predictable framework for investments to tackle climate change. As such, the association denounced the decision of the President of the United States to withdraw from the Paris Agreement. In AmCham EU's view, the Paris Agreement provides clear goals, as well as a balanced and cost-efficient approach to reduce emissions. AmCham EU is committed to sustainable growth and believes the fight against climate change will bring about long-term value creation in the US and EU.

How have you influenced, or are you attempting to influence their position?

As a board member, First Solar participates in and is supportive of the association's overall mission. As one of the member companies at the forefront of the clean energy agenda, we help inform the association's messaging on the EU Green Deal and other clean energy topics. First Solar chairs the association's Communications Group, and led its Environment Committee for 4 years.

Trade association

Chesapeake Solar and Storage Association, or CHESSA (Formerly MDV-SEIA)

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

CHESSA is the second-largest state affiliate of the Solar Energy Industries Association (SEIA) with over 160 member organizations, representing over 10,000 solar jobs in the region. Through direct advocacy, policy formation, regulatory intervention and market representation, CHESSA strives to develop and implement strong solar policies to ensure continued market formation for all solar segments in this region and beyond.

How have you influenced, or are you attempting to influence their position?

As a board member, First Solar participates in and is supportive of the association's overall mission and programs to advance the clean energy agenda.

C12.3d

(C12.3d) Do you publicly disclose a list of all research organizations that you fund?

No

C12.3e

(C12.3e) Provide details of the other engagement activities that you undertake.

1. IEA Photovoltaic Power Systems (PVPS) Program

i) First Solar engages through a group by participating in the IEA's PV task committee 12.

ii) IEA PVPS Task 12 aims to foster international collaboration on PV safety and sustainability by quantifying the environmental profile of PV in comparison to other energy technologies and defining and addressing Environmental, Health, and Safety (EHS) and sustainability issues that are important for market growth.

iii) First Solar engages by contributing to the development of methodology guidelines, best practice white papers, reports, scientific articles, and participation in international expert workshops. First Solar was a contributing author to a publication on end-of-life management of photovoltaic panels, which was published by the IEA PVPS Task 12 and the International Renewable Energy Agency (IRENA). Through its leadership of the Strategy Committee of SolarPower Europe (a member organization of the IEA PVPS), First Solar co-leads the task 12 as deputy operating agent.

iv) First Solar supports the development of internationally accepted and harmonized standards for life cycle assessment, along with minimum standards for EHS in manufacturing and deployment of PV power systems, and best practice exchange within the industry and policymakers.

2. International Renewable Energy Agency (IRENA)

i) First Solar engages through a group of leading renewable energy advocates from both industry and civil society.

ii) IRENA focuses on enabling the transition to renewable energy for a sustainable energy future.

iii) As a Coalition for Action member organization, First Solar has committed to supporting the energy transition by promoting the sustainable use of renewable energy technologies; making a compelling case for renewable energy by collectively compiling the latest knowledge and examples; communicating renewable energy with the public through clear, truthful messages; addressing public concerns over renewable energy technologies by applying best practices and

engaging concerned parties; sharing evidence, communications material, ideas and contacts with fellow Coalition members to strengthen the cases and support for renewable energy.
iv) As a founding member of the coalition, First Solar supports all objectives and commitments to promote the energy transition through the sustainable use of renewable energy technologies.

C12.3f

(C12.3f) What processes do you have in place to ensure that all of your direct and indirect activities that influence policy are consistent with your overall climate change strategy?

Our vision "to lead the world's sustainable energy future" drives every aspect of our business strategy from developing sustainable solar markets, reducing our operational impacts, increasing the efficiency of our products, reducing the levelized cost of solar electricity to compete with fossil fuels, and improving the environmental benefits offered by our technology on a life cycle basis. First Solar established a global Sustainability program in 2011 to bring together all sustainability related activities across the company under one initiative. First Solar's sustainability program drives our commitment to the triple bottom line of "people, planet and profit" through our approach to responsible life cycle management, environmental footprint analysis, resource efficiency and greenhouse gas emissions reduction, waste management, global charitable giving, operational cost reduction, responsible sourcing and human rights, as well as our global PV module recycling services. Since the beginning, we have placed sustainability at the heart of everything we do, focused not on meeting industry standards, but exceeding them and setting new ones. This is why we have a long history of establishing benchmarks in recycling, health and safety, responsible supply chain management, transparency, resource-efficient manufacturing and the carbon and water footprint of our technology. We firmly believe solar should never come at the price of people or the planet ("solar-at-any-cost"). Instead we are committed to delivering Responsible Solar.
First Solar's strategy includes engagement with key policy makers in all our markets and at regional and international level to promote the development and deployment of PV solar as a solution to climate change and energy security, and advocate policies that facilitate these goals. First Solar's Government Affairs and Market Development teams are responsible for guiding public policy that drives demand for solar in target markets, monitoring relevant legislative and regulatory proceedings, advancing First Solar's project pipeline, and managing worldwide stakeholder engagement. First Solar's Government Affairs and Market Development teams works closely with the Business Development, Sustainability, ESG and EHS teams, as well as the Executive Leadership Team to support module sales in various markets as part of our mission to provide cost-advantaged solar technology through innovation, customer engagement, industry leadership, and operational excellence.

C12.4

(C12.4) Have you published information about your organization's response to climate change and GHG emissions performance for this reporting year in places other than in your CDP response? If so, please attach the publication(s).

Publication

In mainstream reports

Status

Complete

Attach the document

First-Solar-2020-Annual-Report.pdf

Page/Section reference

pg.7, 10, 16, 18-20, 48.

Content elements

Strategy
Risks & opportunities
Other metrics

Comment

Other metrics highlighted in our annual report include our carbon footprint, energy payback time, and water footprint advantage

Publication

In voluntary sustainability report

Status

Complete

Attach the document

FSO178_Sustainability_Report_FIN low res.pdf

Page/Section reference

Pg. 4-5, 10-13, 19-29, 51, 56-57, 59-60, 63-64.

Content elements

Governance
Strategy
Risks & opportunities
Emissions figures
Emission targets
Other metrics

Comment

Publication

Other, please specify

TCFD Report

Status

Underway – this is our first year

Attach the document

Page/Section reference

Content elements

Governance
Strategy
Risks & opportunities
Emission targets
Other metrics

Comment

C15. Signoff

C-FI

(C-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.

C15.1

(C15.1) Provide details for the person that has signed off (approved) your CDP climate change response.

	Job title	Corresponding job category
Row 1	Chief Quality and Reliability 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 am submitting to	Public or Non-Public Submission
I am submitting my response		Public

Please confirm below