Climate Change 2017 Information Request
First Solar Inc

1 Module: Introduction

1. Page: Introduction

CC0.1

Introduction
Please give a general description and introduction to your organization.
First Solar, Inc., is a leading global provider of comprehensive photovoltaic (PV) solar energy solutions with over 17 GW sold worldwide. We design, manufacture, and sell PV solar modules with an advanced thin-film semiconductor technology and also develop, design, construct, and sell PV solar power systems that primarily use the modules we manufacture. Additionally, we provide operations and maintenance (“O&M”) services to system owners. We have substantial, ongoing research and development efforts focused on module and system level innovations. We are the world’s largest thin-film PV solar module manufacturer and one of the world’s largest PV solar module manufacturers. Our mission is to create enduring value by enabling a world powered by clean, affordable solar energy.

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 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 commercialized a unique thin-film PV solar technology. Since we began commercial production in 2002, we have focused on our mission of enabling a world powered by clean, affordable, and reliable solar electricity and we have grown to become the world's largest thin film PV solar manufacturer and one of the world's leading PV solar manufacturers. Since 2002 and through 2016, we have sold approximately 17 GW of PV solar modules. Assuming average worldwide irradiance and grid electricity emissions, our products are being used to displace nearly 12 million metric tons of CO2e per year during their 25+ year product life. This is equivalent to powering more than 8 million average homes, planting 300 million trees and saving 30 billion liters of water (or 12,000+ Olympic swimming pools) per year based on worldwide averages.

CC0.2

Reporting Year
Please state the start and end date of the year for which you are reporting data.
The current reporting year is the latest/most recent 12-month period for which data is reported. Enter the dates of this year first.
We request data for more than one reporting period for some emission accounting questions. Please provide data for the three years prior to the current reporting year if you have not provided this information before, or if this is the first time you have answered a CDP information request. (This does not apply if you have been offered and selected the option of answering the shorter questionnaire). If you are going to provide additional years of data, please give the dates of those reporting periods here. Work backwards from the most recent reporting year.
Please enter dates in following format: day(DD)/month(MM)/year(YYYY) (i.e. 31/01/2001).

Enter Periods that will be disclosed
Fri 01 Jan 2016 - Sat 31 Dec 2016

CC0.3

Country list configuration

Please select the countries for which you will be supplying data. If you are responding to the Electric Utilities module, this selection will be carried forward to assist you in completing your response.

Select country
United States of America
Malaysia
Germany
India
Australia
Japan

CC0.4

Currency selection

Please select the currency in which you would like to submit your response. All financial information contained in the response should be in this currency.

USD($)

CC0.6

Modules
As part of the request for information on behalf of investors, companies in the electric utility sector, companies in the automobile and auto component manufacturing sector, companies in the oil and gas sector, companies in the information and communications technology sector (ICT) and companies in the food, beverage and tobacco sector (FBT) should complete supplementary questions in addition to the core questionnaire.
If you are in these sector groupings, the corresponding sector modules will not appear among the options of question CC0.6 but will automatically appear in the ORS navigation bar when you save this page. If you want to query your classification, please email respond@cdp.net.
If you have not been presented with a sector module that you consider would be appropriate for your company to answer, please select the module below in CC0.6.

Further Information

2 Module: Management

2. Page: CC1. Governance

CC1.1

Where is the highest level of direct responsibility for climate change within your organization?

Senior Manager/Officer

CC1.1a

Please identify the position of the individual or name of the committee with this responsibility

First Solar's Senior Vice President of Global Technical Services has the highest level of direct responsibility for climate change within the company and provides regular sustainability updates to the Board. In this role, the SVP of Global Technical Services leads and oversees the company's global technical services and programs including Environmental Health and Safety (EHS), sustainability, recycling, quality and reliability, as well as post-sales and warranty support. The SVP of Global Technical Services reports into the Chief Operational Officer.

The SVP of Global Technical Services also leads the company's Sustainability Council which is composed of senior leaders from Supply Chain, Government Affairs, EHS, Sustainability, Business Development, Technology & Product Development, Legal, Human Resources, Finance, as well as the Chief Operating Officer, the Chief Technology Officer, Chief Accounting Officer and the Chief Information Officer. The Sustainability Council promotes the implementation of cross-functional sustainability strategies and drives the company's sustainability goals, initiatives and programs with a focus on resource efficiency, supply chain risk management, transparency, and utilizing sustainability as a lever for growth. First Solar's corporate sustainability program drives the company's commitment to the triple bottom line of "people, planet and profit" through our approach to responsible life cycle management, environmental footprint analysis (from raw material sourcing through end-of-life recycling), greenhouse gas emissions intensity reduction, waste management, global charitable giving, operational cost reduction, and industry best practices such as responsible land use and our global PV module recycling services.

CC1.2

Do you provide incentives for the management of climate change issues, including the attainment of targets?

Yes

CC1.2a

Please provide further details on the incentives provided for the management of climate change issues

Who is entitled to benefit from these incentives?	The type of incentives	Incentivized performance indicator	Comment
All employees	Monetary reward	Other: 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 more than 3,100 MW in 2016.
All employees	Monetary reward	Other: renewable energy cost reduction	Reductions in PV solar module manufacturing costs which reduce the costs of PV solar and thus allow PV solar to become more cost competitive with conventional technologies and helps PV solar 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 which drive reductions in the costs of PV solar thereby expanding PV markets and displacing electricity generated by fossil fuels. Improvements in efficiency also reduce the overall lifecycle carbon footprint of our product. As a result, our average module conversion efficiency has increased more than 70% over the past decade, from 9.5% in 2006 to 16.4% in 2016.

Who is entitled to benefit from these incentives?	The type of incentives	Incentivized performance indicator	Comment
All employees	Monetary reward	Other: Renewable energy cost reduction	Reductions in PV solar balance of system (BoS) costs which reduces the total installed costs of PV solar and thus allows PV solar to become more cost competitive with conventional technologies and help PV become more widely deployed and accepted.
All employees	Monetary reward	Other: 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	Recognition (non-monetary)	Other: Behaviour change related indicator	Participation in First Solar Way, a leadership development program, focuses on driving product improvements which helps to lower the carbon intensity of our products.
Facility managers	Monetary reward	Energy reduction target	Energy saving targets are included in the performance goals (GPS) of our facilities team. GPS is a performance management process which helps our associates meet their goals. Since 2009, our manufacturing energy intensity has decreased by over 30% due to increased manufacturing throughput and module efficiency. In 2016, our manufacturing energy intensity decreased by approximately 15%. Although our production volume increased by 24% to 3.1GW in 2016, our absolute manufacturing energy consumption only increased by 4%.
All employees	Monetary reward	Emissions reduction project Energy reduction project Efficiency project Other: environmental footprint reduction	First Solar's Business Enablement CEO Award provides recognition and a monetary reward to projects or initiatives that help reduce the company's environmental footprint and improve efficiency. The annual awards are granted to individuals who make extraordinary contributions above and beyond their normal responsibilities. For example, First Solar's recycling team received the company's Business Enablement CEO Award for developing an innovative, resource-efficient recycling technology that requires 30% less capital, chemicals, waste and labor than our previous recycling system.

Further Information

3. Page: CC2. Strategy

CC2.1

Please select the option that best describes your risk management procedures with regard to climate change risks and opportunities

Integrated into multi-disciplinary company wide risk management processes

CC2.1a

Please provide further details on your risk management procedures with regard to climate change risks and opportunities

Frequency of monitoring	To whom are results reported?	Geographical areas considered	How far into the future are risks considered?	Comment
Annually	Board or individual/sub-set of the Board or committee appointed by the Board	All regions and countries in which we operate or pursue business opportunities e.g. Asia Pacific (APAC), Latin America, North America, Europe, Middle East, Africa	1 to 3 years	Functional leaders and risk owners provide an annual ERM update every year. Risk owners may provide their own updates more frequently if needed. ERM updates are provided to the Audit Committee every six months. Impacts, risks, 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.

CC2.1b

Please describe how your risk and opportunity identification processes are applied at both company and asset level

First Solar has implemented an enterprise risk management (ERM) system, which is led by the functional leaders. This team works from a top down approach to catalogue areas of risk to First Solar including areas such as regulatory risks, operational risks, reputational risks, market/customer changes, business continuity risks including due to weather and other extreme events, technology risks, supply chain, organizational adaptability.These include climate change related risks and opportunities such as regulatory and other market drivers, uncertainty in market signals, and commodity price risks. Risks associated with individual assets 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 semi-annual scorecards for our manufacturing sites.

CC2.1c

How do you prioritize the risks and opportunities identified?

On an annual basis, a risk survey is sent out to all functional and regional leads (VPs and above) to understand the current perception of risk and risk trends, from the vantage point of various functional leaders across the company. The survey has a response rate of 86% which is key to capturing various perspectives throughout the company. The risk survey includes climate change related risks and opportunities. Risk areas are assessed through a voting/heat map process based on management's perception of potential impact and likelihood of occurrence. The results of the annual risk survey are reviewed and analyzed by our Executive Leadership Team, and are used to prioritize our risk mitigating efforts in the next year. The Executive Leadership Team then assigns internal cross-functional teams including Environmental, Health, and Safety (EHS) representatives to focus on and drive mitigation of those risks. The ERM program provides annual reports to the Executive Leadership Team and reports are provided to the Audit Committee of the Board of Directors every 6 months by the Vice President of Internal Audit. In addition, First Solar has specialized functional teams dedicated to providing oversight of the adequacy of internal processes and controls around key processes and operational areas. Examples of these teams are: Internal Audit and Environmental Health & Safety (EHS) departments.

CC2.2

Is climate change integrated into your business strategy?

Yes

CC2.2a

Please describe the process of how climate change is integrated into your business strategy and any outcomes of this process

i. Our mission "to create enduring value by enabling a world powered by clean, affordable solar energy" drives our business strategy, from developing sustainable solar markets, reducing the levelized cost of solar electricity to compete with fossil fuels, to minimizing the lifecycle impacts of our PV power solutions. First Solar's Sustainability Council drives the company's sustainability goals, initiatives and programs with a focus on resource efficiency, supply chain risk management, transparency, and utilizing sustainability as a lever for growth. In addition to manufacturing PV modules with the lowest environmental impact in the industry, First Solar is committed to reducing the company's own operational impact. We track and report sustainability performance metrics such as energy and water use, waste generation and recycling, and GHG emissions on our company website. In order to manage our operational impacts, we have set a new five-year goal for 2021 to reduce our GHG emissions intensity per watt produced by 45 percent compared to our 2008 baseline.

ii. Scalable, affordable and reliable renewable energy is crucial to addressing climate change and enabling the transition to a low carbon economy. This need has driven First Solar to focus on the company's core strengths, our thin film module technology and utility-scale offerings. Over the years, utility-scale solar has helped drive down the costs of solar electricity through economies of scale, transforming solar into a mainstream electricity source. First Solar is further enabling greater renewable energy adoption by providing reliable and controllable PV power plants to manage intermittent generation. Our sophisticated power plant controls actively stabilize and improve the reliability of the grid, creating real value for grid operators, utilities and other customers. In line with our mission, we continually focus on driving down the costs and increasing the reliability of our thin film PV technology and power plants.

iii. Climate change concerns and the need for clean energy products have contributed to the development of First Solar's PV solar technology and our overall short and long-term business strategy. In addition to addressing energy security, climate change, and water scarcity, First Solar energy solutions deliver competitive, accessible, and reliable solar electricity globally. Our utility-scale power plants have led the way in driving down the cost and ensuring the reliability of solar electricity, enabling the global transition to renewables and establishing solar as a valued component of the global generation portfolio.

iv. In order to provide clean and affordable solar electricity, both our short and long term strategies are focused on increasing the efficiency of our modules, reducing the cost of solar electricity, and improving the environmental benefits of our technology on a lifecycle basis. The most substantial business decision made in 2016 was influenced by the need for low-cost clean energy products. As a result, our board of directors approved an action plan to bring forward production of our Series 6 product into 2018, a year earlier than previously expected. Our next generation Series 6 technology is expected to have a compelling combination of high efficiency, low cost, and balance of system compatibility.

v. The elimination or reduction of renewable energy subsidies underscores the need for the LCOE from solar systems to continue to decline and remain competitive with other sources of energy generation. Another important component of our long term strategy that has been influenced by climate change is the growing need for sustainable energy in emerging markets. Our long term strategic plan (2020 and beyond) focuses on providing utility-scale PV solar energy solutions in key geographic markets that we believe have a compelling need for mass-scale PV electricity, including markets throughout the Americas, the Asia-Pacific region, and the Middle East. Our long term strategic plan provides for First Solar to compete in key markets that do not require solar-specific government subsidies or support programs by focusing on opportunities in which our PV solar energy solutions can compete directly with fossil fuel offerings on levelized cost of electricity (LCOE) or similar basis. We continue to invest significant amounts in R&D activities (~$124 million in 2016) to further develop our PV technology and drive down the cost of solar electricity.

vi. The Paris Agreement is influencing our business strategy in its potential to create long-term opportunities and generate demand for our PV energy solutions. Policy makers, investors and the public increasingly recognize solar as a sustainable response to the environmental cost of hydrocarbon-fueled power generation. In addition, the Paris Agreement led to an increasing demand for corporate renewables, with companies worldwide committing to procuring 100% renewable electricity. The wholesale commercial and industrial market is a promising opportunity for First Solar given our large-scale PV system expertise.

vii. Our operational model offers PV solar energy solutions that benefit from our capabilities, including: advanced PV

modules; project development; engineering and plant optimization; grid integration and plant control systems; procurement and construction consulting; and O&M services. We believe we are among the lowest cost PV module manufacturers in the industry on a module cost per watt basis, based on publicly available information. Our cost competitiveness is based on our module conversion efficiency, scale, operational excellence, and our fully integrated manufacturing process which enables us to provide climate change solutions that are much less energy intensive than those of our competitors by producing a module in less than 3.5 hours. Our lower carbon and water footprint and faster energy payback time enables the rapid expansion of PV while achieving greater carbon reductions. This is particularly important for customers seeking to reduce GHG emissions and developing countries with incremental energy needs. First Solar also developed the industry's first global module recycling program to recycle manufacturing scrap and end-of-life modules. Recycling ensures the solutions to climate change today do not pose a waste management burden on future generations and enables us to recycle semiconductor material for reuse in new solar modules. By avoiding landfilling of manufacturing waste, GHG emissions associated with landfill disposal are avoided.

viii. We used forward-looking scenario analyses such as the 2°C scenario, when considering the company's GHG target. Due to our transition to Series 6 module manufacturing and the related re-tooling and commissioning requirements, we are unable to set science-based targets at this time. However, we remain committed to evaluating and striving towards science-based targets.

CC2.2c

Does your company use an internal price on carbon?

No, and we currently don't anticipate doing so in the next 2 years

CC2.3

Do you engage in activities that could either directly or indirectly influence public policy on climate change through any of the following? (tick all that apply)

Direct engagement with policy makers
Trade associations
Other

CC2.3a

On what issues have you been engaging directly with policy makers?

Focus of legislation	Corporate Position	Details of engagement	Proposed legislative solution
Other: Senate Joint Resolution (SJR) 172 to establish a property tax exemption for any property in which renewable energy devices have been installed	Support	Senate Joint Resolution (SJR) 172 would amend the Florida Constitution amendment to establish a property tax exemption for any property in which renewable energy devices have been installed. First Solar engaged directly with policy makers and testified in front of the Senate Energy Committee to ensure the bill would include utility-scale solar projects.	The final proposed legislation included utility-scale solar projects and First Solar supported the legislation with no exceptions.
Clean energy generation	Support	First Solar worked with SEIA, AEE, and the Alliance for Clean Energy in New York to develop comments in support of New York's proposed 50% Clean Energy Standard. The comments highlight the need for long-term contracts, as well as, a	First Solar supports the Clean Energy Standard Order which requires New York to procure 50% of its power from renewables by 2030. Including bundled PPAs and utility-owned renewable generation would have made the CES more effective in

Focus of legislation	Corporate Position	Details of engagement	Proposed legislative solution
		procurement methodology that fully recognizes the value of utility-scale solar.	driving greater investment in additional renewable energy projects.
Clean energy generation	Support	The Maryland Clean Jobs Act increases the state's Renewable Portfolio Standard (RPS) to 25% by 2020 with an intent to achieve 40% renewables by 2025. First Solar worked with MDVSEIA and other Maryland clean energy advocates to draft and review the legislation.	First Solar supported the legislation with no exceptions.
Clean energy generation	Support	First Solar engaged directly with legislators in Illinois by participating in stakeholder meetings and lobby days to promote a utility-scale solar carve-out in Illinois's Renewable Portfolio Standard.	The bill (S.B. 2814) includes several key improvements to the RPS and a new utility-scale solar carve out that requires 800-1,200 MW of utility-scale solar to be installed in the state by 2025. Illinois's new Renewable Portfolio Standard (RPS) provides greater stability and predictability for the clean energy sector. First Solar supported the legislation with no exceptions.
Other: Ohio's Alternative Energy Portfolio Standard freeze extension	Oppose	First Solar testified in opposition to legislation (SB320 and HB 554) which sought to prolong a freeze on Ohio's renewable-energy (AEPS) and energy-efficiency (EEPS) standards.	First Solar opposed legislation which aimed to extend a freeze on Ohio's Alternative Energy Portfolio Standard. The AEPS included advanced energy and renewable energy generation and procurement requirements which businesses relied on in order to procure renewables, cut costs, and avoid energy price volatility. Governor John Kasich vetoed the legislation, thereby clearing the way for significant new clean energy investments. As of January 2017 Ohio's Alternative Energy Portfolio Standard is mandatory again.
Other: EPA's Clean Power Plan (111d) to cut carbon emissions from existing power plants	Support	The Clean Power Plan sought to develop a comprehensive regulatory scheme for U.S. power plants in an effort to promote cleaner energy development and reduce greenhouse gas emissions. The CPP was challenged in court by numerous parties who filed a motion to stay. In January 2016, the D.C. Circuit Court of Appeals denied requests to stay implementation of the Clean Power Plan, meaning that the CPP could remain in effect during pending litigation. First Solar directly engaged in support of the CPP by providing declarations opposing the petitions for emergency stay.	First Solar supported the EPA's Clean Power Plan and is in favor of legislation that promotes renewable energy technologies and the transition to a low carbon economy.

CC2.3b

Are you on the Board of any trade associations or provide funding beyond membership?

Yes

CC2.3c

Please enter the details of those trade associations that are likely to take a position on climate change legislation

Trade association	Is your position on climate change consistent with theirs?	Please explain the trade association's position	How have you, or are you attempting to, influence the position?
Solar Energy Industry Association (SEIA)	Consistent	SEIA advocates solar as clean, reliable, and affordable solution to climate change. In addition to promoting continued support for solar energy and increasing the share of renewable energy within the Department of Defense, SEIA calls on the EPA to continue to have stringent requirements on greenhouse gas emissions from existing power plants. SEIA advocates a cap on carbon emissions to enable investment in clean energy technologies and lower greenhouse gas emissions.	As member of the SEIA's Executive Committee and Chair of the Federal Policy Committee, First Solar promotes energy policies that support the adoption of solar energy and other renewable energy technologies to reduce CO2 emissions and mitigate the impacts of climate change.
Business Council for Sustainable Energy (BCSE)	Consistent	The Business Council for Sustainable Energy (BCSE) is committed to advancing the solution technologies and policies that will help reduce emissions. BCSE supports market-based climate change legislation that allows for flexibility and cost-effective emissions reductions, including carbon offsets. The Council has long supported the development and use of output-based emissions regulations as effective ways to promote long-term air quality and to encourage cost-effective emissions reductions. The BCSE has represented the views of clean energy industries in the United Nations Framework Convention on Climate Change (UNFCCC) since 1992. In 2015, BCSE supported an ambitious international climate change agreement as a means of driving low-carbon investment and innovation.	As a board member, First Solar contributes to position papers which promote the adoption of energy policies that support the adoption of solar energy and other renewable energy technologies to reduce CO2 emissions and mitigate the impacts of climate change.
U.S. Partnership for Renewable Energy Finance (USPREF)	Consistent	USPREF educates on policies that promote the financing of renewable energy projects in the United States. USPREF works to assure legislation impacts the renewable energy market correctly and is as efficient and effective as possible. USPREF sends formal responses to administration officials and congressional staff regarding renewable energy policies e.g. tax and loan guarantees.	As a board member of USPREF, First Solar participates in meetings and contributes to position papers that promote solar energy and mitigate the impacts of climate change. First Solar helped set USPREF's 2016-2017 priorities which aim to improve renewable energy finance. In addition to other programs, tax related initiatives will include a five-year assessment of the

Trade association	Is your position on climate change consistent with theirs?	Please explain the trade association's position	How have you, or are you attempting to, influence the position?
			adequacy of tax equity for both ITC and PTC projects, an effort to address the absence of accounting guidance for tax equity financing, and an effort to promote common principles for tax reform that could be addressed across the renewable energy sector.
Large-Scale Solar Association	Consistent	LSA works with its member companies to represent the utility-scale solar industry in important policy discussions, furthering support for large-scale solar development. LSA's principal jurisdictional focus is in California, although LSA sometimes engages with respect to legislation and regulatory matters in other western U.S. states. Key policy areas of focus include recognition of the societal value and economic benefits of climate mitigation policies; progressive utility procurement policies; progressive pricing and tax policies; rational and environmentally sound land use policy; and transmission reform and expansion.	As a member of LSA's Board, First Solar participates in developing LSA's advocacy positions with respect to legislation and regulatory matters concerning climate change, clean energy policy and related infrastructure issues.
ACERA renewable energy association (Chile)	Consistent	Acera is the renewable energy industry association in Chile. Acera has focused its work on 3 areas, which are to promote the generation of non-conventional renewable energies, permanently contribute to the development of a regulatory framework to encourage the production of non-conventional renewable energy, and encourage the installation of 30% renewable energy power in the grid by 2030. Acera´s role was key in the discussion and congress approval of the new renewable energy target of 20% by 2025.	As board member of Acera, First Solar participates in meetings with different stakeholders to promote the inclusion of renewable energies in the national energy policy.
Advanced Energy Economy	Consistent	Advanced Energy Economy (AEE) is a national association of business leaders who are making the global energy system more secure, clean, and affordable. AEE's vision is of a prosperous world that runs on secure, clean, affordable energy. Advanced energy encompasses a broad range of products and services including energy efficiency, demand response, natural gas electric generation, solar, wind, hydro, nuclear, electric vehicles, biofuels and smart grid. In 2016, AEE supported SB 32 which would aims to advance California's energy and climate	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	Is your position on climate change consistent with theirs?	Please explain the trade association's position	How have you, or are you attempting to, influence the position?
		leadership by requiring the California Air Resources Board (ARB) to establish a statewide GHG emissions limit of 40% below 1990 emissions levels, to be achieved by 2030.	
American Council on Renewable Energy	Consistent	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 promotes renewable energy technologies to reduce emissions and mitigate risks associated with climate change.	As a board member, 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.
International Thin Film Solar Industry Association PVThin a.i.s.b.l.	Consistent	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 an EU Ecolabel for PV based on Life Cycle Assessment (LCA) approach	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.
Solar Power Europe	Consistent	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	As a board member and Vice-Chair of the Strategy Committee, First Solar contributed to PV industry position papers to promote further renewable energy deployment in Europe through ambitious targets and consistent PV energy policies.

Trade association	Is your position on climate change consistent with theirs?	Please explain the trade association's position	How have you, or are you attempting to, influence the position?
		efficiency to remain below a 2°C temperature increase.	
Texas Solar Power Association	Consistent	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.	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.
Georgia Large Scale Solar Association (GLSSA)	Consistent	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.	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.

CC2.3e

Please 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.

3. Energy Council of Chile - United States of the American-Chilean Chamber of Commerce:
i)The Council's mission is to promote energy business opportunities in the private sector, both in Chile and in the United States, promote viable commercial projects in clean energy and energy efficiency, and support sustainable development of the energy sectors in both countries.
ii) First Solar engages through a group as a member of the Council.
iii) First Solar contributes to workshops, roundtables and position papers that promote renewable energy.
iv) First Solar worked with the renewable energy industry to facilitate the path to increase Chile's Non-Conventional Renewable Energy (NCRE) from 10% by 2024 to 20% by 2025.

CC2.3f

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 mission "to create enduring value by enabling a world powered by clean, affordable solar energy" drives every aspect of our business strategy from developing sustainable solar markets, 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 the company’s environmental, social, and economic priorities; including life cycle carbon footprint analysis and GHG intensity reduction goal, responsible land use, waste management, supply chain sustainability and our industry-leading recycling services. 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 Global Public Affairs team is 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 global Public Affairs team works closely with Business Development, the Sustainability/EHS team, and the Executive staff (E-staff) to support the development of solar PV energy projects in various markets as part of our overall strategy to create enduring value by enabling a world powered by clean, affordable solar energy.

Further Information

4. Page: CC3. Targets and Initiatives

CC3.1

Did you have an emissions reduction or renewable energy consumption or production target that was active (ongoing or reached completion) in the reporting year?

Intensity target

CC3.1b

Please provide details of your intensity target

ID	Scope	% of emissions in scope	% reduction from base year	Metric	Base year	Normalized base year emissions covered by target	Target year	Is this a science-based target?	Comment
Int1	Scope 1+2 (market-based)	100%	35%	Other: Metric Tonnes CO2e per megawatt (MW) of PV modules produced	2008	246	2016	No, but we anticipate setting one in the next 2 years	First Solar surpassed the company's GHG emissions intensity reduction target in 2015. We evaluated the possibility of setting science-based targets but are not currently able to implement them at this stage. Due to our transition to Series 6 module manufacturing and related re-tooling and replacement of machinery and production equipment, uncertainties related to energy consumption during commissioning, ramp-up and achieving steady-state manufacturing operations with projected module conversion efficiencies, we are unable to set science-based targets at this time. However, we remain committed to evaluating and striving towards science-based targets.
Int2	Scope 1+2 (market-based)	100%	45%	Other: Metric Tonnes CO2e per megawatt	2008	246	2021	No, but we anticipate setting one in	After successfully achieving the company's first GHG emissions

ID	Scope	% of emissions in scope	% reduction from base year	Metric	Base year	Normalized base year emissions covered by target	Target year	Is this a science-based target?	Comment
				(MW) of PV modules produced				the next 2 years	intensity reduction target. First Solar set a new five-year goal for 2021 to reduce our greenhouse gas emissions intensity per watt produced by 45 percent compared to our 2008 baseline. We evaluated the possibility of setting science-based targets but are not currently able to implement them at this stage. Due to our transition to Series 6 module manufacturing and related re-tooling and replacement of machinery and production equipment, uncertainties related to energy consumption during commissioning, ramp-up and achieving steady-state manufacturing operations with projected module conversion efficiencies, we are unable to set science-based targets at this time. However, we remain committed to evaluating and striving towards science-based targets.

CC3.1c

Please also indicate what change in absolute emissions this intensity target reflects

ID	Direction of change anticipated in absolute Scope 1+2 emissions at target completion?	% change anticipated in absolute Scope 1+2 emissions	Direction of change anticipated in absolute Scope 3 emissions at target completion?	% change anticipated in absolute Scope 3 emissions	Comment
Int1	Increase	299			Our manufacturing capacity has increased by more than six-fold since 2008, resulting in an increase in our absolute emissions. Scope 3 is not applicable as our target includes only scopes 1 and 2. Although producing more PV modules results in higher emissions, our products are being used to displace nearly 12 million metric tons of CO2e per year during their 25+ year product life, assuming average worldwide irradiance and grid electricity emissions. This represents more than 30 times the amount of greenhouse gas emissions we emit through our global Scope 1 and 2 operations.
Int2	Increase	337			Our manufacturing capacity has increased by more than six-fold since 2008, resulting in an increase in our absolute emissions. Scope 3 is not applicable as our target includes only scopes 1 and 2. Although producing more PV modules results in higher emissions, our products are being used to displace nearly 12 million metric tons of CO2e per year during their 25+ year product life, assuming average worldwide irradiance and grid electricity emissions. This represents more than 30 times the amount of greenhouse gas emissions we emit through our global Scope 1 and 2 operations.

CC3.1e

For all of your targets, please provide details on the progress made in the reporting year

ID	% complete (time)	% complete (emissions or renewable energy)	Comment
Int1	100%	100%	We surpassed our goal to reduce our greenhouse gas (GHG) emissions intensity by 35% by 2016 from a base year of 2008. Since 2008, our company-wide carbon intensity decreased by 47% through increased module efficiency, manufacturing throughput, and capacity utilization, decreased emissions intensity of purchased grid electricity, and energy conservation and low carbon initiatives.
Int2	0%	0%	This is the first year of our new GHG emissions intensity reduction target. As we transition to Series 6 module manufacturing, new machinery and equipment is expected to impact our energy usage and emissions intensity.

CC3.2

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

CC3.2a

Please 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	Description of product/Group of products	Are you reporting low carbon product/s or avoided emissions?	Taxonomy, project or methodology used to classify product/s as low carbon or to calculate avoided emissions	% revenue from low carbon product/s in the reporting year	% R&D in low carbon product/s in the reporting year	Comment
Company-wide	In addition to manufacturing PV solar modules that generate clean reliable electricity with no air emissions, waste production, and minimal water use,	Avoided emissions	Other: Sinha, P., 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)	100%	More than 80% but less than or equal to 100%	First Solar's eco-efficient PV modules and power plants are displacing more than thirty times the amount of greenhou

Level of aggregation	Description of product/Group of products	Are you reporting low carbon product/s or avoided emissions?	Taxonomy, project or methodology used to classify product/s as low carbon or to calculate avoided emissions	% revenue from low carbon product/s in the reporting year	% R&D in low carbon product/s in the reporting year	Comment
	First Solar constructs PV projects that displace the use of electricity generated by fossil fuels, and provides operations and maintenance products and services to enhance grid stability. Our solar PV solutions are helping displace approximately 5 times the emissions we emit through our global operations. In 2016, First Solar produced 3.1 GWdc of PV solar modules and our company-wide scope 1 and scope 2					se gas emissions we emit through our global operations. In 2016, First Solar's company-wide scope 1 and scope 28 greenhouse gas emissions amounted to approximately 0.4 million metric tons of CO2 equivalent. With over 17GW of modules installed worldwide, First Solar PV solutions are displacing more than 12 million metric tons of CO2 equivalent per year,

Level of aggregation	Description of product/Group of products	Are you reporting low carbon product/s or avoided emissions?	Taxonomy, project or methodology used to classify product/s as low carbon or to calculate avoided emissions	% revenue from low carbon product/s in the reporting year	% R&D in low carbon product/s in the reporting year	Comment
	greenhouse gas emissions amounted to approximately 0.4 million metric tons of CO2 equivalent. Assuming world-wide average irradiance and grid electricity emissions, we conservatively estimate that our 2016 products are being used to displace over 2 million metric tons CO2e per year for the 25+ year product life. Since First Solar began commercial operations in 2002 and through 2016, we have deployed					resulting in a net beneficial carbon impact of over 11 million metrics tons CO2e per year, assuming average worldwide irradiance and grid electricity emissions.

Level of aggregation	Description of product/Group of products	Are you reporting low carbon product/s or avoided emissions?	Taxonomy, project or methodology used to classify product/s as low carbon or to calculate avoided emissions	% revenue from low carbon product/s in the reporting year	% R&D in low carbon product/s in the reporting year	Comment
	approximately 17 GW of PV solar modules. Assuming average worldwide irradiance and grid electricity emissions, our products are being used to displace over 12 million metric tons of CO2e per year for their 25+ year product life. This is equivalent to powering over 8 million average homes and saving over 30 billion liters of water (~12,000 Olympic swimming pools) per year based on worldwide averages.					

CC3.3

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

Yes

CC3.3a

Please identify the total number of projects at each stage of development, and for those in the implementation stages, the estimated CO2e savings

Stage of development	Number of projects	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation	0	
To be implemented*	3	518
Implementation commenced*	0	0
Implemented*	2	1408
Not to be implemented	2	5180

CC3.3b

For those initiatives implemented in the reporting year, please provide details in the table below

Activity type	Description of activity	Estimated annual CO2e savings (metric tonnes CO2e)	Scope	Voluntary/ Mandatory	Annual monetary savings (unit currency - as specified in CC0.4)	Investment required (unit currency - as specified in CC0.4)	Payback period	Estimated lifetime of the initiative	Comment
Energy efficiency: Processes	In 2016, we utilized building management system controls to optimize our cooling tower water and reduce surging at our manufacturing facility in Perrysburg. When the chillers surge they use more energy than required. As	1340	Scope 2 (market-based)	Voluntary	165000	0	<1 year	>30 years	

Activity type	Description of activity	Estimated annual CO2e savings (metric tonnes CO2e)	Scope	Voluntary/ Mandatory	Annual monetary savings (unit currency - as specified in CC0.4)	Investment required (unit currency - as specified in CC0.4)	Payback period	Estimated lifetime of the initiative	Comment
	a result, optimizing the cooling tower water reduced surging and energy consumption.								
Other	In 2016, we selectively removed lights in non-critical areas to reduce energy consumption since our Perrysburg facility is over the required lumen levels in certain areas, We reinstalled the lights in areas that do not have LEDs.	68	Scope 2 (market-based)	Voluntary	8400	1000	<1 year	11-15 years	

CC3.3c

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 R&D 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.

Method	Comment
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.

Further Information

5. Page: CC4. Communication

CC4.1

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	Status	Page/Section reference	Attach the document	Comment
In voluntary communications	Complete	EHS metrics 2017: pg 5 & 6 Greenhouse Gas Emissions and Key Performance Indicators	https://www.cdp.net/sites/2017/19/6419/Climate Change 2017/Shared Documents/Attachments/CC4.1/First-Solar-Sustainability-Metrics-09JUN17.pdf	As part of our commitment to transparency, First Solar reports on a number of selected sustainability performance metrics including our recordable injury rate, energy and water use, waste generation, and greenhou

Publication	Status	Page/Section reference	Attach the document	Comment
				se gas emissions. In addition to manufacturing PV modules with the lowest environmental impact in the industry, First Solar is committed to reducing the company's own operational impact.
In mainstream reports (including an integrated report) but have not used the CDSB Framework	Complete	Annual report pg. 4 & 27 (Market Overview and Support Programs)	https://www.cdp.net/sites/2017/19/6419/Climate Change 2017/Shared Documents/Attachments/CC4.1/First_Solar_Annual_Report_Web_Posting.pdf	The elimination of various clean energy programs and initiatives designed to curtail climate change may create regulatory uncertainty in the renewable energy industry, including the solar energy industry, and our business, financial condition, and results of operation

Publication	Status	Page/Section reference	Attach the document	Comment
				s could be adversely affected as a result.
In voluntary communications	Underway - previous year attached	Sustainability Report: CEO Message; pg.15 (Leading Ecoefficient PV Technology); pg 31 (Greenhouse Gas Emissions Goal)	https://www.cdp.net/sites/2017/19/6419/Climate Change 2017/Shared Documents/Attachments/CC4.1/03801_FirstSolar_SustainabilityReport_08MAR16_Web.pdf	In addition to delivering competitive, accessible and reliable solar electricity globally, First Solar energy solutions provide an ecologically leading solution to climate change, energy security and water scarcity. On a lifecycle basis, First Solar thin film modules have the smallest carbon footprint, lowest water use and fastest energy payback time of any PV technology on the market.

Further Information

3 Module: Risks and Opportunities

6. Page: CC5. Climate Change Risks

CC5.1

Have you identified any inherent climate change risks that have the potential to generate a substantive change in your business operations, revenue or expenditure? Tick all that apply

Risks driven by changes in regulation
Risks driven by changes in physical climate parameters
Risks driven by changes in other climate-related developments

CC5.1a

Please describe your inherent risks that are driven by changes in regulation

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Carbon taxes	First Solar is exposed to price risks for the raw materials, components, and energy costs used in the manufacturing and transportation of our solar modules and BoS parts used in our PV solar power systems.The imposition of carbon taxes could lead to increases in the costs of raw	Increased operational cost	>6 years	Indirect (Supply chain)	About as likely as not	Low	Carbon taxes can have a potential impact on our supply chain by increasing the costs of raw materials such as glass, which have relatively high energy requirements. However, carbon taxes can also result in a greater demand for First Solar products. For this reason, the risk	To mitigate supply chain price risks, we strive to qualify multiple suppliers using a robust qualification process. 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	We classify excess raw materials that are not consumed within our operating cycle as “noncurrent”. Our non-current inventory in 2016 amounted to more than $100 million (compared to $107 million in 2015). Our module collection and recycling liability was $166.3 million at

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	materials, such as glass, which have relatively high energy requirements for production. We may be unable to pass along changes in the costs of the raw materials and components for our products and systems to our customers. Our failure to obtain raw materials and components that meet our quality, quantity, and cost requirements in a timely manner could interrupt or impair our ability to manufacture our solar modules or increase our manufacturing costs. Our						factor is low. Our cost of raw materials decreased by approximately 7% from 2015 to 2016 (from $159 million to $148 million).	such materials. As needed, we may purchase a critical raw material that is used in our core production process in quantities that exceed anticipated consumption within our normal operating cycle (which is 12 months). In addition to achieving substantial environmental benefits, First Solar's recycling program recovers over 90% of our semiconductor material for reuse in new modules and ~90% of the glass for use in new glass products. First Solar is proactively investing	December 31, 2016. We estimate the cost of our collection and recycling obligations based on the present value of the expected probability-weighted future cost of collecting and recycling the solar modules, which includes estimates for the cost of packaging materials, the cost of freight from the solar module installation sites to a recycling center, the material, labor, capital costs, and scale of recycling centers, and an estimated third-party profit margin and return on risk for collection

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	module manufacturing process uses approximately 30 types of raw materials and components to construct a complete solar module. Critical raw materials include glass, semiconductor materials, and packaging components.							in recycling technology improvements and is implementing a cost reduction roadmap to drive down recycling prices. In 2015, we piloted a new recycling technology with a continuous flow recycling process, which represents a significant improvement over previous technologies by increasing process efficiency and throughput while reducing overall operations cost.	and recycling services.
Lack of regulation	Support programs for PV solar electricity generation, depending on the jurisdiction, include FiTs, quotas	Reduced demand for goods/services	1 to 3 years	Direct	Likely	High	Changes to existing regulations and policies may present technical, regulatory, and economic barriers to the	The eventual step-down of the ITC, to 26% in 2020, 22% in 2021, and 10% beginning in 2022, underscores the need for	In 2016, we spent more than $124 million on research and development, and ~ $130 million in 2015, with the

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	(including renewable portfolio standards and tendering systems). In addition to these support programs, financial incentives for PV solar electricity generation include tax incentives, grants, loans, rebates, and production incentives. Many of these support programs expire, phase out over time, require renewal by the applicable authority, or may be amended. Changes to existing regulations and policies, changes may present technical, regulatory, and economic barriers to the purchase and use of PV						purchase and use of PV products or systems, which may significantly reduce demand for our solar modules, systems or services. The 30% Investment Tax Credit (ITC) is a primary economic driver of solar installations in the U.S. which represented 83% (or $2.45 billion) of our sales in 2016. The extension of the 30% ITC through 2019 is expected to contribute to greater medium-term demand visibility in the U.S. The positive impact of the ITC has depended	the cost of solar electricity (LCOE) to continue to decline and remain competitive with other energy generation sources. Our long term strategic plan is a long-term roadmap to achieve our technology, cost leadership, and growth objectives. As part of our long term strategic plan, we are focusing on opportunities in which our PV solar energy solutions can compete directly with fossil fuel offerings on an LCOE or similar basis. We continue to devote substantial resources	primary objective of increasing the energy density and lowering the lifecycle cost of electricity generated by our PV modules and systems. We focus our R&D activities on continuing to lower the LCOE through reductions in BoS costs, improving systems design in terms of grid stability, increasing the conversion efficiency and energy yield of our solar modules and continuously improving durability and manufacturing efficiencies, including throughput improvem

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	products or systems, which may significantly reduce demand for our solar modules, systems or services. The 30% Investment Tax Credit (ITC) is a primary economic driver of solar installations in the U.S. Its extension through 2019 is expected to contribute to greater medium term demand visibility in the U.S. Although our long term strategic plan provides for First Solar to compete in key markets that do not require solar-specific government subsidies or support programs, in the near						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.	to R&D with the primary objective of lowering the lifecycle cost of electricity generated by our PV solar power systems. We lead all PV solar module manufacturers in R&D investment, maintaining a rate of innovation enabling efficiency gains three times faster than multi-crystalline silicon technology (historically our primary competitor) over recent years. Our module conversion efficiency has improved on average more than half a percent every year for the last 10 years	ent, volume ramp, and material cost reduction. Costs are annual and ongoing.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	term our net sales and profits remain subject to regulation and variability based on the availability and size of government subsidies and economic incentives.							(from 9.5% in 2006 to 16.4% in 2016) and we believe we are among the lowest cost PV module manufacturers in the industry on a cost per watt basis, based on publicly available information. Our new Series 6 technology is expected to enable further improvements in conversion efficiency, cost and installation velocity.	
Carbon taxes	The imposition of carbon taxes could lead to an increase in electricity costs for our manufacturing facilities. However, electricity is a fairly small portion of our overall operating costs and other	Increased operational cost	>6 years	Direct	About as likely as not	Low	Carbon taxes could lead to an increase in electricity costs for our manufacturing facilities. However, our fully integrated manufacturing process requires less energy than other	To reduce grid electricity consumption and mitigate risks associated with increasing electricity costs, First Solar is implementing energy efficiency initiatives and installing onsite PV installations as part	We invest in energy reduction projects on an annual basis. Over the past three years, we invested approximately $6.7 million into energy efficiency and onsite PV installations at our manufacturing facilities in

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	electricity supply options are likely to be impacted more, thus actually serving to increase demand for our products.						solar companies therefore this risk is considered to be low. First Solar modules are manufactured in a high-throughput, automated environment that integrates all manufacturing steps into a continuous flow line. 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 ($36). Assuming a carbon price of $36/ metric tonne applied to our 2016 market-	of our standard manufacturing system design at our production sites in Ohio and Malaysia and at our recycling facility in Frankfurt Oder, Germany. Our onsite PV installations produced a total of 7,172 MWh of electricity in 2016. First Solar also implemented process chilled water optimization measures and lighting reduction measures which resulted in 3,468 MWh of electricity savings in 2016. By generating solar electricity and implementing energy saving initiatives at our	Ohio and Malaysia. By reducing our consumption of grid electricity, these projects provide annual monetary savings of over $3 million per year, with more than $7 million saved since 2014. First Solar's fully integrated manufacturing process requires less energy, water and semiconductor material than conventional crystalline silicon, enabling First Solar thin film modules to have the smallest carbon footprint, lowest life cycle water use and fastest energy payback time of all solar

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
							based scope 2 emissions, our electricity costs would increase by an additional $14 million.	manufacturing facilities, we are reducing our risks associated with rising electricity costs and the potential imposition of carbon taxes. Our company-wide GHG emissions intensity target helps drive our facilities' energy efficiency and low carbon initiatives.	technologies.

CC5.1b

Please describe your inherent risks that are driven by changes in physical climate parameters

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Other physical climate drivers	Our asset (manufacturing plants) level scorecards have identified natural disasters such as earthquakes, tornadoes, hurricane,	Reduction/disruption in production capacity	1 to 3 years	Direct	About as likely as not	High	Of the 3.1GW produced in 2016, our manufacturing facility in Perrysburg represented approximately 17%. We	To mitigate the impacts of a natural disaster on our operations in Ohio, we separate our manufacturing capability across several	We own our manufacturing facility in Perrysburg so the cost of management is $0.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	building collapse, flood, etc.) as a key risk driver that can impact our manufacturing plant's abilities to operate in Perrysburg, Ohio. Damage to or disruption of facilities could interrupt our business and impair our ability to generate net sales.This would result in an inability to maintain maximum production levels						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. Depreciation of property, plant and equipment was $211.2 million, $245.7 million, and $245.0 million for the years ended December 31, 2016, 2015, and 2014, respectively.	buildings. We created a separate production unit that creates a redundancy with our manufacturing process. We have implemented our management method so the risk has already been reduced.	
Other physical climate drivers	Our asset level (manufacturing plants) scorecards have identified natural disasters at a supplier's site as a key risk	Reduction/disruption in production capacity	1 to 3 years	Indirect (Supply chain)	Likely	High	Interruption of supply to our Malaysia manufacturing facility caused by physical climate drivers could significant	To mitigate risk impacts from interruptions to supply, we are developing secondary geographically located source suppliers and	We stockpile critical raw materials used in our core production process in quantities that exceed anticipate

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	driver for their ability to disrupt supply & shipment channels at our manufacturing facility in Malaysia. 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.						ly affect the company's production levels. Over two thirds of our total production is based at our facility in Malaysia. Of the 3.1 GW produced in 2016, our manufacturing facility in Malaysia represented approximately 83%.	increasing our inventory by stocking critical materials onsite. We purchase critical raw materials used in our core production process in quantities that exceed anticipated consumption within our operating cycle (which is 12 months). We classify the raw materials that we do not expect to be consumed within our operating cycle as noncurrent. We regularly evaluate the quantities and values of our inventories, including noncurrent inventories, in light of current market conditions and market trends, among other	d consumption within our operating cycle (which is 12 months). We classify excess raw materials that are not consumed within our operating cycle as “noncurrent”. Our non-current inventory in 2016 amounted to more than $100 million. These costs are annual and ongoing.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								factors, and record write-downs for any quantities in excess of demand and for any new obsolescence. This evaluation considers the use of modules in our systems business, historical usage, expected demand, anticipated sales prices, desired strategic raw material requirements, new product development schedules, the effect new products might have on the sale of existing products, product obsolescence, customer concentrations, product merchantability, and other factors.	

CC5.1c

Please describe your inherent risks that are driven by changes in other climate-related developments

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Uncertainty in market signals	The current U.S. administration's proposed and contemplated environmental and tax policies may create regulatory uncertainty in the renewable energy sector, including the solar energy sector, and may lead to a reduction or removal of various clean energy programs and initiatives designed to curtail climate change. Although we believe that solar energy will experience widespread adoption in those applications where it competes economically with traditional forms of	Reduced demand for goods/services	Up to 1 year	Direct	Likely	High	Although our long term strategic plan provides for First Solar to compete in key markets that do not require solar-specific government subsidies or support programs, in the near term our net sales and profits remain subject to regulation and variability based on the availability and size of government subsidies and economic incentives. A reduction or removal of clean energy programs and initiatives	As part of our Long Term Strategic Plan, we are focusing on sustainable geographic markets in which support programs are minimal and where our solar PV generation solutions can compete directly with fossil fuel offerings on an LCOE or similar basis, or complement such fossil fuel electricity generations. In executing our long term strategic plan, we are focusing on providing utility-scale PV solar	Global selling, general and administrative expenses amounted to approximately $262 million in 2016 (or ~9% of net sales) and consist primarily of salaries and other personnel-related costs, professional fees, insurance costs, travel expenses, and other business development and selling expenses. Joint venture investments amounted to $242 million in 2016. These costs are annual and ongoing

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	energy without any support programs, in certain markets our net sales and profit remain subject to variability based on the availability and size of government subsidies and economic incentives. To the extent these support programs are reduced earlier than previously expected or are changed retroactively, or free-field or conversion land applications are disadvantaged, such changes could reduce demand and/or price levels for our solar modules and systems, lead to a reduction in our net						and the incentives in the U.S. may diminish the market for future solar energy offtake agreements and reduce the ability for solar developers to compete for future solar energy offtake agreements, which may reduce incentives for project developers to develop solar projects and purchase PV modules. The U.S. represented 83% (or $2.45 billion) of our sales in 2016.	energy solutions using our modules in key geographic markets that we believe have a compelling need for mass-scale PV electricity, including markets throughout the Americas, the Asia-Pacific region, and the Middle East.As part of these efforts, we continue to optimize resources globally, including business development, sales personnel, and other supporting professional staff in target markets. Joint ventures or other strategic arrangements with partners are a key part of our strategy. We have	

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	sales, and adversely impact our operating results. While the expected potential of the emerging markets we are targeting is significant, policy promulgation and market development are especially vulnerable to governmental inertia, political instability, geopolitical risk, fossil fuel subsidization, potentially stringent localization requirements, and limited available infrastructure.							initiatives in several markets to expedite our penetration of those markets and establish relationships with potential customers. Some of these arrangements involve and are expected to involve significant investments or other allocations of capital that could reduce our liquidity or require us to pursue additional sources of financing, assuming such sources are available to us.	
Other drivers	In certain markets in California and elsewhere, an oversupply imbalance at the grid level may further contribute	Reduced demand for goods/services	1 to 3 years	Indirect (Client)	About as likely as not	Medium-high	Measured in terms of the volume of renewable electricity required to meet its RPS mandate, California's	Grid-friendly solar power plants are crucial to managing intermittent generation and enabling	Our systems business R&D activities are primarily focused on the objective of lowering the LCOE

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	to reduced short-to-medium term demand for new solar installations relative to prior years, lower PPA pricing, and lower margins on module and systems sales to such markets.						Renewable Portfolio Standard (RPS) program is the most significant in the United States, and the California market for renewable energy has dominated the western United States region for the past several years. The California RPS program requires utilities and other obligated load serving entities to procure 50% of their total retail electricity demand from eligible renewable resources by 2030. In 2016, approximately 45% of our total net sales (or ~$1.3 billion)	greater renewable energy adoption. First Solar is differentiating itself from other PV companies by addressing this unmet need and providing reliable and controllable PV power plants. First Solar's operation and maintenance (O&M) services enable us to maximize value and mitigate risk for our customers and offer valuable benefits such as grid integration and stabilization, thereby positioning us to deliver meaningful PV solar energy solutions to varied energy	of a PV solar power system through reductions in BoS costs, improved system design, and energy yield enhancements associated with systems that use our modules. These R&D efforts are also focused on continuing to improve our systems in terms of grid integration and reliability. In 2016, we spent more than $124 million on research and development. These costs are annual and ongoing.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
							were derived from our systems projects or third-party module sales to solar power systems in California. On the other hand, the need for greater grid reliability may also increase demand for our operations and maintenance (O&M) services. As of December 31, 2016, we recognized revenue of $6.1 million for O&M services.	problems worldwide. Our sophisticated power plant controls actively stabilize and improve the reliability of the grid, creating real value for grid operators, utilities and other customers. In a recent study, a First Solar PV plant demonstrated 20-30 percent more accurate regulation for AGC (Automated Generation Control) than the best conventional generation plant. The potential for solar to meet even greater energy demands will only continue to grow in	

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								the future as storage technologies become commercially viable.	
Uncertainty in market signals	The solar module industry is continuously changing, and in the second half of 2016 it experienced sudden and dramatic pricing declines, resulting largely from a combination of increasing capacity and weakening demand in certain markets. An increased global supply of PV modules has caused and may continue to cause structural imbalances in which global PV module supply exceeds demand, which could have a material adverse	Reduced demand for goods/services	Up to 1 year	Direct	Virtually certain	High	In 2016, the solar industry experienced sudden and dramatic module pricing declines. From an operational standpoint First Solar continued to perform well, and we ended the year in a very strong financial position. However, these challenging market conditions necessitated that First Solar undertake significant restructuring actions to accelerate to our next generation Series 6 technology. While the decisions to ramp down our	Challenging market conditions in 2016 necessitated that we undertake a strategic review of our business to determine a path forward that would allow us to generate, over the long-term, attractive returns for our shareholders despite challenging market headwinds. In November 2016, our board of directors approved a set of initiatives intended to accelerate our transition to Series 6 module manufacturing and restructur	We expect to make significant capital investments over the next two years as we transition our production to Series 6 module technology and purchase the related manufacturing equipment. We expect the aggregate capital investment for this program to be approximately $1 billion. During 2017, we expect to spend $525 million to $625 million for capital expenditures, the majority of which is associated with the Series 6

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	effect on our business, financial condition, and results of operations. In the aggregate, we believe manufacturers of solar modules and cells have significant installed production capacity, relative to global demand, and the ability for additional capacity expansion. For example, we estimate that in 2016, over 20 GW of capacity was added by solar module manufacturers, particularly but not exclusively in Asia. During the past several years, industry average sales prices per watt (“ASPs”) have						Series 4 production and discontinue development of our Series 5 module resulted in significant, primarily non-cash, charges (~$640 million) that impacted our 2016 results, these actions were necessary to accommodate the Series 6 transition. We measured the fair value of our manufacturing assets using a combination of income and cost valuation techniques. Our impairment losses include $120.7 million of charges related to stored Series 4 manufacturing	e our operations to reduce costs and better align the organization with our long term strategic plan. Accordingly, we expect to upgrade and replace our existing manufacturing fleet over the next two years with Series 6 manufacturing equipment, thereby enabling the production of solar modules with a larger form factor, better product attributes, and a lower cost structure. While there are certain challenges inherent in transitioning to this new product, we are	transition. We believe these capital expenditures will further increase our solar module conversion efficiencies, reduce manufacturing costs, and reduce the overall cost of systems employing our modules.Our Series 6 manufacturing machinery and equipment is expected to have a useful life of up to 10 years when placed in service.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	declined, at times significantly, both at the module and system levels, as competitors have reduced ASPs to sell-through inventories worldwide. We believe that lower demand in the Chinese market, such as we believe occurred in the second half of 2016, was a key catalyst to the most recent decline in ASPs. If our competitors reduce module pricing to levels near or below their manufacturing costs, or are able to operate at minimal or negative operating margins for sustained periods of time, or if demand for PV modules does not						equipment originally intended for use in previously planned manufacturing capacity expansions.	undertaking several measures to reduce potential risks. Most significantly, our Series 6 modules will utilize essentially the same underlying solar cell technology as our Series 4 product. As a result we believe the core technology risk involved in the transition to be low. In addition, we are developing Series 6 by leveraging more than a decade of internal R&D capabilities and learnings, and deploying it in our existing factories with skilled manufacturing teams.	

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	grow sufficiently to justify the current production supply, our business, financial condition, and results of operations could be adversely affected.								

Further Information

7. Page: CC6. Climate Change Opportunities

CC6.1

Have you identified any inherent climate change opportunities that have the potential to generate a substantive change in your business operations, revenue or expenditure? Tick all that apply

Opportunities driven by changes in regulation
Opportunities driven by changes in physical climate parameters
Opportunities driven by changes in other climate-related developments

CC6.1a

Please describe your inherent opportunities that are driven by changes in regulation

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Renewable energy regulation	Support programs for PV solar electricity generation, including Feed-in-Tariffs	Increased demand for existing products/services	1 to 3 years	Direct	Very likely	Medium-high	Measured in terms of the volume of renewable electricity required	In North America, we continue to execute on our utility-scale project	Project assets consist primarily of costs relating to solar power projects in various stages of

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	(FiTs), quotas, renewable portfolio standards (RPS), and tendering systems help accelerate the adoption of PV solar systems around the world. Although our Long Term Strategic Plan provides for First Solar to transition over time toward operating in sustainable markets that do not require government support programs, in the near-term our net sales and profits remain subject to variability based on the availability and size of government subsidies						to meet its RPS mandate, California's RPS program is the most significant in the U.S., and the California market for renewable energy as dominated the western U.S. region for the past several years. The California RPS program now requires utilities and other obligated load serving entities to procure 50% of their retail electricity demand from eligible renewable resources by 2030. In 2016, approximately 45% (or ~$1.3	pipeline, which includes the construction of some of the world's largest PV solar power systems. We have significant experience and a market leadership position in developing, engineering, constructing, and maintaining utility-scale power plants in the United States, particularly in California and other southwestern states, and increasingly in southeastern states. Currently, our solar projects in the	development. These costs include costs for land and costs for developing and constructing a PV solar power system. Development costs can include legal, consulting, permitting, interconnect, and other similar costs. The net amount of our project assets, deferred project costs, billings in excess of costs and estimated earnings, and payments and billings for deferred project costs, which approximates our net capital investment in the development and construction of systems projects $1.1 billion as of December

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	and economic incentives. In the United States, the solar market continues to advance as solar electricity narrows the cost gap with traditional electricity sources, together with a backdrop of policy support. The majority of U.S. states have enacted legislation adopting Renewable Portfolio Standards (“RPS”) mechanisms. Under an RPS, regulated utilities and other load serving entities are required to procure a specified percentage of their total electricity						billion) of our total net sales were derived from our systems projects or third-party module sales to solar power systems in California. We expect a substantial portion of our consolidated net sales, operating income, and cash flows through the end of 2018 to be derived from several large projects across the Southwest, including the following projects in California: 280 MW California Flats project in Monterey County and the 150 MW	United States account for a majority of the advanced-stage pipeline of projects that we are either currently constructing or expect to construct. We recently included two new solar projects in California (one for 126 MW AC and another for 40 MW AC) to our project pipeline. We also actively participate in legislative and regulatory development activities, shaping policies associated with the deployment of support	31, 2016. Business development and selling expenses (including public affairs)associated with our components and systems segments are part of our selling, general and administrative costs which amounted to approximately $262 million in 2016.

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	sales to end-user customers from eligible renewable resources by a specified date. In terms of the volume of renewable electricity required to meet its RPS mandate, California's RPS program is the most significant in the U.S. and the California market for renewable energy dominates the western U.S. region.The California RPS program now requires utilities and other obligated load serving entities to procure 50% of their total retail						Rosamond project in Kern County.	programs for solar. Our overall company policy has been to ensure support programs provide for the development of sustainable markets with an appropriate reduction in support over time. With the California RPS program increasing from 35% to 50%, we expect opportunities in California to increase through 2030.	

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	electricity demand from eligible renewable resources by 2030.								
Other regulatory drivers	Tax incentive programs exist in the U.S. 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. In 2015, the U.S. Congress extended the 30% federal energy investment tax credit ("ITC") for both residential and commercial solar installations for	Increased demand for existing products/services	1 to 3 years	Direct	Very likely	Medium-high	The positive impact of the ITC has depended to a large degree on the availability of tax equity for solar project financing in the U.S. As a result, the United States continued to account for a majority of our net sales in 2016 (83% or $2.4 billion). In addition, the substantial majority of our systems business sales (PV projects) were in North America in 2016.	In North America, we continue to execute on our advanced-stage utility-scale project pipeline, which includes the construction of some of the world's largest PV solar power systems. We continually seek to make additions to our advanced-stage project pipeline. We are actively developing our early to mid-stage project pipeline in order to secure	Business development and selling expenses (including public affairs)associated with our components and systems segments are part of our selling, general and administrative costs which amounted to approximately $262 million in 2016. With respect to our project development costs, we seek optimal site locations in an effort to maximize solar resources and minimize transmission and permitting costs, and to accelerate lead times

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	eight years, through December 31, 2019. The ITC has been an important economic driver of solar installations in the U.S., including First Solar's utility-scale solar projects, and its extension is expected to contribute to greater medium-term demand visibility in the U.S. The positive impact of the ITC has depended to a large degree on the availability of tax equity for solar project financing in the U.S.						We expect a substantial portion of our consolidated net sales, operating income, and cash flows through the end of 2018 to be derived from several large projects in our pipeline, including the following contracted projects which will be among the world's largest PV solar power systems: the 280 MW California Flats project, located in Monterey County, California; the 250 MW Moapa project, located in Clark County, Nevada; the 150	PPAs and are also pursuing opportunities to acquire advanced-stage projects, which already have PPAs in place. New additions to our project pipeline in the U.S. during the period from February 24, 2016 to February 22, 2017 included a 126 MW AC and a 40 MW AC solar power project in California. We also actively participate in legislative and regulatory development activities, shaping policies associated with	to electricity generation. The net amount of our project assets, deferred project costs, billings in excess of costs and estimated earnings, and payments and billings for deferred project costs, which approximates our net capital investment in the development and construction of systems projects $1.1 billion as of December 31, 2016.

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
							MW Rosamond project located in Kern County, California; and the 150 MW Sun Streams project, located in Maricopa County, Arizona.	the deployment of support programs for solar. The ITC is likely to remain an important economic driver of solar installations in the U.S. through 2019.	
Fuel/energy taxes and regulations	First Solar systems deliver solar energy that is cost competitive with certain conventional energy sources today, depending on the location and application. Our solutions diversify the energy portfolio and reduce the risk of fuel-price volatility, while	Increased demand for existing products/services	1 to 3 years	Direct	Likely	Medium-high	Fuel and energy taxes or regulations could result in increased demand for our utility-scale solar and PV hybrid energy solutions. In 2014 we took our first step into the diesel-PV hybrid solution market with the construction of the 1.7MW Weipa solar project	We are focusing our resources in markets and on 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 electricit	First Solar invested ~$124 million in 2016 on R&D in order to enhance the performance and reduce the costs of our solar modules and PV solar power systems using our modules. Joint ventures or other business arrangements with strategic partners outside of the United States have involved,

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	delivering a LCOE that is cost competitive in some circumstances with electricity generated from fossil fuels. Fluctuations in economic and market conditions that affect the price of, and demand for, conventional sources e.g. increases in the price of natural gas, coal, oil, and other fossil fuels can lead to increased adoption of PV technology and demand for solar modules and systems. For example, declining fuel subsidies in						for Rio Tinto in Queensland, Australia. The project will generate power to meet 20 percent of the mine's daytime electricity demand and save the owner money by reducing the amount of diesel consumed. We are developing our business in other APAC countries including Indonesia, Malaysia, Thailand, and the Philippines. Each of these regions has one or more market characteristics or trends (such as an environment of declining	y demand and/or relatively high existing electricity prices. We continue to devote substantial resources to R&D with the primary objective of lowering the lifecycle cost of electricity generated by our PV solar power systems. We maintain a number of programs and activities to improve our technology and processes in order to enhance the performance and reduce the costs of our solar modules	and are expected in the future to involve, significant investments. In 2016, investments in unconsolidated affiliates and joint ventures amounted to more than $242 million.

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	Indonesia is making PV solar electricity attractive. With fixed pricing and no fuel-price volatility, solar can provide a meaningful value proposition for energy customers burning liquid fuel as their primary energy source. The fact that a PV solar power system requires no fuel provides a unique and valuable hedging benefit to owners of such systems relative to traditional electricity generation assets. Once installed, PV solar power systems can function for 25 or more years with						fuel subsidies in Indonesia) which can make PV solar electricity attractive. In 2016, all other countries apart from the U.S., India, United Arab Emirates, Jordan, Germany, and Australia, represented approximately 2% of our net sales or $59 million.	and PV solar power systems using our modules. We are working with our channel partners, such as Caterpillar Inc., to provide hybrid diesel and/or PV solutions to the distributed generation and commercial and industrial markets. Hybrid diesel solutions, help reduce fuel consumption and costs.	

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	relatively less maintenance or oversight, compared to traditional forms of electricity generation. In addition to these economic benefits, PV solar has several environmental benefits. For example, PV solar power systems do not generate any greenhouse gas or other emissions and use no or minimal amounts of water compared to traditional forms of electricity generation. Solar markets worldwide continue to develop, aided by the above factors as well as demand								

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	elasticity resulting from declining industry average selling prices, both at the module and system level, which make solar power more affordable to new markets, and we have continued to develop our localized presence and expertise in such markets.								
Renewable energy regulation	Japan has evolving electricity market characteristics, particularly after the 2011 Fukushima Daiichi nuclear disaster, which make it an attractive market for PV solar.	Increased demand for existing products/services	1 to 3 years	Direct	Likely	Medium-high	In the Asia-Pacific region, Japan was one of our strongest markets during this past year. In 2016 and early 2017 we added to our contracted development	We continually seek to make additions to our advanced-stage project pipeline. We are actively developing our early to mid-stage project pipeline in order to	In 2016, one of our indirectly wholly-owned subsidiaries borrowed $233.9 million for the development and construction of the 59 MW PV solar power plant located in Ishikawa, Japan.

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	One such characteristic is the announcement of new safety standards following the failure of the Fukushima Daiichi nuclear power station, which resulted in the idling of Japan's nuclear reactors, which had historically generated nearly 30% of the country's electricity. Japan has few domestic fossil fuel resources and relies heavily on fossil fuel imports. Accordingly, the Japanese government has announced a long-term goal of dramatically increasing						pipeline, which is now over 180MW DC and includes 10 smaller projects which have commenced operations. In addition, we have over 350 MW DC of late-stage bookings opportunities that we are working to close. In 2016, we completed the construction of six solar projects and commenced the construction of three additional projects, including the 59 MW AC solar project we acquired the rights to develop in 2015. We are partnering	secure PPAs and are also pursuing opportunities to acquire advanced-stage projects, which already have PPAs in place. New additions to our project pipeline during the period from February 24, 2016 to February 22, 2017 included 41 MW AC of solar power projects in Japan. In 2016, we completed the construction of six solar projects and commenced the construction of three additional projects, including the 59	

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	installed solar power capacity and has provided various incentives for solar power installations. As a result, we continue to see the growth of our development pipeline in Japan.						g with local companies to develop, construct, and operate PV solar power systems, which will further mitigate Japan's dependence on nuclear power and fossil fuel imports. Our sales offerings in Japan also include our modules and O&M services.	MW AC solar project we acquired the rights to develop in 2015. We expect solar demand in Japan to continue to increase over the next several years.	
Other regulatory drivers	While PV solar adoption in the past was driven to a large degree by FiTs and other incentive programs in Germany, France, the United Kingdom (''U.K.''), Italy, and Spain, PV solar has entered its next	Increased demand for existing products/services	Up to 1 year	Direct	Very likely	Medium-high	Our PV technology's carbon footprint advantage in the French renewable energy tenders resulted in First Solar signing over 100MW of module supply agreements. This represented	To manage this opportunity, we have been engaged in business development and module sales activities in France. First Solar's sustainability team supporte	We have been engaged in business development and module sales activities in France which are part of our "selling, general and administrative" expenses which consist primarily of salaries and other personnel-

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	phase in which growth will ultimately be determined by the degree to which PV solar energy solutions can compete economically with more traditional forms of electricity generation, particularly in areas with high prevailing electricity prices, strong electricity demand, and strong solar resources. In particular, Germany, France, and the Netherlands are all running tenders in which utility-scale PV solar projects can bid for capacity. Policymakers have started						approximately 38% of our sales in Europe (260MW).	d business development efforts by gathering LCA data for third party verification.	related costs, professional fees, insurance costs, travel expenses, and other business development and selling expenses. In 2016, global selling, general and administrative expenses amounted to approximately $262 million.

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	incorporating PV life cycle assessment results in energy tendering systems along with other factors such as cost, reliability, and innovation. Renewable tenders in France, for example, include carbon footprint assessment as a component in order to award volumes to PV technologies with the lowest environmental impact. With the lowest carbon footprint in the industry, our thin film PV technology was successfully able to win bids and increase								

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	our market share in France.								

CC6.1b

Please describe your inherent opportunities that are driven by changes in physical climate parameters

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Other physical climate opportunities	Climate change concerns continue to drive demand for solar and other renewable energy solutions. The deterioration of air quality due to high concentration of air pollutants in densely populated areas, such as India or China, can present new business opportunities and demand for our PV energy solutions. PV	Increased demand for existing products/services	Up to 1 year	Direct	Very unlikely	Medium-high	There is significant potential for PV solar in India due to its growing energy needs, substantial population centers, lack of electrification to many parts of the country, high energy costs, strong irradiance, and aggressive renewable energy targets set by the government, which include increasin	We are working to sell modules and develop utility-scale PV solar projects in India to address the energy and renewable purchase obligation needs of utilities and target the open access industrial and commercial power demand. In 2016, we secured rights through a competitive auction to sell power under a	In 2016, our indirect wholly-owned subsidiaries borrowed $19.1 million for costs related to a 25 MW PV solar power plant located in Telangana, and $63.3 million for costs related to an 80 MW PV solar power plant located in Andhra Pradesh, India.

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	systems do not generate any greenhouse gas or other emissions and use no or minimal amounts of water compared to traditional forms of electricity generation. Local air pollution in India for example is one of the driving factors of the country's demand for renewable energy sources. On a life cycle basis, First Solar PV modules and systems have the lowest carbon footprint of all solar technologies.						g the country's solar capacity to 100 GW by the year 2022. In India we crossed the 1GW DC module shipment milestone in early 2016 and have continued to sign additional volume over the course of the year. For the entire year we booked over 340MW DC of module sales and signed a PPA for a 60MW AC development project. This latest project booking brings our total contracted development pipeline in the country to 260MW	25-year PPA for a cumulative capacity of 60 MW AC to the state owned electricity distribution companies in Karnataka and were in the advanced stages of construction of a 50 MW AC project in Telangana. In 2015, we successfully achieved commercial operation of 130 MW AC of projects in Andhra Pradesh and Telangana. We continue to maintain our strong PV module presence in India with over 1,300 MW DC of installed modules as a	

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
							AC. India accounted for more than 5% of our net sales in 2016 (or ~$158 million), compared to $134 million in 2015.	result of our technology's significant energy yield advantage.	

CC6.1c

Please describe your inherent opportunities that are driven by changes in other climate-related developments

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Changing consumer behavior	The wholesale commercial and industrial market is a promising opportunity for First Solar given our large-scale PV system expertise. The demand for corporate renewables is accelerating, with corporations worldwide committing to the RE100 campaign,	Increased demand for existing products/services	1 to 3 years	Direct	Very likely	High	In recent years, commercial customers have demonstrated a growing interest in utility-scale solar to meet their sustainability goals and manage fuel price volatility. In 2015, Apple Inc. committed $848 million to purchase electricity from our	Our utility-scale solar power plants have a much better cost structure than typical on-site C&I systems and are better able to fully satisfy the appetite for green power of many big corporations. We	Business development and selling expenses for the commercial and Industrial (C&I) segment are part of our selling, general and administrative costs which amounted to approximately $262 million in 2016.

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	a collaborative, global initiative of influential businesses committed to 100% renewable electricity. We believe we have a competitive advantage in the commercial and industrial market due to customers' sensitivity to reputational risk, as well as their desire to cover their operations globally. With our financial strength, solid development record, and global footprint, we are well positioned to meet their needs. As one recent example, Apple Inc. (''Apple'') committed to purchase electricity from our California Flats solar project						California Flats solar project under a 25-year power purchase agreement, representing the largest agreement in the industry to provide clean energy to a commercial end user. In 2015, we also signed PPAs with NV Energy for 179MW AC. All the power generated by the 179MW AC power plant will support the commitment of Switch, a leading technology company in Nevada, to utilize renewable energy under NV Energy's green	have joint ventures or other strategic arrangements with partners in several markets, which are generally used to expedite our penetration of those markets and establish relationships with potential customers. For example, we are working with channel partners, such as Caterpillar Inc., to provide hybrid diesel and/or PV solutions to the distributed generation and commercial and industrial markets. Many companies have set 100% renewable targets for 2020, 2030 and beyond,	

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	under construction in Monterey County, California. Apple will receive electricity from 130 MW AC of the project under a 25-year PPA.						energy rider tariff.	so we expect opportunities in the commercial and industrial segment to grow over the next few years.	
Other drivers	Declining hydrocarbon revenues have led some regional governments, specifically the United Arab Emirables and Saudi Arabia, to move towards reducing government support for conventional fuels, thereby paving the way for solar to become even more cost competitive .The fact that a PV solar power system requires no fuel provides a unique and valuable	Increased demand for existing products/services	Up to 1 year	Indirect (Client)	Likely	Medium	The market potential for solar energy in the Middle East continues to be driven by a combination of strong economic fundamentals, aggressive tariff pricing, abundant solar resources, and robust policy. However, as with any emerging market, challenges remain, including those related to evolving policy and legislation	As part of our Long Term Strategic Plan, 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.	Execution of our Long Term Strategic Plan entails the allocation of resources around the globe. We are closely evaluating and managing the appropriate level of resources required as we pursue the most advantageous and cost effective projects and partnerships in our target markets, including the Middle East. As

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	hedging benefit to owners of such systems relative to traditional electricity generation assets. In 2016 alone, the UAE tendered over 1.0 GW of independent power production owned utility-scale solar. Saudi Arabia has also solicited 100 MW of utility-scale solar as part of the inaugural solar independent power production tender, in what is expected to be a 9.5 GW renewable energy program. While there are several motives for investing in solar energy, including energy security, diversification of generation portfolios,						, infrastructure, the availability of financing, the level of competition, and geopolitical risk. First Solar has focused on the region's utility-scale segment while pursuing a range of opportunities. In 2016, we supplied modules to a 200MW AC landmark project in Dubai which accounted for nearly 5% of our net sales or $141 million. Additionally, we completed the 53MW AC Shams Ma'an project in Jordan, which accounts for approxim	Since establishing a presence in the Middle East in 2013, First Solar has focused on the region's utility-scale segment while pursuing a range of opportunities. In addition to constructing the 13 MW DC first phase of the Mohammed bin Rashid Al Maktoum Solar Park in Dubai, First Solar also supplied modules for the Park's 200 MW AC second phase. In Jordan, First Solar completed construction of the 53 MW AC	part of these efforts, we continue to optimize resources globally, including business development, sales personnel, and other professional staff supporting target markets. In 2016, global selling, general and administrative expenses amounted to approximately $262 million. Our selling, general and administrative expense consists primarily of salaries and other personnel-related costs, professional fees, insurance costs, travel expenses

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	and the minimization of domestic consumption of hydrocarbons, the common factor is that the economics of PV solar have made it a compelling choice as a generation source. In executing our long term strategic plan, we are focusing on providing utility-scale PV solar energy solutions using our modules in key geographic markets that we believe have a compelling need for mass-scale PV electricity, including markets throughout the Middle East. In addition, the Middle East is a region where our technology						ately 1% of the country's total generating capacity. In 2016, Jordan alone accounted for approximately 0.4% of our net sales (or over $120 million). We expect to have an installed capacity of nearly 300 MW AC across the region by the end of 2017.	Shams Ma'an PV solar power system, which accounts for approximately 1% of Jordan's annual energy output. As a result of these and other projects, First Solar has become a leading provider of PV solutions in the Middle East, with an expected installed capacity of nearly 300 MW AC across the region by the end of 2017.	, and other business development and selling expenses.

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	has a significant energy yield advantage. By pursuing opportunities in the region's utility-scale segment, First Solar has become a leading provider of PV solutions in the Middle East.								

Further Information

4 Module: GHG Emissions Accounting, Energy and Fuel Use, and Trading

8. Page: CC7. Emissions Methodology

CC7.1

Please provide your base year and base year emissions (Scopes 1 and 2)

Scope	Base year	Base year emissions (metric tonnes CO2e)
Scope 1	Tue 01 Jan 2008 - Wed 31 Dec 2008	1020
Scope 2 (location-based)	Tue 01 Jan 2008 - Wed 31 Dec 2008	123046
Scope 2 (market-based)	Tue 01 Jan 2008 - Wed 31 Dec 2008	123046

CC7.2

Please give the name of the standard, protocol or methodology you have used to collect activity data and calculate Scope 1 and Scope 2 emissions

Please select the published methodologies that you use
The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)

CC7.2a

If you have selected "Other" in CC7.2 please provide details of the standard, protocol or methodology you have used to collect activity data and calculate Scope 1 and Scope 2 emissions

CC7.3

Please give the source for the global warming potentials you have used

Gas	Reference
CH4	IPCC Fifth Assessment Report (AR5 - 100 year)
N2O	IPCC Fifth Assessment Report (AR5 - 100 year)
HFCs	IPCC Fourth Assessment Report (AR4 - 100 year)

CC7.4

Please give the emissions factors you have applied and their origin; alternatively, please attach an Excel spreadsheet with this data at the bottom of this page

Fuel/Material/Energy	Emission Factor	Unit	Reference
Natural gas	56100	Other: kg CO2 per TJ	WRI GHG Emission Factors Compilation; Stationary Combustion
Motor gasoline	69300	Other: kg CO2 per TJ	WRI GHG Emission Factors Compilation; Stationary Combustion
Diesel/Gas oil	74100	Other: kg CO2 per TJ	WRI GHG Emission Factors Compilation; Stationary Combustion
Electricity	685	kg CO2 per MWh	WRI GHG Protocol Tool for Purchased Electricity, V. 4.7; U.S., RFC West Region, Year 2010
Electricity	475	kg CO2 per MWh	WRI GHG Protocol Tool for Purchased Electricity, V. 4.7; Germany, Year 2012
Electricity	926	kg CO2 per MWh	WRI GHG Protocol Tool for Purchased Electricity, V. 4.7; India, Year 2012
Electricity	591	kg CO2 per MWh	Market-based (supplier-specific emission factor from NUR utility; Malaysia, Year 2016
Electricity	277	kg CO2 per MWh	WRI GHG Protocol Tool for Purchased Electricity, V. 4.7; U.S., WECC California Region, Year 2010
Electricity	534	kg CO2 per MWh	WRI GHG Protocol Tool for Purchased Electricity, V. 4.7; U.S., WECC Southwest Region, Year 2010
Electricity	86	kg CO2 per MWh	WRI GHG Protocol Tool for Purchased Electricity, V. 4.7; U.S., WECC Rockies Region, Year 2010
Electricity	553	kg CO2 per MWh	WRI GHG Protocol Tool for Purchased Electricity, V. 4.7; U.S., ERCOT All Region, Year 2010
Electricity	454	kg CO2 per MWh	WRI GHG Protocol Tool for Purchased Electricity, V. 4.7; U.S., RFC East Region, Year 2010
Other: Air travel	0.15	Other: kg CO2 per passenger km	WRI GHG Protocol (Short Haul)
Other: Air travel	0.12	Other: kg CO2 per passenger km	WRI GHG Protocol (Medium Haul)
Other: Vehicle travel	0.54	Other: kg CO2 per mile	WRI GHG Emission Factors Compilation; EF Public; Light Goods Vehicle - Gasoline - Year 2005 - present
Other: Vehicle travel	1.15	Other: kg CO2 per mile	WRI GHG Emission Factors Compilation; EF Public; Heavy Duty Vehicle - Rigid - Diesel - Year 1960-present
Electricity	671	kg CO2 per MWh	Location-based (grid-average emission factor) WRI GHG Protocol Tool for Purchased Electricity, V. 4.7; Malaysia, Year 2012

Fuel/Material/Energy	Emission Factor	Unit	Reference
Electricity	799	kg CO2 per MWh	WRI GHG Protocol Tool for Purchased Electricity, V. 4.7; Australia, Year 2012
Electricity	551	kg CO2 per MWh	WRI GHG Protocol Tool for Purchased Electricity, V. 4.7; Japan, Year 2012
Other: Air travel	0.11	Other: kg CO2 per passenger km	WRI GHG Protocol (Long Haul)
Electricity	406	kg CO2 per MWh	Market-based (supplier-specific emission factor from Direct Energy, Year 2016
Electricity	483	kg CO2 per MWh	WRI GHG Protocol Tool for Purchased Electricity, V. 4.7; Chile, Year 2012

Further Information

9. Page: CC8. Emissions Data - (1 Jan 2016 - 31 Dec 2016)

CC8.1

Please select the boundary you are using for your Scope 1 and 2 greenhouse gas inventory

Equity share

CC8.2

Please provide your gross global Scope 1 emissions figures in metric tonnes CO2e

14730

CC8.3

Please describe your approach to reporting Scope 2 emissions

Scope 2, location-based	Scope 2, market-based	Comment
We are reporting a Scope 2, location-based figure	We are reporting a Scope 2, market-based figure	

CC8.3a

Please provide your gross global Scope 2 emissions figures in metric tonnes CO2e

Scope 2, location-based	Scope 2, market-based (if applicable)	Comment
478205	391378	

CC8.4

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

CC8.5

Please estimate the level of uncertainty of the total gross global Scope 1 and 2 emissions figures that you have supplied and specify the sources of uncertainty in your data gathering, handling and calculations

Scope	Uncertainty range	Main sources of uncertainty	Please expand on the uncertainty in your data
Scope 1	More than 2% but less than or equal to 5%	Assumptions Metering/ Measurement Constraints Data Management	Uncertainty for emissions from stationary combustion is low, as the amount of natural gas and diesel consumed at each manufacturing facility is based on invoices and the associated emissions are based on accepted emission factors. Other significant Scope 1 emissions are from owned construction equipment (for which emissions were estimated from inventory of equipment hours) and refrigerant leakage (for which refrigerant refill data was used). Emissions from owned vehicles were estimated from annual upper bound mileage in a previous year.
Scope 2 (location-based)	More than 2% but less than or equal to 5%	Assumptions Metering/ Measurement Constraints Data Management	Uncertainty for Scope 2 emissions is low as they are composed largely from the purchases of electricity for our manufacturing and R&D facilities. The amount of electricity used at each facility is based on invoices and the associated emissions are based on accepted emission factors. Emissions from owned operational solar projects were estimated from electricity usage at a representative solar project operated and maintained by First Solar. Location-based Scope 2 emissions are based on grid-average emission factors
Scope 2 (market-based)	More than 2% but less than or equal to 5%	Assumptions Metering/ Measurement Constraints Data Management	Uncertainty for Scope 2 emissions is low as they are composed largely from the purchases of electricity for our manufacturing and R&D facilities. The amount of electricity used at each facility is based on invoices and the associated emissions are based on accepted emission factors. Emissions from owned operational solar projects were estimated from electricity usage at a representative solar project operated and maintained by First Solar. Market-based Scope 2 emissions are based on supplier-specific emission factor for our Malaysia and Ohio manufacturing facilities and grid-average emission factors for other sources.

CC8.6

Please indicate the verification/assurance status that applies to your reported Scope 1 emissions

Third party verification or assurance process in place

CC8.6a

Please provide further details of the verification/assurance undertaken for your Scope 1 emissions, and attach the relevant statements

Verification or assurance cycle in place	Status in the current reporting year	Type of verification or assurance	Attach the statement	Page/section reference	Relevant standard	Proportion of reported Scope 1 emissions verified (%)
Triennial process	No verification or assurance of current reporting year	Limited assurance	https://www.cdp.net/sites/2017/19/6419/Climate Change 2017/Shared Documents/Attachments/CC8.6a/Final_FSI_AudRep_2015.pdf	Entire document; Section 7, pg. 25: Statement of Verification	ISO14064-3	100

CC8.7

Please indicate the verification/assurance status that applies to at least one of your reported Scope 2 emissions figures

Third party verification or assurance process in place

CC8.7a

Please provide further details of the verification/assurance undertaken for your location-based and/or market-based Scope 2 emissions, and attach the relevant statements

Location-based or market-based figure?	Verification or assurance cycle in place	Status in the current reporting year	Type of verification or assurance	Attach the statement	Page/Section reference	Relevant standard	Proportion of reported Scope 2 emissions verified (%)
Market-based	Triennial process	No verification or assurance of current reporting year	Limited assurance	https://www.cdp.net/sites/2017/19/6419/Climate Change 2017/Shared Documents/Attachments/CC8.7a/Final_FSI_AudRep_2015.pdf	Entire document; Section 5, pg.17 : Verification of Findings Section 6, pg.23: Conclusions Section 7, pg. 25:	ISO14064-3	100

Location-based or market-based figure?	Verification or assurance cycle in place	Status in the current reporting year	Type of verification or assurance	Attach the statement	Page/Section reference	Relevant standard	Proportion of reported Scope 2 emissions verified (%)
					Statement of Verification		

CC8.8

Please identify if any data points have been verified as part of the third party verification work undertaken, other than the verification of emissions figures reported in CC8.6, CC8.7 and CC14.2

Additional data points verified	Comment
No additional data verified	

CC8.9

Are carbon dioxide emissions from biologically sequestered carbon relevant to your organization?

No

Further Information

10. Page: CC9. Scope 1 Emissions Breakdown - (1 Jan 2016 - 31 Dec 2016)

CC9.1

Do you have Scope 1 emissions sources in more than one country?

Yes

CC9.1a

Please break down your total gross global Scope 1 emissions by country/region

Country/Region	Scope 1 metric tonnes CO2e
United States of America	11864
Germany	546
Malaysia	2320

CC9.2

Please indicate which other Scope 1 emissions breakdowns you are able to provide (tick all that apply)

By GHG type

CC9.2c

Please break down your total gross global Scope 1 emissions by GHG type

GHG type	Scope 1 emissions (metric tonnes CO2e)
CO2	12469
HFCs	2261

Further Information

11. Page: CC10. Scope 2 Emissions Breakdown - (1 Jan 2016 - 31 Dec 2016)

CC10.1

Do you have Scope 2 emissions sources in more than one country?

Yes

CC10.1a

Please break down your total gross global Scope 2 emissions and energy consumption by country/region

Country/Region	Scope 2, location-based (metric tonnes CO2e)	Scope 2, market-based (metric tonnes CO2e)	Purchased and consumed electricity, heat, steam or cooling (MWh)	Purchased and consumed low carbon electricity, heat, steam or cooling accounted in market-based approach (MWh)
United States of America	109657	66574	165241	0
Germany	1035	1035	2176	0
Malaysia	365444	321700	544332	0
India	1325	1325	1431	0
Australia	107	107	135	0
Japan	9	9	16	0
Chile	628	628	1299	0

CC10.2

Please indicate which other Scope 2 emissions breakdowns you are able to provide (tick all that apply)

Further Information

12. Page: CC11. Energy

CC11.1

What percentage of your total operational spend in the reporting year was on energy?

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

CC11.2

Please state how much heat, steam, and cooling in MWh your organization has purchased and consumed during the reporting year

Energy type	MWh
Heat	0
Steam	0
Cooling	0

CC11.3

Please state how much fuel in MWh your organization has consumed (for energy purposes) during the reporting year
51896

CC11.3a

Please complete the table by breaking down the total "Fuel" figure entered above by fuel type

Fuels	MWh
Natural gas	12220
Diesel/Gas oil	31055
Motor gasoline	8621

CC11.4

Please provide details of the electricity, heat, steam or cooling amounts that were accounted at a low carbon emission factor in the market-based Scope 2 figure reported in CC8.3a

Basis for applying a low carbon emission factor	MWh consumed associated with low carbon electricity, heat, steam or cooling	Emissions factor (in units of metric tonnes CO2e per MWh)	Comment
Off-grid energy consumption from an on-site installation or through a direct line to an off-site generator owned by another company	1095	0	In 2015, First Solar installed 7,820 modules to power our manufacturing facility in Kulim, Malaysia. The 750kW installation generates enough energy to power 350 average Malaysian homes and displace 750 metric tons of CO2-eq annually, which is the equivalent of removing 150 cars from the road and saving over 1.4 million liters of water per year, based on national averages.The

Basis for applying a low carbon emission factor	MWh consumed associated with low carbon electricity, heat, steam or cooling	Emissions factor (in units of metric tonnes CO2e per MWh)	Comment
			electricity generated is used for self-consumption.
Off-grid energy consumption from an on-site installation or through a direct line to an off-site generator owned by another company	2705	0	First Solar installed four PV installations (totaling 2.9MW) on our recycling facility in Frankfurt Oder, Germany. The installations generate enough energy to power over 700 average German homes and displace over 1,200 metric tons of CO2-eq emissions per year, based on national averages.The electricity generated is used for self-consumption.
Off-grid energy consumption from an on-site installation or through a direct line to an off-site generator owned by another company	3372	0	First Solar installed a 2.75MW rooftop and ground-mount PV installation at our Perrysburg, Ohio manufacturing facility. The PV installation generates enough energy to power 290 average local homes and displace 1,920 metric tons of CO2-eq emissions per year, based on the regional average grid. The electricity generated is used for self-consumption.
Other	544332	0.591	In 2016, First Solar purchased grid electricity for its Kulim, Malaysia facility with a supplier-specific emissions factor of 0.591 metric tons CO2e/MWh. The national grid average emissions factor for Malaysia is 0.671 metric tons CO2e/MWh.
Other	154308	0.406	In 2016, First Solar purchased grid electricity for its Perrysburg, Ohio, USA facility with a supplier-specific emissions factor of 0.406 metric tons CO2e/MWh. The USEPA eGRID regional grid average emissions factor (RFC West region) is 0.685 metric tons CO2e/MWh.

CC11.5

Please report how much electricity you produce in MWh, and how much electricity you consume in MWh

Total electricity consumed (MWh)	Consumed electricity that is purchased (MWh)	Total electricity produced (MWh)	Total renewable electricity produced (MWh)	Consumed renewable electricity that is produced by company (MWh)	Comment
721802	714630	7172	7172	7172	

Further Information

13. Page: CC12. Emissions Performance

CC12.1

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

Increased

CC12.1a

Please 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

Reason	Emissions value (percentage)	Direction of change	Please explain and include calculation
Emissions reduction activities	0.5	Decrease	First Solar implemented process chilled water optimization measures as well as lighting reduction measures for non-critical areas at its manufacturing facility in Perrysburg, Ohio. These measures resulted in savings of 1,408 metric tons CO2e from avoided electricity consumption in 2016. Our scope 1 and 2 emissions in the previous year (2015) amounted to 312,215 metric tons CO2e. We arrived at a 0.5% decrease in our gross global emissions through (1,408 / 312,215) *100 = 0.5%.
Divestment	0	No change	There were no divestments in 2016.
Acquisitions	0	No change	There were no acquisitions in 2016.
Mergers	0	No change	There were no mergers in 2016.
Change in output	24	Increase	From 2015 to 2016 First Solar increased its production of PV solar modules by 24% from 2.5GW to 3.1GW. If no measures had been introduced, this increased output would have generated an additional 74,932 metric tons CO2e of emissions, or 24% of the previous year's emissions through (74,932 / 312,215)*100 = 24%.
Change in methodology	22	Increase	In 2016, First Solar changed the grid electricity emission factor for its Kulim, Malaysia facility from a supplier-specific factor of 0.386 kg CO2e/kWh in 2015 to a supplier-specific factor of 0.591 kg CO2e/kWh in 2016. Use of the updated supplier specific factor resulted in an increase of 111,588 metric tons CO2e of emissions compared with using the 2015 factor. Also in 2016, First Solar changed the grid electricity emission factor for its Perrysburg, Ohio facility from a location-based factor of 0.685 kg CO2e/kWh in 2015 to a supplier-specific factor of 0.406 kg CO2e/kWh in 2016. Use of the updated supplier specific factor resulted in a decrease of 43,057 metric tons CO2e of emissions compared with using the 2015 factor. The updated emission factors for the two facilities account for 22% of the previous year's emissions through ((111,588-43,057) / 312,215)*100 = 22%.
Change in boundary	0	No change	There were no changes in boundary in 2016.
Change in physical operating conditions	0	No change	There no changes in physical operating conditions in 2016.
Unidentified	0	No change	There were no unidentified changes in 2016.
Other	15.5	Decrease	In 2016, First Solar ran its manufacturing facilities at approximately 97% capacity utilization, which represented a 5.0 percentage point increase from 2015. These improvements combined with increased manufacturing line throughput resulted in a decrease of 48,392 metric tons CO2e of emissions, or 15.5% of the previous year's emissions through (48,393 / 312,215)*100 = 15.5%.

CC12.1b

Is your emissions performance calculations in CC12.1 and CC12.1a based on a location-based Scope 2 emissions figure or a market-based Scope 2 emissions figure?
Market-based

CC12.2

Please describe your gross global combined Scope 1 and 2 emissions for the reporting year in metric tonnes CO2e per unit currency total revenue

Intensity figure =	Metric numerator (Gross global combined Scope 1 and 2 emissions)	Metric denominator: Unit total revenue	Scope 2 figure used	% change from previous year	Direction of change from previous year	Reason for change
0.000138	metric tonnes CO2e	2951328000	Market-based	58	Increase	In 2016, our Scope 1 and 2 GHG emissions (406,108 MT CO2e) increased by 30% relative to 2015 (312,215 MT CO2e). Total revenue decreased by 18% to $2.95 billion in 2016, compared to $3.58 billion in 2015. 312,215/ 3,578,995,000 = 0.000087 in 2015. 406,108/ 2,951,328,000 = 0.000138 in 2016. (0.000138-0.000087) / 0.000087 *100= 58% increase.

CC12.3

Please provide any additional intensity (normalized) metrics that are appropriate to your business operations

Intensity figure =	Metric numerator (Gross global combined Scope 1 and 2 emissions)	Metric denominator	Metric denominator: Unit total	Scope 2 figure used	% change from previous year	Direction of change from previous year	Reason for change
76	metric tonnes CO2e	full time equivalent (FTE) employee	5358	Market-based	54	Increase	In 2016, our Scope 1 and 2 GHG emissions (406,108 MT CO2e) increased by 30% relative to 2015 (312,215 MT CO2e). FTE employees decreased by 16% over this period from 6,350 to

Intensity figure =	Metric numerator (Gross global combined Scope 1 and 2 emissions)	Metric denominator	Metric denominator: Unit total	Scope 2 figure used	% change from previous year	Direction of change from previous year	Reason for change
							5,358. 312,215/ 6,350) = 49 metric tons of CO2e per FTE equivalent in 2015. 406,108/ 5,358 = 76 metric tons CO2e per FTE equivalent in 2016. (76-49) / 49 * 100= 54% increase.
131	metric tonnes CO2e	Other: MW of PV modules produced	3097	Market-based	6	Increase	In 2016, our Scope 1 and 2 GHG emissions (406,108 MT CO2e) increased by 30% relative to 2015 (312,215 MT CO2e). MW of PV modules produced increased by 24% over this period (3.1 GW in 2016 compared to 2.5GW in 2015). 312,215/ 2,518 = 124 MT CO2e per MW of PV modules produced in 2015. 406,108 / 3,097= 131 MT CO2e per MW of PV modules produced in 2016. (131-124) / 124 *

Intensity figure =	Metric numerator (Gross global combined Scope 1 and 2 emissions)	Metric denominator	Metric denominator: Unit total	Scope 2 figure used	% change from previous year	Direction of change from previous year	Reason for change
							100 = 6% increase.

Further Information

14. Page: CC13. Emissions Trading

CC13.1

Do you participate in any emissions trading schemes?

No, and we do not currently anticipate doing so in the next 2 years

CC13.2

Has your organization originated any project-based carbon credits or purchased any within the reporting period?

No

Further Information

15. Page: CC14. Scope 3 Emissions

CC14.1

Please account for your organization's Scope 3 emissions, disclosing and explaining any exclusions

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
Purchased goods and services	Relevant, calculated	478576	Based on life cycle assessment of First Solar PV module production (Table III; DOI: 10.1002/pip.1068) and total modules produced in 2016, and subtracting 2016 Scope 1 and 2 emissions.	25.00%	Bill of materials for PV module manufacturing from a previous year were the basis for the life cycle

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
					assessment combined with modules produced in 2016.
Capital goods	Relevant, calculated	139935	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 2016 capital goods spend by a CO2 emission factor based on the broad sector of purchase.	25.00%	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)	Relevant, calculated	19569	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%.	25.00%	Quantities of purchased electricity were the basis for the estimate.
Upstream transportation and distribution	Relevant, calculated	9089	Glass supply distances and transport methods (truck/rail/ship) to First Solar manufacturing facilities were used in conjunction with emission factors from WRI GHG Protocol transport tool (V. 2.5.1). For transport by ship, 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) were used.	25.00%	GHG Emissions were extrapolated from glass supply distances and transport methods from a previous year combined with data on modules produced in 2016.
Waste generated in operations	Relevant, calculated	2158	In 2016, we disposed of 4.45 million kilograms of waste (or 4,905 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	100.00%	Quantities of disposed non-hazardous and hazardous waste were the basis for the estimate. In 2016, we disposed of 4.45 million kilograms of waste (or 4,905 Tons).

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
			to mass CO2 generated during combustion processes is 44/12.		Note that 23.77 million kilograms of waste (26,202 Tons or 84% of total waste generated) were recycled in 2016.
Business travel	Relevant, calculated	6062	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.	100.00%	Short, medium, and long haul passenger air miles recorded by corporate travel agent were the basis for the estimate
Employee commuting	Relevant, calculated	12750	Number of full-time equivalent employees in 2016 was the basis for this estimate combined with assumptions regarding average employee commuting GHG emissions from the Quantis Scope 3 evaluator tool.	25.00%	
Upstream leased assets	Relevant, calculated	164	Leased vehicle mileage was used in conjunction with vehicle emission factors from the WRI Transport Tool, V. 2.5 and IPCC Fourth Assessment Report GWP values.	50.00%	Vehicle inventory data was the basis for the estimate in conjunction with upper bound mileage estimate per vehicle from a previous year.
Downstream transportation and distribution	Relevant, calculated	13462	Finished product (PV module) transport distances and transport methods (ship) from our largest manufacturing facility (Kulim, Malaysia) 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).	25.00%	GHG Emissions were estimated from quantity of PV modules produced in 2016 in conjunction with port to port distances.
Processing of sold products	Not relevant, explanation provided		Not relevant		Our products are not further processed. In less than 3.5 hours, First Solar's fully integrated manufacturing process transforms

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
					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	Relevant, calculated	0	Our products (PV modules) are energy producing rather than energy consuming products.	100.00%	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 2016, First Solar produced 3.1 GWdc of PV solar modules. Assuming world-wide average irradiance and grid electricity emissions, we conservatively estimate that our 2016 products are being used to displace over 2.16 million metric tons CO2e per year for the 25+ year product life.
End of life treatment of sold products	Relevant, calculated	1451	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.,	25.00%	GHG emissions were estimated from quantity of end of life PV modules recycled in 2016 in conjunction with an electricity

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
			Germany, and Malaysia and market-specific GHG electricity emission factors.		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	Relevant, calculated	463	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).	25.00%	GHG emissions were estimated based on square footage of leased warehouse facilities.
Franchises	Not relevant, explanation provided		Not relevant.		We do not have franchises.
Investments	Relevant, calculated	50301	GHG Emissions from projects in the construction phase were estimated from First Solar Topaz Solar Farm Environmental Impact Report, Appendix 8A, Table 4-10 (which uses URBEMIS vehicle emission factors and IPCC Second Assessment Report GWP values), scaled to 2016 EPC solar deployment of 1696MW (dc).	25.00%	GHG Emissions were extrapolated from First Solar Topaz Solar Farm Environmental Impact Report based on 2016 EPC solar deployment data.
Other (upstream)	Not relevant, explanation provided		Not relevant.		There are no other relevant Scope 3 GHG emissions from upstream sources.
Other (downstream)	Not relevant,		Not relevant.		There are no other relevant Scope 3

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
	explanation provided				GHG emissions from upstream sources.

CC14.2

Please indicate the verification/assurance status that applies to your reported Scope 3 emissions

No third party verification or assurance

CC14.3

Are you able to compare your Scope 3 emissions for the reporting year with those for the previous year for any sources?

Yes

CC14.3a

Please identify the reasons for any change in your Scope 3 emissions and for each of them specify how your emissions compare to the previous year

Sources of Scope 3 emissions	Reason for change	Emissions value (percentage)	Direction of change	Comment
Business travel	Change in output	12	Decrease	In 2016, overall passenger air miles traveled decreased by 12% relative to 2015, with a corresponding decrease in employee air travel GHG emissions.
Upstream leased assets	Other: Change in scope	89	Decrease	In 2016, the proportion of leased versus owned vehicles shifted from 59% leased in 2015 to 8% leased in 2016, thereby increasing Scope 1 emissions from owned vehicles and reducing Scope 3 emissions from leased vehicles.
Waste generated in operations	Change in output	4	Decrease	In 2016, tons of waste disposed decreased by 4% relative to 2015, with a corresponding decrease in waste GHG emissions.
Use of sold products	Emissions reduction activities	23	Decrease	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 2016, First Solar produced 3.1 GWdc of PV solar modules. Assuming world-wide average irradiance and grid electricity emissions, we

Sources of Scope 3 emissions	Reason for change	Emissions value (percentage)	Direction of change	Comment
				conservatively estimate that our 2016 products are being used to displace over 2.16 million metric tons CO2e per year for the 25+ year product life. This represented a 23% decrease in emissions compared to our 2.5 GWdc of 2015 products which are being used to displace over 1.75 million metric tons CO2e per year for the 25+ year product life.

CC14.4

Do you engage with any of the elements of your value chain on GHG emissions and climate change strategies? (Tick all that apply)

Yes, our suppliers
Yes, our customers

CC14.4a

Please give details of methods of engagement, your strategy for prioritizing engagements and measures of success

First Solar performs periodic cross-functional team reviews of our critical suppliers' performance and evaluates new suppliers using a balanced scorecard which focuses on the areas of Quality, Cost, Flexibility, Service, Technology and Sustainability. We prioritize our engagement by focusing on our module and system component suppliers. We recently expanded our supplier audit tool to include questions on supplier energy use and GHG emissions. The Environmental, health and safety (EHS) section of our supplier audit tool uses the Electronics Industry Citizenship Coalition ("EICC") Code of Conduct as a framework and encompasses topics such as environmental management, health and safety, labor and human rights, and ethics. Success in terms of GHG emissions and energy use is measured based on whether the supplier has set energy use and GHG emissions reduction targets. The scorecard is a risk assessment tool used for supplier selection and ranks suppliers in terms of low, medium and high risk to determine whether further engagement or corrective actions are needed.

We work with electric utility customers to meet government mandated renewable portfolio standards through solar PV deployment. We work with commercial/industrial customers to meet carbon mitigation/neutrality goals through solar PV deployment. These engagements receive high priority as they are commercial opportunities. Success is measured by the performance of our solar PV projects and the amount of conventional grid electricity that is displaced.

CC14.4b

To give a sense of scale of this engagement, please give the number of suppliers with whom you are engaging and the proportion of your total spend that they represent

Type of engagement	Number of suppliers	% of total spend (direct and indirect)	Impact of engagement
Active engagement	7	0.38%	First Solar evaluates potential new suppliers using a balanced scorecard which focuses on the areas of Quality, Cost, Flexibility, Service, Technology and Sustainability. We prioritize our engagement by focusing on our module and system component suppliers. We recently expanded our supplier audit tool to include questions on supplier energy use and GHG emissions. Since the evaluated suppliers are new they do not yet represent a significant

Type of engagement	Number of suppliers	% of total spend (direct and indirect)	Impact of engagement
			percentage of our total spend however we anticipate this will increase over the next few years as we continue to roll out our supplier audit tool. Success in terms of GHG emissions and energy use is measured based on whether the supplier has set energy use and GHG emissions reduction targets. Of the 7 new suppliers evaluated so far, 100% of them track their energy use, 86% of them have set energy intensity reduction targets, 57% have set GHG intensity reduction targets, and 28% have set absolute GHG emissions reduction.

Further Information

5 Module: Sign Off

16. Page: CC15. Sign Off

CC15.1

Please provide the following information for the person that has signed off (approved) your CDP climate change response

Name	Job title	Corresponding job category
Alex Heard	Senior Vice President, Global Technical Services	Environment/Sustainability manager

Further Information

6 Module: ICT

17. Page: ICT1. Data center activities

ICT0.1a

Please identify whether "data centers" comprise a significant component of your business within your reporting boundary

No

Further Information

18. Page: ICT2. Provision of network/connectivity services

ICT0.1b

Please identify whether "provision of network/connectivity services" comprises a significant component of your business within your reporting boundary

No

Further Information

19. Page: ICT3. Manufacture or assembly of hardware/components

ICT0.1c

Please identify whether "manufacture or assembly of hardware/components" comprises a significant part of your business within your reporting boundary

No

Further Information

20. Page: ICT4. Manufacture of software

ICT0.1d

Please identify whether "manufacture of software" comprises a significant component of your business within your reporting boundary

No

Further Information

21. Page: ICT5. Business services (office based activities)

ICT0.1e

Please identify whether "business services (office based activities)" comprise a significant component of your business within your reporting boundary

No

Further Information

22. Page: ICT6. Other activities

ICT0.1f

Please identify whether "other activities" comprise a significant component of your business within your reporting boundary

No

Further Information

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