

EPEAT Disclosure Report 2018



11-Dec-19

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The following EPEAT disclosure report was prepared for conformance to the ANSI/NSF 457 Sustainability Leadership Standard.

1. Substances of Very High Concern (Criterion 5.2.1)

First Solar Series 6 PV modules consist of four articles: glass module, junction box, cable, and frame. These articles do not contain substances on the Candidate List of Substances of Very High Concern (SVHC) as defined by EU REACH regulation (revision date: July 16, 2019) above 0.1% by weight per article.

2. Life Cycle Assessment (Criterion 7.1.2 and 7.2.1)

First Solar conducted a life cycle assessment (LCA) of its Series 6 PV modules, which was published in the IEEE Journal of Photovoltaics: <https://ieeexplore.ieee.org/document/8305539> (doi: [10.1109/JPHOTOV.2018.2802786](https://doi.org/10.1109/JPHOTOV.2018.2802786)), in accordance with the requirements of the European Union Product Environmental Footprint Guide. A copy of the conference paper is available on First Solar's website and includes an overview of identified life cycle hotspots: http://www.firstsolar.com/-/media/First-Solar/Sustainability-Documents/Sustainability-Studies/PVSC_44_Addressing-Hotspots-in-the-Product-Environmental-Footprint-of-CdTe-PV.ashx?dl=1.

The LCA quantifies the following mid-point indicators according to ILCD 2011 for First Solar Series 4 modules and First Solar Series 6 modules as follows:

3kWp installation, roof mounted (total all life stages, recycling benefits included)			
Impact category	Unit per kWh DC electricity	First Solar Series 4	First Solar Series 6
Climate change	kg CO2 eq	1.94E-02	1.66E-02
Ozone depletion	kg CFC-11 eq	8.78E-10	9.47E-10
Human toxicity, non-cancer effects	CTUh	4.95E-09	5.11E-09
Human toxicity, cancer effects	CTUh	5.97E-10	5.16E-10
Particulate matter	kg PM2.5 eq	9.95E-06	7.72E-06
Ionizing radiation HH	kBq U235 eq	9.06E-04	7.83E-04
Photochemical ozone formation	kg NMVOC eq	7.43E-05	5.62E-05
Acidification	molc H+ eq	1.46E-04	1.10E-04
Terrestrial eutrophication	molc N eq	2.76E-04	2.07E-04
Freshwater eutrophication	kg P eq	3.60E-06	3.51E-06
Marine eutrophication	kg N eq	2.54E-05	1.91E-05
Freshwater ecotoxicity	CTUe	7.63E-02	7.50E-02
Land use	kg C deficit	1.19E-02	8.61E-03
Water resource depletion	m3 water eq	7.83E-05	6.07E-05
Mineral, fossil & ren resource depletion	kg Sb eq	3.09E-06	2.58E-06
Cumulative energy demand non renewable	MJ	2.90E-01	2.47E-01
Cumulative energy demand renewable	MJ	3.63E+00	3.62E+00
Nuclear waste	m3 HAA eq	2.12E-11	1.84E-11

3. Annual Recycling and Recovery Achievement (Criterion 9.1.2)

		2019
Metric	Unit	Global
Total collected	Metric tons	30,146
Total recycled - metals (not including semiconductor materials)	%	0.2
Total recycled - semiconductor materials	%	0.4
Total recycled - glass	%	90
Total recycled - other materials	%	5
Total disposed - sent to a thermal with energy recovery facility	%	1
Total disposed - sent to a thermal or landfill facility for disposal	%	3
Recycling material recovery rate*	%	>90
Percentage products or components prepared for reuse**	%	0

* Recycling rate is the quotient of Total recycled and Total collected. Because 2019 was a transition year with the ramping of Series 6 technology, the recycling rate is reported as a range rather than a discrete value.

** Refers to products or components that are used again for the same purpose for which they were conceived without any pre-processing, e.g. refurbishment.

4. Material Recovery Targets (Criterion 9.1.3)

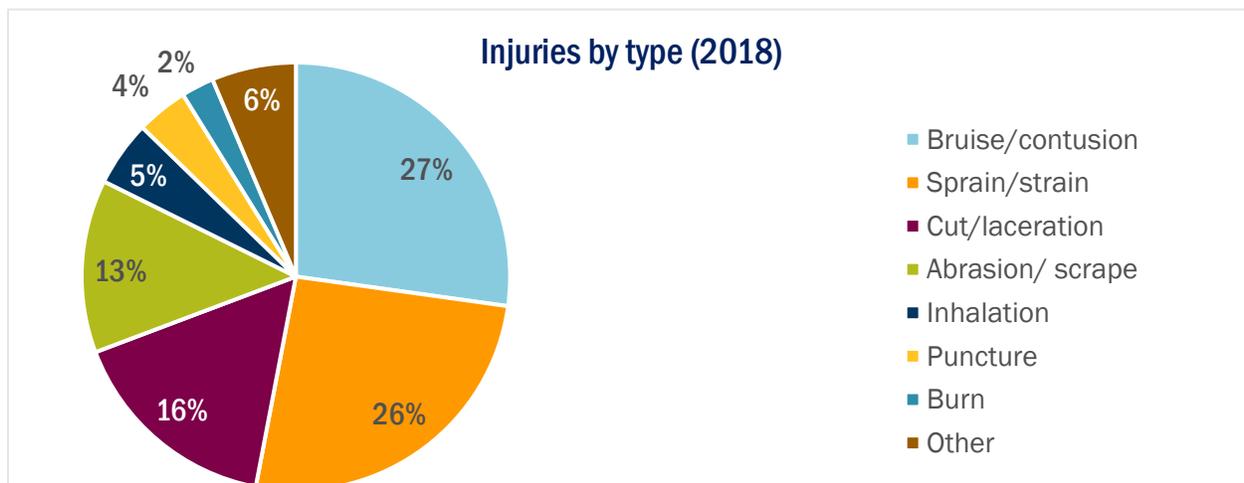
First Solar's high-value PV recycling process recovers more than 90% of a First Solar module for reuse in new First Solar modules, glass products and rubber products. Approximately 90% of the glass and more than 90% of the semiconductor material and more than 90% of other metals are recovered at end-of-life.

First Solar PV Modules Recycling material recovery achievements	
Glass	= 90 mass-%
Metals (not including semiconductor materials)	≥ 90 mass-%
Semiconductor Materials	≥ 90 mass-%

5. Corporate Reporting (Criterion 11.2.1)

Key Performance Indicators	Reference Source of Key Performance Indicator			First Solar	
	GRI Standards ¹⁴	SASB solar energy sustainability accounting standard ³⁰	SEIA Commitment ²⁸	2018	Boundary
PV modules produced in MW AC in reporting period		RR0102-A or RR0102-B	Included	2,706	Manufacturing
Recycled input materials used (%)	301-2	RR0102-10		4.2-8	Semiconductor material
Energy consumption within the organization (MWh)	302-1		Included	677,591	Global (equity share)
Energy consumption in manufacturing (MWh)		RR0102-01.01		675,786	Manufacturing
Energy intensity (kWh/Watt)	302-3			0.25	Manufacturing
Total water withdrawal from all sources (m3)	303-1	RR0102-02.08	Included	3,389,705	Manufacturing, Recycling and R&D
Direct GHG emissions (Scope 1)	305-1		Included	22,200	Global (equity share)
Energy indirect GHG emissions (Scope 2)	305-2		Included	334,088	Global (equity share)
Waste by type and disposal method	306-2		Included	Sustainability metrics	Manufacturing
Type of injury and rates of injury, occupational diseases, lost days, and absenteeism, and number of work related fatalities	403-2		Included	See below	Global (manufacturing and offices)

	2018
Global Recordable Injury Rate (per 200,000 hours)	0.51
Americas	0.68
APAC	0.33
EMEA	0.00
Global Lost Time Injury Rate	0.26
Global Occupational Diseases	n/a
Number of Work-Related Fatalities (Global)	0



Safety data includes all global manufacturing and offices.

6. Corporate Reporting (Criterion 11.2.2)

Key Performance Indicators	Reference Source of Key Performance Indicator				First Solar Boundary
	GRI Standards ¹⁴	SASB solar energy sustainability accounting standard ³⁰	SEIA Commitment ²⁸	2018	
Reduction of energy consumption (MWh)	302-4			132	Manufacturing (electricity)
Water withdrawn in water stressed areas	303-2	RR0102-02.11 & RR0102-02.12 (or WBSCD Global Water Tool ⁴⁰)		0.10%	Manufacturing, Recycling and R&D

Water recycled and reused (m3)	303-3			129,267	Manufacturing, Recycling and R&D
GHG emissions intensity (metric tons of CO2/ MW produced)	305-4			132	Global
Reduction of GHG emissions (MT CO2eq)	305-5			70	Manufacturing (electricity)
Product Recycling Program in Place			Included	Yes	Global

7. Reporting on screening of Tier 1 suppliers (Criterion 11.2.3)

Indicator & GRI Standards Reference		First Solar Disclosure	
Code	Title	2018 Disclosure	Social and Environmental impacts used for screening
414-1	New suppliers that were screened using social criteria	100%	<p>First Solar evaluates new suppliers using a balanced scorecard which focuses on the areas of Quality, Cost, Flexibility, Service, Technology and Sustainability. The EHS section of our supplier audit tool uses the Responsible Business Alliance (formerly known as the Electronics Industry Citizenship Coalition) Code of Conduct as a framework and encompasses topics such as environmental management, health and safety, labor and human rights, and ethics. Specifically:</p> <ul style="list-style-type: none"> • Clean and safe facilities • Minimum wages • Working hours (allowing at least one day off per week) • Health and safety practices • Non discrimination • Freedom of association and collective bargaining • Humane treatment and prevention of harassment or abuse

			<ul style="list-style-type: none"> • Prohibition of child labor • Prohibition of forced or compulsory labor • Collective bargaining <p>Business ethics (including corruption, extortion, embezzlement, conflict of interest, bribery, excessive gift giving, disclosure of information, intellectual property, fair business advertising and competition, privacy and non-retaliation.)</p> <p>Conflict minerals</p>
414-2	Negative impacts on social impacts in supply chain and actions taken	2	Of the 10 suppliers assessed for potential negative social impacts in 2018, 2 suppliers were identified as having potential negative impacts based on their EHS audit score. First Solar is working to drive supplier improvement in Quality and EHS with suppliers.
308-1	New suppliers that were screened using environmental criteria	100%	<p>First Solar evaluates new suppliers using a balanced scorecard which focuses on the areas of Quality, Cost, Flexibility, Service, Technology and Sustainability. The EHS section of our supplier audit tool uses the Responsible Business Alliance (formerly known as the Electronics Industry Citizenship Coalition) Code of Conduct as a framework and encompasses topics such as environmental management, health and safety, labor and human rights, and ethics. Suppliers are screened on the following environmental criteria:</p> <ul style="list-style-type: none"> • Environmental management systems • Pollution Prevention and Resource Reduction • Solid Waste management • Hazardous Substances management • Environmental permits • Air Emissions monitoring and management • Water management • Energy consumption and GHG emissions
308-2	Negative environmental impacts in the supply chain and actions taken	2	Of the 10 suppliers assessed for potential negative environmental impacts in 2018, 2 suppliers were identified as having potential negative impacts based on their EHS audit

			score. First Solar is working to drive supplier improvement in Quality and EHS with suppliers.
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8. Public Disclosure of Use of Conflict Minerals in Products (Criterion 11.4.1)

First Solar is committed to responsible sourcing and operating a supply chain free of conflict minerals. First Solar's [Specialized Disclosure and Conflict Minerals reports](#) are available on our public website (see "Specialized Disclosure" tab in SEC Filings):

<https://investor.firstsolar.com/financials/sec-filings/default.aspx>