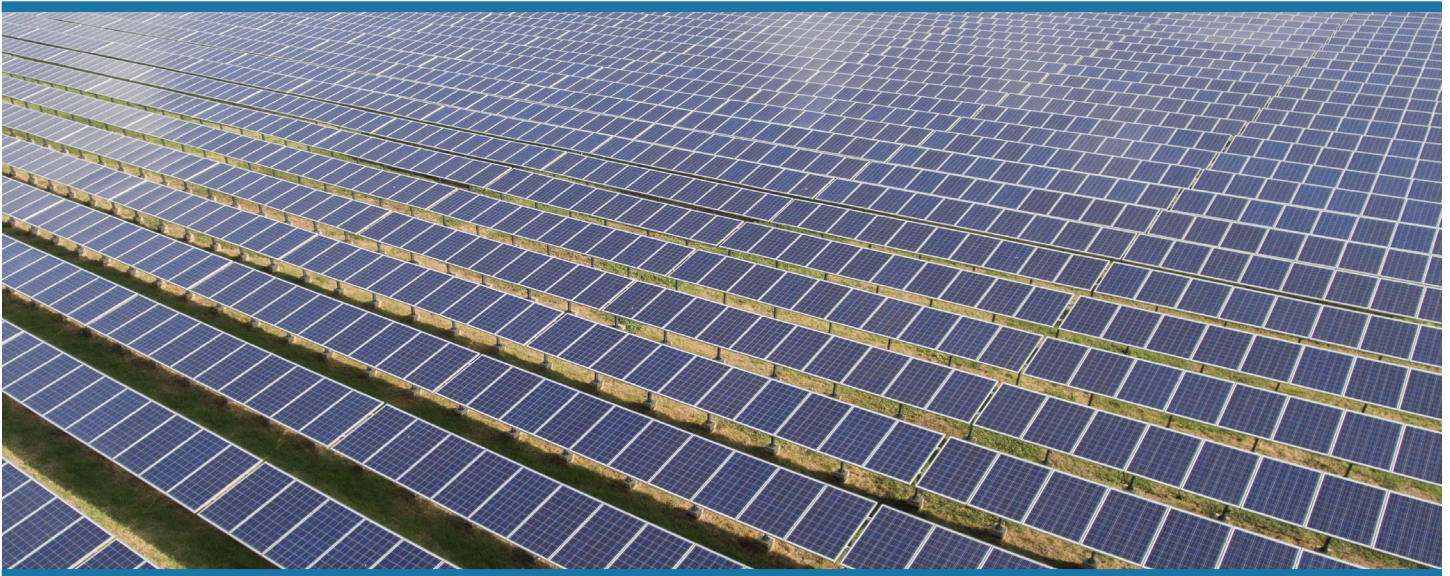


2016-17 SOLAR SCORECARD



www.solarscorecard.com

SVTC's Vision

The Silicon Valley Toxics Coalition (SVTC) believes that we still have time to ensure that the PV sector is safe for the environment, workers, and communities. SVTC envisions a safe and sustainable solar PV industry that:

- 1) Takes responsibility for the environmental and health impacts of its products throughout their life-cycles, including adherence to a mandatory policy for responsible recycling.
- 2) Implements and monitors equitable environmental and labor standards throughout product supply chains.
- 3) Pursues innovative approaches to reducing and work towards eliminating toxic chemicals in PV module manufacturing.

For over three decades, SVTC has been a leader in encouraging electronics manufacturers to take lifecycle responsibility for their products. This includes protecting workers from toxic exposure and preventing hazardous e-waste dumping in developing countries like India, Ghana, and China that lack the proper infrastructure to protect workers or the environment.

“The PV industry’s rapid growth makes it critical that all solar companies maintain the highest sustainability standards.”

The Purpose

The Scorecard is a resource for consumers, institutional purchasers, investors, installers, and anyone who wants to purchase PV modules from responsible product stewards. The Scorecard reveals how companies perform on SVTC’s sustainability and social justice benchmarks to ensure that the PV manufacturers protect workers, communities, and the environment. The PV industry’s continued growth makes it critical to take action now to reduce the use of toxic chemicals, develop responsible recycling systems, and protect workers throughout global PV supply chains. Many PV companies want to produce truly clean and green energy systems and are taking steps to implement more sustainable practices. SVTC is committed to helping these companies achieve that goal. At the same time, we need to create and enforce policies that ensure the safety and improve environmental performance of the entire sector.

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2016–17 SOLAR SCORECARD

SVTC 2016-17 Solar Scorecard Key

Extended Producer Responsibility–15 points

Earning a sunny score means a company participates in or commits (+3) to a fully funded collection and recycling system for End of Life PV modules produced globally (+3 for EPR policy in Europe, +3 for making effort to develop EPR policy in USA). Companies can take more responsibility by clearly describing how all customers can responsibly return PV modules on their websites (+2), making sure all recycling activities take place at a facility with a documented environmental management system and worker safeguards and protections consistent with ISO 14001 (+2), and by offering design for the environment training to product designers (+2).

Emissions Reporting–15 points

A sunny score means that companies report all categories of emissions including chemical and hazardous waste (+5), criteria air pollutants (+3), ozone depleting substances (+2), landfill disposal (+2), and report any sanctions related to non-compliance with environmental regulations (+3).

Worker Rights, Health and Safety–15 points

A sunny score is for companies with a formal commitment that protects worker rights, health, and safety that goes beyond compliance with local laws and regulations (+5 for signing SEIA's commitment, or +5 for a strong company policy). Companies should be en route to paying a living wage for all workers (+2 if all employees are paid more than minimum wage), They should report and show improvements in workday case rates (+2) and recordable incident rates (+2), and adopt OHSAS for 100% of their facilities (+2 for 100% of facilities). Companies should have explicit policies forbidding prison labor (+2).

Supply Chains–15 points

Companies that have a sunny score will have an enforceable commitment from suppliers to protect workers and the environment across all tiers of the supply chain back to polysilicon production or semiconductor preparation (+10 if companies sign the SEIA commitment, have a UNGC quality commitment, or SA8000 certification). Companies could also earn points for screening their supply chain for environmental (+2) and labor & human rights (+2) issues, and ensuring the supply chain factories are OHSAS certified (+1).

Module Toxicity & Materials–10 points

A sunny score is for those companies that offer PV modules that do not contain toxic heavy metals or have them present in levels lower than the high bar for toxics regulation. Some manufacturers have been able to significantly reduce the toxicity of their modules to very low levels (+5). Some PV modules intrinsically contain toxic materials, so EPR will be very important to managing EOL risks. High recycled-content can improve the environmental performance of PV modules (+3), and companies are beginning to adopt halogen-free cables for PV modules (+2).

Energy and Greenhouse Gas (GHG) Emissions–10 points

A sunny score is for companies that report energy use (+3), GHGs (+3), and perfluorocarbons (+2) and report GHGs and/or energy use to a third party (+2).

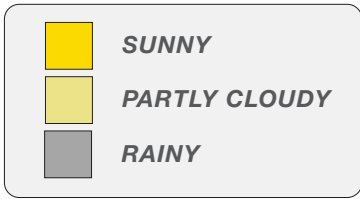
Water–10 points

A sunny score in this category means the company recognizes the importance of reducing impacts to water. They report volume of water use (+5) and wastewater generated (+3) according to several water quality indicators (+2).

Conflict Minerals–10 points

A sunny score means that the company has undergone due diligence to check to see that tin used in PV manufacturing does not contain conflict minerals from the Democratic Republic of the Congo (DRC), Angola, Burundi, Central African Republic, Republic of the Congo, Rwanda, South Sudan, Tanzania, Uganda, Malawi and Zambia as per the guidance outlined by the OECD (+10).

2016-17 SOLAR SCORECARD



Extended Producer Responsibility
 Emissions Reporting
 Worker Rights, Health and Safety
 Supply Chains
 Module Toxicity & Materials
 Energy & GHGs
 Conflict Minerals
 Water



Company		Maximum Score	15	15	15	15	10	10	10	10	100	
2016-17 Leaders	SunPower	15	15	15	15	10	8	10	10	98		
	SolarWorld	14	15	15	15	8	10	10	8	95		
	Trina	13	14	15	15	8	10	10	10	95		
	Aleo	12	14	15	15	8	8	10	10	92		
	Jinko	13	11	15	15	10	8	10	8	90		
	First Solar	15	11	15	11	2	10	10	8	82		
	Hanwha Q CELLS	8	11	15	15	0	8	10	10	77		
	Mitsubishi	3	11	9	11	8	10	10	10	72		
Above Average	Kyocera	3	5	13	11	2	8	10	3	55		
	Motech	6	0	7	11	0	8	10	10	52		
	Panasonic	0	9	7	10	0	8	10	8	52		
	REC	13	2	9	10	2	0	10	5	51		
	WINAICO	5	0	9	10	0	6	10	10	50		
	Astronergy	10	0	9	10	2	8	10	0	49		
	Avancis	13	0	9	10	2	0	10	0	44		
	AUO	10	0	2	10	0	8	10	0	40		
	LG	3	0	2	11	0	6	10	8	40		
	JA Solar	11	1	9	6	0	0	10	0	37		
	Yingli	10	0	9	0	0	8	10	0	37		
Below Average	Calyxo	13	0	2	0	0	0	10	0	25		
	BYD	5	0	4	0	0	0	10	0	19		
	Talesun	7	0	2	0	0	0	10	0	19		
	China Sunergy-Csun	3	0	4	0	0	0	10	0	17		
	Longi Solar	0	0	2	1	0	3	10	0	16		
	Gintech	3	0	2	0	0	0	10	0	15		
	Hanergy	3	0	2	0	0	0	10	0	15		
	Hyundai	3	0	2	0	0	0	10	0	15		
	Suntech	3	0	2	0	0	0	10	0	15		
	Renesola	0	0	2	0	2	0	10	0	14		
	Silfab	2	0	2	0	0	0	10	0	14		
	Boviet Solar	0	0	2	0	0	0	10	0	12		
	ET Solar	0	0	2	0	0	0	10	0	12		
	Hareon Solar	0	0	2	0	0	0	10	0	12		
	Risen	0	0	2	0	0	0	10	0	12		
	Solar Frontier	0	0	2	0	0	0	10	0	12		

the 2016–17 SOLAR SCORECARD

Solar Scorecard Analysis

The Solar Scorecard is based on SVTC's annual survey of photovoltaic (PV) module manufacturers, as well as on prior survey responses, interviews, news stories, and publicly available data. The goal of the Scorecard is to enhance transparency around environmental health, safety, and sustainability issues for communities, workers, and the environment. This year we reworked the Solar Scorecard rubric to better reflect a subset of criteria selected by a stakeholder-led sustainability leadership standard for photovoltaic modules that will be completed later in 2017. Next year the scorecard will more closely mirror the metrics in that standard.

SVTC began scoring photovoltaic manufacturers on sustainability, environmental health and safety issues in 2009 when only 6.4 GW of PV modules were produced. In 2017, the industry is much larger, producing over 100 GW of PV modules, more than a dozen times more than in 2009¹. Four of the top five PV manufacturers responded to the 2016–17 survey, with six manufacturers responding overall. Much of the information scored could be found on company websites, annual reports, or sustainability reports.

The results compiled from SVTC's 2016-17 survey and research include the following:

- PV manufacturers continue to set aside funds for recycling the European Union, but are not setting aside money for EPR in the USA. Two companies (SunPower and First Solar) offer recycling solutions to all of their global customers.
- Nine PV manufacturers do extensive **chemical emissions disclosure and reporting** on their website, up from four in 2015.
- Thirteen companies (the same as in 2014, and 3 less than in 2015) report one or more categories of environmental emissions (**hazardous waste, heavy metals, air pollution, ozone depleting substances, landfill disposal**).
- Two companies are offering PV modules with cables that are **halogen-free**.
- Zero companies can provide documentation to **verify** that their **supply chains do not contain conflict minerals** based on the due diligence guidelines set by the OECD. All companies selling to the USA are engaged in or have started the process of due diligence to determine if conflict minerals are present in their supply chains.

¹ <https://www.pv-tech.org/editors-blog/top-10-solar-module-suppliers-in-2016>

Recommended Actions

Commercial, government, or residential purchasers of PV modules are making a long-term financial and environmental commitment, and PV module manufacturers should make the same long-term commitment to the environment and worker safety.

Use this scorecard to help choose a manufacturer that is committed to high environmental and worker safety standards for PV module manufacturing.

Sponsors

