The Solar Scorecard:

Measuring and Managing Vulnerabilities in the Solar Energy Industry

cpa
Clean Production Action

CORE

The solar industry's environmental programs and practices have not kept pace with exponential growth in the solar market, leading to increased health hazards for workers and communities, supply chain vulnerabilities, and significant financial liabilities for companies.

The Solar Scorecard promotes accelerated growth in the solar industry by rewarding the use of innovative technologies, and benchmarking risk-reduction practices such as chemical management systems for PFAS, lead, cadmium and other materials.

The solar industry must adopt the EPEAT eco-label as a means to institutionalize basic sustainability performance standards.

Companies that have shown leadership to eliminate and reduce their use of hazardous substances can mitigate their risk and gain a competitive advantage.

Summary

Solar Scorecard Development and Initial Findings: 2010

In 2010, environmental standards did not exist for the solar industry. Many solar PV companies, customers, and investors mistakenly assumed solar energy was a "green business" because the modules do not produce pollution or greenhouse gases while in use. The (former) Silicon Valley Toxics Coalition (SVTC) recognized the inherent dangers of using toxic chemicals, and collaborated with groups of socially responsibly investors (SRI) to launch the Solar Scorecard, which encourages solar manufacturers to avoid the environmental pitfalls experienced in the electronics industry and adopt sustainable practices.

The first Solar Scorecard ranked solar companies' environmental programs and practices based on SVTC sustainability and social justice benchmarks. In 2010 only 14 of 25 solar companies responded to the SVTC Solar Scorecard survey questionnaire or posted environmental information on their websites. Although companies such as First Solar and Solarworld were already taking steps toward sustainability, the majority of companies had little incentive to respond.

Emergence of Additional Standards

In 2015 SVTC, with the leadership of Green Electronics Council (GEC), the Solar Scorecard transitioned to an international sustainability standard. The final NSF/ANSI International Sustainability Leadership Standard for Photovoltaics[1] was released in 2017 and laid the foundation for the development of solar industry eco-labels including EPEAT[2], a ranking system used internationally by institutional purchasers, as well as in the public and private sectors, to evaluate, compare and select electronic products based on their environmental attributes. EPEAT is the only electronics ecolabel recognized by the US EPA for use by federal government agency purchasers of photovoltaics modules and inverters.[3]

Although more than 3,480[4] electronic products are registered with EPEAT, in 2024 only two solar companies, First Solar[5] and Hanwha Qcells[6], have certified their products to the EPEAT registry.

Addressing Business Vulnerabilities and a Lack of Progress

Despite more than 15 years of "exponential" growth, the solar industry has not kept pace with the computer and electronics industry and other industrial sectors in adopting sustainable management systems and institutionalizing environmental performance standards. Chemicals used in the manufacturing process can harm workers and communities at the frontline of manufacturing, and chemicals such as PFAS (as well as other substances such as lead and cadmium) are hazardous waste at the end of the lifecycle.

Although three solar companies (Mitsubishi, Avancis, REC) have successfully transitioned to lead-free solder, the industry at large has not discovered methods for publicly sharing chemicals information and data—or a plan that includes metrics, methods, targets, and proof that they are reducing and eliminating their use of hazardous chemicals.

Fortunately, the solar industry can make up for lost time and speed up progress toward sustainability by making "top down" commitments to sustainable management systems, conforming to the solar PV international performance standards released in 2017, and taking advantage of environmental management systems and technologies developed by collaboratively between NGOs, academia and businesses in other sectors.

Accelerating Progress with Solar Scorecard 2.0 (2024-2025)

Solar installations in the United States are expected to quadruple by 2030[7] thanks to the extension of key industry subsidies including the Inflation Reduction Act and the Bilateral Infrastructure Law. Solar companies need ongoing commitments to scale environmental programs along with the projected market growth.

A top-down, values-based approach from executive management is essential to addressing complex, uncertain, and rapidly changing markets with dynamic technological and environmental conditions.

In 2023, the Solar Scorecard team joined forces with the Collaboratory for a Regenerative Economy (CoRE)[8] to address two of the most complex and challenging sustainability issues: hazardous chemical use and environmental health and justice.

Now, the Solar Scorecard Project, in collaboration with CORE, has identified several baseline programs that will help the solar industry catch up to 21st-century environmental practices and prepare for even more demanding EU environmental mandates. These include new European Union Green Deal chemicals policies requiring businesses to reduce or eliminate hazardous chemicals, as well as digital product passport laws that will require producers to attach identifiers (QR codes, RFID) to products that provide detailed information about materials and chemicals used, manufacturing processes, origin of materials, and recyclability.

Solar Scorecard 2.0 scoring will be based on companies adopting the following programs as part of their business practices, helping them reduce their risk.

- **EPEAT Certification.** Solar companies should certify at least one of their products to EPEAT (NSF 457-2019) bronze level by 2025. All products introduced to the market after 2025 should be EPEAT certified.

- **Chemical Footprint Project (CFP).** By 2030, companies should have a chemical management system that utilizes CFP framework and metrics for measuring progress, and should publicly share information on their websites regarding their progress toward the use of safer substitutions, timelines for reducing hazardous chemicals, and verification processes.

- **Reduce worker exposure to hazardous chemicals.** Companies should commit to reducing worker exposure to toxic chemicals in the supply chain, participate in the Clean Electronics Production Network's (CEPN) Toward Zero Exposure program, and report progress toward reducing chemical exposures to workers throughout the supply chain.

- **United Nations Sustainable Development Goals (SDG):** The Solar Scorecard will reward companies for providing criteria, goals, metrics and verification processes relevant to each SDG mentioned on their website.

Solar Scorecard 2024-2025 Preliminary Findings

In 2024, we surveyed companies that represent 85% of the market share based on Department of Energy (DOE) and publicly available research. The solar industry is highly consolidated, and fewer than 20 solar companies have been responsible for 85 to 90 percent of the shipments, according to the DOE.[9]

Unfortunately, most companies do not meet the Solar Scorecard standards, potentially creating risk for these companies, their customers, their workers, and communities.

- None of the companies had committed to chemical reduction goals

- None of the companies demonstrated the capacity to trace hazardous chemicals exposures to workers beyond the first or second tier of their supply chain

- In 14 out of 22 categories, no companies met the Solar Scorecard standard

- Only 2 of the 22 categories had more than half of the companies meeting the standard

Companies are evaluated through a variety of criteria, including prioritizing environmental health, justice, and sustainable development; corporate culture and business models that institutionalize and invest in sustainable programs and systems; utilization of uniform reporting standards; and measurement of progress. The survey utilized the Chemical Use and Environmental Justice questionnaire and Solar Scorecard website search protocols.

The research results are aggregated in such a way to establish a 2024 solar industry chemical use and reduction baseline and to identify individual companies that demonstrate leadership. In January 2025 we will begin officially evaluating and ranking companies based on the survey questions.

Most Companies Fail to Meet Solar Scorecard Standards
Zero Compliance for More than Half of Criteria

Companies in Compliance

■ Compliant   ■ Non-Compliant
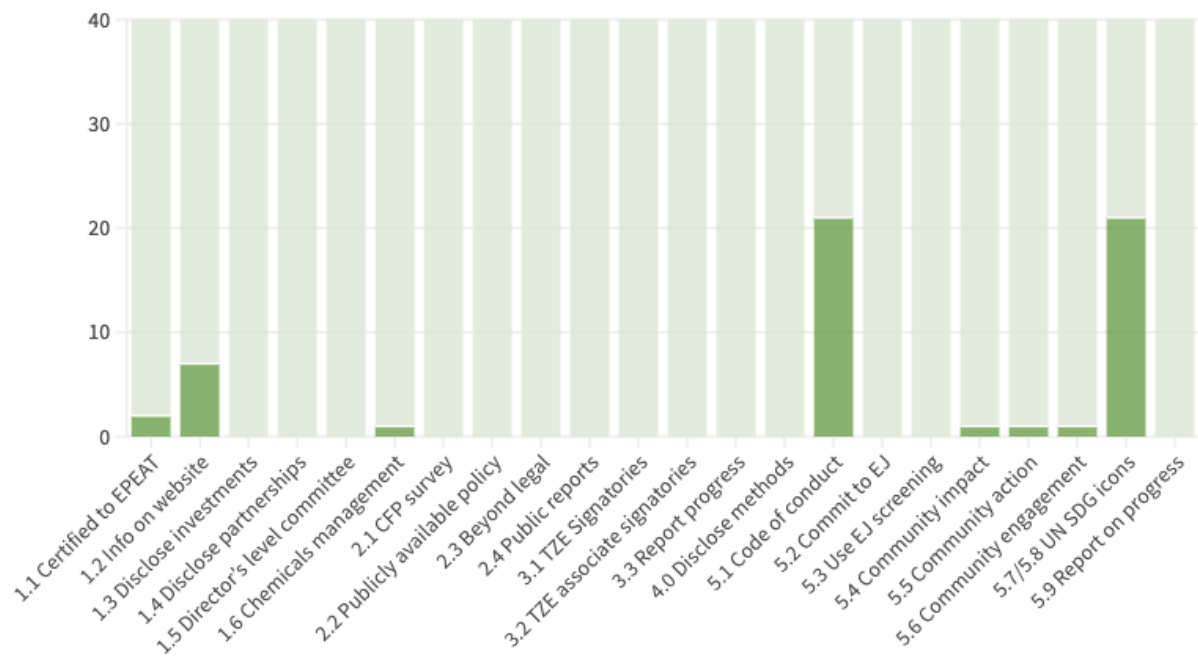
Positive Highlights from the Report

Please visit SolarScorecard.org for the full report.

Avancis

"modules are free of toxic components, such as lead and cadmium[10]"

Hanwha Q-cells

Registered EPEAT products. Includes a "Management of Harmful chemicals" as part of their materiality assessment[12]

AUO

Developed a water-soluble stripper with no reproductive toxicity[11]

First Solar

Registered EPEAT (Electronic Product Environmental Assessment Tool) products. Reducing the chemicals that it uses in its recycling process.

Positive Highlights from the Report

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Renesola

States the desire to avoid and reduce risks and impacts at the social level by maintaining good relationships and communications with the community.[15] Provides case studies on poverty alleviation program in China and a Community Solar Program in Minnesota.

Mitsubishi

Solder-free cells[13]

Sifab

Backsheets are toxin free, fully recyclable, and made from traceable materials with a low carbon footprint.[16]

Suntech

Replaced chrome acid texturing process with nitric acid texturing process.[17]

REC

Eliminated lead from all panel components.[14]

1   http://www.nsf.org/regulatory/regulator-nsf-standards

2   https://www.epeat.net/

3   https://www.epa.gov/greenerproducts/recommendations-specifications-standards-and-ecolabels-federal-purchasing

4   https://www.wifcon.com/discussion/index.php?/blogs/entry/5202-the-electronic-product-environmental-assessment-tool-epeat-lauds-nitaac-for-the-third-year-in-a-row/

5   https://epeat.net/product-details/245713cf9d5d4725ae2db312f541a4a5?backUrl=%252Fpvmi-search-result%252Fpage-1%252Fsize-25

6   https://www.reuters.com/sustainability/first-solar-qcells-panels-score-green-label-preferred-by-us-government-2024-06-04/

7   https://www.reuters.com/article/business/u-s-solar-industry-predicts-installations-will-quadruple-by-2030-idUSNIKBN2B80AX/

8   https://www.corebuffalo.org/

9   https://www.nrel.gov/docs/fy23osti/84515.pdf

10   https://www.avancis.de/en/enterprise/responsibility

11   https://csr.auo.com/en/environment/cycle/chemicals

12   https://www.hanwhasolutions.com/static/ko/data/Hanwha_Solutions_Sustainability_Report_eng.pdf

13   https://www.solarelectricsupply.com/mitsubishi-120-watt-solar-panel-pv-mf120ec4

14   https://www.recgroup.com/en/news/another-green-check-lead-free1-rec-alpha-pure-certified-low-carbon-footprint-solar-panel.

15   https://emeren.com/wp-content/uploads/2022/11/RSP-Green-Energy-Solutions-More-info.pdf

16   https://endurans-solar.com/about-us/sustainability/

17   https://www.suntech-power.com/wp-content/uploads/download/Publicity-Material/Suntech-Sustainability-Report-2021.pdf

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Let's make a difference, together

For more information about the Solar Scorecard:

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SolarScorecard.org

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