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Solar Energy Production Much Cleaner than Fossil Fuel, But Industry Can Still Improve, New Report Says

Survey of Over 100 Solar Manufacturers Reveal Best Industry Practices

A new report released today highlights the best practices of photovoltaic (PV) manufacturers to protect workers and the environment during the production of solar panels. It also analyzes investor considerations regarding environmental, social, and governance practices for responsible management of PV companies.

The report, *Clean & Green: Best Practices in Photovoltaics*, was released by [As You Sow](#), a nonprofit organization that promotes corporate responsibility through shareholder advocacy and innovative legal strategies. Along with highlighting how solar manufacturing companies are reducing environmental, public health, and safety risks, the report offers steps companies can take to ensure clean production and fiduciary responsibility.

Historically, the solar industry has faced hurdles competing against fossil fuels on cost, and the industry faces additional challenges because large-scale manufacturing of solar panels currently requires the use of several compounds that are toxic to humans or the environment.

“Even though there are toxic compounds used in the manufacturing of many solar panels, the generation of electricity from solar energy is much safer to both the environment and workers than production of electricity from coal, natural gas, or nuclear,” said Amy Galland, PhD, Research Director at As You Sow and author of the report. “For example, once a solar panel is installed, it generates electricity with no emissions of any kind for decades, whereas coal-fired power plants in the U.S. emitted nearly two billion tons of carbon dioxide and millions of tons of toxic compounds in 2010 alone.”

The report was compiled from a survey of over 100 solar manufacturers around the world, and best practices were determined via consultation with scientists, engineers, academics, government labs, and industry consultants.

“We have been working with solar companies to study and minimize the environmental health and safety risks in the production of solar panels and the industry has embraced the opportunities. This report clearly lays out the main challenges and the steps industry leaders have taken to reduce the environmental impacts of their products – steps that the rest of the industry should follow,” said Vasilis Fthenakis, PhD, director of the National PV Environmental Health and Safety Research Center, Brookhaven National Laboratory and director of the Center for Life Cycle Analysis, Columbia University.

Responses indicated that many PV manufacturers beat standards set for emissions, are reducing water use and reusing water on their own initiatives, and are participating in voluntary international programs related to

worker safety. Several companies also are using safer materials, relying on renewable energy to power energy-intensive processes, reducing waste by developing recycling programs that recover materials for reuse, and improving relations with workers and communities throughout their supply chains.

Best Industry Practices Include:

- **Implementing worker safety and public health protocols.** First Solar has a laboratory at each manufacturing facility to monitor treated water and ensure their outflows are safe.
- **Reducing water use.** Between 2006 and 2010, Suntech reduced its water use by 51% per MW by recycling discharged water and supplying it to its HVAC systems. SunPower, Suntech, and Trina Solar all clean and reuse water.
- **Implementing producer responsibility programs.** First Solar has a prefunded collection and recycling program that enables up to 95% of the semiconductor material to be reused in new modules. Abound Solar has a cradle-to-cradle program to reclaim hazardous compounds.
- **Considering environmental and social criteria when selecting suppliers.** Companies require their suppliers to implement environmental management systems and meet their standards for treatment of workers.
- **Ensuring a system for audits that contain transparent criteria, corrective actions, and regular auditing cycles.** REC, SunPower, Suntech, and United Solar Ovonic incorporate each of these into their auditing programs.
- **Publishing corporate social responsibility (CSR) reports.** SunPower, Suntech, and Trina Solar already publish CSR reports and SolarWorld and Q-Cells publish integrated reports.
- **Using recycled and recyclable materials.** One company's panels are made from 85% recycled material and are themselves 100% recyclable and non-toxic, and Suntech uses easily recyclable materials.
- **Linking executive compensation to environmental or safety metrics.** Compensation for executives at SunPower is tied to environmental health and safety performance.

If the right policy measures are in place, solar energy can supply more than two-thirds of the total electricity needs of the U.S. by 2050. Right now, however, funding for fossil energy research is five times that of the photovoltaic research budget and fossil fuels get significant and on-going support in the form of subsidies and tax incentives not available to technology for renewable generation sources.

"The sun is the world's most abundant and cleanest source of energy, yet our electricity and transportation systems are almost completely reliant on fossil fuels," said Andrew Behar, CEO of As You Sow. "In order for solar to be competitive with other forms of energy, there needs to be a significant change in the allocation of federal funding for research and incentive programs."

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As You Sow is a nonprofit organization that promotes environmental and social corporate responsibility through shareholder advocacy, coalition building, and innovative legal strategies. For more information visit www.asyousow.org.