

Are Solar Manufacturers Getting Their Environmental House in Order?

Joel Makower | Aug. 26, 2013

For the past four years, the Silicon Valley Toxics Coalition has been rating the solar energy industry — the manufacturers of solar panels — on their environmental performance and transparency. The latest results, just out, don't reveal a particularly pretty picture. But they don't tell the whole story.

The SVTC Solar Scorecard ranks manufacturers of solar photovoltaic modules according to a range of environmental, sustainability and social justice factors. In its fourth year of requesting environmental information from solar companies, only 10 out of 40 companies — about 35 percent of the PV module market share — bothered to respond to its survey. More than a fourth of the top 40 solar companies fail to make “almost any” environmental information publically available on their websites, says SVTC.



Image credit: Yingli Solar

The study found that:

Only three of the top 40 PV manufacturers publicly report extensive chemical emissions disclosure and reporting.

Twelve of the top 40 manufacturers post annual hazardous chemical reduction targets on their websites or in sustainability reports.

The number of PV companies with fully funded extended producer responsibility (EPR) schemes dropped from one to zero. First Solar, the only major company with a fully-funded EPR program for the last three years, cut its program in most U.S.-based sales.

“There are a couple or key environmental leaders in the solar industry, but the remainder of the field is kind of riding on their coattails,” Sheila Davis, SVTC’s executive director, told me.

But is the industry really that bad? On the one hand, there’s no question that manufacturing polysilicon solar cells — the kind used in most panels — is a dirty business. On the other, the industry is quietly getting its act together — before regulators and activists force them to do so.

The PV cell manufacturing process includes a number of hazardous materials, most of which are used to clean and purify the semiconductor surface, notes the Union of Concerned Scientists. “These chemicals, similar to those used in the general semiconductor industry, include hydrochloric acid, sulfuric acid, nitric acid, hydrogen fluoride, 1,1,1-trichloroethane, and acetone.” The group notes that “Workers also face risks associated with inhaling silicon dust. Thus, PV manufacturers must follow U.S. laws to ensure that workers are not harmed by exposure to these chemicals and that manufacturing waste products are disposed of properly.”

The United States and European Union have strict restrictions on use of such chemicals. But some solar panels use ma-

materials produced in countries with lax environmental laws, notably China, and that can lead to the same kinds of environmental and social problems that have bedeviled the consumer electronics industry.

There's more. In many cases, a toxic sludge is created when metals and other toxins are removed from water used in the manufacturing process. If a company doesn't have its own treatment equipment, it will need to send contaminated water to an approved hazardous waste disposal site. Again, worker health and safety is an issue.

And then there's e-waste — the detritus created when solar panels outlive their useful lives. While the good news is that most panels are rated to last 20 years or more, activists fear that without good EPR programs in place, we'll be facing an avalanche of used panels, with all their toxic ingredients, in a little more than a decade. With solar sales continuing their steep increase, that could lead to huge disposal problems by mid-century.

But there are signs the industry is turning itself around. Last year, the Solar Energy Industries Association, the sector's largest trade group, released a Commitment to Environmental & Social Responsibility, a voluntary code of conducts for its members. The code, based on the Electronic Industry Citizenship Coalition's Code of Conduct, includes provisions regarding the environment, labor, ethics, health and safety, human rights and environmental management systems. SEIA worked with the nonprofits BSR and **As You Sow** in developing the code. Among other things, signatories agree to transparency, reporting and continuous improvement.

So far, seven companies have signed on: Dow Solar, SunPower, Suntech, Trina, Yingli Solar, SunEdison and PV Recycling. According to John Smirnow, SEIA's Vice President of Trade & Competitiveness, those signatories represent more than half of the solar panels sold in the United States, though 86 percent of global solar module production occurred in Asia last year, according to GTM Research.

Smirnow notes that getting solar companies to pay attention to environmental issues can be challenging these days, given the business challenges faced by the industry. Module prices have dropped 80 percent in the last six years, putting operating margins for most manufacturers in the red. Earlier this year, Suntech, once the world's largest solar panel manufacturer, filed for bankruptcy, though indications are that it is down but not out. There's an excess of module manufacturing capacity today, and experts predict more consolidation is on the way. (SVTC estimated that the 14 percent drop in responses to its survey was due to the bankruptcy of former participants "and the declining market shares of major PV producers.")

In this context, the solar industry "is actually doing pretty well on sustainability," Smirnow told me, quickly adding, "We need to do better." Signatories to the Solar Commitment currently are putting together responses to the first set of key performance indicators, which they will report publically later this year or early next, he says.

There are other SEIA initiatives taking shape. One focuses on recycling. "We're looking at what the European Union has done, what some of the older more established sectors have done on recycling and developing what we think should be a roadmap for the solar industry within the U.S.," says Smirnow. Moreover, he says, "Next year, we'll see the key performance indicator list grow" as the association adds more criteria to the code of conduct. In addition, SEIA is undergoing a recruitment drive for the code of conduct. "I anticipate in the next few weeks you'll see at least one fairly significant solar company sign on."

SVTC's Davis agrees that the industry's intentions are good. "The SEIA Solar Commitment addresses SVTC's worker health and safety and environmental concerns," she says. "We would like to see more companies sign on." And for all solar companies to be transparent: "We're simply asking companies to post the information on the website," she explains. SVTC plans to update its scores in December, "to see who's actually posting information." As it stands, only two of the manufacturers SVTC tracks achieved the group's highest markets on posting emissions data — REC and Solar-

World.

Still, as activist-industry environmental spats go, this doesn't rank anywhere near the rancor and resentment that defines — say, the issue of genetically modified organisms or nuclear power. In this case, both sides are supportive of the other's efforts, and they don't seem that far apart.

But that seeming alignment could become eclipsed by other issues. The aforementioned EPR/takeback issue is one. Another is prison labor. The New York Times reported last year that a company called Federal Prison Industries, also known as Unicor, hired by prisons to provide job-training skills to inmates, already has set up solar factories in New York and Oregon, paying prisoners between 23 cents and \$1.15 an hour. While the company is not allowed to sell finished products to the private sector, the law generally requires federal agencies to buy its products, even if they are not the cheapest.

It's unclear whether this practice takes place outside the United States. Regardless, SVTC is looking for companies to commit to not using prison labor. Fully half of the 40 companies in the SVTC scorecard scored poorly on that metric, including Hyundai, Mitsubishi, Panasonic, Samsung, Sharp and Westinghouse. (The SEIA's code is ambiguous on the topic, stating that "forced, bonded or indentured labor or involuntary prison labor shall not to be used," but saying nothing about prisoners who volunteer for solar manufacturing prison jobs.)

"That wasn't really on the radar for a lot of companies," said Davis. "We really wanted to flag that as something that we don't want them to do."