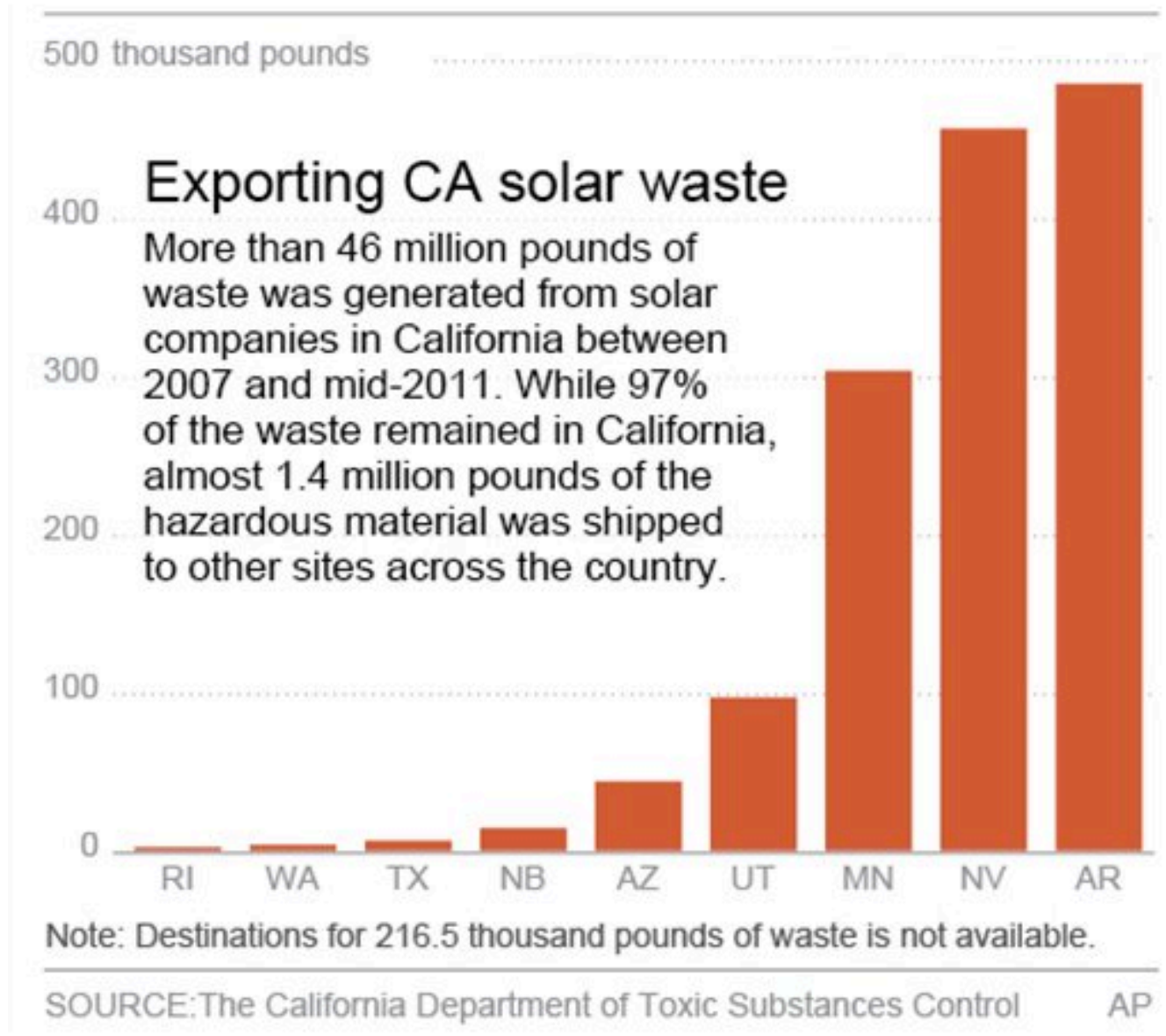


## Solar Industry Grapples with Hazardous Wastes

JASON DEAREN, Associated Press



SAN FRANCISCO (AP) — Homeowners on the hunt for sparkling solar panels are lured by ads filled with images of pristine landscapes and bright sunshine, and words about the technology's benefits for the environment — and the wallet.

What customers may not know is that there's a dirtier side.

While solar is a far less polluting energy source than coal or natural gas, many panel makers are nevertheless grappling with a hazardous waste problem. Fueled partly by billions in government incentives, the industry is creating millions of solar panels each year and, in the process, millions of pounds of polluted sludge and contaminated water.

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To dispose of the material, the companies must transport it by truck or rail far from their own plants to waste facilities hundreds and, in some cases, thousands of miles away.

The fossil fuels used to transport that waste, experts say, is not typically considered in calculating solar's carbon footprint, giving scientists and consumers who use the measurement to gauge a product's impact on global warming the impression that solar is cleaner than it is.

After installing a solar panel, "it would take one to three months of generating electricity to pay off the energy invested in driving those hazardous waste emissions out of state," said Dustin Mulvaney, a San Jose State University environmental studies professor who conducts carbon footprint analyses of solar, biofuel and natural gas production.

The waste from manufacturing has raised concerns within the industry, which fears that the problem, if left unchecked, could undermine solar's green image at a time when companies are facing stiff competition from each other and from low-cost panel manufacturers from China and elsewhere.

"We want to take the lessons learned from electronics and semiconductor industries (about pollution) and get ahead of some of these problems," said John Smirnow, vice president for trade and competitiveness at the nearly 500-member Solar Energy Industries Association.

The increase in solar hazardous waste is directly related to the industry's fast growth over the past five years — even with solar business moving to China rapidly, the U.S. was a net exporter of solar products by \$2 billion in 2010, the last year of data available. The nation was even a net exporter to China.

New companies often send hazardous waste out of their plants because they have not yet invested in on-site treatment equipment, which allows them to recycle some waste.

Nowhere is the waste issue more evident than in California, where landmark regulations approved in the 1970s require industrial plants like solar panel makers to report the amount of hazardous materials they produce, and where they send it. California leads the consumer solar market in the U.S. — which doubled overall both in 2010 and 2011.

The Associated Press compiled a list of 41 solar makers in the state, which included the top companies based on market data, and startups. In response to an AP records request, the California Department of Toxic Substances Control provided data that showed 17 of them reported waste, while the remaining did not.

The same level of federal data does not exist.

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The state records show the 17 companies, which had 44 manufacturing facilities in California, produced 46.5 million pounds of sludge and contaminated water from 2007 through the first half of 2011. Roughly 97 percent of it was taken to hazardous waste facilities throughout the state, but more than 1.4 million pounds were transported to nine other states: Arkansas, Minnesota, Nebraska, Rhode Island, Nevada, Washington, Utah, New Mexico and Arizona.

Several solar energy experts said they have not calculated the industry's total waste and were surprised at what the records showed.

Solyndra, the now-defunct solar company that received \$535 million in guaranteed federal loans, reported producing about 12.5 million pounds of hazardous waste, much of it carcinogenic cadmium-contaminated water, which was sent to waste facilities from 2007 through mid-2011.

Before the company went bankrupt, leading to increased scrutiny of the solar industry and political fallout for President Barack Obama's administration, Solyndra said it created 100 megawatts-worth of solar panels, enough to power 100,000 homes.

The records also show several other Silicon Valley solar facilities created millions of pounds of toxic waste without selling a single solar panel, while they were developing their technology or fine-tuning their production.

While much of the waste produced is considered toxic, there was no evidence it has

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harmed human health.

The vast majority of solar companies that generated hazardous waste in California have not been cited for waste-related pollution violations, although three had minor violations on file.

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, then it will send contaminated water to be stored at an approved dump.

According to scientists who conduct so-called "life cycle analysis" for solar, the transport of waste is not currently being factored into the carbon footprint score, which measures the amount of greenhouse gases produced when making a product.

Life cycle analysts add up all the global warming pollution that goes into making a certain product — from the mining needed for components to the exhaust from diesel trucks used to transport waste and materials. Not factoring the hazardous waste transport into solar's carbon footprint is an obvious oversight, analysts said.

"The greenhouse gas emissions associated with transporting this waste is not insignificant," Mulvaney said.

Mulvaney noted that shipping, for example, 6.2 million pounds of waste by heavy-duty tractor-trailer from Fremont, Calif., in the San Francisco Bay area, to a site 1,800 miles away could add 5 percent to a particular product's carbon footprint.

Such scores are important because they provide transparency to government and consumers into just how environmentally sustainable specific products are and lay out a choice between one company's technology and another's.

The roughly 20-year life of a solar panel still makes it some of the cleanest energy technology currently available. Producing solar is still significantly cleaner than fossil fuels. Energy derived from natural gas and coal-fired power plants, for example, creates more than 10 times more hazardous waste than the same energy created by a solar panel, according to Mulvaney.

The U.S. solar industry said it is reporting its waste, and sending it to approved storage facilities — thus keeping it out of the nation's air and water. A coal-fired power plant, in contrast, sends mercury, cadmium and other toxins directly into the air, which pollutes water and land around the facility.

"Having this stuff go to ... hazardous waste sites, that's what you want to have happen," said Adam Browning, executive director of the Vote Solar Initiative, a solar advocacy group.

Environmental advocates say the solar industry needs greater transparency, which is getting more complicated as manufacturing moves from the U.S. and Europe to

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less regulated places such as China and Malaysia.

The Silicon Valley Toxics Coalition, a watchdog group created in 1982 in response to severe environmental problems associated with the valley's electronics industry, is now trying to keep the solar industry from making similar mistakes through a voluntary waste reporting "scorecard." So far, only 14 of 114 companies contacted have replied. Those 14 were larger firms that comprised 51-percent of the solar market share.

"We find the overall industry response rate to our request for environmental information to be pretty dismal for an industry that is considered 'green,'" the group's executive director, Sheila Davis, said in an email.

While there are no specific industry standards, Smirnow, head of the solar industry association, is spearheading a voluntary program of environmental responsibility. So far, only seven of the group's nearly 81 manufacturers have signed the pledge.

"We want (our program) to be more demanding, but this is a young industry and right now manufacturing companies are focused on survival," he said.

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