

Leaden Rays?

Solar power push in India and China could worsen lead pollution



The batteries used to store electricity from solar panels could become a major source of lead pollution in China and India, a new study warns. It concludes both nations will need to improve mining, manufacturing and recycling practices if they want to prevent planned solar power expansions from causing massive releases of the toxic element.

Renewable energy advocates have hailed China's plans to produce 1.6 gigawatts of solar power by 2020, and India's effort to add 12 gigawatts by 2022, including the distribution of 20 million small battery-powered "solar lanterns" in rural areas. In particular, both nations have targeted solar panels as a way to produce electricity in rural households that aren't connected to the electrical grid.

But that means using batteries – typically lead-acid batteries (LABs) – to store the power until it is needed, two researchers note in *Energy Policy*. LABs "comprise about 80% of all lead consumption," write Perry Gottesfeld of Occupational Knowledge International in San Francisco, California and Christopher R. Cherry of the University of Tennessee, Knoxville. And studies show that a battery can lose up to one-half of its lead over its life cycle due to everything from poor mining practices to sloppy recycling. That's bad news for people and the environment, since lead poisoning is major cause of birth and developmental defects.

To understand what those losses might mean for India and China, the researchers took a close look at the LAB life-cycle and made some assumptions about how long the batteries would last and how they would be used. The results were sobering. In China, they estimated 33% of battery lead would be lost – or 12 kilograms of lead would leak into the environment for each kilowatt-year (kW-year) of installed photovoltaics (PVs). In India, the estimate was 22% loss, or 8.5 kilograms per kW-year. In China, that's a grand total of 386 tons of lost lead, and 2,030 tons in India. The majority of the predicted losses – which equal one-third of total global lead production in 2009 – are associated with the mining and smelting of lead ore.

"As advocates struggle to accelerate the adoption of PV solar technology, their reliance on LABs poses a significant threat to their environmental and sustainable development goals," they conclude. To head off threat, they say governments and battery makers will need to make mining and smelting safer, and move early to set up sound recycling programs. One option might be to "rent" batteries to users, who would get a deposit back when they return the battery for recycling. "Without specific government regulations that mandate how used batteries will be collected," they add, "LAB companies and solar power distributors have little incentive to institute policies to improve product stewardship." – **David Malakoff | July 12, 2011**

Source: Gottesfeld, P., Cherry, C.R., Lead emissions from solar photovoltaic energy systems in China and India. *Energy Policy* (2011), doi:10.1016/j.enpol.2011.06.021

Image: The Ashden Awards for sustainable energy

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