

## **CAN MINING PROVIDE A RENEWABLE ENERGY FUTURE?<sup>1</sup>**

**David Rosenfeld**©

It's difficult to look out over miles of waste rock and tailings from a century of copper mining in the American Southwest and see anything but environmental destruction. But a growing number of mining companies and renewable energy developers are beginning to use these vast plains of disturbed dirt as the ideal spots for large-scale solar and wind power projects.

Mine sites in the region attract developers such as Tessera Solar for several reasons, said communications manager Janette Coates. Existing transmission lines, available water and roads capable of supporting wide, heavy loads provide ready-made infrastructure. And reclaiming land that's already been disturbed will reduce permitting costs. Another draw is the potential to lease large tracts from a single owner. Plus, as demonstrated by last year's controversy over Mojave Desert land suggested as a home for solar arrays, projects planned for "spoiled" land face fewer political headwinds that threaten renewable energy proposals in more pristine areas. There's enough disturbed land at these mine sites for projects to provide a reasonable amount of power.

The potential exists at one particular Arizona mine with 10,000 acres of waste rock and tailings to produce up to 1 gigawatt of combined solar and wind power, about as much as an average coal-fired power plant, said Blair Loftis, national director of alternative and renewable energy for Kleinfelder, a large engineering consultant firm. "It's incremental over time," Loftis said. "The developers we talk to are extremely excited about it because for them it's the path of least resistance." Wind and solar developers, he said, could save up to 15 percent off their startup costs on a mine site. Loftis said he believes such projects may be on the cusp of a boom that could spur the economy, reclaim jobs in depressed mining towns and contribute to the nation's renewable energy goals. Momentum is gaining, he said, to transform large swathes of former mining land into renewable energy hot spots.

For example, Tessera has projects on mine sites in developmental stage, though Coates said the company wasn't ready to make any announcements because the projects are "still new and in their infancy." Tessera also owns Stirling Energy Systems, which makes solar units that use a mirrored dish to focus the sun's heat on a hydrogen-fueled engine, said to be among the most efficient forms of solar energy. Freeport-McMoRan Gold and Copper recently announced a proposed a 15-megawatt solar energy plant at its Bagdad Mine in Prescott, Ariz., making it the largest proposed solar plant in the state. Developers will sell its energy to the Arizona Public Service Company, which helps the power company meet its renewable energy needs.

Hundreds of proposed abandoned mine sites have been floated by the U.S. Environmental Protection Agency for renewable energy projects under a two-year effort called Re-Powering America's Land. The program encourages private developers to transform abandoned mines, landfills, Superfund sites and brownfields into something positive. In some cases, the energy produced actually helps power cleanup efforts such as filtering contaminated groundwater. The EPA has achieved several success stories, such as a solar array on a landfill in Colorado and a wind farm on a former New York steel mill. When it comes to active and abandoned mines, though, few projects have moved past the planning stage. There are about 450 abandoned mines

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in the EPA's database of potential sites, while specific evaluations and community involvement have occurred at just 20.

Shahid Mahmud, who heads the EPA's team on abandoned mine land, said mining companies could be doing a lot more. "I wish they would engage more. We talk to them and there's a lot of potential. From a carbon sequestration point-of-view and greening their practices, it would be good for them to pursue it." Outside Questa, N.M., for example, the EPA forced owner Chevron Mining to put up an array of solar panels as part of the environmental cleanup of a steel-alloy mine. Gov. Bill Richardson recently celebrated the groundbreaking of the 1-megawatt system. Aside from persuasion and clean energy mandates, there are few financial incentives for mining companies to lease their land for renewable energy. Their incentive often has more to do with corporate relations than profit. "One needs to still make a business case for why it makes sense for a mining company to participate," said Krishna Parameswaran, director of environmental services and compliance for ASARCO LLC, operator of three mines in the Southwest for the past century. ASARCO recently emerged from Chapter 11 bankruptcy and has so far just begun conversations with solar and wind power developers.

Parameswaran, who co-wrote a 2005 book on sustainable mining practices, said mining companies should consider more than financial gains, which would likely be negligible. "Another aspect is on regulatory matters," he said. "There are laws we have to comply with so there is always a little bit of tension. Working together with regulatory agencies in this area helps build relationships."

Not to be forgotten is the economic stimulus that larger renewable energy projects provide. Tessera's 850 MW project breaking ground later this year in California (unrelated to a mine site) will employ 300 to 700 people to build and up to 180 permanent jobs, Coates said. In Australia, mining giants BHP Billiton and Rio Tinto are working on plans to host the world's largest solar power plant — a \$1 billion, 250-MW solar thermal system with engineering firm WorleyParsons. They also launched a study last year looking at the potential to build 33 additional solar thermal stations capable of producing 250 MW each by 2020. "If this really pans out, when you're done mining, there is some other industrial activity continuing so you don't have to go through boom and bust cycles," Parameswaran said.