

High Noon

As the climate warms, environmentalists square off over Big Solar's claim to the Mojave Desert



Feature story - [From the May 04, 2009 issue of High Country News](#) by Judith Lewis

Jim Harvey loves Germany. Not that he's ever been there, to appreciate the sauerbraten, for instance, or revel in the Bavarian Alps. What he loves about Germany he loves in the abstract; he finds it on spreadsheets, in databases and academic studies. Specifically, studies that describe how Germany gets thousands of megawatts of electricity from solar energy without plowing under a single acre of pristine land.

"In *GER-many*," Harvey says, laying extra stress on that first syllable, "they will have installed 10,000 megawatts of solar energy by the end of 2011, 90 percent of it in buildings and on rooftops." Compare that to California, where "we put 100 megawatts of rooftop solar on the books for 2008 and have the nerve to say 'Yippee! We're right on schedule.' And then we spend the rest of our time sitting in meetings and hearings and conferences talking about how we're going to let big energy companies scrape our deserts to build their big solar plants, and how that's the only way we can stop climate change."

The dilemma is "bogus," Harvey says, savoring one of his favorite words. "It's bogus."

Outside the window where he sits this February day at the Joshua Tree National Park Visitor's Center, a Japanese mom in shorts and a T-shirt snaps pictures of her shivering kids against the distant sable hills. Snow shimmers on the surrounding mountains; all around tower piles of granite boulders dotted with barrel and beavertail cactuses. This is the Mojave Desert, for which Harvey left his native Chicago eight years ago. It is a land he now claims he would throw himself in front of a bulldozer to save.

And, he fears, he might have to. As of late March, the Bureau of Land Management had received 199 applications for industrial-scale solar plants, totaling 1.7 million acres, in the desert Southwest. Companies like Solar Millennium, Optisolar and Chevron Energy Partners have filed requests for nearly 1 million acres of land in California alone, the vast majority of it in Harvey's beloved and sun-drenched Mojave.

"These big solar companies," Harvey concludes, "they're no different from big oil or coal."

Tall and sturdily built, a Web site designer by trade, Harvey lives with his wife, Catherine Janowicz, in the Johnson Valley, a small desert community near Joshua Tree. He wears a bandana around his forehead underneath a charcoal rancher's hat, and his face is pierced in seven places. (There used to be more, he says, before his dentist threatened him with a \$15,000 bill.) In his spare time, he tinkers with a fleet of antique Harley-Davidson motorcycles, and at regular intervals heads out to tour the West's open roads on his bike, Catherine on the back.

Harvey had no record as an activist until about three years ago, when he helped bring San Bernardino water officials to task for violating public meeting laws. But living in the embattled desert has changed him. In the late summer of 2007, Harvey started going to meetings about a 500-kilovolt transmission corridor for renewable energy that would cut through the Johnson Valley on its way to Los Angeles, and started to see a pattern: It wasn't simply one energy corridor he was fighting, but a whole movement to turn the open Mojave into an industrialized renewable energy zone.

"It all started with the Energy Policy Act of 2005," he says. "The goal of that bill was to add 10,000 megawatts of renewable energy on public lands by 2015." Add to that several states' laws requiring utilities to get more electricity from carbon-free sources; California, for instance, ordered investor-owned utilities to draw 20 percent of their electricity from renewable sources by 2010, and 33 percent by 2020. "The land grab was on," Harvey says. "These big energy companies got busy making us think they were doing something for the environment. But they're liars."

In the spring of 2008, Harvey jumped on one of his Harleys and rode through the Mojave National Preserve to check out the Ivanpah Valley, where the Oakland, Calif.-based BrightSource Energy company wants to clear close to 7,000 acres of public land to generate 400 megawatts of solar power. Harvey had heard BrightSource spokespeople describe the land as disturbed by cattle grazing and off-highway vehicle use, but what he found instead was a "lush creosote forest -- some of the most beautiful desert land in the world." Within a week, he announced the startup of the National Alliance for Sensible Energy Policy, "a nonpartisan group adamantly opposed to BLM giving our lands to energy corporations."

One year later, the group has become the Alliance for Responsible Energy Policy, and Harvey has become an authority among people with long histories of desert activism, people who have spent their lives fighting garbage dumps, development and expanding military bases. "I gave them a voice," he says. "I let them know that it was all right to pound on the table and say, 'No!' to the national leaders of their organizations." He now travels around the region to Sierra Club meetings and high schools, armed with statistics about how photovoltaic technology can displace coal-fired electricity and save us from catastrophic climate change. He explains the arcane details of a new California law that promises low-interest loans for solar installations. He discusses how "thin-film" technology will drop in price as it penetrates the market. He describes how the city of Gainesville, Fla., jumpstarted rooftop solar by purchasing renewable energy from small suppliers, an effort modeled after Germany's *Stromeinspeisungsgesetz*, a term that translates awkwardly into English as "feed-in tariff."

"If you put a system on your roof you can sell every electron of that at a premium rate," he says. "Cities that have done it find out that it only raises electric rates a little every month."

People who continue to insist, in spite of all Harvey's carefully marshaled evidence, that we cannot quickly reduce the planet-warming carbon in the atmosphere without the help of industrial-scale solar plants -- people like Carl Zichella, the Sierra Club's director of Western Renewable Programs -- make Harvey furious. "Carl Zichella says that rooftop solar is 'no solution at all,' " Harvey hisses, referring to a quote Zichella gave the *New York Times*.

Harvey has one word for him: Germany.

BrightSource's proposed \$3 billion Ivanpah

Solar Electric Generating Station consists of three concentrating solar thermal power plants, each of which uses thousands of seven-by-10-foot sun-tracking mirrors, called "heliostats," to focus the sun's energy on a tower, where, just like any conventional fossil-fuel plant, heat turns water into steam that spins turbines. (Other kinds of concentrating solar plants use "parabolic troughs," heating liquid by focusing curved mirrors on pipes lower to the ground.) An ingenious but relatively primitive technology, concentrating solar power, or CSP, costs an average of 15 cents per kilowatt hour over a plant's 30-year lifetime, roughly half the current cost of photovoltaics, which turn the sun's radiation directly into electricity. It has been heralded as "the technology that will save humanity" by physicist Joseph Romm, a veteran of the Clinton Energy Department and author of a book about global warming called *Hell and High Water*. "I don't believe any set of technologies will be more important to the climate fight" he wrote on his blog at ClimateProgress.org.



Compared to other forms of energy, CSP needs a lot of land -- approximately 8.5 acres per megawatt, 17 times as much land as a nuclear plant needs to generate the same amount of electricity. Constructing the Ivanpah solar plant would require grading more than six square miles clean of vegetation, leveling 100-year-old cactuses and creosote along with 202 specimens of a rare desert plant known as Mojave milkweed -- 80 percent of the known population, as well as 11 other rare plants unique to the Mojave. It would require rerouting ephemeral creeks and washes that carry runoff from the Clark Mountains into Ivanpah Dry Lake during the desert's sometimes ferocious winter storms. It is being designed by engineers who appear to be learning about the desert ecosystem as they go: The original plan for the Ivanpah plant had no proposal for managing stormwater, as if no one had considered that rain falls in the desert.

Tom Hurshman, the project manager at the BLM, says he's "gone back and forth with hydrologists and civil engineers working on the project" to get them to address the stormwater issue; he's also "questioning some of the assumptions they put into their design."



"We're looking at pretty much an exclusive use of public lands here," Hurshman says. "The scope of these projects is far larger than anything the BLM and the Energy commission have ever seen before. It's taking us a while just to figure out what questions we need to ask."

There may be worse places to locate a solar plant than the Ivanpah Valley, including another tract BrightSource picked out in the Sleeping Beauty Mountains, a wilderness that serves as a corridor for wildlife traveling between Joshua Tree and the Mojave National Preserve. That project is among more than a dozen proposed on a 600,000-acre parcel purchased by The Wildlands Conservancy in 1999 and donated to the federal government. In early March, Sen. Dianne Feinstein, D-Calif., announced

that she plans to introduce legislation putting those acres — called the Catellus lands after the railroad-turned-real-estate company that once owned them — off-limits to wind, transmission and solar projects.

Right now, however, Ivanpah matters more than all those projects, because it's the first large-scale solar plant on public land to move into the concurrent permitting process with the BLM and the California Energy Commission in 16 years. It is, says G. Sid Silliman, the president of the Sierra Club's Mojave-adjacent San Geronio Chapter, "the model for all future projects. We want to make sure it gets done right." If the BLM isn't sure about the questions, many national environmental organizations are pounding on the door with questions of their own.

For instance, what does it mean to describe land as "disturbed"? The federal government has long granted grazing rights to the Ivanpah parcel, but that didn't prevent it from becoming a de facto refuge for the threatened desert tortoise, 30 of which were found during project surveys. Each of those tortoises will need to be relocated before the project advances, a process that will likely result in some of them dying. Consequently, the Sierra Club, Defenders of Wildlife, the National Parks Conservation Association and several other groups consider the land high-value habitat, and have asked the state Energy Commission to require that BrightSource compensate for it by purchasing five times as much similar land for conservation. But no environmental organization with a significant number of members east of the Mississippi River opposes Ivanpah altogether.

Silliman chooses his words meticulously: "It does seem to be true that the people who settled on the Ivanpah site perhaps didn't look at it as fully as they should have," he says. He has recommended that BrightSource consider moving the project to private land, to a site near the California-Nevada border in Daggett, Calif. But even if it stays in the Ivanpah Valley, Silliman says, "the project would contribute to renewable energy standards in the state. And that's important to us."

The Sierra Club's fence-sitting rankles Harvey, who cannot see in it any kind of strategy, only a bald capitulation by "envirocrats" to energy companies. He has many allies. In early April, as spring wildflowers delivered on their annual promise to the desert tortoise -- the reptiles could be spotted prowling the land with bunches of yellow and orange flowers in their jaws -- Kevin Emmerich and Laura Cunningham of the group Basin and Range Watch went out to Ivanpah to document the bloom. They posted Emmerich's images on a Web site, and sent them to Carl Zichella.



Zichella declined to comment for this article, deferring to Silliman to explain the club's nuanced position. But in a widely circulated response to Emmerich and Cunningham's photos, he made an attempt to put the Sierra Club's position in the larger context of global environmental catastrophe. "Friends," he wrote.

"Beautiful photos; thanks for sending them. A quick Q: with scientists saying a one-degree increase in temperature could lead to a 20 percent decline in species in the desert southwest, how many springs like this year's do you think the desert has left?"

The Sierra Club has nothing against Germany, Zichella went on to say; in fact, the club supported state and federal legislation for feed-in tariff (California Assemblymember Jared Huffman authored one; U.S. Rep. Jay Inslee, D-Wash., wrote another). It's just that rooftop solar can't happen fast enough, or solve the problem alone. Without large-scale solar, "we will never do what needs to be done to save the places we have fought for and love."

Harvey says he understands the threat of climate change perfectly well. "This is simple," he says. "I'm trying to save intact desert ecosystems. Carl Zichella is not."

It's not hard to understand why the Ivanpah Valley is a solar engineer's dream. A southeast-facing alluvial plain at the base of the Clark Mountains, it gets 300 full days of sun every year, shining through clear dry air at an elevation of 3,000 feet. A 115-kilovolt transmission line cuts across the site, which means BrightSource could avoid the controversy of plowing under more habitat to build new transmission. If you want to build a solar electric plant on the least amount of land for the least amount of money and generate the most energy per square inch, this is the place to do it.

Such location-related cost and efficiency issues could decide whether industrial-scale solar thermal gets off the ground in the U.S., or meets the same fate it did in decades past. Back in the 1980s, Arnold Goldman, who founded BrightSource as Luz International, oversaw the construction of nine plants in the Mojave, totaling 354 megawatts. But he and other solar developers abandoned their plans when energy prices dropped and federal tax breaks expired; since then, the company has built only a few small plants, including a 1.5 megawatt demonstration facility in Israel's Negev Desert.

The faltering economy could again stall large-scale solar projects. "It's hard for renewables to compete with conventional energy," says Arthur Haubenstock, BrightSource's director of regulatory affairs — especially if you're "trying to do it in the most ecological and environmental way possible." Following the BLM's recommendation for desert solar plants, the three

Ivanpah generators will use air instead of water to condense used steam and return water to the boiler. The process, called "dry-cooling," costs more and reduces efficiency, but also cuts water use by 90 percent -- a necessity in a land of little rain and already overdrawn aquifers.

Haubenstock says the company is counting on the \$60 billion embedded in the American Recovery and Reinvestment Act to help the industry along. It has raised \$160 million in investments from Google, Chevron, Morgan Stanley and British Petroleum, and has secured two contracts, one to provide 900 megawatts of solar-generated power to Pacific Gas and Electric, and another for 1,300 megawatts with Southern California Edison.

Yet even with the investments and contracts, it makes little financial sense for BrightSource CEO John Woolard to negotiate for land with a variety of private landowners -- who, in the current market, can get as much as \$10,000 an acre -- when the company can access public land through federal leases or a land-exchange program at around \$700 per acre. "Private landowners can hold land hostage," says Haubenstock.

Then again, private landowners can also streamline energy development when it suits them, and might offer a simpler solution. The Desert Protective Council's Larry Hogue, who tracks the renewable energy land rush on his Desert Blog, cites a concentrating solar thermal plant to be constructed by Spain's Abengoa Solar for Arizona Public Service as an early example of responsible land management. The project still faces many hurdles, including financing, but a lengthy review complicated by squabbling environmentalists is not among them. The project will occupy three square miles of privately owned land on a former alfalfa field in Gila Bend, Ariz., 70 miles from Phoenix.

"The solar plant will use less water than the alfalfa did," Hogue says. "We have to support that."

This is the real discussion, Hogue argues, that is missing from the enviro-on-enviro media narrative. It's not that some environmentalists are opposed to renewable energy. It's that states, the federal government, solar developers and utilities have not taken the time to arrive at a thoughtful land-use policy that would move solar projects forward.

"We are not opposed to renewable energy," says The Wildlands Conservancy's David Myers. "But if you read the New York Times, you might think that we are. All our preserves run on wind and solar." What Myers does oppose is giving over the land his organization donated for conservation to any kind of private development, whether tract housing, solar plants or wind farms. "If Ken Salazar does not stop this, then the Obama administration is breaking a 100-year tradition of conservation that extends back through three generations," he says.

Myers claims that BrightSource uses "absolutely no discretion in placing its projects. But I would personally go out and find BrightSource the right places to put their solar energy farms. We're great at finding land. We have hundreds of thousands of acres in California along grid interties that are fallowed farmlands we would welcome them to use. There is degraded land throughout the Mojave, lands that the whole environmental community will support."

Myers predicts that even if all state and federal agencies sign off on Ivanpah, BrightSource will end up stuck in court with Defenders of Wildlife and the Sierra Club for years over exactly how much land should compensate for the desert tortoise habitat lost to its solar plant. On the other hand, if the company had gone about the process more reasonably from the get-go, "all of these projects could have been fast-tracked."

There's a way of looking at the Ivanpah site, passing by it on the I-15 freeway, that makes it seem like a fine place to put a concentrating solar plant. In fact, in the shadow of Primm, Nev., an unmitigated monstrosity of casinos, fast-food chains and amusement park rides, a few thousand acres of mirrors might actually look like a work of art.

But there's another approach to Ivanpah, literally and figuratively. You can start driving there from the Marine base at Twentynine Palms, and thread your way up through the Mojave National Preserve. You can rumble along busted-up tarmac roads past the original Roy's Motel along old Route 66 and the eerie black protuberance of the Amboy Crater, and pass through the Joshua tree forest at Cima, as dense as any stand of coastal redwoods. When you come at it this way, the Ivanpah Valley belongs to a continuum of open space extending west across the rugged Clark Mountains. It's a swath of land stuck between segments of the Mojave Preserve that remains unexploited simply because no one has gotten around to exploiting it.

Back at the Joshua Tree café, Harvey goes through a series of calculations to determine how much rooftop solar California would need to meet its state-mandated goals. A reasonably sufficient solar array for a single-family home generates about 5 kilowatts, he figures; many homes in the desert where he lives run on arrays of 2 or 3 kilowatts. If we all lit our homes with compact fluorescents and LEDs, if we outfitted them with better insulation and passive solar heat, if we just plain used less energy, couldn't we easily displace 400 megawatts of coal-fired generation, just as BrightSource claims Ivanpah will?

Most of all, if the United States, or at least California, adopted an energy policy more like Germany's, couldn't we stall climate change without any large-scale renewables at all?

There's just one problem: Germany, for all its success with solar, still burns the coal of two Californias. In fact, this spring, Vattenfall Europe is haggling over the terms of a 1,640-megawatt coal plant it hopes to build in Hamburg without burdensome environmental restrictions.

Harvey is not deterred. "All that means is that we've got to use conservation, too," he says. "We can't just keep using more and more energy."

Four days earlier, Harvey had stood before the Sierra Club's Desert and San Geronio Chapters in Shoshone, on the edge of Death Valley, and presented his findings. "You should have heard the room in there," he says. "People were literally jumping to their feet applauding what I had to say." Unfortunately, the club still refused to give a clear thumbs-down on Ivanpah.

"Literally, they were talking about how they were going to relocate all the tortoises. Do you know what that means?" A recent plan to move desert tortoises off land to be occupied by a military base in the Mojave was abandoned when more than 15 percent of the animals turned up dead.

"Every relocation effort is a death sentence for those tortoises," Harvey complains. "They're lying if they say it's not."

Harvey left that day in despair. "I woke up Sunday morning at 5 a.m. thinking that I'd just lost my dog or best friend. I was just sick to my stomach. This is the first time that I feel like I may lose this battle."

At least that loss, if it happens, will be a long way off. BrightSource has yet to file all its documents with the California Energy Commission and the BLM. After it does, it has many more hurdles to clear before it can bulldoze a single acre of ground.

If that day comes, though, Harvey vows he will be ready. "If this project isn't the one that would make you lie down in front of a bulldozer and say, '*You can't do this*,' what is? Thousands of pristine, beautiful Clark Mountain acres are going to be leveled and gone forever. What do you stand for," he wants to know, "if you don't stand up for this?"

