Q&A: Climate change solution can carry environmental costs

May 13 2024, by Ethan Baron, The Mercury News

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Solar power, widely seen as humanity's best hope for avoiding catastrophic climate change, can carry a heavy environmental cost, depending on where panels and transmission lines are built.

Some of that infrastructure—providing electricity to millions of Californians—is going into places it should not, says San Jose State University environmental studies professor and sustainable energy expert, Dustin Mulvaney. Killing plants and animals, of course, is not a goal for solar developers, but the collateral damage has sparked bitter debate over where panels and lines belong.

California has done a good job of protecting its public lands while facilitating solar development, Mulvaney says. But many residents are powering their homes with electricity from Nevada, where pristine natural areas are taking an increasingly hard hit, and from private, California projects in important animal and plant habitats, he says.

Several "aggregators"—community-based alternatives to utility giants that are often marketed as "clean"—have contracts for power from a Southern California project that would see 4,000 Joshua trees leveled, he says. Other projects feeding aggregators bring significant loss of wildlife habitat.

Mulvaney believes sacrificing nature for solar is unnecessary. California could meet its electricity needs by putting solar panels on just a tenth of its contaminated sites, old mines, unusable former farmlands, parking lots and other disturbed areas, he says. "We need to be building out our electricity transmission infrastructure toward those sites," Mulvaney says. The more solar close to major urban areas, the better, he adds. Every home and Amazon warehouse presents another rooftop-solar opportunity, he says.

This news organization sat down with Mulvaney recently to discuss solar power. The interview has been edited for length and clarity.

Describe the controversy over where to put solar

generation facilities?

Most big solar farms are not controversial. They get controversial when they go onto landscapes that are of significance, either ecological significance or cultural significance—sometimes there are important cultural resources for tribes.

Do we have need for both rooftop solar and utility-scale solar?

We should have more rooftop, but we're going to need more utility scale based on the way our grid is built.

Why do we have solar developments and proposals for pristine areas, when already-altered land is available?

Transmission lines are why we see projects where they are. Back in the '60s we built transmission lines to connect to coal-fired power plants in the western United States. As those coal-fired power plants are turning off, those transmission lines suddenly have power availability.

The (planned new) Greenlink transmission line which is going to connect Las Vegas and Reno goes through a Native American site and through a bunch of sensitive ecosystems. And we're already seeing applications for solar farms along that transmission corridor. That's going to be power that goes to California, probably. Nevada has fewer protections for its public lands.

What roles do the big utilities like PG&E and Southern California Edison play in where solar farms go up?

The community choice aggregators are playing a bigger role than the utilities in determining these development patterns now. The community choice aggregators are doing much of the (power) purchasing. For the Yellow Pine solar farm on the Nevada border (to produce electricity for Silicon Valley Clean Energy and Central Coast Community Energy), lots of desert tortoises had to be removed from that site. Forty-something of those tortoises were eaten by badgers right away.

Could we meet our electricity needs without big solar farms?

There's nothing theoretically prohibiting rooftop solar and batteries from powering a community. Do you have enough sun? We get those back to back to back to back cyclones in the winter. Sometimes the cloud cover's all the way across the Central Valley. Do you have enough batteries? The battery storage probably makes that prohibitively expensive at this stage. It would require rethinking how we move power around.

What do we stand to lose by putting big solar farms in the wilderness?

All sorts of species, old-growth barrel cactus, desert tortoise, kit fox. The desert tortoise just last week was up-listed by the California Department of Fish and Game to be endangered. That species has lost 90% of its population since 1980. Bighorn sheep and pronghorn antelope are impacted by solar farms because their habitat gets fragmented by them. Their populations get more isolated, they have inbreeding.

Could we meet all our needs without putting solar on undisturbed wilderness?

There's a great study. You can avoid important lands to conservation and it would only increase the cost of power by 3%, based on their estimates.

Where are some places where you could put reasonable amounts of solar generation to help avoid bringing power in from the desert or Nevada?

On the western side of the Central Valley a lot of those soils are contaminated with selenium. That would be an area where you could have less impact. That's where you could put pretty big utility scale projects that would be really close to the Bay Area, and above the bottleneck—California has a (power line capacity) bottleneck for the power, around Los Banos. We have to build more renewables above the bottleneck in northern California to help the Bay Area.

What about Southern California?

You have a lot of renewables in Southern California already. Southern California just needs more rooftop solar on their warehouses and things like that.

What should Californians know about disputes over the solar power they are increasingly consuming?

This is a very solvable problem. You can get a lot of benefits out of projects if you … start thinking about these projects as multi-functional: growing food and solar on the same landscape. Aquaculture underneath some floating solar. Apiaries—people are bringing honeybees into solar farms.

This is a pretty neat technology that could be used to solve multiple

problems at once. Now we're thinking about climate change, so we don't think about land. We need to be really thinking about holistic solutions.

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Citation: Q&A: Climate change solution can carry environmental costs (2024, May 13) retrieved 16 August 2024 from
https://techxplore.com/news/2024-05-qa-climate-solution-environmental.html