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FROM Jim FALANGA

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## Coalition to Protect Our Rural Communities Inc

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### Solar Panels Produce Tons of Toxic Waste—Literally

A closer look at solar panels opens a wide array of questions that need answers.

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#### A Popular Choice

Solar panels have been heralded as the alternative to fossil fuels for decades. Most readers have likely seen exciting headlines claiming we could power the world's energy demands multiple times were we simply to cover the Sahara Desert with a solar farm the size of China. The fact that such endeavors would be unsustainable due to their size and the sheer amount of maintenance required or that the necessary infrastructure to bring this energy all around the world is simply unimaginable is irrelevant to those who dream of a solar future.

That's fine; we're all dreamers in one way or another. This fantasy has grasped many voters, however, and politicians are all too keen to jump on the gravy train of alternative energy. Solar panels are subsidized to an enormous extent, as are solar farms, be they public or private. In the age of emissions trading and international climate conferences, nothing is applauded more than showing off some big investments into harvesting the sun as an electricity supplier.

### What's Inside?

Beyond the clear misallocation of resources and energy market price distortions, there is a further environmental problem associated with solar panels.

Beyond the inefficient use of these resources to begin with (in the process of making crystalline silicon from silicon, of the raw silicon is lost), there are numerous human health concerns directly related to the manufacture and disposal of solar panels.

cancer biologist David H. Nguyen, PhD, toxic chemicals in solar panels include cadmium telluride, copper indium selenide, cadmium

gallium (di)selenide, copper indium gallium (di)selenide, hexafluoroethane, lead, and polyvinyl fluoride. Silicon tetrachloride, a byproduct of producing crystalline silicon, is also highly toxic.

The pro-solar website EnergySage : There are some chemicals used in the manufacturing process to prepare silicon and make the wafers for . One of the most toxic chemicals created as a byproduct of this process is silicon tetrachloride. This chemical, if not handled and disposed of properly, can lead to , harmful air pollutants that increase lung disease, and if exposed to water can release , which is a corrosive substance bad for human and environmental health.

For any user of solar panels, this is not an immediate risk as it only affects manufacturers and recyclers. More disconcerting, however, is the environmental impact of these chemicals. installed capacity and power-related weight, we can estimate that by 2016, photovoltaics had spread about 11,000 tons of lead and about 800 tons of cadmium. A hazard summary of cadmium compounds produced by the EPA that exposure to cadmium can lead to serious lung irritation and long-lasting impairment of pulmonary functions. Exposure to lead hardly needs further explanation.