

**Addressing the scale and complexity of the global energy challenge.**



## **ARE GREEN JOBS, JUST JOBS? INNOVATION, ENVIRONMENTAL JUSTICE, AND THE LIFE CYCLE IMPACTS OF PHOTOVOLTAICS**

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**Summary:** Green jobs and innovation are widely heralded as means to a low carbon economy. But what is a green job and how clean are they? This paper explores the environmental justice (EJ) implications from solar energy manufacturing, deployment, and end-of-life. Photovoltaic (PV) manufacturing processes involve hazardous materials and processes similar to those found in the electronics industry, where groundwater contamination and occupational burdens were widespread. Seen as the frontiers of innovation and darlings of venture capital, some emerging thin film PV semiconductors are made of toxic materials or by novel nanoscale processes. These new commodity assemblages are producing new political ecological configurations of energy procurement and generation, linking Malaysian thin film PV fabs to public lands in the US Desert Southwest. To understand these impacts researchers have turned to life cycle assessment tools to evaluate and compare the impacts of various technologies through the construction and commensuration of performance metrics. By integrating traditions in global commodity chains, political ecology, and science and technology studies, this research explains how such renewable energy metrics can obscure potential environmental justice impacts from PV manufacturing, and how an uncritical moral economy of carbon is shaping solar energy deployment.

### **Dustin Mulvaney, Ph.D.**

Dustin Mulvaney is Assistant Professor of Sustainable Energy Resources at San José State University. Dr. Mulvaney recently completed a two-year National Science Foundation Science, Technology, and Society (STS) postdoctoral fellowship at the University of California, Berkeley. This research focused on the life cycle and environmental justice impacts of renewable energy commodity chains, particularly solar and bio- energy technologies drawing on frameworks from science studies and political ecology that engage in multi-sited ethnographies of global production systems. Dustin also recently finished a three-year Switzer Environmental Leadership fellowship where he served as senior research scientist on the Silicon Valley Toxics Coalition's Just and Sustainable Solar Energy campaign. Dustin's Ph.D. is from the Environmental Studies Department at the University of California, Santa Cruz, where his dissertation research sought to explain why social movement actors were effective at implementing precautionary policies for some genetically engineered commodities, and ineffective at others. He has a B.S. in Chemical Engineering and M.S. in Environmental Policy Studies from the New Jersey Institute of Technology. Previously he worked for a Fortune 500 chemical manufacturer and a bioremediation start-up.

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