



## EPP and Center for Climate and Energy Decision Making Sponsored Seminar

Joshuah Stolaroff  
Environmental Engineer  
Lawrence Livermore National Laboratory



Presenting on:

“Enzymes for energy: Why we need new energy technologies and how biology can help”

February 12, 2014

12 noon

(Lunch served at 11:50am)

Baker Hall 129 Conference Room

Department of Engineering and Public Policy

### **Seminar Abstract:**

As much as climate change is a socio-political problem, substantial technological advances are still possible and needed. The recent abundance of shale gas has dampened enthusiasm for carbon capture and storage (CCS) research, however, inexpensive gas on its own offers little carbon benefit in the long run. Meanwhile, shale operations leak or flare large amounts of methane and catastrophic methane release from the rapidly-warming Arctic is a significant risk with no clear solution.

Most chemical reactions relevant to these and other problems in clean energy are carried out by nature under ambient conditions with high efficiency. These include the exchange of carbon dioxide in and out of solution, the conversion of methane to liquid hydrocarbons, and the dissolution and formation of silica minerals. Enzymes (biological catalysts) are widely used in the pharmaceutical industry but so far have had limited application in energy and other large-scale industries. However, recent advances in synthetic biology and computational chemistry make a new wave of innovation possible.

### **Speaker Bio:**

Joshuah Stolaroff is an environmental engineer whose research focuses on technology and policy related to climate change. He has been at Lawrence Livermore National Laboratory for four years, where he co-leads a project on methane conversion to liquids and develops carbon capture technology. He led a study of mitigation strategies for Arctic methane release and assessed the utility of atmospheric greenhouse gas measurement for international treaty verification. Previously, he was a AAAS Science and Technology Policy Fellow at the U.S. Environmental Protection Agency, where he led the Agency's report on the greenhouse gas impacts of land management and materials management. He holds a PhD in Civil & Environmental Engineering and Engineering & Public Policy from Carnegie Mellon University and a BS in Environmental Engineering Science from the University of California, Berkeley. For his dissertation, he developed technology to capture carbon dioxide from ambient air.

**Carnegie Mellon University**