

**Institute of Energy Technology – Professorship of Renewable Energy Carriers*****Invitation to a Seminar***

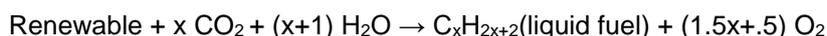
**Date:** Friday, May 11, 2012  
**Time:** 16:00-17:00  
**Place:** Maschinenlaboratorium ETH Zürich, ML-J25/26

**Speaker:** **Prof. Ellen B. Stechel**  
Deputy Director, LightWorks and Professor of Practice, Chemistry  
Arizona State University, Tempe, AZ, USA  
Sandia National Laboratories, Albuquerque, NM, USA -- Retired

**Title:**

**Sunshine to Petrol*****Abstract –***

Before the century concludes, the world needs to find abundant, cost-effective, safe, secure, and sustainable alternatives to fossil fuels. This presentation highlights an approach developed at Sandia National Laboratories for activating carbon dioxide (CO<sub>2</sub>) to precursors for liquid hydrocarbon fuels. A chemical equation, closely resembling photosynthesis, summarizes the intent:



When the renewable resource is concentrated solar and the conversion pathway is an internally recuperating, continuous flow, two-step metal-oxide based thermo-chemical cycle (“chemical heat engine”); we refer it as “Sunshine to Petrol.” We expect that the development of processes that efficiently, cost-effectively, and sustainably reenergize thermodynamically spent CO<sub>2</sub> feedstock to create fuels would be a major achievement and the achievement required to address the dual challenges of energy (transportation) security and the threat of irreversible climate change.

***Biosketch –***

Ph.D. 1978, University of Chicago, IL, USA. Dr. Stechel has proven expertise in managing large R&D efforts within national laboratory and industry environments. She has divided her career between a national laboratory and industry (Ford) and between science and research management and has recently joined ASU. In addition to her scientific accomplishments in chemical dynamics, computational science, electronically stimulated processes on surfaces, strongly correlated electron systems, and solar thermochemical, she has 17 years experience combined in R&D and D&D management. Until recently she was the program director for the Sunshine to Petrol Project. From 1998-2005, Stechel worked for Ford Motor Company covering a range of energy and environmental programs inside Ford and in Universities. She is now the Deputy Director of LightWorks at Arizona State University, and Assoc. Director of LightSpeed Solutions. LightWorks is a campus wide imitative to establish large multi-disciplinary, multi-organizational project teams in light inspired research for energy and sustainability organized around five challenge areas and three accelerators. Fuels from sunlight is one of the challenge areas and is led by Stechel. At Sandia, she had a number of positions and retired as manager of the Concentrated Solar Technologies department, which includes Sandia’s unique National Solar Thermal Test Facility (NSTTF). She is a fellow of the American Chemical Society.

