

MECHANICAL ENGINEERING DEPARTMENT

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Co-Sponsored by the Initiative for Renewable Energy and the Environment

Fuel Cells, the Hydrogen Economy, and Your Energy Future

by

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Wednesday, February 28, 2007

3:30-4:30 p.m.

Room 402 Walter Library

Coffee and cookies will be available at 3:15 p.m. in Room 401 Walter Library before the seminar

ABSTRACT — The advent of fuel cells that can efficiently transform the chemical energy in a fuel directly into electricity has excited both the technical community and the general public and raised an expectation that these advancements may provide a way around a foreseeable energy shortage. Leading the list of expectations are efficient electric vehicles fueled with domestically produced hydrogen having no harmful environmental emissions. The use of fuel cell systems for stationary power production has also generated excitement because of the high electrical efficiencies, the cogeneration opportunities and the low emissions expected from these systems. The opportunities presented by hydrogen-fueled fuel cell systems has provided impetus for transformation from a petroleum to a hydrogen economy in which domestically-produced hydrogen would be transported in a manner similar to natural gas. The objectives of this seminar are to briefly review the different fuel cell concepts that are currently receiving developmental attention. Then the characteristics of hydrogen will be reviewed in order to determine its feasibility as a transportation fuel and the merits of a hydrogen economy. The advantages and disadvantages of using fuel cell systems for transportation and stationary power applications will be reviewed. Finally the role fuel cell systems may be expected to have in our energy future will be discussed.

BIO — **Professor Sanford Klein** has been on the faculty of the Mechanical Engineering Department at University of Wisconsin - Madison since 1977. He is associated with the Solar Energy Laboratory and has been involved in many studies of solar and other types of energy systems. He has contributed over 150 publications relating to the analysis of energy systems. Professor Klein's current research interests are on thermodynamics, refrigerant properties, solar energy applications, magnetic refrigeration, and cryogenic applications. In addition, he has also actively involved in the development of engineering computer tools for both instruction and research. He is the primary author the general simulation program, TRNSYS, the finite element heat transfer program, FEHT, and the general engineering equation solving program, EES. Professor Klein is a Fellow of the American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE) and the American Solar Energy Society (ASES).

Website: http://www.engr.wisc.edu/me/faculty/klein_sanford.html

Informal Faculty Luncheon: Wednesday, February 28, 2007, 12:00 noon. Meet in 1100 ME and walk to lunch with other faculty. Prof. Sanford Klein will be able to attend.