

4CF06-2006-000157

Abstract for an Invited Paper
for the 4CF06 Meeting of
the American Physical Society

The Sustainable Hydrogen Economy: Addressing the Challenges Ahead

JOHN A. TURNER, National Renewable Energy Laboratory

It is rapidly becoming apparent that energy is one of the most important issues facing our world today; in fact, in today's society energy is as important as food and water. Humankind finds itself faced the challenge of how to continue to power society, particularly in the face of the rapidly growing economies of emerging nations like India and China, and yet answer questions of sustainability, energy security, geopolitics and global environment. One of the major issues facing America and most other countries in the world is how to supply a transportation fuel, an energy carrier to replace gasoline. Hydrogen as an energy carrier, primarily derived from water, can address issues of sustainability, environmental emissions and energy security. The "Hydrogen Economy" then is the production of hydrogen, its distribution and utilization as an energy carrier. While the vision of a hydrogen economy has been around for over 130 years, the most recent push to use hydrogen as an energy carrier came as part of a US Presidential Initiative, announced in the 2003 State of the Union Address. It is important that we consider hydrogen in tandem with other technologies as an alternative to the once-abundant hydrocarbon resources on which our society depends. This talk will introduce sustainable energy systems, including fuel cell technology and discuss the vision, the barriers and possible pathways for the production and implementation of hydrogen into the energy infrastructure.