FUTURE takes
Transcultural Futurist Magazine
ISSN 1554-7744

Vol. 3, no. 4 (Winter 2004-2005)

Futurist Book Group Discussion

The Hype About Hydrogen

by Joseph J. Romm
Island Press, ISBN 155963703X

Synopsis of the January 2005 Futurist Book Group meeting; summarized by Ken Harris

The Futurist Book Group's first selection of 2005 was ***The Hype About Hydrogen*** by Joseph J. Romm. Romm's central ideas are that the switch to a hydrogen economy (i.e., a time when a substantial fraction of our energy is delivered by hydrogen made from sources of energy that have no net emissions of greenhouse gases) is technically feasible and highly desirable to prevent global warming, but that transition will not be easy. He explains in great detail why it will be especially difficult to energize the transportation sector with hydrogen and concludes that the transition will require intervention by government in the marketplace on an unprecedented scale. Romm held various positions in the Department of Energy in the Clinton Administration and currently heads the Center for Energy and Climate Solutions.

Romm shows that there is fairly strong near-term potential for energizing buildings, especially commercial buildings, with hydrogen fuel cells. They can be economically competitive with fossil fuel systems by co-generation of electricity and heat. However, they are likely to be economically competitive only in newly constructed buildings because of the high-cost of retrofitting existing buildings. They do provide highly reliable electric power, but business owners who need highly reliable power are not likely to switch to fuel cell power solely for that reason. This is because first, fuel cell power is only slightly more reliable than electricity from the electric power grid, and second it is still a largely untested technology. There is also good potential for energizing new homes with fuel cells using co-generation. However, getting the right infrastructure in place will be a challenge. Installation may require specially-trained plumbers and electricians. Moreover, for home owners to have sufficient incentive to install fuel cell systems, they will have to be allowed to sell any excess electricity they produce to the electricity grid at retail whereas in most states they may do so only at the much lower avoided cost.

The characteristics of hydrogen make it especially challenging to use as a transportation fuel. First while, hydrogen is abundant in nature, it is chemically bonded in other substances. So energy has to be used to free it, and producing that energy causes environmental pollution unless it comes from a non-polluting source. Second, hydrogen is one of the least energy dense fuels. So, to gather enough of it for practical use, it has to be highly compressed, and then it must be stored in special tanks, which onboard a

car or truck add weight. Third hydrogen is highly volatile. To power the US transport sector with hydrogen will require setting up a totally new infrastructure that will deal with all these characteristics of hydrogen. The infrastructure will include the equipment to be installed on millions of vehicles and at thousands of filling stations and a system for transporting the hydrogen to the filling station. Many wise decisions will be needed to avoid the expensive undertaking of building this new infrastructure more than once. Moreover, the economics become more questionable as the internal combustion engine becomes far more efficient and less polluting and as hybrid cars grow in popularity.

Romm's last chapter "Choosing Our Future" is a multi-part, long-term strategy for conversion to a hydrogen economy. The key element in his strategy likely is "prepare the public for the tough choices ahead." Futurists should read this important book and accept this challenge.