Wednesday, November 20, 2002

Petroleum Club, 800 Bell (downtown)
Social 11:15 a.m., Lunch 11:45 a.m.

Cost: $25 Preregistered members; $30 Nonmembers & Walk-ups

Make your reservations now by calling 713-463-9476 or by e-mail to Joan@hgs.org (include your name, meeting you are attending, phone number, and membership ID#).

by Michael J. Economides
and ***Ronald E. Oligney***

Future Colors of Energy

Energy demand and the search for energy sources will also continue to dominate world geopolitics.

In early 2000 we published *The Color Of Oil*, which went on to become a national best seller on the subject of energy. The book used colors to symbolize the various important aspects of the energy enterprise and, among other things, it pointed out that at the start of the new millennium, energy consumption has replaced industrialization as the national trait that separates rich from poor countries. Our conclusion was that the energy industry ultimately deserved the color Purple, that of the imperial cloak: it will stay around and will dominate for a long time.

Energy consumption will continue to increase and conservation, while it evokes warm sentiments, has never really played a role in cutting total energy consumption. Conservation always addresses the old rather than the new. Energy for the world has been a particularly dynamic process. Energy consumption per dollar of the gross domestic product (GDP) has declined steadily for almost a century and, in spite of their differences in geography and culture, developed nations such as the United States, Europe, and Japan use today roughly the same amount of energy per dollar of their GDP. Even more important is that the dominant fuel has changed from wood, to coal, to oil and, now emerging, natural gas, which will eventually be replaced by hydrogen. The latter, in all likelihood, will be extracted for centuries from hydrocarbons, mostly natural gas.

This de-carbonization of fuels is not just motivated by environmental concerns, which are considerable, but instead it is a historical imperative, tracing the development of more refined, more efficient fuels and the "miniaturization" of the engines of our economy and industry. While energy consumption has been going up the engines of modern society have become smaller, more focused, and more individualistic. Gases in this transformation are superior to liquids and certainly far superior to solids.

Michael J. Economides

The foreseeable future will be dominated by fuel cells, which will be first stationary home units, then micro-engines, and eventually take over the biggest prize of all, mobile engines. Fuels cells will do to the internal combustion engine what it did to the steam engine a century ago. Change of fuels goes with the change of engines. The technological transformation for the society will be nothing short of revolutionary. The economic impact will be in the trillions of dollars.

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It is, thus, ironic that politicians the world over try to stem the torrent of energy needs and changes with small dikes of protectionist politics and legislations, in vain attempts to bolster passé energy forms such as coal. Even more outlandish are environmentalist ideologues, who inundated by anachronistic notions of social conflict, propose highly inadequate solutions such as solar and wind energies, or take even more destructive postures without regard to the importance that energy plays on the workings of a modern society. None is more insidious than the rhetoric about global warming and the preposterous claims of its anthropogenic nature. In any case the transformation we envision surely should quiet any such silliness.

We examine here a prudent and constructive national and international energy policy, one that is free of strident and non-constructive government regulation and one that will contain a number of pillars. These will include a full throttle effort toward deepwater petroleum, a "trillion-dollar" idea, with emphasis on natural gas. Liquid natural gas (LNG) and a new variant, compressed natural gas (CNG), will serve to ameliorate economical production deficiencies among large energy ➢

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consumers by opening up the practically infinite worldwide supply of natural gas and the huge diversity of its sources.

Energy demand and the search for energy sources will also continue to dominate world geopolitics. The transition to natural gas will serve actually to soften future global friction between the current lone superpower, the United States, and China, the superpower-in-the-making. The diversity and volumes of the fuel stand in stark contrast to the concentration of oil resources and the geopolitical vulnerabilities that they breed for all nations.

There is one thing that is certain. Future energy will be colorful and, in turn, will continue to color all facets of human activity and industry.

Biographical Sketch

MICHAEL J. ECONOMIDES is University Professor at the Cullen College of Engineering, University of Houston. Before that he served in senior academic positions both in the USA and abroad. He has had multi-national industrial experience with a major service company and does a wide variety of industrial consulting. Publications include authoring or co-authoring 10 technical textbooks and almost 200 journal papers and articles. He has had professional activities in over 70 countries. In addition to his technical interests, he has written extensively in wide-circulation media on a broad range of issues associated with energy and geopolitical issues. ■