The Electrochemical Society
INTERFACE

# Red, Blue, or Green?

I am writing this column during the home stretch of the presidential election year in the U.S. Notwithstanding the election-year hype and policy differences (*e.g.*, off-shore drilling, nuclear power), both sides of the political spectrum are remarkably like-minded in their approach to energy and the environment. Both parties support "energy independence" and recognize the need to wean ourselves away from our reliance on fossil fuels. They recognize that demand will soon exceed supply because of the dwindling fossil resource base, the India-China effect, and also growth in demand in other developing parts of the world. However, the recent worldwide liquidity crunch and Wall Street woes may well have unseated energy as a focal point of future challenges facing the global community. A comprehensive energy policy (and an economic policy, for that matter) that addresses both short-term and long-term scenarios necessarily transcends political ideologies and this demands a concerted shift from "business as usual" on the part of private and public sectors and by Democrats and Republicans alike.

Energy R&D has always been subject to political winds in this country and to the vicissitudes in the price of crude oil. I started working on energy research problems during my post-doctoral years at Colorado State University in the 1970s. My initial funding support accrued from an NSF Research Applied to National Needs (RANN) project focused on the feasibility of extracting oil from oil shale. This was during a period following the Arab oil embargo and the energy climate was not dissimilar to what it is now. I initially worked on Green River oil shale—the largest known oil shale deposits in the world covering portions of Colorado, Utah, and Wyoming. Roughly a trillion barrels of oil are locked up in this deposit and this represents more than triple the proven oil reserves of Saudi Arabia. Assuming the present U.S. demand for petroleum products (*ca.* 20 million barrels per day), this resource base would last for more than 500 years. There are similar substantial oil sand resources (*ca.* 170 billion barrels) in the Athabasca deposit in northeastern Alberta in Canada, which I researched in terms of their thermal and electrical properties. Oil from oil sand has already emerged as a viable industry creating instant wealth and employment in Alberta and attracting investments from major oil producers. Unlike in the case of oil shale where an *in situ* (underground) retorting scheme is envisioned for extracting and processing the kerogen (the organic oil precursor), a surface mining process (Clark Hot Water Extraction Process or variants thereof) is used for extracting the bitumen from the oil sand. Both processes require non-trivial amounts of water and the environmental impacts of oil production are being debated in both cases.

The momentum built in the R&D underlying the utilization of these alternate energy sources during the 1970s, as well as in other viable approaches based on coal-to-liquid fuels and solar energy conversion, was badly dented in the 1980s when the price of oil dropped to below $10 per barrel. The Republican administration during this period was not focused on energy issues nor did national priorities change substantially during the 1990s with a Democratic regime in place. Energy is at center stage again in the 21st century but funds for energy R&D are relatively sparse and renewable sources have hardly made a dent in our energy mix. Two wars, and concerns with national security, continue to bleed precious funding resources. Worse still, the recessionary trends and the concomitant recent decline in the price of oil may well defocus the underlying supply/demand issues facing our energy and environmental future. All the more reason why a bi-partisan energy R&D policy must be formulated very soon and one which is immune to the cyclical forces exerted by political party platforms, economic/speculative bubbles, and the pricing dynamics of petroleum-producing cartels. In other words, such a policy cannot be red or blue but mainly green. Stay tuned.

Raj K.

**Krishnan Rajeshwar**
**Editor**

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