

REALIZING A CARBON REGIME

A VIABLE ENERGY POLICY NEEDS TO BALANCE CLIMATE CHANGE AND ENERGY SECURITY

I have been to quite a number of conferences recently. PowerGen, of course, but also three different events focused on carbon and related issues. This is what I have heard.

Monetizing carbon

Julio Friedmann, Carbon Management Program Leader at Lawrence Livermore National Laboratory (Livermore, CA) opened a presentation by stating that the current rate of polar ice cap melting was not predicted to occur until 2040 - 2050. The general consensus is that the Bali accords will coincide with the timing of the Kyoto Phase 2 and that the requirements will converge in 2012 - 2013.

There is significant enthusiasm for local and regional Cap & Trade initiatives, but they are nationally inconsistent. This has resulted in what one described as "carbon federalism." The logical outcome is some form of overriding national standard.

This issue is currently being sorted out in the U.S. Supreme Court. A national standard is all well and good, but does raise the question of "where have they been?" My guess is that we are headed to the national standard which, unfortunately, will have a lower ramp rate (adoption rate), given the current administration's bias, but at least it will be a ramp.

CO₂ is currently being traded at \$32/m.t. (metric ton) on the European exchanges. One of the key issues is whether U.S. companies will be allowed to offset their CO₂ targets with credits purchase outside the country.

The two speakers that best represented the electric utility point of view are both strong advocates of Cap & Trade, or allocation programs, versus any form of tax incentive. This reinforces my feeling that a tax incentive is a better approach.

I have already gone on record as favoring a tax form because it eliminates the need to set the cap, which I see as favoring those with influence. One of the speakers advocated for a \$50/ton safety valve, which I take to mean a price cap. I do not see why this is required.

All the efforts on capture and sequestration are focused on demonstration programs, either under phase 3 of the Regional Partnership Program, or the U.S. Department of Energy (DOE) Clean Coal Power Initiative. One of the speak-

ers identified all of the existing and planned projects. By his count, these projects would capture 26 million - 27 million metric tons per year (MTY) by 2025. A recent Electric Power Research Institute report established a goal of 500 MTY by 2030, to achieve a 550 ppm CO₂ atmospheric concentration level.

The scale of both the problem and the actions required is still not yet understood. Scott Klara, DOE's Technology Manager for Sequestration, put things into perspective. According to Klara, one million metric tons of CO₂ in a supercritical liquid state would fill the volume of the Empire State Building. A 600 MW coal plant would generate four million tonnes per year.

The U.S. produces 6.0 billion metric tons (6.0 giga metric tons), enough to fill the volume of Lake Erie, twice. Not to worry Cleveland, the identified saline aquifer storage volume is 3,700 giga metric tons.

Permitting still appears to be the single most important obstacle. There remains considerable confusion on property rights issues involved with geologic sequestration, and as Julio Friedmann stated, "If you do not have a storage site, you do not have a project." And according to another, a property rights analysis did not lead to a lot of clarity. This does not sound good.

Energy portfolio

There is a lot of talk about renewable resources, such as wind, solar, biomass and geothermal, and of all things, nuclear is making its return as a green energy source. Not everyone is on board with this though.

An issue that drew the utility's attention has been the impact of the Renewable Portfolio Standard (RPS). One of the speakers at PowerGen saw this as a "mandated waste of time," since some areas of the country do not have much of a renewable resource. I guess this means wind. The other was quick to characterize RPS as Demand Side Management (DSM) and Efficiency, and stated that no new coal or nuclear facilities would be permitted until DSM and efficiency alternatives were fully explored.

Mark Savoff, Executive Vice President Operations for Entergy, empha-

sized the need for existing coal to survive, and advocated for bolt-on retrofit options for capture. Patrick Moore, Co-Founder and former Leader of Greenpeace, who stated that he wanted to advocate for, rather than against, has become a leading proponent of nuclear power, categorizing his former organization as the biggest single obstacle to progress. According to Moore, Green peace opposes all options that address CO₂.

Andrew White, President of GE-Hitachi Nuclear Energy, informed the PowerGen audience that every one of the existing nuclear facilities has filed for or received a 20-year extension on its operating license. White also referred to a nuclear technology that caught my attention.

The Prism or S-Prism reactor is a class of fast breeding reactors Liquid Metal Fast Reactors (LMR). These designs have a reported breeding ratio of 1.22, which is a nuclear reactor that consumes fissile and fertile material at the same time as it creates new fissile material. According to an S-Prism Fuel Cycle Study published in the ICAPP '03 proceedings, a typical 1,000 MWe Light Water Reactor (LWR) will produce about 1,000 metric tons of spent fuel and require the production of 11,000 metric tons of depleted uranium over its lifetime. An equivalent S-Prism reactor will produce little waste and consumes less than 1 metric ton of uranium-238 per year.

In general, the portfolio discussion at PowerGen did seem more balanced this year. In prior years climate change issues alone were driving policy and action, and debates were conducted at the extremes. This year, the climate change issue was balanced by the realities and demand for energy security as well. It is only from such balance that a viable energy policy can emerge. ■

Author

Peter Baldwin is an industry consultant (www.base-e.net) and former executive of Ingersoll-Rand Company's Northern Research and Engineering Corp. (NREC) subsidiary. Reach him at pete_baldwin@base-e.net.

