

Empowering America: The Search for Energy Sources

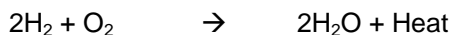
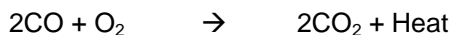
The use of oil as a source of energy has made life so easy for us that we hardly give thought to the fact that one day the supply will be exhausted. For instance, we have overcome the crisis of the 1970s which led, *inter alia*, to the development of cars with high fuel economy, and today our desire for mobility centers about the power of sports-utility vehicles.

Many possibilities are being explored for alternate energy sources, all of which carry operating pricetags that far exceed the cost of oil - up to now. Researchers have proposed that the federal government increase taxes charged on oil-burning energy sources, such as to make the price of energy from alternate sources comparable with the inflated price of the oil source.

One major area for which this principle has been proposed is the generation of electric energy. The use of oil or coal will produce carbon dioxide, which is released to the atmosphere. Electricity producers have been instructed by various government bodies (EPA, NRECA, DOE, etc.) to restrict the emission of carbon dioxide, because of its relatively high density and specific heat, and therefore its ability to store heat adjacent to the surface of the earth. To meet these limitations, some electric utilities have resorted to a process that was popular during the heyday of the American steel industry - burning coal in air to produce Producer Gas, and using the white-hot coals to reduce steam to Water Gas. Ideally, the two processes are operated simultaneously, using a mixture of air and steam and deriving a mixture of hydrogen, carbon monoxide, carbon dioxide and nitrogen. The chemical reactions may be illustrated:



This method, described by Massachusetts Institute of Technology (MIT) researchers as Integrated Gasification Combined Cycle Technology, uses some of the calorific energy of the coal to generate the gases, and is therefore more costly to operate. It has the distinct advantage of producing no fly ash from the smokestack; all of the gases from the gas producer are filtered and fed to the steam generator, where the combustibles are burned with additional air:



MIT researchers have pointed out that the only way in which this method will find acceptance is for the government to increase the carbon dioxide emissions charge to equal the higher cost of using this system.

It is of interest to note that in the United Kingdom, the system has been used along with "Carbon Capture," a method of recovering the carbon dioxide generated at the steam boilers, thereby achieving zero emissions.

The MIT researchers have tossed up this method, with its political implications, against nuclear generation, widely used in other parts of the world, but not favored in the USA. Perhaps the Tallahassee Scientific Society can allay the popular fears surrounding nuclear generation, which is proving to be the cleanest and most cost-effective alternate to oil. It is time that our researchers also find an application for nuclear waste; the Society may be able to assist in this endeavor, too.

From Our President

By Barry Boerner, Ph. D.

I read an interesting editorial in *Science* called "Framing Science" by Matthew C. Nisbet and Chris Mooney, where we are called to

actively "frame" information to make it relevant to different audiences. Some scientists have embraced this concept, while others continue to hope that merely increasing the general public's general knowledge of science will result in their viewpoints becoming more like ours. Unfortunately, it seems that

citizens use their value predispositions (political or religious) to screen the daily torrent of news clips.

The use of “frames” to organize central ideas and concepts that are worded to resonate with core values and assumptions allows citizens to rapidly identify why the issue is important, who might be responsible, and what should be done. It is important that accurate facts be presented to overcome the “framing” done by administration spokespersons that emphasize “scientific uncertainty” or “unfair economic burden” and encourage the status quo and inaction on the issue of global warming, for example. Other topics have been framed in religious morality (ID, for example) to further muddy the waters.

The evolution issue also highlights the need for any such messages to be positive and respect diversity. The authors feel that “many scientists not only fail to think strategically about how to communicate on evolution, but belittle and insult others’ religious beliefs” which results in further alienation and reduces any chance that those citizens will come to accept evolution as a valid concept.

Sticking safely to the facts only provides additional opportunities that they will be repeatedly misapplied and twisted to support the opposing ideas. We are encouraged, rather, to strategically avoid emphasizing the technical details of science when trying to defend it. The public still likes a good story, and will “tune out” the dry, factual discussions that support the proper conclusion. It would seem that our best approach is to get one-on-one with citizens and get to know them, so we can better “frame” our discussions to emphasize their core values and world views. Perhaps we should become something like “evangelical scientists” to “win the lost” of the world. I fear if we do nothing different, interest in science and reason as thought processes may disappear altogether (hopefully the need for technology and the comfort that it brings will keep this from happening).

I encourage everyone to become more proactive in promoting science to the public in a positive and inclusive manner.

Tidbits

- HAPPY BIRTHDAY, TSS! Tuesday, May 23, marks the eighteenth birthday of Tallahassee Scientific Society. Founded on that date in 1989, the Society responded to the need to improve scientific awareness and literacy in our community, to enhance education in the sciences, and to provide a forum wherein professional scientists and technologists may “exchange notes.” As we look back over eighteen years, we see that many of our initiatives have “slowed,” and need to be revived. The call is extended to ALL members, to rise to the occasion, and share in restoring our Society to the high ideals that attended its founding.
- THIS issue of the Newsletter will cover both May and June, 2007, both because of limited contributions for publication, and because our Editor is going to be “out of circulation” for at least six weeks, undergoing major surgery. As our Society develops in the future, we will be better prepared to have deputies to carry our proverbial batons whenever someone has to be away from office.
- Please remember to attend the memorial service for our late Board Member, Dr. Dave Gruender, on Thursday, May 24, at the Werkmeister Hall, on FSU Campus. Our Treasurer, Dr. Dave Edelson, a close friend of the family, will speak on behalf of the Society.