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Three Blind Men and the Elephant

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Three Blind Men and the Elephant

Just like the blind men in the popular story of perceiving the elephant, the three major constituencies participating in the energy debate have greatly different perceptions of the problem.
The constituency that is worried about climate change believes the energy problem is caused by profligate use of fossil fuel that has dramatically changed our atmosphere.

The energy security group sees dangerous reliance on foreign sources of oil increasingly held by countries hostile to the US.

The economic vitality group sees high energy prices and their effect on the economy and our life-style.

Just like the blind men, each of the three constituencies perceives a different problem. And just as with the blind men, while each perspective is right as a piece of the elephant, it takes all the perspectives together to actually solve the problem.

Environmentalists focus on solutions responding to the scientific consensus that greenhouse gases are creating rapid climate change. The tipping point has come: it is now a consensus position among scientists the global warming is being affected by anthropogenic activity to 90% certainty according to the last IPCC report. Although they still struggle with the prediction of how much global temperatures will rise if we do nothing – is it 5 deg or 10 under BAU? This group believes that we cannot afford to take a chance because we get only one chance. We can not afford to do this kind of experiment with the Earth. Any choice which decreases our CO_2 footprint is favored, even if it means a decrease in standard of living.

The energy security constituency sees the geo-politics of oil becoming increasingly dire. They look at oil money being used to fund anti-American activities of groups such as the Wahabis in Saudi Arabia, Hezbollah in Lebanon and the infamous Al Qaeda. They quip that the Iraq war is the first war where we are paying for both sides. They note Iran and the Shia throughout the Middle East seeing the possibility of controlling 2/3 of the world's oil. They see oil and gas being used by Russia to exert political power using the gas tap and Hugo Chavez in Venezuela clearly anti-American and now a virtual dictator who controls 15% of our oil imports. Conflicts in Nigeria over oil wealth and corruption affected our oil supply. Countries such as China are at best unwilling to join political action against countries such as Sudan that supply them oil, and at worst, selling them arms in order to cement their relationships with respect to importing oil.

This security constituency favors ending our vulnerability by ending our "addiction to foreign oil". This group thinks that there is no domestic source of energy that is bad. They will be happy to see our corn turned into ethanol; our coal turned into liquid fuel for transportation. No matter that the price of tortillas doubles in Mexico, we expand corn farming at the expense of the environment, our tanks and pipes in gas stations corrode

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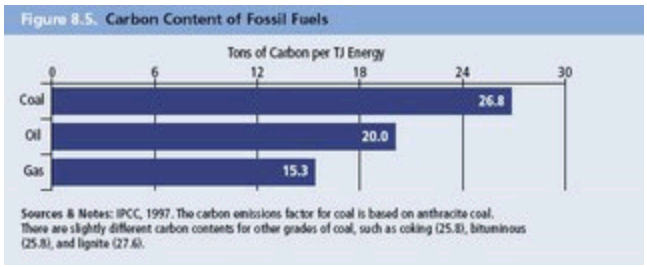
and leak, or we make liquid fuel from coal-thus increasing the carbon footprint by 30% per unit of energy.



http://climatechangeaction.blogspot.com/2006/10/peak-oil-climate-change-and-oil-sands.html

The economic vitality group sees increasing international demand for oil occurring simultaneously with a peaking supply of light sweet crude. They see an oil market where higher prices drive more production of oil which is heavier and more sour (supply follows demand). However, fast growth in world-wide demand increases even faster and prices will go up. For example, China adds 10,000 cars per month, and there is an uncanny correlation between the price of oil and the amount of oil imported by China. The security contingent also worries about reliability of supply as affected by pipeline leaks in Alaska or hurricanes or potential terrorism. This constituency thinks the problem is one of capacity and favors solutions that will increase oil production, reservoirs, pipelines and refineries. They believe that the energy system will be determined by the market and want solutions that favor investment in capacity.

What the environmentalists don't seem to get is climate change by itself will fail to gather broad enough support to achieve the environmentalists' goals. People will not likely choose to shiver in the dark for a climate problem which is intangible to them. Where environmentalists have been successful they have built coalitions with other constituencies. As an example, the renewable energy portfolio standards (RPS) in California, Nevada, New York, and Texas etc. are supported by people who want to lower emissions to protect air quality, or protect the state from energy supply crises or promote economic development within the boundaries of the state. The adoption of an RPS addresses a coalition of interests. In Nevada, there was an effort to change the RPS to a low-carbon portfolio standard. The effort failed because those who were interested in economic development or energy security in the state saw no benefit. Security hawks who drive Priuses (Prii?) are another example of people who favor an solution to reduce oil imports that also favorably affects climate.

What the security contingent doesn't seem to understand is that the concept of energy security also needs to include the security for areas of the globe that will be affected by climate change. Climate change will have profound affects on the ability of the developing world to thrive. Water supplies – for example the glaciers in the Himalayas which supply water for much of SE Asia are melting, droughts in Africa may become worse, rising sea levels will displace millions of people, traditional agriculture may fail, fish may die out and ecosystem service in general may fail. Vast populations may find

themselves without homes, food or water and will become ripe for becoming violent to get what they need to survive. So, if the security contingent wants to support the use of abundant domestic coal to avoid importing oil, they should also support CO_2 capture and sequestration to control the emissions. They should not make choices solely to address the current military crisis in the Middle East. Security should come to mean the security of our way of life – including sufficient water, air, food, health etc. Looked at in this manner, climate change is fundamentally a security problem.

What the economic constituency doesn't seem to completely get is that changing our energy system to meet climate and security needs will be an economic stimulus. New industries will be born to meet these needs and these will generate revenue and jobs. Countries such as Japan and the UK, and states such as California have understood this and are preparing to lead the way with new technology and businesses. In California, the venture capitalists were instrumental in helping to influence the legislature to pass AB32, the state's law that mandates an ambitious carbon cap of
– A return to 2000 levels by 2010
– A return to 1990 levels by 2020
– An 80% reduction below 1990 levels by 2050

By 2025: That's a reduction of 382 tons of carbon dioxide, the amount of carbon spewing from 43 coal-fired power plant stacks each year. These business men see a new opportunity for technology to solve society's problems and make some of them quite rich in the process. A study released by UC Berkeley last year projected that reducing so-called greenhouse gas emissions in California would create 17,000 jobs and add $60 billion to the state gross domestic product by 2020.

http://www.sfgate.com/cgi-bin/article.cgi?file=/chronicle/archive/2006/10/15/ING3JLM9791.DTL :

Bob Epstein, co-founder of Sybase, GetActive Software and Environmental Entrepreneurs: "California is exporting nearly $30 billion every year -- that's $2,500 from every Californian household -- to buy imported fossil fuels. AB32 will bring that money back to California,"

"Sustainable technologies are the next big thing ... the mother of all markets," proclaimed John Doerr, the venture capitalist who helped to start Google and who recently doubled the size of his investments in green technologies.

A successful response to the energy problem will require the three constituencies to share perspectives and to support common solutions, of which there are many.

As an example, energy efficiency and conservation meet the needs of all three constituencies by reducing oil imports, lowering emissions and increasing energy security.

Perhaps the largest problem with efficiency is our time horizon. Efficiency generally requires that we spend money now to save energy, and therefore money later. We need to understand and overcome the barriers to these investments whether they are cultural or there is a real economic problem. There is a strong role for a regulatory approach to overcome these barriers. For example: Building codes, CAFÉ standard, appliance standards all respond to this issue.

In the electricity sector the problem is that utilities make more money the more electricity they sell. "Calling efficiency the "fifth energy source," Duke CEO Jim Rogers recently told members of a Senate Energy and Natural Resources subcommittee that Congress should encourage states to change their regulatory models to break the link between earnings and power generation. ..Rogers also suggested that the true paradigm shift might occur if utilities made efficiency part of their standard service, from which consumers would have to actively opt out if they do not want to participate. http://www.eenews.net/eenewspm/2007/02/12/#2

Fuel switching and system optimization is difficult to implement. California has a loading order for utilities that require them to use efficiency first, then renewables, then nuclear, then gas, then oil, then coal. However, EPRI planning documents show that all their analysis is based on loading according to cost. We will need a price for carbon if we are to employ the market. You will hear about this today from Jay Apt.

Transportation accounts for about 1/3 or our carbon footprint. You will hear from Dan Sperling today on how to ensure our transportation Hydrogen for transportation is a long-term research problem – where do you get the hydrogen from?

Nuclear power can provide emission-free base load electricity allowing plug-in hybrid cars, reducing oil use and revitalizing our nuclear power industry for the world market. We need to reduce the cost of domestic nuclear power plant construction, something that should be quite possible given the advances in construction technology achieved over the 30 years since we built a nuclear power plant in this country. We also need to deal with the waste. Nuclear power is otherwise perfect from point of view of energy security and climate. The externalities of nuclear power are different: the waste and the non-proliferation problems. Per Peterson will talk about this.

Coal is the most abundant and inexpensive source of energy and coupled with underground sequestration of CO_2, we can use this source and also address climate change. Coal-to-liquids considered as a way to off-set oil imports would have little impact on climate if we include the capture and sequestration of resulting CO_2 emissions. We need to see a better assessment of out ability to do CCS at the scales required and I believe you will hear more about this from Ernie Moniz and Alex Farell today.

The three blind men are all looking at the same elephant and seeing different parts. Our best hope for success is that they share perspectives and support solutions that respond to all three perspectives. However, it is the case that two of these constituencies largely solve the third. If we make carbon the clarifying concept and work to make least cost solutions, we will automatically solve the security problem. We will reduce energy demand through efficiency, use more renewable energy and do the research to make renewable energy lest costly. If on the other hand, you start with security, you could pick solutions that either have little effect on the climate problem or at worst, increase our green house gas emissions significantly. If you start with climate and find solutions that are economical, you will on the way solve the security problem thus you essentially will solve the whole problem. The trick is that we have to have climate solutions that are also economical.

I might add here that I am largely talking about the energy problem of the first half of our century. This problem in this time horizon is dominated by the need for early action on the climate problem and the urgency of oil politics. Much of our energy system infrastructure has 50 year life spans. Much of what is in use now will be in use for decades and what we build now will be with us throughout the lifetimes of current adult population. The solution will be largely dominated by an expansion and refinement of existing technology with the need to use this technology wisely and control costs. In contrast, the energy system of the second half of the century will likely be dominated by the research and development we do now. In the near term, there will be no silver bullets that take care of everything. In the far term, there may be a silver bullet which projects like Helios at Berkeley are aiming for.

In the near term, we will be slinging all our arrows. The problem is a systems problem. This means it is critical that we figure out what sets of existing energy sources, carriers and end uses provide us the best target energy system from a climate, security and economic standpoint. And even more importantly what societal choices will maximize our chances of reaching these targets. What policies, regulations, R&D, infrastructure investments will help us realistically transform our energy system to one that is climate friendly? [This is exactly the subject of CEMAC – the Calif Energy Modeling and Analysis Consortium – including LLNL, LBNL, Stanford and UCB -- . This group has come together to develop a new energy modeling architecture that will allow us to examine these choices and provide the basis of making deliberative societal actions which are more likely to yield the target energy systems we desire. We have AB32 in California, our current Congress is pushing to enact similar legislation, but once we have these carbon caps how will be implement them? How will we account for the adoption of new technology and uncertainties about the future in making these choices. CEMAC is working to develop tools to answer these questions.] We need to be a lot more deliberate than lurching from hydrogen to ethanol.

In summary, Bob Williams of Princeton mentioned this quote to me from Karl Popper in "The Open Society and Its Enemies"
"Instead of posing as prophets, we must become the makers of our fate."

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[Karl P. Popper, "The Open Society and Its Enemies, Volume II, The High Tide of Prophecy: Hegel, Marx, and the Aftermath," Chapter 25 (Has History Any Meaning?). p. 280, Princeton University Press, Princeton, New Jersey, first paperback printing, 1971.]

It is exactly this that we need to do with energy in the 21st century. We must become the makers of our energy, climate and security fate. Let's hope we have the wisdom and capacity to make one of the largest possible changes in human behavior ever required.

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