



Peak Oil and the Environment Day 2 Part 1

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[Julian Darley](#) seems to think that the world may be reaching Peak natural Gas. This has considerable impact on likely future supplies of LNG to the US, and to everywhere else for that matter. It was the first statement he made in chairing the last panel of the "Peak Oil and the Environment" Forum in D.C. this afternoon, but it was also the last statement I heard at the meeting. I had to leave for my flight, and with the program running just enough late I missed both it and the last presentation (and me with only 17 pages of notes from today).

So how was the last day? It began with the [Hon. Mona Sahlin](#), Swedish Minister for Sustainable Development and a member of a Government with the intent to "increase social happiness" as a goal rather than "filling the gap" between projected available oil and gas and supplies. And so Sweden will move towards independence from imported fuel, with a [Commission](#) that is developing a plan to achieve this. The plan is helped by the extensive use of [district heating](#) where houses are heated collectively from central boilers (as happens on the odd campus in the United States). By using biomass to provide that heat (61% of the need) they can go a fair way toward their target. In order to change fuels since, as they say "they love the car, but hate the gasoline," they are adjusting taxes and provide incentives such as free parking to drivers of hybrids and biofueled cars. They are also investing heavily in research into getting gas from biomass and across the board R & D to develop alternate technologies and resources. (It is paying off, since this technology is now the 8th largest export commodity).

[Nate Hagens](#) then took over the chair for the morning session. He is influenced by the work of [Joseph Tainter](#). I should have mentioned Dr Tainter, who gave the last talk, after dinner, last night, but having compromised my anonymity by taking too many notes as it was, and having by then met Ken, I am left only with the memory of an intriguing speech that made an analogy with the fall of the Roman Empire and other regimes in history.

The theme of the morning was nominally the potential supply that we should look for, as oil falls away. (And, as a note to Jerome and others I will try and report what was said, rather than my opinions, though those may follow in a subsequent post). The first talk was by [Cutler Cleveland](#) who pointed out that the hydrogen supply will cost more, and do less than it is currently touted to perform. He also noted that the process to license new nuclear power plants [has begun](#). His main theme was to provide EROI (Energy Return On Investment] data for the major fuel sources and was the first to "rubbish" ethanol. (He was kinder to oil shale). He made a point of noting that he only accepted information from peer reviewed publications - information from the rest is "junk." (Pause for a round of "Any old iron? [Any old iron?](#) from your "rag and bone" correspondent, repair the glass and move on). He has set up a web site for his work, and to get additional information on justifiable values for energy balances and costs.

He was followed by [Daniel Lashof](#). Since Governor Schweitzer had mentioned that his dog was 6% more popular in his state than he, the Governor was, Dan brought a toy dog to the podium to palliate the masses. He divided the possible answers to our supply problem into green (good), which included ethanol, and brown (bad) fuels, which latter included oil shale and tar sands. During his presentation I began to feel that the [polar bears drowning](#) may be the ecological "one-sheet" for this year. Tar sands are "a real and present danger to the environment." He cast doubt on EROI calculations by pointing out that no-one seems concerned that it takes 3 units of coal to make one unit of electricity. He also suggested that, with some skilled knowledge, the ethanol supply could be produced from a much smaller acreage than is commonly supposed.

It was obviously bed time, since [Charles Hall](#) the next to the podium, was so anxious to find his bed-time toy (a rabbit) that he was reduced to pulling it out of a hat at the end of his talk. He suggested that all our concerns and information was based on the work of [Jean Laherrere](#) and suggested that, to be considered, any new alternative must be able of being scaled up to generate 5 Quads (or exajoules). His team, he had about 5(?) students with him, are working with [J.S.Harold](#) and are trying to get a handle on EROI issues and (if I read the curve correctly) he was projecting that based on EROI issues, that this will kill most further conventional oil development by somewhere between 2015, and 2025.

He was followed by [David Pimentel](#) who bluntly stated that we have too many people for our resources. We are adding quarter of a million folk a day, and 3.7 billion of the population are malnourished. In the U.S. we eat 2,200 lb/person/year and we should eat only a third of that. 99% of our food comes from the land, and <0.1% of the sun's energy is captured by crops (against 20% by PV). And while he wished that biofuels and ethanol would save us, the EROI, and soil losses, prove that this is not going to happen. We get, 100 gallons of ethanol/acre of corn and this contains around 19,400 kcal/gal against an input of 25,000 kcal/gal. He pointed out that those who criticize his numbers do not include farm machines; processing machines; hybrid corn; irrigation; environmental impacts; by product credit; and similar items. He drew attention to the latest DoE information that we produce 3.4 billion gallons of ethanol a year, which is less than 1% of the fuel used by our vehicles (I am typing with a [rapped knuckle](#) for a minute). We need 1,700 gal of water/gal of ethanol and corn causes more soil erosion than any other crop.

[David Blittersdorf](#) gave a talk on the wind power business which he started after figuring out the coming of Peak oil, in 1997. He mentioned that Israel [mandates solar hot water](#), and that most of the technology that was lost when solar firms went bankrupt in the 1980's is coming back. He pointed out that if it wasn't for the wind-powered water pumps the early steam trains would have never made it across the United States, since they watered every few miles. He went through the current sizes of machines, manufacturers, and pointed out that the latest machines have a span the size of a 747 wing and EROI is moving from 15-40 toward the 80 - 100:1 of the most modern systems. Germany leads with 18,428 MW installed, Spain is next (10,027) and we are third at 9,149 MW, the world total was 59,000 MW in 2005. Small domestic wind systems are still more expensive than cars, but the price is dropping. He also described the building that they created that includes a ground source heat pump (GSHP) solar, wind and wood chip heat. He recommended (to audience applause) that we move to electric mass transit.

The nuclear part of the morning was provided by [Claudio Filipone](#) who explained how nuclear reactors worked, the problems that he saw at Yucca Mountain (disclaimer - I have done some work on that problem) and pointed out that even if that site worked, then we would still need 9 of them to deal with the problem. The current system is grid-locked and nothing is moving forward. Further the current system is oriented against innovation, and locked in to earlier designs, not accepting recent developments. One of these is [The Clean And Environmentally Safe Advanced](#)

[Reactor \(CAESAR\)](#) The reactor principle, if I understand it, is that the reactor first creates the plutonium as it works, and then burns it as it continues to work, so that it does not need refueling. I felt that it is very worthwhile to chase down and read some of his papers (and wished he'd spent more time on that part of the presentation).

My notes on the discussion are embarrassingly brief Dr Lashof said that our objective should be to stop global warming, and that CTL should be taken off the table.

Dr Hall noted that most solutions scare him, and the only thing worse than running out of oil, is not running out of oil. We need to look at demand side control, and how this affects where we live.

Dr Pimentel noted that switchgrass does not fix nitrogen in the soil, and while soybeans do, they give a lower yield of fuel. We must reduce fuel consumption (the target should be by 50%). We cannot continue to use coal, and must find a low carbon alternative, such as solar or a similar technology. We can replace coal use in the US with Natural Gas, but this is not going to work in India and China.

Unless we create a carbon tax coal will continue to be a major part of the program. We teach a million students a year, we teach conventional economics as though it were real. We need to see the end of "Faith Based Economics".

We need political leadership - Germany showed that this would work with their commitment to wind power, and its success.

Silver bullets only kill vampires, we need the right tools for the job. Further we need to look at integrated solutions rather than trying to solve the issue with only one of the available answers.

The market will drive the answer and we need to engage those that have money.

We need to consider soil erosion more critically and salinization, we use 80% of the water in Nebraska for irrigating corn. It takes 500 years to make 1 mm of topsoil, and you need 6 inches to grow crops.

Dr Hall commented that he was currently being funded at \$6 million to study frogs in Puerto Rico, but had had nothing to study energy - checked with rest of panel they hadn't either. The money that is being provided is going to engineers (ed. Note a disclosure - I am an engineer). We need to put money into the policy realm so as to drive funding to engineers into the areas where they will develop what we want. But bear in mind that the problem is long-term and we think short-term.

It was then time for lunch, and since this is getting long, I will also break here, and resume on the morrow.



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