

Today's Notes:

1. **The New Energy Reality: From Star Wars to Smart Grid**
2. **New Abundance of Hydrocarbon Energys**
3. **Stephen Chu Interview**

1. THE NEW ENERGY REALITY

Can anyone ever forget the Reagan Administration's dalliance with Star Wars? President Reagan was roundly criticized as having had the epiphany while watching "Torn Curtain" a 1964 movie starring Paul Newman that spawned the idea of making the country impervious to missile attacks. On March 23, 1983 President Reagan surprised everyone by charging the US scientific establishment to rebuke their nuclear past by building such a defensive missile system capable of making nuclear arms obsolete. \$26 billion was allocated over 5 years to the research.¹² 26 years later we are thankful that President Reagan pursued this line of research. Iran, North Korea and possibly even Venezuela could very well acquire or build significant long range ballistic missile capability within the next decade.

That was "Star Wars." Today we have the "Smart Grid" referring to a complete overhaul / rebuild of electrical transmission grid of the United States. On Monday May 18th Energy Secretary Stephen Chu gave a very good interview on the Smart Grid **and with it the new energy reality** of the United States and perhaps the rest of the world. Up till that time no one could tell me just what a smart grid was. It is stunning how quickly American innovation and expertise can dream up new solutions to problems. It is, however, disappointing that the environmental problems of a hydrocarbon-based economy and the more difficult but related problems of peak oil and our dependence on foreign suppliers were not addressed long ago.

For example, a buildout of nuclear power beginning in 1983 would have solved all three of the aforementioned problems. Excess electrical generating power is easily converted to hydrogen, waste heat and the catalyst for the electric automobile would have been at hand a decade ago. Perhaps this would have saved General Motors and Chrysler from their now certain ignominious fates. But Three Mile Island and Chernobyl intervened. Alternative energy advocates believe these events to be Godsend. More sober analysts realize that we are far behind the curve on nuclear energy in every respect – importing most of our uranium when it exists in abundance in this country and Canada.

But I must laud Energy Secretary Chu for his forthright discussion of the new energy reality while hosting a conference at the White House this week. Though I am convinced that the

¹ Others have claimed that President Reagan's inspiration was a 1940 movie, *Murder in the Air* in which Reagan had played an American secret agent charged with protecting a newly invented super weapon, the "Inertia Projector," capable of paralyzing electrical currents and destroying all enemy planes in the air. Still others claim that he generated the idea of missile defense after a 1979 visit to NORAD at Cheyenne Mountain.

² In a speech on March 25, 1983 he said he wanted to embark on a long-range research-and-development effort to counter the threat of Soviet ballistic missiles and to make these nuclear weapons "impotent and obsolete."

budgetary estimates for this megaproject are too low and the timeframes too short – he has embraced the problem head on. Here’s what he says:

1. The Smart Grid will require two decades of re building to allow 15% to 25% of our energy to be renewable, wind and solar.
2. It will cost \$4.5 billion (in Pres. Obama’s current stimulus bill) to begin the buildout.
3. The new smart grid will allow peak use pricing (selectively) and will engage base load energy production when the *sun ain’t shinin’ and the wind don’t blow!*
4. Peak use pricing will shave 1% of peak load requirements; reduce the need for stand by base load capacity and save “billions of dollars” per year.
5. ***“The smart grid is also needed also to manage two way flows. As plug in hybrids get to market penetration we would really need to manage these two way flows. So that you are storing electricity and you are sending it back to the grid.”***
6. The new energy reality will not put our way of life at risk as some critics have claimed. Instead it will save our lifestyle.
7. American technology and innovation applied to the SG will eventually drive the price of energy lower.
8. Carbon capture and sequestration is in the future but conservation and energy efficiency are much more important today. There will be a carbon cap and trade system.
9. Nuclear energy is important but cannot provide more than its 20% of our current electrical needs. The DOE is providing \$18.5 billion in guarantees to jump start the nuclear industry.
10. Auto makers will fall under the new energy reality. Washington (specifically the DOE) will be making loans to the automakers to help them build the cars (Hybrids or electrics) that are required.

This is the most precise statement of the government’s intentions relative to the new energy reality that I have heard. Secretary Chu has revealed the grand plan for exiting the hydrocarbon era. This includes plans for electricity production, environmental remediation, global warming, renaissance of the USA auto industry under government control and infrastructure.

The new energy reality will be run by the government. The positioning is now almost fully in place. Government will decide on real time energy pricing schedules. Government will decide where the electricity flows and when it flows. Government, through auto czars, will decide on subsidies and loans and the types of cars that our automakers can produce and by implication the types of cars. Government through the EPA Czar has already decided that CO2 is in fact a global warming threat. Government will decide on pricing of carbon, the rebates and for how long the rebates will last. I would look for General Electric to be a very big player in the new energy reality.

This overreaching program is now close to being a fait accompli. It is a brilliant framework that has been crafted quietly but carefully. The fallout from the new energy reality will be increased prices for energy – some of which will flow through in taxation for health care and debt reduction programs.

There are a few “buts.”

First, as Dr Chu suggests wind and solar are variable energy sources. As such they are expensive. This makes the new energy reality a hybrid system which must have either coal or nuclear for base load generation capacity. We favor both sources.

In addition Dr. Chu indicates that the Smart Grid will take 20 years to build. At the end of that time only 15% to 25% of the energy will be alternative. One must ask what energy sources will be green enough to complement wind and solar to the extent of 75% of total US energy requirements. Further the Smart Grid is being developed so that hybrid electric vehicles can be accommodated. Once again we wonder how quickly hybrid electric cars will become a significant part of the scene. It would certainly seem that for the next decade or two we are stuck with hydrocarbons. Let's get drilling and stop procrastinating. I include below the text of the Bloomberg Interview with Dr. Stephen Chu. Please read it carefully.

Smart Grid isn't Star Wars, central planning, anyone?

2. ABUNDANCE

There is an apparent abundance of new natural gas and oil discoveries in the world. The problem is that these resources are not readily available. Cuban sources say that that country could enter the top 15 in oil and gas production within a decade. The U.S. Geological Survey estimates that Cuba's offshore fields contain about 5 billion barrels of oil—comparable to Colombia or Ecuador—as well as 10 trillion cubic feet of natural gas. Last October, however, Cuba's state oil company unveiled a dramatically higher estimate: more than 20 billion barrels of recoverable crude—a level that, if proved correct, compares to that of the United States.

So much for Venezuela's assistance to Cuba in view of these new potential discoveries. So much for Venezuela's heavy oil. Geopolitics and friendships in the Americas are about to become very clouded as Cuba ascends the energy ladder and perhaps, just perhaps, accepts the Obama Administration's new found friendship.

Many thanks to John Burns for alerting me to the discovery of significant, very high grade gas hydrates (ice) in the deep waters of the Gulf of Mexico. The DOE's Office of Fossil Energy's National Energy Technology Laboratory (NETL) has established that gas hydrate can and does occur at high saturations within reservoir-quality sands in the Gulf of Mexico.

“During the expedition, gas hydrate was found at saturations ranging from 50 % to more than 90 % in high-quality sands. The deposits were also found in close accordance with the project's pre-drill predictions, providing increased confidence in the gas hydrate exploration and appraisal technologies.”

Russia has recently threatened war over the ownership of oil and gas riches in the Arctic that that country claims as her own. The Lomonosov ridge seems to extend from the Russian mainland deep into the Arctic Ocean. It thus may allow Russia to claim a significant share of the gas and oil riches located there. As you can see while we postulate on moving away from hydrocarbons and everyone bemoans the terrible greenhouse gases that are given off, everyone is quietly staking geopolitical claims, exploring and drilling to

find new sources of this carbon-based energy. There are not really good replacements in the next two or three decades – no matter what Washington’s pontificators try to tell us.

Meanwhile Iran and Venezuela cheat on OPEC producing substantially more oil than allowed under the cartel’s recent quota.

Yet we say are moving away from these new short term voyages of hydrocarbon discoveries as suggested by MN 1 above. But are we really? This will require a complete makeover of our energy infrastructure, transportation systems and delivery systems (Smart Grid?). It will also be a significant agent of change for all citizens who must ultimately pay for this.

3. ENERGY SECRETARY STEPHEN CHU INTERVIEWED BY BLOOMBERG NEWS ON MAY 18TH 2009.

**Bloomberg TV
(Energy and Telecommunications Executives Development of the Smart Grid)
Interview with Secretary Of Energy Dr. Stephen Chu Monday, May 18, 2009**

SMART GRID: \$4.5 Billion in the Stimulus Bill is devoted to the Smart Grid technologies. Americans are still trying to figure out what a smart grid really is. Tell me why that money is well spent?

Secretary Chu: I think that when you think of what we are going for, we’re going to go for more renewable energy. Renewable energies are variable. So we need a grid that can slosh the energy back around as wind, for example, stops blowing or the sun doesn’t shine any more. So it is very important to manage the flows of energy when you can’t actually count on a very steady type of energy. That’s one point of the smart grid.

Another part of the smart grid is that it will allow us to do real time pricing. So that we can actually start to charge for electricity at the actual time it is being used. We have a situation in the United States where if you shed 1% of the peak power you could save billions of \$s a year by just shedding that. You don’t have to build stand by power. That stand by power for that upper 1% is really costing ratepayers a lot of money

Limits of investments to Individual Projects. Spending Caps on Individual Projects \$20 million dollars. Should expand (caps) to allow larger utilities can participate?

SC: Well, I think we should look at that but it really depends on if the statute needs modification and it looks like it’s a good case we can work with Congress in doing that.

But let me go back to this other issue. The smart grid is needed also to manage two way flows. As plug in hybrids get to market penetration we would really need to manage these two way flows. So that you are storing electricity and you are sending it back to the grid.

The grid is antiquated; it is not ready for the future?

SC: Well it can be much more ready for the future so I would say now the time to do it. It’s going to take a couple of decades to really modernize the grid to where we can get renewable energy at the level of 15%, 20%, 25%. So we’ve got to start today.

Legislation: Energy and Commerce Committee taking up the first major piece of climate legislation. Your Views? It differs in some key respects from what President Said on campaign trail. Will this president support it?

SC: I think this legislation is a compromise that is a good compromise. I know there are some people who feel it could be a stronger piece of Legislation. I feel that it is very important that we get started. So I am very encouraged by the work of Chairmen Markey and Waxman.

One aspect is the Permits and Allowances that allow industrial polluters to actually put CO₂ into the air. An auction? Yet Waxman and Markey give away 85% of those credits free to industrial producers of CO₂. Is that a problem for this Administration?

SC: What that bill is designed to do as its evolving – is that it has to help America make this transition. In those areas, for example where heavily coal generating states and in the areas of heavily industrial states you want to help the US make this transition. So what Chairmen Markey and Waxman actually doing is to are allow the US to make this transition.

But that being said remember that there is going to be a cap on carbon and that cap will be decreasing each year little by little, 2% per year. That's really going to be the driver that will get this country started on reducing its carbon emissions.

Critics: You put at risk the American Way of Life. You put at risk the American Economy?

SC: I don't think so. I think once you set this long term signal in place, America has shown remarkable innovation. . We will do this in the Clean Air Act in decrease of sulphur dioxide. We will do this with carbon dioxide. Once American innovation really begins to churn it always brings the price down further than what was initially projected

Is the answer carbon sequestration and capture? Is it feasible?

SC: I think there is not just one answer carbon capture and sequestration is one part of it. I would go back to the best things we can do are energy efficiency and conservation.

The first couple of decades the biggest things will be using our energy more efficiently and more wisely.

Is another part of the answer Nuclear Energy? About 20% of US electricity generation now comes from nuclear. Do you see that figure going up in the future?

SC: I think we will have to work hard to even maintain 20% nuclear. Do I want it to go up? I actually do. I think nuclear energy is base load. It's clean and the DOE in this administration will be working to, hard, to restart the nuclear industry.

Are there steps Government can take for nuclear renaissance? Utilities are finding it harder financing to build those new nuclear plants. Can you provide more help?

SC: Yes, What we are doing, there are two major things we are doing today for example we are helping to get the new nuclear reactors for example Westinghouse AP1000 licensed with the NRC. We also have \$18.5 billion in loan guarantees and we are nearing the end of, I think there are 4 finalist companies that are being evaluated for these loan guarantees.

Automakers: are you prepared to give more money out the door for the automakers to help them make more fuel efficient cars?

SC: Absolutely. I think that there we are definitely being prepared... We are accelerating the ability to review and make commitments to the automobile manufactures on these loans.

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