



## Lloyd's 'Sustainable Energy Security' White Paper - Some hits; some misses

Posted by [Gail the Actuary](#) on July 19, 2010 - 10:37am

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Lloyd's hired Chatham House to prepare a white paper on the risks of peak oil called [Sustainable Energy Security: Strategic risks and opportunities for business](#). It seems to me that this new report gets quite a few things right, but it misleads in the direction of thinking things are better than they really are, when it comes to timing and alternatives.

First, what does it get right? The big thing it gets right is what it lists as Conclusion 2:

2. Traditional fossil fuel resources face serious supply constraints and an oil supply crunch is likely in the short-to-medium term with profound consequences for the way in which business functions today.

Some other things it seems to get right include these points, listed as "Conclusions" to the report:

1. Energy security is now inseparable from the transition to a low-carbon economy and businesses plans should prepare for this new reality.

5. Increasing energy costs as a result of reduced availability, higher global demand and carbon pricing are best tackled in the short term by changes in practices or via the use of technology to reduce energy consumption.

6. The sooner that businesses reassess global supply chains and just-in-time models, and increase the resilience of their logistics against energy supply disruptions, the better.

7. While the vast majority of investment in the energy transition will come from the private sector, governments have an important role in delivering policies and measures that create the necessary investment conditions and incentives.

There are quite a lot of other things the report mentions that makes sense as well. For example, it mentions the potential problem with rare raw materials, if we attempt to ramp up production of new high tech devices, such as electric automobiles. It talks about the possibility of new environmental risks from carbon capture and storage. It also talks about water shortages potentially being an issue for electric power plants, especially if climate change causes areas to be hotter and drier. And, as indicated in the conclusions, it talks about supply chain risks, and the possibility of disruption to electric supply, for example, if suitable fuel is not available.

## Where the Report Misleads

### High Tech Alternatives

One of the problems I have with the report is the assumption that the world should be planning to transition to high tech alternatives. Furthermore, the report seems to say that there is lots of money to be made during the transition by those who plan right.

The report starts out with the following quote:

“In some cases, the surprise element is only a matter of timing: an energy transition, for example is inevitable; the only questions are when and how abruptly or smoothly such a transition occurs. An energy transition from one type of fuel (fossil fuels) to another (alternative) is an event that historically has only happened once a century at most with momentous consequences.” ([US National Intelligence Council 2008](#))

I very much agree with the basic statement, that energy transitions take place at most once a century, with momentous consequences. We know we are reaching limits on oil, and that in not too long we will have to transition away from fossil fuels all together. The big question in my mind is **what** we transition to. This quote says **alternative**, and I expect it intends that we read into this quote to mean something like high-tech wind, solar PV, second generation biofuels, hydrogen, fusion, or something else that will allow us to maintain business as usual, since the rest of the paper talks about options such as these.

But at this point, we really don't have any alternatives that can be constructed and maintained in a system without fossil fuels, except some pretty simple things that were used in the time period around 1500-1800 AD --water power, sail boats, low tech wind turbines, animal power, wood, and human energy, for the most part--but these aren't the kinds of alternatives being discussed in the report.

Transitions take such a long time (at least 40 years, according to Vaclav Smil in [History, Requirements, Prospects](#)) that we need to make plans so that at the end point, we truly have a sustainable system. There is not really time for two transitions--one to extend fossil fuels a bit with high-tech add-ons, and a second transition away from fossil fuels all together. So we really need to figure out what we can maintain for the long term, and transition there, it seems to me.

### The Main Impact of Oil Shortages will be High Prices

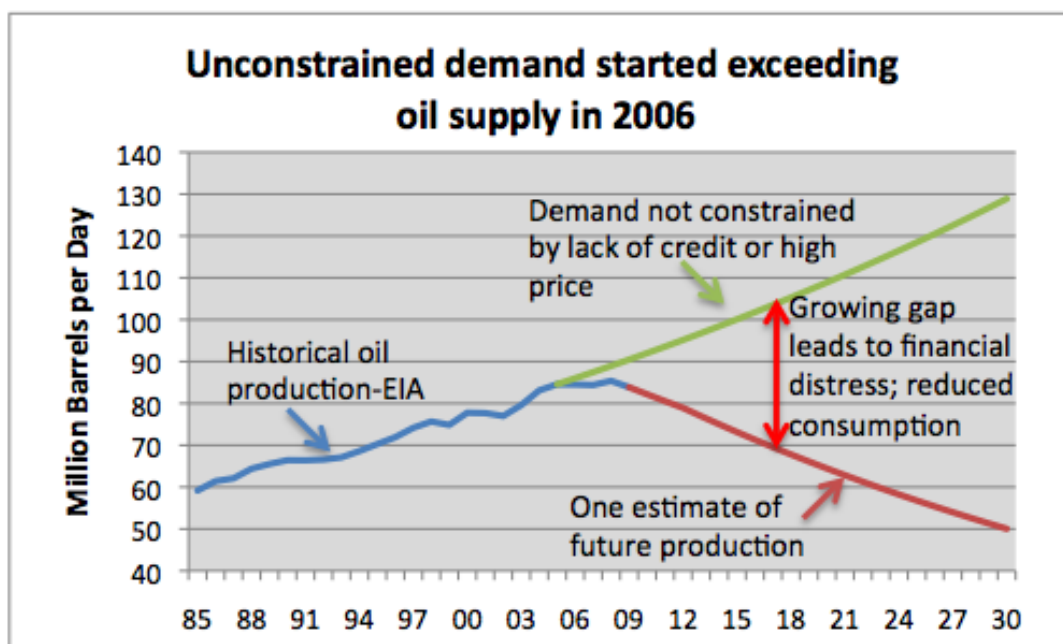
The report seems to assume throughout the standard belief that oil shortages will cause high prices. There is an assumption, too, that this is all still in the future.

It seems to me that the biggest impact of oil shortages is recession--something that is not even

mentioned in the report, and something that companies would do well to learn to adapt to. This means companies would probably do best to concentrate on basics, since people are likely to be buying fewer and fewer discretionary items.

What tends to happen if oil prices rise is that people will find the price of essentials (food, gasoline for transportation to work, and perhaps home heating costs) rising. With these prices higher, consumers will cut back on discretionary spending--vacation trips, new higher-priced homes, new cars, and going out to eat for example. These cutbacks will have a recessionary impact, and will tend to bring down the price of oil (as well as raise unemployment). Many people will find it harder to find the funds to repay loans (either because of the higher price of oil, or because they have been laid off from work, in the recessionary aftermath), so debt defaults will rise greatly as well.

While the report seems to indicate this is all in the future, it is really something that we are already experiencing, starting not long after world oil production hit a plateau in 2005.



We have already begun seeing recessionary impacts and problems with the credit system. We have seen very high oil prices, and a drop back in these high prices to prices which are lower, but still high by pre-2005 standards. In the years ahead, recessionary impacts and credit problems are likely to get worse. It is unclear to what extent oil prices will really rise and stay at extremely high levels. The \$200 barrel level mentioned in the white paper seems very speculative.

Insurance companies are likely to be hit particularly hard by loan defaults, because many of their assets are bonds. For example, there are many municipalities that are having difficulties maintaining tax revenues, and may have difficulty repaying their debt. This would seem to be an area which the report fails to warn about.

## Natural Gas as Transition Fuel

The other area where the report misleads is in giving more hope to natural gas as a transition fuel than would seem to be warranted. For example, it quotes from CERA:

“A major new factor – unconventional natural gas – is moving to the fore in the US energy scene...it ranks as the most significant energy innovation so far this century. It

has the potential, at least, to cause a paradigm shift in the fuelling of North America's energy future." IHS-CERA 2010: [Fueling North America's Energy Future, the Unconventional Natural Gas Revolution and the Carbon Agenda](#)

It then goes on to say:

Unanticipated technological developments dramatically increased the availability of non-conventional (mostly shale) gas in the US last year. In 2000, non-conventional gas provided just 1% of total gas supply, but by 2009 it had reached 20%. Forecasts suggest this will reach 50% by 2035. As natural gas prices fell in the US, demand for LNG fell internationally and volumes destined for US import were redirected to other (mainly Asian) markets. But the full impact is highly uncertain. Production from shale gas wells seems to peak much faster than conventional gas, and data is limited. Assessments of the Barnett wells in the US using horizontal drilling showed that most of the recoverable gas is extracted in the first few years. ([International Energy Agency: World Energy Outlook 2009](#)).

Is the US experience set to become a global phenomenon? Some suggest that resources in OECD Europe are large enough to displace 40 years of imports of gas at the current level, assuming recovery rates in line with those in North America. Exploration is already under way in Europe (including in France, Germany, Poland and the UK) to assess this potential. ([Eurostat 2009: Energy Statistics to Support EU Policies and Solutions](#))

There may be some potential for a small ramp up in natural gas production, but we need to remember that a major change in infrastructure to accommodate a much larger natural gas supply will take many years and significant fossil fuel resources. A big reason natural gas prices in North America dropped once production rose is because insufficient new infrastructure to use this new supply was in place (for example, new cars or trucks using natural gas as fuel and new stations for such vehicles to refuel). Adding new infrastructure takes time. People don't lower the temperature in their homes (so as to use more gas for electricity for cooling) or ramp up industrial production of fertilizer (so as to use more natural gas), just because more natural gas is available--especially if the new natural gas is at a high price.

But it is not clear there is really all that much more natural gas. First, the amount of natural gas used today is less than that of oil, so expanding natural gas to replace oil is not something that can really be considered. But even raising the current amount by say, 30%, is likely to be difficult. One of the issues is how much can be produced at affordable prices. If the prices are much higher than today, there may be some of the same issues with recession and cutback in demand as with high priced oil. And there are concerns that a huge expansion of natural gas will require drilling in populated areas, with possible environmental issues associated with fracking. A transition to natural gas as a primary fuel source--assuming we really do have enough--would likely take 40 years as Smil indicates, and by that time what natural gas we have would likely be gone.

The report seems to suggest natural gas might be used as a transition fuel, but if high tech alternatives that don't rely on fossil fuels really are lacking, it is doubtful that there will really be a new fuel supply to transition to--especially one that will permit business as usual.

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The report is valuable for pointing out the peak oil issue. The major problem of this report is that it attempts to sugar-coat what peak oil will look like. Or perhaps, the authors are confused about peak oil implications themselves.



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