



Congressional Briefing: Can Oil Production Meet Rising Demand?

Posted by [Gail the Actuary](#) on October 15, 2010 - 10:30am

Topic: [Policy/Politics](#)

On Thursday, October 7, the [Environmental and Energy Study Institute](#) (EESI) conducted a congressional briefing on challenges of the oil industry to keep pace with rising global demand, and the potential implications for oil prices, national security and the world economy.

The panelists included a combination of some people in Washington DC for the ASPO-USA meeting ([Robert Hirsch](#), [Tad Patzek](#), and [Arthur Berman](#)) and some people currently or recently involved with government offices (including [Franklin Rusco](#), Director of Energy at the GAO, and [Guy Caruso](#), Former Administrator of the EIA). I found it especially interesting that the latter two, especially Guy Caruso, were concerned about oil supply. As head of the EIA from 2002 to 2008, Guy Caruso did not seem to voice these concerns.



This video can be found at [Can Oil Production Meet Rising Demand?](#) An mp3 recording and copies of presentations can be found at the [EESI site](#). Below the fold I show some of the slides and mention a few of the comments made by the presenters.

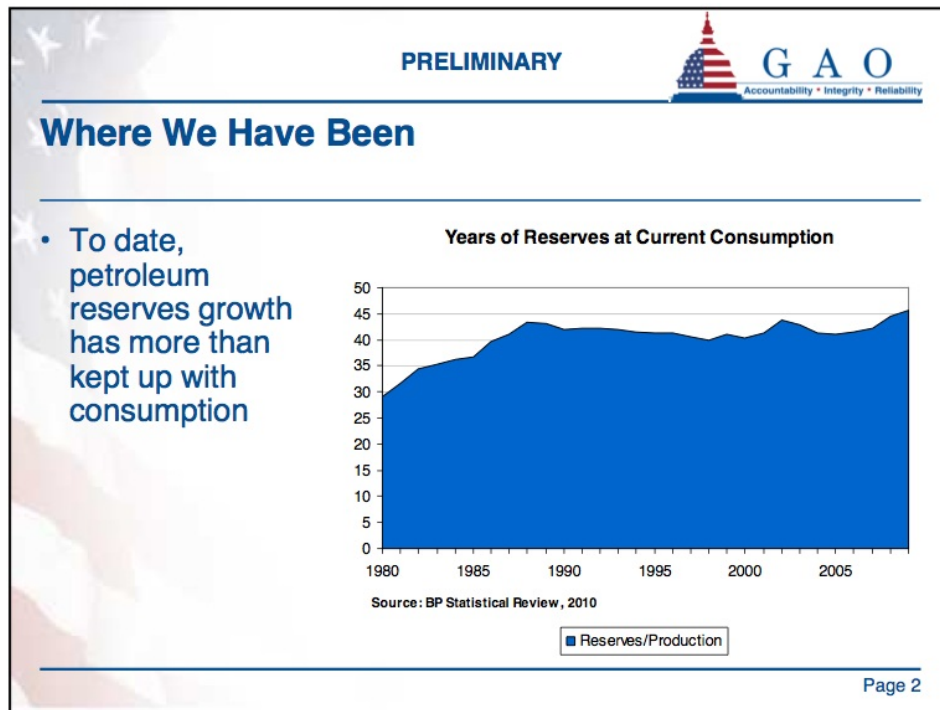
The overall theme of the presentations seemed to be that there are many types of risks that supply will be inadequate to meet demand--rising demand from emerging economies, inadequate investment, and oil that cannot be pulled out of the ground fast enough, even though the appearance is that there is plenty of oil available. The result is likely to be high prices leading to recession. Alternatives are not scaling up quickly enough to be likely to be very helpful for a very long time - 25 years according to Art Berman.


Below, I summarize the presentations. Note that I have not shown all of the slides. You will need to look at the individual presentations (linked for the individual presenters) to get all of the slides.

Franklin Rusco's Presentation

The first person to give a [presentation](#) was Franklin Rusco, Director of Energy, Government Accountability Office. (The GAO put out a report in 2007 called [CRUDE OIL: Uncertainty about Future Oil Supply Makes It Important to Develop a Strategy for Addressing a Peak and Decline in Oil Production.](#))

Rusco quotes the high reserve to production ratio for oil, then asks, "Why be concerned?" Whether or not oil peaks, he has concerns about the possibility of rising demand possibly leading to a spike in prices, and therefore leading to recessionary impacts. There is also an issue with reserves being in unstable areas, so one cannot count on supply. One can see many of his points from these slides.




PRELIMINARY 

So Why Worry?

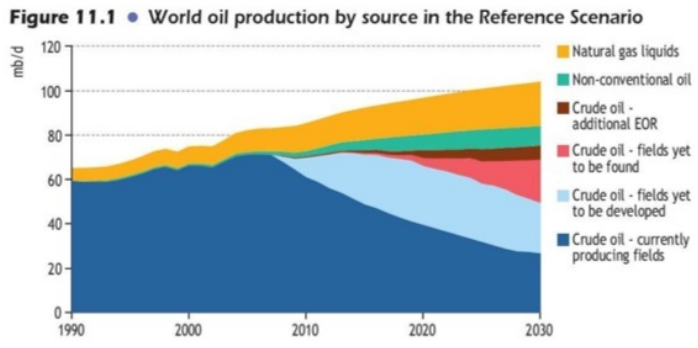
- Future oil demand is highly uncertain but will rise with global economic expansion.
- Some predict a peak in conventional crude oil production which, when coupled with rising demand will lead to extreme price increases and economic dislocations.
- Whether or not (or when) a peak occurs, rapid increases in conventional production will be increasingly challenging and depend on below the ground and above the ground factors.
 - Below the ground: The total reserves of conventional oil are uncertain but are certainly finite. Huge pools of easy-to-extract oil have almost all been found and exploited. Exploiting new reserves will require large investments by many companies and countries.
 - Above the ground: Even if sufficient conventional reserves exist, will they be available and will they be developed in a time frame to keep up with growing demand? Oil reserves are spread out across the globe, much of it in unstable regions or environmentally sensitive areas that are currently off limits.

Page 3

PRELIMINARY 

A Projection of Where Future Supply May Come From

Figure 11.1 • World oil production by source in the Reference Scenario



mb/d

120
100
80
60
40
20
0

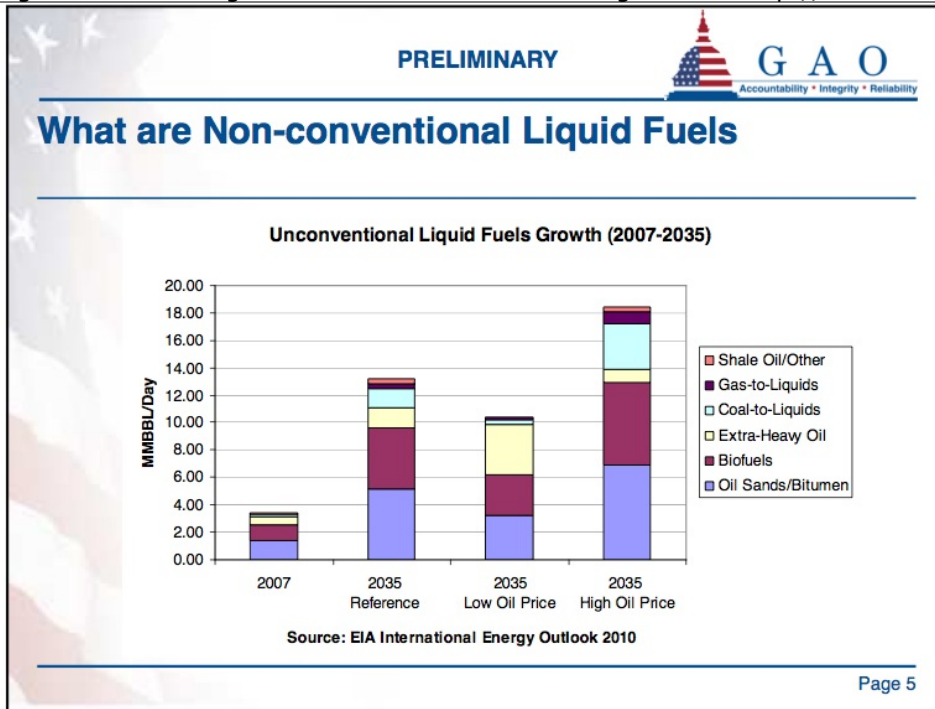
1990 2000 2010 2020 2030


- Natural gas liquids
- Non-conventional oil
- Crude oil - additional EOR
- Crude oil - fields yet to be found
- Crude oil - fields yet to be developed
- Crude oil - currently producing fields

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250 World Energy Outlook 2008 - OIL AND GAS PRODUCTION PROSPECTS

Page 4



- PRELIMINARY** 
- ## Unconventional Liquid Fuels Face Many Challenges
- With possible exception of biofuels, unconventional liquid fuels have larger carbon emissions per BTU than conventional oil.
 - Unconventional liquid fuels generally require more water to produce and pose greater environmental risks to extract and process.
 - All unconventional fuels cost more to produce and deliver.
- Page 6

PRELIMINARY



What Does This Mean?

- For either below or above the ground reasons, prices of liquid fuels may rise if supply growth can not keep up with the growth in demand caused by global economic expansion.
- Depending on the severity of oil price increases, economic growth may be slowed until and unless alternatives to liquid fuels are developed.
- The other speakers will elaborate on these and other issues and we will leave ample time for questions at the end.

Page 7

Tad Patzek's Presentation

Tad Patzek, who is a professor at the University of Texas, gave his [presentation](#) next. He summarized his main point as, "It is all about the rate, stupid."

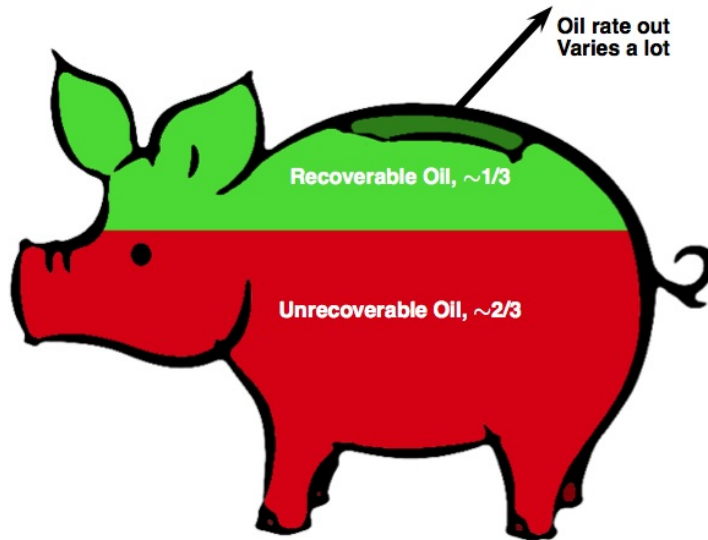
Summary of Conclusions...

- The global rate of production of oil is peaking **now**, coal will peak in **2-5 years**, and natural gas in **20-50 years**
- There is **PLENTY** of fossil fuels ("resources") left all over the Earth
- The resource **size** (current balance of a banking account) is mistakenly equated with the **speed** of drawing it down (ATM withdrawals)
- Few understand the ever more stringent **daily withdrawal limits** imposed by nature on our ATM cards (oil & gas wells and coal mines)
- Even fewer understand the **high minimum balances** (resource left behind) imposed on all oil, coal and gas recovery deposits

Summary of Conclusions...

- Economists, business people, and policy makers generally have **poor** understanding of banking
- They know what the rate of withdrawals (energy **demand**) should be, but have little idea about the withdrawal limits (energy **supply**)
- **Offshore** and **unconventional** fields will be producing an increasing portion of global oil supply
- Solar energy flow-based solutions (wind turbines, photovoltaics, and biofuels) will require **most radical changes** of our lifestyles
- Thermodynamically, industrial-scale biofuels are **not** sustainable, and will damage the Earth's most vital ecosystems

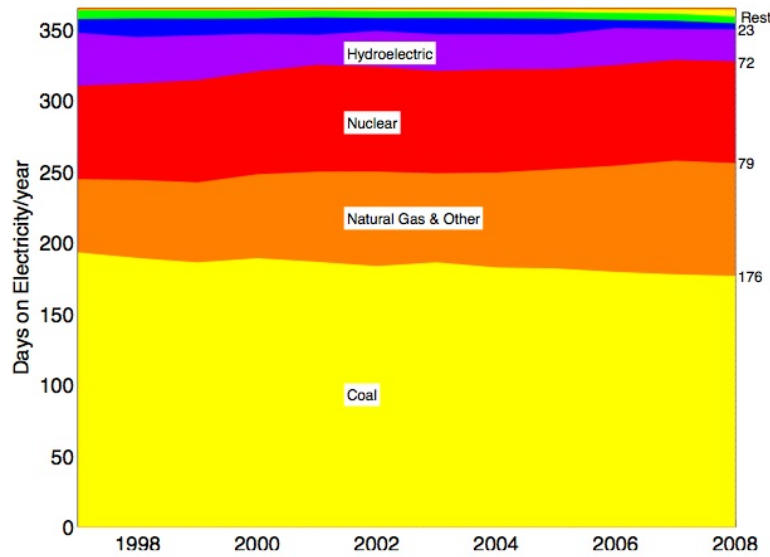
Accumulation vs. Production



Accumulation = Piggy Bank, Coin Slot = Oil Wells, Injection Wells, and Surface Facilities

This is a good visual depiction of the problem!

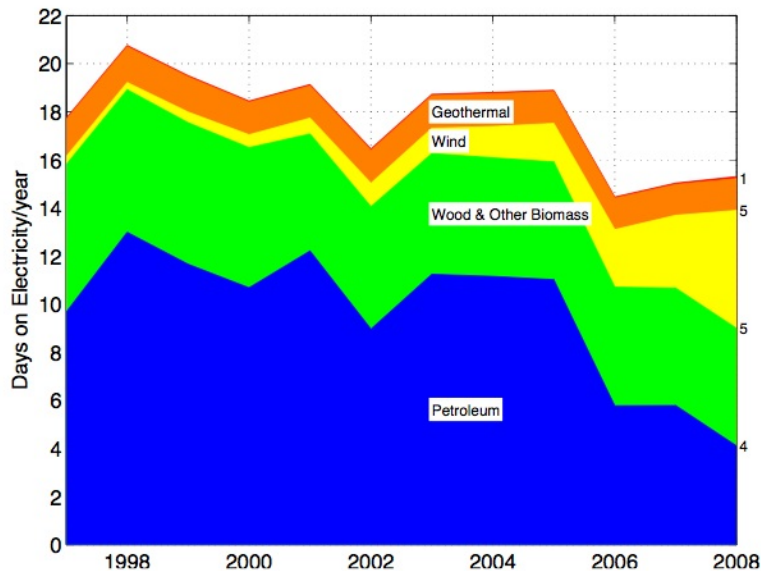
Electricity generation



37% of U.S. primary energy use. Source: DOE EIA, accessed 03/28/2010

The above graph shows the share of electricity generation from different sources. (Click on any of the images for a larger view.) The numbers on the right hand side show the days out of 365 that the fuels would provide electricity. From the bottom up, the fuels are coal, natural gas, nuclear, hydroelectric, and "rest". The "rest" is 23 days out of 365. This amount is about the same at the beginning and the end of the period shown.

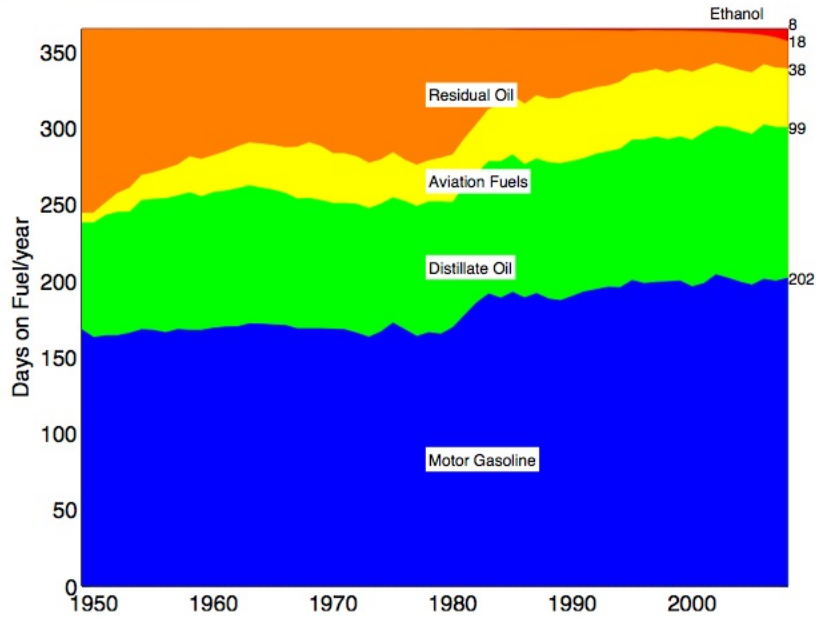
Electricity generation – Rest



Solar thermal and PV = 1 hour of U.S. electricity. Source: DOE EIA, accessed 03/28/2010

The above graph shows a breakout of the "rest". Petroleum consumption is decreasing (now mostly in Hawaii), and wind has recently increased. In 2008, it would account for 5 days out of 365 days of electricity generation.

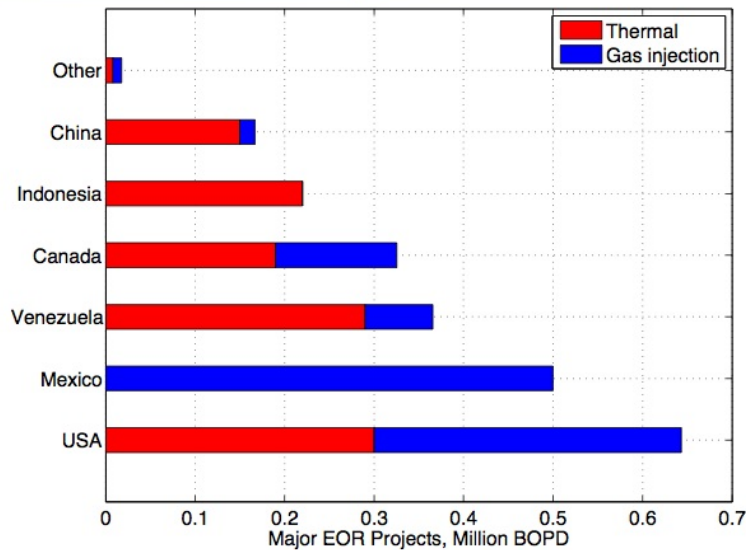
Transportation Fuels



31% of U.S. primary energy use. Source: DOE EIA, accessed 03/28/2010

The above graph shows different liquid fuels, divided into the number of days out of 365 they would provide fuel for. Ethanol is the little sliver in red, which would amount to eight days out of 365.

World EOR Projects: 2.5 MBOPD



Adapted from the Oil & Gas Journal, Thomas, 2007

Tad Patzek's point relating to the above graph was that there is not a lot of additional oil production through Enhanced Oil Recovery now (or at least when the graph was made in 2007). So we shouldn't hold out huge expectations for the future.

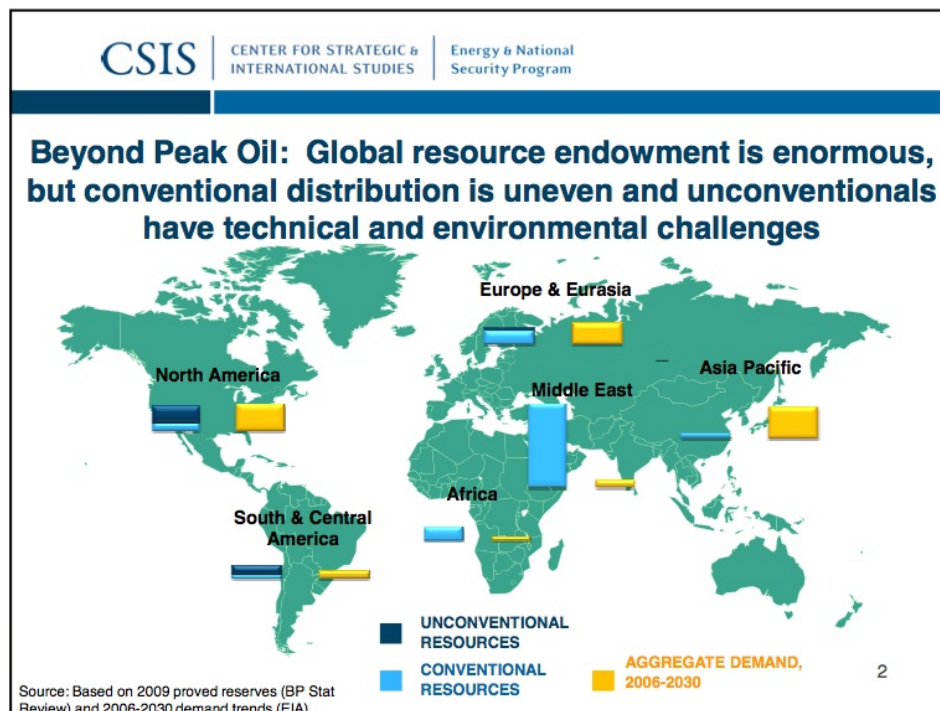
Guy Caruso's Presentation

Guy Caruso is Senior Advisor, Center for Strategic and International Studies and Former Administrator, U.S. Energy Information Administration (EIA). At some point along the line, he also worked for the International Energy Agency (IEA). As I indicated above, I found his testimony the most surprising, since while at the EIA from 2002-2008, he didn't seem to mention any problems. Caruso started out his talk by saying this is a topic "near and dear to my heart".

In his [presentation](#), Caruso talked about the National Petroleum Council's (NPC) 2007 report, [Facing Hard Truths About Energy](#). He says that in that report, and in the view of the EIA, the big concerns were above ground factors--access to reserves, adequate investment, and geopolitics. (When you include adequate investment as one of the above-ground factors, it seems to me that you are getting back to the Limits to Growth view of the limit on oil production--we reach the point where we can't invest enough to keep pulling oil out fast enough, because the net energy of what is being extracted is too low.)

In his talk, Guy Caruso says that current liquid fuels production is 85 million barrels a day. "Maybe we will get to 100 million barrels a day; maybe we won't. That is the debate we are talking about today." I found this comment pretty amazing, for someone recently with the EIA.

Guy Caruso also had some interesting things to say about the IEA (not EIA). He said that the IEA has been very much influenced by the work of Robert Hirsch and Matt Simmons. He also said that in the new IEA forecasts (expected out in about three weeks), the forecast amount of oil consumption in 2030 will drop below the 100 million barrels a day for 2030, so it will be lower than last year's forecast. He also said that forecast crude oil production for 2030 will only be in the 60+ million barrels a day range, in the new IEA forecast. He didn't say that this is a decline from current production, but it is.

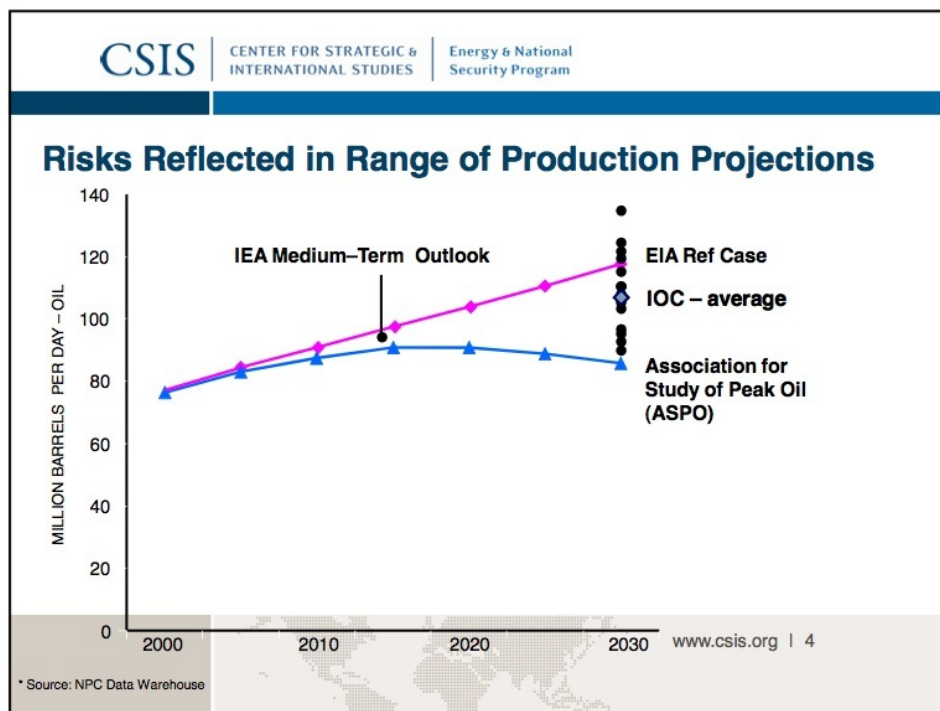


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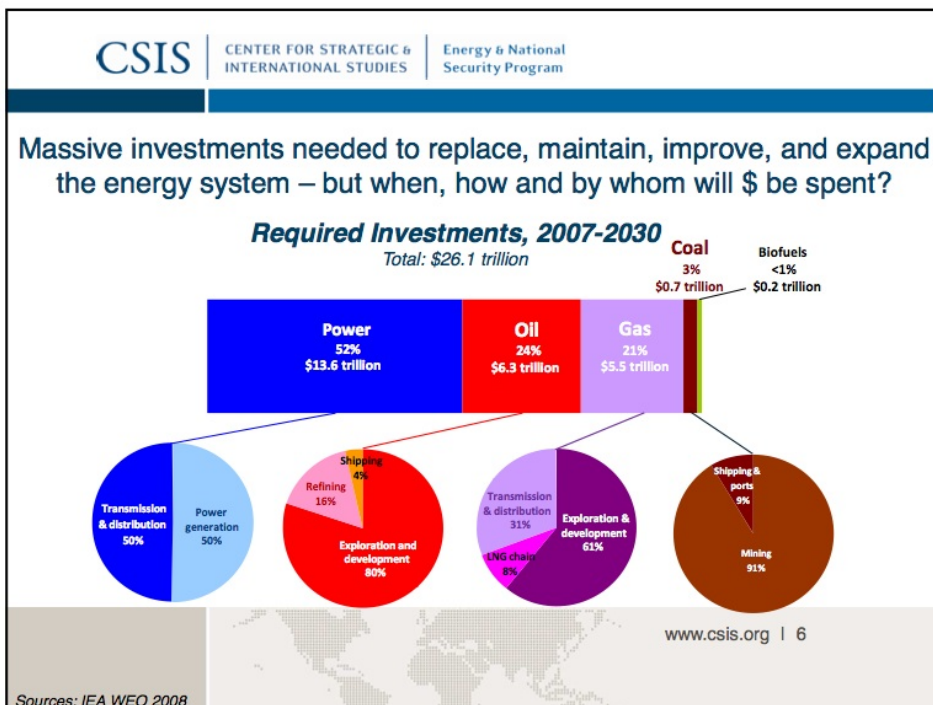
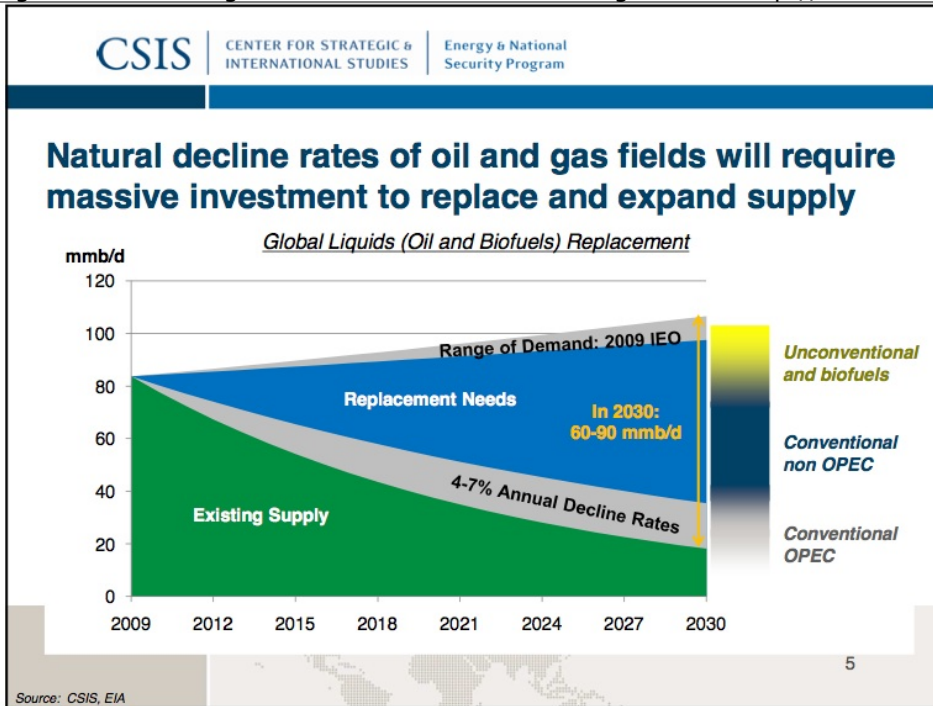
The Hard Truth: Supply

The world is not running out of energy resources, but there are accumulating risks to continuing expansion of oil and natural gas production from the conventional sources relied upon historically. These risks create significant challenges to meeting projected total energy demand.

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In the above graph of NPC forecasts, the "ASPO" figure quoted is Jean LaHerrere of ASPO Paris's number.



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As we grapple with issues of supply reliability, volatile price, shifting geopolitics and climate change, we need an energy policy that is at once sustainable, adaptive, and in the interim uses the current system as much as practicable even as we promote and incentivize new technologies and fuels

Policy choices need to be robust against a variety of factors and outcomes; if technology breakthroughs occur – all the better, but we cannot count on replacements at scale within the 2020 timeframe

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Robert Hirsch's Presentation

What follows are only a few slides from Robert Hirsch's [presentation](#). After the slides I show, he goes into the need for mitigation of the types shown in his [2005 report](#) to the Department of Energy.

Messages

- In the next 2-5 years, world oil production will begin to decline & will continue downhill.
- Oil shortages will deepen annually until mitigation takes hold more than a decade later. There will be no quick fixes.
- Annually declining world oil production will mean deepening economic distress for over a decade.
- Oil is energy / energy is not oil – It's a liquid fuels problem.

2

Robert Hirsch explains that when he says we have a liquids fuels problem, not an energy problem, his point is that all the windmills in the world, or other types of electrical energy, won't run the vehicles currently in operation that are built to operate on petroleum based fuels.

Expecting World Oil Production Peaking and/or Decline Now or Soon

Statements & positions vary.

- IEA
- Chevron
- Shell
- Total Oil
- Statoil
- Hess Oil
- Toyota
- Volvo
- James Schlesinger
- Boone Pickens
- Matt Simmons
- Corps of Engineers
- CIBC (Canada)
- Raymond James
- EWG (Germany)
- U.K. Industry Oil Study Group
- ASPO Organizations
- Many retired oil geologists

Well known deniers include EIA, OPEC, CERA, & ExxonMobil.

3

A Sampling of Recent Warnings

- "... an imminent peak and sharp decline in oil production could cause a worldwide recession." U.S. GAO – 2007
- "Peak oil is now." German Energy Watch Group – 2008
- "By 2012, surplus oil production capacity could entirely disappear....." U.S. Department of Defense – 2008 & 2010.
- "A global peak is inevitable. The timing is uncertain, but the window is rapidly narrowing." UK Energy Research Centre - 2009
- "The next five years will see us face ... the oil crunch." UK Industry Taskforce on Peak Oil and Energy Security – 2009

4

Arthur Berman's Presentation

Art's [presentation](#) was short, only a single slide. He elaborates on the points shown in the slide below.

He starts off by saying that we are not getting off oil now, and in his view we are not getting off oil in any meaningful way in 25 years. Currently fossil fuels make up 87% of our energy use. It is really very difficult for alternative forms of energy to account for very much, and you can't put

It is going to be nearly impossible for the US to become energy independent in the next 25 years. In fact, it is unlikely that the share we can produce ourselves will increase in the next 25 years.

Peak oil is less an issue about oil supply than it is about cost. Oil will cost more. This higher cost oil brings the economy, if not to a halt, to a "screeching slow down". We are using three times as much oil as we are finding. This has not changed in the 32 years he has worked in the field.

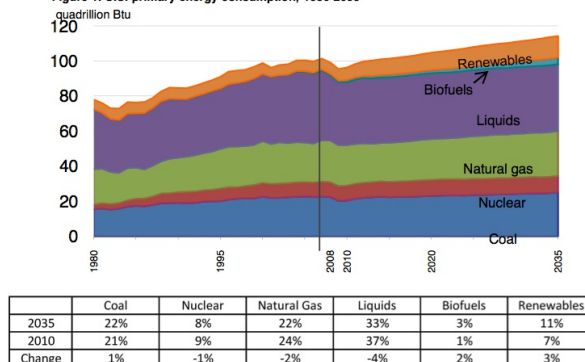
The various fuels shown in the EIA and IEA analyses are not interchangeable. For example, you can't put natural gas liquids in a car or airplane. Ethanol has limited uses, and requires a lot of natural gas for production.

While there still are undiscovered reserves, the new fields we are finding are smaller and smaller, and in more remote locations. The cost of production rises for these fields, adding to the high cost and recessionary impacts noted previously.

Key Energy Messages

- It will be difficult to "get off of oil" in the next 25 years.
- It will be difficult to make alternative energy a meaningful part of our energy supply in the next 25 years.
- It will be difficult to become more energy independent in the next 25 years.
- Oil supply is less of an issue than oil cost:
 - ✓ Oil will probably cost a lot more in the next 5 years,
 - ✓ That has serious implications for the U.S. and global economies that are predicated on cheap oil.

Figure 1. U.S. primary energy consumption, 1980-2035



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