The Oil Drum
DISCUSSIONS ABOUT ENERGY AND OUR FUTURE

National Petroleum Council Report Based on API Call and Report Review

Posted by Gail the Actuary on July 21, 2007 - 9:30pm
Topic: Supply/Production
Tags: american petroleum institute, national petroleum council, peak oil [list all tags]

On Wednesday, I participated in a bloggers conference call sponsored by the American Petroleum Institute (API). The main topic was the National Petroleum Council's report "Facing the Hard Truths about Energy". Participating in the call were

• Rod Nelson - senior VP for technology and strategy, Schlumberger Limited (for NPC)
• Tom R. Eizember - senior planning advisor, ExxonMobil Corporation (for NPC)
• John Felmy - chief economist, API
• Ron Planting - statistics manager, API
• Byron King- The Daily Reckoning
• Ed Morrissey - Captain's Quarters, Heading Right, and Blog Talk Radio
• "McQ" - The QandO Blog
• Gail Tverberg - TheOilDrum

In this article, I will discuss the NPC's report, based both on a review of the report and what I learned in the call. The conference call also included discussion of API's June 30, 2007 statistics for the US oil industry, but I will not discuss these, since they are similar to EIA's (high crude oil inventory, low gasoline inventory, etc.).

A Step in the Right Direction

Based on the conference call discussion and my review of the report, the NPC report seems to be a step in the right direction. Since the NPC is an industry group and has always provided optimistic forecasts in the past, it shouldn't be a big surprise that it doesn't go all the way to peak oil indications. But it very definitely starts talking about peak oil indications, and includes peak oil indications in its range of indications. It also recommends taking many of the same actions that one would expect based on peak oil indications.

Report Objectives

The "key questions" to be addressed by the NPC report were

• What does the future hold for global oil and natural gas supply?

• Can incremental oil and natural gas supply be brought on-line, on-time, and at reasonable price to meet future demand without jeopardizing economic growth?

• What oil and gas supply strategies and/or demand-side strategies does the Council recommend the U.S. pursue to ensure greater economic stability and prosperity?

A few things to note:

• The request relates to **oil** and **natural gas**.

• The question about future supply is about future **global** supply, even for natural gas.

• There is no time frame given. The authors chose a 2030 time-frame.

• The request is broad enough that the NPC interprets the request as permitting the use of estimates of others, without doing an analysis of who is correct and who is not.

What NPC in fact does in this report is show ranges of both supply estimates and demand estimates. These estimates are from as many sources as possible, including ASPO organizations. There is no attempt to judge whether one estimate is better than another. NPC's conclusion, based on comparing a range of supply estimates with a range of demand estimates, is that there is a significant chance that by 2030 we will come up short both in terms of oil supply and total energy supply (not said in so many words, however). NPC then provides a list of recommendations to try to decrease demand and increase supply.

Let's look at some particular areas of interest.

Oil Supply

The main oil supply graph in the executive summary is this one:

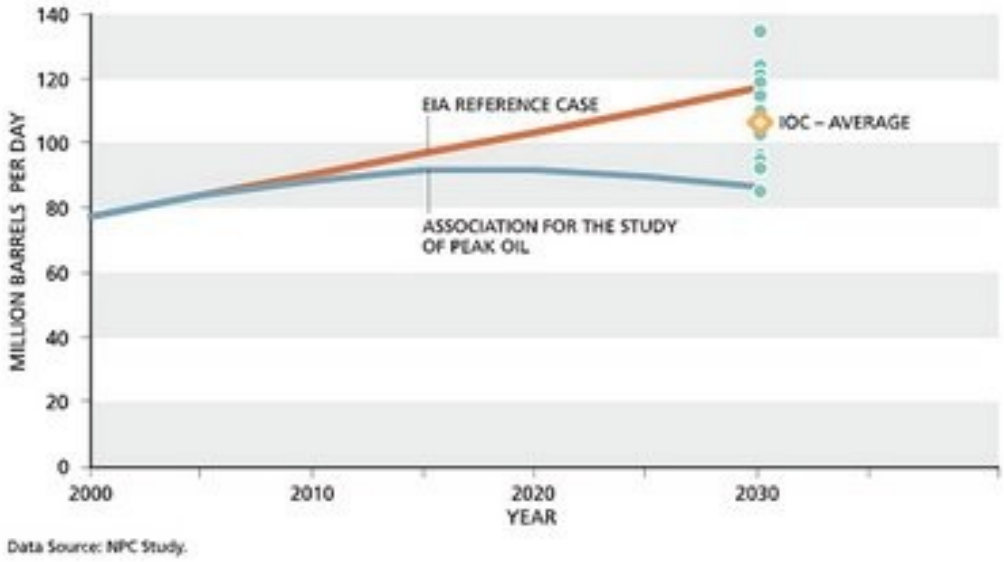


Figure ES-8. Understanding the Range of Global Oil Forecasts

This graph shows ASPO and an EIA indications and the range between them. Thus, the report is, in effect, giving equal weight to ASPO and EIA, which is about as good as one might hope for in an analysis that bases its analysis on projections from a variety of sources, without review.

The graph is followed in the executive summary by this write-up about Peak Oil.

The Peak Oil Debate

Concerns about the reliability of production forecasts and estimates of recoverable oil resources raise questions about future oil supply and deliverability. These concerns are strongly expressed in "peak oil" forecasts in which (1) oil production does not grow significantly beyond current levels and (2) an inevitable decline in oil production is increasingly near at hand. Views about oil supply tend to diverge after 2015, with peak oil forecasts providing the lower bound. These forecasts generally consider oil supply independently of demand and point to supply shortfalls. Such views contrast with forecasts and economic models that expect market forces to provide incentives for developing global hydrocarbon and other resources to meet energy needs through at least 2030.

Forecasts that see an imminent peak in oil production use several indicators to support their case, including: historical peaks in production for individual countries; extrapolations of the production cycle from individual wells to fields, basins, and the world; and the historical dominance of large reservoirs in supplying the world's oil. These historical indicators for production of conventional oil are countered by expectations for new discoveries, enhanced recovery techniques, advancing technology for producing oil from unconventional sources, and reassessments and revisions of know resources. The economic and investment climate, as well as access to resources, will also affect the production base.

For further discussion of peak oil forecasts and related issues, please see Chapter 2, "Energy Supply," in this report.

Thus, any reader of the summary report gets an introduction to peak oil, written in such a way that peak oil sounds like at least a possible alternative.

The oil supply situation is summarized in the executive summary as follows:

> There is uncertainty about the potential of the oil resource base to sustain growing oil production rates. Additional uncertainty surrounds the industry's potential to overcome multiple increasing risks, including access to promising areas for development, and the rate and timing of investment, technology development, and infrastructure expansion. The study observed a range of oil projections from less than 80 million to 120 million barrels per day in 2030. This wide range results from differing assumptions about these uncertainties.

Thus, the study never picks a single number as its estimate - in the write up or on the graph. It only shows ranges including the ASPO estimates.

During the conference call, I asked how the projected range compared to the indications of IEA's recent Medium Term Oil Market report, with indications through 2012. The NPC representatives said the IEA 2012 indications correspond well with the predicted range at 2012.

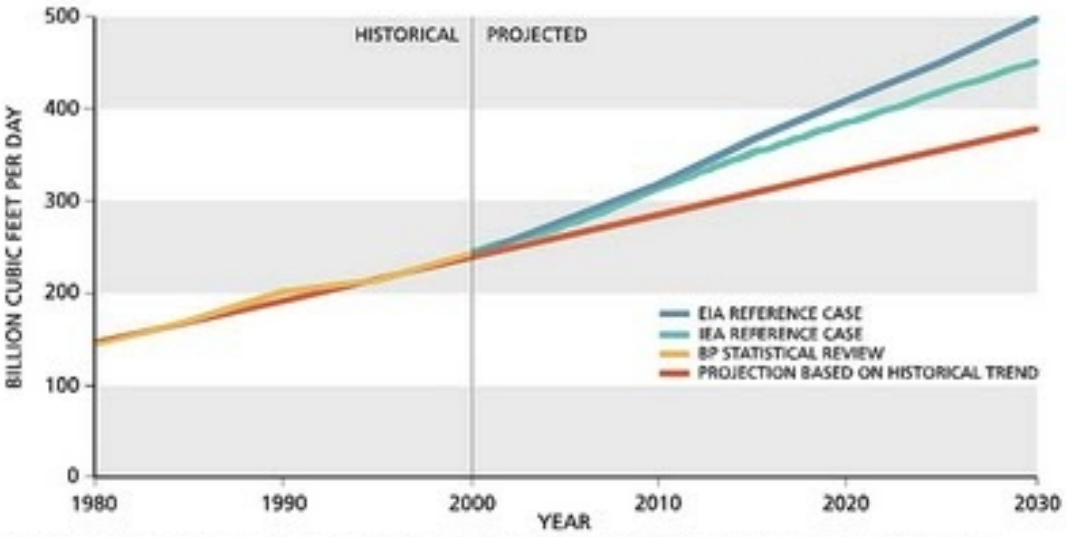
Natural Gas Supply - World

Natural gas supply is discussed less than oil supply in the executive summary. What is said is

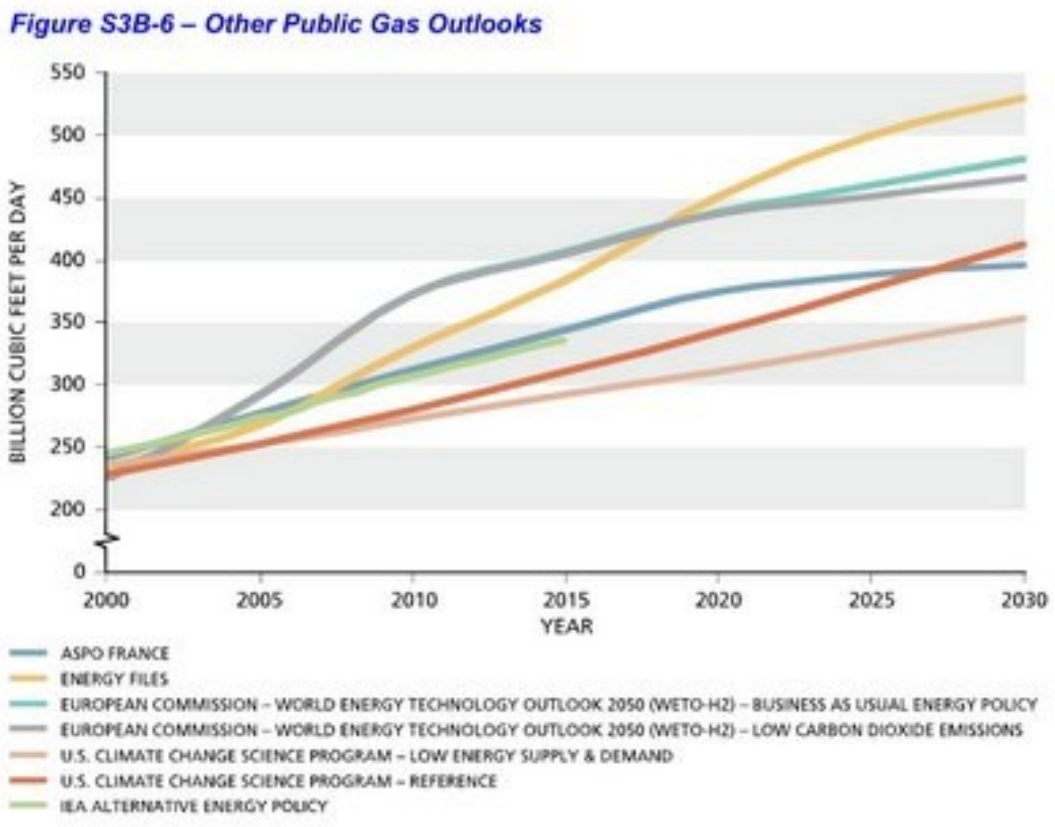
> The natural gas resource appears more than adequate to meet the increased natural gas production typically anticipated by energy outlooks over the study period.

This statement only makes sense if one remembers that the "key question" that was asked was about **global** natural gas supply. In the body of the report, we find these graphs of expected world natural gas production:

Figure S3B-4 – EIA and IEA Gas Reference Case Outlooks



Data Sources: Energy Information Administration (EIA), International Energy Outlook 2006; International Energy Agency (IEA), World Energy Outlook 2006; and BP Statistical Review of World Energy 2005.

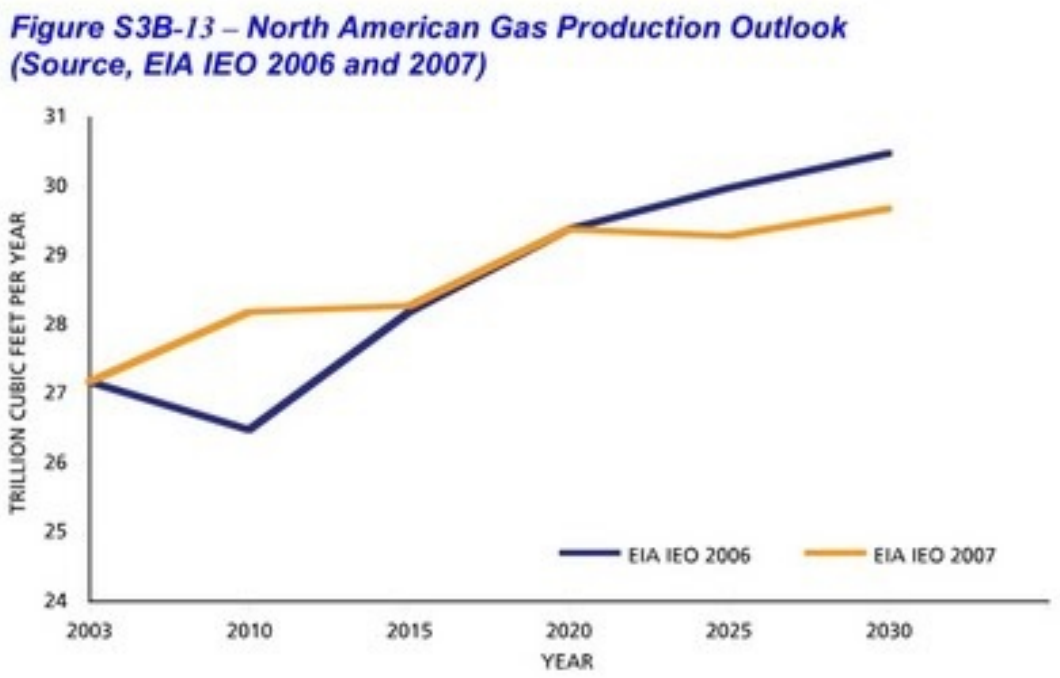


The upper graph shows EIA and IEA projections, plus expected based on historical growth. The bottom graph shows some other projections, including ASPO France's. Since all of the projections show significant growth in natural gas production, no problem is seen with world natural gas production.

Because of these projected increases, natural gas is seen as a growing source of energy in the future, helping make up for the relative lack of growth of oil. I have real questions about the reasonableness of this conclusion, but given the EIA, IEA and ASPO projections, I can understand this result.

Natural Gas Production - US

US natural gas production is not mentioned in the executive summary. In the body of the report, a graph is shown of EIA projections of future production:



Since EIA does not indicate a problem with future production, and there is no ASPO projection available, the NPC's write up gives only a hint that there may be problems ahead. The write up in the Supply Chapter in the body of the report says:

> The forecasts analyzed for this current study largely agree that domestic conventional gas production will decline over the forecast period, assuming that restricted onshore and offshore areas will not be developed. The balance of natural gas supply to the United States over the next 25 years is generally expected to be met by a combination of three elements:
>
> • Increased domestic production of unconventional gas (basin-centered gas, tight gas, shale gas, coalbed methane)
>
> • Arctic gas resources from Alaska and the Canadian Mackenzie Delta, both of which require development and massive new infrastructure to bring gas to market
>
> • Increased LNG imports.
>
> Each of these elements may be subject to risks that make development slower or less significant that the forecasts assume.

I think this statement very much understates the problem. The NPC relies on projections of EIA, since it has no alternative projections. Without written documentation showing how bad the situation really is, NPC takes only a small step toward issuing a warning.

Supply vs Demand for Oil and Natural Gas

When NPC compares supply and demand, this is what the executive report says:

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

This is not a very direct way of saying that we are likely to run into problems with oil and natural gas production, but the effect is the same. The report then makes a variety of recommendations to attempt to increase supply and decrease demand. The writers of this report view the actions that they are recommending as similar to what they would recommend in the case of peak oil. In the body of the report, when discussing peak oil, this statement is made:

> Peak oil forecasts project that oil supply will not grow significantly beyond current production levels and therefore may not keep pace with projected global demand; a peak and decline in oil production is inevitable and may be near-at-hand. The conclusions lead to calls to develop additional resources to increase supply, accelerate the use of unconventional resources as substitutes for oil, and moderate demand in order to bridge the supply shortfalls. Such actions generally converge with the recommendation of this study.

Trade

The report makes it very clear that continued trade is very important if energy supply is to meet energy demand, and this is important for US energy security. The executive summary then make a statement that I think is true, but is likely to be the downfall of this approach to energy security:

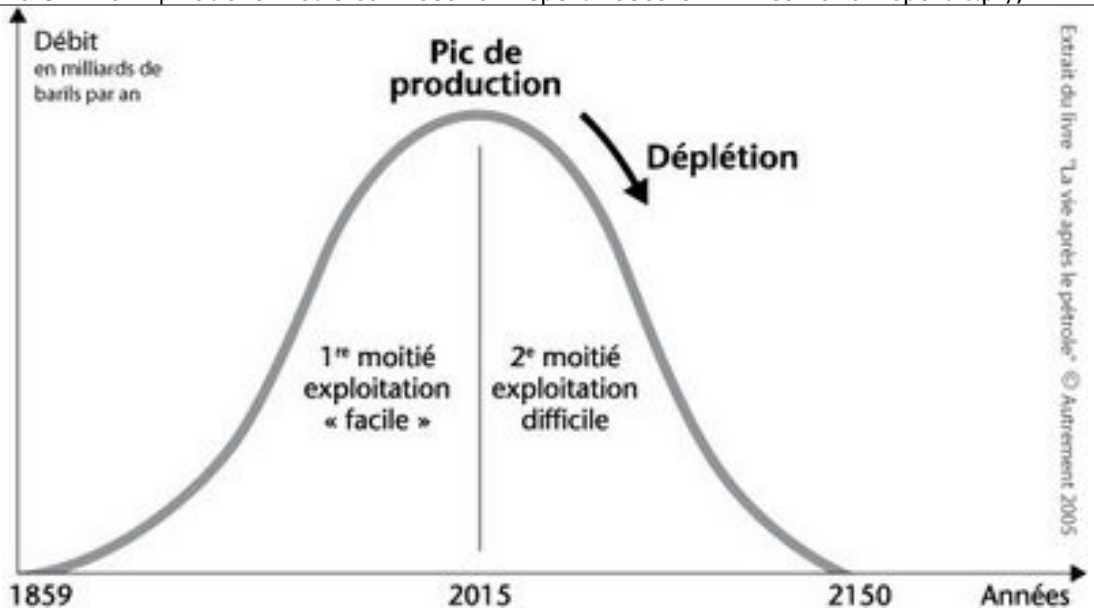
> There can be no U. S. energy security without global energy security.

The report then does talk about trying to enhance global energy security.

ASPO Projections

As I read this report, it becomes clear that it is very important that correct ASPO projections (or peak oil projections from another authoritative source) be available for people preparing studies of this kind, and for other interested people.

If we look at the oil supply chart near the top of this story, the ASPO oil projections quoted show a peak oil date of 2015, and expected oil supply of approximately 85 million BPD in 2030. The text of the report indicates that these projections are from ASPO France. These numbers sound high to me. The only oil projections I found on the ASPO France web site is this schematic drawing, with a peak date of 2015:



It seems to me that someone should verify that the ASPO France oil production numbers being used in the NPC graph are in fact the intended ones. If they are incorrect, the report should be amended before the final report is released in September. The "Peak Oil" write-up shown just below the oil supply graph also says that there is little divergence in forecasts between ASPO and the other organizations until after 2015. If this is not true, this should also be corrected.

Another projection shown in the report, that of Peak Oil Netherlands Foundation (shown on Figure S3A-17 of the report), shows expected total liquids of just under 80 million BPD in 2030. This is quite likely the bottom number in in the 80 million to 120 million BPD range quoted in the NPC supply paragraph above. This estimate is not much lower than the ASPO France estimate.

Now that evidence seems to be accumulating that peak oil may be at hand, it seems to me that we need to be increasingly careful with our peak oil forecasts. If we project peak oil in 2015, with production of 85 million BPD in 2030, people are likely to think that there is not much to worry about. The problem is still a long ways off, and the decline, when it finally does come, will be so gradual that we will only get back to where we are now by 2030.

If the evidence is for a significantly worse outcome than this, we need to say so. We need to have reports published in prominent places on the web sites of ASPO organizations showing when we expect peak oil to occur, and what the pattern of decline is likely to be. Perhaps a range of values is needed. If a fixed date is given, even a few years in the future, people are likely to think there is nothing to worry about until the chosen date arrives.

There is also a need for good published projections with respect to natural gas supply, by region of the world. If there are issues with projecting large increases in LNG imports, we need to saying this as well. Projections for both oil and natural gas need to include easy-to-understand explanations and graphs, so that lay people can understand them and news organizations using them can easily write a story with the information provided.

A Couple of Specific Points I Would Object To

This is a draft report. Presumably participants like Matt Simmons can object to errors prior to the finalization of the report. There are a couple of things in the body of the report that don't directly affect the executive summary that I think should be objected to.

Estimated Recoverable Oil

One is in "Supply Chapter, Section III.A: Oil and Other Liquids" on page 2 of 28, in Section 2, Crude Oil Endowment. Earlier in the section it says that the total conventional and unconventional oil in place endowment has been variously estimated at 13 trillion to 15 trillion barrels. If one includes all the tar sands, oil shale and the like, I think one can get to a number like this. It then defines recoverable resources. At the end of this section, it says:

> Generally, about one-third of the oil in place is currently assumed to be ultimately recoverable. This assumption yields an estimated 4.5 trillion barrels of conventional and unconventional Ultimately Recoverable oil.

Lumping convention and unconventional together and applying a one third factor seems absurd to me. In the sections that follow, the authors talk about "Unconventional Oil Endowment and Recovery" and "Conventional Oil Endowment and Recovery". The first of these sections talks about the difficulty of recovering unconventional oil. The second offers some specific estimates of different agencies regarding conventional recoverable oil. I would leave out the section I quoted above.

North Sea Description

Another section that I find misleading is one Stuart Stanford commented on earlier. It says

> Peak oil forecasts are concerned about the ability to extend and apply experience from mature areas to less produced areas. As a hydrocarbon province matures, production transitions from large reservoirs to smaller, less prolific, and possibly higher cost reservoirs. In the United States, for example, production from smaller and mature reservoirs dominates supplies. Peak oil forecasts assume that remaining smaller reservoirs will not compensate for declines in the larger reservoirs, resulting in declining conventional oil production in the near future. However, the North Sea has seen the evolution away from larger, depleted fields to smaller fields that can be brought online using existing infrastructure. North Sea production has actually been sustained for many years at significantly higher levels than was generally thought likely in the 1980s and early 1990s. Production growth from 1990 to 2000 shows how production in mature basins can revive as a result of new technology, price, or market dynamics.

While it is probably technically correct, it is misleading since it does not talk about the steep decline since 2000. I think it should be removed.

Charts that Others Object to that I Can Live WIth

There are couple of charts that others have called objectionable, including this one

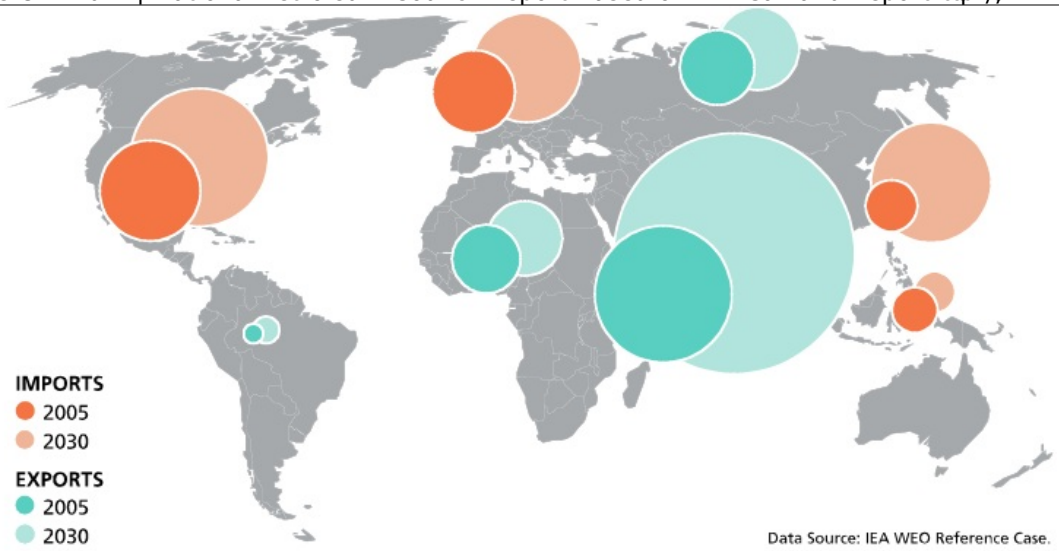
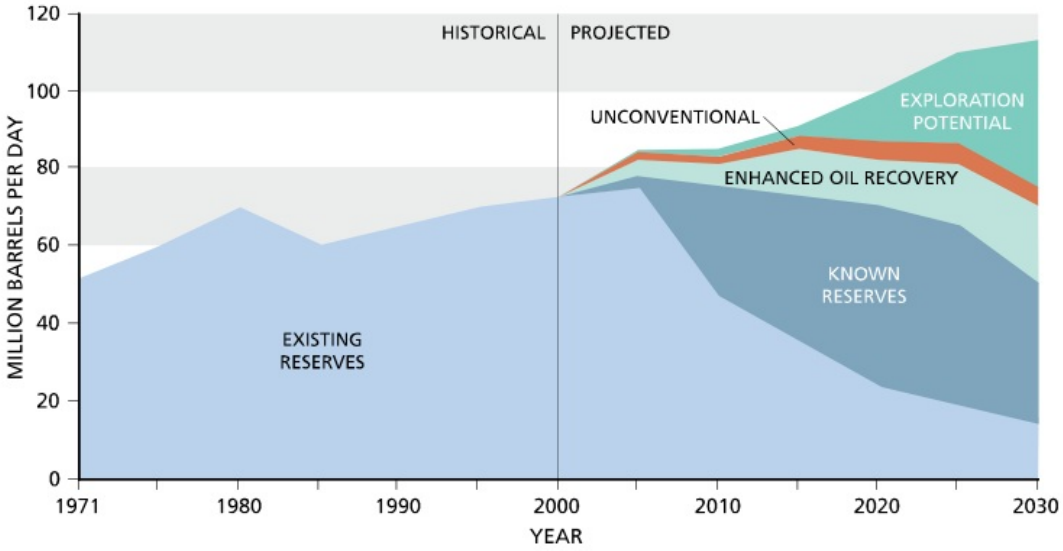


Figure ES-6. Net Regional Oil Imports and Exports

and this one:



If one reads the executive summary, the top chart is characterized as "one projection of significant changes" in exports /imports, and is clearly labeled as showing IEA data. It is now numbered ES-5.

The bottom chart seems to have been included in earlier drafts, but is not included in the current draft of the Executive Summary. Thus, it is already out.