



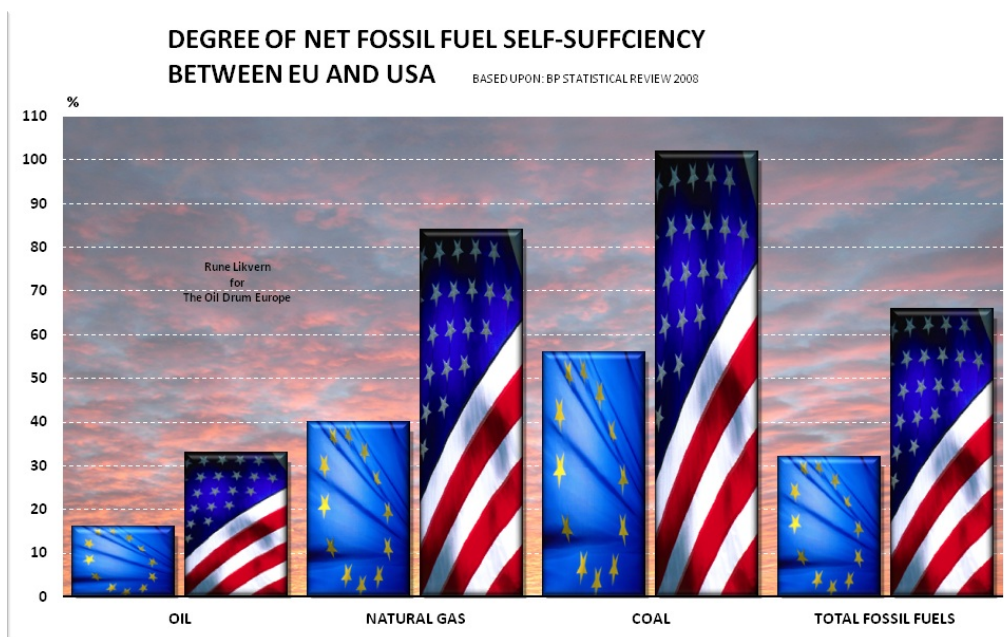
Has Fossil Fuel Consumption Within the EU Peaked?

Posted by [Rune Likvern](#) on July 10, 2008 - 9:50am in [The Oil Drum: Europe](#)

Topic: [Demand/Consumption](#)

Tags: [coal](#), [eu energy policy](#), [natural gas](#), [oil](#), [original](#), [peak fossil fuel](#), [russia](#), [self-sufficiency](#) [[list all tags](#)]

The title will hopefully make some readers choke on their coffee and spill the remains in their cup all over their computer(s).



Click on all charts to enlarge

[Editor's note: Rune Likvern the Norwegian energy man otherwise known as nrgyman2000 or NGM2 has joined TOD E as a contributor. Welcome aboard Rune.]

One thing that caught my attention some time back was the perceived lack of interest for energy questions, usage and supplies within the European Union (EU) compared to the USA. As this post will show the likelihood that the EU's fossil fuel consumption has peaked, back in 1979, is now very real. It will also compare the degree of net fossil fuel self-sufficiency between the EU and the USA as of 2007.

The EU has to a much larger extent (presently approximately twice that of USA) allowed its energy mixture and fossil fuel consumption to be based upon imports. The EU energy independence is not a realistic choice or goal (unless living standards are swiftly and dramatically lowered), and there are reasons to believe that the EU members will continue to find it increasingly hard to harmonize their energy policies towards energy exporters which will add to the strains within the union.

This is something Putin (Russia is presently EU's biggest supplier of fossil fuels) seems to have

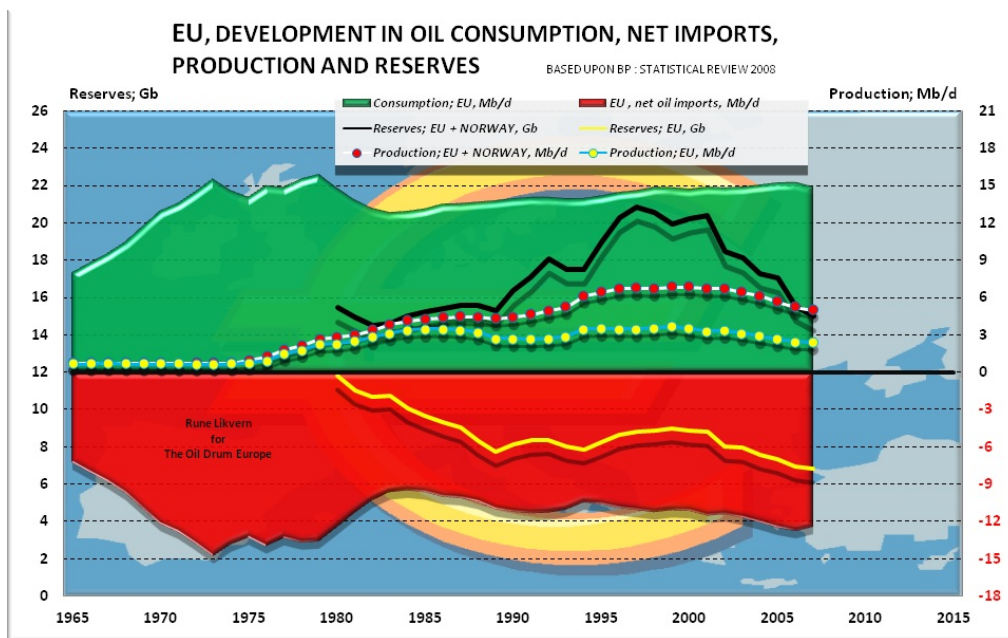
been aware of while the EU occupied itself with defining goals for greenhouse gas emissions it sleepwalked into increased reliance on Russian fossil fuel imports. Former head of IEA recently urged the EU to reduce their dependence on Russian fossil fuel supplies. It looks like *realpolitik* again will trump wishes, which is evident to everyone who cares to have a closer look at the hard data.

On the bright side it now looks very likely that the EU will reach its agreed goals for reductions in greenhouse gas emissions by 2020, but for totally different reasons than set out in its lengthy, costly and wasted political programs.

NOTE: Some of the diagrams presented in this post may, for some readers, appear overloaded with information, but if the readers allow themselves the necessary time to interpret them I think the reward will lie in a much better understanding of the energy challenges now facing the EU.

OIL WITHIN THE EU

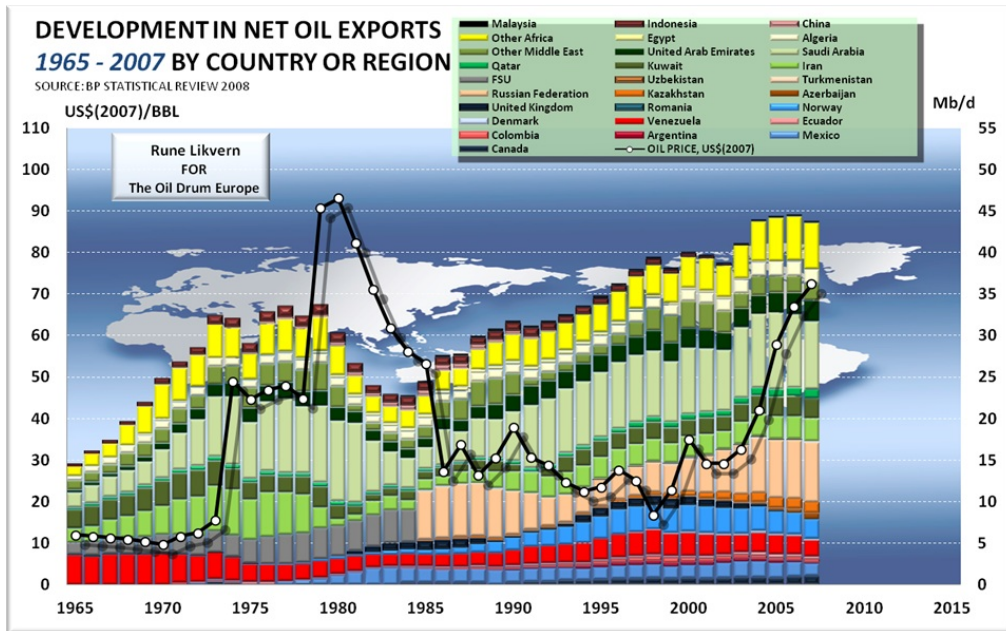
The diagram illustrates that the EU and Norway, which is not a formal EU member, are rapidly drawing down their oil reserves and the oil production has for some time been and will continue to be in a steep decline. The steep oil declines are possible to predict from EU's R/P ratio of 7,8 and Norway's R/P ratio of 8,8 at end of 2007. (The R/P ratios does not indicate any growth possibilities for oil production, generally it is hard to obtain growth with R/P numbers below 9.)



THE EU AND OIL. The above diagram shows the development in EU oil consumption (green area), (EU, (EU + Norway)) oil production (lines with circles) and EU net oil imports (red area) plotted against the secondary y-axis. Further the reported development in proven oil reserves for EU (yellow line) and (EU + Norway; black line) plotted against the primary y-axis. Diagram based upon BP Statistical Review 2008. NOTE: Scaling of secondary y-axis.

The EU will, if oil consumption is to be maintained at present levels, increasingly have to bid against other liquid bidders for declining global net oil exports (ref, diagram further down as it is now hard to envision further growth in global net oil exports in the foreseeable future). The diagram also illustrates a marginal decline in EU's net oil imports during the recent years though it is too early to draw any firm conclusions about the reasons for this, but the continued growth in oil prices remain a prime suspect. The future declines in EU's and Norway's oil production will make it increasingly difficult for the EU to maintain present oil consumption levels through

The decline in the EU's and Norway's oil production also means that the EU increasingly will have to base their oil imports from more distant sources. This will be amplified with the present decline in Russian oil exports, as Russia now exports huge amounts of oil to the EU. This is now thought to aggravate the future oil supplies' security and reliability for EU.



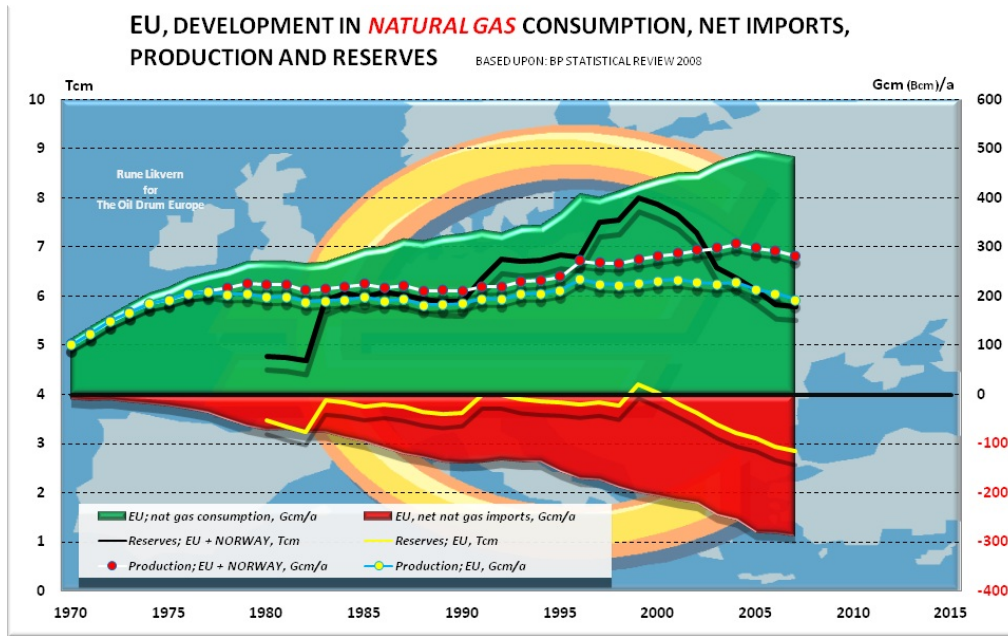
GLOBAL NET OIL EXPORTS. The diagram above shows the development in net oil exports expressed in Mb/d, against the secondary y-axis, for countries and regions that were net oil exporters between 1965 - 2007. The coloring of the stacked columns is done so it should be possible to read trends for the various regions as proposed by BP. BP data does not include agro fuels (bio fuels) and refinery gains in their statistics. The inflation adjusted oil price in US\$2007 is also plotted against the primary y-axis. Diagram based upon BP Statistical Review 2008.

The diagram illustrates that global net oil exports for all practical purposes has been flat since 2004, which coincides with the run up in oil prices. It is within this reality that the EU will have to increase its imports and thus participate in the global bidding war for oil if it wants to maintain its present levels of oil consumption. At some stage the price increases for oil (and energy sources) will certainly erode economical growth and result in wealth transferral from oil importers to exporters. Presently it is hard to spot where this limit in oil prices will be drawn, but the pain will increasingly be felt by a growing number of people.

Outlook for future growth in EU oil consumption: *Poor, with a decent likelihood of decline.*

NATURAL GAS WITHIN THE EU

The diagram illustrates that the EU and Norway are rapidly drawing down their natural gas reserves. As of end 2007 the EU's natural gas R/P ratio was 14.8, largely helped by the remaining reserves of the Groningen gas field in Holland. Natural gas production within the EU peaked in 2004 and is now in terminal decline led by UK, Germany, Netherlands and Italy. Norwegian natural gas production is still growing and is now projected by the Norwegian government to reach a plateau of 125 - 140 Gcm/a (Bcm/a) (up from 90 Gcm/a in 2007) by the middle of next decade. This growth is now forecast to partially offset the declines in natural gas production within the EU. This means that if the EU is to maintain present levels of natural gas consumption it will increasingly have to rely on imports from more distant sources like Russia, North Africa



EU AND NATURAL GAS. The above diagram shows the development in EU's natural gas consumption (green area), (EU, (EU + Norway)) natural gas production (lines with circles) and EU net natural gas imports (red area) plotted against the secondary y-axis. Further the reported development in proven natural gas reserves for EU (yellow line) and (EU + Norway; black line) plotted against the primary y-axis. Diagram based upon BP Statistical Review 2008.

NOTE: Scaling of secondary y-axis.

NOTE: BP Statistical Review 2008 lists Norwegian proven natural gas reserves at end of 2007 at 2,96 Tcm while MOE (Norwegian Ministry of Oil and Energy) in their Fact sheets for 2008 lists proven natural gas reserves at 2,31 Tcm. Between these two I would bet my money on MOE's figures.

Gazprom, which has a monopoly on Russian natural gas exports, have forecast a growth in their natural gas production of 30 - 40 Gcm/a towards 2020. It is now believed that much of this growth is for the domestic market and some for increased exports towards European and Asian customers. This suggests now that any increase in Russian natural gas exports to EU towards 2020 will be small.

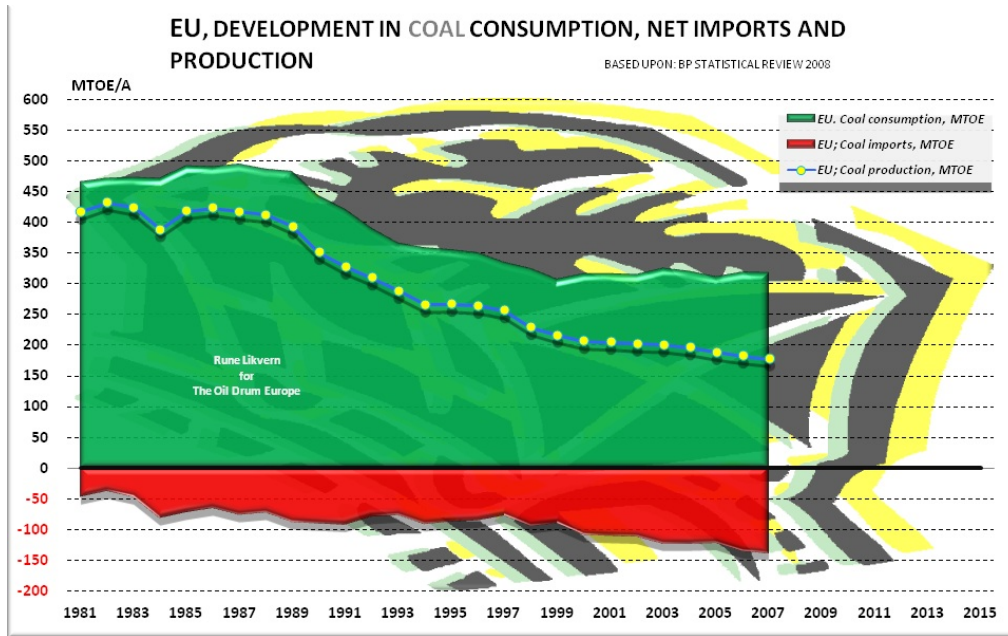
Natural gas consumption within the EU had a high in 2005 of 496 Gcm/a and was close to 25 Gcm/a lower in 2007. The reason for this seems to be mostly due to milder winters in recent years. The present run up in oil prices has also affected natural gas prices and there is now reason to believe that this will affect consumption.

In a possible future post I will present a more detailed analysis on the EU's future natural gas supplies challenges.

Outlook for future growth in EU natural gas consumption: *Poor, with a decent likelihood of decline.*

COAL WITHIN THE EU

The EU has through the years changed their energy mixture, where coal once was king. This has happened due to the high availability of natural gas which also helped reduce greenhouse gases



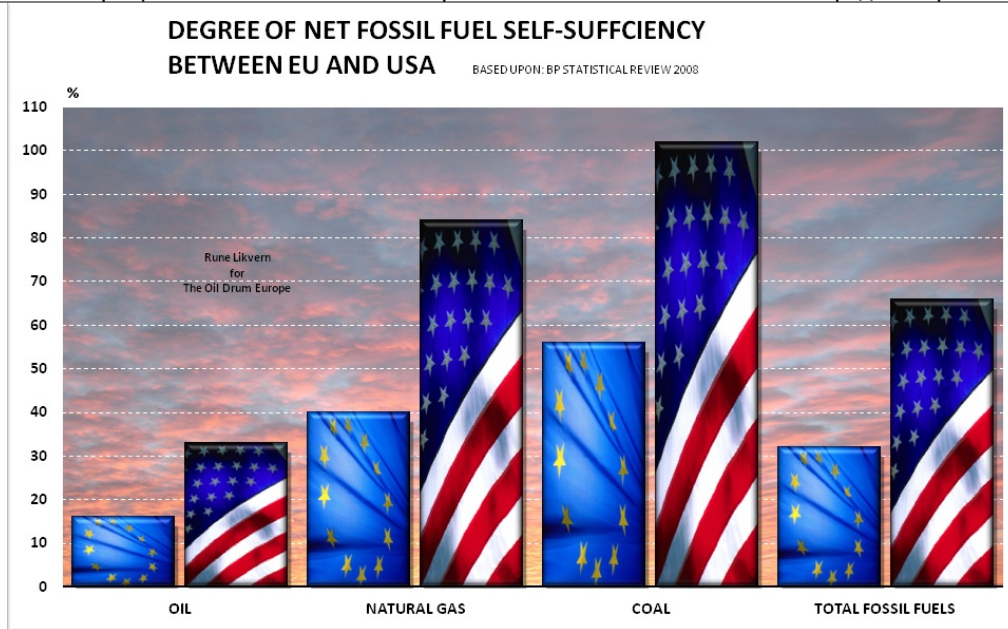
EU AND COAL. The above diagram shows the development in EU's coal consumption (green area), EU's coal production (lines with circles) and EU net coal imports (red area) plotted against the secondary y-axis Diagram based upon BP Statistical Review 2008.

As the above diagram shows coal consumption has steadily declined within EU and has for the last 8 - 10 years remained flat. This has happened while EU's coal production has been and still is in decline which has resulted in increased reliance on coal imports. As natural gas and nuclear mainly substituted and displaced coal, many coal mines within the EU and coal fired power plants have been decommissioned. It is believed it will take approximately ten years to reopen a closed coal mine while building a new coal fired power plant generally will take 5 years, thus it seems likely the EU increasingly will rely on growing coal imports if coal to a larger extent is reintroduced into the EU's energy cocktail. Given that technology is available for CO₂ capture and sequestration from coal fired power stations, which makes coal a more political acceptable energy source than nuclear, it seems likely that coal is in for a future growth in consumption within EU.

Outlook for future growth in EU coal consumption: *Good.*

SELF-SUFFICIENCY OF FOSSIL FUELS USA vs EU

The diagram clearly shows that the degree of self-sufficiency for fossil fuels is twice as high in the USA compared with the EU. It is diagrams like this one which now should raise interests for energy questions among Europeans. In addition the USA now has a higher R/P ratio for all fossil fuels. Future outlook is that dependence on fossil fuel imports will grow faster in the EU than in USA which should illustrate the urge for EU to develop long term and unified supplies strategies for fossil fuels.



The diagram above shows the degree of fossil fuel self- sufficiency (in percent) between EU and USA as of 2007. USA is presently a net exporter of coal. Diagram based upon BP Statistical Review 2008.

It now looks like EU increasingly will have to rely upon increased future fossil fuels imports from Russia or find other ways to reduce consumption and thus alter its reliance on fossil fuel imports.

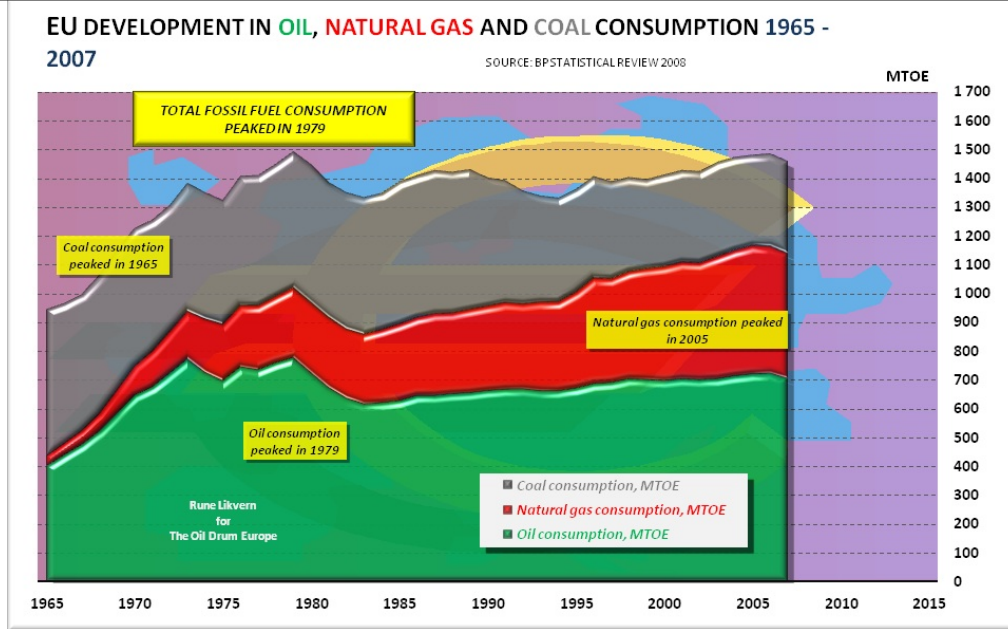
EU's future energy policy will increasingly find itself between a rock and a hard place.

HAS FOSSIL FUELS CONSUMPTION WITHIN EU REALLY PEAKED?

The diagram shows that coal consumption peaked in 1965 and it is now hard to foresee that coal consumption within the EU will grow approximately 200 MTOE to reach the same historical level.

Oil consumption within the EU peaked in 1979 and was in 2007 approximately 1 Mb/d lower. With expected oil production declines within the EU and declining global net oil exports it now seems unrealistic to believe that oil consumption within the EU will grow in the future.

Strong evidence suggests now that natural gas consumption within the EU peaked in 2005.



EU AND FOSSIL FUEL CONSUMPTION. The above diagram shows the development in EU's oil (green area), natural gas (red area) and coal consumption (grey area) in MTOE (Million Tons Oil Equivalent). Diagram based upon BP Statistical Review 2008.

If fossil fuel consumption within the EU is to grow this analysis suggests that coal will increasingly substitute oil and natural gas in the energy mixture. If coal can or will be introduced at a speed which covers the expected declines in oil and natural gas consumptions remains to be seen.

There is now a real possibility that fossil fuel consumption within EU peaked long ago in 1979 with a more recent secondary peak in 2005.

There seems to be a division of labor within the energy mixture, where oil is used for transport (mobility), and natural gas for cooking, heating and some electricity generation and coal mainly for electricity and some heat generation. Oil will easily substitute the other two fossil fuels, while a substitution the other way is either hard or at best negligible.

As we are at or near the apex of global liquid fuels supplies and this is a situation that is new to the world economy and therefore and as of now little is understood what will happen on the down slope of global liquid fuels supplies there are perhaps questions that needs to be asked.

How will declines in global liquid fuels supplies affect demand/consumption for energy from other sources?

Fact is there are little historical data to give any good and reliable guidance and therefore the consequences are poorly understood. Often the substitution argument is brought forward when the question is raised. However if history may be of little guidance like the early 80's and Russia after the dismantling of Former Soviet Union, the consumption from the other energy sources (taken into account that some substitution will take place) will trend in the same direction as liquid fuels which is.....downward.

There is some logic to this; energy from other sources is consumed to build vehicles and tools that consume oil, and as oil availability declines it is to be expected that demand for oil consuming vehicles and tools also will decline. This could thus create a feedback loop reducing demand for energy from other sources.

In such a context the market will see to it that future emissions of greenhouse gases will substantially decline. And this will happen without the implemetation of any political programs.

SOURCES:

[1] MOE FACT SHEETS 2008

[2] BP STATISTICAL REVIEW OF WORLD ENERGY 2008

[3] GAZPROM in questions and answers (2007)

Other articles on EU energy on The Oil Drum

[EU oil imports set to grow by 29% by 2012](#)

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