Jean Laherrère 26 April 2017

Michael Lynch on my estimates of UK oil fields

Michael C. Lynch (MCL) has criticized my estimates of the oil reserves of UK fields in his 2016 book "The "peak oil" Scare and the Coming Oil Flood"
http://www.abc-clio.com/ABC-CLIOCorporate/product.aspx?pc=A4345C

ABC-CLIO 479 pages

But first he rightly notices that I have always refused to forecast oil price (because human behavior is too irrational)
p132

> But more important, predicting price is totally different from predicting supply, as many peak oilers acknowledge. Jean Laherrere refuses to forecast price for that very reason (although a careful reading of the quote above will suggest that I should eschew the practice as well.) Supply

Then he criticized the size of my figures and if some of my first old figures were not very good, I challenge him to draw his figures as well as mine for the last ten years: it is obvious in the rest of this paper that MCL's figures are poor, incomplete, missing legends and often units, sometimes unreadable

p137

> racy of many of his forecasts. And Laherrere produces forecasts in the form of extremely small figures, with 120 years in a one-inch square, most of them in the past few years, making it all but impossible to judge the degree of error only a few years later.

-UK oil production
MCL mentions my forecast on UK oil production page 138 and also on Forties in the text of page 139 and in the legend of Figure 9.2, but this graph displays not Forties production but only oil production per well by regions??

p138

> Similarly, Laherrere produced a later forecast of UK production using the discovery curve Laherrere figure which predicted that production

p139

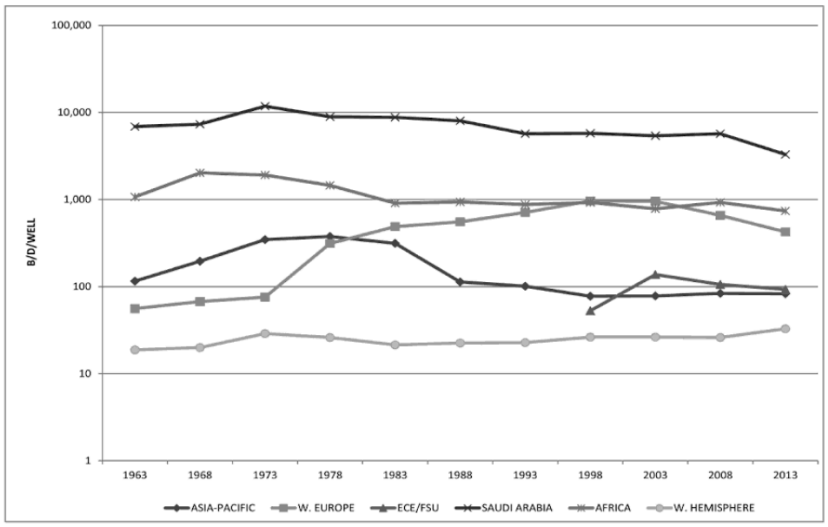


Figure 9.2 Forties Production and the Campbell Forecast for UK Total (Campbell [1991], UK Brown Book, and BP SRWE)

would be under 1 million barrels per day by 2005, whereas the actual is approximately 1.7, or 70% higher.[25] The subsequent sharp decline still left him well under actual; 2014 production was roughly 0.9 million barrels per day, versus his prediction of 0.5 million barrels per day.

The overly pessimistic UK production forecasts are notable because the United Kingdom is the *one of the best understood provinces,* relatively small, well-known geology, with an extremely detailed data available. Nor were any major "unconventional" fields added in recent years, which would skew the results in other countries, such as the United States. Overall, the models used by these two authors have failed badly at the easiest possible test.

Blanchard has bragged about his success forecasting North Sea production, noting that he was accurate for 2010, whereas DOE was almost 100% too high[26] (both from 1999). He does seem to understate the actual slightly, leaving him off by only about 10%.

Production in the Former Soviet Union serves as an interesting litmus test of the bias of peak oil theorists. In 1991, the FSU was known to have many under- and unexplored areas, as well as billion barrel fields that had been discovered but not developed, and was relying on technology far more primitive than that used in the West. Everything should have suggested that the region would see good prospects for recovery, yet not only did Campbell not foresee

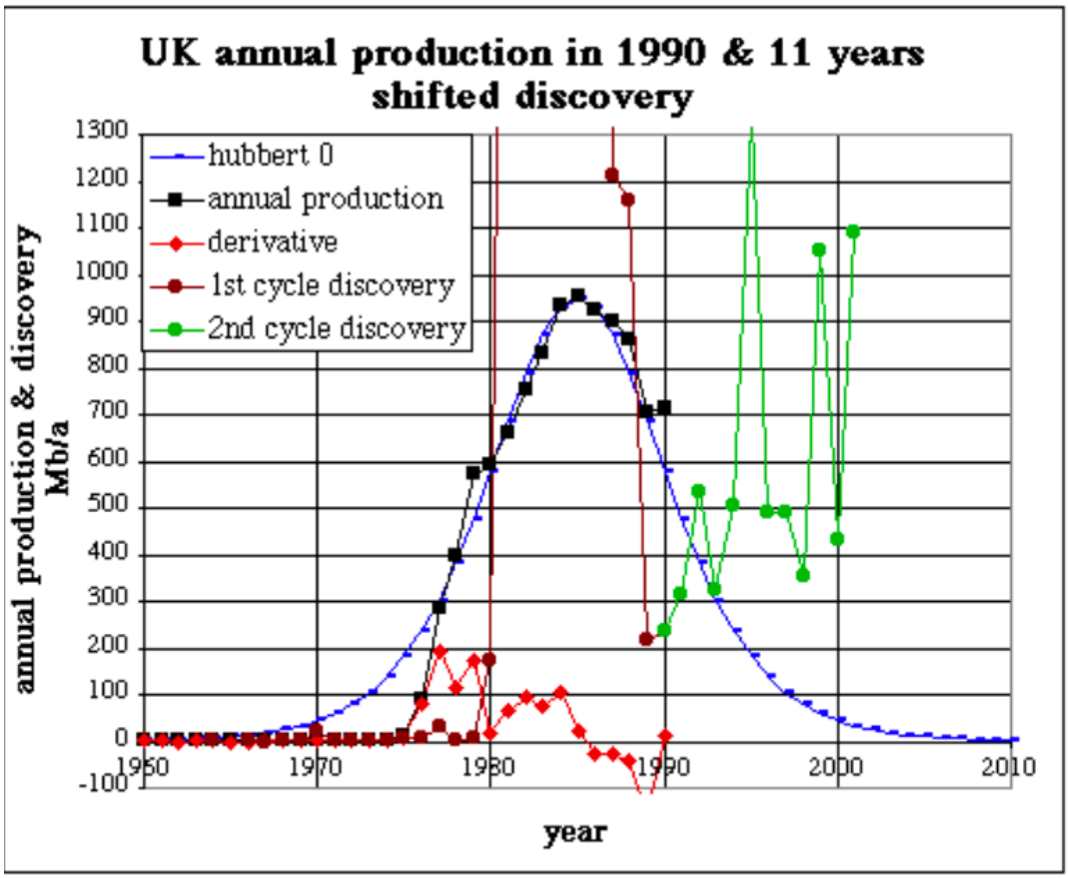
MCL claims that my *UK oil production in 2005 is under 1 Mb/d when actually it is 1.7 Mb/d*: but he does not show any of my graphs doing so.
I searched for my UK oil production forecasts before 2005

My 2000 paper on displays two cycles of oil discovery and production in the UK
THE HUBBERT CURVE: ITS STRENGTHS AND WEAKNESSES
by J.H. Laherrère version proposed to Oil and Gas Journal on Feb 18 2000
http://dieoff.org/page191.htm
4a UK- First Cycle: discovery and production as estimated in 1990

The United Kingdom is sometimes quoted by detractors of Hubbert modelling as an example of a country where it does not work because an early peak in 1990 was followed by a saddle and an unexpected second peak. In fact, there were two discovery cycles, which may be satisfactorily modelled with the multi-Hubbert approach. The first cycle of discovery peaked in at 0.9 Gb/a in 1974; to be followed by a second discovery cycle peaking at 1.3 Gb/a in 1984.

Figure 11 plots the two cycles with a good correlation between the discovery and production curves with a shift of 11 years. It clearly indicates that a second production peak was already developing by 1990. The rapid rise at the end of the 1970s obscures the natural inflection point, which cannot accordingly be used for modelling. The explanation is that whereas onshore production can start with the first well, offshore production rises rapidly once the facilities have been installed. In the case of the United Kingdom, several giant oilfields had been discovered after the opening of North Sea grabens in 1968 and were placed on production more or less simultaneously ten years later.

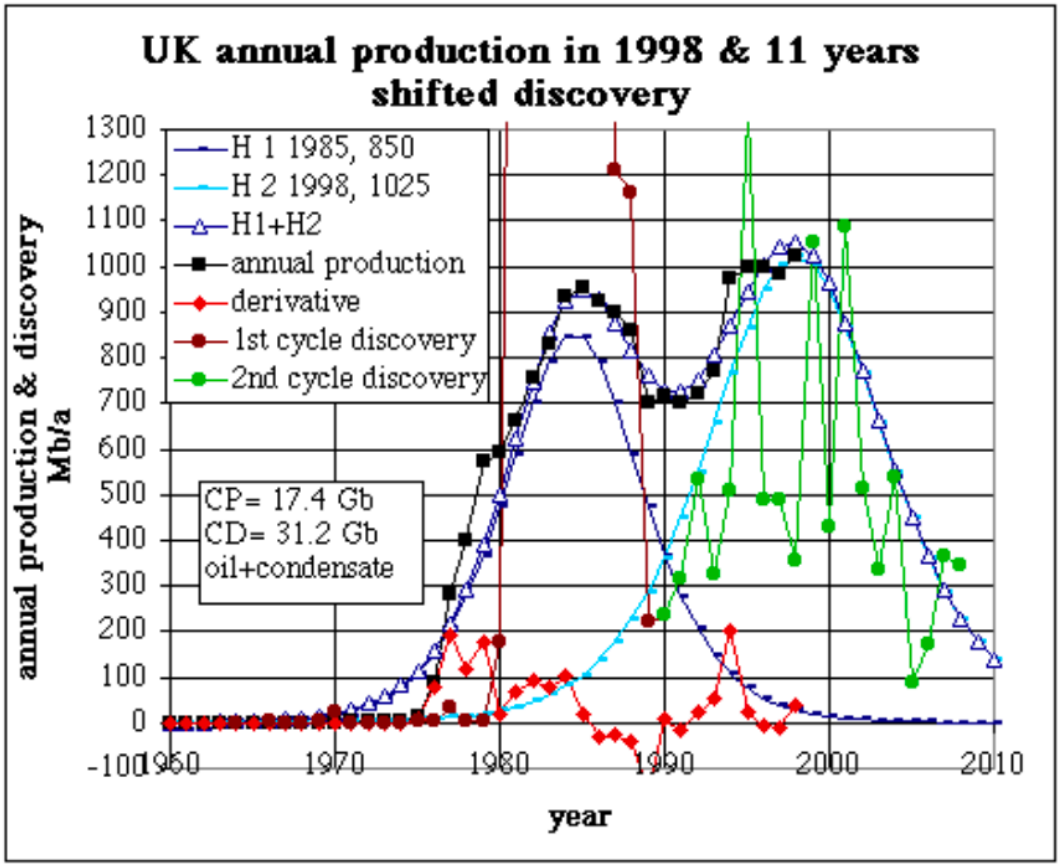
Figure 11:



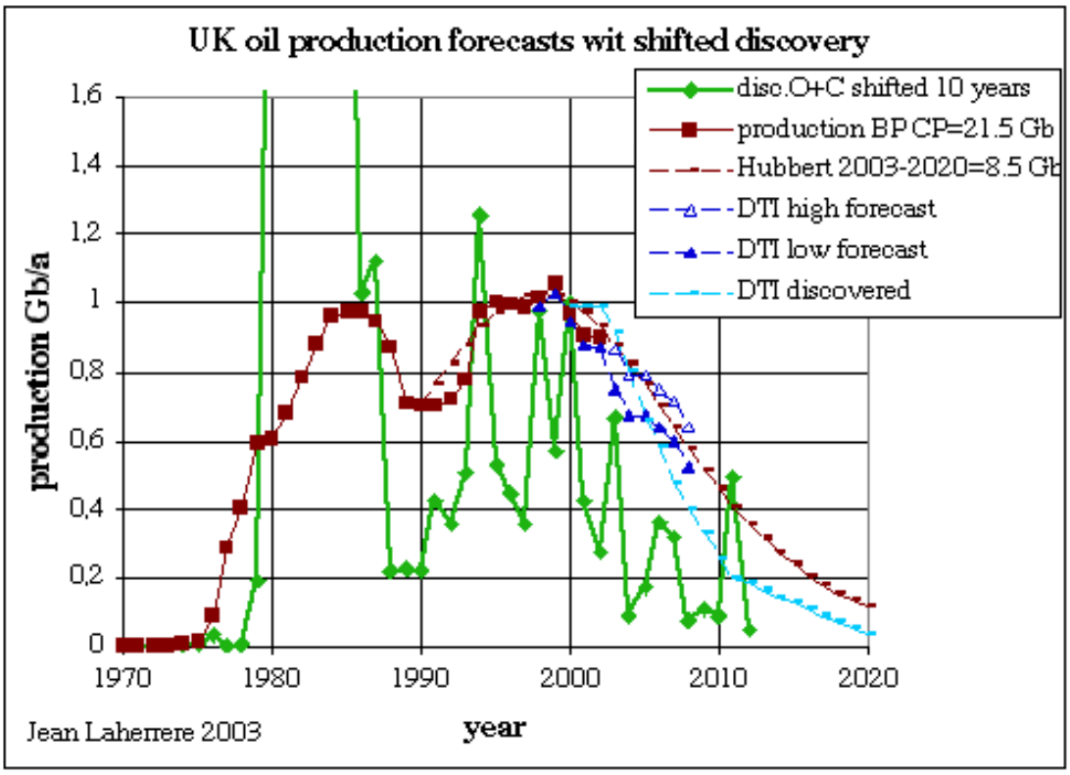
4b UK Second Cycle: discovery and production as estimated in 1998

*The eleven-year shift between the discovery and production curves, shown on Figure 12, fits well with the present status of production: 17.4 Gb of oil and condensate have been produced so far, and 31.2 Gb have been discovered, of which 5.1 Gb is yet to be developed. The model shows clearly that production is now close to peak and will be already in decline by 2001. Figure 10 shows modelling with two Hubbert cycles respectively peaking in 1985 and 1998. The inflection point for the second cycle was in 1994, but as in the case of the first peak, the rise offshore is too sharp (772 Mb/a in 1993), so it is better to take it at the average 1993-1994, namely 873 Mb/a. The value of the first cycle decline should be removed (100), so the second peak should be around 1015 Mb/a (775*1.31). In fact, a good fit for the second*

Hubbert curve is 1025 Mb/a for 1998. Production from the first cycle will be almost exhausted by 2000, and the second cycle will be approaching exhaustion by 2010. A new cycle could arise in frontier offshore areas to the West.
Figure 12:

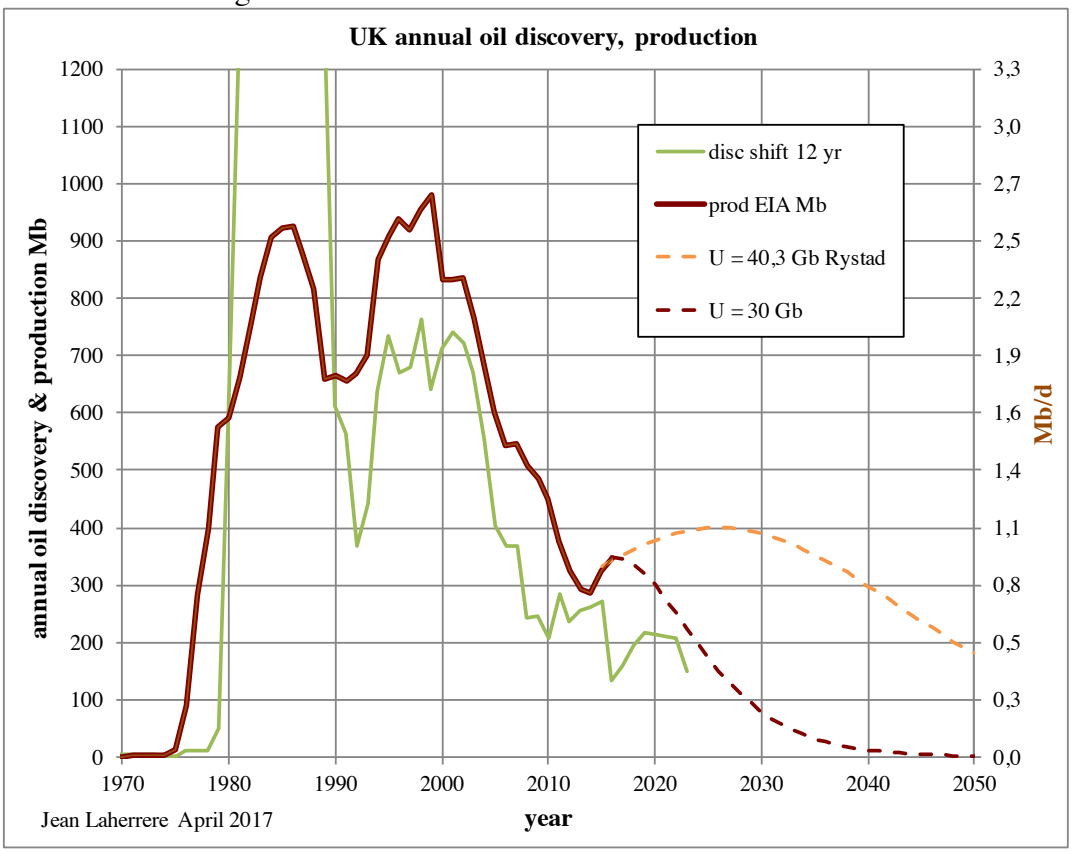


My 2003 paper in Copenhagen *www.hubbertpeak.com/laherrere/Copenhagen2003.pdf* displayed figure 47a UK oil annual production, confirming the second peak forecasted by my 2000 paper: the annual production is reported in Gb, when MCL is talking about Mb/d

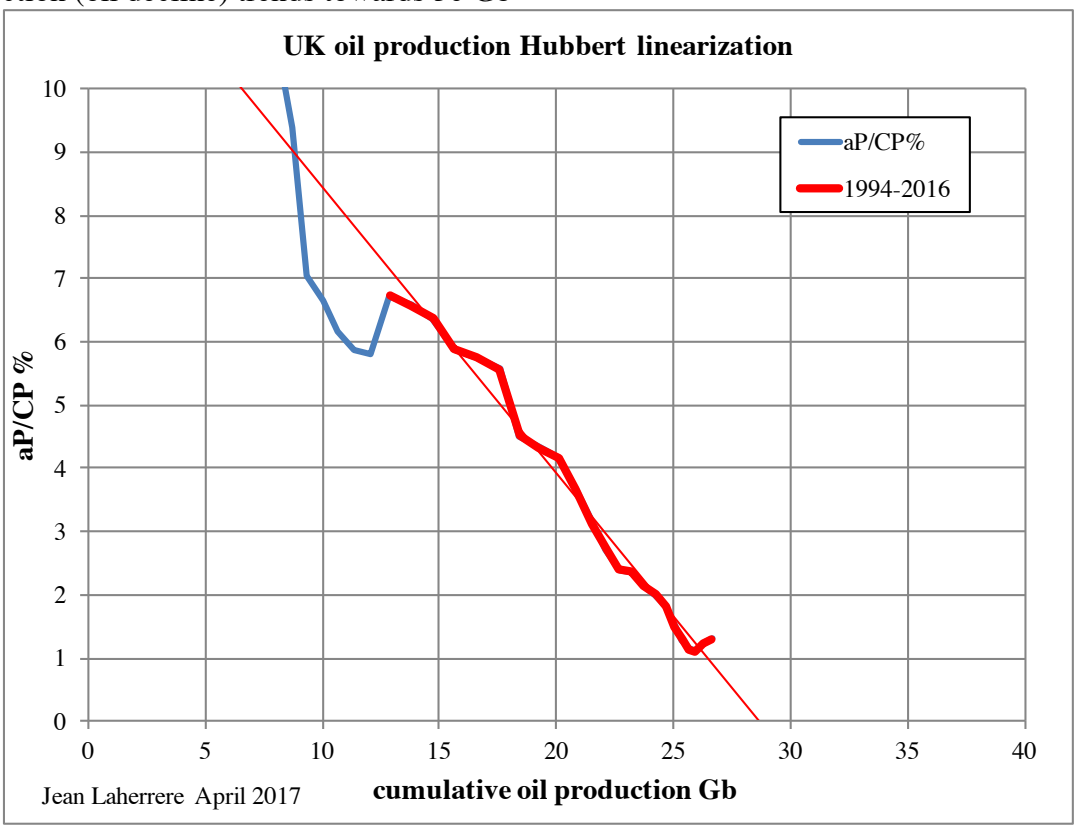


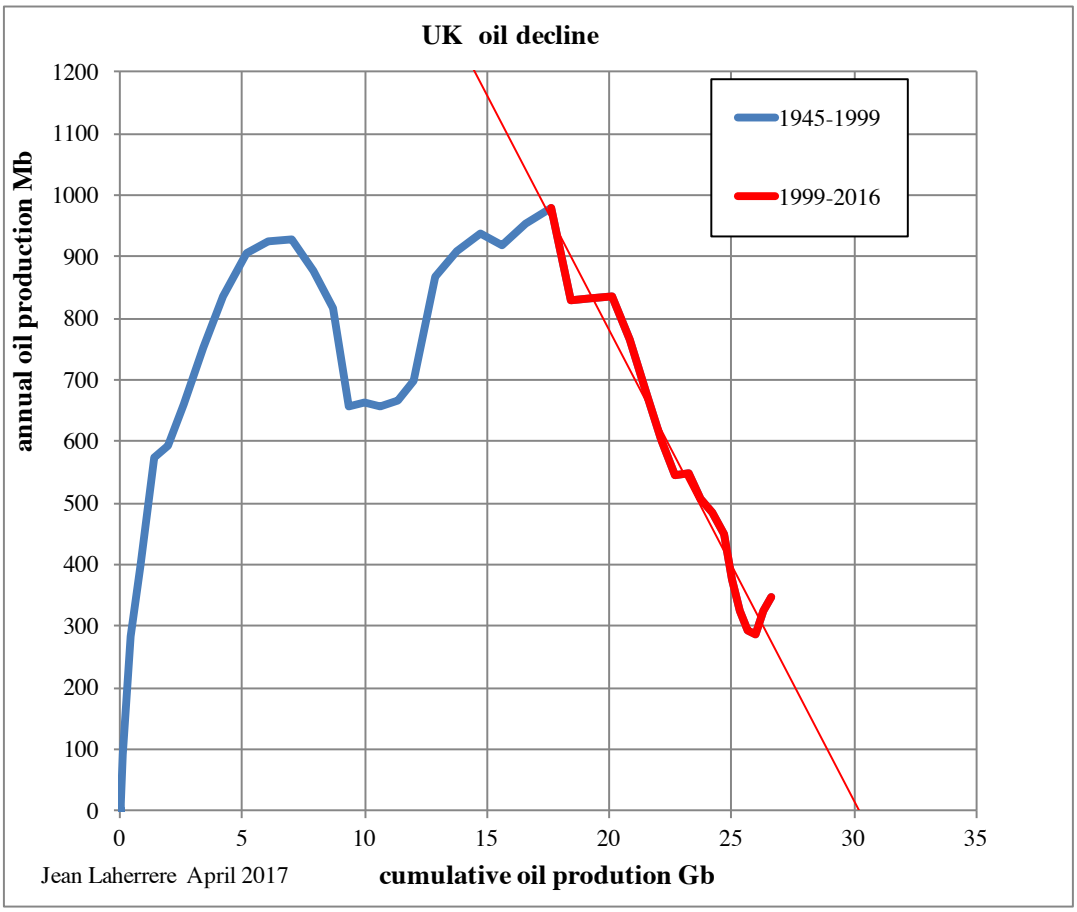
MCL confuses Mb/d and Gb/a! His claim on UK oil production is then completely wrong!

UK present oil production decline follows fairly well the discovery shifted by 12 years and my 2003 forecast looks good!

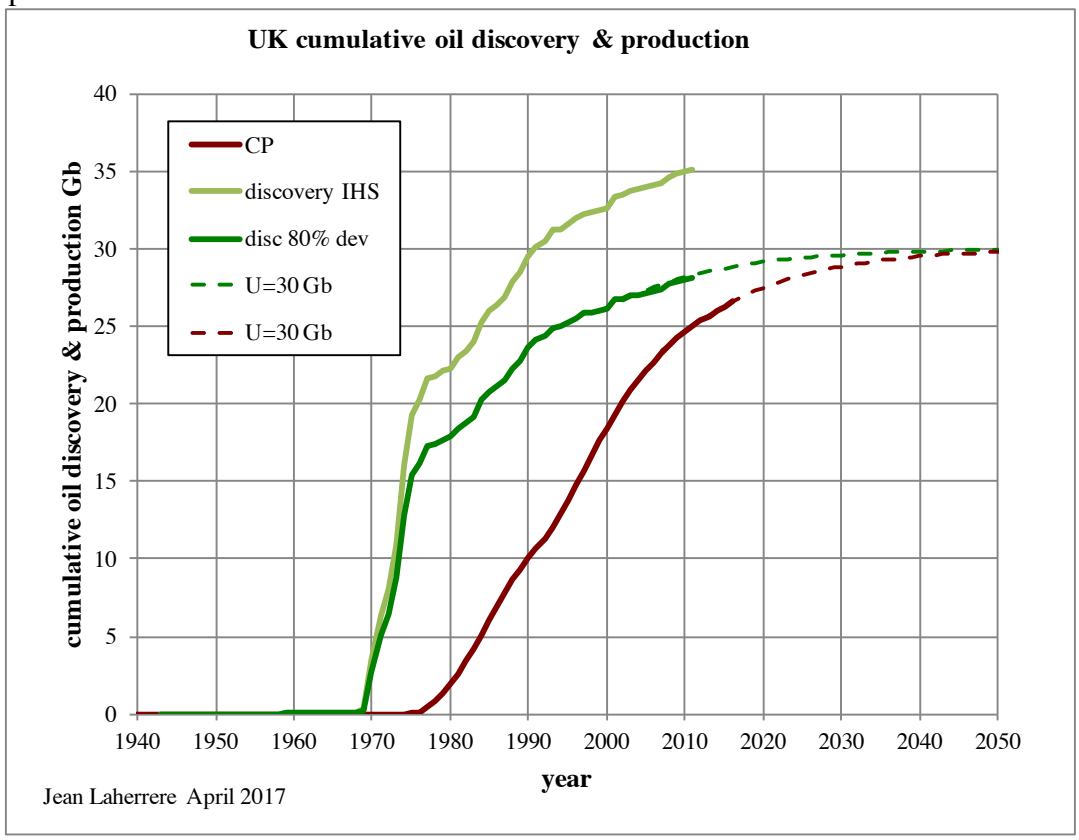


The 30 Gb oil ultimate is based on extrapolation of past production and past discoveries. The linear extrapolation of annual/cumulative production (Hubbert linearization) and oil production (oil decline) trends towards 30 Gb

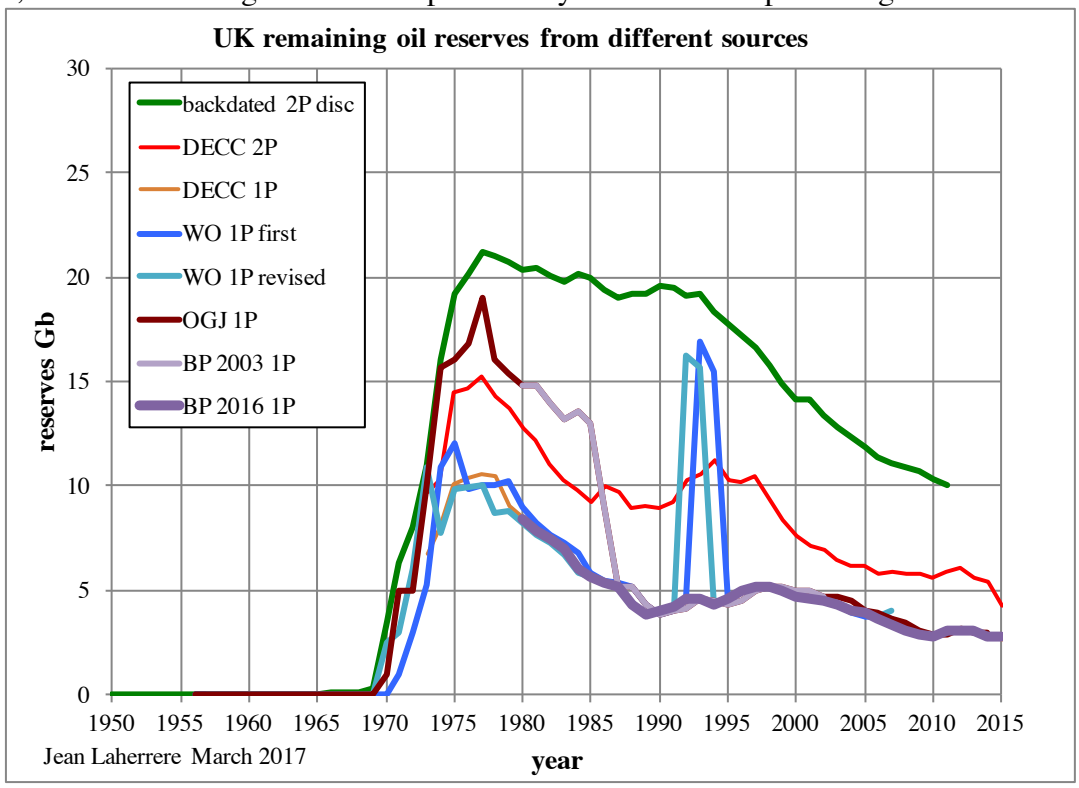




The extrapolation of oil discoveries is disturbed by the fact that on the North Sea there are many small oil discoveries (reported h by IHS), which are uneconomical and will likely be never produced

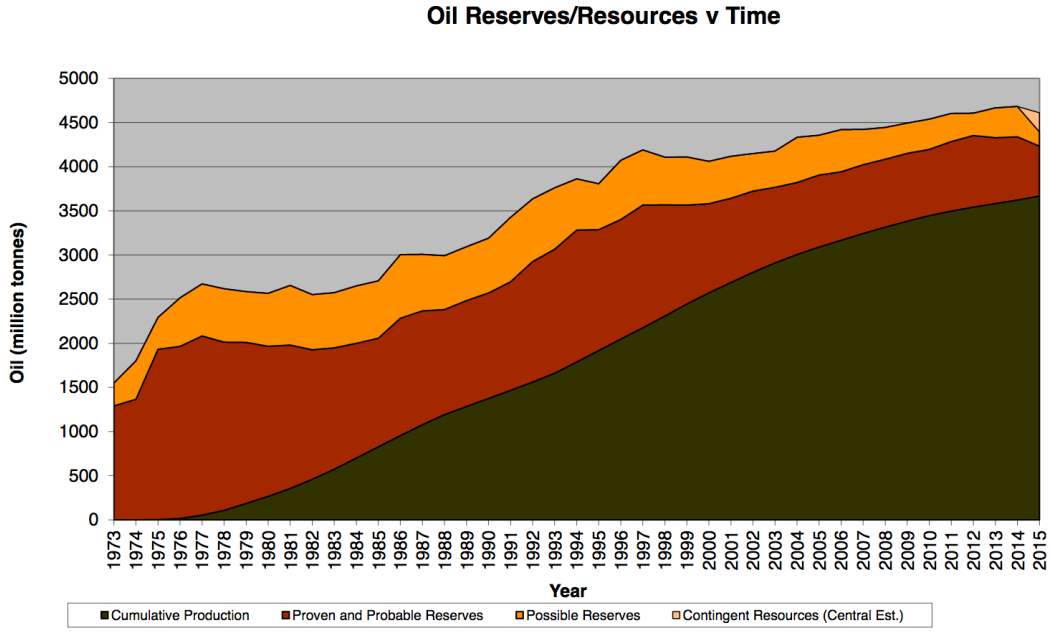


At end 2010, there is a 5 Gb difference between remaining 2P reserves from IHS and from DECC, because the UK government reported only reserves from producing fields



DECC = Department of Energy & Climate Change (former DTI) became part of Department for Business, Energy & Industrial Strategy in July 2016!
New site for UK reserves:
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/226021/Appendix_2_Historic_UK_Oil_and_Gas_Reserves_and_Production.pdf
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/539799/UK_Oil_Reserves_and_EUR_2016__12_July_2016_.pdf

Stacked Graph to Show Oil Reserves, Contingent Resources and Production from 1973 to 2015

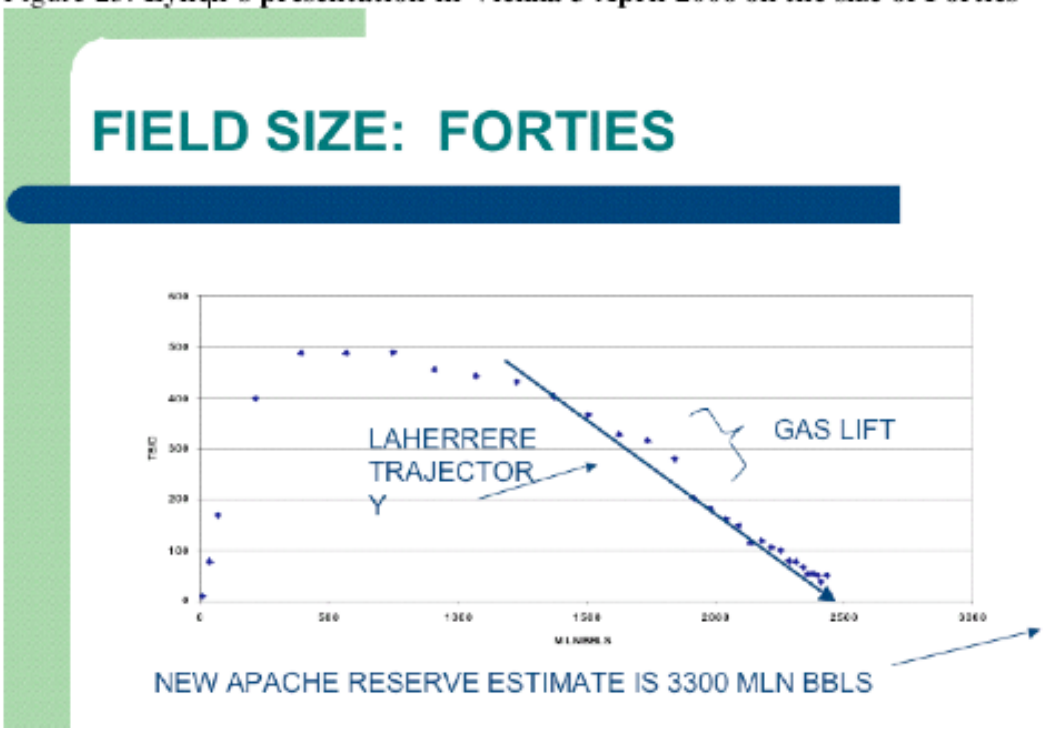


By the way, UK definition of probable reserves is wrong, despite they claim to follow SPE PRMS guidelines
https://www.gov.uk/guidance/oil-and-gas-uk-field-data#uk-oil-and-gas-reserves-and-resources
Probable Reserves that are not yet proven, but which are estimated to have a better than 50% chance of being technically and commercially producible
SPE PRMS http://www.spe.org/industry/docs/PRMS_Guidelines_Nov2011.pdf
Probable reserves are those additional Reserves that are less likely to be recovered than Proved Reserves but more certain to be recovered than Possible Reserves. It is equally likely that actual remaining quantities recovered will be greater than or less than the sum of the estimated Proved plus Probable Reserves (2P). In this context, when probabilistic methods are used, there should be at least a 50% probability that the actual quantities recovered will equal or exceed the 2P estimate.
UK definitions confuse probable reserves with proved + probable reserves!
UK reports the 3P reserves (in the above graph dark brown + light brown) as the arithmetic addition of 3P field reserves: it is wrong, as indicated by the PRMS guidelines: the addition should be probabilistic. Arithmetic addition of field reserves to get the country reserves is only correct for 2P reserves. Arithmetic addition of 1P field reserves underestimates the country 1P reserves, arithmetic addition of 3P field reserves overestimates the country 3P reserves.
PRMS: *The process of summing reservoir (or project) level estimates of resource quantities to higher levels or combinations such as field, country, or company totals. Arithmetic summation of incremental categories may yield different results from probabilistic aggregation of distributions.*

-Forties oil field

In 2006 in Vienna EGU, MCL displays a graph on Forties with an ultimate of 3300 Mb and Laherrere trajectory towards 2500 Mb (almost unreadable!)

Figure 25: **Lynch's presentation in Vienna 3 April 2006 on the size of Forties**



In his 2017 post on peak.oil.com, MCL argues that my estimate on Forties was wrong

"Peak Oil: Not Just Wrong but Invalid Production" Michael Lynch March 29, 2017

http://peakoil.com/production/peak-oil-not-just-wrong-but-invalid

Laherrère has noted that the Forties field production followed a declining trend for years, suggesting that the field's total resource could be estimated by extrapolating it to the intersection with the x-axis.

The addition of gas-lift caused production to differ from the trend briefly, but then the trend resumed to his great delight—proving, he insisted, that geology determined the profile of a field's production.

Nonsense. Since he published his graphs, the Forties oil production trend has changed, going flat instead of declining for roughly ten years, with an increase in the field's proved reserves of 150 million barrels. Production patterns are determined by the geology and chemistry of the deposit, plus the engineering decisions on how to produce it, plus the fiscal regime in place. The latter two can change, as was the case with the Forties field and many others. New investment regularly adds reserves to mature fields, and the trade press is full of articles describing such additions.

I have shown Forties oil production forecast on many papers:

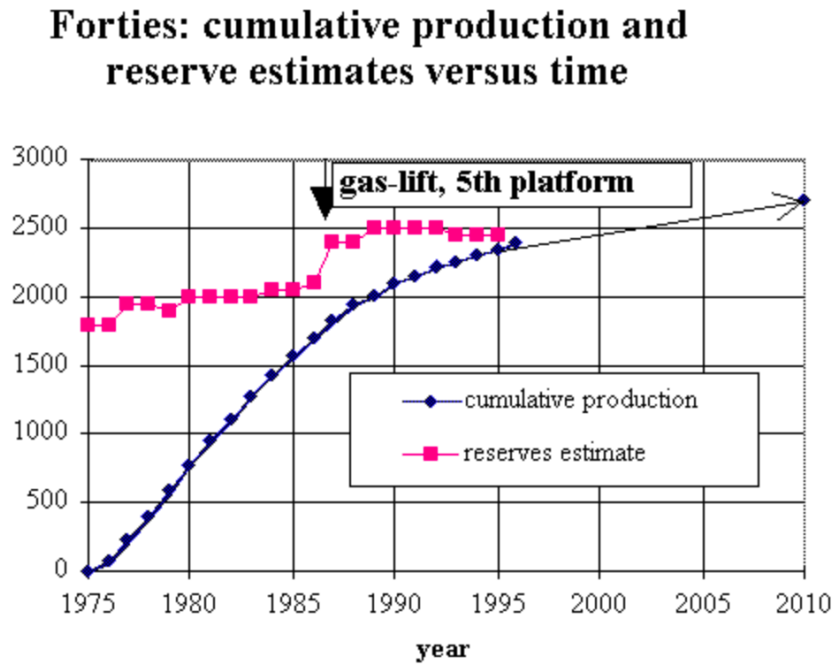
-1997

"Distribution and Evolution of "Recovery Factor" presented at "Oil Reserves Conference" in Paris, November 11, 1997 (attended by MCL) International Energy Agency

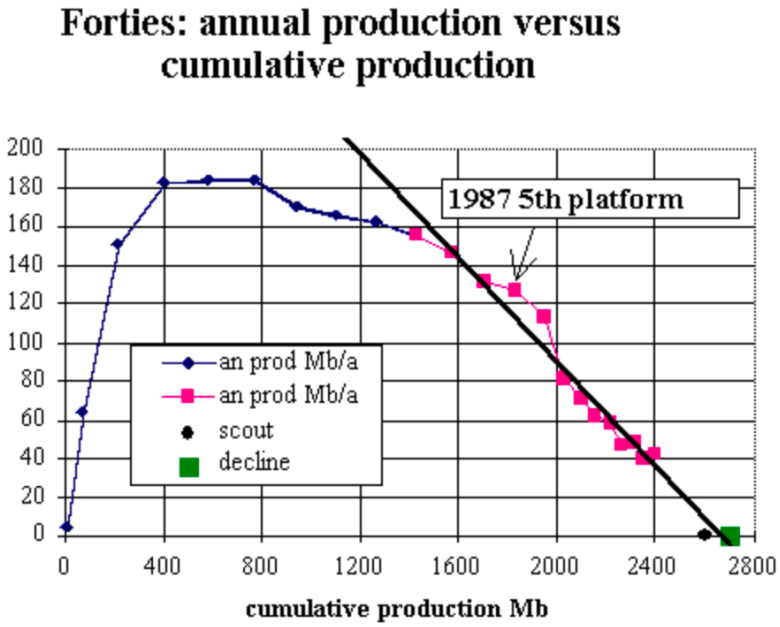
http://www.hubbertpeak.com/laherrere/iea1997/

My 1997 forecast was 2700 Mb

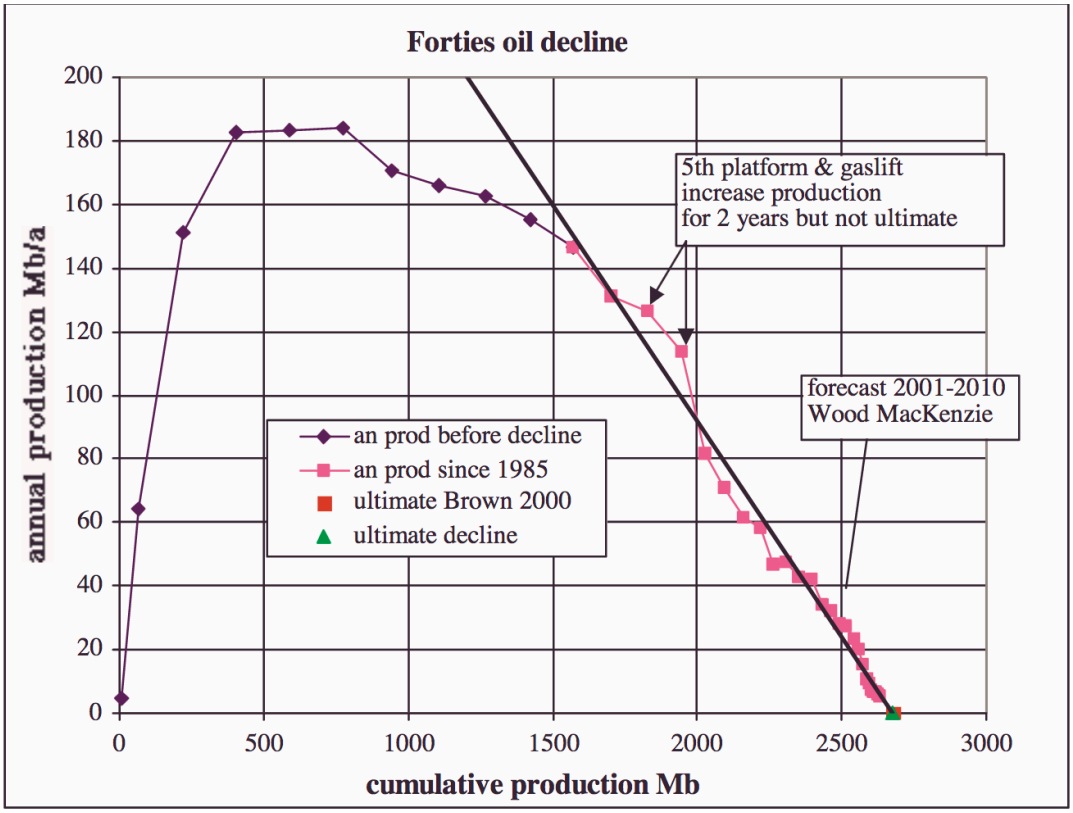
-figure 11a:



-figure 11b:



-2001
"Estimates of Oil Reserves" Paper presented at the EMF/IEA/IEW meeting IIASA, Laxenburg, Austria - June 19, 2001 Plenary Session I: Resources
http://www-personal.umich.edu/~twod/oil-ns/articles/laherrere-long_iew2001.pdf
Fig 21



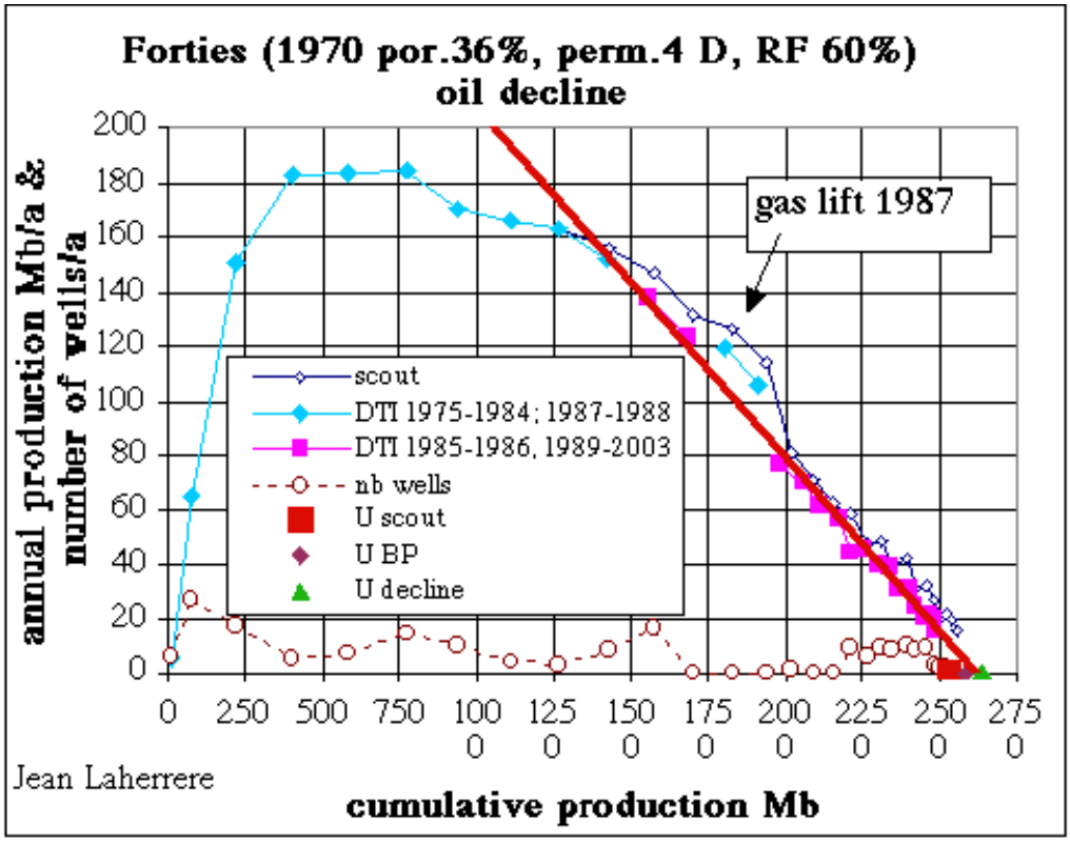
My 2001 forecast was still 2700 Mb

-2003

-Laherrère J.H. 2003 "How to estimate future oil supply and oil demand? " International conference on Oil Demand and Oil Production - Prospects for the Future by The Danish Board of Technology and The Danish Association of Civil Engineers December 10 www.oilcrisis.com/laherrere/Copenhagen2003.doc

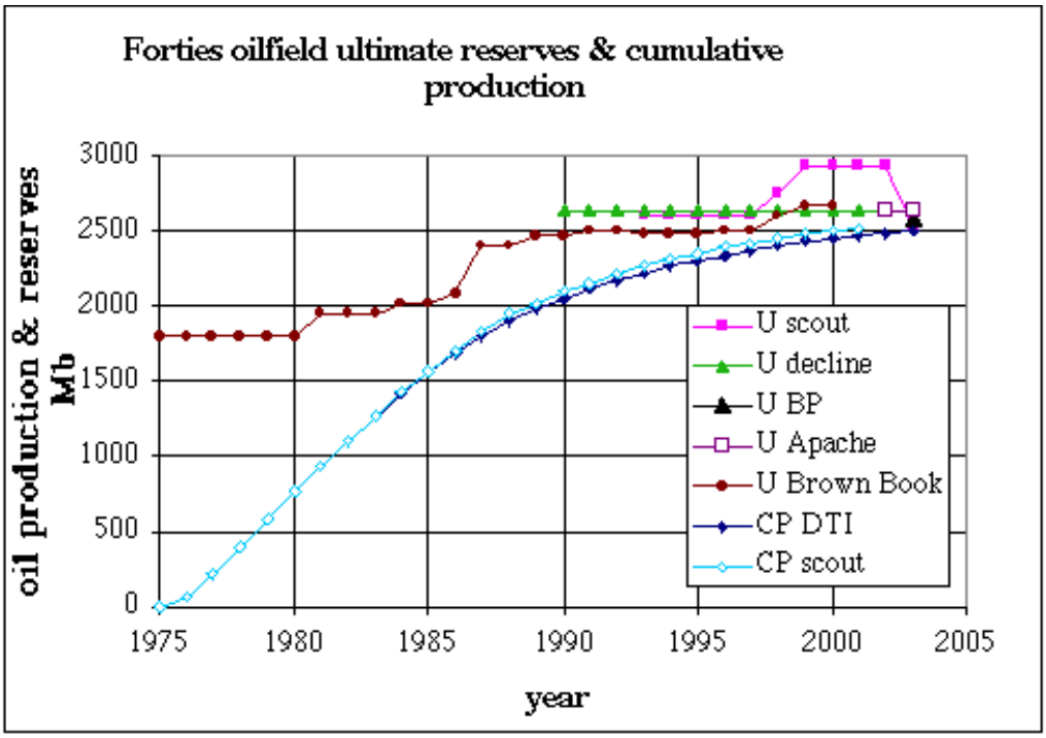
Forties is a good example of no growth despite new technology (gaslift), but higher production during two years, meaning more money, but not more reserves.

Figure 36a: Forties oil decline: production increase in 1987-1988 with gaslift, no global growth



Evolution of Forties reserves varies from sources (DTI, OGJ) and shows that as there is no referee, any statement has to be careful compared to the truth i.e. annual production decline. Any claim of reserve growth has to be shown by a reduction of the production decline, if not, it means that the former estimate was wrong. It is not reserve growth, but bad reserve reporting.

Figure 36b; Forties reserve evolution: depends upon sources



MCL denies the reliability of the estimates of field ultimate from oil decline versus cumulative production: the case of East Texas oil field is very interesting

East Texas is the largest oilfield in the US 48, found in 1930 and obliged to partial shut down by the State troops in 1931 because of overproduction. From the late 1940s, more than 380 wells, found deviated in order to steal oil from neighbours, were shut down. It was estimated to contain up to 6 Gb (still claimed in 2002 by Merritt), but now decreased to 5.4 Gb, after drilling over 30 000 wells. The decline from 1966 to 1957 is the same as the last decline from 1995 to 2001. The increase in production due to water injection was temporary.

Figure 29a: East Texas oil decline 1931-2001:no decline growth

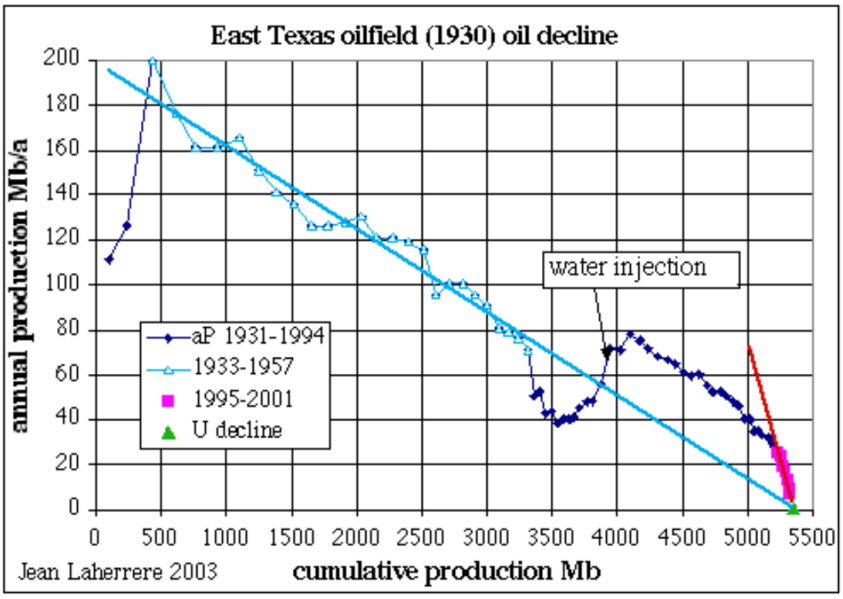
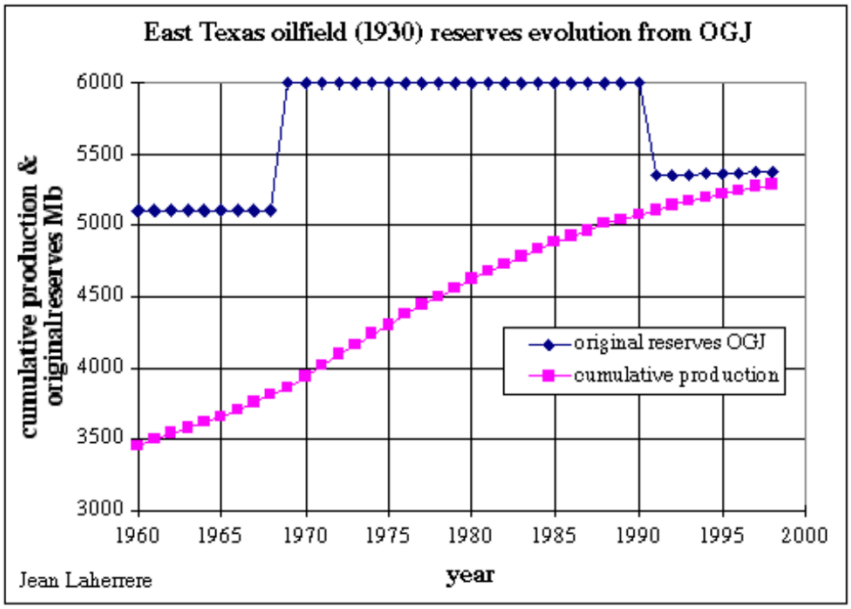


Figure 29b: East Texas oil reserves evolution: negative growth



-2014

« Introduction to Peak Oil" R.W. Bentley Springer 22 March 2016

www.springer.com/cn/book/9783319263700

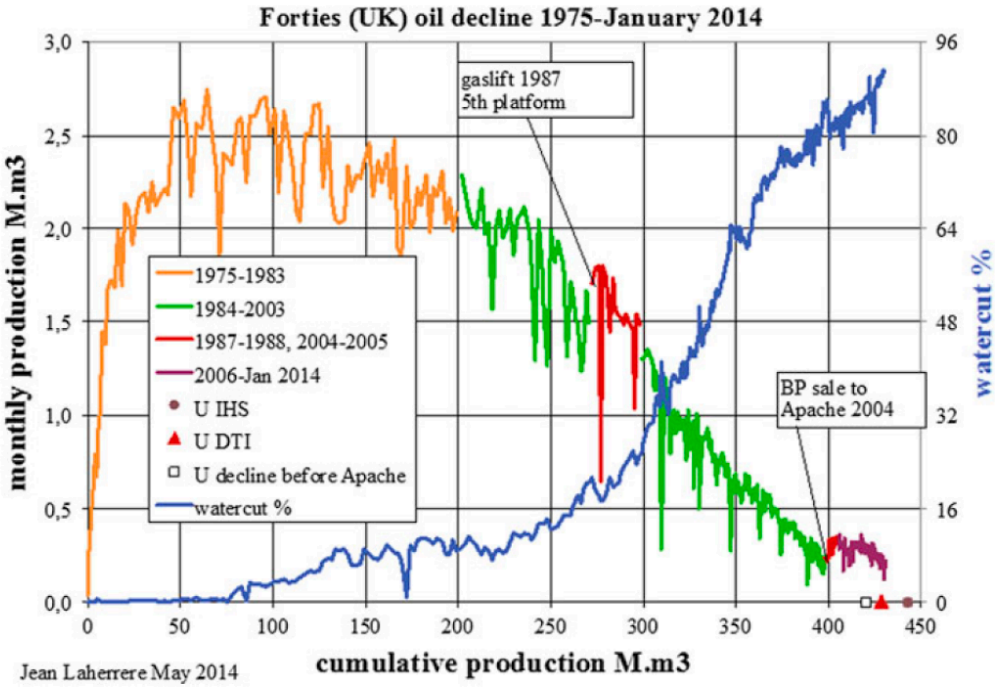


Fig. 2.3 Linearised plot of field decline: Example of the Forties field. Unlike a normal production plot of production versus date, this approach plots production (here as monthly data) versus cumulative production, and hence linearises the decline curve if the decline is exponential.

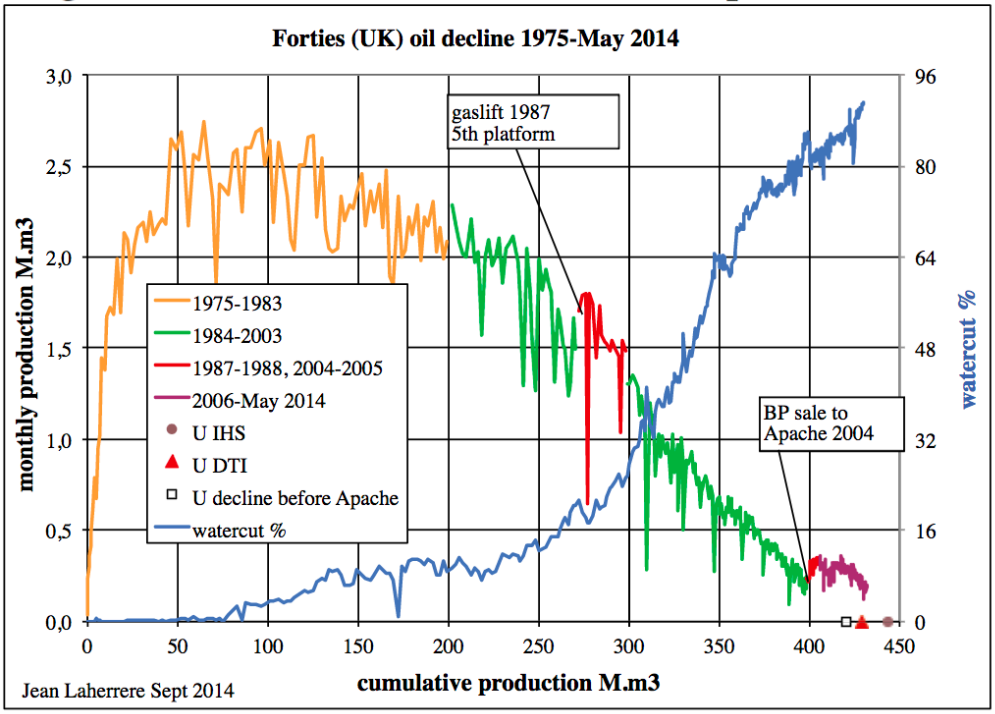
Notes

- Colours indicate production at different time periods.
- U IHS: URR estimated by IHS Energy.
- U DTI: URR estimated by the UK Dept. of Trade and Industry (data now from DECC).
- Right-hand scale shows increase in 'water cut' (water co-produced with oil as a result of water drive) over time, as a percentage of field total all-liquid (oil plus water) production.

Source J. Laherrère

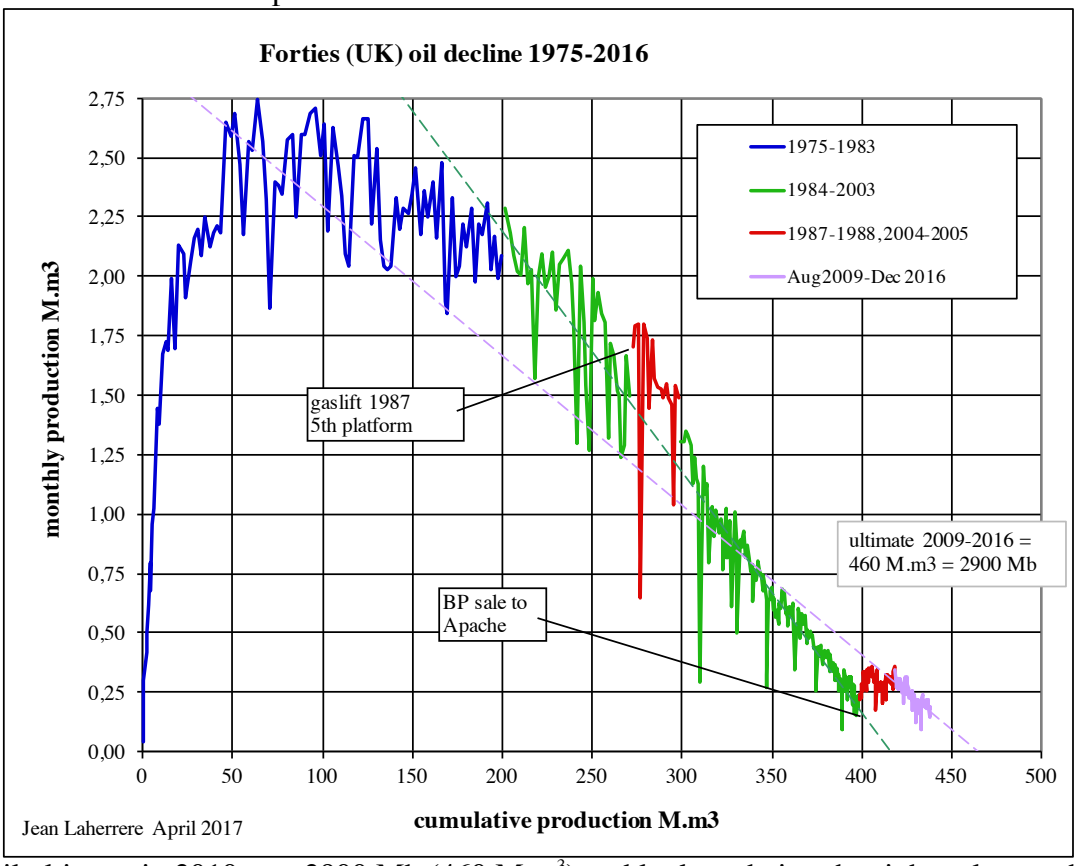
Jean Laherrère Club de Nice XIIIe Forum annuel 27 novembre 2014
« Fiabilité des données énergétiques ! » http://www.clubdenice.eu/2014/Laherrere.pdf

Fig 9: Forties (Mer du Nord) déclin du pétrole 1975-2014



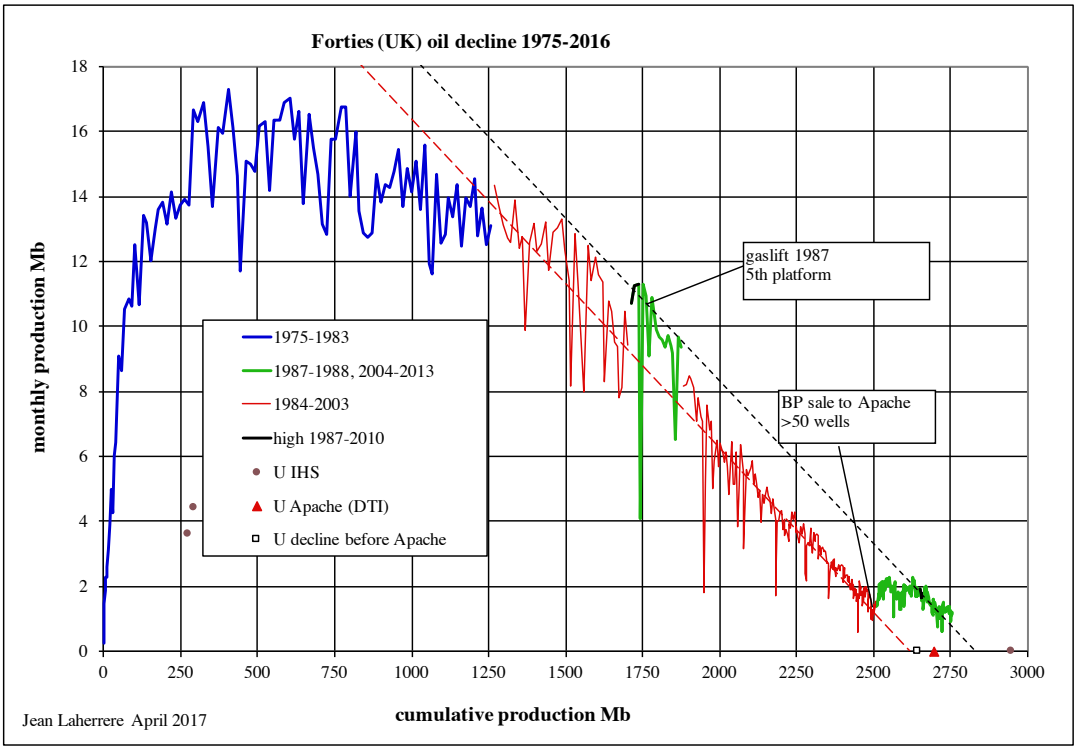
-2017

The oil decline linear extrapolation leads towards an ultimate of 460 M.m3 or 2900 Mb

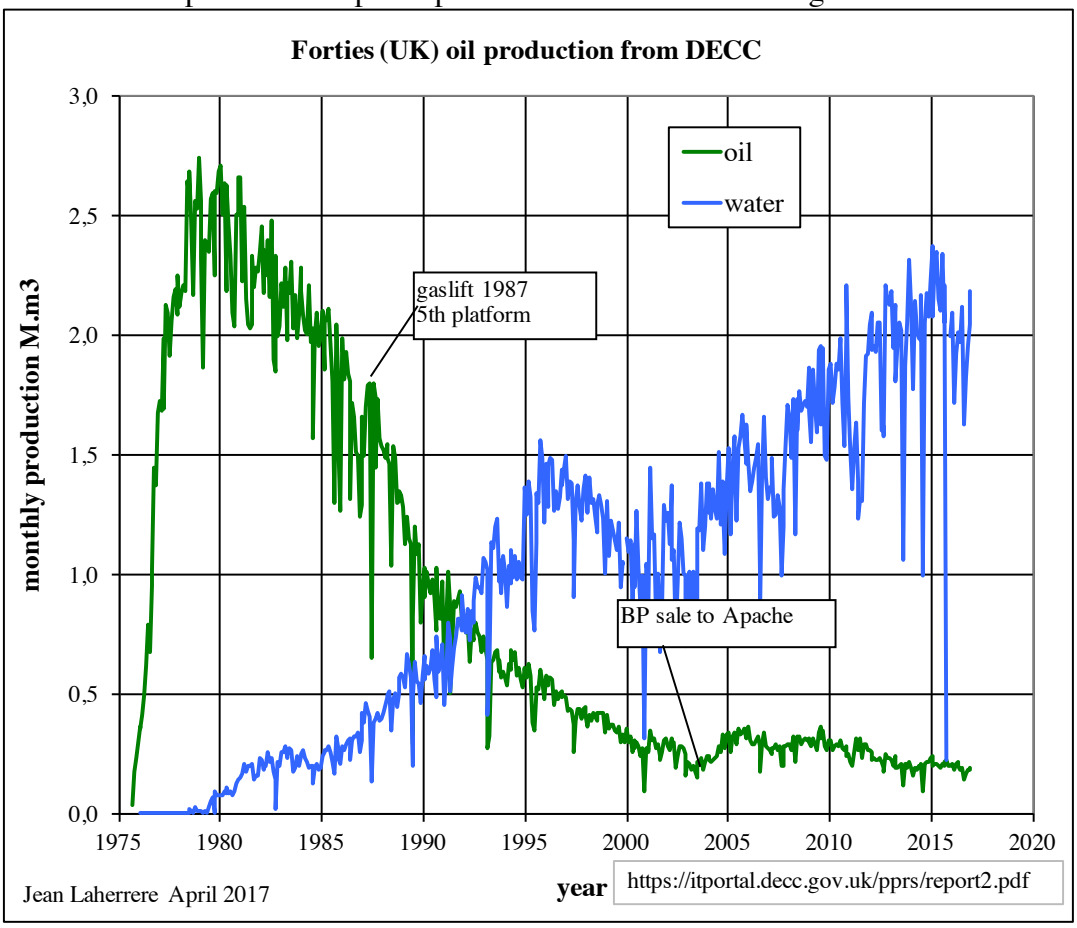


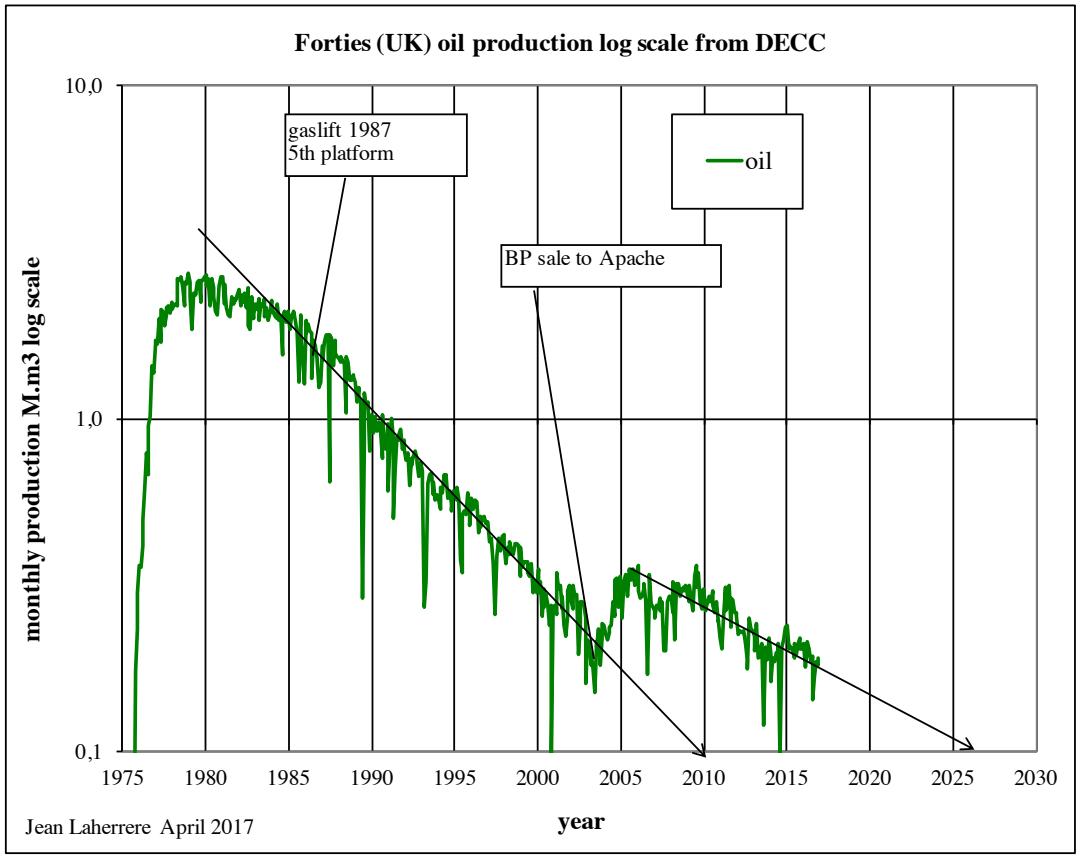
IHS oil ultimate in 2010 was 2900 Mb (460 M.m^3) and looks at being the right value on the above oil decline

Same graph in annual oil production in Mb.

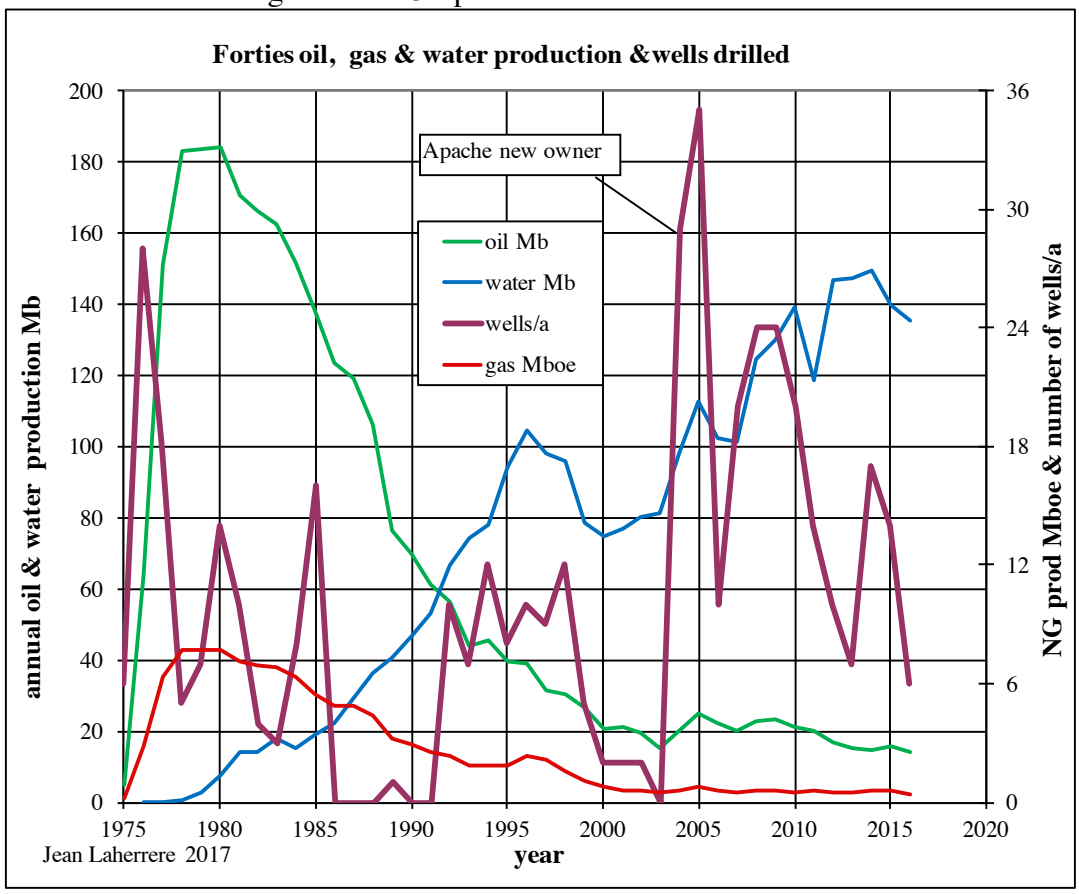


BP sold Forties to Apache in 2003 because the production was low as the oil price (<30 $/b) to pay for the high cost of offshore production from a major, when, as a small independent, Apache was able to produce cheaper. Apache estimated the remaining reserves to 147.6 Mb

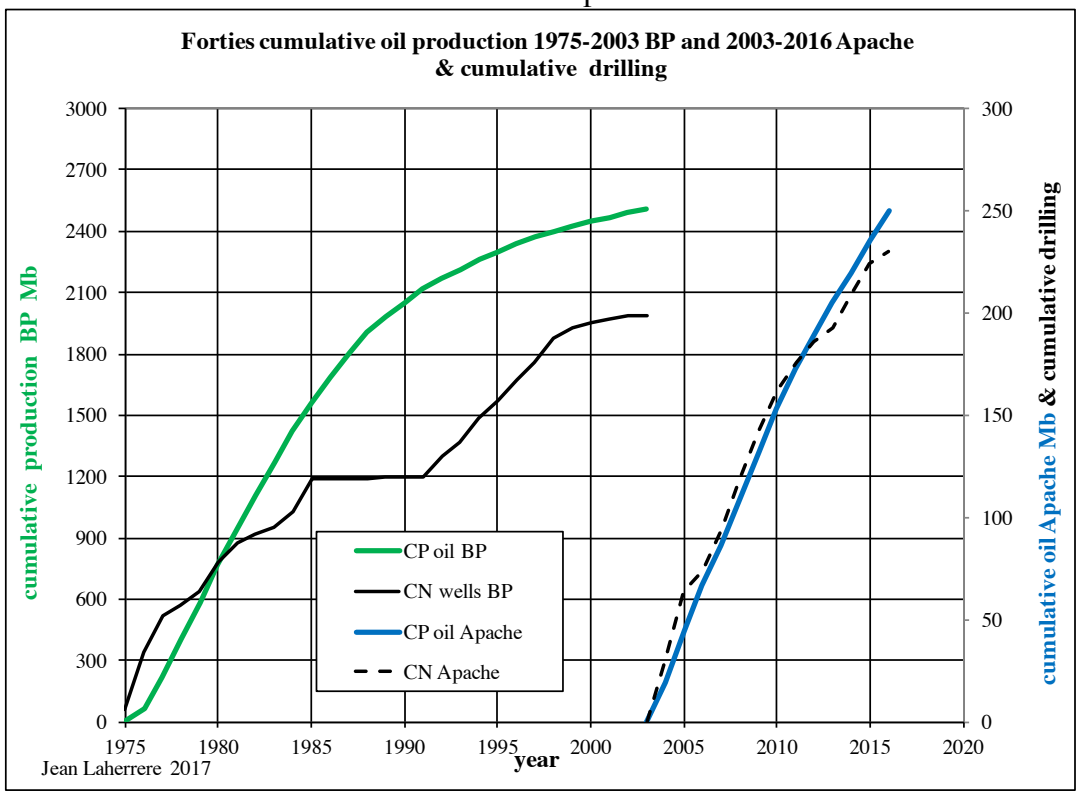




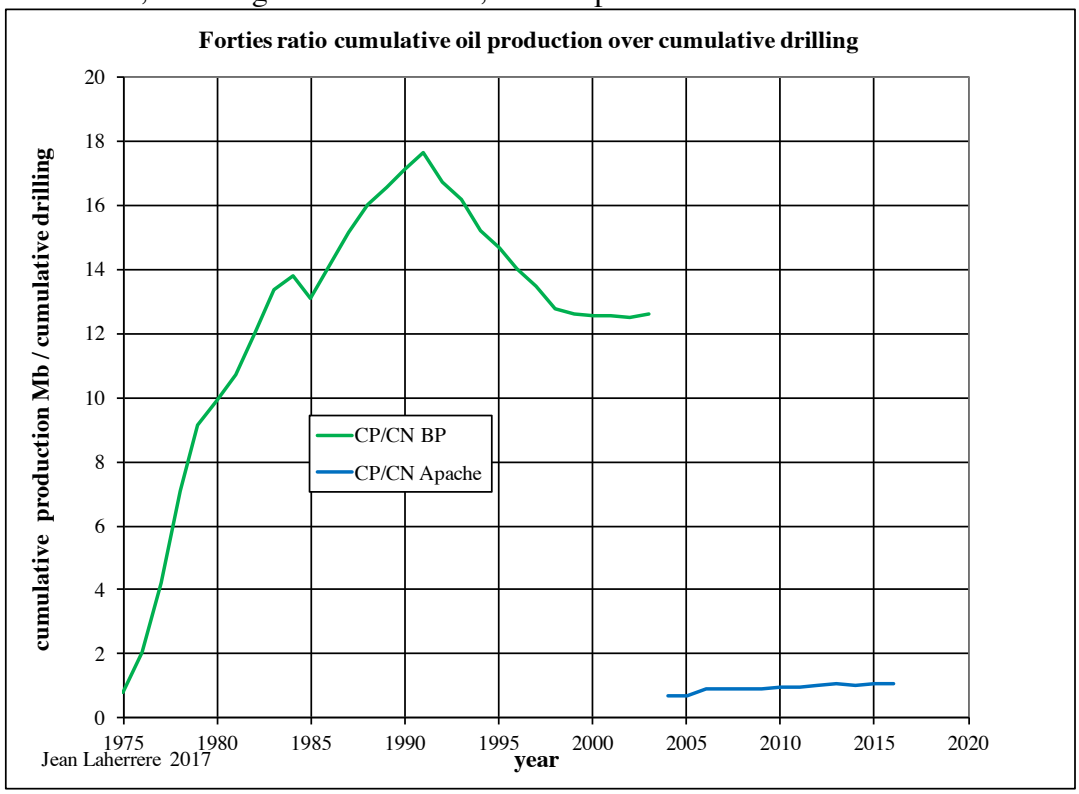
Apache started new drilling in 2004. Oil production increases but also water and water cut.



BP from 1975 to 2003 drilled about 200 wells and has produced about 2500 Mb when Apache from 2004 to 2016 has drilled about 230 wells and produced 250 Mb.



The ratio cumulative production over cumulative number of wells peaked about 18 Mb/well in 1991 with BP, finishing in 2003 over 12, when Apache in 2016 was about 1 Mb/well



Apache has succeeded in increasing oil production but with less efficiency than BP: the last barrels are always expensive, and thanks to the increase of oil price until 2025

-Discussions with MCL

I met Michael C Lynch several times in different meetings:
-1997 in Paris at the conference organized by JM Bourdaire Director IEA where Michael was the carrier of Morris Adelman's briefcase and the voice of his master. Being on MIT site for more than 10 years, MCL failed to finish his thesis!
-2000 in Abu Dhabi The Emirates Center for Strategic Studies and Research (ECSSR) annual conference « The future of oil as a source of energy » Oct.7-8,
Picture of the UAE meeting with from left: first Cutler Cleveland, fourth myself, seventh MCL

-2006 in Vienna "European Geosciences Union" "Great Debates in the Geosciences" "In 30 years petroleum will have become a little-used energy source" 3 April

I sent the following mail to MCL in 2007
De : Jean.laherrere@wanadoo.fr
Objet : Rép : Peak Oil Summary
Date : 12 juin 2007
À : lynch@energyseer.com
Cc : graphs@TrendLines.ca, jguy@npc.org, sbandrews@att.net, RLHirsch@comcast.net, aspotwo@eircom.net, Albert.Bartlett@colorado.edu, odac@btconnect.com, Lisa.Wright@mail.house.gov, msimmons@simmonsco-intl.com, rheinberg@igc.org, stuartstaniford@sbcglobal.net, Roger.Bentley@whitfieldsolar.com, GaffiganM@gao.gov, Rudall@aol.com, david.strahan@blueyonder.co.uk, medlock@rice.edu, pjackson@cera.com, RBS@ecotopia.com, asmith@herold.com, dlpaul@chevron.com, JCAG@chevron.com, steve.london@halliburton.com, sgill@simmonsco-intl.com, mariano.gurfinkel@beg.utexas.edu, wdkirchner@marathonoil.com, Timothy.Grant@netl.doe.gov, nancy.johnson@hq.doe.gov, alan.j.kelly@exxonmobil.com, mnichols@npc.org, alisi@npc.org, RBS@solarquest.com, wyoungst@mindspring.com, skorpela@columbus.rr.com, aleklett@tsl.uu.se, pierrerene@pierrerenebauquis.com, jmbourdaire@tele2.fr, r.orourke@aspo-ireland.org, chall@esf.edu, bardi@unifi.it, rrosa@uevora.pt

Michael
I was really wrong to challenge you to show the data on what your claims are based

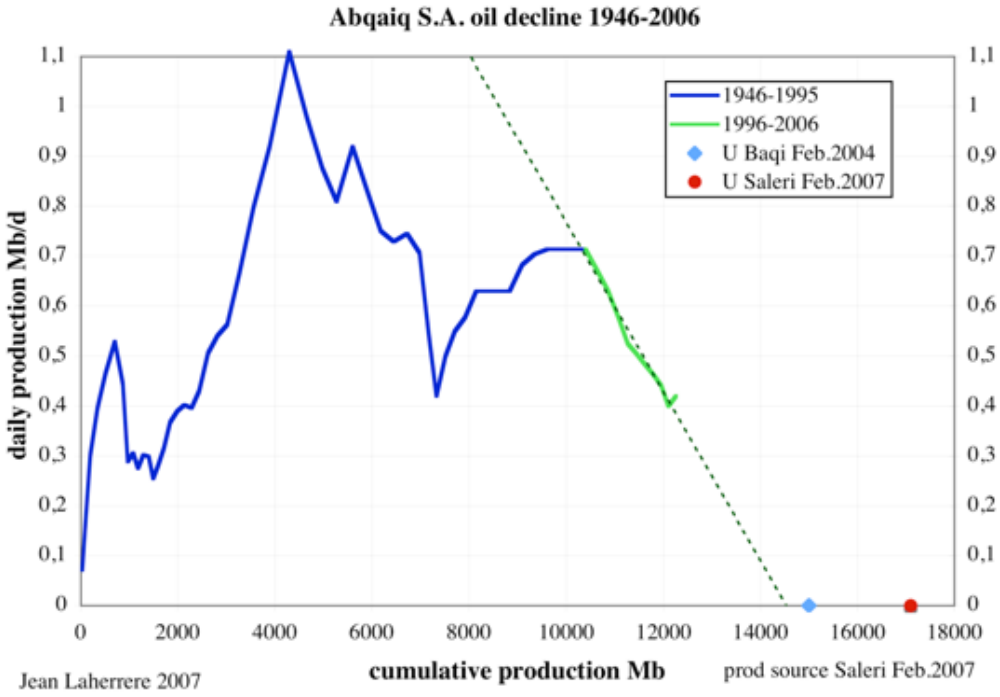
I should have known better, because we have debated for more than 10 years (Paris 1997, Abu Dhabi 2000, Vienna EGU 2006) and as usual, you accuse us of what you are doing: avoiding debate on your work, not answering questions and claiming without any proof that you are right and that Campbell and myself are wrong
"Calumny, calumny, it will be always something left" as said a French writer
Attacking Colin and myself seems to be a part of your business: you are only invited in debate on peak oil to attack us to make the balance!
In the past, you were the only one, but now you have competition with CERA!

You claim that I do not give sources, the scout companies (that you can buy if you want them) do not give sources of their data, what is interesting is the data (not the sources). Operators want to keep data confidential (except in UK and Norway) and do not want any official release, in particular when listed on the US stock market with the stupid and obsolete SEC rules.
If you want to have data, join Matt in asking the release of worldwide annual field production, as in UK and Norway, also for MMS and for some US States as Texas and California)
When I mention oil decline of many fields showing a negative reserve growth, as East Texas, Brent, all the data of these fields can be found on the web and the graphs on my papers on www.oilcrisis.com show all the data

You claim that you are not working with field data and it is obvious that you have never work in exploration or reserves estimate.
You told me in Abu Dhabi that the only physical connection with oil production is that you have a royalty on a US stripper called Michael Lynch: it is not enough to claim some competence on the subject of field reserves.
You should know that country reserves are the aggregation of field reserves!
You cannot judge country reserves if you do not know the detail of field reserves
In fact, you are completely incompetent on the subject of reserves and you pretend that you are right on the subject and that I am wrong!
I remind you that I started in the oil business in 1955 exploring in many parts of the world and later being in charge of the Total exploration techniques for more than a decade. I was involved in
-exploring and deciding the drilling of thousands of wells, resulting in hundreds of discoveries including several supergiants as Hassi Messaoud and Hassi R'Mel;
-estimating field reserves and writing reserves definition (for France: OGJ p 62 august 13, 1990, and for SPE/WPC 1997 which are the rules of the oil industry for defining 2P);
-chairing the writing of a dozen of exploration manuals for the French oil industry.
-writing 4 reports on world oil and gas reserves, using a worldwide database, and totaling over 1300 pages
-plotting field oil decline on more than one thousand major fields and displaying many of them in papers on the web (www.oilcrisis.com)
I have seen all of the technical breakthrough of the last 50 years: common depth point, magnetic recording, 3D, 4D, horizontal drilling, probabilistic approach, sophisticated logging, dynamic positioning drillship etc.
I pretend to be an exploration technician who can challenge most of present explorers, same for reserve estimate.
And on the present technicians I have the advantage to be free to speak, being retired!

You claim that I withdrew facts that I did not like, it is wrong, because I have shown several

fields with positive reserve growth as Ekofisk and Eugene Island 330 (see -Laherrère J.H. 2007 «Uncertainty of data and forecasts for fossil fuels» Universidad de Castilla-La Mancha, Ciudad Real, 24 April www.hubbertpeak.com/laherrere/Castilla200704.pdf) .
You mention IHS reserve growth but it is obvious that you do not read my papers where I said, first that part of this IHS growth is due that in the past (in particular 1995 which is the database used by USGS), many fields (>1500) were missing in particular in FSU. The other reason for IHS growth is that they have now added 90 Gb in Saudi Arabia without geological reason but only to match Aramco 2P remaining value released during the debate between Matt and Baqi-Saleri. In the past when Aramco was publishing only proved value, IHS was then free to put their scout 2P value but not anymore when Aramco has published a 2P estimate. Aramco is now a good sustainable client and likely the last to be bought by a competitor. There is no way for IHS to contradict Aramco, and for the same reason, BP Statistical Review publishes OPEC political values without any comment.
To increase reserves, IHS simply increased oil recovery factor, in particular for Ghawar from 60% to 70%, same for Shaybah.
I have shown (Castilla-La Mancha figure 11) that Aramco oil recovery factor is higher than Abu Dhabi for the same basin. So, I it is obvious that IHS values for Aramco are overestimated. But I do claim that any estimate of the real values of Aramco fields cannot be done presently (except for Abqaiq) because of lack of data showing a significant decline.



I remind you that on the energyresources list where I was fed up of your attack ad hominem, I sent a mail showing all your mistakes
message 74679
De: *jean.laherrere@wanadoo.fr*
Objet: ***Rép : [energyresources] Re: Peak Oil UK-conference review***
Date: *1 mai 2005*
À: *energyresources@yahoogroups.com*

Mike

can you show me any of my recent papers based on fractal, it is obvious that you do not know what is fractal and furthermore true fractal?
again, you confuse things, as in the past you were confusing Non-OPEC with Non-OPEC-non-FSU (happily now you are learned that what BP Review was reporting as Non-OPEC has an asterisk saying that FSU was excluded)

Show me a graph where I am obviously wrong, after you understand what is a creaming curve and what is an asymptote (re your Maureen field curve: I see a curve going towards zero which has nothing to do with asymptote)
I know that my old graphs are not perfect and it is why I am producing better and more recent ones, as you can see on www.oilcrisis.com/laherrere.

Your 2004 OTC paper "Scientific (and unscientific) petroleum supply forecasting" has nothing to do with science, but it is pure statements as claiming for example that creaming curves (cumulative mean discovery versus the cumulative number of new field wildcats) are political
it seems that you have now stopped to confuse them with the rank-field size distribution = what I call fractal, it means that I have answered this point in past discussions and you are changing the attack)
what do you mean by political creaming curve?
is it the concept? the data?
is it a scientific approach? can you prove it?

Comparing Forties production curve with the total UK production is childish and means nothing, it is as comparing Prudhoe Bay production to the full US production! So, what?

Show me where I withhold data,
again, your usual statement without any proof
I challenge you to prove it
I am the one who is showing the most unpublished data
I have not found one of your graphs showing new data, of course you have only the political data from OGJ, WO and BP Review to play with
It is not my fault if I have access to confidential data and not you, just buy them!

I have many graphs showing your confusion (in particular the many I sent you in 2001) but this list cannot allow them
I sent you in 2001 many comments and graphs, but it is obvious that you do not want to give up, as you exist only by attacking us, even on wrong reasons
You are invited to speak only to show someone (there are not so many) who say that we are wrong, unfortunately for your audience, you are unable to prove it, except by confusing things. I still wonder if it is by purpose or not
I challenge you to write for a full year without mentioning Campbell, Simmons and myself, as your papers would be empty!
I do not refuse to respond as I did answer already? I simply refuse to continue to answer the same wrong attacks on the same items
I have better things to do as writing my Lisbon paper
Stop attacking me as I requested a long time ago, stop talking about me and I will stop to be obliged to say that you confuse things
I am fed up to hear always the same for years stupid attacks
You should go back to MIT finishing writing your thesis that you dropped after spending three

unsuccessful years, you have still many things to learn about science.
But first please tell the truth and stop attacking people!
jean laherrere

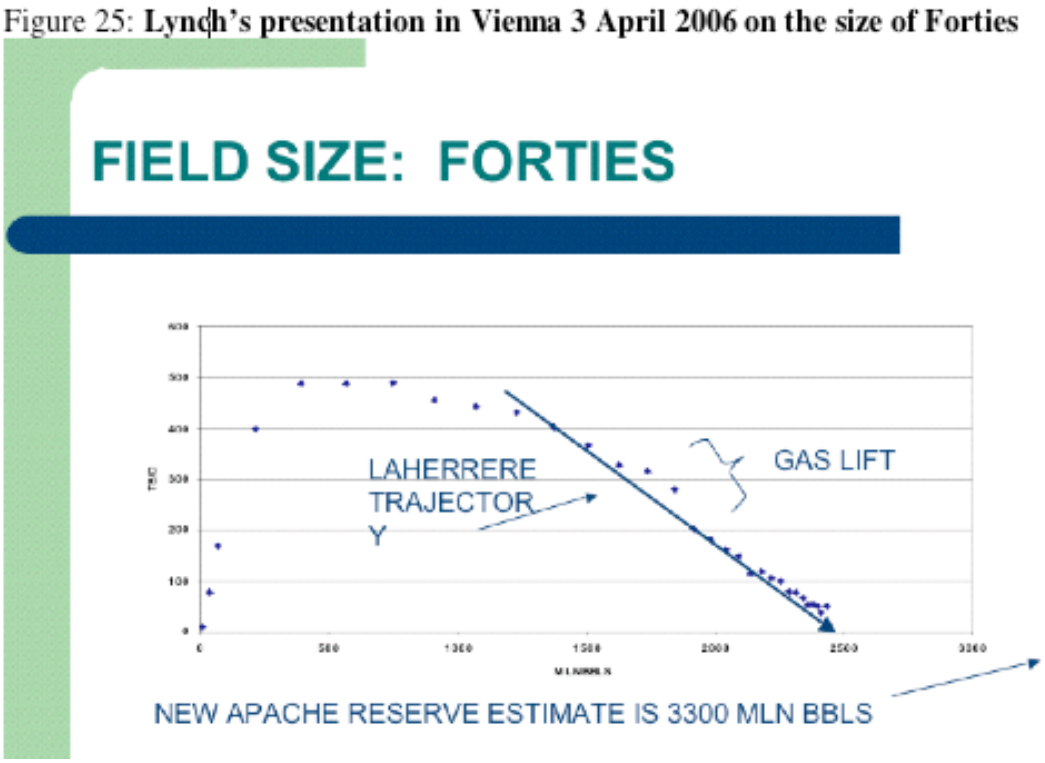
and you replied
Message 75120
De: "wilfrid02144" <mclynch@aol.com>
Date: 7 mai 2005
À: energyresources@yahoogroups.com
Objet: [energyresources] ***Re: Peak Oil UK-conference review***
Répondre à: energyresources@yahoogroups.com
I will reply to Laherrere's May 1 post shortly. It was detailed enough to require some effort (I attempt to be precise, even cautious, in my substantive remarks, knowing they will be dissected in detail).

I am still waiting for your reply two years later

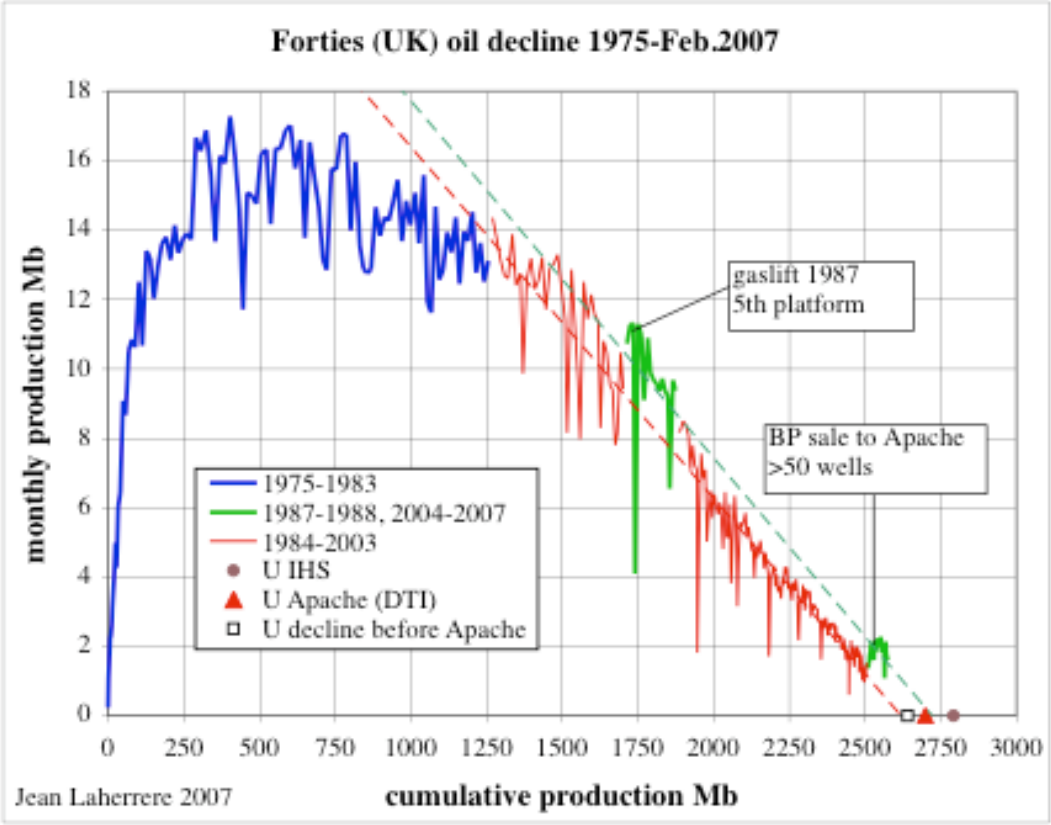
The oildrum displays some comments from an energyresources member:
ET on December 2, 2006 - 12:10am
Having spent about 5 years as a member of energyresources list I read a lot of Mike Lynch's 'stuff.' One of the most notable interchanges was on the subject of creaming curves, between Lynch and Laherrere, the upshot of which was that Lynch had no real idea of what a creaming curve was. I recall that after that episode he didn't show his 'face' on the list for quite a while. I don't have any respect for his ideas. He is not IMO the least bit rigorous or scientific.

On the 2006 EGU debate you have shown this graph on Forties to claim reserve growth (my paper ASPO 5 in Pisa)
Figure 25: Lynch's presentation in Vienna 3 April 2006 on the size of Forties

Figure 25: **Lynch's presentation in Vienna 3 April 2006 on the size of Forties**



So, you claim that Forties reserve ultimate is about 3300 Mb when the present data trends towards 2700 Mb.



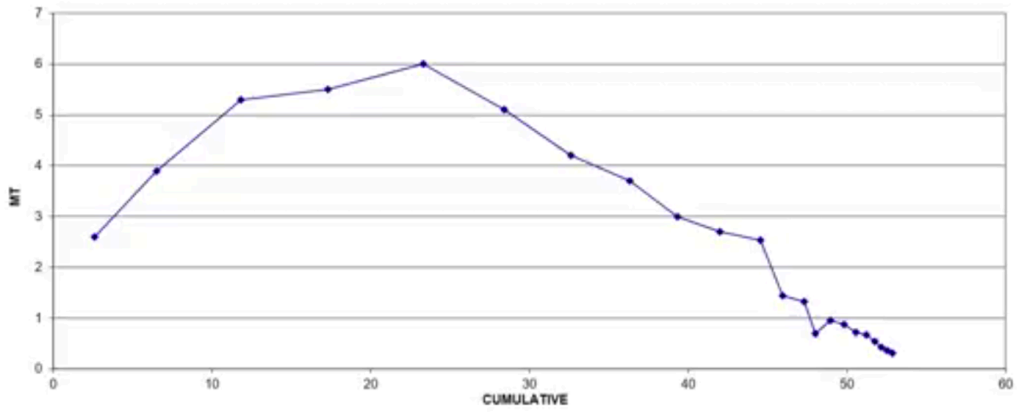
BP sold Forties to Apache because of the strong depletion, leaving to a smaller company with less overheads to make a profit for the last barrels. Apache drilled many wells (>50 wells) to get quickly the maximum production but the burst was short and the decline is still leading towards around 2700 Mb (without taking into account a possible collapse as for Brent). Forties is likely to be a perfect example of negative growth of 600 Mb related to Lynch's value of 3300 Mb.

Michael please do not make any claim on subjects where you do not know anything, as for example reserves.
Please stay on subject you know and where you make interesting oil price forecasts, as for oil prices of 35 $/b you did in 2005.

It is obvious that MCL did not take into account all my comments to his attacks and that he still sticks in 2017 at these old wrong arguments. Why to change his views if some people believe that he is right because his claims meet their wishes!

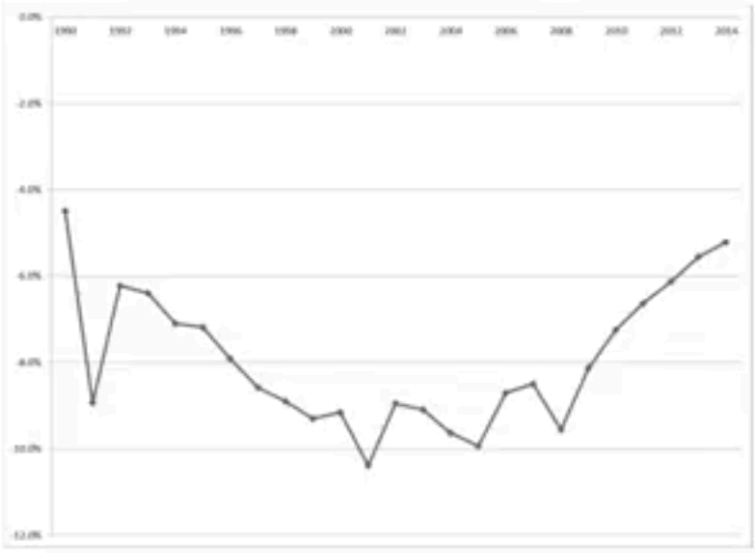
-**Thistle**
MCL claims that I am wrong on Thistle in his video Petroleum Follies V Can Production Keep Up https://www.youtube.com/watch?v=cIV8bPq311A
-Time 11 26: this incomplete graph is assumed to be Thistle and the Y axis entitled *Mt* is assumed to be annual production and the X axis entitled *cumulative* is assumed to be production in Mt for an unknown period (?)

FIELD LEVEL EXAMPLE



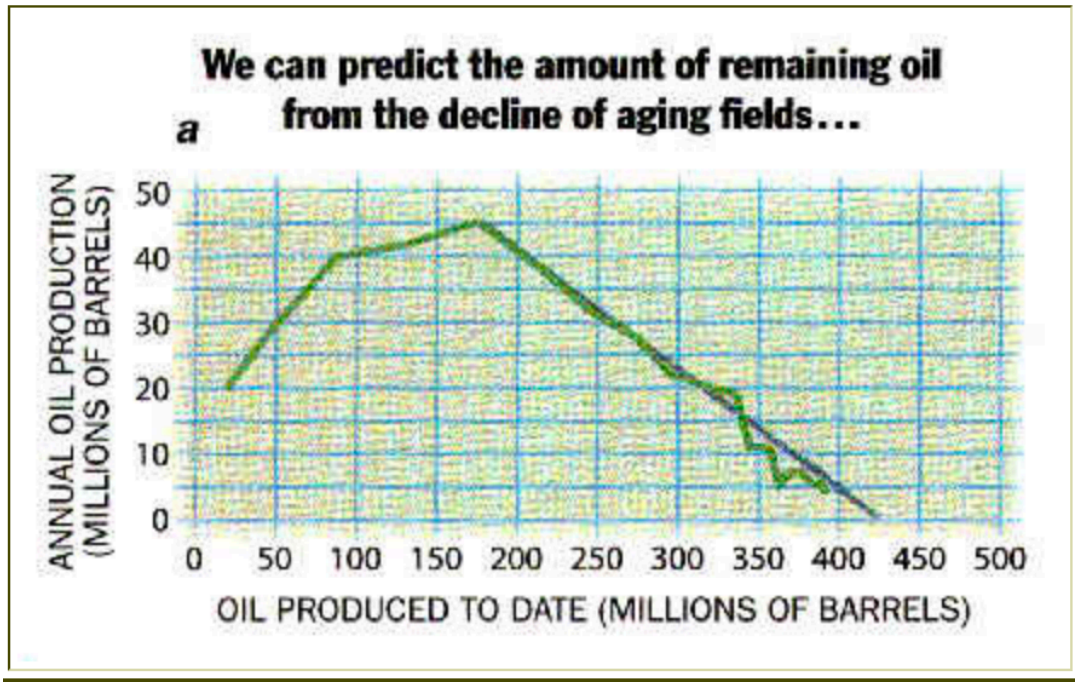
-time 12 06 the next poor graph entitled “but if updated” is assumed to be Thistle decline rate for a longer time period beyond the last graph (he said: starting from the beginning of production to present) increasing sharply for the last six points (unreadable years).
The graph is so poor that it is impossible to read numbers on both axes, no legend

BUT IF UPDATED...



It is impossible to know when the decline rate raised again and the date of last data!

In our 1998 paper “The end of cheap oil” CJ Campbell, JH Laherrere Scientific American http://dieoff.org/page140.htm Thistle oil production is extrapolated towards an ultimate of 420 Mb.

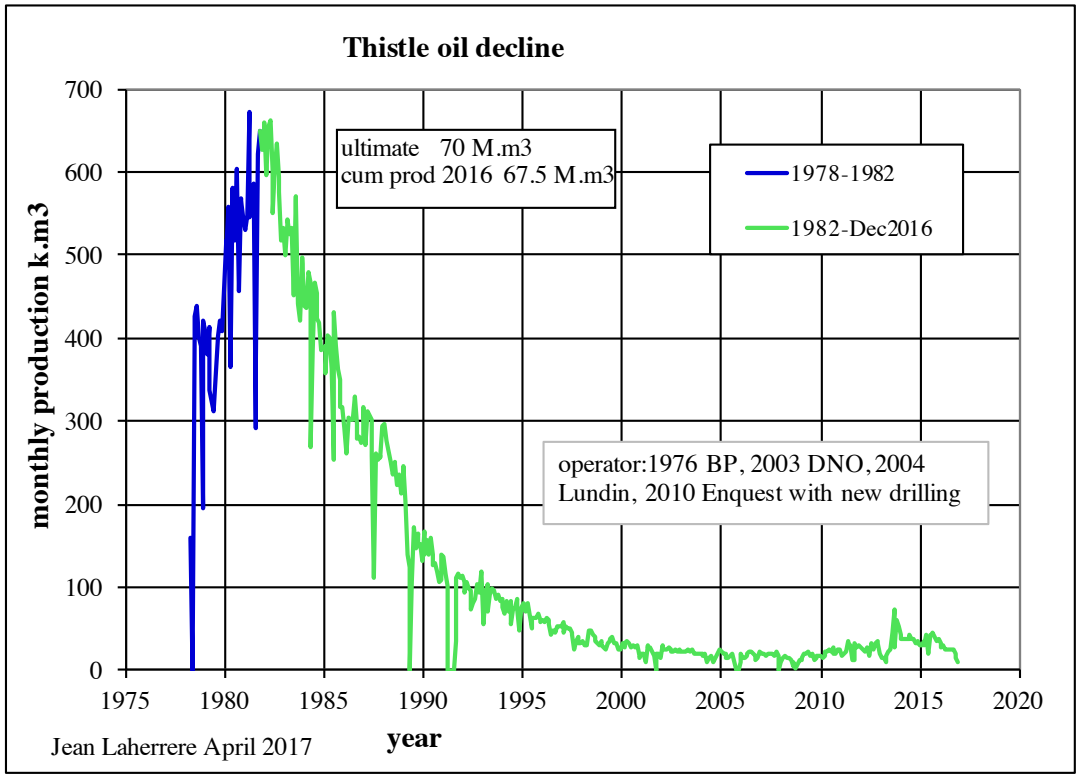


The same ultimate of 420 Mb is reported in the 2013 book pages 68 & 69: "The First Half of the Age of Oil: An Exploration of the Work of Colin Campbell and Jean Laherrère" Charles Hall, Carlos A. Ramírez-Pascualli http://www.springer.com/us/book/9781461460633

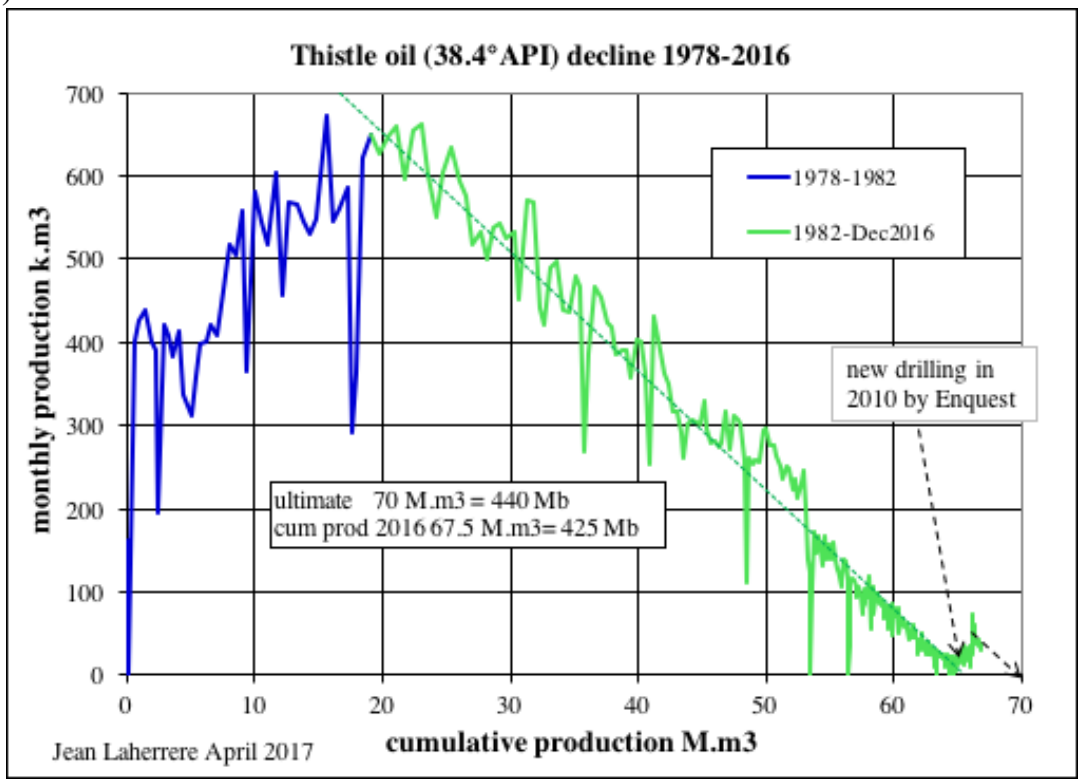
6.8 The Methodology Used by Campbell and Laherrère in 1998

In 1998, Campbell and Laherrère combined several techniques to conclude that about 1,000 Gb of conventional oil remained to be produced. First, they extrapolated published production figures for older oil fields that had begun to decline (see Sect. 7.3.3). According to these calculations, the Thistle field off the coast of Britain, for example, would yield about 420 Mb. In May 2011, the cumulative production of Thistle was 412 Mb; the field is still producing a mix of oil and 96% water.

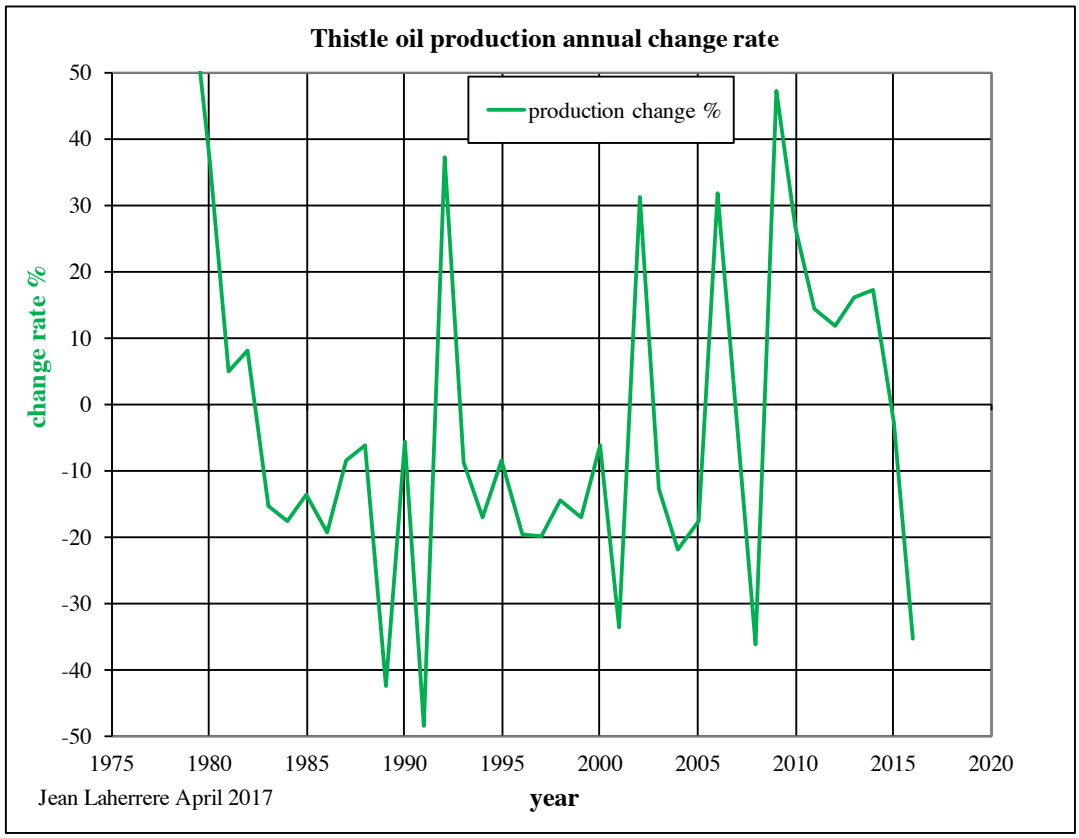
The 2017 graph of Thistle oil production in thousand cubic meter indicates that the operator was in 1976 BP, in 2003 DNO, in 2004 Lundin and in 2010 Enquest which carried out new drilling



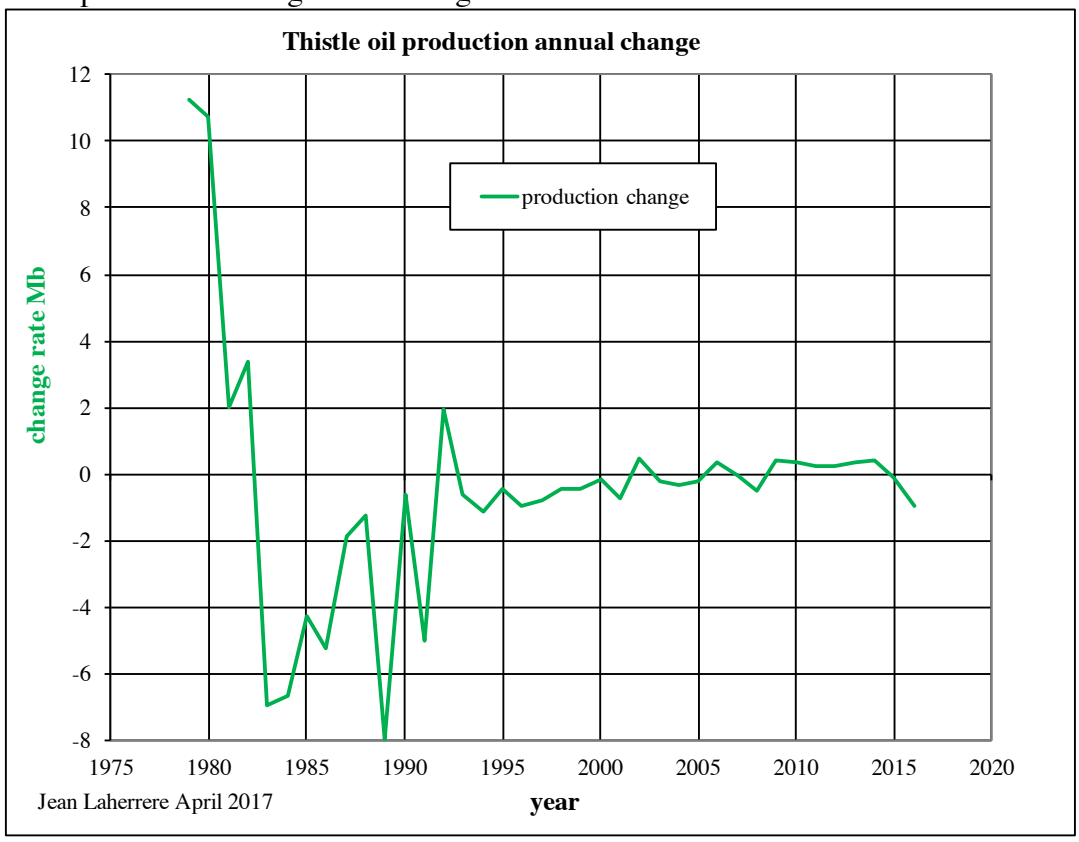
The decline of oil production can be extrapolated from 1982 to 2010 towards 440 Mb (70 $M.m^3$)



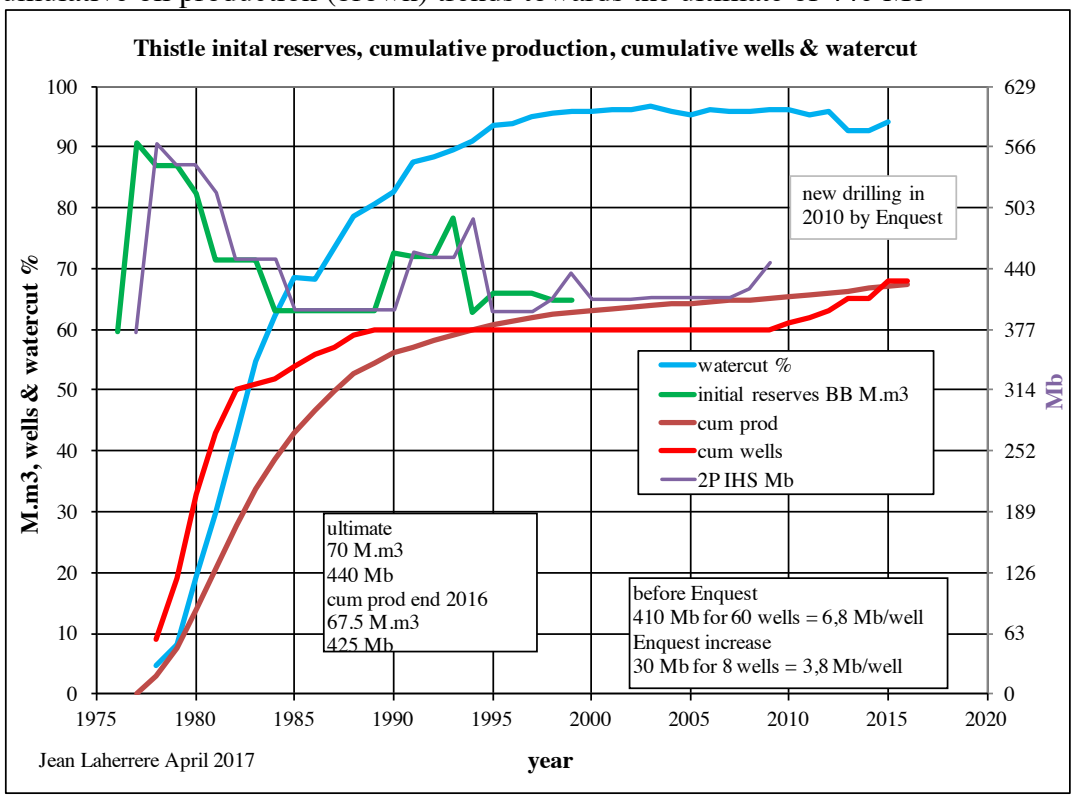
Thistle DECC oil production annual change rate (1977-2016) is displayed to be compared to the poor MCL graph entitled “but it updated” showing increase for the last six points (unreadable years). Production change rate displays few sharp peaks, but always followed by a decrease the following year. It is hard to find the same data as MCL “but if updated” graph



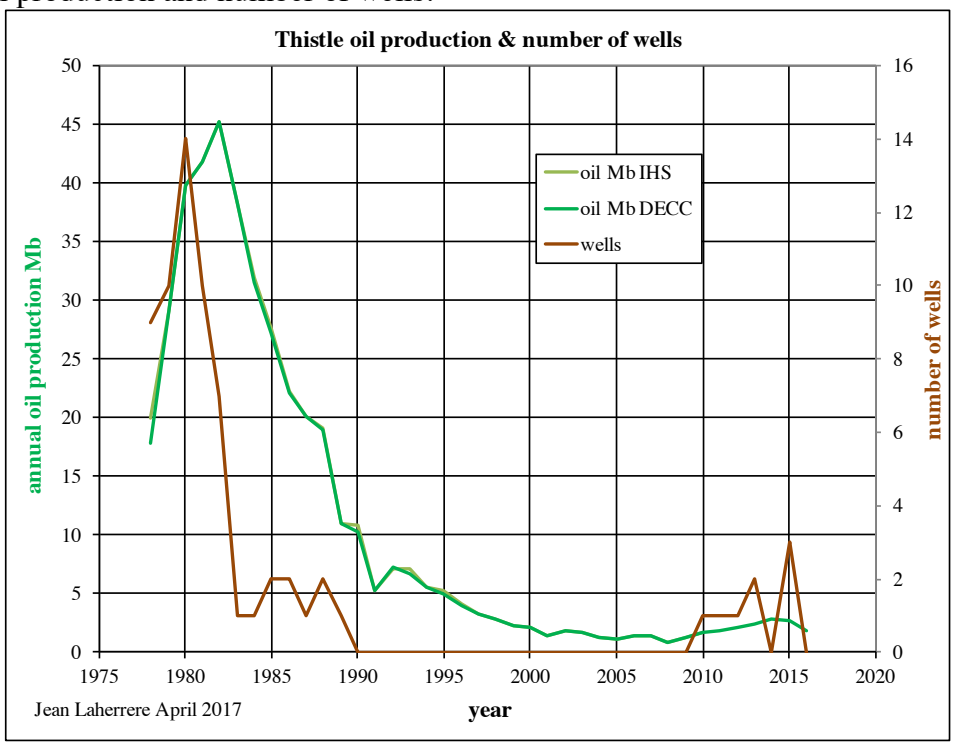
The annual production change does not agree either!



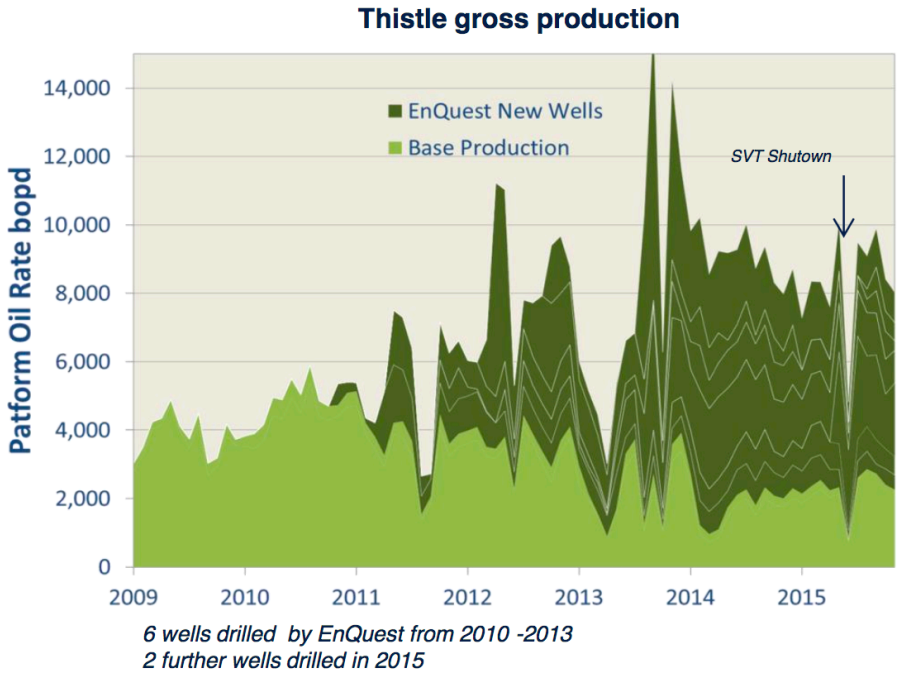
The present Thistle cumulative production, wells, reserves & watercut graph shows that 2P reserves have oscillated but with a negative growth from 1980 estimates.
The cumulative oil production (brown) trends towards the ultimate of 440 Mb



IHS reported 6 Mb of initial reserves of condensate in 1976, but no change furthermore!
DECC does not report any condensate production for Thistle.
As for Forties oil field, Thistle cumulative production versus cumulative wells gives 6.8 Mb/well before Enquest and 3.8 Mb/well for Enquest.
Annual oil production and number of wells.



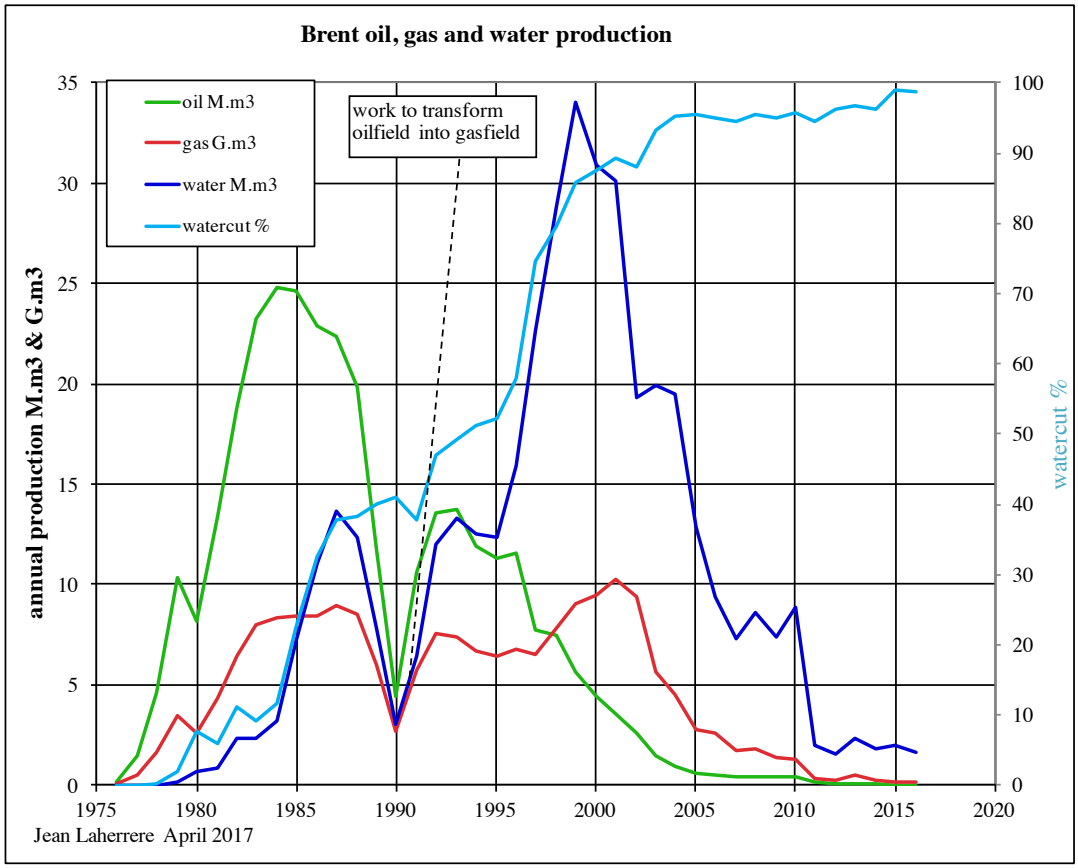
Enquest 2015 annual report gives Thistle production from 2009 to 2015 with the contribution of their new wells separated from the old wells from BP
http://www.enquest.com/~/media/Files/E/Enquest/2015%20FYR_docs/FYR2015Final.pdf



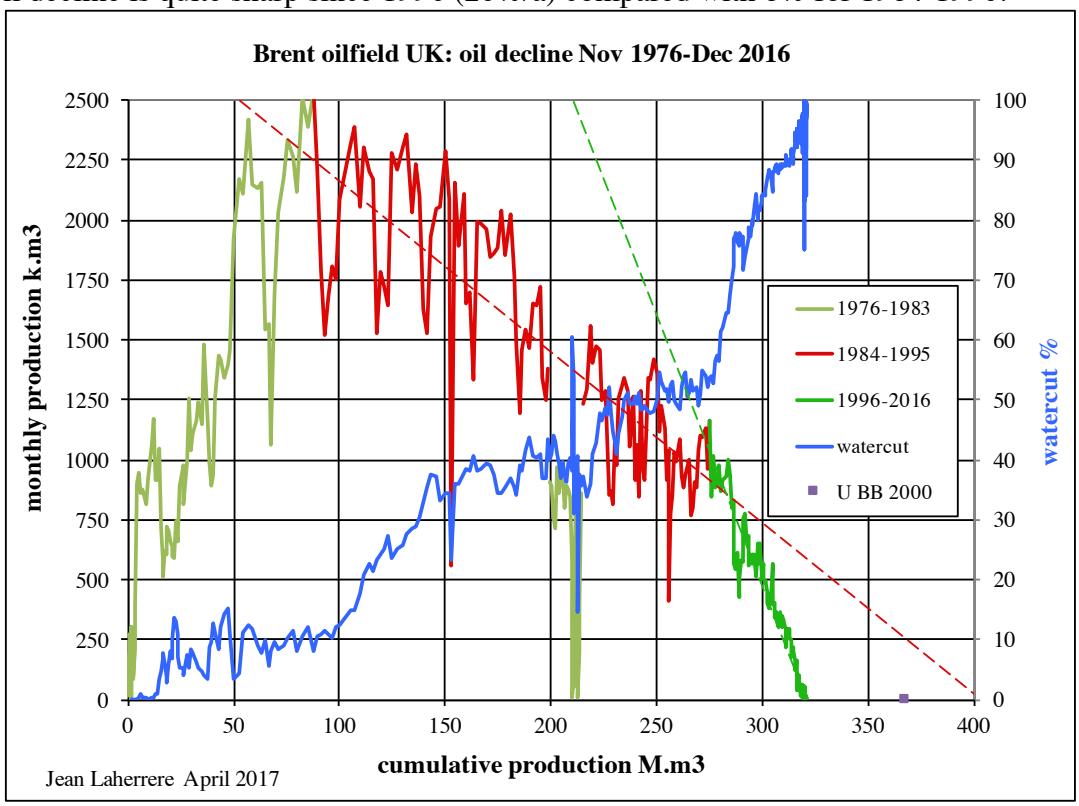
The increase looks great on this graph, but it represents 6 000 b/d, when Thistle peak was 45 Mb/a or 120 000 b/d: Enquest addition is only 5% of the peak!

My 1998 Thistle ultimate was 420 Mb and now my 2017 ultimate is 440 Mb: my first estimate was wrong by 20 Mb or 5%, which is within the range of uncertainty.
For me any oil data is uncertain by at least 5% because of uncertainty in production data and in oil definition, because of the presence of NGL, in particular condensate.
MCL claims that my estimate was wrong, but he did not indicate any other value, so in contrary with Forties I cannot see how wrong is his Thistle ultimate, but for me he is wrong to say that I was wrong!

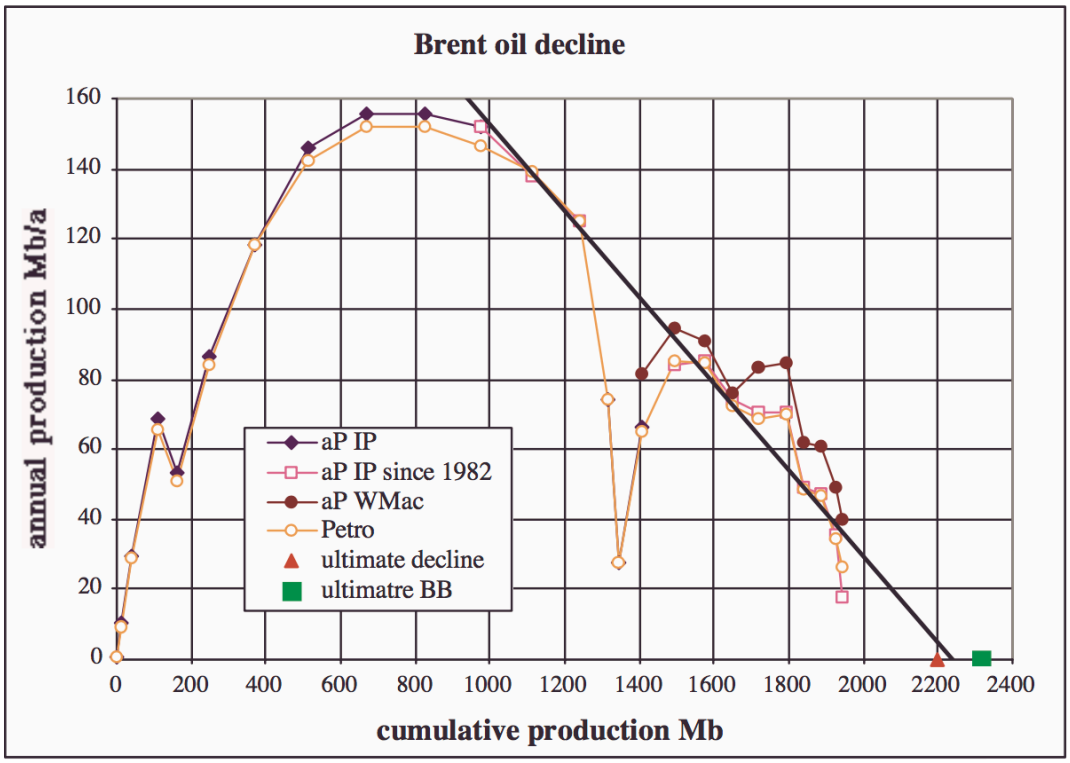
-**Brent field**
In 1990 Shell operator, stopped oil production to transform the oil platform into a gas field. Brent oil field is almost depleted, producing today mainly gas, with one platform out of 4, with a watercut of 98.6%.



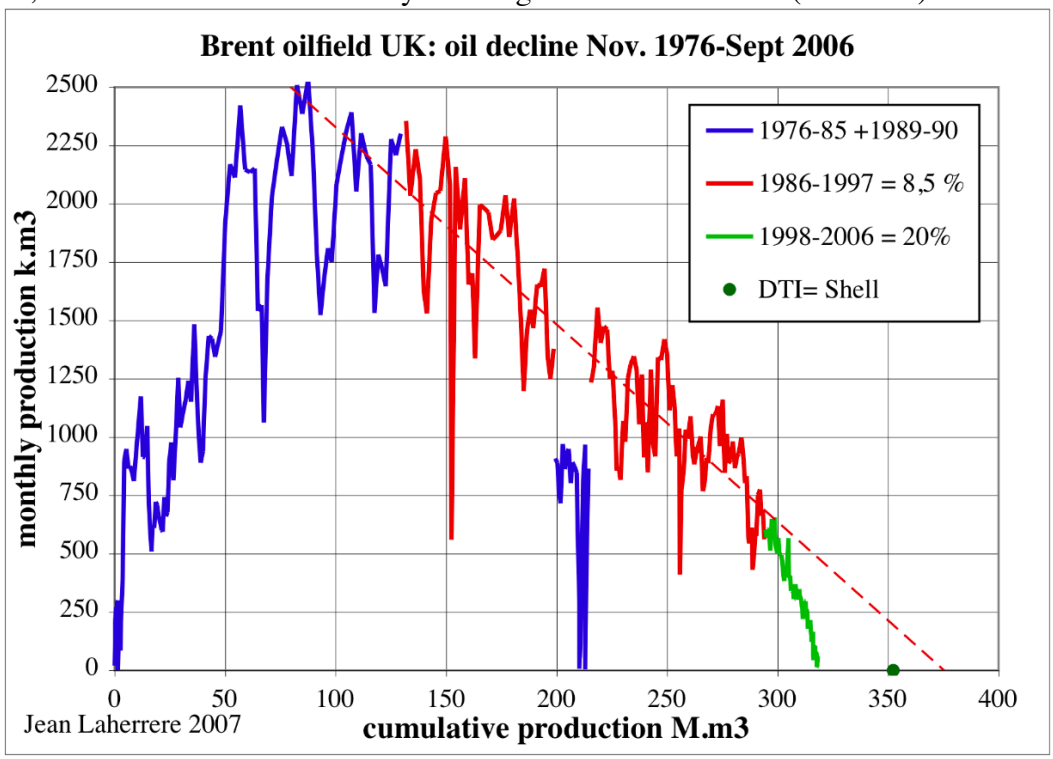
The oil decline is quite sharp since 1996 (20%/a) compared with 8% for 1984-1996.



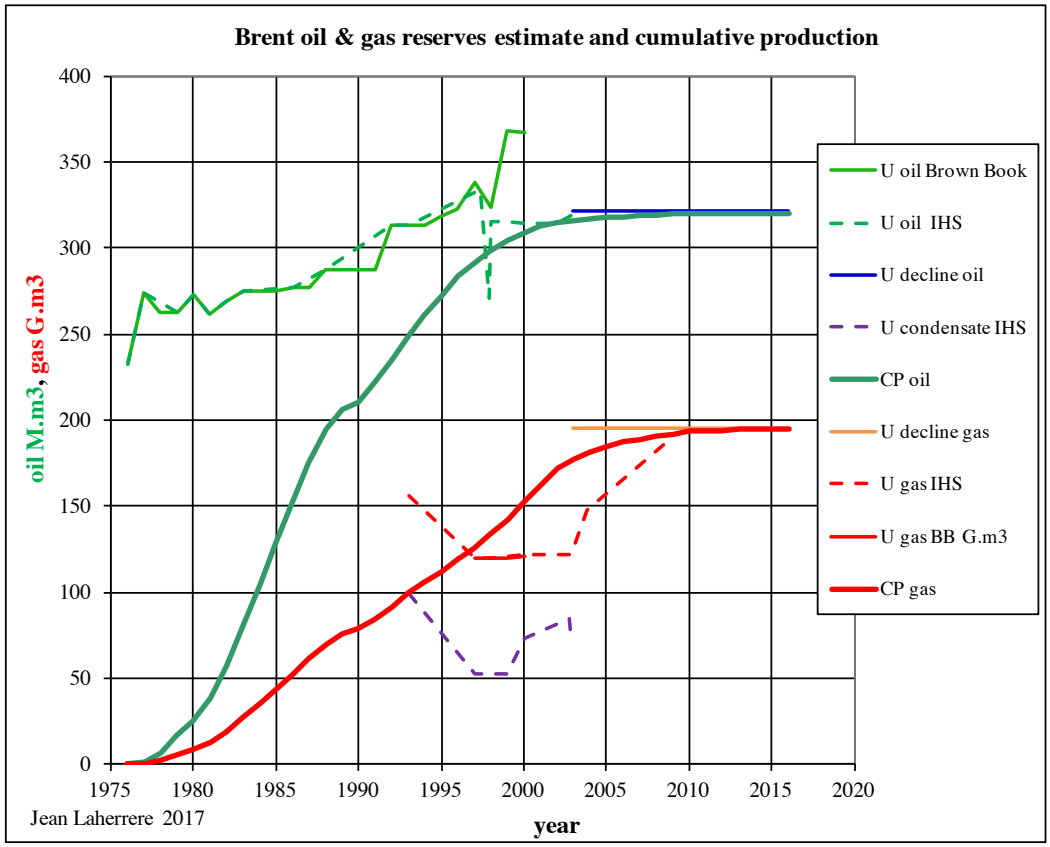
In my 2001 (IIASA meeting) paper, I estimated the ultimate at 2200 Mb: too optimistic, ignoring the last decline since 1996.



In 2007, Brent oil decline was already trending towards 322 M.m3 (2025 Mb)



Brent oil and gas reserves are displayed ass the cumulative production



For the Brent field, IHS reports condensate reserves for 460 Mb in 2010, but does not report any annual condensate production and it is obvious that IHS oil reserves includes condensate!
The Brown Book oil reserves were too low in 1980 and too high in 2000, BB 2000 natural gas reserves were too low.
The decommissioning of Brent four platforms is already started and will take 10 years.

Conclusion:
MCL is known as being the most critical writer and speaker against peak oil, following Morris Adelman's view. It is why he was invited to challenge us, because before the shale oil burst there were few.
He claims for decades that Colin Campbell and myself are wrong based on poor, badly or wrongly defined graphs. He was famous only as the one to argue with us.

He claims for decades that the future price of oil should be 30 $/b (Aug 2009 paper on NY Times: ""Peak oil" is a waste of energy" *Oil remains abundant, and the price will likely come down closer to the historical level of $30 a barrel as new supplies come forward in the deep waters off West Africa and Latin America, in East Africa, and perhaps in the Bakken oil shale fields of Montana and North Dakota*).
As a broken watch is right twice per day, but just for one second, MCL is wrong most of the times and when he is right, as for oil price at 30 $/b, it is for few days (since 2004 only 13 days below 30 $/b at the beginning of 2016).
MCL was wrong on UK oil fields in all of his writings or videos.

I do not see the coming oil flood announced by MCL in his 2017 book. But wait and see!
But what I have seen for the last 20 years is that MCL cannot claim any right forecast, except for few days for oil price below 30 $/b since 2004!