Prague Praha 22 April 2008 Workshop "Natural Gas Security in Central Europe"

Forecasts of natural gas exports to Europe

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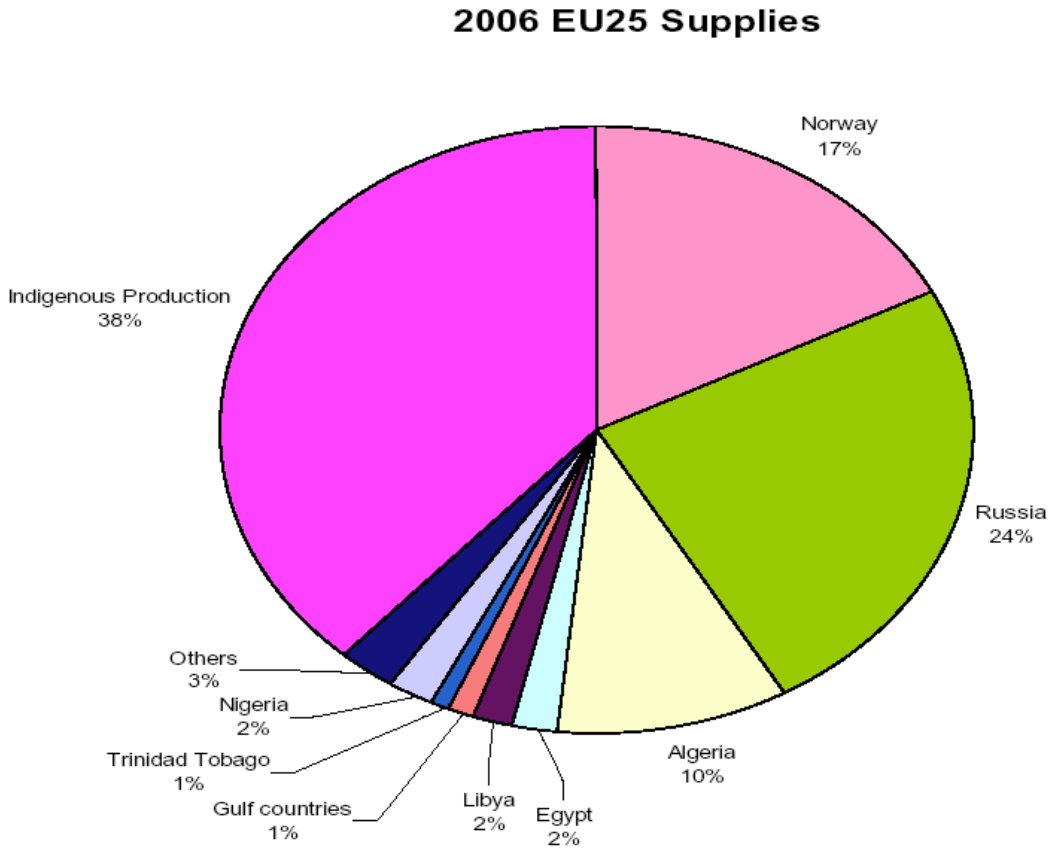
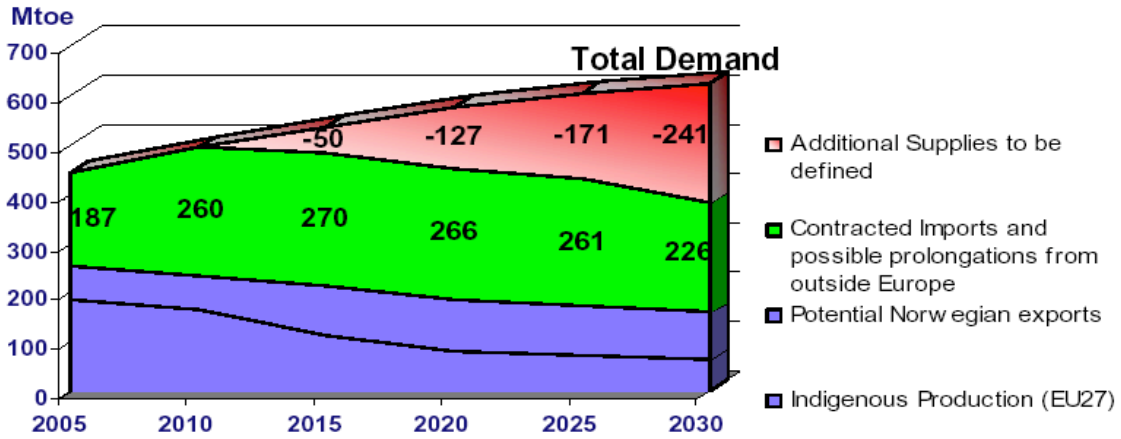
Eurogas (European union of the natural gas industry) displays the Europe EU25 supplies in 2006, showing the importance of Russia (buying supply from other FSU countries) and Norway

Figure 1: *2006 EU25 gas supplies*



Eurogas forecasts in addition to the identified contracts additional supplies to be defined of 241 Mtoe = 268 G.m3

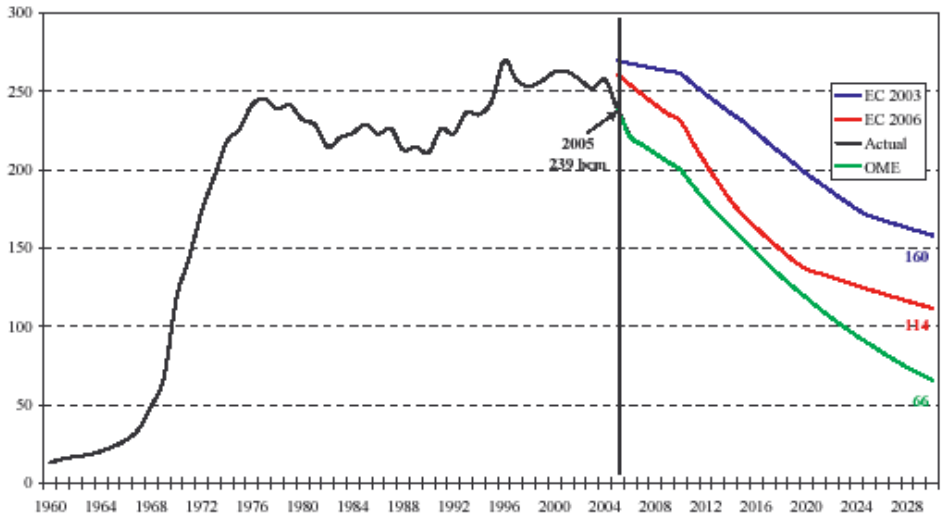
Figure 2: *Eurogas forecast (long-term outlook to 2030) for EU27*



Observatoire Mediterraneen de l'Energie OME has published in June 2007 « Natural gas: Supply and market Security Issues- Europe and its suppliers »

Figure 3: *prevision OME forecast for EU27 production*

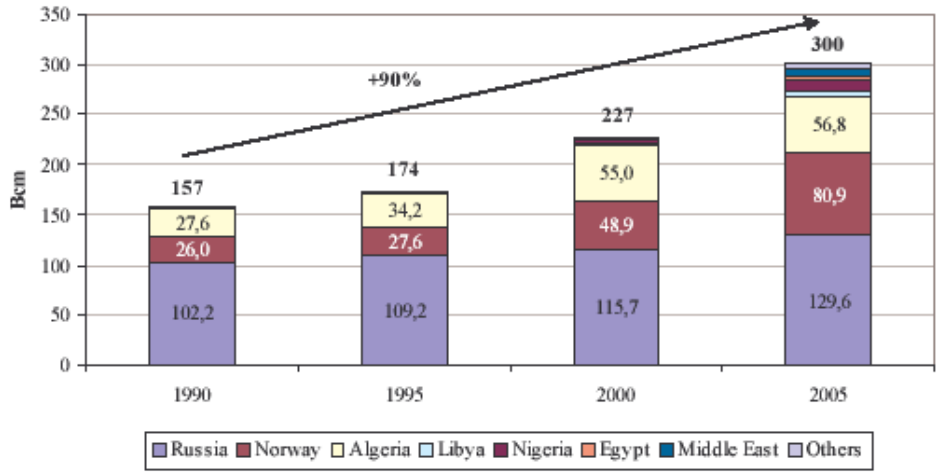
Figure 1. EU gas production outlooks to 2030 (in bcm)



Sources: DG TREN (2003, 2006) and OME

OME forecasts in 2030 a production for Europe being a quarter of 2000
The, increase in importations has been 90% from 1990 to 2005
Figure 4: *exportations EU27 1990-2005*

Figure 3. EU natural gas imports development, 1990-2005



Sources: CEDIGAZ

P.Scaroni ENI CEO at the last WEC Nov.2007 forecasted that Europe natural gas production will be cut in half in 2020 and importations will double in 2030, but energy savings could be huge in Europe houses.
What about importations ?
J.Stern stated in October 2006 «The new security environment for European gas : worsening geopolitics and increasing global competition for LNG » Oxford Institute for Energy Studies that IEA WEO 2005 forecasts are over-optimistic without proposing any values.
Figure 5: *exportations forecasts IEA WEO 2005 from J.Stern*
Table 1: Middle East and North African Gas Export Projections 2003–2030 (Bcm)*

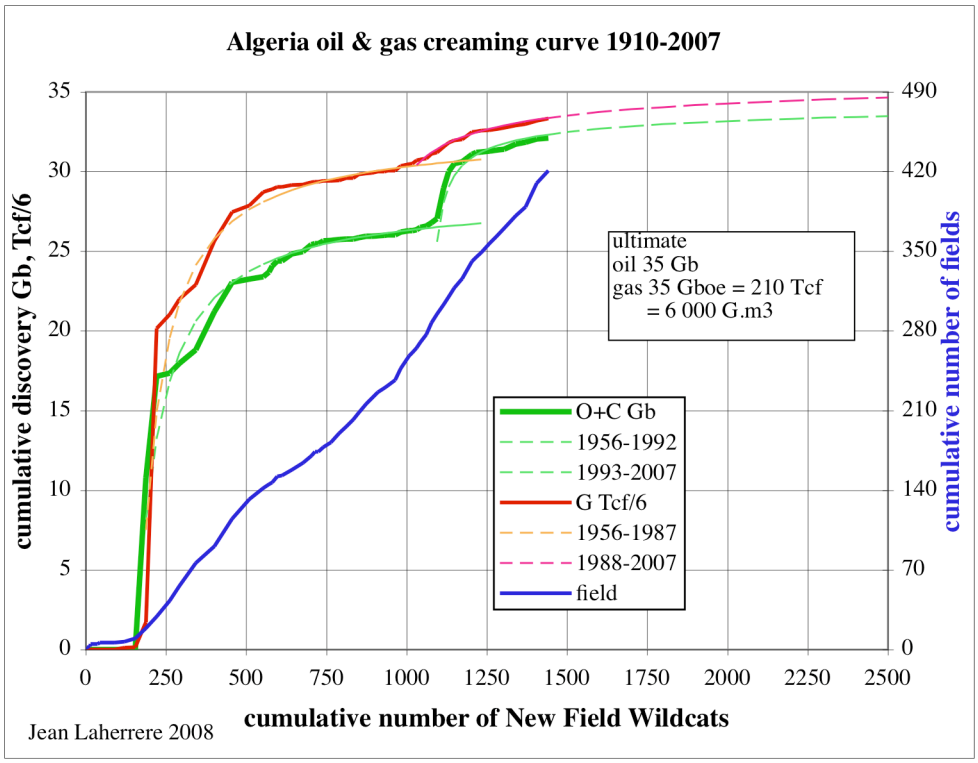
	TO EUROPE			TOTAL EXPORTS			
	2003	2010	2030	2003	2010	2020	2030

Middle East	2	35	117	34	102	185	244
North Africa	61	83	170	63	86	143	200
TOTAL	63	118	287	97	188	327	444
Major Exporters**:				2003	2010	2020	2030
Qatar				19	78	126	152
Algeria				64	76	114	144
Iran				-	5	31	57
Egypt				-	10	19	28
Libya				1	2	13	34
Iraq				-	1	7	17
TOTAL				84	2182	2330	2462

**in addition to the countries listed, MENA includes: UAE, Kuwait and Saudi Arabia.*
*** figures are for 'net trade'.*
Source: International Energy Agency, World Energy Outlook 2005, Paris: OECD, 2005, pp. 178–9, 560, 564, 568, 580, 592, 596, 600, 604.

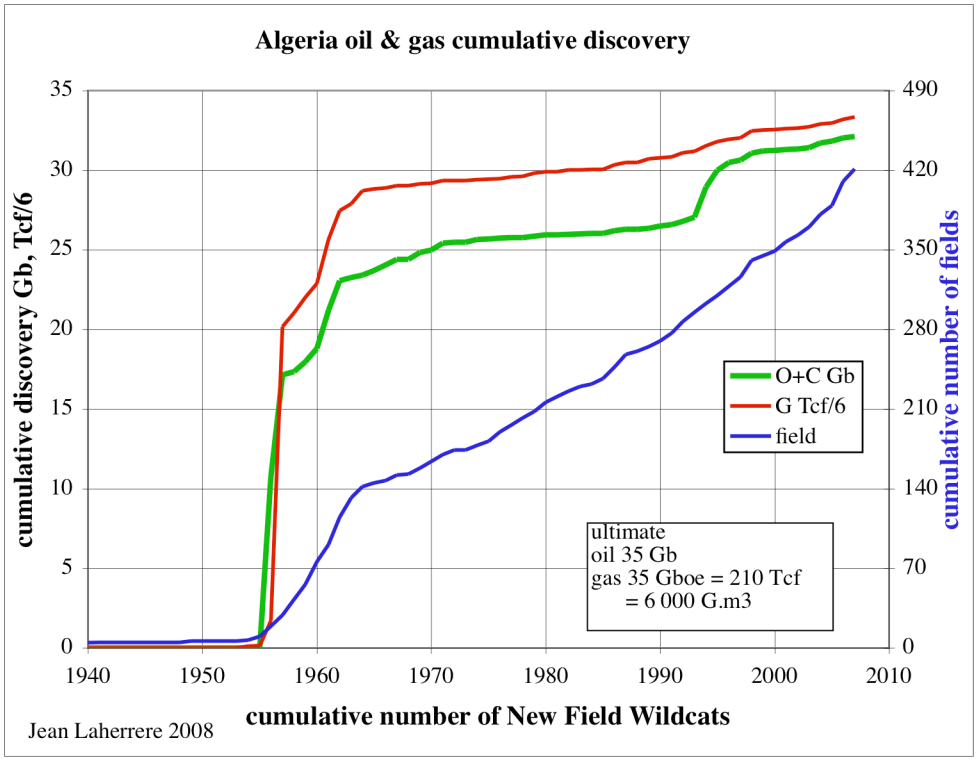
I propose a certain amount of graphs to clear the inventory of reserves, productions and consumptions of the main exporting countries to Europe. Iraq was ignored because without any reliable history on natural gas and uncertain future.

-Algeria
Creaming curve (cumulative backdated 2P discoveries versus cumulative number of pure exploratory wells = new field wildcat = NFW) allows to model ultimates with several cycles for oil and natural gas. The cumulative number of fields shows that the number does not decrease when volume does, indicating the maturity of exploration. There are two cycles, the first one with the discovery of Hassi Messaoud and Hassi R'Mel (I participated in these discoveries) and the second one with the discovery of Berkine in the 90s.
Figure 6: *Algeria: oil & gas creaming curves 1910-2007*

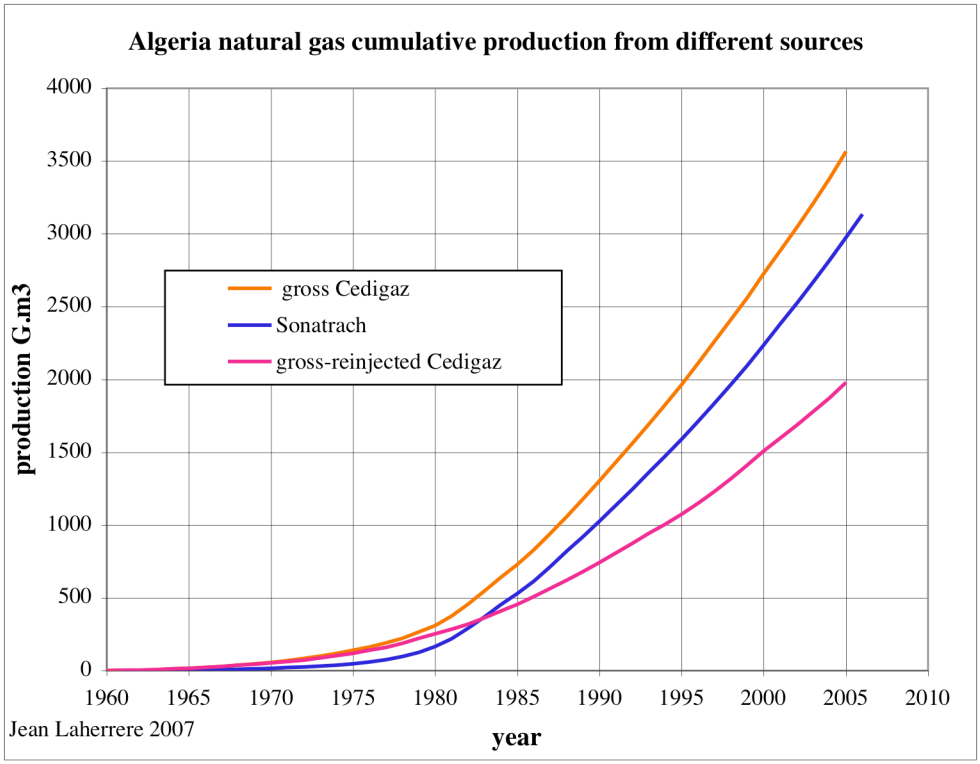


The number of fields shows a straight line despite the flattening of the volume. Success ratio stays good but the size decreases.

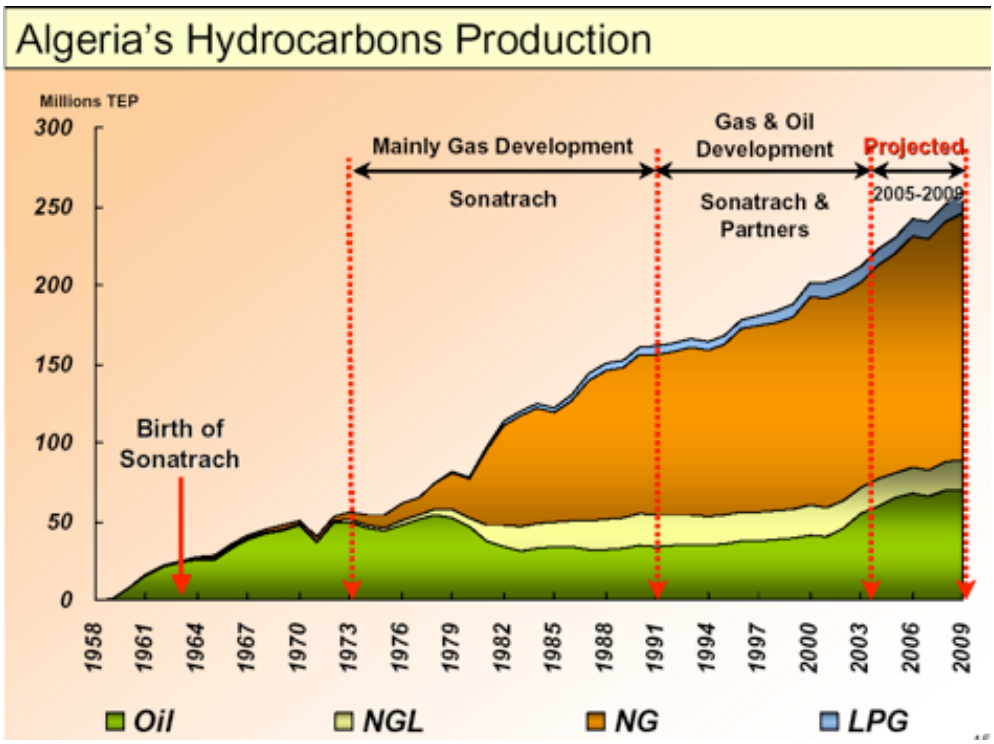
Oil ultimate is about 35 Gb and gas ultimate also 35 Gboe or 210 Tcf or 6000 G.m3 = 6 T.m3 (10^6 m^3 is in fact km3, which can be written G.m3 but not Gm3 = 10^{27} m^3 = one million earth volume, as it is written by many official organisations!).
Cumulative discoveries versus time is more difficult to extrapolate than creaming curve because the stops and go of exploration.
Figure 7: *Algeria: cumulative discovery and production 1940-2007*



Cumulative discovery is compared to cumulative production which must be subtracted from discovery to get remaining reserves : it should be gross production less reinjected, but very often it is marketed production, omitting to count the loss of flaring, venting and others.
The production reported by Sonatrach gives a cumulative quite different (1 T.m3) because the large amount of reinjected gas after removing the liquids, practice praised by Algeria because these liquids are not included in the OPEC quotas.
Figure 8: *Algeria: cumulative production from different sources*

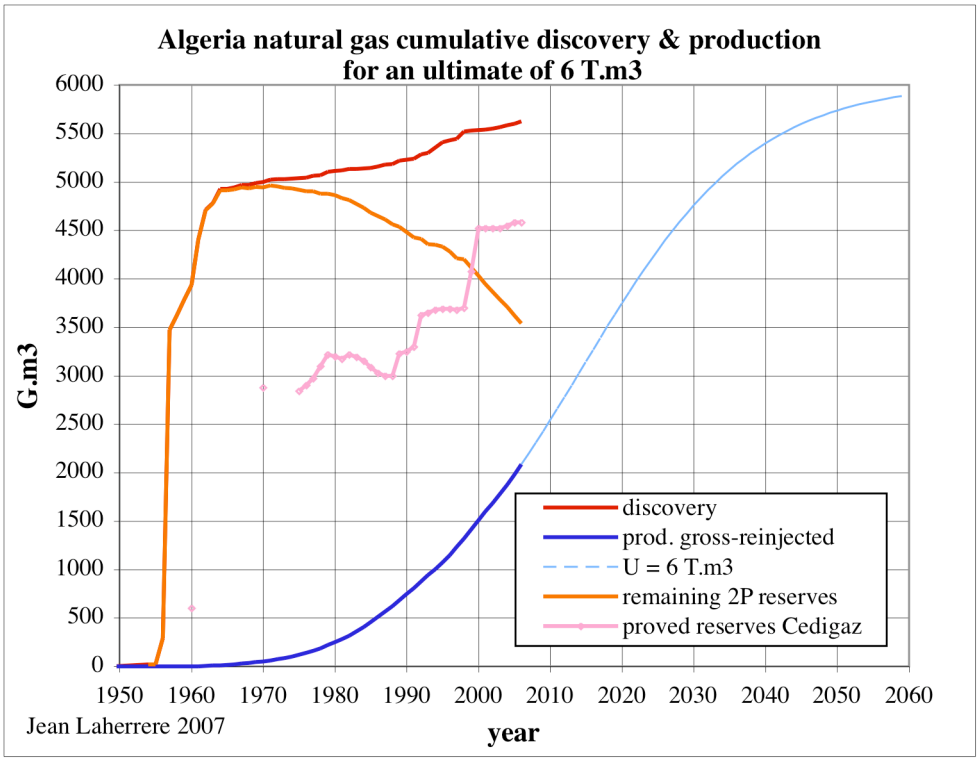


Condensate production has been important during the period where oil production was constrained, because being outside quotas. But should the large amount of reinjected dry gas be recovered completely in the future ?
Figure 9: *Algeria: oil & gas production and Sonatrach forecast 1958-2009*



The gross-reinjected cumulative production is modelled with a logistic curve trending toward an ultimate of 6 T.m3. This model takes into account only geological constraints and shows what Nature can offer, assuming no other constraints coming from the demand, investments and political hurdles : this assumption is unlikely.

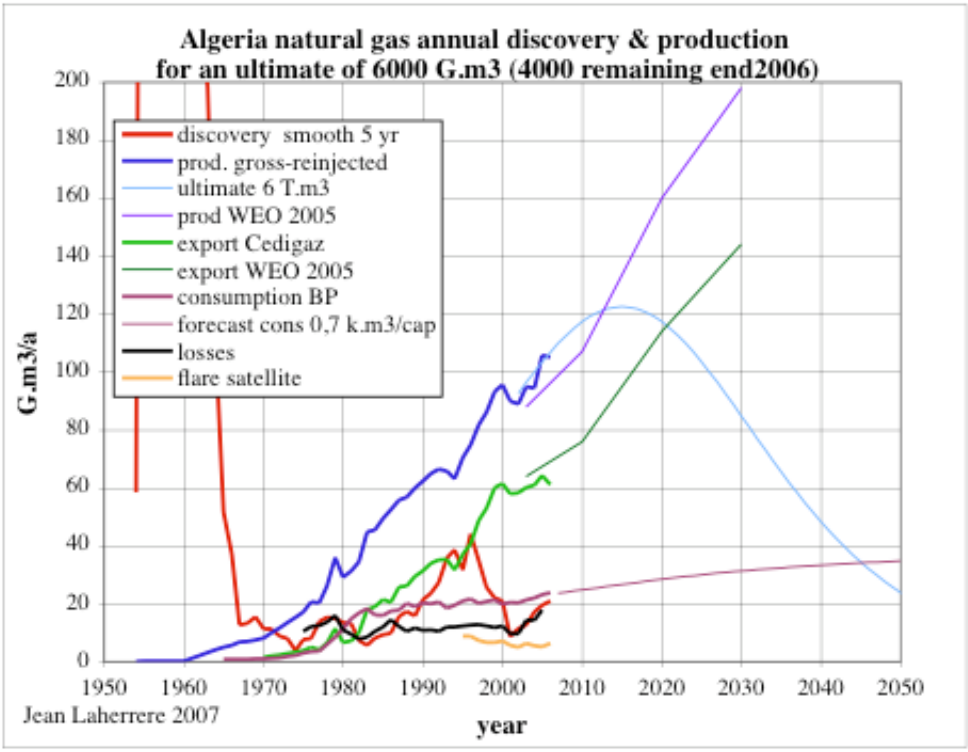
Figure 10: *Algeria: cumulative discovery & production for an ultimate of 6 T.m3 (no other constraint), technical and political reserves*



Technical remaining 2P reserves (orange) are compared to published (political) so-called proved reserves (pink). Political reserves increase when technical reserves decrease, because discovery is less than production since 1970 !

Annual discovery (smoothed on 5 years) and production are compared to consumption as exportation with forecasts toward the ultimate as 2005 IEA (WEO). Losses (flaring and other) are important, more than half the consumption. Since 1995 volume of flaring are estimated from satellites views (NOAA)

Figure 11: *Algeria: annual discovery, production for an ultimate of 6 T.m3 (no other constraint), consumption, exportation and losses*



WEO 2005 exportation forecast becomes after 2020 larger than the production estimated with an ultimate of 6 T.m3. It seems unlikely !

Consumption is estimated by multiplying population forecasts and consumption per capita (figure 14). Domestic consumption is compared to population forecasts based on fertility rates (sources : USCB (Census Bureau) and UN revision 2006.

Figure 12: *Algeria: fertility rate 1950-2050*

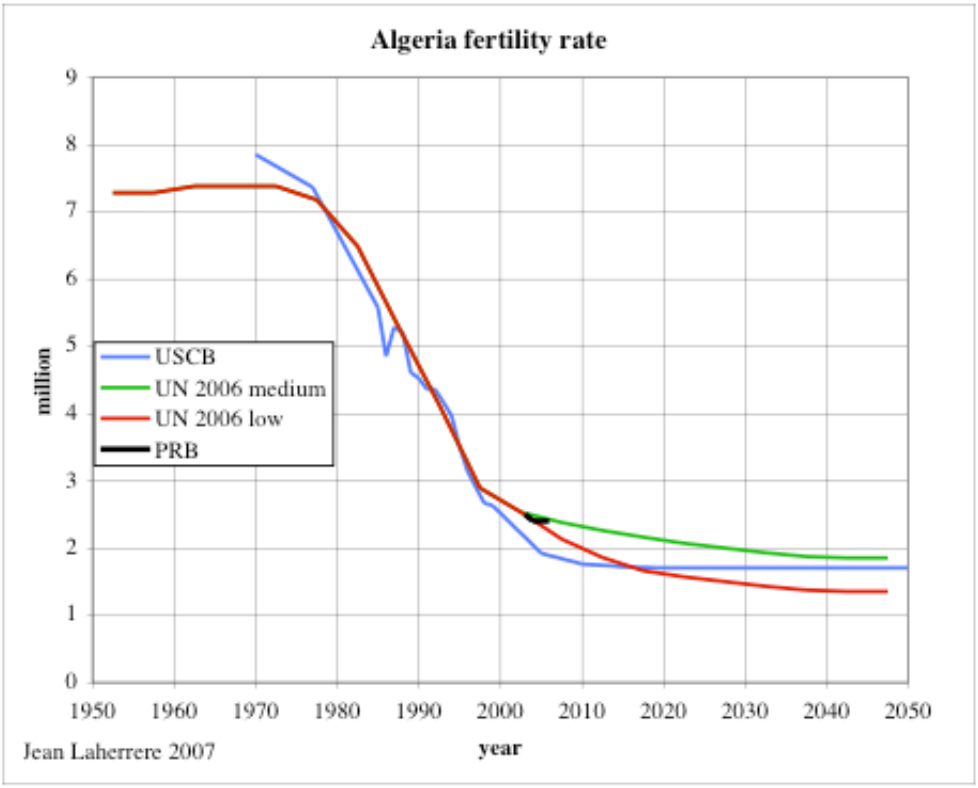
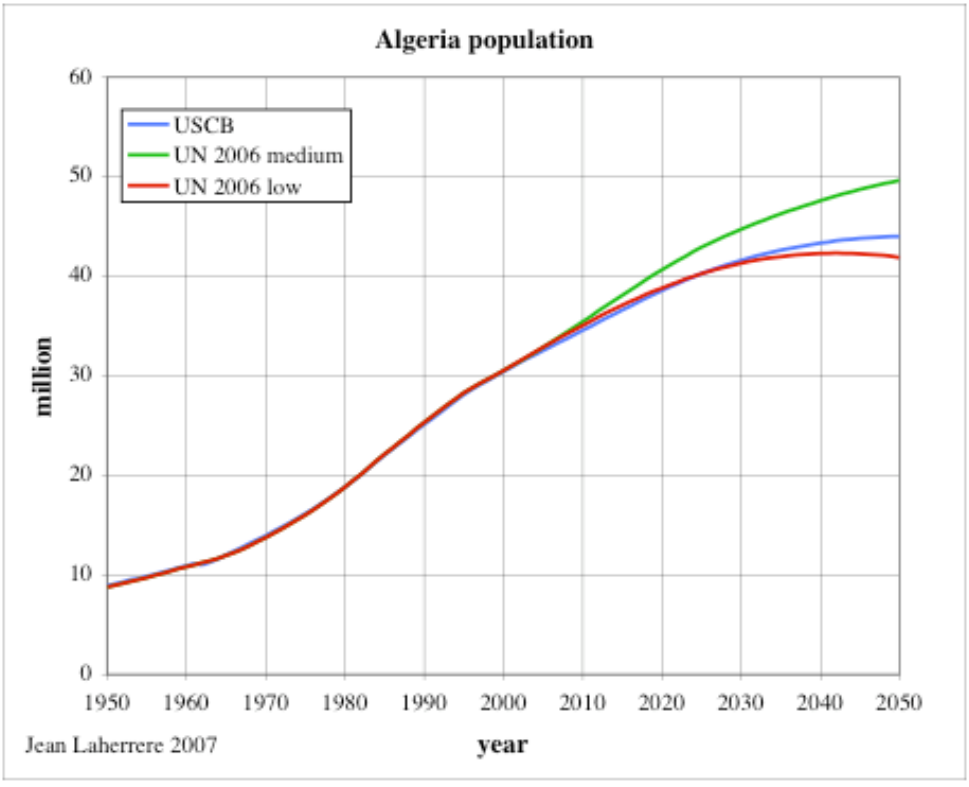
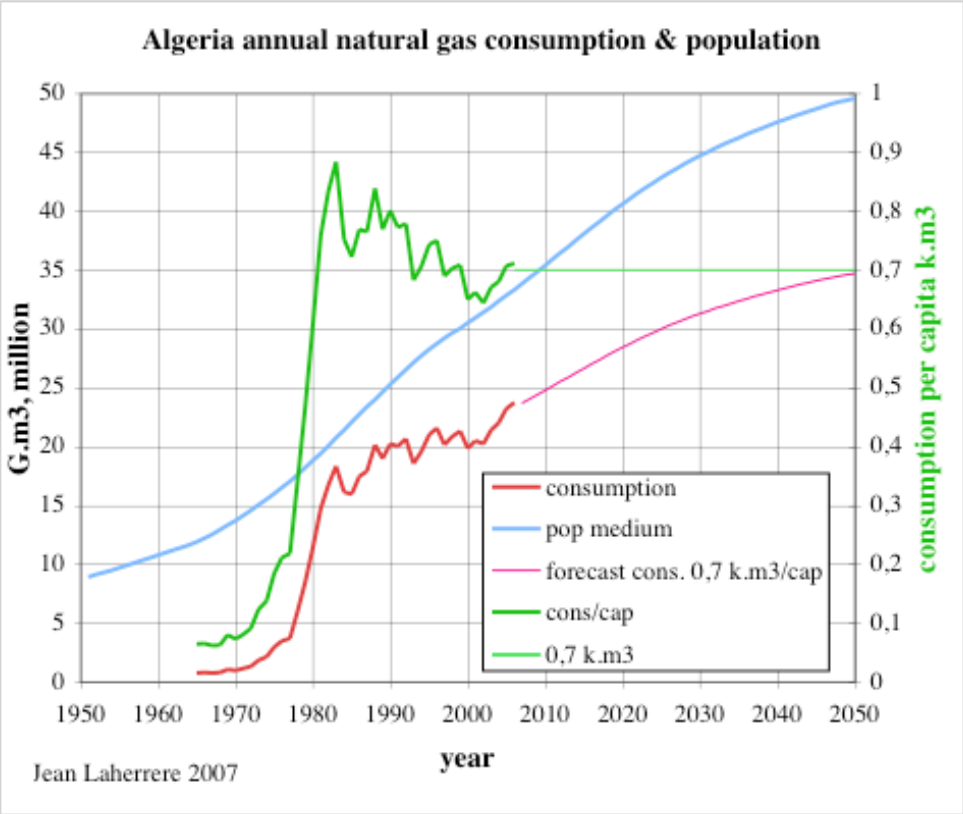


Figure 13: *Algeria: population 1950-2050*



Annual consumption per capita has decreased since 1983 from 0,9 k.m3 to 0,7 k.m3. We assume that future consumption will stay at this level until 2050. With the UN medium forecast domestic consumption could grow to 35 G.m3 in 2050, which is more than production forecast. So gas consumption per capita should decrease !

Figure 14: *Algeria: natural gas consumption and population 1950-2050*



Assuming no loss, an exportation potential is estimated between forecast of gross-reinjected production and consumption, compared also to IEA WEO 2005.

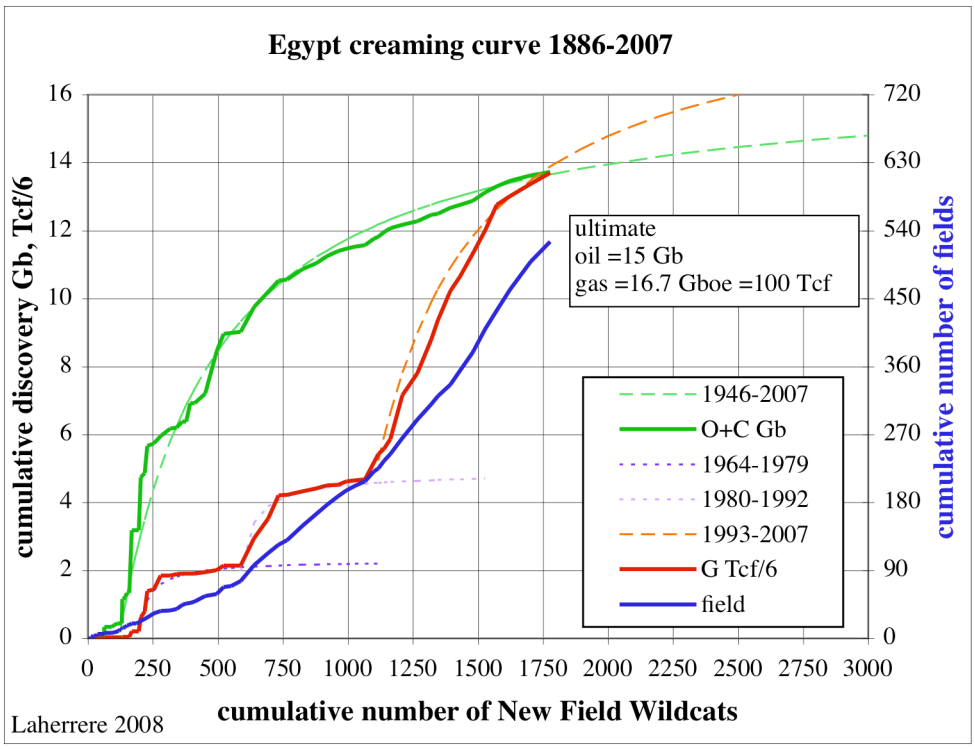
G.m3	gross-reinj	consump.	pot. export	prod WEO	export WEO
2003	95	21	74	88	64
2010	117	25	92	107	76
2020	117	28	89	160	114
2030	85	31	54	198	144

WEO estimations look unrealistic for 2020 and mainly 2030
Losses (flaring and others) in 2005 are about 18 G.m3!

-Egypt

Egypt creaming curve has one cycle for oil but three for gas. The recent gas discoveries in the Nil delta show a real potential for new discoveries.

Figure 15: *Egypt: creaming curve 1886-2007*

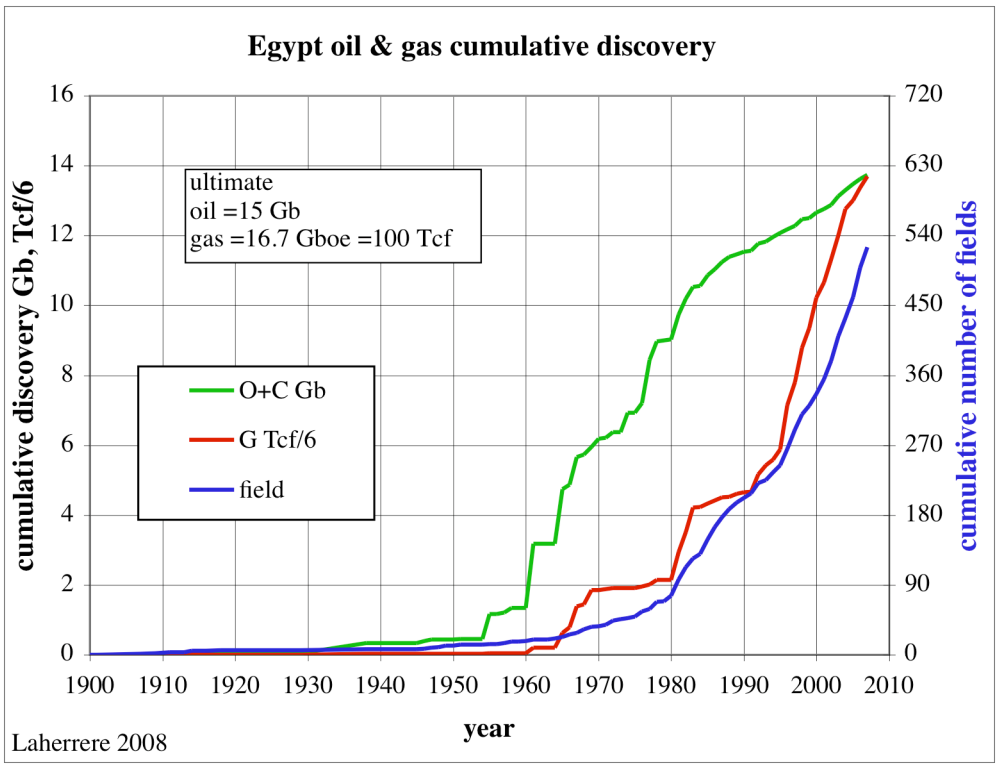


The number of fields increases with better seismic offshore.

Ultimate is estimated at 15 Gb for oil and 16.7 Gboe or 100 Tcf or 3000 G.m3 for gas.

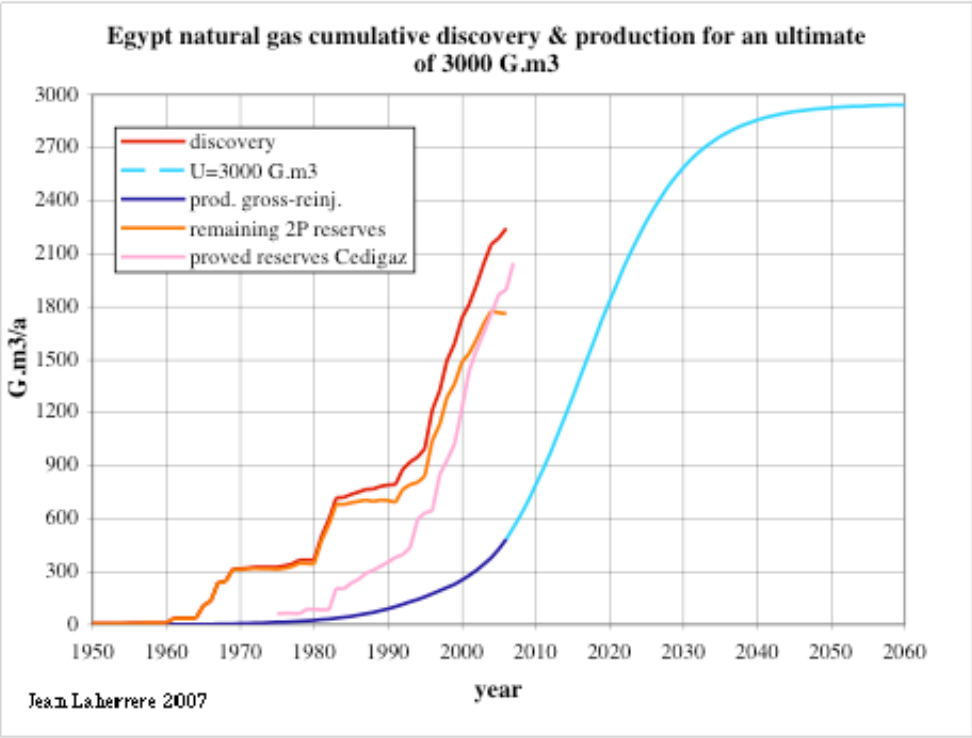
Same data versus time

Figure 16: *Egypt: oil & gas cumulative discoveries 1886-2007*



Natural gas cumulative discoveries and production (gross-reinjected) trend towards the same ultimate of 3000 T.m3

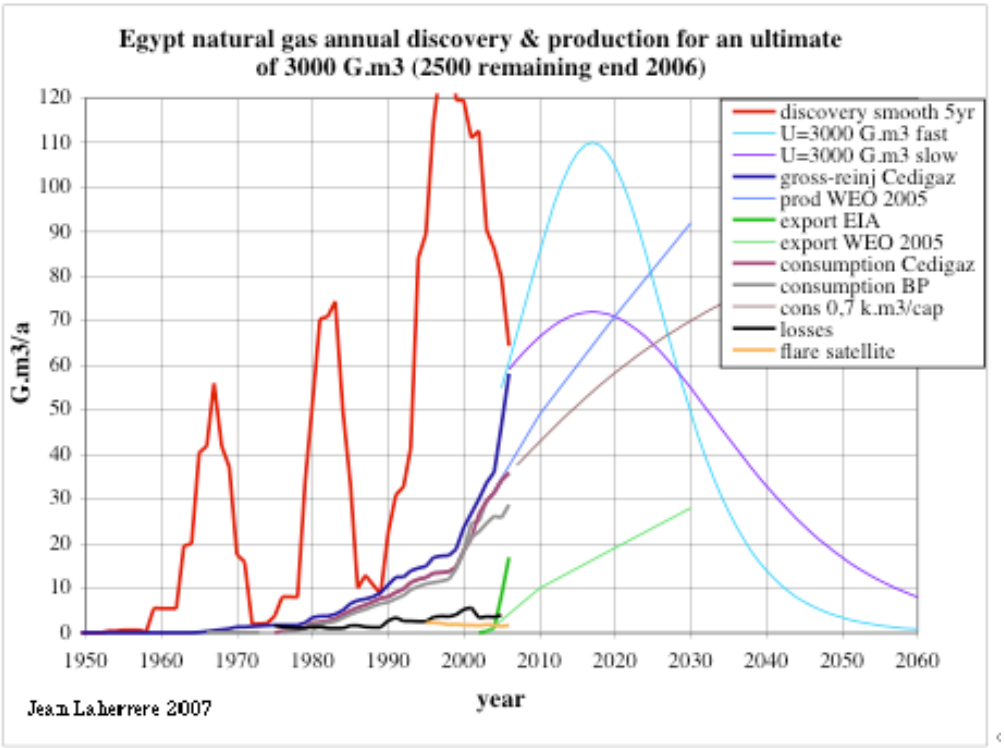
Figure 17: *Egypt: natural gas cumulative discovery & production for an 3 T.m3 ultimate with technical and political remaining reserves*



2P remaining reserves are not too far from so called proved reserves.

Annual gas discovery and production with forecasts for 3 T.m3 ultimate are computed with a fast production in line with the last years (peak at 110 G.m3) and a slow production (peak at 70 G.m3). IEA WEO 2005 forecasts are displayed for production & exportation (2010 forecast lower than 2006 value !).

Figure 18: *Egypt: annual discovery & production for 3 T.m3 ultimate (no other constraint), consumption, exportation & losses*



Consumption forecast is based on population and fertility rate forecasts

Figure 19: *Egypt: fertility rate 1950-205*

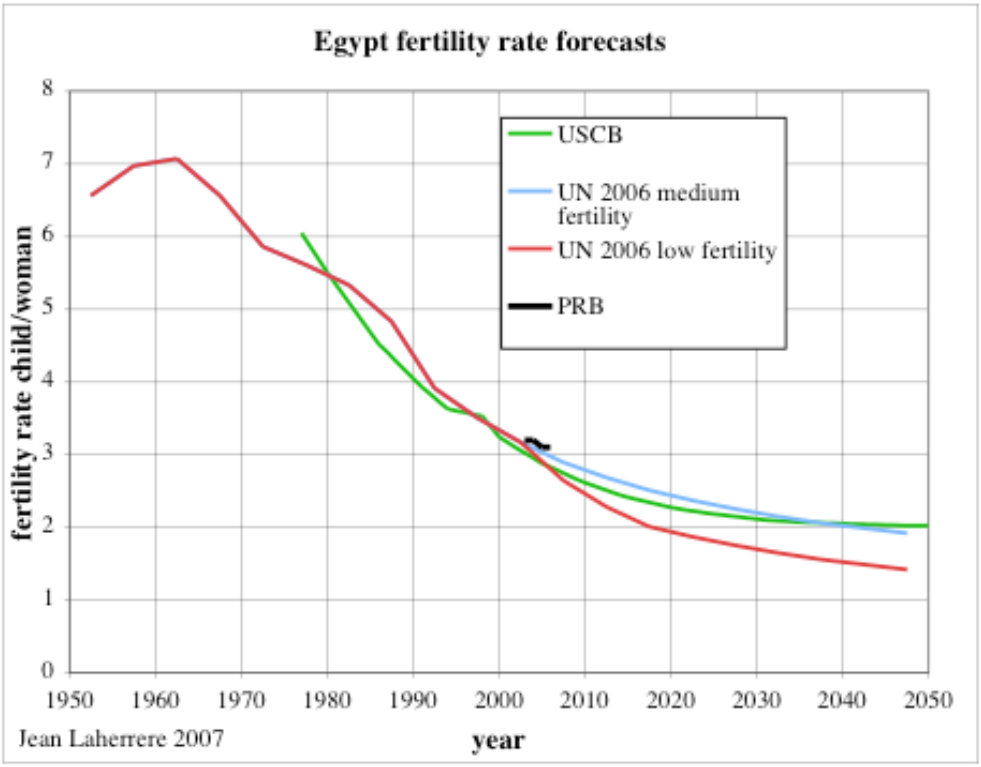
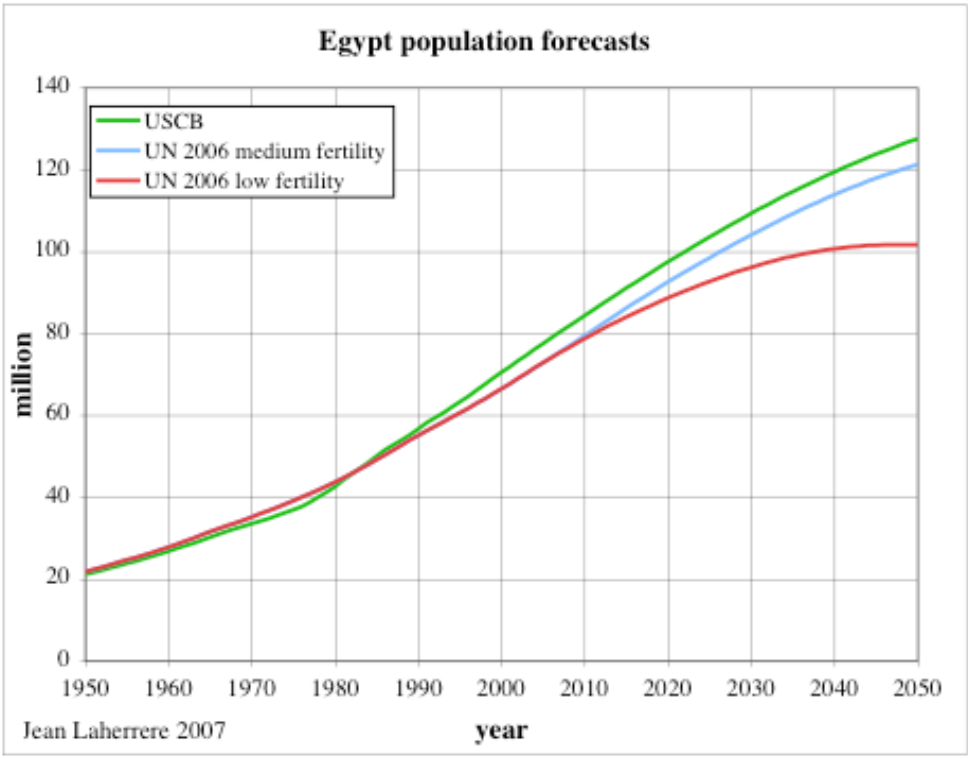
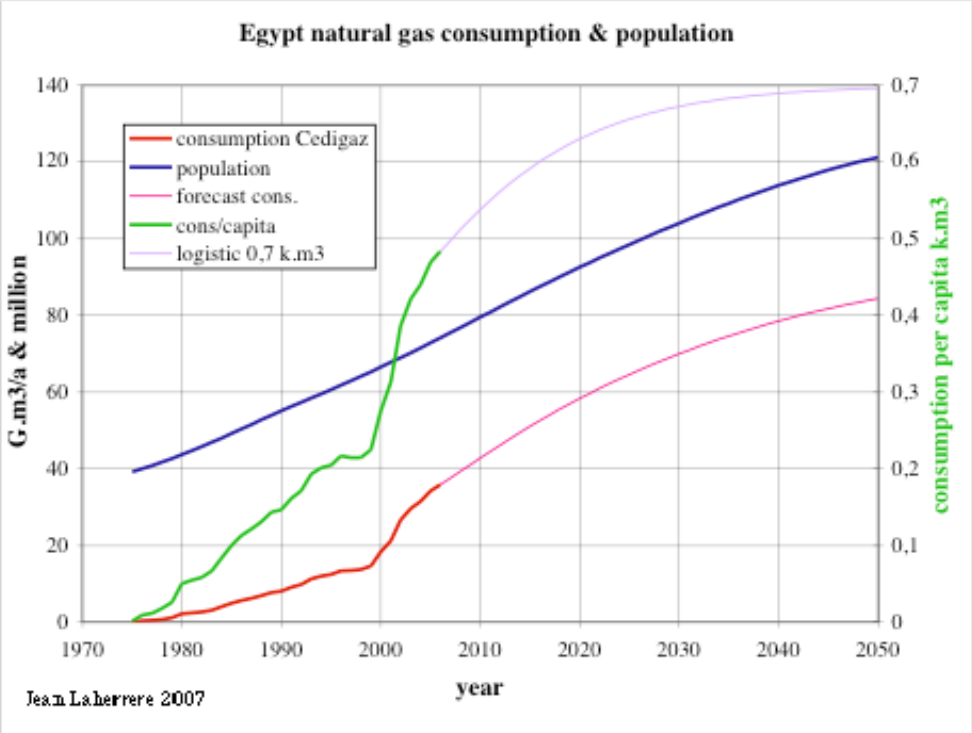


Figure 20: *Egypt: population 1950-2050*



Consumption per capita is extrapolated with a logistic curve for an asymptote of 0,7 k.m3 (estimate for Algeria)

Figure 21: *Egypt: gas consumption and population*



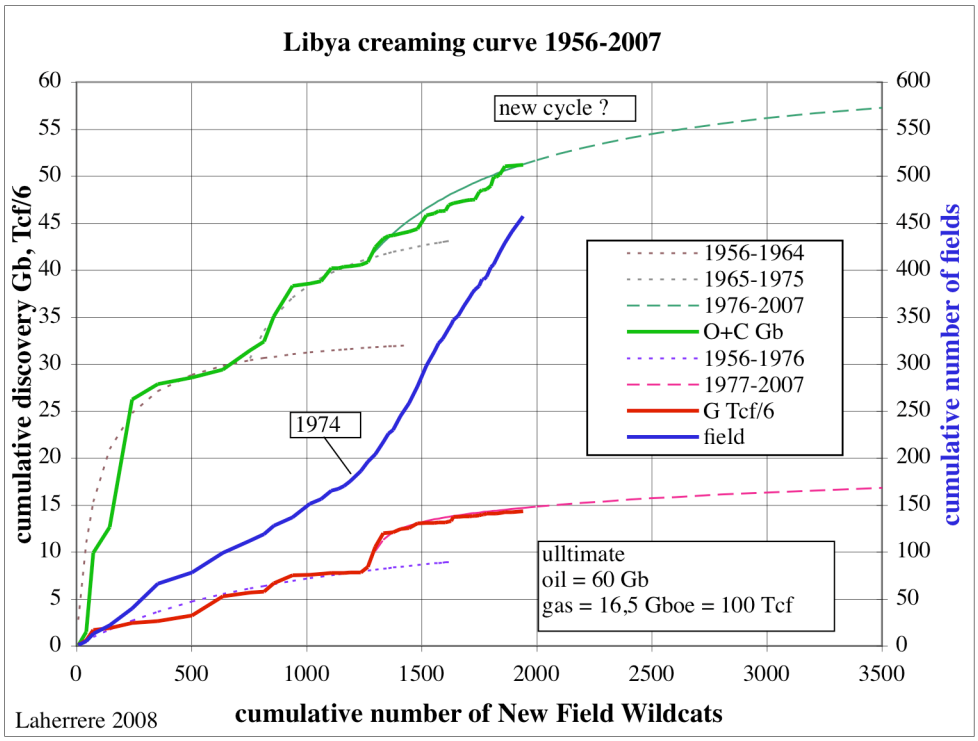
Forecasts comparison is as below:

G.m3	gross-reinj	consum.	pot. export	prod IEA	export IEA
2003	34	30	4	29	0
2010	85 or 66	43	42or23	49	10
2020	105or71	58	47or13	71	19
2030	49or55	70	-21or-15	92	28

IEA forecasts for exportation are too pessimistic for 2010 and 2020 but too optimistic for 2030.
2004 losses (flaring & others) are about 3,9 G.m3

-Libya

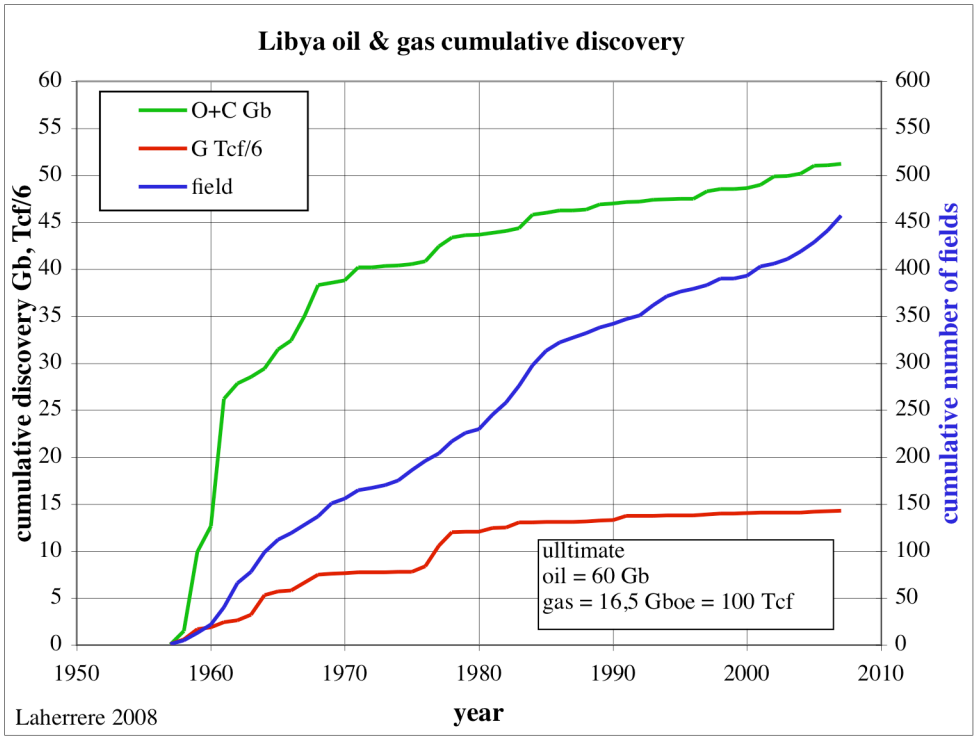
Creaming curves show that Libya is more endowed with oil than with gas, both with two cycles but in different periods. Oil ultimate is 60 Gb and for gas 16,5 Gboe or 100 Tcf or 2800 G.m3.
Figure 22: *Libya: creaming curve 1956-2007*



Sharp increase in the number of fields after 1977 (better seismic)

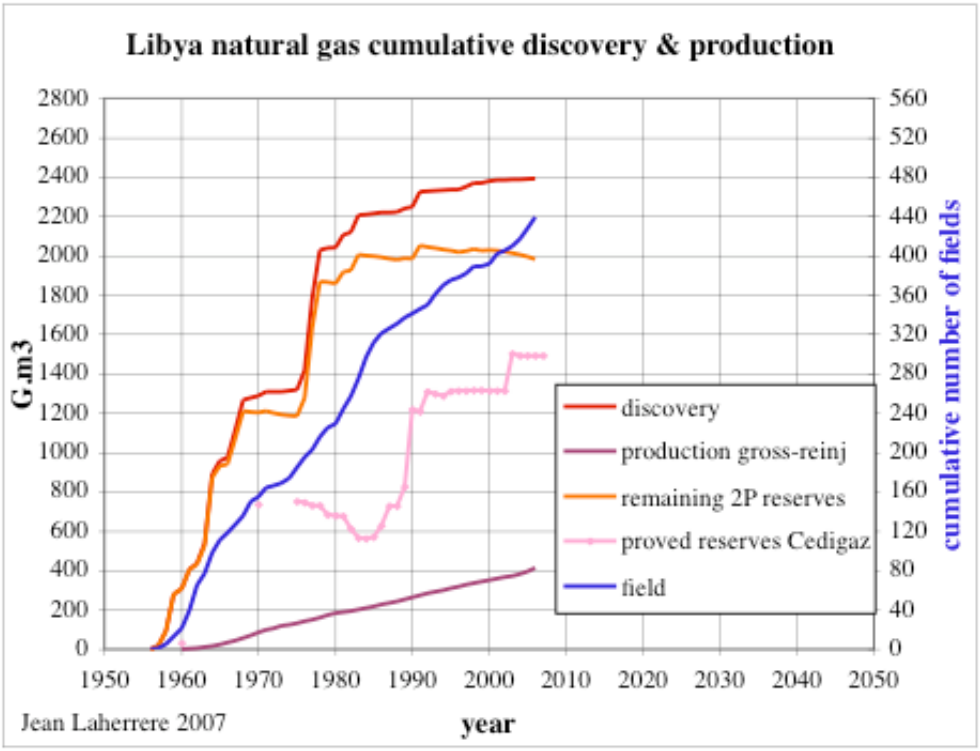
same data versus time

Figure 23: *Libya: oil & gas cumulative discovery*



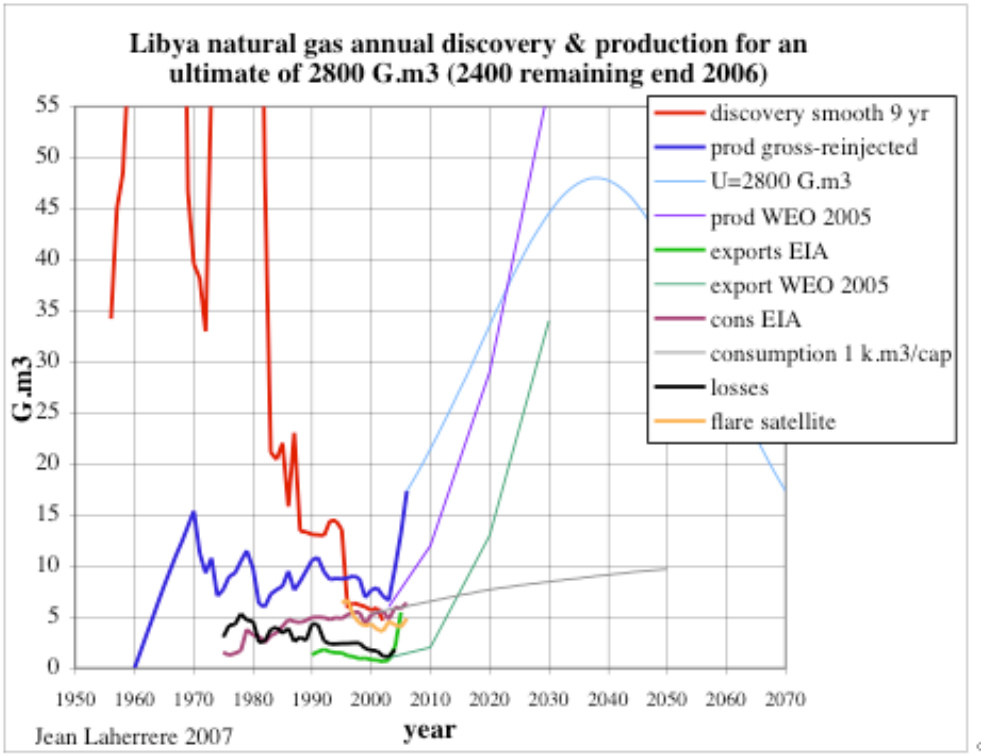
Natural gas cumulative production is a small part of the discovery, showing that gas has been little produced.

Figure 24: *Libya: natural gas cumulative discovery, production & remaining reserves*



Since 1985 the proved reserves are on increase when flat for proven+probable !

Figure 25*: Libya: annual natural gas discovery, production for 2.8 T.m3 ultimate (no other constraint), consumption, exportation & losses*



Flaring seen from satellite (4,2 G.m3 in 2004) is much larger than the country official report (0,9) !

Consumption forecast is based on population and fertility rate (high 3 compared to Algeria 2.5 but identical to Egypt).

Figure 26: *Libya: fertility rate 1950-2050*

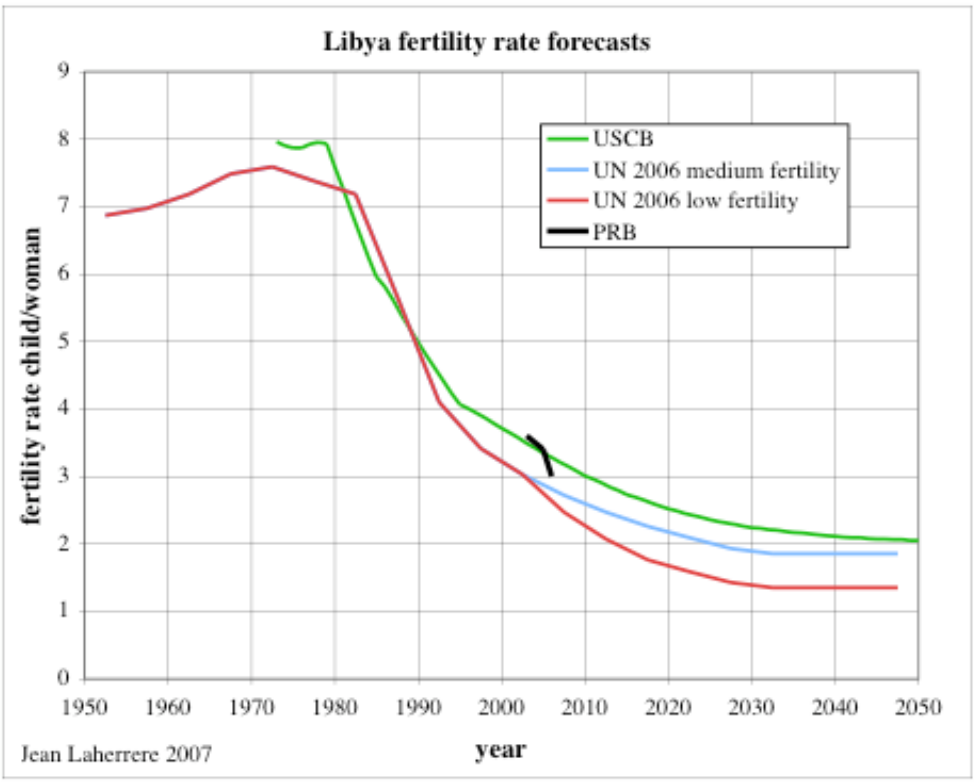
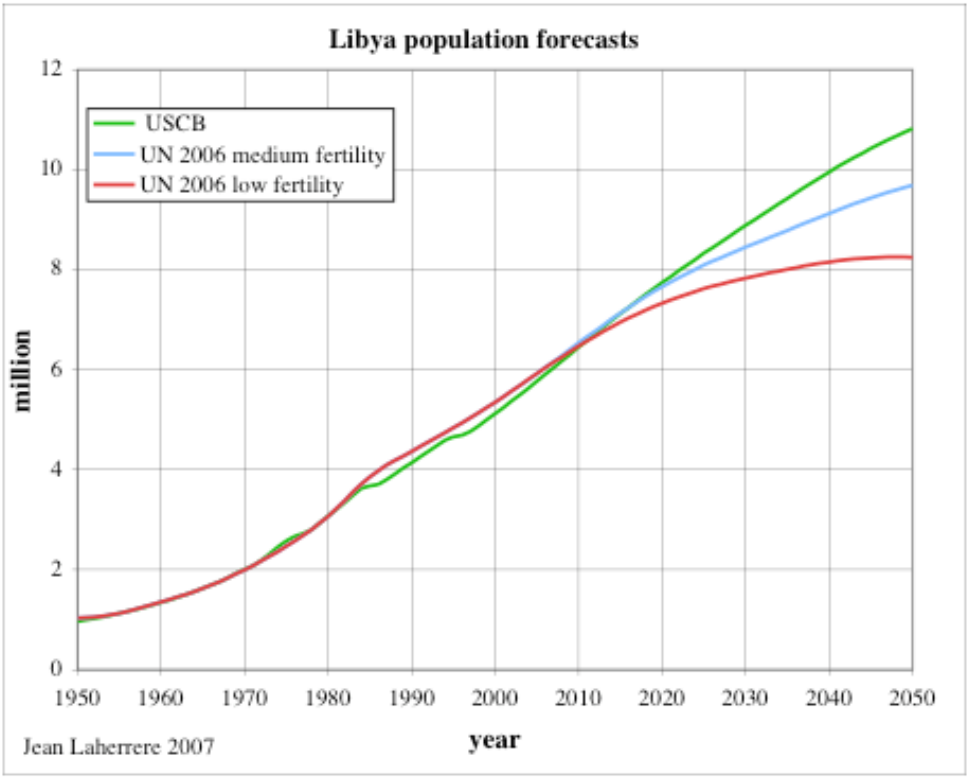


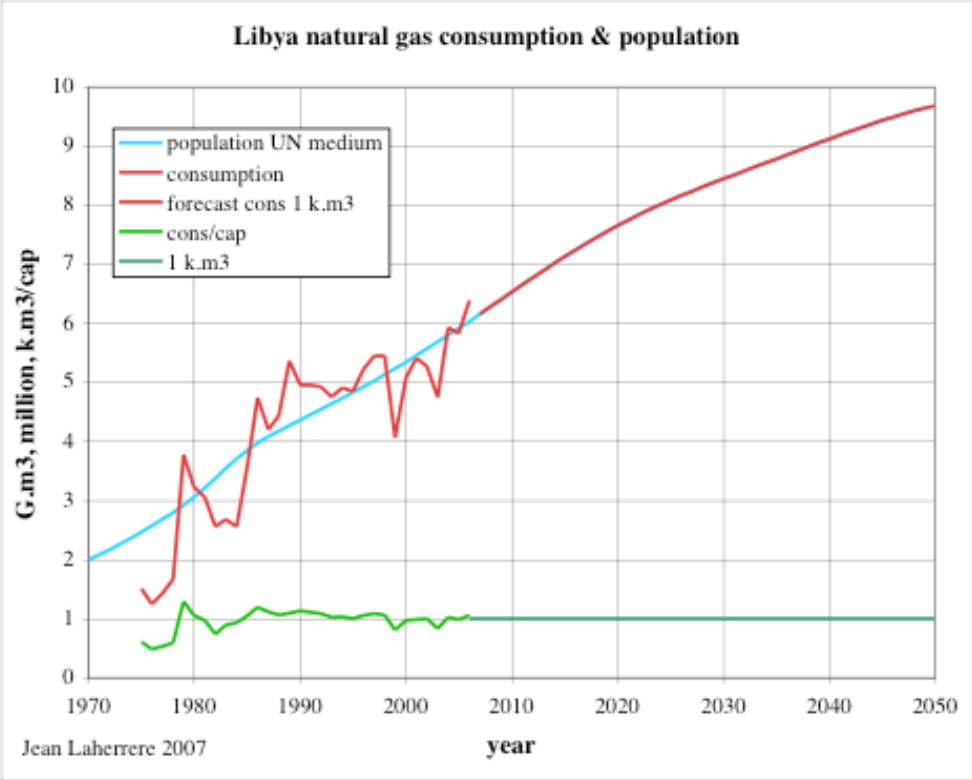
Figure 27: *Libya: population 1950-2050*



Large increase of population from 6 to 10 millions in 2050

Gas consumption per capita is stable for the last 25 years and is assumed to stay at the same level until 2050.

Figure 28: *Libya: gas consumption & population 1950-2050*



Forecast comparison des previsions is as below:

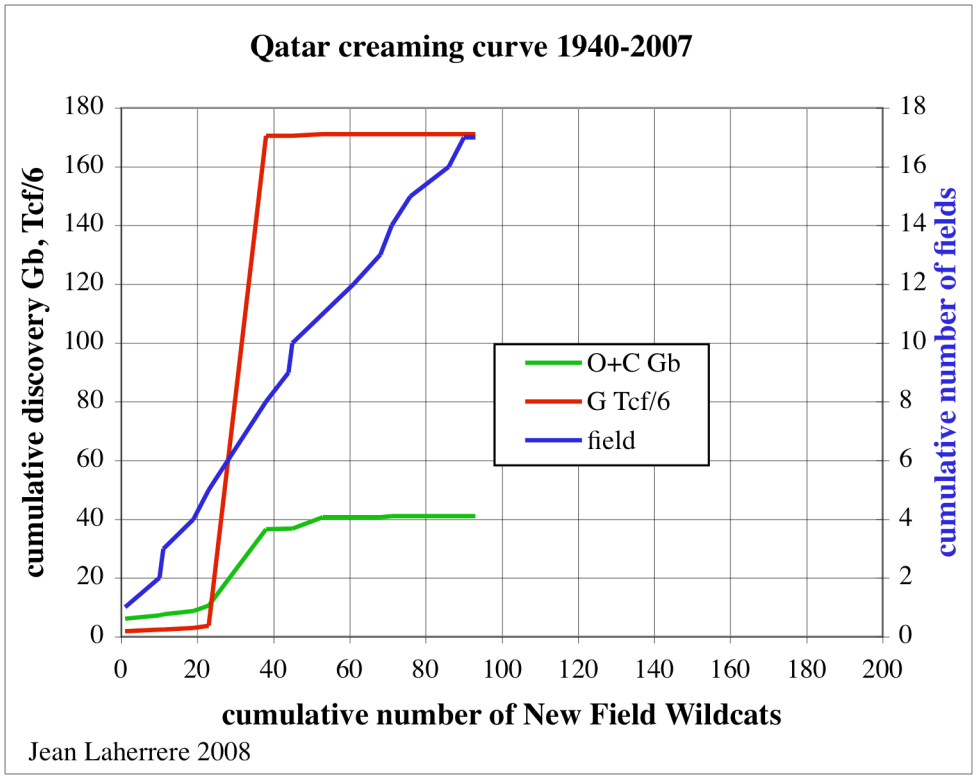
G.m3	gross-reinj	cons.	pot export	prod IEA	export IEA
2003	7	5	2	6	1
2010	21	7	14	12	2
2020	34	8	26	29	13
2030	44	8	36	57	34

IEA forecasts look likely.
Losses (flaring & others) in 2004 is 1.8 G.m3 for Cedigaz and 0,9 G.M3 for EIA.

-Qatar

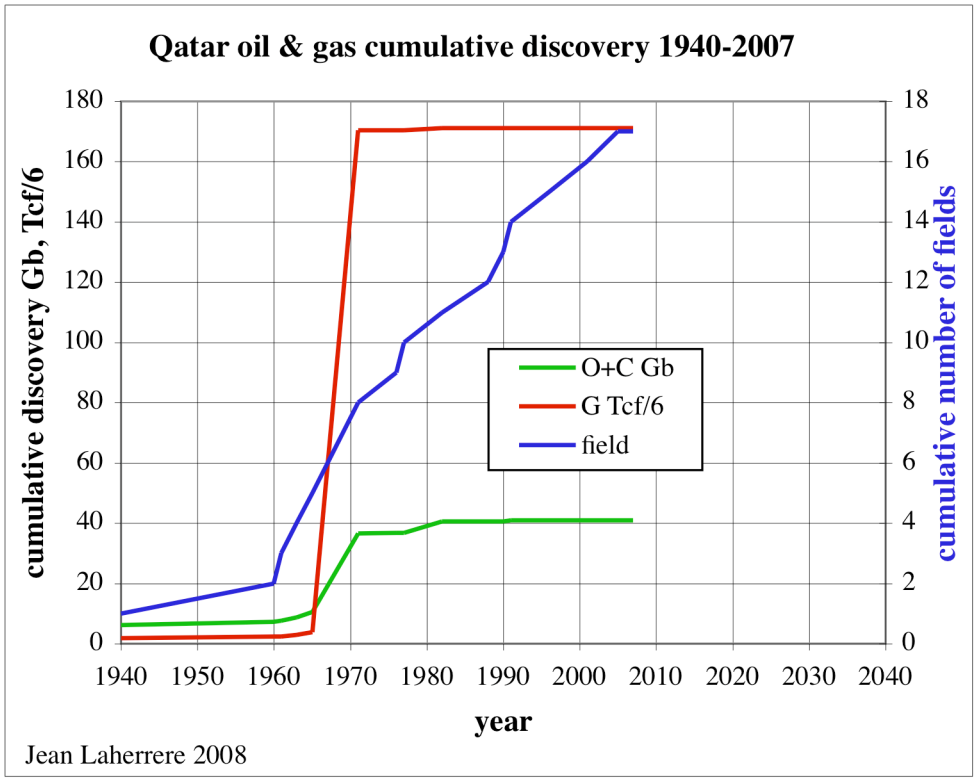
Qatar creaming curve is crushed by the North Field which extends (one third) into Iran with South Pars, making by far North Dome the world largest gasfield. Urengoy, considered for a long time as the largest gasfield, is only one fifth in volume! Furthermore, having 40 Mb of condensate per Tcf, it is also a supergiant, as large as Greater Burgan !

Figure 29: *Qatar: creaming curve 1940-2007*



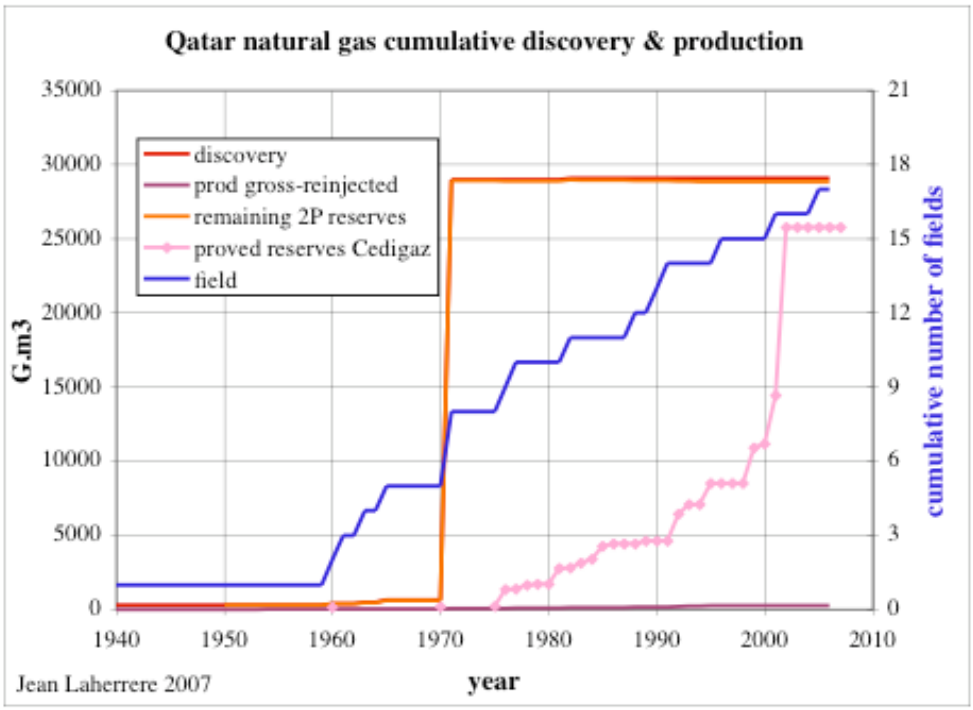
Reserves estimate, in a carbonate reservoir with few wells drilled, is uncertain. In the Iranian side a dry well has been drilled (reservoir facies change) and reported reserves should be carefully considered. .

Figure 30: *Qatar: oil & gas cumulative discoveries 1940-2007*

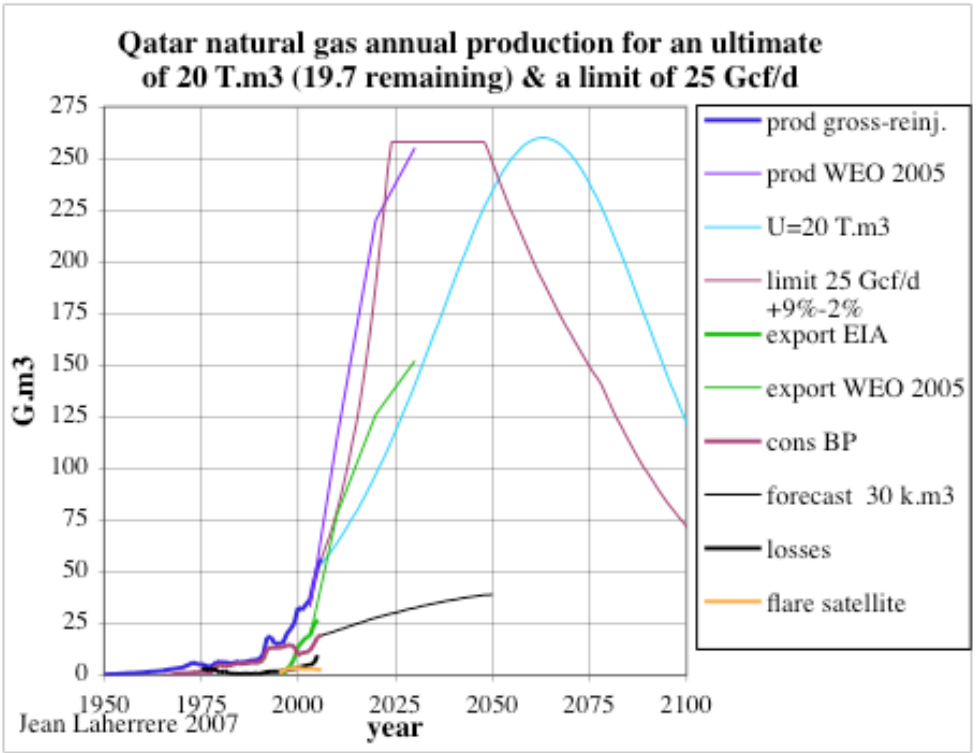


Natural gas cumulative discovery and production show that very little has been produced and 2P reserves are not too far from recent proved reserves.

Figure 31*: Qatar: natural gas cumulative discovery, production and technical & political reserves*



Gas discoveries are estimated as 28 T.m3, but it seems better to limit them to 20 T.m3, waiting to obtain a better knowledge of the reservoir. Furthermore Qatar with a small population has decided to limit the production to 25 Gcf/d (260 G.m3/a). Production forecast is limited to this level with a fast increases (9%/a) with a 25 years plateau and a decline of 2%/a for an ultimate of 20 T.m3.
Figure 32: *Qatar: natural gas annual discovery, production for a 20 T.m3 ultimate (no other constraint), consumption, exportation & losses*



Flaring estimate by satellite is less than reported losses which are great because losses in extraction plants are much larger than flaring.

Fertility rates are uncertain and sources vary.
Figure 33: *Qatar: fertility rate*

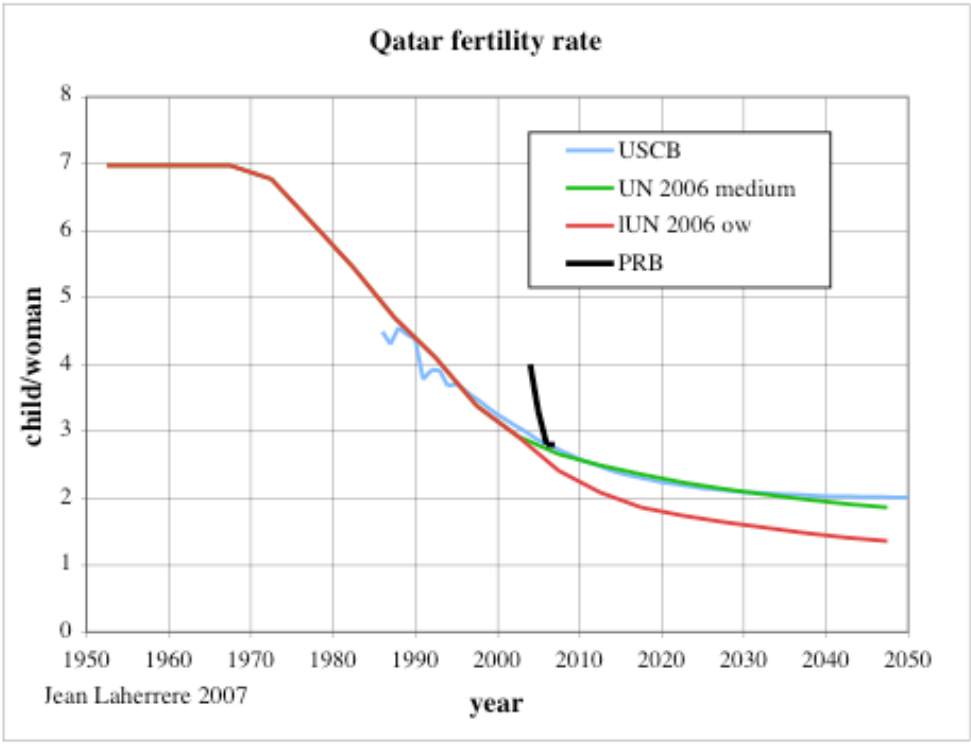
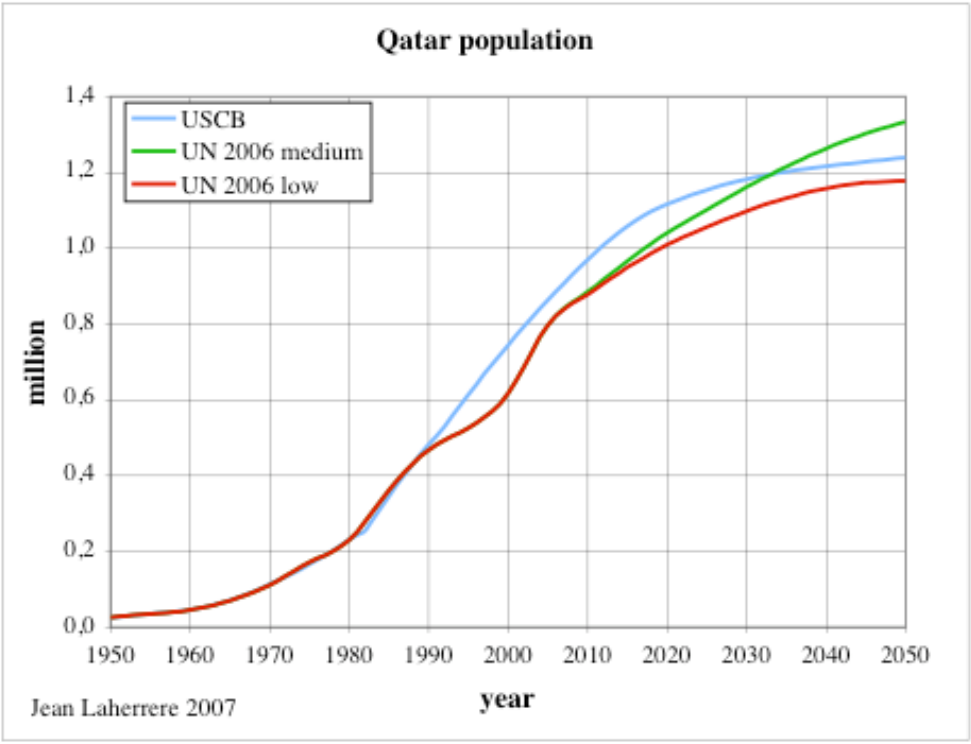


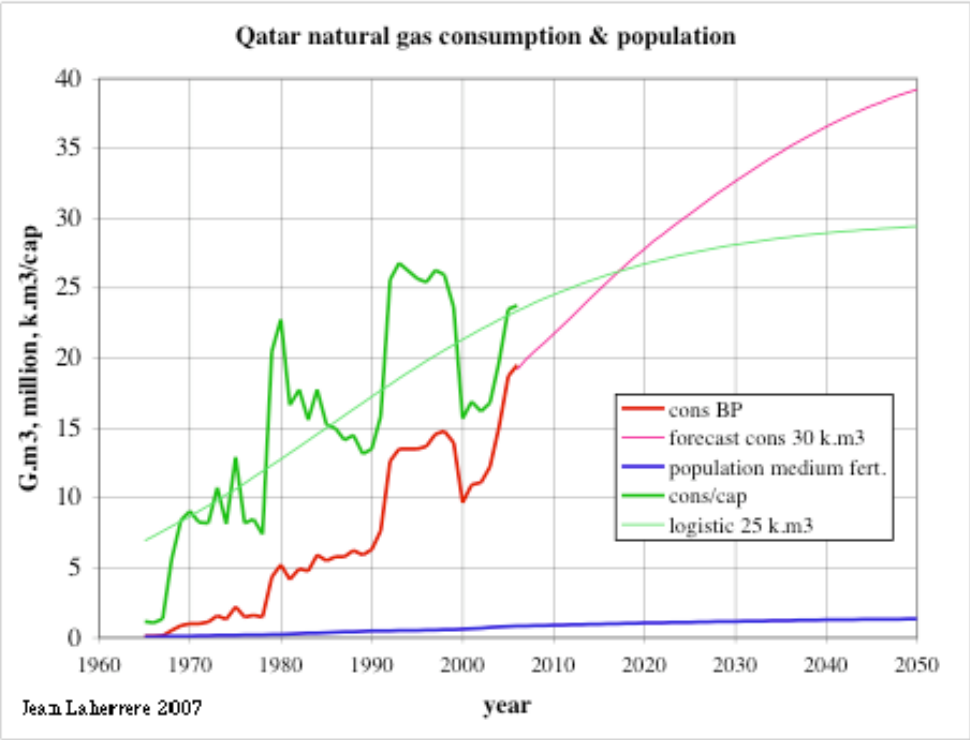
Figure 34: *Qatar: population 1950-2050*



The present population (0.8 M) excludes foreign workers which are numerous.

Natural gas consumption per capita is huge (>20 k.m3/a) because a large volume is used in the liquefaction gas plants and small population, but total consumption is less than uncertainty on production. Annual consumption per capita is modelled for a maxi of 30 k.m3

Figure 35: *Qatar: natural gas consumption & population*



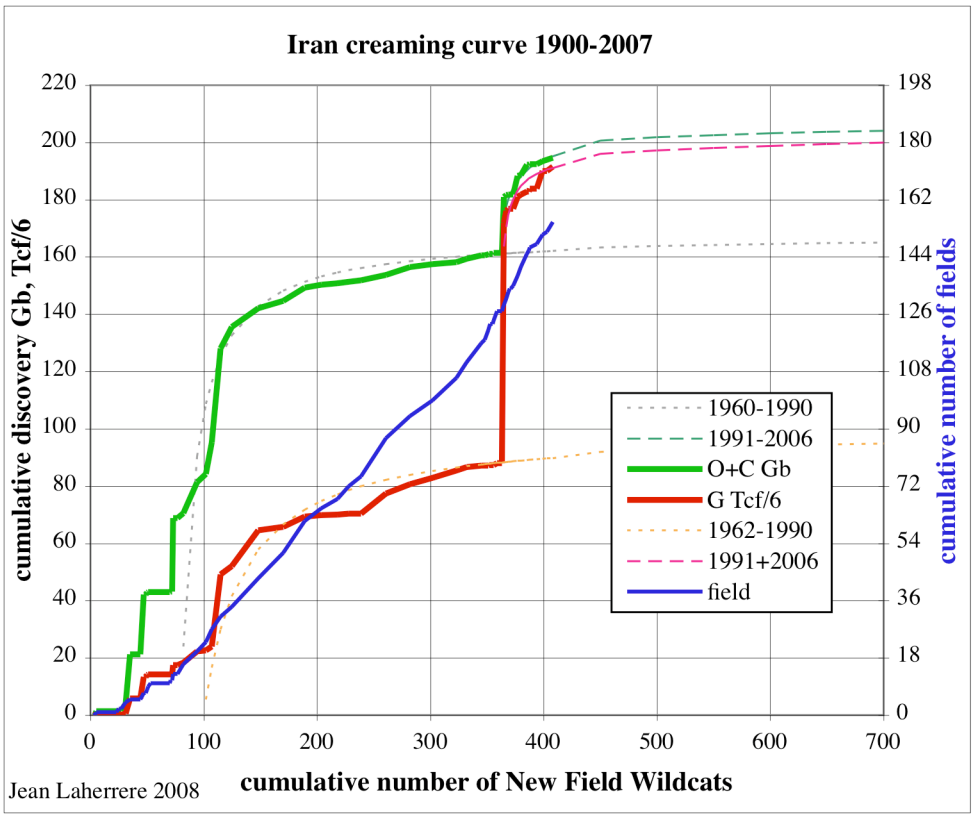
Forecasts comparison is as below

G.m3	gross-reinj	cons	pot export	prod AIE	export AIE
2003	36	20	16	19	33
2010	80ou64	20	60ou 44	78	115
2020	190ou97	21	170ou80	126	220
2030	250ou150	23	230ou130	152	255

IEA forecasts are too optimistic. Qatar with a small population ha s no interest to increase too sharply its production and several projects have been cancelled, in particular Exxon GTL plant. Losses are reported weak for EIA (0,3 G.m3 in 2004), important for Cedigaz (9,8 in 2005)

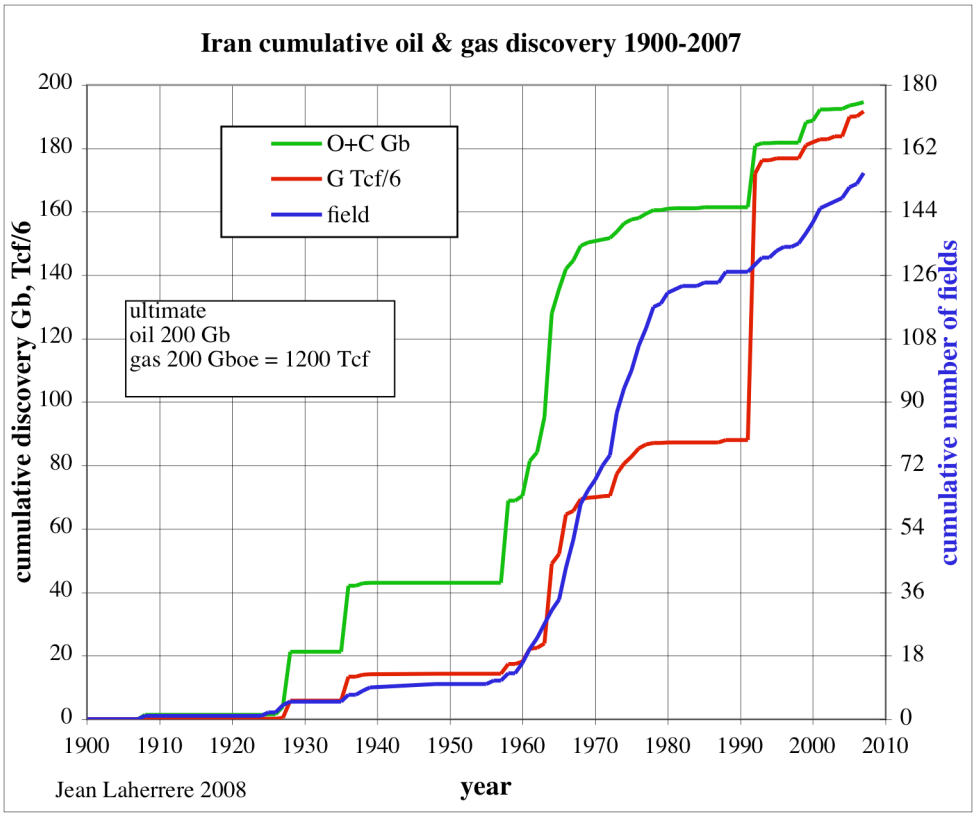
-Iran

Iran creaming curve shows two major cycles, of which South Pars is the last one.
Ultimates are for oil 200 Gb and for gas 200 Gboe = 1200 Tcf or 34 T.m3.
Success ratio of discovery stays about the same for the century of exploration (straight cumulative number of fields)
Figure 36: *Iran: creaming curve 1900-2007*



same data versus time

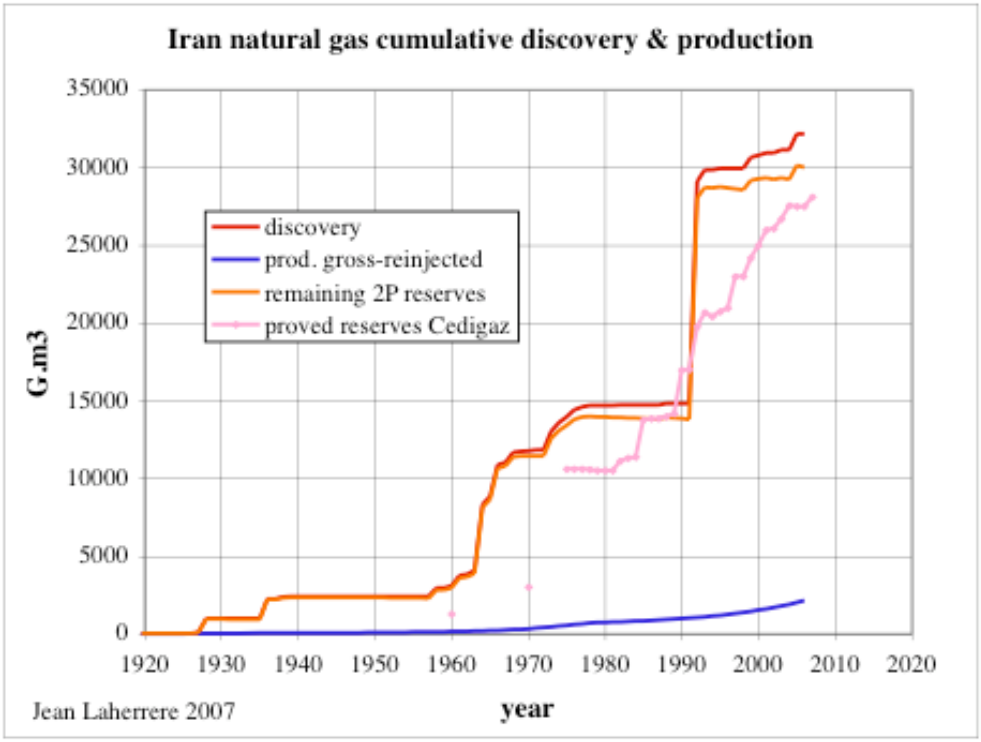
Figure 37: *Iran: oil & gas cumulative discoveries*



South Pars has been drilled in 1991, but the discovery of the North Dome was made in Qatar in 1971 (two thirds in Qatar= North Field, one third in Iran= South Pars). The uncertainty of the reserves has been already mentioned. But as said JM Bourdaire (former IEA and WEC director), in front of such large reserves, the matter is not the size of the tank but the size of the tap. Huge

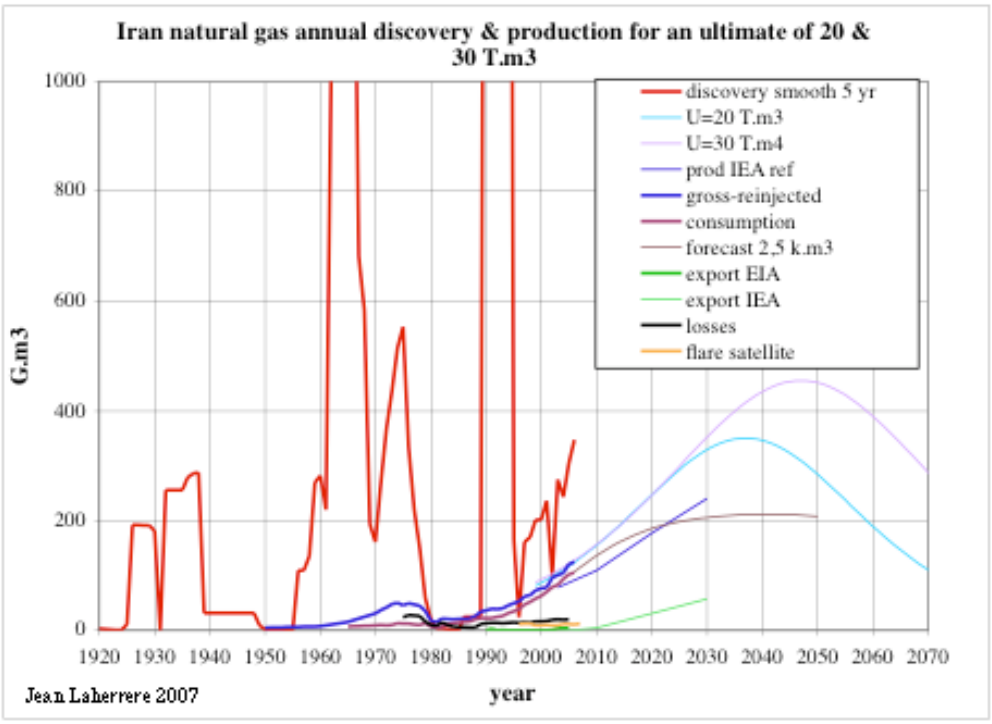
investments are needed and the Iranian service contract for IOCs is bad, in addition to the US embargo.

Figure 38*: Iran: natural gas cumulative discovery, production and technical & political reserves*



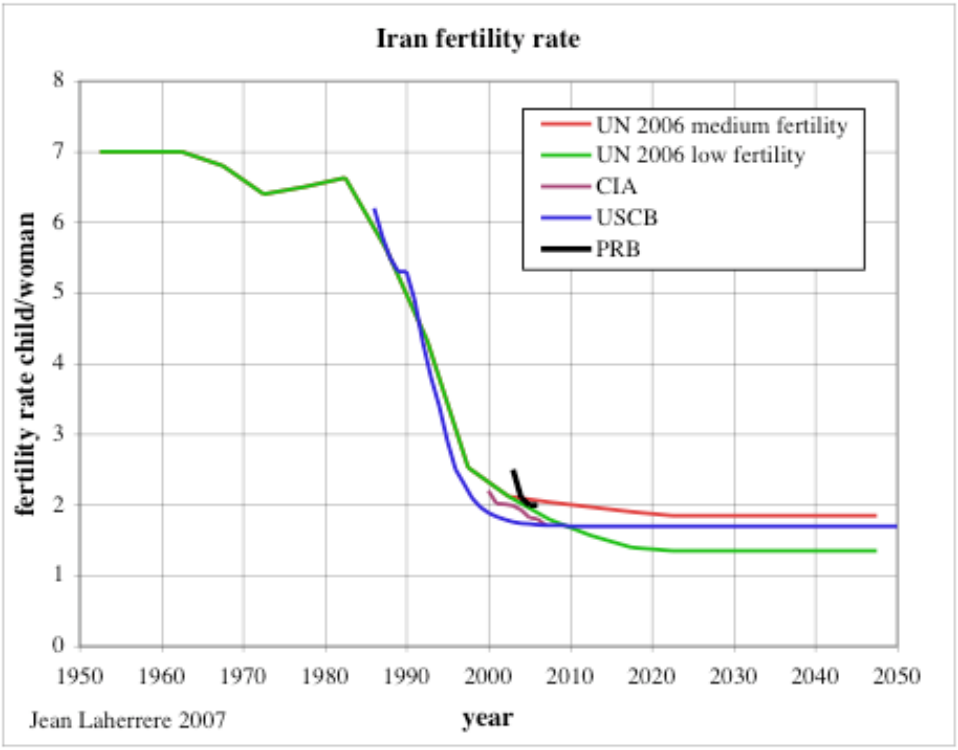
Proved reserves are slightly over 2P reserves, but both seems high. It seems more reasonable to forecast only for ultimate a range 20-30 T.m3

Figure 39: *Iran: natural gas annual discovery, production for ultimate 20-30 T.m3 (no other constraints), consumption, exportation & losses*

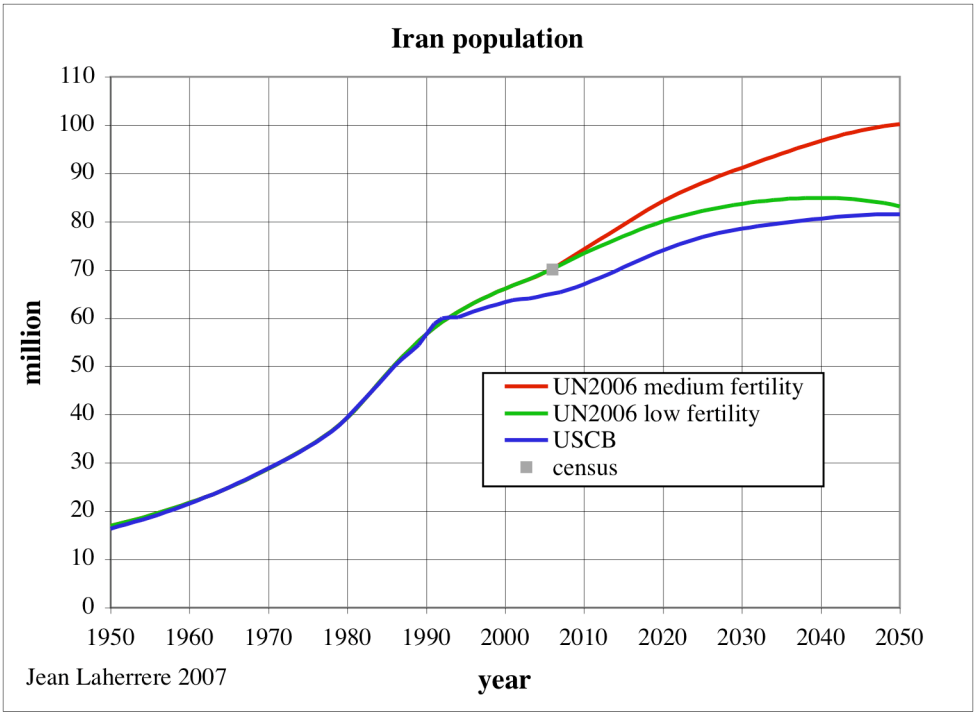


Natural gas consumption is estimated for a consumption per capita increasing from 1.5 to 2.5 k.m3. Then consumption in 2050 is about production for an ultimate of 20 T.m3

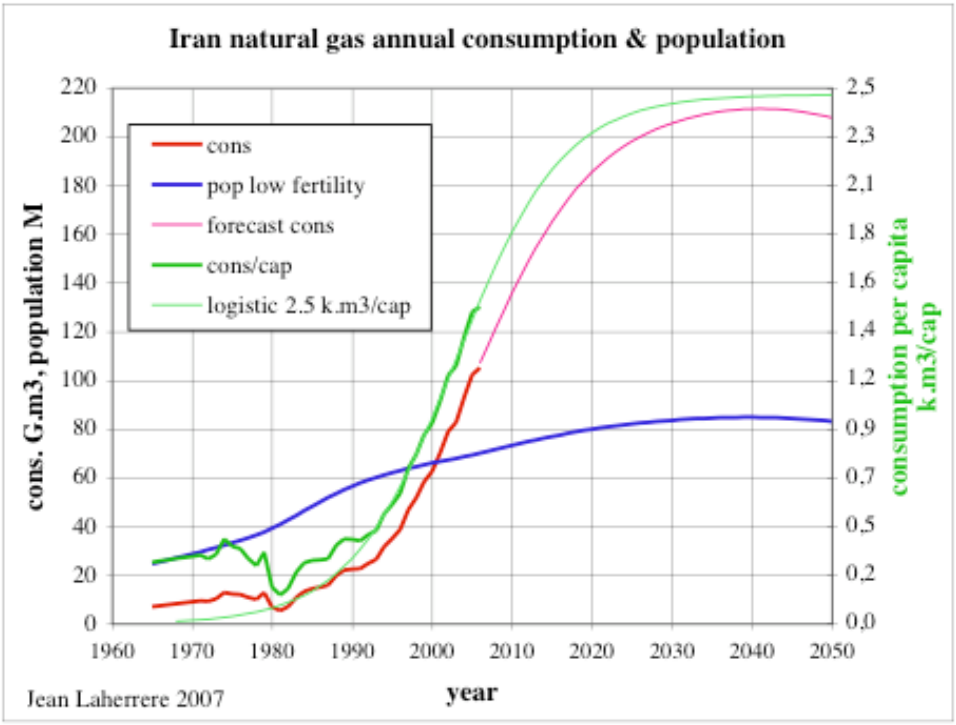
Population forecast depends mainly upon fertility rate which has decreased sharply, in line with the correlation between fertility and women education.
Figure 40*: Iran: fertility rate*



Iran population will peak about 2050.
Figure 41: *Iran: population*



Natural gas consumption per capita which is presently 1.5 k.m3 is foreseen to peak at 2.5 k.m3 in 2050, value which is low compared to Qatar where population is small in front of gas plants.
Figure 42*: Iran : gas consumption & population*



Forecasts comparison is as follows :

G.m3	gross-reinj	cons	pot export	prod AIE	export AIE
2003	101	83	18	78	-2
2010	156	130	26	109	5
2020	257	170	87	177	31
2030	330ou350	180	150ou170	240	57

IEA forecasts seem pessimistic in front of discovered reserves, is it political? Of course the export potential should be diminished by losses as flaring and other (0,9 G.m3 for Cedigaz en 2004 but 12 G.m3 pour EIA).

-North Africa & Middle East

Aggregation of the 5 countries Algeria, Egypt, Libya, Qatar and Iran gives the following :

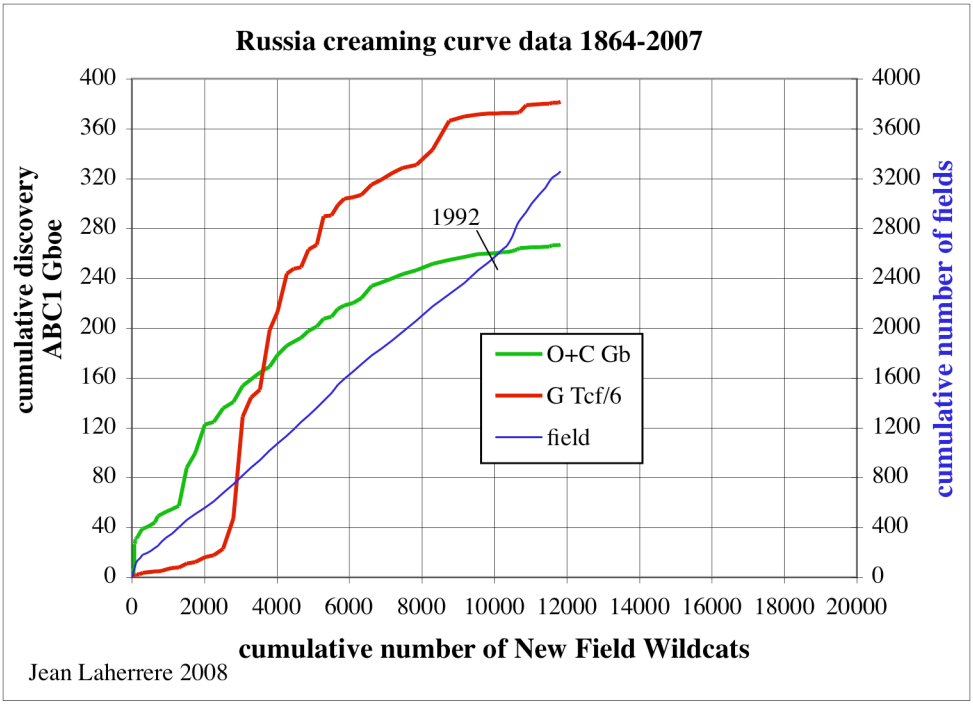
total 5	gross-reinj	alt	consum.	pot. export	alt	prod WEO	export WEO
2003	273	273	159	114	114	220	96
2010	459	424	225	234	199	355	208
2020	703	576	285	419	295	563	397
2030	778	664	312	**469**	**355**	739	**518**

Exportation potential should be reduced by losses in the future. IEA exportation forecasts from North Africa and ME could be obtained in the high alternate for 2010 & 2020, but they are unrealistic for 2030. Could other alternative sources compensate ?

-Russia

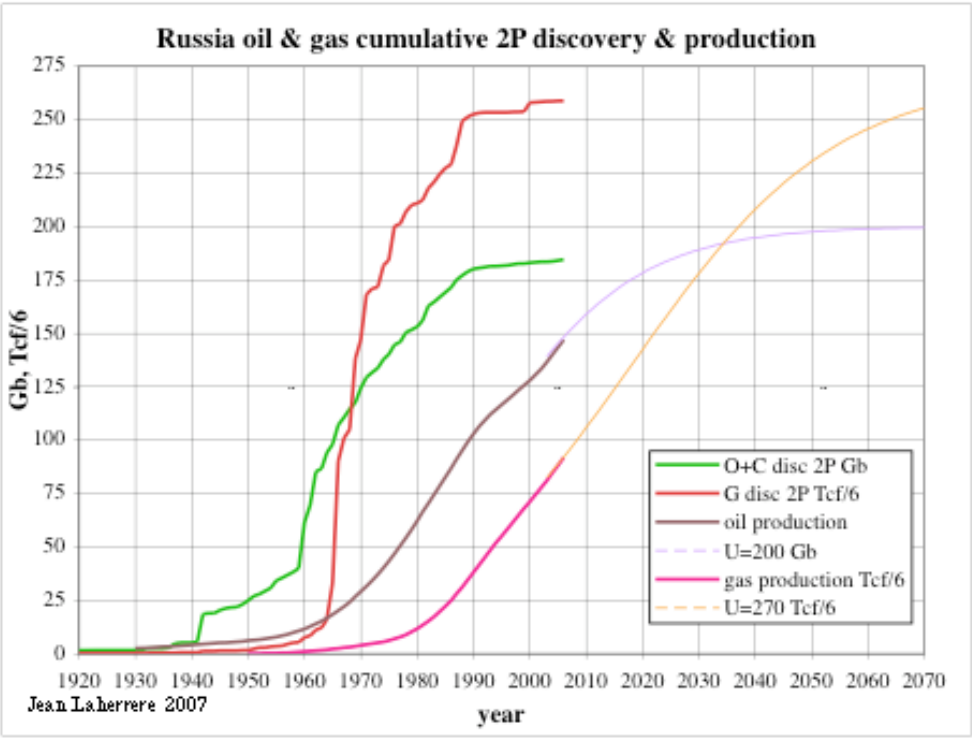
Russian classification (Khalimov 1979) is based on the maximum theoretical recovery getting in fact 3P= proven+probable +possible and was qualified by the same Khalimov as grossly exaggerated (1993). Reserves should be reduced by about 30% looking at the decline of mature fields as Urengoy.

Figure 43: *Russia: oil & gas creaming curve from values of Russian classification ABC1*



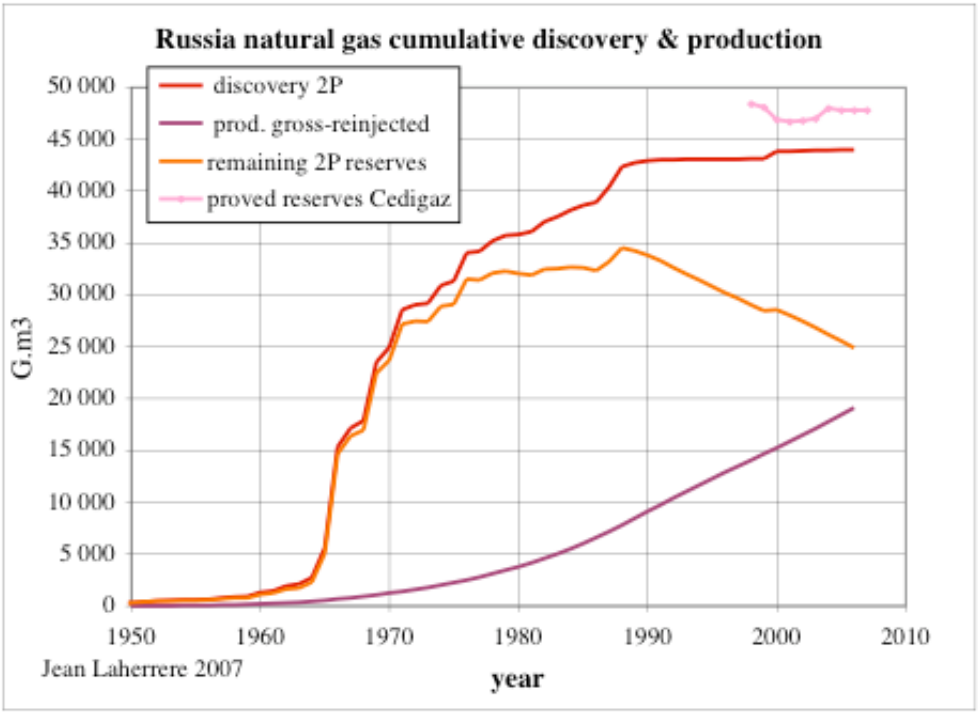
same versus time

Figure 44: *Russia: oil & gas cumulative discovery*



Russian ultimate is estimated at 200 Gb for oil and 270 Gboe = 1600 Tcf= 45 T.m3 for gas.

Figure 45: *Russia: natural gas cumulative 2P discovery, production, remaining reserves from political & technical sources*

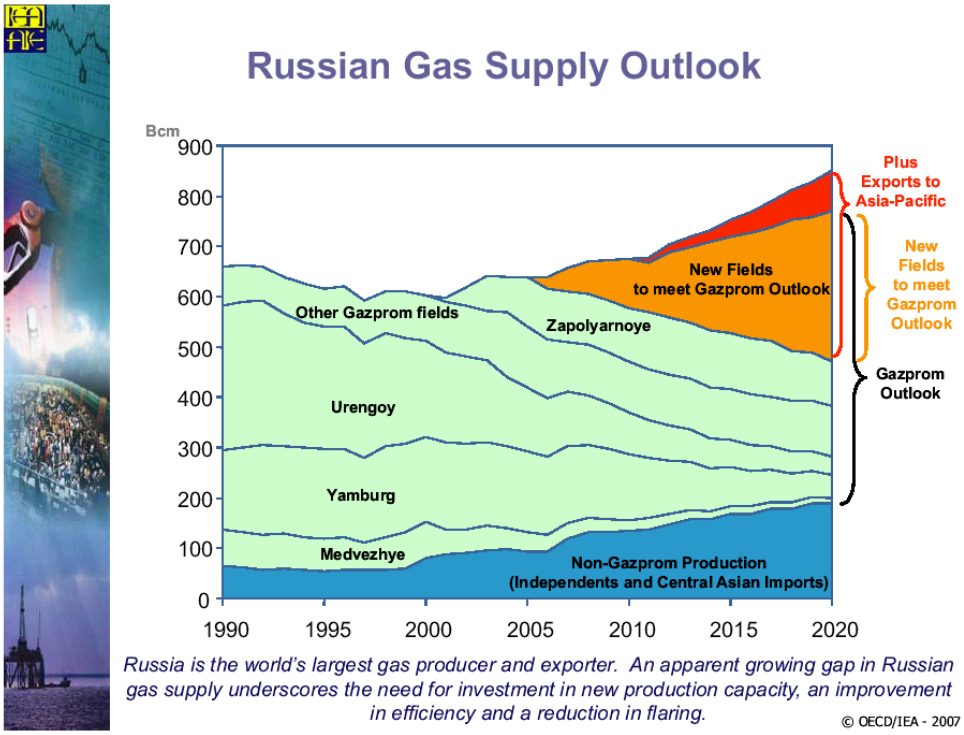


2P remaining reserves are much lower than the so-called proved estimates.
Annual discovery displays two cycles as the annual production, the second cycle in production seems to come from the breakdown of FSU but the second cycle in discovery is due simply to reduction of exploration in the 1980s as shown in the creaming curve (figure 43). It is a strange coincidence !
Figure 46: *Russia: natural gas annual discovery, production ultimate 45 T.m3 (no other constraints), consumption, exportation &losses*

IEA states no flaring for Russia when Cedigaz reports 6,8 G.m3 and satellite 50 G.m3 ! no comment !
Natural gas consumption is foreseen to decline with population when IEA forecasts an increase. Wasting natural gas was huge in Russia because there was no meter in Moscow when heating is included in the rent. Natural gas price has to be increased and consumption to be charged to the

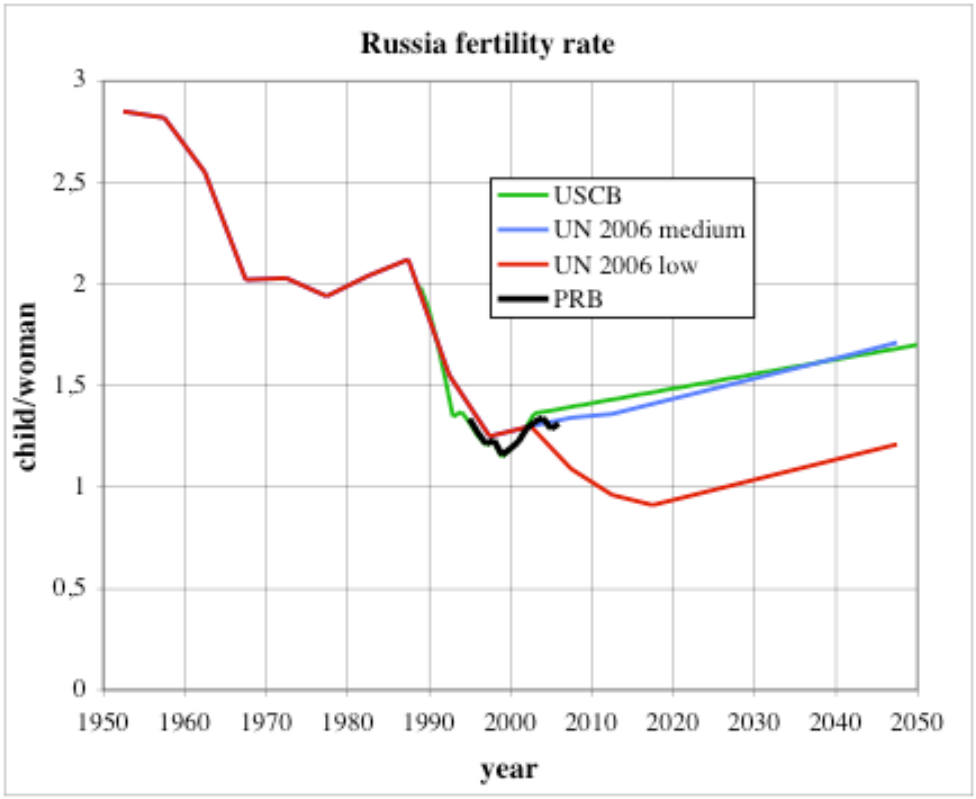
user to motive him. IEA forecasts an important decline in Gazprom gasfields but developing new gasfields to satisfy the demand. Gazprom policy is criticized by Vladimir Milov who doubts about the possibility of Gazprom to finance development of difficult gasfields as those in Yamal peninsula (Bovanenko found in 1971with 150 Tcf is larger than Shtokman found in 1988 with 129 Tcf). Western money is asked to develop Shtokman, but not for Bovanenko!

Figure 47*: Russia: natural gas production forecast by IEA 1990-2020*



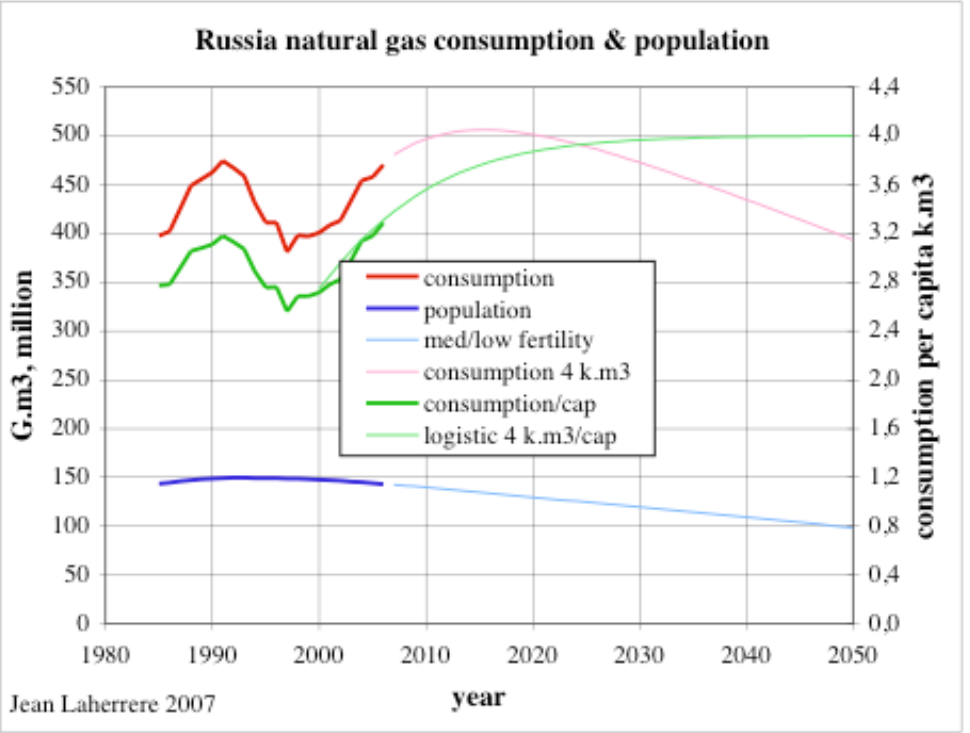
How to extrapolate the Russian gas consumption when in the past natural gas was considered as free and endless as water ?

Figure 48*: Russia: fertility rate*

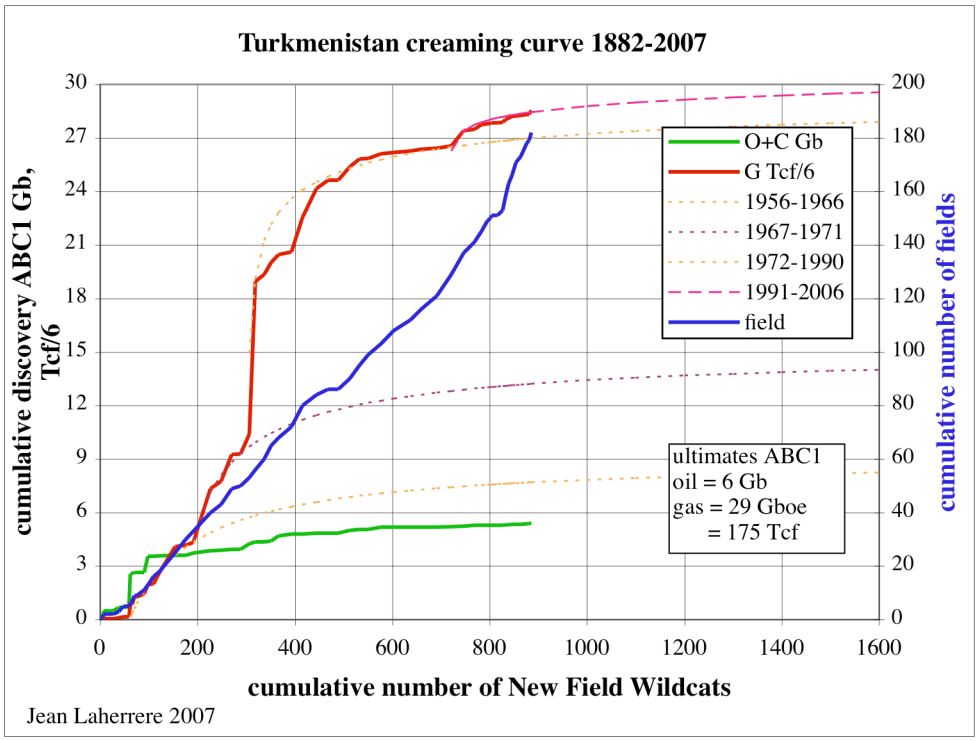


Russia population will decrease by 50 millions in 60 years!
Figure 49: *Russia: population*

Figure 50: *Russia: natural gas consumption & population*

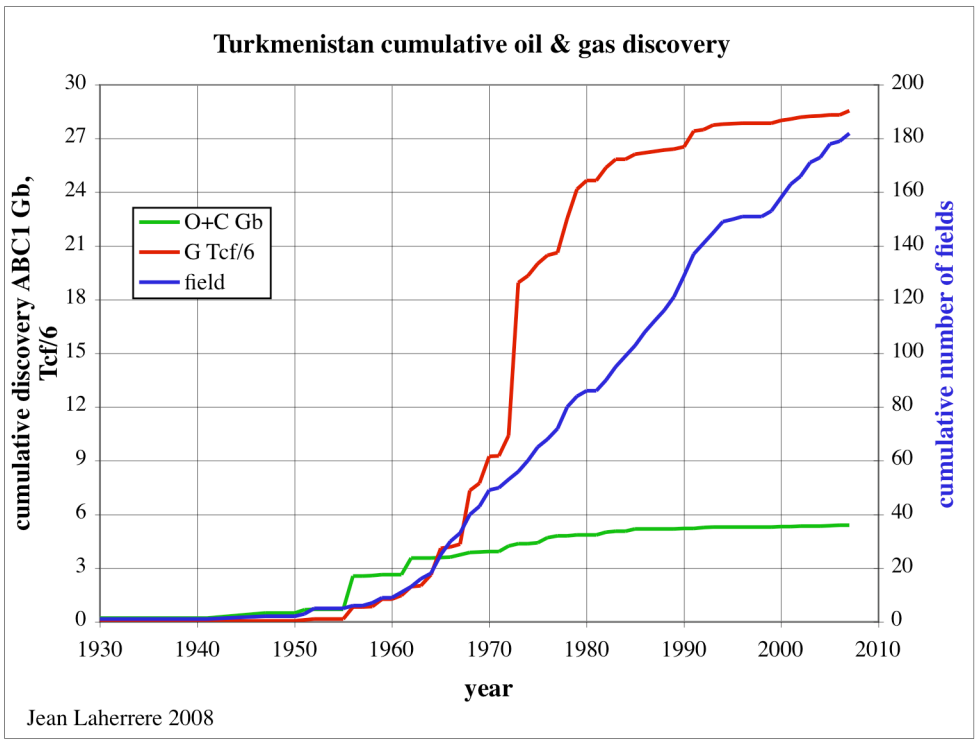


-Turkmenistan
A large part of natural gas exportation to Europe comes from Turkmenistan where Gazprom buys it cheap because controlling the gaspipes and sells it expensive to Europe.
It is important to include Turkmenistan in Russia exportation potential study
Figure 51: *Turkmenistan: creaming curve 1882-2007*



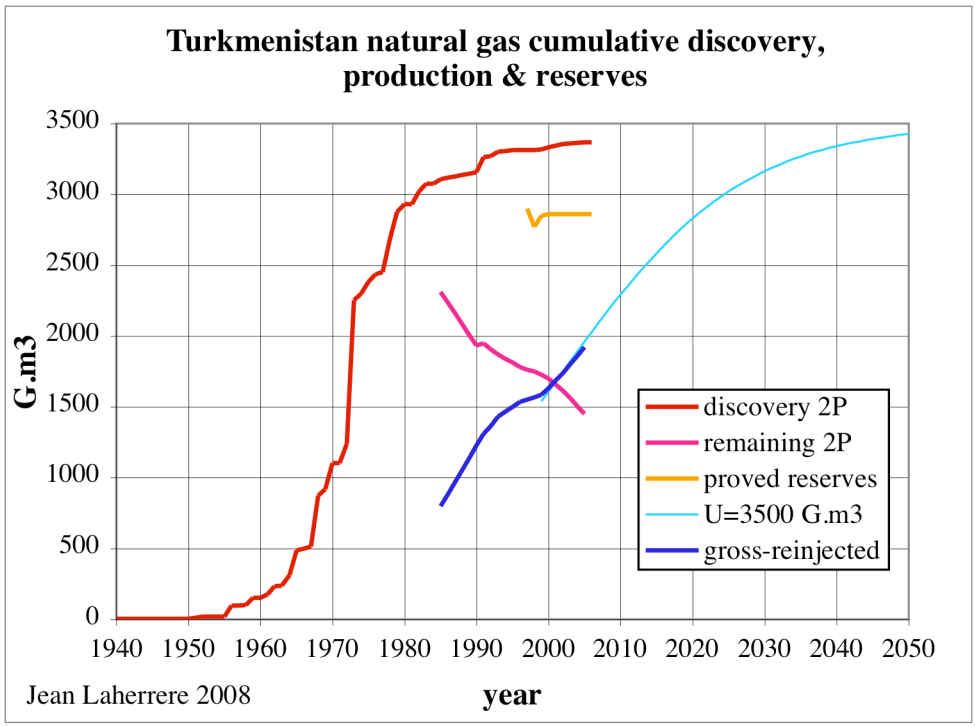
Natural gas discovery has three cycles, but the last one is small and a new one should be small too. Turkmenistan reserves are ABC1 and should be reduced by 30% to obtain 2P.

Figure 52: *Turkmenistan: cumulative oil & gas discovery*



Remaining 2P natural gas are in decline and much lower than the reported so called proved reserves. The ultimate is estimated at 3500 G.m3.

Figure 53: *Turkmenistan: cumulative gas discovery, production and reserves*



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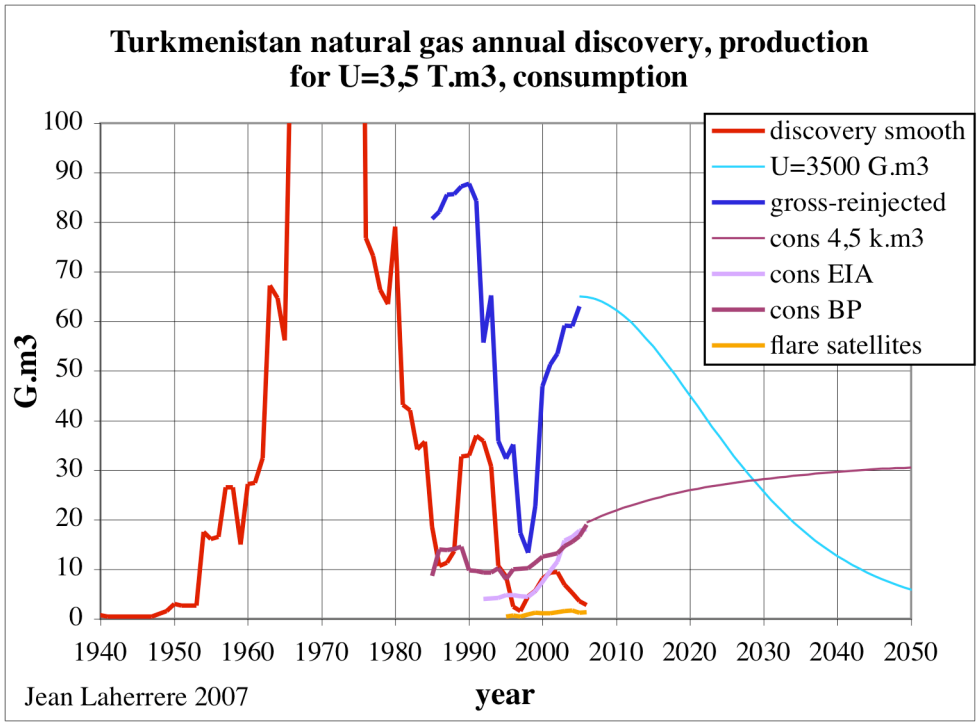
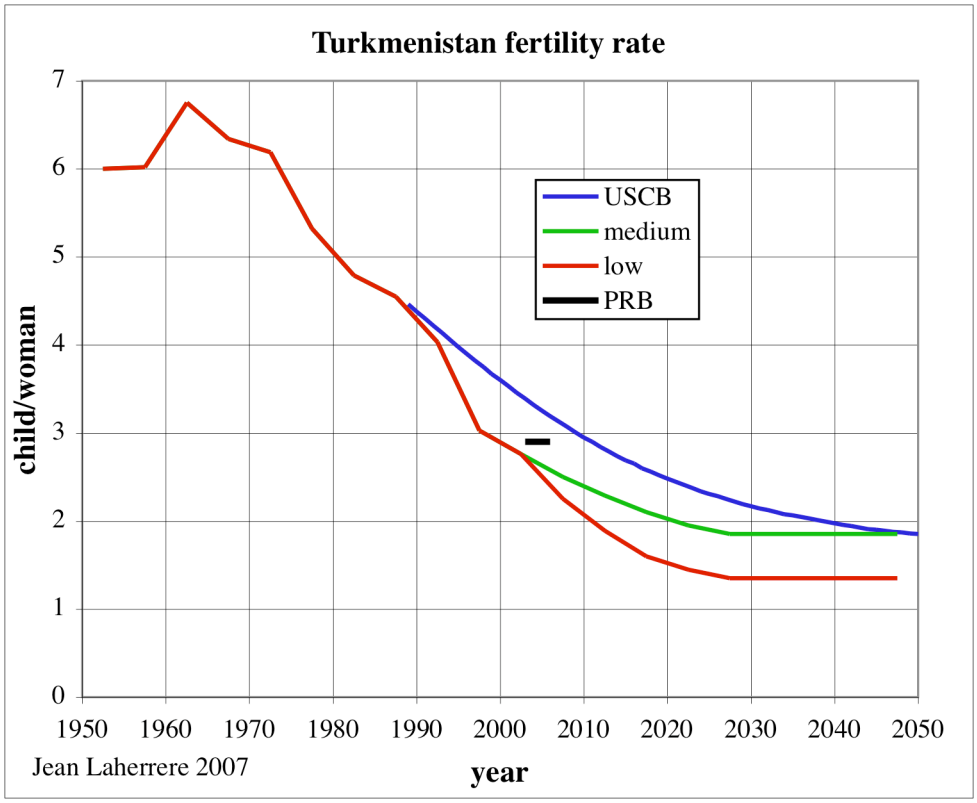
Natural gas production should be close to peak assuming a 3500 G.m3 ultimate. Consumption should reach production around 2025.

Figure 54: *Turkmenistan: annual gas discovery, production and consumption*



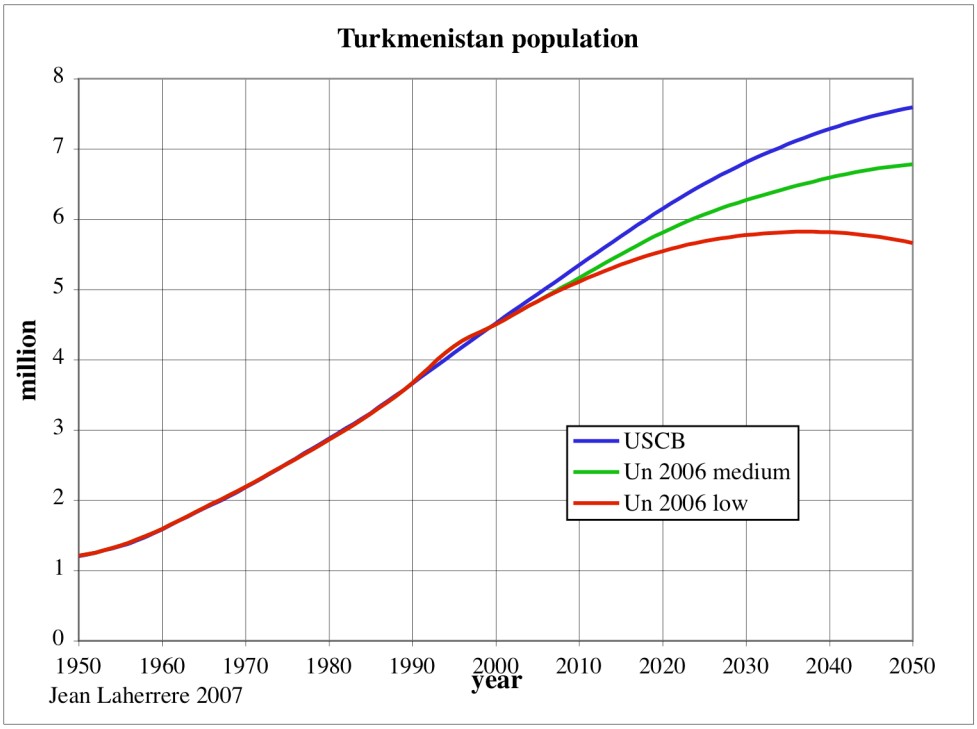
Turkmenistan fertility rate is badly reported (discrepancy between USCB, UN & PRB), but in decline

Figure 55: *Turkmenistan: fertility rate*



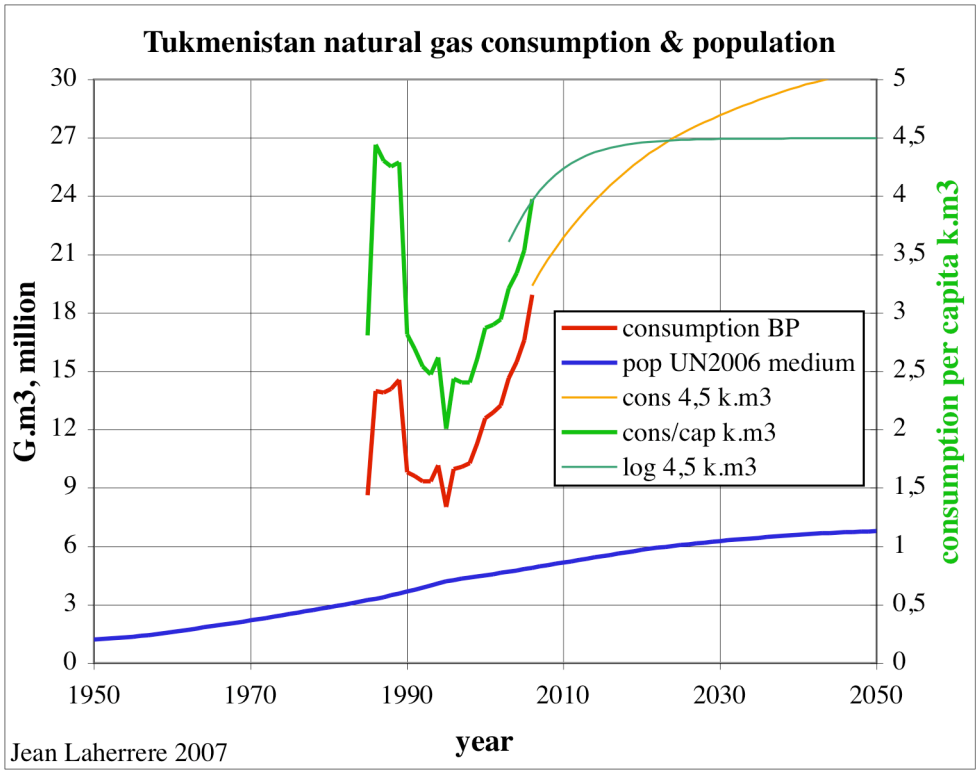
However Turkmenistan population will peak only around 2040-2050, compared to Russia peak in 1992.

Figure 56: *Turkmenistan: population*



Natural gas consumption per capita was over 4 k.m3 in 1988, down to 2 in 1994 and back to 4 in 2005. We forecast an asymptote at 4.5 k.m3.

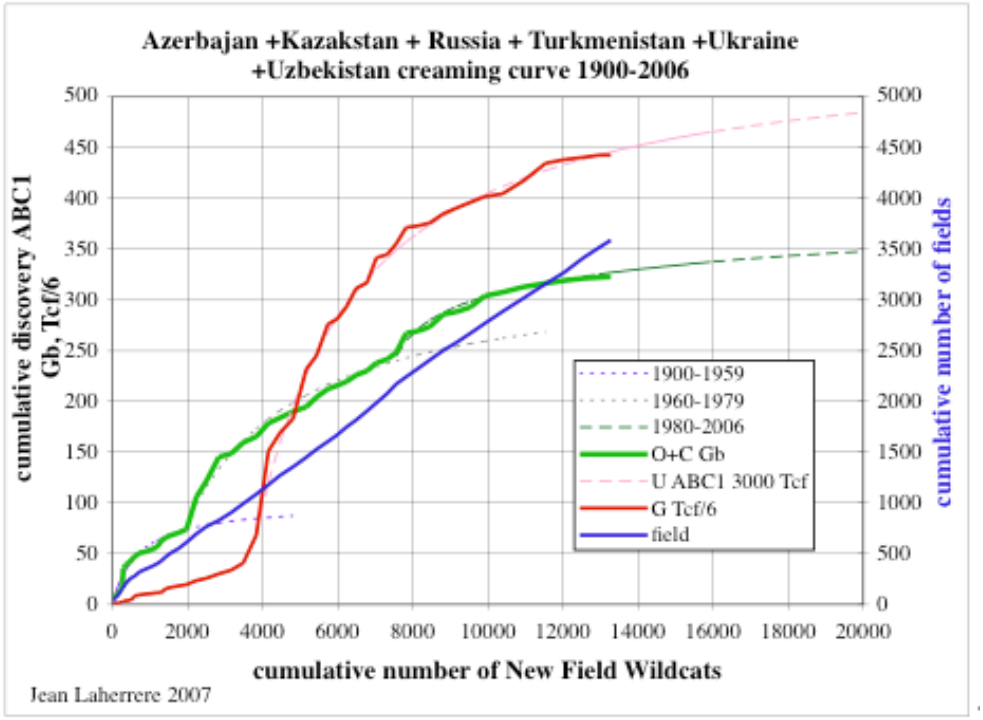
Figure 57: *Turkmenistan: natural gas consumption and population*



-FSU

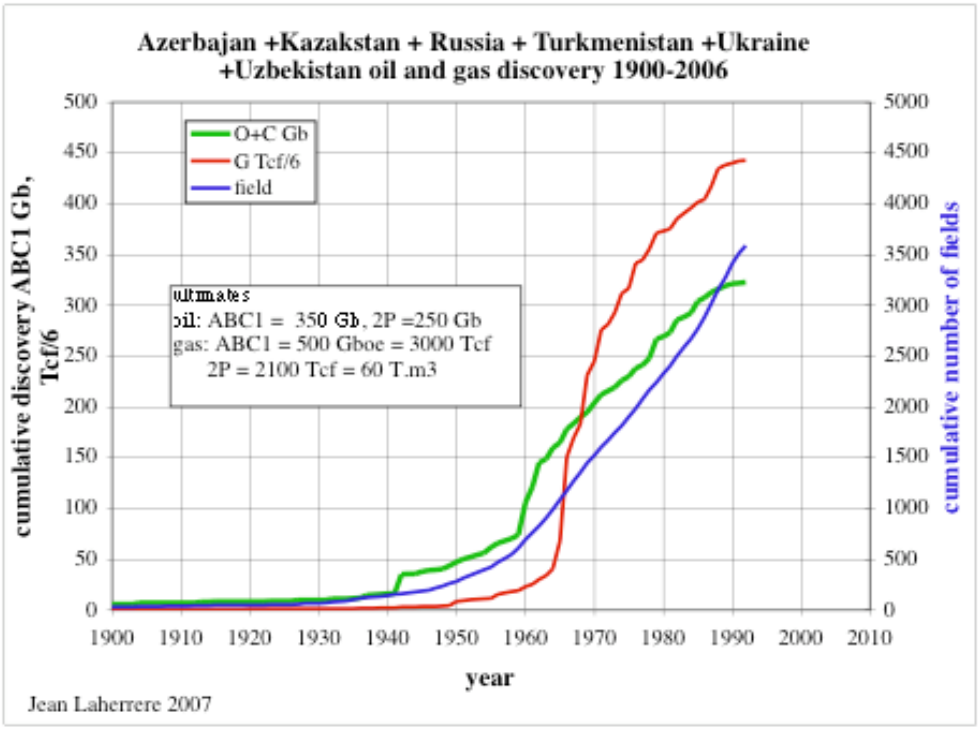
It is difficult to get past production data in the FSU countries, so we go back to the FSU aggregation of main producers as Azerbaijan, Kazakhstan, Russia, Turkmenistan, Ukraine & Uzbekistan, which in fact are still controlled for gas exportation by Gazprom and its gaspipes.

Figure 58: *FSU: oil & gas creaming curve from ABC1 estimates*



same data versus time

Figure 59: *FSU: oil & gas cumulative discovery ABC1*



ABC1 estimates are reduced by 30% to obtain 2P values. The oil ultimate then is reduced from 350 Gb to 250 Gb. The natural gas ultimate is reduced from 500 Gboe = 3000 Tcf to 2100 Tcf or 60 T.m3.

The natural gas discovery is compared to production forecast for an ultimate of 60 T.m3
Figure 60: *FSU: natural gas cumulative 2P discovery & production for ultimate = 60 T.m3*

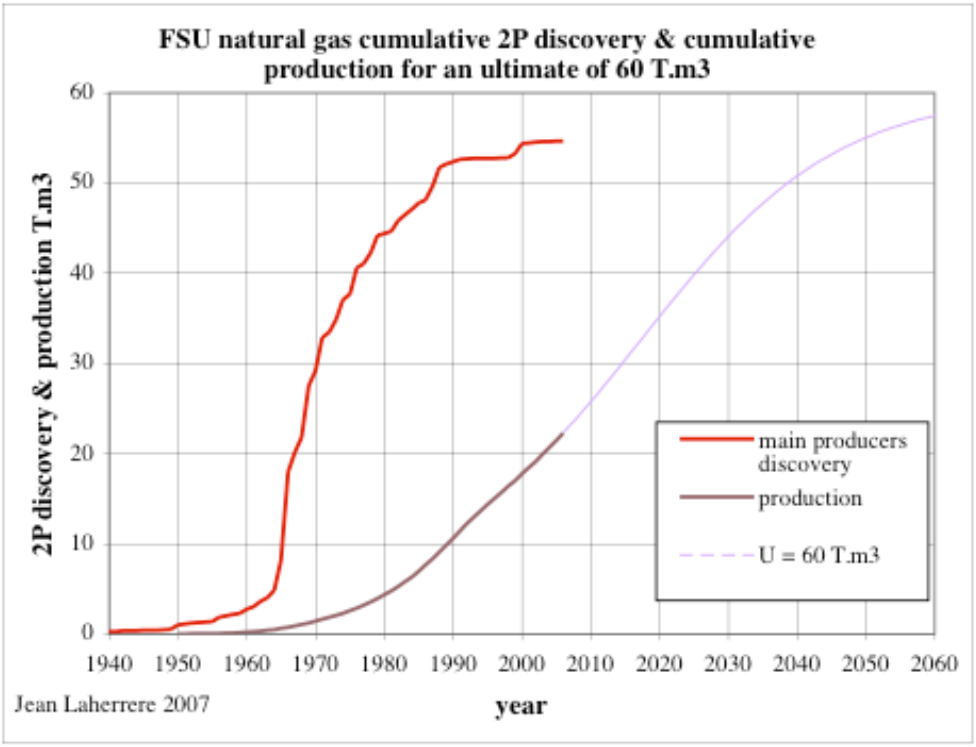
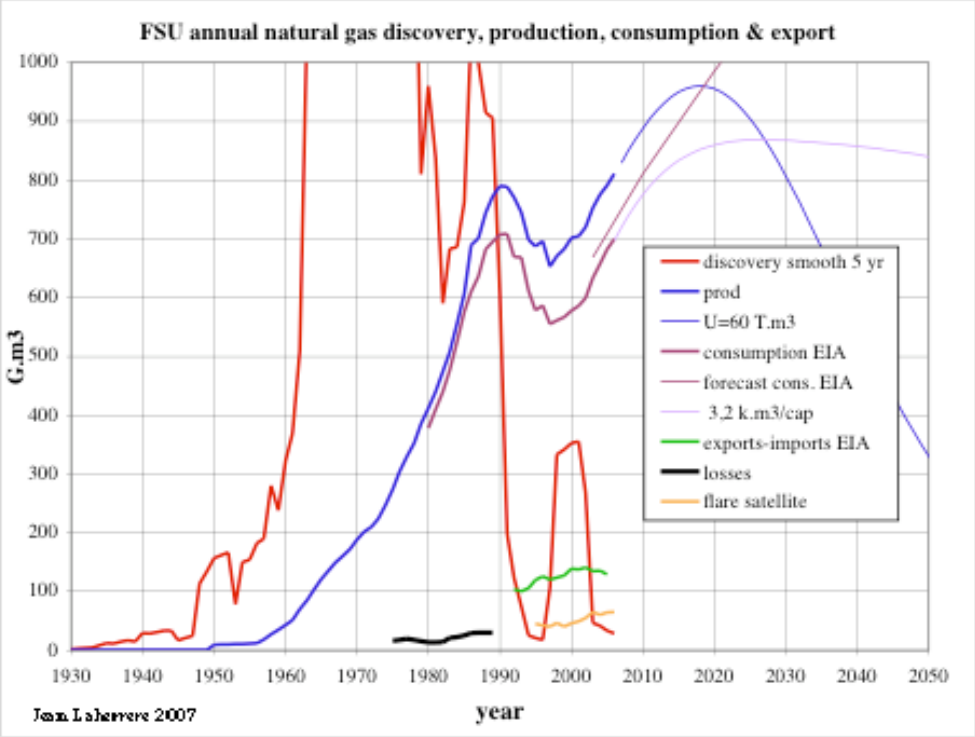
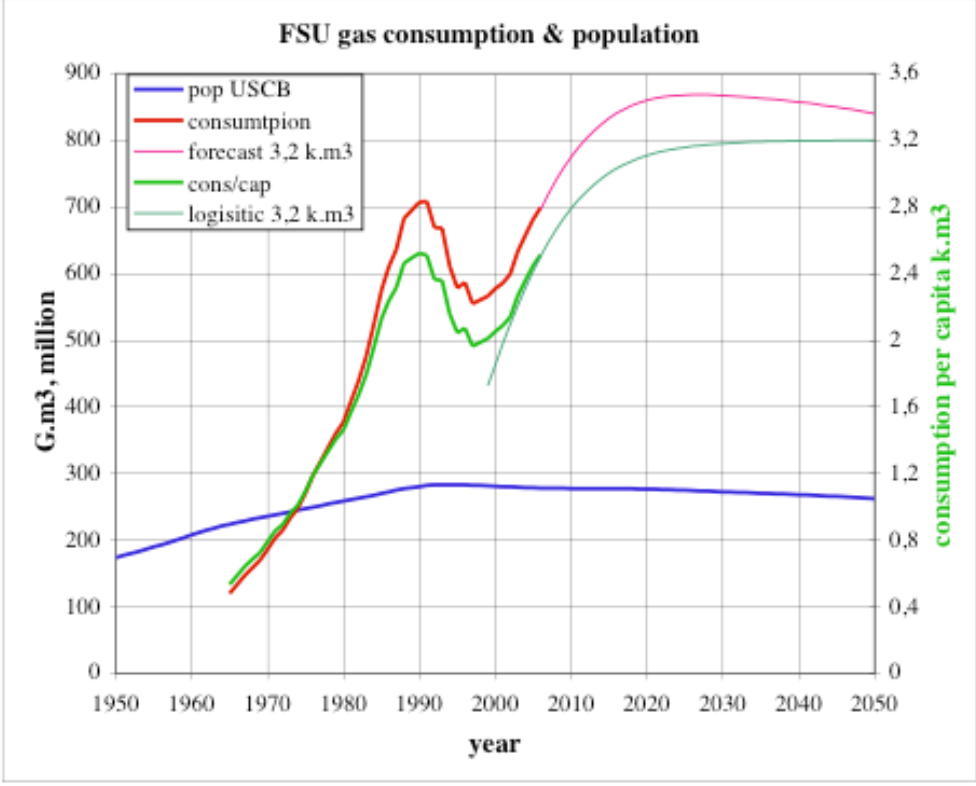


Figure 61*: FSU: natural gas annual discovery, production for ultimate 60 T.m3 (no other constraints), exportation & losses*

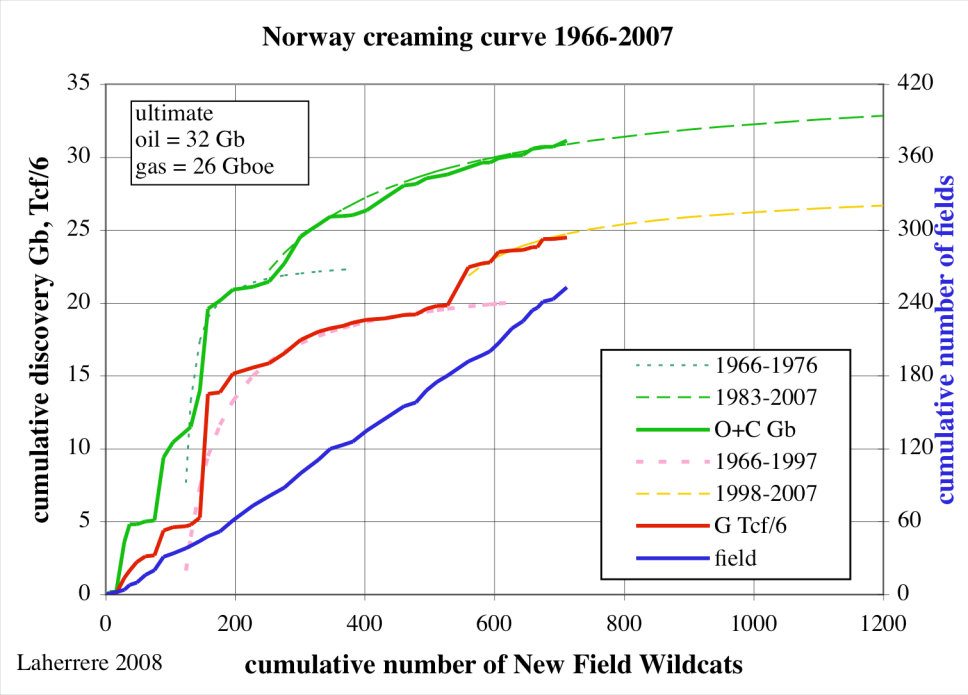


USDOE/EIA consumption forecast diverges from forecast based on population and reasonable consumption per capita. With an 60 T.m3 ultimate, FSU could not export beyond 2020 if IEA consumption is right and beyond 2025 if capita consumption does not increase over 3,2 k.m3 (which has to be reduced after 2025). Consumption forecast does not take into account the necessary decrease depending upon investments, human behaviour and political decisions.
Figure 62: *FSU: natural gas consumption & population*

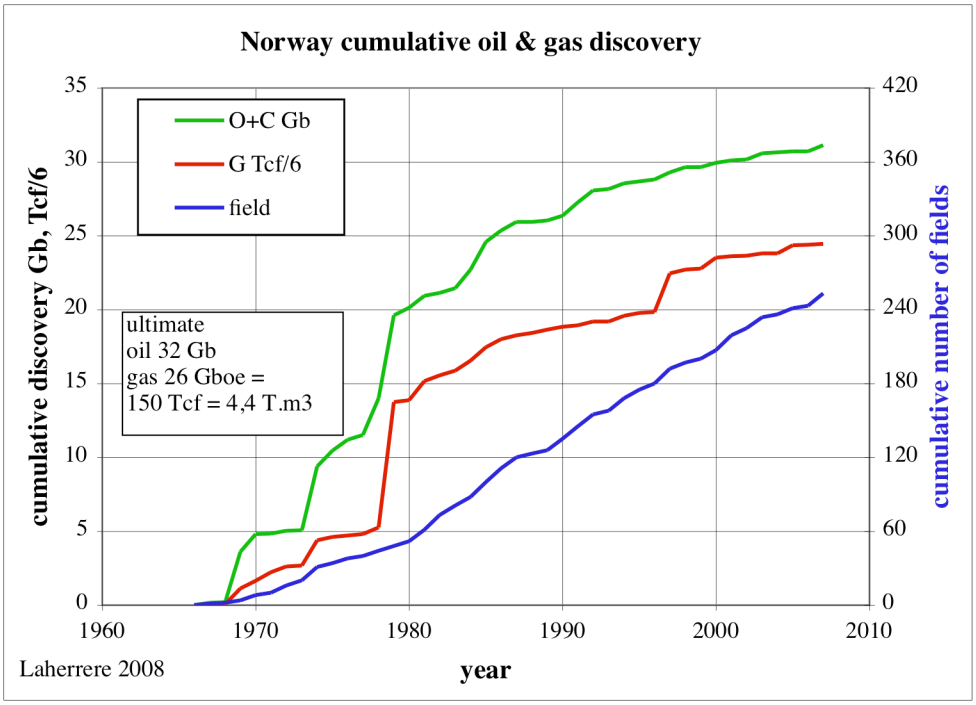


-Norway

Norway which onshore is only basement, has some sedimentary basins offshore, of which the North Sea part beyond the deepest trough is due to the non geological equidistance rule. Exploration seems mature with only 2 or 3 cycles, leaving little room for an important new cycle.
Figure 63: *Norway: oil & gas creaming curve 1966-2007*



Ultimate is 32 Gb for oil and 150 Tcf (4.4 T.m3) for gas (NPD estimate = 4 T.m3 discovered +2 T.m3 yet to find)
Figure 64: *Norway: oil & gas cumulative discoveries*



Natural gas cumulative discovery is compared to production with an ultimate of 4400 G.m3
Figure 65*: Norway: natural gas cumulative discovery, production & remaining reserves*

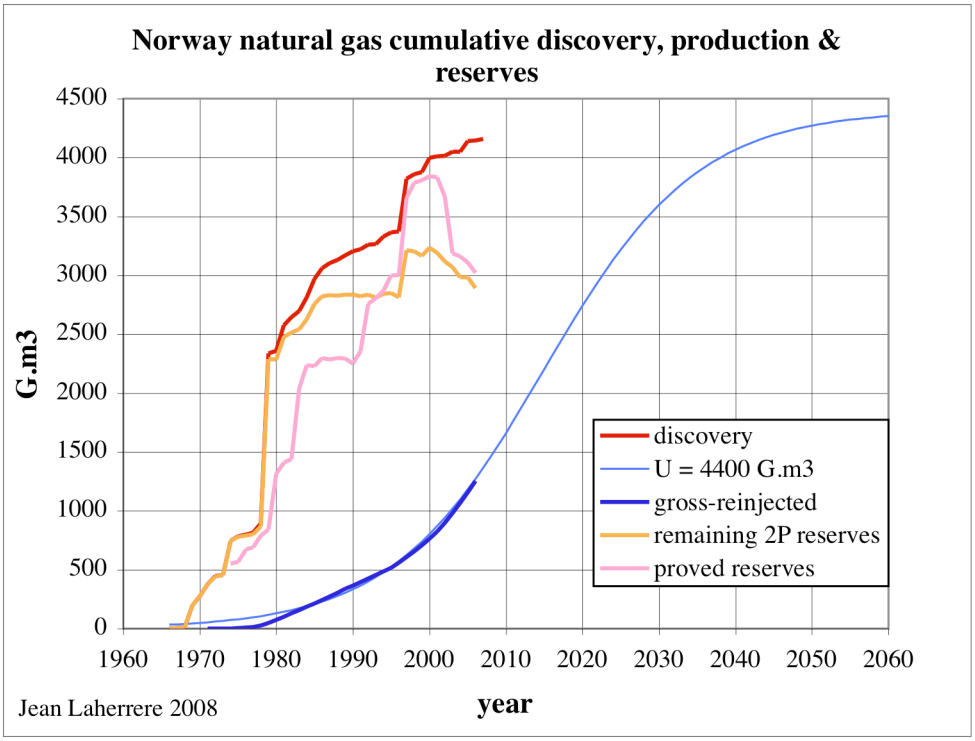
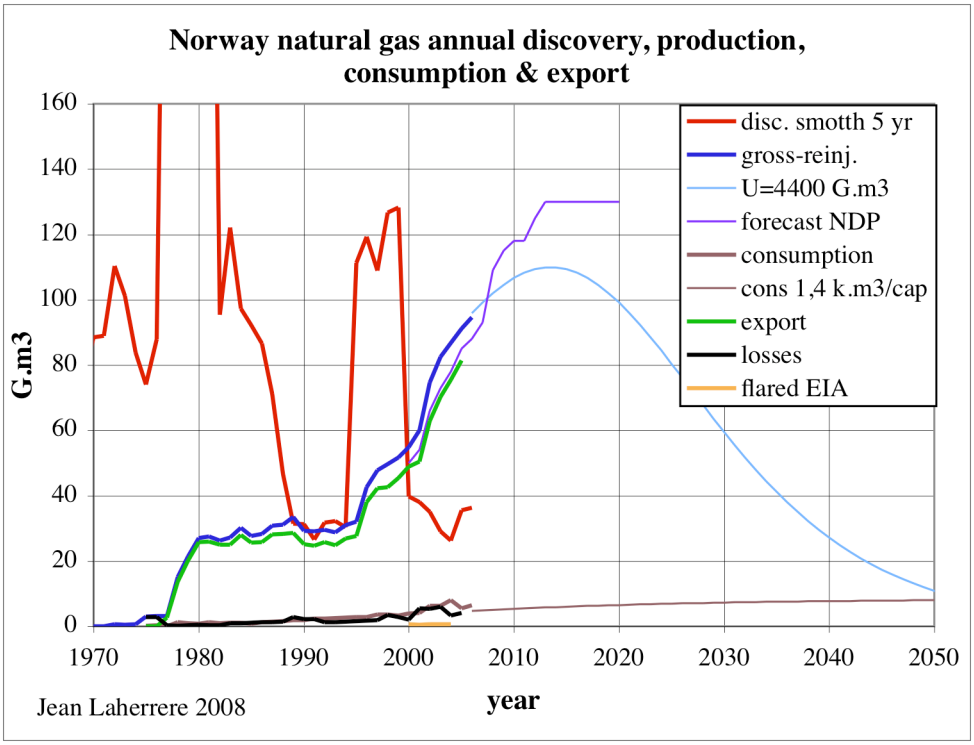


Figure 66: *Norway: natural gas annual discovery, production for ultimate 4.4 T.m3 (no other constraints), consumption & export*



Norway fertility rate is below replacement value and population should decline
Figure 67: *Norway: fertility rate*

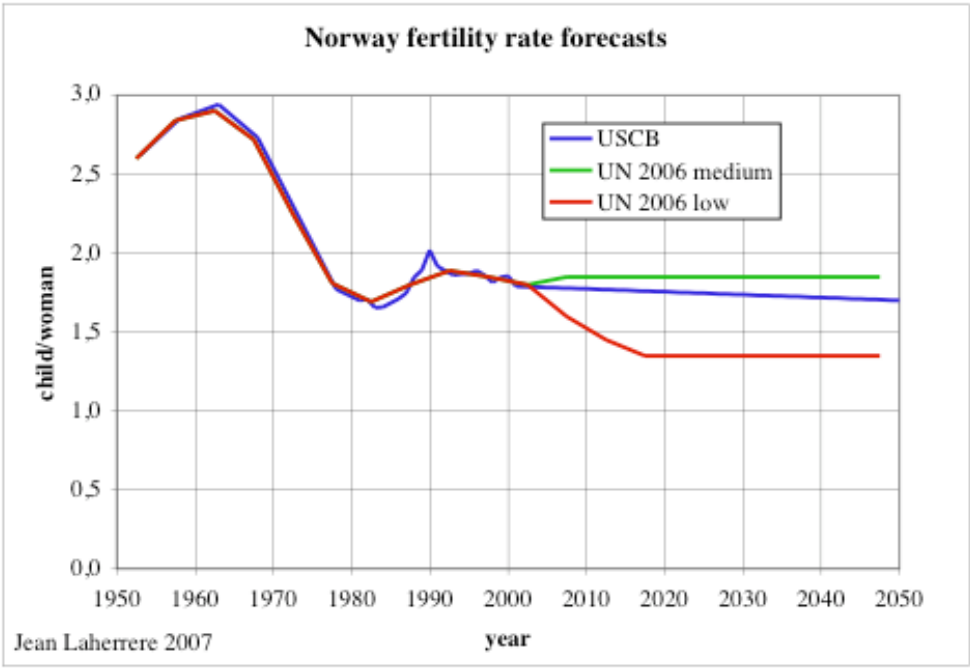
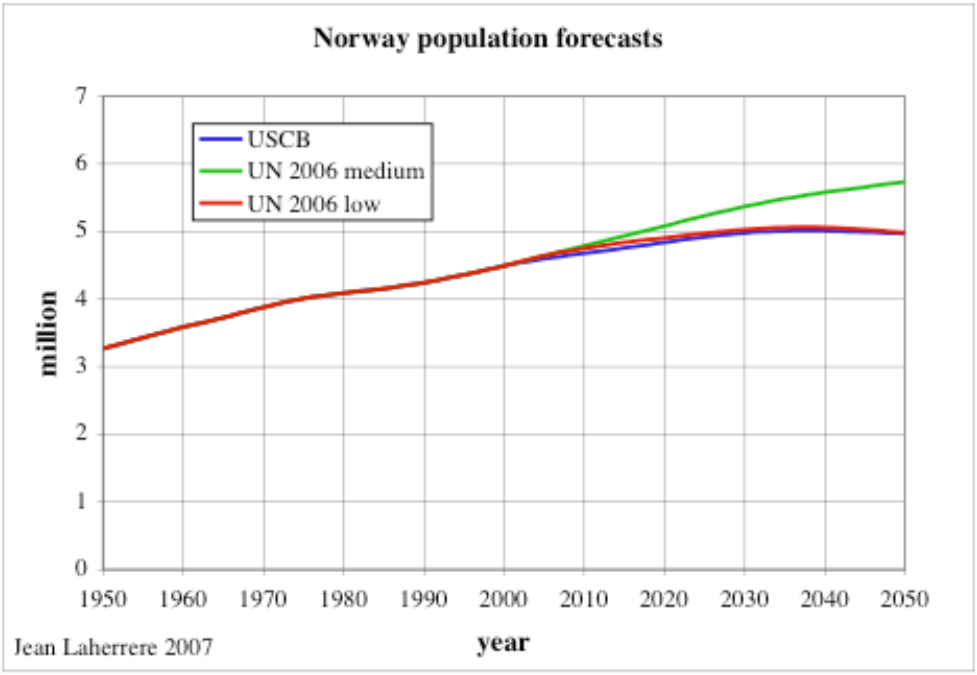
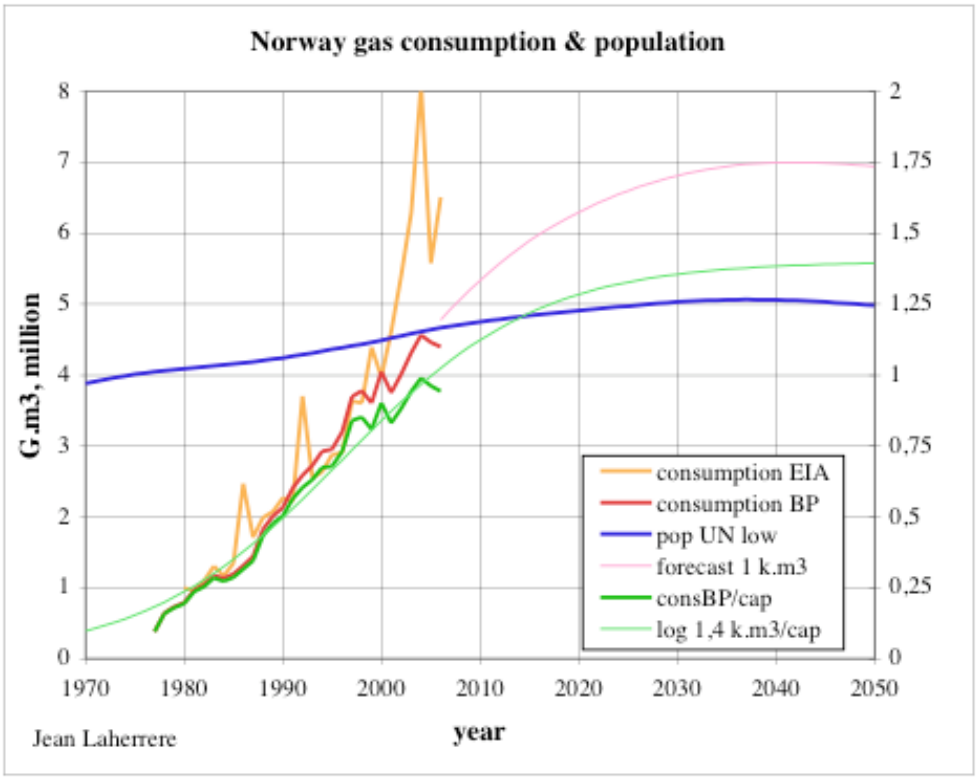


Figure 68*: Norway: population*



Natural gas consumption per capita has increased from 1980 to 2006 from 0.25 to 1 k.m3, and is assumed to trend towards 1.4 k.m3

Figure 69: *Norway: gas consumption & population*



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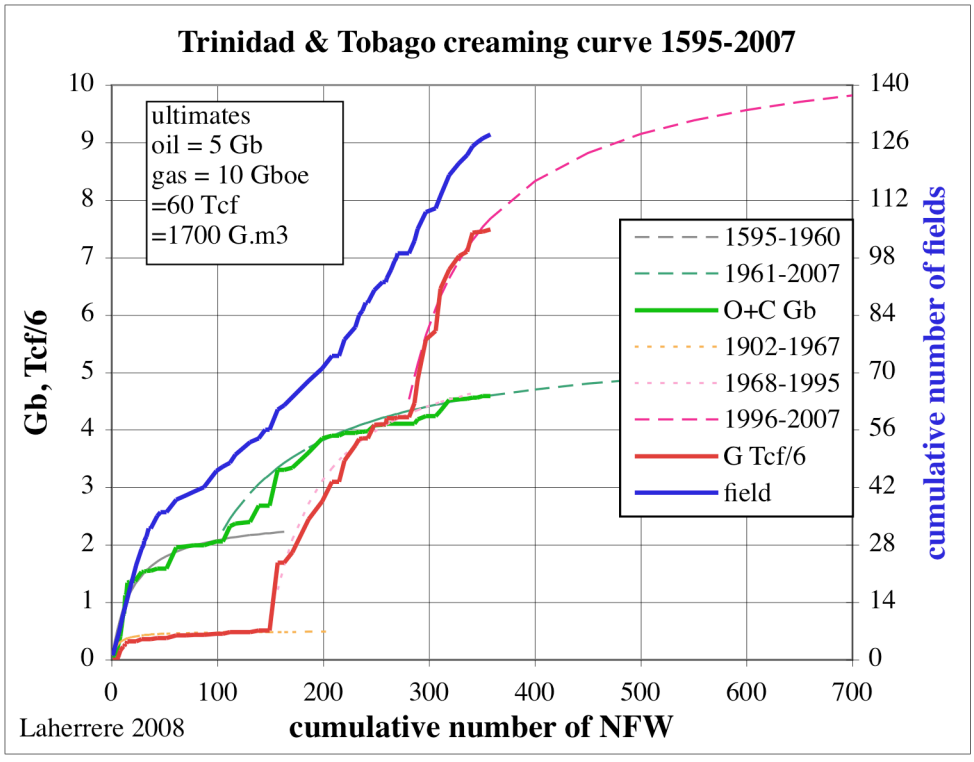
Natural gas consumption values vary from sources u in 2004 : 0,2 G.m3 (Eurostat domestic use), 4,6 G.m3 (BP), 8,7 G.m3 (EIA) and European Union of the natural gas industry reports an insignificant (inland) consumption. It appears strange for a country where all oil & gas statistics are public (only country with UK). Of course, terms are never defined !

-Trinidad et Tobago

Creaming curve shows potential for more discovery in particular for natural gas. Ultimate is 5 Gb for oil and 60 Tcf (1700 G.m3) for gas.

Figure 70: *Trinidad: oil & gas creaming curve 1595-2007*



same data versus time
Figure 71: *Trinidad: oil & gas cumulative discovery*

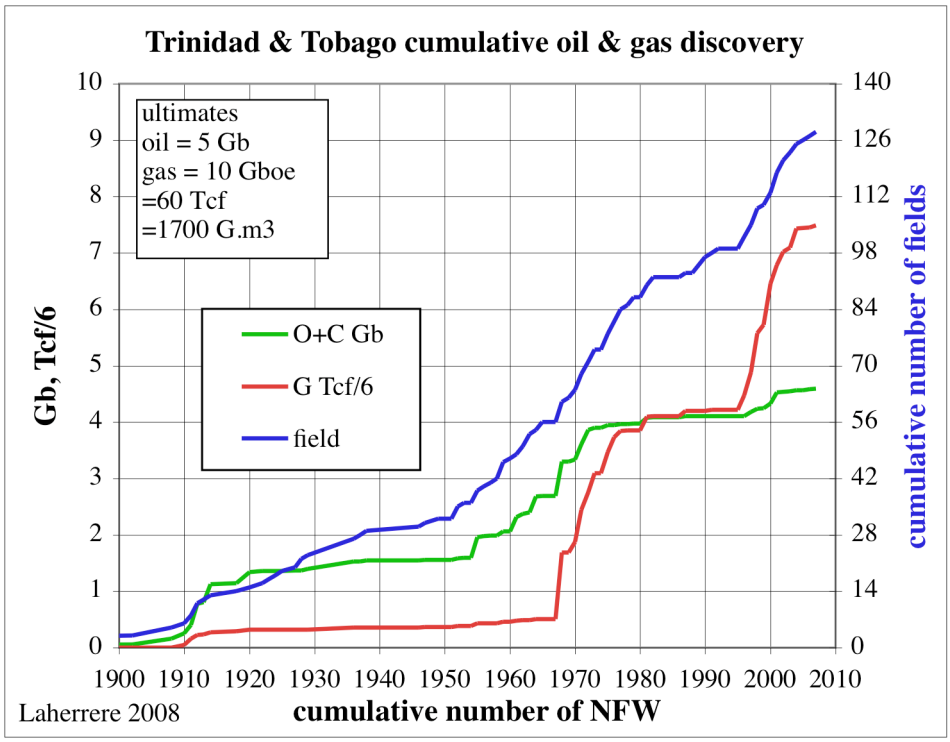
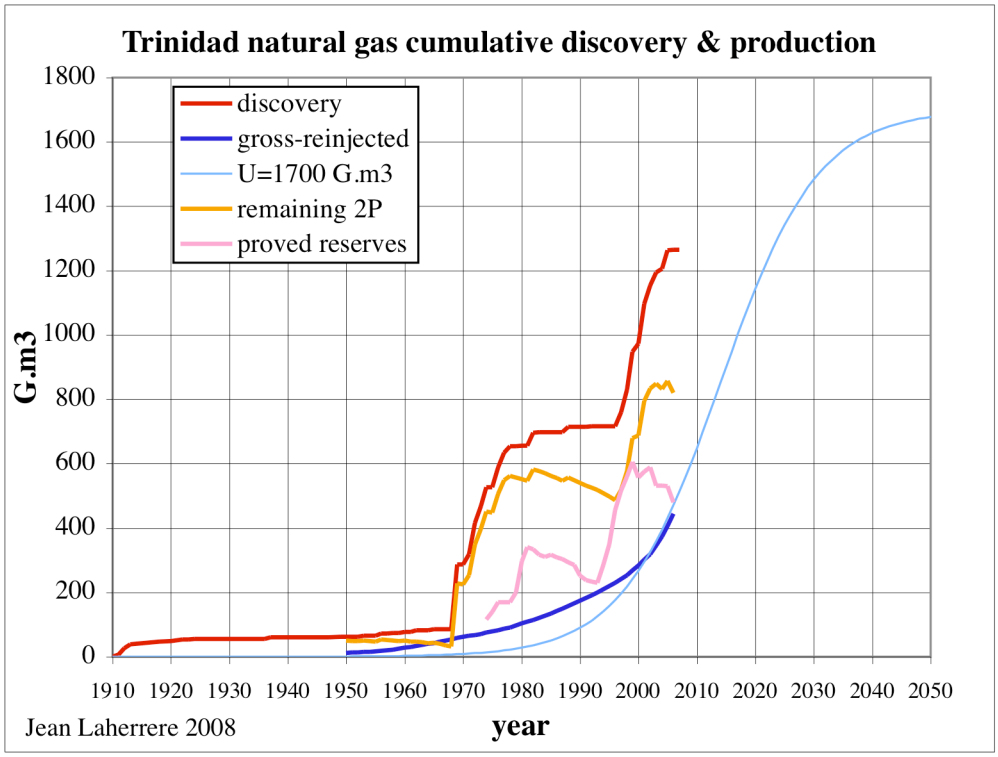
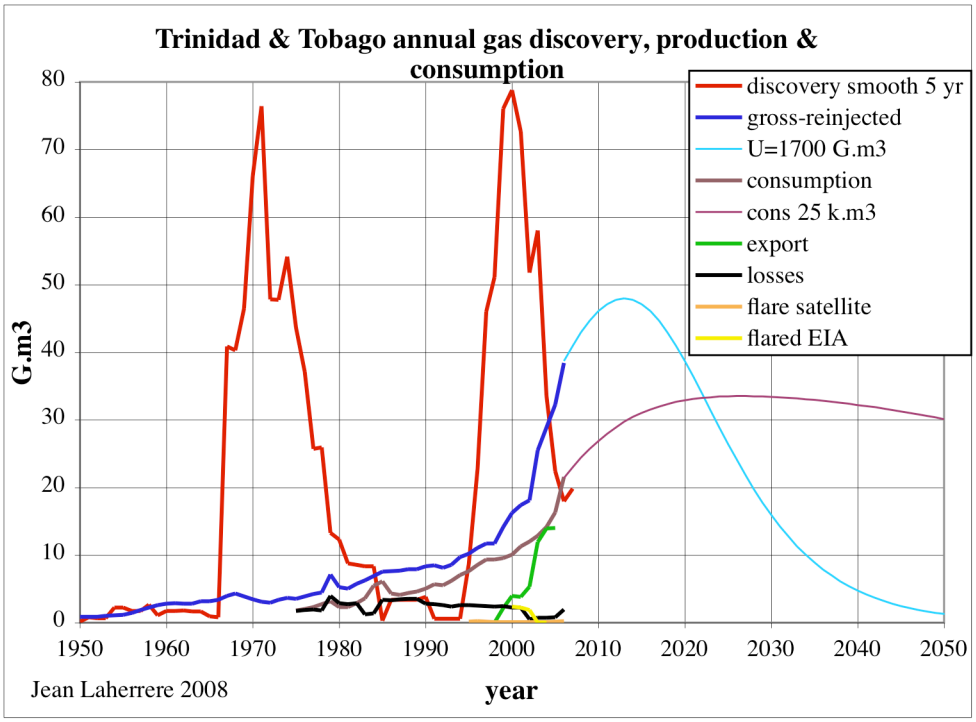


Figure 72: *Trinidad: natural gas cumulative discovery, production & remaining reserves*

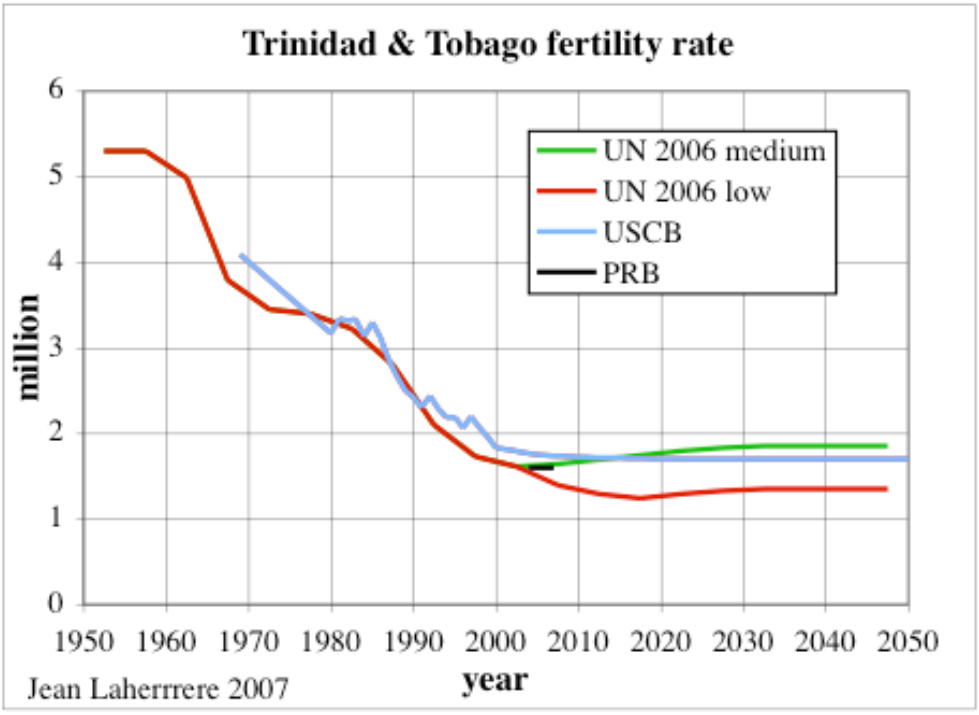


Annual gas discovery displays two cycles of same peak (1970 and 2000), but production will display one peak around 2015 unless liquefaction plants had a longer and lower plateau.
Gas consumption per capita is high (15 k.m3 but less than Qatar at 23) and T&T consumption will reach production around 2020, which is close for high investments plants !

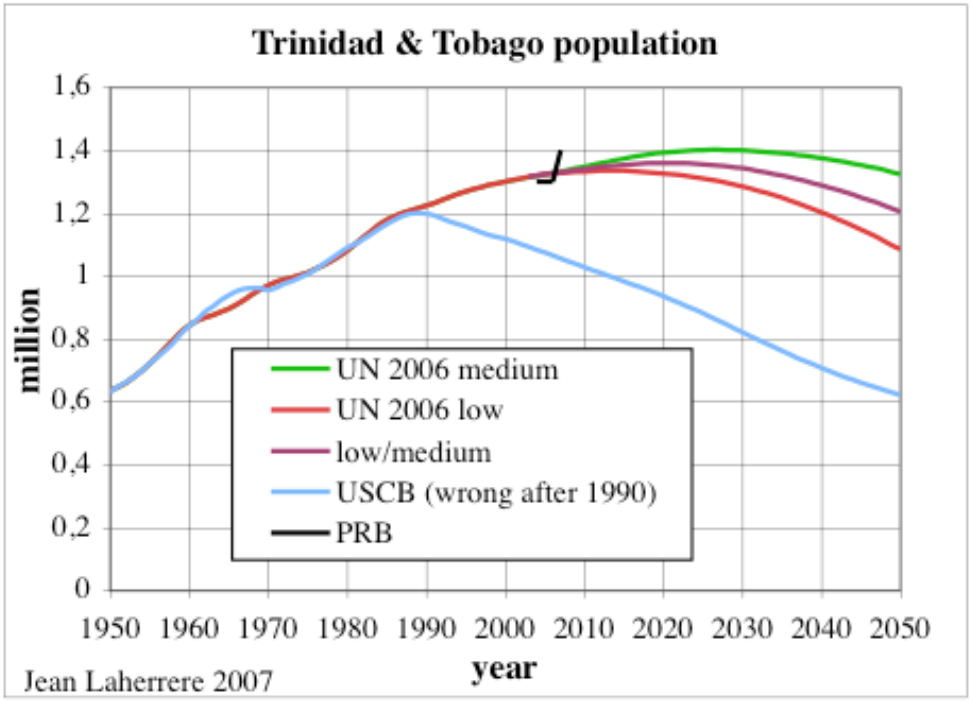
Figure 73: *Trinidad : natural gas annual discovery, production for ultimate 1.7 T.m3 (no other constraints) & consumption*



T&T fertility rate is below replacement.
Figure 74: *Trinidad : fertility rate*



T&T population will peak around 2025
Figure 75: *Trinidad : population*



Natural gas consumption per capita has largely increase with gas plants and will peak around 25 k.m3.

Figure 76: *Trinidad : gas consumption & population*