

**Evolution of world NGL production forecasts****Table of content**

	Page
Introduction	2
IEA	11
EIA	12
ExxonMobil	12
OPEC	13
ENI	15
Equinor	15
Shell	16
JL	16
Synthesis of world NGL production forecasts	19
Largest NGL producers	20
Forecast by country	21
US	21
Saudi Arabia	22
Iran	23
Qatar	24
Russia	25
Canada	26
UAE	27
Algeria	28
Mexico	29
Kazakhstan	30
Australia	31
Argentina	32
Brazil	33
UK	34
Egypt	35
Nigeria	36
Norway	37
Kuwait	39
Indonesia	40
Libya	41
Venezuela	42
India	43
Thailand	44
Malaysia	45
Oman	46
Azerbaijan	47
Iraq	48
Bolivia	49
Turkmenistan	50
Peru	51
Equatorial Guinea	52
Angola	53

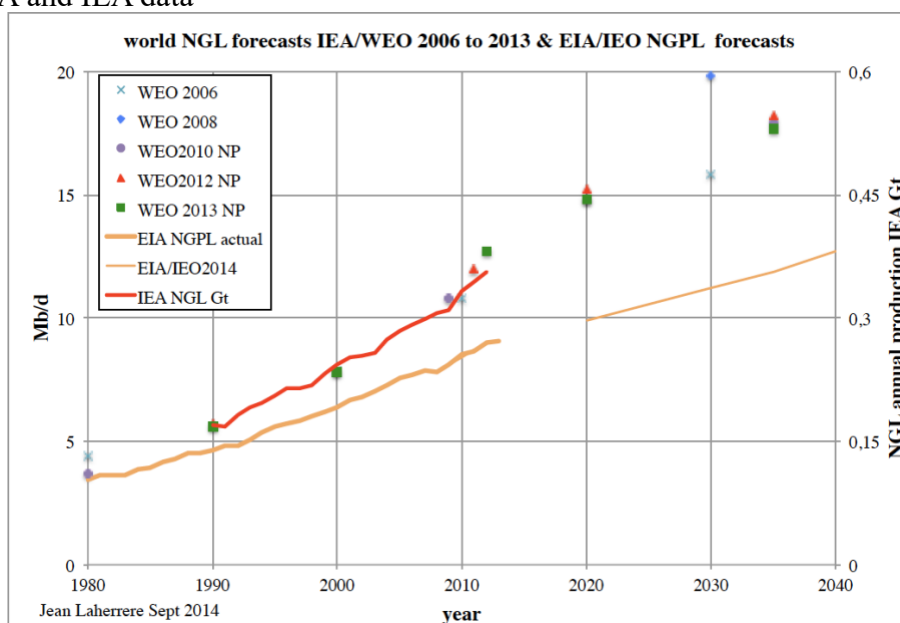
New Zealand	54
Trinidad	55
Pakistan	56
Bahrain	57
Syria	58
Japan	59
Brunei	60
Chile	61
Vietnam	62
Bangladesh	63
China	64
Ghana	65
CIS	66
World	67
Conclusion	72

### -Introduction

My previous paper on NGL was in 2019 “World NGL production”

<https://aspofrance.org/2019/06/17/world-ngl-production/> complaining about the discrepancy between EIA NGPL and IEA NGL and the uncertainty on NGL data.

I remind my 2014 graph with IEA in Mt and EIA in Mb/d showing a large discrepancy between EIA and IEA data



What is the definition of NGL?

IEA Natural Gas Liquids Supply Outlook 2008 2015

April 2010

[https://iea.blob.core.windows.net/assets/c1453def-6929-4df3-8fc7-8886cbf740ed/NGL2010\\_free.pdf](https://iea.blob.core.windows.net/assets/c1453def-6929-4df3-8fc7-8886cbf740ed/NGL2010_free.pdf)

*The term Natural Gas Liquids (NGLs) is confusing, and the many different definitions used are reflected in the wide variance in the way NGL figures are reported across sources.*

*A liquid with an API gravity of 50° API or higher, can be characterized as a condensate.*

*A company or country will often report the volumes of field condensate together with other crude oil.*

In 2013 EIA proposed this NGL definition change:

### **EIA's Proposed Definitions for Natural Gas Liquids**






<b>Term</b>	<b>Current Definition</b>	<b>Proposed Definition</b>	<b>Note</b>
<b>Lease condensate</b>	<b>Condensate (lease condensate):</b> A natural gas liquid recovered from associated and non associated gas wells from lease separators or field facilities, reported in barrels of 42 U.S. gallons at atmospheric pressure and 60 degrees Fahrenheit.	<b>Lease condensate:</b> Light liquid hydrocarbons recovered from lease separators or field facilities at associated and non-associated natural gas wells. Mostly pentanes and heavier hydrocarbons. Normally enters the crude oil stream after production.	Includes lease condensate as part of the crude oil stream, not an NGL.
<b>Plant condensate</b>	<b>Plant condensate:</b> One of the natural gas liquids, mostly pentanes and heavier hydrocarbons, recovered and separated as liquids at gas inlet separators or scrubbers in processing plants.	<b>Plant condensate:</b> Liquid hydrocarbons recovered at inlet separators or scrubbers in natural gas processing plants at atmospheric pressure and ambient temperatures. Mostly pentanes and heavier hydrocarbons, equivalent to pentanes plus.	Adds temperature and pressure.
<b>Natural gas plant liquids (NGPL)</b>	<b>Natural gas plant liquids:</b> Those hydrocarbons in natural gas that are separated as liquids at natural gas processing plants, fractionating and cycling plants, and in some instances, field facilities. Lease condensate is excluded. Products obtained include liquefied petroleum gases (ethane, propane, and butanes), pentanes plus, and isopentane. Component products may be fractionated or mixed.	<b>Natural gas plant liquids (NGPL):</b> Those hydrocarbons in natural gas that are separated as liquids at natural gas processing plants, fractionating and cycling plants. Products obtained include ethane, liquefied petroleum gases (propane and butanes), and pentanes plus. Component products may be fractionated or mixed. Lease condensate is excluded.	Identifies ethane separate from the LPG and includes it in NGPL. Removes isopentane, since it is part of pentanes plus. A supply definition.

EIA glossary:

*Natural gas plant liquids (NGPL): Those hydrocarbons in natural gas that are separated as liquids at natural gas processing, fractionating, and cycling plants. Products obtained include ethane, liquefied petroleum gases (propane, normal butane, and isobutane), and natural gasoline. Component products may be fractionated or mixed. Lease condensate and plant condensate are excluded. Note: Some EIA publications categorize NGPL production as field production, in accordance with definitions used prior to January 2014.*

*Natural gas plant liquids (NGPL) production: The extraction of gas plant liquids constituents such as ethane, propane, normal butane, isobutane, and natural gasoline, sometimes referred to as extraction loss. Usually reported in barrels or gallons, but may be reported in cubic feet for purposes of comparison with dry natural gas volumes.*

EIA

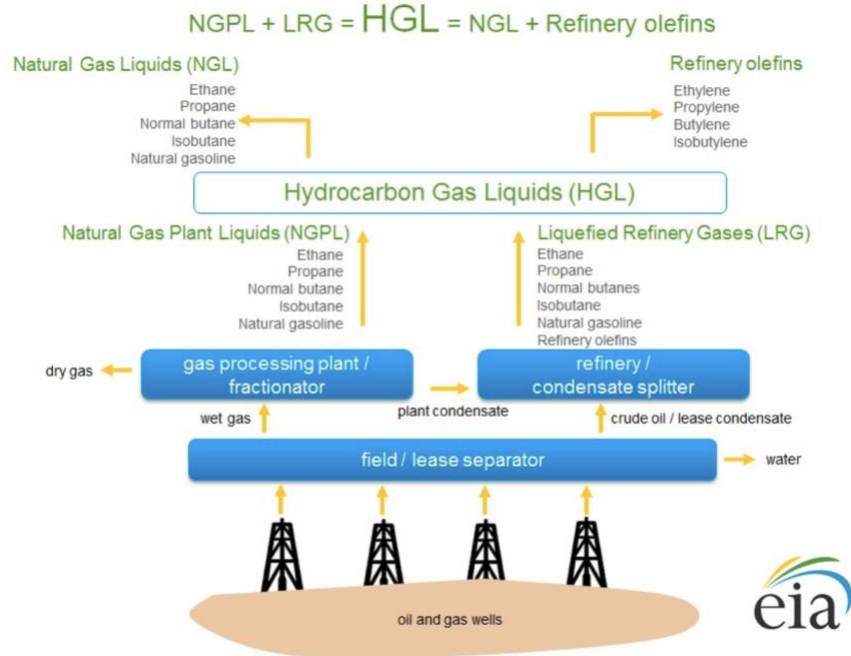
NGL Attribute Summary				eia
Natural Gas Liquid	Chemical Formula	Applications	End Use Products	Primary Sectors
Ethane	<chem>C2H6</chem> 	Ethylene for plastics production; petrochemical feedstock	Plastic bags; plastics; anti-freeze; detergent	Industrial
Propane	<chem>C3H8</chem> 	Residential and commercial heating; cooking fuel; petrochemical feedstock	Home heating; small stoves and barbeques; LPG	Industrial, Residential, Commercial
Butane	<chem>C4H10</chem> 	Petrochemical feedstock; blending with propane or gasoline	Synthetic rubber for tires; LPG; lighter fuel	Industrial, Transportation
Isobutane	<chem>C4H10</chem> 	Refinery feedstock; petrochemical feedstock	Alkylate for gasoline; aerosols; refrigerant	Industrial
Pentane	<chem>C5H12</chem> 	Natural gasoline; blowing agent for polystyrene foam	Gasoline; polystyrene; solvent	Transportation
Pentanes Plus*	Mix of <chem>C5H12</chem> and heavier	Blending with vehicle fuel; exported for bitumen production in oil sands	Gasoline; ethanol blends; oil sands production	Transportation

C indicates carbon, H indicates hydrogen; Ethane contains two carbon atoms and six hydrogen atoms  
 \*Pentanes plus is also known as "natural gasoline." Contains pentane and heavier hydrocarbons.

Source: U.S. Energy Information Administration, Bentek Energy LLC.

NGPL are compared with refinery olefins:

[https://www.gem.wiki/Natural\\_Gas\\_Liquid\\_\(NGL\)\\_Pipelines](https://www.gem.wiki/Natural_Gas_Liquid_(NGL)_Pipelines)



<https://www.energy.gov/sites/prod/files/2017/12/f46/NGL%20Primer.pdf>

**Table 1. Natural gas liquids, uses, products, and consumers**

<b>NGL</b>	<b>Chemical formula</b>	<b>Uses</b>	<b>End-use products</b>	<b>End-use sectors</b>
<b>Ethane</b>	C <sub>2</sub> H <sub>6</sub>	Petrochemical feedstock for ethylene production; power generation	Plastics; anti-freeze; detergents	Industrial
<b>Propane</b>	C <sub>3</sub> H <sub>8</sub>	Fuel for space heating, water heating, cooking, drying, and transportation; petrochemical feedstock	Fuel for heating, cooking, and drying; plastics	Industrial (includes manufacturing and agriculture), residential, commercial, and transportation
<b>Butanes: normal butane and isobutane</b>	C <sub>4</sub> H <sub>10</sub>	Petrochemical and petroleum refinery feedstock; motor gasoline blending	Motor gasoline; plastics; synthetic rubber; lighter fuel	Industrial and transportation
<b>Natural gasoline (pentanes plus)</b>	Mix of C <sub>5</sub> H <sub>12</sub> and heavier	Petrochemical feedstock; additive to motor gasoline; diluent for heavy crude oil	Motor gasoline; ethanol denaturant; solvents	Industrial and transportation

Pentane is described as natural gasoline.

Schlumberger glossary:

*natural gas liquids*

*Components of natural gas that are liquid at surface in field facilities or in gas-processing plants. Natural gas liquids can be classified according to their vapor pressures as low (condensate), intermediate (natural gasoline) and high (liquefied petroleum gas) vapor pressure. Natural gas liquids include propane, butane, pentane, hexane and heptane, but not methane and ethane, since these hydrocarbons need refrigeration to be liquefied. The term is commonly abbreviated as NGL.*

Ethane is excluded as needing to be liquefied!

United nations <https://www.unescwa.org/sd-glossary/natural-gas-liquids-ngl>

Natural gas liquids (NGL) Definition:

*Liquid or liquefied hydrocarbons produced in the manufacture, purification and stabilization of natural gas. Their characteristics vary, ranging from those of ethane, butane and propane to heavy oils.*

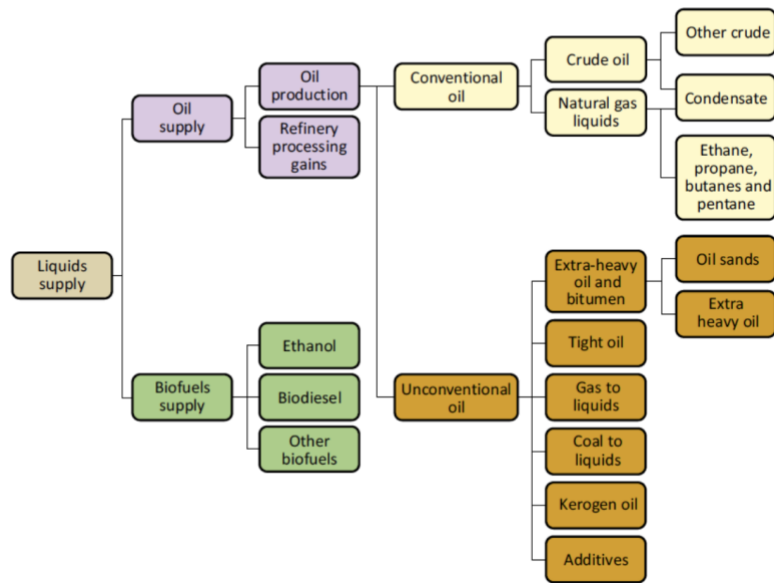
*NGL's are either distilled with crude oil in refineries, blended with refined petroleum products or used directly depending on their characteristics.*

NGLs can be dangerous as indicated by [foodandwaterwatch.org](http://foodandwaterwatch.org)

*The boom in NGL processing and production has been accompanied by a litany of documented incidents, including explosions, fires, environmental degradation and fatalities, a side effect of their hazardous nature. NGLs are volatile and flammable, and because their presence in air can go undetected, they can be particularly dangerous*

IEA defines condensate as either crude if sold with crude or natural liquids if sold with NGL

**Figure C.1** ▶ Liquid fuels classification



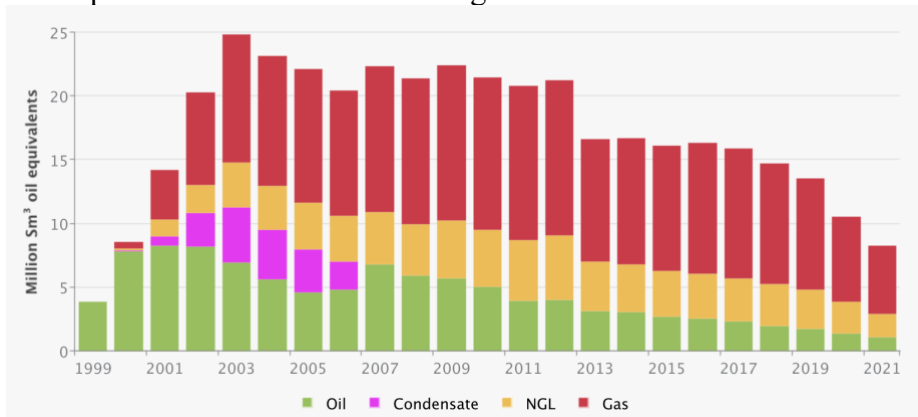
It is a bad practice, leading to confusion!

IEA follows Norwegian Petroleum Directorate reporting for Asgard field condensate was reported as condensate where from 2001 to 2006 and later as oil

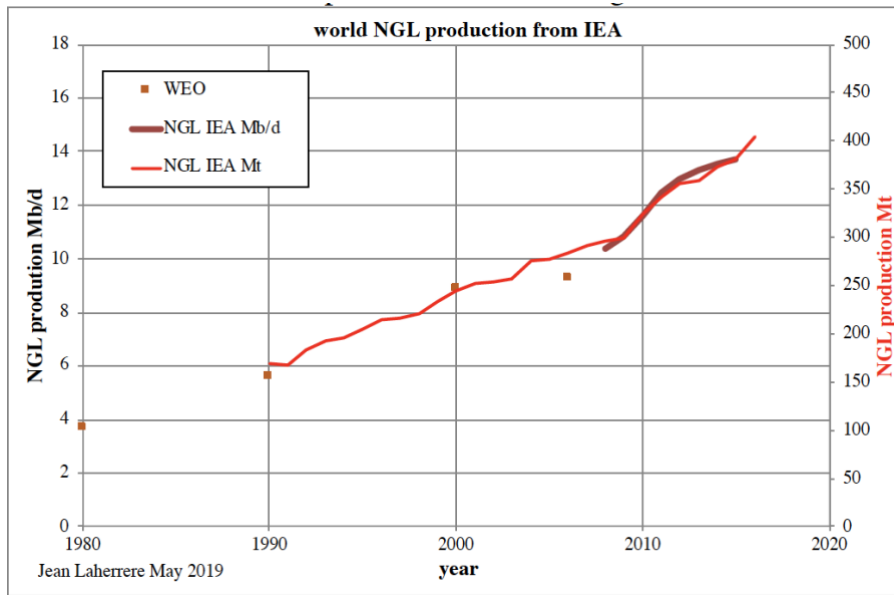
It is confusing!

Usually, condensate is in NGL

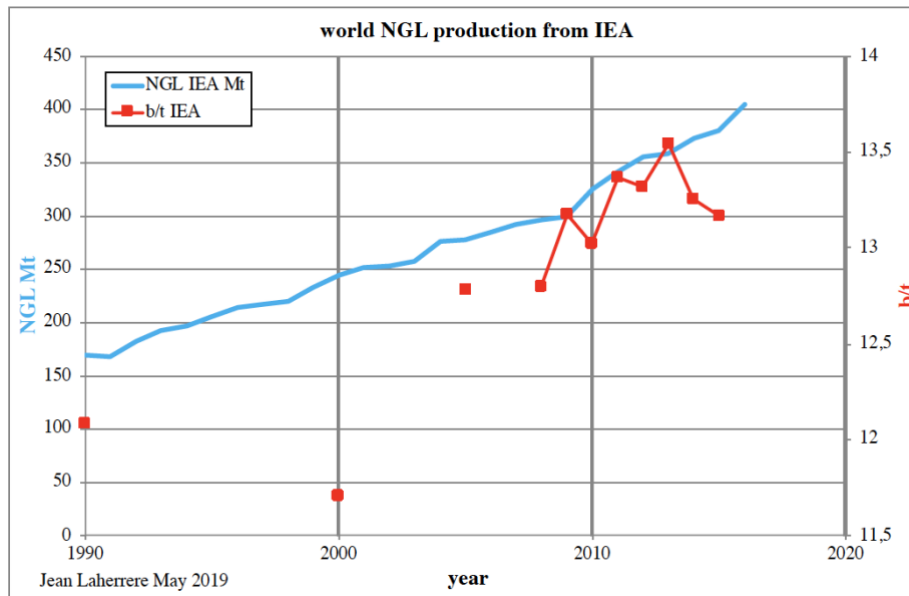
<https://www.norskpetroleum.no/en/facts/field/asgard/>



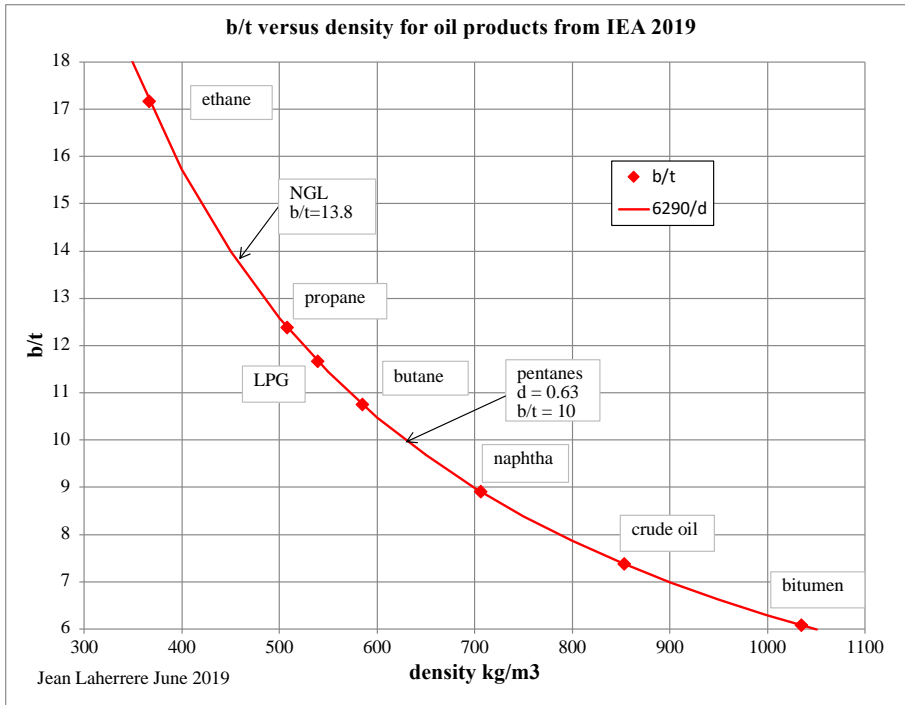
IEA reported NGL in Mb/d and Mt



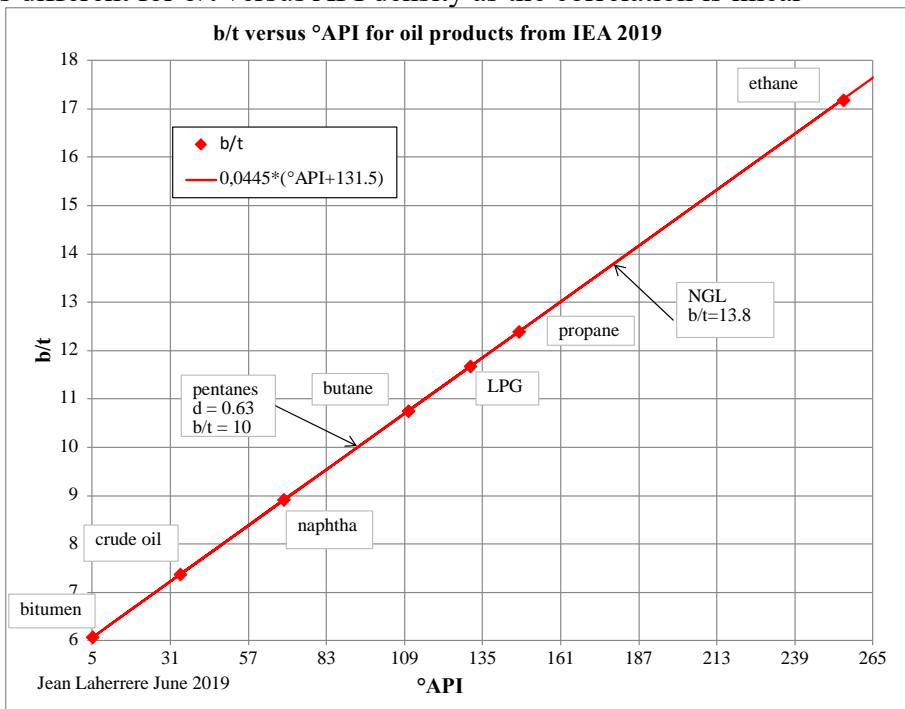
The ratio b/t increases to over 13



In fact, b/t varies from 6 (bitumen) to 17 (ethane) as shown in this graph b/t versus density in kg/m<sup>3</sup>

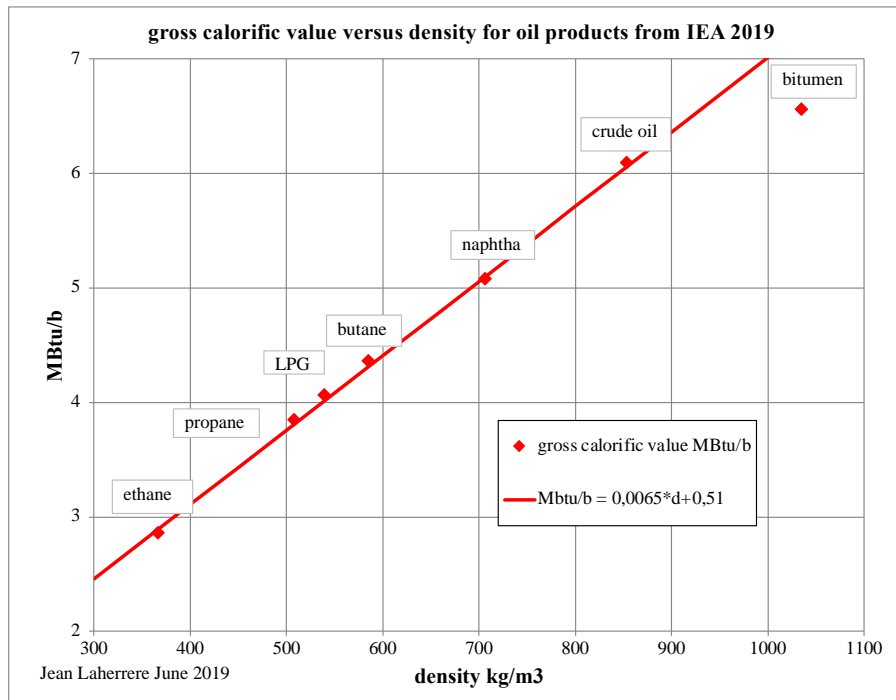


The graph is different for b/t versus API density as the correlation is linear



As the graph Mbtu/b versus density in kg/m³

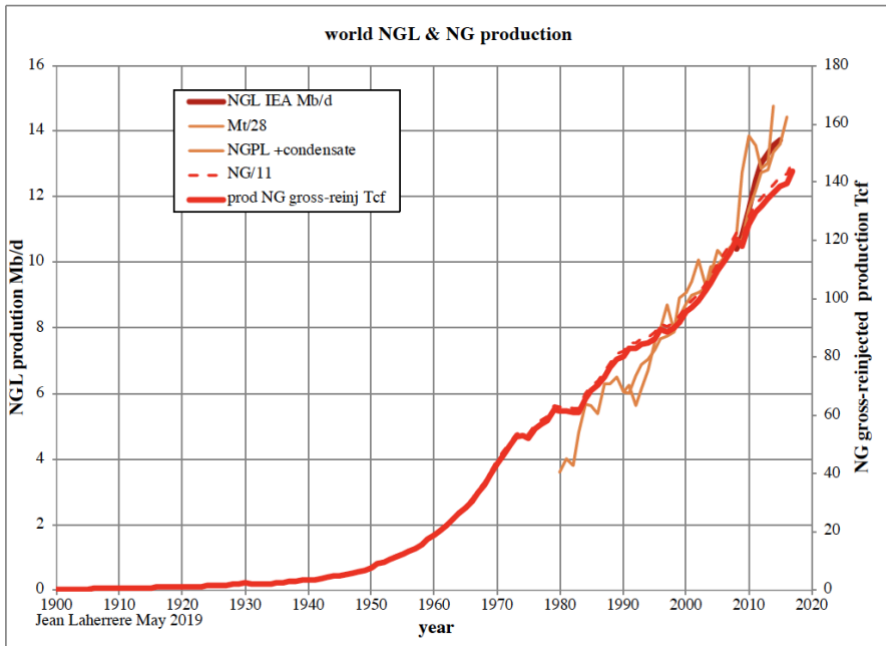




Heat content of NGL varies between 2,8 MBtu/b (ethane) and 4.6 MBtu/b (natural gasoline)  
MER dec 2023

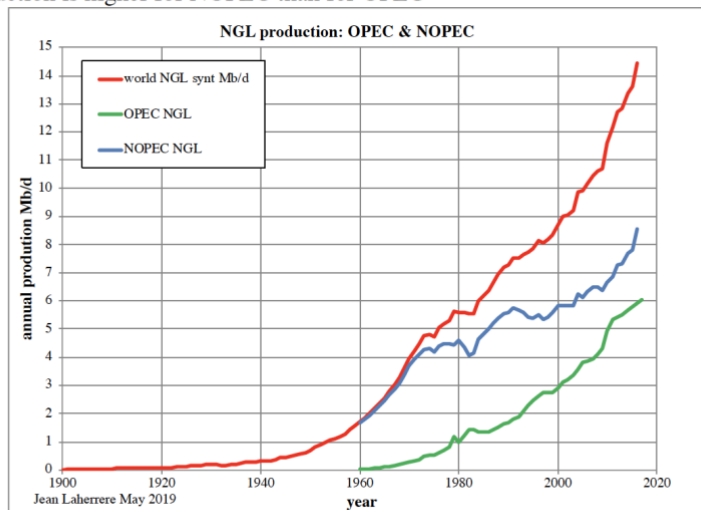
**Table A1. Approximate Heat Content of Petroleum and Biofuels**  
(Million Btu per Barrel, Except as Noted)

Commodity	Heat Content	Commodity	Heat Content
Asphalt and Road Oil	6.636	Motor Gasoline (Finished)—see Tables A2 and A3	
Aviation Gasoline (Finished)	5.048	Motor Gasoline Blending Components (MGBC)	
Aviation Gasoline Blending Components	5.048	Through 2006	5.253
Crude Oil—see Table A2		Beginning in 2007	5.222
Distillate Fuel Oil—see Table A3 for averages		Oxygenates (excluding Fuel Ethanol)	4.247
15 ppm sulfur and under	5.770	Petrochemical Feedstocks	
Greater than 15 ppm to 500 ppm sulfur	5.817	Naphtha Less Than 401°F	5.248
Greater than 500 ppm sulfur	5.825	Other Oils Equal to or Greater Than 401°F	5.825
Hydrocarbon Gas Liquids		Petroleum Coke—see Table A3 for averages	
Natural Gas Liquids		Total, through 2003	6.024
Ethane	2.783	Catalyst, beginning in 2004	<sup>a</sup> 6.287
Propane	3.841	Marketable, beginning in 2004	5.719
Normal Butane	4.353	Residual Fuel Oil	6.287
Isobutane	4.183	Special Naphthas	5.248
Natural Gasoline (Pentanes Plus)	4.638	Still Gas	
Refinery Olefins		Through 2015	<sup>b</sup> 6.000
Ethylene	2.436	Beginning in 2016	<sup>a</sup> 6.287
Propylene	3.835	Unfinished Oils	5.825
Butylene	4.377	Waxes	5.537
Isobutylene	4.355	Miscellaneous Products	5.796
Hydrogen	<sup>c</sup> 6.287	Other Hydrocarbons	5.825
Jet Fuel, Kerosene Type	5.670	Biofuels, Fuel Ethanol—see Table A3	
Jet Fuel, Naphtha Type	5.355	Biofuels, Biodiesel	5.359
Kerosene	5.670	Biofuels, Renewable Diesel Fuel	5.494
Lubricants	6.065	Biofuels, Other	5.359



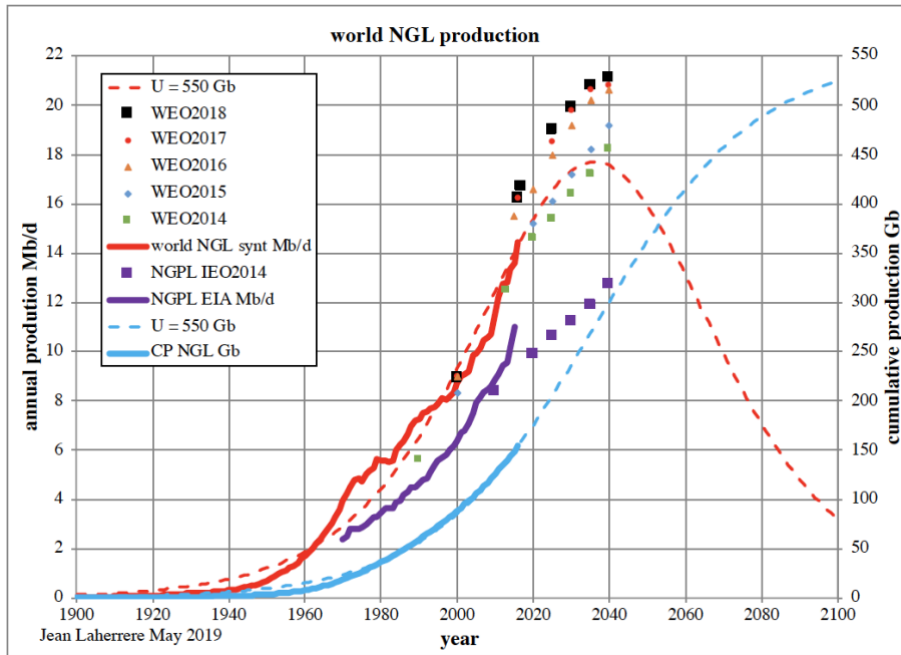
I reported in 2019 the problem of OPEC data with a variable number of members which has varied from 5 to 15 with time

NGL production is higher for NOPEC than for OPEC



The problem for this graph is that the number of members of OPEC varies with time: the departure of Qatar from OPEC in 2018 will change all the data in 2019

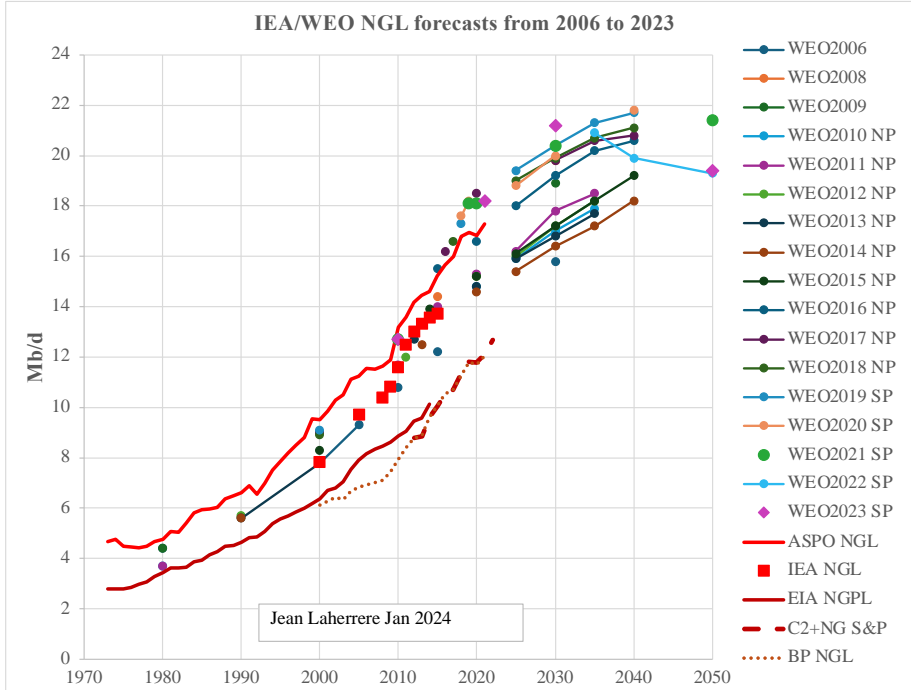
In 2019 I forecasted a 550 Gb NGL ultimate with a peak around 2040 compared with IEA/WEO 2014 to 2018



*To conclude NGL reporting is a mess because there is no consensus on NGL definition. IEA and OPEC should jointly agree on a definition of NGL and then should provide right historical series, covering OPEC and Non-OPEC production*

### -IEA

The evolution of IEA/WEO SP (stated policies) from 2006 to 2023 shows first that the past data varies as being badly defined and reported and second that NGL productions were increasing up to 2050 except for the forecasts in 2022 (blue) and in 2023 (purple):



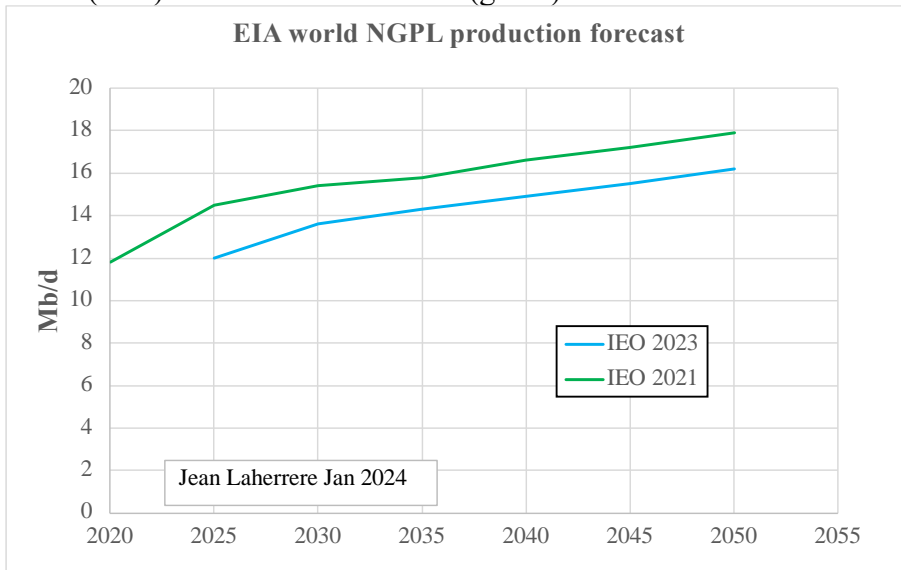
The discrepancy between NGL production data from ASPO, IEA, EIA, S&P and BP is huge and shows the uncertainty of measuring NGL data

### -EIA

EIA forecasts report rarely NGL data

As for oil and gas, NGL production is always on the increase as EIA is politically against US peak:

But 2023 forecast (blue) is below 2021 forecast (green)



-ExxonMobil = XOM

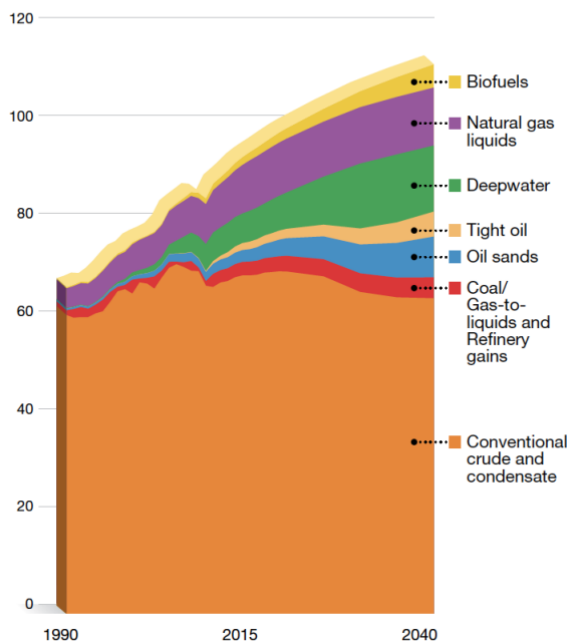
2012

2015

## Liquids Supply

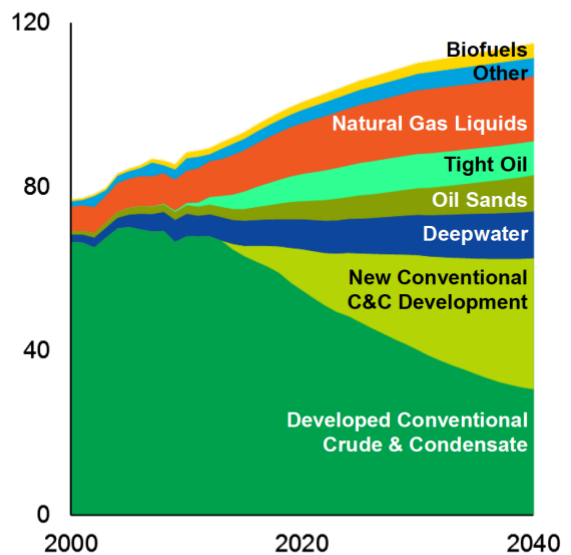
### Liquids supply by type

Millions of oil-equivalent barrels per day



### World Supply by Type

MBOE

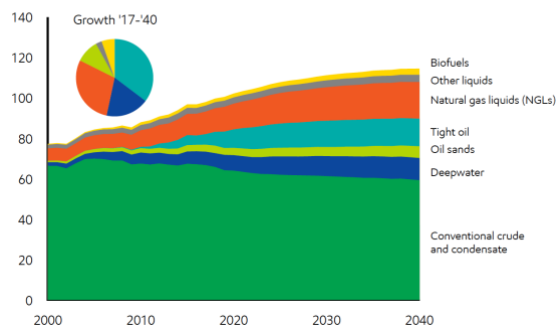


ExxonMobil

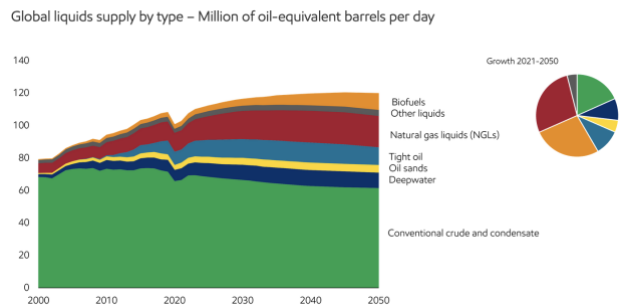
2019

2023

Liquids supply highlights the need for investment  
Global liquids supply by type – MBDOE



Liquids supply highlights the need for investment

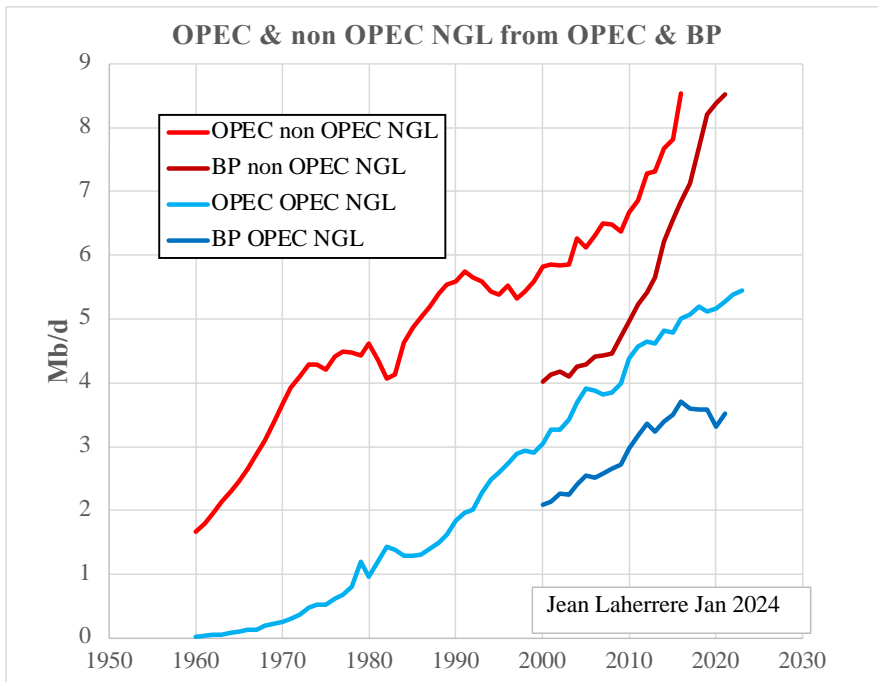


**-OPEC**

OPEC requires quotas for their members on crude oil production but not on condensate or NGL.

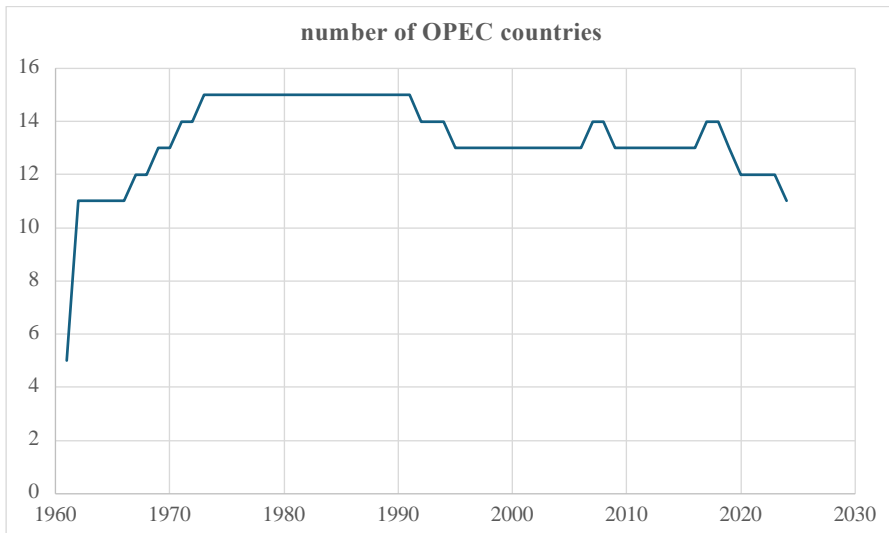
There is a huge discrepancy between NGL data production from OPEC sources and BP sources

For 2000 OPEC reports 6 Mb/d for OPEC NGL when BP 4 and OPEC reports 3 Mb/d for non OPEC NGL when BP 2: a difference of 50%

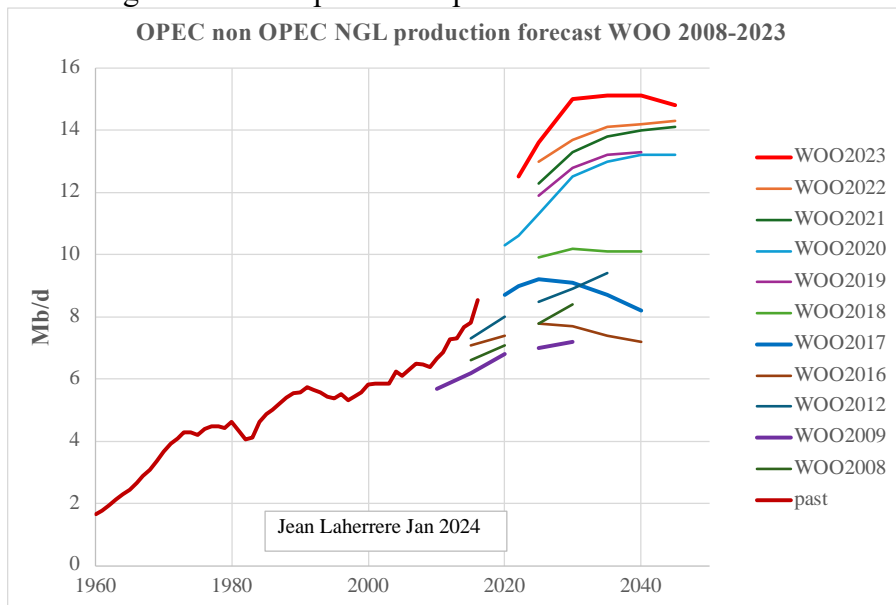


It means that past data on NGL production can varies by 50%

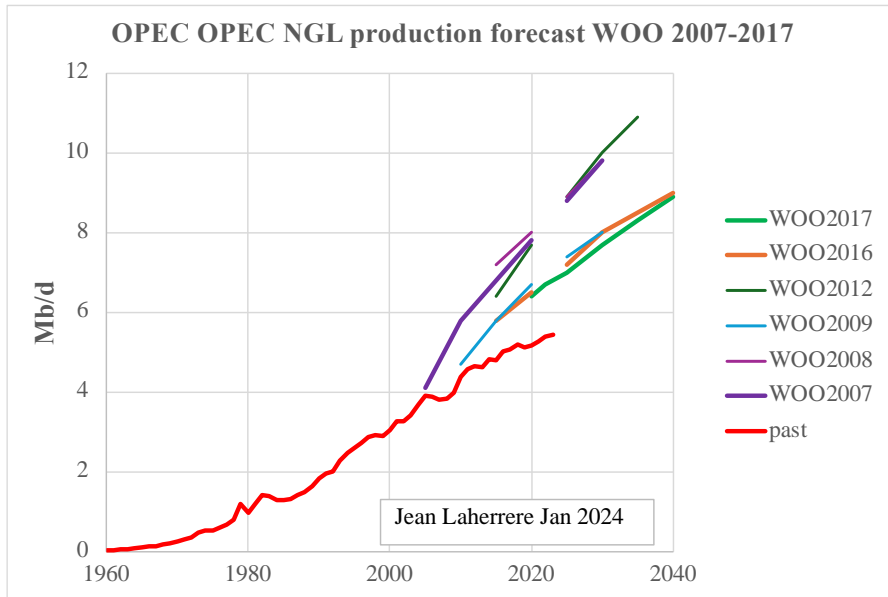
There is a problem of the NGL data but also of the composition of OPEC which varies with time from 1961 to 2024



Past NGL production data change but also forecasts.  
 OPEC forecasts for 2040 non OPEC NGL production being 7 Mb/d in WOO2016 but 15 Mb/d in WOO2023: quite a change!  
 The change in OPEC is part of the problem!

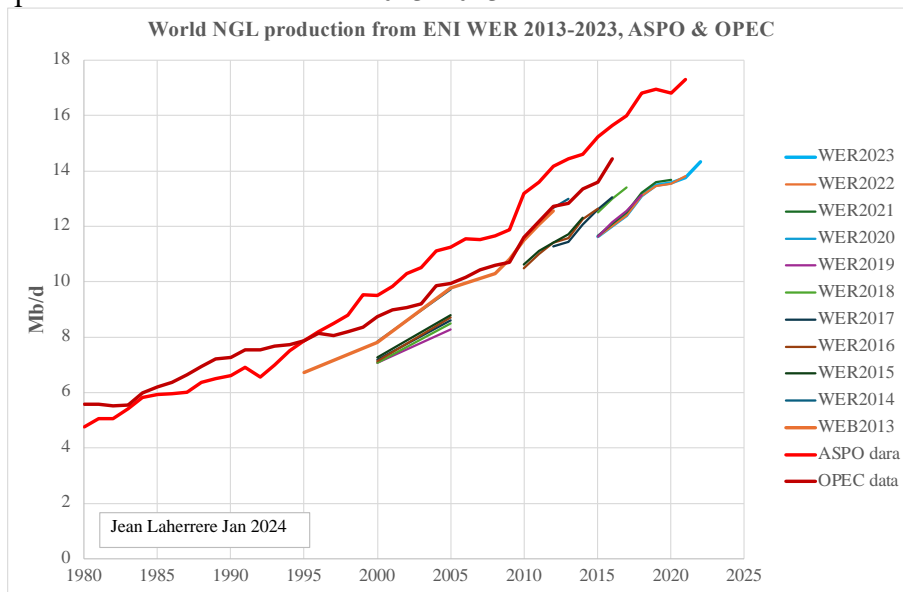


WOO2007 forecasted 2020 OPEC NGL production near 8 Mb/d when in fact 5: what a bad forecast!  
 WOO2023 does not forecast OPEC NGL production!



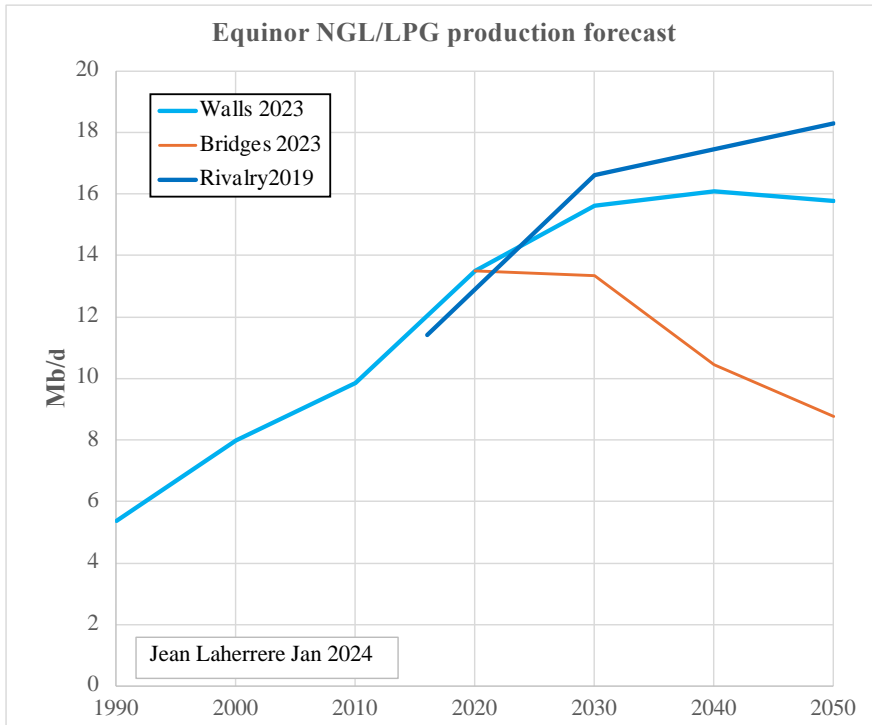
**-ENI**

World NGL production from ENI/WER2013-2023 & ASPO & OPEC



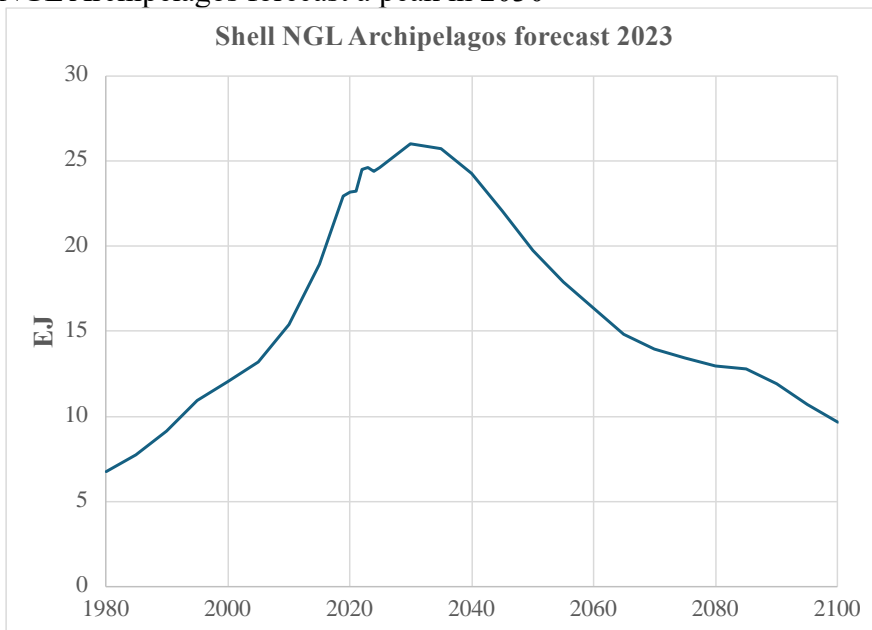
**-Equinor**

Walls 2023 scenario forecasts NGL peak beyond 2050



**-Shell**

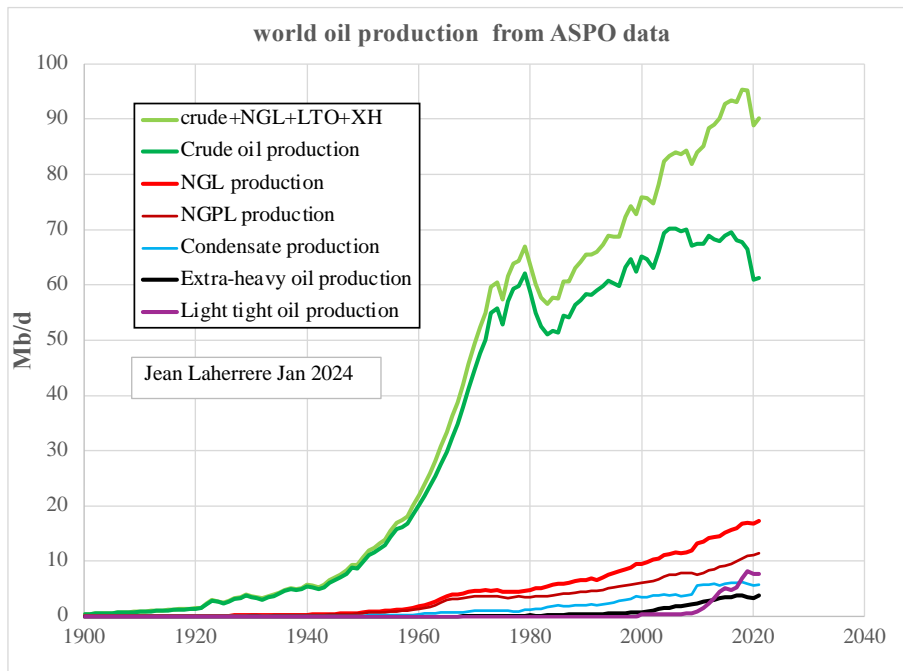
Shell 2023 NGL Archipelagos forecast a peak in 2030



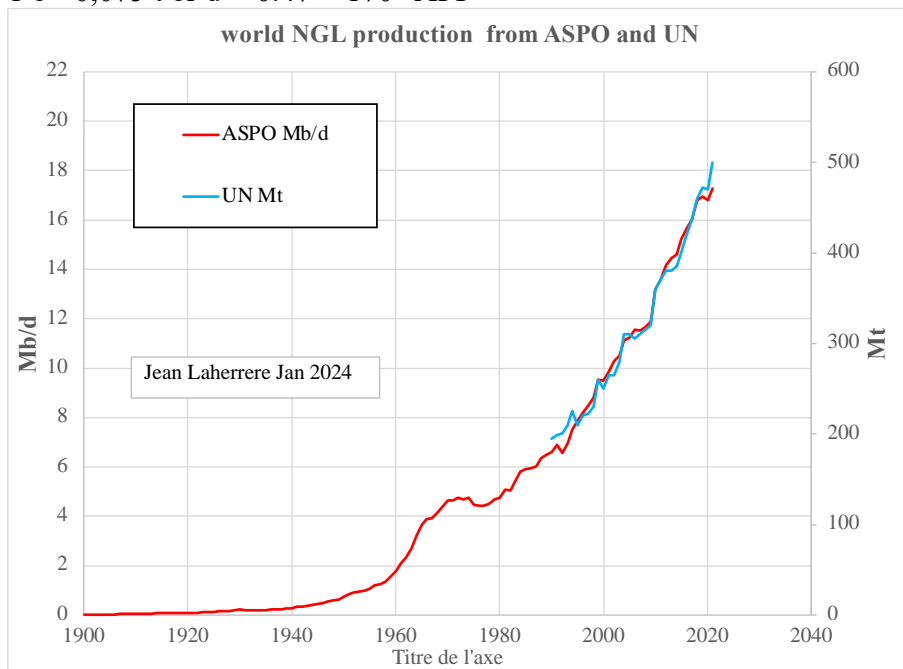
**-JL**

ASPO France data on NGL production starts from 1900 and is significant since 1950

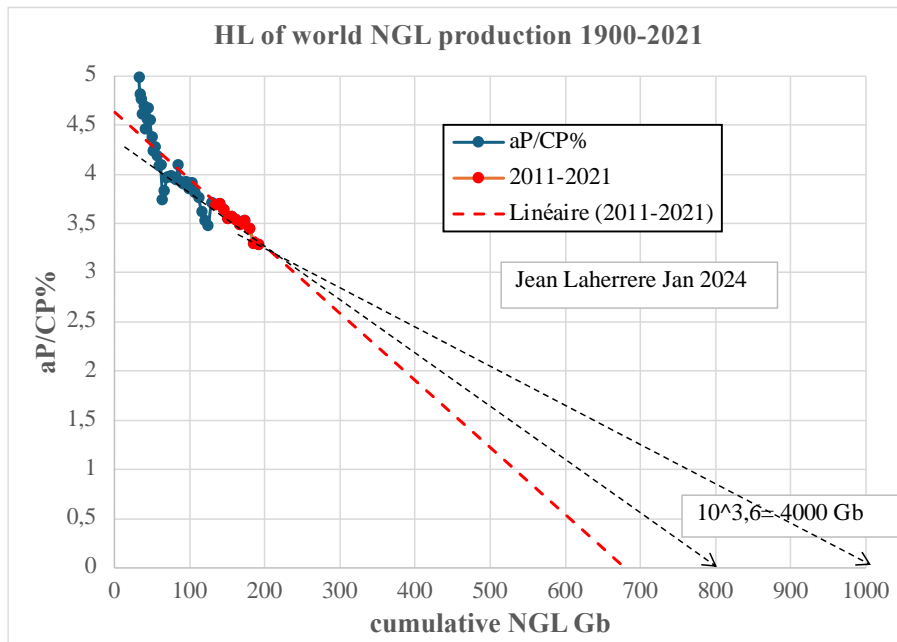




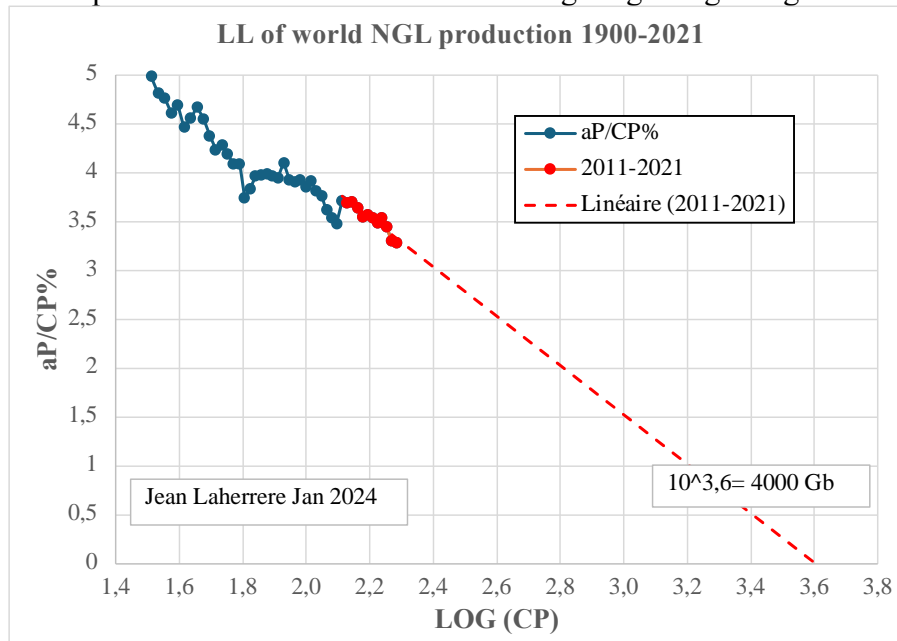
NGL is reported on volume by ASPO data and in weight by UN.org  
 The ratio is 1 b = 0,075 t or d = 0.47 = 170 °API



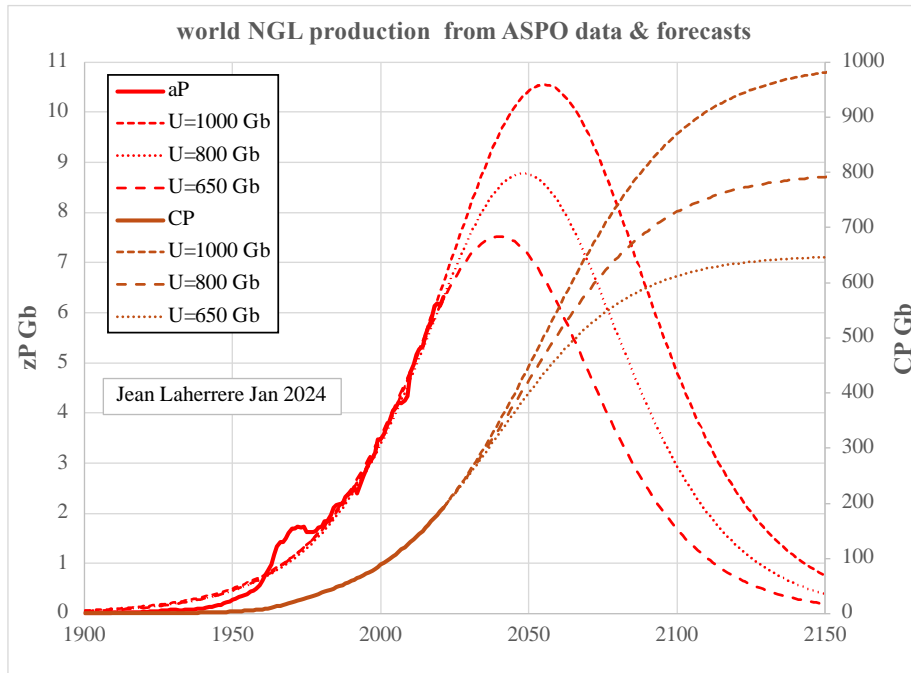
HL of World NGL production trends fairly towards 700 Gb



LL of world NGL production trends towards 4000 Gb giving a huge range of uncertainty

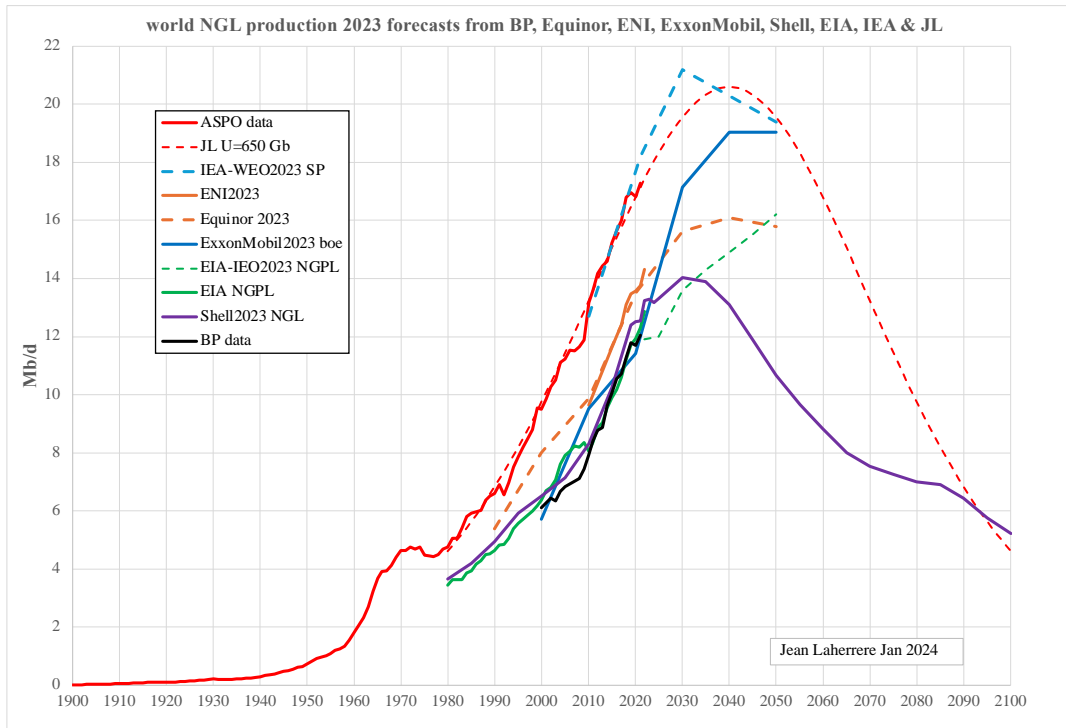


World NGL production is forecasted with different ultimates: 650, 800 and 1000 Gb  
 Each modelling fits very well with the past, showing that past production is not the best way to estimate ultimate with HL but it is the only way when geological reserves estimates (2P) of past discoveries are not reliable.

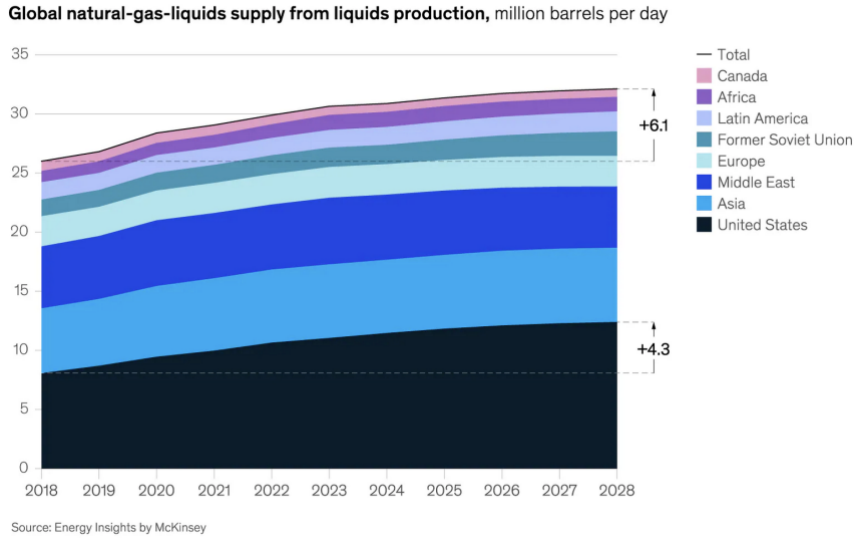


**-Synthesis of world NGL production forecasts**

It is obvious that past NGL data is a mess. However, most forecasts except EIA are for a peak before 2040

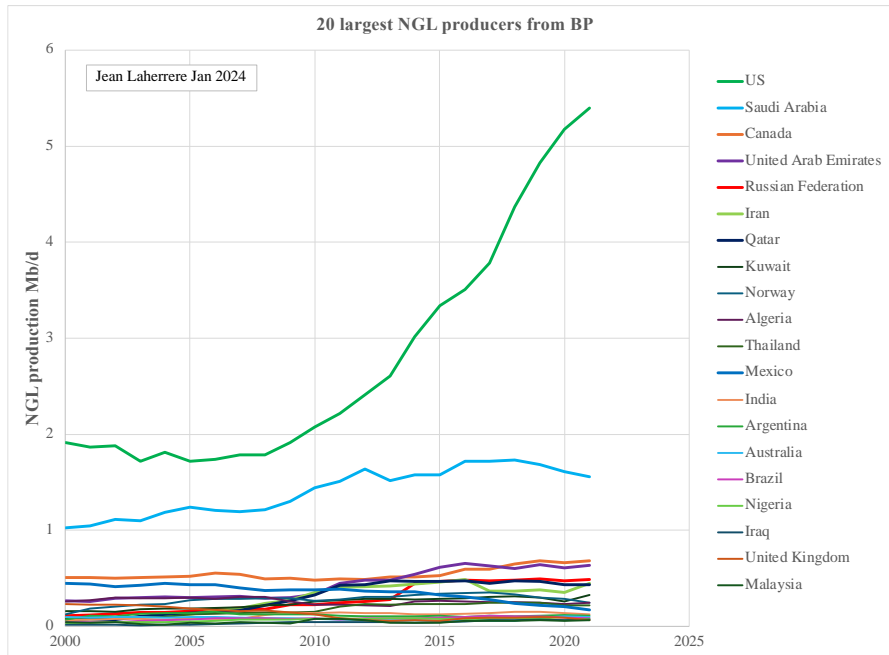


McKinsey reports in 2018 global NGL production at 26 Mb/d



**-Largest NGL producers**

The largest 2021 NGL producer is US followed by Saudi Arabia, Canada, UAE and Russian Federation from BP Stats



From ASPO data  
Largest production in 2022 in M.m3

2022	ngpl	cond	ngl
world	739	382	1121
united_states	344	53	397
saudi_arabia	81	44	125
cis	45	52	97
canada	52	24	77
united_arab_emi	44	23	67
russia	37	30	67
iran	21	43	64
qatar	22	41	63
algeria	15	11	26
mexico	10	13	23
kazakhstan	6	15	21
australia	6	12	18
nigeria	5	10	16
oman	0	12	13
egypt	6	7	13
norway	11	1	12
kuwait	12		12
thailand	11		11
united_kingdom	4	7	11
argentina	8	3	10
brazil	5	4	9
india	6	3	9
malaysia	3	6	9
azerbaijan	0	6	6
iraq	6		6
indonesia	1	4	6
bolivia	2	3	5

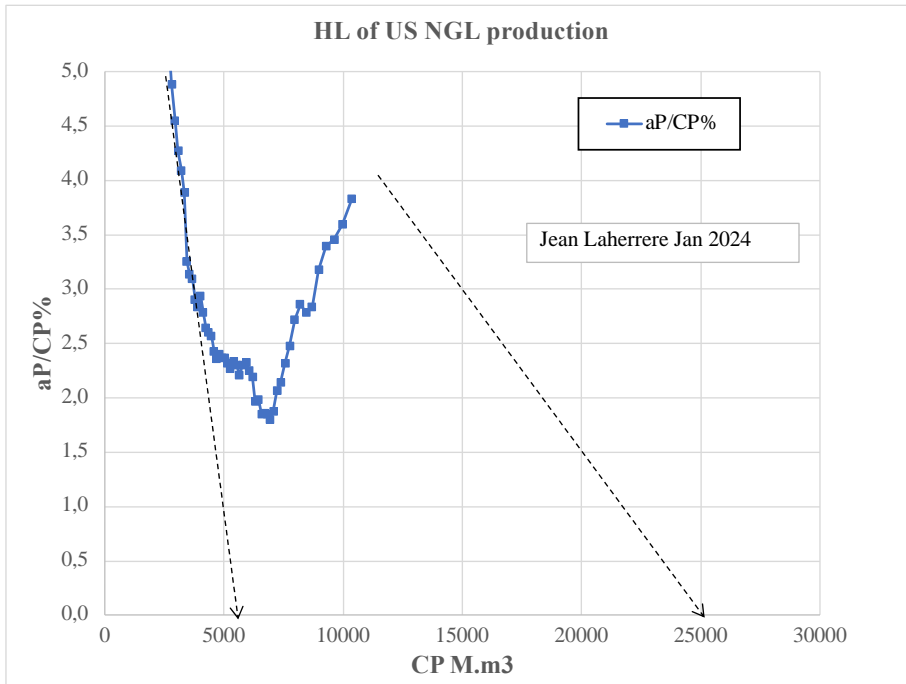
### **-Forecast by country**

Few members of ASPO France have financed Hugo Duterne to gather condensate and NGPL production data for every oil producer.

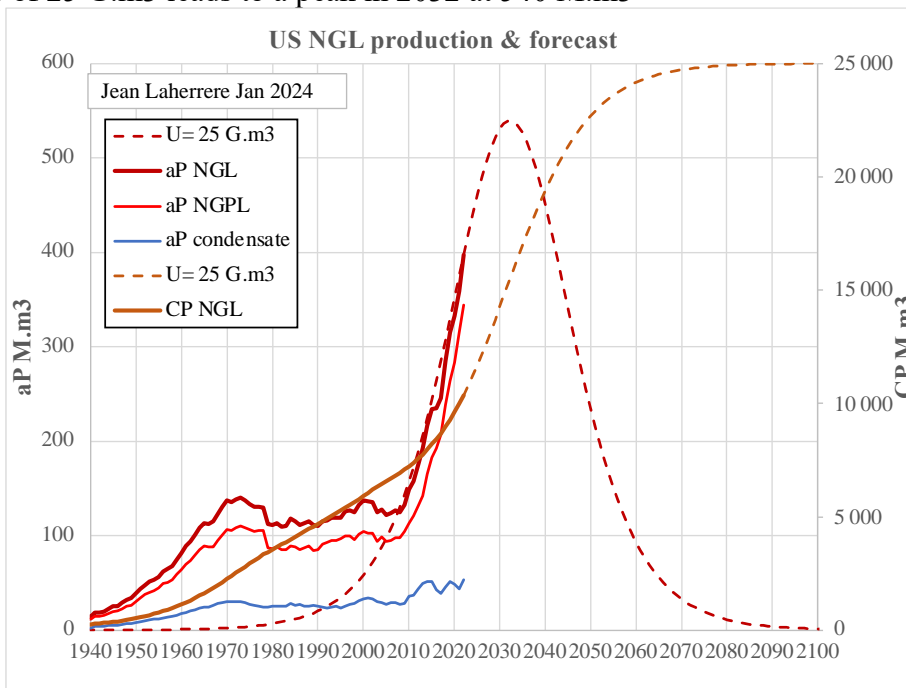
Ultimate is estimated by using HL = Hubbert Linearization

### **-US**

HL of US NGL is useless a wild guess is taken with an ultimate of 25 G.m3

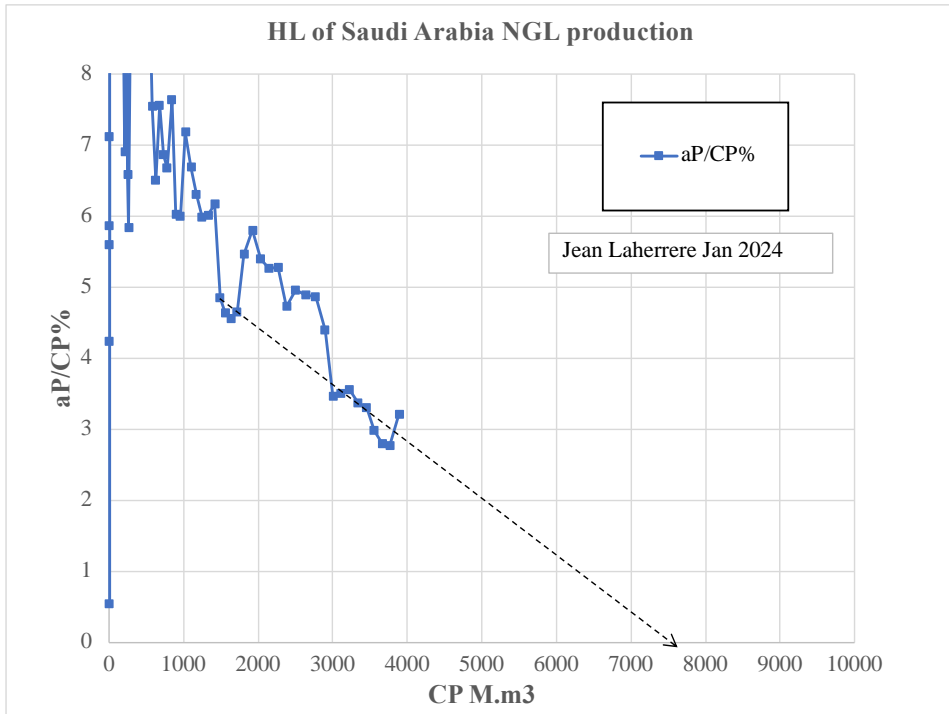


An ultimate of 25 G.m3 leads to a peak in 2032 at 540 M.m3

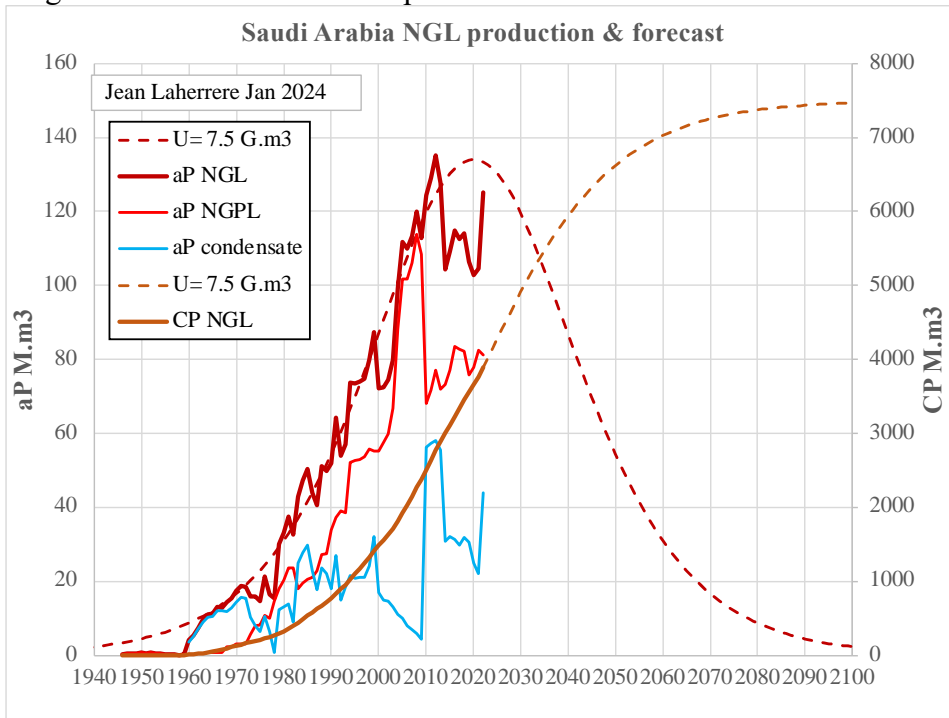


**-Saudi Arabia**

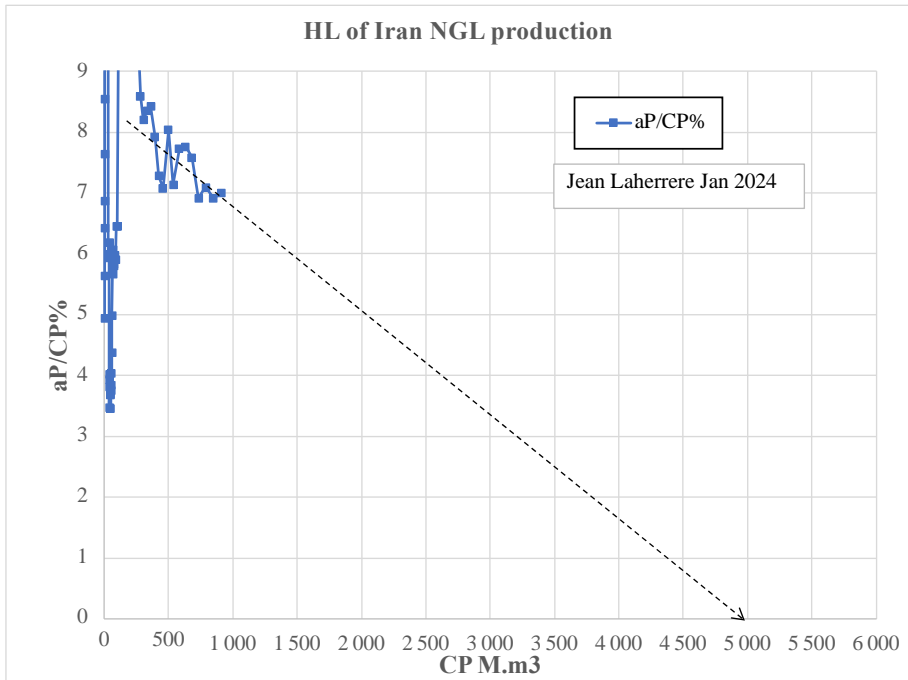
HL trends (poor quality) towards 7.5 G.m3



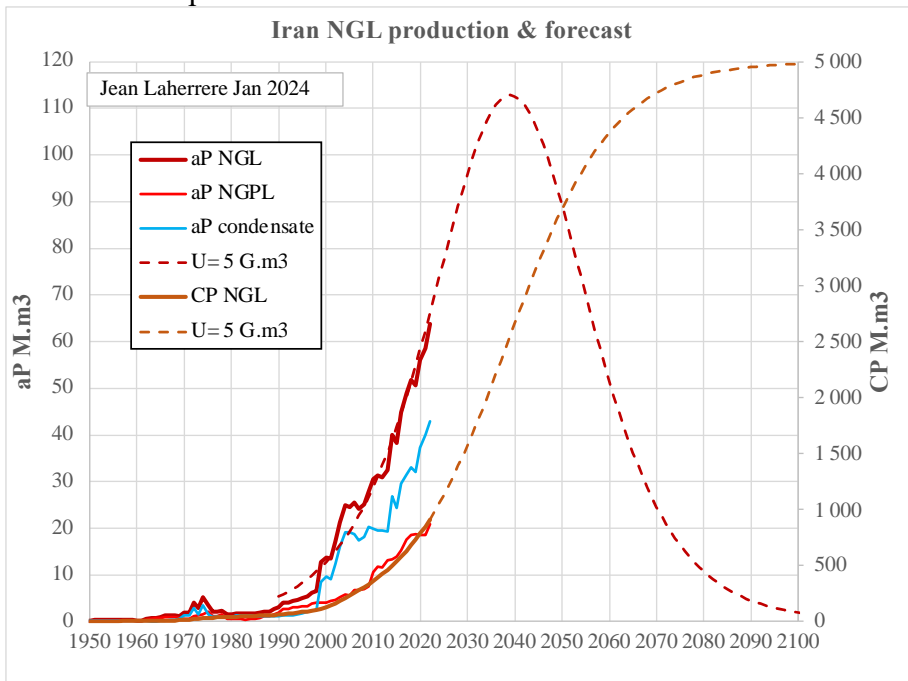
This 7.5 G.m3 gives a future decline and a peak in 2012



**-Iran**  
HL (poor quality) trends towards 5 G.m3



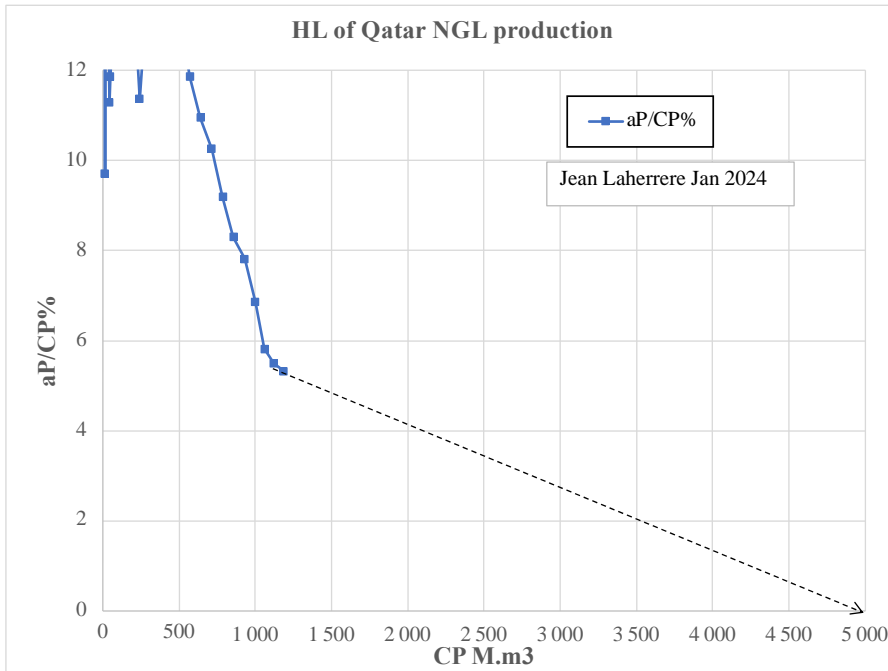
Iran NGL production will peak around 2040 at 110 M.m3



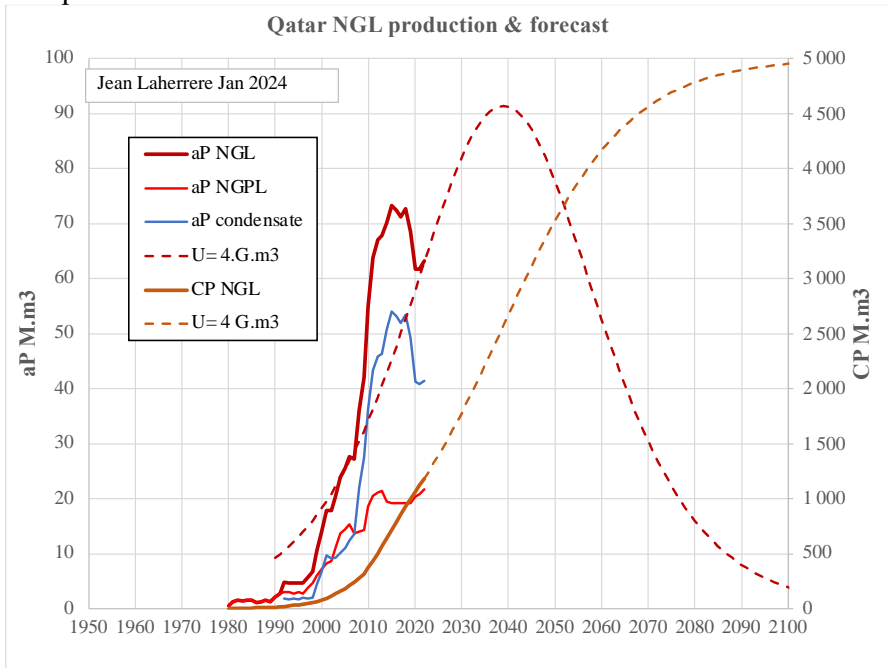
**-Qatar**

HL is useless and an ultimate of 5 G.m3 is guessed



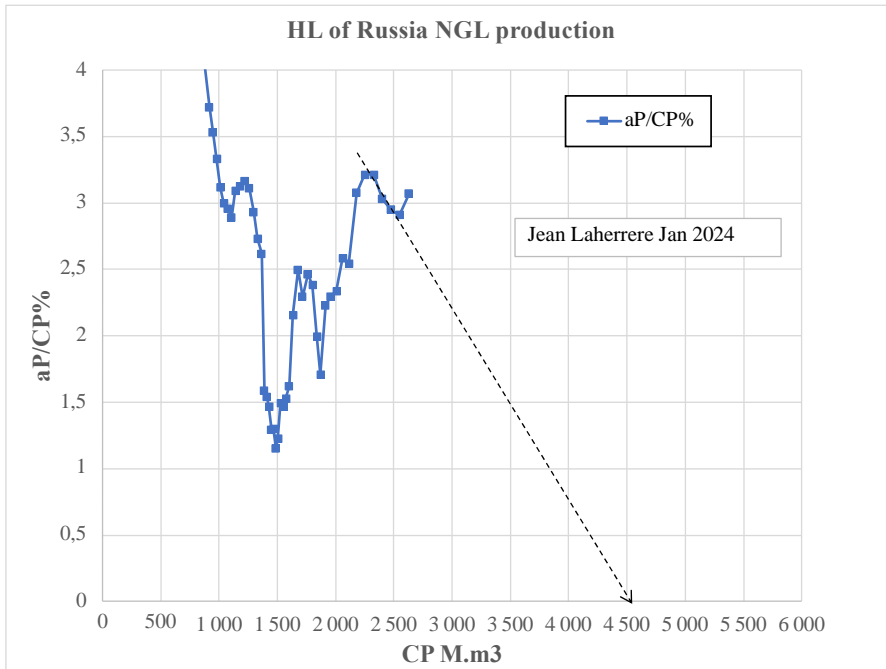


Qatar NGL will peak around 2040 at 90 M.m3

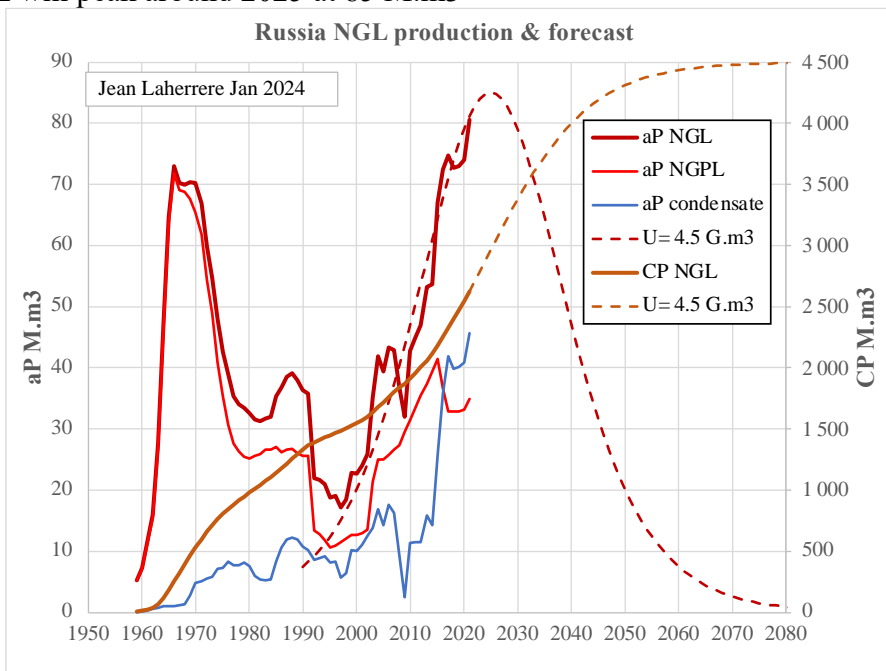


**-Russia**

HL is very poor (VP) and trends towards 1.5 G.m3

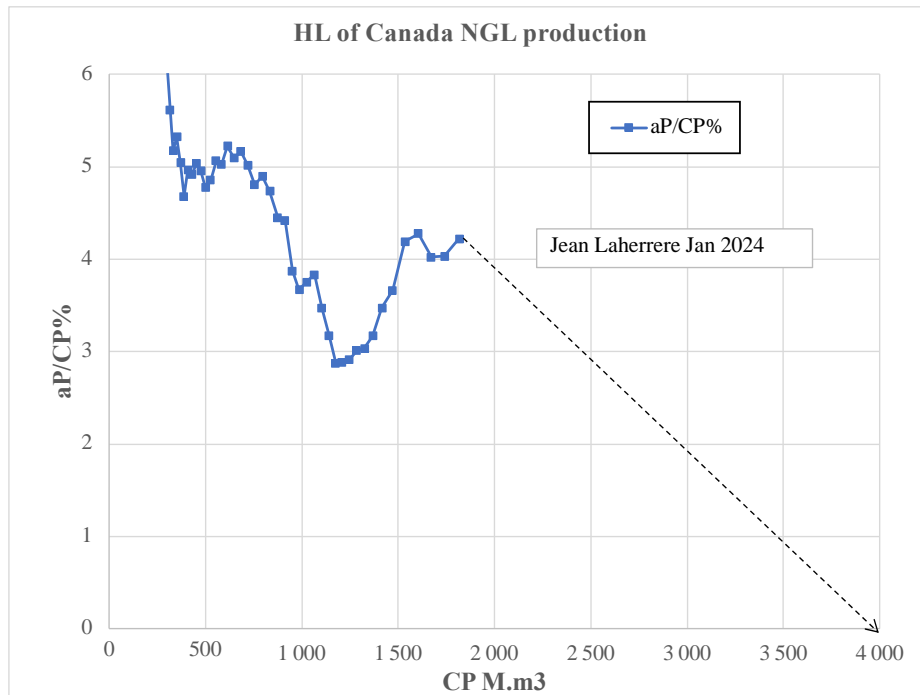


Russia NGL will peak around 2025 at 85 M.m3

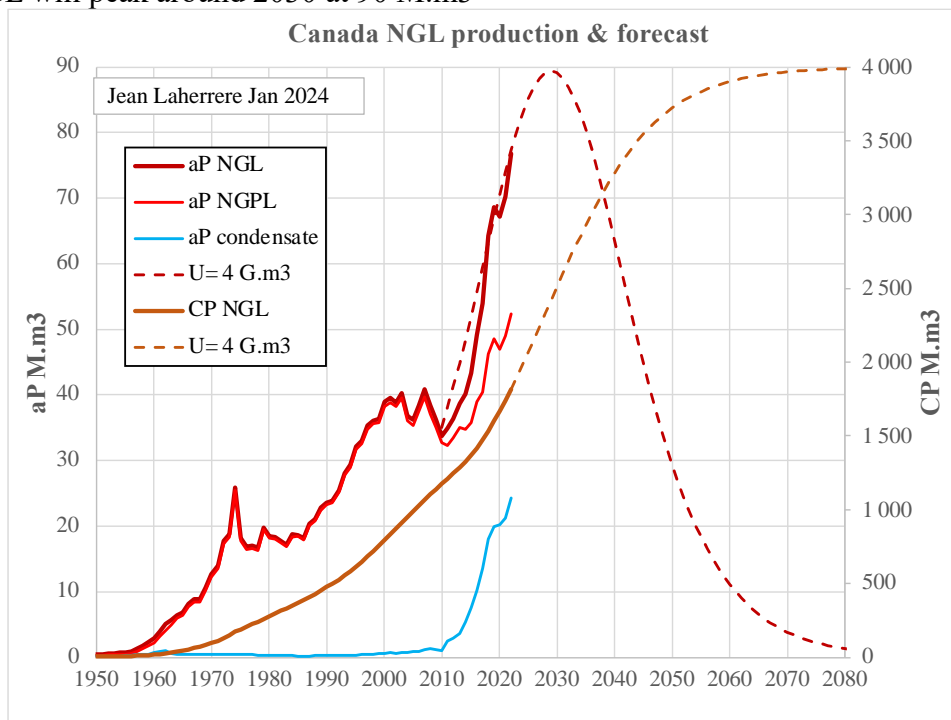


**-Canada**

HL is useless but an ultimate is guessed at 4 G.m3

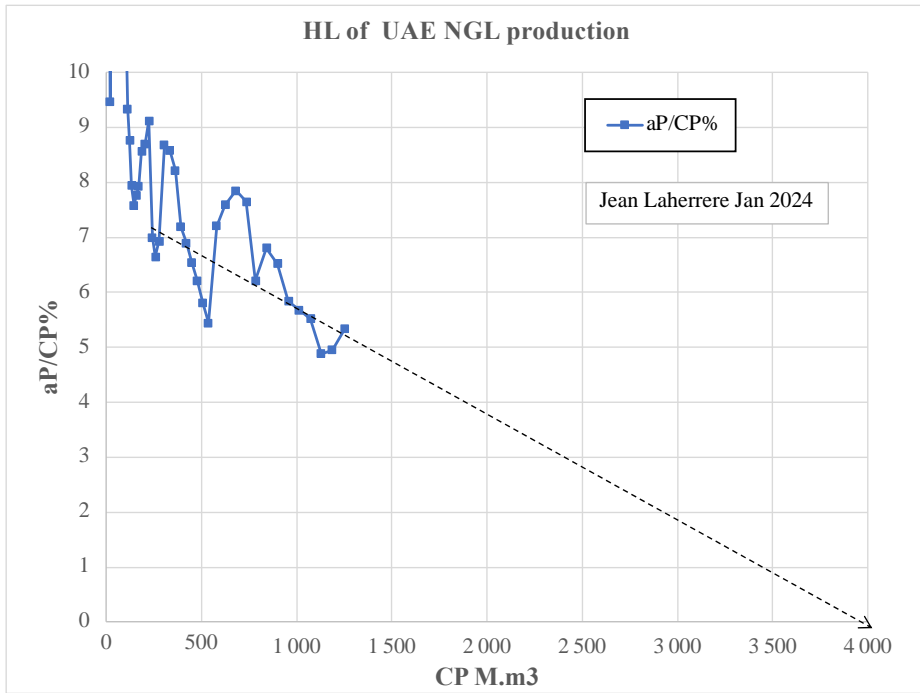


Canada NGL will peak around 2030 at 90 M.m3

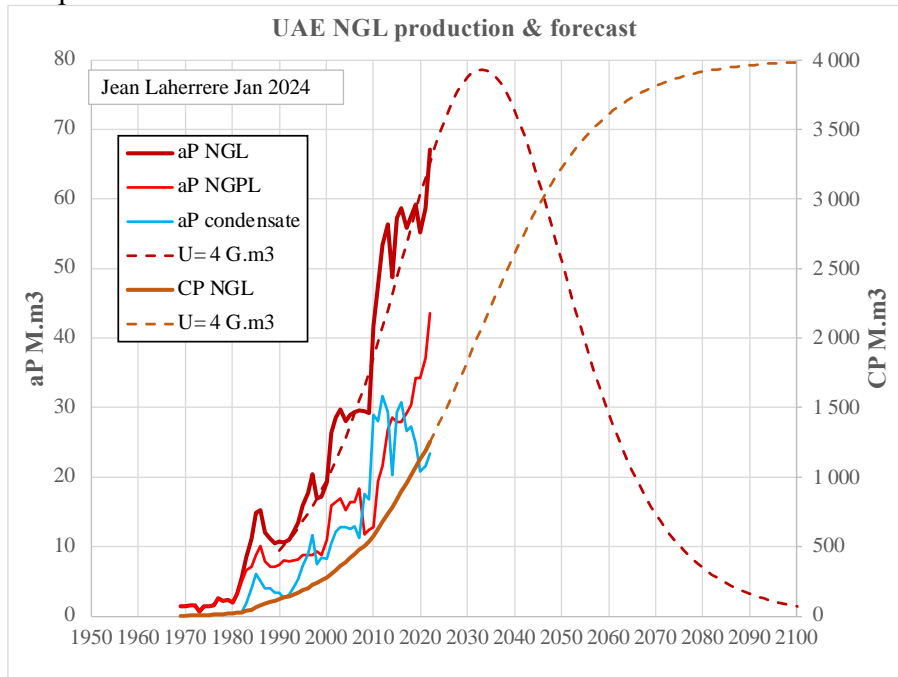


**-UAE**

HL is poor, trending towards 4 G.m3

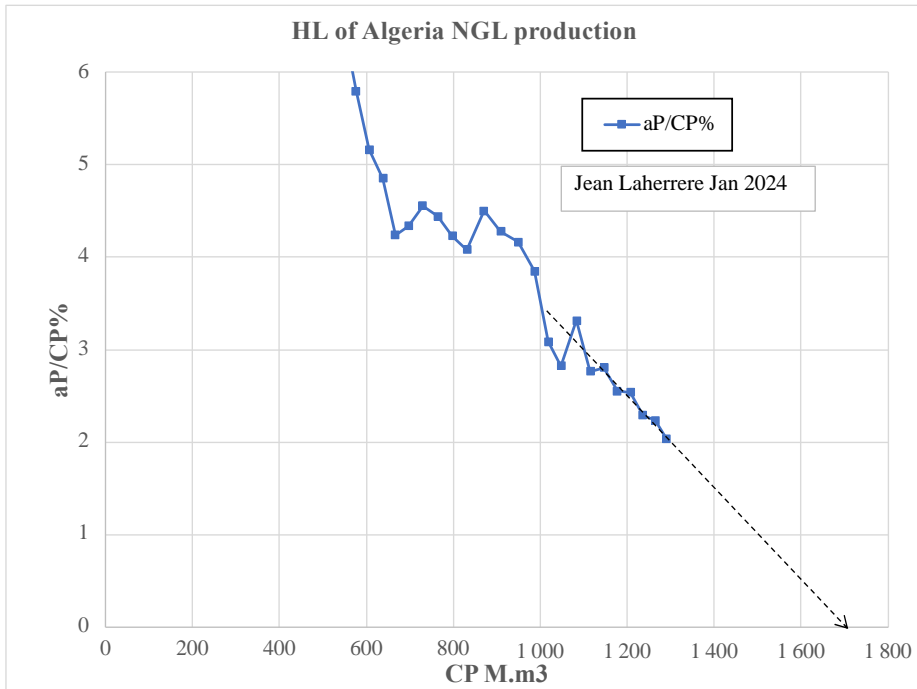


UAE NGL will peak around 2030 at 80 M.m3

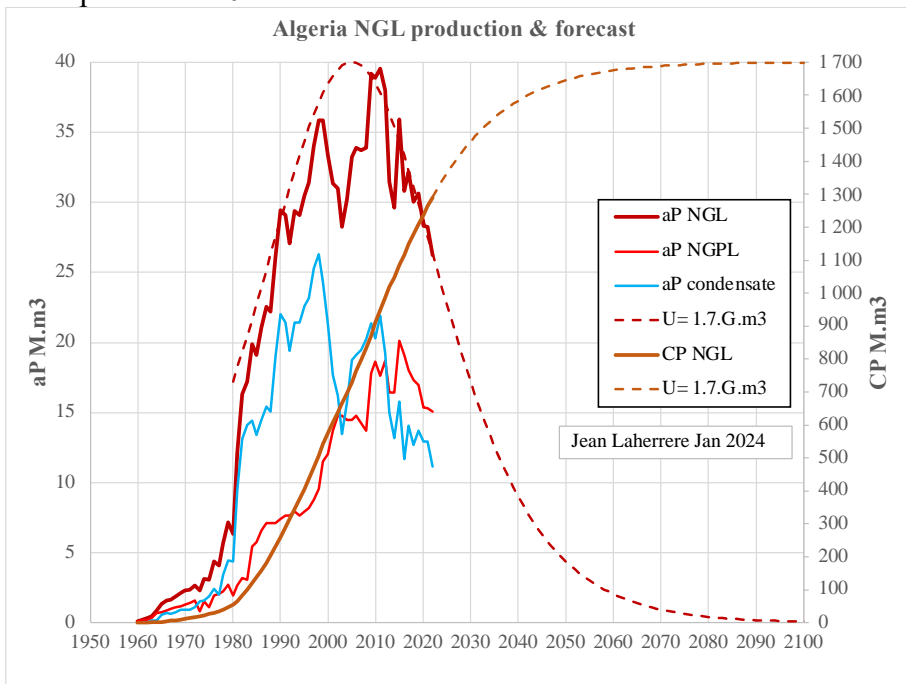


**-Algeria**

HL is fair, trending towards 1.7 G.m3

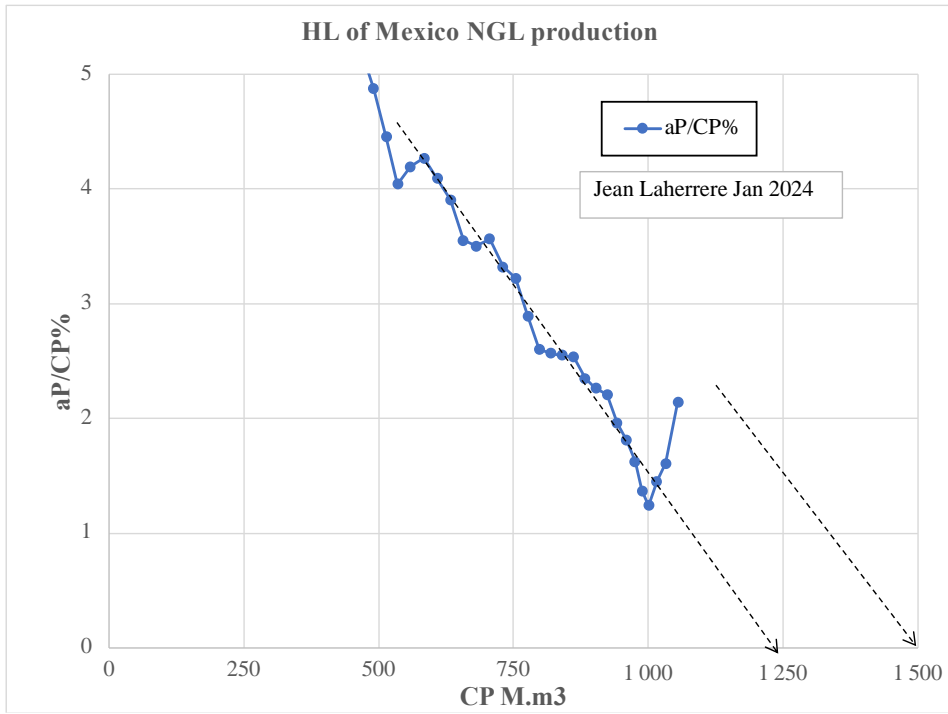


Algeria NGL has peaked in 2011

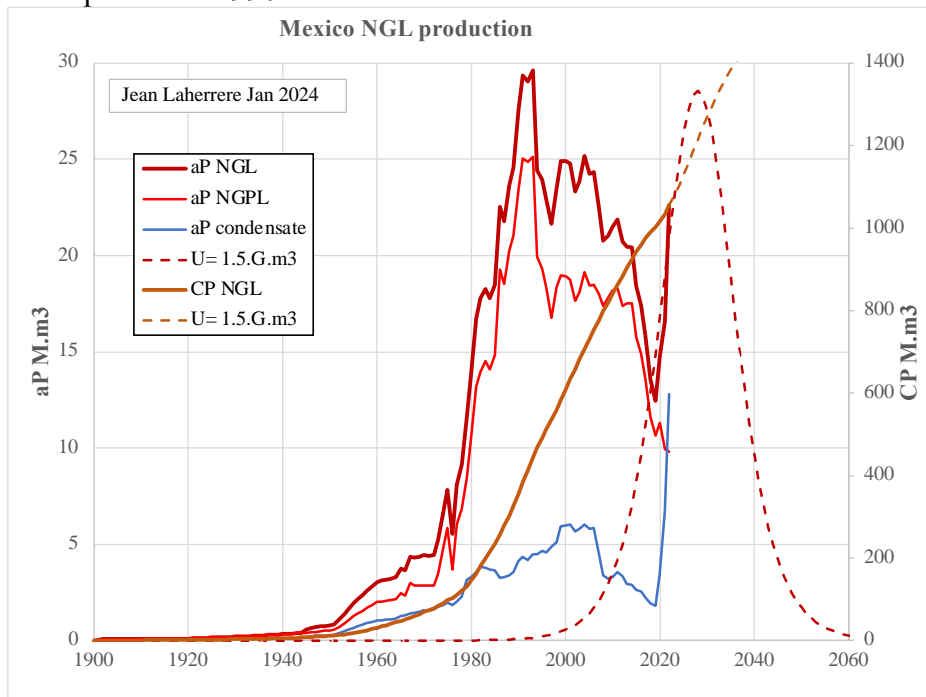


**-Mexico**

HL is useless: an ultimate of 1.5 G.m3 is guessed

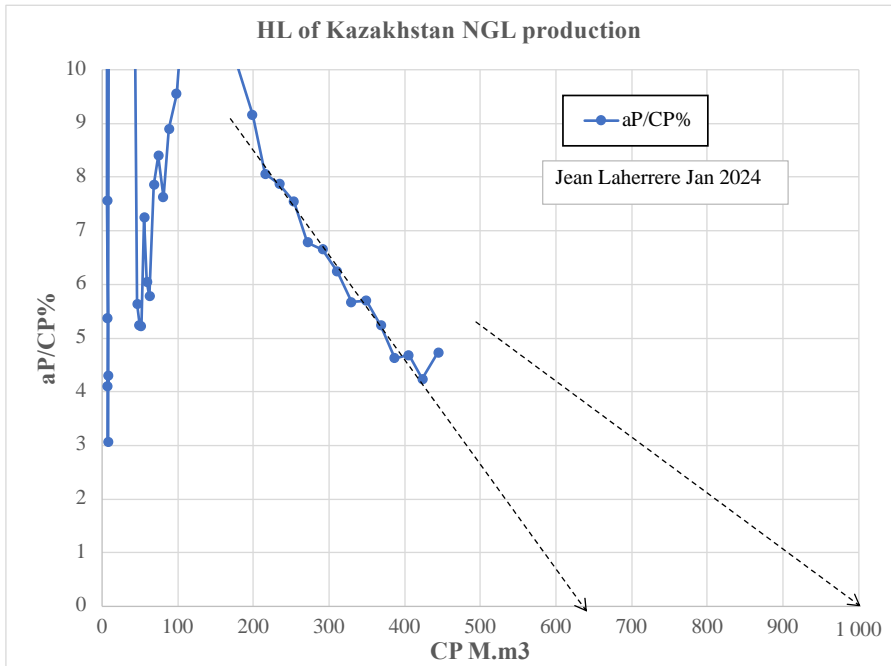


Mexico NGL has peaked in 1990

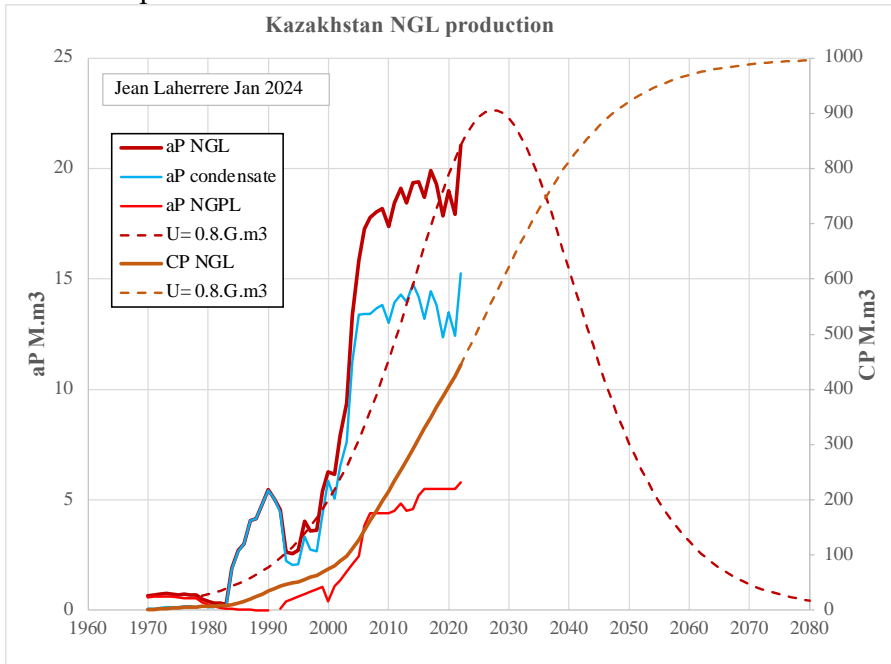


**-Kazakhstan**

HL is useless: an ultimate of 1 G.M3 is guessed

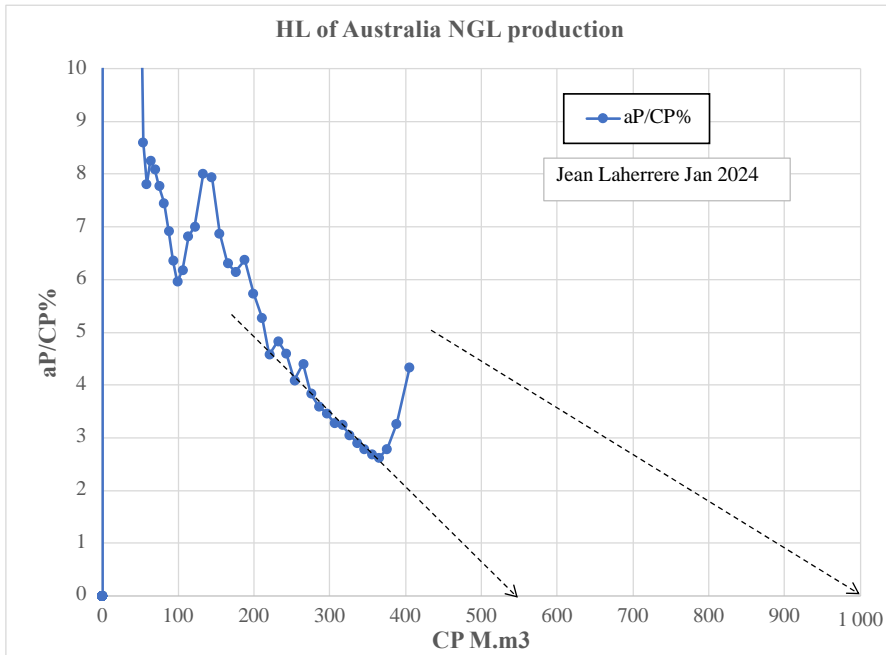


Kazakhstan NGL will peak about 2030 at 23 M.m3

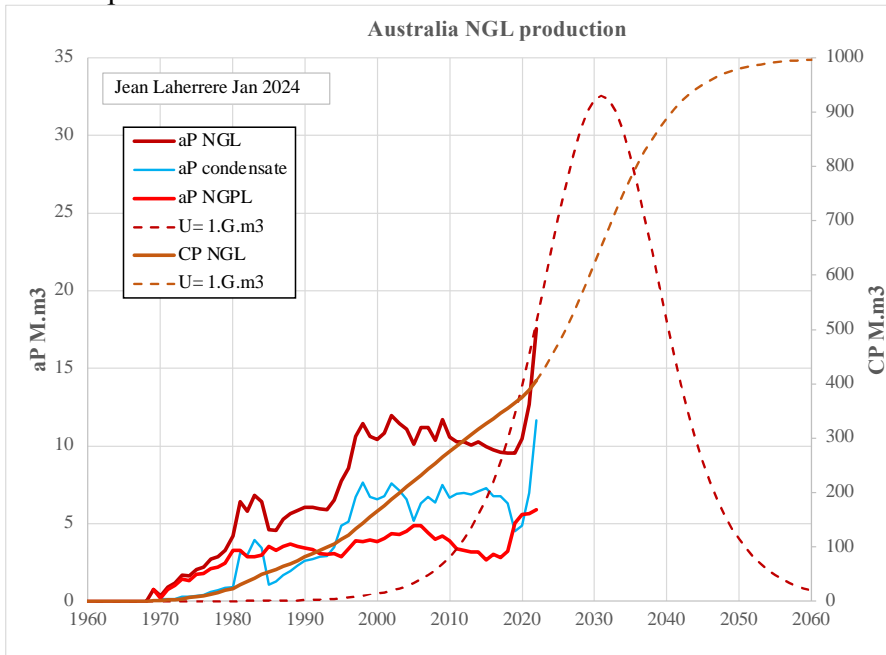


**-Australia**

HL is useless and an ultimate of 1 G.m3 is guessed



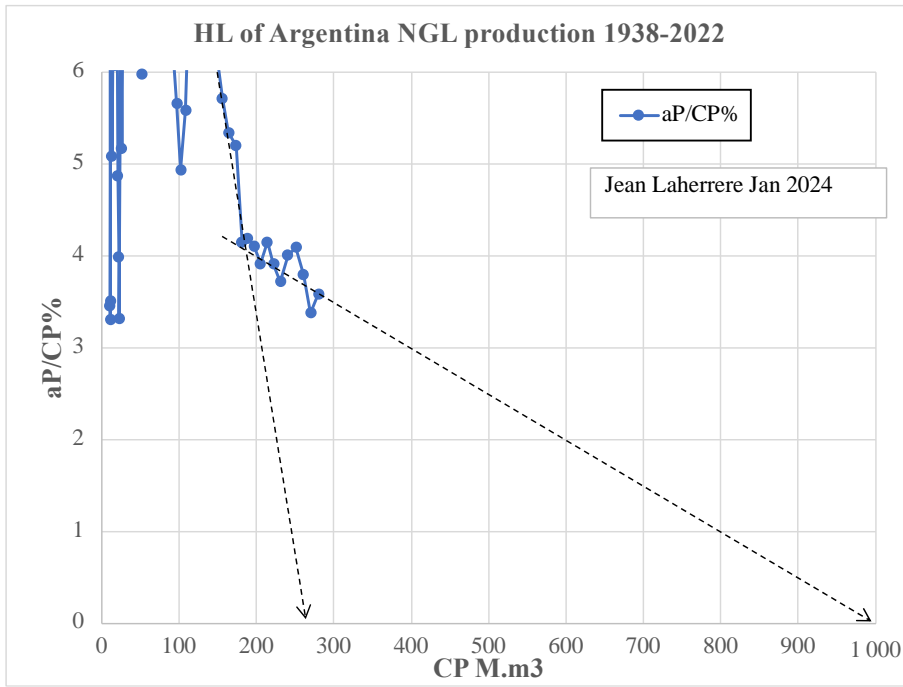
Australia NGL will peak around 2030 at 32 M.m3



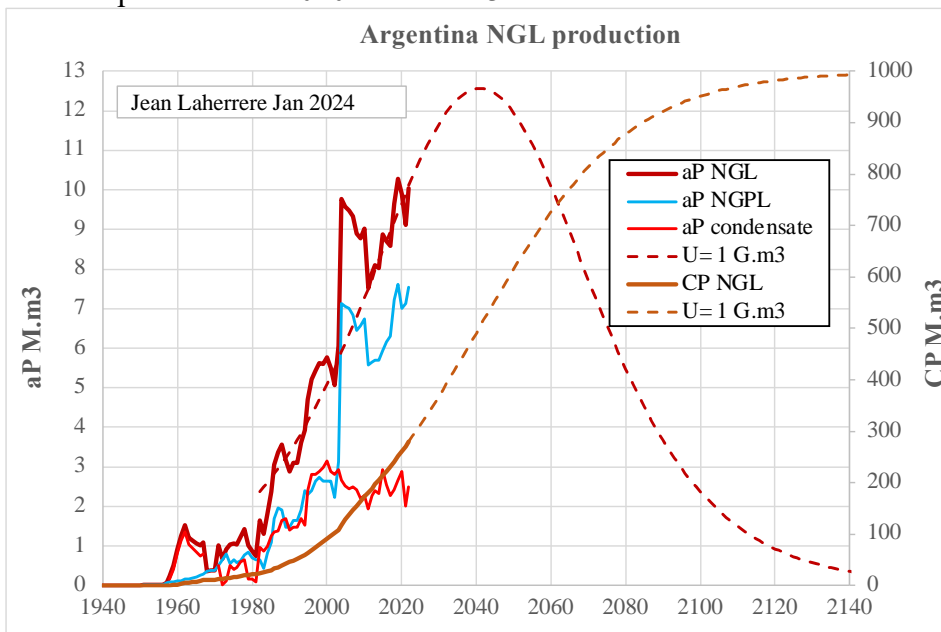
**-Argentina**

HL is very poor (VP) trending towards 1 G.m3



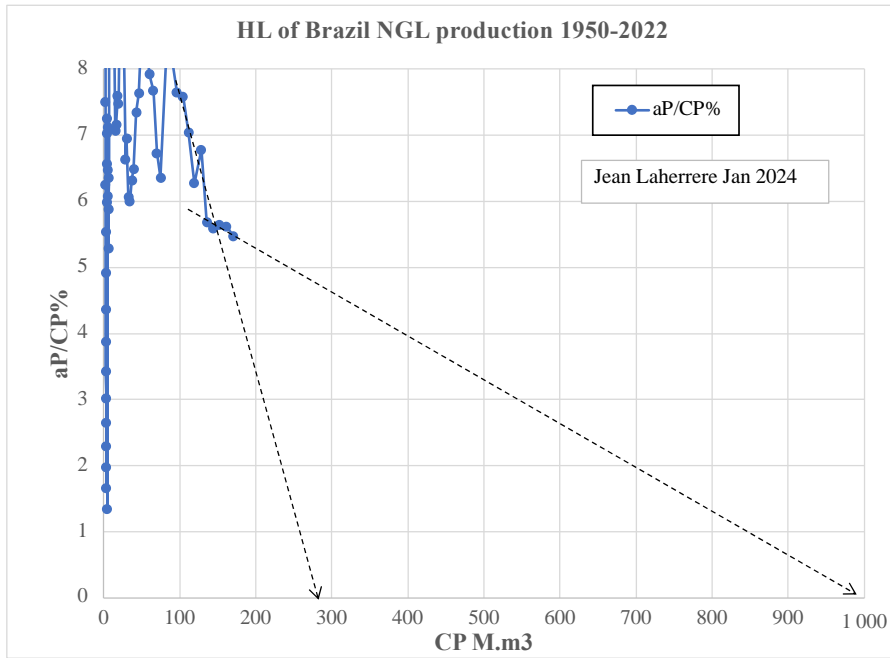


Argentina NGL will peak around 2040 at 12 M.m3

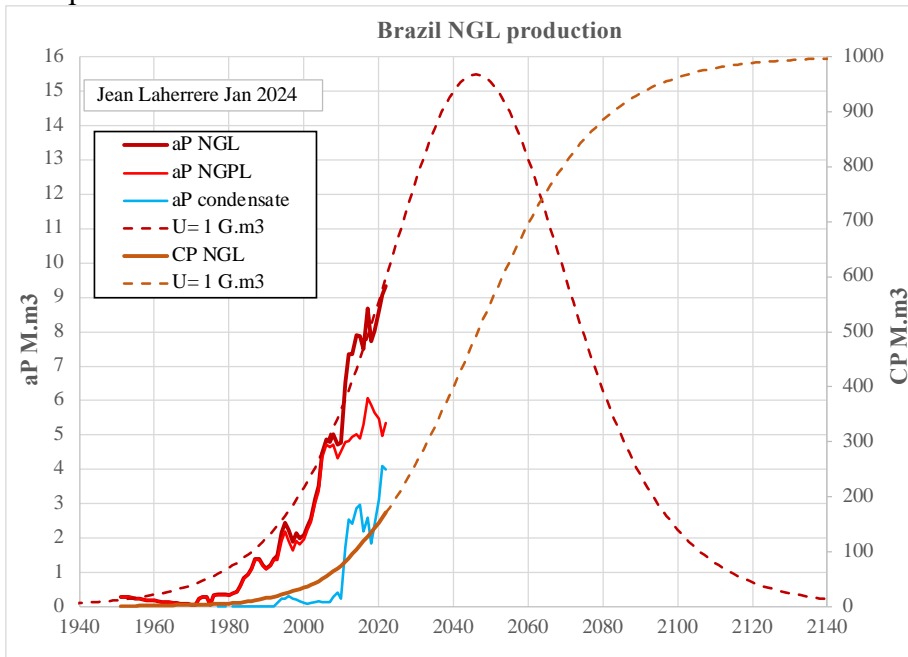


**-Brazil**

HL is VP trending towards 1 G.m3

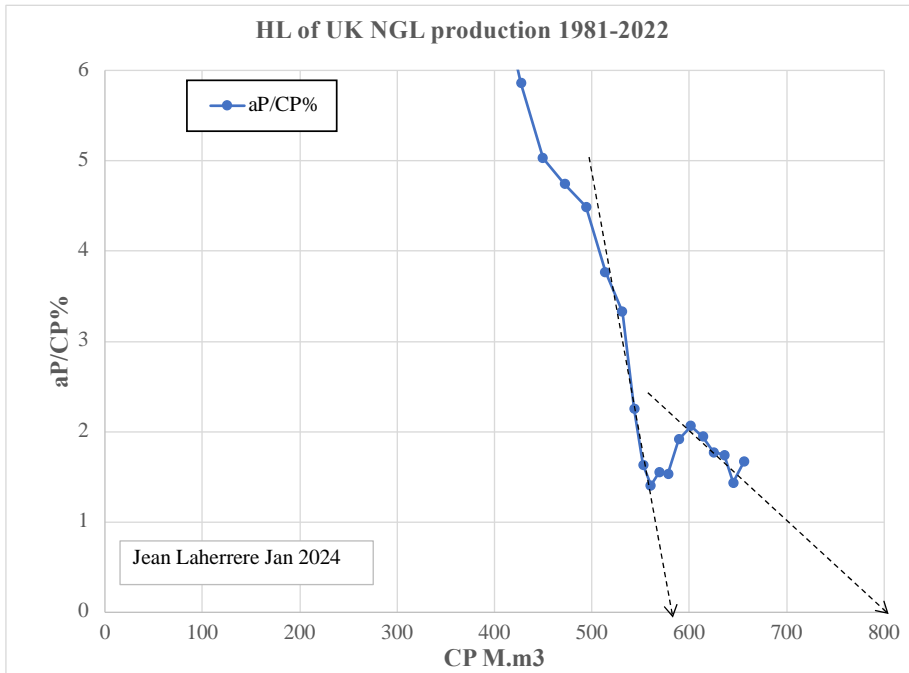


Brazil NGL will peak around 2040 at 15 G.m3

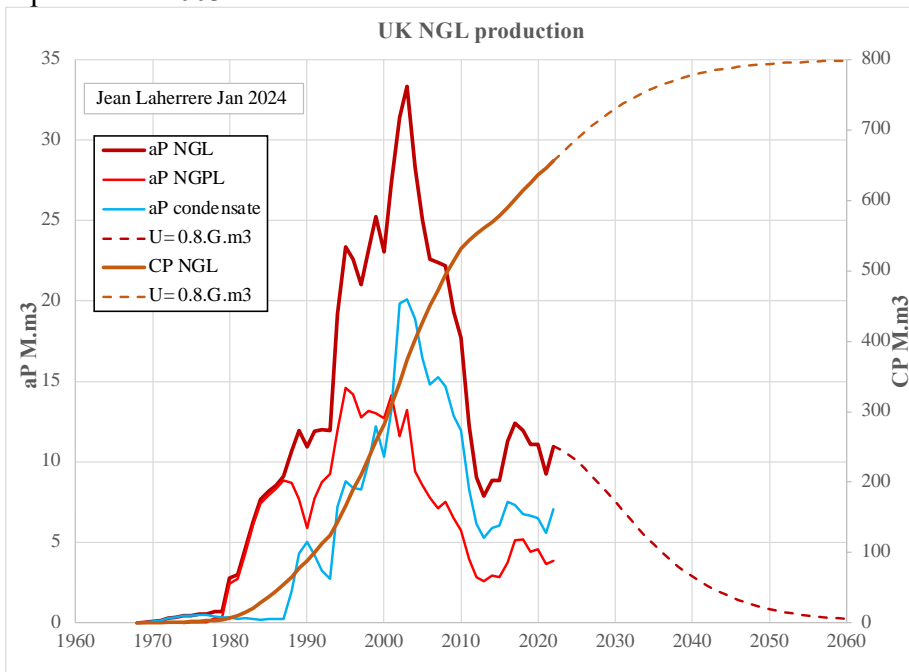


-UK

HL is poor trending towards 0.8 G.m3

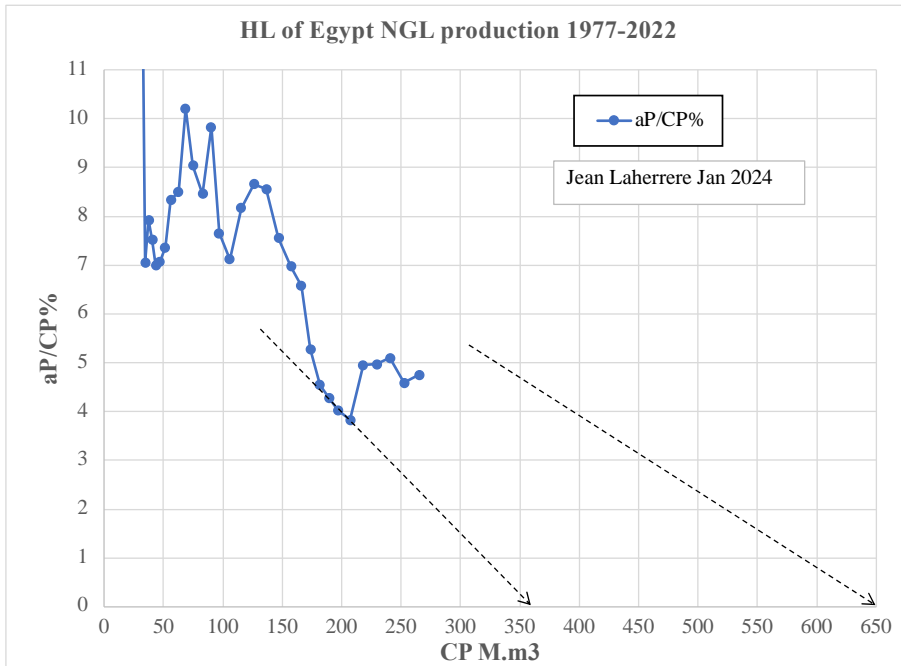


UK NGL has peaked in 2003

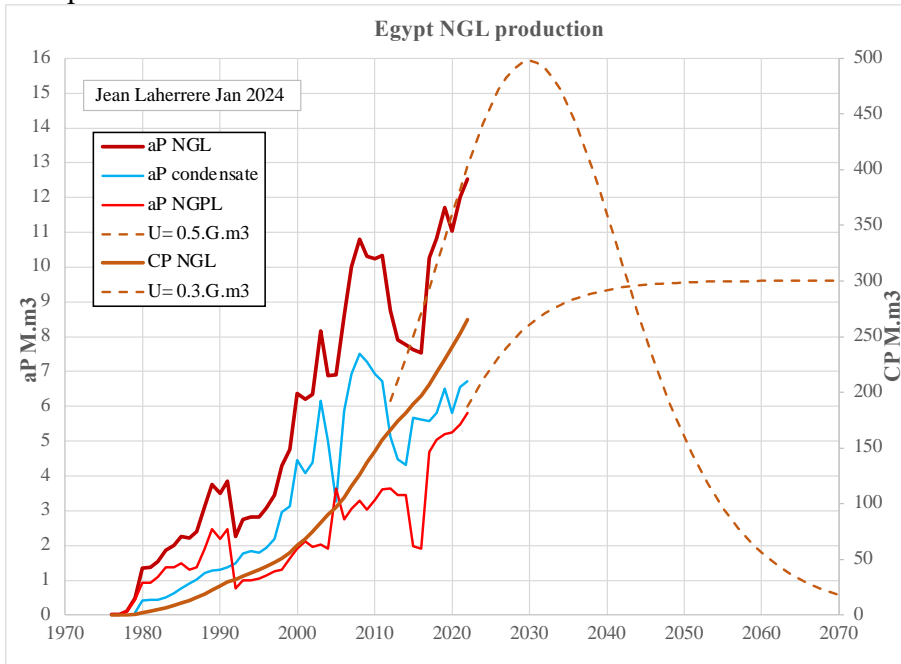


**-Egypt**

HL is useless and an ultimate of 0.65 G.m3 is guessed

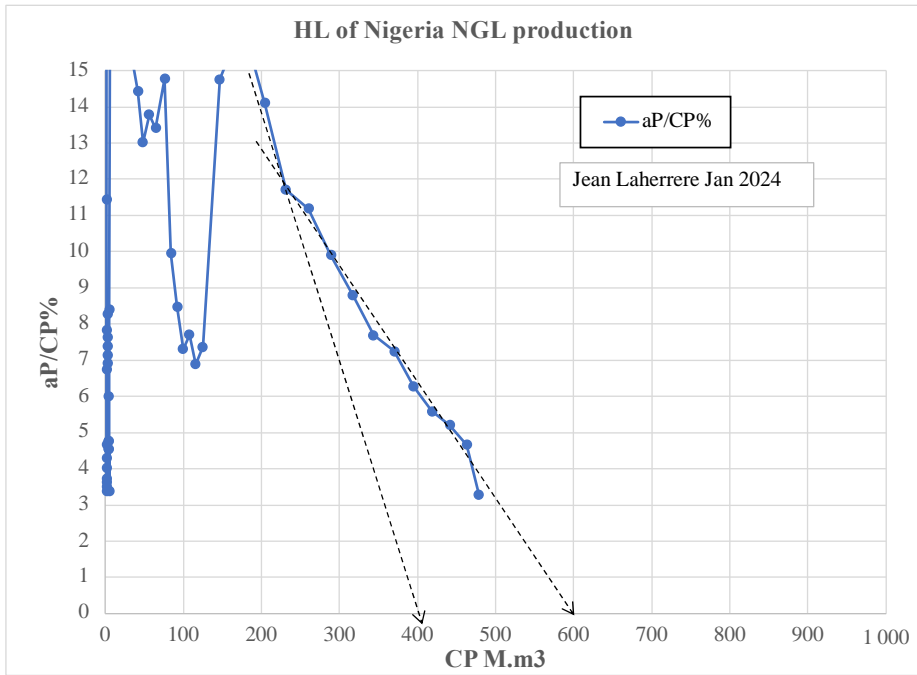


Egypt NGL will peak around 2030 at 16 M.m3

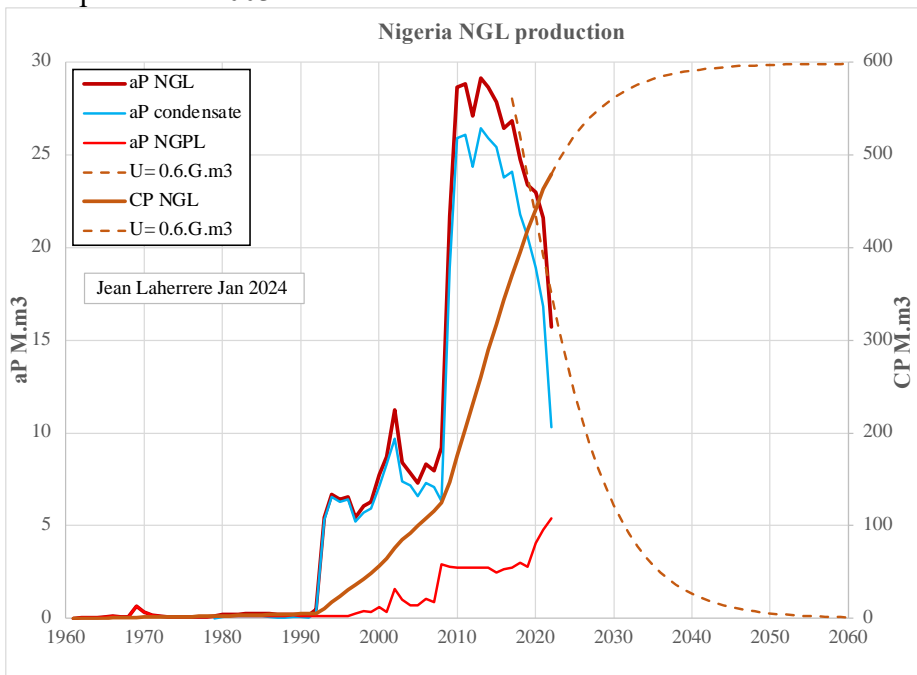


**-Nigeria**

HL is fair trending towards 0.6 G.m3

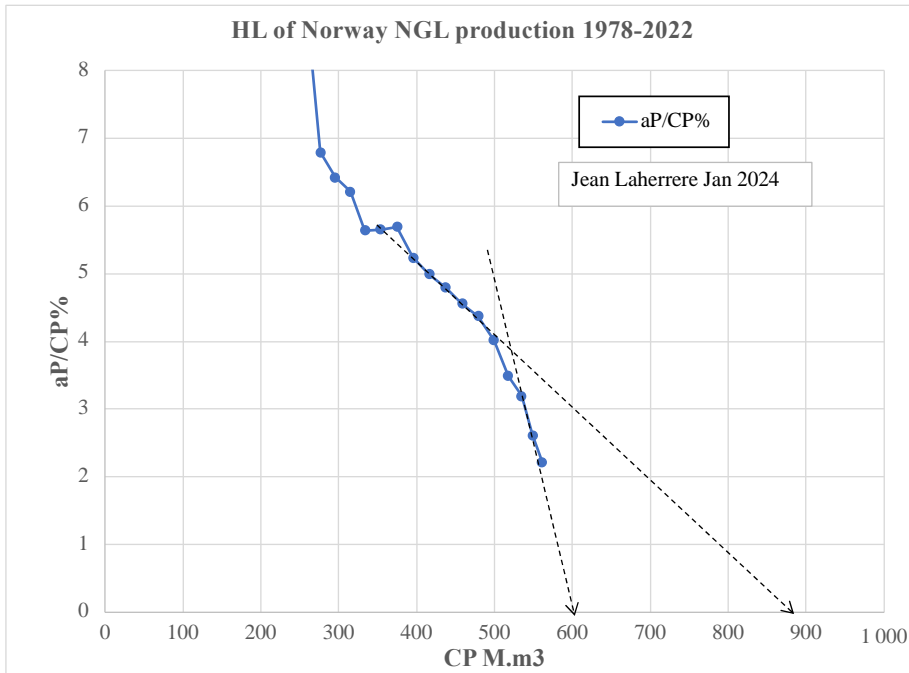


Nigeria NGL has peaked in 2003

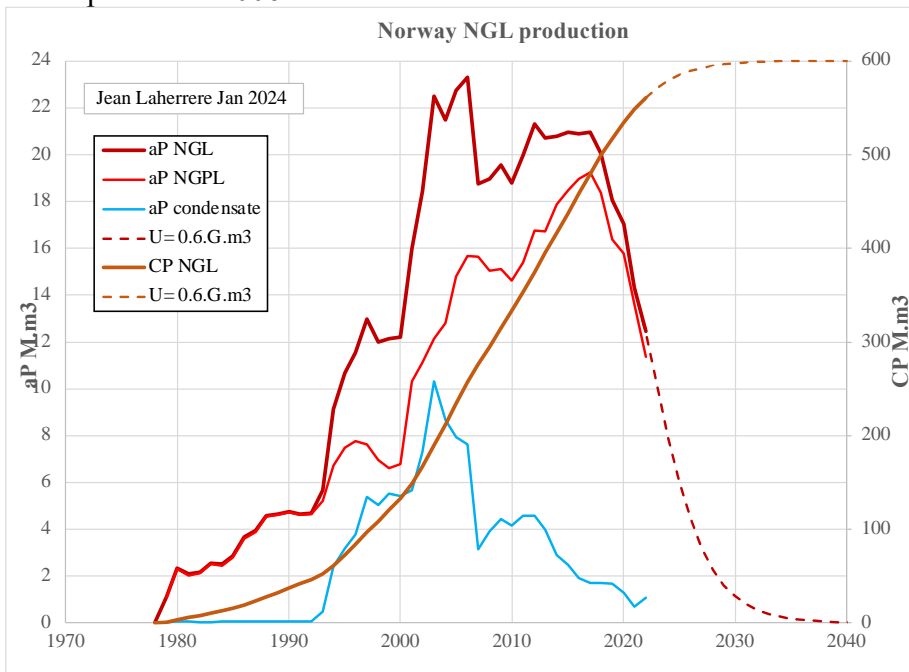


-Norway

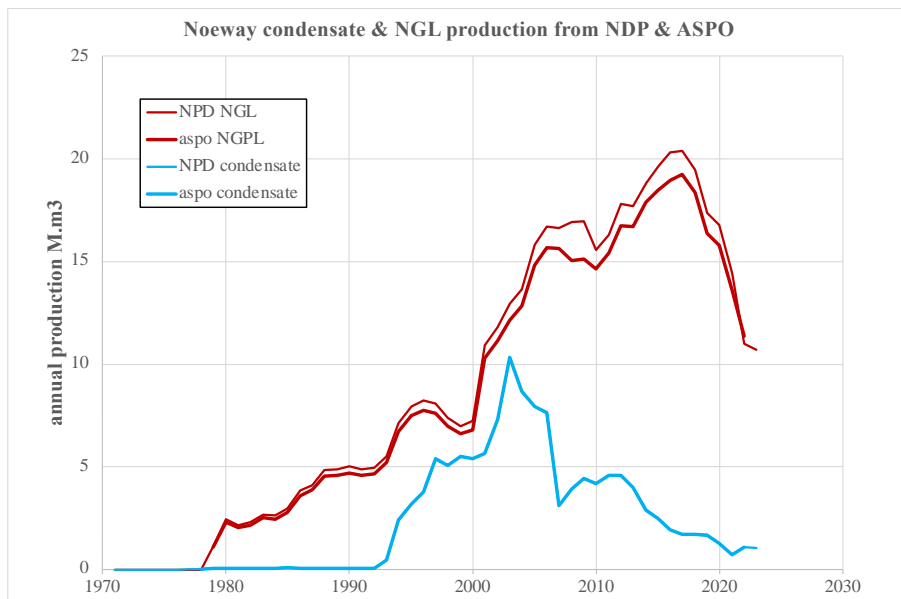
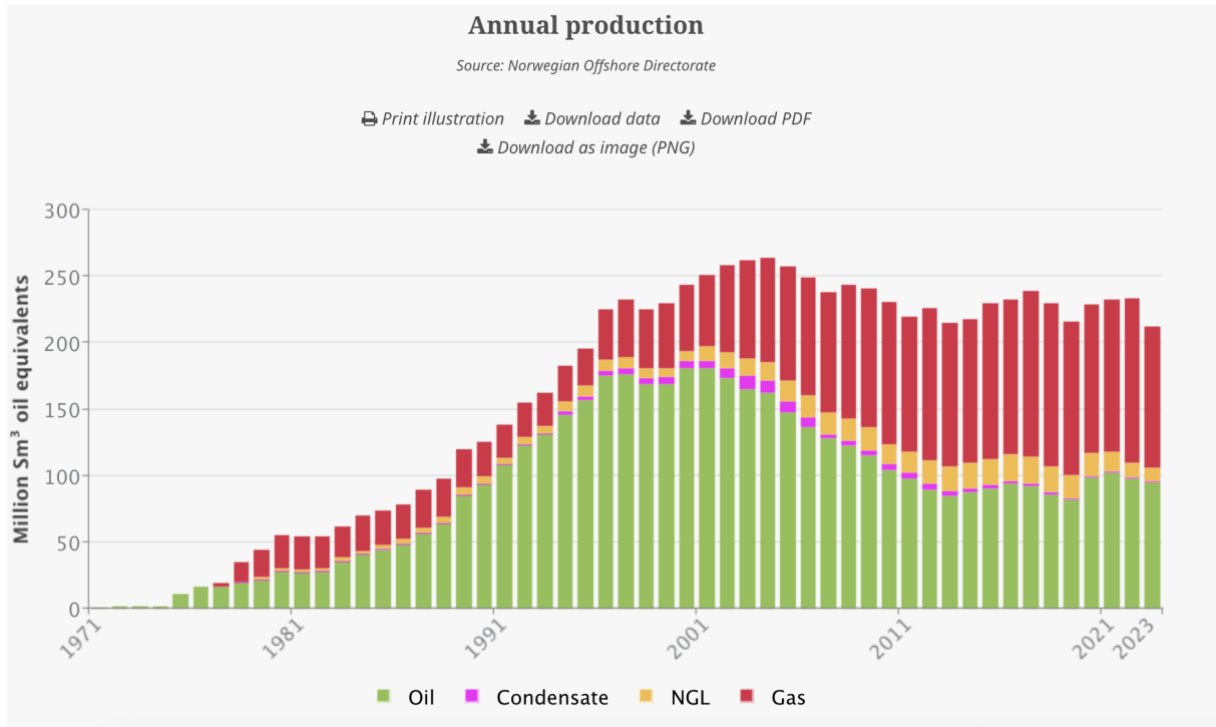
HL is poor trending towards 0.6 G.m3



Norway NGL has peaked in 2006

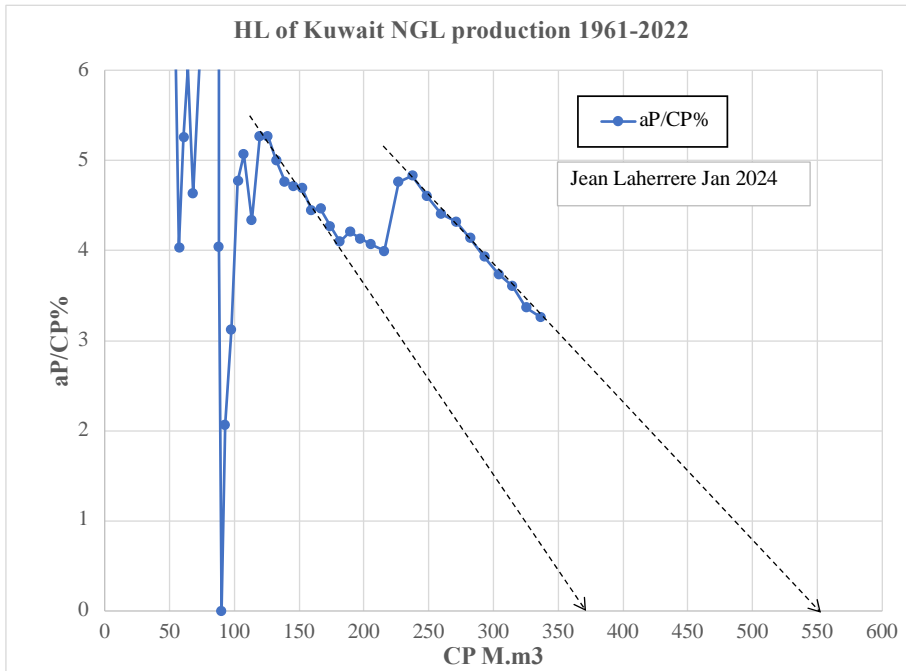


NPD (now NOD as Petroleum was changed in offshore as metal is the new target) calls NGL what is NGPL for ASPO

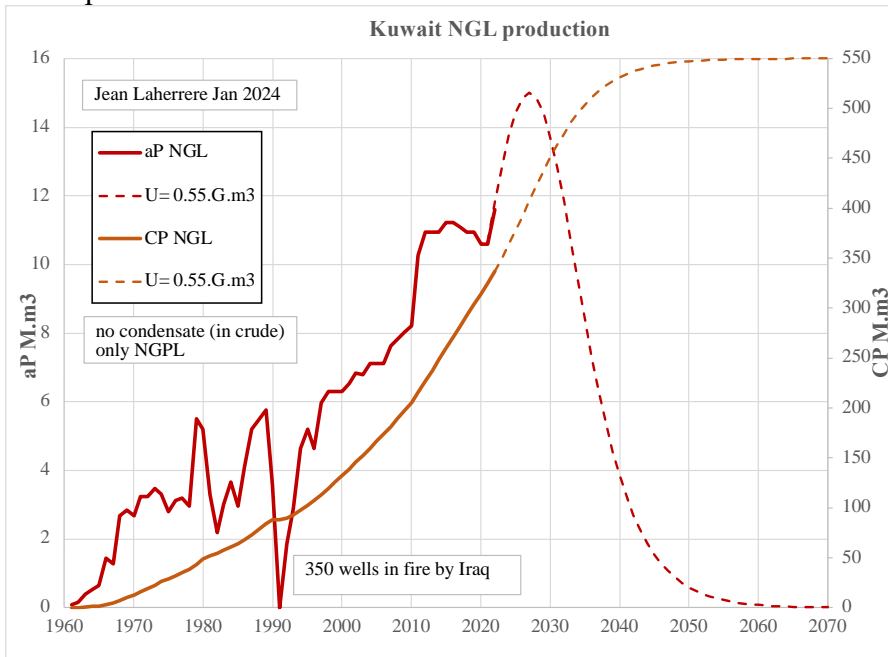


**-Kuwait**

HL is fair trending towards 0,55 G.m3



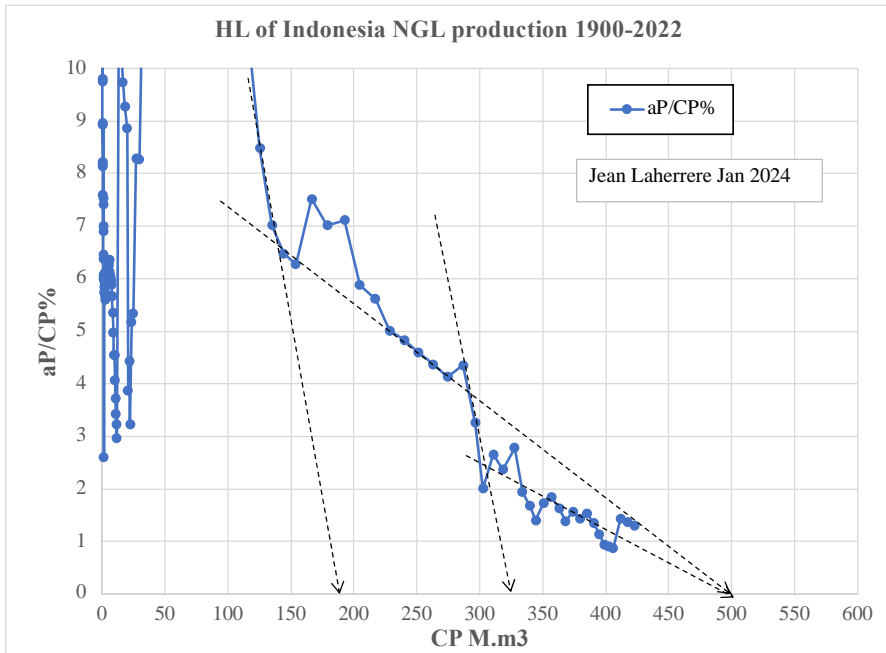
Kuwait NGL will peak around 2035 at 15 M.m3



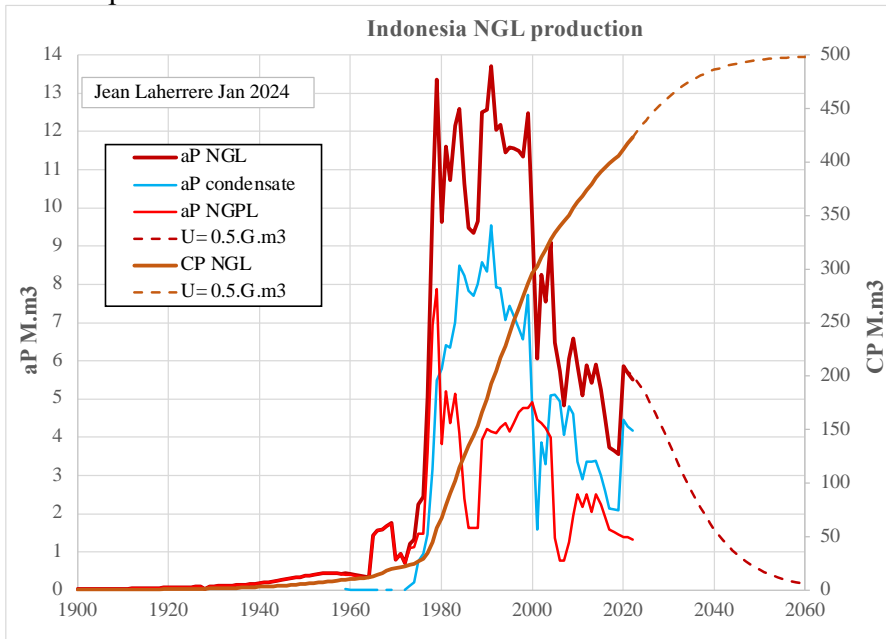
**-Indonesia**

HL is poor trending towards 3.5 G.m3



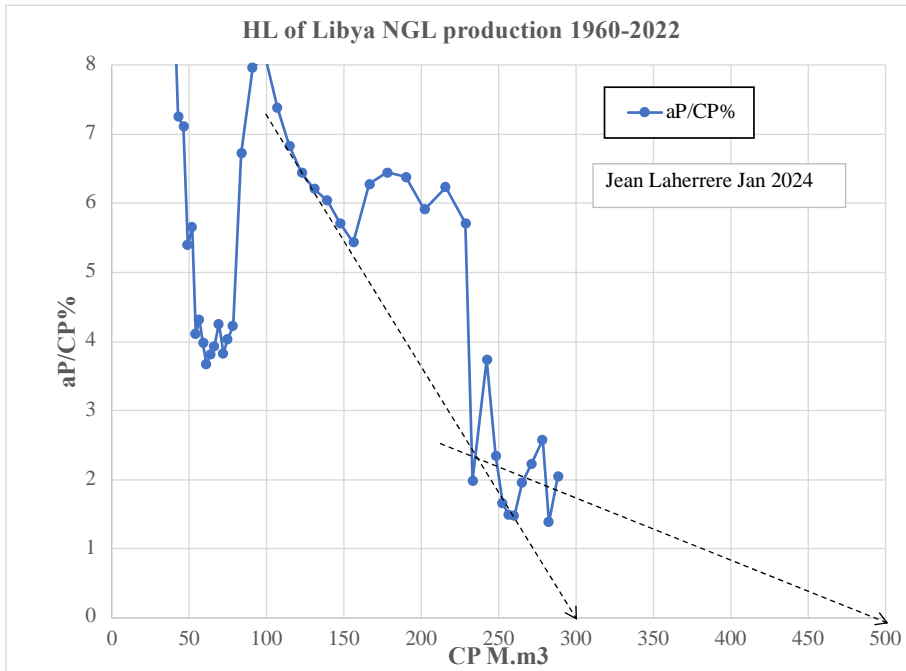


Indonesia NGL has peaked in 1991

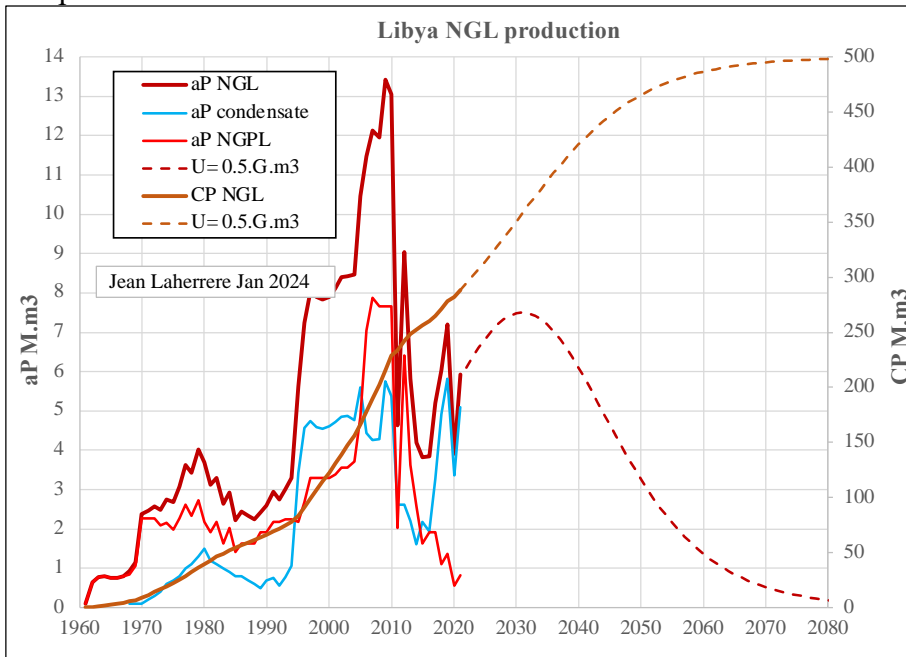


**-Libya**

HL is useless: an ultimate of 0,5 G.m3 is guessed

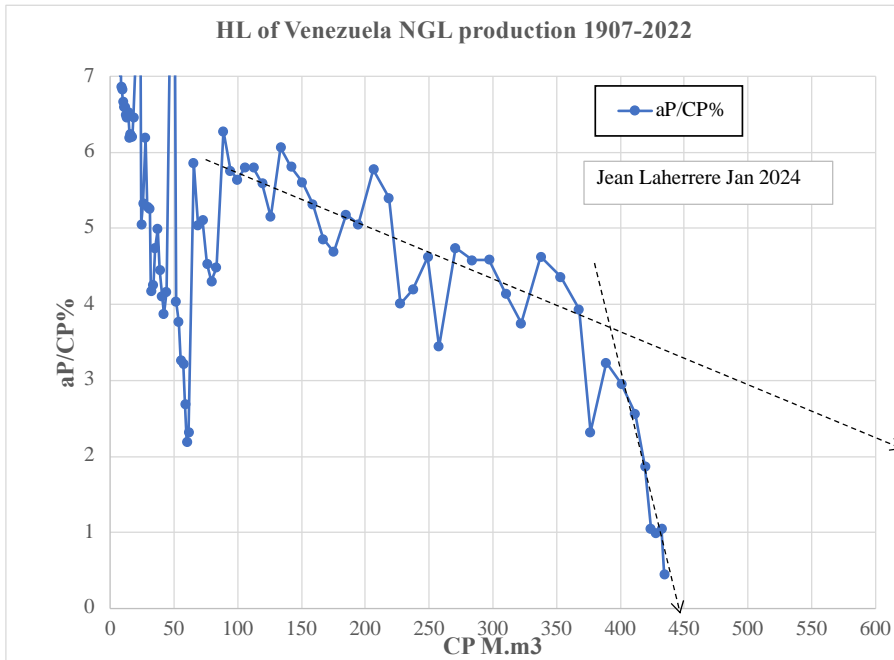


Libya NGL has peaked in 2009

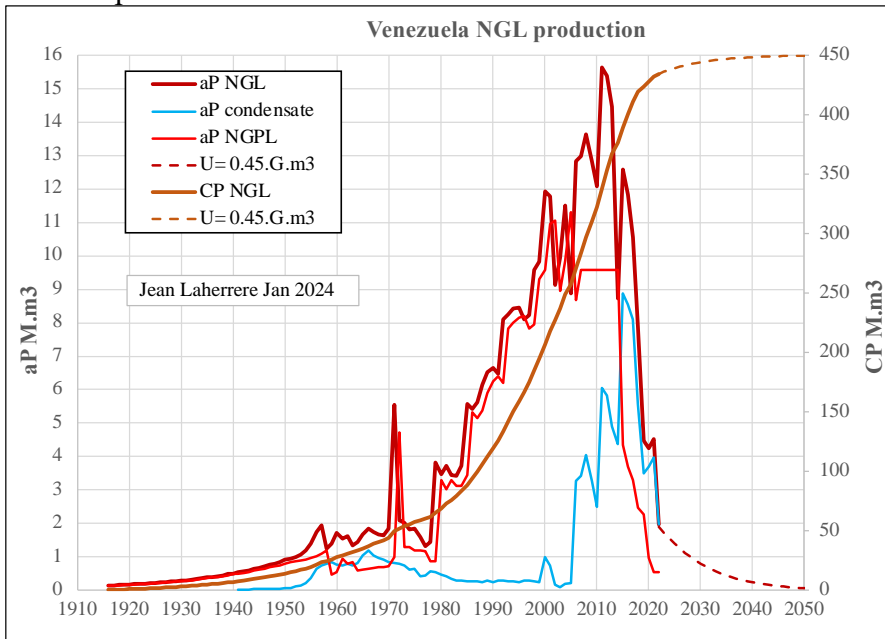


**-Venezuela**

HL is good (? but due to bad pollical behavior) trending towards 0.45 G.m3



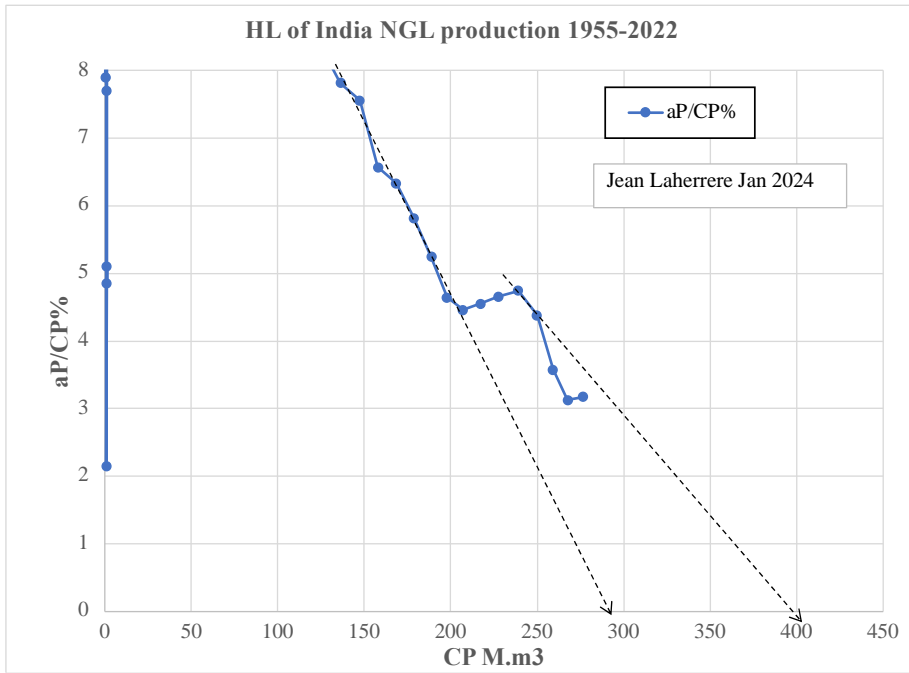
Venezuela NGL has peaked in 2011



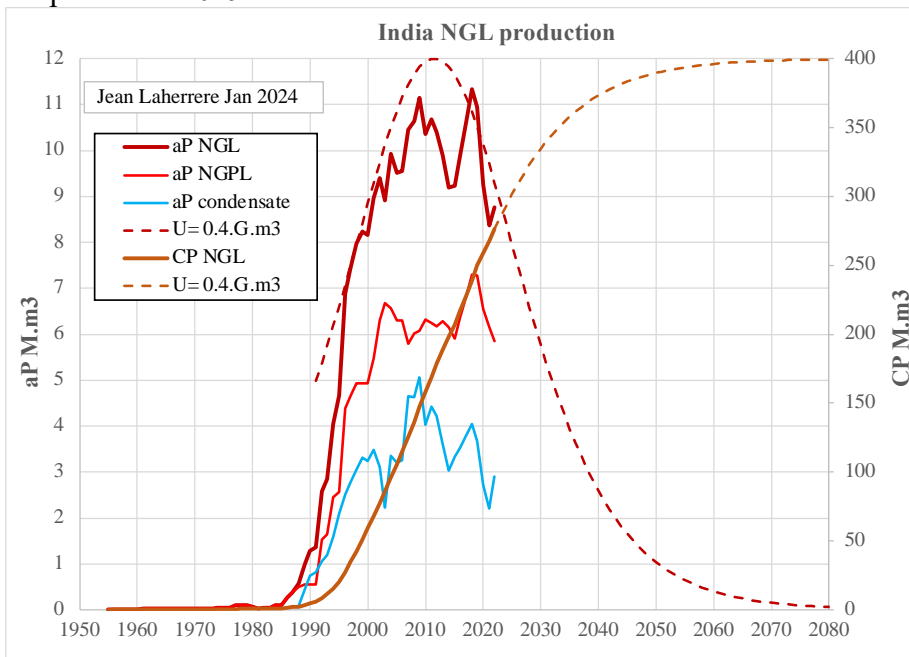
There are large reserves of unproduced gas close to Orinoco, which can be used to produced Orinoco extra heavy oil

**-India**

HL is VP trending towards 0.4 G.m3

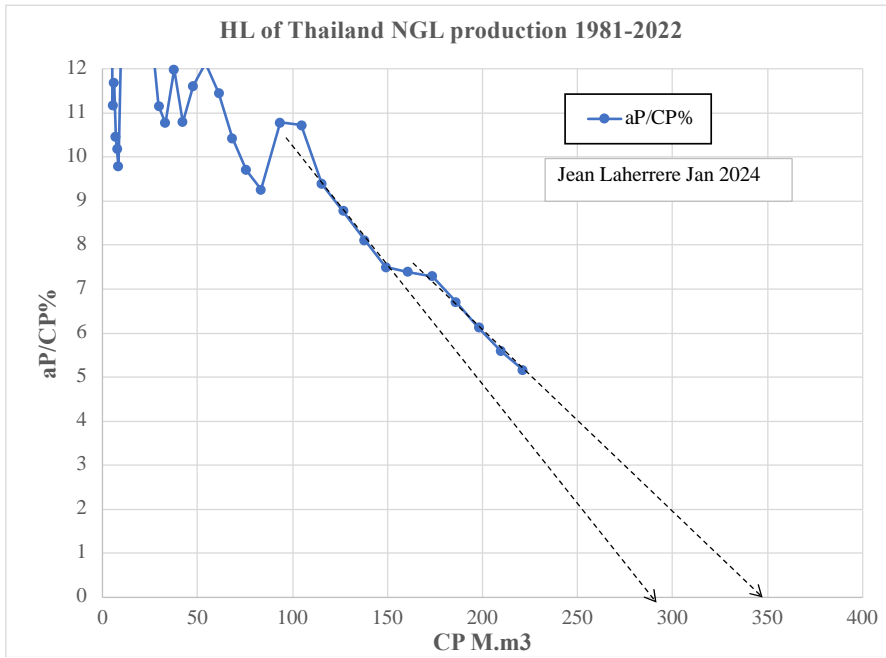


India NGL has peaked in 2019

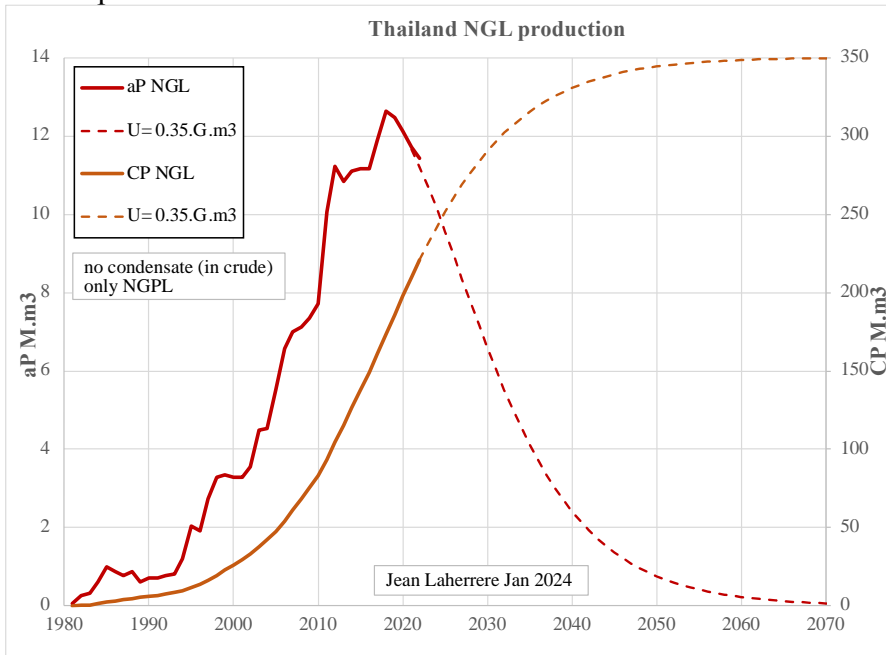


**-Thailand**

HL is fair trending towards 0,35 G.m3

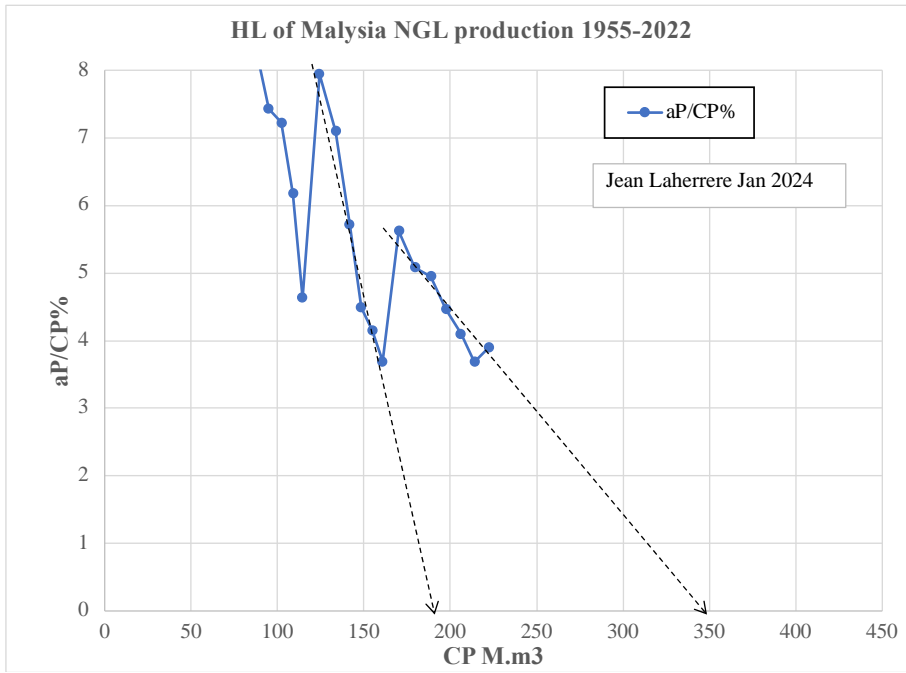


Thailand NGL has peaked in 2018

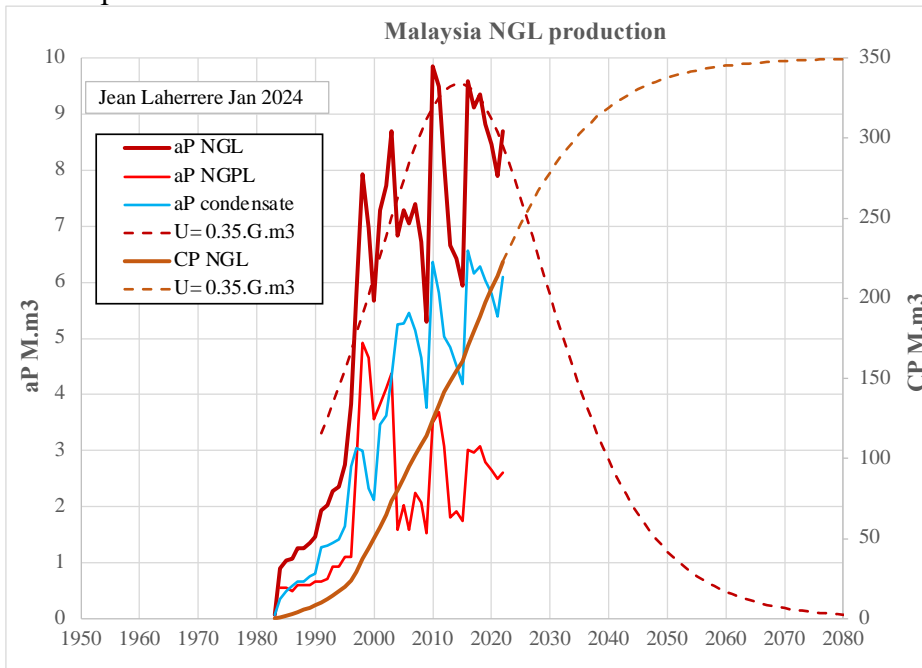


**-Malaysia**

HL is poor trending towards 0.35 G.m3

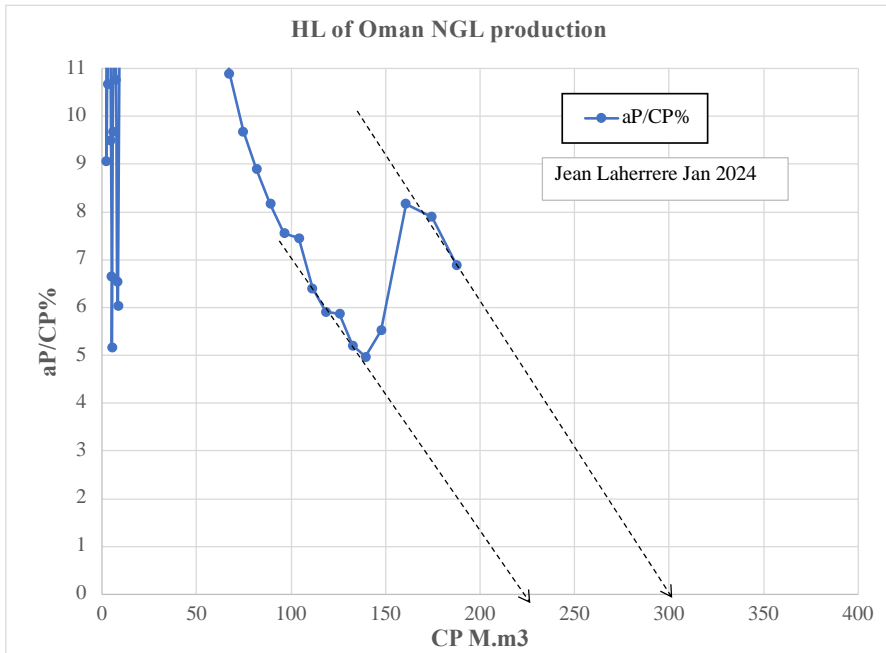


Malaysia NGL has peaked in 2010

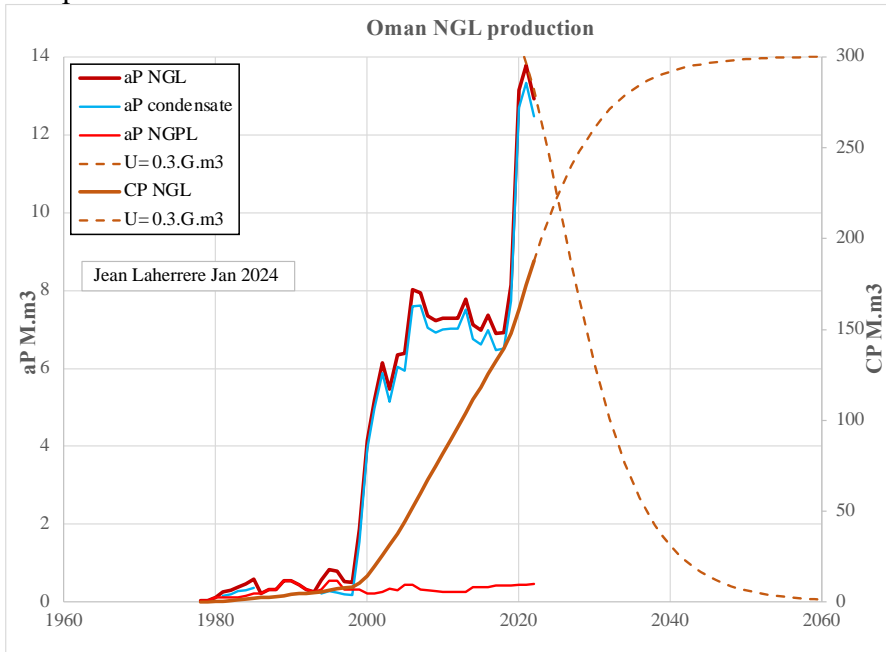


**-Oman**

HL is poor trending towards 0.3 G.m3

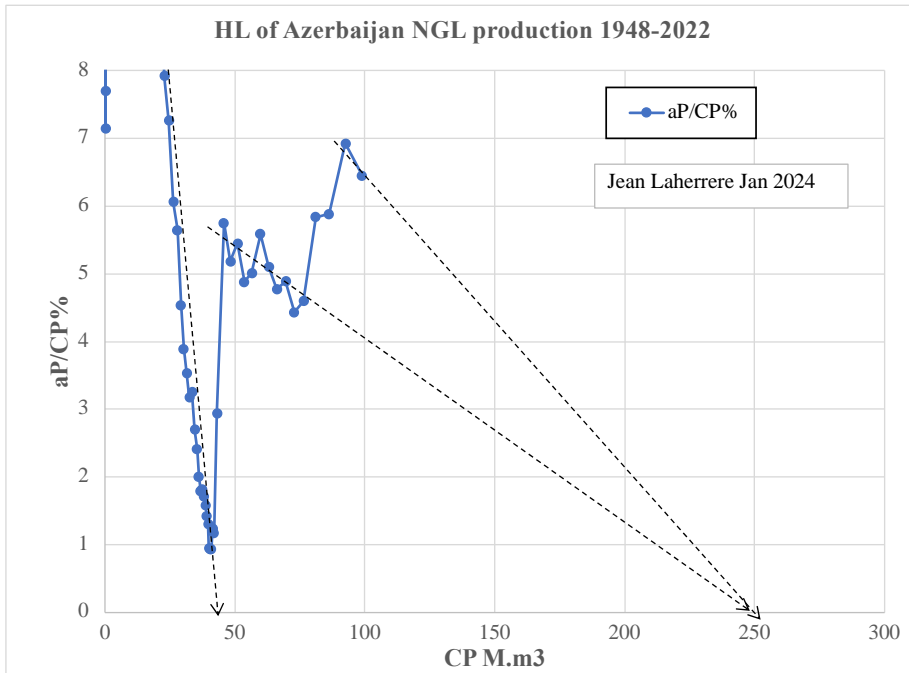


Oman NGL has peaked in 2021

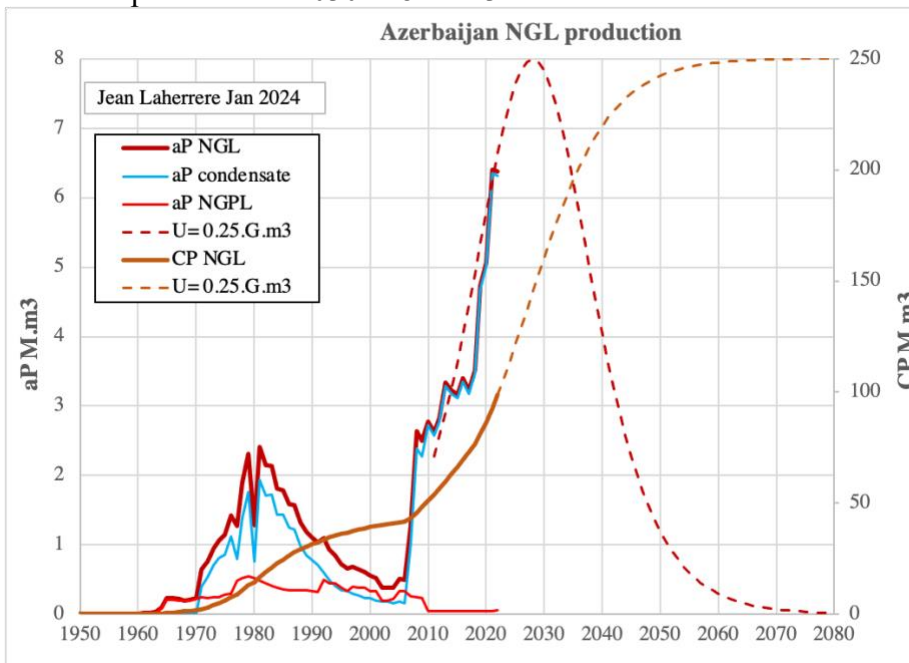


**-Azerbaijan**

HL is very poor trending towards 0,25 G.m3



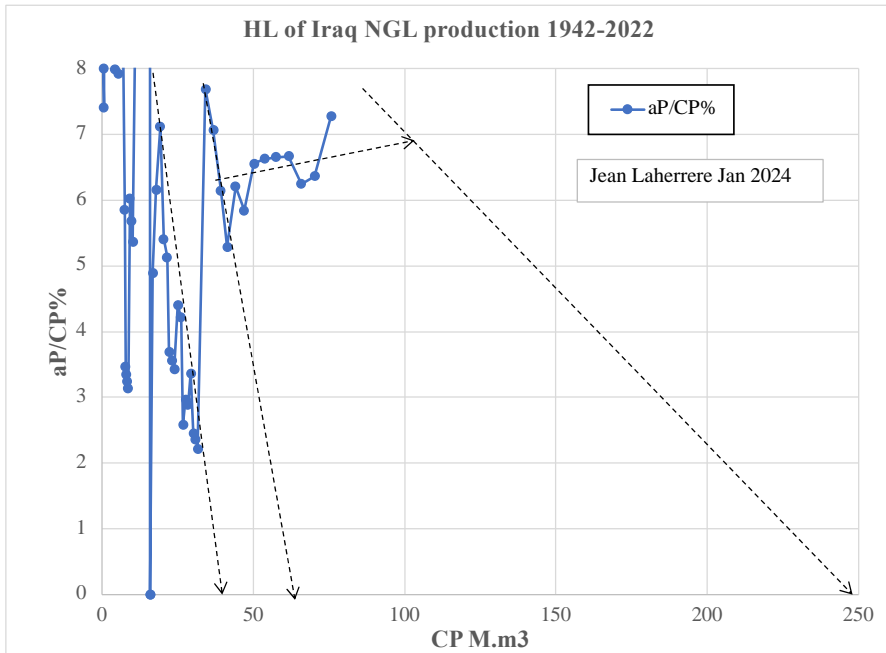
Azerbaijan NGL will peak around 2030 at 8 M.m3



**-Iraq**

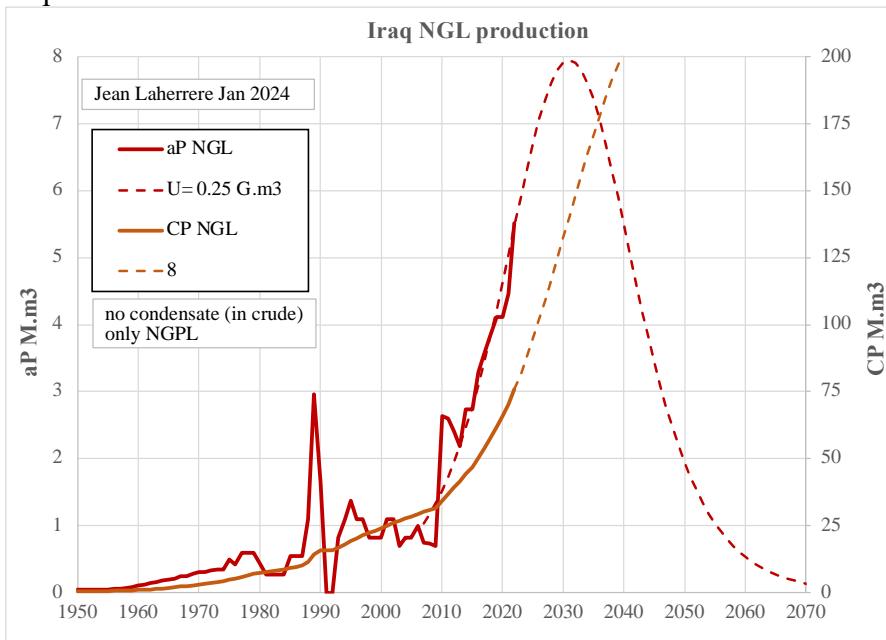
HL is useless and an ultimate of 0.25 G.m3 is guessed





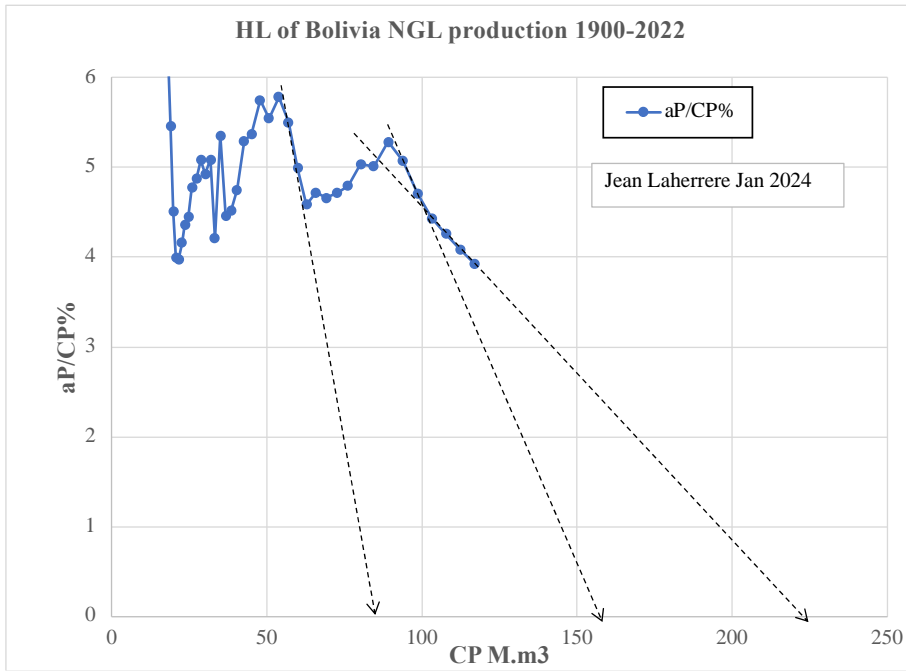
A lot of gas is flared in Iraq (largest flaring after Russia) by lack of pipelines: Iraq is working with the World Bank through the Global Gas Flaring Reduction Partnership to bring flaring to an end by 2030.

Iraq NGL will peak around 2030 at 8 M.m3

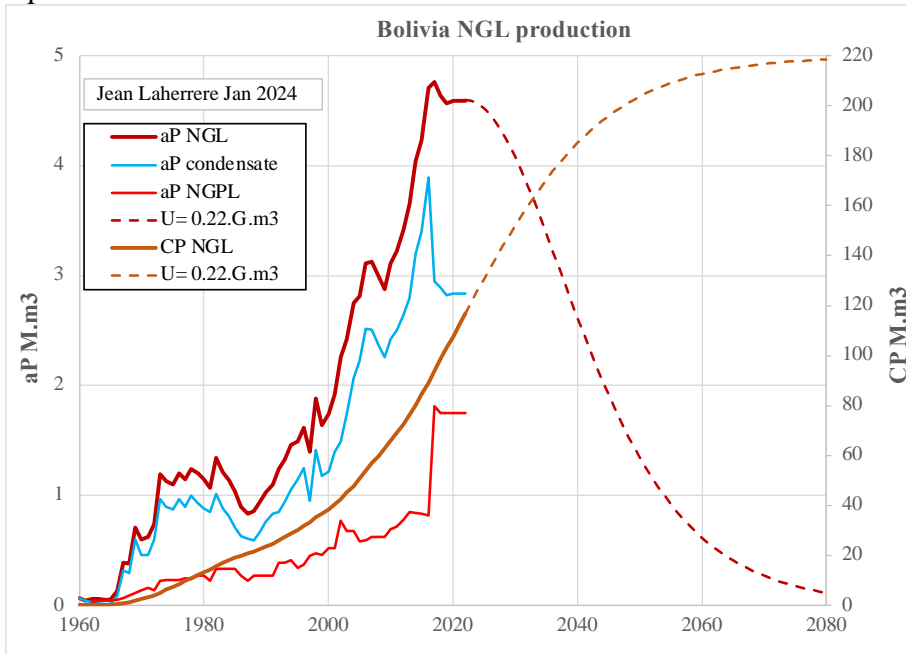


**-Bolivia**

HL is fair, trending towards 0.22 G.m3

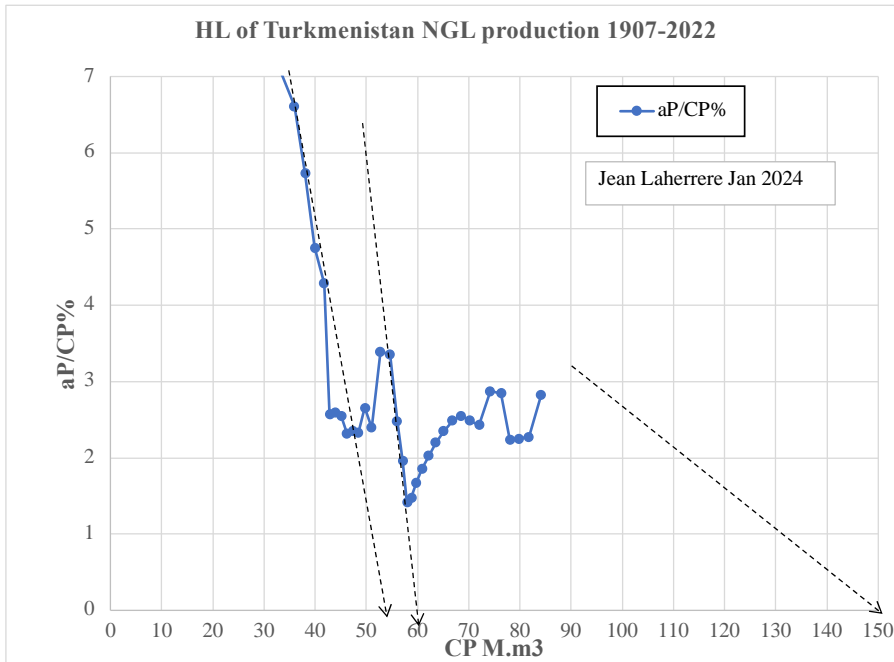


Bolivia NGL peaked in 2018

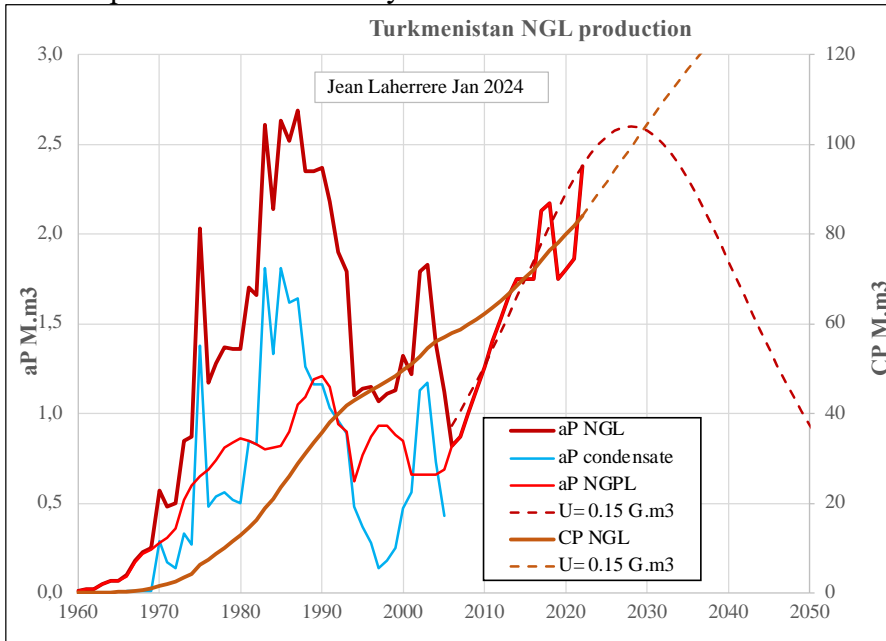


**-Turkmenistan**

HL is useless: a n ultimate of 0.15 G.m3 w is guessed

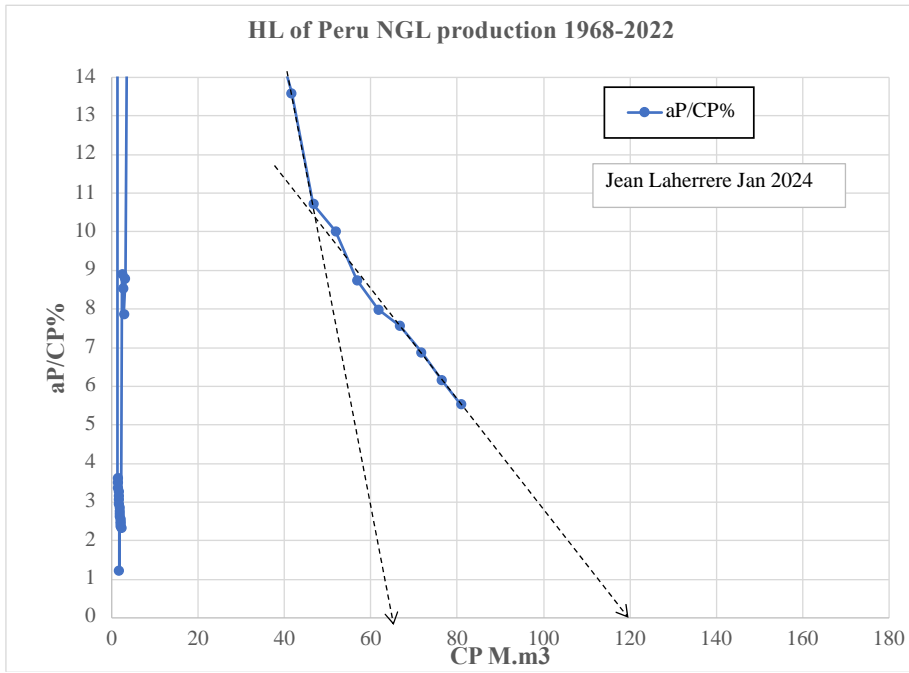


Turkmenistan NGL peaked in 1987 or maybe around 2030

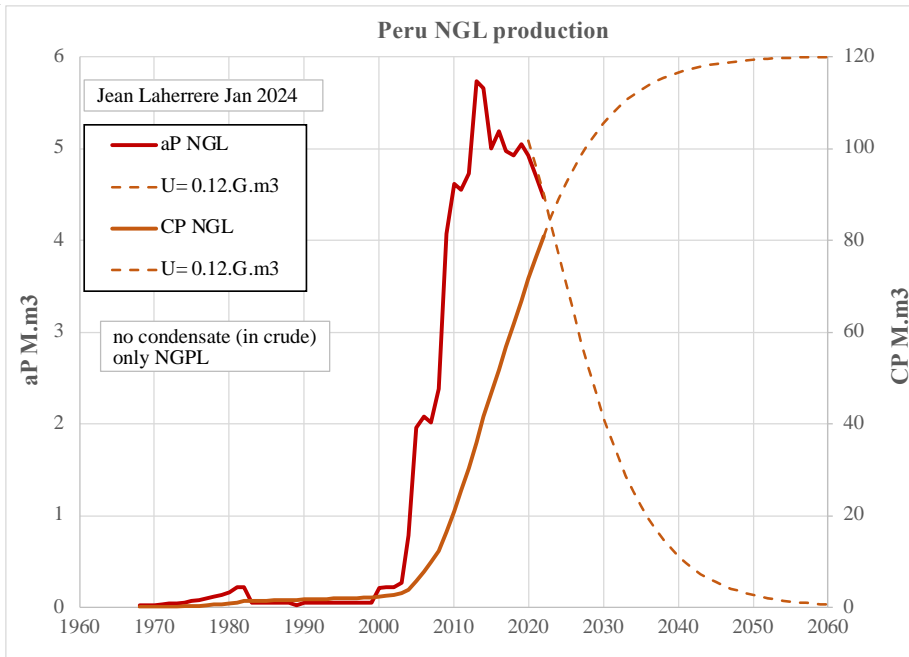


**-Peru**

HL is fair trending towards 0.12 G.m3

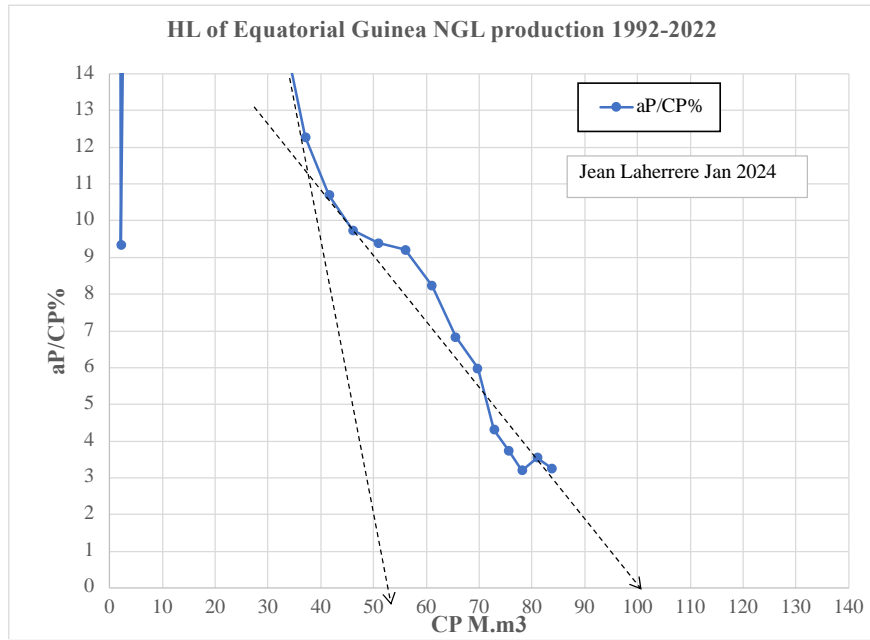


Peru NGL peaked in 2014

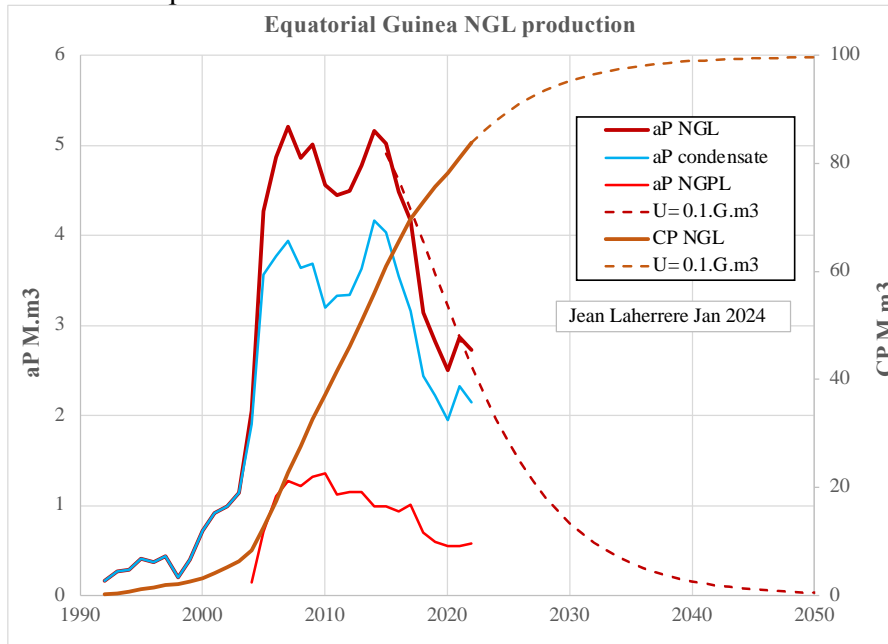


**-Equatorial Guinea**

HL is poor trending towards 0,1 G.m3

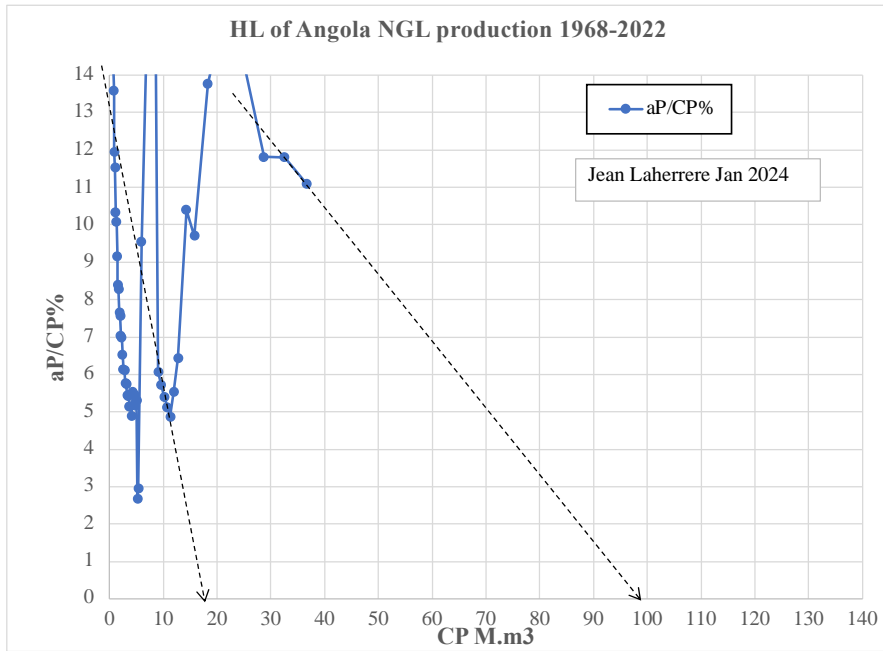


Equatorial Guinea NGL peaked in 2007

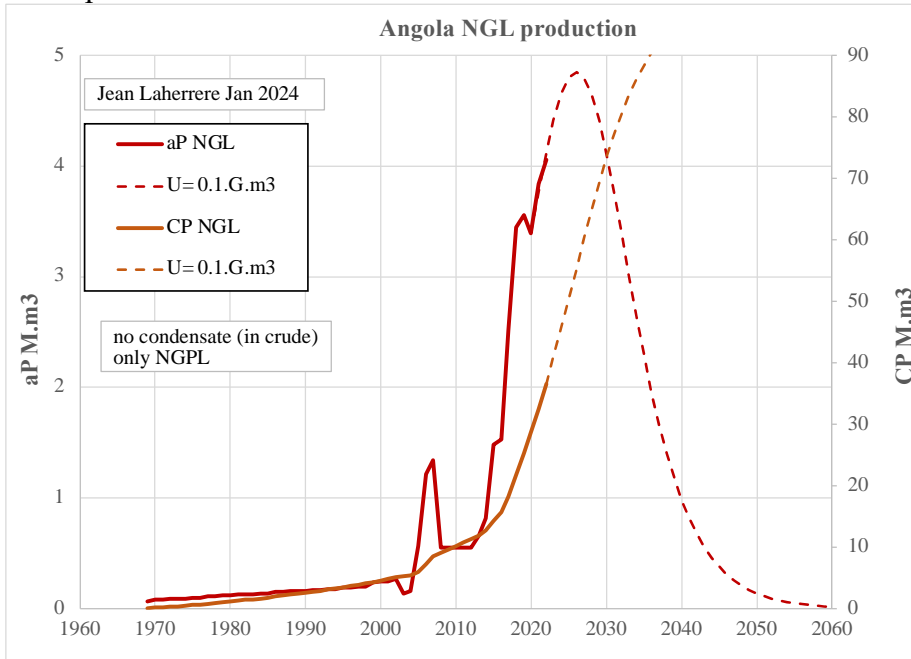


**-Angola**

HL is very poor trending towards 0,1 G.m3

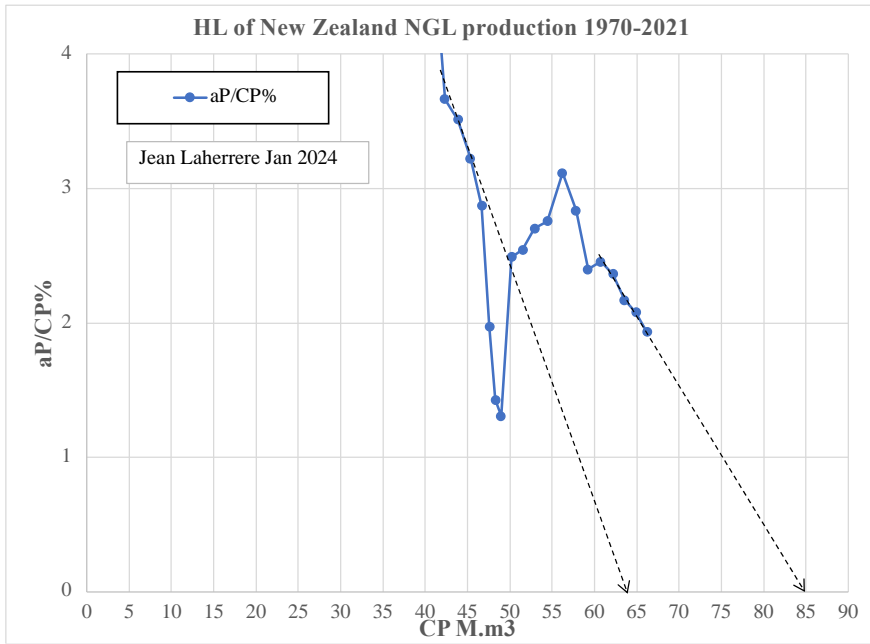


Angola NGL will peak around 2030 at 5 M.m3

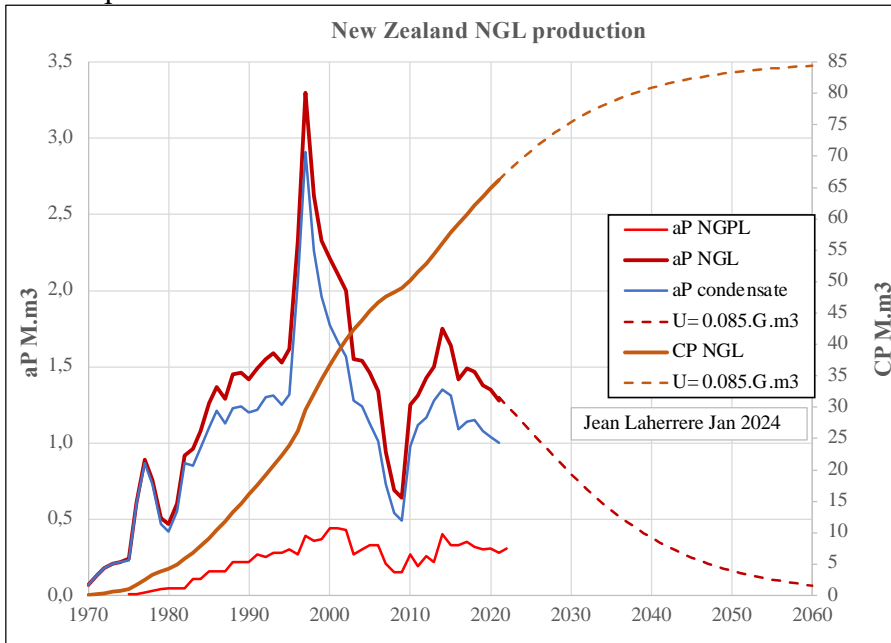


**-New Zealand**

HL is fair trending towards 0,085 G.m3

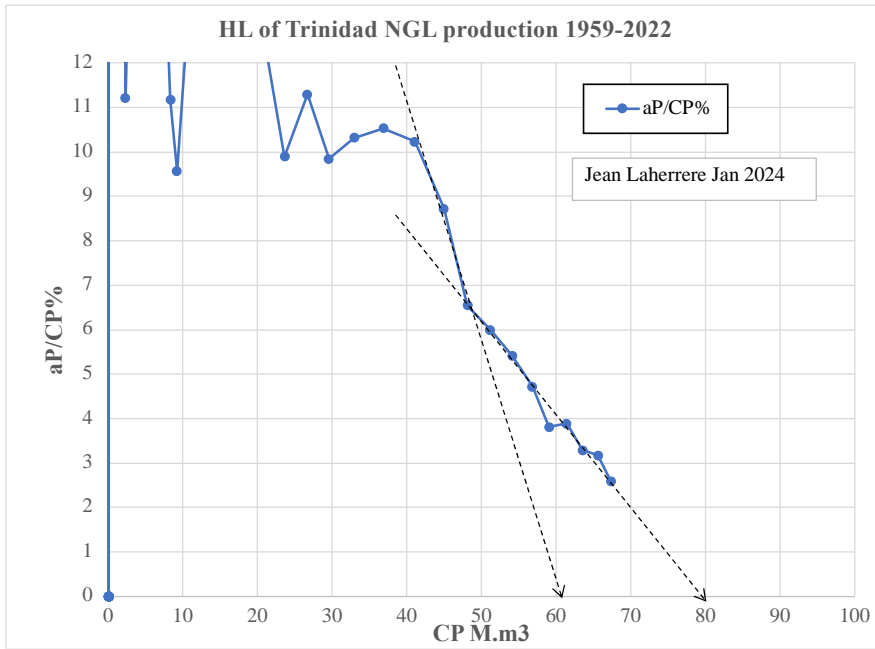


New Zealand NGL peaked in 1997

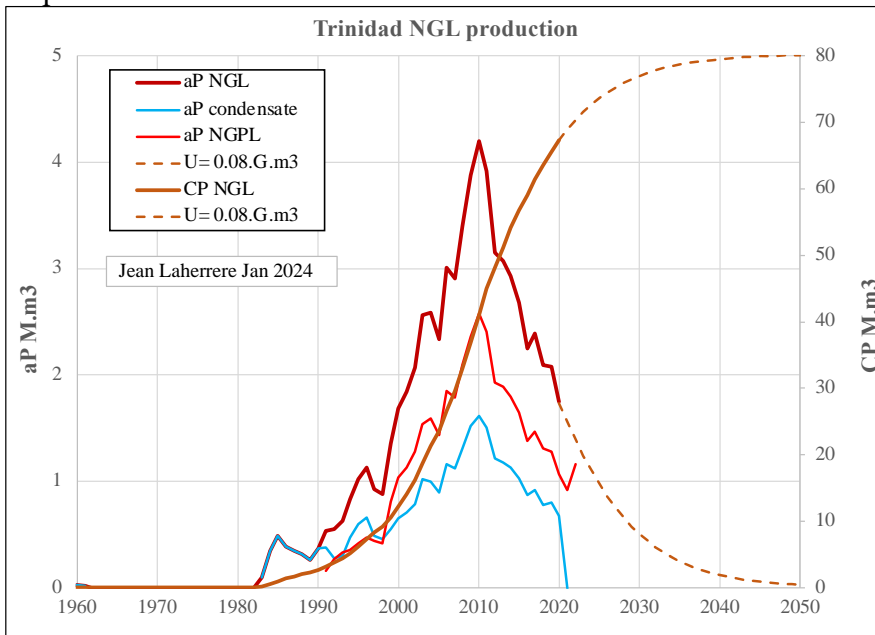


**-Trinidad**

HL is fair trending towards 0.08 G.m3



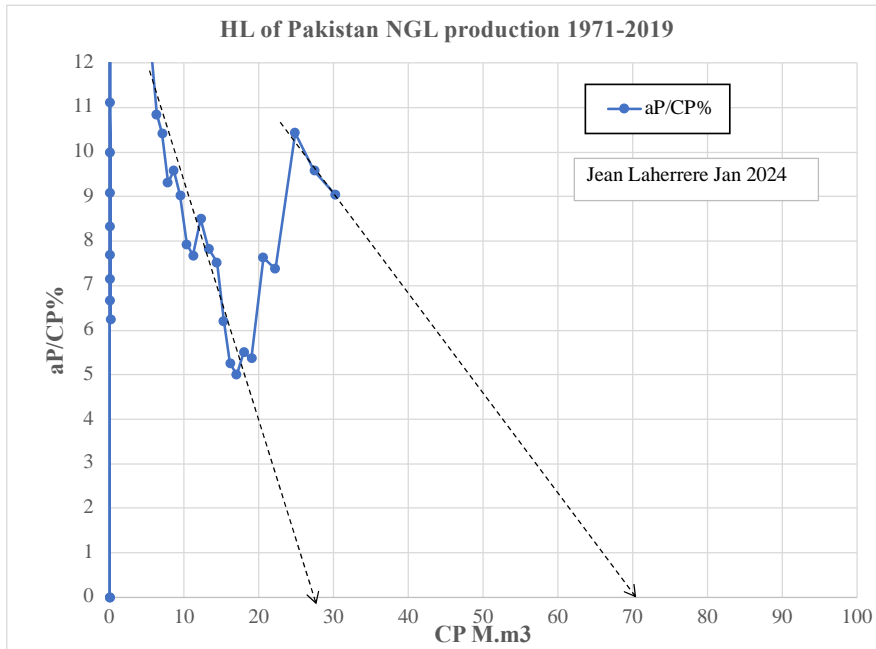
Trinidad NGL peaked in 2010



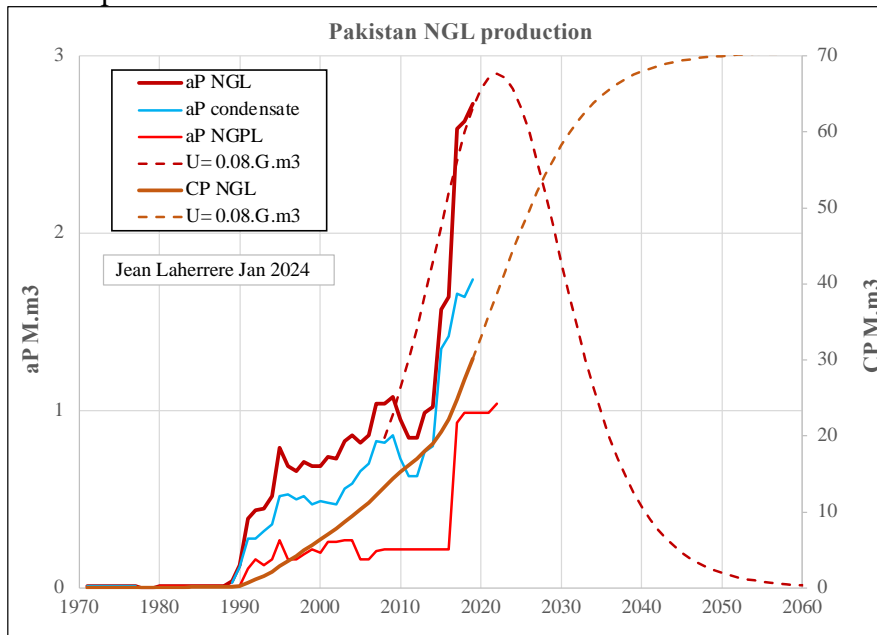
**-Pakistan**

HL is poor trending towards 0,07 G.m3



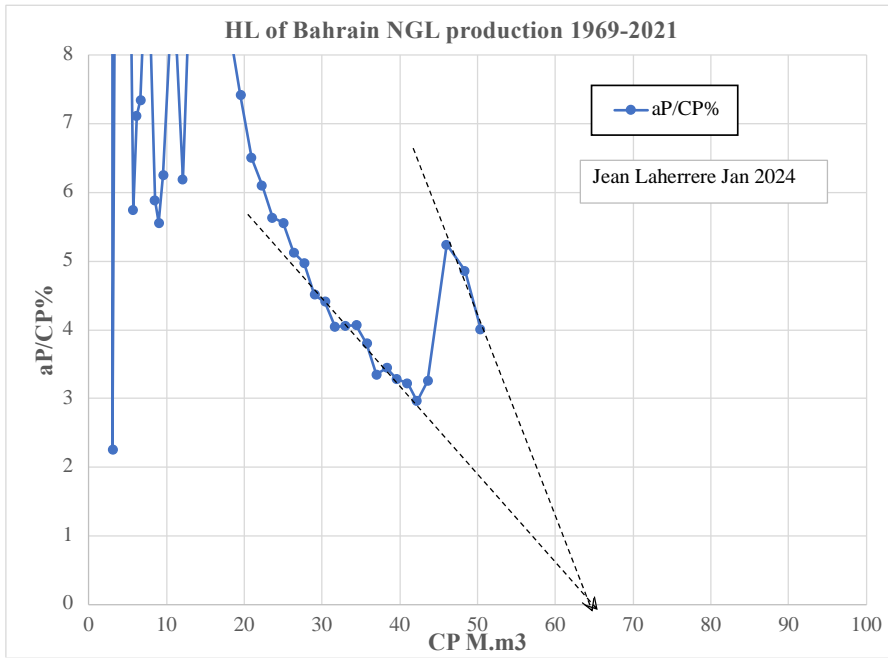


Pakistan NGL will peak around 2025 at 3 M.m3

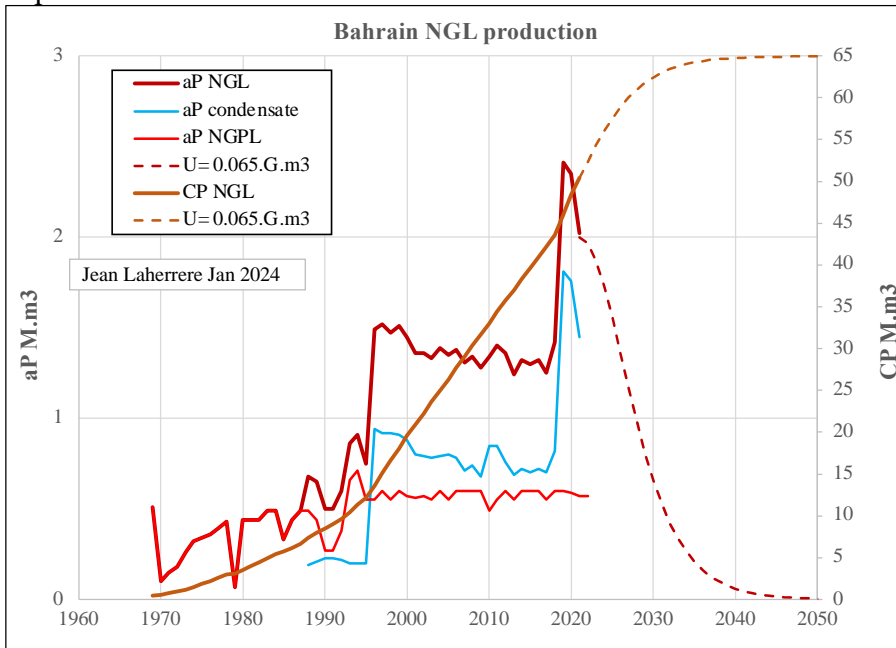


**-Bahrain**

HL is fair trending towards 0.065 G.m3

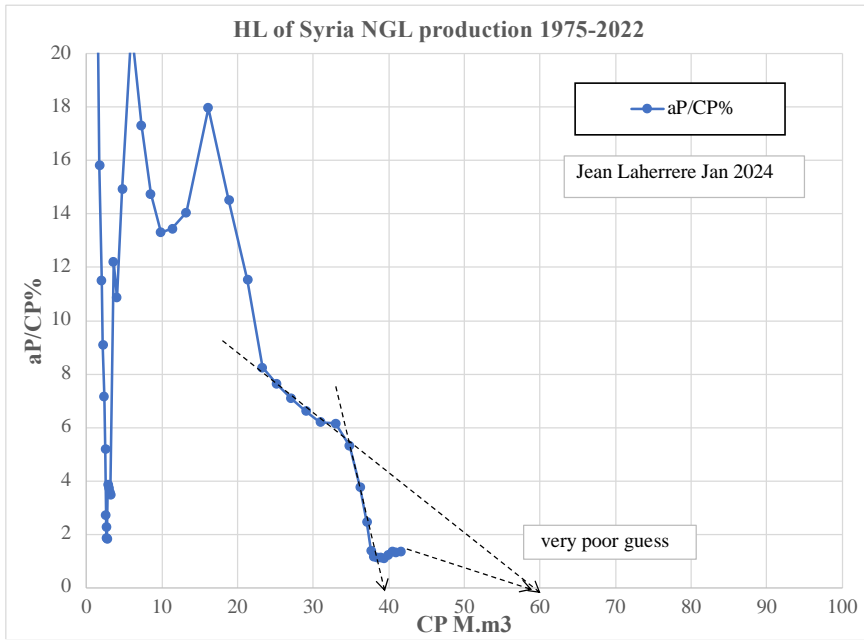


Bahrain NGL peaked in 2019

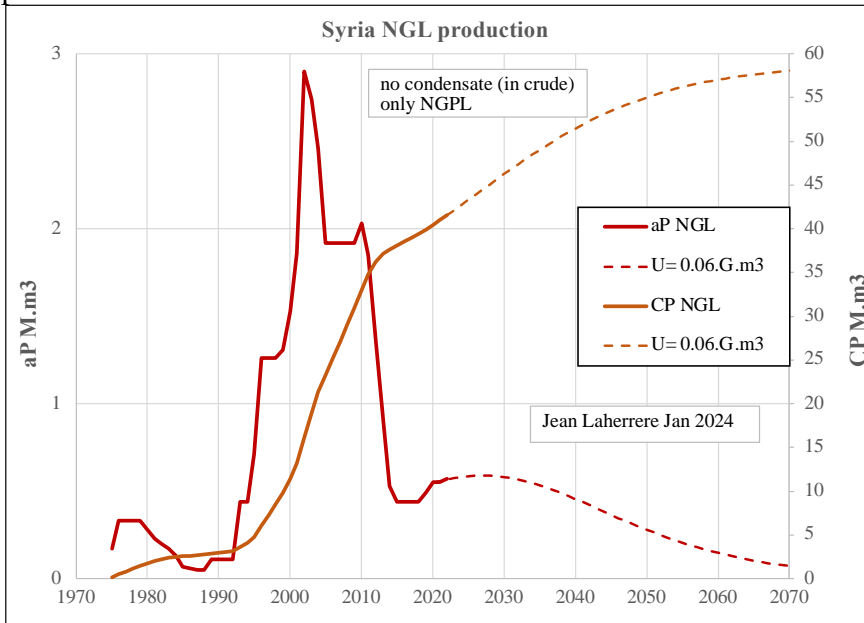


**-Syria**

HL s very poor (war) trending towards 0,06 G.m3

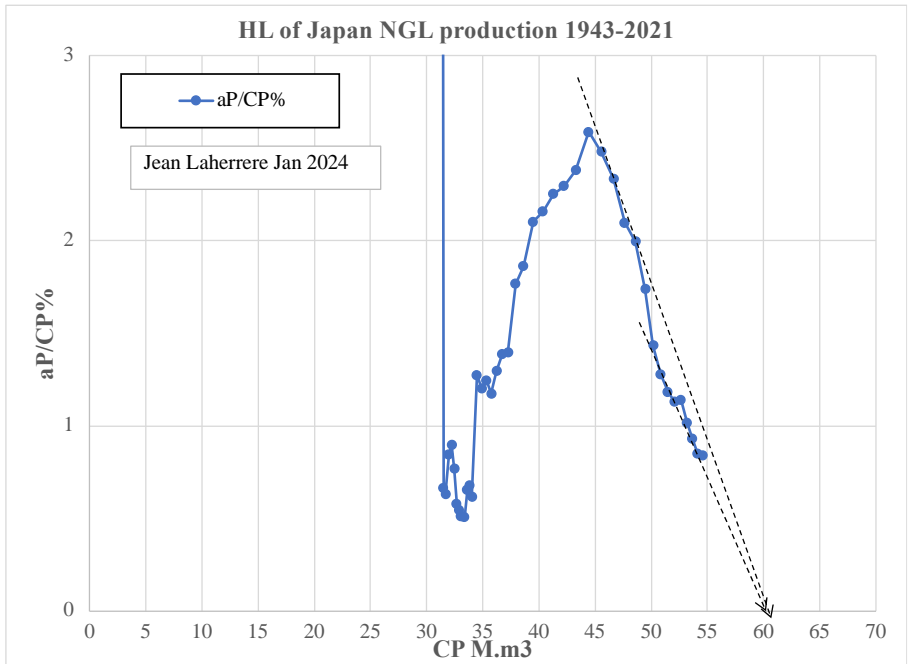


Syria NGL peaked in 2002

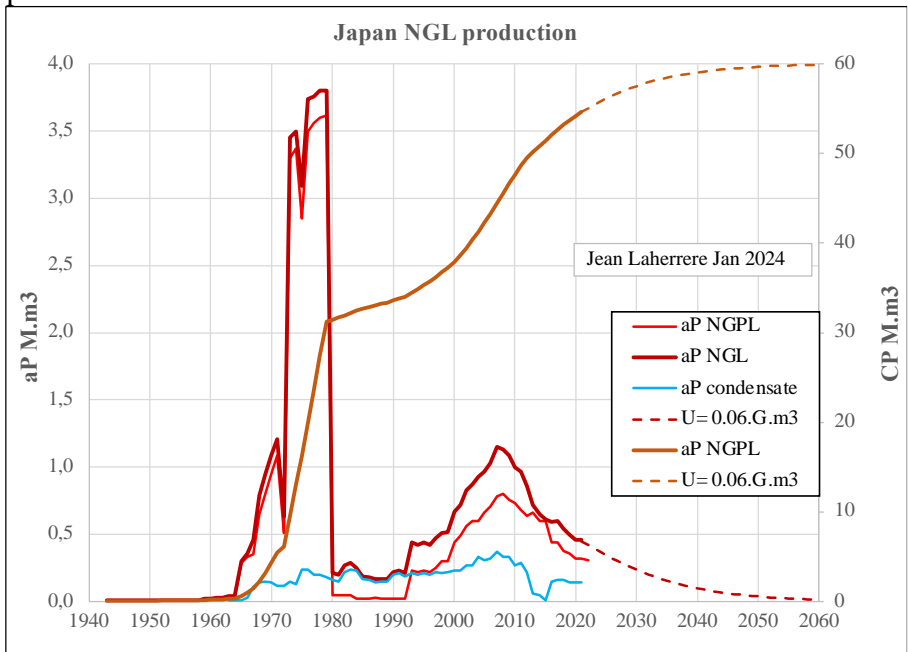


**-Japan**

HL is fair trending towards 0,06 G.m3

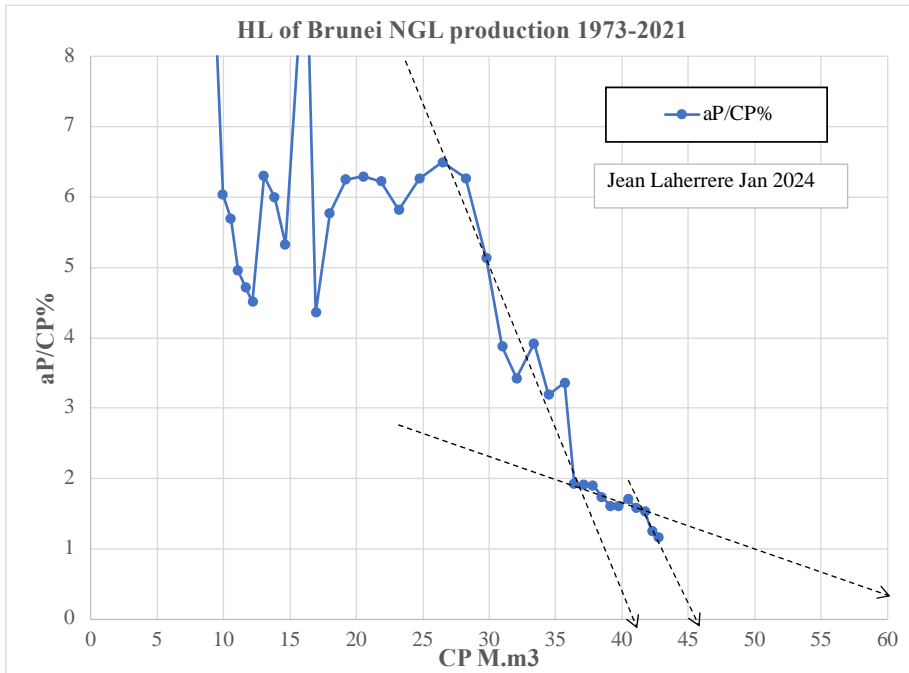


Japan NGL peaked in 1979

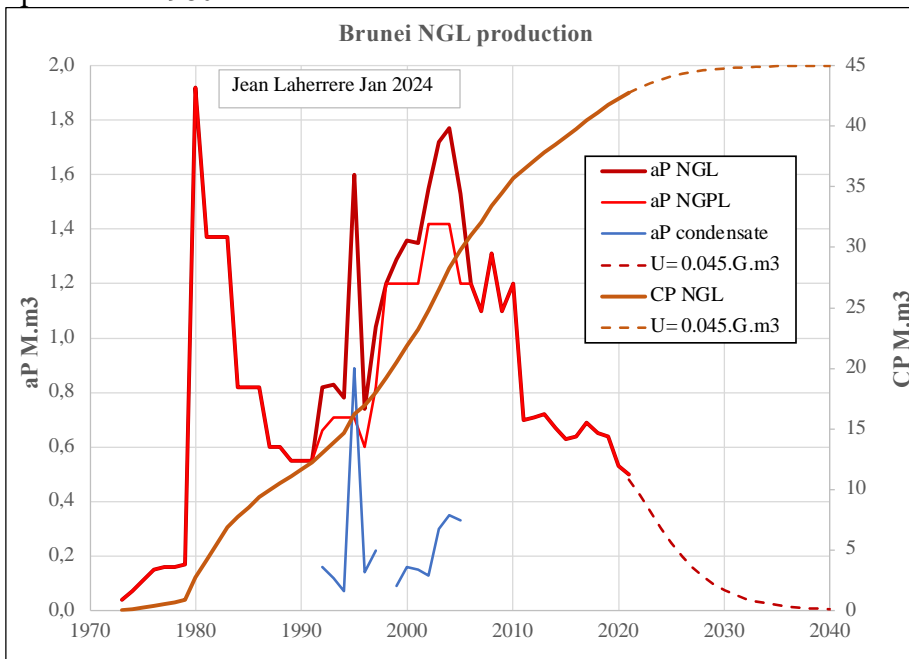


**-Brunei**

HL is poor trending towards 0.045 G.m3

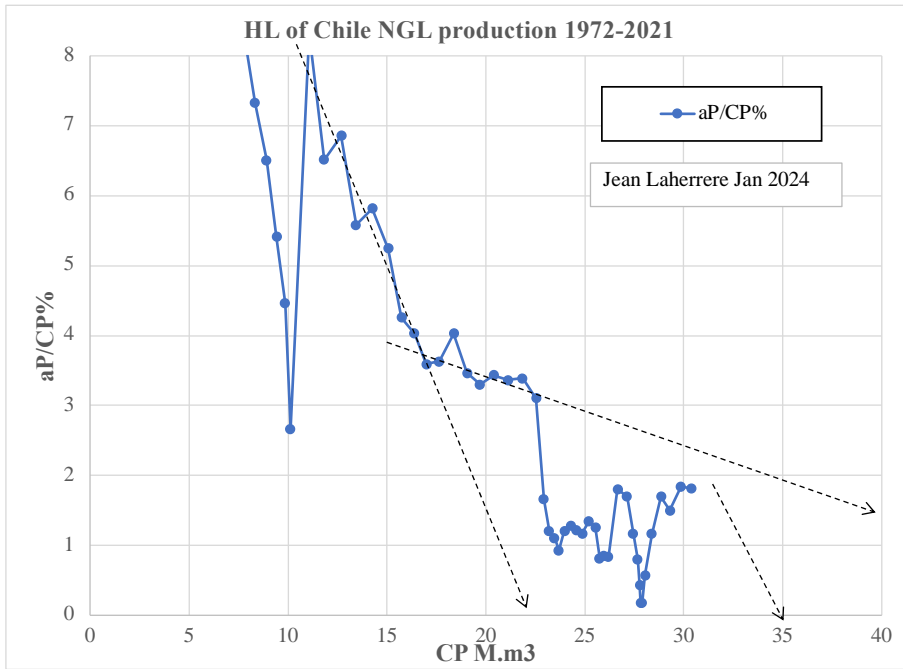


Brunei NGL peaked in 1980

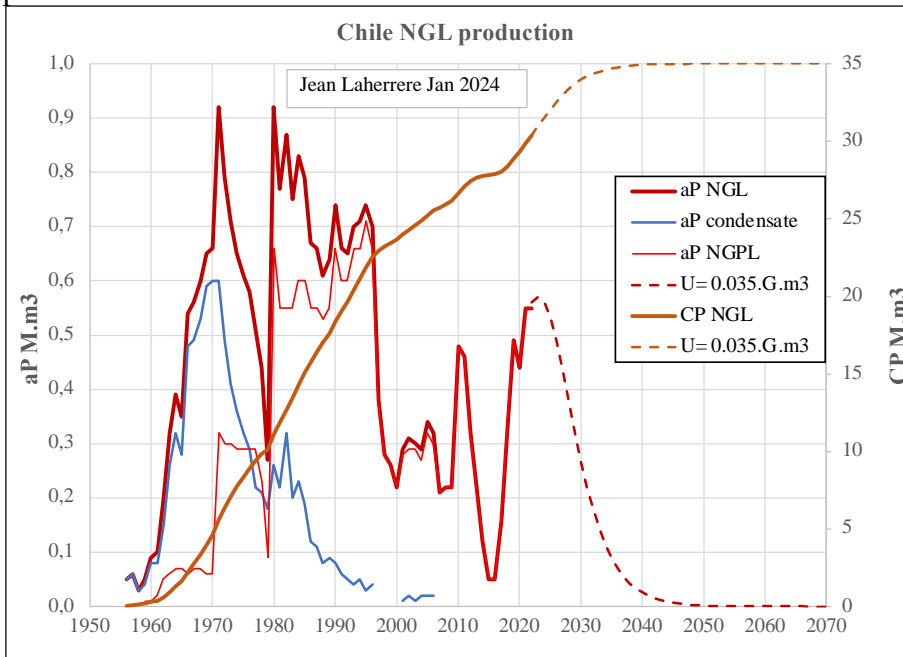


**-Chile**

HL is useless: an ultimate of 0.035 G.m3 is guessed

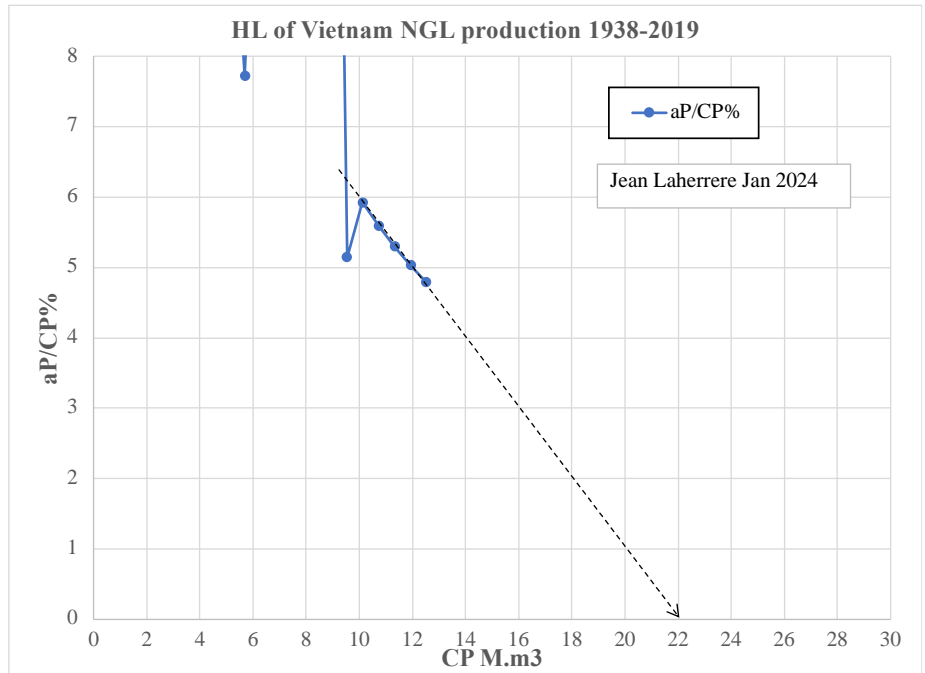


Chile NGL peaked in 1980

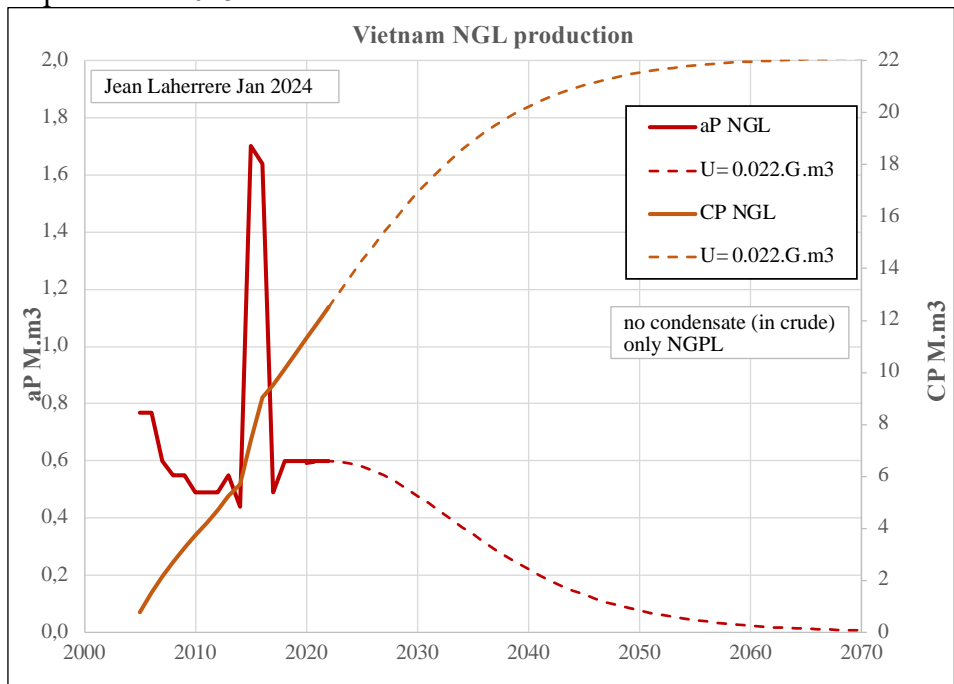


**-Vietnam**

HL is fair trending towards 0.022 G.m3

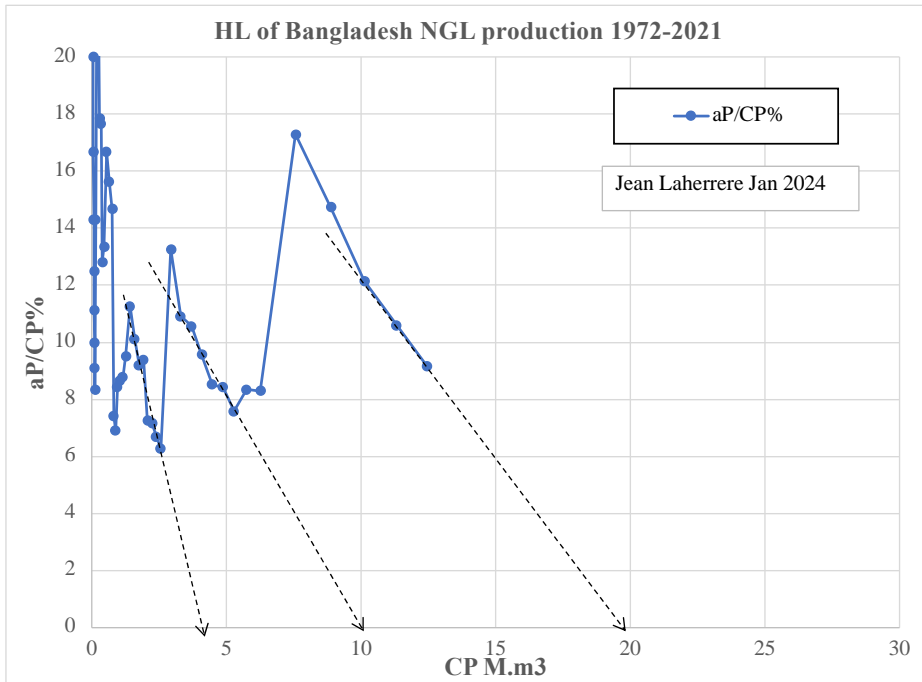


Vietnam NGL peaked in 2015

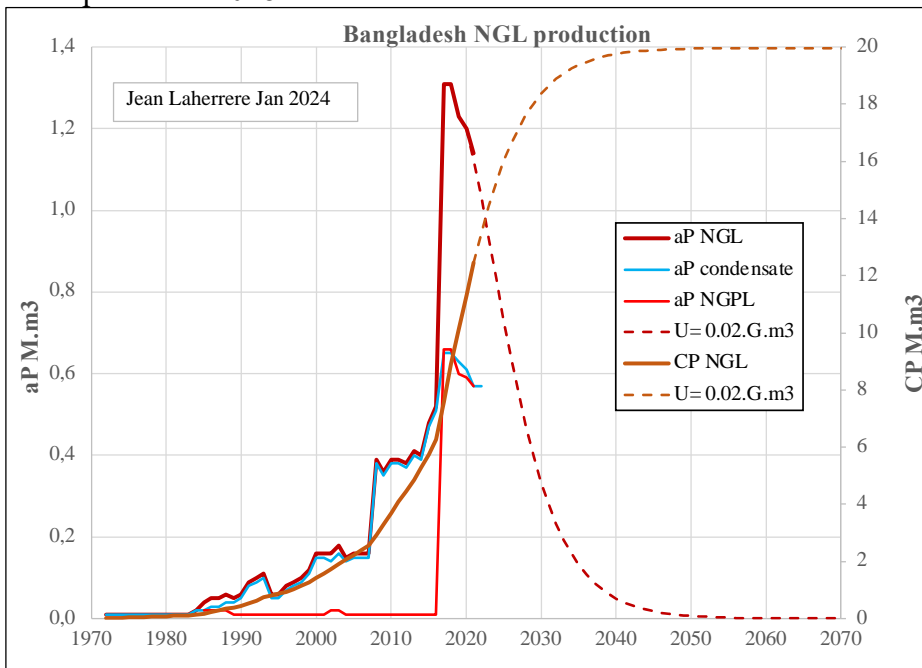


**-Bangladesh**

HL is fair trending towards 0.02 G.m3



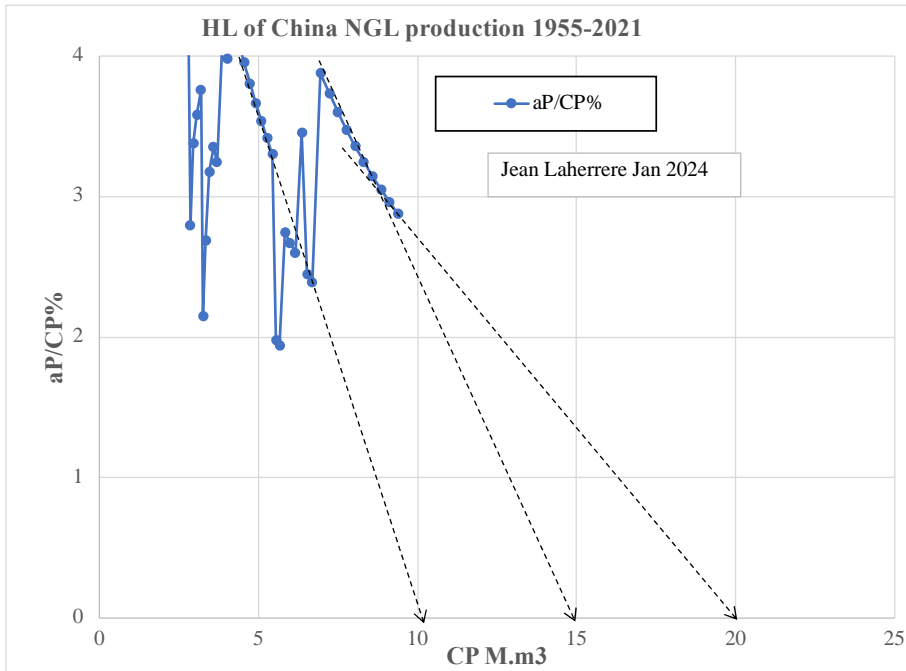
Bangladesh NGL peaked in 2018



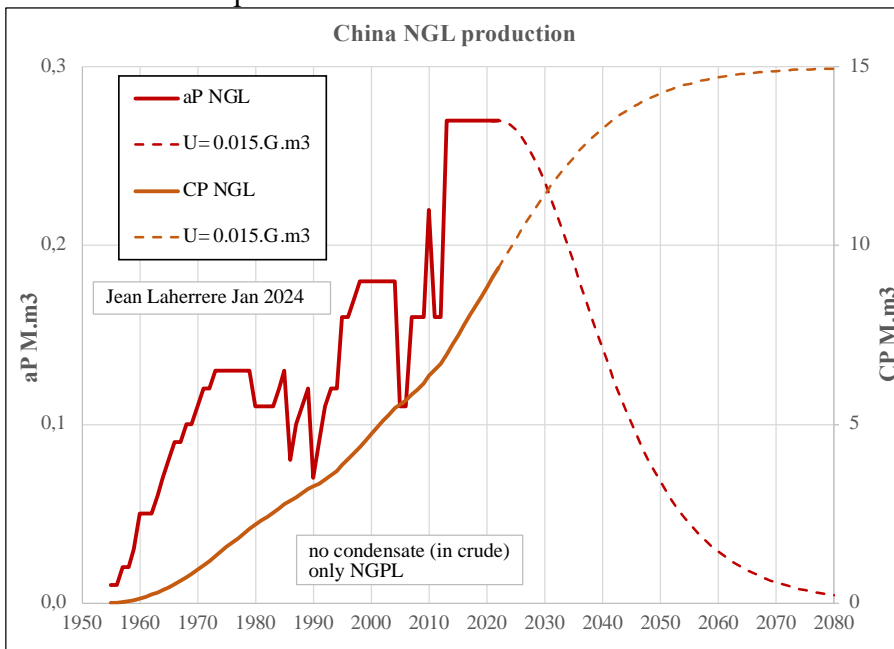
**-China**

HL is poor trending towards 0.015 G.m3





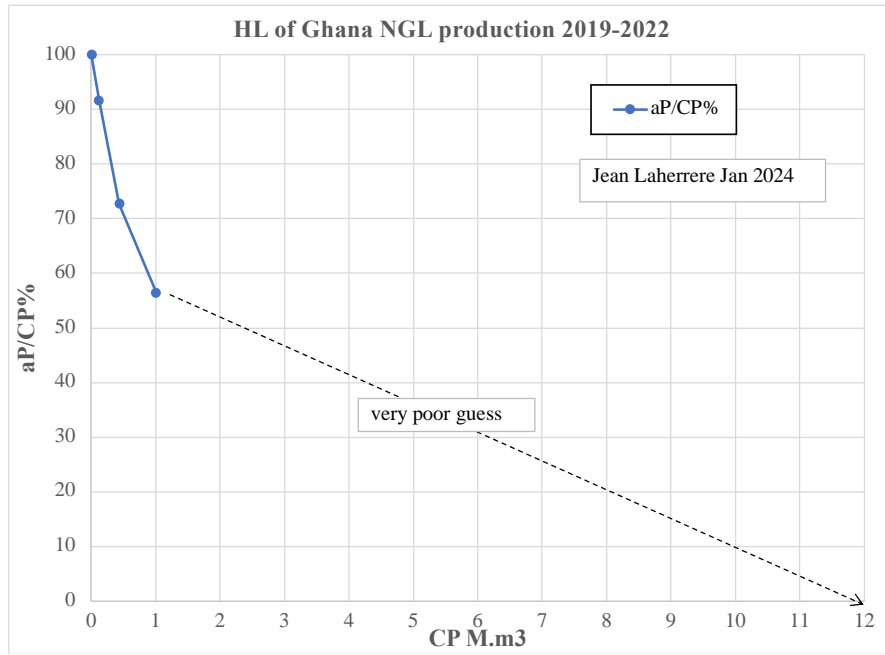
China NGL peaked (?) in 2021 but China data is always unreliable: ASPO data reports no condensate in China as it is reported within crude.



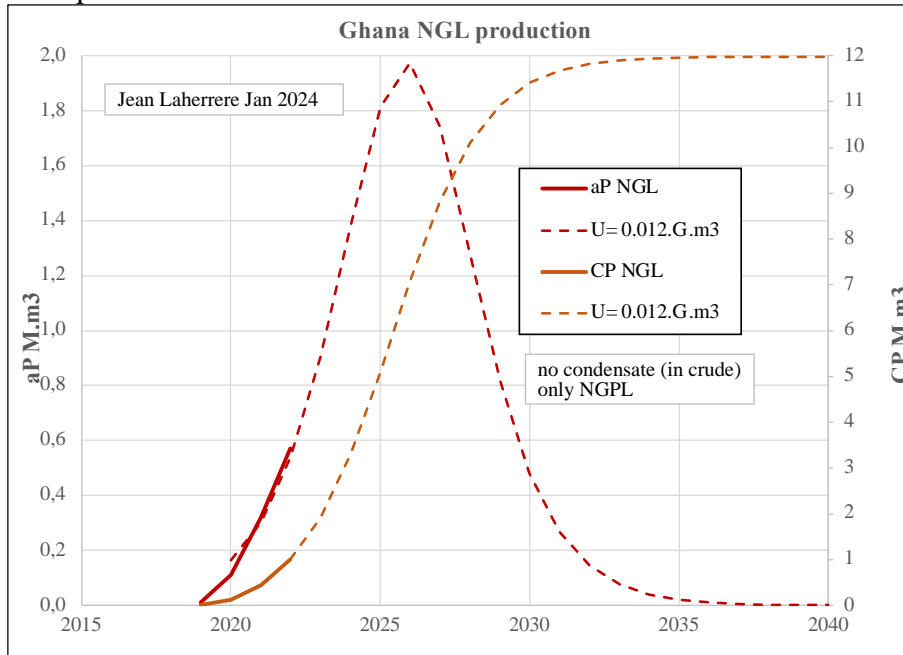
In 2023 China found a giant condensate gas field in Bohai sea

**-Ghana**

HL is useless an ultimate of 0.012 G.m3 is guessed

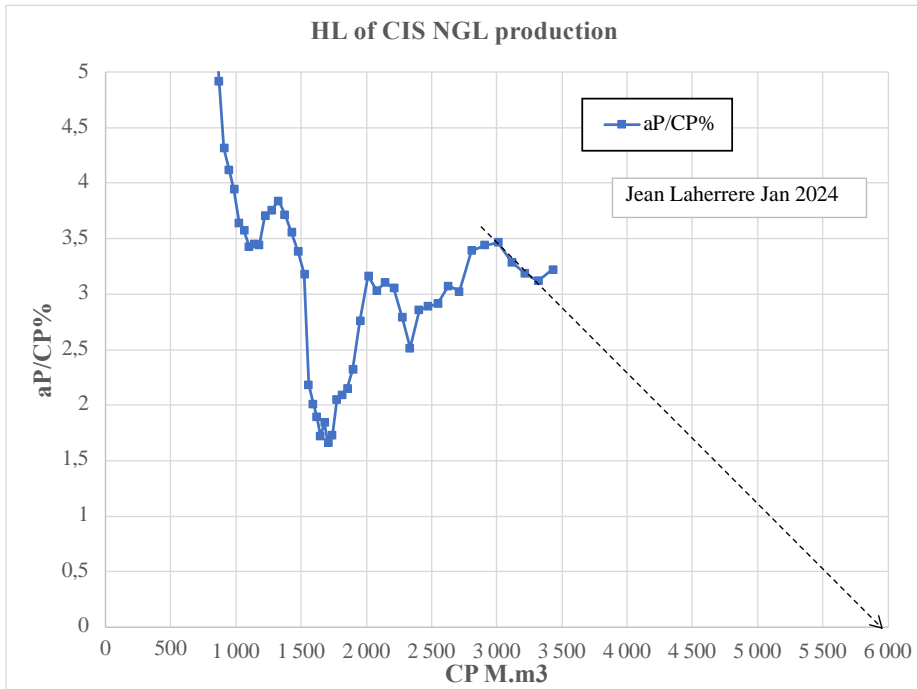


Ghana NGL will peak around 2025 at 2 M.m3

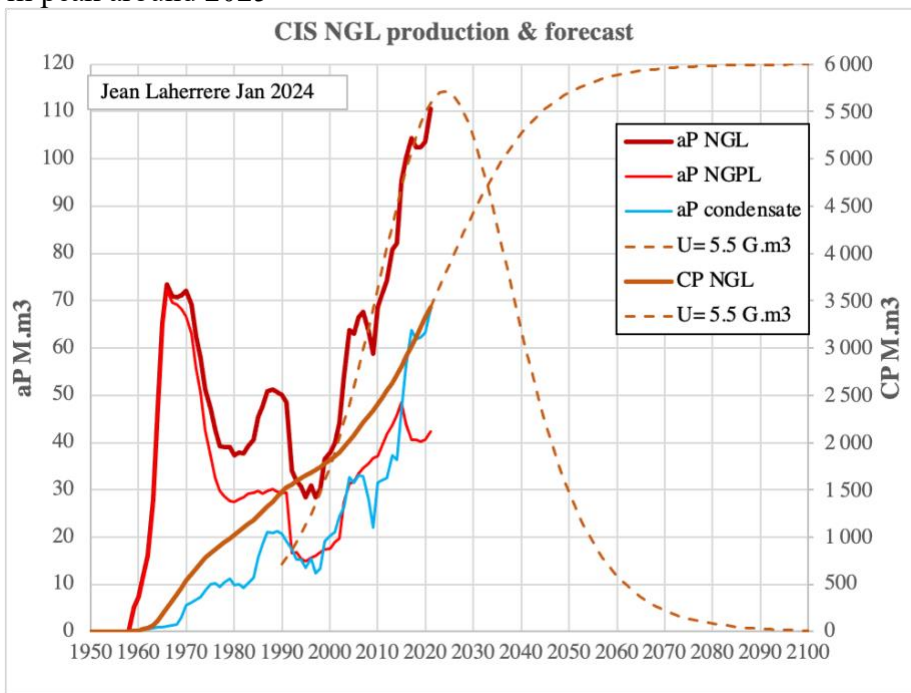


-CIS

HL is very poor, trending towards 6 G.m3: the sum of CIS countries ultimates is 5.9

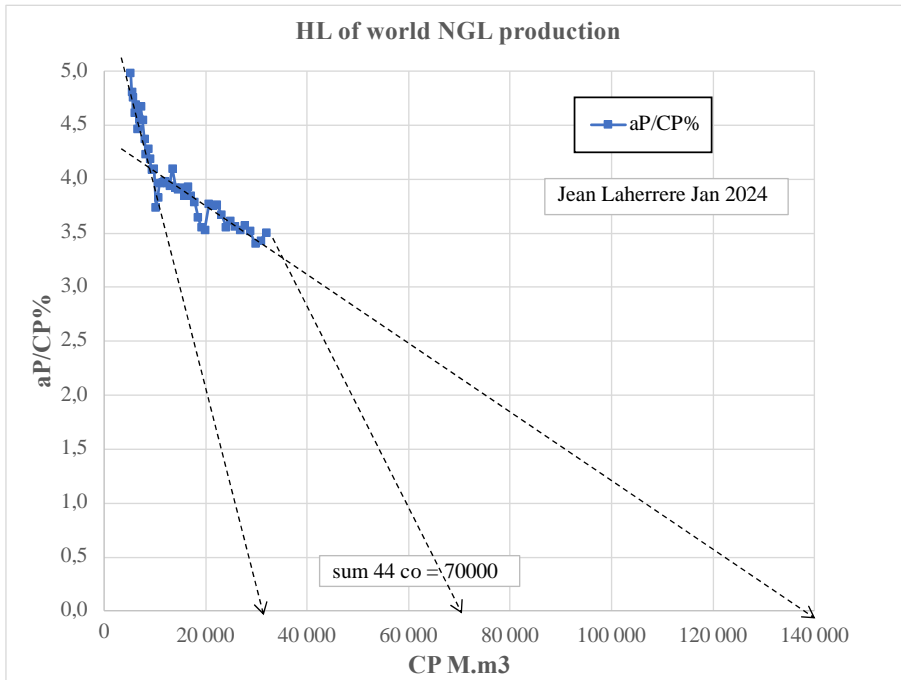


CIS NGL will peak around 2025

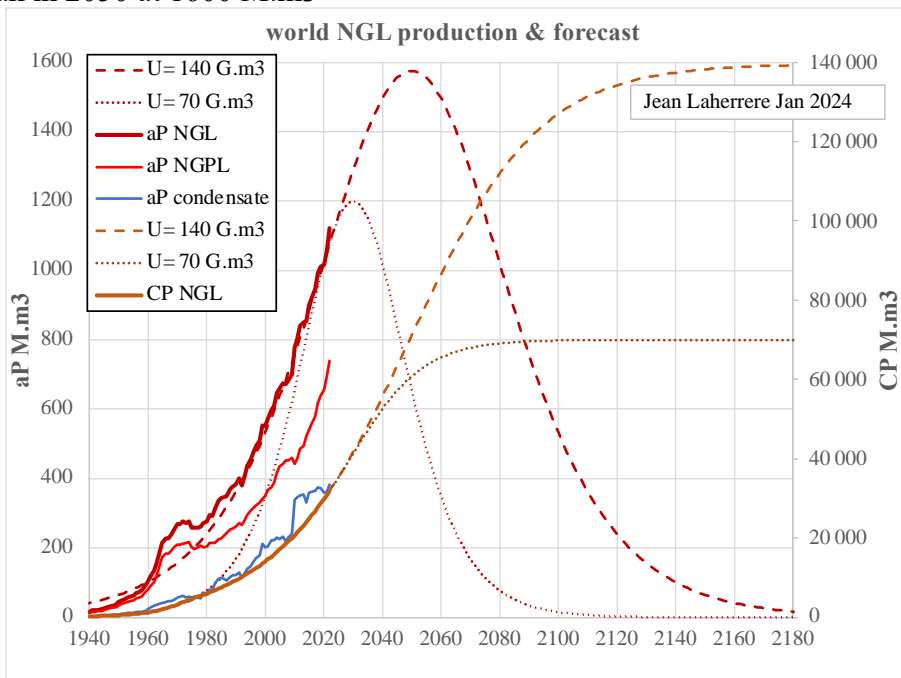


**-world**

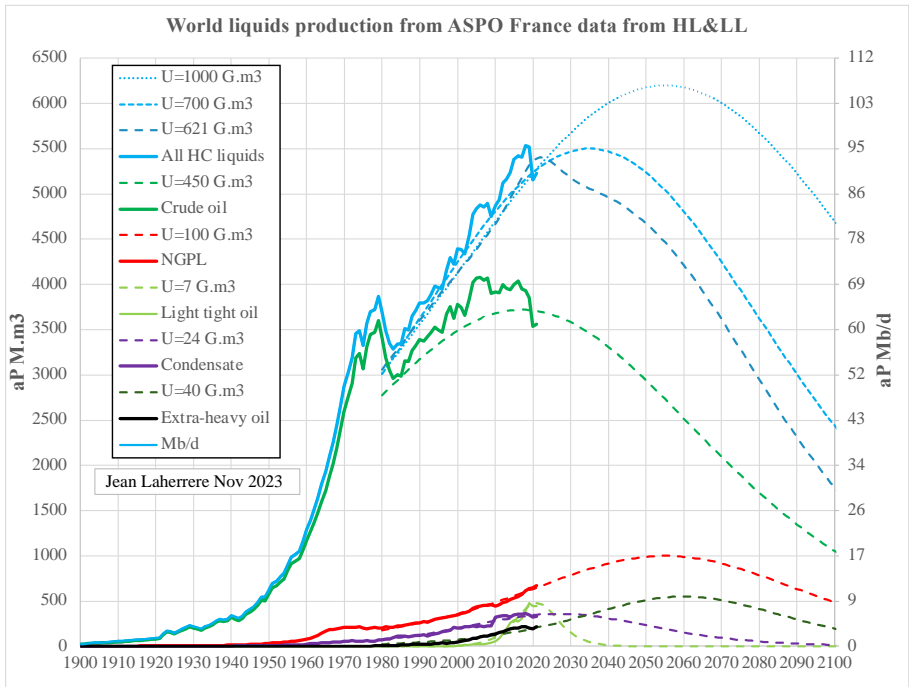
HL is fair trending towards 140 G.m3 but the sum of the 44 countries is only 70 G.m3, meaning that our guesses in useless HL countries are too low



An ultimate of 70 G.m3 means a peak in 2030 at 1200 M.m3 when an ultimate of 140 G.m3 means a peak in 2050 at 1600 M.m3



The ultimate of liquids production from HL and LL <https://aspofrance.org/2023/12/23/extrapolation-of-past-oil-production-to-forecast-future-production/> was in Nov 2023 700 G.m3 for liquids, 450 for crude, 100 for NGPL and 24 for condensate



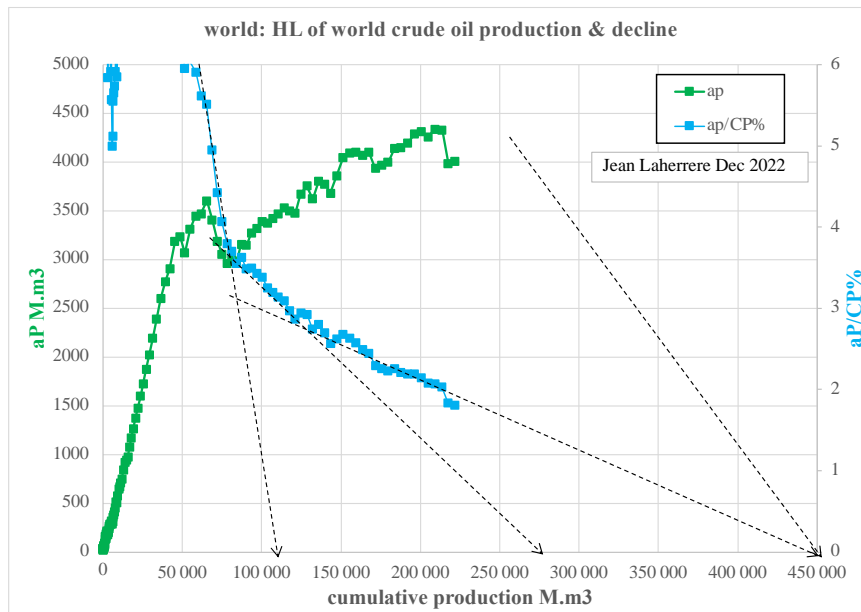
	M.m3	no condensate	aP 2022	CP2022	U	quality	peak time	peak		U Gb
	world		1120	31950	140000	F	2050	1575		881
	world		1120	31950	70000	?	2030	1200		440
	CIS		110	3430	6000	VP	2021	110		38
rank	countries								CIS	
1	US		397	10370	25000	?	2032	540		157
2	Saudi Arabia		125	3890	7500	P	2012	135		47
3	Iran		62	900	5000	P	2039	113		31
4	Qatar		61	1190	5000	?	2039	92		31
5	Russia		67	2695	4500	VP	2025	85	4500	28
6	Canada		78	1820	4000	?	2029	90		25
7	UAE		66	1250	4000	P	2033	79		25
8	Algeria		26	1290	1700	F	2011	40		11
9	Mexico		13	1055	1500	?	1993	30		9
10	Kazakhstan		51	440	1000	?	2026	26	1000	6
11	Australia		17	400	1000	?	2031	33		6
12	Argentina		10	200	1000	VP	2041	13		6
13	Brazil		9	170	1000	VP	2046	15		6
14	UK		11	660	800	P	2003	33		5
15	Egypt		12	265	650	?	2030	16		4
16	Nigeria		10	480	600	F	2013	29		4
17	Norway		12	560	600	P	2006	23		4
18	Kuwait	x	12	340	550	F	2027	15		3
19	Indonesia		6	420	500	P	1991	14		3
20	Libya		6	300	500	?	2009	13		3
21	Venezuela		2	420	450	G	2011	16		3
22	India		9	275	400	VP	2019	11		3
23	Thailand	x	12	220	350	F	2018	13		2
24	Malaysia		9	220	350	P	2010	10		2
25	Oman		13	190	300	P	2021	14		2
26	Azerbaijan		6	100	250	VP	2028	8	250	2
27	Iraq	x	5	75	250	?	2031	8		2
28	Bolivia		5	115	220	F	2018	5		1,4
29	Turkmenistan		2,4	84	150	?	1987	2,6	150	0,9
30	Peru	x	5	80	120	F	2014	6		0,8
31	Equat Guinea		3	84	100	P	2007	5		0,6
32	Angola	x	4	36	100	VP	2026	8		0,6
33	New Zealand		1,3	65	85	F	1997	3,3		0,5
34	Trinidad		2	70	80	F	2010	4		0,5
35	Pakistan		3	30	70	P	2021	2		0,4
36	Bahrain		2	50	65	F	2019	2,4		0,4
37	Syria	x	0,5	40	60	VP	2002	3		0,4
38	Japan		0,5	55	60	F	1979	4		0,4
39	Brunei		0,5	43	45	P	1980	1,9		0,3
40	Chile		0,5	30	35	?	1980	0,9		0,2
41	Vietnam		0,6	13	22	F	2015	1,7		0,1
42	Bangladesh		1,1	12	20	F	2018	1,1		0,1
43	China	x	0,3	9	15	P	2021	0,3		0,1
44	Ghana	x	0,6	1	12	?	2026	2		0,1
	sum 44 co	8	1139	31012	70009					440
	summ CIS								5900	37

The quality of HL is mainly useless and very poor, fair and good are only 14 out of 47 = 30 % meaning that 70% of the estimates are unreliable!

quality HL	number
?	13
F	13
P	12
VP	8
G	1
sum	47

The poor quality of HL NGL extrapolation is due to the poor quality of the NGL data.

Crude oil production data gives better HL extrapolation: fair quality with an ultimate of 450 G.m3 being about the double of the present cumulative production which means crude oil peak today!



World NGL ultimate at 140 G.m3 represents 31 % of the world crude oil ultimate at 450 G.m3

In this study 12 countries have not yet reached NGL peak time

	country	peak time
1	Brazil	2046
2	Argentina	2041
3	Iran	2039
4	Qatar	2039
5	UAE	2033
6	Australia	2031
7	Iraq	2031
8	Egypt	2030
9	Canada	2029
10	Azerbaijan	2028
11	Kazakhstan	2026
12	Russia	2025

For crude oil production, only 5 countries are before peak: Brazil, Canada oilsands, Venezuela Orinoco, Guyana, and likely Namibia.

**-Conclusion**

World NGL data is a mess as condensate is often reported with crude.

There is no consensus on NGL definition

NGL production data varies largely within sources and uncertainty may reach 50%

NGL forecasts are highly unreliable

However, most agencies forecasts (except EIA) display a NGL peak before 2040

World NGL forecast is more reliable than most of NGL countries forecasts

World NGL ultimate (from 550 Gb to 900 Gb) represents a significant part of world crude oil ultimate, about 30%.

NGL future production will compensate partly for a while the coming crude oil decline.