



21 & 22 January Amsterdam: the permanent oil crisis conference - [www.permanentoilcrisis.com](http://www.permanentoilcrisis.com)

## Quantifying the oil supply shock

In the boardrooms of OECD governments a new message is now being heard. One of an upcoming oil shock starting in 2010/2011, with high oil prices beyond 100 dollars per barrel. With that message the international energy agency (IEA) has become the first major international institute to acknowledge the certainty of an oil supply problem in the near term future. Their World Energy Outlook 2008 contains a new rigorous analysis of upcoming oil fields and decline rates. The IEA now foresees oil production to increase by a mere 2 million barrels per day in the period to 2015, from the present 86 to 88 million barrels per day.

This estimate is based on an average decline rate of 4.0% to 4.5% for oil fields currently in production (6.7% for post-peak oil fields), 28 million b/d of scheduled production from new oil fields between 2007 and 2015, and an expected delay of 5 million b/d of the 28 million b/d projects due to project slippage. So in effect the world will see 23 million b/d added to the oil supply pool according to the IEA from 2007 to 2015. This is barely enough to cover the decline in oil fields that have passed their peak.

The uncertainty in this estimate has become greater with the unfolding of the credit crunch, and the decline of oil prices to 50 dollars per barrel. Many projects are now seeing delays for at least a year as they can no longer generate returns in this oil price environment, and it is hard to get sufficient financing. Petrobras has postponed tendering of 28 deep sea rigs to 2009, and several oil companies active in tar sand plays have decided to postpone investments as well. Problems are also occurring in the North Sea, where companies are struggling to get sufficient cash to grow production. This will lead to steeper production decline rates in that region of the world. A first estimate of the oil projects effected by the double whammy of low oil prices and the credit crunch suggests that oil production will be 2 million barrels per day lower on the long run up to 2015 than previously expected, if the present situation continues for a while longer into the larger part of 2009.

A larger degree of uncertainty is present in the estimate of decline rates. The average decline rate estimate of 4.5% per year in currently producing conventional oil fields is based upon an analysis of several hundred oil fields for which the data is available. But for several key fields, such as Ghawar in Saudi Arabia, there simply is no data available. If a few key fields would begin to decline earlier than expected it could drive the average world decline rate up to 6% per year, if not higher. That would imply that oil production will have peaked and begins to decline.

Hopefully the geology of the oil fields in the Middle East, and the efforts of the respective oil companies in that part of the world, will prevent such a situation from happening for at least a decade. The oil production plateau that we are on, as has now been confirmed by the IEA, is bad enough for the world in itself. It will cause a new oil shock as soon as the world economy climbs out of recession and oil demand increases again annually by 1 to 2 million b/d. A situation which is no longer possible. No longer can a path of continued growth of the world economy be sustained by increasing oil production. Alternative fuels have now become a necessity for sustained economic growth.

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## Definitions

Crude Oil, petroleum found in liquid and semi liquid form including deepsea and lease condensates.

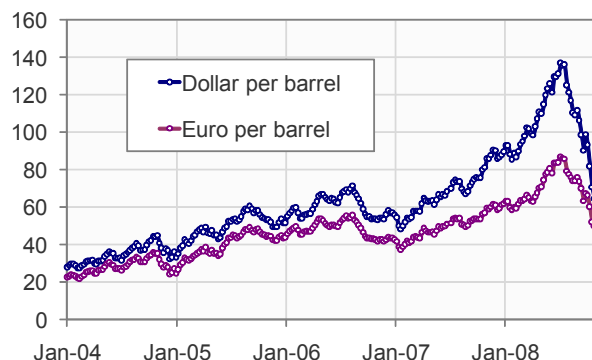
Liquids, all forms of liquid fuels including conventional, heavy, and extra heavy oil, oil shale, oil sands, natural gas liquids, lease condensates, gas-to-liquids, coal-to-liquids, and biofuels.

One Barrel of oil is equivalent to 159 litres

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**Chart 1:** Oil Price Weighed Average of Blends

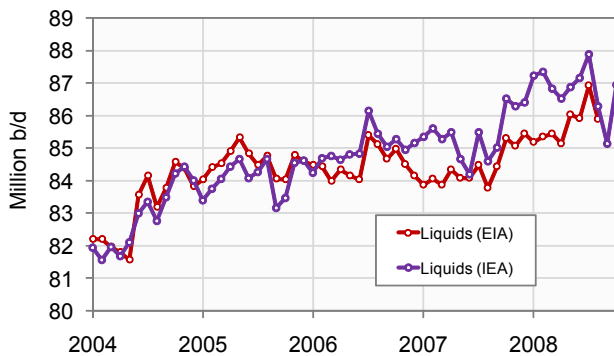


Source: Energy Information Administration

**World liquids production status**

In October world production of total liquids increased by 1.81 million barrels per day from September according to the latest figures of the International Energy Agency (IEA). Resulting in total world liquids production of 86.94 million b/d.

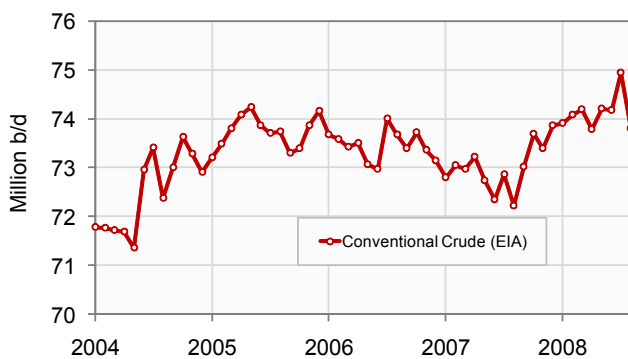
Average global production in 2007 was 85.41 million b/d according to the IEA. In 2008 an average of 86.82 million b/d has been produced from January to October. The US Energy Information Administration (EIA) in their International Petroleum Monthly puts average global 2007 production at 84.40 million b/d and average liquids production from January to August 2008 at 85.73 million b/d.

**Chart 2: World Liquids Production Jan. 2004 - October 2008**


Source: Energy Information Administration, International Energy Agency

**World crude oil production status**

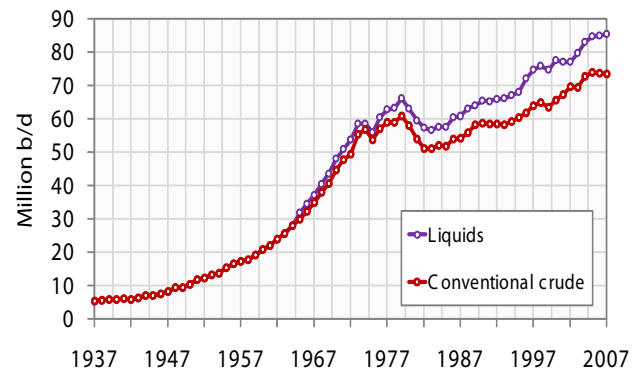
Latest available figures from the Energy Information Administration (EIA) show that crude oil production including lease condensates decreased by 1.14 million b/d from July to August. Resulting in a total production of crude oil including lease condensates of 73.80 million barrels per day. The all time high production record of crude oil now stands at 74.94 million b/d reached in July 2008.

**Chart 3: World Crude Oil Production January 2004 - August 2008**


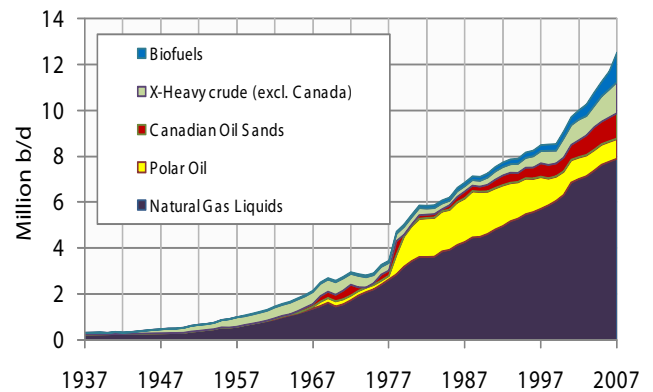
Source: Energy Information Administration

**World conventional crude versus liquids production ratio**

Approximately 86% of world liquids production in 2007 came from conventional crude oil including lease condensates. The remaining share of 14% was produced by other unconventional sources including Biofuels, Extra Heavy Oil, Tar Sands, Polar Oil and Natural Gas Liquids. In absolute amounts unconventional production has increased steadily, from 4 million b/d at the end of the 1970's, to approximately 12 mb/d in 2007 excluding lease condensates.

**Chart 4: World Crude and Liquids production 1937 - 2007**


Source: Energy Information Administration, IHS Energy, International Energy Agency

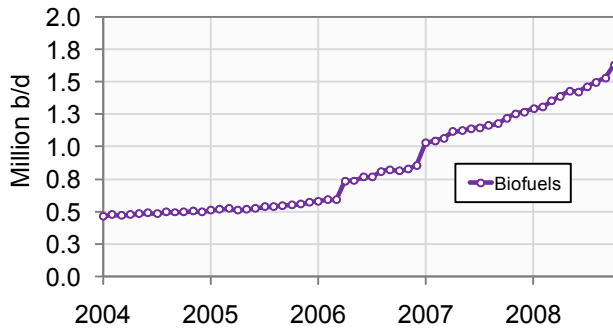
**Chart 5: World Unconventional Production 1937 - 2007**


Source: Energy Information Administration, IHS Energy, International Energy Agency, Canadian Association of Petroleum Producers

**World biofuel production status**

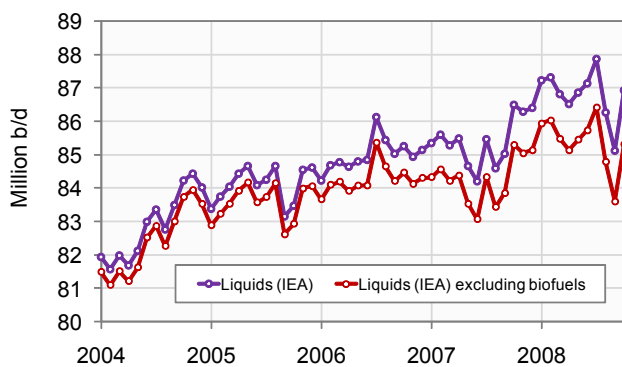
In October total world biofuel production was 1.63 million barrels per day according to statistics compiled from the Energy Information Administration, the International Energy Agency and the Brazilian ministry of Energy. With an estimated 695,000 b/d from the United States, 415,000 b/d from Brazil and 520,000 b/d from other countries.

**Chart 6:** World biofuels production Jan. 2004 - October 2008



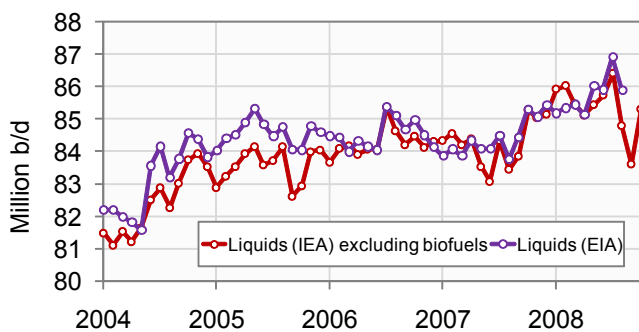
Source: Energy Information Administration, International Energy Agency, Brazilian Ministry of Energy

**Chart 7:** Liquids vs liquids excl. biofuels I Jan. 2004 - October 2008



Source: Energy Information Administration, International Energy Agency, Brazilian Ministry of Energy

**Chart 8:** Liquids vs. liquids excl. biofuels II - Jan. 2004 - Oct. 2008

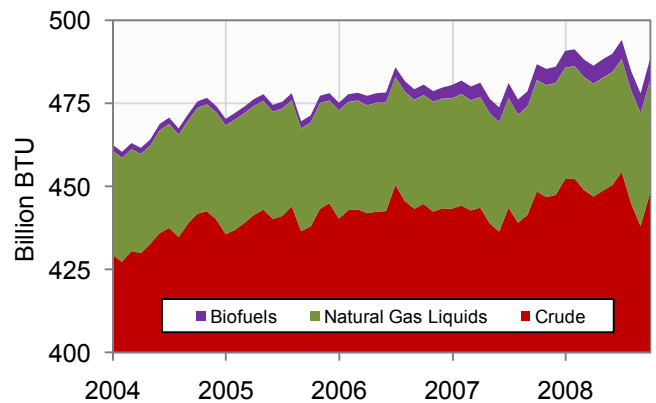


Source: Energy Information Administration, International Energy Agency, Brazilian Ministry of Energy

**World gross & net energy available from liquids**

In oil production statistics the barrel that gets counted is not the barrel that can be used by society. Different types of liquids that are aggregated as total 'oil' production, in the oilwatch monthly defined as total liquids, contain different amounts of energy per barrel. For example, a barrel of crude oil contains approximately 5.8 million BTU while a barrel of natural gas liquids contains 4.2 million BTU. In 2008 11 percent of total liquids production comes from natural gas liquids and biofuels. When converting to actual energy values we learn that the energy available to society is 3.5% lower than all liquids production statistics counted in barrels suggests. This difference has been rising slightly over time, with 2.5% less energy available to society in 2002 when comparing a barrel to the BTU's in a barrel.

**Chart 9:** Gross Energy available from liquids Jan. 2004 - Oct. 2008

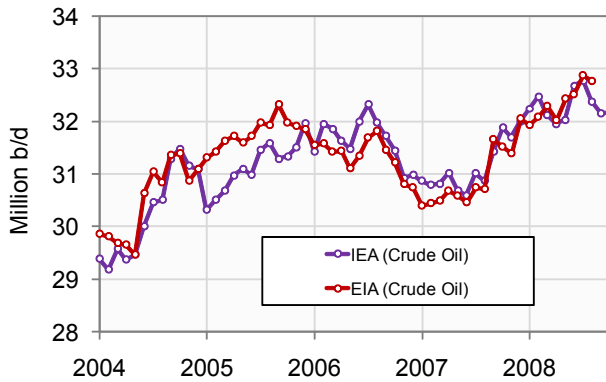


Source: Energy Information Administration, International Energy Agency

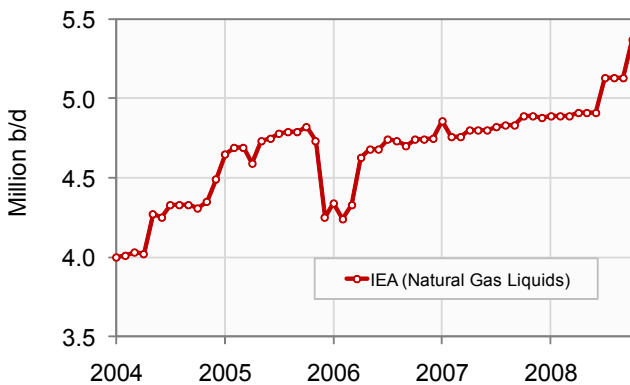
The actual energy available for society to consume is lower than shown in chart 9, however, because an incremental amount is needed to bring the oil out of the ground as the oil industry has to drill deeper at more extreme locations which costs more energy. Next to the additional energy needed in processing oil to deliver a useful product due to a decline in quality from conventional to more unconventional oil. Studies by Professor Charles Hall and his science group at State University New York show that the energy that is necessary to draw a barrel of 159 liters of oil out of the ground from conventional oil has increased from approximately 3 liters of oil equivalent in the beginning of the 1990s to 6 liters of oil equivalent now. It is not known to what percentage this amount of energy comes from oil, gas or coal, the main energy inputs for the oil and gas industry.

**OPEC production status**

Total crude oil production including lease condensates of the OPEC cartel decreased by 10,000 b/d to a level of 32.15 million b/d, from September to October, according to the latest available estimate of the IEA. Natural Gas Liquids production increased by 240,000 b/d to a level of 5.37 million b/d from September to October. Average total liquids production in OPEC countries in 2008 from January to October was 37.33 million b/d, versus 35.96 million b/d in 2007 and 35.71 million b/d in 2006.

**Chart 10: OPEC Crude Oil Production January 2004 - Oct. 2008**


Source: Energy Information Administration & International Energy Agency

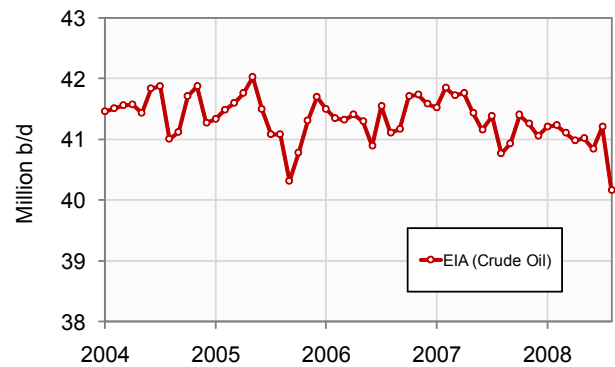
**Chart 11: OPEC Natural Gas Liquids Prod. Jan. 2004 - Oct. 2008**


Source: International Energy Agency

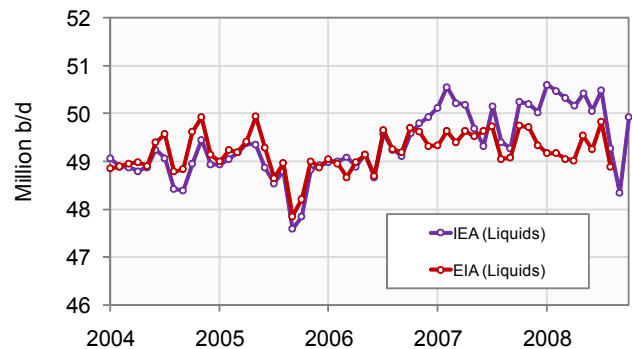
**Non-OPEC production status**

Total crude oil production including lease condensates of non-OPEC decreased by 1,0 million b/d from July to August to a level of 40.16 million b/d, according to the latest available estimate of the EIA. Average crude oil production of Non-OPEC from January to August 2008 was 40.97 million b/d, versus 41.35 million b/d in 2007 and 41.41 million b/d in 2006.

Total non-OPEC liquids production increased by 1.58 million b/d to a level of 49.42 million b/d from September to October, according to the latest figures of the IEA. Average total liquids production of non-OPEC in 2008 from January to October was 49.50 million b/d, versus 49.45 million b/d in 2007 and 48.75 million b/d in 2006.

**Chart 12: Non-OPEC Crude Oil Production Jan. 2004 - August 2008**


Source: Energy Information Administration

**Chart 13: Non-OPEC Liquids Production Jan. 2004 - Oct. 2008**


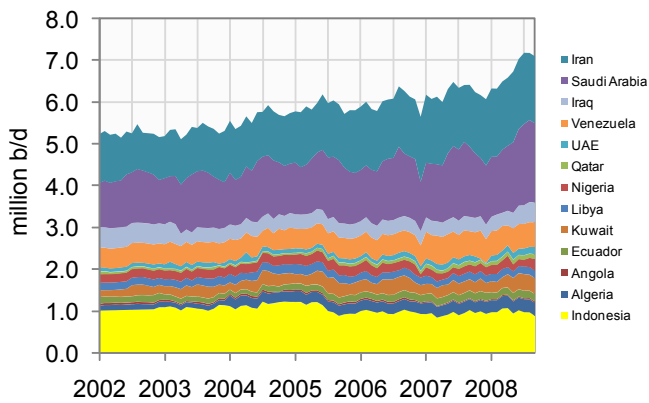
Source: International Energy Agency & Energy Information Administration

**OPEC liquids demand developments**

In 2002 OPEC-13 (including Iraq and Indonesia) consumed 5.26 million b/d according to the JODI database. OPEC-13 demand has increased by 1.2 million b/d to 6.46 million b/d from 2002 to 2007. The increase was mainly caused by higher consumption in Iran and Saudi Arabia, which increased by 476,000 and 357,000 b/d between respectively 2002 and 2007.

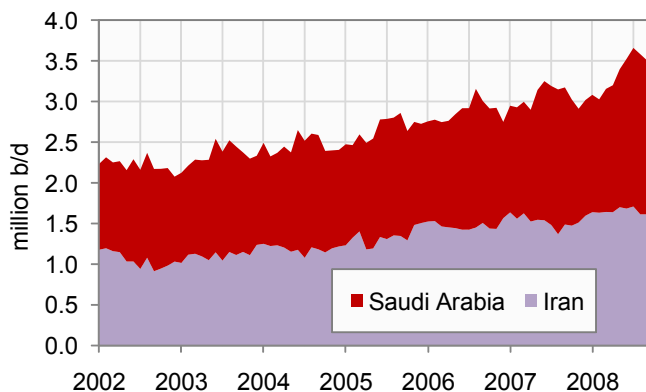
In 2008 this pace of growth has continued until July 2008. Since then liquids consumption in Saudi Arabia and Iran has declined by respectively 58,000 b/d and 96,000 b/d. Average consumption in Saudi-Arabia from January to September 2008 was 1.7 million b/d and in Iran 1.65 million b/d. Average consumption in the same period of 2007 in Saudi Arabia was 1.55 million b/d and in Iran 1.53 million b/d.

**Chart 14:** OPEC-13 Liquids Demand January 2002 - Sept. 2008



Source: JODI Database

**Chart 15:** Iran & S. Arabia Liquids Demand Jan. 2002 - Sept. 2008



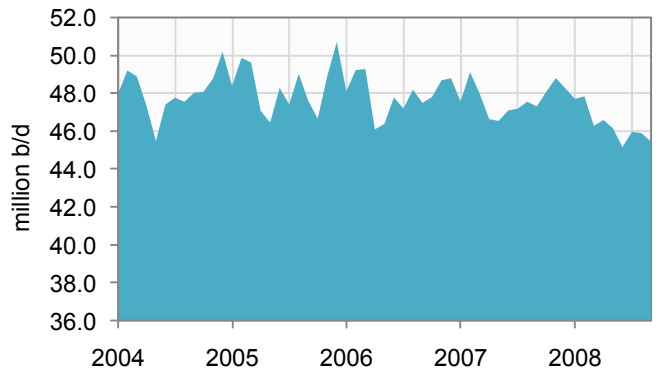
Source: JODI Database

**Non-OPEC liquids demand developments**

In 2005 the group of OECD countries consumed an average of 48.34 million b/d, which declined to 47.93 million b/d in 2006. Of the total 2006 OECD consumption decline, 315,000 b/d came from North America and 156,000 b/d from other OECD countries while consumption in OECD Europe increased by 56,000 b/d. In 2007 OECD liquids consumption decline continued by 241,000 b/d to an average of 47.68 million b/d. This decline was caused by a consumption decline of 350,000 b/d in OECD Europe and a decline of 157,000 b/d in OECD Asia. Consumption in OECD North America grew by 267,000 b/d.

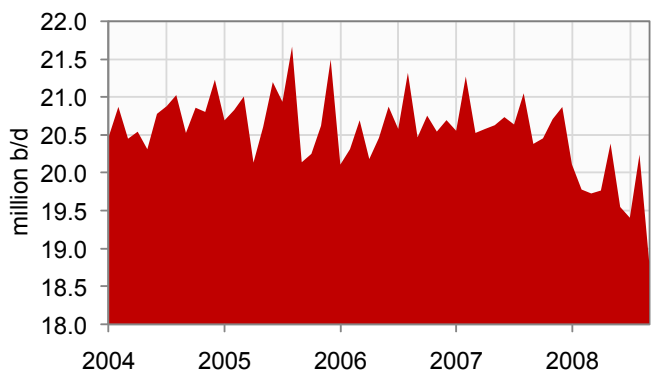
The decline in OECD consumption is accelerating much faster in 2008. Consumption in September 2008 was 45.46 million b/d, a decline of 1.85 million b/d year on year. Average consumption from January to September 2008 was 46.34 million b/d, which is 1.11 million b/d lower than consumption in the same period in 2007. The decline is mainly a result of a decrease in oil consumption in the United States. Consumption is 951,000 b/d lower on average in the US from January to September 2008 than in the same period last year. In comparison, Mexican and Canadian consumption are almost flat relative to 2007 consumption.

**Chart 16:** OECD Liquids Demand Jan. 2004 - Sept. 2008



Source: Energy Information Administration

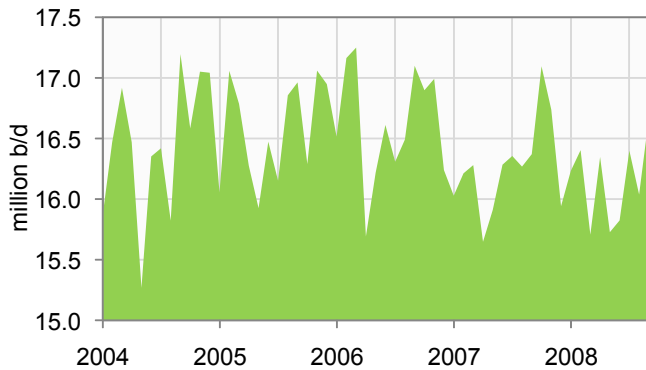
**Chart 17:** United States Liquids Demand Jan. 2004 - Sept. 2008



Source: JODI Database

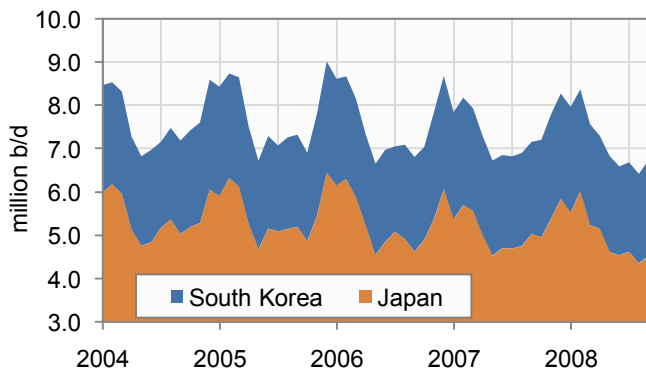
In the 27 countries of the European Union the decline in consumption apparent in recent years appears to have halted for now. From January to September 2008 16.15 million b/d were consumed on average, relative to 16.15 million b/d in the same period in 2007.

**Chart 18:** EU-27 Liquids Demand January 2004 - Sept. 2008



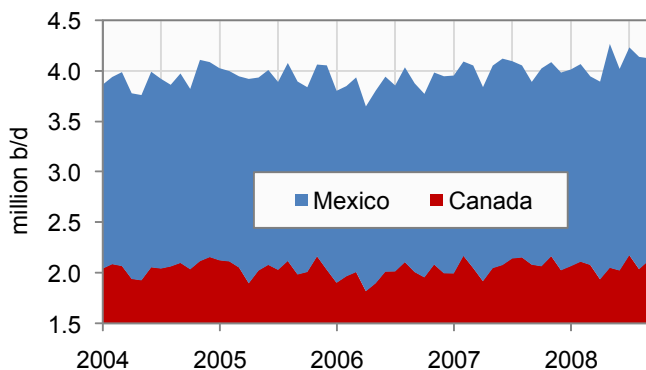
Source: JODI Database

**Chart 19:** S. Korea & Japan Liquids Demand Jan. 2002 - Sept. 2008



Source: JODI Database

**Chart 20:** Mexico & Canada Liquids Demand Jan. 2004 - Sept. 2008



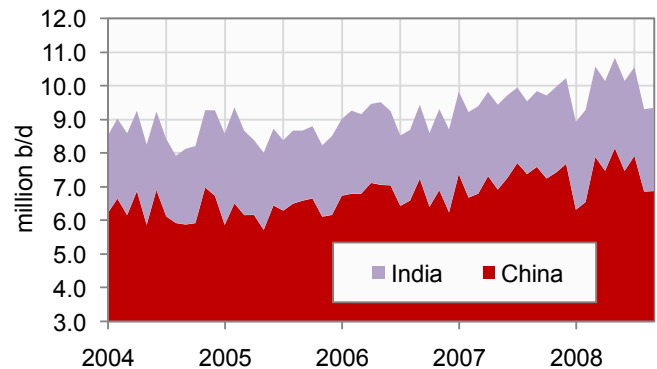
Source: JODI Database

**India & China liquids demand developments**

Chinese liquids consumption averaged 7.28 million b/d from January to September 2008 according to the JODI database. An increase of only 50,000 b/d versus average 2007 January to September consumption of 7.23 million b/d. In 2005 China consumed on average 6.27 million b/d, growing to 6.78 million b/d in 2006 and 7.29 million b/d in 2007. But growth has also been impacted here since July. Liquids consumption in September was 1.04 million b/d lower than in July.

Consumption in India was 2.62 million b/d from January to September 2008, versus an average of 2.43 million b/d in 2007 and 2.29 million b/d in 2006.

**Chart 21:** India & China Liquids Demand Jan. 2002 - Sept. 2008

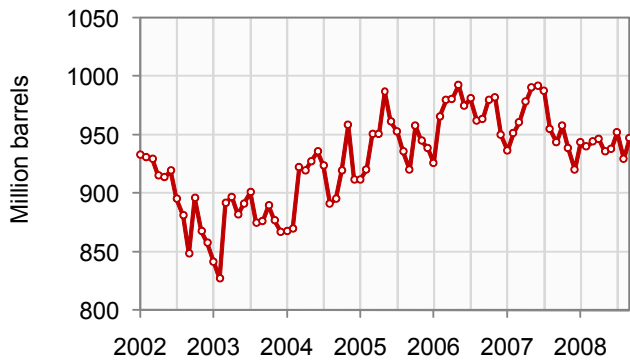


Source: JODI Database

**Total OECD crude oil and oil product stocks status**

Industrial inventories of crude oil in the OECD in September increased to a level of 947 million barrels from 929 million barrels in August according to IEA statistics.

**Chart 22:** OECD Crude Oil Stocks January 2002 - Sept. 2008

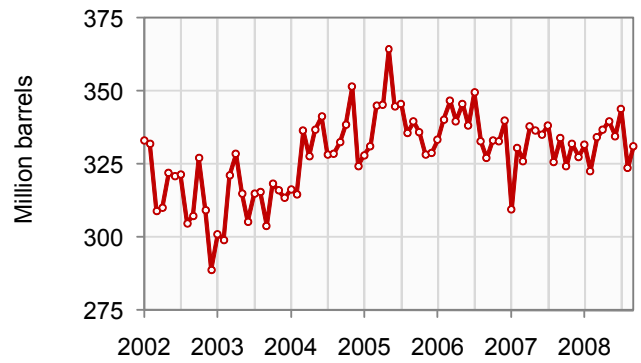


Source: International Energy Agency

**OECD Europe crude oil and oil product stocks status**

Industrial inventories of crude oil in OECD Europe increased in September to a level of 331 million barrels from 324 million barrels in August according to IEA statistics.

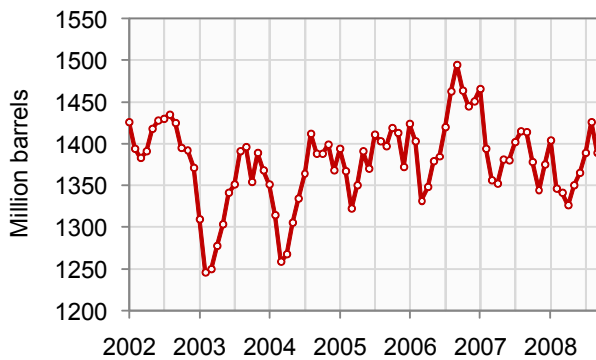
**Chart 24:** Europe Crude Oil Stocks January 2002 - Sept. 2008



Source: International Energy Agency

Total industrial product stocks in the OECD were 1389 million barrels in September 2008, a decrease of 37 million barrels from a stock level of 1426 million barrels in August. Total product stocks stand slightly higher than the five year average of 1381 million barrels.

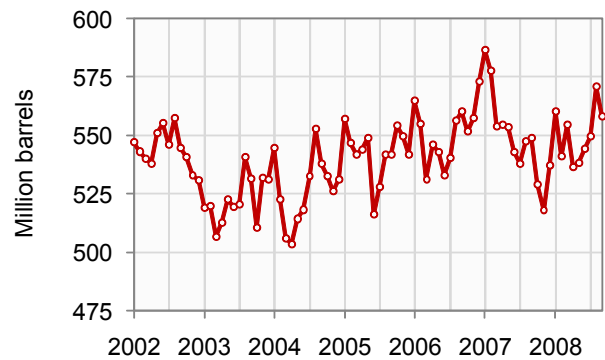
**Chart 23:** OECD Product Stocks Jan. 2002 - Sept. 2008



Source: International Energy Agency

Total industrial product stocks in OECD Europe were 558 million barrels in September 2008, a decrease of 13 million barrels from a stock level of 571 million barrels in August. Total product stocks stand slightly higher than the five year average of 542 million barrels.

**Chart 25:** Europe Product Stocks January 2002 - Sept. 2008



Source: International Energy Agency

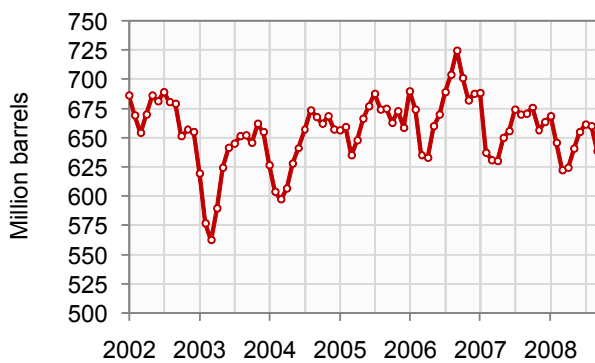
**OECD America crude oil and oil product stocks status**

Industrial inventories of crude oil in OECD America increased in September to a level of 449 million barrels from 440 million barrels in August according to IEA statistics.

**Chart 26: North America Crude Oil Stocks Jan. 2002 - Sept. 2008**


Source: International Energy Agency

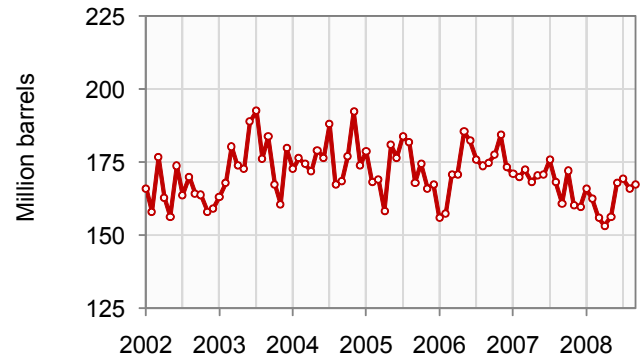
Total industrial product stocks in OECD America were 639 million barrels in September 2008, a decrease of 21 million barrels from a stock level of 660 million barrels in August. Total product stocks stand slightly lower than the five year average of 658 million barrels.

**Chart 27: N. America Product Stocks January 2002 - Sept. 2008**


Source: International Energy Agency

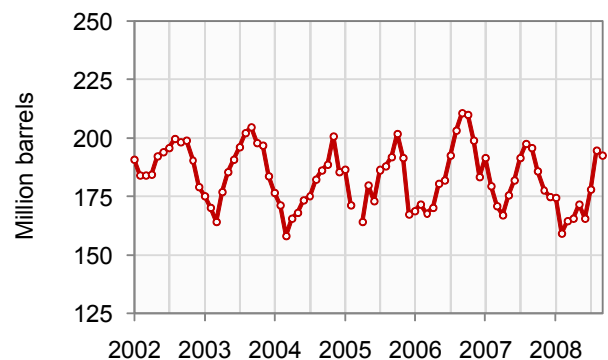
**OECD Pacific crude oil and oil product stocks status**

Industrial inventories of crude oil in OECD Pacific increased in September to a level of 167 million barrels from 166 million barrels in August according to IEA statistics. Stock levels remain stronger after the low level of 153 million barrels reached in April 2008.

**Chart 28: Pacific Crude Oil Stocks January 2002 - Sept. 2008**


Source: International Energy Agency

Total industrial product stocks in OECD Pacific were 193 million barrels in August 2008, a decrease of 2 million barrels over a stock level of 195 million barrels in August. Total product stocks stand slightly higher than the five year average of 182 million barrels.

**Chart 29: Pacific Product Stocks January 2002 - Sept. 2008**


Source: International Energy Agency



**World crude oil export status**

The series was derived by subtracting the consumption of oil products, refinery fuel and direct crude oil sales from liquids production in producer countries. Data comes from the Joint Oil Data Initiative (JODI) for demand and the International Energy Agency (IEA) and Energy Information Agency (EIA) for supply. Biofuels are not included in consumption data but are included in production data. Because biofuels are not identified in the production data it is not possible to separate this flow. Given that net energy biofuel production has increased by approximately 50,000 to 100,000 b/d annually in recent years, the series is slightly optimistic.

This method gives a crude approximation of the export market because it assumes that all producers refine their own oil products to satisfy internal market needs. In reality not all oil producers have their own refineries to meet internal product demand. Therefore, more crude will be exported to foreign countries where it is refined into usable products. These usable products are then imported back to the country where the crude oil came from. To derive precise export statistics one would need to combine four components for each individual oil producing country: 1) crude oil export flows, 2) crude oil import flows, 3) total product export flows, 4) total product import flows. Statistics that show only crude oil exports or total product imports on an aggregate basis only reveal one component of the equation, and cannot be taken at face value.

Unfortunately, data on all four components is not readily available for countries outside the OECD. At the moment the statistics shown are purely based on the method of subtracting the consumption of oil products, refinery fuel and direct crude oil sales from liquids production in producer countries, unless otherwise noted.

From 2005 to 2006, worldwide liquids production increased by nearly 1 million b/d from 84.1 million b/d in 2005 to 85 million b/d in 2006 according to the IEA. The exports database, which uses the methodology outlined above, shows that annual worldwide exports are roughly in the order of 46.3 million b/d, 47.5 million b/d, 47.4 and 47.3 million b/d in 2004, 2005, 2006 and 2007 respectively. From January to September 2008 the estimate suggests average world exports amounted to 47.56 million b/d.

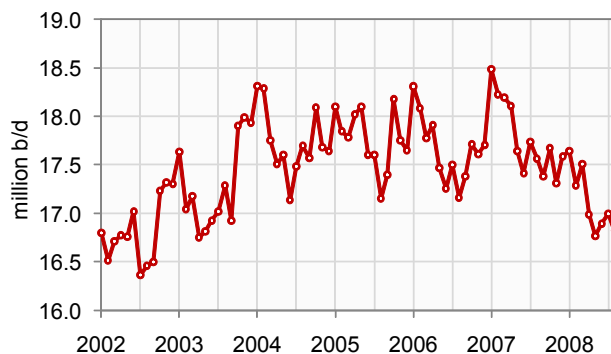
**Chart 30: World Liquids Exports Estimate Jan. 2002 - Sept. 2008**



Source: derived from the IEA, EIA and JODI Database

From January to September 2008 average non-OPEC exports were estimated to be 17.15 million b/d. An estimate of exports for 2003 gives a figure of 17.42 million b/d, increasing to 17.93 million b/d in 2004 and subsequently declining to 17.75 million b/d in 2005 and 17.68 million b/d in 2006. In 2007 non-OPEC exports increased to 17.89 million b/d.

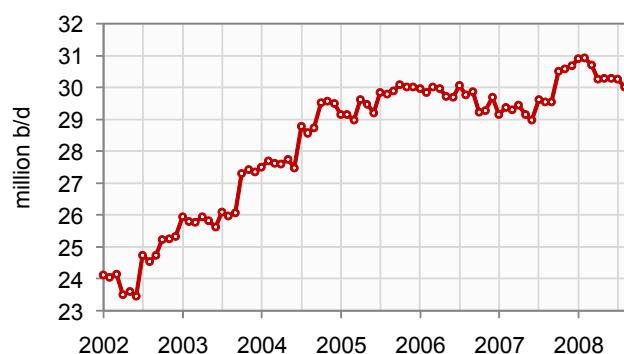
**Chart 31: Non-OPEC Liquids Exports January 2002 - Sept. 2008**



Source: derived from the IEA, EIA and JODI Database

An estimate of exports for OPEC 13 (including Iraq and Indonesia) for 2004 gives a figure of 28.37 million b/d, increasing to 29.60 million b/d in 2005, 29.76 million b/d in 2006 and declining to 29.46 million b/d in 2007. From January to September 2008 OPEC exports amounted to an average level of 30.41 million b/d.

**Chart 32: OPEC Liquids Exports January 2002 - August 2008**

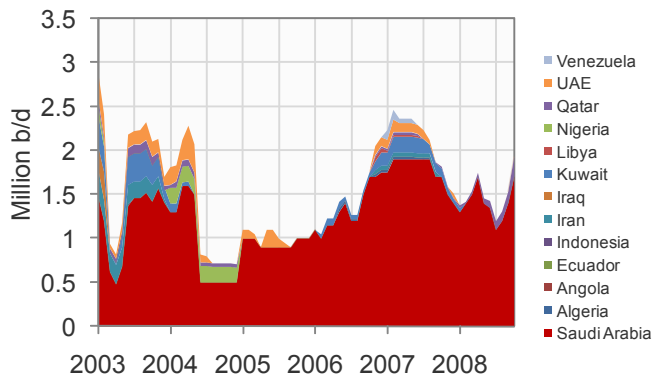


Source: derived from the IEA, EIA and JODI Database

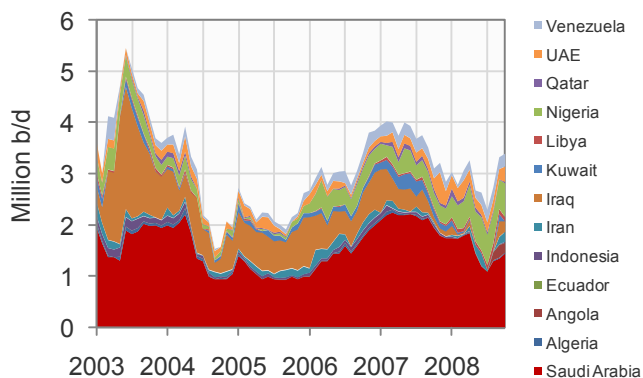
**OPEC spare capacity**

Total OPEC spare production capacity increased to 1.93 million b/d in October from a level of 1.53 million b/d in September according to the Energy Information Administration. Mainly due to an in Saudi spare capacity from 1.4 million b/d to 1.7 million b/d, next to a smaller increase of spare capacity from Qatar from 0.13 to 0.22 million b/d.

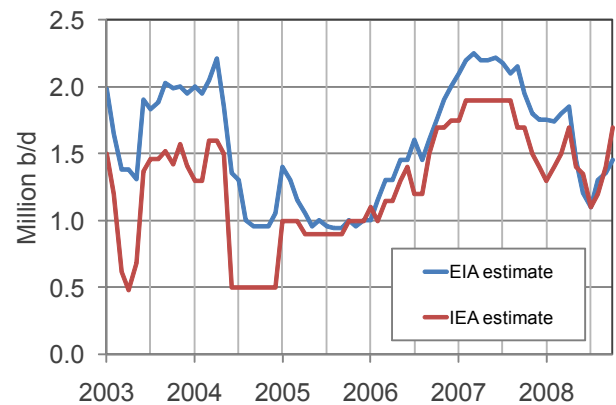
According to the International Energy Agency total effective spare capacity (excluding Indonesia, Iraq, Venezuela and Nigeria) stands at 2.28 million b/d in October from a level of 2.21 million b/d in September. Estimating Saudi Arabia to be capable of producing an additional 1.45 million b/d within 90 days, Algeria, Iran, Libya, Qatar and the United Arab Emirates another 0.64 million b/d and Angola another 0.19 million b/d.

**Chart 33: EIA OPEC Spare Capacity Jan. 2003 - October 2008**


Source: Energy Information Administration

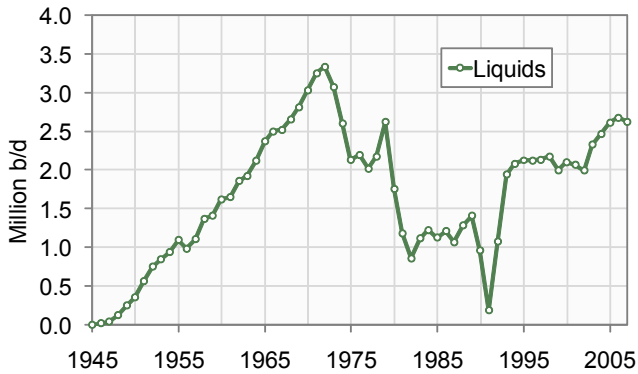
**Chart 34: IEA OPEC Spare Capacity Jan. 2003 - October 2008**


Source: International Energy Agency

**Chart 34a: Saudi Arabia Spare Capacity Jan. 2003 - Oct. 2008**


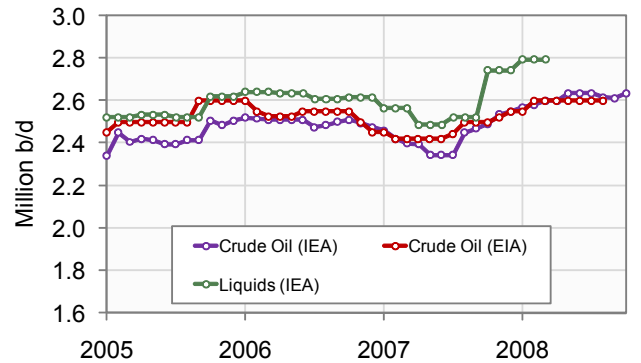
Source: Energy Information Administration, International Energy Agency

**Chart 35:** Kuwait Production 1945 - 2007



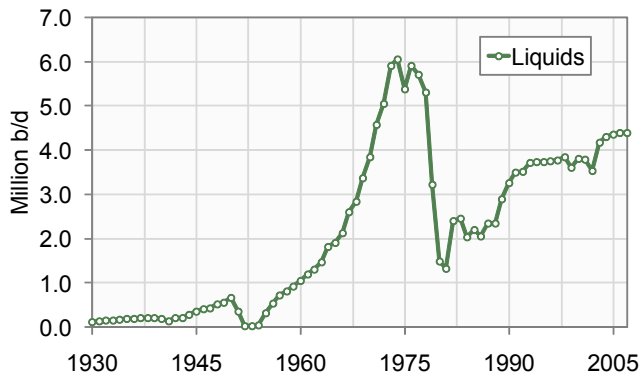
Source: ASPO Ireland & BP Statistical Review

**Chart 36:** Kuwait Production January 2005 - October 2008



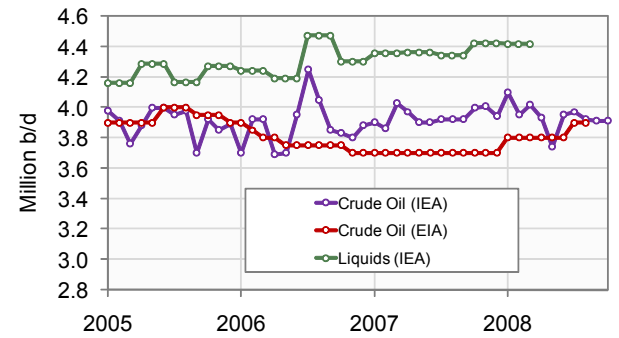
Source: Energy Information Administration & International Energy Agency

**Chart 37:** Iran Production 1930 - 2007



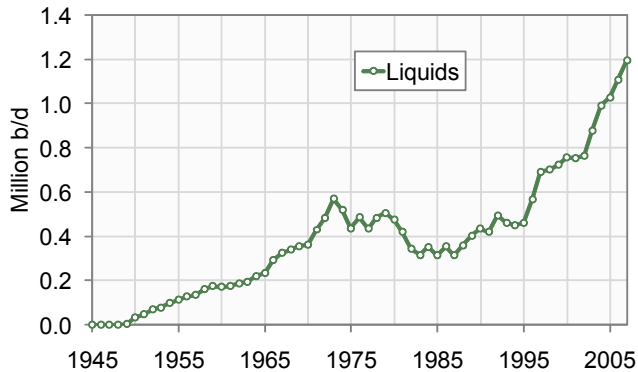
Source: ASPO Ireland & BP Statistical Review

**Chart 38:** Iran Production January 2005 - October 2008



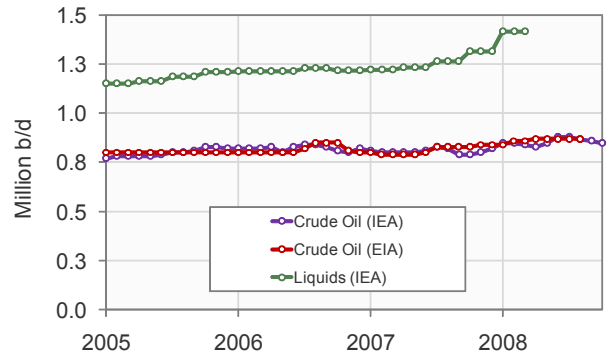
Source: Energy Information Administration & International Energy Agency

**Chart 39:** Qatar Production 1945 - 2007

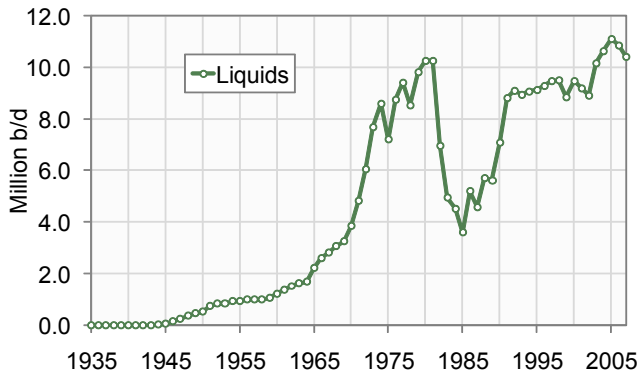


Source: ASPO Ireland & BP Statistical Review

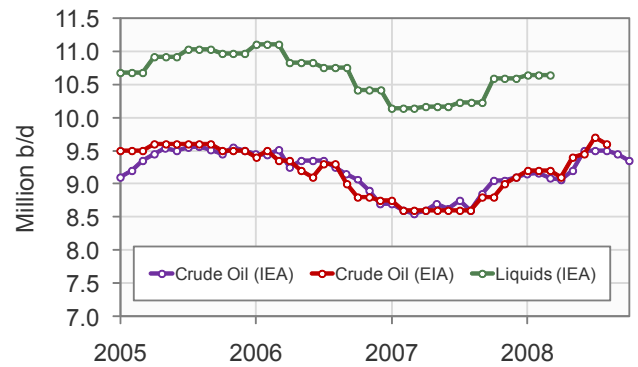
**Chart 40:** Qatar Production January 2005 - October 2008



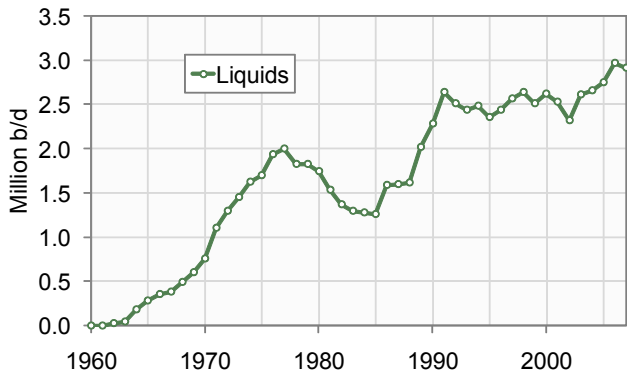
Source: Energy Information Administration & International Energy Agency

**Chart 41: Saudi Arabia Production 1935 - 2007**


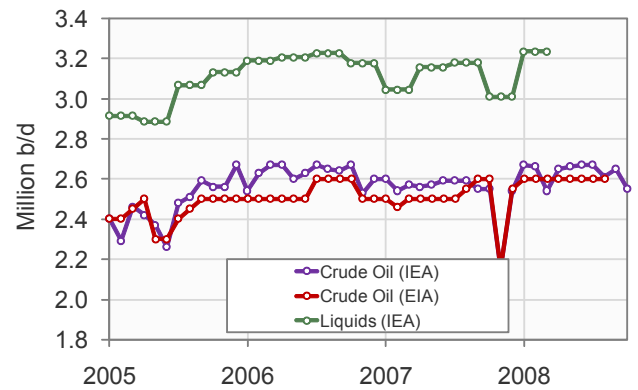
Source: ASPO Ireland &amp; BP Statistical Review

**Chart 42: Saudi Arabia Production January 2005 - Oct. 2008**


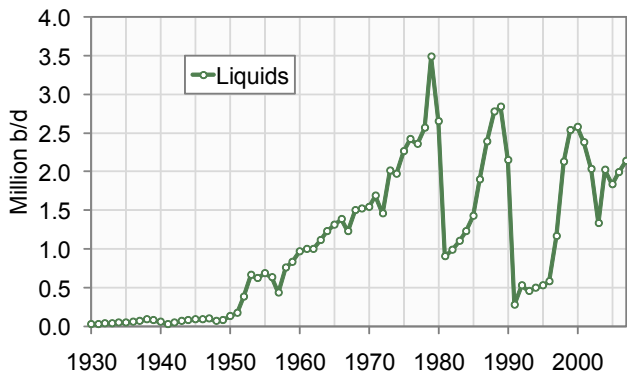
Source: Energy Information Administration &amp; International Energy Agency

**Chart 43: UAE Production 1960 - 2007**


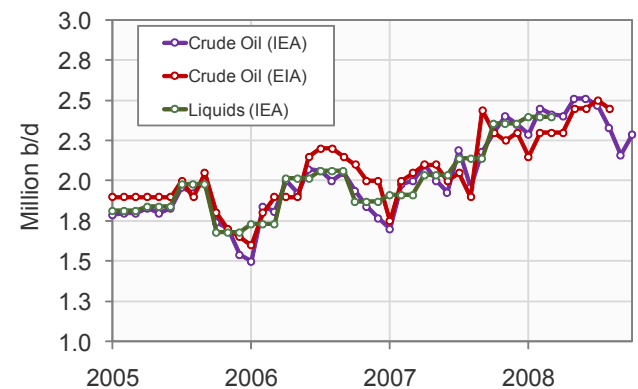
Source: ASPO Ireland &amp; BP Statistical Review

**Chart 44: UAE Production January 2005 - October 2008**


Source: Energy Information Administration &amp; International Energy Agency

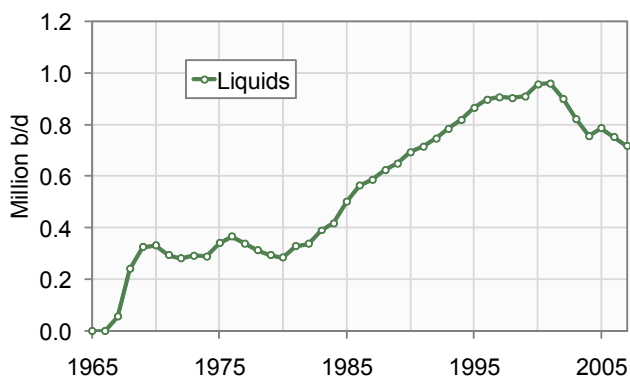
**Chart 45: Iraq Production 1930 - 2007**


Source: ASPO Ireland &amp; BP Statistical Review

**Chart 46: Iraq Production January 2005 - October 2008**


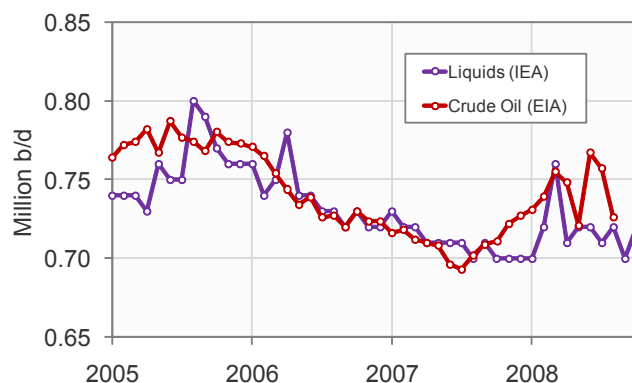
Source: Energy Information Administration &amp; International Energy Agency

**Chart 47:** Oman Production 1965 - 2007



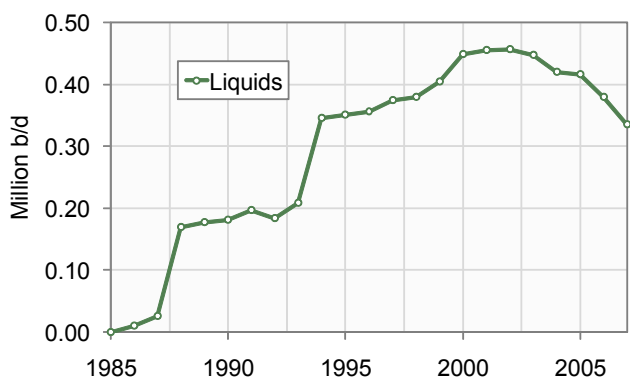
Source: Energy Information Administration & International Energy Agency

**Chart 48:** Oman Production January 2005 - October 2008



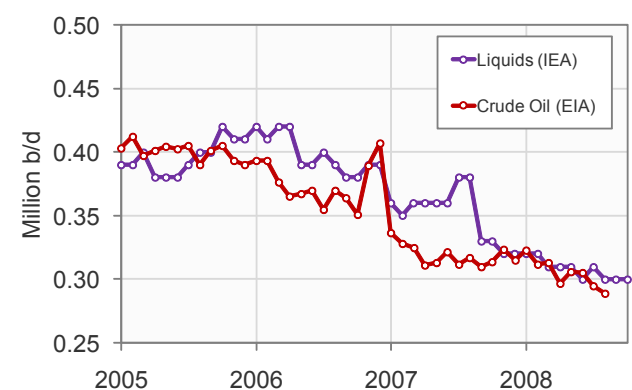
Source: Energy Information Administration & International Energy Agency

**Chart 49:** Yemen Production 1985 - 2007



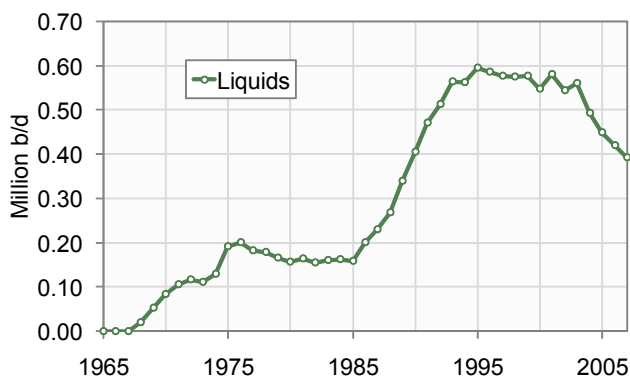
Source: Energy Information Administration & International Energy Agency

**Chart 50:** Yemen Production January 2005 - October 2008



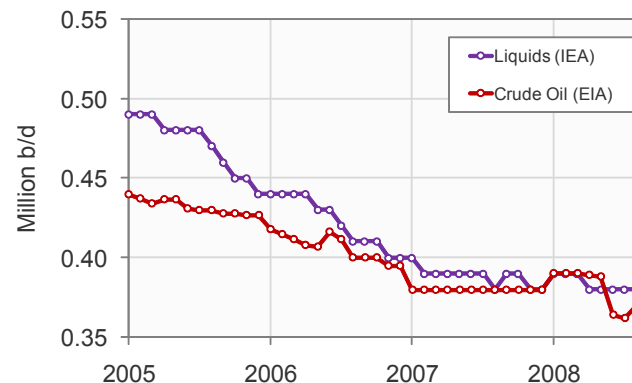
Source: Energy Information Administration & International Energy Agency

**Chart 51:** Syria Production 1965 - 2007

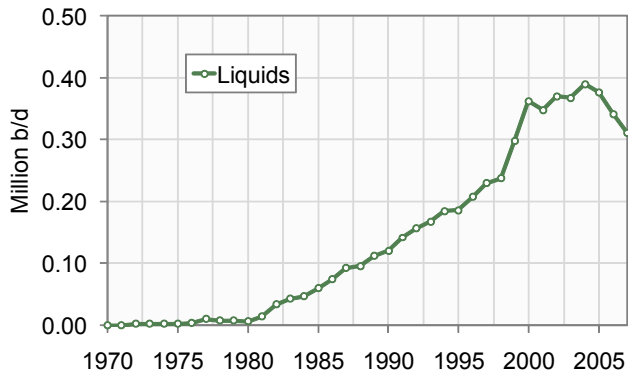


Source: Energy Information Administration & International Energy Agency

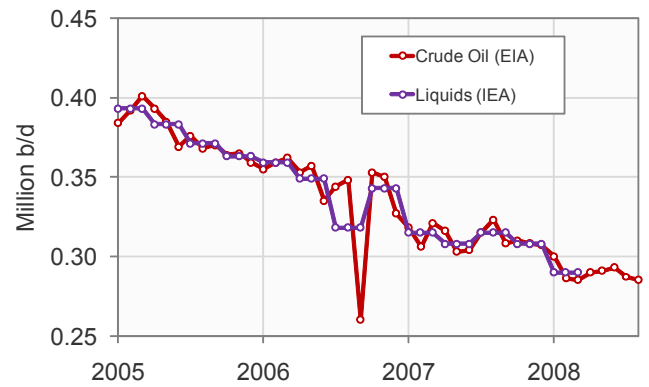
**Chart 52:** Syria Production January 2005 - October 2008



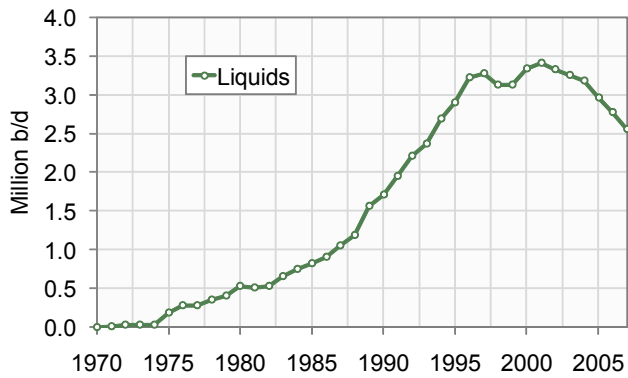
Source: Energy Information Administration & International Energy Agency

**Chart 54: Denmark Production 1970 - 2007**


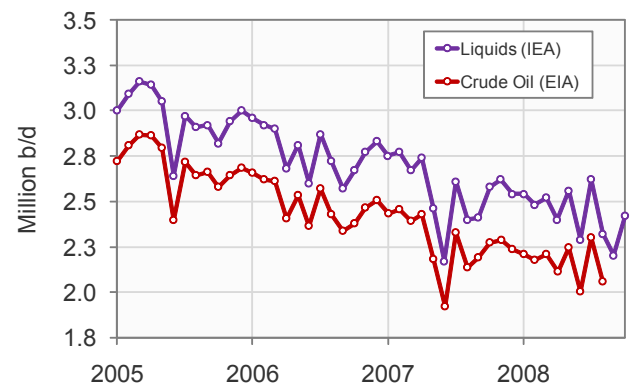
Source: ASPO Ireland &amp; BP Statistical Review

**Chart 54: Denmark Production January 2005 - August 2008**


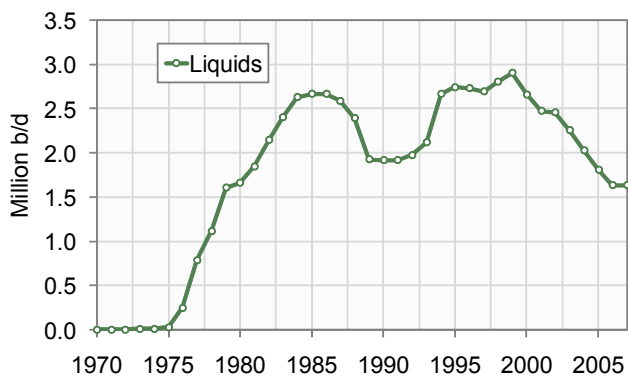
Source: Energy Information Administration &amp; International Energy Agency

**Chart 55: Norway Production 1970 - 2007**


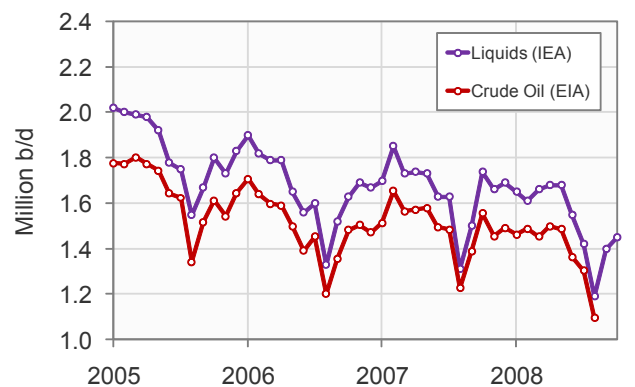
Source: ASPO Ireland &amp; BP Statistical Review

**Chart 56: Norway Production January 2005 - October 2008**


Source: Energy Information Administration &amp; International Energy Agency

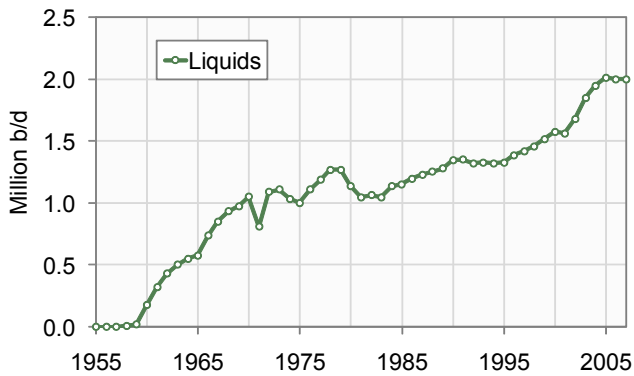
**Chart 57: United Kingdom Production 1970 - 2007**


Source: ASPO Ireland &amp; BP Statistical Review

**Chart 58: United Kingdom Production Jan. 2005 - Oct. 2008**


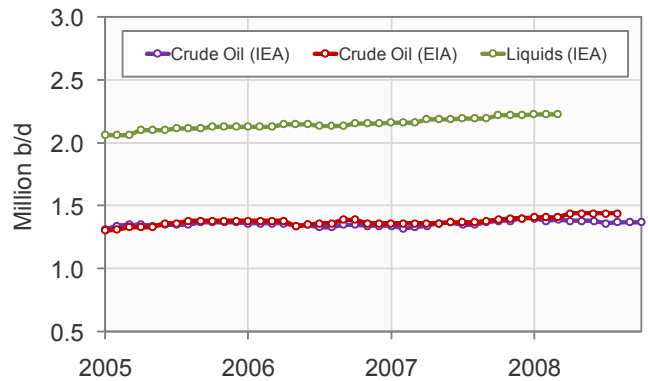
Source: Energy Information Administration &amp; International Energy Agency

**Chart 59:** Algeria Production 1955 - 2007



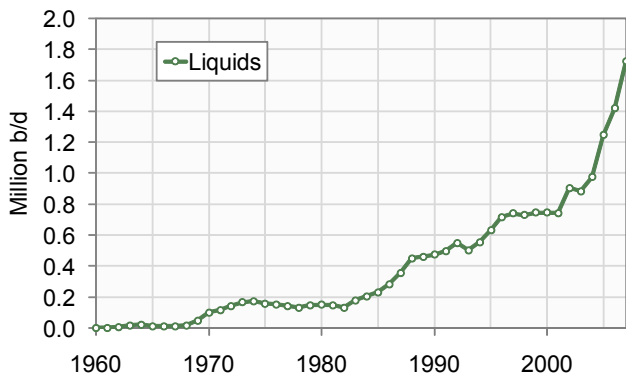
Source: ASPO Ireland & BP Statistical Review

**Chart 60:** Algeria Production January 2005 - October 2008



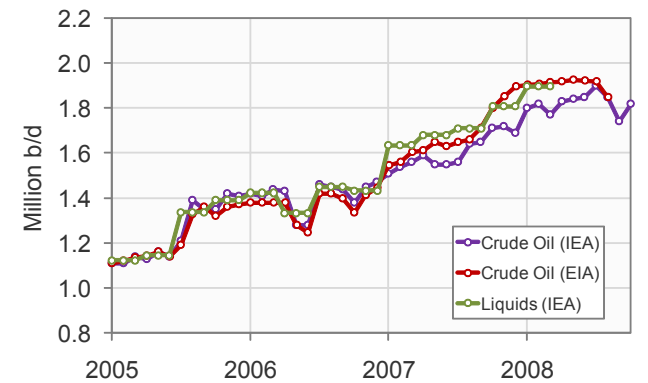
Source: Energy Information Administration & International Energy Agency

**Chart 61:** Angola Production 1960 - 2007



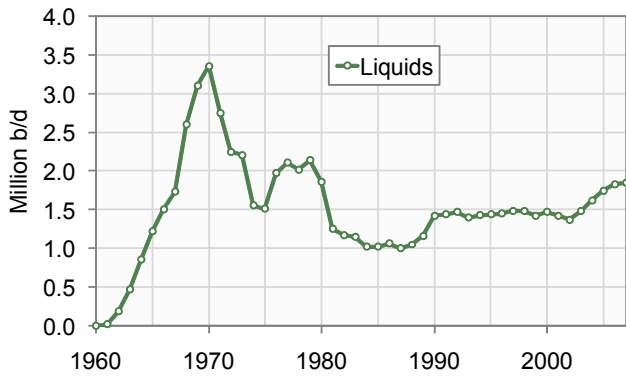
Source: ASPO Ireland & BP Statistical Review

**Chart 62:** Angola Production January 2005 - October 2008



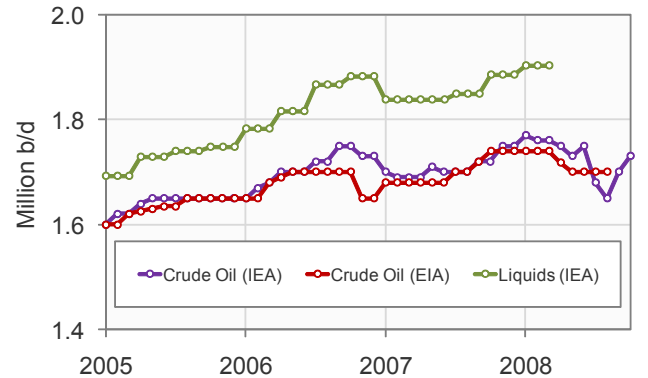
Source: Energy Information Administration & International Energy Agency

**Chart 63:** Libya Production 1970 - 2007

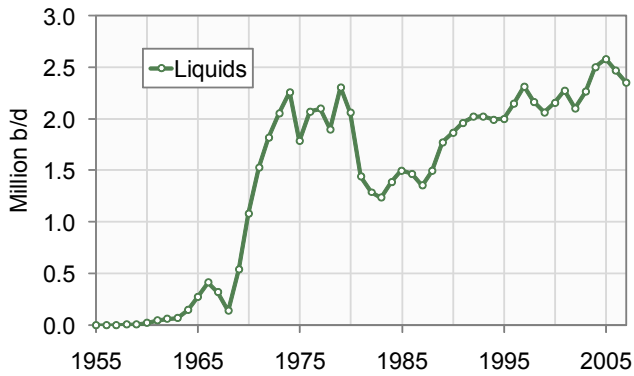


Source: ASPO Ireland & BP Statistical Review

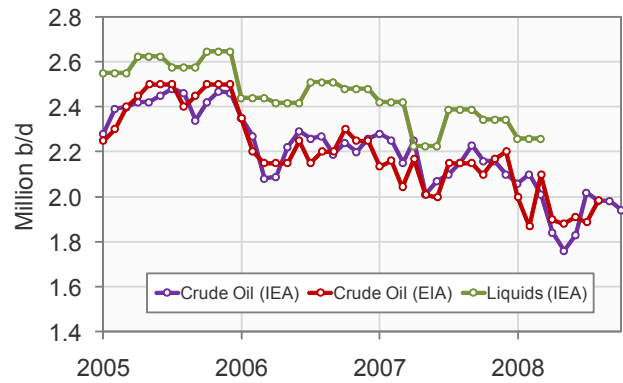
**Chart 64:** Libya Production January 2005 - October 2008



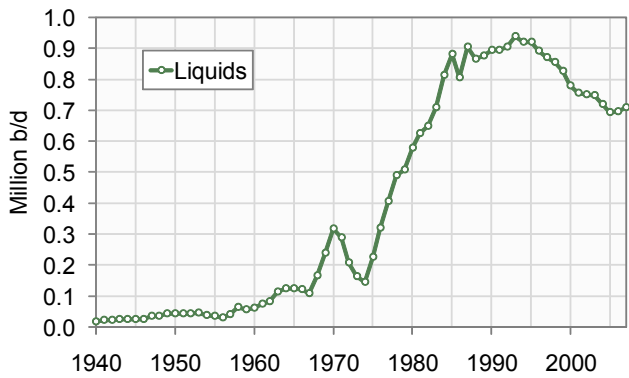
Source: Energy Information Administration & International Energy Agency

**Chart 65:** Nigeria Production 1955 - 2007


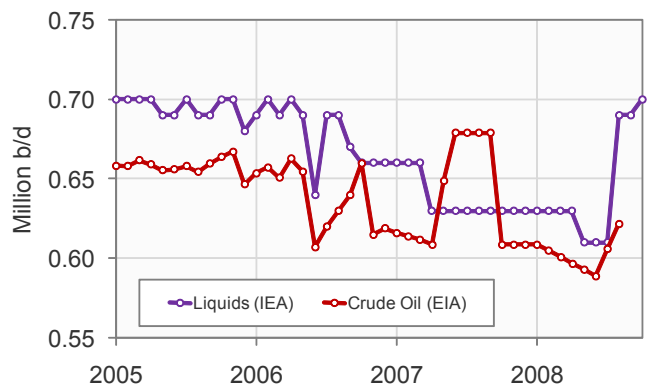
Source: ASPO Ireland &amp; BP Statistical Review

**Chart 66:** Nigeria Production January 2005 - October 2008


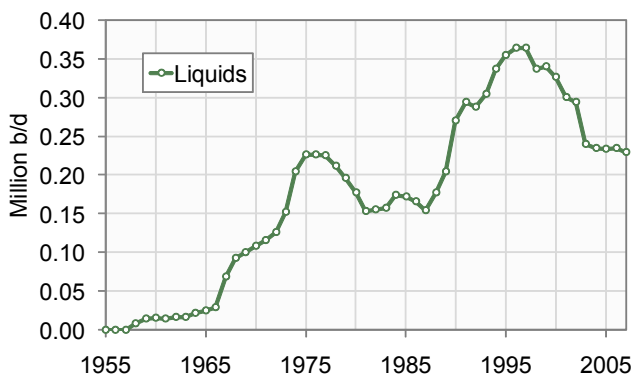
Source: Energy Information Administration &amp; International Energy Agency

**Chart 67:** Egypt Production 1940 - 2007


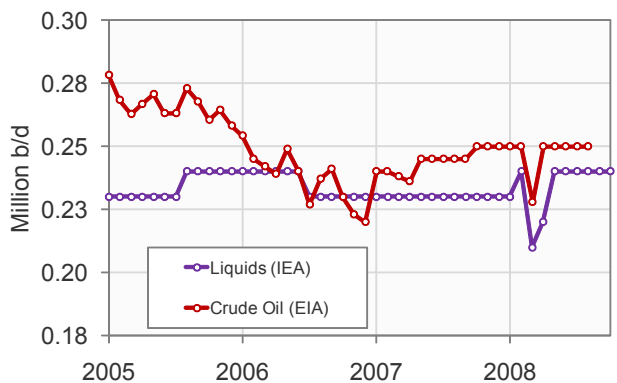
Source: ASPO Ireland &amp; BP Statistical Review

**Chart 68:** Egypt Production January 2005 - October 2008


Source: Energy Information Administration &amp; International Energy Agency

**Chart 69:** Gabon Production 1955 - 2007


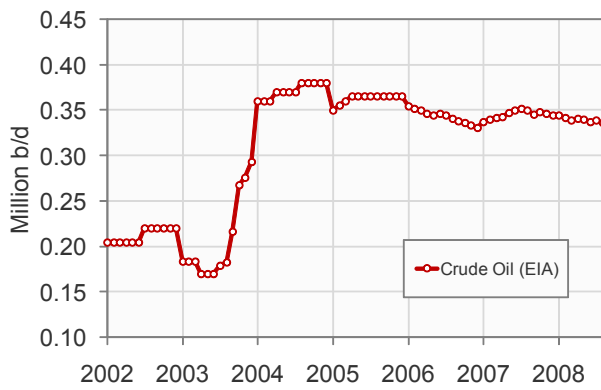
Source: ASPO Ireland &amp; BP Statistical Review

**Chart 70:** Gabon Production January 2005 - October 2008


Source: Energy Information Administration &amp; International Energy Agency

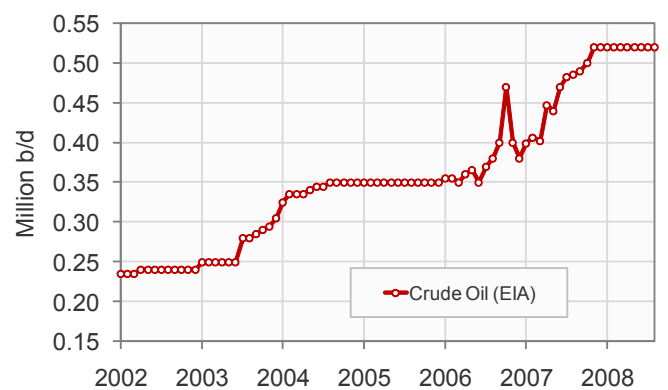


**Chart 71:** Equatorial Guinea Production Jan. 2002 - Aug. 2008



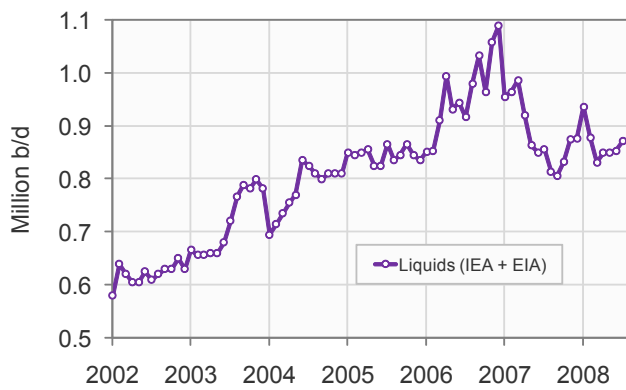
Source: Energy Information Administration

**Chart 72:** Sudan Production January 2002 - August 2008

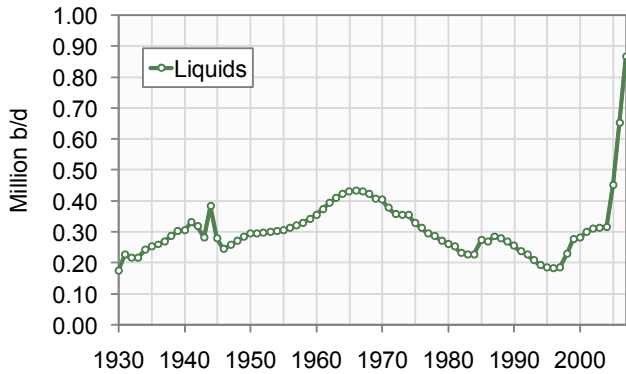


Source: Energy Information Administration

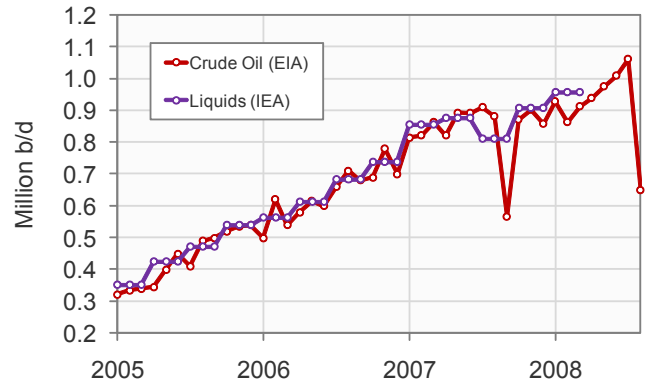
**Chart 73:** Other Africa Production January 2002 - August 2008



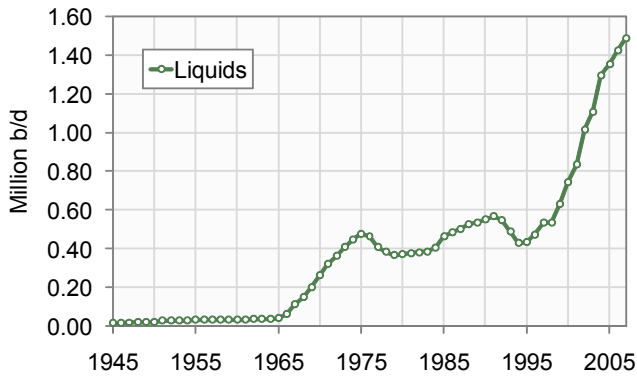
Source: Energy Information Administration & International Energy Agency

**Chart 74: Azerbaijan Production 1930 - 2007**


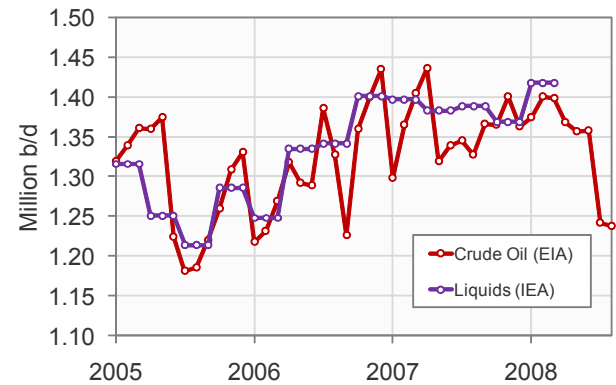
Source: ASPO Ireland &amp; BP Statistical Review

**Chart 75: Azerbaijan Production January 2005 - August 2008**


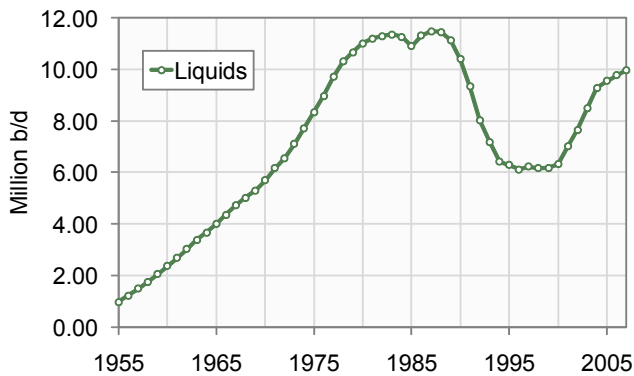
Source: Energy Information Administration &amp; International Energy Agency

**Chart 76: Kazakhstan Production 1945 - 2007**


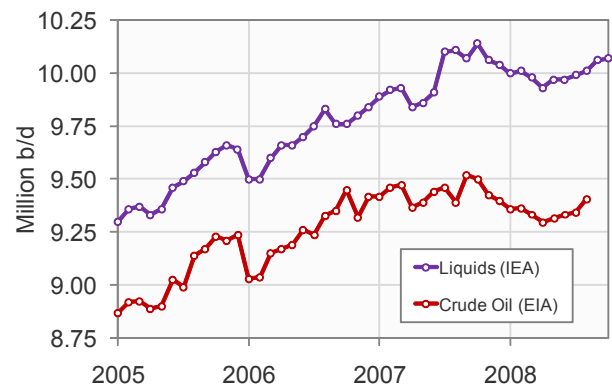
Source: ASPO Ireland &amp; BP Statistical Review

**Chart 77: Kazakhstan Production January 2005 - August 2008**


Source: Energy Information Administration &amp; International Energy Agency

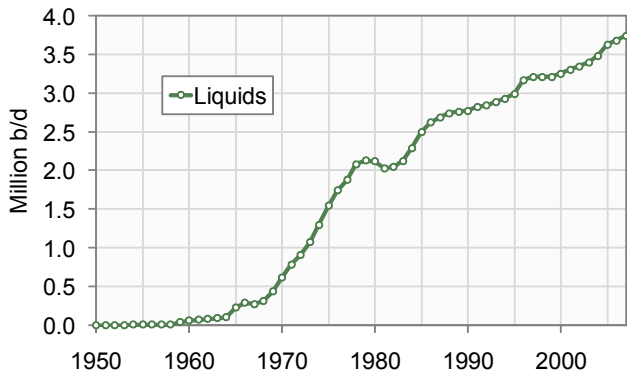
**Chart 78: Russia Production 1955 - 2007**


Source: ASPO Ireland &amp; BP Statistical Review

**Chart 79: Russia Production January 2005 - October 2008**


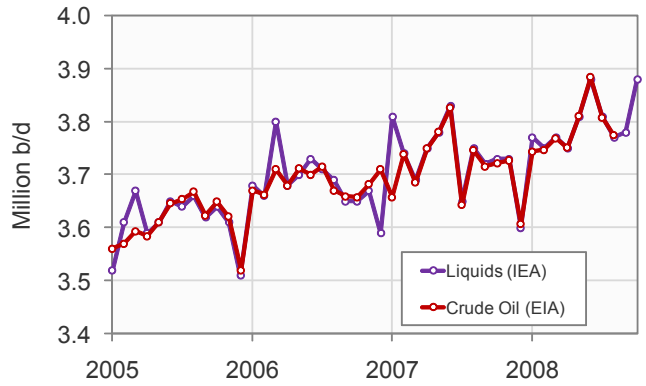
Source: Energy Information Administration &amp; International Energy Agency

**Chart 80:** China Production 1950 - 2007



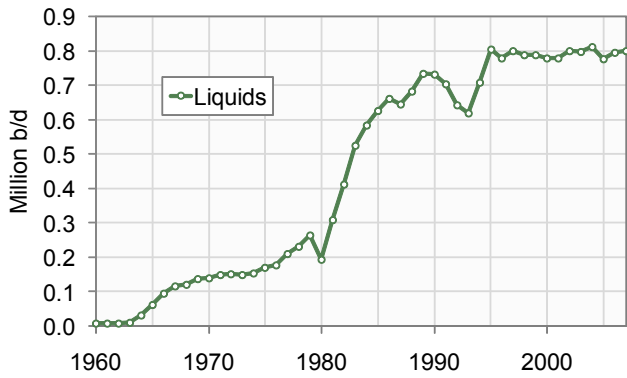
Source: ASPO Ireland & BP Statistical Review

**Chart 81:** China Production January 2005 - October 2008



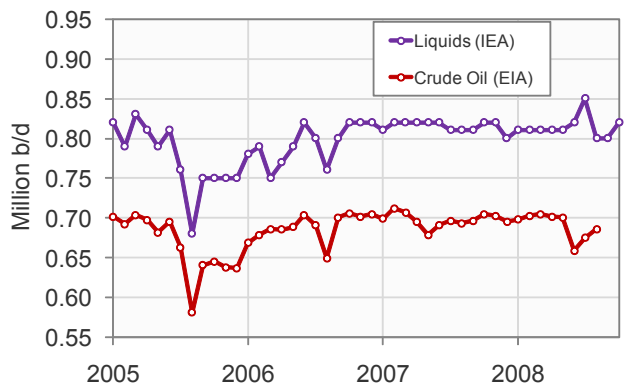
Source: Energy Information Administration & International Energy Agency

**Chart 82:** India Production 1960 - 2007



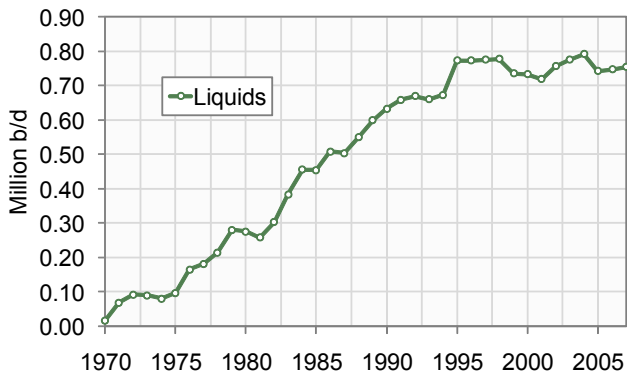
Source: ASPO Ireland & BP Statistical Review

**Chart 83:** India Production January 2005 - October 2008



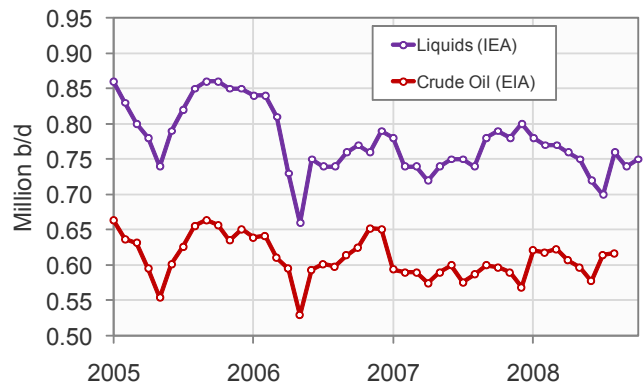
Source: Energy Information Administration & International Energy Agency

**Chart 84:** Malaysia Production 1955 - 2007

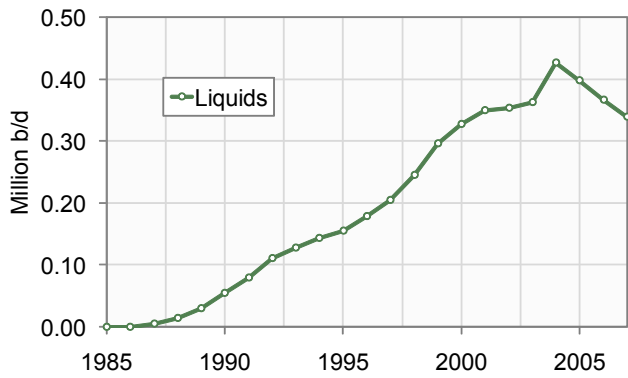


Source: ASPO Ireland & BP Statistical Review

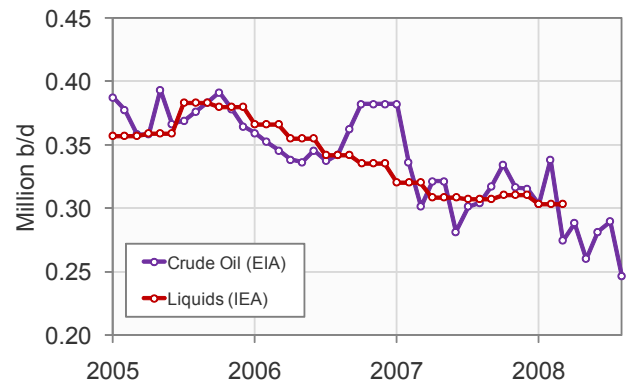
**Chart 85:** Malaysia Production January 2005 - October 2008



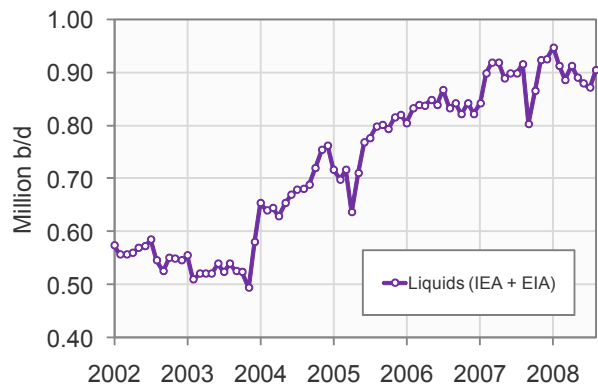
Source: Energy Information Administration & International Energy Agency

**Chart 86:** Vietnam Production 1955 - 2007


Source: ASPO Ireland &amp; BP Statistical Review

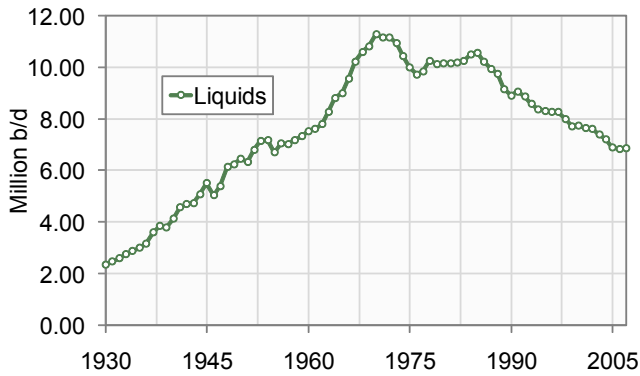
**Chart 87:** Vietnam Production January 2005 - August 2008


Source: Energy Information Administration &amp; International Energy Agency

**Chart 88:** Other Asia Production January 2002 - August 2008


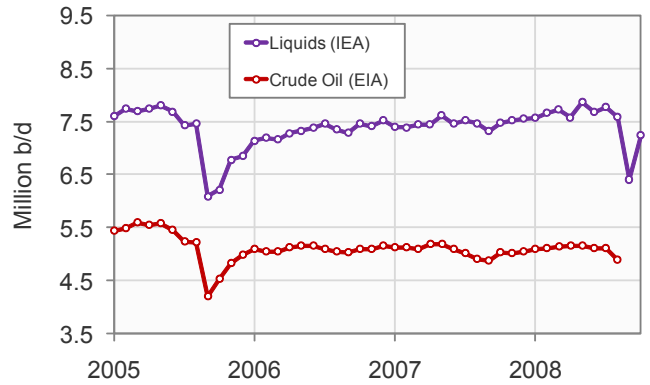
Source: Energy Information Administration &amp; International Energy Agency

**Chart 89:** United States Production 1930 - 2007



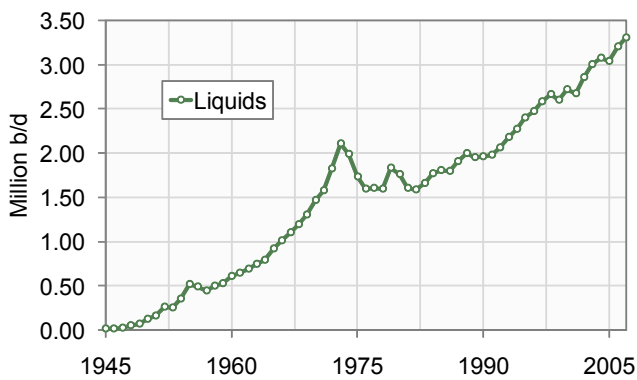
Source: ASPO Ireland & BP Statistical Review

**Chart 90:** United States Production January 2005 - Oct. 2008



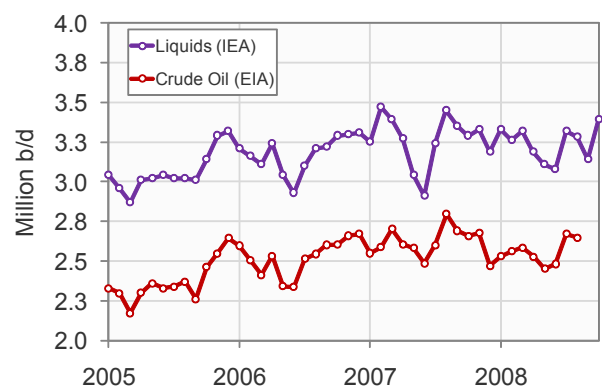
Source: Energy Information Administration & International Energy Agency

**Chart 91:** Canada Production 1945 - 2007



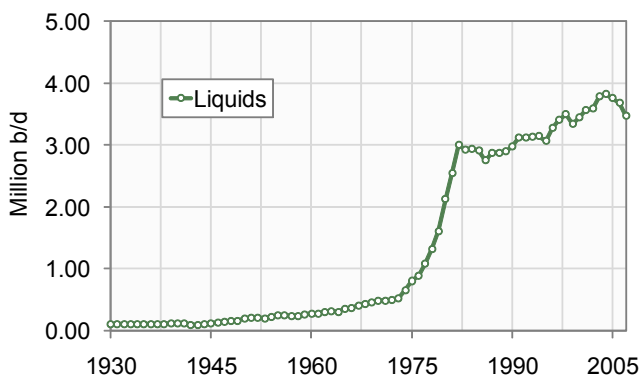
Source: ASPO Ireland & BP Statistical Review

**Chart 92:** Canada Production January 2005 - October 2008



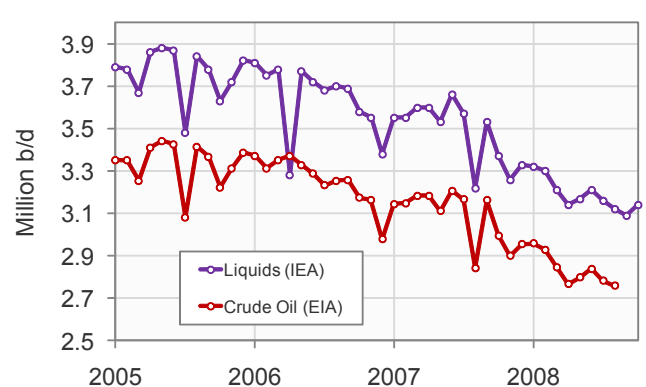
Source: Energy Information Administration & International Energy Agency

**Chart 93:** Mexico Production 1930 - 2007

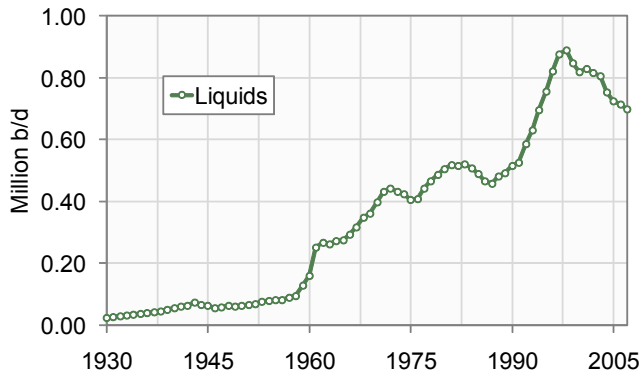


Source: ASPO Ireland & BP Statistical Review

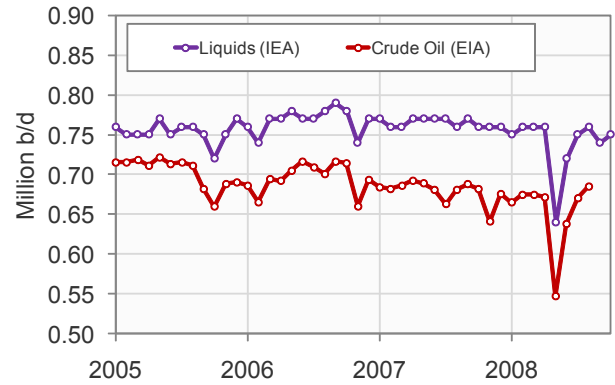
**Chart 94:** Mexico Production January 2005 - September 2008



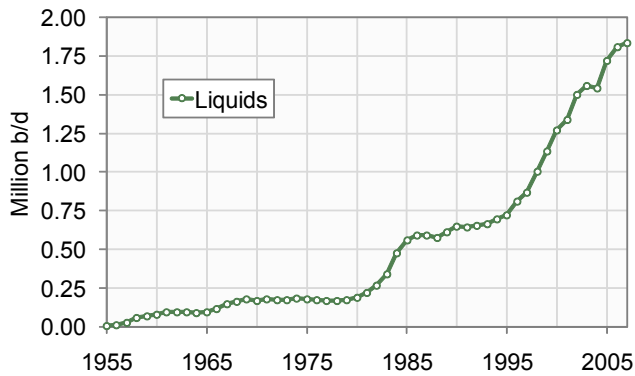
Source: Energy Information Administration & International Energy Agency

**Chart 95: Argentina Production 1930 - 2007**


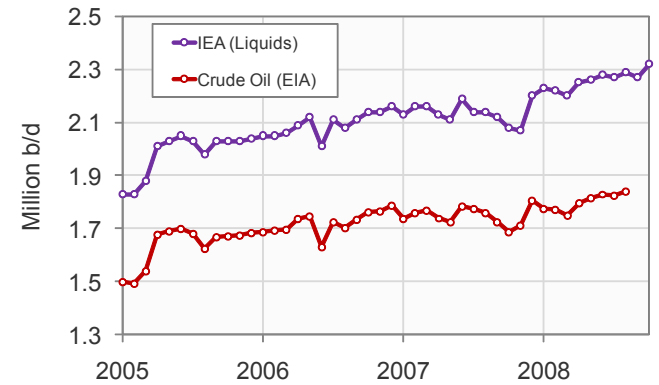
Source: ASPO Ireland &amp; BP Statistical Review

**Chart 96: Argentina Production January 2005 - October 2008**


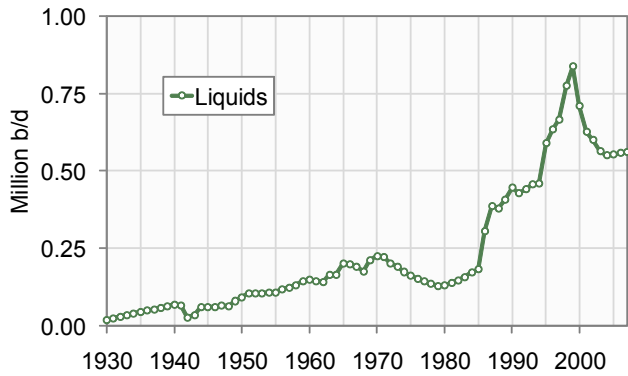
Source: Energy Information Administration &amp; International Energy Agency

**Chart 97: Brazil Production 1955 - 2007**


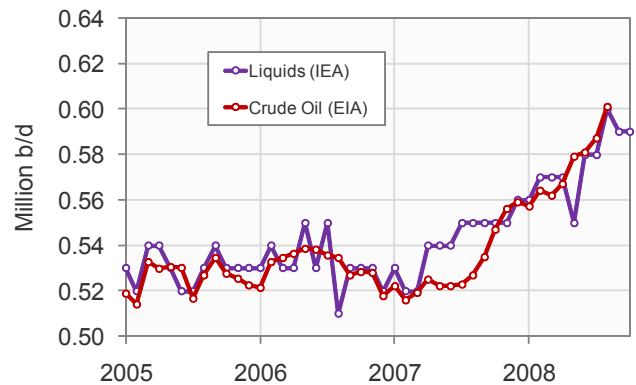
Source: ASPO Ireland &amp; BP Statistical Review

**Chart 98: Brazil Production January 2005 - October 2008**


Source: Energy Information Administration &amp; International Energy Agency

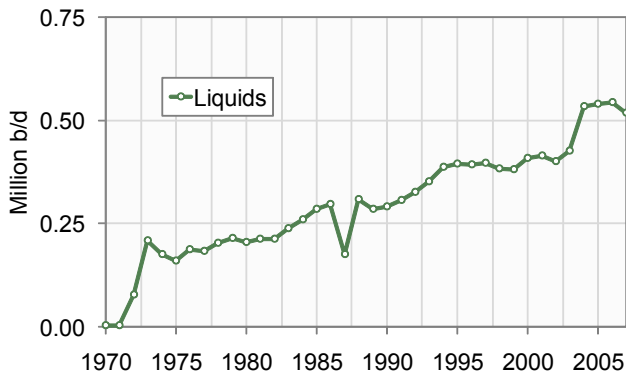
**Chart 99: Colombia Production 1930 - 2007**


Source: ASPO Ireland &amp; BP Statistical Review

**Chart 100: Colombia Production January 2005 - October 2008**


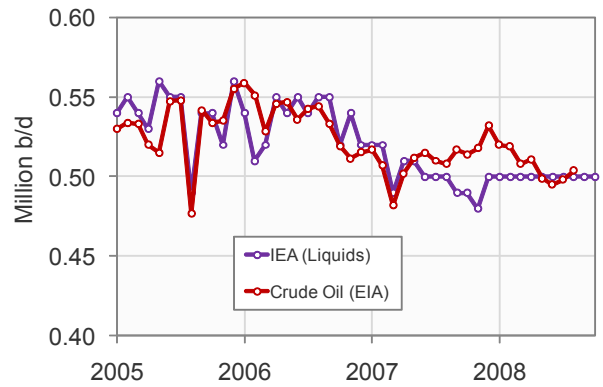
Source: Energy Information Administration &amp; International Energy Agency

**Chart 101:** Ecuador Production 1970 - 2007



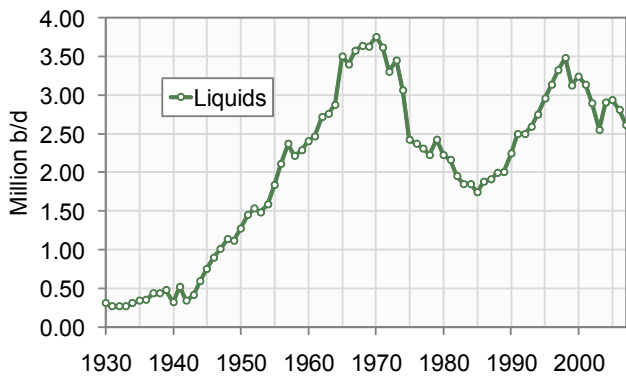
Source: ASPO Ireland & BP Statistical Review

**Chart 102:** Ecuador Production January 2005 - October 2008



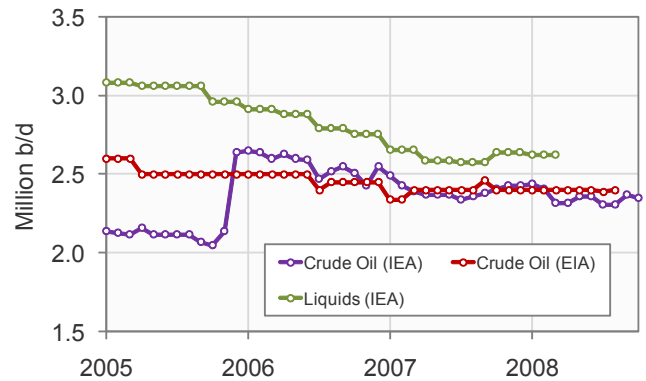
Source: Energy Information Administration & International Energy Agency

**Chart 104:** Venezuela Production 1930 - 2007



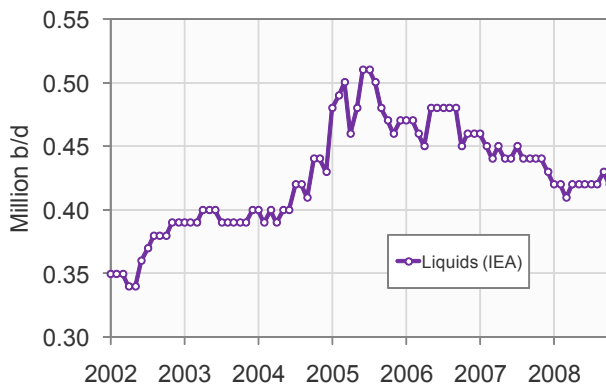
Source: ASPO Ireland & BP Statistical Review

**Chart 105:** Venezuela Production Jan. 2005 - October 2008

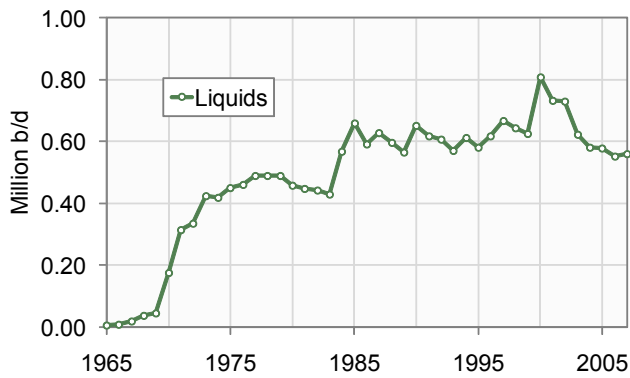


Source: Energy Information Administration & International Energy Agency

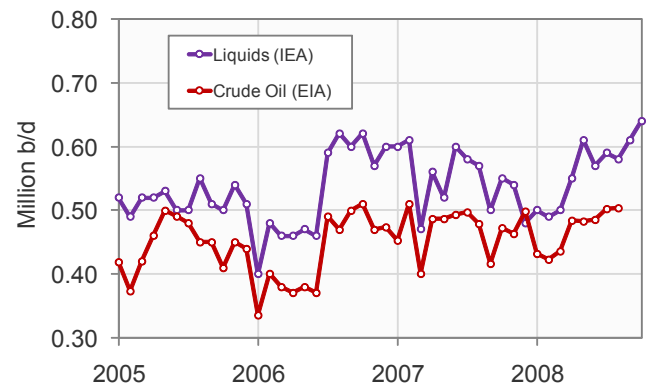
**Chart 106:** Other S. America Production Jan. 2002 - Oct. 2008



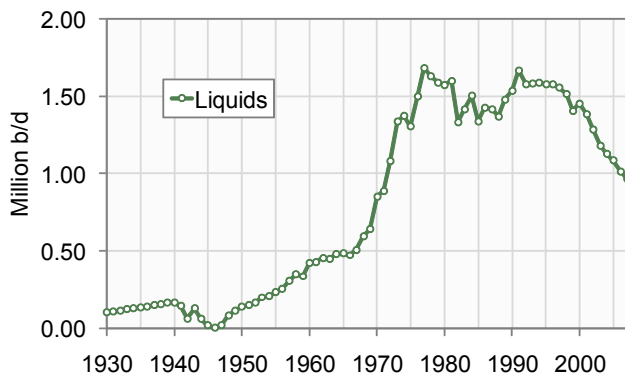
Source: International Energy Agency

**Chart 108: Australia Production 1970 - 2007**


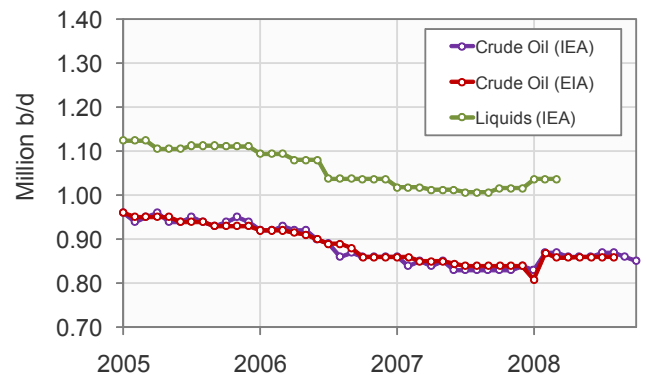
Source: ASPO Ireland &amp; BP Statistical Review

**Chart 109: Australia Production January 2005 - October 2008**


Source: Energy Information Administration &amp; International Energy Agency

**Chart 110: Indonesia Production 1930 - 2007**


Source: ASPO Ireland &amp; BP Statistical Review

**Chart 111: Indonesia Production January 2005 - October 2008**


Source: Energy Information Administration &amp; International Energy Agency