China’s oil consumption and giant oil fields

Last year China surpassed the United States as largest energy consuming country of the world according to the International Energy Agency. The US still consumes far more oil than China, however, at an average of 19 million barrels per day in the first half of 2010 versus 8.8 million in China. Growth in Chinese oil consumption has remained quite strong throughout the years at an average of 7% since 2003 while US consumption initially was stable around 20.7 million b/d until the economic crisis caused a consumption decline. If the current pace of Chinese growth could be continued and US consumption would stabilize it would take at least until 2020 for China to surpass US oil consumption levels.

That change alone would require at least 10 million barrels of additional Chinese oil imports and probably more due to the onset of peak oil in China in this decade. In “the development journey and outlook of Chinese giant oilfields” published in Petroleum Exploration and development in April of this year, Hook et al. find that 70% of Chinese oil production was obtained from 9 giant oil fields. Five of these are already in decline, three will begin their decline around 2009/2010 and only one, the giant Xinjiang will be able to maintain its current plateau production until around 2020. The overall conclusions from the article’s authors: 1) the stable plateau in production of the nine giants maintained since the late 1980’s will turn into a decline of 3% per year around 2010, 2) It is questionable that other sources can offset declining giant oilfields production due to their large share in production. Resulting in the expectation that peak oil will arrive in China in 2010. For now China’s production is for now still rising crossing the 4 million per day barrier in April of 2010 and standing at 4.09 million b/d in July 2010 according to the International Energy Agency.

Rembrandt Koppelaar
World liquid fuels production
In July 2010 world production of all liquid fuels increased by 860,000 b/d from June according to the latest figures of the International Energy Agency (IEA). Resulting in total world liquid fuels production of 87.22 million b/d. Liquids production for June 2010 was revised upwards in the IEA Oil Market Report of August from 86.15 to 86.36 million b/d. Average global liquid fuels production in 2009 was 84.94 versus 86.6 and 85.32 million b/d in 2008 and 2007.

Chart 2: Liquids Production January 2004 - July 2010

World biofuels production
Total world biofuels production in June 2010 is estimated at 1.84 million b/d according to biofuel statistics of the International Energy Agency.


World oil production capacity
Total oil production capacity in July 2010 increased by 820,000 b/d from June 2010 from 90.16 to 90.98 million b/d. World production capacity is measured here as the sum of world liquid production excluding biofuels plus total OPEC spare capacity excluding Iraq, Venezuela and Nigeria.

Chart 4: World Production Capacity Jan. 2003 - July 2010

Source: International Energy Agency, EIA.
World oil production

**EIA liquids versus IEA liquids excluding biofuels production**
Liquid fuels production figures published by the Energy Information Administration in their International Petroleum Monthly excludes biofuels produced in countries beside the United States and Brazil. The remaining difference is caused by discrepancies between natural gas liquids and Canadian unconventional oil production.

**World crude oil production**
Latest figures from the Energy Information Administration (EIA) show that crude oil production including lease condensates decreased by 103,000 b/d from April to May 2010. Resulting in total production of crude oil including lease condensates of 73.34 million b/d.

**World natural gas liquids production**
Natural Gas Liquids production from natural gas fields increased 89,000 b/d from April to May 2010 according to the latest International Petroleum Monthly of the Energy Information Administration (EIA). Resulting in total NGL production of 8.56 million b/d.
World conventional crude versus liquids production ratio

Approximately 85% of world liquid fuels production in 2008 came from conventional crude oil including lease condensates. The remaining share of 15% was produced by 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 1970s, to approximately 12.9 mb/d in 2008, excluding lease condensates.

World unconventional liquid fuels production

In 2008 the biggest part of unconventional liquid fuels production came from Natural Gas Liquids at 11% or 7.94 million b/d. Secondly, extra heavy crude and bitumen at 3.4% or 2.68 million b/d of which 1.27 million b/d from Canadian oil sands and 1.41 million b/d from other sources. Thirdly, Biofuels at 1.8% or 1.45 million b/d. And finally Polar Oil at a production rate of 840,000 b/d in 2008 or 1.1% of total liquids supply.

World energy content from liquid fuels production

In production statistics all liquid fuels are aggregated as total ‘oil’ production while containing different amounts of energy per barrel produced. For example, a barrel of crude oil contains around 5.8 million British Thermal Units while a similar barrel of natural gas liquids contains 4.2 million BTU. Conversion to BTU’s shows that actual available energy worldwide in January 2010 was 3.3% lower than liquids statistics counted in barrels would suggest.
OPEC oil production

OPEC natural gas liquids production
OPEC natural gas liquids remained stable from June to July 2010 at a level of 5.08 million b/d. Average OPEC natural gas liquids production in 2009 was 4.67 million b/d, versus 4.47 and 4.55 million b/d in respectively 2008 and 2007.

OPEC crude oil production
Total crude oil production excluding lease condensates of the OPEC cartel increased by 230,000 b/d to a level of 29.2 million b/d, from June to July 2010, according to the latest available estimate of the IEA. Average crude oil production in 2009 was 28.7 million b/d, versus 31.43 and 30.37 million b/d in respectively 2008 and 2007.

OPEC liquid fuels production & production capacity
Total liquid fuels production in OPEC countries increased by 230,000 b/d from June to July 2010 to a level of 34.28 million b/d. Liquids production for June 2010 was revised upwards in the IEA Oil Market Report of August from 33.97 to 34.05 million b/d. Average liquid fuels production in 2009 was 33.7 million b/d, versus 36.09 and 35.02 million b/d in respectively 2008 and 2007. All time high production of OPEC liquid fuels stands at 36.4 million b/d reached in July 2008.
Non-OPEC natural gas liquids production increased by 8,000 b/d from April to May 2010 to a level of 3.38 million b/d. Average Non-OPEC natural gas liquids production in 2009 was 3.34 million b/d, versus 3.65 and 3.79 million b/d in respectively 2008 and 2007.

Non-OPEC crude oil production
Total Non-OPEC crude oil production including lease condensates decreased by 165,000 b/d to a level of 42.23 million b/d, from April to May 2010, according to the latest available estimate of the EIA. Crude oil production for April 2010 was revised downwards in the EIA International Petroleum Monthly of August from 42.48 to 42.40 million b/d. Average crude oil production in 2009 was 41.61 million b/d, versus 41.32 and 41.80 million b/d in respectively 2008 and 2007.

Non-OPEC liquid fuels production
Total liquid fuels production excluding biofuels in Non-OPEC countries increased by 580,000 b/d from June to July 2010. Resulting in a production level of 51.11 million b/d according to the International Energy Agency. Liquids production for June 2010 was revised upwards in the IEA Oil Market Report of August from 50.38 to 50.52 million b/d. Average liquid fuels production in 2009 was 49.67 million b/d, versus 49.32 and 49.34 million b/d in respectively 2008 and 2007.
Saudi Arabia oil consumption
Oil consumption in Saudi Arabia increased by 159,000 b/d from April to May 2010 to a level of 2.04 million b/d. Average Saudi Arabian oil consumption in 2009 was 1.82 million b/d, versus 1.65 and 1.52 million b/d in respectively 2008 and 2007.

Iran oil consumption
Oil consumption in Iran decreased by 5,000 b/d from April to May 2010 to a level of 1.50 million b/d. Average Iranian oil consumption in 2009 was 1.52 million b/d, versus 1.64 and 1.52 million b/d in respectively 2008 and 2007.

OPEC oil consumption
Oil consumption in all OPEC oil producers combined increased by 6,000 b/d from April to May 2010. Resulting in a consumption level of 6.28 million b/d. Average OPEC oil consumption in 2009 was 5.94 million b/d, versus 5.76 and 5.30 million b/d in respectively 2008 and 2007.
OECD oil consumption
Oil consumption in OECD countries decreased by 500,000 b/d from April to May 2010. Resulting in a consumption level of 43.43 million b/d. Average OECD oil consumption in 2009 was 43.92 million b/d, versus 46.10 and 47.68 million b/d in respectively 2008 and 2007.

North America oil consumption
Oil consumption in North America increased by 1.0 million b/d from April to May 2010. Resulting in a consumption level of 23.84 million b/d. Average oil consumption in North America in 2009 was 22.51 million b/d, versus 23.50 and 24.72 million b/d in respectively 2008 and 2007.

European Union oil consumption
Oil consumption in the European Union decreased by 785,000 b/d from April to May 2010. Resulting in a consumption level of 12.48 million b/d according to JODI statistics. Average consumption in the European Union in 2009 was 13.6 million b/d, versus 14.25 and 14.32 million b/d in respectively 2008 and 2007.
Canada oil consumption
Oil consumption in Canada increased by 197,000 b/d from April to May 2010. Resulting in a consumption level of 2.26 million b/d. Average consumption in Canada in 2009 was 1.96 million b/d, versus 2.06 and 2.08 million b/d in respectively 2008 and 2007.

Mexico oil consumption
Oil consumption in Mexico increased by 65,000 b/d from April to May 2010. Resulting in a consumption level of 1.92 million b/d. Average oil consumption in Mexico in 2009 was 1.87 million b/d, versus 1.95 and 1.94 million b/d in respectively 2008 and 2007.

United States oil consumption
Oil consumption in the US increased by 744,000 b/d from April to May 2010. Resulting in a consumption level of 19.66 million b/d. Average consumption of oil in the US in 2009 was 18.68 million b/d, versus 19.50 and 20.70 million b/d in respectively 2008 and 2007.
France oil consumption
Oil consumption in France decreased by 162,000 b/d from April to May 2010. Resulting in a consumption level of 1.66 million b/d. Average consumption of oil in France in 2009 was 1.84 million b/d, versus 1.94 and 1.94 million b/d in respectively 2008 and 2007.

Germany oil consumption
Oil consumption in Germany increased by 126,000 b/d from April to May 2010. Resulting in a consumption level of 2.38 million b/d. Average oil consumption in Germany in 2009 was 2.42 million b/d, versus 2.56 and 2.47 million b/d in respectively 2008 and 2007.

Italy oil consumption
Oil consumption in Italy decreased by 61,000 b/d from April to May 2010. Resulting in a consumption level of 1.40 million b/d. Average consumption in Italy in 2009 was 1.53 million b/d, versus 1.60 and 1.67 million b/d in respectively 2008 and 2007.

Chart 26: France Oil Consumption January 2004 - May 2010
Chart 27: Germany Oil Consumption Jan. 2004 - May 2010
Chart 28: Italy Oil Consumption January 2004 - May 2010
**Spain oil consumption**

Oil consumption in Spain decreased by 64,000 b/d from April to May 2010. Resulting in a consumption level of 1.36 million b/d. Average oil consumption in Spain in 2009 was 1.46 million b/d, versus 1.54 and 1.59 million b/d in respectively 2008 and 2007.

**United Kingdom oil consumption**

Oil consumption in the United Kingdom decreased by 122,000 b/d from April to May 2010. Resulting in a consumption level of 1.41 million b/d. Average oil consumption in the United Kingdom in 2009 was 1.57 million b/d, versus 1.61 and 1.67 million b/d in respectively 2008 and 2007.

**Poland oil consumption**

Oil consumption in Poland increased by 31,000 from April to May 2010. Resulting in a consumption level of 531,000 b/d. Average consumption in Poland in 2009 was 530,000 b/d, versus 527,000 and 507,000 b/d in respectively 2008 and 2007.
South Korea oil consumption
Oil consumption in South Korea decreased by 115,000 b/d from April to May 2010. Resulting in a consumption level of 2.15 million b/d. Average consumption in South Korea in 2009 was 2.25 million b/d, versus 2.21 and 2.29 million b/d in respectively 2008 and 2007.

Netherlands oil consumption
Oil consumption in the Netherlands decreased by 386,000 b/d from April to May 2010 to a consumption level of 727,000 million b/d. Average oil consumption in the Netherlands in 2009 was 905,000 b/d, versus 945,000 and 920,000 b/d in respectively 2008 and 2007.

Japan oil consumption
Oil consumption in Japan decreased by 489,000 b/d from April to May 2010. Resulting in a consumption level of 3.92 million b/d. Average oil consumption in Japan in 2009 was 4.43 million b/d, versus 4.92 and 5.13 million b/d in respectively 2008 and 2007.
China oil consumption
Oil consumption in China decreased by 24,000 b/d from April to May 2010. Resulting in a consumption level of 9.12 million b/d according to JODI statistics. Average oil consumption in China in 2009 was 8.05 million b/d, versus 6.92 and 7.29 million b/d in respectively 2008 and 2007.

India oil consumption
Oil consumption in India decreased by 40,000 b/d from April to May 2010. Resulting in a consumption level of 3.03 million b/d. Average oil consumption in India in 2009 was 2.85 million b/d, versus 2.60 and 2.43 million b/d in respectively 2008 and 2007.

Taiwan oil consumption
Oil consumption in Taiwan decreased by 27,000 b/d from April to May 2010. Resulting in a consumption level of 1.03 million b/d. Average consumption in Taiwan in 2009 was 976,000 b/d, versus 978,000 and 958,000 b/d in respectively 2008 and 2007.
OECD crude oil stocks
Industrial inventories of crude oil in the OECD in June 2010 decreased to 1016 million from 1028 million barrels in May according to the latest IEA statistics. Current OECD crude oil stocks are 46 million barrels higher than the five year average of 970 million barrels. In the July Oil Market Report of the IEA a total stock level of 1041 million barrels was tabulated for May which has been revised downward to 1028 million barrels in the August edition.

OECD product stocks
Industrial product stocks in the OECD in June 2010 increased to 1440 million from 1435 million barrels in May according to the latest IEA Statistics. Current OECD product stocks are 30 million barrels higher than the five year average of 1410 million barrels. In the July Oil Market Report of the IEA a total stock level of 1417 million barrels was tabulated for May which has been revised upward to 1435 million barrels in the August edition.

Europe crude oil stocks
Industrial inventories of crude oil in OECD Europe in June 2010 decreased to 339 from 357 million barrels in May according to the latest IEA statistics. Current OECD Europe crude oil stocks are 3 million barrels higher than the five year average of 336 million barrels. In the July Oil Market Report of the IEA a total stock level of 360 million barrels was tabulated for May which has been revised downward to 357 million barrels in the August edition.
Pacific crude oil stocks
Industrial inventories of crude oil in OECD Pacific in June 2010 increased to a level of 168 from 166 million barrels in May according to the latest IEA statistics. Current OECD Pacific crude oil stocks are equal to the five year average of 168 million barrels. In the July Oil Market Report of the IEA a total stock level of 175 million barrels was tabulated for June which has been revised downward to 166 million barrels in the August edition.

Pacific product stocks
Industrial product stocks in OECD Pacific in June 2010 increased to a level of 168 from 167 million barrels in May according to the latest IEA statistics. Current OECD Pacific product stocks are 11 million barrels lower than the five year average of 179 million barrels. In the July Oil Market Report of the IEA a total stock level of 167 million barrels was tabulated for May which remained unchanged in the August edition.

Europe product stocks
Industrial product stocks in OECD Europe in June 2010 increased to 564 million from 568 million barrels in May according to the latest IEA statistics. Current OECD Europe product stocks are 9 million barrels higher than the five year average of 555 million barrels. In the July Oil Market Report of the IEA a total stock level of 573 million barrels was tabulated for May which has been revised downward to 568 million barrels in the August edition.
**North America crude oil stocks**
Industrial inventories of crude oil in OECD North America in June 2010 increased to 508 million barrels in May according to the latest IEA statistics. Current OECD North America crude oil stocks are 42 million barrels higher than the five year average of 466 million barrels. In the July Oil Market Report of the IEA a total stock level of 506 million barrels was tabulated for May which has been revised downward to 505 million barrels in the August edition.

**North America product stocks**
Industrial product stocks in North America in June 2010 increased to 708 million from 700 million barrels in May according to the latest IEA Statistics. Current North American product stocks are 32 million barrels higher than the five year average of 676 million barrels. In the July Oil Market Report of the IEA a total stock level of 677 million barrels was tabulated for May which has been revised upward to 700 million barrels in the August edition.

**US gasoline stocks**
Gasoline stocks in the United States in July 2010 increased to 222 million from 218 million barrels in June according to the latest EIA Statistics. Current Gasoline stocks are 12 million barrels higher than the five year average of 210 million barrels.
**Mexico oil exports**
Crude oil exports from Mexico decreased by 10,000 b/d from 2nd qrt. 2009 to 3rd qrt. 2009 to a level of 1.32 million b/d. Average oil export from Mexico in 2009 up to the 3rd qrt. was 1.35 million b/d, versus 1.55, 1.85, and 2.04 million b/d in respectively 2008, 2007 and 2006.

**United Kingdom oil exports**
Crude oil exports from the United Kingdom decreased by 246,000 b/d from 2nd qrt. 2009 to 3rd qrt. 2009 to a level of 768,000 b/d. Average oil export from the United Kingdom in 2009 up to the 3rd qrt. was 886,000 b/d, versus 957,000 b/d, 1.02, and 1.0 million b/d in respectively 2008, 2007 and 2006. Since 2004 the United Kingdom became a net importer of oil. Net imports were 387,000 b/d in 3rd qrt. 2009.

**Norway oil exports**
Oil exports from Norway increased by 130,000 b/d from 2nd qrt. 2009 to 3rd qrt. 2009 to a level of 1.73 million b/d. Average oil export from Norway in 2009 up to the 3rd qrt. was 1.74 million b/d, versus 1.67, 1.97, and 2.17 million b/d in respectively 2008, 2007 and 2006.
Denmark oil exports
Oil exports from Denmark increased by 29,000 b/d from 2nd qrt. to 3rd qrt. 2009 to a level of 212,000 b/d. Average oil export from Denmark in 2009 up to 3rd qrt. was 187,000 b/d, versus 184,000, 191,000 and 233,000 b/d in respectively 2008, 2007, and 2006.

Australia oil exports
Oil exports from Australia increased by 14,000 b/d from 2nd qrt. to 3rd qrt. 2009 to a level of 255,000 b/d. Average oil export from Australia in 2009 up to 3rd qrt. was 252,000 b/d, versus 270,000, 252,000 b/d and 217,000 b/d in respectively 2008, 2007, and 2006.

Japan oil imports
Oil imports in Japan remained stable at 3.43 million b/d from 2nd qrt. to 3rd qrt. 2009. Average oil import in Japan in 2009 up to 3rd qrt. was 3.58 million b/d, versus 4.12, 4.09 and 4.15 million b/d in respectively 2008, 2007, and 2006.
Oil Imports & Exports

OECD oil imports
Oil imports in the group of OECD countries increased by 395,000 million b/d from 2nd qrt. to 3rd qrt. 2009 to a level of 29.84 million b/d. Average oil import in OECD countries in 2009 up to 3rd qrt. was 29.91 million b/d, versus 32.19, 32.47 and 32.7 million b/d in respectively 2008, 2007, and 2006.

United States oil imports
Oil imports in the United States increased by 78,000 b/d from 2nd qrt. to 3rd qrt. 2009 to a level of 10.64 million b/d. Average oil import in the United States in 2009 up to 3rd qrt. was 10.68 million b/d, versus 11.43, 11.55 and 11.77 million b/d in respectively 2008, 2007, and 2006.

OECD Europe oil imports
Oil imports from OECD Europe decreased by 14,000 b/d from 2nd qrt. to 3rd qrt. 2009 to a level of 12.02 million b/d. Average oil import in OECD Europe in 2009 up to 3rd qrt. was 12.01 million b/d, versus 12.98, 13.05 and 13.18 million b/d in respectively 2008, 2007, and 2006.

Chart 53: OECD Oil Imports 1st qrt. 2002 - 3rd qrt. 2009

Chart 54: USA Oil Imports 1st qrt. 2002 - 3rd qrt. 2009

IEA OPEC spare capacity
According to the International Energy Agency total effective spare capacity (excluding Iraq, Venezuela and Nigeria) increased from June to July 2010 by 10,000 b/d to a level of 5.6 million b/d. Of total effective spare capacity an additional 3.92 million b/d is estimated to be producible by Saudi Arabia within 90 days, the United Arab Emirates 0.36 million b/d, Angola 0.26 million b/d, Iran 0.31 million b/d, Libya 0.12 million b/d, Qatar 0.2 million b/d, and the other remaining countries 0.43 million b/d.

EIA OPEC spare capacity
Total OPEC spare production capacity in July 2010 decreased by 10,000 b/d to a level of 4.96 million b/d from 5.05 million b/d in June according to the Energy Information Administration. Of total effective spare capacity an additional 3.75 million b/d is estimated to be producible by Saudi Arabia, the United Arab Emirates 0.30 million b/d, Angola 0.1 million b/d, Iran 0.1 million b/d, Libya 0.15 million b/d, Qatar 0.26 million b/d, and the other remaining countries 0.15 million b/d.

Saudi Arabia spare capacity
Spare capacity in Saudi Arabia decreased from 3.85 to 3.75 million b/d from June to July 2010 according to the Energy Information Administration. Statistics from the International Energy Agency show Saudi spare capacity increasing from 3.85 to 3.92 million from June to July 2010.
Middle East Oil Production

**Chart 59:** Kuwait Liquids Production 1945 - 2008

Source: ASPO Ireland & BP Statistical Review of World Energy

**Chart 60:** Iran Liquids Production 1930 - 2008

Source: ASPO Ireland & BP Statistical Review of World Energy

**Chart 61:** Qatar Liquids Production 1945 - 2008

Source: ASPO Ireland & BP Statistical Review of World Energy

**Chart 62:** Kuwait Oil Production January 2004 - July 2010

Source: International Energy Agency & Energy Information Administration

**Chart 63:** Iran Oil Production January 2004 - July 2010

Source: International Energy Agency & Energy Information Administration

**Chart 64:** Qatar Oil Production January 2004 - July 2010

Source: International Energy Agency & Energy Information Administration
Chart 65: Saudi Arabia Liquids Production 1935 - 2008
Chart 66: UAE Liquids Production 1960 - 2008
Chart 67: Iraq Liquids Production 1930 - 2008
Chart 68: Saudi Arabia Oil Production January 2004 - July 2010
Chart 69: UAE Oil Production January 2004 - July 2010
Chart 70: Iraq Oil Production January 2004 - July 2010

Source: ASPO Ireland & BP Statistical Review of World Energy
Source: ASPO Ireland & BP Statistical Review of World Energy
Source: ASPO Ireland & BP Statistical Review of World Energy
Source: International Energy Agency & Energy Information Administration
Source: International Energy Agency & Energy Information Administration
Source: International Energy Agency & Energy Information Administration
Middle East Oil Production

Chart 71: Oman Liquids Production 1965 - 2008
Source: ASPO Ireland & BP Statistical Review of World Energy

Chart 72: Yemen Liquids Production 1985 - 2008
Source: ASPO Ireland & BP Statistical Review of World Energy

Chart 73: Syria Liquids Production 1930 - 2008
Source: ASPO Ireland & BP Statistical Review of World Energy

Chart 74: Oman Oil Production January 2004 - July 2010
Source: International Energy Agency & Energy Information Administration

Chart 75: Yemen Oil Production January 2004 - July 2010
Source: International Energy Agency & Energy Information Administration

Chart 76: Syria Oil Production January 2004 - July 2010
Source: International Energy Agency & Energy Information Administration
Africa Oil Production

Chart 83: Algeria Liquids Production 1955 - 2008

Chart 84: Angola Liquids Production 1960 - 2008

Chart 85: Libya Liquids Production 1970 - 2008

Chart 86: Algeria Oil Production January 2004 - July 2010

Chart 87: Angola Oil Production January 2004 - July 2010

Chart 88: Libya Oil Production January 2004 - July 2010
Chart 107: Azerbaijan Liquids Production 1930 - 2008
Source: ASPO Ireland & BP Statistical Review of World Energy

Chart 108: Kazakhstan Liquids Production 1945 - 2008
Source: ASPO Ireland & BP Statistical Review of World Energy

Chart 109: Russia Liquids Production 1955 - 2008
Source: ASPO Ireland & BP Statistical Review of World Energy

Chart 110: Azerbaijan Oil Production January 2004 - May 2010
Source: International Energy Agency & Energy Information Administration

Chart 111: Kazakhstan Oil Production January 2004 - May 2010
Source: International Energy Agency & Energy Information Administration

Chart 112: Russia Oil Production January 2004 - July 2010
Source: International Energy Agency & Energy Information Administration
Oceania Oil Production

**Chart 130:** Australia Liquids Production 1970 - 2008

**Chart 131:** Indonesia Liquids Production 1930 - 2008

**Chart 132:** Australia Oil Production January 2004 - July 2010

**Chart 133:** Indonesia Oil Production January 2004 - July 2010

Source: ASPO Ireland & BP Statistical Review of World Energy

Source: International Energy Agency & Energy Information Administration