

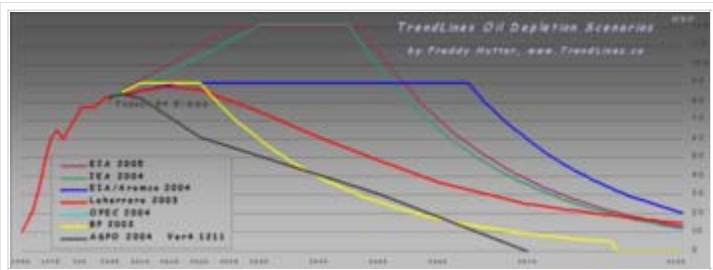
Oil reserves

From Wikipedia, the free encyclopedia

Oil reserves refer to portions of oil in place that are recoverable under economic constraints. In comparison, oil in place, or STOOIP, meaning "Stock Tank Original Oil In Place", represents all of the liquid hydrocarbon contained in a reservoir.



An oil well in Canada. Some regard Canada as having the world's second largest oil reserves.



Peak Oil Depletion Scenarios Graph which depicts cumulative published depletion studies by ASPO and other depletion analysts.

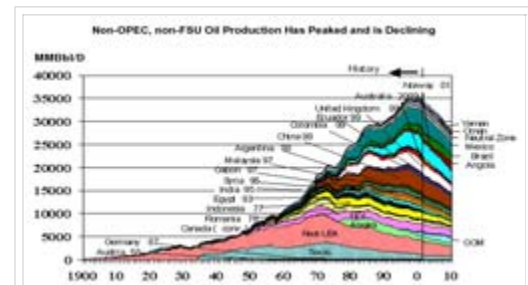
Oil in the ground is not a reserve unless it is economically recoverable, since as the oil is extracted, the cost of recovery increases incrementally. The recovery factor (RF) is the percentage of STOOIP which is economically recoverable under a given set of conditions.

$$\text{Reserves} = \text{STOOIP} * \text{RF}$$

Proven, probable and possible reserves are the three most common categories of reserves. They represent the certainty that a reserve exists based on the geologic and engineering data and interpretation for a given location. The international authority for reserves definitions is generally the Society of Petroleum Engineers. The U.S. Securities and Exchange Commission has, in recent years, demanded that oil companies with exchange listed stock adopt reserves accounting standards that are consistent with conservative industry practice. In a notable case, Royal Dutch Shell was required to write down the value of its oil reserves for 2001 and 2002 based on application of more strict definitions of reserves categories.

Between 1859 and 1968, 200 gigabarrels (200 billion barrels, 31 km³) of oil were used. 2006, as prices near inflation-adjusted record highs from 1980, world consumption is on track to 30 gigabarrels per year. [1] (<http://www.eia.doe.gov/emeu/international/contents.html>)

As the price of oil increases a vast number of oil-derived products will become more expensive to produce, including gasoline, lubricating oils, plastics, tires, roads, synthetic fabrics, etc. Science has so far been unable to find an affordable alternative to any of these products, even when compared to crude oil prices of \$50/bbl and above.



Hubbert Peak Graph showing oil production has peaked in non-OPEC and non-FSU countries

Contents

- 1 World oil resources
 - 1.1 Risk and oil reserves
- 2 North American reserves
 - 2.1 Canada
 - 2.2 United States
 - 2.3 Mexico
- 3 Middle Eastern reserves

- 3.1 Saudi Arabia
- 3.2 Iran
- 3.3 Iraq
- 3.4 United Arab Emirates and Kuwait
- 3.5 2020 Vision
- 4 Oil supplies
- 5 Oil exploration
- 6 Strategic oil reserves
- 7 OPEC countries
- 8 Oil reserves by country
 - 8.1 Countries that have already passed their production peak
 - 8.2 Countries where production can be increased
 - 8.3 Countries to be classified
- 9 Alternative fuels
- 10 See also
- 11 References
- 12 External links

World oil resources

It has been estimated that there was initially a total of 2,050 (Colin Campbell, 2005) to 2,390 gigabarrels (380 km³) of crude oil on Earth, of which, depending upon which estimate you believe, about 45% to 70% has been used so far. The *World Energy Resources Program* of the United States Geological Survey produces the official estimates of the world oil resources for the U.S. Federal Government. They estimate the remaining world oil reserves are about 1,000 gigabarrels, and current estimates place the exhaustion of the remaining known reserves within the next 50 years. Estimates of undiscovered reserves range widely from 275 to 1,469 gigabarrels (44 to 234 km³). (It should be noted that one barrel equals 42 US gallons, or 158.97 litres.) The Middle East has about 50% of the known remaining world oil reserve. The USGS estimates the total reserves are about three times the known amount.

There are margins of uncertainty concerning the actual size of proven oil reserves.[2]

(<http://news.bbc.co.uk/1/hi/business/4681935.stm>) Presumably for political reasons, some nations have not allowed audits of the size of their fields. This is especially true of Middle East members of OPEC, as well as nations that belonged to the USSR. OPEC limits the amount of oil output a member nation can produce to a portion of the remaining reserves, giving an incentive to manipulate the data. For example, in 1985 Kuwait increased the estimated size of their oil fields by 50%, which allowed them to increase their output. Other member nations quickly followed suit. The Saudi national oil company controls the largest amount of proven oil reserves in the world.

Crude oil is assumed to be a non-renewable resource, however research in the abiotic oil theory could change that viewpoint. Some estimates, such as the USGS, predict that oil reserves will become economically unrecoverable by the 2050s. However, these numbers are open to debate as they include only reserves that are presently in development or considered economically recoverable. They do not include tar sands and bitumen, nor do they take into account possible coal-derived production, methane extraction from waste, the recycling of tires, or recycled plastics. Estimates also do not include any reserves in Antarctica, which is protected from exploration by environmental treaties. Although none of these sources are currently economical, they could be used to produce significant quantities of hydrocarbons in the future, and they may become important as crude oil production dwindles, or if new technology makes them easier to recover. Higher crude oil prices also make these sources more attractive; industry observers believe that sustained prices above \$40/bbl will provide the incentive and return on investment to make previously undesirable oil deposits economically viable.

Risk and oil reserves

Oil reserves are a primarily a measure of geological risk - of the probability of oil existing and being producible under current economic conditions using current technology. The three categories of reserves generally used are proven,

probable, and possible reserves. Proven reserves generally have a probability of at least 90% of existing, probable reserves have a probability of between 50% and 90%, and possible reserves have a probability of less than 50%. Oil companies will have all three categories of reserves in their inventories, but the U.S. Securities and Exchange Commission rejects the probability concept and prohibits companies from mentioning probable and possible reserves in their filings. Thus, official estimates of proven reserves will always be understated compared to what oil companies think actually exists. For practical purposes companies will use proven plus probable estimate, and for long term planning they will be looking primarily at possible reserves.

Other types of risk also exist - economic risk, technological risk, and political risk. Outside of the United States these are usually larger than geological risk. Economic risk is the probability that the oil exists but cannot be produced at current prices and costs. There is a vast quantity of oil in this category, so economists will always be more optimistic than geologists. Technological risk is the probability that the oil exists but cannot be produced using existing technology. Again, there is a great deal of oil and near-oil in this category, such as the world's oil shale deposits. And political risk is the risk that oil exists but cannot be produced because political conditions prevent it. Since most of the world's oil is in politically unstable countries, political risk is usually the biggest risk and the most difficult to quantify.

The other types of risk make reserve estimates outside the United States somewhat hypothetical and subject to revision without warning. An example is the sudden increase of Canadian oil reserves from 5 to 179 gigabarrels, moving Canada to second place in world oil reserves. There is no geological risk in the Canadian oil sands - their existence has been known for centuries. The change occurred because of the learning curve combined with disruptive technology. Under heavy cost pressure, companies reduced their production costs from \$30 per barrel to \$10/bbl. Meanwhile, the Alberta Oil Sands Technology and Research Authority developed a new process called steam assisted gravity drainage (SAGD) to recover the deeper oil sands. At the same time, improvements in directional drilling technology made drilling horizontal SAGD wells much cheaper. At the end of it all, the Alberta Energy and Utilities Board (AEUB) plugged new numbers into its computer models and with the stroke of a keyboard, quadrupled North American proven oil reserves. No new oil had been found, some potential reserves had just reached an economic and technological tipping point.

North American reserves

Canada

Canada's proven oil reserves in recent years have been raised from total conventional oil reserves of around 5 gigabarrels, to the much larger figure of around 180 gigabarrels which includes the Athabasca Oil Sands [3] (<http://www.rense.com/general37/petrol.htm>) deposit, placing Canada second to only Saudi Arabia. Other estimates (BP Statistical Review of World Energy) place Canada's petroleum reserves in the 17 gigabarrel range, by only counting oil sands under development.

However, oil company estimates of oil sands reserves can be misleading to the average person because oil sands do not really contain oil at all, but a semisolid hydrocarbon known as bitumen. Oil companies only book them as oil reserves after they build a strip mine or thermal facility to extract them and an upgrader to convert them to synthetic crude oil (syncrude or SCO).

When oil prices were low, Canadian oil sands companies such as Suncor Energy and Syncrude reduced their costs to around US \$15/bbl. As a result, the oil price increases of 2004 and 2005 to over \$60/bbl is definitely high enough to attract investment capital, and there are now nearly \$100 billion worth of projects under construction or planned in the Canadian oil sands. The main constraint on their development is a severe labor and housing shortage in Fort McMurray, the only significant community in the oil sands area. Canadian oil sands production in 2005 was around 0.4 gigabarrels per year, or half of total Canadian and one hundredth of total global production. It is expected to rise to 0.7 gigabarrels per year or 67% of Canadian production by 2010 and by 2015, if world oil prices stay high, it may be as high as 1.5 gigabarrels per year.

United States

United States proven oil reserves declined to a little more than 21 gigabarrels by the end of 2004 according to the Energy

Information Administration, a 46% decline from the 39 gigabarrels it had in 1970 when the huge Alaska North Slope reserves were booked. Since there have been millions of oil wells drilled in the US and there is nowhere left for an elephant the size of ANS to remain hidden, it appears that US oil reserves are on a permanent downward slide. It is characteristic of oil fields that as they get closer to the end of production, the more accurate estimates of what is left become, US oil reserve numbers can be considered very accurate compared those of the Middle East, Canada and Venezuela.

United States crude oil production peaked in late 1970 at over 4 gigabarrels per year, but declined to 1.8 gigabarrels per year by early 2006. In fact, production in the fall of 2005 fell to only 1.5 gigabarrels per year as a result of hurricanes in the Gulf of Mexico. At the same time, US consumption of petroleum products increased to over 7.3 gigabarrels per year. The difference was mostly made up by imports, with the largest supplier being Canada, which increased its exports of crude oil and refined products to the US to 8.8 gigabarrels per year at the end of 2005.

The United States has the largest known concentration of oil shale in the world, according to the Bureau of Land Management and holds an estimated 800 gigabarrels of recoverable oil, enough to meet U.S. demand for oil at current levels for 110 years. Oil shale is developable given high enough oil prices, and the technology for converting oil shale to oil has been known since the middle ages.

However, the main constraint on oil shale development is probably going to be that Canadian oil sands are only about half as expensive to produce, and the US has full access to oil sands production under the North American Free Trade Agreement NAFTA. In addition, there are environmental concerns about oil shale development. The oil shale areas are semi-arid, in which mine scars last for centuries, and are at the headwaters of several important rivers, notably the Powder River in a region in which water rights are very important. By contrast, the Canadian oil sands are in an uninhabited boreal forest that periodically burns to the ground in forest fires, and the rivers are very large and flow toward the Arctic Ocean. As a result, the oil shales are probably not going to see development until oil sands production is well underway.

Mexico

While the government of Mexico claims it has over 100 gigabarrels of oil, the prestigious Oil and Gas Journal estimates its proven reserves at 14.6 gigabarrels. The basis of the problem is that the constitution of Mexico gives the state oil company, PEMEX, a monopoly over oil production and the Mexican government treats Pemex as a cash cow, taking 60% of its revenues in taxes. As a result, Pemex has insufficient funds to develop new reserves.

Since 1979, Mexico has produced most of its oil from the Cantarell Field, the second-biggest field in the world by production, but which is now going into a terminal decline. 40% of Mexico's remaining reserves are in the Chicotepec Field, which was found in 1926, but it has remained undeveloped because the oil is in impermeable rock requiring \$38 billion to drill 20,000 wells - more wells than Pemex has drilled in its entire 70-year history - using technology Pemex doesn't have. Production costs would be four times as high as its existing fields. The remainder of Mexico's offshore fields are much smaller, much more expensive to develop, and contain heavy oil that buyers do not want.

All of this really requires foreign capital and foreign technology, which the Mexican constitution forbids. As a result, Mexico's proven reserves have fallen every year for more than a decade, and it now has less than 10 years worth of oil reserves at current production levels.

Middle Eastern reserves

There are varying estimates of how much oil is left in Middle Eastern reserves. Several oil companies and the U.S. Department of Energy state that the Middle East has two-thirds of *all* the world's oil reserves. Other oil experts, however, argue that the Middle East has two-thirds of only *all proven* oil reserves, and that the percentage of all oil reserves it has could be much lower than two-thirds [4] (<http://www.radford.edu/~wkovarik/oil/>) . The U.S. Geological Survey says that the Middle East has only between half and a third of the recoverable oil reserves in the world.

Saudi Arabia

With one-fourth of the world's proven oil reserves and some of its lowest production costs, Saudi Arabia produces over 4 gigabarrels of oil per year and is likely to remain the world's largest oil exporter for the foreseeable future. However, there are serious political risks involved in Saudi Arabian domination of the world oil market. In spite of recent increases in oil income, Saudi Arabia faces serious long-term challenges, including rates of unemployment of at least 13 percent, one of the world's fastest population growth rates (its population has tripled since 1980), and a political system best described as medieval.

According to the Oil and Gas Journal, Saudi Arabia contains 262 gigabarrels of proven oil reserves, around one-fourth of proven, conventional world oil reserves. Although Saudi Arabia has around 80 oil and gas fields, more than half of its oil reserves are contained in only eight fields, and more than half its production comes from one field, the Ghawar field.

One challenge for the Saudis in maintaining or increasing production is that their existing fields sustain 5-12 percent annual decline rates, meaning that the country needs around 2 to 4 gigabarrels per year in new capacity each year just to compensate. The challenge is that the Ghawar field, found in 1948, has produced about half its total reserves, and is starting to run into production problems - notably there are rumors that it is now producing more water than oil. Other Saudi fields are not only smaller, but more difficult to produce. Historically, when Saudi Arabia has run into production problems in other fields, it has simply shut them in and stepped up production in Ghawar, but if Ghawar runs into problems that no longer will be possible.

Since Saudi Arabia is the world's largest producer of oil their reserves are analyzed very closely and estimates vary on the amount of economically recoverable oil in Saudi Arabia. The raw data is not available to outside scrutiny. The International Energy Agency has predicted that Saudi oil output will double during the next two decades, projecting production of 7 gigabarrels per year in 2020 - although this seems unlikely, if only for political reasons.

A dissenting opinion regarding Saudi oil reserves came from Matthew Simmons who claimed in his 2004 book "Twilight in the Desert" that Saudi Arabia's oil production is declining, and that it will not be able to produce more than current levels - about 4 gigabarrels per year [5] (<http://www.iags.org/n0331043.htm>) . In addition to his belief that the Saudi fields have hit their peak, Simmons also argues that the Saudis may have irretrievably damaged their large oil fields by overpumping salt water into the fields in an effort to maintain the fields' pressure and thus make the oil easier to extract. Saudi Aramco challenged Simmons' claims and asserted Saudi Arabia would be able to increase its output to 120-150% of its present rate within ten years' time. However, ever since 1982 the Saudis have withheld their well data as well as any detailed data on their reserves, giving outside experts no way to test these claims.

Iran

Iran has the world's second largest reserves of conventional crude oil at 133 gigabarrels, according to the CIA World Factbook, although it should be noted that both Canada and Venezuela have larger reserves if Non-conventional oil is included. Iran is the second largest oil producer globally with approximately 9% of the world's oil. Iran became an Islamic republic in 1979 after the ruling monarchy was overthrown in the Iranian revolution and relations with the United States have been strained since a group of Iranian students seized the US Embassy in Tehran in the Iran hostage crisis of 1979.

Iran averages about 1.5 gigabarrels per year, which is a significant decline from the 6 gigabarrels per year it produced when the Shah of Iran was in power. The United States prohibits imports of oil from Iran, which limits its exposure to an Iranian oil cutoff, but does not reduce the likelihood that an interruption of Iranian oil would cause a spike in world oil prices. American pressure on Iran to renounce Iran's nuclear program makes the possibility of military confrontation quite high, and the political risks of Iranian oil far outweigh any geological ones.

Iraq

Iraq has the third largest reserves of conventional oil in the world at 112 gigabarrels. Despite its vast oil reserves and low costs, production has not recovered since the US-led 2003 invasion of Iraq. Constant looting, insurgent attacks, and sabotage in the oil fields has limited production to around 0.5 gigabarrels per year at best. Political risk is thus the main constraint on Iraqi oil production and likely to remain so in the near future.

United Arab Emirates and Kuwait

The United Arab Emirates and Kuwait are nearly tied for the fourth largest conventional oil reserves in the world at 98 and 97 gigabarrels, respectively. The UAE produces about 8.8 gigabarrels per year and has about 100 years of reserves at that rate while Kuwait produces about the same amount and also has about 100 years of reserves. Abu Dhabi has 94 percent of the UAE's oil reserves while most of Kuwait's oil reserves are in the Burgan Field, the world's second largest oil field after Saudi Arabia's Ghawar. Kuwait hopes to step up oil production to reach capacity of 4 million bbl/d by 2020, but since Burgan was found in 1938 and is getting very mature, this will be a challenge. Furthermore, according to data leaked from the Kuwait Oil Company (KOC), Kuwait's remaining proven and non-proven oil reserves are about only about half the official figure - 48 gigabarrels.

2020 Vision

The US EIA (Energy Information Administration) reduced their forecast for Saudi oil production to 15.4 mb/day in 2020 and Middle East OPEC countries increasing to 35.2 mb/day by 2020 from 20.7 mb/day in 2002 [Internation Energy Outlook 2005 table E1 [6] ([http://www.eia.doe.gov/oiaf/ieo/pdf/0484\(2005\).pdf](http://www.eia.doe.gov/oiaf/ieo/pdf/0484(2005).pdf))]. These estimates were further reduced in the 2006 Annual Energy Outlook, in which Middle East OPEC production was projected to be 26.9, 18.5, 26.4 mb/day in 2020 assuming \$50/\$85/\$33 oil prices respectively [7] (<http://www.eia.doe.gov/oiaf/aeo/pdf/appendixes.pdf>) .

Oil supplies

The term oil supplies is sometimes used to mean the same thing as oil reserves. However, Oil reserves refer mainly to oil in the ground that can be recovered economically. Oil supply also includes the oil production and processing facilities and the oil delivery systems that provide oil to the end user. When there is a 'shortage' of supply it is more often a problem of the delivery systems than a failure of reserves. While geologists are sure the world will run out of oil, economists are sure there will always be a price at which supply will meet demand, albeit possibly at a higher price than people would like to pay.

Oil exploration

Main article: Oil exploration

Arctic basins tend to be richer in natural gas than in oil. The abundance of gas in the Arctic so far from main markets will require moving gas long distances. Problems of ensuring that oil and gas keep flowing freely in arctic subsea pipelines are virtually identical to those experienced at a depth of 8,000 feet in the Gulf of Mexico, where temperatures are at or close to the freezing point along the seafloor where hydrates can form. Technology for moving oil from the seafloor to the shore is similar to that employed in Norway, and may someday have application in Alaska.

Shell, one of the world's largest oil companies, believes Arctic waters, including those of northern Alaska, hold great potential as an oil and natural gas frontier. Shell sees the Arctic as a very tantalizing opportunity to develop new oil and gas resources and the last remaining frontier. The company's views tend to support studies by academics and agencies that Arctic basins contain 25% of the world's remaining undiscovered resources. Most of these basins are unexplored and undeveloped. Shell recognizes how "difficult and challenging" the social, environmental, and economic aspects will be. Shell believes that technology solutions developed for other areas, such as the deepwater, will have applications in the offshore Arctic.

However, in early 2006, Royal Dutch Shell made a bold move into non-conventional oil when purchased C\$465 million worth of leases in northern Canada just outside the Athabasca Oil Sands. Mysteriously, Shell did not assign the property to Shell Canada, which already has a large oil sands operation in the area, but created a new, wholly-owned subsidiary called SURE Northern Energy Ltd. (SURE Northern) to develop the leases. While the area is known to contain large oil deposits, it is not included in current Canadian oil reserves because the geology is harder and more rocky than the sand which characterizes most oilsands projects.

Strategic oil reserves

Many countries maintain government-controlled oil reserves for both economic and national security reasons. Although there are global strategic petroleum reserves, the following highlights the strategic reserves of the top three oil consumers.

The United States maintains a Strategic Petroleum Reserve at four sites in the Gulf of Mexico, with a total capacity of 0.727 gigabarrels of crude oil. The sites are enormous salt caverns that have been converted to store crude oil. The US SPR has never been filled to capacity; the largest amount reached thus far was 0.7 gigabarrels on August 17, 2005, whereafter reserves were drawn down to meet demand in the aftermath of Hurricane Katrina. This reserve was created in 1975 following the 1973-4 oil embargo, and as of 2005 it is the largest emergency petroleum supply in the world. At current US consumption rates (over 7 gigabarrels per year), the SPR would supply all normal US demand for approximately 37 days.

China, the second largest consumer of oil after the United States, has begun a plan to build strategic crude reserves as the country's demand for energy continues to grow. The size of this future Chinese strategic petroleum reserve will be in the neighborhood of approximately 0.15 gigabarrels. It has also told its three largest state oil groups to purchase foreign oil holdings to ensure adequate strategic energy supplies to power the country's rapidly growing economy. Separately, Kong Linglong, director of the National Development and Reform Commission's Foreign Investment Department, said that the Chinese government would soon move to establish a government fund aimed at helping its state oil groups purchase offshore energy assets.

Japan, the third largest consumer of oil, has its own state controlled strategic petroleum reserve. According to Japan's Agency for Natural Resources and Energy, Japan has state reserves of petroleum for 92 days of consumption and privately held reserves for another 78 days of consumption, for a total of 171 days of consumption. These reserves are particularly important for Japan since they have practically no domestic petroleum production and import at least 95% of their oil.

OPEC countries

Many countries with extensive oil reserves are members of the Organization of the Petroleum Exporting Countries, or OPEC. The members of the OPEC cartel hold about two-thirds of the world's oil reserves, allowing them to significantly influence the international price of crude oil.



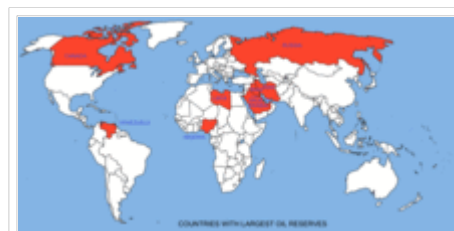
OPEC countries

Oil reserves by country

As the amount of oil left is an



An offshore oil platform in the Gulf of Mexico. Mexico is estimated to have about 14 gigabarrels of oil reserves



Countries with largest oil reserves

estimate, not a known amount, there are many differing estimates for the amount of oil



remaining in different regions of the world. The following table lists the highest and lowest estimates for regions, and countries, with significant oil reserves in gigabarrels (10^9 barrels), as listed here [8] (<http://www.eia.doe.gov/emeu/international/reserves.html>) . The large range of some country's estimates, Canada in particular, stems from factors such as the potential future development of non-conventional oil from tar sands, oil shale, etc.

Country/Region	Lowest estimate	Highest estimate
North America	40.9	214.8
Canada	4.7	178.8
United States	21.3	29.3
Mexico	12.9	14.8
Central & South America	76	101.1
Venezuela	52.4	77.2
Brazil	10.6	11.2
Western Europe	16.2	17.3
Eastern Europe & Former USSR	79.2	121.9
Russia	60	72.3
Kazakhstan	9	39.6
Middle East	708.3	733.9
Iran	125.8	130.8
Iraq	115	115
Kuwait	99	101.5
Qatar	15.2	20
Saudi Arabia	261.9	262.7
UAE	69.9	97.8
Africa	100.8	112.4
Algeria	11.4	15.3
Libya	33.6	39.1
Nigeria	35.3	36.6
Asia and Oceania	36.2	41.1
China	15.4	18.3
Australia	1.5	4
India	4.9	5.6
Indonesia	4.7	5.3
World total	1082	1277

Countries that have already passed their production peak

State	Regular Oil (light, heavy, deepwater, polar)			Other hydrocarbon reserves			Total Rec Dep
	Oil Discovery peak	Oil Production peak	Oil Depletion midpoint	Natural Gas peak	Coal peak	Oil peak (tar sand, shale)	Recoverable Oil Depletion
North America							
Canada	1958	1973	1988				
USA	1930	1971	2003				
Mexico	1977	2002	1999				
South America							
Argentina	1960	1998	1994				
Colombia	1992	1999	1999				
Venezuela ¹	1941	1970	2003				
Chile	1960	1982	1979				
Ecuador ²	1969	2004	2007				
Peru	1861	1983	1988				
Trinidad and Tobago	1969	1978	1983				
Europe							
Albania	1928	1983	1986				
Austria	1947	1955	1970				
Croatia	1950	1988	1987				
Denmark	1971	2002	2004				
France	1958	1988	1987				
Germany	1952	1966	1977				
Hungary	1964	1987	1987				
Italy	1981	1997	2005				
Netherlands	1980	1987	1991				
Norway	1979	2003	2003				
Romania	1857	1976	1970				
Ukraine	1962	1970	1984				
United Kingdom	1974	1999	1998				
Africa							



An oil power plant in Iraq, which has some of the world's largest oil reserves

Cameroon	1977	1986	1994							
Congo	1984	2001	2000							
Egypt	1965	1995	2007							
Gabon ²	1985	1996	1997							
Libya ¹	1961	1970	2011							
Sudan	1980	2005	2009							
Tunisia	1971	1981	1998							
Middle East										
Bahrain	1932	1970	1977							
Oman	1962	2001	2003							
Qatar ¹	1940	2004	1998							
Syria	1966	1995	1998							
Yemen	1978	1999	2003							
Eurasia and Central Asia										
Turkey	1969	1991	1992							
Uzbekistan	1992	1998	2008							
Rest of Asia										
Brunei	1929	1978	1989							
China	1953	2003	2003							
India	1974	2004	2003							
Indonesia ¹	1955	1977	1992							
Malaysia	1973	2004	2002							
Pakistan	1983	1992	2001							
Thailand	1981	2005	2008							
Oceania										
Papua New Guinea	1987	1993	2007							
Australia	1967	2000	2001							

Data from [9] (<http://www.peakoil.ie/newsletters>) and the annual British Petroleum Energy Report.

¹ OPEC member

² former OPEC member

Countries where production can be increased

State	Regular Oil (light, heavy, deepwater, polar)			Other hydrocarbon reserves			Total Recoverable Hydrocarbons Depletion (projected)		
	Oil Discovery peak	Oil Production peak	Oil Depletion midpoint	Natural Gas peak	Coal peak	Oil peak (tar)	Recoverable Oil Depletion	Recoverable Natural Gas depletion	Recoverable Coal depletion

State	Oil Discovery peak	Oil Production peak	Oil Depletion midpoint	Natural Gas peak	Coal peak	Oil peak (tar sand, shale)	Recoverable Oil Depletion	Recoverable Natural Gas depletion	Recoverable Coal depletion
North America									
Costa Rica									
Panama									
Jamaica									
Bahamas									
multiple additional countries									
South America									
Suriname									
Guyana									
Paraguay									
Uruguay									
Europe									
Estonia									
Serbia									
Latvia									
multiple additional countries									
Africa									
Equatorial Guinea									
Sahrawi Republic Western Sahara									
multiple additional countries									
Middle East									
Lebanon									
Jordan									
Israel									
Palestine (West Bank and Gaza Strip)									
Eurasia and Central Asia									
Armenia									
Cyprus									
Georgia									
Kyrgyz Republic									

available.)

See also

- Non-conventional oil
- Oil exploration
- Hubbert peak theory
- Strategic Petroleum Reserve
- Global strategic petroleum reserves
- Association for the Study of Peak Oil and Gas

References

- Adams Neal, *Terrorism & Oil* (2002, pg.66), ISBN 0878148639
- Various, *The Oil Industry of the Former Soviet Union: Reserves, Extraction, Transportation* (1998, pg. 24-59), ISBN 9056990624
- Robert J Art, *Grand Strategy for America* (2003, pg.62), ISBN 0801441390
- Paul Roberts, "The End of Oil", (2004 p47-p52), Bloomsbury, pbk, ISBN 0 7475 7081 7

External links

- The Life After The Oil Crash: The End Of The World As We Know It (<http://www.lifeaftertheoilcrash.com>)
- Society of Petroleum Engineers: Petroleum Reserves & Resources Definitions (http://www.spe.org/spe/jsp/basic/0,,1104_1008242,00.html)
- TrendLines' current Peak Oil Depletion Scenarios Graph (<http://www.TrendLines.ca/economic.htm>)
- The-end-of-oil.com by Paul Roberts (<http://the-end-of-oil.com/>)
- U.S. Department of Energy Office of Fossil Energy information on managed reserves (<http://www.fossil.energy.gov/programs/reserves/index.html>)
- U.S. Department of Energy International Energy Outlook July 2005 ([http://www.eia.doe.gov/oiaf/ieo/pdf/0484\(2005\).pdf](http://www.eia.doe.gov/oiaf/ieo/pdf/0484(2005).pdf))
- U.S. Department of Energy Annual Energy Outlook 2006 (<http://www.eia.doe.gov/oiaf/aeo/index.html>)
- *Twilight in the Desert*, a book by Matthew Simmons explaining how Saudi reserves are questionable at best and discusses the possibility that the Saudis have damaged the large oil fields by pumping seawater into them.
- Discusses Peak Oil implications (<http://www.peakoil.org/>)
- Peak Oil and Permaculture (<http://www.energybulletin.net/524.html>) - An interview with David Holmgren
- LOGDIGI (<http://www.logdigi.com>)
- Oil-Gas-News.Com (<http://www.oil-gas-news.com>) .

Retrieved from "http://en.wikipedia.org/wiki/Oil_reserves"

Categories: Peak oil

-
- This page was last modified 18:03, 9 May 2006.
 - All text is available under the terms of the GNU Free Documentation License (see **Copyrights** for details).
Wikipedia® is a registered trademark of the Wikimedia Foundation, Inc.