

BP Statistical Review of World Energy

June 2016

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Introduction

- 1 Group chief executive's introduction
- 2 2015 in review

① Oil

- 6 Reserves
- 8 Production and consumption
- 14 Prices
- 16 Refining
- 18 Trade movements

② Natural gas

- 20 Reserves
- 22 Production and consumption
- 27 Prices
- 28 Trade movements

③ Coal

- 30 Reserves and prices
- 32 Production and consumption

④ Nuclear energy

- 35 Consumption

⑤ Hydroelectricity

- 36 Consumption

⑥ Renewable energy

- 38 Other renewables consumption
- 39 Biofuels production

① Primary energy

- 40 Consumption
- 41 Consumption by fuel

Appendices

- 44 Approximate conversion factors
- 44 Definitions
- 45 More information

65
65th edition

About this review

For 65 years, the *BP Statistical Review of World Energy* has provided high-quality objective and globally consistent data on world energy markets. The review is one of the most widely respected and authoritative publications in the field of energy economics, used for reference by the media, academia, world governments and energy companies. A new edition is published every June.

Online tools and resources

Key information

All the tables and charts found in the latest printed edition are available at bp.com/statisticalreview plus a number of extras, including:

- Historical data from 1965 for many sections.
- Additional data for refined oil production demand, natural gas, coal, hydroelectricity, nuclear energy, electricity, renewables and CO₂ emissions.
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The data series for proved oil and gas reserves in *BP Statistical Review of World Energy June 2016* does not necessarily meet the definitions, guidelines and practices used for determining proved reserves at company level, for instance, as published by the US Securities and Exchange Commission, nor does it necessarily represent BP's view of proved reserves by country. Rather, the data series has been compiled using a combination of primary official sources and third-party data.

Group chief executive's introduction

Energy in 2015 – slow demand growth amid plentiful supply.



Welcome to the *BP Statistical Review of World Energy*. This is the 65th edition of the Statistical Review, an important milestone for a publication that has traced developments in global energy markets since 1951, a year when coal provided more than half of the world's energy and the price of oil was around \$16 (in today's money). Remarkably, the share of oil in global energy then was almost identical to its share today, at a little over 30%.

We believe the BP Statistical Review contributes to the world's understanding of energy markets by providing timely and objective data to help inform discussions, debates and decision-making. Its annual data helps us better interpret the swings and fluctuations that we are living through, and the historical data provide an important context for gauging where we may be heading next.

This year's edition records the data for 2015, a year in which significant long-term trends in both the global demand and supply of energy came to the fore.

On the demand side, we are seeing a gradual deceleration in global energy consumption as the huge boost from globalization and Chinese industrialization slowly subsides. That slowing was compounded last year by continuing weakness in the global economy. As a result, global primary energy consumption grew by just 1.0% in 2015, similar to the rate of growth seen in 2014, but much slower than the average seen over the past decade. Much of this weakness was driven by China, where energy consumption grew at its slowest rate in almost 20 years. Even so, China remained the world's largest growth market for energy for a fifteenth consecutive year.

The supply of energy in recent years has been driven by different factors, notably technological advances that have increased the range and availability of different fuels. The US shale revolution has unlocked huge swathes of oil and gas resources. And rapid technological gains have supported strong growth in renewable energy, led by wind and solar power. These advances meant that, despite the weakness of energy demand, oil, natural gas and renewable energy all recorded solid growth in 2015. Their gain was at the expense of coal, which saw its largest fall on record, taking its share within primary energy to its lowest level since 2005.

As we know, the contrasting trends in the demand and supply of energy had major effects on energy prices, with oil, gas and coal prices all falling sharply last year. These price declines played a key role in prompting adjustments in energy markets: boosting demand in some markets, most notably oil; curtailing supply and

shifting the fuel mix in others. The extent of this adjustment bodes well for the future stability of our industry.

The combination of slow demand growth and a shift in the fuel mix away from coal towards natural gas and renewable energy had important implications for carbon emissions. In particular, carbon emissions from energy consumption are estimated to have been essentially flat in 2015, the lowest growth in emissions in nearly a quarter of a century, other than in the immediate aftermath of the financial crisis. Last year was of course significant for the UN-led COP21 meetings in Paris and the historic agreement to tackle climate change. BP supports those aims and is committed to playing its part in helping to achieve them. The stalling in the growth of carbon emissions in 2015 is a step in the right direction. But it is only a small step: the scale of the challenge remains substantial, requiring major shifts in both energy efficiency and the fuel mix.

Our industry is living through a period of profound change. But that is nothing new: the past 65 years have seen huge changes to the global energy landscape. Our task as an industry is to take the steps necessary to provide the energy to meet the world's growing demand and ensure our sector remains resilient to the many factors that may buffet us in the near term. We must continue to invest in energy, in all its forms, to meet future needs. That is no easy task and requires fine judgements – judgements that can be more confidently made when based on the kind of solid data and analysis provided by the Statistical Review. The need for BP's Statistical Review over the next 65 years is likely to be just as great as in the past.

Let me conclude by thanking BP's economics team and all those who helped us prepare this review – in particular those in the governments of many countries around the world who have contributed their official data again this year. Thank you for your continuing cooperation and transparency.

A handwritten signature in black ink that reads "Bob Dudley".

Bob Dudley
Group chief executive
June 2016

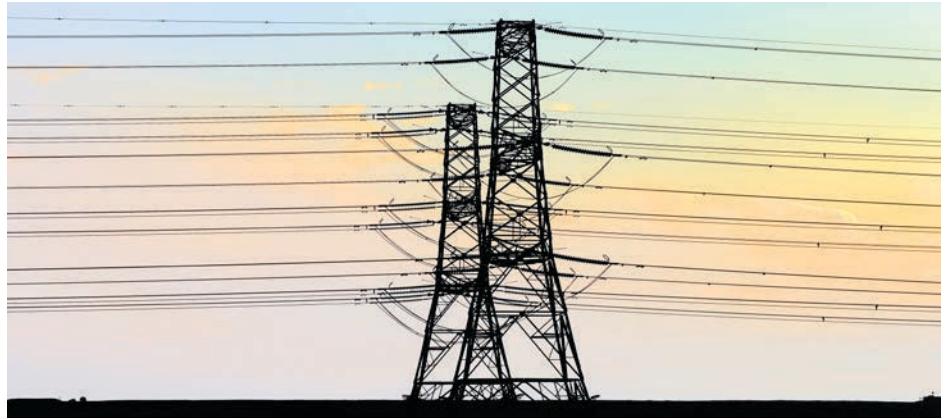
2015 in review

Growth in global primary energy consumption remained low in 2015; and the fuel mix shifted away from coal towards lower-carbon fuels.



The six-level Puxi Viaduct in Shanghai is one of city's busiest interchanges and is used by thousands of vehicles every hour.

In the UK the National Grid supplies electricity using about 7,200km of power cable line and 690km of underground cable.



Global primary energy consumption increased by just 1.0% in 2015, similar to the below-average growth recorded in 2014 (+1.1%) and well below its 10-year average of 1.9%. Other than the recession of 2009, this represented the lowest global growth since 1998. Consumption growth was below the 10-year average for all regions except Europe & Eurasia; emerging economies accounted for 97% of the increase in global consumption. OECD consumption experienced a small increase, with growth in Europe offsetting declines in the US and Japan. Chinese consumption slowed further, but still recorded the world's largest increment in primary energy consumption for the fifteenth consecutive year. Russia recorded the largest volumetric decline in primary energy consumption. By fuel, only oil and nuclear power grew at above-average rates, with oil gaining global market share for the first time since 1999. Renewables in power generation continued to grow robustly, to nearly 3% of global primary energy consumption, while coal consumption recorded the largest percentage decline on record. Global CO₂ emissions from energy are estimated to have been essentially flat. Prices for all fossil fuels fell in 2015 for all regions. Crude oil prices recorded the largest decline on record in dollar terms, and the largest percentage decline since 1986. The annual average price for Brent, the international crude oil benchmark,

declined by 47%, reflecting a growing imbalance between global production and consumption. The differential between Brent and the US benchmark West Texas Intermediate (WTI) narrowed to its smallest level since 2010. Natural gas prices fell in all regions, with the largest percentage declines in North America; the US benchmark Henry Hub fell to its lowest level since 1999. Coal prices around the world fell for the fourth consecutive year.

Energy developments

Oil remained the world's leading fuel, accounting for 32.9% of global energy consumption. Although emerging economies continued to dominate the growth in global energy consumption, growth in these countries (+1.6%) was well below its 10-year average of 3.8%.

Emerging economies now account for 58.1% of global energy consumption. Chinese consumption growth slowed to just 1.5%, while India (+5.2%) recorded another robust increase in consumption. OECD consumption increased slightly (+0.1%), compared with an average annual decline of 0.3% over the past decade. A rare increase in EU consumption (+1.6%) more than offset declines in the US (-0.9%) and Japan (-1.2%), where consumption fell to the lowest level since 1991.

+1.0%

Growth of global primary energy consumption, well below the 10-year average of 1.9%.

+1.5%

Growth of Chinese primary energy consumption, the world's largest increment.

+1.9mb/d

Growth of global oil consumption.

32.9%

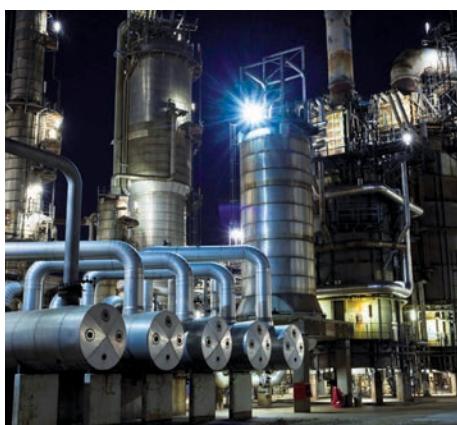
Oil's share of global energy consumption, the first increase since 1999.

Expanded coverage

Country coverage of refinery throughput and capacity has been expanded. The oil trade tables now break out China and Russia and provide the split of crude oil and oil products for inter-area movements.

The storage tanks, pipes and towers at BP's Rotterdam refinery.

The Valhall platform complex in the Norwegian North Sea, Norway.



Prices

Dated Brent averaged \$52.39 per barrel in 2015, a decline of \$46.56 per barrel from the 2014 level and the lowest annual average since 2004. Crude oil prices rose in early 2015 as global consumption rebounded and US production began to register month-on-month declines. But strong growth in OPEC production, particularly in Iraq and Saudi Arabia, caused prices to fall sharply later in the year. The Brent – WTI differential narrowed for a third consecutive year, to \$3.68 per barrel.

Consumption and production

Global oil consumption grew by 1.9 million barrels per day (b/d), or 1.9% – nearly double the recent historical average (+1%) and significantly stronger than the increase of 1.1 million b/d seen in 2014. The relative strength of consumption was driven by the OECD countries, where consumption increased by 510,000 b/d (+1.1%), compared with an average decline of 1.1% over the past decade. Growth was well above recent historical averages in the US (+1.6%, or 290,000 b/d) and the EU (+1.5%, or 200,000 b/d), while Japan (-3.9%, or -160,000 b/d) recorded the largest decline in oil consumption. Outside of the OECD, net oil importing countries recorded significant increases: China (+6.3%, or +770,000 b/d) once again accounted for the largest increment to demand, while India (+8.1%, or 310,000 b/d) surpassed Japan as the world's third-largest oil consumer. But this was offset by slower growth in oil producers, such that oil demand growth in the non-OECD as a whole (+2.6%, or 1.4 million b/d) was below its recent historical average.

Global oil production increased even more rapidly than consumption for a second consecutive year, rising by 2.8 million b/d or 3.2%, the strongest growth since 2004. Production in Iraq (+750,000 b/d) and Saudi Arabia (+510,000 b/d) rose to

record levels, driving an increase in OPEC production of 1.6 million b/d to 38.2 million b/d, exceeding the previous record reached in 2012. Production outside OPEC slowed from last year's record growth but still grew by 1.3 million b/d. The US (+1 million b/d) had the world's largest annual growth increment and remained the world's largest oil producer. Elsewhere, production growth in Brazil (+180,000 b/d), Russia (+140,000 b/d), the UK and Canada (+110,000 b/d each) was offset by declines in Mexico (-200,000 b/d, the world's largest decline), Yemen (-100,000 b/d) and elsewhere.

Refining and trade

Global crude runs rose by 1.8 million b/d (+2.3%), more than triple their 10-year average growth, despite declines in South & Central America, Africa and Russia. Strong refining margins lifted crude runs by 1 million b/d in the OECD, with growth in Europe (+740,000 b/d) the highest since 1986. In contrast, global refining capacity grew by only 450,000 b/d, the smallest increase in 23 years. Delayed expansion in China, combined with closures in Taiwan and Australia, resulted in a fall in Asian capacity for the first time since 1988. Global refinery utilization rose by 1 percentage point to 82.1%, the fastest increase in five years.

After barely growing in 2014, global trade of crude oil and refined products expanded by 3 million b/d (+5.2%) last year, the largest increase since 1993. Crude oil trade was lifted by growing exports from the Middle East (+550,000 b/d), while Europe and China accounted for the largest increases in imports (+770,000 b/d and +530,000 b/d respectively). Growth in refined product exports was again led by the US (+470,000 b/d); the country's net oil imports fell to 4.8 million b/d, the lowest since 1985.



④ Natural gas

④ Coal

+5.4%

Growth of US gas production,
the world's largest increment.

-1.8%

Decline in global coal
consumption, the largest
on record.

Gas

Consumption and production

World natural gas consumption grew by 1.7% in 2015, a significant increase from the very weak growth (+0.6%) seen in 2014 but still below the 10-year average of 2.3%. As with oil, consumption growth was below average outside the OECD (+1.9%, accounting for 53.5% of global consumption) but above average in the OECD countries (+1.5%). Among emerging economies, Iran (+6.2%) and China (+4.7%) recorded the largest increments to consumption, even though growth in China was sluggish compared with a 10-year average growth of 15.1%. Meanwhile, Russia (-5%) recorded the largest volumetric decline, followed by the Ukraine (-21.8%). Among OECD countries, the US (+3%) accounted for the largest growth increment, while EU consumption (+4.6%) rebounded after a large decline in 2014. Globally, natural gas accounted for 23.8% of primary energy consumption.

Global natural gas production grew by 2.2%, more rapidly than consumption but below its 10-year average of 2.4%. As with consumption, the US (+5.4%) recorded the largest growth increment, with Iran (+5.7%) and Norway (+7.7%) also recording significant increases in production. Growth was above average in North America, Africa, and Asia Pacific. EU production once again fell sharply (-8%), with the Netherlands (-22.8%) recording the world's largest decline. Large volumetric declines were also seen in Russia (-1.5%) and Yemen (-71.5%).

Trade

Global natural gas trade rebounded in 2015, rising by 3.3%. Pipeline shipments increased by 4%, driven by growth in net pipeline exports from Russia (+7.7%) and Norway (+7%). The largest volumetric increases in net pipeline imports were in Mexico (+44.9%) and France (+28.8%). Global LNG trade increased by 1.8%. Export growth was led by Australia (+25.3%) and Papua New Guinea (+104.8%), offsetting declines in shipments from Yemen (-77.2%). Higher net LNG imports for Europe (+15.9%) and rising Middle Eastern imports (+93.8%) were partly offset by declines in net imports in South Korea (-10.4%) and Japan (-4%). International natural gas trade accounted for 30.1% of global consumption; the pipeline share of global gas trade rose to 67.5%.

Coal

Global coal consumption fell by 1.8% in 2015, well below the 10-year average annual growth of 2.1% and the largest percentage (and volumetric) decline in our data set. All of the net decline was accounted for by the US (-12.7%, the world's largest volumetric decline) and China (-1.5%), partially offset by modest increases in India (+4.8%) and Indonesia (+15%). Global coal production fell by 4%, with large declines in the US (-10.4%), Indonesia (-14.4%), and China (-2%). Coal's share of global primary energy consumption fell to 29.2%, the lowest share since 2005.

▼ A coal digger extracting coal at a mine.

▲ A gas rig at BP's Alice well site near Durango, Colorado.





Other fuels



▲ Sugar cane reception, preparation and juice extraction facilities at BP Biofuels' Ituiutaba plant in Brazil.

▼ Wind turbines at the Goshen wind farm in Idaho Falls, Idaho.



+213 terawatt-hours
Growth in renewable power generation, the largest increment on record.

+0.1%
Increase in global CO₂ emissions from fossil fuel use.

In detail



Additional information – including historical time series for the fuels reported in this review; further detail on renewable forms of energy; oil consumption by product; electricity generation; and CO₂ emissions from energy use – is available at bp.com/statisticalreview

Nuclear and hydroelectric

Global nuclear output grew by 1.3%, with China (+28.9%) accounting for virtually all of the increase. China has passed South Korea to become the fourth-largest supplier of nuclear power. Elsewhere, increases in Russia (+8%) and South Korea (+5.3%) offset declines in Sweden (-12.6%) and Belgium (-22.6%). EU output (-2.2%) fell to the lowest level since 1992. Nuclear power accounted for 4.4% of global primary energy consumption.

Global hydroelectric output grew by a below average 1%, compared with a 10-year average of 3%. China (+5%) remains by far the world's largest producer of hydroelectricity; as with nuclear power, China accounted for all of the net global increase, even though growth in percentage terms was less than half the recent historical average. Elsewhere, growth in Turkey (+64.6%, following a very weak 2014) and Scandinavia was offset by drought conditions in Italy, Spain and Portugal (-28.6% combined) and Brazil (-3.3%). Hydroelectric output accounted for 6.8% of global primary energy consumption.

Renewables

Renewable energy sources in power generation continued to increase in 2015, reaching 2.8% of global energy consumption, up from 0.8% a decade ago.

Renewable energy used in power generation grew by 15.2%, slightly below the 10-year average growth of 15.9% but a record increment (+213 terawatt-hours), which was roughly equal to all of the increase in global power generation. Renewables accounted for 6.7% of global power generation. China (+20.9%) and Germany

(+23.5%) recorded the largest increments in renewables in power generation. Globally, wind energy (+17.4%) remains the largest source of renewable electricity (52.2% of renewable generation), with Germany (+53.4%) recording the largest growth increment. Solar power generation grew by 32.6%, with China (+69.7%), the US (+41.8%) and Japan (+58.6%) accounting for the largest increases. China overtook Germany and the US to become the world's top generator of solar energy. Global biofuels production grew by just 0.9%, well below the 10-year average of 14.3%: Brazil (+6.8%) and the US (+2.9%) accounted for essentially all of the net increase, partly offset by large declines in Indonesia (-46.9%) and Argentina (-23.9%).

Carbon dioxide emissions

Emissions of CO₂ from energy consumption increased by only 0.1% in 2015. Other than the recession of 2009, this represented the lowest growth rate since 1992. This encouraging outcome was driven by a combination of slightly slower energy consumption growth and a shift in the global fuel mix (with lower global coal consumption partly offset by growth in natural gas and non-fossil fuels). Emissions growth was below average in every region except Europe & Eurasia. The US (-2.6%) and Russia (-4.2%) accounted for the largest absolute declines in emissions, while India (+5.3%) saw the largest increase. Chinese emissions declined for the first time since 1998. This year's estimates on CO₂ emissions reflect a more detailed breakdown of fuel consumption by product type, as well as allowances for non-combusted hydrocarbons. See bp.com/statisticalreview for a detailed explanation of the revised methodology.

Acknowledgements

We would like to express our sincere gratitude to the many contacts worldwide who provide the publicly available data for this publication, and to the researchers at the Centre for Energy Economics Research and Policy, Heriot-Watt University who assist in the data compilation.

Total proved reserves

	At end 1995 Thousand million barrels	At end 2005 Thousand million barrels	At end 2014 Thousand million barrels	At end 2015 Thousand million barrels	At end 2015 Thousand million tonnes	Share of total	R/P ratio
US	29.8	29.9	55.0	55.0	6.6	3.2%	11.9
Canada	48.4	180.0	172.2	172.2	27.8	10.1%	107.6
Mexico	48.8	13.7	10.8	10.8	1.5	0.6%	11.5
Total North America	126.9	223.6	238.0	238.0	35.9	14.0%	33.1
Argentina	2.4	2.2	2.4	2.4	0.3	0.1%	10.2
Brazil	6.2	11.8	16.2	13.0	1.9	0.8%	14.1
Colombia	3.0	1.5	2.4	2.3	0.3	0.1%	6.3
Ecuador	3.4	4.9	8.0	8.0	1.2	0.5%	40.4
Peru	0.8	1.1	1.4	1.4	0.2	0.1%	34.3
Trinidad & Tobago	0.7	0.8	0.8	0.7	0.1	♦	18.1
Venezuela	66.3	80.0	300.0	300.9	47.0	17.7%	313.9
Other S. & Cent. America	1.0	1.5	0.5	0.5	0.1	♦	9.9
Total S. & Cent. America	83.7	103.6	331.7	329.2	51.0	19.4%	117.0
Azerbaijan	1.2	7.0	7.0	7.0	1.0	0.4%	22.8
Denmark	0.9	1.3	0.6	0.6	0.1	♦	9.6
Italy	0.8	0.5	0.6	0.6	0.1	♦	14.7
Kazakhstan	5.3	9.0	30.0	30.0	3.9	1.8%	49.3
Norway	10.8	9.7	6.5	8.0	1.0	0.5%	11.3
Romania	1.0	0.5	0.6	0.6	0.1	♦	19.5
Russian Federation	113.6	104.4	103.2	102.4	14.0	6.0%	25.5
Turkmenistan	0.5	0.5	0.6	0.6	0.1	♦	6.3
United Kingdom	4.5	3.9	2.8	2.8	0.4	0.2%	8.0
Uzbekistan	0.3	0.6	0.6	0.6	0.1	♦	25.3
Other Europe & Eurasia	2.2	2.2	2.1	2.1	0.3	0.1%	15.0
Total Europe & Eurasia	141.2	139.5	154.6	155.2	21.0	9.1%	24.4
Iran	93.7	137.5	157.8	157.8	21.7	9.3%	110.3
Iraq	100.0	115.0	143.1	143.1	19.3	8.4%	97.2
Kuwait	96.5	101.5	101.5	101.5	14.0	6.0%	89.8
Oman	5.2	5.6	5.2	5.3	0.7	0.3%	15.3
Qatar	3.7	27.9	25.7	25.7	2.7	1.5%	37.1
Saudi Arabia	261.5	264.2	267.0	266.6	36.6	15.7%	60.8
Syria	2.6	3.0	2.5	2.5	0.3	0.1%	253.7
United Arab Emirates	98.1	97.8	97.8	97.8	13.0	5.8%	68.7
Yemen	2.0	2.9	3.0	3.0	0.4	0.2%	176.5
Other Middle East	0.1	0.1	0.2	0.2	†	♦	2.8
Total Middle East	663.3	755.5	803.8	803.5	108.7	47.3%	73.1
Algeria	10.0	12.3	12.2	12.2	1.5	0.7%	21.1
Angola	3.1	9.0	12.7	12.7	1.7	0.7%	19.0
Chad	-	1.5	1.5	1.5	0.2	0.1%	52.4
Republic of Congo	1.3	1.5	1.6	1.6	0.2	0.1%	15.8
Egypt	3.8	3.7	3.7	3.5	0.5	0.2%	13.2
Equatorial Guinea	0.6	1.8	1.1	1.1	0.1	0.1%	10.4
Gabon	1.5	2.1	2.0	2.0	0.3	0.1%	23.5
Libya	29.5	41.5	48.4	48.4	6.3	2.8%	306.8
Nigeria	20.8	36.2	37.1	37.1	5.0	2.2%	43.2
South Sudan	n/a	n/a	3.5	3.5	0.5	0.2%	64.9
Sudan	0.3	0.6	1.5	1.5	0.2	0.1%	39.2
Tunisia	0.4	0.6	0.4	0.4	0.1	♦	18.6
Other Africa	0.7	0.5	3.7	3.7	0.5	0.2%	38.3
Total Africa	72.0	111.3	129.3	129.1	17.1	7.6%	42.2
Australia	3.8	3.7	4.0	4.0	0.4	0.2%	28.3
Brunei	1.1	1.1	1.1	1.1	0.1	0.1%	23.8
China	16.4	15.6	18.5	18.5	2.5	1.1%	11.7
India	5.5	5.9	5.7	5.7	0.8	0.3%	18.0
Indonesia	5.0	4.2	3.6	3.6	0.5	0.2%	12.0
Malaysia	5.2	5.3	3.6	3.6	0.5	0.2%	14.2
Thailand	0.3	0.5	0.4	0.4	†	♦	2.3
Vietnam	0.8	3.1	4.4	4.4	0.6	0.3%	33.3
Other Asia Pacific	1.1	1.4	1.3	1.3	0.2	0.1%	12.0
Total Asia Pacific	39.1	40.8	42.6	42.6	5.7	2.5%	14.0
Total World	1126.2	1374.4	1700.0	1697.6	239.4	100.0%	50.7
of which: OECD	149.2	244.0	253.9	255.3	38.0	15.0%	29.7
Non-OECD	976.9	1130.4	1446.1	1442.3	201.3	85.0%	58.0
OPEC	786.6	927.8	1211.1	1211.6	169.9	71.4%	86.8
Non-OPEC	339.6	446.6	488.9	486.0	69.4	28.6%	24.9
European Union#	8.3	7.0	5.6	5.6	0.7	0.3%	10.1
CIS	121.5	122.2	141.9	141.1	19.1	8.3%	27.8
Canadian oil sands: Total	41.5	173.6	166.2	166.2	27.0		
of which: Under active development	3.6	10.2	24.4	24.4	4.0		
Venezuela: Orinoco Belt	-	-	221.7	222.3	35.7		

†Less than 0.05.

♦Less than 0.05%.

n/a not available.

#Excludes Estonia and Latvia in 2005.

Notes: Total proved reserves of oil – Generally taken to be those quantities that geological and engineering information indicates with reasonable certainty can be recovered in the future from known reservoirs under existing economic and operating conditions. The data series for total proved oil does not necessarily meet the definitions, guidelines and practices used for determining proved reserves at company level, for instance as published by the US Securities and Exchange Commission, nor does it necessarily represent BP's view of proved reserves by country.

Reserves-to-production (R/P) ratio – If the reserves remaining at the end of any year are divided by the production in that year, the result is the length of time that those remaining reserves would last if production were to continue at that rate.

Source of data – The estimates in this table have been compiled using a combination of primary official sources, third-party data from the OPEC Secretariat, World Oil, Oil & Gas Journal and independent estimates of Russian reserves based on official data and Chinese reserves based on information in the public domain.

Canadian oil sands 'under active development' are an official estimate. Venezuelan Orinoco Belt reserves are based on the OPEC Secretariat and government announcements.

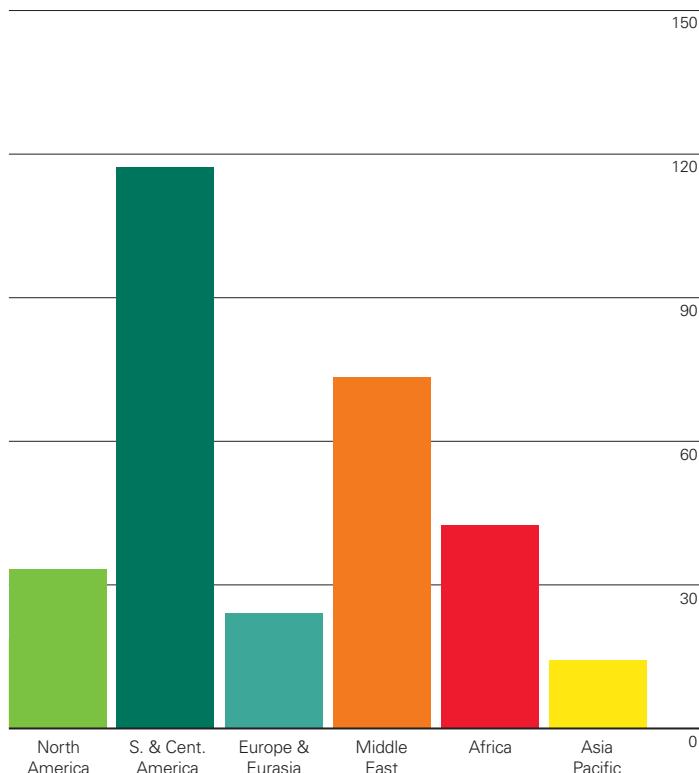
Reserves include gas condensate and natural gas liquids (NGLs) as well as crude oil.

Shares of total and R/P ratios are calculated using thousand million barrels figures.

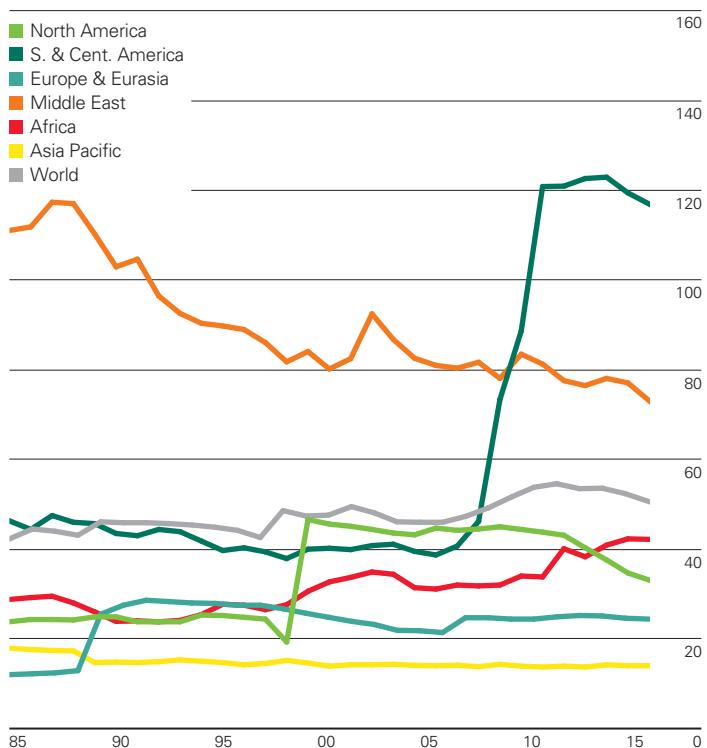
Reserves-to-production (R/P) ratios

Years

2015 by region



History

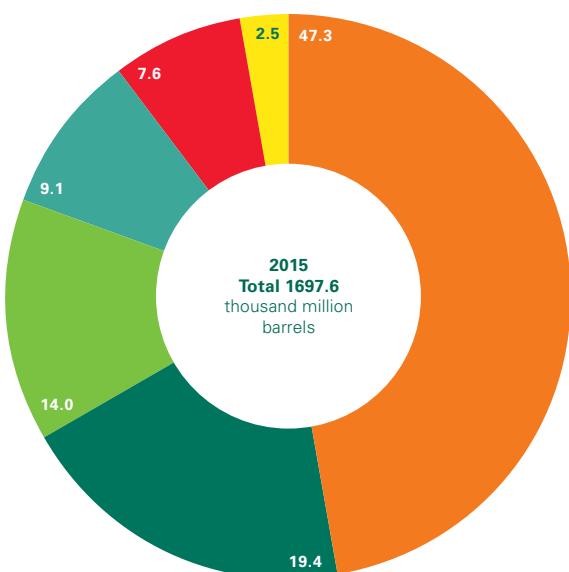
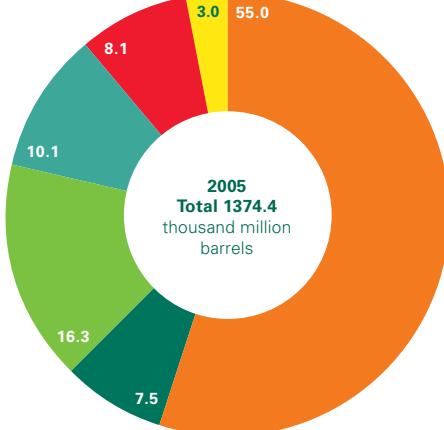
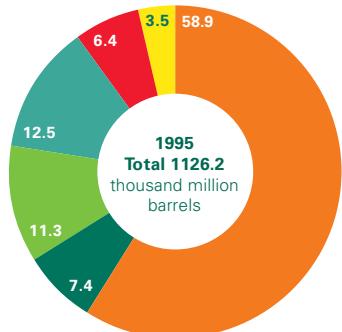


Global proved oil reserves in 2015 fell by 2.4 billion barrels (-0.1%) to 1697.6 billion barrels, just the second annual decline in our data set (along with 1998). Reserves have nonetheless increased by 24%, or 320 billion barrels, over the past decade; and are sufficient to meet 50.7 years of global production. Brazil recorded the largest decline, with proved reserves falling by 3.2 billion barrels, while Norwegian proved reserves grew by 1.5 billion barrels. OPEC countries continue to hold the largest share (71.4%) of global proved reserves. On a regional basis, South & Central American reserves have the highest R/P ratio, 117 years. Lags in reporting official data mean that 2015 figures for many countries are not yet available.

Distribution of proved reserves in 1995, 2005 and 2015

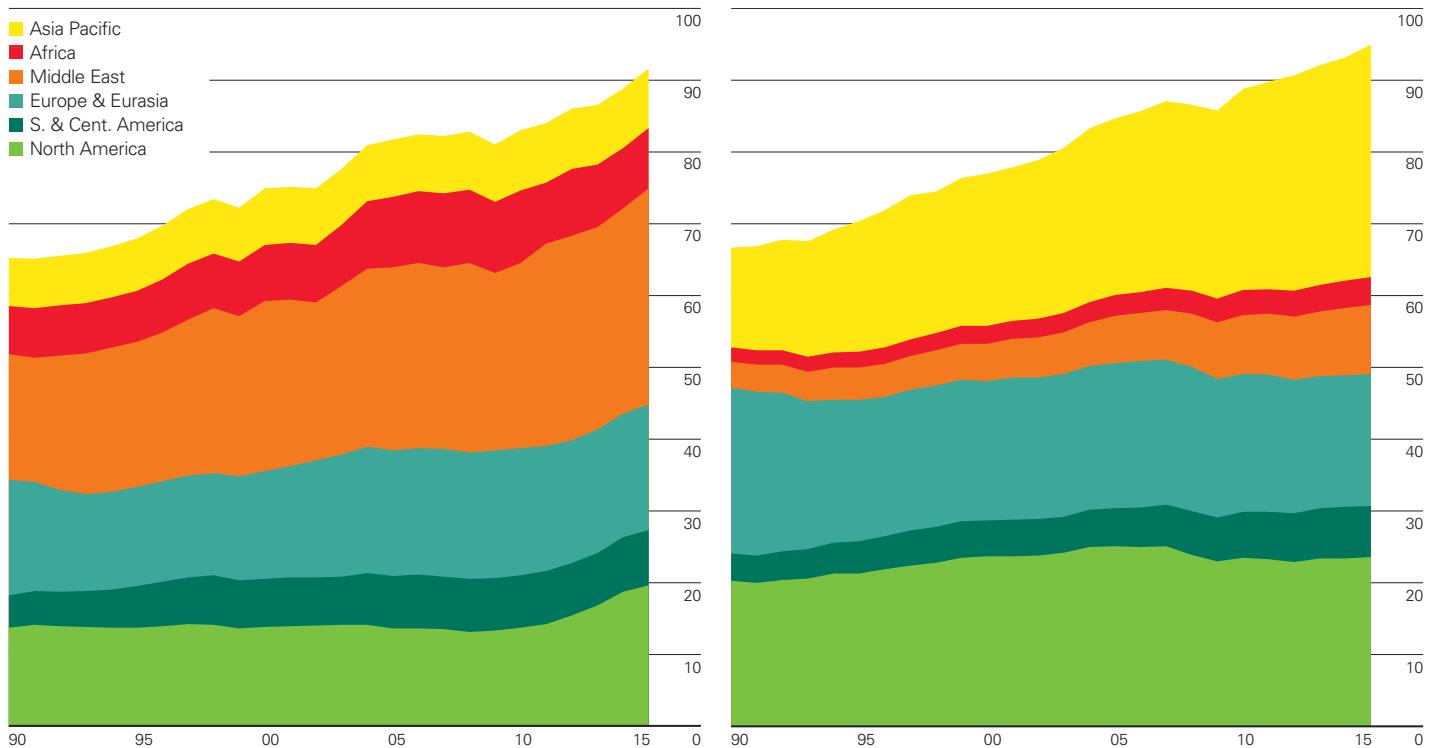
Percentage

- Middle East
- S. & Cent. America
- North America
- Europe & Eurasia
- Africa
- Asia Pacific



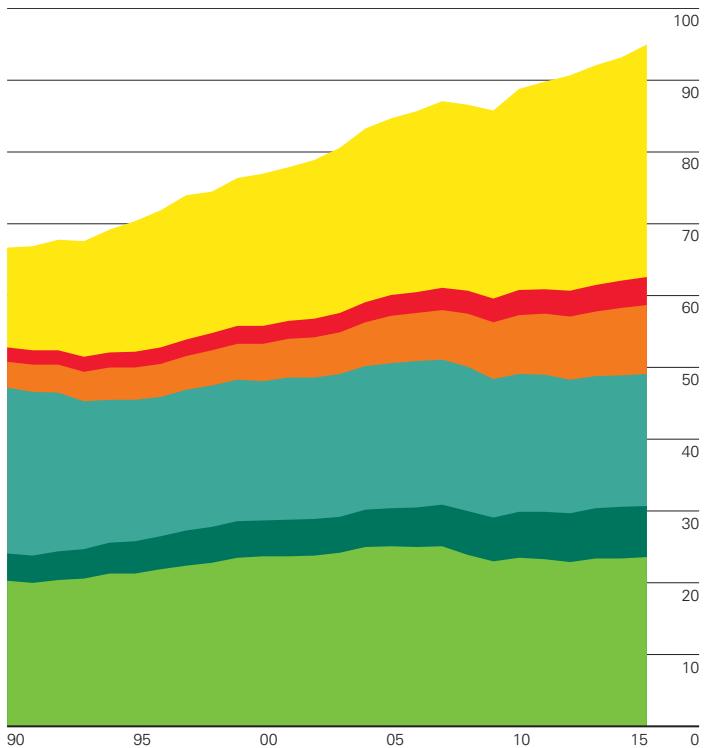
Oil: Production by region

Million barrels daily



Oil: Consumption by region

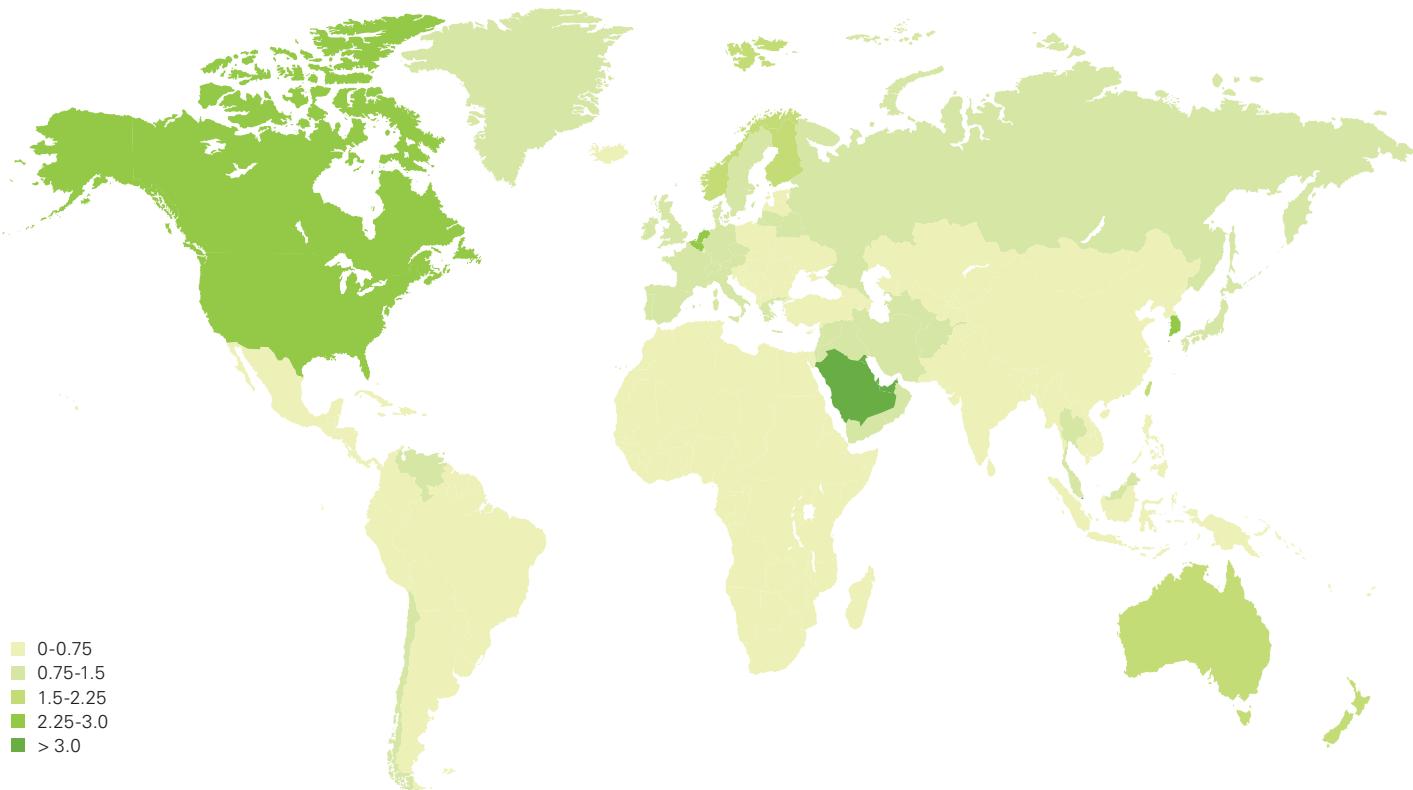
Million barrels daily



World oil production growth in 2015 significantly exceeded the growth in oil consumption for a second consecutive year. Production grew by 2.8 million b/d, led by increases in the Middle East (+1.5 million b/d) and North America (+0.9 million b/d). Global oil consumption increased by 1.9 million b/d, nearly double the 10-year average, with above-average growth driven by OECD countries. The Asia Pacific region accounted for 74% of global growth, with China once again contributing the largest national increment to global oil consumption growth (+770,000 b/d).

Oil: Consumption per capita 2015

Tonnes



Spot crude prices

US dollars per barrel	Dubai \$/bbl*	Brent \$/bbl†	Nigerian Forcados \$/bbl	West Intermediate \$/bbl‡
1980	35.69	36.83	36.98	37.96
1981	34.32	35.93	36.18	36.08
1982	31.80	32.97	33.29	33.65
1983	28.78	29.55	29.54	30.30
1984	28.06	28.78	28.14	29.39
1985	27.53	27.56	27.75	27.98
1986	13.10	14.43	14.46	15.10
1987	16.95	18.44	18.39	19.18
1988	13.27	14.92	15.00	15.97
1989	15.62	18.23	18.30	19.68
1990	20.45	23.73	23.85	24.50
1991	16.63	20.00	20.11	21.54
1992	17.17	19.32	19.61	20.57
1993	14.93	16.97	17.41	18.45
1994	14.74	15.82	16.25	17.21
1995	16.10	17.02	17.26	18.42
1996	18.52	20.67	21.16	22.16
1997	18.23	19.09	19.33	20.61
1998	12.21	12.72	12.62	14.39
1999	17.25	17.97	18.00	19.31
2000	26.20	28.50	28.42	30.37
2001	22.81	24.44	24.23	25.93
2002	23.74	25.02	25.04	26.16
2003	26.78	28.83	28.66	31.07
2004	33.64	38.27	38.13	41.49
2005	49.35	54.52	55.69	56.59
2006	61.50	65.14	67.07	66.02
2007	68.19	72.39	74.48	72.20
2008	94.34	97.26	101.43	100.06
2009	61.39	61.67	63.35	61.92
2010	78.06	79.50	81.05	79.45
2011	106.18	111.26	113.65	95.04
2012	109.08	111.67	114.21	94.13
2013	105.47	108.66	111.95	97.99
2014	97.07	98.95	101.35	93.28
2015	51.20	52.39	54.41	48.71

*1980-1985 Arabian Light, 1986-2015 Dubai dated.

†1980-1983 Forties, 1984-2015 Brent dated.

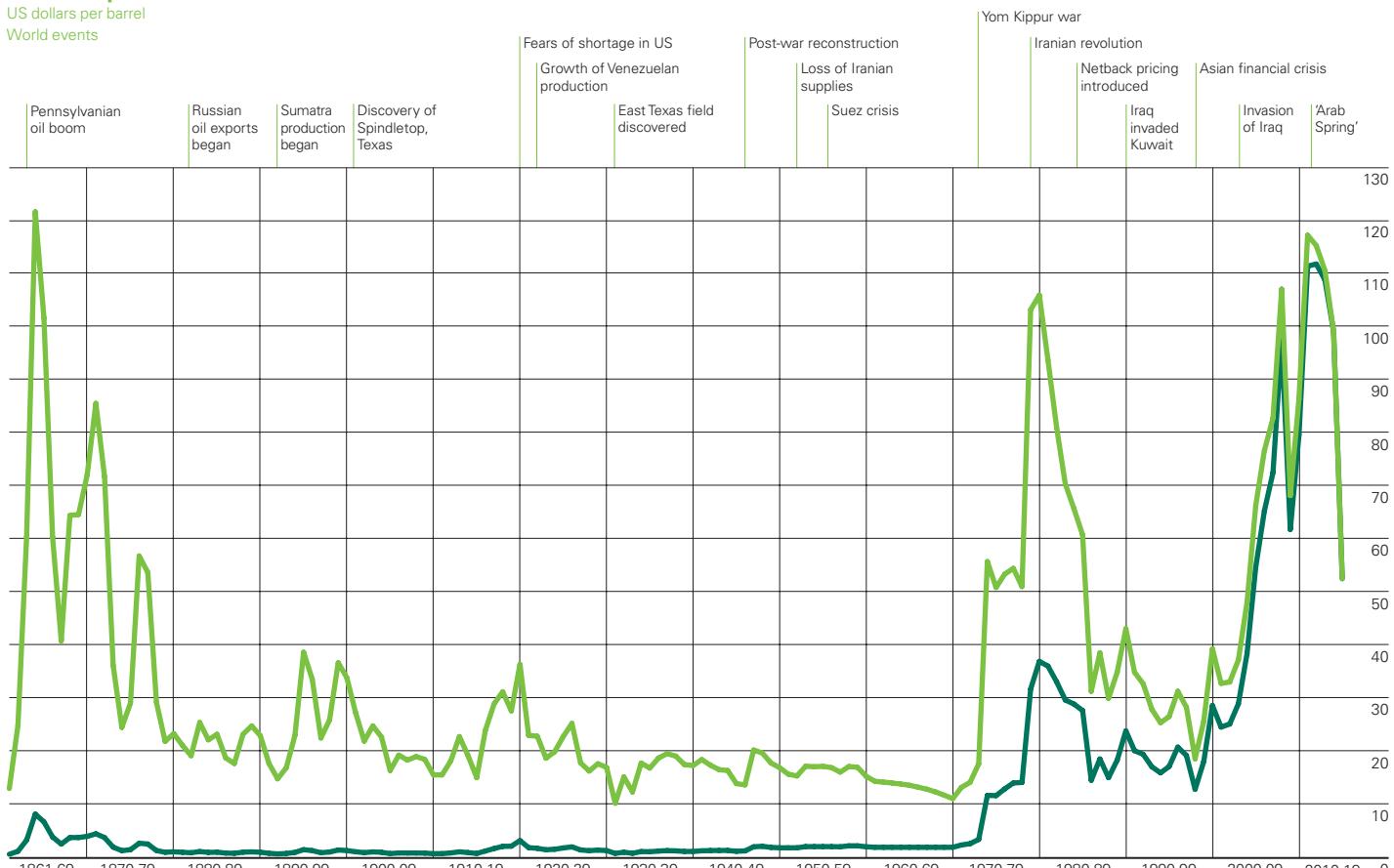
‡1980-1983 Posted WTI prices, 1984-2015 Spot WTI (Cushing) prices.

Source: Platts.

Crude oil prices 1861-2015

US dollars per barrel

World events

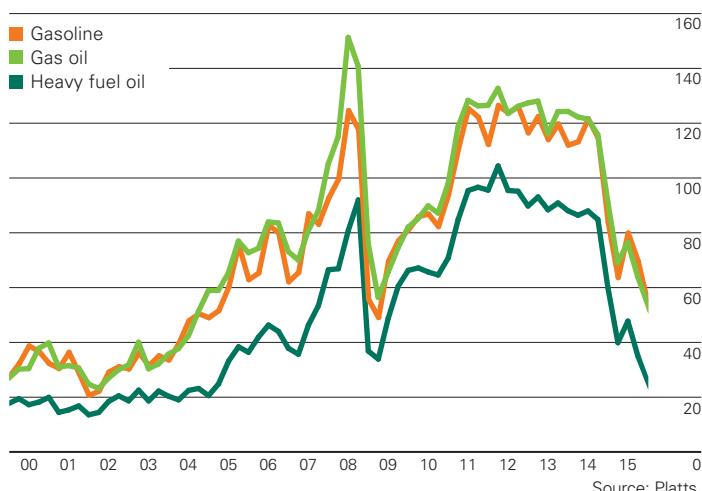


■ \$ 2015 (deflated using the Consumer Price Index for the US)
■ money of the day

1861-1944 US average.
1945-1983 Arabian Light posted at Ras Tanura.
1984-2015 Brent dated.

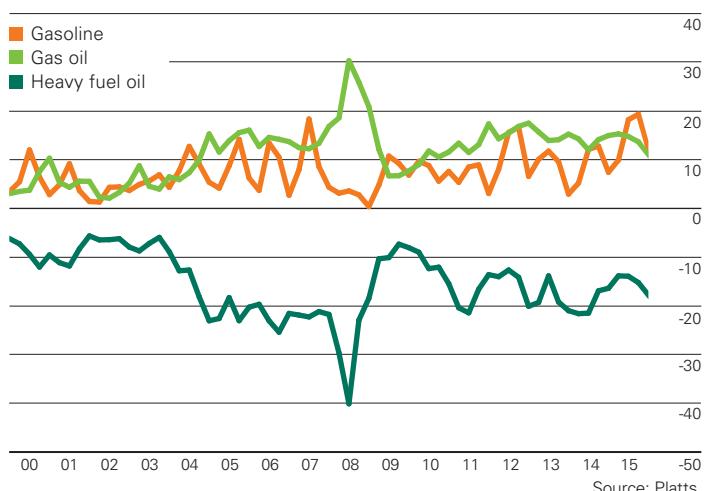
Oil product prices (Rotterdam)

US dollars per barrel



Product differentials to crude (Rotterdam products minus Dated Brent)

US dollars per barrel



Regional refining margins

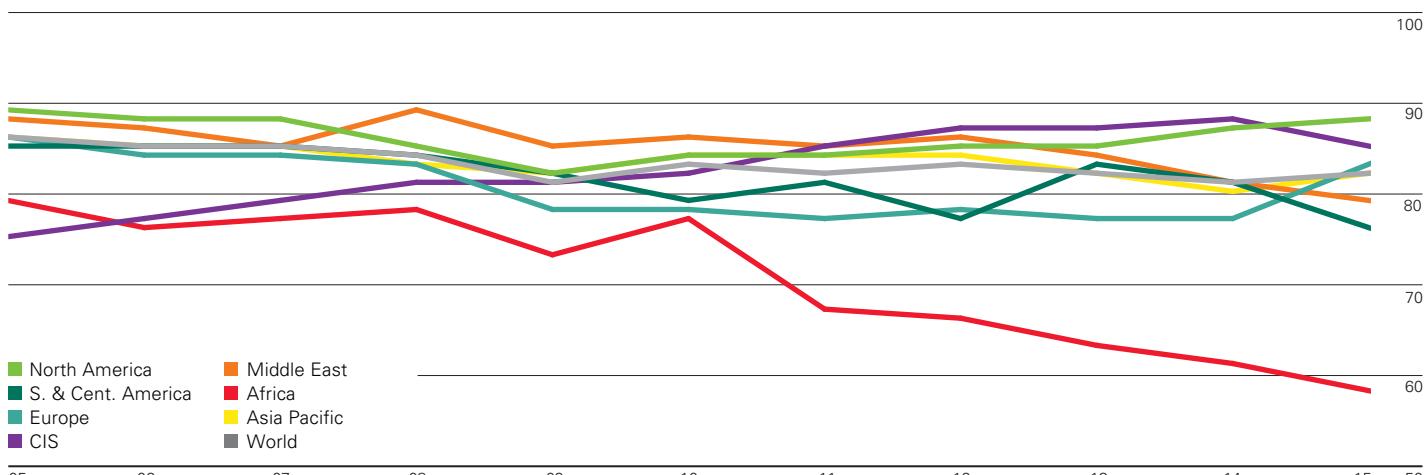
US dollars per barrel



Note: The refining margins presented are benchmark margins for three major global refining centres: US Gulf Coast (USGC), North West Europe (NWE – Rotterdam) and Singapore. In each case they are based on a single crude oil appropriate for that region and have optimized product yields based on a generic refinery configuration (cracking, hydrocracking or coking), again appropriate for that region. The margins are on a semi-variable basis, i.e. the margin after all variable costs and fixed energy costs.

Refinery utilization

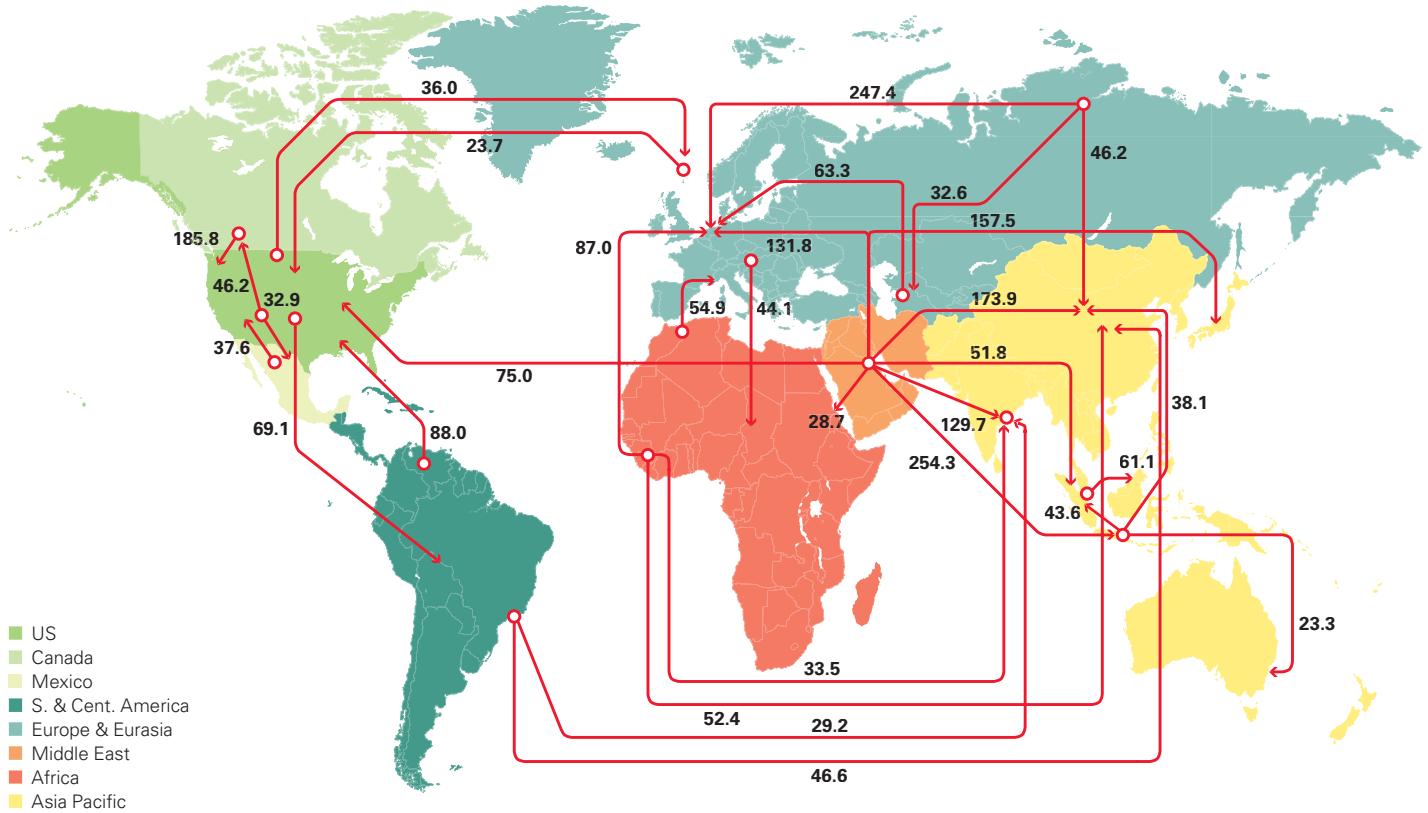
Percentage (based on average annual capacity)



Global crude runs rose by 1.8 million b/d in 2015, led by Europe and China. Europe recorded its largest increase in crude runs since 1986. Global refining capacity growth slowed to 450,000 b/d, the lowest in 23 years. Capacity in Asia Pacific fell for the first time since 1988. Global average refinery utilization rose by 1% to 82.1%, the fastest increase in 5 years.

Major trade movements 2015

Trade flows worldwide (million tonnes)



Oil trade in 2014 and 2015

Million tonnes	2014				2015			
	Crude imports	Product imports	Crude exports	Product exports	Crude imports	Product imports	Crude exports	Product exports
US	365.7	90.7	17.8	175.9	366.0	98.1	24.5	198.3
Canada	29.0	26.6	148.5	26.3	32.7	29.3	159.4	30.0
Mexico	†	31.8	56.5	7.5	†	37.0	59.8	8.2
S. & Cent. America	23.4	86.3	162.5	31.5	20.1	91.3	172.4	29.0
Europe	449.7	171.6	10.1	111.3	488.1	184.0	10.2	129.2
Russia	1.5	3.0	241.2	143.5	2.9	2.0	254.7	150.1
Other CIS	23.2	13.7	80.7	15.3	23.2	12.9	81.0	11.9
Middle East	10.9	43.7	852.0	135.7	7.9	37.1	879.6	141.3
North Africa	9.7	29.2	61.8	21.7	8.1	32.7	61.5	19.0
West Africa	0.5	26.6	216.9	7.6	0.5	28.1	215.5	6.2
East & S. Africa	11.1	23.4	9.3	1.7	6.7	22.4	8.4	1.5
Australasia	26.8	21.7	11.4	3.4	24.5	25.8	9.2	3.0
China	309.2	56.9	0.6	31.4	335.8	69.5	2.8	36.7
India	188.4	16.9	†	57.7	195.1	23.3	0.2	55.0
Japan	168.5	47.8	†	13.6	167.8	46.7	0.3	17.4
Singapore	45.5	109.1	†	81.6	45.7	125.7	0.1	88.7
Other Asia Pacific	241.6	154.6	35.0	88.1	252.3	163.3	37.8	103.6
Total World	1904.4	953.7	1904.4	953.7	1977.2	1029.3	1977.2	1029.3

Thousand barrels daily	2014	2015	2014	2015	2014	2015	2014	2015
US	7343	7351	1897	2050	357	491	3677	4145
Canada	582	657	556	613	2983	3200	550	627
Mexico	†	‡	664	1201	1135	171	157	100
S. & Cent. America	470	404	1804	3462	3264	605	658	204
Europe	9031	9801	3588	2701	204	3139	2327	3847
Russia	9031	9801	3588	2701	204	3139	2999	3847
Other CIS	30	57	62	5115	4843	3139	41	5115
Middle East	465	465	287	1626	1620	249	320	287
North Africa	218	158	914	17665	17109	2954	2836	17109
West Africa	194	162	610	1235	1241	397	454	1241
East & S. Africa	10	9	555	130	4356	130	159	4327
Australasia	224	134	490	32	187	32	36	170
China	538	491	453	63	230	63	70	184
India	6209	6743	1189	767	12	57	657	1453
Japan	3783	3919	354	1150	1	3	1207	488
Singapore	3384	3370	999	363	‡	6	283	976
Other Asia Pacific	914	918	2282	1855	‡	1	1706	2628
Total World	38245	39707	19937	21516	38245	21516	19937	21516

†Less than 0.05.

‡Less than 0.5.

Notes: Bunkers are not included as exports. Intra-area movements (for example, between countries in Europe) are excluded. Crude imports and exports include condensates.

 Natural gas

Total proved reserves

	At end 1995 Trillion cubic metres	At end 2005 Trillion cubic metres	At end 2014 Trillion cubic metres	At end 2015 Trillion cubic metres	Trillion cubic feet	Share of total	R/P ratio
US	4.7	5.8	10.4	10.4	368.7	5.6%	13.6
Canada	1.9	1.6	2.0	2.0	70.2	1.1%	12.2
Mexico	1.9	0.4	0.3	0.3	11.4	0.2%	6.1
Total North America	8.5	7.8	12.8	12.8	450.3	6.8%	13.0
Argentina	0.6	0.4	0.3	0.3	11.7	0.2%	9.1
Bolivia	0.1	0.8	0.3	0.3	9.9	0.2%	13.5
Brazil	0.2	0.3	0.5	0.4	15.0	0.2%	18.5
Colombia	0.2	0.1	0.1	0.1	4.8	0.1%	12.2
Peru	0.2	0.3	0.4	0.4	14.6	0.2%	33.1
Trinidad & Tobago	0.3	0.5	0.3	0.3	11.5	0.2%	8.2
Venezuela	4.1	4.3	5.6	5.6	198.4	3.0%	173.2
Other S. & Cent. America	0.2	0.1	0.1	0.1	2.2	♦	24.0
Total S. & Cent. America	5.9	6.9	7.6	7.6	268.1	4.1%	42.5
Azerbaijan	n/a	0.9	1.2	1.1	40.6	0.6%	63.2
Denmark	0.1	0.1	†	†	1.1	♦	6.7
Germany	0.2	0.2	†	†	1.4	♦	5.4
Italy	0.3	0.1	†	†	1.6	♦	7.3
Kazakhstan	n/a	1.3	0.9	0.9	33.1	0.5%	75.7
Netherlands	1.6	1.3	0.7	0.7	23.8	0.4%	15.7
Norway	1.4	2.4	1.9	1.9	65.6	1.0%	15.9
Poland	0.1	0.1	0.1	0.1	3.3	0.1%	23.1
Romania	0.4	0.6	0.1	0.1	3.9	0.1%	10.7
Russian Federation	31.1	31.2	32.4	32.3	1139.6	17.3%	56.3
Turkmenistan	n/a	2.3	17.5	17.5	617.3	9.4%	241.4
Ukraine	n/a	0.7	0.6	0.6	21.3	0.3%	34.7
United Kingdom	0.7	0.5	0.2	0.2	7.3	0.1%	5.2
Uzbekistan	n/a	1.2	1.1	1.1	38.3	0.6%	18.8
Other Europe & Eurasia	0.3	0.2	0.2	0.2	7.0	0.1%	31.4
Total Europe & Eurasia	40.2	43.0	57.0	56.8	2005.1	30.4%	57.4
Bahrain	0.1	0.1	0.2	0.2	6.1	0.1%	11.1
Iran	19.4	27.6	34.0	34.0	1201.4	18.2%	176.8
Iraq	3.4	3.2	3.7	3.7	130.5	2.0%	*
Israel	†	†	0.2	0.2	6.4	0.1%	21.9
Kuwait	1.5	1.6	1.8	1.8	63.0	1.0%	119.1
Oman	0.5	1.0	0.7	0.7	24.3	0.4%	19.7
Qatar	8.5	25.6	24.5	24.5	866.2	13.1%	135.2
Saudi Arabia	5.5	6.8	8.3	8.3	294.0	4.5%	78.2
Syria	0.2	0.3	0.3	0.3	10.1	0.2%	66.0
United Arab Emirates	5.9	6.1	6.1	6.1	215.1	3.3%	109.2
Yemen	0.3	0.3	0.3	0.3	9.4	0.1%	100.0
Other Middle East	†	†	†	†	0.2	♦	44.9
Total Middle East	45.3	72.6	80.1	80.0	2826.6	42.8%	129.5
Algeria	3.7	4.5	4.5	4.5	159.1	2.4%	54.3
Egypt	0.6	1.9	1.8	1.8	65.2	1.0%	40.5
Libya	1.3	1.3	1.5	1.5	53.1	0.8%	118.0
Nigeria	3.5	5.2	5.1	5.1	180.5	2.7%	102.1
Other Africa	0.8	1.2	1.2	1.1	38.8	0.6%	53.9
Total Africa	9.9	14.1	14.1	14.1	496.7	7.5%	66.4
Australia	1.2	2.2	3.5	3.5	122.6	1.9%	51.8
Bangladesh	0.3	0.4	0.2	0.2	8.2	0.1%	8.7
Brunei	0.4	0.3	0.3	0.3	9.7	0.1%	21.7
China	1.7	1.6	3.7	3.8	135.7	2.1%	27.8
India	0.7	1.1	1.4	1.5	52.6	0.8%	50.9
Indonesia	2.0	2.5	2.8	2.8	100.3	1.5%	37.8
Malaysia	2.3	2.5	1.2	1.2	41.3	0.6%	17.1
Myanmar	0.3	0.5	0.5	0.5	18.7	0.3%	27.0
Pakistan	0.6	0.9	0.5	0.5	19.2	0.3%	12.9
Papua New Guinea	†	†	0.2	0.1	5.0	0.1%	14.3
Thailand	0.2	0.3	0.2	0.2	7.8	0.1%	5.5
Vietnam	0.1	0.2	0.6	0.6	21.8	0.3%	57.9
Other Asia Pacific	0.4	0.4	0.3	0.3	9.9	0.2%	15.8
Total Asia Pacific	10.1	13.0	15.4	15.6	552.6	8.4%	28.1
Total World	119.9	157.3	187.0	186.9	6599.4	100.0%	52.8
of which: OECD	14.5	14.9	19.7	19.6	690.8	10.5%	15.1
Non-OECD	105.4	142.4	167.3	167.3	5908.6	89.5%	74.5
European Union	3.6	3.0	1.3	1.3	46.0	0.7%	10.8
CIS	31.1	37.6	53.7	53.6	1891.3	28.7%	71.3

*More than 500 years.

†Less than 0.05.

♦Less than 0.05%.

††Not available.

Notes: Proved reserves of natural gas – Generally taken to be those quantities that geological and engineering information indicates with reasonable certainty can be recovered in the future from known reservoirs under existing economic and operating conditions. The data series for total proved natural gas reserves does not necessarily meet the definitions, guidelines and practices used for determining proved reserves at a company level, for instance as published by the US Securities and Exchange Commission, nor does it necessarily represent BP's view of proved reserves by country.

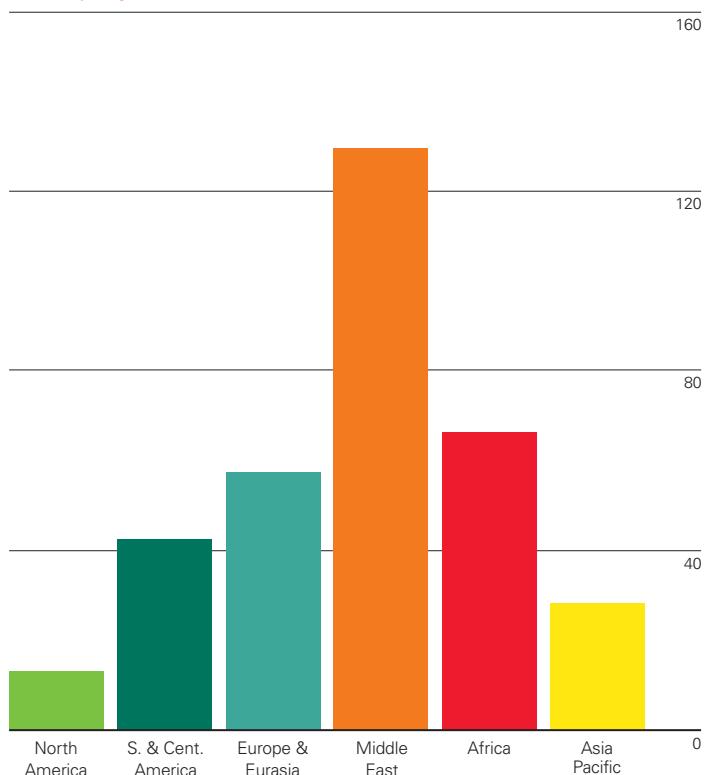
Reserves-to-production (R/P) ratio – If the reserves remaining at the end of any year are divided by the production in that year, the result is the length of time that those remaining reserves would last if production were to continue at that rate.

Source of data – The estimates in this table have been compiled using a combination of primary official sources and third-party data from Cedigaz and the OPEC Secretariat.

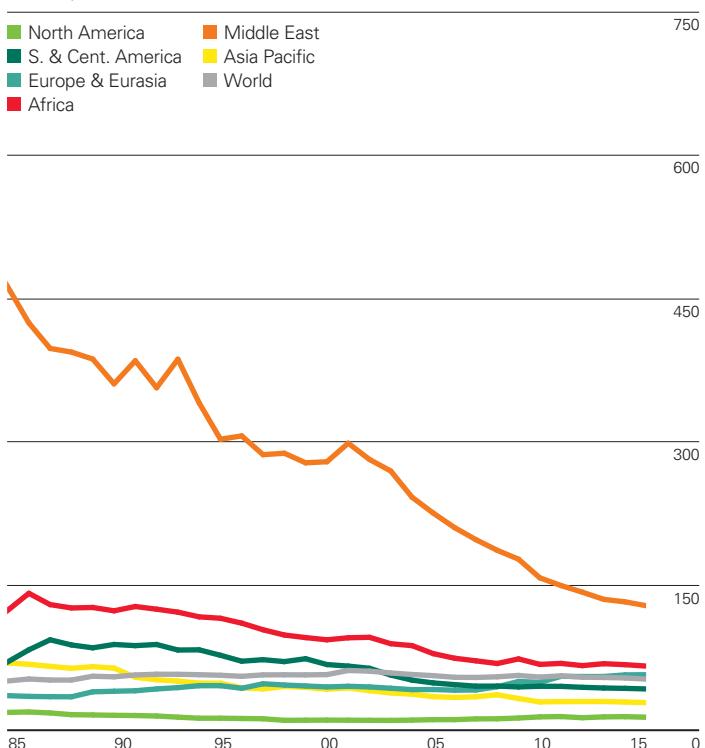
Reserves-to-production (R/P) ratios

Years

2015 by region



History

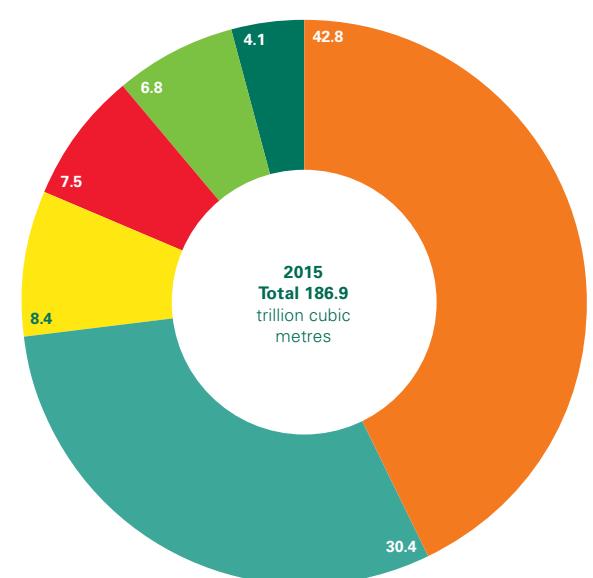
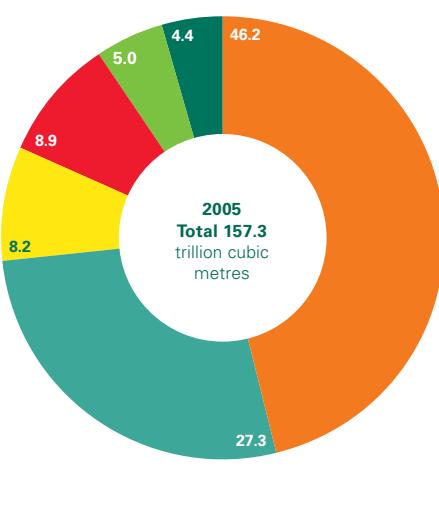
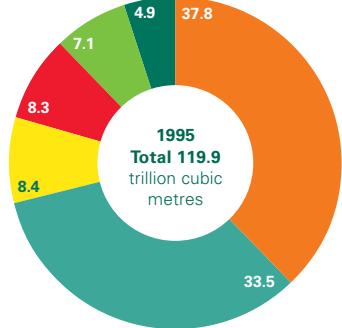


As was the case for oil, global proved natural gas reserves in 2015 fell slightly, (by 0.1 trillion cubic metres (tcm), or -0.1%) to 186.9 tcm, sufficient to meet 52.8 years of current production. Small declines in Russian and Norwegian reserves drove the decline. Reserves have increased by 29.6 tcm over the past decade. The Middle East region holds the largest proved reserves (80 tcm, 42.8% of the global total), and has the highest regional R/P ratio (129.5 years). Lags in reporting official data mean that 2015 figures for many countries are not yet available.

Distribution of proved reserves in 1995, 2005 and 2015

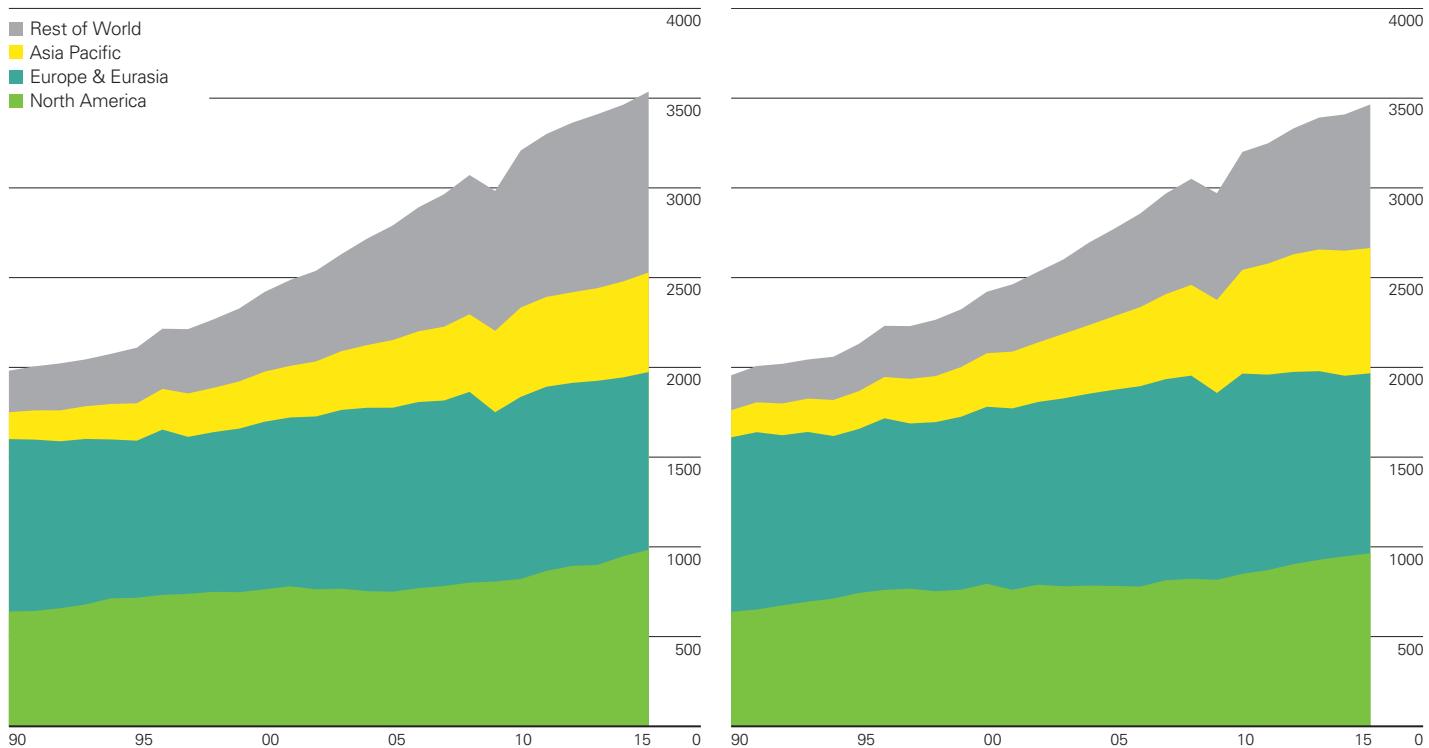
Percentage

- Middle East
- Europe & Eurasia
- Asia Pacific
- Africa
- North America
- S. & Cent. America



Natural gas: Production by region

Billion cubic metres



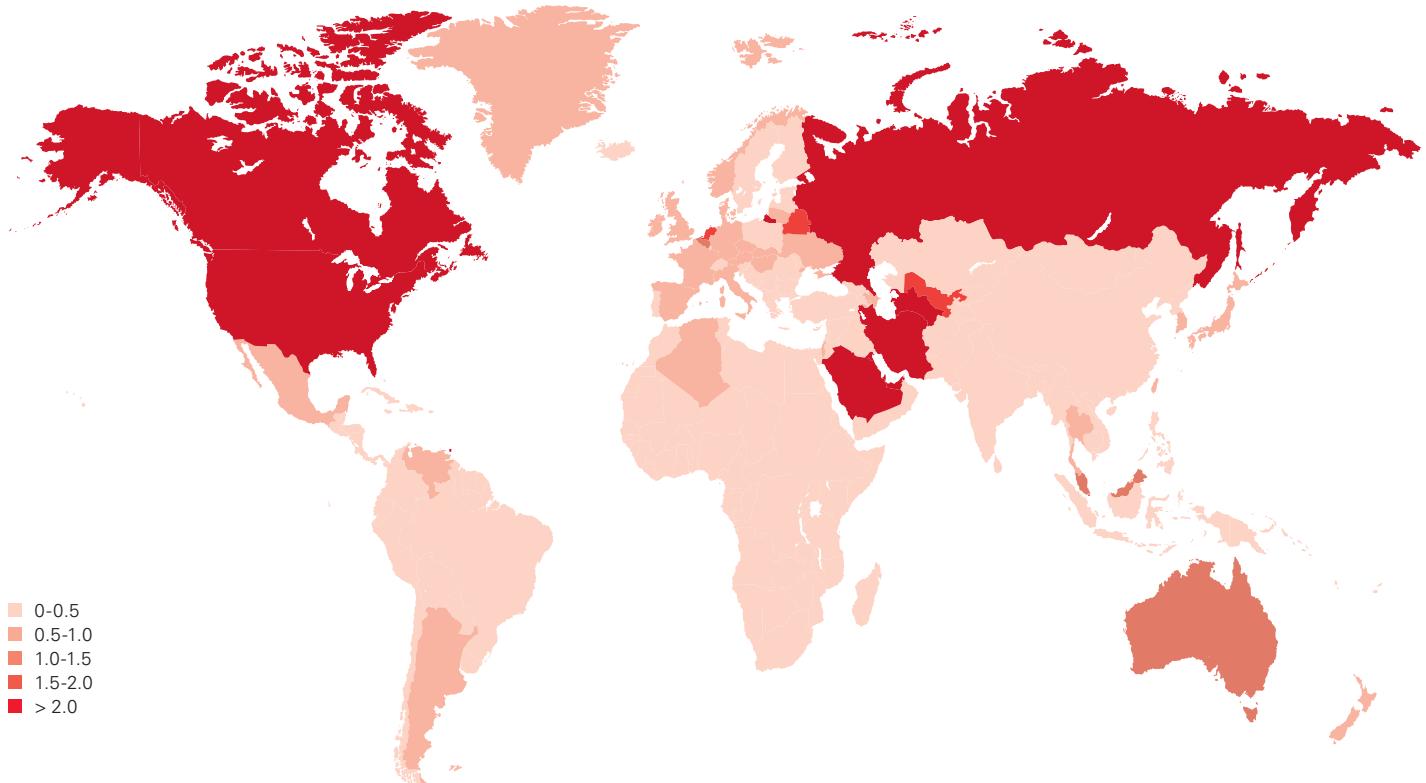
Natural gas: Consumption by region

Billion cubic metres

World natural gas production growth accelerated to 2.2% in 2015, slightly below the 10-year average growth of 2.4%. North America (+3.9%) recorded the largest growth increment, driven by continued strong increases in US output, while production in Europe & Eurasia declined by 0.7%, with large declines in the Netherlands and Russia. Consumption growth (+1.7%) also accelerated from a very weak 2014, but remained below the 10-year average of 2.3%. The Middle East recorded the strongest regional growth rate (+6.2%), while consumption in Europe & Eurasia declined by 0.3%, with a decline in Russia offsetting growth in the EU.

Natural gas: Consumption per capita 2015

Tonnes oil equivalent



Prices

\$/mmBtu



Prices

US dollars per million Btu	LNG Japan cif	Natural gas				Crude oil OECD countries cif
		Average German Import Price*	UK (Heren NBP Index)†	US Henry Hub‡	Canada (Alberta)‡	
1985	5.23	4.25	—	—	—	4.75
1986	4.10	3.93	—	—	—	2.57
1987	3.35	2.55	—	—	—	3.09
1988	3.34	2.22	—	—	—	2.56
1989	3.28	2.00	—	1.70	—	3.01
1990	3.64	2.78	—	1.64	1.05	3.82
1991	3.99	3.23	—	1.49	0.89	3.33
1992	3.62	2.70	—	1.77	0.98	3.19
1993	3.52	2.51	—	2.12	1.69	2.82
1994	3.18	2.35	—	1.92	1.45	2.70
1995	3.46	2.43	—	1.69	0.89	2.96
1996	3.66	2.50	1.87	2.76	1.12	3.54
1997	3.91	2.66	1.96	2.53	1.36	3.29
1998	3.05	2.33	1.86	2.08	1.42	2.16
1999	3.14	1.86	1.58	2.27	2.00	2.98
2000	4.72	2.91	2.71	4.23	3.75	4.83
2001	4.64	3.67	3.17	4.07	3.61	4.08
2002	4.27	3.21	2.37	3.33	2.57	4.17
2003	4.77	4.06	3.33	5.63	4.83	4.89
2004	5.18	4.30	4.46	5.85	5.03	6.27
2005	6.05	5.83	7.38	8.79	7.25	8.74
2006	7.14	7.87	7.87	6.76	5.83	10.66
2007	7.73	7.99	6.01	6.95	6.17	11.95
2008	12.55	11.60	10.79	8.85	7.99	16.76
2009	9.06	8.53	4.85	3.89	3.38	10.41
2010	10.91	8.03	6.56	4.39	3.69	13.47
2011	14.73	10.49	9.04	4.01	3.47	18.56
2012	16.75	10.93	9.46	2.76	2.27	18.82
2013	16.17	10.72	10.64	3.71	2.93	18.25
2014	16.33	9.11	8.25	4.35	3.87	16.80
2015	10.31	6.61	6.53	2.60	2.01	8.77

*Source: 1985-1990 German Federal Statistical Office, 1991-2015 German Federal Office of Economics and Export Control (BAFA).

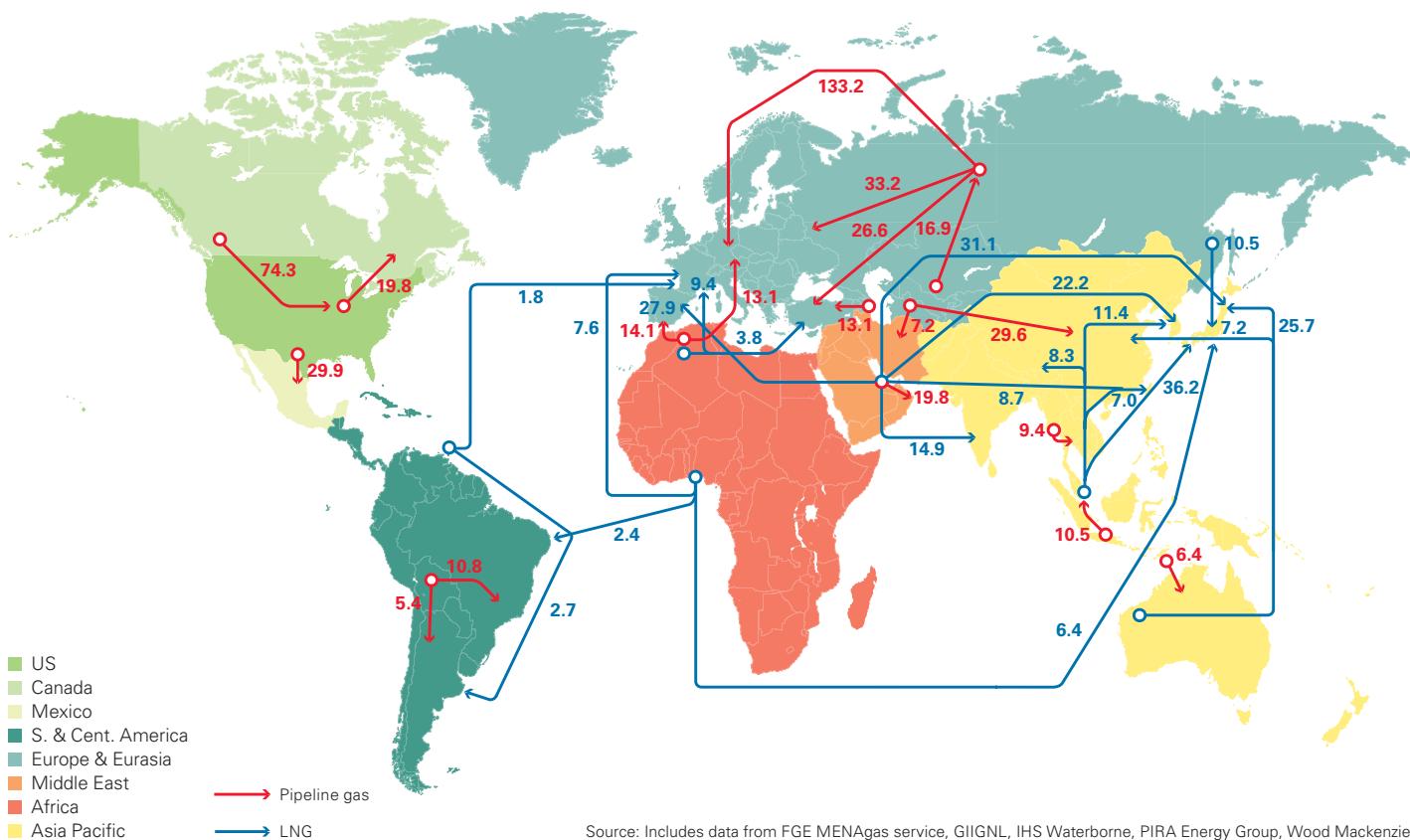
†Source: ICIS Heren Energy Ltd.

‡Source: Energy Intelligence Group, *Natural Gas Week*.

Note: cif = cost+insurance+freight (average prices).

Major trade movements 2015

Trade flows worldwide (billion cubic metres)



Gas trade in 2014 and 2015 in billion cubic metres

Billion cubic metres	2014				2015			
	Pipeline imports	LNG imports	Pipeline exports	LNG exports	Pipeline imports	LNG imports	Pipeline exports	LNG exports
US	74.6	1.7	42.4	0.5	74.4	2.6	49.7	0.8
Canada	21.8	0.5	74.6	—	19.8	0.6	74.3	—
Mexico	20.6	9.4	†	—	29.9	7.1	†	—
Trinidad and Tobago	—	—	—	18.4	—	—	—	17.0
Other S. & Cent. America	18.7	20.9	18.7	5.8	18.5	20.0	18.5	5.0
France	28.6	7.2	1.9	0.5	35.9	6.6	1.6	0.4
Germany	88.4	—	20.0	—	104.0	—	29.0	—
Italy	46.6	4.6	0.2	—	50.2	6.0	0.2	—
Netherlands	23.2	1.1	46.1	0.6	30.2	2.0	40.6	1.2
Norway	†	—	102.4	5.3	†	—	109.5	6.0
Spain	17.0	15.5	†	5.1	15.2	13.1	0.5	1.6
Turkey	41.1	7.3	0.6	—	39.7	7.5	0.6	—
United Kingdom	29.4	10.7	10.0	—	29.0	12.8	13.4	0.3
Other Europe	102.4	5.4	8.9	2.1	97.2	7.1	13.1	1.4
Russian Federation	24.2	—	187.7	14.3	16.9	—	193.0	14.5
Ukraine	17.5	—	—	—	16.2	—	—	—
Other CIS	30.3	—	69.0	—	29.8	—	64.5	—
Qatar	—	—	20.5	102.9	—	—	19.8	106.4
Other Middle East	27.4	5.4	9.6	27.1	27.3	10.5	8.4	19.8
Algeria	—	—	25.4	17.5	—	—	25.0	16.2
Other Africa	8.8	—	10.9	31.9	8.9	3.8	11.1	32.5
China	31.3	26.5	—	—	33.6	26.2	—	—
Japan	—	122.9	—	—	—	118.0	—	—
Indonesia	—	—	9.7	21.8	—	—	10.5	21.9
South Korea	—	48.6	—	0.2	—	—	43.7	0.3
Other Asia Pacific	25.4	44.6	18.7	78.4	27.6	50.7	21.0	93.0
Total World	677.1	332.3	677.1	332.3	704.1	338.3	704.1	338.3

†Less than 0.05.

Source: Includes data from FGE MENAgas service, GIIGNL, IHS Waterborne, PIRA Energy Group, Wood Mackenzie.

Total proved reserves at end 2015

Million tonnes	Anthracite and bituminous	Sub-bituminous and lignite	Total	Share of total	R/P ratio
US	108501	128794	237295	26.6%	292
Canada	3474	3108	6582	0.7%	108
Mexico	860	351	1211	0.1%	84
Total North America	112835	132253	245088	27.5%	276
Brazil	–	6630	6630	0.7%	*
Colombia	6746	–	6746	0.8%	79
Venezuela	479	–	479	0.1%	*
Other S. & Cent. America	57	729	786	0.1%	244
Total S. & Cent. America	7282	7359	14641	1.6%	150
Bulgaria	2	2364	2366	0.3%	66
Czech Republic	181	871	1052	0.1%	23
Germany	48	40500	40548	4.5%	220
Greece	–	3020	3020	0.3%	63
Hungary	13	1647	1660	0.2%	180
Kazakhstan	21500	12100	33600	3.8%	316
Poland	4178	1287	5465	0.6%	40
Romania	10	281	291	♦	11
Russian Federation	49088	107922	157010	17.6%	422
Serbia	1	13410	13411	1.5%	352
Spain	200	330	530	0.1%	173
Turkey	322	8380	8702	1.0%	192
Ukraine	15351	18522	33873	3.8%	*
United Kingdom	228	–	228	♦	27
Uzbekistan	47	1853	1900	0.2%	481
Other Europe & Eurasia	1388	5494	6882	0.8%	187
Total Europe & Eurasia	92557	217981	310538	34.8%	273
South Africa	30156	–	30156	3.4%	120
Zimbabwe	502	–	502	0.1%	121
Other Africa	942	214	1156	0.1%	122
Middle East	1122	–	1122	0.1%	*
Total Middle East & Africa	32722	214	32936	3.7%	123
Australia	37100	39300	76400	8.6%	158
China	62200	52300	114500	12.8%	31
India	56100	4500	60600	6.8%	89
Indonesia	–	28017	28017	3.1%	71
Japan	337	10	347	♦	296
Mongolia	1170	1350	2520	0.3%	103
New Zealand	33	538	571	0.1%	168
Pakistan	–	2070	2070	0.2%	*
South Korea	–	126	126	♦	71
Thailand	–	1239	1239	0.1%	82
Vietnam	150	–	150	♦	4
Other Asia Pacific	713	1075	1788	0.2%	37
Total Asia Pacific	157803	130525	288328	32.3%	53
Total World	403199	488332	891531	100.0%	114
of which: OECD	155494	229321	384815	43.2%	206
Non-OECD	247705	259011	506716	56.8%	85
European Union	4883	51199	56082	6.3%	112
CIS	86524	141309	227833	25.6%	435

*More than 500 years.

♦Less than 0.05%.

Notes: Total proved reserves of coal – Generally taken to be those quantities that geological and engineering information indicates with reasonable certainty can be recovered in the future from known reservoirs under existing economic and operating conditions. The data series for total proved coal reserves does not necessarily meet the definitions, guidelines and practices used for determining proved reserves at company level, for instance as published by the US Securities and Exchange Commission, nor does it necessarily represent BP's view of proved reserves by country.

Reserves-to-production (R/P) ratio – If the reserves remaining at the end of any year are divided by the production in that year, the result is the length of time that those remaining reserves would last if production were to continue at that rate.

Reserves-to-production (R/P) ratios are calculated excluding other solid fuels in reserves and production.

Source of reserves data: World Energy Resources 2013 Survey, World Energy Council.

Prices

US dollars per tonne	Northwest Europe marker price†	US Central Appalachian coal spot price index‡	Japan coking coal import cif price	Japan steam coal import cif price	Asian marker price†
1995	44.50	27.01	54.47	47.58	–
1996	41.25	29.86	56.68	49.54	–
1997	38.92	29.76	55.51	45.53	–
1998	32.00	31.00	50.76	40.51	29.48
1999	28.79	31.29	42.83	35.74	27.82
2000	35.99	29.90	39.69	34.58	31.76
2001	39.03	50.15	41.33	37.96	36.89
2002	31.65	33.20	42.01	36.90	30.41
2003	43.60	38.52	41.57	34.74	36.53
2004	72.08	64.90	60.96	51.34	72.42
2005	60.54	70.12	89.33	62.91	61.84
2006	64.11	62.96	93.46	63.04	56.47
2007	88.79	51.16	88.24	69.86	84.57
2008	147.67	118.79	179.03	122.81	148.06
2009	70.66	68.08	167.82	110.11	78.81
2010	92.50	71.63	158.95	105.19	105.43
2011	121.52	87.38	229.12	136.21	125.74
2012	92.50	72.06	191.46	133.61	105.50
2013	81.69	71.39	140.45	111.16	90.90
2014	75.38	69.00	114.41	97.65	77.89
2015	56.64	53.59	93.85	79.47	63.52

†Source: IHS McCloskey Northwest Europe prices for 1995-2000 are the average of the monthly marker, 2001-2015 the average of weekly prices. The Asian prices are the average of the monthly marker.

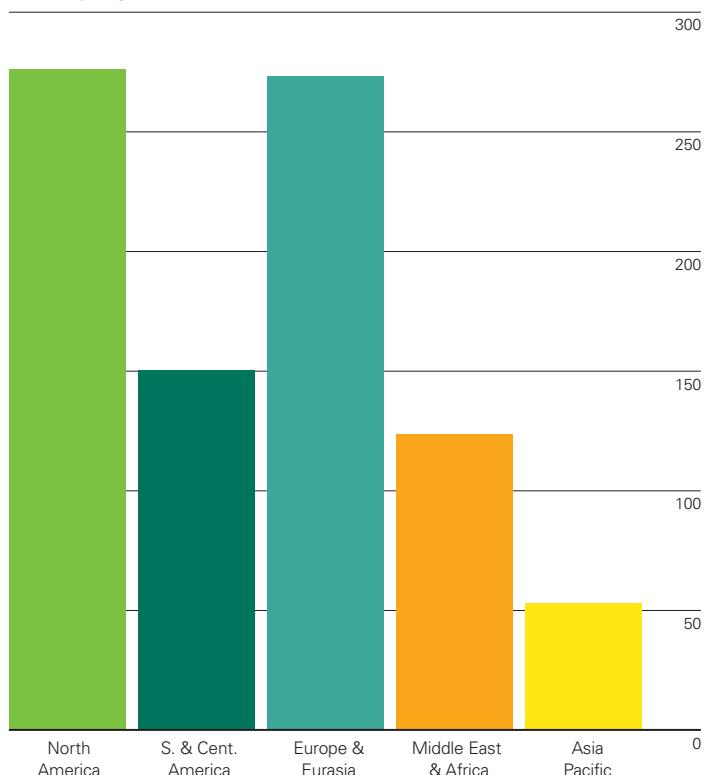
‡Source: Platts. Prices are for Central Appalachian 12,500 BTU, 1.2 SO₂ coal, fob. Prices for 1995-2000 are by coal price publication date, 2001-2015 by coal price assessment date.

Note: cif = cost+insurance+freight (average prices); fob = free on board.

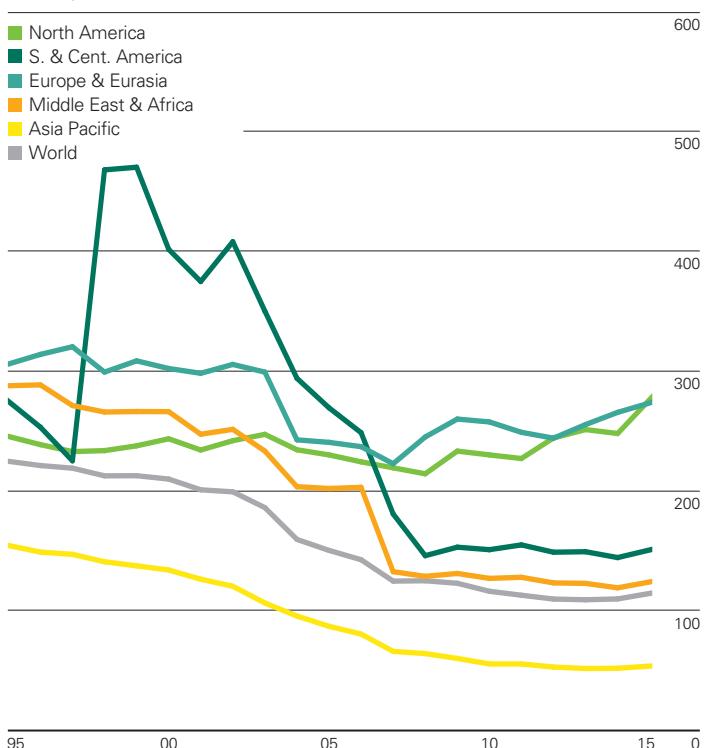
Reserves-to-production (R/P) ratios

Years

2015 by region



History

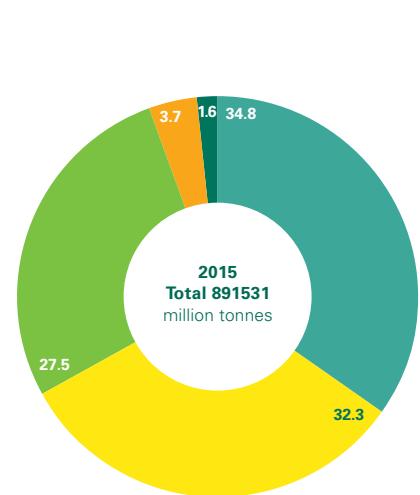
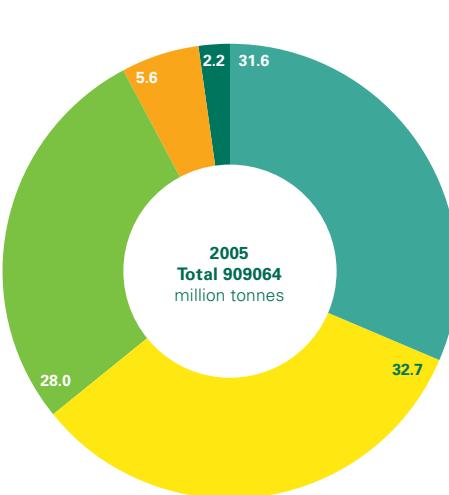
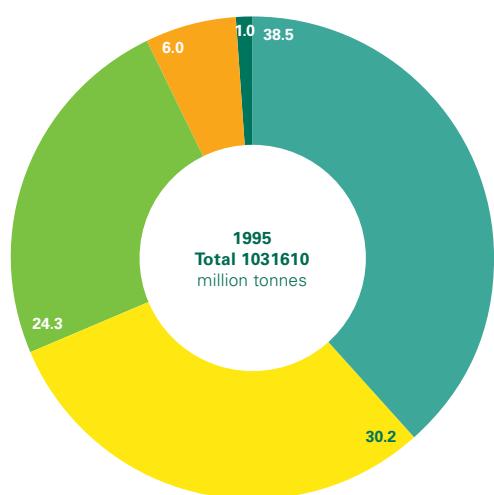


World proved coal reserves in 2015 were sufficient to meet 114 years of global production, by far the largest R/P ratio for any fossil fuel. By region, Europe & Eurasia holds the largest proved reserves while North America has the highest R/P ratio – 276 years. The Asia Pacific region holds the second-largest reserves, but higher rates of production – accounting for 70.6% of global output – leave it with the lowest regional R/P ratio (53 years).

Distribution of proved reserves in 1995, 2005 and 2015

Percentage

- Europe & Eurasia
- Asia Pacific
- North America
- Middle East & Africa
- S. & Cent. America



Source: World Energy Resources 2013 Survey, World Energy Council.

Coal: Production*

Million tonnes oil equivalent	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Change 2015 over 2014	2015 share of total
	2015											
US	580.2	595.1	587.7	596.7	540.8	551.2	556.1	517.8	500.9	508.0	455.2	-10.4% 11.9%
Canada	35.3	34.8	35.7	35.6	33.1	35.4	35.5	35.9	36.6	35.8	32.1	-10.3% 0.8%
Mexico	6.1	6.8	7.3	6.9	6.1	7.3	9.4	7.4	7.2	7.2	7.0	-3.2% 0.2%
Total North America	621.6	636.7	630.7	639.2	580.0	594.0	600.9	561.1	544.6	551.1	494.3	-10.3% 12.9%
Brazil	2.8	2.6	2.7	2.9	2.3	2.3	2.4	2.9	3.7	3.4	3.4	- 0.1%
Colombia	38.8	43.0	45.4	47.8	47.3	48.3	55.8	58.0	55.6	57.6	55.6	-3.4% 1.5% ♦
Venezuela	5.3	5.2	5.0	3.7	2.4	1.9	1.9	1.4	0.9	0.6	0.6	0.1% ♦
Other S. & Cent. America	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.5	1.7	2.4	1.7	-27.7% ♦
Total S. & Cent. America	47.2	51.2	53.4	54.8	52.4	52.9	60.5	62.7	61.9	64.0	61.3	-4.1% 1.6%
Bulgaria	4.2	4.3	4.7	4.8	4.6	4.9	6.2	5.6	4.8	5.1	5.9	14.7% 0.2%
Czech Republic	23.6	23.9	23.8	22.8	20.9	20.6	20.8	19.8	17.7	16.7	16.4	-1.8% 0.4%
Germany	56.6	53.3	54.4	50.1	46.4	45.9	46.7	47.8	45.1	44.1	42.9	-2.7% 1.1%
Greece	8.5	8.2	8.4	8.1	8.2	7.3	7.5	8.0	6.7	6.4	6.0	-6.1% 0.2%
Hungary	1.7	1.8	1.8	1.7	1.6	1.6	1.6	1.6	1.6	1.6	1.5	-3.5% ♦
Kazakhstan	37.3	41.4	42.2	47.9	43.4	47.5	49.8	51.6	51.4	48.9	45.8	-6.3% 1.2%
Poland	69.4	68.0	62.5	60.9	56.4	55.4	55.7	57.8	57.2	54.0	53.7	-0.6% 1.4%
Romania	6.6	6.5	6.9	7.0	6.6	5.9	6.6	6.3	4.6	4.4	4.8	8.4% 0.1%
Russian Federation	135.6	141.0	143.5	149.0	141.7	151.0	157.6	168.3	173.1	176.6	184.5	4.5% 4.8%
Serbia	n/a	n/a	8.0	8.3	7.4	7.2	7.8	7.3	7.7	5.7	7.3	27.7% 0.2%
Spain	6.6	6.2	5.9	4.4	3.8	3.3	2.6	2.5	1.8	1.6	1.2	-24.5% ♦
Turkey	11.2	13.2	14.8	16.7	17.4	17.5	17.9	17.0	15.5	16.4	11.7	-28.4% 0.3%
Ukraine	34.9	35.7	34.0	34.4	31.8	31.8	36.3	38.0	36.6	25.9	16.4	-36.7% 0.4%
United Kingdom	12.7	11.4	10.7	11.3	11.0	11.4	11.5	10.6	8.0	7.3	5.3	-26.8% 0.1%
Uzbekistan	0.9	0.8	1.0	0.9	1.0	1.0	1.1	1.2	1.1	1.2	1.1	-8.8% ♦
Other Europe & Eurasia	22.9	24.8	16.3	16.5	16.6	16.9	17.1	15.6	18.0	17.2	15.3	-11.5% 0.4%
Total Europe & Eurasia	432.7	440.4	438.8	444.8	418.8	429.2	446.8	459.0	450.9	433.1	419.8	-3.1% 11.0%
Total Middle East	1.0	1.0	1.1	1.0	0.7	0.7	0.7	0.7	0.7	0.7	0.7	- ♦
South Africa	138.4	138.3	138.4	141.0	139.7	144.1	143.2	146.6	145.4	148.2	142.9	-3.6% 3.7%
Zimbabwe	2.2	1.4	1.3	1.0	1.1	1.7	1.7	1.0	2.0	3.7	2.7	-28.1% 0.1%
Other Africa	1.0	1.1	0.8	0.9	0.8	1.0	1.3	4.5	5.4	5.9	5.9	0.2% 0.2%
Total Africa	141.5	140.7	140.5	142.8	141.6	146.8	146.1	152.1	152.8	157.8	151.4	-4.0% 4.0%
Australia	206.5	211.6	217.9	224.9	232.6	240.5	233.4	250.4	268.2	287.3	275.0	-4.3% 7.2%
China	1241.7	1328.4	1439.3	1491.8	1537.9	1665.3	1851.7	1873.5	1894.6	1864.2	1827.0	-2.0% 47.7%
India	189.9	198.2	210.3	227.5	246.0	252.4	250.8	255.0	255.7	271.0	283.9	4.7% 7.4%
Indonesia	93.9	119.2	133.4	147.8	157.6	169.2	217.3	237.3	276.2	281.7	241.1	-14.4% 6.3%
Japan	0.6	0.7	0.8	0.7	0.7	0.5	0.7	0.7	0.7	0.7	0.6	-10.5% ♦
Mongolia	3.7	4.1	4.8	5.2	8.2	15.2	19.9	18.1	18.0	15.4	14.9	-3.1% 0.4%
New Zealand	3.3	3.6	3.0	3.0	2.8	3.3	3.1	3.0	2.8	2.5	2.0	-16.6% 0.1%
Pakistan	1.6	1.8	1.7	1.8	1.6	1.5	1.4	1.5	1.3	1.5	1.5	-2.3% ♦
South Korea	1.3	1.3	1.3	1.3	1.2	1.0	1.0	1.0	0.8	0.8	0.8	0.9% ♦
Thailand	6.1	5.5	5.3	5.2	5.1	5.3	6.2	5.2	5.3	5.2	4.4	-15.7% 0.1%
Vietnam	19.1	21.7	23.8	22.3	24.7	25.1	26.1	23.6	23.0	23.4	23.3	-0.4% 0.6%
Other Asia Pacific	22.0	22.4	20.6	22.0	23.5	24.7	24.8	25.2	28.9	28.5	28.1	-1.4% 0.7%
Total Asia Pacific	1789.5	1918.5	2062.2	2153.4	2241.8	2404.0	2636.4	2694.6	2775.5	2782.2	2702.6	-2.9% 70.6%
Total World	3033.6	3188.5	3326.7	3436.0	3435.3	3627.6	3891.4	3930.2	3986.5	3988.9	3830.1	-4.0% 100.0%
of which: OECD	1033.9	1051.3	1046.8	1055.3	993.5	1013.2	1013.7	990.1	983.3	1002.8	921.4	-8.1% 24.1%
Non-OECD	1999.6	2137.2	2280.0	2380.7	2441.8	2614.4	2877.8	2940.1	3003.2	2986.1	2908.8	-2.6% 75.9%
European Union	198.8	193.2	187.0	178.9	167.9	165.6	168.4	167.7	157.3	150.3	145.3	-3.4% 3.8%
CIS	209.4	219.5	221.5	233.0	218.8	232.0	245.7	260.3	263.5	254.2	249.4	-1.9% 6.5%

*Commercial solid fuels only, i.e. bituminous coal and anthracite (hard coal), lignite and brown (sub-bituminous) coal, and other commercial solid fuels. Includes coal produced for Coal-to-Liquids and Coal-to-Gas transformations.

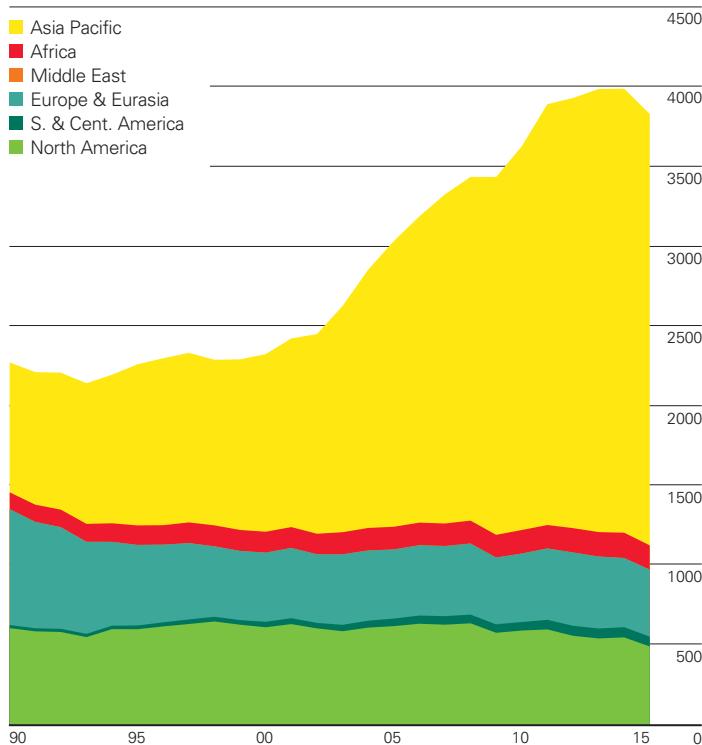
♦Less than 0.05%.

n/a not available.

Note: Coal production data expressed in million tonnes is available at bp.com/statisticalreview

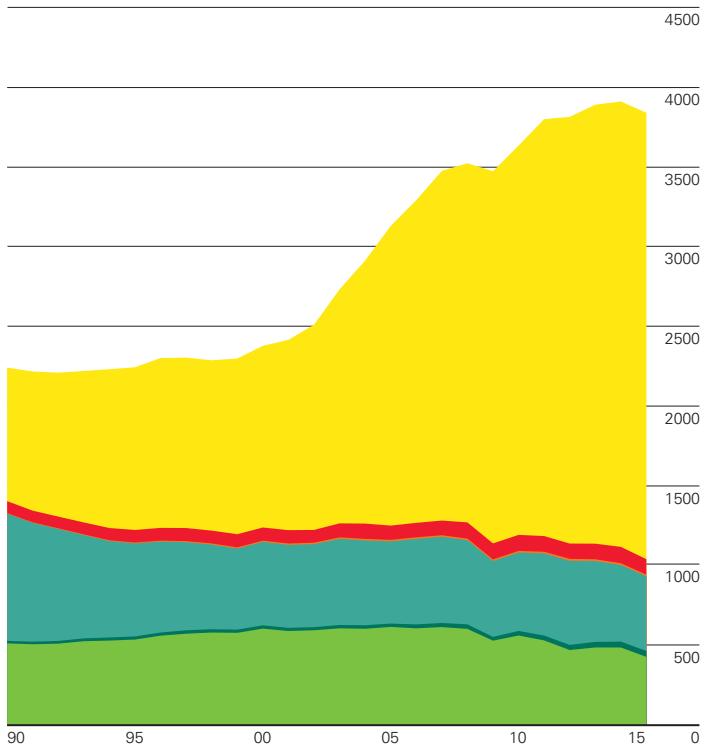
Coal: Production by region

Million tonnes oil equivalent



Coal: Consumption by region

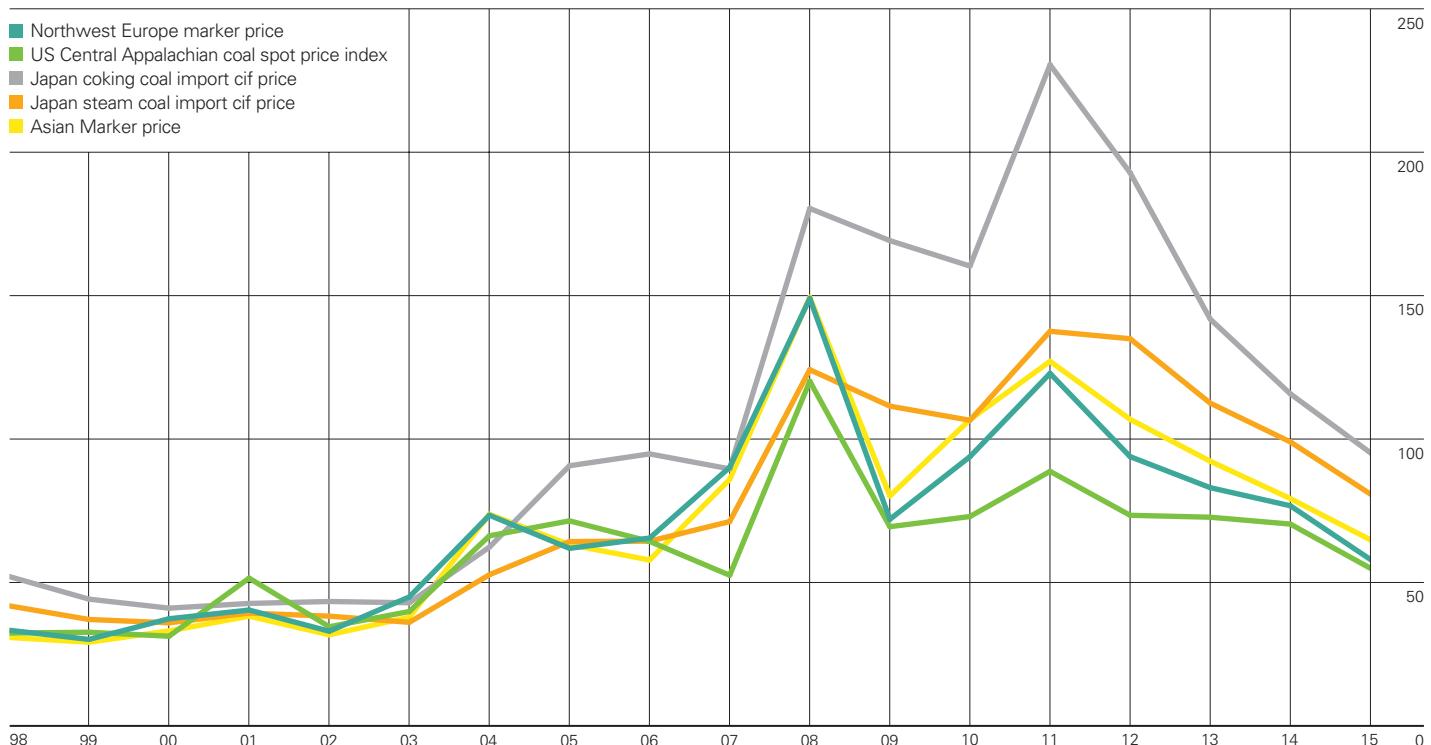
Million tonnes oil equivalent



World production and consumption of coal declined in 2015, by 4% and 1.8%, respectively. Production fell for the first time since 1998, with large declines in Asia Pacific (-2.9%) and North America (-10.3%). China remained by far the world's largest producer even though output fell by 2%. Coal consumption declined in all regions except South & Central America and Asia Pacific. The US and China accounted for all of the net decline in global consumption.

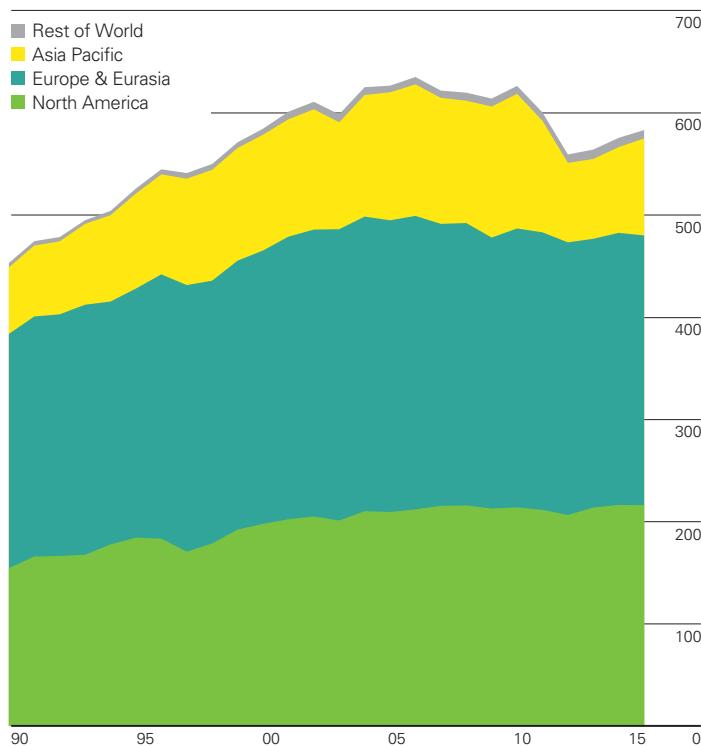
Coal prices

US dollars per tonne



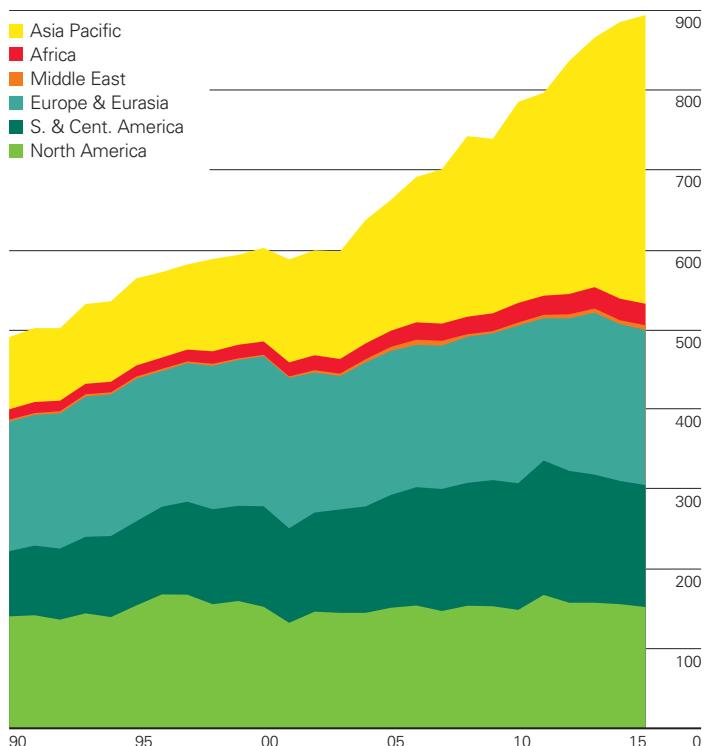
Nuclear energy consumption by region

Million tonnes oil equivalent



Hydroelectricity consumption by region

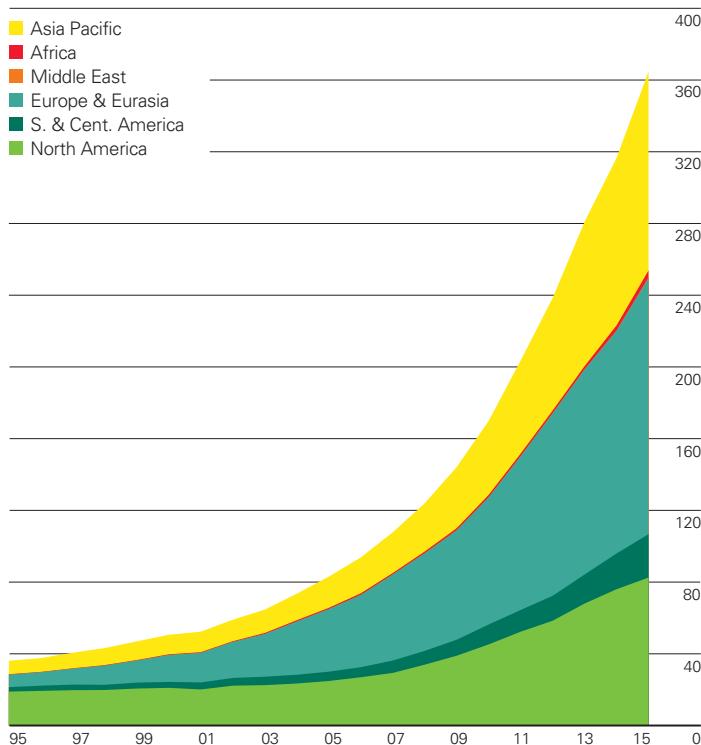
Million tonnes oil equivalent



World nuclear power generation increased by 1.3% in 2015, well above the 10-year average of -0.7%. The Asia Pacific region accounted for all of the net increase, driven by growth in China (+28.9%), which passed South Korea to become the world's fourth-largest producer of nuclear power. World hydroelectric output grew by a below-average 1%, with the Asia Pacific region again accounting for all of the net growth, even though the region's growth was just over half the 10-year average.

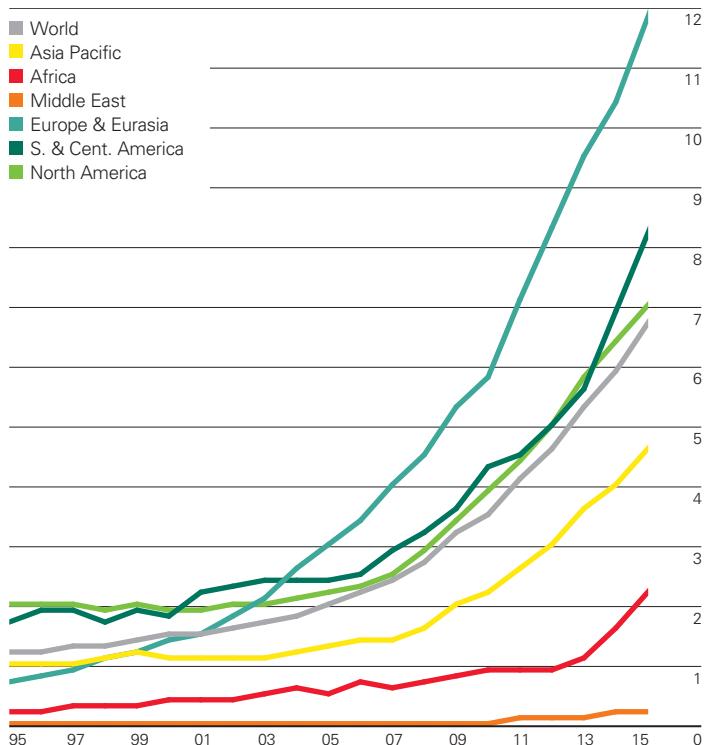
Other renewables consumption by region

Million tonnes oil equivalent



Other renewables share of power generation by region

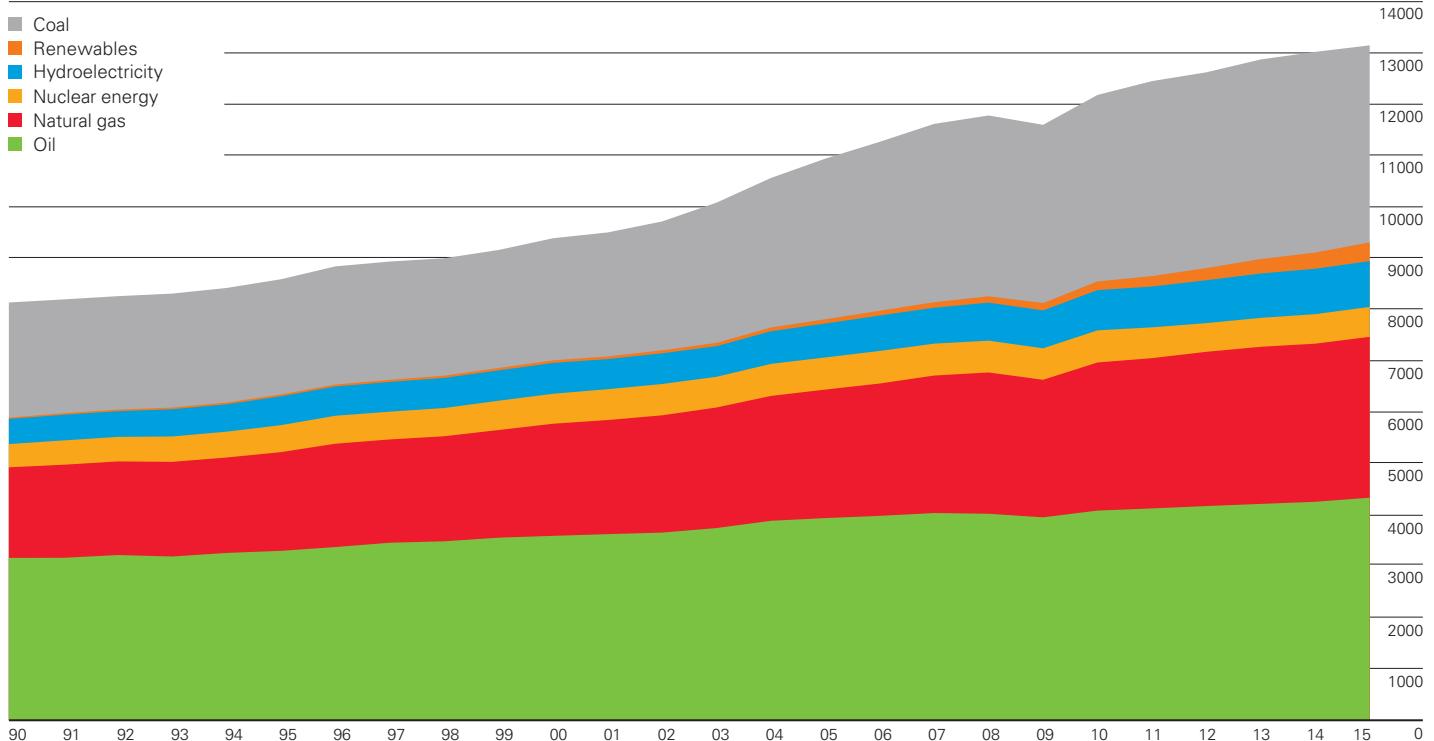
Percentage



Renewable energy in power generation grew by 15.2%, slightly below the 10-year average growth rate, but the largest increment on record (+48 mtoe). Globally, wind provided the largest growth increment (+28 mtoe), but solar had the highest growth rate (+32.6%). Regionally, Europe & Eurasia and Asia Pacific provided the largest growth increments (+18.8 mtoe and 17.5 mtoe, respectively). Non-hydro renewable energy accounted for 6.7% of global power generation in 2015, up from 2% a decade ago. The Europe & Eurasia region has the highest share of power from renewables, at 11.9% (reaching 18.6% in the EU).

World consumption

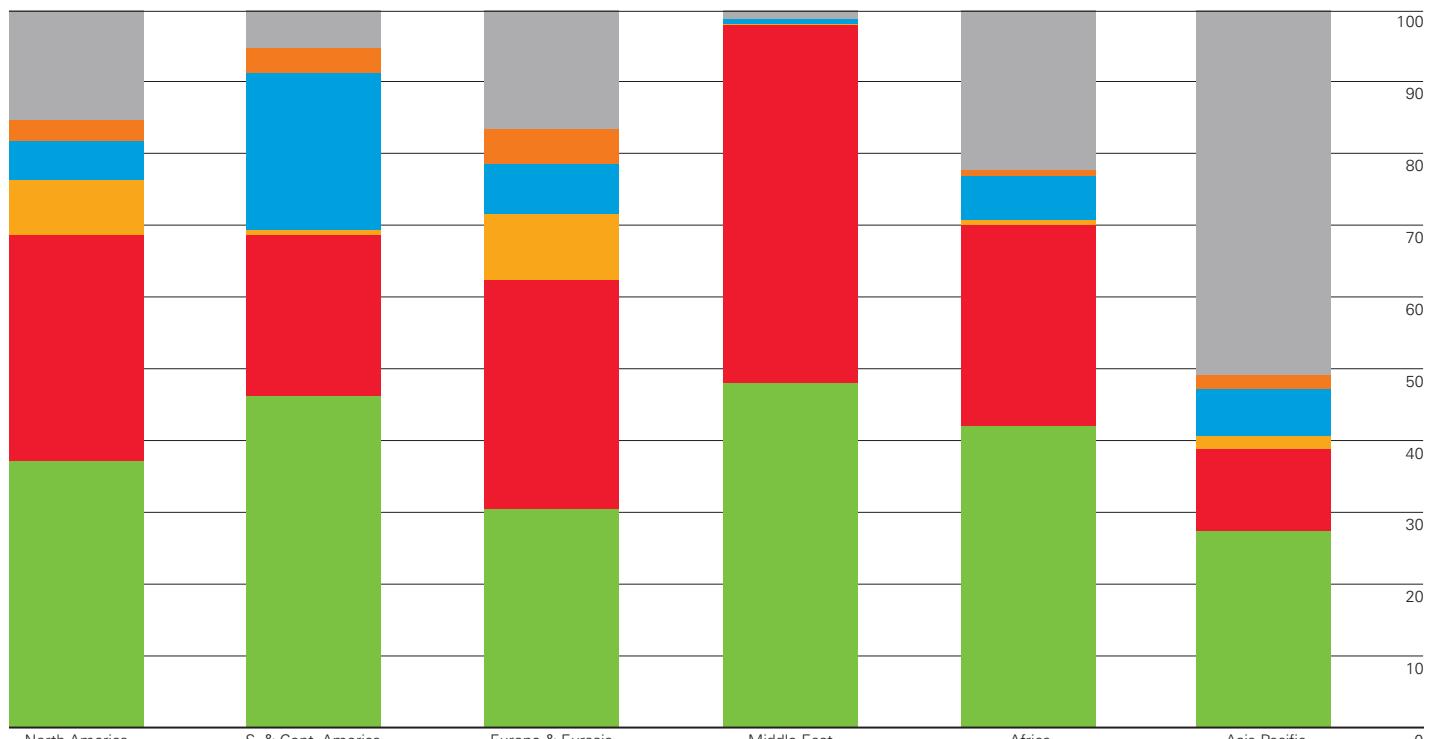
Million tonnes oil equivalent



World primary energy consumption grew by a below-average 1.0% in 2015, the slowest rate of growth since 1998 (other than the decline in the aftermath of the financial crisis). Growth was below average in all regions except Europe & Eurasia. All fuels except oil and nuclear power grew at below-average rates. Oil remains the world's dominant fuel and gained global market share for the first time since 1999, while coal's market share fell to the lowest level since 2005. Renewables in power generation accounted for a record 2.8% of global primary energy consumption.

Regional consumption by fuel 2015

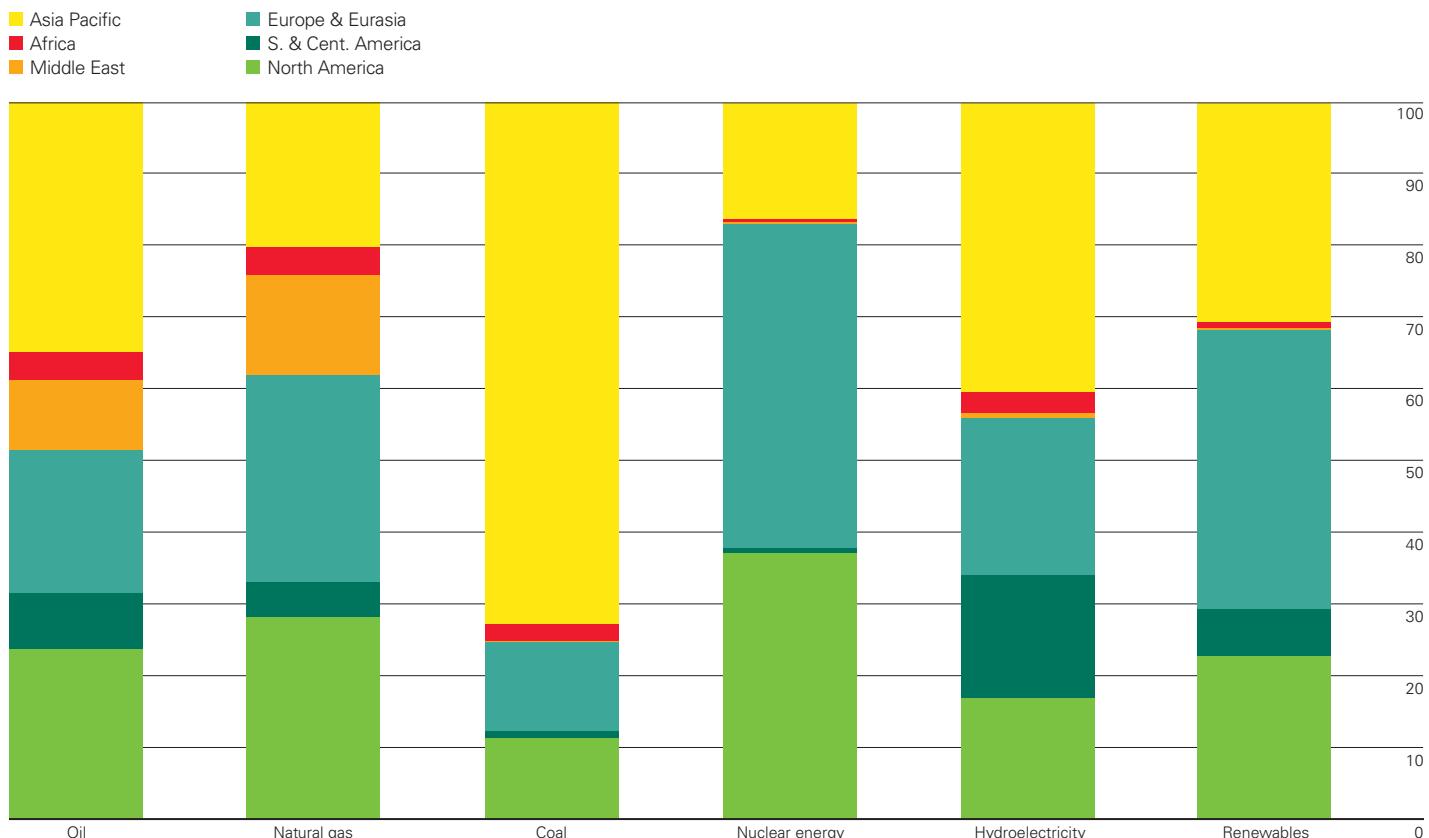
Percentage



Oil remains the dominant fuel in Africa and the Americas, while natural gas dominates in Europe & Eurasia and the Middle East. Coal is the dominant fuel in the Asia Pacific region, accounting for 51% of regional energy consumption – the highest share of any fuel for any region. Europe & Eurasia is the only region with no fuel reaching one-third of the total energy mix. The Middle East has the least diverse fuel mix, with oil and gas combined accounting for 98% of energy consumption.

Fuel consumption by region 2015

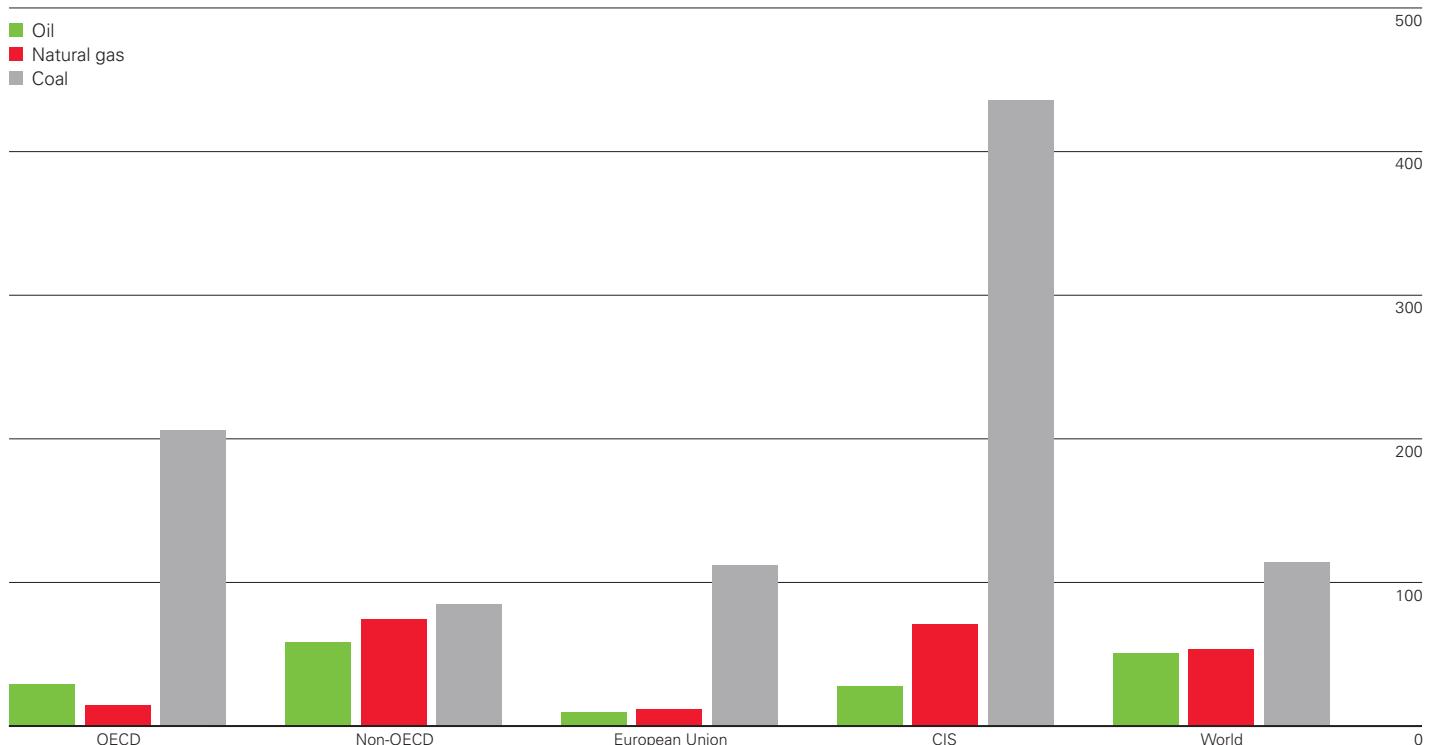
Percentage



Asia Pacific is the leading consumer of oil, coal, and hydroelectricity, while Europe & Eurasia is the leading consumer of natural gas, nuclear power, and renewables in power generation. Asia Pacific dominates global coal consumption, accounting for 72.9% of global consumption. Natural gas is the only fuel for which no region accounts for more than 30% of global consumption (with Europe & Eurasia accounting for 28.8% of global consumption).

Fossil fuel reserves-to-production (R/P) ratios at end 2015

Years



Coal remains – by far – the most abundant fossil fuel by R/P ratio; oil and natural gas reserves have increased over time, although both registered small declines in 2015. Non-OECD countries account for the majority of proved reserves for all fossil fuels. The Middle East holds the largest reserves for oil and natural gas, and the highest R/P ratio for natural gas; South & Central America holds the highest R/P ratio for oil. Europe & Eurasia holds the largest coal reserves and North America has the highest R/P ratio.

Appendices

Approximate conversion factors

Crude oil*

From	To				
	tonnes (metric)	kilolitres	barrels	US gallons	tonnes per year
	Multiply by				
Tonnes (metric)	1	1.165	7.33	307.86	-
Kilolitres	0.8581	1	6.2898	264.17	-
Barrels	0.1364	0.159	1	42	-
US gallons	0.00325	0.0038	0.0238	1	-
Barrels per day	-	-	-	-	49.8

*Based on worldwide average gravity.

Products

	To convert			
	barrels to tonnes	tonnes to barrels	kilolitres to tonnes	tonnes to kilolitres
	Multiply by			
Liquefied petroleum gas (LPG)	0.086	11.60	0.542	1.844
Gasoline	0.120	8.35	0.753	1.328
Kerosene	0.127	7.88	0.798	1.253
Gas oil/diesel	0.134	7.46	0.843	1.186
Residual fuel oil	0.157	6.35	0.991	1.010
Product basket	0.125	7.98	0.788	1.269

Natural gas (NG) and liquefied natural gas (LNG)

From	To					
	billion cubic metres NG	billion cubic feet NG	million tonnes oil equivalent	million tonnes LNG	trillion British thermal units	million barrels oil equivalent
	Multiply by					
1 billion cubic metres NG	1	35.3	0.90	0.74	35.7	6.60
1 billion cubic feet NG	0.028	1	0.025	0.021	1.01	0.19
1 million tonnes oil equivalent	1.11	39.2	1	0.82	39.7	7.33
1 million tonnes LNG	1.36	48.0	1.22	1	48.6	8.97
1 trillion British thermal units	0.028	0.99	0.025	0.021	1	0.18
1 million barrels oil equivalent	0.15	5.35	0.14	0.11	5.41	1

Definitions

Statistics published in this review are taken from government sources and published data. No use is made of confidential information obtained by BP in the course of its business.

Country and geographic groupings are made purely for statistical purposes and are not intended to imply any judgement about political or economic standings.

North America

US (excluding US territories), Canada, Mexico.

South & Central America

Caribbean (including Puerto Rico and US Virgin Islands), Central and South America.

Europe

European members of the OECD plus Albania, Bosnia-Herzegovina, Bulgaria, Croatia, Cyprus, The former Yugoslav Republic of Macedonia, Georgia, Gibraltar, Latvia, Lithuania, Malta, Montenegro, Romania and Serbia.

Commonwealth of Independent States (CIS)

Armenia, Azerbaijan, Belarus, Kazakhstan, Kyrgyzstan, Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine, Uzbekistan.

Europe & Eurasia

All countries listed above under the headings Europe and CIS.

Middle East

Arabian Peninsula, Iran, Iraq, Israel, Jordan, Lebanon, Syria.

North Africa

Territories on the north coast of Africa from Egypt to western Sahara.

West Africa

Territories on the west coast of Africa from Mauritania to Angola, including Cape Verde, Chad.

East and Southern Africa

Territories on the east coast of Africa from Sudan to Republic of South Africa. Also Botswana, Madagascar, Malawi, Namibia, Uganda, Zambia, Zimbabwe.

Asia Pacific

Brunei, Cambodia, China, China Hong Kong SAR*, China Macau SAR*, Indonesia, Japan, Laos, Malaysia, Mongolia, North Korea, Philippines, Singapore, South Asia (Afghanistan, Bangladesh, India, Myanmar, Nepal, Pakistan, Sri Lanka), South Korea, Taiwan, Thailand, Vietnam, Australia, New Zealand, Papua New Guinea, Oceania.

*Special Administrative Region.

Australasia

Australia, New Zealand.

OECD members

Europe: Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, UK.

Other member countries: Australia, Canada, Chile, Israel, Japan, Mexico, New Zealand, South Korea, US.

OPEC members

Middle East: Iran, Iraq, Kuwait, Qatar, Saudi Arabia, United Arab Emirates.

North Africa: Algeria, Libya.

West Africa: Angola, Nigeria.

South America: Ecuador, Venezuela.

Units

1 metric tonne	= 2204.62lb = 1.1023 short tons
1 kilolitre	= 6.2898 barrels = 1 cubic metre
1 kilocalorie (kcal)	= 4.187kJ = 3.968Btu
1 kilojoule (kJ)	= 0.239kcal = 0.948Btu
1 British thermal unit (Btu)	= 0.252kcal = 1.055kJ
1 kilowatt-hour (kWh)	= 860kcal = 3600kJ = 3412Btu

Calorific equivalents

One tonne of oil equivalent equals approximately:

Heat units	10 million kilocalories 42 gigajoules 40 million British thermal units
Solid fuels	1.5 tonnes of hard coal 3 tonnes of lignite
Gaseous fuels	See Natural gas and liquefied natural gas table
Electricity	12 megawatt-hours

One million tonnes of oil or oil equivalent produces about 4400 gigawatt-hours (= 4.4 terawatt-hours) of electricity in a modern power station.

1 barrel of ethanol = 0.57 barrel of oil

1 barrel of biodiesel = 0.88 barrel of oil

European Union members

Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, UK.

Non-OECD

All countries that are not members of the OECD.

Methodology

The primary energy values of nuclear and hydroelectric power generation, as well as electricity from renewable sources, have been derived by calculating the equivalent amount of fossil fuel required to generate the same volume of electricity in a thermal power station, assuming a conversion efficiency of 38% (the average for OECD thermal power generation).

Fuels used as inputs for conversion technologies (gas-to-liquids, coal-to-liquids and coal-to-gas) are counted as production for the source fuel and the outputs are counted as consumption for the converted fuel.

Percentages

Calculated before rounding of actuals. All annual changes and shares of totals are on a weight basis except on pages 6, 13, 16, 17, 18 and 20.

Rounding differences

Because of rounding, some totals may not agree exactly with the sum of their component parts.

Tonnes

Metric equivalent of tons.

More information

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