

Energy Demand

Primary energy - the energy found in natural resources e.g. coal, wind, uranium

Secondary energy - a form of energy produced from primary energy sources e.g. electricity or petroleum

Energy mix - the range of energy sources used

World Primary Energy Consumption - 2015:

World primary energy consumption grew by a below average 1% in 2015. This is the slowest growth rate since 1988, excluding the decline after the financial crisis. Growth was also below average in all regions around the world except Europe & Eurasia. All energy source types except oil and nuclear energy grew at below average rates in 2015. Oil remained the dominant fuel and gained global market share for the first time since 1999. Coal market share fell for the first time since 2005. Renewables grew significantly with power generation accounting for 2.8% of primary global energy consumption.

Energy Type	Trend	Reasons for the trend
Coal	Coal grew from 2350 million oil equivalent in 1990 to 2700 million oil equivalent in 2015	Due to the fact that China has rapidly industrialised over the past two decades. It has powered its development using coal fired power stations. The fossil fuel is also very abundant and widely traded around the world.
Oil	Oil consumption grew from 3000 million oil equivalent in 1990 to 4400 oil equivalent in 2015.	The amount of oil being consumed increased due to the fact that many countries are developing. This means that the quality of life and wages are increasing here, allowing people to afford more luxury goods e.g. buying a car. The exploitation of new oil sources such as tar sand oils and shale oil means that new supplies are making their way into global markets.
Natural Gas	There was an increase of 1000 million oil equivalent between 1990 and 2015, from 2050 million oil equivalent to 3100 million oil equivalent	The increase in consumption of natural gas has only been steady due to the fact that new methods of extracting natural gas have been discovered such as shale gas through the use of fracking. This means that there is a constant supply around the world.
Nuclear	Nuclear energy grew from 300 million oil equivalent in 1990 to 550 million oil equivalent in 2015.	There has been an increase in nuclear energy consumption due to the fact that China is heavily invested around the world in nuclear projects. For example Hinkley Point in the UK. However growth hasn't been significant due to the fact that there are still fears about the safety of nuclear energy, especially after the Fukushima explosion.
Renewables	Renewables like the other energy sources also saw an increase, however it only grew from 250 million oil equivalent to 900 million oil equivalent.	The growth in renewables may be due to the fact that the increased fears surrounding global warming mean that many countries are moving to more sustainable, renewable fuels instead of fossil fuels which are heavily polluting. Growth was large however stunted due to physical factors e.g. it has to be sunny or windy.
Hydroelectricity	Hydroelectricity grew significantly compared to the other energy sources from 10 million oil equivalent to 400 million oil equivalent.	An increase in the use of hydroelectricity may be due to the increased use of them in small scale schemes in rural developing countries. The use of hydro-electricity is high in Central and South America and this is likely to increase growing into Africa.

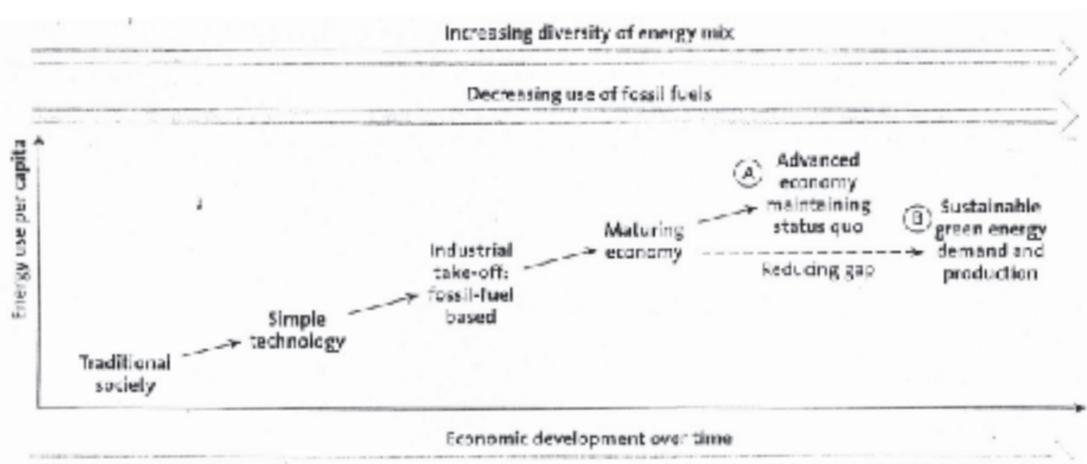


Regional Energy Consumption

Oil remained the dominant fuel in Africa and America in 2015, whilst natural gas dominated usage in Europe & Eurasia and the Middle East. Coal was the dominant in the Asia Pacific region, accounting for 51% of regional energy consumption. This was the highest energy share of any region. The Middle East had the least diverse mix of fuels in 2015 with oil and gas accounting for 98% of their consumption.

The Energy Transition Model:

The model below shows how a country at different stages of development has different mixes of energy:



1. **Traditional Society** - Energy is supplied by human and animal labour plus fuelwood for cooking and heating. Only rural parts of LEDCs fit this description with energy demand being low.
2. **Simple Technology** - The use of wind and water for power is now developing. Agriculture is mechanised so it is now less labour intensive. Industries are now growing using local power sources and resources. An increase in the country's GDP is due to the increased energy demand.
3. **Industrialisation and take-off** - the secondary manufacturing centre grows and therefore so does the use of fossil fuels. The population becomes more urban, with greater domestic energy demand with public transport now being well established (using diesel initially). The GDP of the country now rises rapidly.
4. **Maturing Economy** - The standard of living in many countries has now increased meaning that power generation is mainly focused with fossil fuels. Due to the increased standard of living there is a high consumption of electrical goods, individual transport e.g. cars. Due to this though there is a heavy impact on the environment. GDP and energy demand remain high
5. **Advanced economy (A)** - If the previous stage continues then per capita energy consumption rises, diminishing fossil fuel reserves. This will cause problems for the growing population and cease GDP from rising due to the energy gap. **(B)** - The development of new sustainable, renewable is used in countries. The use of fossil fuels decreases as well as the use of nuclear. 95% of energy is now generated by renewables, often locally rather than centrally.



Energy demand in China and India:

Energy demand in developing and emergent economies is high. The two biggest emergent countries arguably in the world now are India and China. Their energy demand is shown below:

1. India

- Energy and fuel consumption is increasing due to the increased vehicle ownership, with 260 million vehicles being added to India's car fleet in the last 25 years
- The World Bank has agreed with India to invest \$20 billion in solar power, such as a 2MW plant created by India's Azure Group
- The diminishing supplies of oil in India, means they are training and investing a number of engineers and developing nuclear power. Russia is helping them to do this

2. China

- China has been heavily dependent on coal during its rapid industrialisation since 1990, but demand has continued to grow at 0.8% a year in a period until 2025, down from 3.5% a year since 2000
- In 2004 China invested an estimated \$2 billion in renewable energy, however this has grown significantly with in 2011 the investing totalling \$50 billion and 2014 \$81 billion.
- The slowing growth in China and and greater energy efficient means that energy demand will rise by 1.5% over the next two decades, alongside India.

