press release

BP Energy Outlook 2018:
Energy demand grows as fuel mix continues to diversify

The 2018 edition of BP's *Energy Outlook* is published today and considers the forces shaping the global energy transition out to 2040 and the key uncertainties surrounding that transition. The speed of the energy transition is uncertain and the new *Outlook* considers a range of scenarios.

Its **'Evolving Transition' scenario**, which assumes that government policies, technologies and societal preferences evolve in a manner and speed similar to the recent past, expects:

- Fast growth in developing economies drives up global energy demand a third higher.
- The global energy mix is the most diverse the world has ever seen by 2040, with oil, gas, coal and non-fossil fuels each contributing around a quarter.
- Renewables are by far the fastest-growing fuel source, increasing five-fold and providing around 14% of primary energy.
- Demand for oil grows over much of *Outlook* period before plateauing in the later years.
- Natural gas demand grows strongly and overtakes coal as the second largest source of energy.
- Oil and gas together account for over half of the world's energy.
- Global coal consumption flatlines and it seems increasingly likely that Chinese coal consumption has plateaued.
- The number of electric cars grows to around 15% of the car parc, but because of the much higher intensity with which they are used, account for 30% of passenger vehicle kilometers.
- Carbon emissions continue to rise, signalling the need for a comprehensive set of actions to achieve a decisive break from the past.

The new *Outlook* was launched in London today by Spencer Dale, group chief economist, and Bob Dudley, group chief executive.

"BP's strategy has to be resilient and adaptable to significant changes in the energy industry. This *Outlook* considers the possible implications of some of these changes and helps inform our long-term planning. We cannot predict where these changes will take us, but we can use this knowledge to get fit and ready to play our role in meeting the energy needs of tomorrow," said Bob Dudley.

"We are seeing growing competition between different energy sources, driven by abundant energy supplies, and continued improvements in energy efficiency. As the world learns to do more with less, demand for energy will be met by the most diverse fuels mix we have ever seen," said Spencer Dale.

Much of the narrative in the *Outlook* is based on the Evolving Transition scenario. This scenario, and the others considered in the *Outlook*, are not predictions of what is likely to happen, rather they explore the possible implications of different judgements and assumptions.

The *Outlook* considers several scenarios and explores the energy transition from three different viewpoints: fuels, sectors and regions. Unless otherwise stated, the findings below relate to the Evolving Transition scenario.

Fuel analysis

"By 2040, oil, gas, coal and non-fossil fuels each account for around a quarter of the world's energy. More than 40% of the overall increase in energy demand is met by renewable energy," explained Dale.

Oil demand grows over much of the *Outlook,* although it plateaus in the later years. All the demand growth comes from emerging economies. The growth in supply is driven by US tight oil in the early part of the *Outlook*, with OPEC taking over from the late 2020s as Middle East producers adopt a strategy of growing market share. The transport sector continues to dominate global oil demand, accounting for more than half of the overall growth. Most of the growth in energy demand from transport, which flattens off towards the end of the *Outlook,* comes from non-road (largely air, marine, and rail) and trucks, with small increases from cars and motorbikes. After 2030, the main source of growth in the demand for oil is from non-combusted uses, particularly as a feedstock for petrochemicals.

Natural gas grows strongly over the period, supported by increasing levels of industrialization and power demand in fast-growing emerging economies, continued coal-to-gas switching, and the increasing availability of low-cost supplies in North America and the Middle East. By 2040, the US accounts for almost one quarter of global gas production, and global LNG supplies will more than double. The sustained growth in LNG supplies greatly increases the availability of gas around the world, with LNG volumes overtaking inter-regional pipeline shipments in the early 2020s.

Coal consumption flatlines over the *Outlook* period, with falls in China and the OECD offset by increasing demand in India and other emerging Asian economies. China remains the largest market for coal, accounting for 40% of global coal demand to 2040.

Renewable energy grows over 400% and accounts for over 50% of the increase in global power generation. This strong growth is enabled by the increasing competitiveness of wind and solar. Subsidies are gradually phased out by the mid-2020s, with renewable energy increasingly able to compete against other fuels. China is the largest source of growth, adding more renewable energy than the entire OECD combined, with India becoming the second largest source of growth by 2030.

Sector analysis

Power accounts for nearly 70% of the increase in primary energy demand. The mix of fuels used in power generation is set to shift materially, with renewable energy gaining share more quickly than any energy source in history, increasing from 7% today to around a quarter by 2040. Even so, coal remains the largest source of energy in power generation by 2040.

Transport energy demand grows by only 25% despite total demand for transportation more than doubling, reflecting accelerating gains in vehicle efficiency. The transport sector continues to be dominated by oil (around 85% in 2040), despite increasing penetration of alternative fuels – particularly natural gas and electricity.

This year's *Outlook* argues that the penetration of electricity in the transport sector is best measured by considering both the number of electric vehicles (EVs) and how intensively each vehicle is used. In the Evolving Transition scenario, the share of EVs in the global car parc reaches around 15% by 2040 – more than 300 million cars in a car parc of almost 2 billion. However, the share of passenger car kilometres powered by electricity, which also takes account of the intensity with which electric cars are used, is over 30%. The *Outlook* shows how the interaction of fully-autonomous cars with shared mobility has the potential to substantially boost the intensity with which electric cars are driven.

A key uncertainty in the period to 2040 is the speed with which sales of electric cars increases. To gauge the significance of this uncertainty, the *Outlook* considers a scenario in which there is a worldwide ban on the sales of cars with internal combustion engines (ICE) from 2040. This scenario reduces liquid fuel demand by around 10 million barrels a day relative to the Evolving Transition scenario but, even so, the level of oil demand in 2040 in the 'ICE ban' scenario is higher than in 2016.

"The suggestion that rapid growth in electric cars will cause oil demand to collapse just isn't supported by the basic numbers – even with really rapid growth," explains Dale. **"Even in the scenario where we see an ICE ban and very high efficiency standards, oil demand is still higher in 2040 than it is today."**

Industrial energy demand, including both combusted and non-combusted uses of fuels, accounts for around half of the increase in energy consumption.

Improving efficiency drives slower growth in industrial energy demand (excluding the non-combusted sector), in large part driven by China's transition towards a less energy-intensive service and consumer-facing sectors. Some of China's slowing growth is likely to be displaced to lower-income economies, including India and Africa.

Non-combusted use of fuels, particularly as feedstocks for petrochemicals, are the fastest growing source of overall demand for oil and gas. Non-combusted use of fuels grows at almost twice the rate of other industrial uses, although increasing environmental

pressures on the use of some products, particularly single-use plastics and packaging, dampens growth quite materially relative to past trends. Oil accounts for nearly two-thirds of the growth in non-combusted use of energy, with natural gas providing much of the remainder.

Regional analysis

All the growth in energy consumption is in fast-growing developing economies: China and India account for half of the growth in global energy demand to 2040. Through the period China's energy growth slows as it transitions to a more sustainable pattern of economic growth. India's slowing in demand growth is less pronounced and by the early 2030s it overtakes China as the world's fastest growing market for energy. In the latter stages of the *Outlook*, Africa also plays an increasingly important role in driving energy demand, contributing more to global demand growth from 2035 to 2040 than China.

Carbon emissions

In the *Outlook*'s Evolving Transition scenario, carbon emissions rise by 10% by 2040. While this is far slower than the rates seen in the past 25 years, it remains higher than the sharp decline thought to be necessary to achieve the Paris commitments.

As such, the *Outlook* also explores an Even Faster Transition scenario, which has the same broad decline in carbon emissions as the International Energy Agency's 'Sustainable Development Scenario' where carbon emissions fall by almost 50% by 2040. Most of the additional abatement of emissions in this scenario, relative the Evolving Transition scenario, come from the power sector, which is almost entirely decarbonized by 2040.

"We need a far more decisive break from the past," concluded Dudley. **"In BP, we continue to believe that carbon pricing must be a key element as it provides incentives for everyone to play their part – from consumers using energy more efficiently to producers providing more low-carbon forms of energy."**

Notes to editors:

- The new edition of the *BP Energy Outlook* will be launched at 1430 GMT on 20 February 2018.
- Go to www.bp.com/energyoutlook to download the *Outlook* or additional country & regional insights, and view other material such as videos or an animation.
- Join the conversation online #bpstats.

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