International Association of Oil & Gas Producers

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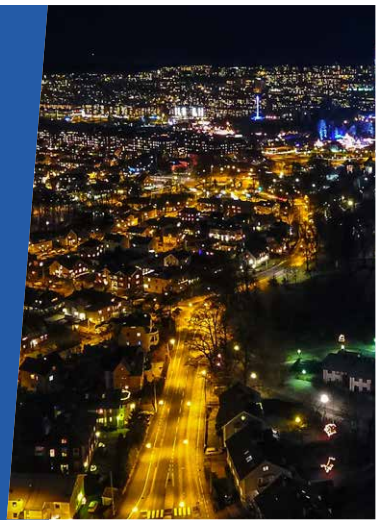
Global energy brief

Oil & gas investment needed along the lower carbon pathway

In line with the world's commitment to a future that sees global temperatures increasing by no more than 2 degrees above pre-industrial levels, oil & gas will still be needed to meet about half of global energy needs between now and 2040. That's the conclusion of the International Energy Agency (IEA) in its *World Energy Outlook 2017*.

Recent reports by two of the world's leading independent energy companies, BP and Statoil, support this forecast.



Together, these analyses of the energy future show that while the role of renewables such as solar and wind power is growing, oil and natural gas will still be essential components of the energy mix. Oil will primarily be needed for transport – particularly in aviation and shipping – as well as for petrochemicals and feedstocks. And gas will have a growing role in power generation, which will continue to rely on gas plants to supplement intermittent supplies of renewables when the sun isn't shining and the wind is still. Gas, in the form of LNG, will also be needed to power ships and heavy vehicles.

Each of the three forecasts – from IEA, BP and Statoil – merits a closer look.

IEA: a continuing need for oil and gas

The IEA, an independent body based in Paris, considers three scenarios for the period between now and 2040:

- *New Policies* – which the IEA identifies as the 'central' scenario – takes into account the Nationally Determined Contributions that are the building blocks of the Paris Agreement on combatting climate change.
- *Current Policies* – is the least ambitious scenario in terms of progress in controlling climate change, based only on those policies or measures in place as of mid-2017.
- *Sustainable development* – the most ambitious IEA scenario, envisions an energy sector linked to the United Nations Sustainable Development agenda, which includes universal access to modern energy by 2030, urgent climate change action in line with the Paris Agreement and measures to improve air quality.

Looking at the range of energy sources currently available, the IEA has produced a summary of world primary energy demand by fuel and scenario.

World primary energy demand by fuel and scenario (Mtoe)

			New Policies		Current Policies		Sustainable Development	
	2000	2015	2025	2040	2025	2040	2025	2040
Coal	2,311	3,837	3,842	3,929	4,165	5,045	3,023	1,777
Oil	3,670	4,327	4,633	4,830	4,815	5,477	4,247	3,306
Gas	2,071	2,938	3,436	4,356	3,514	4,682	3,397	3,458
Nuclear	676	671	839	1,002	839	997	920	1,393
Hydro	225	334	413	533	409	513	429	596
Bioenergy*	1,023	1,326	1,530	1,801	1,507	1,728	1,272	1,558
Other renewables	60	200	490	1,133	441	856	633	1,996
Total	**10,036**	**13,633**	**15,183**	**17,584**	**15,690**	**19,298**	**13,921**	**14,084**
Oil & gas share	**57.2%**	**53.3%**	**53.1%**	**52.2%**	**53.1%**	**52.6%**	**54.9%**	**48.0%**

** Includes the traditional use of solid biomass and modern use of bioenergy.*
IOGP calculations for oil & gas share.

This shows that under the 'New Policies' and 'Current Policies' scenarios, demand for oil and gas will steadily increase to 2040. Under the more challenging 'Sustainable Development' scenario, the volumes of oil will fall from current levels. During the same period, the need for gas will increase. Together, oil and gas will still be needed to meet 48.0 of total energy demand in 2040.

As a result, the IEA points out, there will be a need for continuing investment in both exploration and production if a growing and increasingly prosperous world is to rely on secure and affordable access to heat, light and mobility.

BP: a 30% rise in energy demand and a surprise on electric cars

Major oil and gas producer BP projects a 30% increase in energy demand during the next 20 years in its most likely case, which the company largely attributes to growth in Asian prosperity.

Concerns over climate change notwithstanding, oil and gas will play vital roles in maintaining security of supply for a growing world population, BP says. Particularly important will be the role of cleaner-burning gas in power generation, while reliance on coal diminishes.

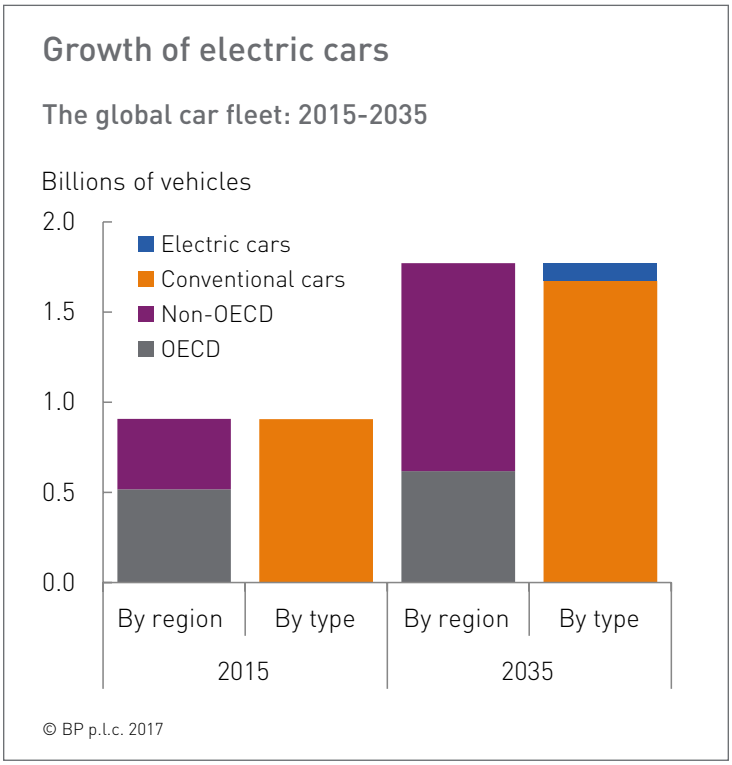
BP predicts that natural gas will be the fastest growing fossil fuel over the next 20 years, much driven by US shale gas production. As part of that growth, liquified natural gas (LNG) will become increasingly important because it is relatively easy to transport to meet global market demands.

BP also sees an increase in the demand for oil. However, the dominant source of growth will shift from transport to industrial uses. These include petrochemicals, feedstocks and lubricants – all of which are consistent with projected increases in global prosperity.

While the growth in carbon emissions continues in its base case, it will be at less than one third the rate the world has seen in the past 20 years. BP attributes this progress to accelerating efficiency improvements and the aforementioned shift in the fuel mix away from coal to gas and renewables.

BP also discusses a case consistent with meeting the 2°C objective (its 'Even faster transition case') and notes that even in this scenario oil and gas still provide around half of the world's energy in 2035.

On the subject of electric cars, BP notes that out of the billion cars on the road today, only two million are powered by electricity. Although this will rise dramatically to roughly 100 million electric cars in BP's central projection covering the next 20 years, electric cars will still only account for around 4-5% of cars on the road; reducing oil demand by no more than 1%.



Even if electric car growth occurs at double BP's projected rate, this will not be a game-changer for oil demand within BP's 20-year forecast window. Greater impact from the 'mobility revolution' could come from autonomous vehicles (which increases fuel efficiency) as well as more car-sharing (greater vehicle use) and ride-pooling (lower vehicle mileage), the company says.

Statoil: oil & gas to meet more than 40% of energy demand in 2050

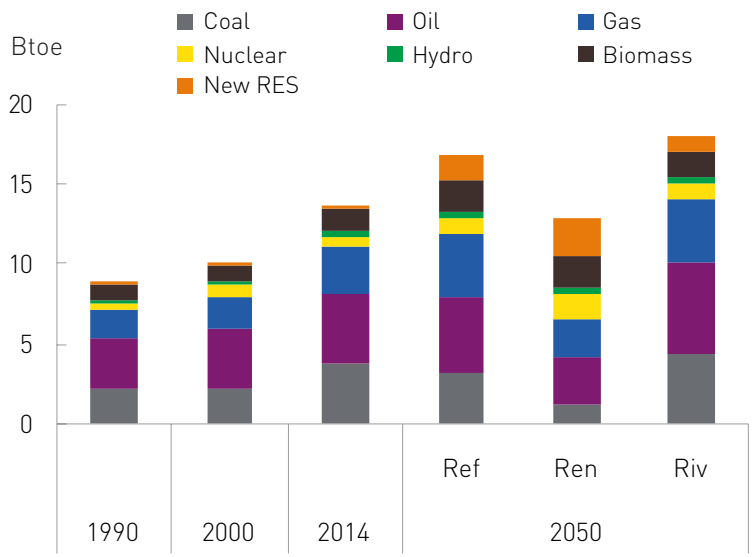
Norway-based Statoil, an international producer of oil and gas, has extended its *Energy Perspectives* for the first time to 2050. Even then, the company says, oil and gas will remain crucial to the energy mix. Like the IEA, Statoil looks to the future through three scenarios:

- *Reform* – is based on the national climate targets of the Paris agreement (COP21), and gradually more weight on market-driven developments in global energy markets, with policies playing a supportive role.
- *Renewal* – is a very ambitious back-casted scenario delivering a trajectory for emissions consistent with the 2-degree target (according to IEA's estimates for energy related CO_2 emissions based on 50% probability of staying within 2-degrees global warming by the end of the century).
- *Rivalry* – is impacted by geopolitical conflict and larger differences in the regional development, both with regards to economic development and transformation of the energy systems.

Each of the scenarios takes into account global population growth. Along with that growth, more people are joining the middle class, which means the underlying global demand for products, services and activities that require energy is also increasing.

The table below shows the split by fuel according to the three scenarios.

Total primary energy demand in the three scenarios, by fuel



Source: IEA (history), Statoil (projections)

Even the ambitious Renewal scenario will require large investment in oil and gas due to natural decline in supply – around 6% per year – from existing fields. Oil supply in 2050 from new reserves not currently in production will correspond to 15 times the current production of Norway, Statoil says. While Statoil is more optimistic about the growth in electric cars and plug-in hybrids – which *Energy Perspectives* says could account for around 90% of private cars in 2050 – there will still be significant demand for oil. By the end of the forecast period, even in the most challenging scenario, more than 60 million barrels of oil per day will be needed for a variety of uses, including transport (road freight and shipping), aviation and petrochemicals.

Keeping the lights on

All three forecasts – from the IEA, BP and Statoil – envision a world that will still rely on oil and gas for decades to come, no matter what scenario plays out.

But that vision depends on continuing investment to compensate for the inevitable depletion in existing oil and gas fields at a rate as high as 6% per year. Since the lead times for oil and gas projects can be 10 years or more, the work to make the most out of existing fields and to find new ones needs to be on-going.

Such activity, in parallel with investments in new sources of energy, will keep the world on-track to a low-carbon future.

In summary:

IEA, one of the foremost independent energy authorities, forecasts that **the world will rely on oil and gas for between 48% and 53% of its energy needs in 2040.**

BP, taking into account growing global prosperity **between now and 2035, expects a 30% increase in energy demand**. Cleaner-burning natural gas will play an increasingly important role in power generation while progress in the 'mobility revolution' will come more from autonomous vehicles, car-sharing and carpooling than from any switch to electric vehicles.

Statoil, based on three scenarios, expects **oil and gas to account for between 45% and 51% of energy demand in 2040** – showing that even if the world manages to hit the UN's ambitious 2-degrees Celsius target, oil and gas will still be the largest component of the energy mix. To ensure future oil and gas supplies, investment is needed now.

Sources:

International Energy Agency *World Energy Outlook 2017* available from www.iea.org

BP Energy Outlook 2017 available in full from www.bp.com/energyoutlook

Statoil Energy Perspectives 2017 available in full from www.statoil.com

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