

Changes in the fuel market in 2019

Last year, the United States exerted immense pressure on the global economy. It was also the world's largest oil producer, exporting on average 3m barrels of crude oil a day, with WTI oil cheaper on average by USD 7.31/bbl than Brent crude, produced in the North Sea.

Proprietary indicator 1

The macro environment was significantly impacted by a decision made by OPEC and non-OPEC countries, including Russia and Kazakhstan, on December 6th 2019 to cut oil output by 1.2 mbd.

Crude demand fell again in 2019 on lower international trade volumes (driven chiefly by the US-China trade war and Brexit). Crude oil prices spiked occasionally in response to developments in the Middle East (instability caused by new US sanctions imposed on Iran, attacks on oil installations in Saudi Arabia), the OPEC and non-OPEC countries' policy of cutting production as a consequence of falling demand, and growing production in non-OPEC countries (including US, Brazil, Canada).

The 2019 average price of crude oil was USD 64.2/bbl, down USD 7.1/bbl year on year.

The period of subdued oil prices provided an incentive for significant optimisation in the E&P industry. The costs of drilling and offshore services, direct production costs and new field development costs were reduced. Standardised technical solutions, technological advancement, and improvement of contracting and procurement of products and offshore services helped to reduce average operating expenses by more than 40% relative to 2013.

The profitability of the LOTOS Group's production operations is affected by numerous legal regulations, including the Polish Geological and Mining Law, EU regulations, and international conventions, such as those on environmental protection.

In the near future, the following will be of key importance:

- planned amendments to tax regulations applicable to hydrocarbon production;
- continued tightening of environmental protection regulations;
- increase in mandatory collateral relating to the risk of environmental damage;
- amendments to the regulations pertaining to emergency stocks of crude oil and certain petroleum products.

Under such conditions, both innovative technologies and innovative cooperation models should be implemented in order for the LOTOS Group to remain profitable and attractive to investors.

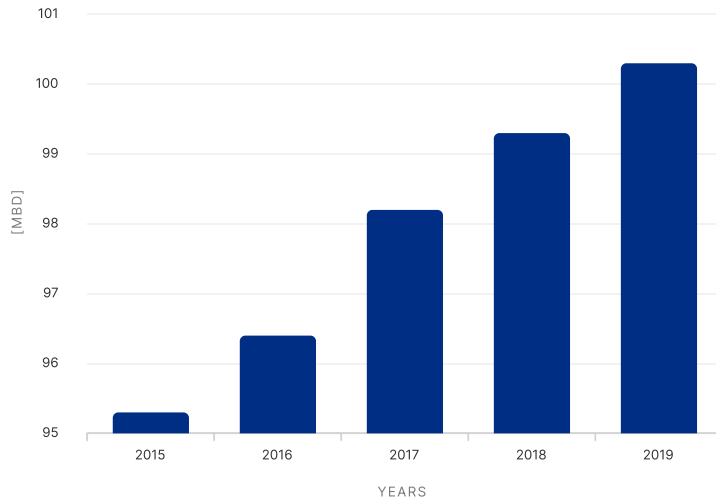
The profitability of refining is directly affected by fluctuations in crude oil and natural gas prices, as well as the amount and structure of demand for and supply of petroleum products. According to JBC Energy, global demand for refining products should continue to grow.

Continued growth of CEE economies can generate further increase in fuel consumption and its ultimate convergence with consumption levels in Western Europe. From fuel producers' perspective, it is the CEE market that offers more potential given its predicted growth in the coming years. In the opinion of the LOTOS Group, demand for petroleum products, in particular diesel oil and aviation fuel, should grow noticeably also in Poland.

Demand

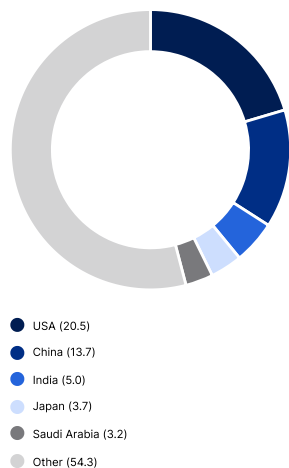
In 2019, global demand for crude oil averaged 100.2 mbd (million barrels per day), compared with 99.3 mbd in 2018 (up 0.9%).

Crude oil demand in 2015-2019 (mbd)



Source: International Energy Agency (IEA).

Key crude oil consumers in 2019 (mbd)



Currently, the world's largest crude oil consumers are the US, China and India. In the US, a significant portion of crude processed is sourced from domestic reserves.

Demand for crude oil has been steadily growing, with the key drivers of oil and gas demand including:

- Global population growth. At the end of 2019, the world's population was estimated at 7.7bn. Over the past years, it grew at an average rate of 1.6% annually, driven mainly by populations in developing countries (primarily in Asia and Africa).
- Urbanisation rate. Access to energy is closely linked to the urbanisation rate. The most urbanised regions of the world are North America (in 2018, 82% of its population lived in urban areas), Latin America and the Caribbean (81%), and Europe (74%). The urbanisation rate in Asia was approaching 50%. At the same time, Africa is mostly rural, with only 43% of its population living in urban areas in 2018, although this ratio is expected to rise.
- Economic growth rate. In 2019, the global economic growth rate slowed down significantly. The World Bank estimates that

in 2019 Gross World Product rose 2.4% year on year (compared with 3.0% in 2018). The GDP growth rate in developed countries was 1.6% vs 3.5% in emerging economies.

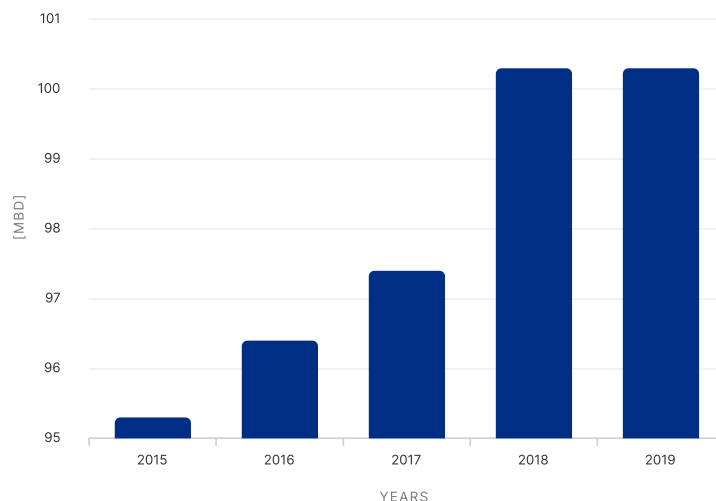
- Environmental protection initiatives. In order to reduce atmospheric pollution, emissions trading schemes have been introduced, whereby CO₂ emission allowances can be purchased and sold on market terms. The number of allowances is being gradually reduced, which, coupled with the sizeable demand, drives their prices up. The high price of emission allowances stimulates a shift in the energy mix towards an increased share of renewable energy sources. The crude oil demand is also affected by legal regulations governing exhaust gas emissions from means of transport, which account for approximately 58% of the demand. The EU countries have agreed to adopt standards to reduce carbon dioxide emissions from new cars by 37.5% by 2030 (with an interim target of 15% by 2025). Local measures are also undertaken, e.g. certain European cities have prohibited vehicles with compression-ignition engines. The European Union has issued new regulations on the promotion of renewable energy sources, which requires Member States to add biofuels to gasoline and diesel oils. In December 2018, a Renewable Energy Directive (RED II) was promulgated, providing for a greater role of advanced biofuels.
- By 2030, at least 14% of the energy consumed in transport is to come from renewable sources, while the share of biofuels with a high risk of indirect impact on land use change (ILUC) should gradually decrease, until zero levels are reached in 2030.
- Changes in population preferences. A growing number of societies, especially in highly developed countries, are aware of the climate warming problems. Therefore, despite high prices, they purchase increasingly more electricity-powered vehicles. Electric vehicles are also used for public transport services. New trends are being observed in people's behaviours, such as more frequent use of public transport, car rental and car sharing.
- Technological progress. In addition to the use of new alternative fuels, innovations are being introduced to reduce fuel consumption by traditional propulsion systems, e.g. by improving the efficiency of automotive engines, reducing the weight of commercial vehicles, recovering power during braking, or streamlining vehicle bodies.

Supply

In 2019, crude oil production reached 100.3 mbd (million barrels per day).

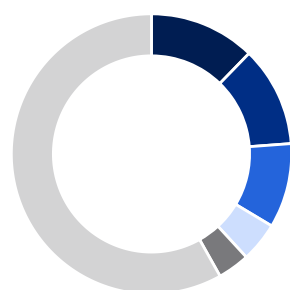
In December 2018, the Organisation of Oil Exporting Countries (OPEC) and a group of other crude oil producers (including Russia and Kazakhstan) announced that they would cut down crude oil production by 1.2 mbd relative to October 2018. In December 2019, the OPEC and non-OPEC countries increased the production cuts to 1.7 mbd, and stated that the agreed volumes would remain in force until the end of March 2020. At the same time, Saudi Arabia undertook to reduce its output by 400 tbd (thousand barrels per day), so the actual reduction volume is 2.1 mbd. 2019 also saw the escalation of tensions in the Middle East (sanctions on Iran, attacks on oil infrastructure in Saudi Arabia) and Libya (the civil war).

Crude oil production in 2015–2019 (mbd)



Source: IEA.

Main crude oil producers in 2019 (mbd)



- USA (12.3)
- Russia (11.6)
- Saudi Arabia (9.8)
- Iraq (4.6)
- Canada (3.7)
- Other (58.34)

Currently, the United States is the world's largest oil producer. Over the past ten or so years, its production increased from 5.5 mbd in 2010 to 12.3 mbd in 2019. This was made possible by the development of shale oil extraction technologies and techniques (such as hydraulic fracturing and horizontal drilling). The high level of crude oil production was also driven by growing US exports, which in 2019 amounted to 3.0 mbd. Other countries of key importance to the international oil market include Russia, Saudi Arabia, Iraq and Canada.