Pricing the Turbulence

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XII Eurasian Economic Forum in Verona
October 24th, 2019
Hydrocarbons Will Remain the Foundation of Global Energy Balance

Primary Energy Consumption, mmtoe

- Oil: 4,662 (2018), 5,279 (2040)
- Gas: 3,309 (2018), 4,582 (2040)
- Coal: 3,772 (2018), 3,444 (2040)
- Other: 1,350 (2018), 3,131 (2040)

Source: IHS Markit, BP
Asia – Key Driver for Oil Demand Growth

mmt per year

Asia
2020

India
+159

China
+92

Indonesia
+29

Malaysia
+5

Vietnam
+21

Other Asia
-2

Asia
2040

1 820

Source: Rosneft analysis based on Wood Mackenzie and IHS Markit
US Crude Production Growth Continues

Left Axis – drilling rigs count, right axis – production, kbpdk

+30%  Spudded wells per rig per month
x2   Initial production per new well

Source: Baker Hughes, DOE USA
Forced Substitution by the US

Crude deliveries to EU, mmt

2017  27.3  -8.8  -32%
2018  18.5
2017  9.2
2018  22.7  +13.6  x2.5

Source: Eurostat
Associated Gas Flaring in Permian

mmcm per day

Source: Rosneft analysis based on Rystad Energy
Global Oil Market Production

Crude and condensate production, kbdp

Note. Production of Saudi Arabia is without condensate
Source: Russian Ministry of Energy, DOE, OPEC
New Reality

**US sanctions without United Nations Security Council approval**

**Iran and Venezuela production reduction in Sep 2019 comparing to Oct 2016 OPEC+ reference level**

-0.2...-0.4 pp of Global GDP Growth

-3.0 mmbpd**
Global Economy Slowdown

Real GDP Growth Outlook for 2019, change in percentage points

Note: Current and previous forecasts published in October 2019 and 2018, respectively
Source: IMF
Global Financial System – Shifting Gears

Top-5 Banks Market Capitalization, bn USD

<table>
<thead>
<tr>
<th></th>
<th>2007</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>EU</td>
<td>627</td>
<td>942</td>
</tr>
<tr>
<td>USA</td>
<td>830</td>
<td>301</td>
</tr>
</tbody>
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Source: Bloomberg
World Reserve Currencies

Share of USD and Euro, %

In Central Banks’ Reserves

- **US Dollar**
- **Euro**

In EU Trade

- **Euro**
- **US Dollar**

Source: IMF, Eurostat
Pricing the Turbulence

VLCC capacity

$120 mm

Volatility and Uncertainty Increase

Strait of Hormuz

$1 bn per day

Saudi Arabia

$300 mm per day

140 characters in tweets
Price of Decarbonisation: Additional Costs for Stable Energy Supply

USD per 1 MWh

Grid costs for transmission and distribution
Balancing costs ensures stability in the event of unforeseen interruptions
Connection costs

Power Generation Costs

Renewable energy share in total electricity production volume

Source: OECD Nuclear Energy Agency
EV: Availability of Raw Materials for Batteries Production

Indexed to production in 2000
(production in 2000 = 1)

**Cobalt**
- Reserves
- D.R. Congo 52%
- Price
- Production

**Lithium**
- Reserves
- Chile 57%
- Australia 19%
- Argentina 14%
- Price
- Production

Source: BP Statistical Review of World Energy
Motor Fuel Taxation

EU Taxes on Motor Fuel: 283 bn EUR

% of Budget Revenues

Italy: 6.3%
France: 4.1%
Germany: 3.8%

Average for EU: 4.7%

% of GDP

Italy: 2.7%
France: 1.9%
Germany: 1.5%

Average for EU: 1.8%

Note. Data for 2017
Source: Eurostat
The True Price of Renewables

Renewables Energy Subsidies, bn EUR

European Union

Note. Real prices, 2017
Source: European Commission, IEA
Reducing Energy Inequality

Population without Access to Electricity

- **World**: 835 millions (22% in 2000, 11% in 2017)
- **High Income Countries**: 0% (2000, 0% in 2017)
- **Middle Income Countries**: 429 millions (21% in 2000, 8% in 2017)
- **Low Income Countries**: 406 millions (85% in 2000, 59% in 2017)

Source: World Bank
Russia – the Largest and the Most Reliable Supplier of Energy to Europe

EU Crude Oil Production and Consumption

Crude and Oil Products Supply to EU by Origin

Source: BP Statistical Review of World Energy
Efficiency and Reliability of the Russian Oil Industry

Global Liquid Hydrocarbons Capacity by Breakeven in 2030

Source: Rosneft estimates based on IHS Markit and Wood Mackenzie data
JVs Hydrocarbon Reserves, mmtoe

2014: 605
2018: 1391

3x

Note. The data presented according to the PRMS classification for 3P reserves (proved, probable and possible) in proportion to ownership.
Source: Rosneft (DeGolyer & MacNaughton)
“Vostok Oil” – New Horizons
Rosneft’s Strategic Priority – Leading Peer Positions in Sustainable Development

Implementation of 17 UN Sustainable Development Goals in Strategic Principles with Selection of 5 Strategic Priorities

Achievements

>240 bn RUB «green» investments over 5 years
9.3 bn RUB energy savings in 2018
>125 bn RUB investments in projects aimed at APG utilization for 2013-2018

Goals

4.4 mmtoe energy consumption reduction by 2022
8 mmt CO₂ reduction of greenhouse gas emissions by 2022
Up to 170 stations compressed natural gas volumes growth
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