Stable prospects for SUEK’s high-CV products

Demand for SUEK’s coal is driven by growing electricity consumption in Asia and the necessity to provide heat to millions of people in Russia.

**Demand**

- The commissioning of new coal-fired energy facilities in Asia, the Middle East and Africa will offset the decline in demand in Europe.
- Excess supply in the natural gas market, primarily in Europe, will restrain gas and coal prices until the balance in the gas market is restored.
- By 2022, India will overtake China as the leading coal importer. China may limit coal imports and support domestic producers.

**Supply**

- Decline in exports by 2030 from Indonesia
- Rising costs of licensing, building and maintaining new facilities in
  - Australia
  - USA
  - Colombia

**SUEK’s response**

- Strict cost control
- Capacity development
- Business diversification

**Energy sources by 2030, Mtoe**

<table>
<thead>
<tr>
<th>Energy Source</th>
<th>Europe</th>
<th>Asia Pacific</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coal</td>
<td>210</td>
<td>472</td>
</tr>
<tr>
<td>Oil</td>
<td>63</td>
<td>182</td>
</tr>
<tr>
<td>Natural gas</td>
<td>172</td>
<td>303</td>
</tr>
<tr>
<td>Nuclear fuel</td>
<td>7</td>
<td>34</td>
</tr>
<tr>
<td>Hydrogeneration</td>
<td>215</td>
<td>401</td>
</tr>
<tr>
<td>Renewable energy</td>
<td>7</td>
<td>34</td>
</tr>
</tbody>
</table>

**Coal imports in 2030**

- Europe, Middle East, Africa: -23 Mt
- Asia: +38 Mt

Global trends

The global power industry is facing serious challenges. While the global community has promised full access to electricity for all, 850 million people still live without this basic necessity. Population growth, urbanisation, industrialisation and a gradual transition from gasoline to electric vehicles will drive growth in electricity demand of 2% annually. To meet this growing demand, affordable, versatile and reliable energy sources are needed. At the same time, a heightened focus on climate change and environmental issues are forcing producers to operate responsibly and minimise their environmental footprint.

Developing economies will account for the greatest proportion of electricity demand growth (3% per year), especially in Asia, where higher industrial output and household incomes, and the development of the services sector, will demand more electricity. China will account for around one third of the global increase in electricity demand, India and Southeast Asia will account for approximately another third. As a result, Asia’s electricity consumption will grow by 7 p.p., to 54% of global consumption in 2040.

In advanced economies demand growth will be only 0.7% per year, with efficiency improvements restraining the growth of electricity consumption to support ongoing digitisation and electrification. The biggest driver of the demand increase will be a transition to heating using electric heat pumps rather than gas heating.

When it comes to supply, the largest area of growth will come from solar and wind generation, the share of which will grow from 7% to 24% by 2040, according to the International Energy Association. Nevertheless, coal will remain the largest source of electricity with a share of 25%, with its consumption remaining stable.

1. Not including co-generation (heat and electricity) plants.

Coal industry developments

The main trends in coal-fired generation include:

- Improving power plant efficiency consuming coal with higher specific calorific value (high-CV coal)
- Tighter restrictions on SOx and NOx emissions
- Consumption growth in India and Southeast Asia to offset lower demand in Europe, the USA and potentially China

In addition to the power industry, other sectors will increase their consumption of coal. By 2040, the use of coal in the metallurgical, cement and chemical industries will increase by 225 Mt.

Coal will remain the primary fuel in Asia’s energy system, where demand will grow by an average of 0.4% annually over the next 10 years.

India

India, which became the world’s second largest coal consumer in 2018, will be the main driver of growth in global coal demand. Whilst India is planning to increase the share of renewable energy generated, strong demand for electricity is expected to boost coal generation by 38% by 2030. Although the country has set ambitious goals for growing its domestic coal production, thermal coal imports will continue to grow by 1.2% a year, increasing by 26 Mt, to reach 205 Mt, in 10 years. High-CV coal will be especially demanded by the Indian cement industry. As electrification of mobility increases, demand for electricity will increase and currently underutilised coal-fired power stations (current average utilisation rate around 61%) are the cheapest means to produce more electricity.

Southeast Asia

Southeast Asia, i.e. countries such as Vietnam, Malaysia and the Philippines, will be active drivers of coal demand growth in Asia in the coming decade due to their energy generation development and intense industrialisation. Total imports to Southeast Asia are expected to increase by 90 Mt, to 220 Mt, in 2030.

Japan

In July 2018, the Japanese government approved the 5th Strategic Energy Plan, which focuses on energy security, safety and better economic efficiency. Under the plan, by 2030 CO2 emissions will be reduced by 26% compared with 2013 levels due to the development of renewable energy. Thus, coal consumption volumes are expected to decrease by 11 Mt to 114 Mt in 2030.

South Korea

In accordance with the 8th Basic Plan issued in December 2017, 7.3 GW of new coal-fired power capacities will be built by 2022. In addition, by 2022 7 old coal-fired power plants will be shut down. However, after 2022, the country does not plan to launch new coal stations. Also, several stations with a total capacity of 2.1 GW will be transferred from coal to gas. At the same time, old facilities (>30 years) will stop from March to June to reduce air pollution. South Korea’s imports of thermal coal are expected to decline to 100 Mt by 2030 from 107 Mt in 2019, due to government policies to decarbonize and combat air pollution, replace old capacities with new ones with more efficient ones, and reduce coal consumption by industry.

China

China remains one of the largest importers of coal. Electricity generation in China will gradually shift from coal to gas, nuclear and renewable energy sources. The Chinese government has already taken steps to reduce excess coal-fired capacities and optimise the construction of new facilities. The combination of the Chinese authorities’ attempts to limit coal imports, with slower growth in coal generation, will result in demand for imported coal falling by 76 Mt to 144 Mt in 2030. As a result, India will replace China as the No. 1 coal importer. However, the current average utilisation rate of coal-fired power plants of around 50% is low and as demand for electricity will increase also through e-mobility, coal-fired power plant utilisation could increase.

More efficient technologies change coal demand, Mtce

<table>
<thead>
<tr>
<th>POWER</th>
<th>2018</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subcritical</td>
<td>1,478</td>
<td>622</td>
</tr>
<tr>
<td>Supercritical</td>
<td>544</td>
<td>1,206</td>
</tr>
<tr>
<td>Ultra-supercritical</td>
<td>428</td>
<td>778</td>
</tr>
<tr>
<td>IDCC and CCUS</td>
<td>972</td>
<td>778</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>INDUSTRY</th>
<th>2018</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iron and steel</td>
<td>830</td>
<td>194</td>
</tr>
<tr>
<td>Chemicals</td>
<td>233</td>
<td>433</td>
</tr>
<tr>
<td>Cement</td>
<td>433</td>
<td>194</td>
</tr>
<tr>
<td>Other</td>
<td>661</td>
<td></td>
</tr>
</tbody>
</table>

Currently, supply and demand tend to converge and remain in a fundamental balance. The surplus of coal capacities makes up only 3% of the global market (approximately 30 Mt). If we compare this to similar basic industries, the capacity utilisation rate in the coal industry is around 97%, while the utilisation rate in other sectors such as non-ferrous metallurgy, fertiliser or steel production does not exceed 80%.

Given excess capacity, today’s low prices could lead to eventual decline for those producers that have high production costs. Even so, global capacities that are currently planned for commissioning are likely to be positioned on the right side of the global cost curve, mainly due to greater production challenges (stripping ratios and transportation distances).

Indonesia, currently the largest coal exporter, will decrease international supplies due to rising domestic consumption.

In 2017, China introduced a regulation scheme for domestic spot prices, a ‘corridor mechanism’, to reduce price volatility and ensure sustainable relationships between coal and power companies. This mechanism stipulated a cap of 600 CNY/t (equivalent to $86.5/t FOB NEWC) for domestic contractual prices, with higher prices triggering regulatory intervention. Similarly, the floor figure is 470 CNY/t ($68.1/t FOB NEWC), the breaching of which can also trigger regulatory action. Most market players believe that the scheme will remain in effect and will continue to influence the global coal market.

Another factor that is beginning to exert an increasing influence on coal prices, especially in Europe, is gas prices. Natural gas generation, which is one of the primary alternatives to coal generation in the regions with the appropriate gas infrastructure, will develop at a faster pace (CAGR 2018-2040 1.7% versus 0.1% for coal generation). Despite this, the share of gas power generation will remain at approximately the current level of 22–23% until 2040. The availability of large, inexpensive gas resources in the United States has a significant impact on the global markets. In addition, gas generation produces lower CO2 emissions compared to other fossil fuels, making it more attractive to consumers as a basic energy source given stricter carbon regulation.

In general, over the next 20 years, coal generation will remain the main source of reliable, affordable energy for rapidly developing countries, where people urgently need uninterrupted access to safe electricity. In other parts of the world, the future of coal generation will depend on producers’ ability to adapt cost-effectively to increasingly flexible energy systems and to more stringent environmental and climate regulations.

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43% of thermal coal trade is high-CV coal

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At Central bank of Russia CBR rate average for 2019.

Sea deliveries.
Russian coal and energy market

Coal is one of Russia’s most important energy resources. Annual Russian consumption of thermal coal has remained stable at an average of 155 Mt for the past five years.

In 2014, the Russian government launched its coal industry development programme to 2030, focused on:

- A responsible approach to developing resources both at currently operating and new deposits
- Stimulating the development of state-of-the-art technology for coal mining, processing and washing, to increase the value of products, and consequently improve business profitability and create new jobs
- Investment in personnel development and R&D to meet the best international standards (in quality and health & safety)
- Removing infrastructure restrictions on the development of the coal industry and, above all, reducing bottlenecks at railways and ports

See https://www.rosugol.ru/programme/index_1.php

Coal-fired power plants generate 17% of all electricity in Russia. This share rises to 45% in Siberia, where most of SUEK’s energy assets are located, a major industrial region with a relatively small number of people who delay utilities payments and close to the main coal producing regions.

Coal demand in Siberia and the Far East, and capacity utilisation at coal-fired thermal power plants in those regions, is influenced by hydroelectric output, which accounts for approximately 50% of electricity generation. In low-water years, hydropower plants produce less electricity, which has to be compensated for by coal-fired generation, while in years with high water levels, the opposite is true.

Coal-fired power generation is the most efficient source of energy in Siberia as it consumes local coals and can combine electricity generation with heat generation.

The aluminum industry is the major consumer of electricity in Siberia, accounting for 30% of demand. Changes in aluminium output therefore significantly influence the energy balance of the region. New aluminium capacities planned for launch by 2025 (Boguchansky and Taishet aluminium smelters) may increase Siberian electricity demand by 9%. There are a number of other industrial and infrastructure projects that may increase the demand for coal-fired power, given the absence of hydropower-generation expansion projects.

In 2007–2016, Russia ran a state programme to support the upgrade and construction of new power capacities under capacity delivery agreements (DPM-1). In 2019, the Russian government adopted a new state support programme (DPM-2), which will enable power producers to upgrade 40 GW of capacity by 2030.

Depending on the weather, approximately 16% of coal consumption is used to heat homes and social and industrial facilities. Coal generation accounts for 95% of heat production in Siberia.
45% of electricity in Siberia is generated from coal

95% of heat in Siberia is generated from coal

In addition, thermal coal is used in the metallurgical, cement and other industries in Russia.

The major driver of heat consumption is rising urbanisation. According to a state programme, the construction of new houses will increase to 120 million m² by 2025.

On the supply side, capacity development is restricted by the current tariff system based on actual costs, which makes long-term investment planning impossible. The planned transition to the ‘alternative boiler’ method will enable the government to increase tariffs above the rate of inflation to justify the costs of capacity upgrades and favour the co-generation of heat and power. Therefore, the transfer to this tariff allows long-term investment for the upgrade of heat networks. Of the cities supplied by SUEK, Rubtsovsk has been the first to trial a transfer to the ‘alternative boiler’ method.

Major suppliers of thermal coal to the Russian market include SUEK, EN+ Group, Russian Coal, Kuzbassrazrezugol and Luchegorsky open pit. Products supplied by these five companies cover approximately 57% of the total demand for thermal coal in Russia. 15% of Russian thermal coal demand is also covered by imports, mainly from Kazakhstan.

‘Alternative boiler’ tariff is a method introduced in Russia in 2017 to calculate heating prices, when only the maximum long-term level is set. It is calculated based on the cost of constructing and operating a new alternative boiler house. The final heating price is determined by agreement of the parties.