

MODERNIZATION OF OIL REFINERIES

INCREASED PRODUCTION EFFICIENCY

ESTABLISHING TECHNOLOGICAL LEADERSHIP

OMSK OIL REFINERY

The Omsk Oil Refinery is one of the most modern refineries in Russia and one of the largest in the world. Gazprom Neft has been modernizing the Omsk Oil Refinery since 2008. This has made it possible to reduce the refinery's impact environmental impact by 36%, and this impact will be reduced by an additional 28% by 2020. Total investment in the modernization of the oil refinery will exceed RUB 300 billion.

For more about the refinery, see the 'Oil refining' section, p. 80

STAGE I. 2008–2015:

- light naphtha isomerization complex;
- cat-cracked petrol and diesel fuel hydrotreating complex;
- transition to Euro-5 fuel.

STAGE II. 2016–2020:

- construction of the delayed coking unit, which will ensure the additional release of light petroleum products and will become Russia's first

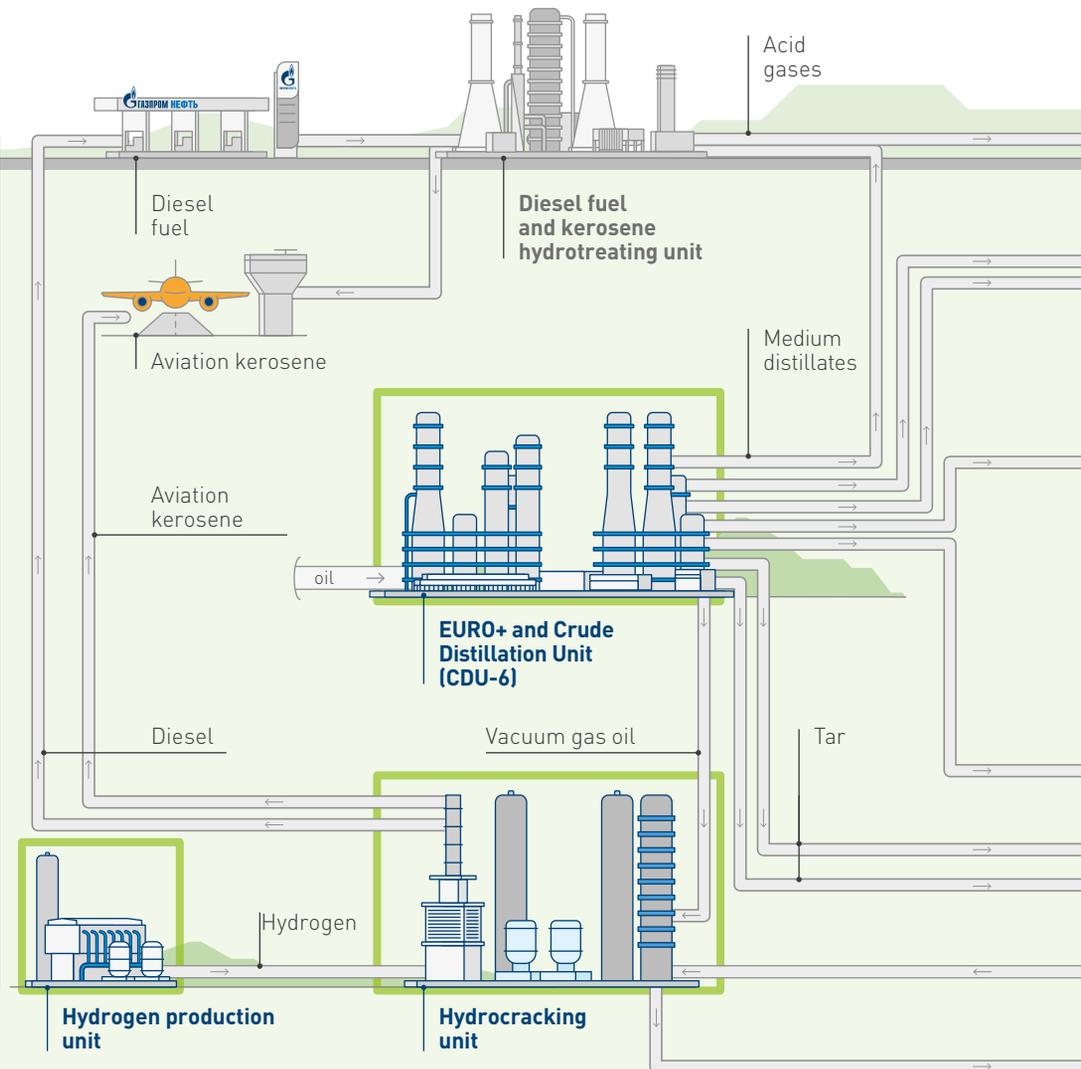
production facility of needle coke, a valuable raw material for the metallurgical, nuclear, chemical, and space industries;

- construction of the Biosphera treatment facilities (see pp. 34-35);
- the new crude vacuum unit-6 for primary oil refining will replace several obsolete units;
- construction of a deep oil refining complex (see insert 2).

Hydrocracking complex at the Omsk Oil Refinery

Technology C.1

The Omsk Oil Refinery will employ the so-called severe two-stage hydrocracking under pressure of 18 MPa and temperature of 380–400°C, which is capable of operating in two modes: fuel and oil. As a result of the hydrocracking unit, the Omsk Oil Refinery will increase the output of refined light petroleum products by more than 6% and take the raw material base for the production of modern group II and III oils with a high viscosity index to the next level.



MOSCOW OIL REFINERY

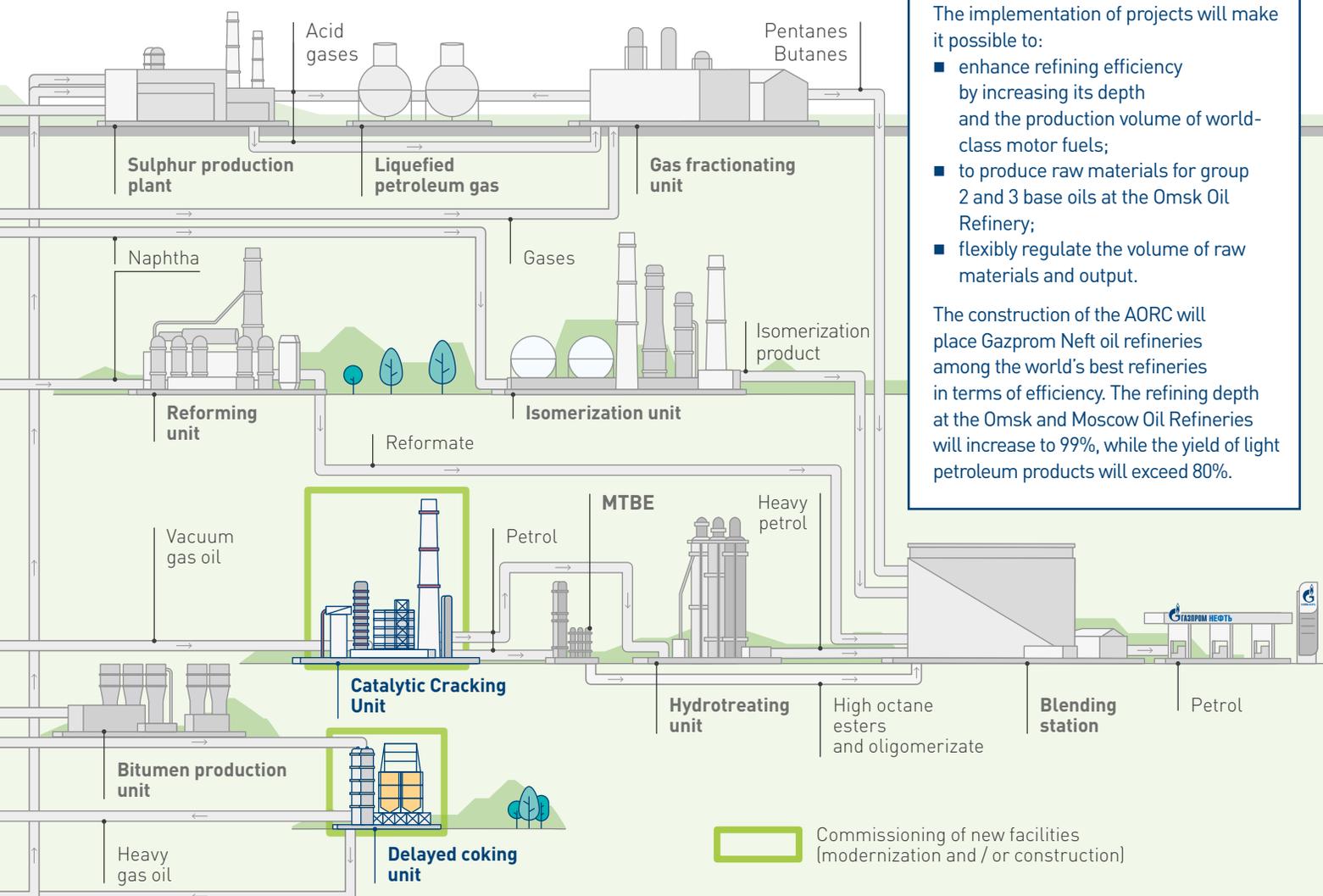
The Moscow Refinery is one of the industry leaders in terms of the production of Euro-5 high-octane gasoline and diesel fuel. Gazprom Neft has been carrying out the comprehensive modernization of the Moscow Oil Refinery since 2011 to achieve the best production standards and ensure environmental safety. Total investment in the modernization of the Moscow Oil Refinery will amount to RUB 250 billion.

STAGE I. 2011–2015:

- light naphtha isomerization complex;
- cat-cracked petrol hydrotreating unit;
- transition to Euro-5 fuel.

 For more about the refinery, see the 'Oil refining' section, p. 80

DIAGRAM OF THE MOSCOW OIL REFINERY AFTER STAGE II OF MODERNIZATION



STAGE II. 2016–2023:

- modernization of the crude vacuum unit-6 for primary oil refining ensured its enhanced energy efficiency;
- reconstruction of the catalytic cracking complex increased its capacity by 20% and made it possible to increase the yield of light petroleum products and reduce their sulphur content to improve environmental performance;
- the combined Euro+ oil refining unit within crude distillation units, reforming, hydrotreating of diesel fuels, and a gas fractionating unit (GFU) will replace the "small technological ring" for oil refining that was introduced in the 1960s and will reduce pollutant emissions by 11 % per 1 tonne of refined oil;
- construction of a deep oil refining complex (see insert 2).

Increase in oil refining depth at the Moscow and Omsk Oil Refineries

Technology C.2

up to 99%

REFINING DEPTH AT THE MOSCOW AND OMSK OIL REFINERIES FOLLOWING MODERNIZATION

up to 81%

YIELD OF LIGHT PETROLEUM PRODUCTS AT THE MOSCOW AND OMSK OIL REFINERIES FOLLOWING MODERNIZATION

The key projects in the Stage II modernization of the Moscow and Omsk Oil Refineries are the construction of advanced oil refining complexes (AORC) as part of hydrocracking and delayed coking plants. The implementation of projects will make it possible to:

- enhance refining efficiency by increasing its depth and the production volume of world-class motor fuels;
- to produce raw materials for group 2 and 3 base oils at the Omsk Oil Refinery;
- flexibly regulate the volume of raw materials and output.

The construction of the AORC will place Gazprom Neft oil refineries among the world's best refineries in terms of efficiency. The refining depth at the Omsk and Moscow Oil Refineries will increase to 99%, while the yield of light petroleum products will exceed 80%.