

## Retention of low-cost position



### ➔ The increase of the efficiency along the value chain

The Coal segment's long-term programme to improve efficiency continues.

In 2017, planned cost optimisations saved US\$73 million, with the additional effect of US\$61 million coming from productivity growth, improving auxiliary material usage, optimisation of industrial services, and G&A and payroll optimisations.

### ➔ Main projects in 2017

#### Degassing efficiency improvement

##### Status

- Began degassing seams using long directional holes at the Yerunakovskaya-VIII mine;
- Introduced modern equipment to increase the length of traditional underground seam degassing holes at the Rapsadskaya and Yerunakovskaya mines.

##### 2018 plan

- Expand underground seam degassing using long directional holes to the Alardinskaya and Rapsadskaya-Koksovaya mines;
- Search for new seam degassing technology with a low gas recovery factor for use at the Osinnikovskaya mine;
- Continue experimenting with degassing seams using plasma impulse excitation.

#### Tunnelling rates increase

##### Status

- Increased tunnelling rates by 15% year-on-year after adding high-efficiency tunnelling equipment;
- Reached a maximum rate of 600 metres per month using the bolter miners at the Rapsadskaya and Yerunakovskaya mines.

##### 2018 plan

- Achieve targeted 15% year-on-year tunnelling growth;
- Reach new sustainable peak tunnelling rates;
- Continue adding high-efficiency tunnelling equipment.

#### Operating time increase at clearing faces

##### Status

- Increased average daily operating time by reducing accident and operational delays, as well as repair shift work;
- Increased average daily production per face by 5% year-on-year to 6.3 thousand tonnes per day.

##### 2018 plan

- Reach 500 thousand tonnes per month at faces in the Alardinskaya and Rapsadskaya mines (seam no. 6);
- Increase operating time and extraction on face no. 4-1-5-4 at the Osinnikovskaya mine to 5 thousand tonnes per day with final extraction of reserves in June 2018;
- Ramp up of both both the Alardinskaya and Rapsadskaya mines to 500 thousand tonnes per month;
- Achieve mine rate of 5 thousand tonnes per day at longwall no. 4-1-5-4 of Osinnikovskaya mine.

#### Rapsadskaya washing plant upgrade

##### Status

- Launched flotation at the Rapsadskaya washing plant's third section which led to an increase in concentrate output by 3%.

##### 2018 plan

- Reduce ash content in mined raw coal (+1% to the yield);
- Begin using the new flotation equipment at the first and second sections of the Rapsadskaya washing plant (+1.5% to the yield from 2019).

#### Production flow optimisation at washing plants

##### Status

- Screw separation section was automated at the Rapsadskaya washing plant, which increased concentrate production volumes at section no. 7 by boosting coal processing volumes;
- Optimised operations at the Kuznetskaya washing plant, which helped to improve coal processing efficiency and increased concentrate output by 73 thousand tonnes.

##### 2018 plan

- Setup raw coal and concentrate warehouses at coal washing plants to reduce idle time from logistics and to increase plant operating time;
- Increase concentrate production by reducing ash content in the mined raw coal;
- Reduce idle time at the Rapsadskaya washing plant on crushing large coal chunks, purchase crushers for the open-pit at Rapsadskaya-Koksovaya site and Alardinskaya mines;
- Launch a press filter at the Kuznetskaya washing plant to increase concentrate output.

#### Saleable product output optimisation

##### Status

- Additional volumes of saleable products were produced at current washing capacities through the sieving of low ash coal from the Uskovskaya and Mezhegyugol mines on saleable raw coal and coal for further processing.

##### 2018 plan

- Acquire sieving equipment for the Uskovskaya mine;
- Launch dry enrichment at Razrez Rapsadskiy;
- Separate high-ash coal with sieving equipment directly at Razrez Rapsadskiy and open-pit at Rapsadskaya-Koksovaya site.