

# Success factors and KPIs



## CUSTOMER FOCUS

### STEEL

#### Strategic goals

- Increase domestic market sales of finished steel products
- Secure a 70% domestic market share in rails
- Develop market leadership in steel products in Siberia
- Increase the share of semi-finished products with high-premiums

#### Overview 2018

- Developed the pipeline of investment projects to enhance finished steel products sales, including modernising the rail and beam mill at EVRAZ NTMK, constructing the new continuous casting machine No. 5 at EVRAZ NTMK, and constructing the new integrated flat casting and rolling complex at EVRAZ ZSMK
- Launched the new ball mill at EVRAZ NTMK with a capacity of 145 thousand tonnes
- Efforts to direct sales towards large infrastructure projects, improve lead times and expand the product mix drove beam sales up 7%, from 572 thousand tonnes in 2017 to 612 thousand tonnes in 2018
- Sales of rebar grew by 8%, from 1,629 thousand tonnes in 2017 to 1,766 thousand tonnes in 2018
- The debottlenecking initiatives at the wheel rolling mill led to 15% growth in wheels sales, from 173 thousand tonnes in 2017 to 199 thousand tonnes in 2018
- Launched a project with a key client, Russian Railways, including developing new types of rails (DT350U) and additional services, driving sales volumes to Russian Railways up 8%, from 719 thousand tonnes in 2017 to 774 thousand tonnes in 2018
- Achieved US\$12 million of savings on logistics for Russian steel plants, mainly due to increased carloads, better railcar usage terms, and more efficient dispatching and port haulage

**The total effect of customer focus initiatives on EBITDA is US\$63 million**

#### Outlook 2019

- Continue working on logistics efficiency by further increasing railcar loading and improving terms of shipments
- Continue the programme to promote the use of beams in infrastructure and construction
- Optimise the rounds mix and enhance the sales volumes of balls at EVRAZ NTMK
- Adjust the vanadium price formula closer to global benchmarks

### COAL

#### Strategic goals

- Reach 100% self-sufficiency in all coal grades at EVRAZ steel plants

#### Overview 2018

- Total internal coal use at EVRAZ steel plants reached 69%, compared with 50% in 2017, and EVRAZ self-sufficiency in OS grade coal rose to 37%, compared with 5% in 2017, mainly due to the ramp-up of volumes at the Raspadskaya-Koksovaya open-pit mine to 1.7 million tonnes from 0.7 million tonnes in 2017
- Expanded export sales volumes by 16% year-on-year to 7.7 million tonnes due to geographical diversification (mainly to Indonesia, Korea, Slovakia and Hungary) and increased shipments to the Baltic Sea
- Increased the load of railcars closer to the maximum capacity of 70 tonnes per car (69.1 tonnes per car in 2018, compared with 68.5 tonnes per car in 2017)

#### Outlook 2019

- Further expand overseas shipments, mainly to Indonesia, Vietnam and Japan
- Continue maintaining product quality, especially during the winter season
- Maintain focus on the efficiency of logistics in the Far East direction

### STEEL, NORTH AMERICA

#### Strategic goals

- Increase sales volumes to maintain energy pipe leadership in large-diameter pipe, line-pipe and OCTG
- Reach a market share of 45% in rails in North America

#### Overview 2018

- Increased the market share in large-diameter pipes in North America to 22%, up by 5 percentage points from 17% in 2017
- Increased the market share in rails in North America to 40%, up by 5 percentage points from 35% in 2017
- Achieved 111 thousand tonnes in seamless pipe sales, up 46% year-on-year

**The total effect of customer focus initiatives on EBITDA is US\$3.9 million**

#### Outlook 2019

- Commercialise new products, increase heat-treated plate sales and increase shipments to energy transmission and water pipe sectors at EVRAZ Portland
- Launch production of EVRlock connections at the EVRAZ Pueblo threading line after finalising the investment project
- Expand tire cord grade wire shipments made with EVRAZ Pueblo steel
- Increase large-diameter pipe sales from the EVRAZ Regina and Portland facilities



#### KPI

For KPIs and detailed tracking, see pages 28–29.



## ASSET DEVELOPMENT

### STEEL

#### Strategic goals

- Generate annual improvement initiatives in the amount of 3% of the cost base at every business unit

#### Overview 2018

- Launched the new blast furnace No. 7 at EVRAZ NTMK with a capacity of 2,550 thousand tonnes a year: in 2018, the furnace produced 1,908 thousand tonnes of pig iron
- Achieved US\$23 million of savings at EVRAZ ZSMK's steelmaking operations, mainly by optimising the consumption of ferroalloys, standardising the scrap blend and improving lime quality
- Enhanced the vanadium recovery at EVRAZ NTMK's steelmaking operations by 8.6% year-on-year by increasing the number of melts using the duplex process, optimising melt timing and increasing the number of melting sessions using bottom blowing
- Achieved an effect of US\$19 million from energy efficiency programmes at Russian steel plants, including from the launch of boiler unit No. 9 at EVRAZ ZSMK that recovers secondary gases

**The combined effect from these initiatives equals US\$134 million**

#### Outlook 2019

- Complete the major construction works for the blast furnace No. 6 overhaul at EVRAZ NTMK
- Improve the performance of blast furnace No. 7 to achieve full capacity in 2019 and bring the mill's total pig iron production to 4.9 million tonnes
- Continue the efficiency efforts at EVRAZ NTMK to enhance the production of vanadium slag by further increasing the of melts and vanadium recovery
- Achieve further increases in the productivity of the coke, sinter and blast furnace operations at EVRAZ NTMK and EVRAZ ZSMK

### COAL

#### Strategic goals

- Reach a saleable annual product volume of 22 million tonnes
- Generate annual cost-reduction initiatives in the amount of 3% of the cost base and remain in the first quartile of the global cost curve

#### Overview 2018

- Increased overall mining volumes to 24.2 million tonnes, up by 4% from 23.3 million tonnes in 2017, primarily due to growth of 1 million tonnes at the Rospadskaya-Koksovaya open-pit mine
- Reduced the ash content at the Rospadsky open-pit mine by 6%, which helped to increase the washed concentrate production yield to 76%, up by 7 percentage points from 69% in 2017

**The combined effect from the initiatives equals US\$70 million**

#### Outlook 2019

- Implement longwall mining instead of room and pillar mining at Rospadskaya-Koksovaya, increasing K grade extraction from the current 0.5 million tonnes to 1.4 million tonnes
- Increase the mine drifting speed and the total boring volume by more than 15%
- Launch the flotation process at the Abashevskaya washing plant to increase concentrate yield by around 2%
- Increase productivity at the Rospadskaya, Abashevskaya and Kuznetskaya washing plants by improving the technological process and modernising equipment

### STEEL, NORTH AMERICA

#### Strategic goals

- Increase steelmaking capacity at EVRAZ Regina and EVRAZ Pueblo
- Achieve full capacity utilisation at EVRAZ Portland with higher-value products

#### Overview 2018

- Reached the targeted parameters of the EVRAZ Regina steelmaking upgrade and LDP mill no. 5 investment projects by the end of 2018: monthly slab production was 87.8 thousand tonnes in Q4 2018, compared with 77.9 thousand tonnes in Q1 2018; the degassing rate was 89% in Q4 2018, compared with 36% in Q1 2018; and the prime yield for large-diameter pipe was 90% in Q4, compared with 75% in Q1 2018
- Launched EVRAZ Pueblo's threading line and completed major construction works for the heat treatment line at EVRAZ Red Deer
- Increased productivity and yield savings at EVRAZ Portland with a total rolling volume of 605 thousand tonnes, up 15% from 526 thousand tonnes in 2017
- Initiated the design and engineering work on a new rail mill at EVRAZ Pueblo with planned capacity of 600 thousand tonnes per annum to produce 100-metre rails.

**The combined effect from these initiatives equals US\$68 million**

#### Outlook 2019

- Continue achieving alloy savings and further melt shop volume growth at EVRAZ Regina
- Ramp up the threading line and billet production at EVRAZ Pueblo
- Launch the heat treatment line at EVRAZ Red Deer
- Decrease the electrode consumption levels at EVRAZ Regina

### KPI

For KPIs and detailed tracking, see pages 28–29.

# Digital transformation

EVRAZ digital transformation strategically addresses the customer focus and asset development success factors.

## OUR VISION

EVRAZ digital transformation vision is to constantly monitor best practices and success stories, and to plan implementations in the Group when technology matures to an adequate level and can drive productivity gains, cost reductions and safety improvements.

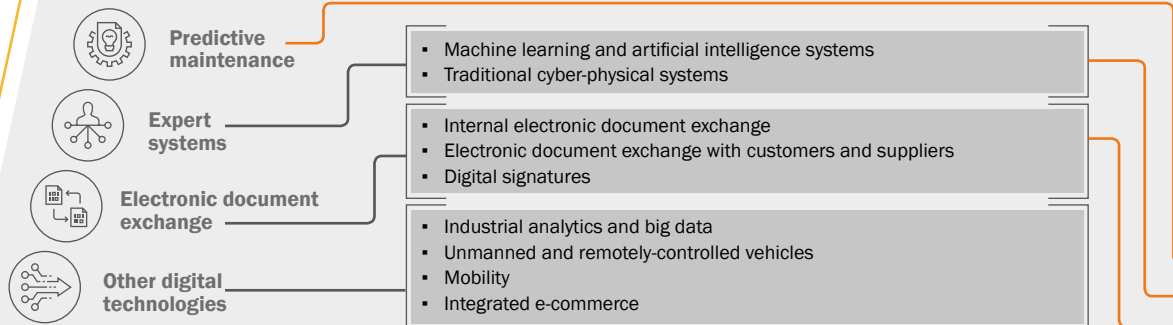
### RESULTS IN 2018

**24** projects implemented

**16** projects being implemented

**29** projects being considered

#### Main digital transformation initiatives



## KEY PROJECTS IN 2018

### Mining and transport equipment control system

|                                 |                                |
|---------------------------------|--------------------------------|
| Subject (area)                  | Remotely-controlled operations |
| Category                        | Mining                         |
| Company                         | EVRAZ KGOK                     |
| Project status as of 31.12.2018 | Launched                       |

An automated monitoring system for mining and transport equipment in the quarry has been implemented, including dump trucks, bulldozers, excavators, autoloading and mobile canteens.

The system monitors in real time and displays information about the location and operating parameters (speed, mileage, remaining fuel, etc) of dump trucks, loaded weight and the position of mobile canteens.

Using a Wi-Fi network deployed in the quarry, all data are promptly transmitted to the computers of the plant's dispatchers and chief specialists. The drivers of excavators and dump trucks also see the data on smart screens in the cabs of their vehicles.

#### Implementation effect

“The project has improved the productivity of quarry dump trucks by 10% while reducing ore loss and stabilising ore quality.”

**Alexander Trofimov**

Chief mining engineer at EVRAZ KGOK

### System to optimise the iron smelting process at blast furnace DP-7

|                                 |                |
|---------------------------------|----------------|
| Subject (area)                  | Expert systems |
| Category                        | Steel          |
| Company                         | EVRAZ NTMK     |
| Project status as of 31.12.2018 | Launched       |

IT solutions aimed at optimising the iron smelting technological process have been implemented. They allow to use the following functions:

- Information support (analysis of raw materials and products, history of process parameters)
- Process modelling and parameter calculation
- Expert system includes process diagnostics, forecasting and suggesting corrections

The main goals are to stabilise product quality (pig iron), reduce costs and improve productivity (by preventing negative deviations).

#### Implementation effect

The improved optimisation system has made it possible to reduce fuel consumption, stabilise the process and standardise the decisions taken by the technical staff during various shifts, which has increased overall productivity.

“Using the expert system's functions at the initial stage of the blast furnace's development has significantly reduced the time needed to reach the design parameters and improved the process performance metrics.”

**Konstantin Mironov**

Head of the blast furnace shop at EVRAZ NTMK

### Unmanned aerial vehicle (UAV) system for automated surveying

|                                 |                                             |
|---------------------------------|---------------------------------------------|
| Subject (area)                  | Remotely-controlled operations              |
| Category                        | Mining                                      |
| Company                         | Razrez Rapsadsky (Rapsadskaya Coal Company) |
| Project status as of 31.12.2018 | Launched                                    |

A UAV system with specialised photo processing and 3D terrain modelling software has been purchased.

The staff was trained in the operation and maintenance of the UAV system and new software.

#### Implementation effect

“The more efficient surveying system has reduced downtime of quarry equipment and increased the timeliness of taking production decisions.”

**Mikhail Burenkov**

Chief geologist at Razrez Rapsadsky

“The system has created significant time savings for surveying.”

**Valentina Tarasenko**

Chief surveyor at Razrez Rapsadsky

“The user-friendly system helps to take objective managerial decisions.”

**Igor Osadchy**

Director of Razrez Rapsadsky

## PLANS AND PRIORITIES FOR 2019

▶ Develop a predictive maintenance system based on vibration diagnostics data in the wheel-banding shop

EVRAZ NTMK

▶ Develop a recommendation system based on machine learning for the steel smelting shop's continuous casting machine

EVRAZ ZSMK

▶ Develop a recommendation system based on machine learning

Raspadskaya washing plant (Raspadskaya Coal Company)

▶ Develop an expert system based on machine learning in the convertor shop

EVRAZ NTMK

▶ Develop mathematical models for determining non-metallic inclusions while manufacturing rail products

EVRAZ ZSMK

▶ Develop a programme of projects for the transition to electronic document exchange within companies (up to 100,000 documents a month)

EVRAZ NTMK, EVRAZ Metall Inprom

### Automated process control system for steel blowing in converters 4 and 5 of the steel smelting shop

|                                 |                |
|---------------------------------|----------------|
| Subject (area):                 | Expert systems |
| Category:                       | Steel          |
| Company:                        | EVRAZ ZSMK     |
| Project status as of 31.12.2018 | Launched       |

The system optimises smelting in a 350-tonne automated converter.

The blowing pattern is determined using historical smelting data. The system forms optimal control actions in the pattern using three main criteria:

- Regulation of oxygen consumption during blowing
- Regulation of tuyere position during blowing
- Formation and return of part of the loose materials during blowing

#### Implementation effect

The introduction of the system has contributed to the overall effect of the program which aims to improve the efficiency of steel production at EVRAZ ZSMK.

### Electronic document exchange with Russian Railways using digital signatures

|                                 |                                |
|---------------------------------|--------------------------------|
| Subject (area):                 | Lean and paperless back office |
| Category:                       | Sales                          |
| Company:                        | EVRAZ Trading Company          |
| Project status as of 31.12.2018 | Launched                       |

Document exchange has been made paperless with a key customer, Russian Railways, using digital signatures.

Document exchange previously required printing, hand-signing and stamping, and then couriering documents to the customer and archiving paper documents.

The project has made the process fully paperless. Employees sign invoices with digital signatures in the enterprise resource planning system. The documents are then automatically packaged with additional attributes, signed and sent online via the electronic document exchange operator to the customer. At the customer's end, documents are either signed digitally or sent back for correction.

#### Implementation effect

The project's implementation has achieved the quantitative effect of reducing the receivables turnover ratio by five days for a cost savings of roughly RUB50 million a year.

The following qualitative effects have also been achieved:

- Increasing productivity thanks to making documents paperless
- Eliminating the risk of document loss
- Improving the satisfaction of a key customer

### Mobile apps on explosion-proof tablets to monitor underground work

|                                 |                          |
|---------------------------------|--------------------------|
| Subject (area):                 | Mobility                 |
| Category:                       | Mining                   |
| Company:                        | Raspadskaya Coal Company |
| Project status as of 31.12.2018 | Launched                 |

Mobile apps have been developed to collect information about the status of equipment operating in the coal mines.

The apps are installed on explosion-proof tablets and use an underground Wi-Fi network to send the user all current information about the mine's operation, including the location of workers in the mine tunnels, data about the operation and condition of the conveyor belt, as well as the status and sensor readings from the mine gas monitoring and firefighting water supply systems.

Apps have also been developed to control downtime in underground conditions and monitor degassing, including check-lists, control measurements, patrols, behavioural safety conversations and HSE regulations. The apps are integrated with the central control room and include a reporting and monitoring system.

#### Implementation effect

The project has made it possible to objectively monitor mine gas levels, work status and mining equipment. Instant recording of photos and videos has improved data accuracy. The efficiency of shift transfer and reporting has also increased.