

Layers of possibilities



Analyst Day

Lubin, 12-14 February 2019

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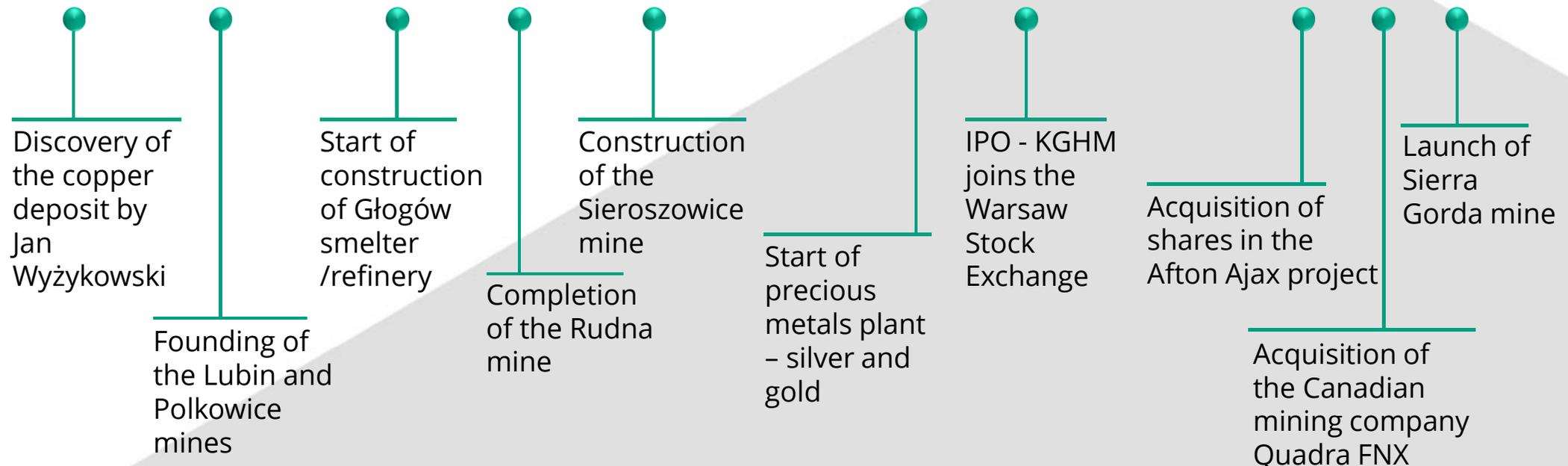
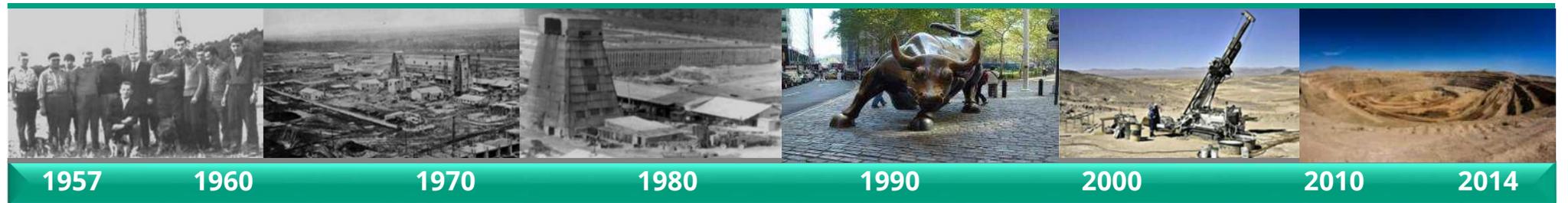
Opening of Analyst Day

Marcin Chludziński
President of the Management Board
KGHM Polska Miedź S.A.

KGHM Polska Miedź – A Proud History of Mining and Metallurgy

Discovery of the copper deposit brought about a fundamental change in the region's economy thanks to the growth of KGHM Polska Miedź S.A.

As a result of M&A activities, capped by the acquisition of Quadra FNX, KGHM became a truly global copper producer aimed at continued growth.



The KGHM Group today – a global metals producer on three continents focused on copper and silver, with other value-added minerals

Canada (Ontario)

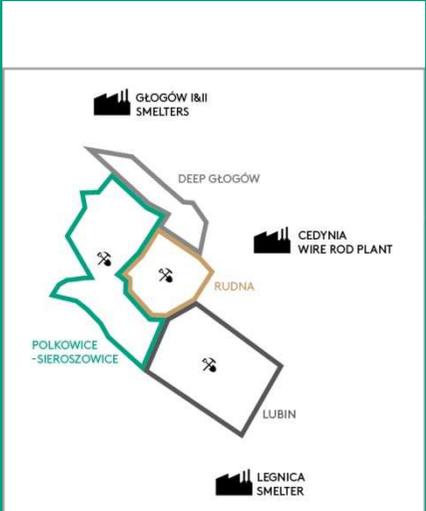
- **Morrison***
(Cu, Ni, TPM)
- **McCreeedy West**
(Cu, Ni, TPM)

USA

- **Robinson**
(Cu, Au, Mo)
- **Carlota**
(Cu)

Chile

- **Sierra Gorda**
(Cu, Mo, Au)
- **Franke**
(Cu)



Poland (Head Office)

- **Mines (Cu, Ag, TPM, other):**
 - ZG Lubin mine
 - ZG Rudna mine
 - ZG Polkowice-Sieroszowice mine
- **Metallurgical plants**
 - HM Głogów (smelting, refining)
 - HM Legnica (smelting, refining)
 - HM Cedyňa (wire rods)



Strategy of KGHM for the years 2019-2023



Strategic development directions of the KGHM Group

#1 Higher production	<ul style="list-style-type: none"> • Higher ore processing by Sierra Gorda (130 kt Cu ore throughput) • Continued high level in Poland (450 kt Cu)
#2 Energy independence	<ul style="list-style-type: none"> • 50% of consumption provided by internal generating resources in the following decade
#3 International Assets 2.0	<ul style="list-style-type: none"> • Review, integration, financial efficiency
#4 Long-term financial strategy	<ul style="list-style-type: none"> • Effective use of long-term instruments, an additional 20% efficiency thanks to back-office digitalisation
#5 Ecosystem Innovation for KGHM	<ul style="list-style-type: none"> • Higher spending on R&D - over PLN 200 million (min. 1% of annual revenues)
#6 Technologies of the future	<ul style="list-style-type: none"> • KGHM 4.0: Internet of Things, automation and digitalisation
#7 New quality safety and development	<ul style="list-style-type: none"> • The Strategy emphasises an ambitious plan for the Management Board and employees, prioritises sustainable development

ELASTICITY/FLEXIBILITY
<ul style="list-style-type: none"> ✓ INDUSTRY 4.0 ✓ DIGITALISATION ✓ ELECTROMOBILITY
EFFICIENCY
<ul style="list-style-type: none"> ✓ INCREASE IN COMPETITIVENESS ✓ INDUSTRY 4.0
ECOLOGY
<ul style="list-style-type: none"> ✓ FOCUS ON ECOLOGICAL PRODUCTION ✓ CIRCULAR ECONOMY ✓ DEVELOPMENT OF PRO-ECOLOGICAL REGULATIONS ✓ ELECTROMOBILITY
E-INDUSTRY
<ul style="list-style-type: none"> ✓ ROBOTISATION ✓ INDUSTRY 4.0 ✓ SOCIETY BASED ON KNOWLEDGE ✓ DIGITALISATION

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KGHM
POLSKA MIEDŹ

Production

Radosław Stach

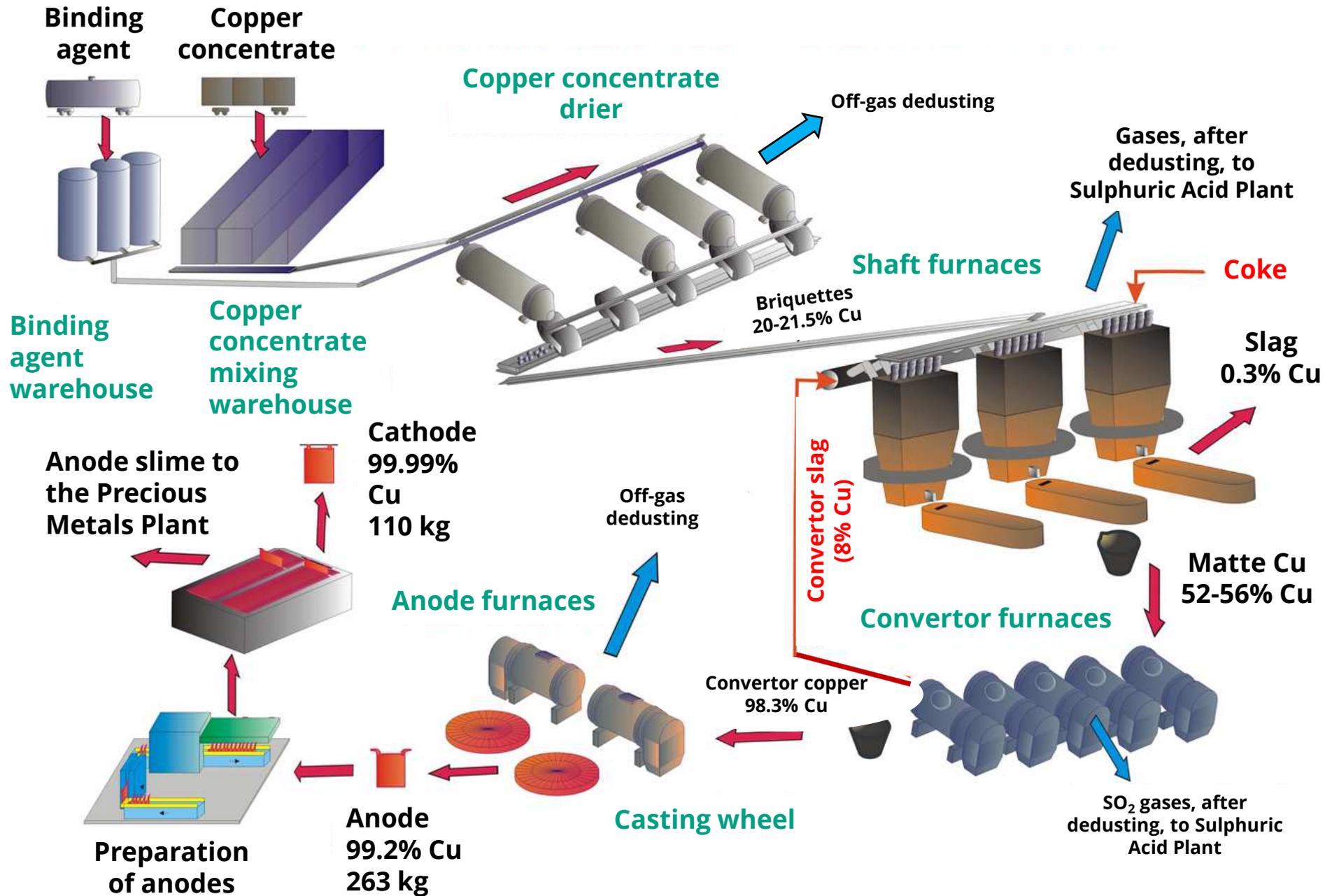
Vice President of the
Management Board (Production)

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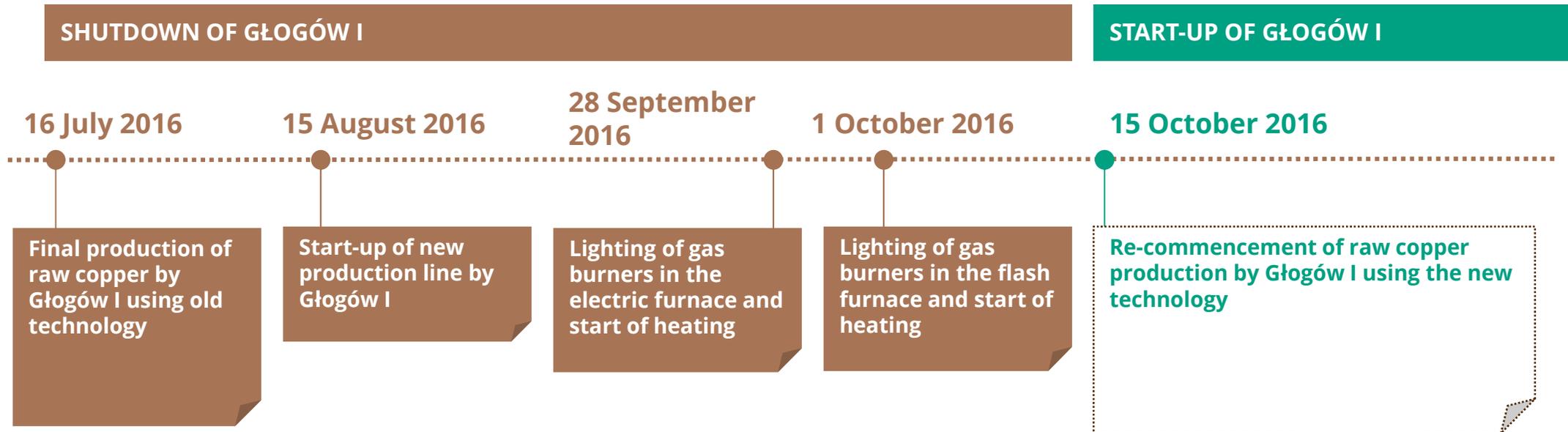
New areas in copper metallurgy

Technology used by the Głogów I smelter until September 2016

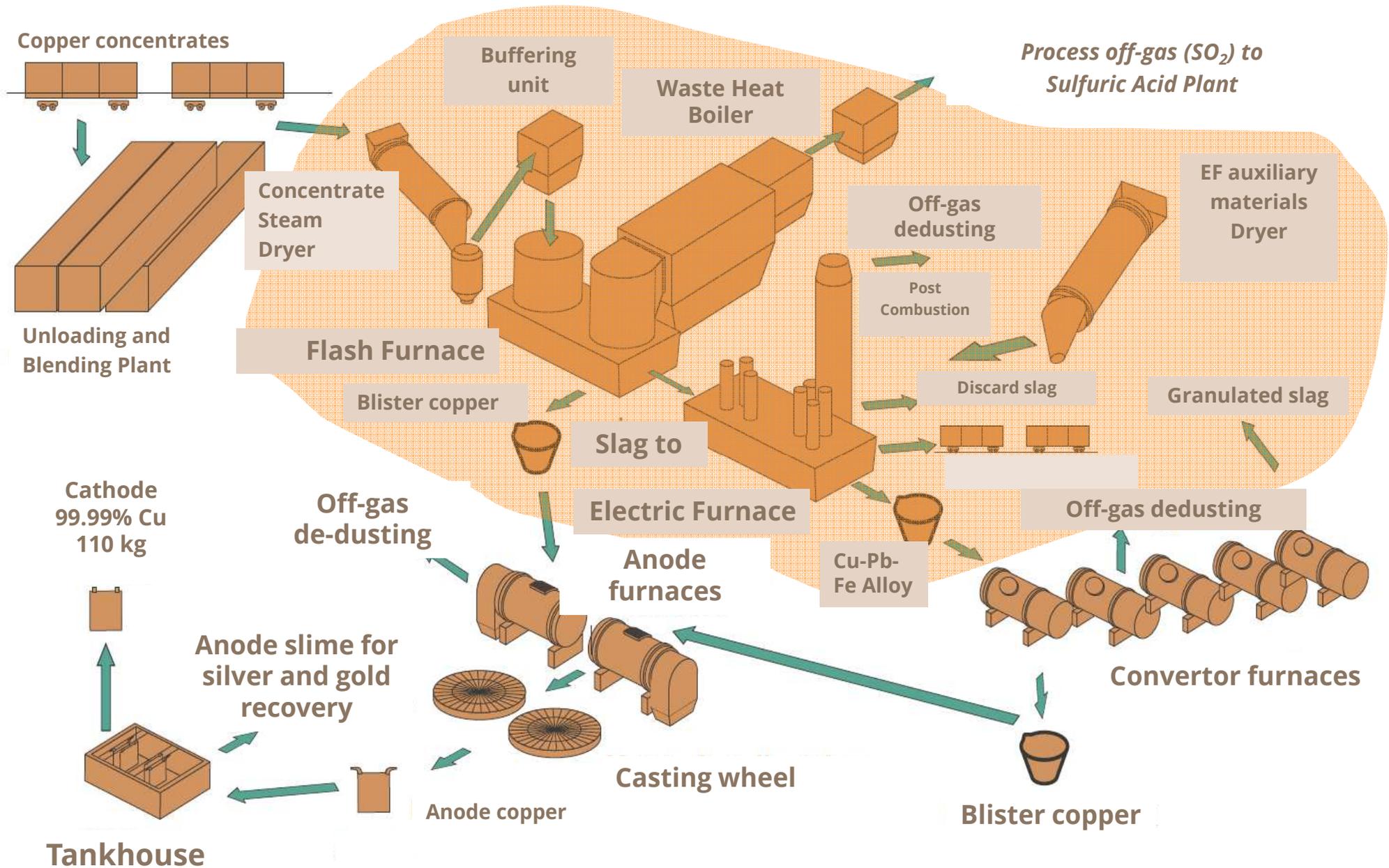


Start-up of flash furnace technology at the Głogów I smelter

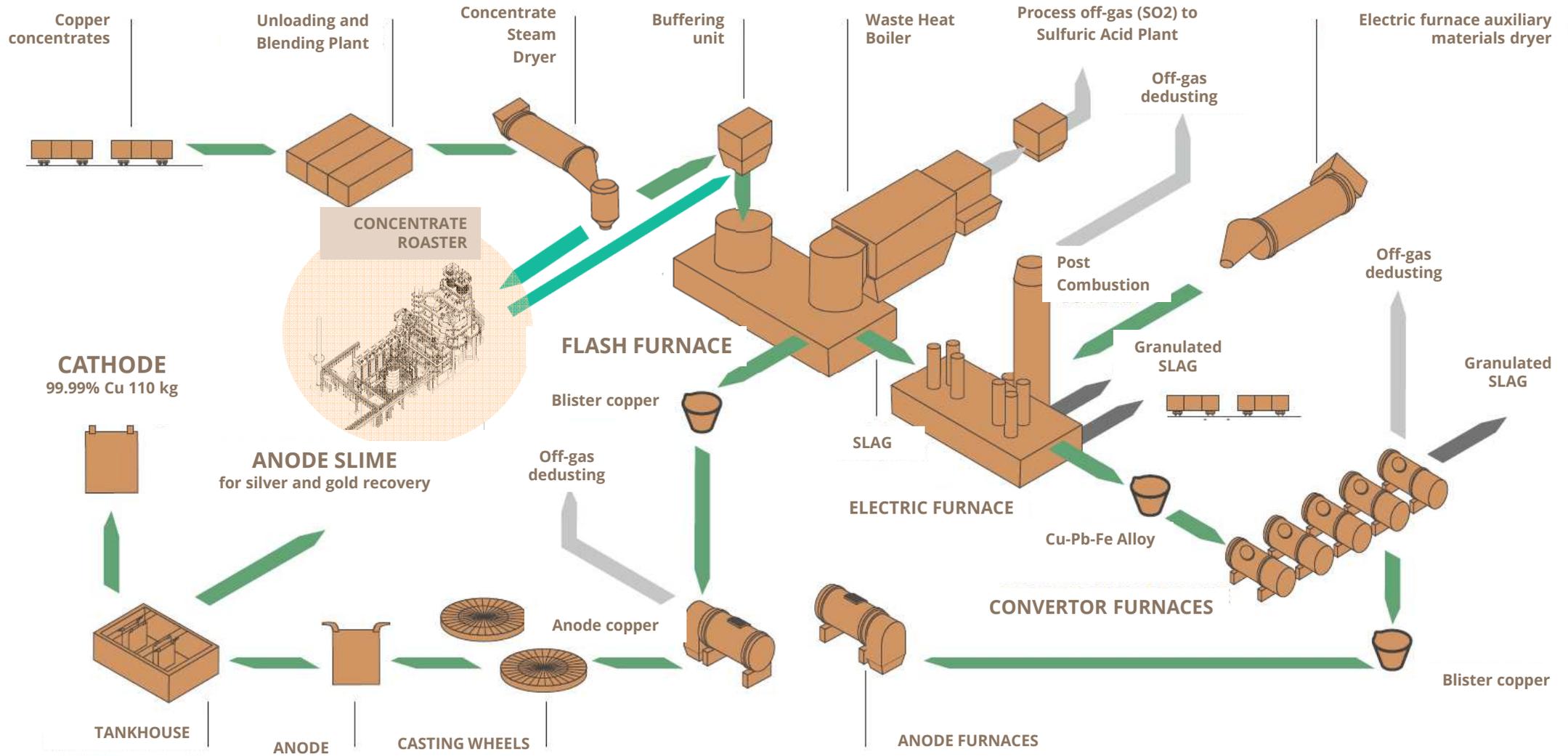
Shutdown and key events



Technology used by the Głogów I smelter from September 2016

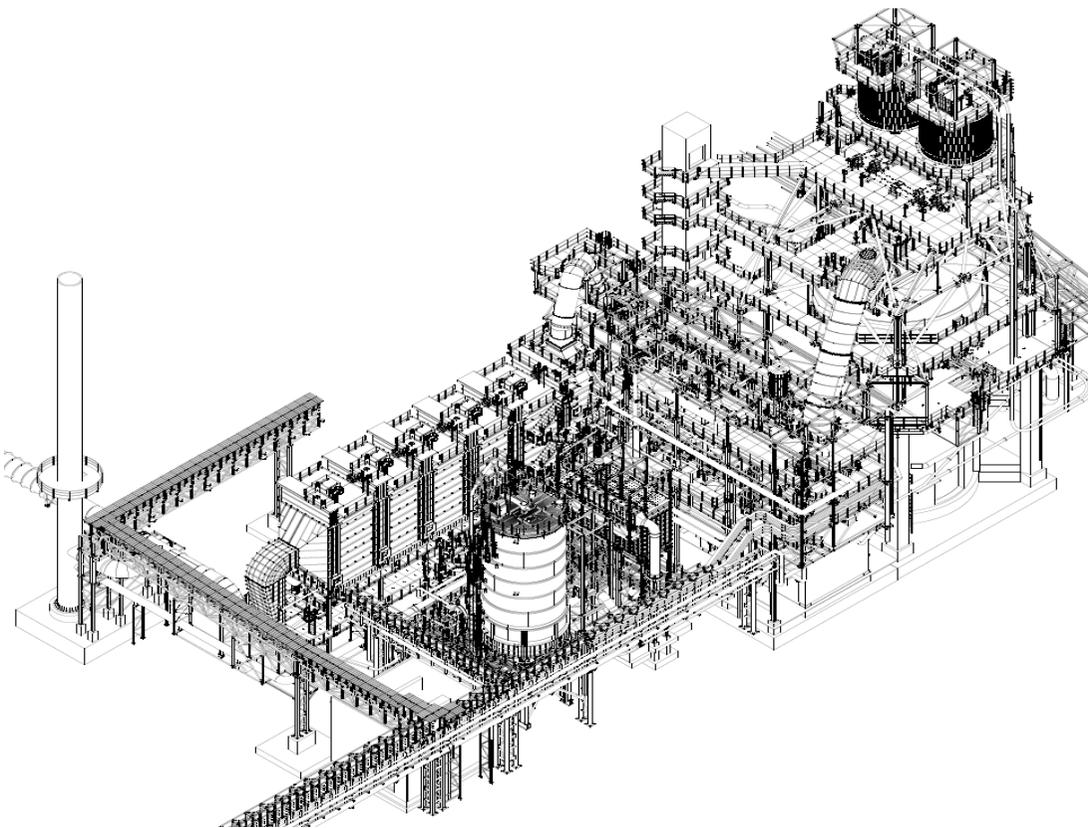


Głogów I – copper concentrate roasting installation



Głogów I – copper concentrate roasting installation (cont.)

The copper concentrate roasting installation is aimed at eliminating organic carbon and sulphur from concentrates in order to reduce the calorific value of the material charged to the flash furnace of Głogów I and thereby increase the efficiency of the concentrates processing cycle. The operation of the roaster is based on fluidised bed technology. The resulting material following roasting is then comprised of oxides and sulphides.



Głogów I – copper concentrate roasting installation (cont.)

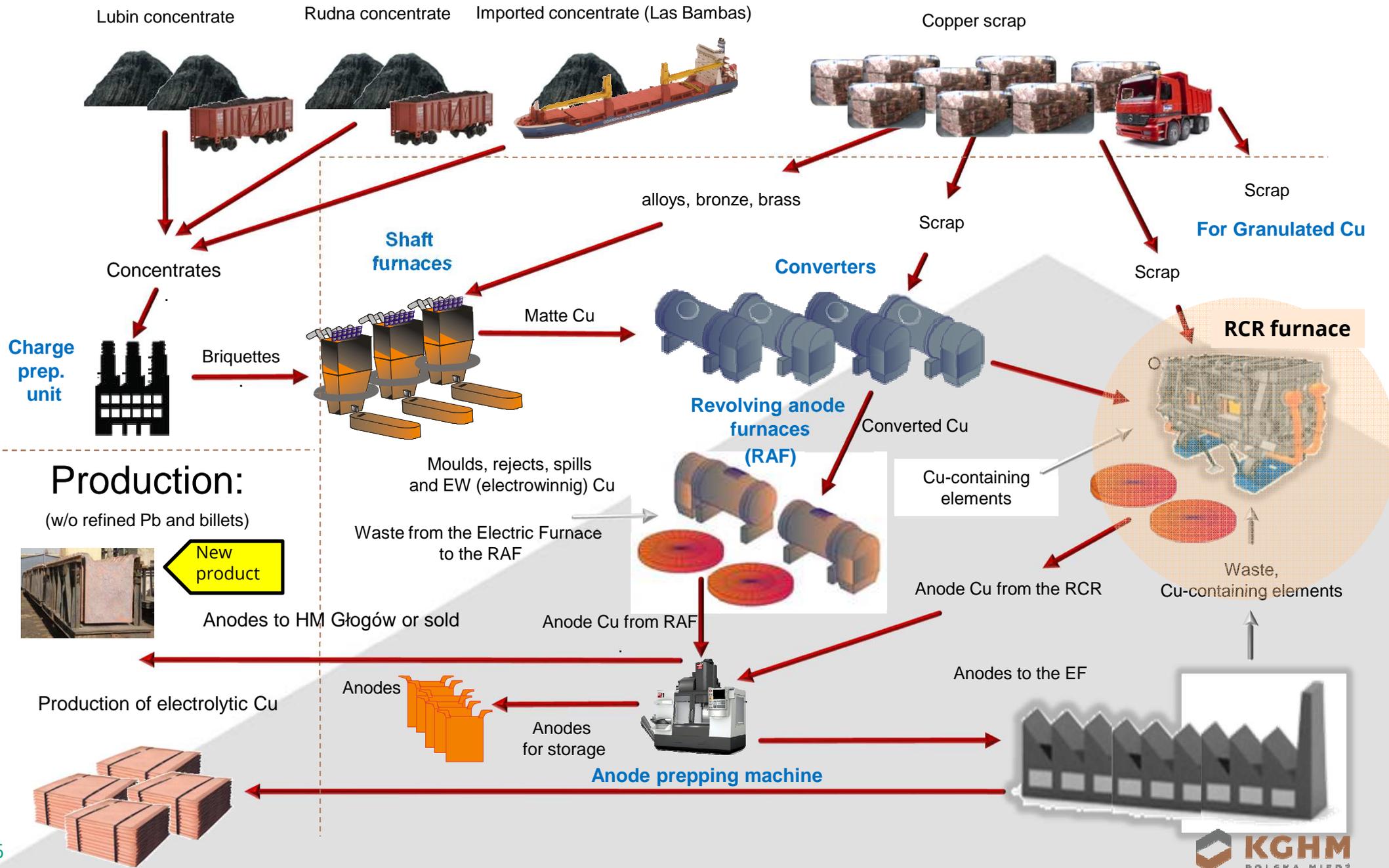
The roaster utilizes fluidised bed technology, which means that heated material, in appropriately small fractions, creates a layer (thickness of approx. 1.5m) under which air is blown. This creates a fluid with suspended solids, in which the speed at which the minerals contained in the concentrate are drawn upward matches their gravitational drop (i.e. the material acts like a liquid). Thanks to the size (surface area) of the concentrate portion thus achieved (comprised of sulphides, hydrocarbons and elements of barren rock) it is possible to achieve maximum oxidation, which generates energy for heating the next portion of concentrate.

During the roasting process gases containing high levels of high-temperature CO₂ and SO₂ are recovered, which after cooling in the boiler and dedusting in cyclones and electrofilters are sent to the sulphuric acid plant. Heat from the gases is recovered from the fluidised bed of the roaster and from its cooling units using piping and a recovery boiler, then the steam created from this process (around 30 t/h) is put through a generator to produce electricity (around 7.4 MW).



Głogów I's concentrate roasting installation is in the process of being brought on line.

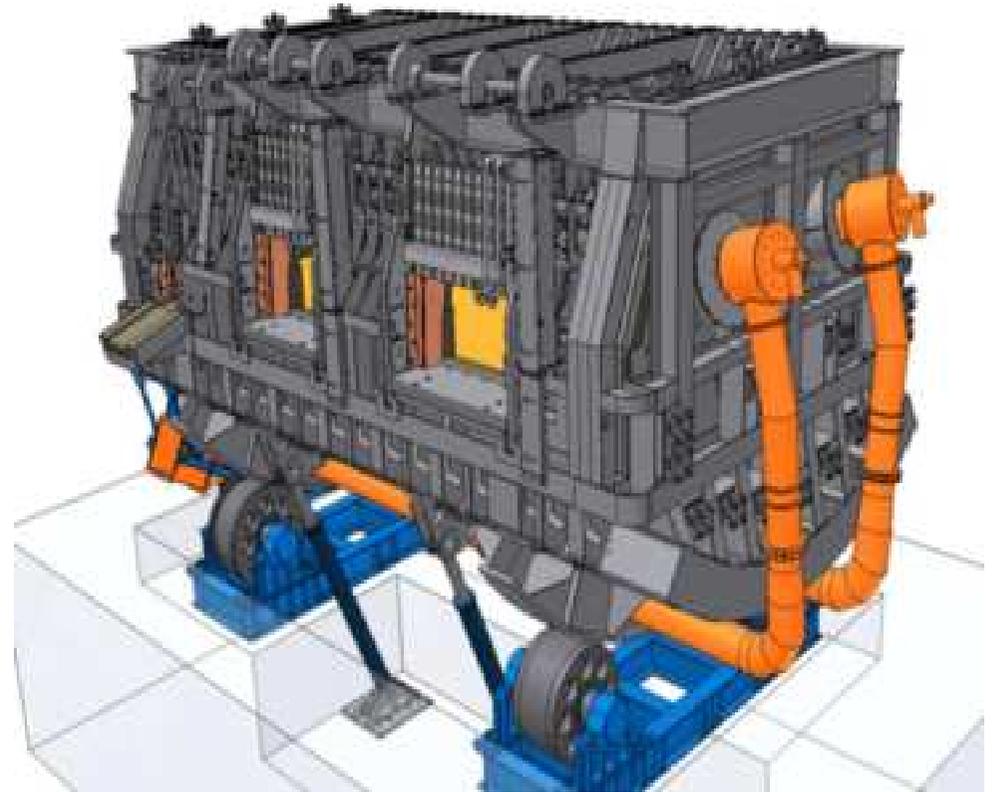
HM Legnica metallurgical plant – RCR furnace technology



HM Legnica - Revolving Casting-Refining furnace (RCR)

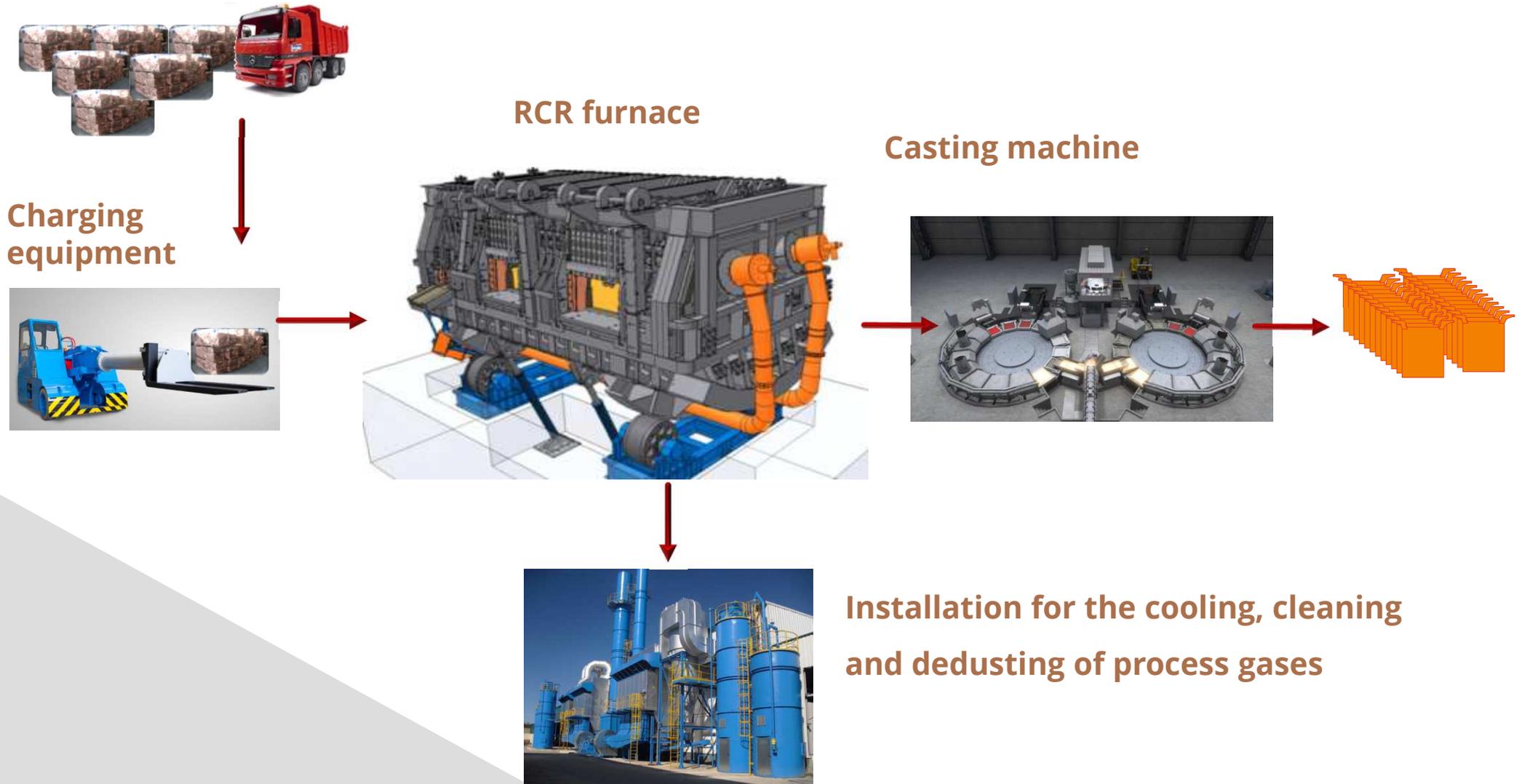
RCR – This is a tank-type, revolving furnace with a casting element (air, oxygen, gas) and a refining element, with a dedusting and ventilation sequence as well as loading and casting (carousel).

- Casting and fire refining capacity up to 100 kt/year based on copper-bearing charge material containing a min. 89% Cu. (scrap classes I-III, tank hall waste, anode forms, anode scrap and waste, etc.).
- Average copper content in waste is 95%.
- The product of the furnace's casting and refining is anode copper.
- Maximum annual anode copper production of 90 kt.

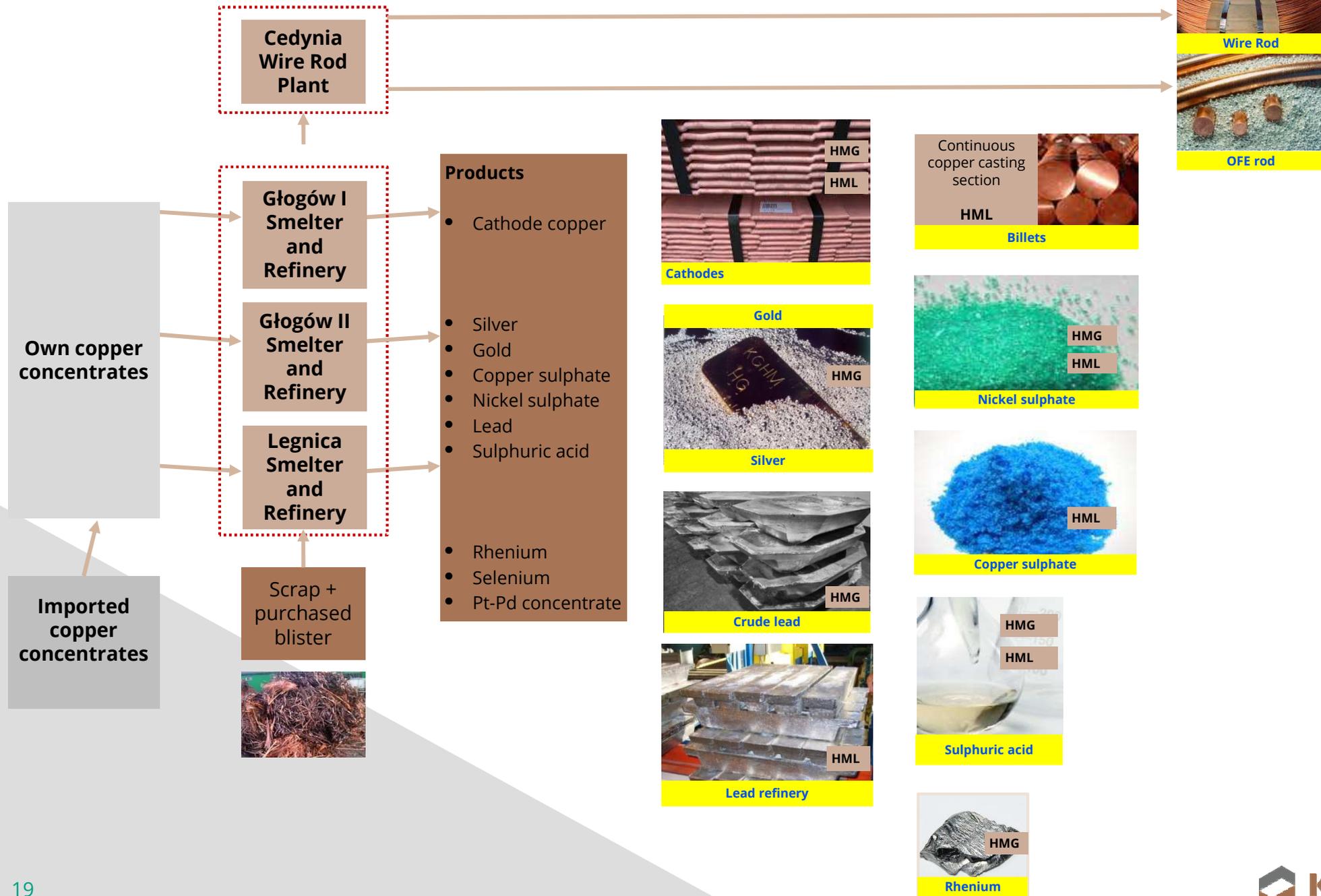


Commissioning of the RCR furnace for the processing of scrap at the HM Legnica plant is expected in April 2019. Ramp-up to full capacity by the RCR furnace at the HM Legnica plant is on schedule.

Primary parts of the RCR furnace installation



Metallurgy in KGHM is dedicated to the processing of own concentrates but other copper-bearing materials can also be efficiently processed



Production targets

Execute the production plan for 2019 as follows:

- ❑ **Electrolytic copper** **559 thousand tonnes**
- ❑ **Metallic silver** **1 341 tonnes**

Pursuant to the strategy for the years 2019 – 2023:

- ❑ Maintain cost-effective domestic and international production.
- ❑ 35% of metallurgical production to the year 2030 from purchased metal-bearing materials, including scrap
- ❑ Average annual metallurgical production in the period 2019-2023 - 540 thousand tonnes
- ❑ Maintain high-quality products (especially cathodes).
- ❑ Actions aimed at reducing the amount of waste and tailings produced
- ❑ On-going actions aimed at maintaining all installations in good working order, in terms of production as well as environmental protection.
- ❑ Enhance the flexibility of production lines to deal with changes in the composition of concentrates produced by KGHM.

Significant Investments in the years 2019-2026

Development-type investments

- ❑ Commissioning of the copper concentrate roasting installation at HMG I in 2019.
- ❑ Construction of an installation to produce scorodite (an ecologically neutral waste product of arsenic), realisation after 2022 – presently at the R&D stage.
- ❑ Construction of a revolving casting–refining (RCR) furnace at the HM Legnica metallurgical plant.
- ❑ Post-2022: modernisation of the sulphuric acid plant to adapt to the increased flow of sulphates from imported concentrates (HMG).

Replacement-type investments

- ❑ Renovation of the Tank Hall, 2022 – 2026 (HMG).
- ❑ Construction of a new anode slimes cleaning installation, 2019-2021 (HMG).

Program to Restrict Arsenic Emissions - BAT As

Program goal: to adapt metallurgical infrastructure to existing EU legal requirements, with Program execution in the years 2018-2022 (status: under analysis).

- ❑ Development of the Concentrates Warehouse.
- ❑ Modernisation of the Deduster of Anodes Unit II.
- ❑ Renovation of the wet electrofilters in the Lead Section.
- ❑ Construction of the Biechów III Tailings Storage Facility.
- ❑ Construction of an installation to prepare desulphurised off-gas materials for smelting in the flash furnace.
- ❑ Installation to remove arsenic and mercury from gases of the Solinox installation.
- ❑ Construction of a second-stage wet deduster for the chargé materials dedusting installation to reduce arsenic and mercury emissions to the levels set forth in BAT conclusions.
- ❑ Design and construction of an installation to remove arsenic from gases above the TM-16 casting machine.
- ❑ Construction of an installation to remove sulphur and dust from granulate production process gases.
- ❑ Modernisation of the PSZ.1 bag filter dedusting unit and of the PSZ.2 and PSZ.3 cassette filters at the Shaft Furnaces.
- ❑ Modernisation of the shaft furnaces settlement chambers at HM Legnica

Summation – Metallurgy in KGHM

- ❑ KGHM efficiently processes its own concentrates along with supplementation by imported concentrates and other copper-bearing materials.
- ❑ Planned average annual metallurgical production in the period 2019-2023: 540 thousand tonnes.
- ❑ KGHM is intensifying the processing of copper scrap and plans to process over 100 thousand tonnes of scrap at the HM Legnica metallurgical facility.
- ❑ KGHM limits its environmental footprint by applying closed-circuit methods.
- ❑ KGHM is not only a key producer of copper and silver but also of other materials (gold; sulphuric acid; copper sulphate; nickel sulphate; lead; sulphuric acid; rhenium; selenium; Pt-Pd concentrate; road-building material from waste slag). Moreover, the company is analysing the economic feasibility of recovering materials containing Bi (bismuth), Co (cobalt), Zn (zinc), Sn (tin) and Sb (antimony).
- ❑ KGHM is an environment-friendly copper producer, in compliance with environmental standards.
- ❑ KGHM's metallurgical facilities have achieved nearly 100% production capacity, in terms of the processing of its own concentrates, imported materials and scrap.



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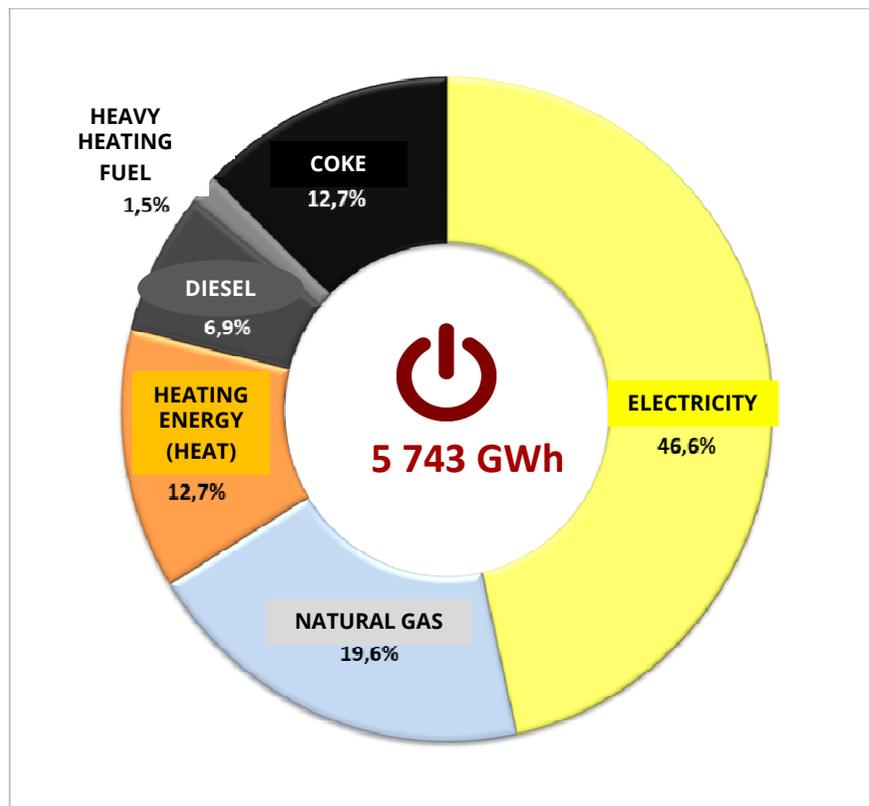


Energy

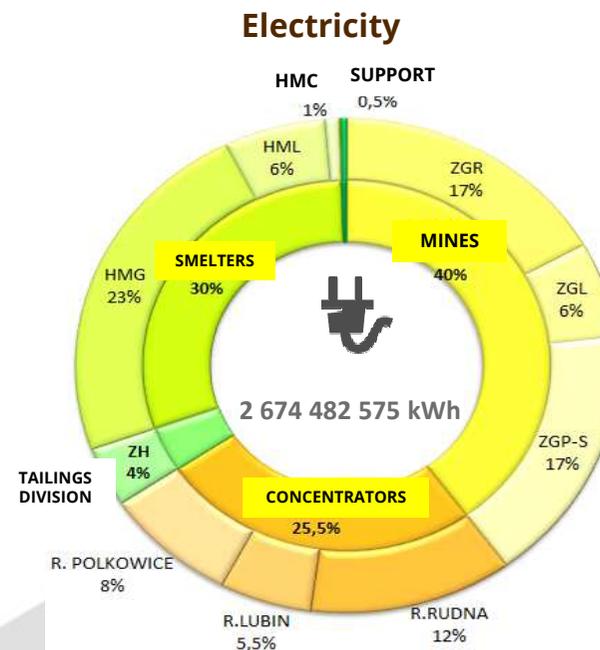
Adam Bugajczuk

Vice President of the Management Board
(Development)

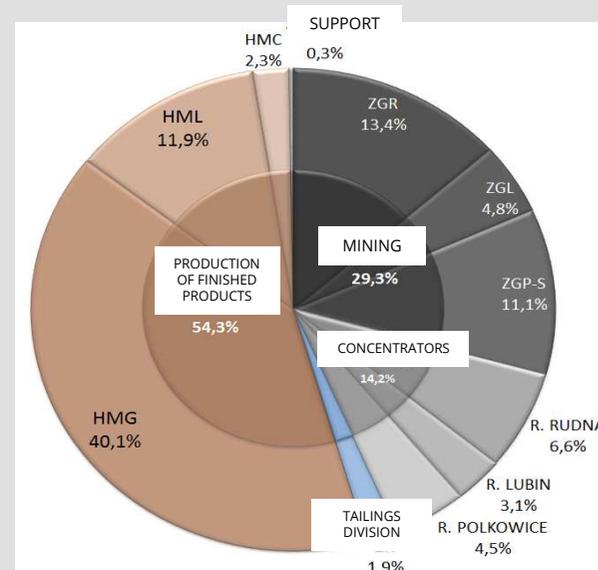
Energy flows - energy review 2017



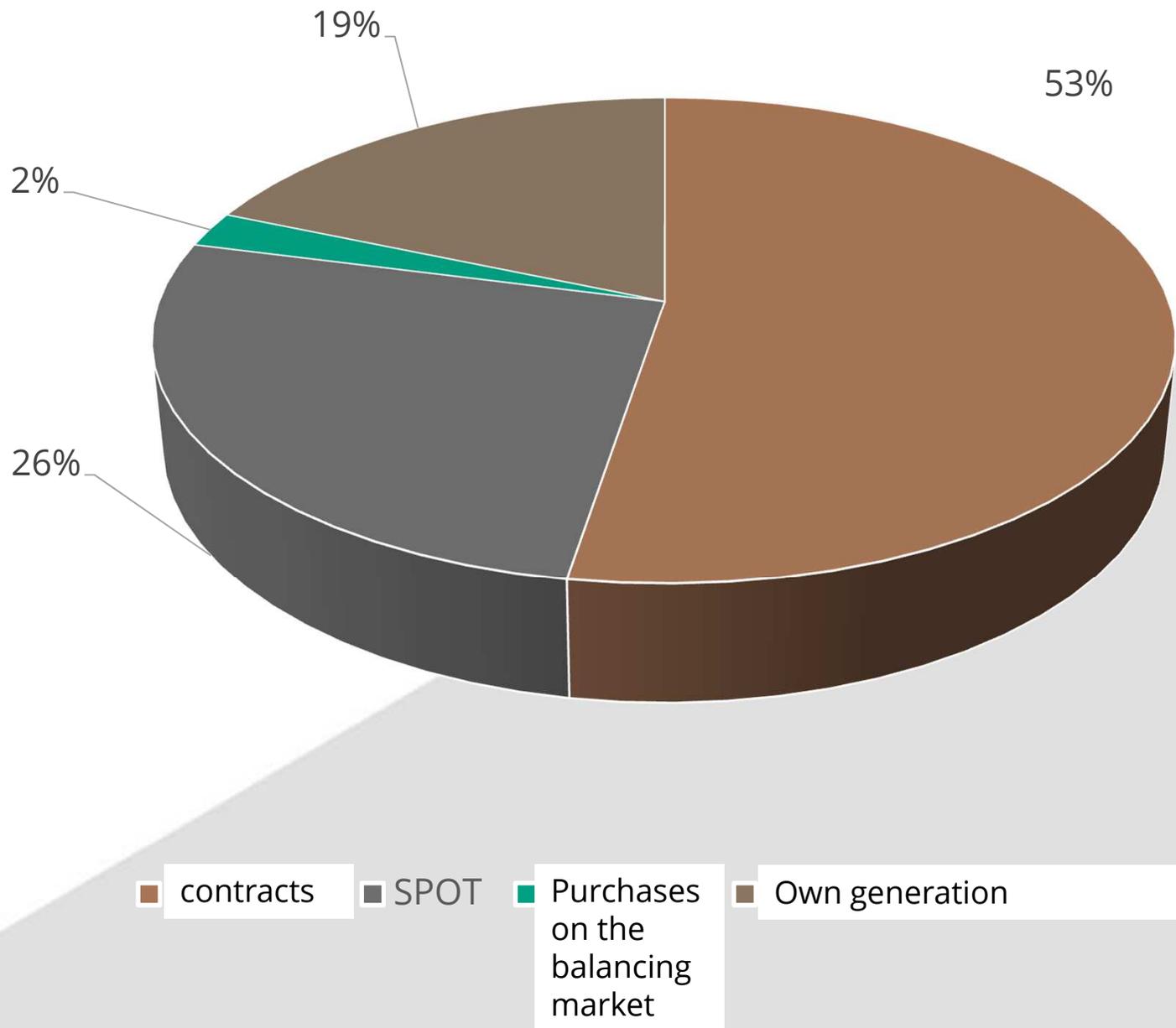
Total energy flows



Structure of Energy use in KGHM



Struktura of electricity procurement 2018



Prices, prices...

EUA SPOT candle chart (EUR)



BASE_Y-19

Yr prior to delivery – CO₂ increases



BASE_Y-18

1 and 2 years prior to delivery



BASE_Y-20

2 years and 1 year prior to delivery



Energy Policy and Energy Management System certificate compliant with PN-EN 50001



URZĄD DOZORU TECHNICZNEGO
UDT - CERT

CERTYFIKAT

Nr CSE/1048/2017

Jednostka Certyfikująca Systemy Zarządzania UDT-CERT
poświadcza, że firma:

KGHM Polska Miedź S.A.

ul. M. Skłodowskiej-Curie 48, 59-301 Lubin
wraz z lokalizacjami wymienionymi w załączniku

wdrożyła oraz stosuje system zarządzania energią zgodny z normą

PN-EN ISO 50001:2012

Zakres certyfikacji:

**Wydobycie i wzbogacanie rud miedzi.
Hutnictwo i rafinacja koncentratów miedzi.**

Data udzielenia certyfikacji:	04.09.2017
Data wydania certyfikatu:	19.09.2017
Data ważności certyfikatu:	03.09.2020

Dyrektor Departamentu
Certyfikacji i Oceny Zgodności



Jacek Niemczyk

Prezes UDT



Andrzej Ziółkowski




UDT-CERT, 02-353 WARSZAWA, UL. SZCZĘŚLIWICKA 34



Polityka Energetyczna KGHM Polska Miedź S.A.

Jako globalne przedsiębiorstwo surowcowe, tworzone przez ludzi z pasją i kompetencjami, wiemy jak fundamentalne dla budowania wartości naszej firmy i bezpieczeństwa pracy naszych pracowników jest efektywne zarządzanie energią.

Podstawowym celem KGHM Polska Miedź S.A. w zakresie zarządzania energią jest prowadzenie racjonalnej gospodarki energetycznej przy zapewnieniu bezpieczeństwa energetycznego zasilania obiektów i instalacji.

Wiemy, że podstawowe zasady zarządzania energią to:

- identyfikacja występujących strumieni energetycznych i nadzór nad nimi,
 - zmniejszanie zużycia energii i eliminowanie jej strat,
 - stałe monitorowanie i doskonalenie wykorzystania nośników energii oraz możliwości jej odzyskiwania.
- Równocześnie, mając świadomość, że jakość życia naszych pracowników, współpracowników i akcjonariuszy zależy od kondycji finansowej i wartości firmy, dążymy do:
- zapewnienia wymaganego poziomu niezawodności procesu technologicznego,
 - zmniejszenia wydatków ponoszonych na zakup energii, dzięki optymalizacji jej zużycia i wykorzystaniu alternatywnych źródeł.

Dlatego, wykorzystując systemowe narzędzia zarządzania energią, w tym normę PN-EN ISO 50001, zobowiązujemy się do:

- zapewnienia wszelkich zasobów wymaganych do realizacji zaplanowanych celów i zadań,
- prowadzenia działań zgodnie z przepisami prawa i innymi wymaganiami związanymi z wykorzystaniem energii,
- kreowania pożądanych postaw, budowania świadomości i stałego podnoszenia kompetencji pracowników Spółki i współpracowników, realizujących zadania na rzecz KGHM,
- zapobiegania marnotrawstwu w obszarze wykorzystania energii,
- współpracy z partnerami i dostawcami w zakresie zakupu dóbr materialnych i usług z uwzględnieniem efektywności energetycznej jako istotnego kryterium wyboru,
- stałego nadzoru nad Systemem Zarządzania Energią i jego efektywnym działaniem za pomocą okresowych przeglądów na poziomie najwyższego kierownictwa KGHM.

Niniejsza Polityka Energetyczna jest opublikowana, znana i realizowana przez wszystkich pracowników KGHM Polska Miedź S.A. i inne osoby pracujące na rzecz Spółki.

Wydanie 1
Lubin, 28 listopada 2016 r.


Przes Zarządu



Energy Savings Program and Energy Management System



65.4
GWh

• TOTAL FINAL ENERGY SAVINGS FROM ALL FLOWS
_____ 2018 _____

32.2
GWh

• TOTAL FINAL ENERGY SAVINGS FROM ALL FLOWS
_____ 2017 _____

Power supply security for KGHM – blackout management

In case of a loss of power supply, KGHM is able to independently provide energy supply to ensure the safe evacuation of 4.5 thousand miners to the Surface.



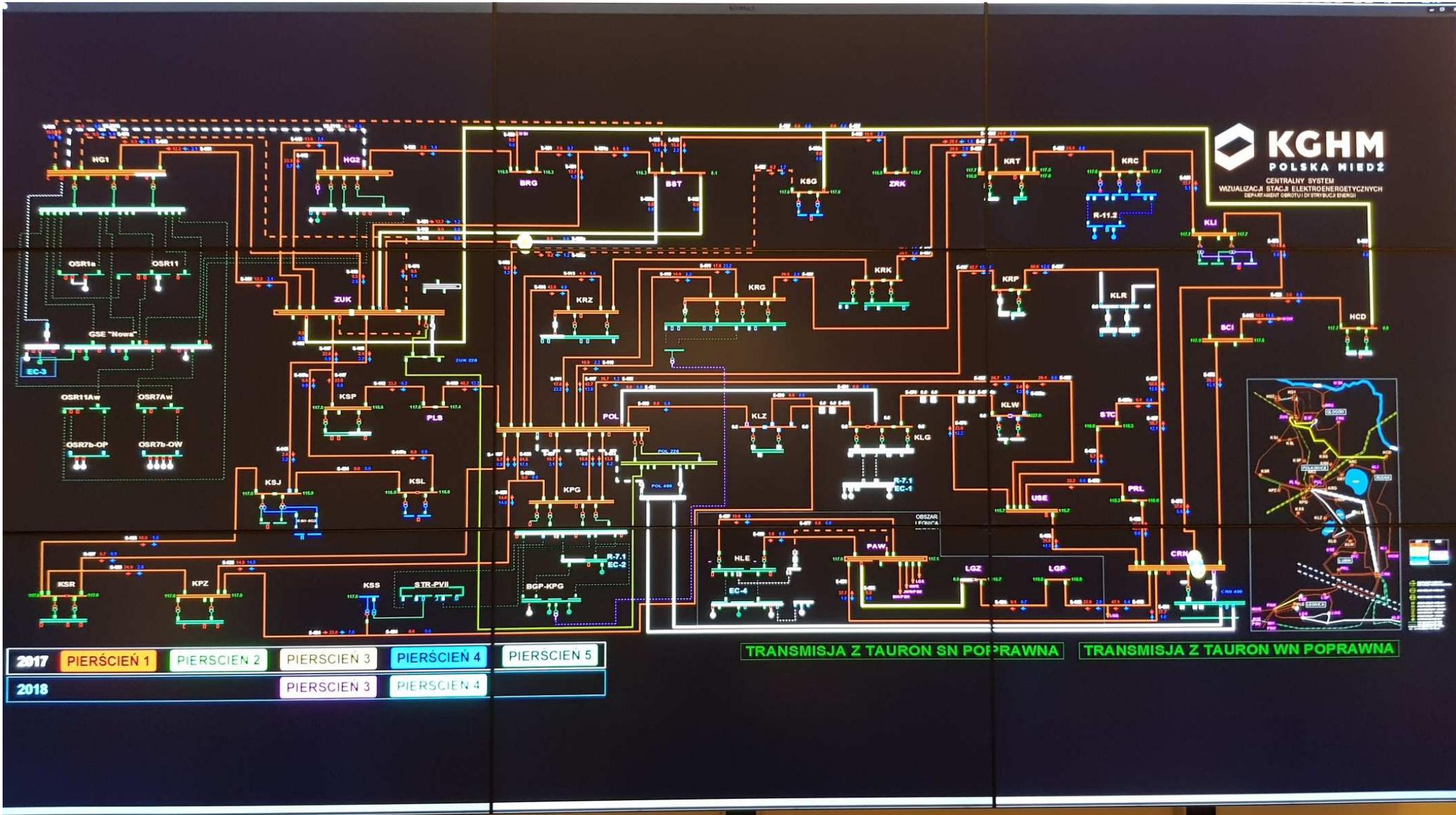
As a result of the completion in 2014 and 2015 of projects aimed at enhancing energy security (such as the Gas-Steam Blocks in Polkowice and Głogów and the gas engine in Legnica), KGHM is able to assure itself of the „minimum level of security”, understood as:

- Mining – ensuring power supply to enable underground employees to reach the Surface.
- Processing – ensuring power supply to enable the pumping of water and slimes.
- Metallurgy – ensuring power supply to enable a controlled shut-down of the production line.

Gas-Steam Blocks – a key initiative of KGHM in the electricity and heat generation sector

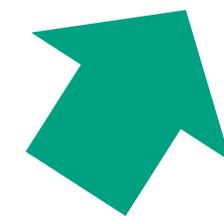
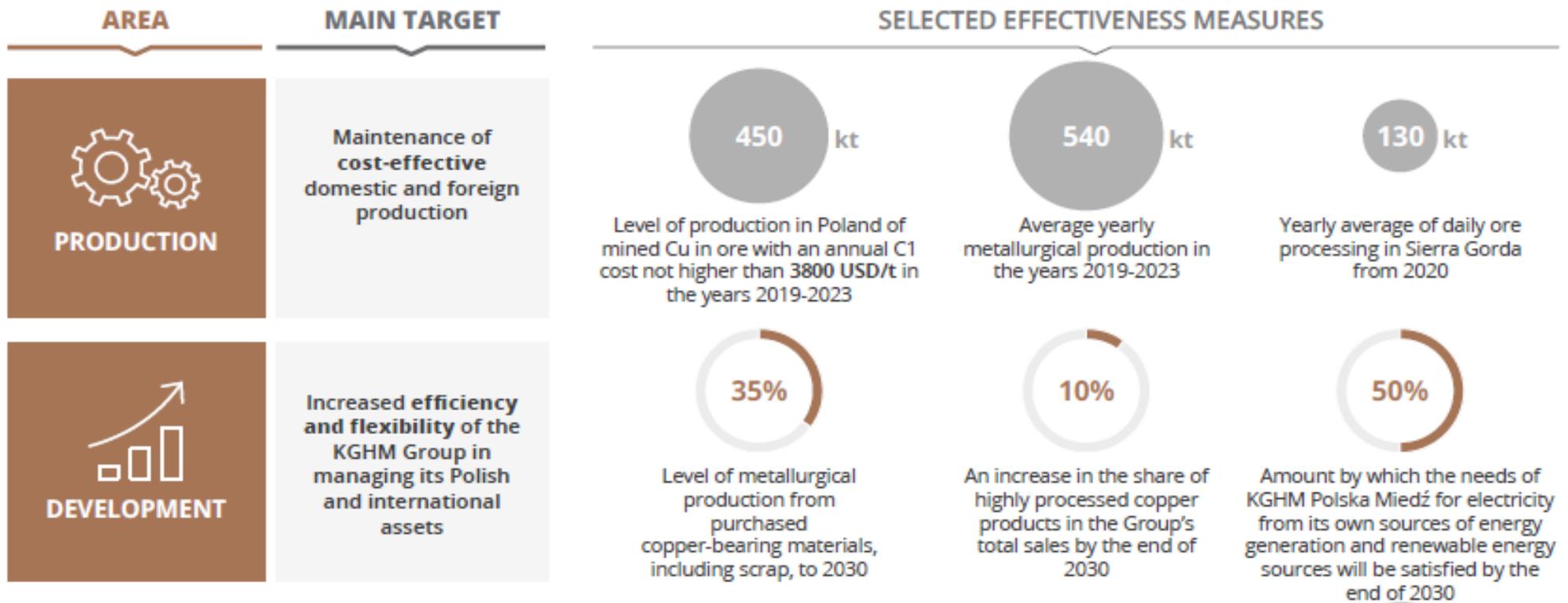


Central energy management visualisation system



Strategic assumptions with respect to internal generation sources

Strategy in practice Selected key operating initiatives



Directions for new power generation installations

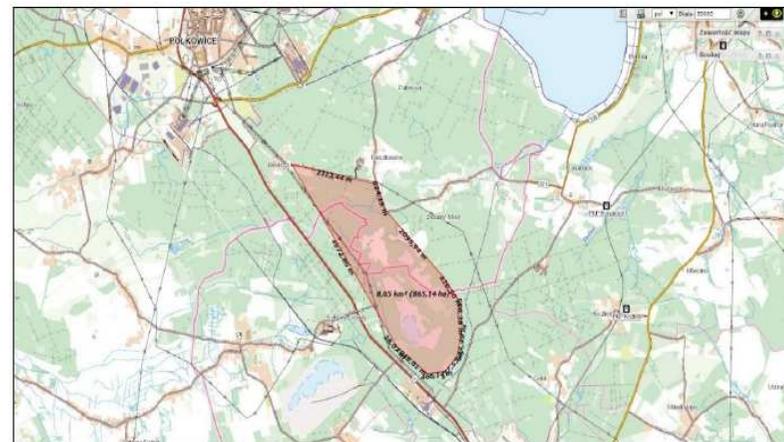
- ▶ another high-efficiency, tri-generation climate control station



- ▶ Surface area utilising solar panels



- ▶ Area free of forest and w/o water – approx. 50 ha



- ▶ Area free of forest and w/o water – approx. 100 ha



CAPEX – Main production line investment projects in Poland

Deposit Access Program



The **DAP Program** includes the construction of the **GG-1 ventilation shaft** designed for transporting material and employees, with a target depth of 1350m and a diameter of 7.5m.

Procedures were commenced related to a change in planning documentation related to the future construction of the **GG-2 „Odra” shaft**.

Construction began on the **Surface-based Central Air Conditioning System (SAS)** at the GG-1 shaft. An environmental impact decision was obtained for building the SAS along with a construction permit.

In 2018 a total of 45,302.5 metres of **underground excavations in the Rudna and Polkowice-Sieroszowice mines** were built, or nearly 80 % of the total amount of access and preparatory tunneling in KGHM.

Program to adapt the technological installations of KGHM to the requirements of BAT Conclusions for the non-ferrous metals industry together with restricting arsenic emissions (BATAs)

The **BATAs Program** comprises 26 new investment projects underway at the Głogów and Legnica metallurgical facilities. The goal of the program is to adapt the technological installations of KGHM to BAT conclusions for the non-ferrous metals industry.



Increasing production capacity to 160 thousand tonnes of copper/year at the Legnica metallurgical plant



This project involves construction of a **Revolving Casting-Refining furnace** with associated infrastructure, for the processing of copper scrap containing over 90% Cu. Start-up is planned for the second quarter of 2019.

Development of the Żelazny Most Tailings Storage Facility

Based on the permit received in 2016 to develop the Main Facility to a crown height of 195 meters a.s.l. and a permit to further operate the Tailings Storage Facility, the dam is being built up successively as part of the on-going operations of the Parent Entity.

In March 2018 permission was received to **build the Southern Quarter**, enabling the additional deposition of waste tailings in the amount of 170 million m³. A permit was also received enabling **construction of the Tailings Segregation and Thickening Station** and construction was begun.



Exploration

Geological work is underway under concessions to explore and assess copper ore deposits in the regions **Synklina Grodziecka and Konrad, Retków-Ścinawa and Głogów**, as well as potassium-magnesium salt deposits in the **Puck** region



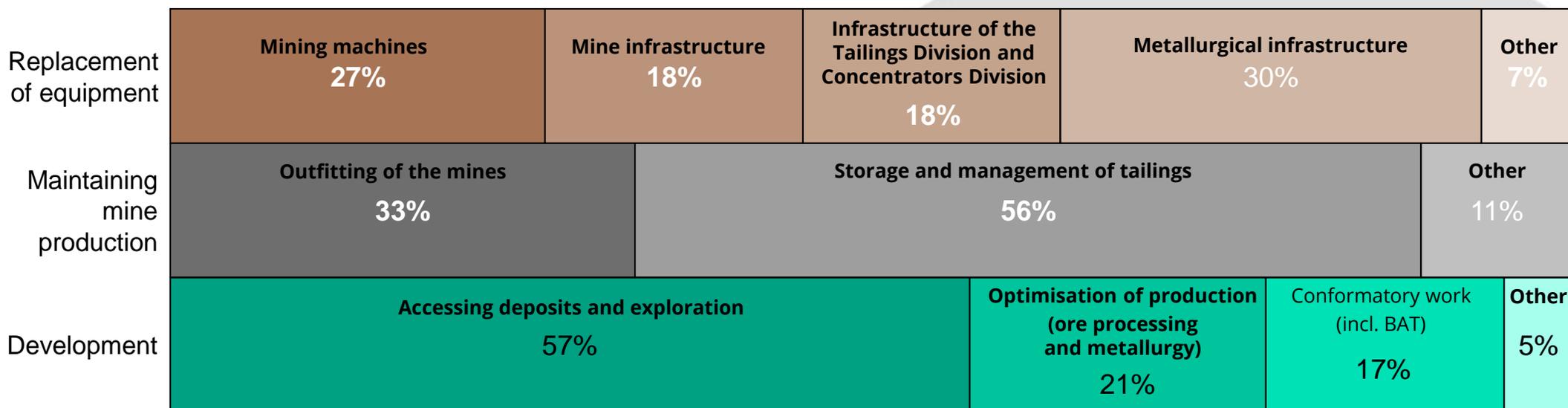
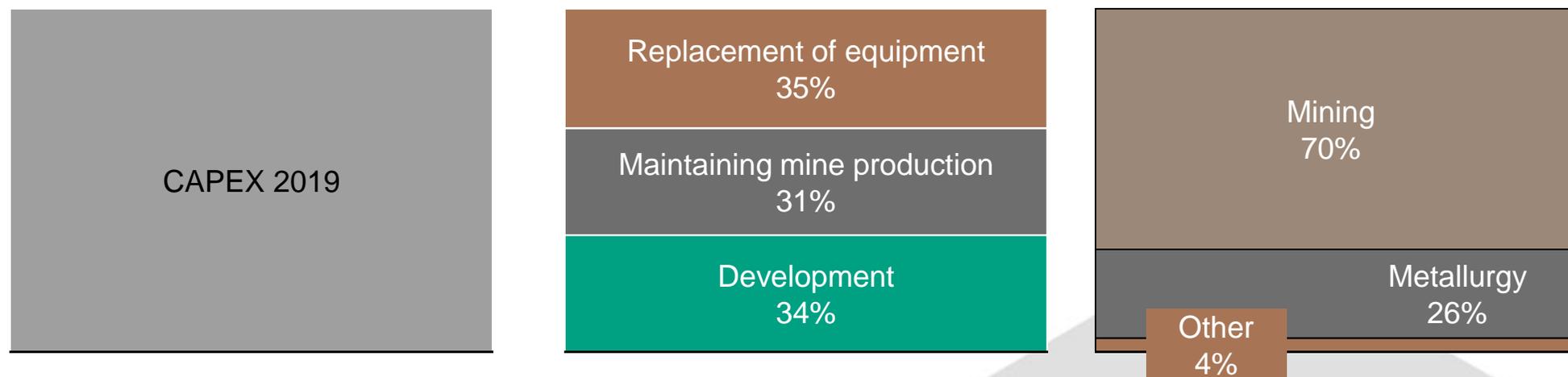
KGHM 4.0 Program

The **KGHM 4.0 Program** is a venture representing an implementation of the Industry 4.0. concept within the technical-organisational environment of KGHM Polska Miedź S.A.

In 2018, under the group of projects in the **area Industry**, an electric vehicle charging point available to anyone was opened in Lubin. Under the group of projects in the area ICT projects are being advanced involving among others multidimensional data analysis and standardisation of ERP systems.



CAPEX structure in 2019





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Sierra Gorda

Paweł Gruza

Vice President of the Management Board
(International Assets)

Sierra Gorda

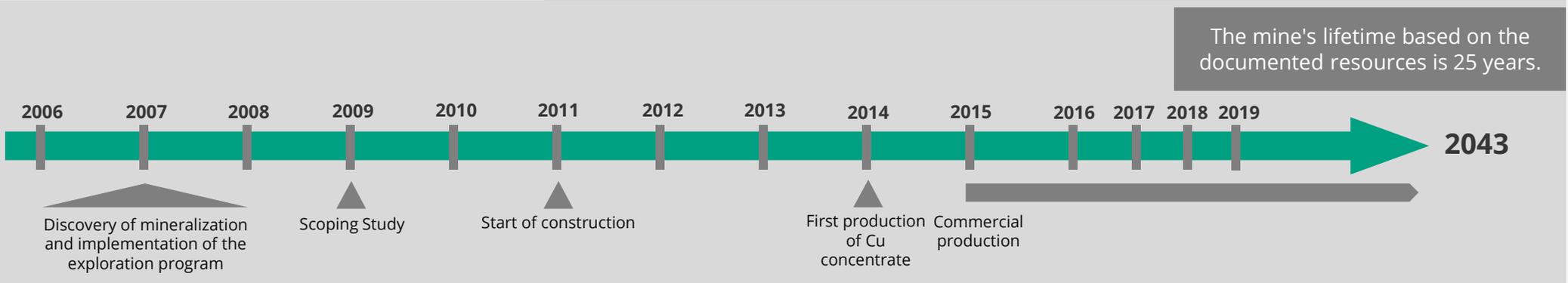
Sierra Gorda is an open-pit copper and molybdenum mine located in the Chilean Antofagasta region in the Atacama desert, 60 km from the town of Calama in the north of Chile.

Sierra Gorda is a Joint Venture between:

- KGHM Polska Miedź S.A. – 55% interest,
- Sumitomo Metal Mining – 31.5% interest,
- Sumitomo Corporation – 13.5% interest.



Development of Sierra Gorda



The products of the Sierra Gorda technological process:

- Cu concentrate
- Mo concentrate

Cu Payable in 2018

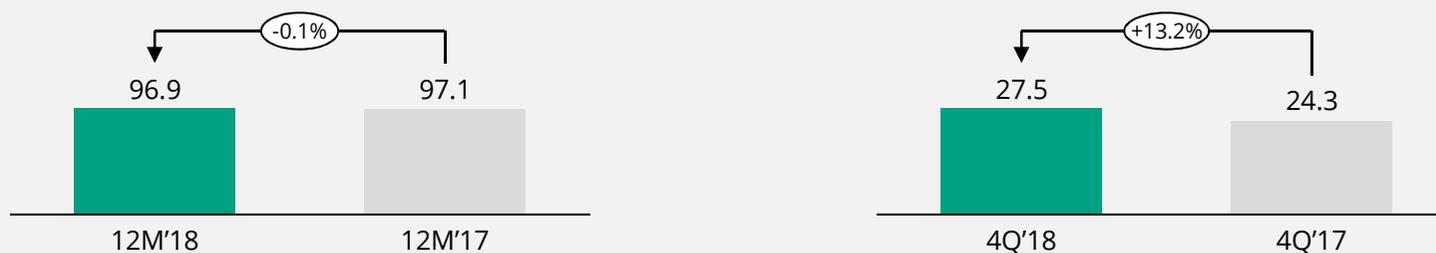
96.9 kt

Mo Payable in 2018

26.7 Mlbs

Sierra Gorda – production results

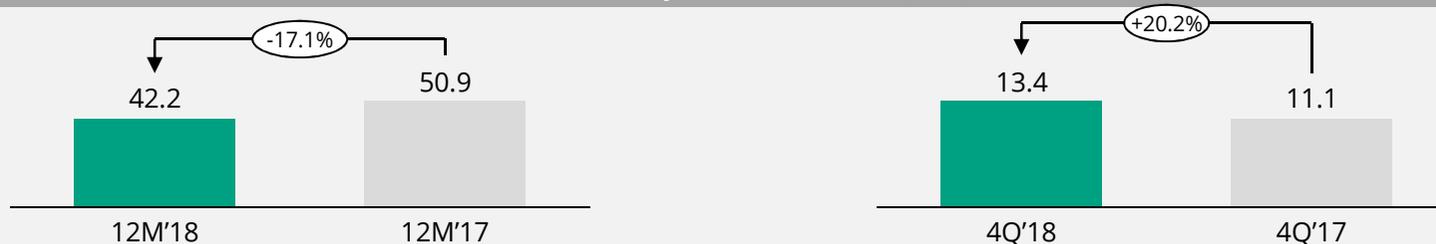
Cu Payable Production [kt]



Mo Payable Production [Mlbs]



TPM Payable Production [koz]

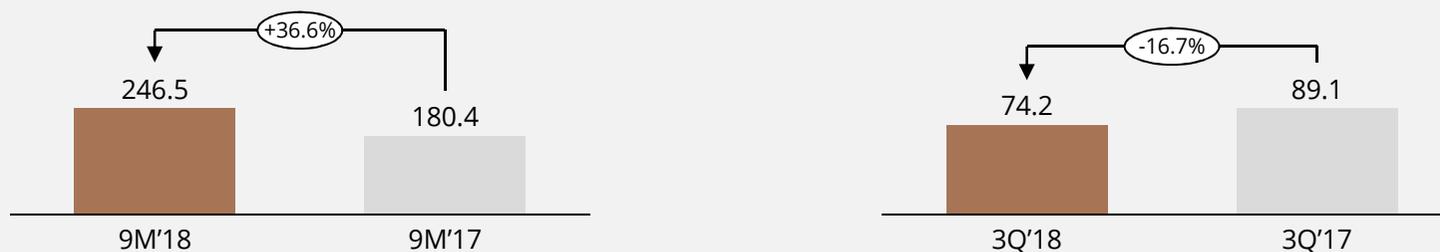


Silver Payable Production [t]



Sierra Gorda – financial results

EBITDA [M USD]

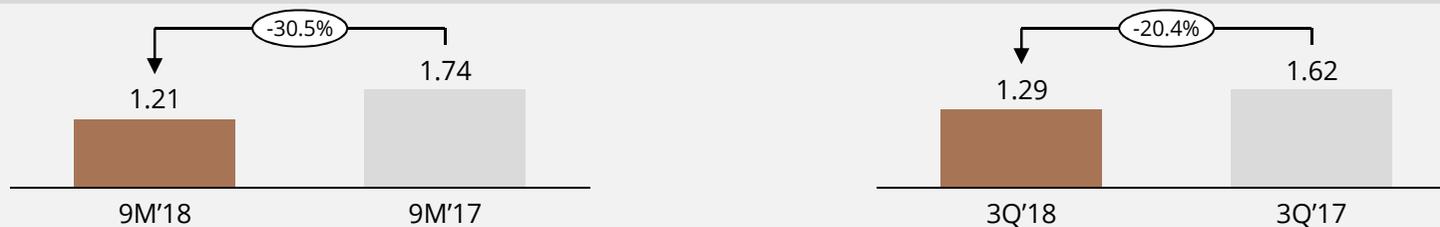


EBIT [M USD]



C1 [USD/lb]

C1 cost is the unit cash cost of production of copper payable, taking into account the costs of extraction and processing, transport costs, mining tax, administrative costs and refining processing (TC / RC) costs.



Revenues [M USD]



Debottlenecking Program

The primary goal of the Debottlenecking Program is to optimize the use of existing Sierra Gorda infrastructure, make necessary investments and increase the capacity of the processing plant.

The program assumes achievement of an average annual daily throughput of 130 ktpd from 2020 and 140 ktpd from 2021.

Analyses are being carried out in regards to updating the detailed work schedule and project costs.



Key aspects of the Debottlenecking Program:

Ball mills performance

Initiatives include increasing the capacity of the ball mills (improvement of cooling system) and diverting some material from the ball mills to additional vertimills.

Achievement of a safe tailings density level

To obtain a monthly waste concentration density at the level of 55-62% as set forth in the updated environmental application in the case of increased throughput to 130-140 ktpd, an additional thickener must be installed.

Increasing shear tanks efficiency

Increasing the average annual daily throughput requires modification of the shear tanks which are responsible for Cu and Mo concentrates separation.

Upgrading conveyor belts

The transmission capacity of the conveyor belts needs to be increased and their maintenance improved in order to avoid unscheduled shutdowns.

Installation 4th Cu filter

Increasing average annual daily throughput requires installation of an additional (4th) Cu concentrate filter. Sierra Gorda has already ordered it.

Tailings storage facility



In recent months Sierra Gorda has been working on ensuring the proper functioning of the tailings storage facility and securing further waste storage capability. Due to the low content of solids in waste and the accumulation of water in the storage facility, a potential risk of reduced facility stability has been identified.

The Sierra Gorda team, with the Owners' support, has implemented numerous initiatives aimed at securing the technical and legal status of the tailings storage facility. The current condition of the tailings storage facility is stable. Supervision over the activities and development of the TSF is administrated by the TSF Committee.

- In November Sierra Gorda received approval of the new PAO with acceptance of the structural changes to the TSF's design by Sernageomin.
- The Environmental permit (EIA) obligates Sierra Gorda to ensure a monthly waste concentration density at the level of 55-62% and approved the new closure plan which does not require a gravel covering on the storage facility (a savings of 70 M USD). Currently estimated closure costs amount to 51 M USD.
- The process of implementing the spigoting system has been completed. There are two operating spigoting lines, ensuring effective control of waste depositing.
- Completion of the installation of an additional thickener is planned for 2020.
- Planned expansion of the TSF on the south side is currently being analyzed – the final scope, schedule and costs will be determined within the next several months.
- Ongoing work related to raising the height of dams 1, 2 and 6 in order to secure further waste storage capability.

Sierra Gorda: long-term challenges



Achieving assumed throughput and stable plant operation

- Execution of the Debottlenecking Program, which assumes optimization of the use of existing Sierra Gorda infrastructure, making necessary investments and increasing the capacity of the processing plant,
- An effective maintenance plan, to secure more stable plant operations and eliminate unscheduled shutdowns.

Organizational culture focused on cost effectiveness

- Sierra Gorda is constantly developing its organizational culture, aimed at costs optimization,
- Programs aimed at identification, development and monitoring saving initiatives (VCP) must be expanded,
- Sierra Gorda has to continue evaluation and implementation of the programs which optimize costs of external services (internalizing some of the maintenance works (MARC) etc.).

Technological innovations supporting Sierra Gorda's competitiveness

- As a mine operating on a deposit with a relatively low metal content, Sierra Gorda has to implement the latest and most effective technological solutions as part of the production process, following the trends in the industry,
- The range of tasks includes evaluation of implementation of autonomous trucks, development of integrated systems for production management and tools for budgeting and costs control.

Building a long-term relationship with Sumitomo Metal Mining and Sumitomo Corporation

- Effective cooperation between the Owners of Sierra Gorda is one of the most important success factors of the mine,
- KGHM Polska Miedź S.A. should develop good relations with its Partners from Japan.

Project Sierra Gorda Oxide

Basic information	
Type of mine/plant	Sierra Gorda oxide ore (open-pit). Copper production in the SX-EW plant.
Ownership	The copper ore belongs to Sierra Gorda (JV Co) 55% KGHM, 45% Sumitomo
Main product	Copper cathodes
Annual copper production	~ 30 ktpa
LOM	10 years



Current state

- Project assumes processing of the copper oxide ore (overburden of the Sierra Gorda sulfide ore deposit) on the permanent heap, and production of copper cathodes in an SX-EW plant.
- The project has Basic Engineering and partially Detailed Engineering finalized.
- In 2017 a technical – economic analysis of different project scenarios was developed. The scenarios were differentiated by capacity, usage of new and used infrastructure, building a leach pad at the Sierra Gorda site or usage of PLS pipelines, etc. The goal of the analysis was to generate the highest economic value and minimize potential risks of the project.
- In 2018 work on selected project options continued. It was focused on the possibilities of ore preparation for the heap leaching process by preliminary crushing. Technical and operational assumptions of the selected option will be detailed in 2019, for example through the results of the ongoing column leaching tests of the crushed material.
- Other work will also be carried out, consisting of getting necessary permits for the project, work related to more detailed analysis of selected technical aspects (additional geotechnical studies, a hydrogeological model update together with the Sierra Gorda mine, additional heap stability analysis, etc.).



KGHM
POLSKA MIEDŹ

**THANK YOU FOR YOUR
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Layers of possibilities



Financial presentation

Katarzyna Kreczmańska-Gigol
Vice President of the Management Board
(Finance)

Strategy of the KGHM Polska Miedź S.A. Group



**FINANCIAL
STABILITY**

Ensure long-term **financial stability** and the development of mechanisms supporting further development



Basing of the Group's financing on long-term instruments



Shorter cash conversion cycle



Efficient management of market and credit risk by the KGHM Group

Optimisation of net working capital management



INVENTORIES

Initiatives to optimise inventories in cooperation with business units – production, procurement and sales. Optimisation of materials management – through rationalisation and improvement of the efficiency of the process of materials procurement and by restricting the amount of working capital tied up in materials inventories



RECEIVABLES

Decrease in receivables by improving the effectiveness of documentary collection management, and therefore enlargement of the group of customers/counterparties subjected to factoring.



LIABILITIES

Extending accounts payable repayment periods (availability of period depends on supplier's portfolio). Possibility of using debt factoring.

With respect to financing, the strategy foresees being based in long-term instruments and efficient management of liquidity and risk



Financial stability

Ensure long-term **financial stability** and the development of mechanisms supporting further growth

Flexibility



- Develop a model and financing structure able to deal with **market challenges** and **model operations**

Efficiency



- Enhance **financing efficiency** by **diversifying its sources** and matching financing periods to the needs of the Group

Ecology, safety and sustainable development



- **Ensure the Group's operational safety** through long-term **stable** financing

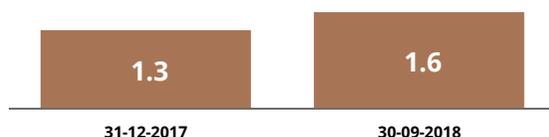
E-industry



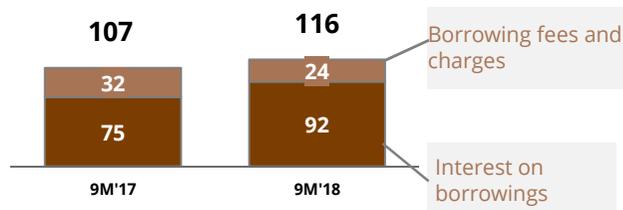
- Utilise **modern methods** of financial and risk management

Net debt of the KGHM Polska Miedź S.A. Group – as at end-September 2018

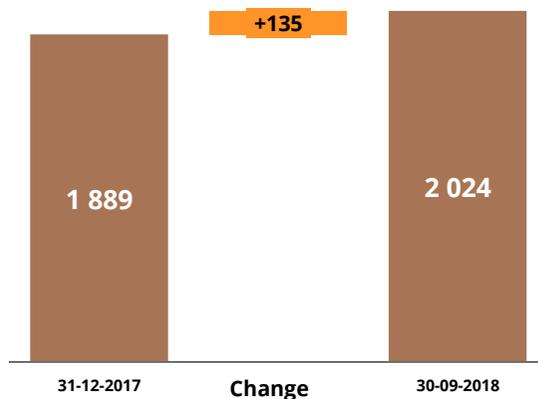
Net Debt / adjusted EBITDA



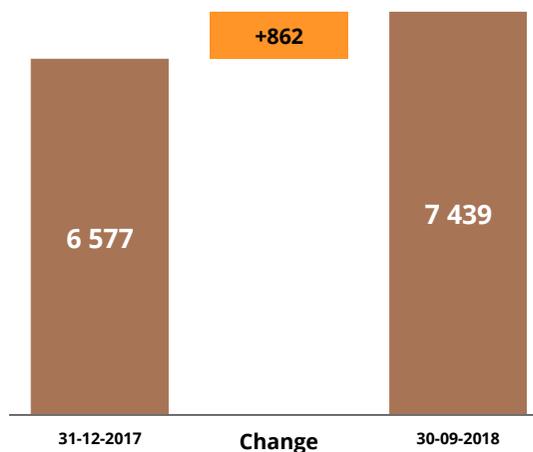
Borrowing costs (mn PLN)



KGHM Group net debt
(mn USD)



KGHM Group net debt
(mn PLN)



- In accordance with the financial strategy adopted by KGHM Polska Miedź S.A., the basic currency in which debt is incurred is the USD (natural hedging).
- The level of debt in 2018 was mainly due to:

Increases in debt:

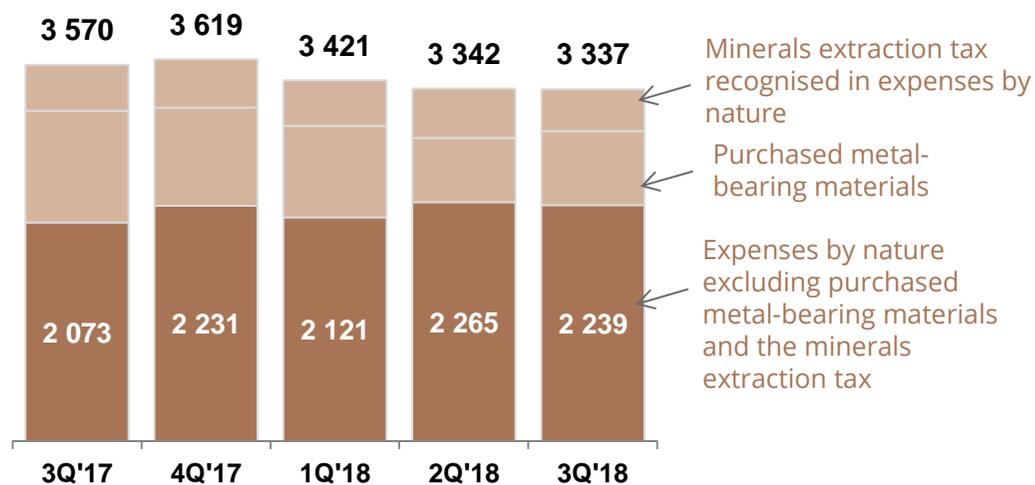
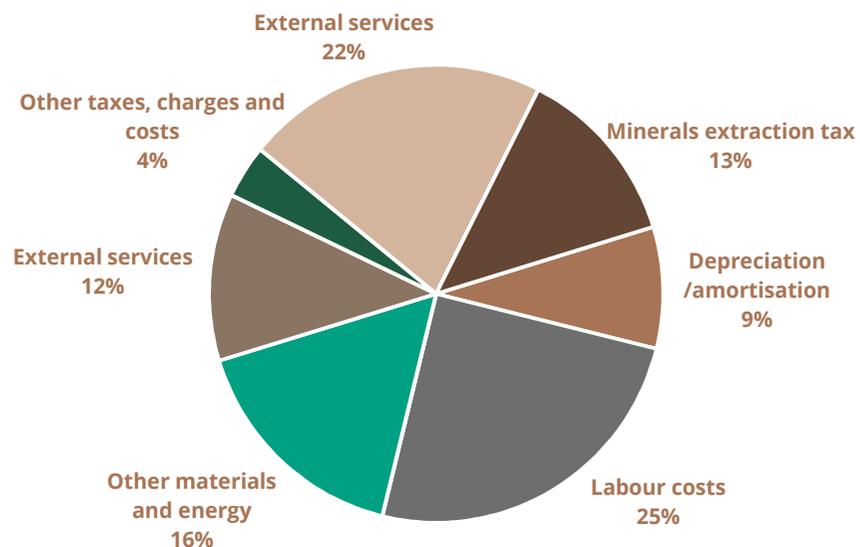
- cash expenditures on property, plant and equipment (PLN 1 918 million in the Group),
- the minerals extraction tax (PLN 1 303 million in KGHM Polska Miedź),
- the financing of inventories (an increase by PLN 831 million in the Group),
- negative exchange differences (an increase in debt by PLN 393 million),
- financing of Sierra Gorda (PLN 262 million),
- a decrease in trade payables (a decrease by PLN 142 million in the Group),

Decreases in debt:

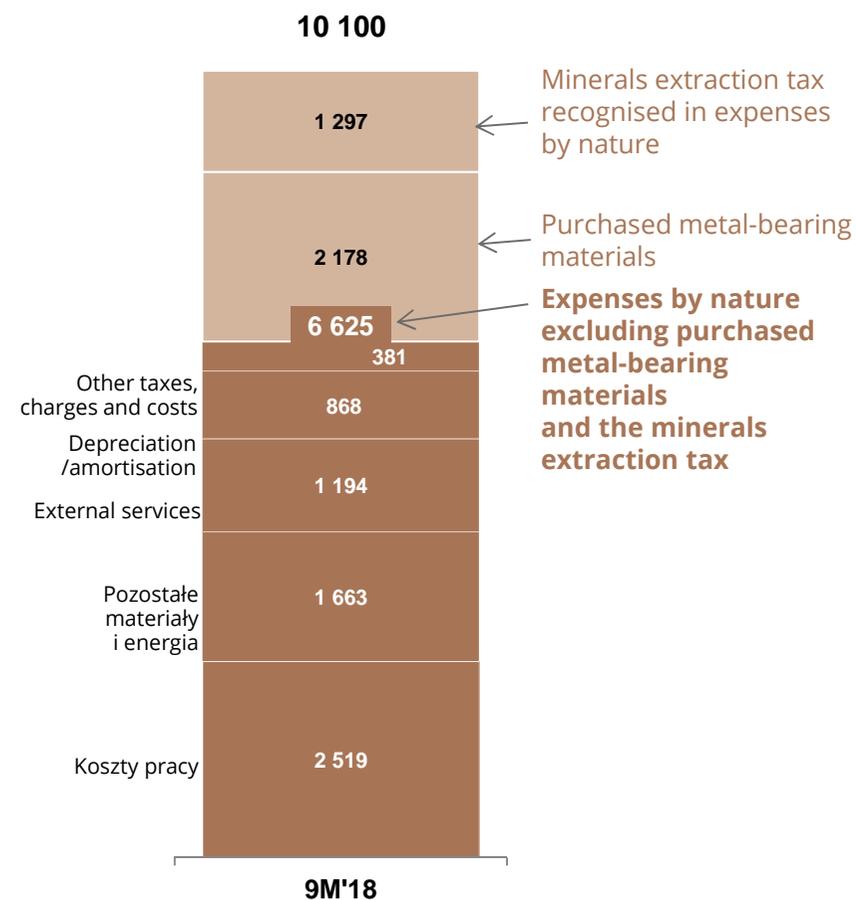
- positive cash flow from operating activities, excluding the change in working capital and the minerals extraction tax (PLN 3 865 million in the Group),
- change in receivables (a decrease in the Group by PLN 234 million).

Expenses by nature in KGHM Polska Miedź S.A.

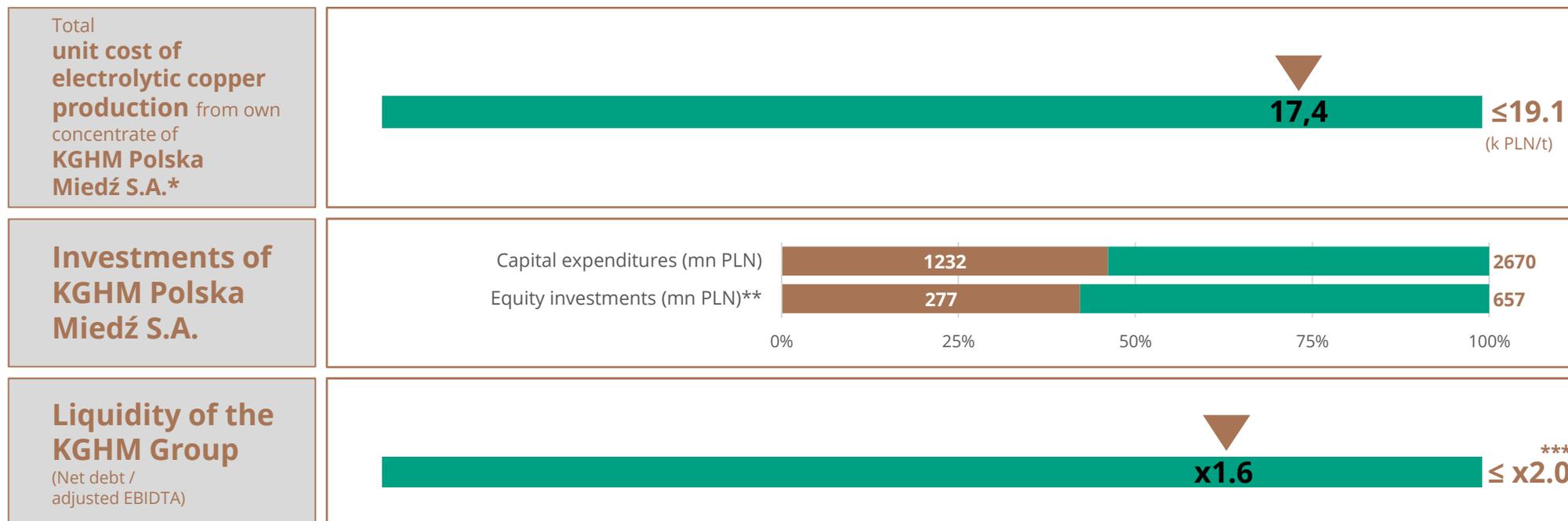
Structure of expenses by nature



Expenses by nature (mn PLN)



Group liquidity stable and safe after the first 3 quarters of 2018



* Sum of costs of extraction, floatation and metallurgical processing per cathode, together with support functions and cathode selling costs, adjusted by the value of inventories of half-finished products and work in progress, less the value of anode slimes and divided by the volume of electrolytic copper production from own concentrates

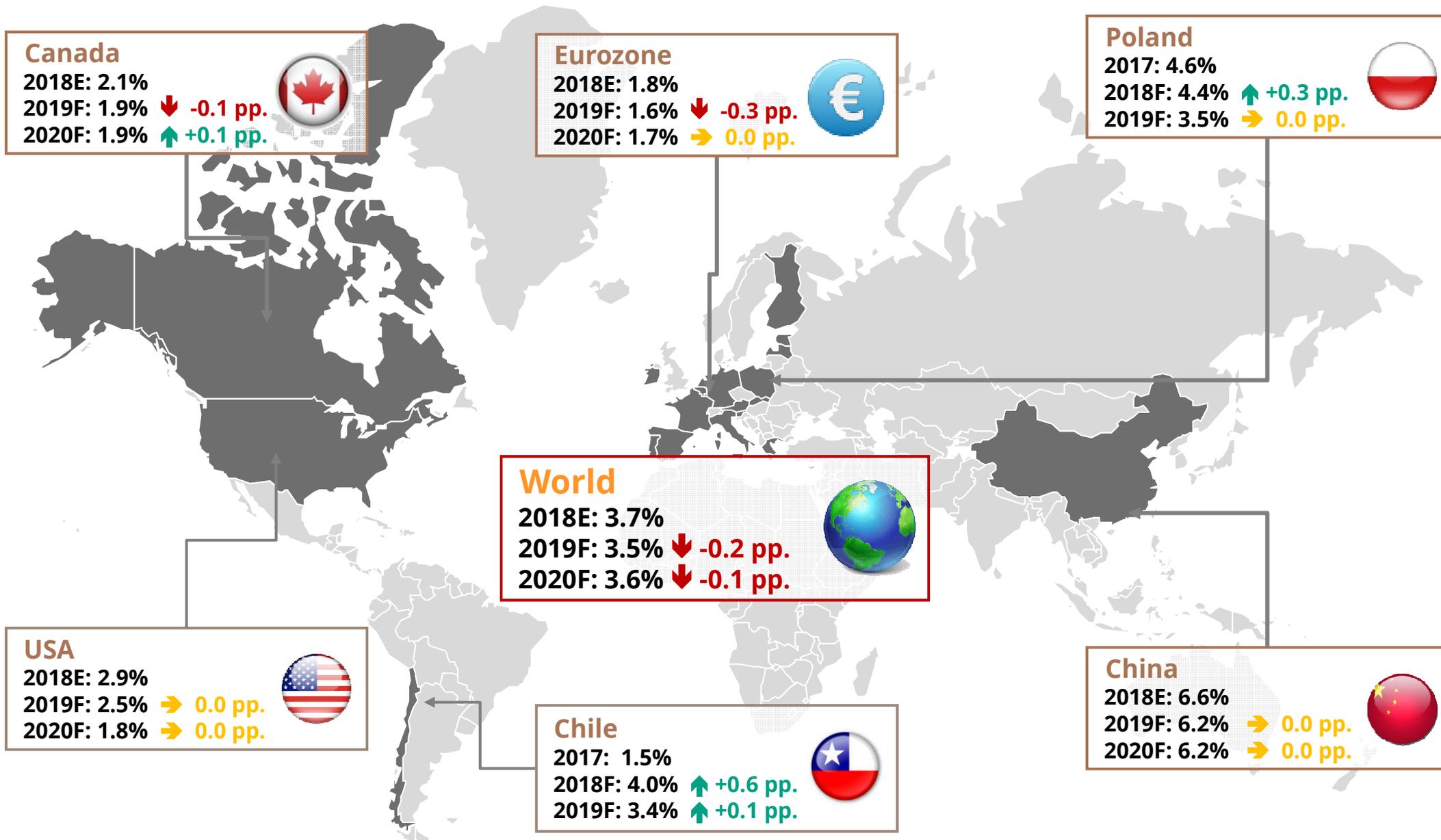
** Loans granted and acquisition of shares and investment certificates of subsidiaries together with loans for these subsidiaries

*** Level of net debt/EBITDA ≤ 2 related to the Financial Liquidity Policy adopted by the Company and is not part of the budget assumptions of KGHM for 2018.

Risk management

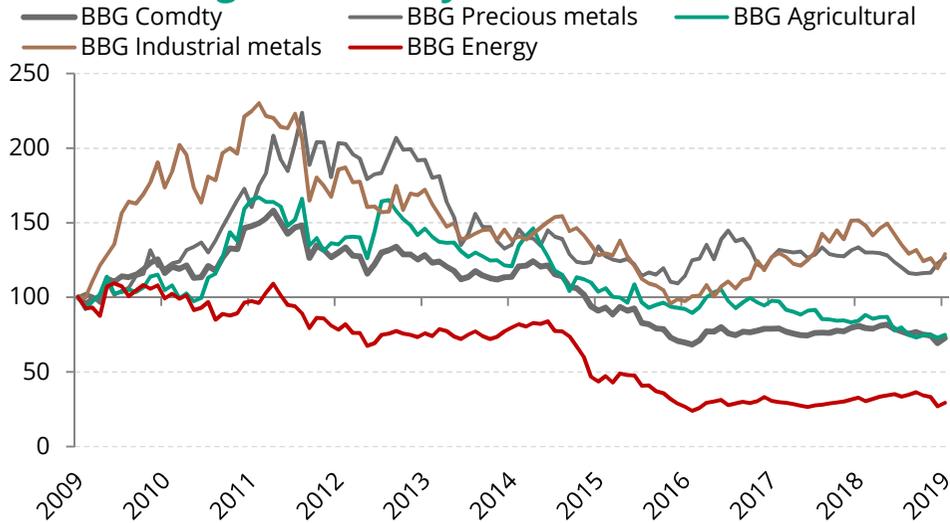
Copper market and macroeconomic assumptions

January 2019 IMF forecasts' revision



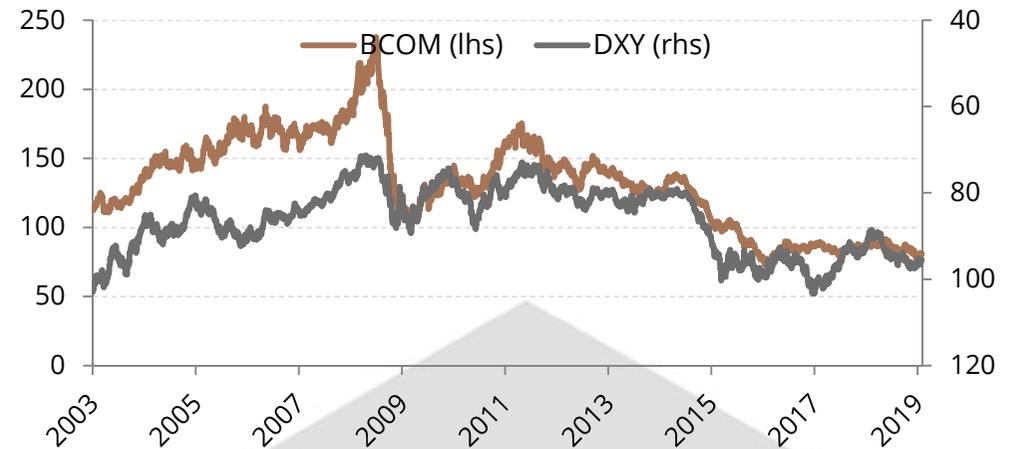
Main factors affecting the copper price

Bloomberg Commodity Index



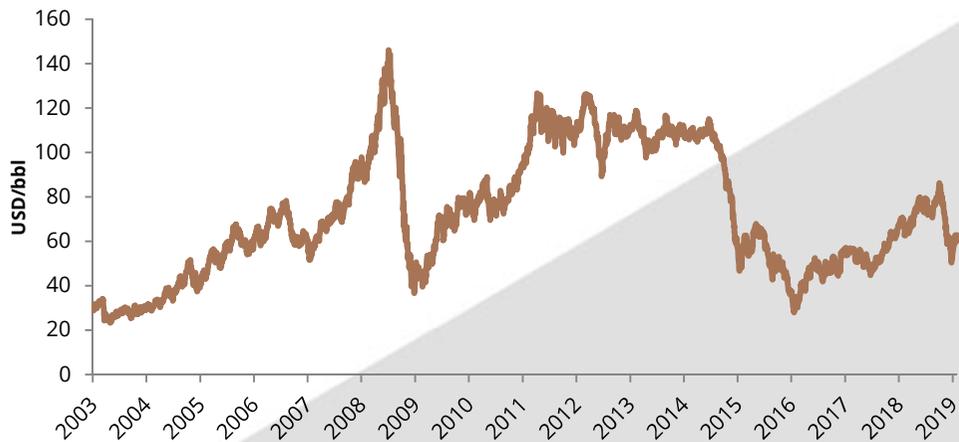
Source: KGHM Polska Miedź, Bloomberg

Dollar Index vs Bloomberg Commodity Index



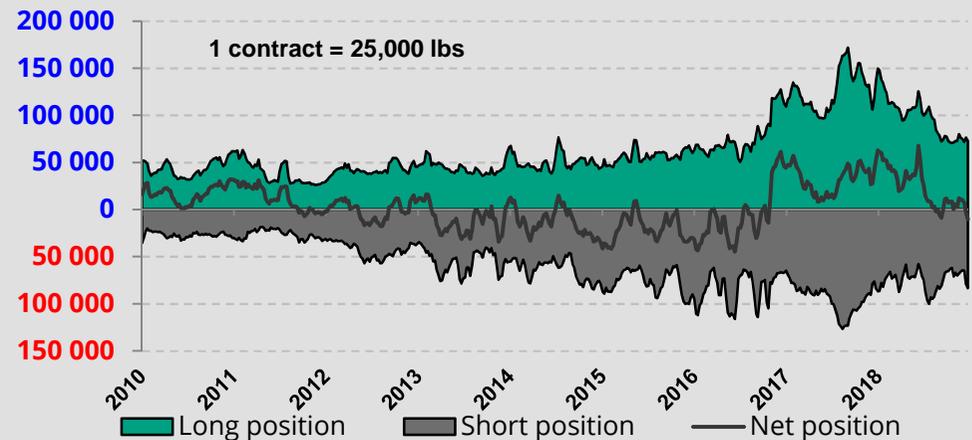
Source: KGHM Polska Miedź, Bloomberg

Oil price(Brent)



Source: KGHM Polska Miedź, Thomson Reuters

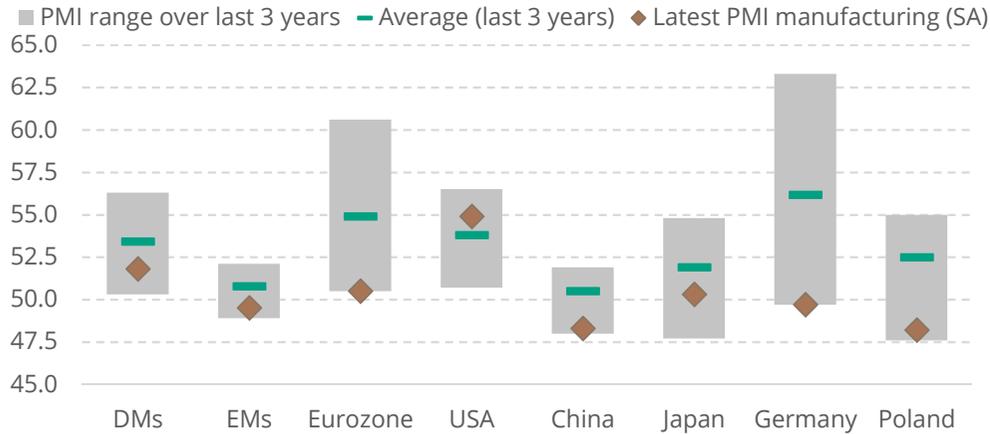
Non-commercial net position - COMEX



Source: KGHM Polska Miedź, Bloomberg

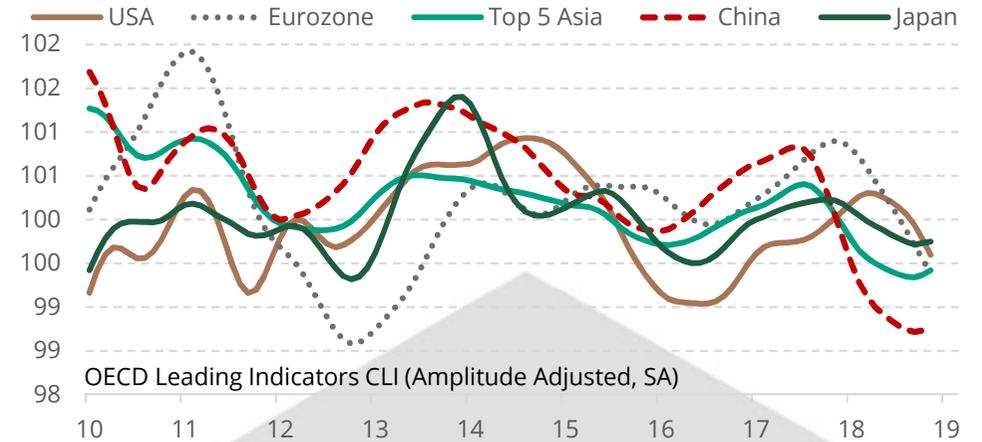
Macroeconomic environment

PMI



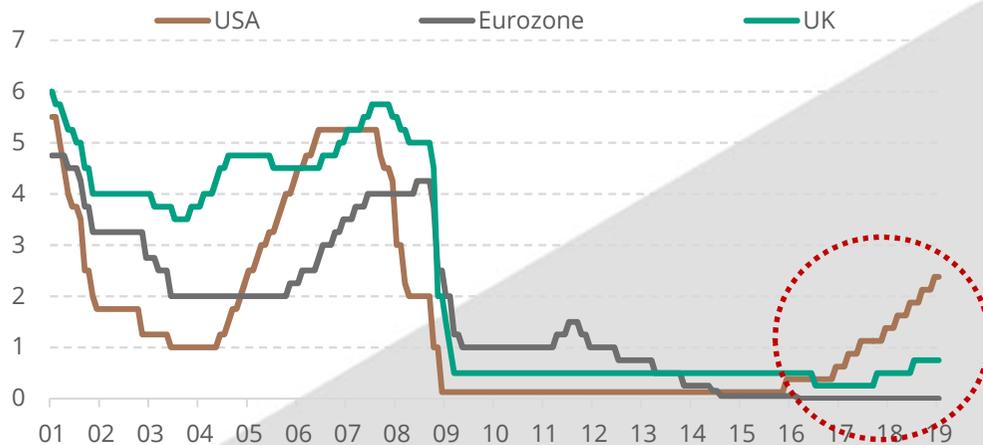
Source: KGHM Polska Miedź, Bloomberg

CLI



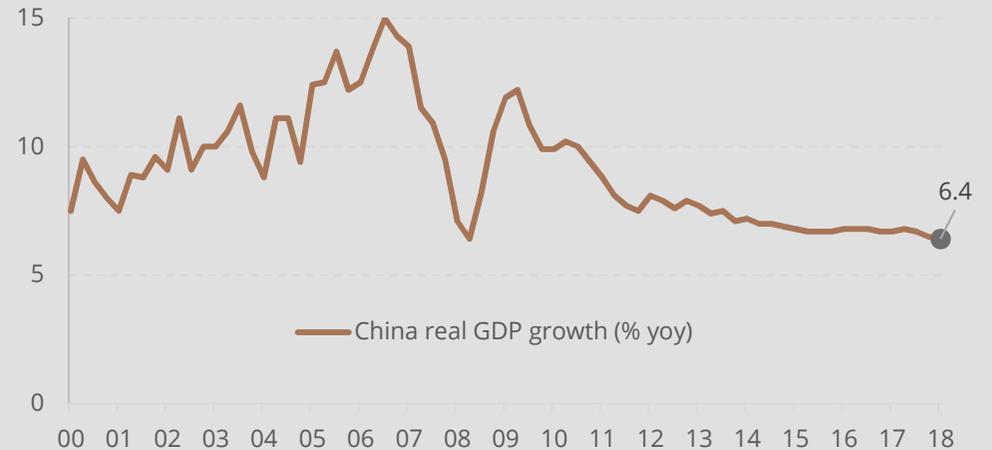
Source: KGHM Polska Miedź, Bloomberg

Level of main interest rates



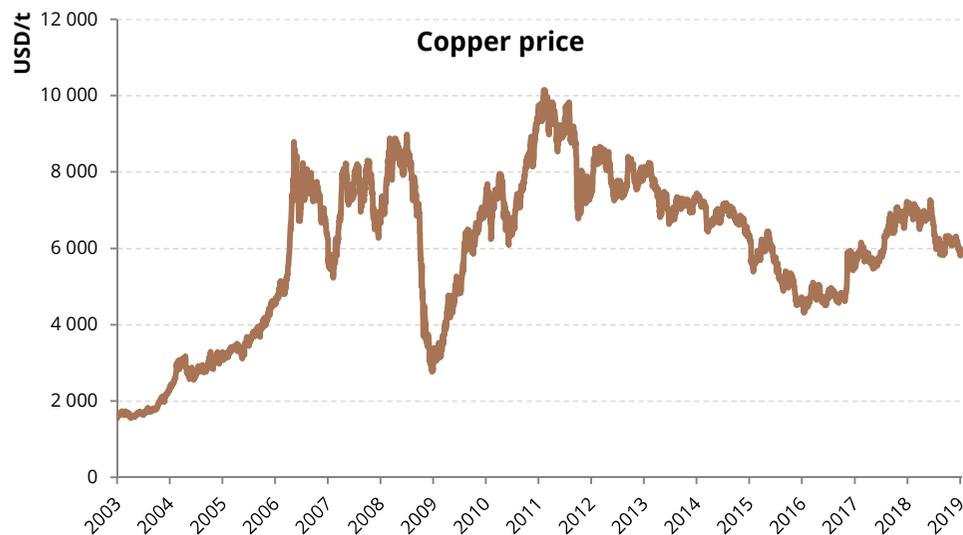
Source: KGHM Polska Miedź, Bloomberg

Real GDP growth in China

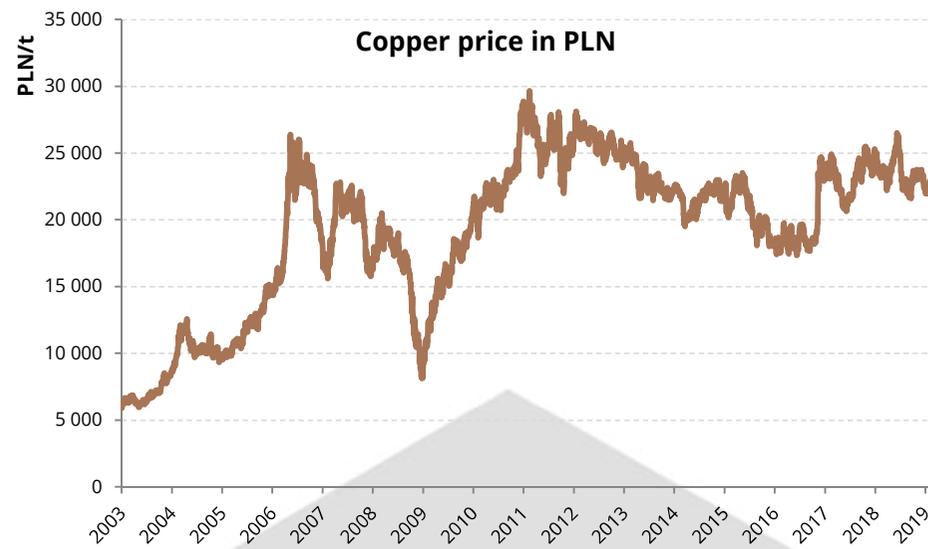


Source: KGHM Polska Miedź, Bloomberg

Key market risk factors for KGHM



Source: KGHM Polska Miedź, Bloomberg



Source: KGHM Polska Miedź, Bloomberg

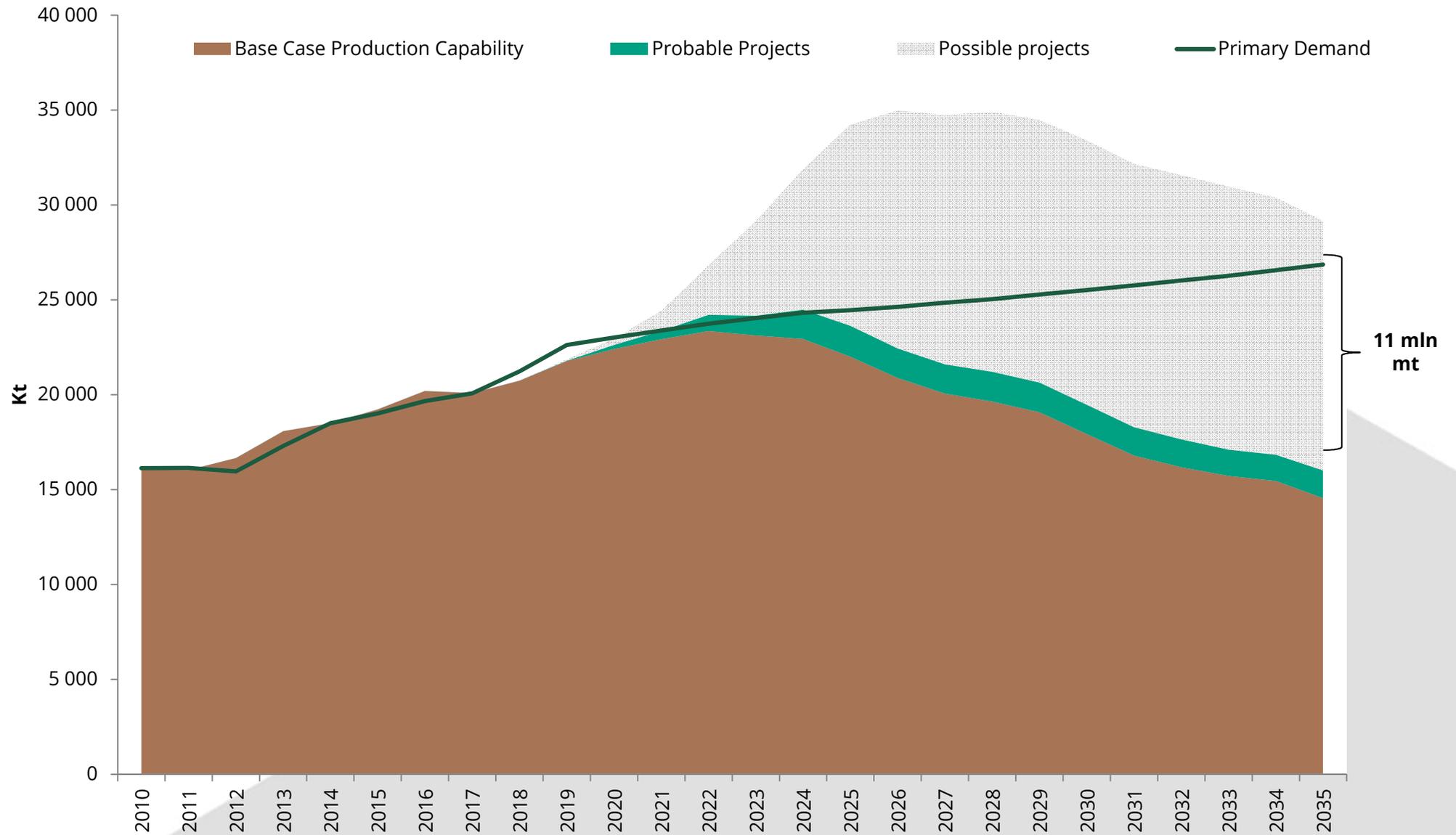


Source: KGHM Polska Miedź, Bloomberg



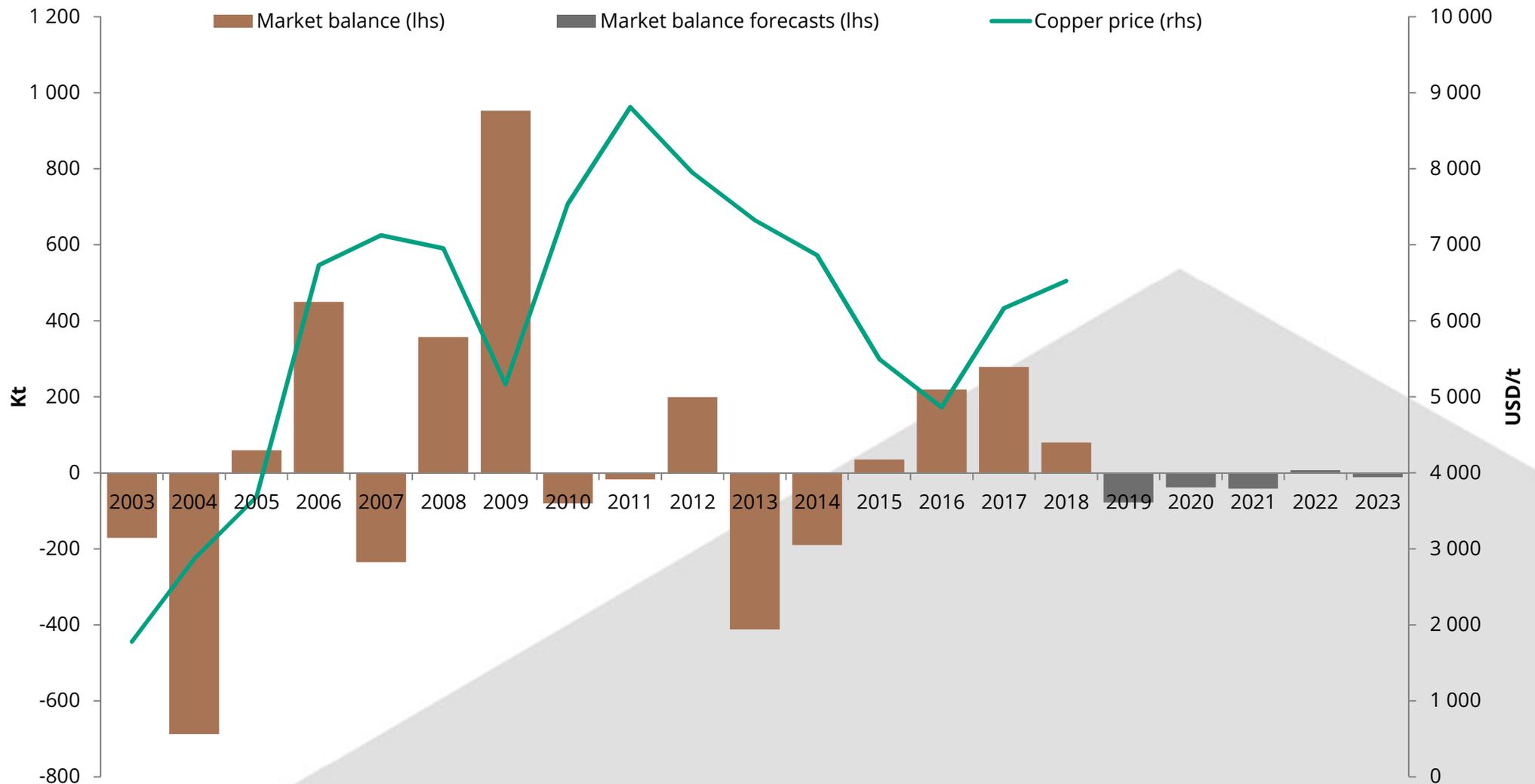
Source: KGHM Polska Miedź, Bloomberg

Copper mining and potential mining projects



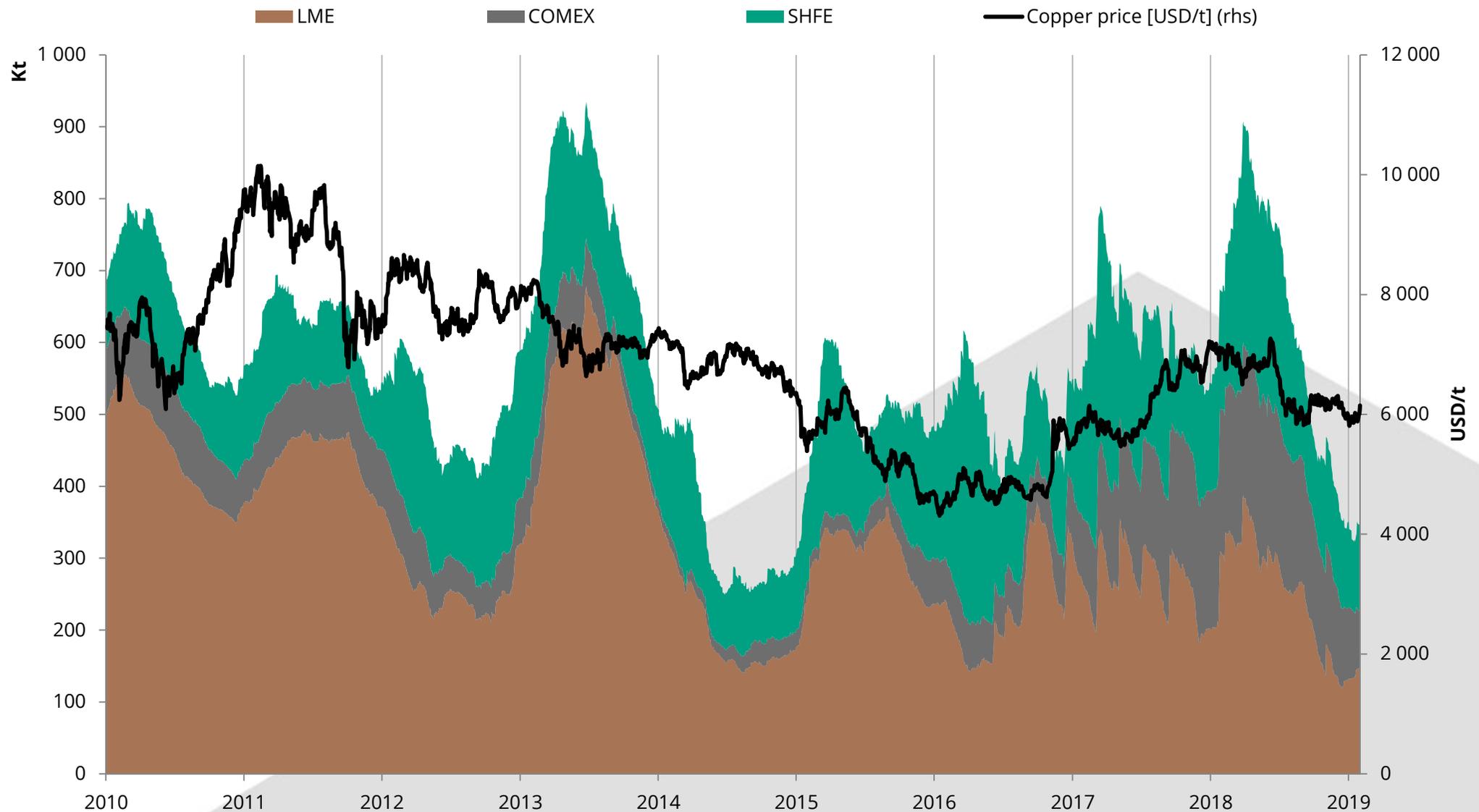
Source: Reuters, KGHM Polska Miedź

The deficit on the refined copper market is not always reflected in the metal price level...



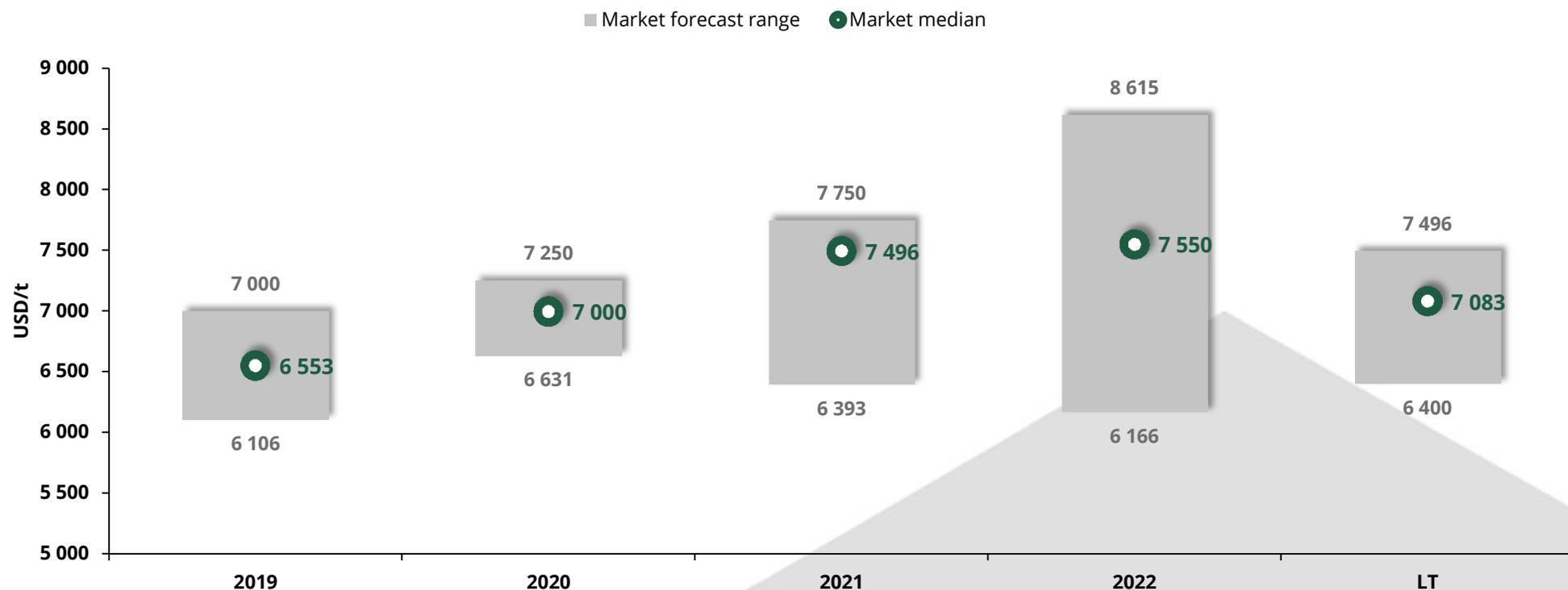
Source: KGHM Polska Miedź, market forecasts

...as well as the red metal's stocks level



Source: Reuters, KGHM Polska Miedź

Review of copper price market forecasts



Source: KGHM Polska Miedź, Market reports

	2019	2020	2021	2022	LT
Market lower band	6 106	6 631	6 393	6 166	6 400
Market upper band	7 000	7 250	7 750	8 615	7 496
Market median	6 553	7 000	7 496	7 550	7 083
Number of observations	19	18	13	10	14

Market Risk Management

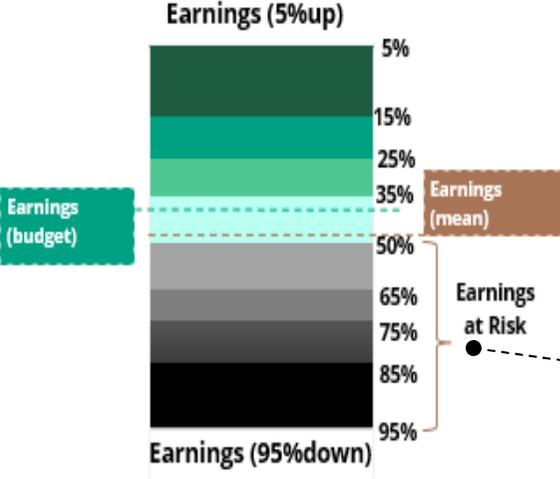


KGHM implements all market risk management targets in compliance with the approved policy

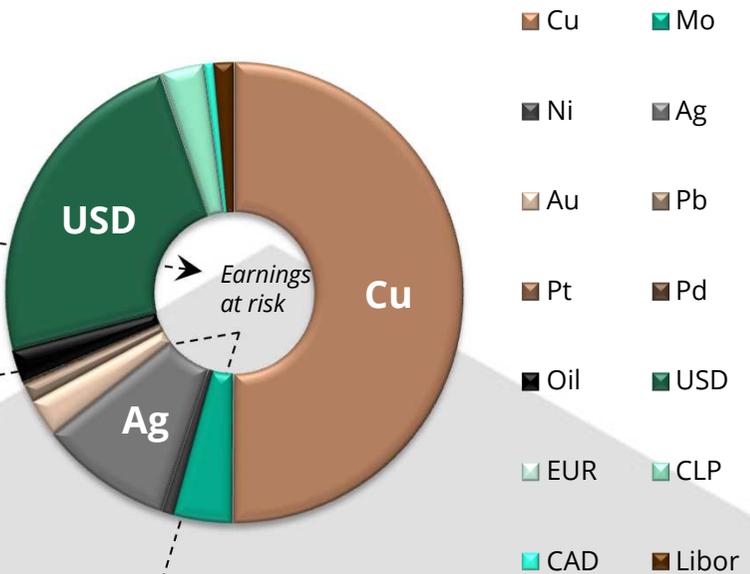
KGHM's market risk policy objectives:

- ❑ limitation of volatility of pre-tax earnings,
- ❑ Increasing probability that the budget assumptions are met (with consideration for current assumptions regarding macroeconomic factors and sales conditions),
- ❑ Reducing probability that the Group becomes insolvent,
- ❑ Maintaining the Group in good financial condition, in particular with respect to the expected creditworthiness (ratings) as well as the requirements of debt suppliers (covenants),
- ❑ Supporting realization of Group's strategy and decision-making in the area of investment activities, including financing of investment projects.

Well established sensitivity analysis based on at-Risk measures allows for the classification on each of the key risk assets in the KGHM Group



Key risk assets sensitivity in KGHM Group (based on Earnings-at-Risk report)

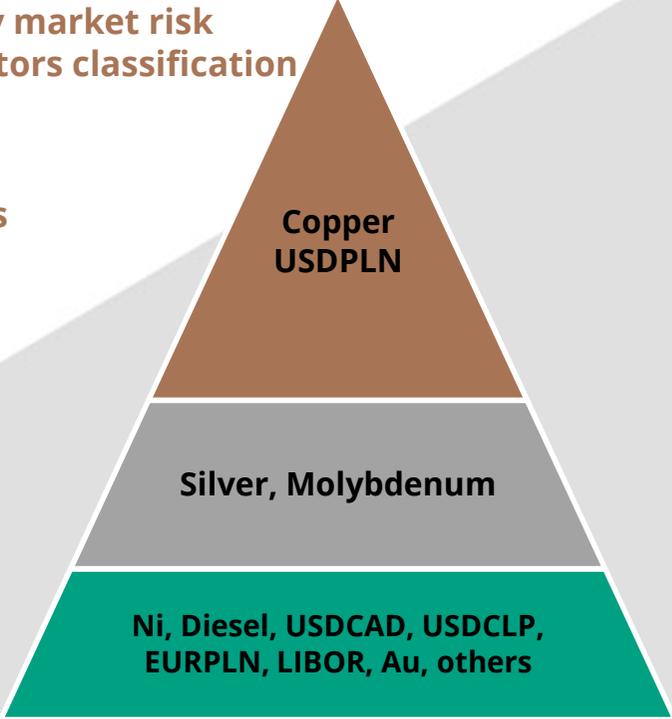


Key market risk factors classification

Strategic risk assets

Meaningful risk assets

Noticeable risk assets



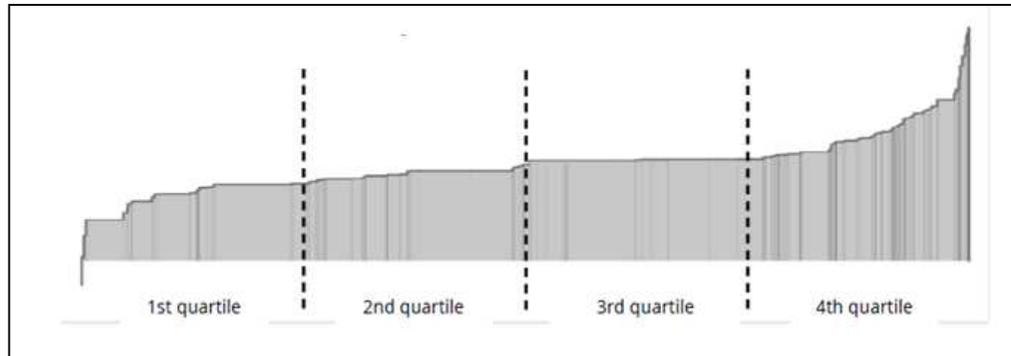
Market risk management main themes

- ❑ Very high volatility of commodities prices and exchange rates
- ❑ Significant sensitivity of KGHM's net income on changes in macroeconomic environment
- ❑ Commodity markets are cyclical
- ❑ Annual revenues are denominated in USD while cost are in PLN
- ❑ Relatively high position in the industry's cost curve
- ❑ Investment plans
- ❑ Social responsibility



Investors accept mining companies' exposure to market risk but not bankruptcy risk

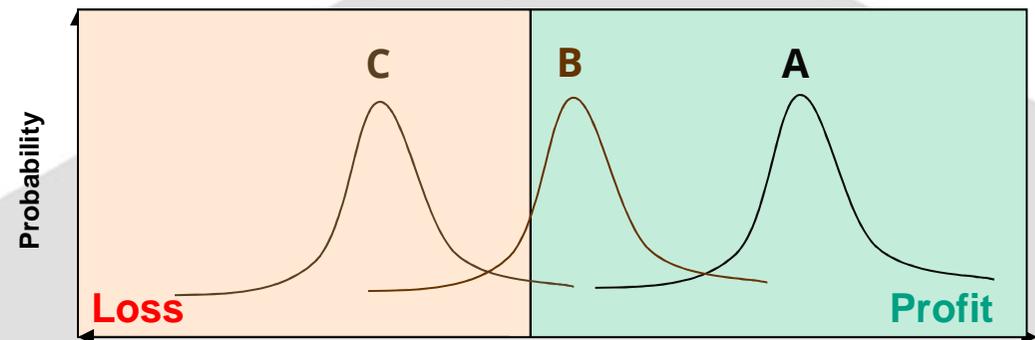
Metals mining production cost curve – copper market



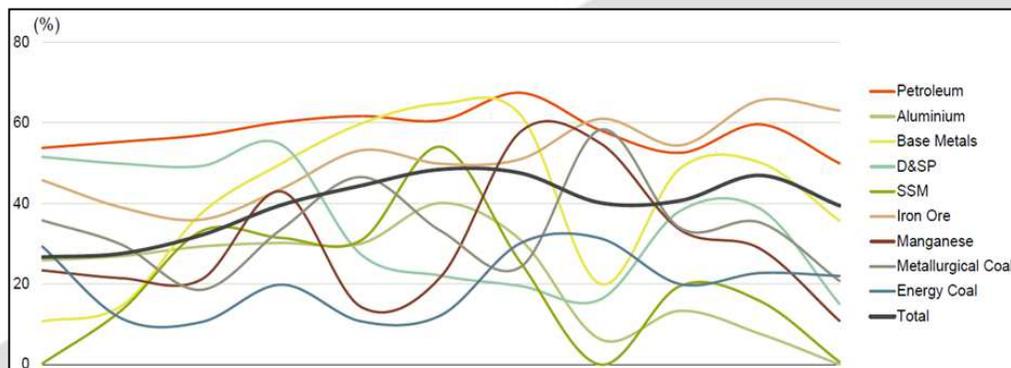
Position on the cost curve determines approach to market risk management. The lower the production cost the more volatility a mine/company can accept.

- A** – BHP Billiton, Rio Tinto
- B** – KGHM, First Quantum, Antofagasta
- C** – New mines, small projects, mines on late stage of exploitation

Potential mines profile types



Margins generated on specific sectors are volatile



The revenues diversification level determines the way a mining company may manage market risk.

The way how mining companies manage strategic risk is very diverse

	Active hedging approach	Opportunistic hedging approach	No hedging
BHP Billiton		X	
Rio Tinto		X	
Codelco			X
Vale	X		
Glencore Xstrata	X		
AngloAmerica		X	
Freeport McMoRan		X	
Norilsk Nickel			X
Boliden		X	
Antofagasta	X		
First Quantum	X		
Kazakhmys		X	
Teck	X		
Hindustan Zinc Limited		X	



We follow some simple rules when trading derivatives

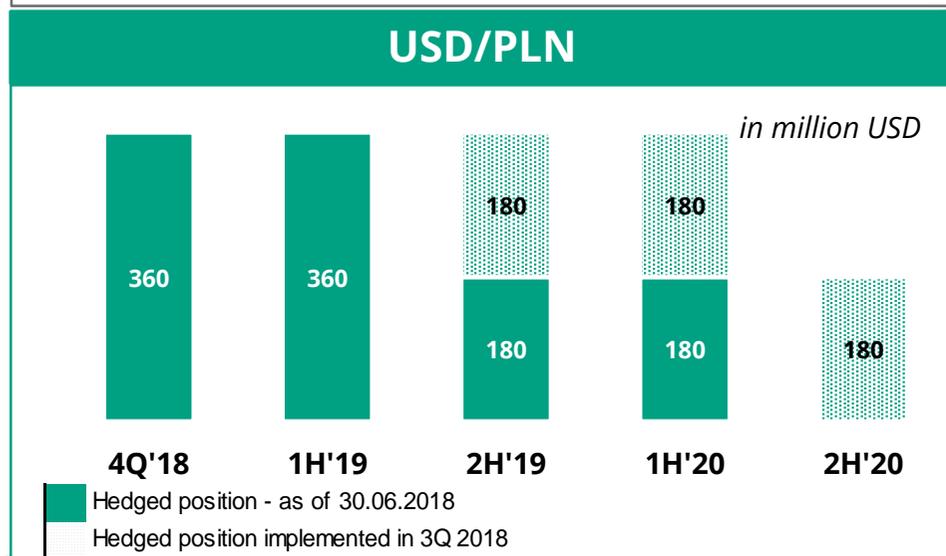
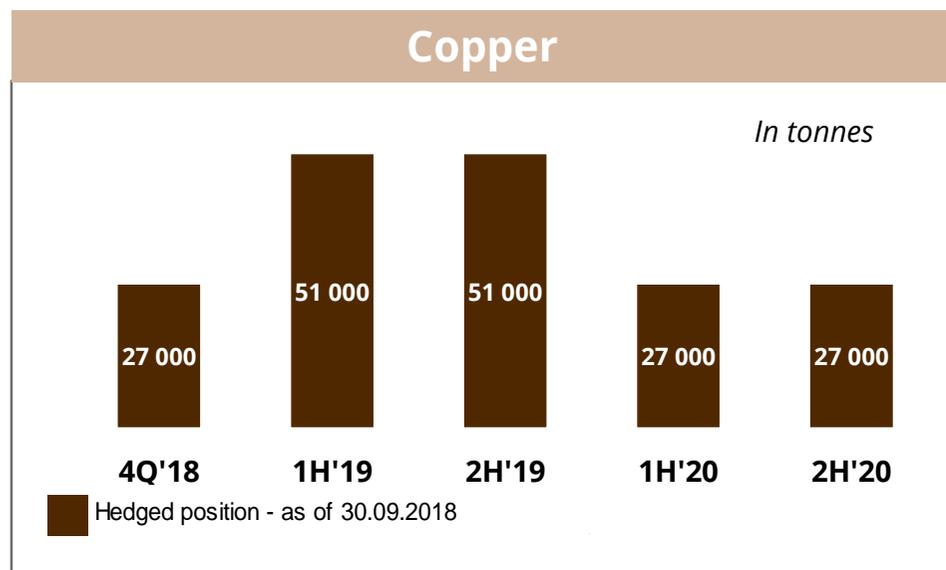
- ❑ KISS = „Keep it simple, stupid”
- ❑ Plain vanilla instruments
- ❑ Simple option structures: Collar, Seagull, Put Spread
- ❑ With price participation
- ❑ No exotic instruments
- ❑ Mid-to-long term horizon



Transparency – the company’s position in derivatives is shown in detail in our financial statements.

The accrued result on derivatives achieved by KGHM Polska Miedź S.A. as at 30 September 2018 amounted to PLN 50 million

Market risk management – hedged positions on the copper market and the USD/PLN (as at 30 September 2018)



- ### Result on derivatives
- In the first 9 months of 2018, KGHM Polska Miedź S.A. recorded a result on derivatives and hedges in the amount of PLN 50 million, of which:
 - PLN 110 million increased sales revenue (transactions settled to 30 September 2018),
 - PLN 87 million decreased the result on other operating activities
 - PLN 28 million increased the result on finance activities.
 - The fair value of derivatives (MtM) in KGHM Polska Miedź S.A. as at 30 September 2018 amounted to PLN 548 million.
 - The revaluation reserve on cash flow hedging instruments as at 30 September 2018 amounted to PLN 144 million..
 - Since 1 January 2018 the company has applied new hedge accounting principles pursuant to IFRS 9.



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