



## **AURUBIS BULGARIA AD**

### **Plant overview**

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**27 February 2018**



- » **Aurubis Group**
  - » Integrated Copper Producer
  
- » **Aurubis Bulgaria**
  - » 60 Years of History
  
- » **ONE Aurubis**
  - » Aurubis Operating System

# Aurubis Group: Production Sites



## Business Units Primary Copper

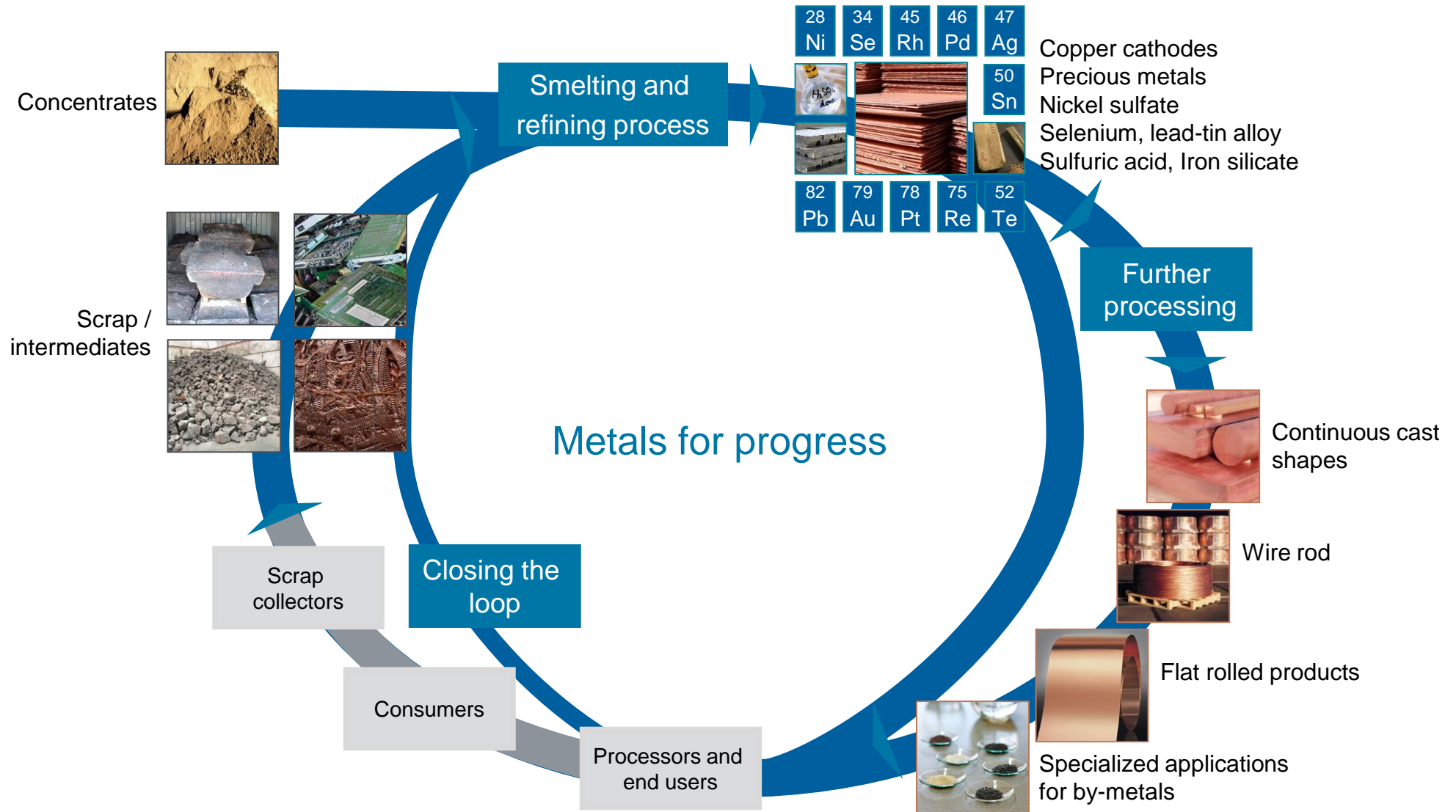
- » Hamburg Germany
- » Pirdop Bulgaria

## Business Units Copper Products

- |               |          |              |         |
|---------------|----------|--------------|---------|
| » Avellino    | Italy    | » Mortara    | Italy   |
| » Buffalo     | USA      | » Olen       | Belgium |
| » Dolný Kubín | Slovakia | » Pori       | Finland |
| » Emmerich    | Germany  | » Röthenbach | Germany |
| » Fehrbellin  | Germany  | » Smethwick  | GB      |
| » Hamburg     | Germany  | » Stolberg   | Germany |
| » Lünen       | Germany  | » Zutphen    | The ND  |

Aurubis has a service and sales network in more than 20 countries (Europe, Asia and North America)

## Productivity, efficiency, environment protection, expertise



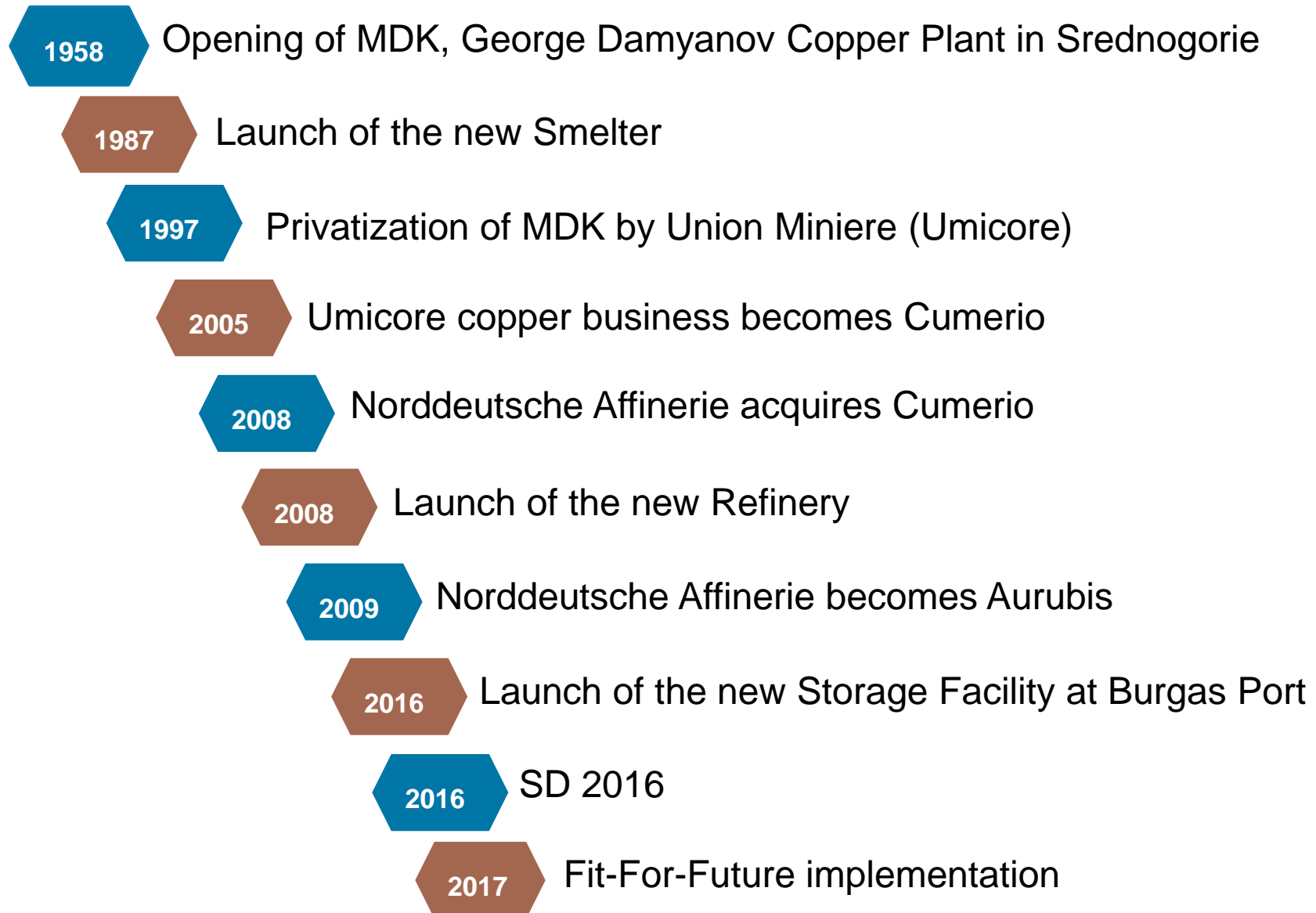


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2004

Integrated system for quality management is certified under ISO 9001

2009

Analytical Laboratories received a certificate of accreditation under ISO 17025

2009

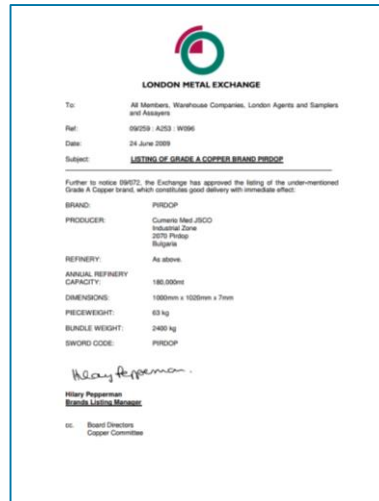
Cathodes Grade A certified on the London Metal Exchange

2011

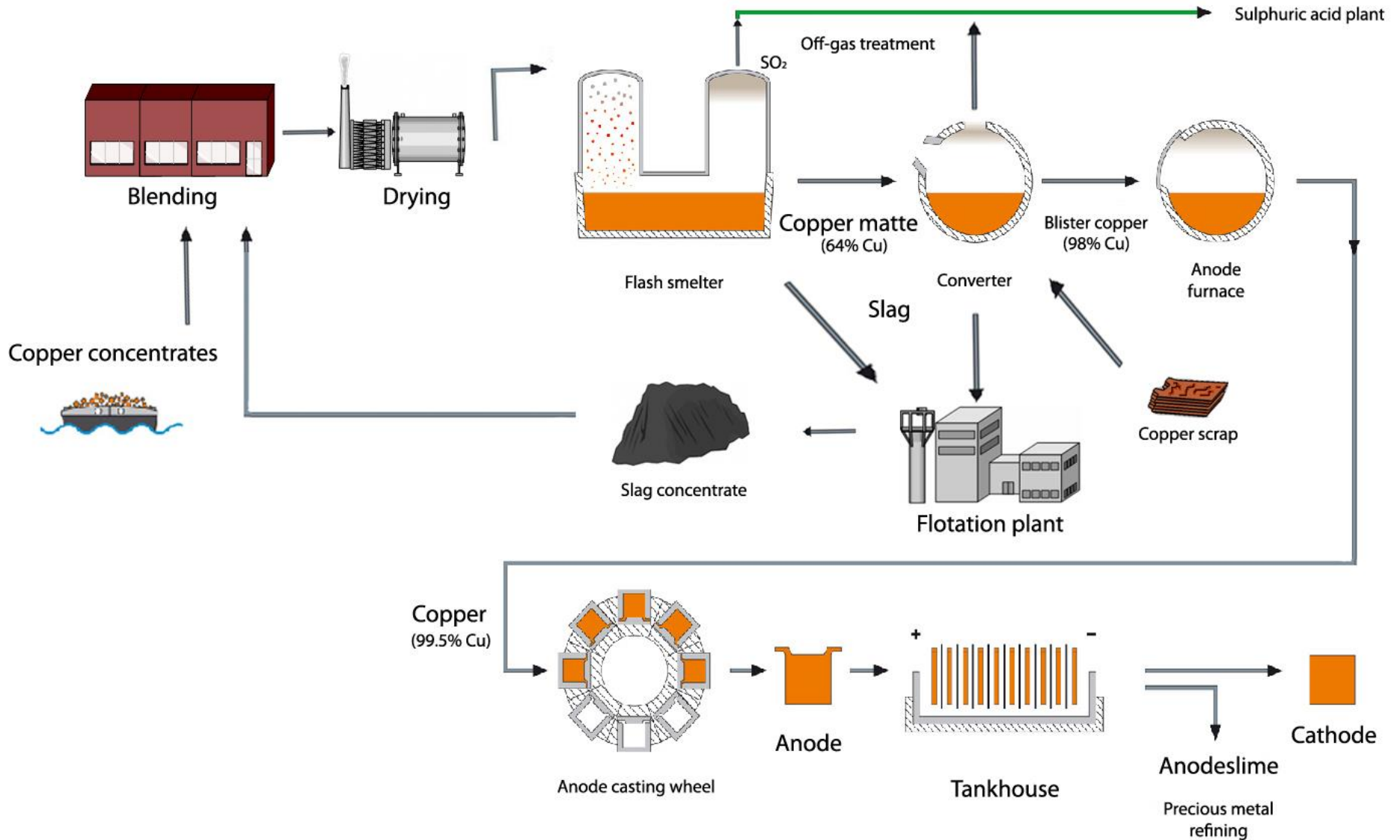
Integrated system for environmental management is certified under ISO 14 001

2012

Authorized Economic Operator (AEO-Full) for customs simplifications, security and safety, valid in all EU Member States



# Production Process





## Smelter

- » Throughput capacity 1.47 Mio. tpy Fresh concentrates
  - » 2 Steam dryers
  - » Flash Smelting Furnace & Waste Heat Boiler
  - » Pier-Smith Converters (2 or 3 hot)
  - » Anode Furnaces (2 in operation)
  - » Casting wheel (4 type of anodes)
- » Anode production > 400,000 tpy



## Refinery

- » New Refinery launched in 2008
  - » Design capacity 180,000 tpy cathodes
  - » ISA 2000 technology, Australia
  - » Automated machinery (Outotec, Kuenz)
  - » 2 circulations / 2 Bleed treatment installations
- » Current capacity 230,000 tpy cathodes
  - » Continuous improvement, no big investments



### Flotation Plant



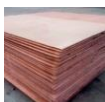

- » 900 000 t annual capacity reached after 2009-2010 expansion project fulfilment
- » Automated system
  - » Slag: reception, cooling, excavation
  - » Crushing. Milling and classification
  - » Flotation: main, cleaning, control
- » Production output
  - » Copper concentrate, 20-27 percent
  - » Iron silicate fines



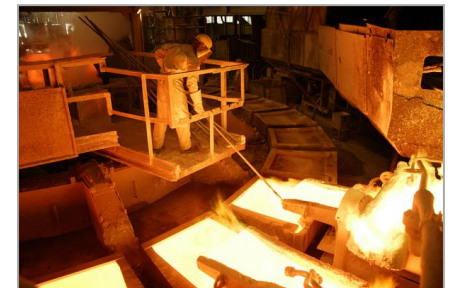
### Acid Plant

- » Two production lines, capacity:
  - » Acid line 1: 66 000 - 160 000 Nm<sup>3</sup>/h
  - » Acid line 2: 120 - 160 000 Nm<sup>3</sup>/h
- » Processes
  - » Gas mixture cleaning, cooling, drying
  - » Catalyst oxidation: SO<sub>2</sub> > SO<sub>3</sub>
  - » SO<sub>3</sub> absorption

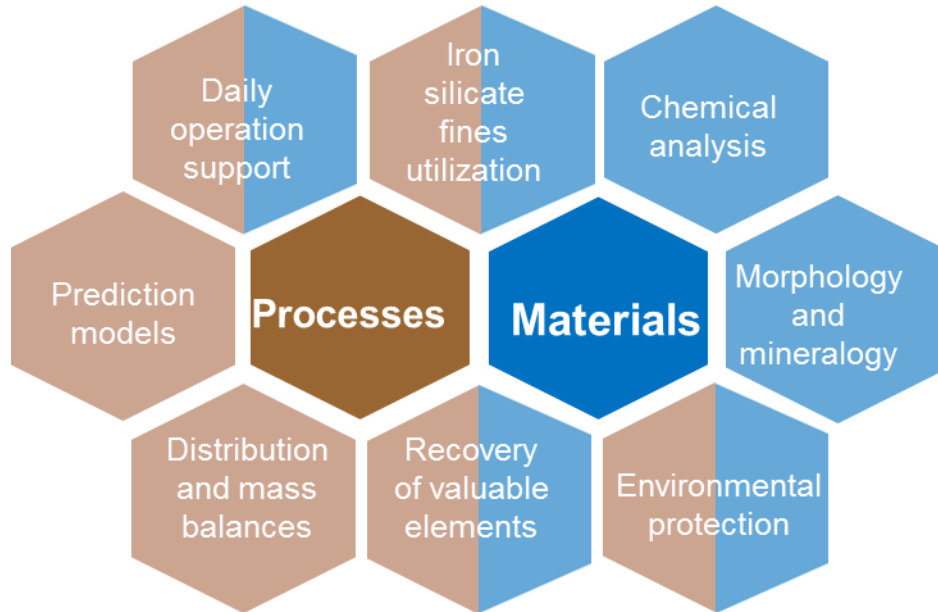


Production (t)	2016 *	2017
 Concentrates	1 055 600	1 357 100
 Anode copper	296 800	375 200
 Cathode copper	216 400	228 500
 Sulfuric acid	1 041 400	1 358 500

(\*) Figures with 54-day Shutdown



## Materials characterization core capability



Established in 2010, currently 9 highly qualified researchers in two teams

- » Development and implementation of new processes and products
- » Troubleshooting
- » Materials characterization
- » New methods development
- » Prediction models
- » Technology testing
- » Improvement and optimization

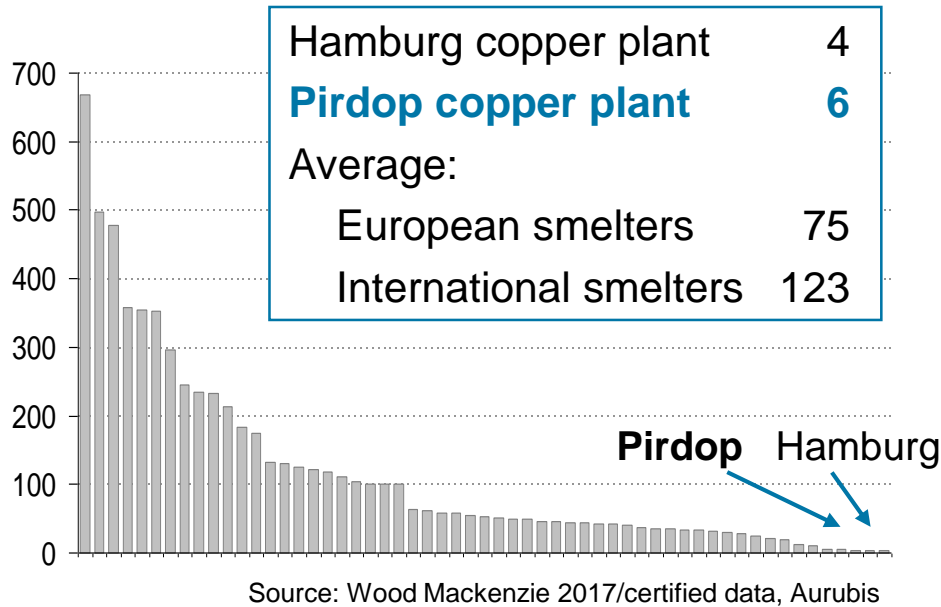


**Rain Water Treatment Plant, 2014**

- » Development of specific solutions by R&D
- » Lab testing of technologies before commissioning

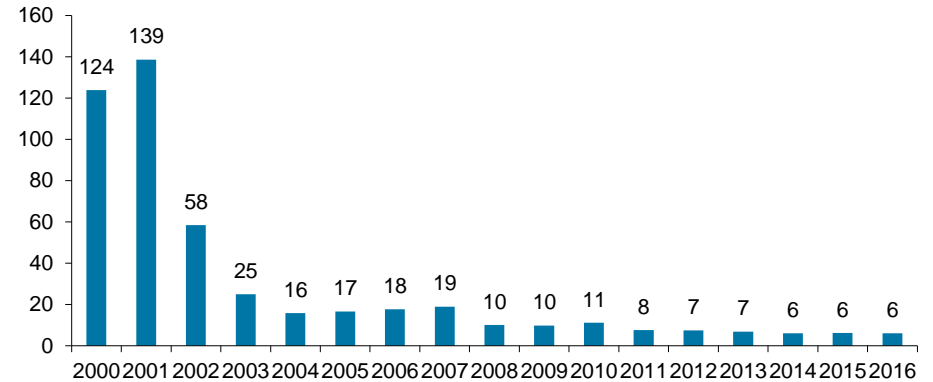


## SO<sub>2</sub> emissions of copper smelters (kg SO<sub>2</sub> per t of copper)

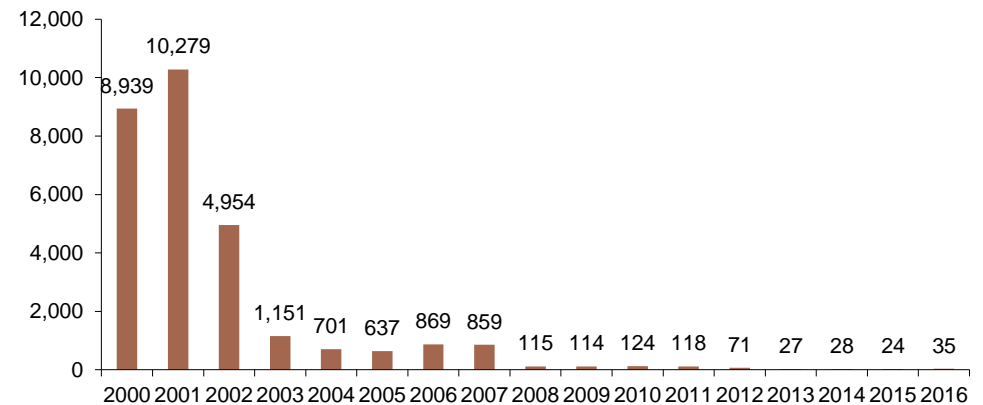


- » Outstanding success in environmental and climate protection
- » One of the most environmentally friendly copper producers in the world today

## SO<sub>2</sub> emissions of Pirdop Plant, 2000-2016 (kg SO<sub>2</sub> per t of copper)

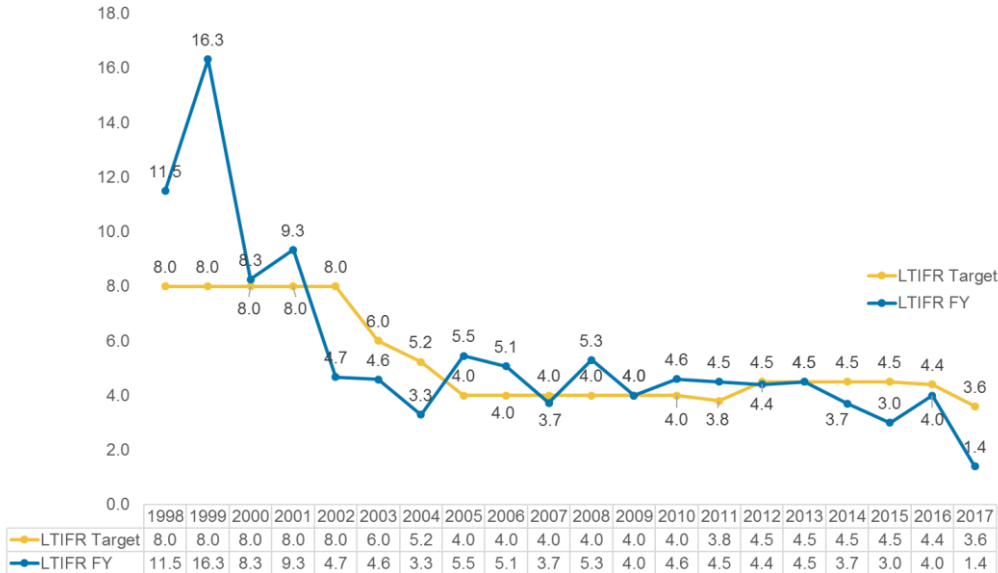


## Dust emissions of Pirdop Plant, 2000-2016 (g per t of copper)

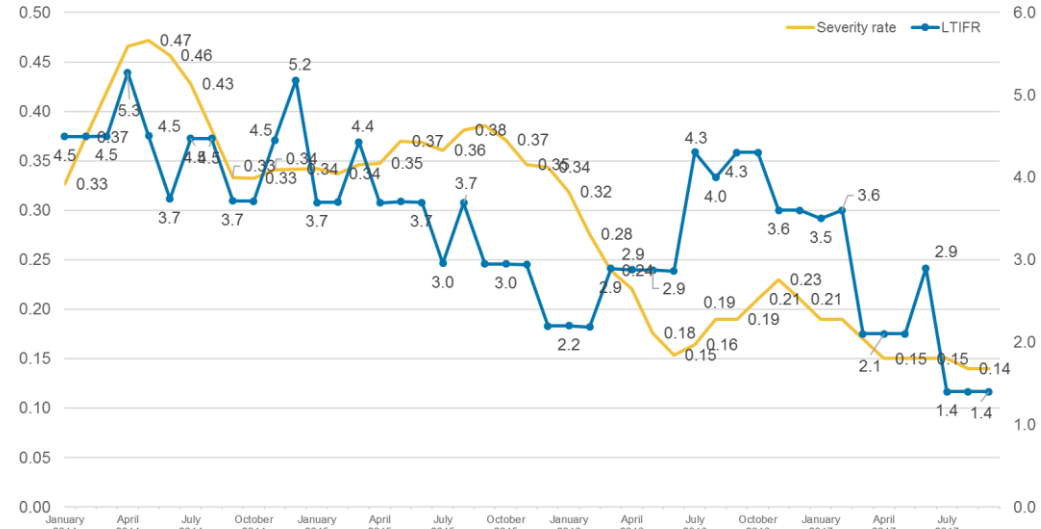




Pirdop site Lost Time Injury Frequency Rate (1998 - 2017 Financial Years)



LTIFR & Severity rate (2014 - 2017)



- » **Safety perception survey and Safety level assessment by DuPont in 2015**
  - More than 1000 participants (Aurubis & Contractors)
  - Score of 1,3 in DuPont Safety level (Corresponding to fundamental safety level)
  - Road Map for improvement
- » **Logout & Tagout System implemented on site form September 2017**
  - Reaching all areas in the plant;
  - Personal padlocks to everybody (Aurubis & Contractors)
    - » Leading KPI's for the Annual Managers targets



## » Recent initiatives in plant

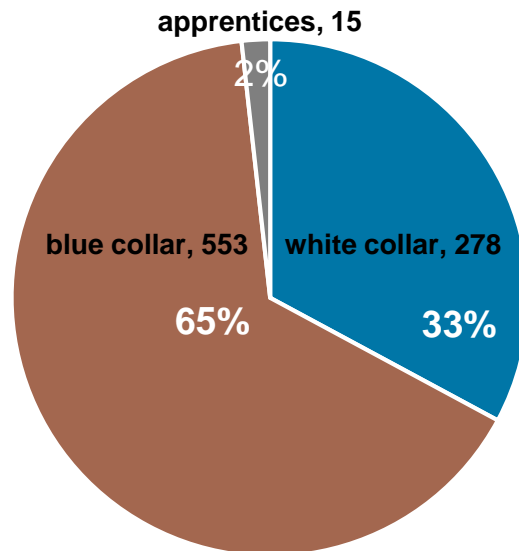
- » Significantly improved Aurubis Site General Induction
- » Implemented Permit to work procedures
- » Qualitative Accident investigation implemented
- » Monthly CEO Safety Walk-Around
- » Pro-active Health and Safety inspection by H&S Team
- » Aurubis Bulgaria Monthly Safety Council
- » Post accident talk led by CEO
- » Budgeting Safety

## » Third parity management

- » Third party high risk equipment inspection outsourced
- » Aurubis Site Rules are included in every Tender documentation
- » Monthly H&S Meeting with the contractors
- » Meeting with potential contractors during Tender phase
- » Introducing Method Statement Policy

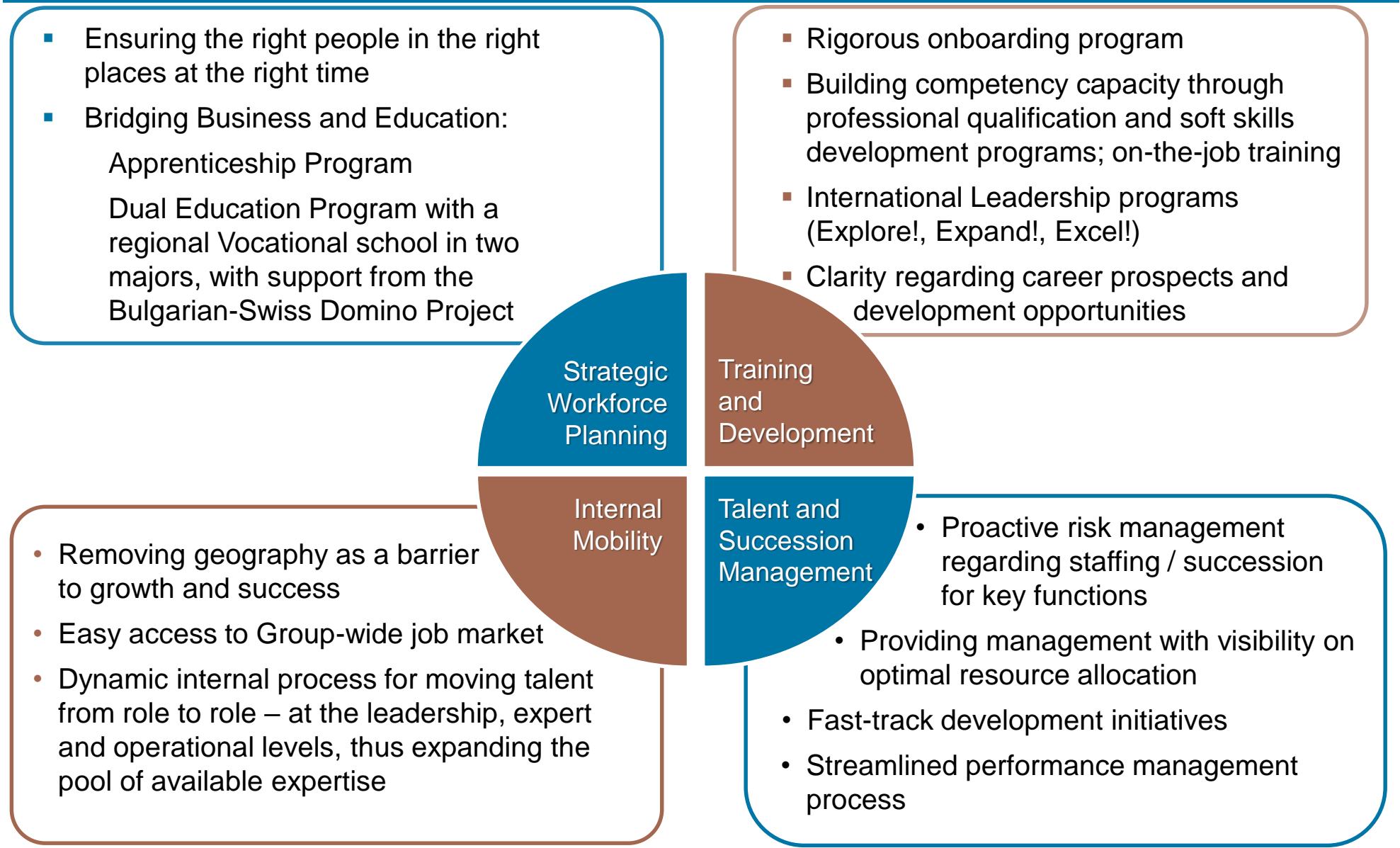


## 846 FTEs as of 30/09/2017, Site Pirdop



## Gender distribution

	Female	Male
Grand total	21%	79%
White collar	38%	62%
Blue collar	13%	87%
Apprentices		100%



## Over EUR 600 M direct investment since 1997

- » EUR 417 M in modernization of the production processes
- » EUR 106 M in environmental performance
- » EUR 78 M in equipment renovation

## Spectrum 2018 EUR 180 M investment program

- » EUR 75 M in sustainable operations and control
- » EUR 55 M in ensuring competitiveness
- » EUR 26 M in improving supply chain logistics
- » EUR 20 M in renovation and improvement of smelting process
- » EUR 2.5 M in sustainable social projects





## Part of Spectrum 2018 investment program

- » 11 production facilities modified
- » Fulfilled in 54 days, ahead of schedule
- » Zero incidents
- » The company kept Top 2 position despite of the shut down

## Improvements after the Shut Down

- » Smooth functioning of the main units for the next 10 years
- » Sustainable quality improvement of the entire production process
- » Highest global standards in environmental protection



## Port Burgas, 2016/2017

- » Unloading, control and storage of copper concentrates and sulphuric acid
- » Investment in cooperation with BMF Port Burgas
- » Handling up to 1 Mio.tpy concentrates and up to 1 Mio.tpy H<sub>2</sub>SO<sub>4</sub>

## Landfilling depot, 2016

## Rain Water Treatment Plant, 2014

### Rain Water Treatment Plant, 2014

- » Development of specific solutions by R&D of Aurubis Bulgaria
- » Lab testing of technologies before commissioning



## Turnover and taxes

- » EUR 1.7 B total turnover, 2016
- » EUR 51 M corporate profit tax, 2012-2016
- » EUR 79.2 M VAT paid to the customs, 2016

## Export and import, 2017

- » EUR 2.5 Billion export sales, ~9% of Bulgaria's total export
- » EUR 1.7 Billion import of raw materials, ~6% of Bulgaria's total import

## Employment

- » ~ 850 directly employed
- » More than 800 employees of subcontractors working permanently on site
- » 1 500 from the Srednogorie region indirectly employed during complex repair works

- » Support of universities, academic bodies, innovation projects
- » National level partnership projects with cultural institutions
- » Over EUR 3 M invested in the last 10 years for sustainable development of the Srednogorie region:
  - » Schools and educational initiatives
  - » Development of young talents
  - » Culture
  - » Green sports
  - » Healthcare & local hospital
  - » People with disabilities
  - » Partnership with local organizations & communities

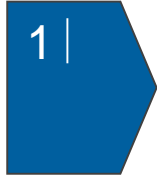






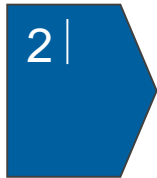
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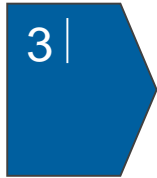
## **We excell at metallurgy:**

Fostered by innovation, we are the leader in sustainable processing of primary and secondary raw materials.



## **We grow:**

Building on our copper expertise, we expand our business model and strengthen our geographical footprint, ensuring superior financial performance.



## **We are the partner of choice:**

Together with our customers and suppliers, we develop value-creating solutions.



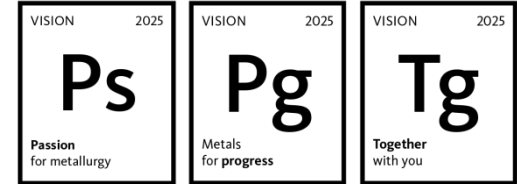
## **We act as one team:**

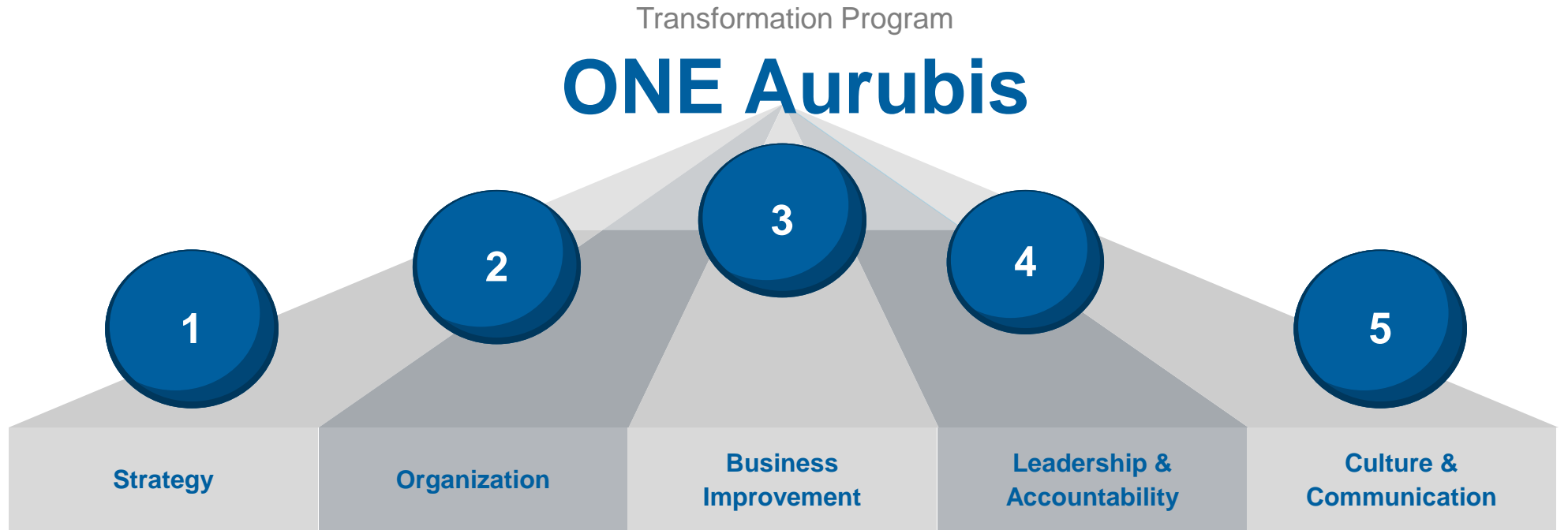
While strengthening the individual capabilities of each employee, we shape the future of Aurubis as one team.



## **We improve every day:**

In everything we do, we set continuous improvement as a guiding principle.





## Clear Direction

- › Implementation of group and business strategies
- › Implementation of functional strategies

## Efficient Organization

- › Review of the organization
- › An organization that supports vision and strategy

## Improved Processes

- › Continuous improvement in all functions

## Employee Development

- › 360° feedback
- › Leadership programs
- › Employee training

## Unifying Culture

- › Check the company values with our employees
- › Transparency regarding steps and success of the Aurubis ONE program

# Aurubis Operating System (AOS): group-wide standardization driving Efficiency

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- » AOS is a methodology for continuous and sustainable process optimization
- » With AOS, procedures in all areas will be optimized, performance data will be standardized and process losses will be eliminated in alignment with goals
- » AOS has been started in Hamburg and Pirdop, and will be transferred to other sites and other administrative functions

- 
- » Improves workplace safety
  - » Enhances performance and efficiency
  - » Increases results



**Thank you for  
your attention!**

**Q&A**

