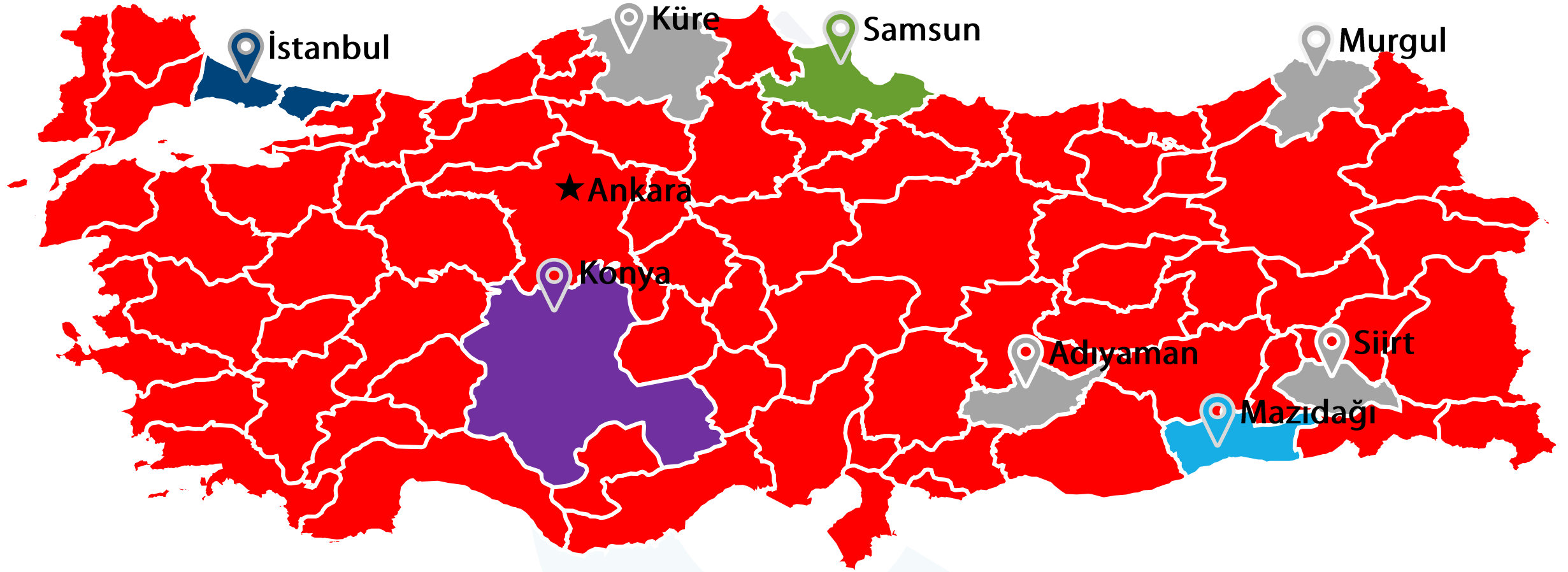


ICoNiChem & Eti Bakır General Introduction

Cobalt Congress 2023
9-11 May, Istanbul

ETİ BAKIR PRODUCTION LOCATIONS



- Cengiz Holding Head Office
- Copper Mine and Concentrator
- Bauxite Mine and Aluminum Production
- Copper Smelter and AS Fertilizer Production
- Metal Recovery and Fertilizer Production Complex



- Subsidiary of **CENGİZ HOLDİNG**
- Phosphate mine acquired in 2011, was shutdown since 1994
- Operating on **1,5 Million m²** plant site and **80 Million m²** mine site
- **1.500 individuals** directly employed, during construction reached more than **5.000 employees**
- Cobalt and Fertilizer is produced with **national resources**
- **1st Cobalt Recovery from Pyrite in the World (2% global market share)**
- **1st Solvent Extraction Plant for Cobalt, Zinc and Copper in Türkiye**

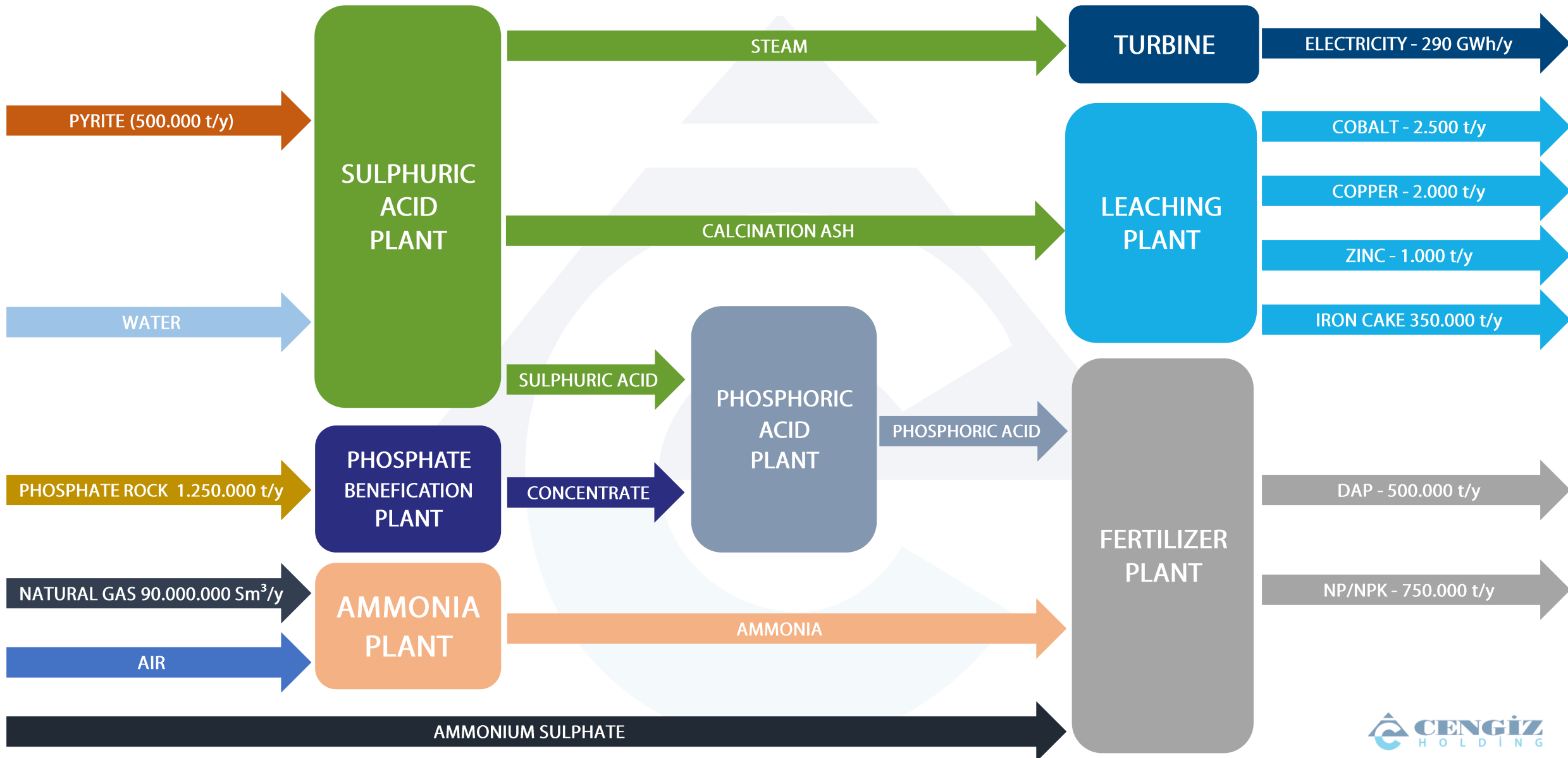
OUR MISSION & VISION

We aim to become an international role-model organization by exceeding the expectations of our stakeholders with our management approach and continuously developing processes.

As Eti Bakır, we are pioneering in bringing all components of our natural resources to the economy in the most efficient way and with sustainability.



ETİ BAKIR - PRODUCTION PROCESS



OUR PRODUCTS



2.500 t/y Cobalt



1.000 t/y Zinc



350.000 t/y Iron Concentrate



2.000 t/y Copper



135 t/y Nickel-Cobalt
Cake



750.000 t/y NP Fertilizer

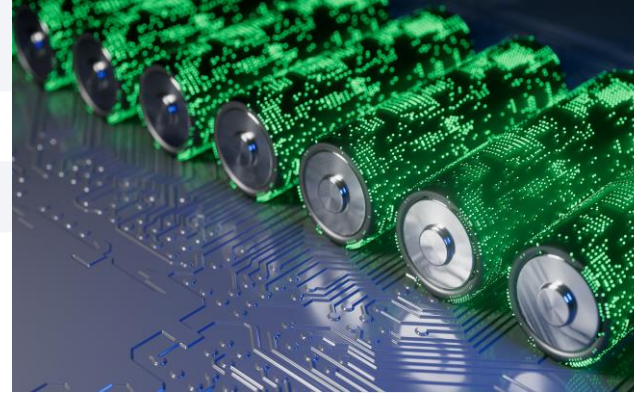


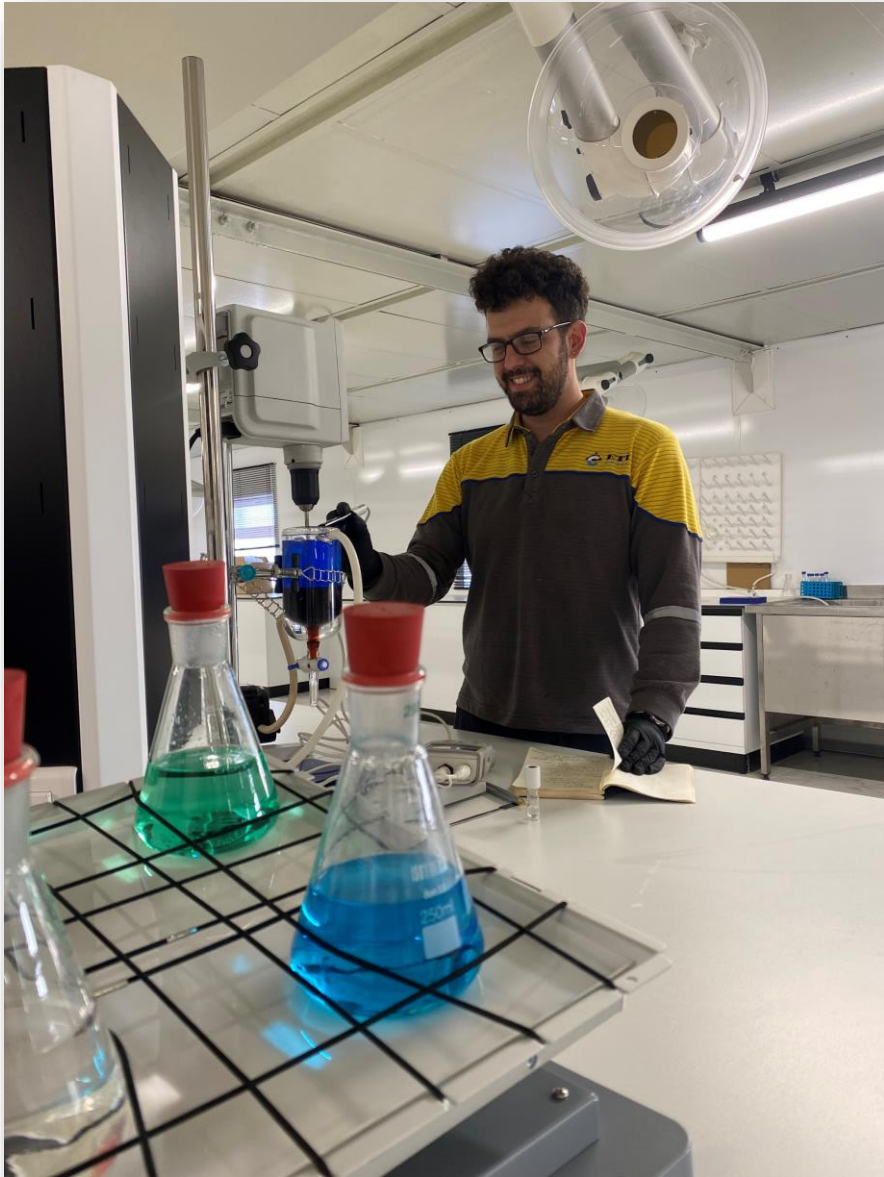
or 500.000 t/y DAP Fertilizer

KEY MARKETS FOR OUR PRODUCT

Our Markets

- Li-ion Battery
- Catalyst
- Pigment / Decolouriser
- Drier in Paint and Ink
- Rubber Adhesion
- Animal Feed
- Superalloy
- Medical Alloy
- Hard Facing / Stellite
- High Speed Steel
- Permanent Magnet
- Hard Metal (WC) And Diamond Tool Application

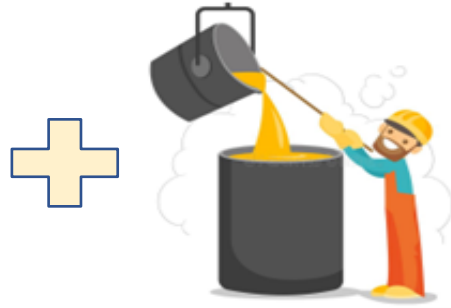
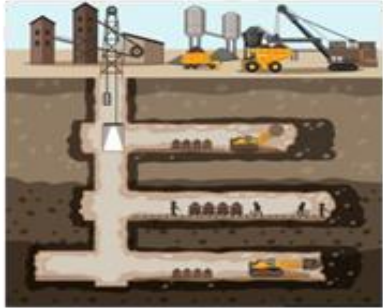




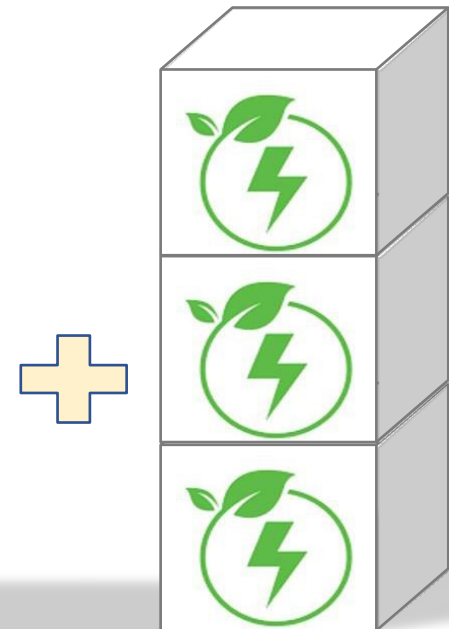
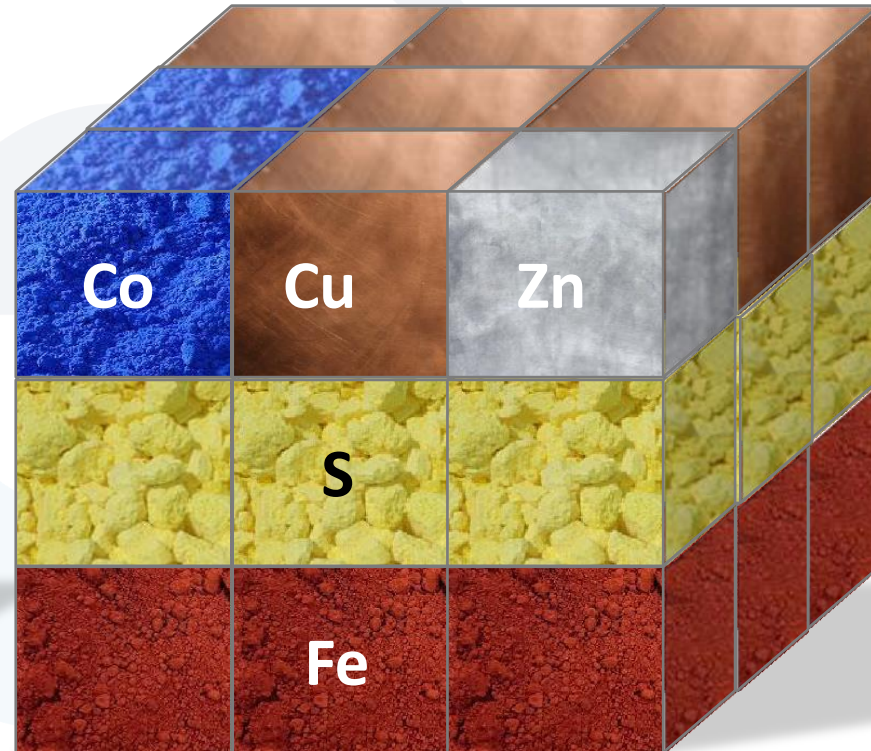
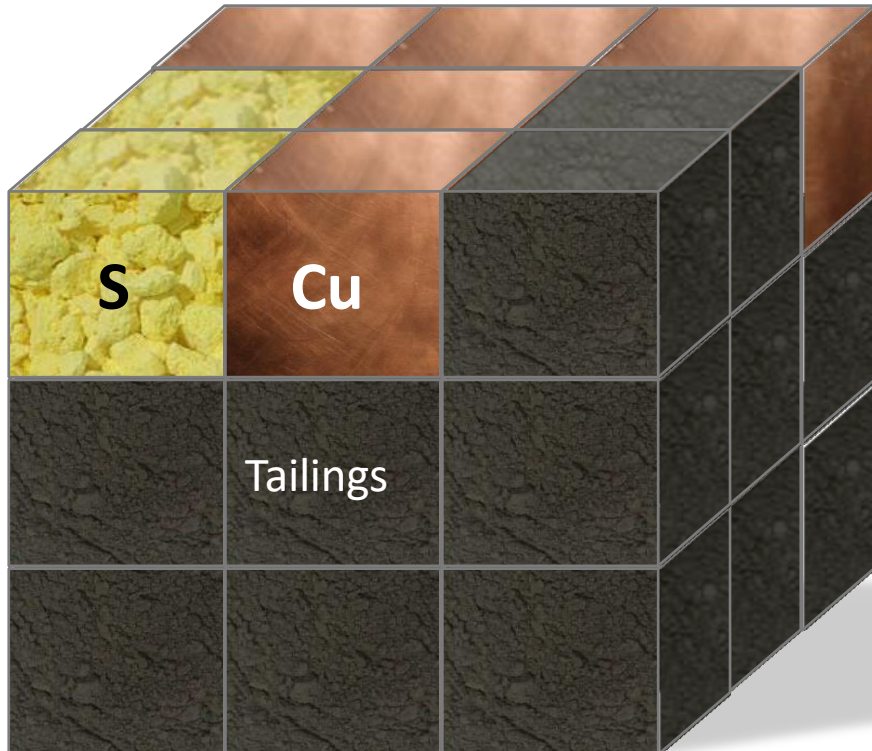
Quality Control and R&D

- TS EN ISO/IEC 17025
- Impartial, fast, effective, continuous, stable and independent
- National and International Standards
- Accurately and reliably
- Process quality control
- Process optimization
- Black Mass recycling
 - ✓ Co ✓ Ni ■■■ Mn ■■■ Li
- New product research

Küre Cu Mine Samsun Smelter

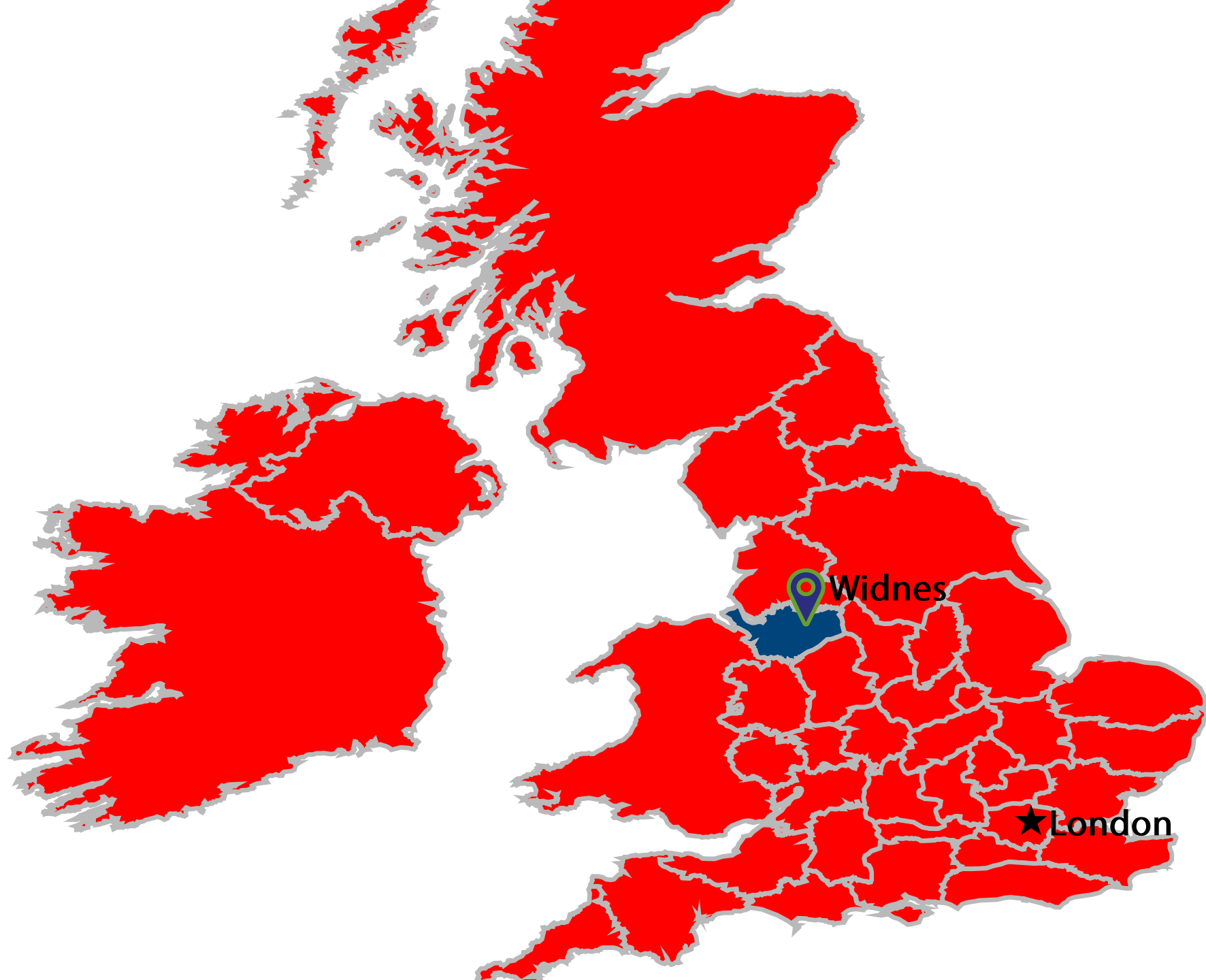


Mazıdağı Plant



- Sustainable Sulphur Resource
- Responsible Cobalt resource corresponds to 2% of global production
- **30 MW** power generation from waste heat corresponding to **80%** of total consumption of the plant
- **50 MW** solar power plant will be commissioned by mid 2024
- Reducing CO₂ emission by Railway connection





Widnes

★ London

ABOUT US

- ICoNiChem is an expert in transition metal chemistry specialising in cobalt and nickel compounds made from 100% ethically source feedstocks to modern industries across the globe.
- The raw material of the facility is CoCO_3 produced in Turkey, as a vertical integration of both plants.
- Capable of processing cobalt secondaries and cobalt metal in nitrate medium.
- >40 years of experience



HISTORY

- Site was started in Widnes in 1970s
- Originally called Chemcat
- Started with cobalt products plus manganese nitrate, Raney nickel
- Sold to Shepherd in 1995
- Became Shepherd Widnes in 1998
- Sold to GIL in August 2016
- Sold to Cengiz family in December 2020



OUR MISSION & VISION

To grow a speciality chemical business based on quality and manufacturing excellence using ethically sourced raw materials, providing consumers with a compelling offer built on world class customer service.

Sustainable transition metal products developed by a focused organisation bringing real benefit to people in a modern world.



OUR PRODUCTS



Cobalt Acetate



Cobalt Hydroxide



Cobalt Oxide



Cobalt Carbonate



Cobalt Sulphate



Cobalt Nitrate



Cobalt Chloride



Nickel Carbonate

KEY MARKETS FOR OUR PRODUCT

- PET/PTA catalyst
- De sulfurisation/GTL catalysis
- RAP's for tyres and paint
- Pigments and Dyes for ceramic
- Metal finishing
- Li-ion Battery
- Animal feed and bio application



PROCESSES

- 1500-1800MtCo/yr plant capacity
- Nitric acid cobalt dissolve
- Non nitrates through precipitation by carbonate or hydroxide
- Acetate, Sulphate & Chloride crystal products made by secondary reaction with acid
- Flash calcination to produce oxides
- Jet milling to enhance physical properties



CUSTOMER SERVICE EXCELLENCE

- ICoNiChem is a business which has continually traded for more than 40 years
- A dedicated team ensures a quick responses to enquiries offering & a personal service
- Customer centric responsive structure providing 100% OTIF in a culture of continuous improvement
- Leading Quality and Environmental systems



Accredited to
ISO9001
in 1998



Accredited to
ISO14001
in 2005



QUALITY CONTROL

In recent years, the company invested in a new laboratory facility and is proud of its leading-edge resources in analysis. This is used in routine QA and continuous improvement R&D work.

- 100% batch testing is in place
- EDTA auto titrator for Co%
- ICP & AA for metals
- Particle size distribution:
 - Specific Surface Area [SSA]
 - Total Organic Carbon [TOC]
 - Carbon & Sulphur Content [C&S]
- Offsite specialist testing for Dioxins





PURIFICATION

- Nitrate Medium
- Selective precipitation to separate: Cu, Fe, Pb, Ca, Mg
- Liquid-liquid extraction to separate: Mn, Zn, Ni, Na

INCOMING FEED

- 150,000ppm Mn on 100%Co
- 150,000ppm Ni on 100%Co



FINISHED PRODUCT

- 150ppm Mn on 100% Co [99.9% eff]
- 150ppm Ni on 100% Co [99.9% eff]

SINCE 2014 WE HAVE BEEN RECOVERING NICKEL FROM SX "WASTE" STREAM

- Ni separated by solvent extraction must contain some Co
- Passed through second solvent extraction process to recover Ni
- Product contains 20-25 parts Ni to 1 part Co
 - Sold as intermediate source of Ni as carbonate
 - Co returned to main site processing stream





ICoNiChem continues to invest significantly in site improvements at Widnes.

- Total capital investment since divestiture in excess of £3.0 million

Current Projects

- Reduction of operating costs by switching from nitric acid to sulfuric acid as main non-Co raw material
- Introduction of some non-Co products aligning with Cengiz Holdings portfolio

INVESTING FOR THE FUTURE

Faraday Battery Challenge Sponsored by UK Government 'R2LiB'

- Ran from 2018 to 2021
- 9 project partners
- Over £2 million spent on the project, approx. 50% funded by Innovate UK

“The first example of a remanufactured cathode in the UK from recycled transition metals, showing comparable performance to non-recycled commercial materials.”



STRATEGIC OPPORTUNITY

Our history of metals processing (especially separation techniques) and global reputation for cobalt products places ICoNiChem at the forefront of black mass recycling.

- We have received enquiries from around the world from producers of black mass
- We have already completed trials processing black mass from a variety of sources including handheld devices, portable batteries and EV batteries
- Operating permits under COMAH & PPC in place
- We are working on developing the process further to recover lithium
- We have started engineering design work for a dedicated black mass recovery plant (potentially) at the Widnes site

BLACK MASS RECYCLING

- ICoNiChem is actively trying to develop a circular economy for black mass recycling within the UK.
- The carbon footprint of local recycling clearly has advantages over sending batteries or black mass abroad and our hydrometallic process has similar advantages over traditional shredding/smelting.
- Importantly, we have a proven technical process and the financial capability to expand.
- We see it as the next strategic objective for us to establish partner(s) in the automotive sector that to make the circular economy possible.





1974 **45 YEARS**
UNINTERRUPTED
MANUFACTURE



QUALITY
(REACH, COMA, ISO)



**MANUFACTURING
CAPACITY OF 2000MT**
ONGOING INVESTMENT
TO LIFT THIS TO 4000MT



ONLY UK
MANUFACTURER
OF COBALT CHEMICALS



OVER 100
STANDARD COBALT
CHEMICALS SUPPLIED
ONE OFF SPECIFICATIONS
HAPPILY MADE TO ORDER



25 MANY CUSTOMERS
REACHING
25 YEAR
ANNIVERSARY



FINISHED PRODUCT
99.95% EFFICIENT



**GLOBAL
SUPPLY**
90+% EXPORT



R&D +
QUALITY CONTROL
12% WORKFORCE



**ETHICALLY
SOURCED**



**TOLLING
CAPACITY
OF 2000MT**



KEY MARKET
PET/PTA CATALYSTS
DE- SULFURISATION
GTL CATALYSIS
RAP'S FOR TYRES
AND PAINTS, PIGMENTS

Thanks For Listening



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