

Update on Meta Nikel Gördes Operation

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Outline



Strategic Importance of Nickel



Nickel Production and Mining in the World



General Information About Zorlu Holding and Meta Nikel



Investment Plans

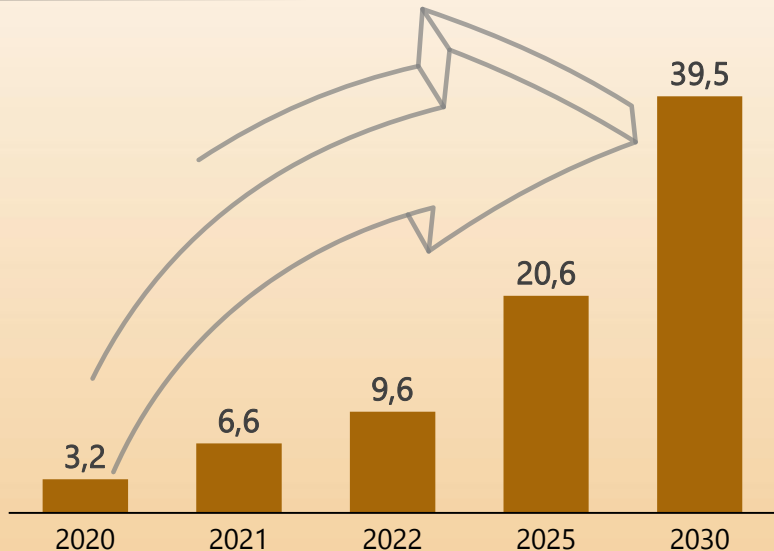


Sustainability Targets

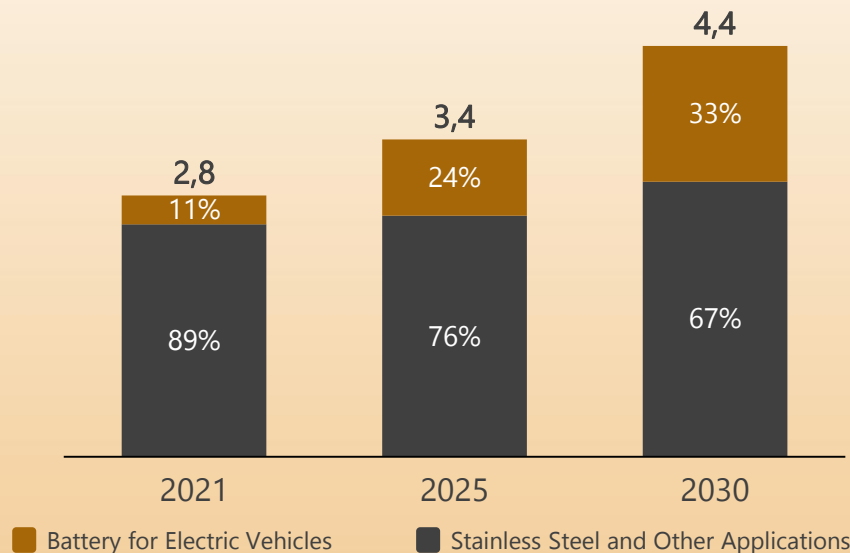
Strategic Importance of Nickel

The demand for nickel, which is primarily used in stainless steel, is rapidly increasing with its use in electric vehicle batteries.

Global Passenger Electric Vehicle Sales Development
(MN Unit)

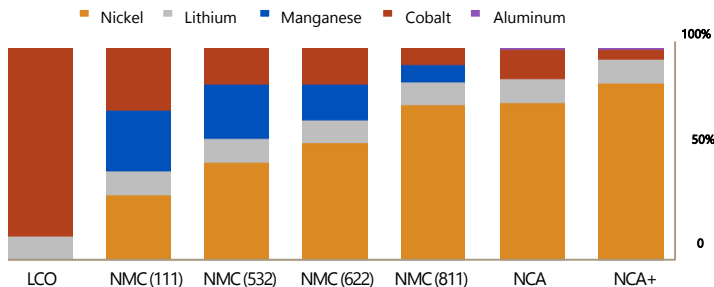


Global Nickel Development by Application
(MNt)



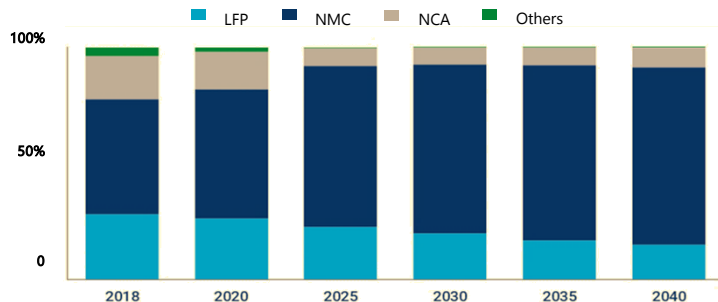
The demand for nickel from the battery industry will account for more than 25% of the total nickel market by 2030

Metal Contents in Different Cathode Chemistries (%)



- *The Electric Vehicle Industry is taking action to use more nickel in battery cathodes.*

Share of Cathode Chemistries in Electric Vehicles (%)



- *NMC is becoming increasingly dominant in the lithium-ion battery chemistry for electric vehicles.*

LCO: Lithium Cobalt Oxide, NMC: Lithium Nickel Manganese Cobalt Oxide, NCA: Lithium Nickel Cobalt Aluminum Oxide, LFP: Lithium Iron Phosphate Oxide

Top Nickel Producing Countries



Indonesia



Philippines



Russia



Australia



Meta Nikel Kobalt A.Ş

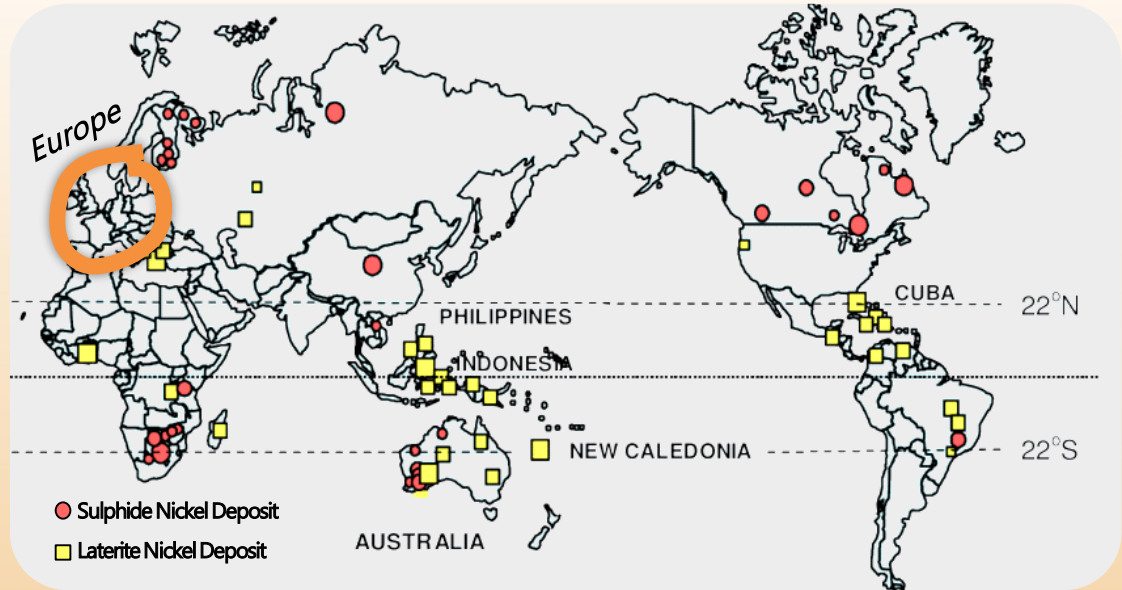
Nickel Production and Mining in the World

Nickel Deposits in the World

Europe will be an Important Region for Nickel Demand

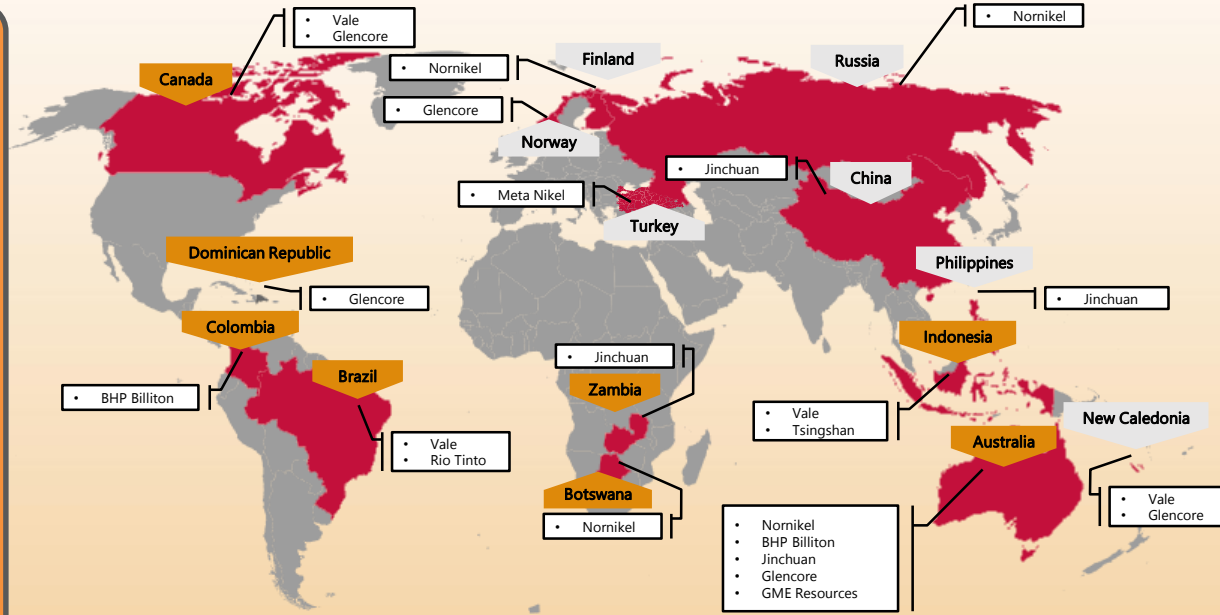
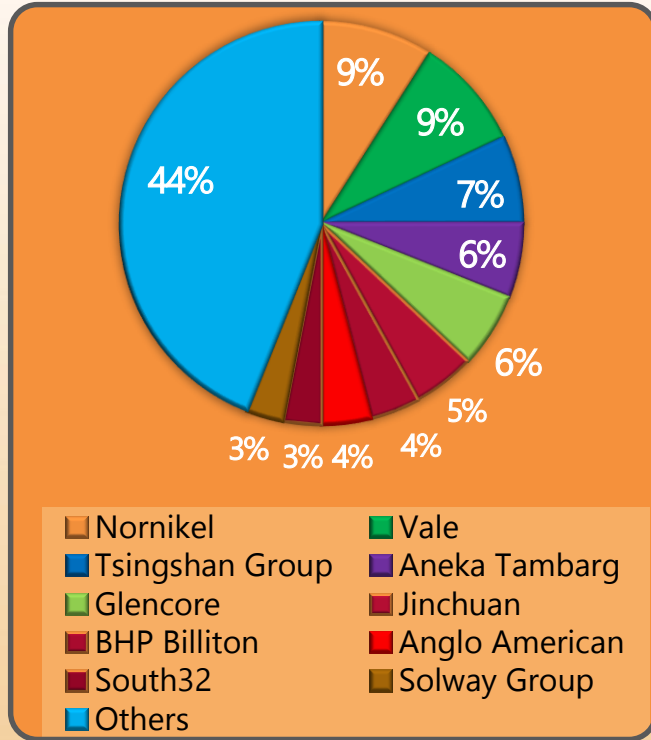
- Europe region is very poor in terms of nickel resources.
- However, Europe will be a key hub in EV ecosystem and **Göteborg** has a strategic location

- **More than 1000 GWh** battery cell manufacturing capacity has announced in Europe by 2030
- It corresponds ~350K tons of Nickel demand



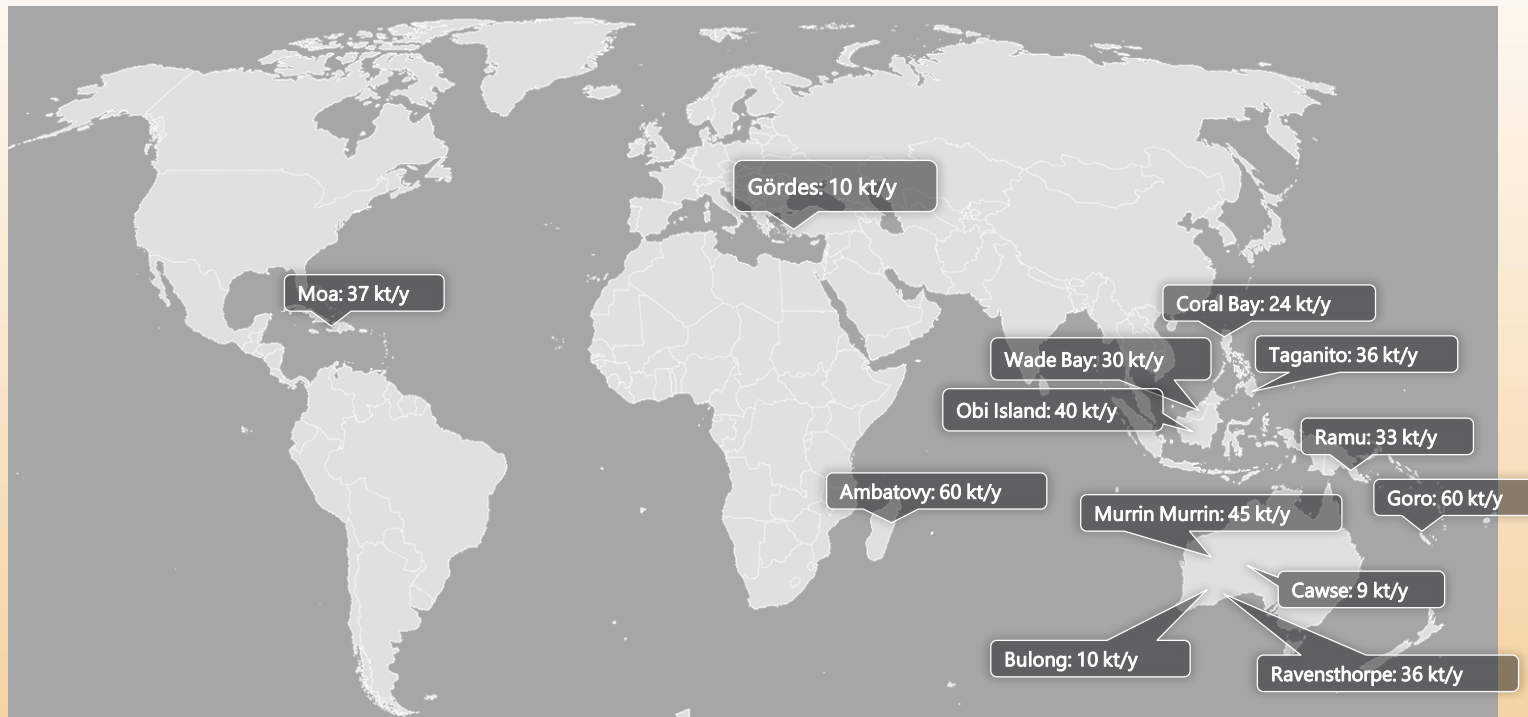
- Nickel deposits are generally located in different countries and some of them have high political risk.

World Nickel Producers



• Australia, Indonesia, South Africa, Russia and Canada account for more than 50% of global nickel resources.

Production Capacities of HPAL Plants



HPAL

Information about Nickel Ore in Turkey

LATERITE ORE

Eskişehir – Mihaliçcik

Manisa – Çaldağ

Manisa – Gördes

2 different
types of nickel
mineralization
in Turkey

SULPHIDE ORE

Bitlis

Sivas

Bursa

*Nickel contents
are low and not
economical*

Companies Operating in Turkey and their Work Status

- Manisa - Gördes: **Meta Nikel Kobalt A.Ş**
(Turkey's first and only concentrated nickel processing plant)
- Manisa
- Eskişehir

*Meta Nikel aims to produce
the nickel forms needed by
Turkey with its new
investments.*

General Information About Zorlu Holding and Meta Nikel

Zorlu Group

As part of our "**Responsible Investment Holding**" approach, we focus on technology and innovation, and develop human-oriented ecosystems and regenerative business models.

One of the 3 group of companies that provides the most employment in Turkey: **33,000 employees**

Champion of export in the electronics industry for 20 years

One of the 3 Turkish companies to be amongst the top 1000 global firms with the highest R&D expenditures

Turkey's **first unmanned aerial vehicle manufacturer**

Turkey's **first domestic smartphone manufacturer**

Turkey's first, and Europe's only industrial plant for **nickel and cobalt concentrates**

One of the **largest industrial complexes** in Europe, producing in a single location in the field of electronics, white goods and telecommunication

Global leader in microthread technology utilizing nanotechnological practices

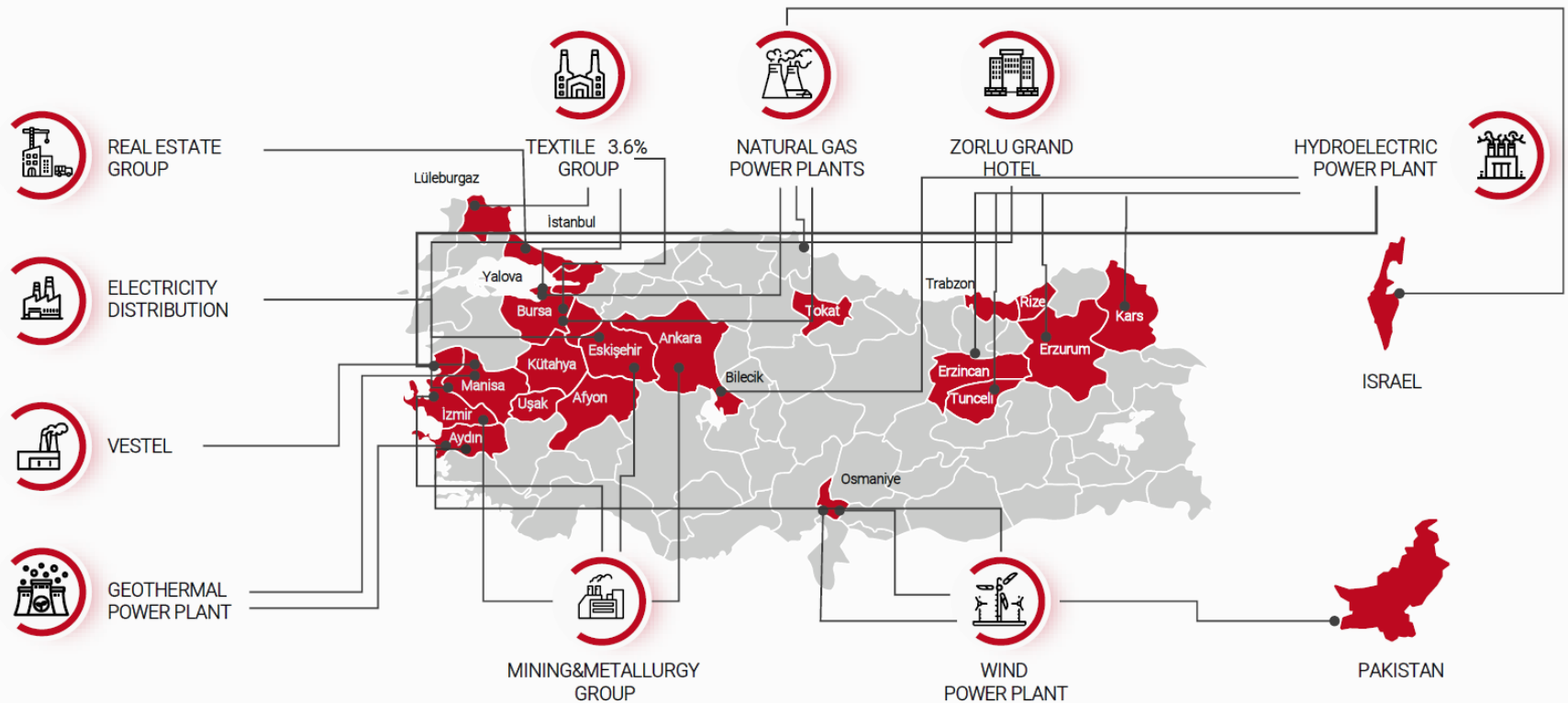
Leader in renewable energy with 6 natural gas, 4 geothermal, 4 wind and 7 hydroelectric power plants

A first in Europe and Turkey: Polymer Recycling Plant

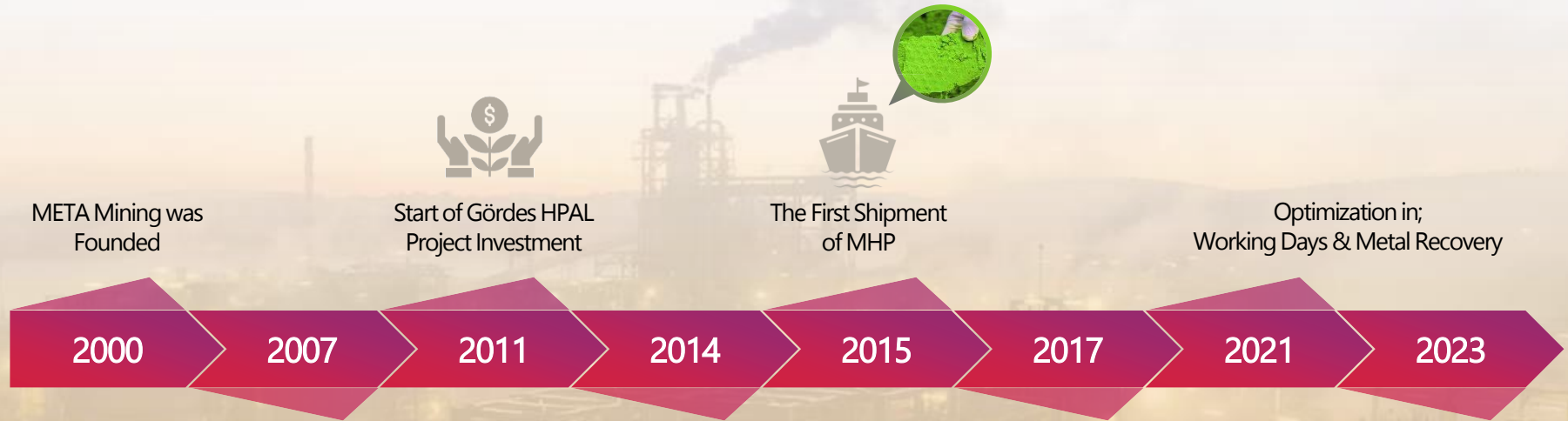
Our Industry-Leading Companies

Electronics and White Goods	VESTEL	REGAL	
Textile	KORTEKS	ZORLUTEKS	ZORLU HOMETEKs
Energy	ZORLUENERJİ	ZES Zorlu Energy Solutions	electrip GELECEĞİN SÜREKLİ ENERJİSİ
Real Estate	 ZORLU CENTER İSTANBUL	ZORLU GAYRİMENKUL	LEVENT 199
Other	ZORLU PSM	meta NİKEL KOBALT A.Ş.	JULES VERNE TRAVEL & EVENT
		ZORLU GRAND HOTEL TRAKZON ★★★★★	ZORLU AIR ZORPET
			ZORLU FAKTORİNG ZORLU MADEN GRUBU

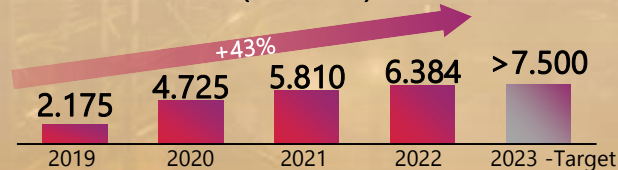
Strong production for a Stronger Turkey



Brief History of Meta Nikel Gördes Plant



Meta-Nikel Production Development (Nickel-Ton)



Metal Nikel Ore Sites



- Manisa/Gördes is a plant with a nickel metal production capacity of 10,000 tons/year.
- Eskişehir mine production and reserve development studies continue.
- Geological survey studies continue at our licensed sites in Uşak.

Gördes and Eskişehir sites have sources of Scandium, which is one of the rare earth elements.

Meta Nickel Reserve Information



Status

Reserves

Mt

Ni (%)

Co (%)

Proven

Gördes

38.3

0.63

0.03

Eskişehir

9.8

0.68

0.04



Potential

Gördes

6.3

0.66

0.03

Eskişehir

28.6

0.70

0.04



Total Reserves

Gördes

44.6

0.63

0.03

Eskişehir

38.4

0.69

0.04

* Meta has a mining site and license in Eskişehir

* All values are based on Jorc Code (2016) and Additional Resource Estimates (2019)

General information of Meta Nikel

PROCESS & CAPACITY

HPAL

(High Pressure Acid Leaching)

Capacity

10,000 tons Nickel Metal

750 tons Cobalt Metal



PRODUCT

MHP

(Mixed Hydroxide Precipitate)

Ni: %36-40

Co: %1.8-2.2



R&D CENTER STUDIES

Nickel Sulfate

Nickel Metal

Cobalt Sulfate

Cobalt Metal

Manganese Sulfat/Oxide

Scandium Oxide/Fluoride



General information of Meta Nikel

Meta Nikel Employees



710 Employees in Total
%15 Female Employees



Certification



ISO 9001
Quality
Management
System

ISO 45001
Occupational Health &
Safety Management
System

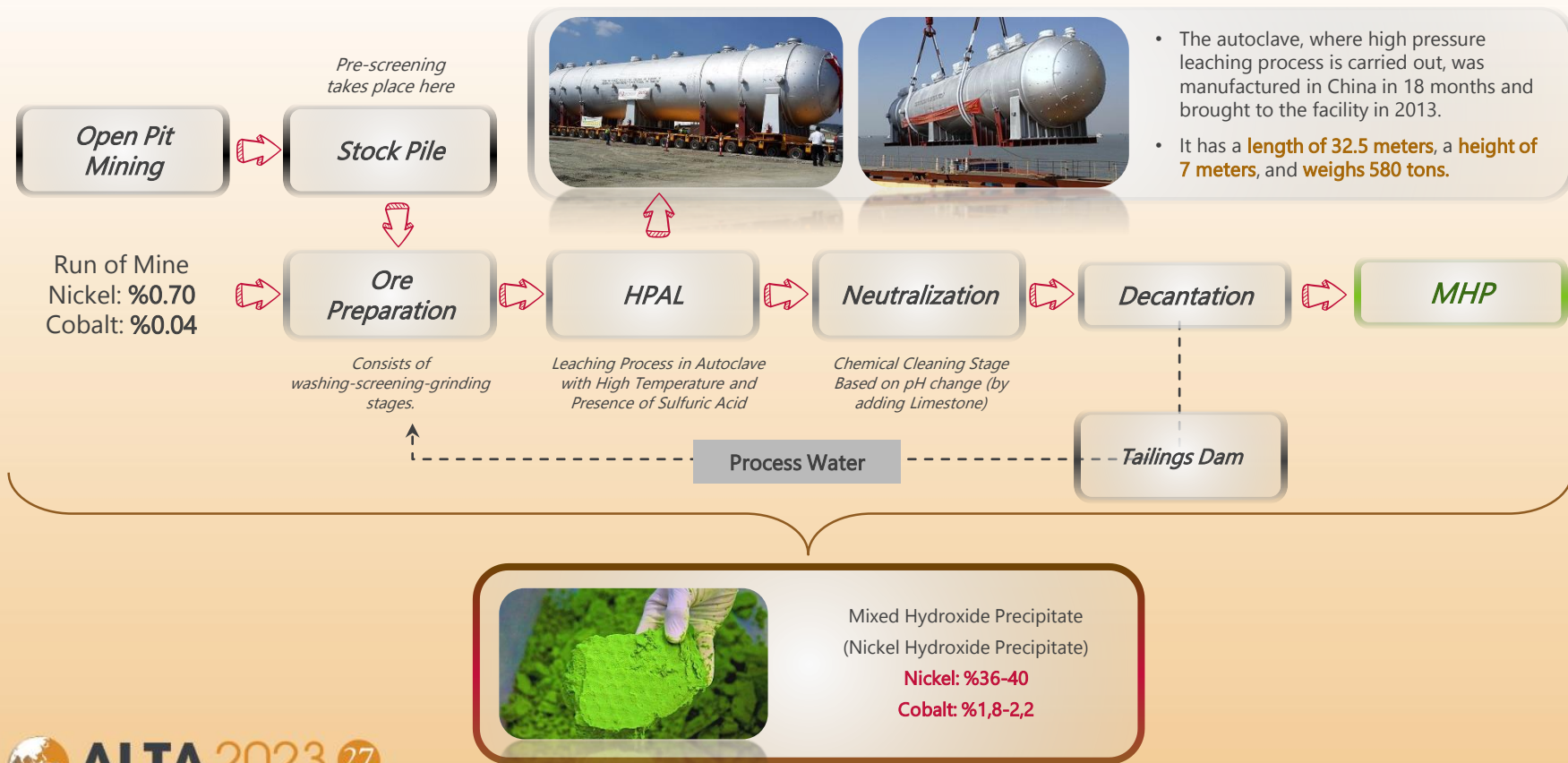
ISO 14001
Environmental
Management
System

IRMA
Initiative for Responsible
Mining Assurance



IRMA ENGAGEMENT MAP
increasing transparency and catalyzing connections between mining stakeholders

MHP is produced using the latest process technology (HPAL)



MHP is produced using the latest process technology (HPAL)



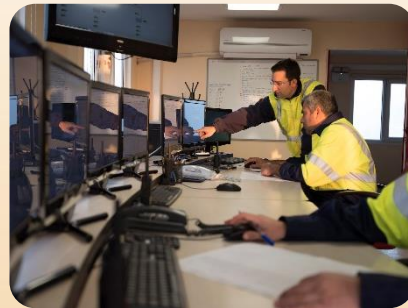
Low Acid Consumption



Latest Process Technology



Environmentally Friendly



Meta Nickel located in Gördes exports all of its production.



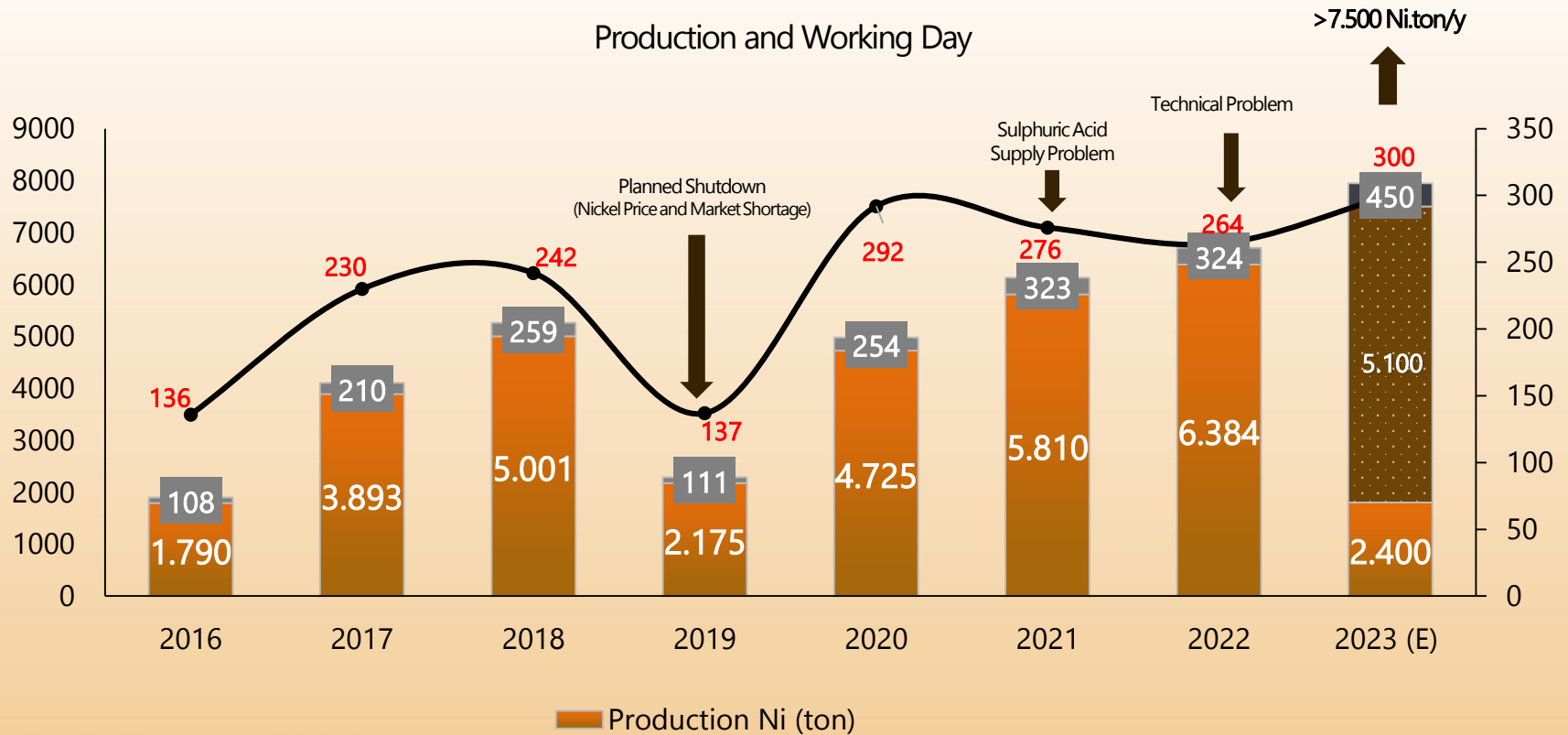
Meta Nickel located in Gördes exports all of its production.



- MHP is produced at the Meta Nickel Gördes Plant then transported to the Izmir/Aliaga Port which is 150 km away from Gördes and exported to China and South Korea.
- Sulfuric acid is supplied from Aurubis, one of Europe's largest acid producers located in Bulgaria.



Meta Nickel has been carrying out increasing nickel and cobalt production since its establishment.



Investment Plans

Investment Plans



Sustainability of Production



Cost Advantage



Profit Maximization

Key Objective

1

Ore Preparation Investment

Throughput Improvements:

Increase in capacity utilization via pre-processing of the ore mix
Reduction sulphuric acid consumption due to elimination of the impurities

Cost & ESG

2

Nickel / Cobalt Sulphate Production Facility Investment

Value-Added Battery Materials

Value-Added Nickel and Cobalt Sulphate (LME+ ~5 % premium) will drive the profitability
Battery materials are the growth pillars of nickel / cobalt demand

Value

3

Gördes Capacity Increase Investment

Capacity Expansion

Additional 5.000 tons of Nickel and Cobalt equivalent Sulphate Production Plant in Gördes

Volume

4

Boiler Investment

Capacity Expansion

The goal is to achieve sustainable production.

Volume & ESG

5

Tailing Dam Investment

Volume Expansion

Increasing the tailing dam storage level.

Volume

6

Sulphuric Acid Production Facility Investment (Long Term)

Production Sustainability

Cost reduction and control via in-house production
Sustainability of the process with regards to supply continuity and carbon footprint

Cost & ESG

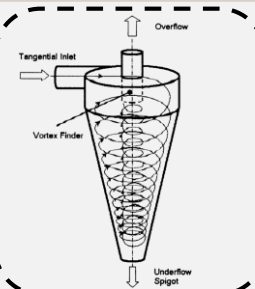
1. Ore Preparation Investment

Gördes Site

Hydrocyclone System

2

Separation of multi-phase mixtures of particles with different densities and sizes



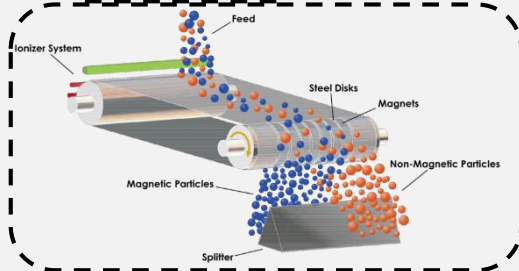
1

Nickel ore is entered into hydrocyclone system

Wet Magnetic Separator

3

Elimination of impurities and enrichment of nickel grade



- Reduction In Sulphuric Acid Consumption
- Higher Feeding Capacity

Tailor made Project!

Eskişehir Site

Dry Magnetic Separator

1

Removal of Impurities in the Ore

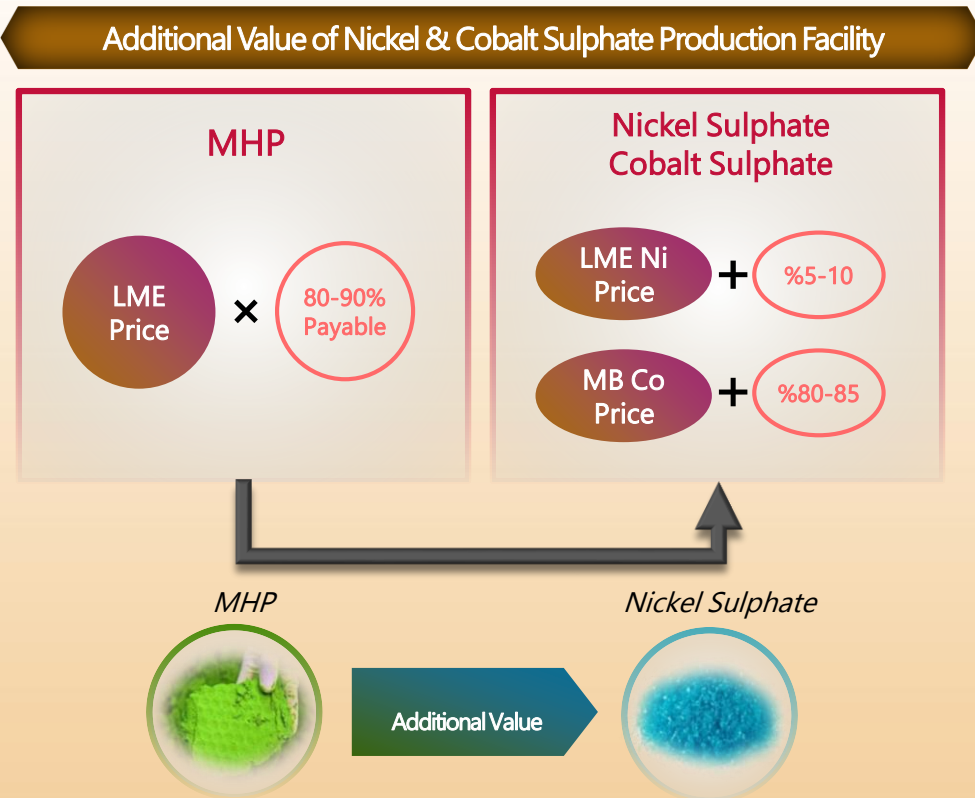
2

Pre-Enrichment of Nickel Grade

- Inert ores with 0.68-0.7% Ni grade increase to 0.9-1.0% Ni grade. (~%30 Ni enrichment)

- Increased Plant Efficiency
- Increased Production Capacity
- Sustainable Production
- Enrichment of the Unprocessed Low Grade Eskişehir Nickel-Cobalt Ore

2. Nickel / Cobalt Sulphate Production Facility Investment



10 K Ni.ton/year
Production Capacity

Other Benefits

Increase in product variety

- MHP
- Nickel/Cobalt Sulphate and Metal

Production of a Critical End Product

- Producing the end product that battery manufacturers and OEM's need
- Supply chain becomes more durable and transportation costs are eliminated

3. Gördes Capacity Increase Investment

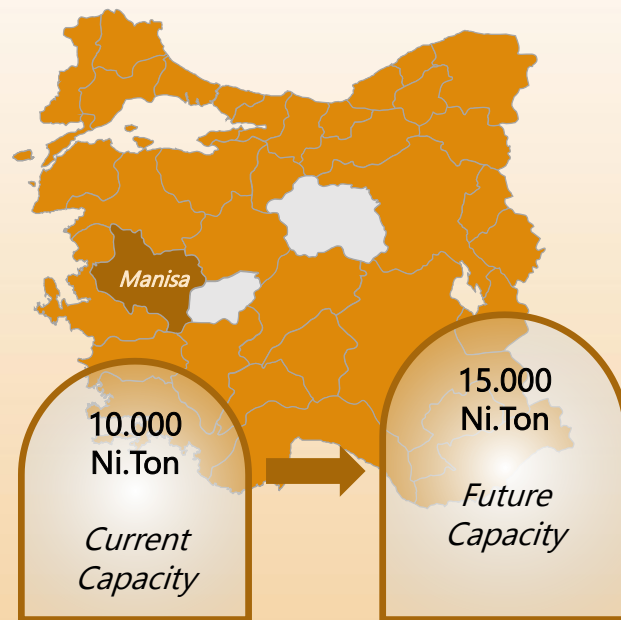
Capacity Expansion

Capacity Increase In Gördes

- *Additional 5.000 tons of Nickel and Cobalt equivalent Sulphate Production Plant in Gördes*

Key Advantages

- *Capacity expansion requires low capex and ramp-up time compared to greenfield investment*
- *Reserves will run out faster due to use of available resources*
- *Being more sizeable player and increasing available nickel for offtake's*
- *Cost Advantage*
- *Revenue Growth*
- *High Profitability*
- *Capacity Increase*
- *Competitive Advantage*



4. Boiler Investment/Improvement of Existing Boilers and Carbon Capture System

Project Target

Sustainable production
Increased Production capacity

Latest Status in the Project

The bid evaluation process continues.
Financing alternatives are being evaluated.



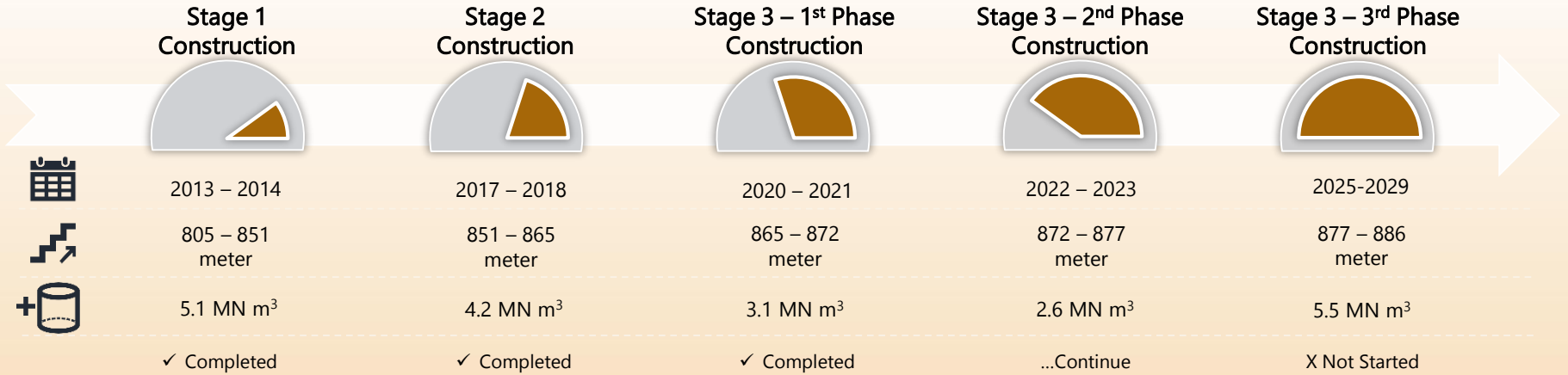
New Boiler Investment

- 1 **Feedstock:** Coal
 - **Project Capacity:** 75 tons/h 60 bar saturated steam

Modification of Existing Boiler

- 1 **Feedstock:** Coal
 - **Project Capacity:** 60 tons/h 60 bar saturated steam
 - **Feedstock:** Fuel Oil
 - **Project Capacity:** 60 tons/h 60 bar saturated steam

5. Tailing Dam Investment



General Information About the Project

Project Target: Increasing the Tailing Dam storage elevation from 772 m to 879 m, thereby increasing volume.

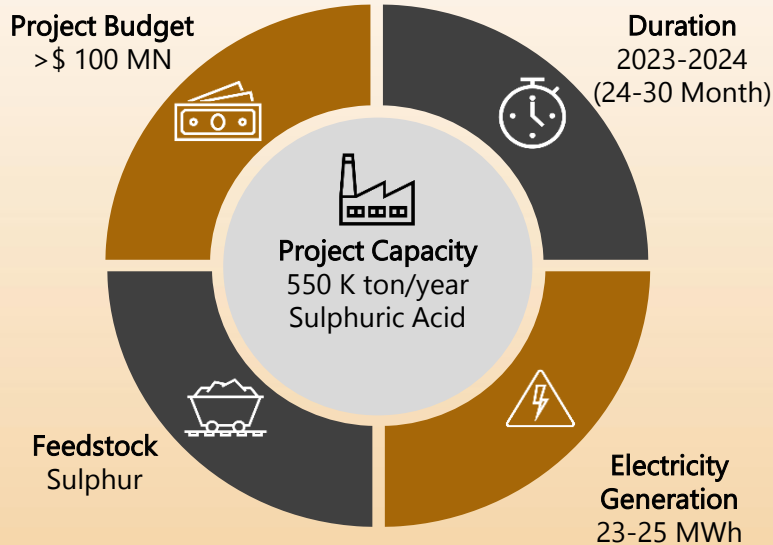
Project Duration: 5 Months (May 2023)

Latest Situation On The Project

A contract was signed with Uluova company and site delivery was made. Filling work; continues at **828.90 m** elevation with the material extracted from the landslide area.

6. Sulphuric Acid Production Facility Investment

Planned Project (Long Term Plan)



Final Situation

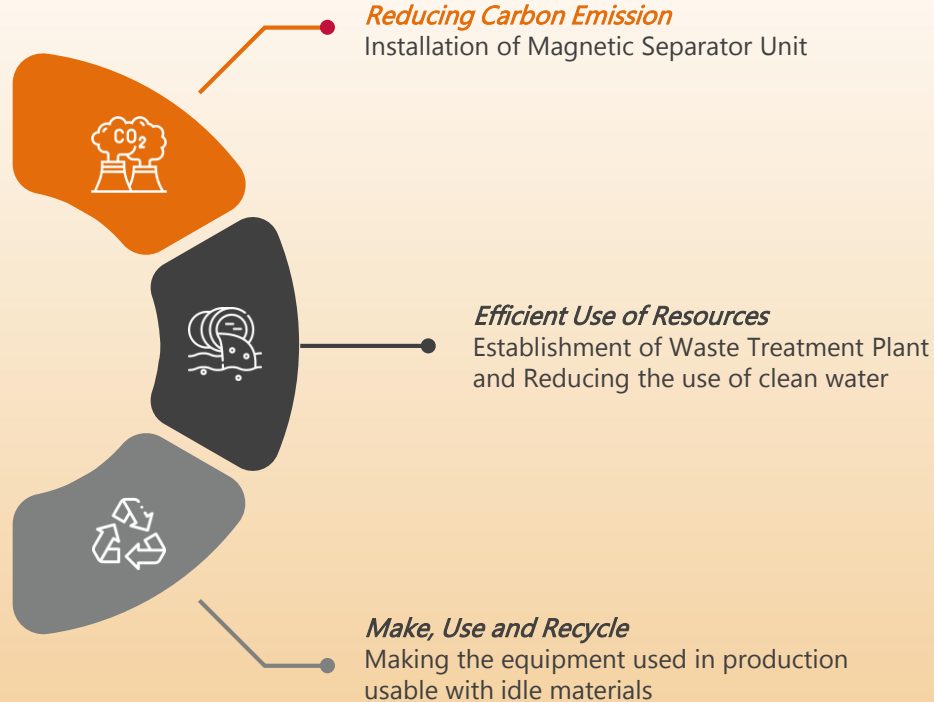
*A investment plan was made for **sulphuric acid** production,*

Instead, a 5-year long-term supply agreement was signed with Aurubis.

*This could allow Meta Nickel to **reduce operating costs** by purchasing sulphuric acid from Aurubis instead of investing in its own production facilities.*

Sustainability Targets

Meta Nickel Sustainability Targets



TARGET OF CLEAN WATER USAGE

Current Situation

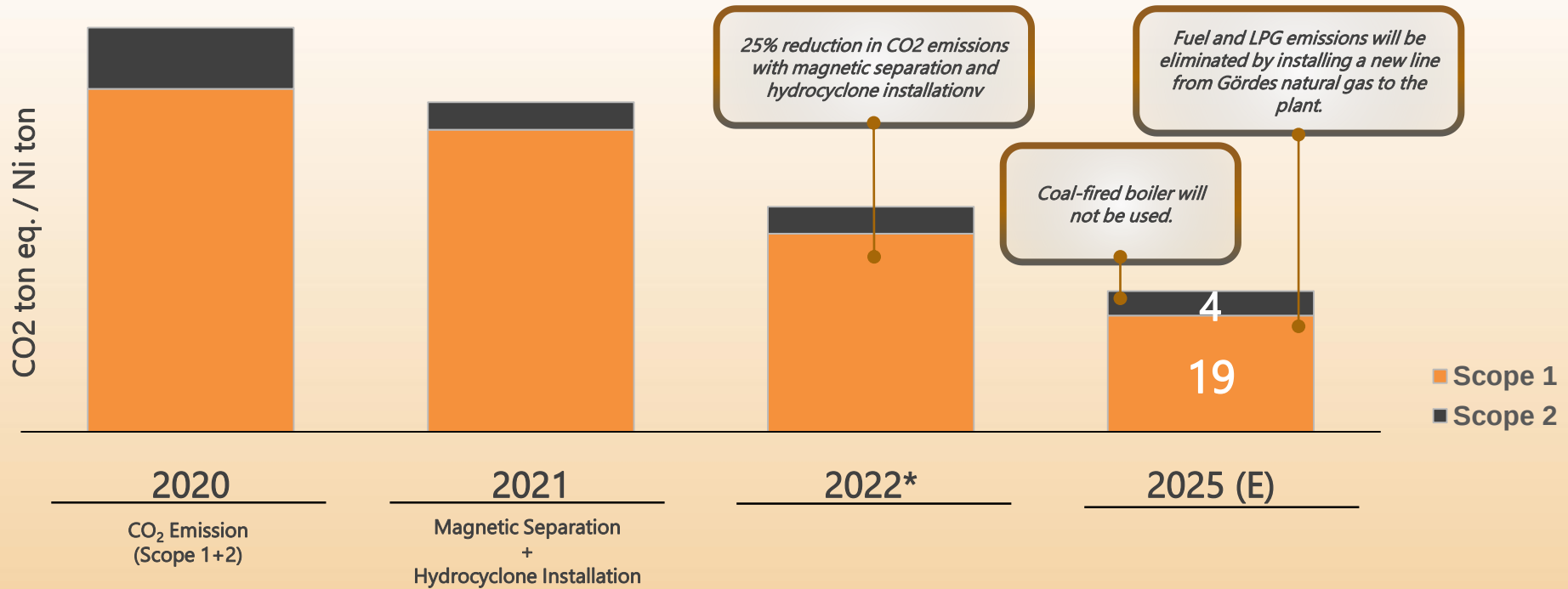


2050 Targets

As of 2023, while the **use of raw water** was **35%**, the use of **Tailings Dam water** increased to **65%**.

Reducing raw water consumption to zero thanks to the closed loop system

Meta Nickel Sustainability Targets – CO₂



As a result of the completion of new project investments; Meta Nickel Scope 1 emission target by the end of 2025 <20 tons of CO₂e /ton of nickel.

Meta Nickel Sustainability Targets – Water

Current Situation

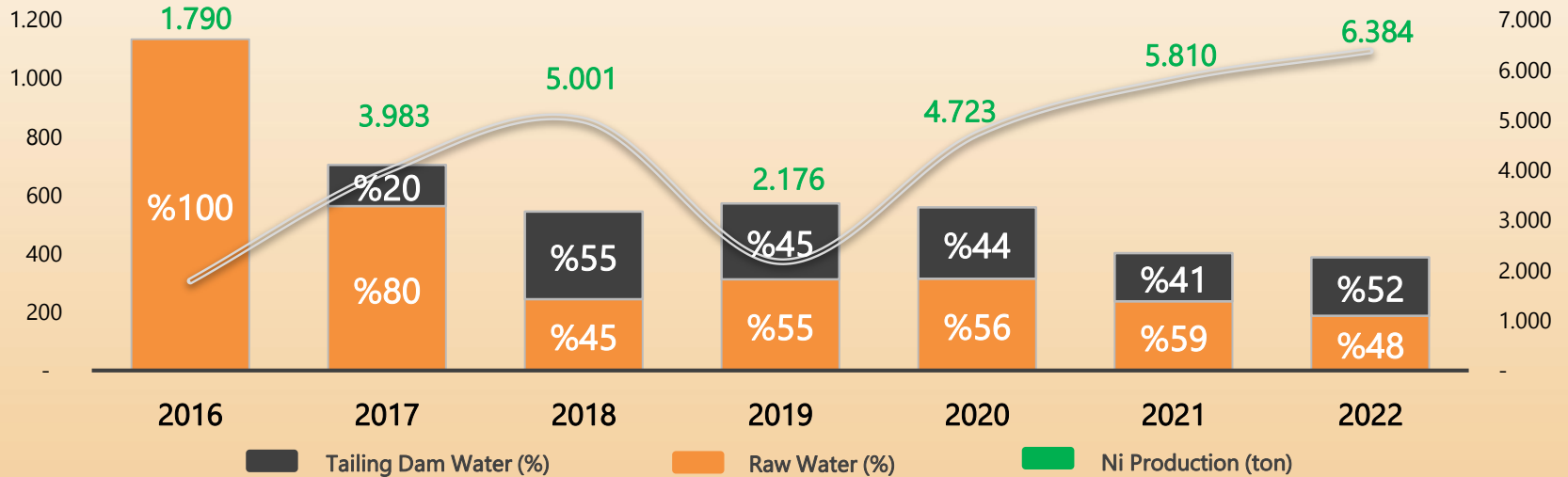
As of 2023, while the use of raw water was 35%, the use of tailing dam water increased to 65%.

2030 Target

Further reduction and minimizing raw water consumption

2050 Target

Raw water will not be consumed thanks to closed loop system



Thank you!

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#sözümüzgeleceğe

