



Ukrainian  
Geological  
Survey



Ministry of Ecology and  
Natural Resources of  
Ukraine

# UKRAINE

## Critical Minerals Portfolio

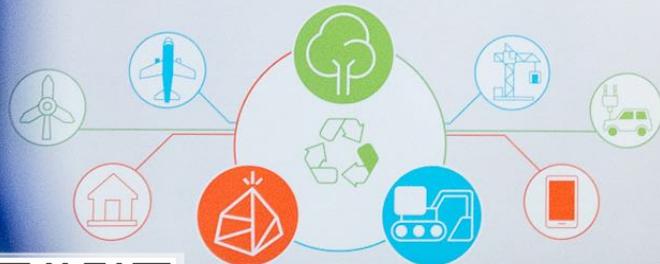




European  
Commission

## Raw Materials Week

European Innovation  
Partnership on Raw Materials



# The EU-Ukrainian Strategic Partnership on Critical Minerals

- In July 2021 the EU and Ukraine signed a Memorandum on Strategic Partnership in the Raw Materials
- In November 2022, Ukraine was represented for the first time at the European Raw Materials Week, where it held an investment forum together with the European Commission, presenting mining business opportunities
- The next investment forum was held in June 2023 during the second Ukrainian Recovery Conference in London



## Ukraine proposes a wide range of mining investment opportunities

100 projects of mainly ten critical raw materials\* could be developed to bridge the current mining gap in Europe

	Greenfield	Brownfield
Licensed	26	9
Unlicensed	50+	11
Dobra hard-rock lithium deposit (4220 acres) – 50 year license available	Stremyhorodske is one of largest titanium deposits globally – 50 year license available	Novopoltavske is large phosphate and rare earth deposit globally – \$300 mln investment needed

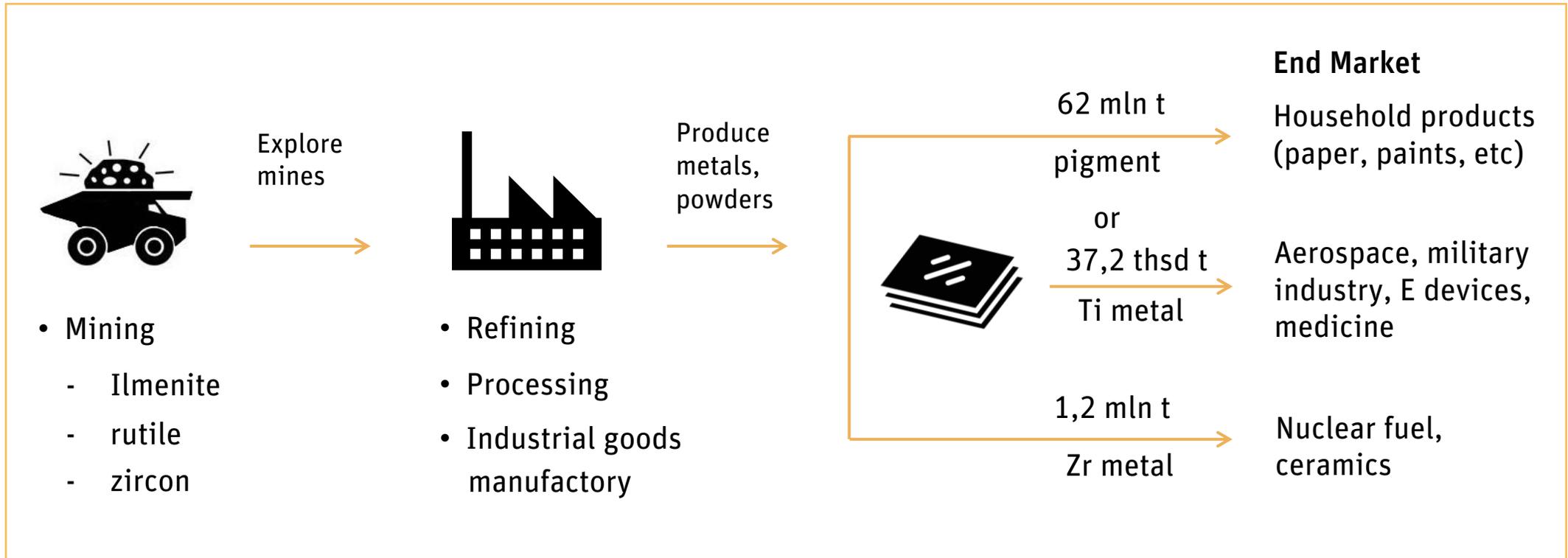
\* main mineral: Ilmenite, Rutile, Zircon, Lithium, Graphite, Nickel, Beryllium, Rare Earth Elements, Polymetallic, Zink



# Titanium

- Ukraine is one of the 10 leading countries in the world in terms of proven reserves of titanium and accounts for 7% of global production
- 28 fields and more than 30 ore occurrences have been discovered so far. The main titanium-containing minerals are ilmenite, rutile. Zirconium is often a coproduct.
- Currently, titanium is mined at six heavy-mineral sands fields, from which ~900.000 tons of concentrate are produced thereof (~ 350 thousand tons  $\text{TiO}_2$ ) in 2020. There is an ongoing privatization of largest titanium mining and processing factory in Europe – United Mining&Chemical Company
- It is possible to process up to 50 thousand tons of concentrate into the sponge inside of the country with further refining to titanium metal abroad

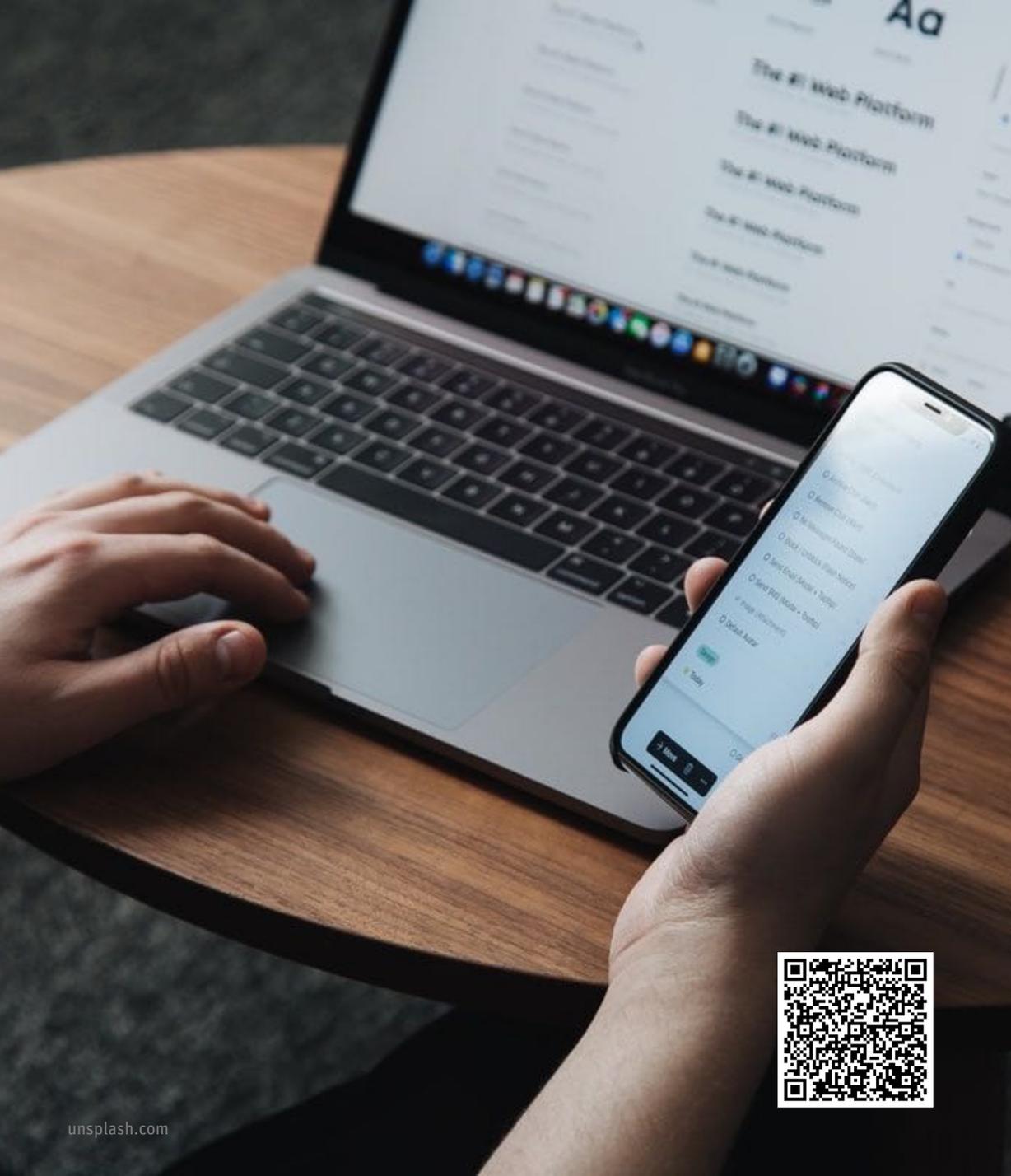
# The discovered reserves of Ukrainian titanium are equal to 15 years of production of titanium globally





# Lithium

- As of today lithium is not mined in Ukraine. Its reserves account for near a one third of those proven in Europe and ~3% of world's
- There are three explored fields with a lithium oxide content of 1.1–1.4% and one promising area for further exploration. There are also several lithium ore occurrences
- Implementation of one project at the stage of production and primary processing requires \$150–250 million of investments
- One petalite field is licensed by UkrLithiumMining LLC. The reserves are approved according to JORC classification



# Graphite

- Ukraine is one of the world's five leading countries in terms of graphite reserves, which are about 19 million tons of ore with a natural graphite content of 5-8%
- There are six known fields, one of which currently produces annually 5,5 thousand of graphite concentrate, and was acquired in 2021 by the Australian public company Volt Resources
- The Ukrainian BGV Group and the Turkish ONUR Group are operators of 3 licenses. Several promising ore occurrences available for purchasing
- In order to develop the innovative potential of graphite, the European Commission initiated a scientific research program Graphene Flagship

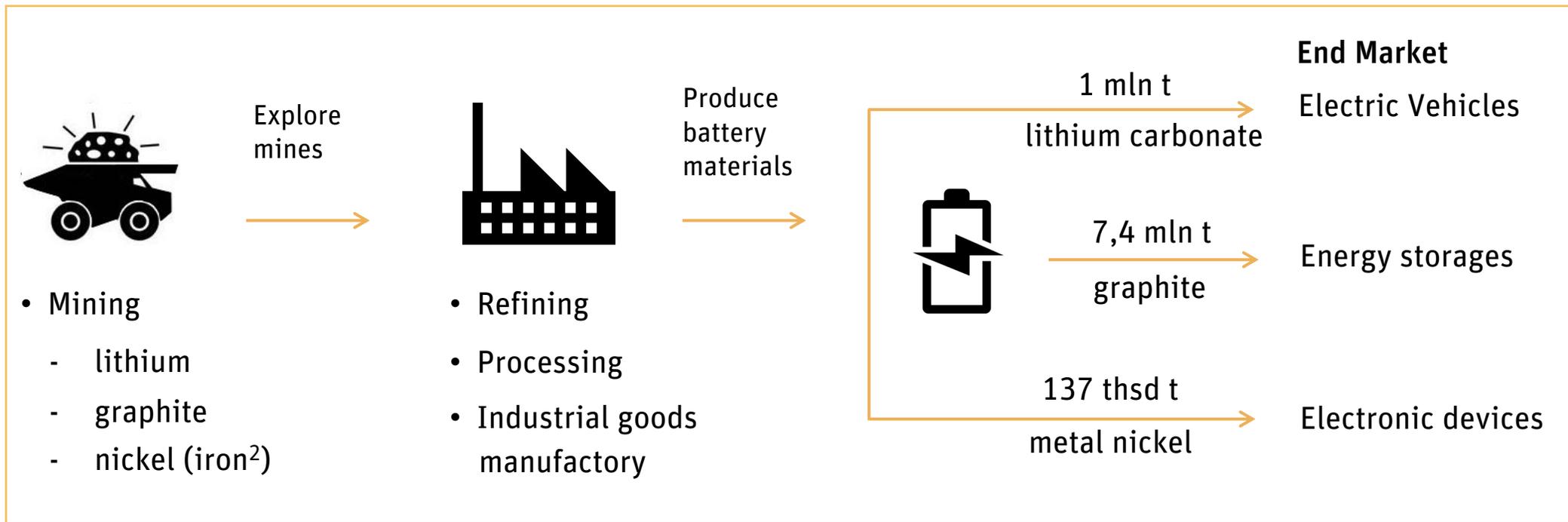


## Nickel & Cobalt

- There are 12 silicate nickel fields in Ukraine, which contain cobalt as a coproduct. The cobalt reserves are up to 9 thousand tons
- Ukraine's industry, precisely the Pobuzhsky ferronickel plant, imports nickel and cobalt raw materials
- The main prospects for the development of cobalt are related to Kapitanivske and Prutivske deposits, which have been operated by private investors since 2019



# The discovered reserves of lithium and graphite will be enough to produce cathode and anode materials for Li-batteries with total capacity of 1000 GW/h to support the manufactory of about 20 millions of Electric Vehicles<sup>1</sup>



<sup>1</sup> Capacity 60 kW/h

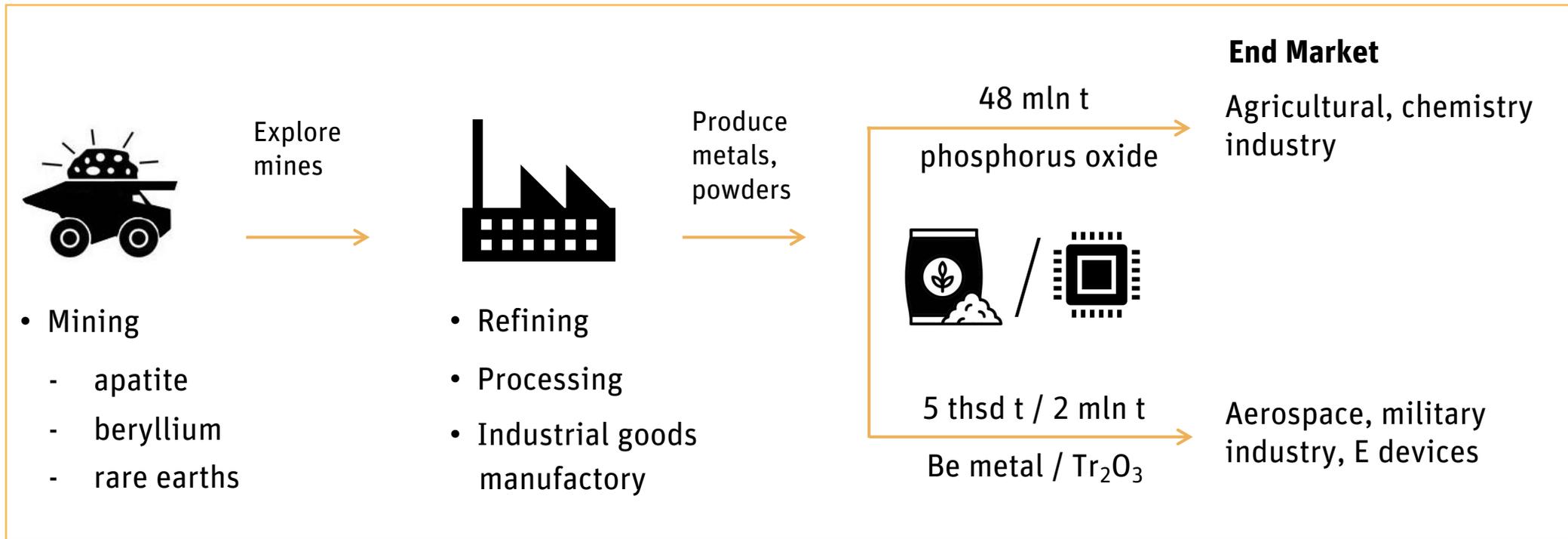
<sup>2</sup> LFP, graphite share – 29%, lithium – 13%



## Rare and rare earth metals

- Rare and rare earth metals such as tantalum, niobium, and beryllium are known to exist in six fields. Tantalum and niobium extraction in non-commercial volumes is carried out only as a coproduct of titanium
- The projections of rare earth production are related to the development of the Novopoltavske apatite ore field and potentially several other ore occurrences
- There is one beryllium field in Ukraine (Perzhanske) with reserves of 15,3 thousand of BeO, containing also tantalum, niobium, zirconium, tin, molybdenum, lithium, zinc, etc. A production license for this deposit was issued in 2019 to the BGV Group

# The development of combined apatite and rare earth deposits will allow to produce 100 millions tons of phosphate fertilizers and materials for high-tech electronic products





# Gold-lead-zinc deposits

- Ukrainian industry carries out a metallurgical processing of lead-containing materials and obtains on their basis lead, zinc and their alloys
- The reserves of lead and zinc are mainly concentrated in ores of polymetallic deposits
- There are no affinage production and melting plants in Ukraine, which are able to work with lead, copper, zinc concentrates
- There are accounted seven fields, and the production is currently carried out at Muzhiyivske field. New 20-years licenses for exploration, pilot development and production are open for e-auctions



## Ukraine declared the Open Door Policy to attract strategic investors

### Concession

Easy way to obtain E&P license for up to 20 years through e-auctions

### PSA

Agreement with the Government for up to 50 years with fiscal stability and international arbitration clauses

### Farm-in

Partnership with operator of license



## Sustainable and Green mining

- All mining projects in Ukraine have to meet high national and global standards in health, safety and environment (HSE)
- Ukraine implemented EU procedure of environmental impact assessment, which fully complies with the Directive 2011/92/EU
- Local budgets receive up to 30% of the royalty paid from the extraction of minerals. Mining companies are obliged to report according to EITI
- Following EU Association Agreement, Ukraine officially announced to join the European Green Deal Initiative, including commitments to reduce CO2 emission

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THE PRESIDENT OF UKRAINE

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