

UKRAINE

Investment Opportunities in Exploration & Production

Strategic and Critical Raw Materials

Au
Co
Mo
Ti
Li
Zr
Be
Cr
Ni



Ministry of Environmental
Protection and Natural
Resources of Ukraine





Key messages

The raw materials base of Ukraine is able to meet the needs of the national industry as well as to facilitate its export potential development of resilient value chains of critical minerals

Domestic enterprises consume mainly local raw materials for metallurgy, machine building and construction. Energy resources, agrochemical raw materials, non-ferrous metals are imported

The deposits of the so-called metals of a low-carbon future used in innovation technology are hardly produced in Ukraine. It is important now to increase their production, create enrichment and processing capacities, as demand for them is expected to grow rapidly in the world market

Available resources and prospects for production of **critical raw materials** in Ukraine, as well as their integration to global value chains will support development of open strategic autonomies, therefore will help to avoid unwilling economic dependencies

The **Investment Atlas** contains proposals with deposits of strategic and critical raw materials for their licensing through e-auctions or PSA tenders.

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



Strategic and Critical Raw Materials

Li

Lithium

Ti

Titanium

Zr

Zirconium

Ni

Nickel

Co

Cobalt

Cr

Chrome

Mo

Molybdenum

Be

Beryllium

Ta

Tantalum

Nb

Niobium

Au

Gold

Pb Zn

Lead Zink

C

Graphite

C_(x)H_(x)

Hydrocarbons

The list is not limited to the above mentioned



Lithium

- Ukraine possesses one of the largest lithium deposits in Europe
- It is an ultralight metal used for manufacturing of Li-batteries for energy storages, electric vehicles and devices, ceramics and glass
- There are three hard-rock lithium deposits and one promising area, as well as a number of occurrences for pioneering exploration
- As of today lithium is not extracted in Ukraine. One lithium deposit is being operated under a license

KRUTA BALKA license



- lithium ore, tantalum niobium rubidium, cesium-containing
- E&P license up to 20 years
- Zaporizhzhia region
- 150 ha
- lithium oxide content: ~0.86%
- measured resources – 'for official use only'

Open for nomination

PSA DOBRA license



- lithium ore, tantalum niobium rubidium, cesium beryllium tin, gold
- E&P license up to 50 years
- Kirovohrad region
- 1707 ha
- lithium oxide content: ~1.38
- measured resources – 'for official use only'

Open for nomination

SHEVCHENKIVSKE license



- lithium ore, tantalum, niobium beryllium
- production license up to 20 years
- Donetsk region
- 40 ha
- lithium oxide content: ~1.1
- proved reserves – 'for official use only'

Is being prepared for e-auction

Lithium ore spots





Titanium and Zirconium

- Ukraine is among top ten countries in the world in terms of proven reserves of titanium ores and provides more than 7% of their global production
- 28 discovered deposits have been explored. The main titanium-containing mineral is ilmenite and rutile. Zirconium is often a coproduct
- Currently, only heavy mineral sands deposits are being developed, which make up 25% of total reserves, the rest is contained in hard-rock deposits.
- Titanium is used in aviation and missile technology, ship-building, machine building, food, medical industry and non-ferrous metallurgy

SELYSHCHANSKA license



- titanium ore
- exploration license
- Zhytomyr region
- 1860 ha
- content of TiO_2 –
50–70 kg / m³

Sold for \$1.8 million
April, 2021

MALYSHIVSKE (North-Western – 2) license



- titanium ores, zirconium
disten, sillimanite, staurolite
- E&P license up to 20 years
- Dnipropetrovsk region, Kirovohrad region
- 3310 ha
- indicated resources (thousand tons):
Disten + sillimanite – 1408
staurolite – 568
rutile-ilmenite sands – 'for official use only'

Open for nomination

YURIIVSKO-KOZIIVSKYI license



- titanium ores, zirconium ores
- E&P license up to 20 years
- Zhytomyr region
- 2350 ha
- conditional ilmenite:
P₁ – 2,7 million tons, 163,02 kg / m³
P₃ – 2,8 million tons, 65,53 kg / m³

Open for nomination

BILOVODSKA license



- titanium ores, zirconium
- E&P license up to 20 years
- Sumy region
- 62 ha
- inferred resources of titanium-zirconium ores (thousand tons):
zircon – 11
rutile – 15

Open for nomination

KORCHAKIV license



- titanium ores, zirconium
- E&P license up to 20 years
- Sumy region
- 750 ha
- inferred resources of titanium-zirconium ores (thousand tons):
zirconium – 115
rutile – 137

Open for nomination

KHRAPIVSCHYNA license



- titanium ores, zirconium
- E&P license up to 20 years
- Sumy region
- 170 ha
- inferred resources of titanium-zirconium ore (thousand tons):
zirconium – 59
rutile – 75

Open for nomination

HAYDARIV license



- titanium ores zirconium
- E&P license up to 20 years
- Kharkiv region
- 971 ha
- inferred resources of titanium-zirconium ores cat. P₂ (thousand tons):
ilmenite – 1759
zirconium – 402

Open for nomination

PSA

NOSACHIVSKE license



- titanium ore
- E&P license up to 50 years
- Cherkasy region
- 180 ha
- titanium ore reserves – 'for official use only'

Open for nomination

PSA

STREMYHORODSKE license



- titanium ore
- E&P license up to 50 years
- Zhytomyr region
- 225 ha
- titanium ore reserves – 'for official use only'

Open for nomination

TARASIVSKE license



- titanium ore
- E&P license up to 20 years
- Kyiv region
- 1019 ha
- titanium ore reserves – 'for official use only'

Open for nomination

Titanium ore spots



Nickel, cobalt, chromium, copper, molybdenum

- Ukraine possesses considerable deposits of non-ferrous metals and imports significant volumes of those for its own needs
- Explored fields and prospective areas are complex and mainly concentrated within the Ukrainian Crystalline Massif
- The production of these raw materials is either not carried out or is very limited
- The estimated reserves are (thousand tons):
nickel – 215, cobalt – 8.8, chromium oxide – 453;
measured and indicated resources (thousand tons):
chromium oxide – 3120, copper – 95

PROSPECTIVE FIELD ZALISY-SHMEN'KY license



- ores of copper
- exploration license
- Volyn region
- 2337 ha
- content of Cu – up to 2.6%
- measured resources
(thousand tons):
cat. P₂ – 160

Sold for \$600 000
May, 2022

LYPOVENKIVSKE license



- ores of chromium, nickel
cobalt
- production license
- Kirovohrad region
- 42 ha
- content of Co – up to 0.043%,
Ni – up to 1.05%
- chromium ore reserves
(thousand tons) cat. C₁ – 1.061
ores of cobalt-nickel-silicate
reserves cat. A+B – 4694
inferred resources – 3225

Open for nomination

VERBYNSKA license



- molybdenum ore
- E&P license up to 20 years
- Zhytomyr region
- 290 ha
- content of Mo – up to 2%
- measured resources (thous. tons)
cat. C₂: molybdenum – 1.792 Mo – 5
cat. P₁: molybdenum – 90 Mo – 2.7

Open for nomination

ZHELEZNIAKY license



- ores of copper, nickel, cobalt
platinum, palladium
- E&P license up to 20 years
- Zhytomyr region
- 290 ha
- content of Ni – 0.66%
Cu – 0.063%, Co – 0.013%
- inferred resources (thous. tons)
cat. P₃: Ni – 151
Cu – 14
Co – 3

Open for nomination

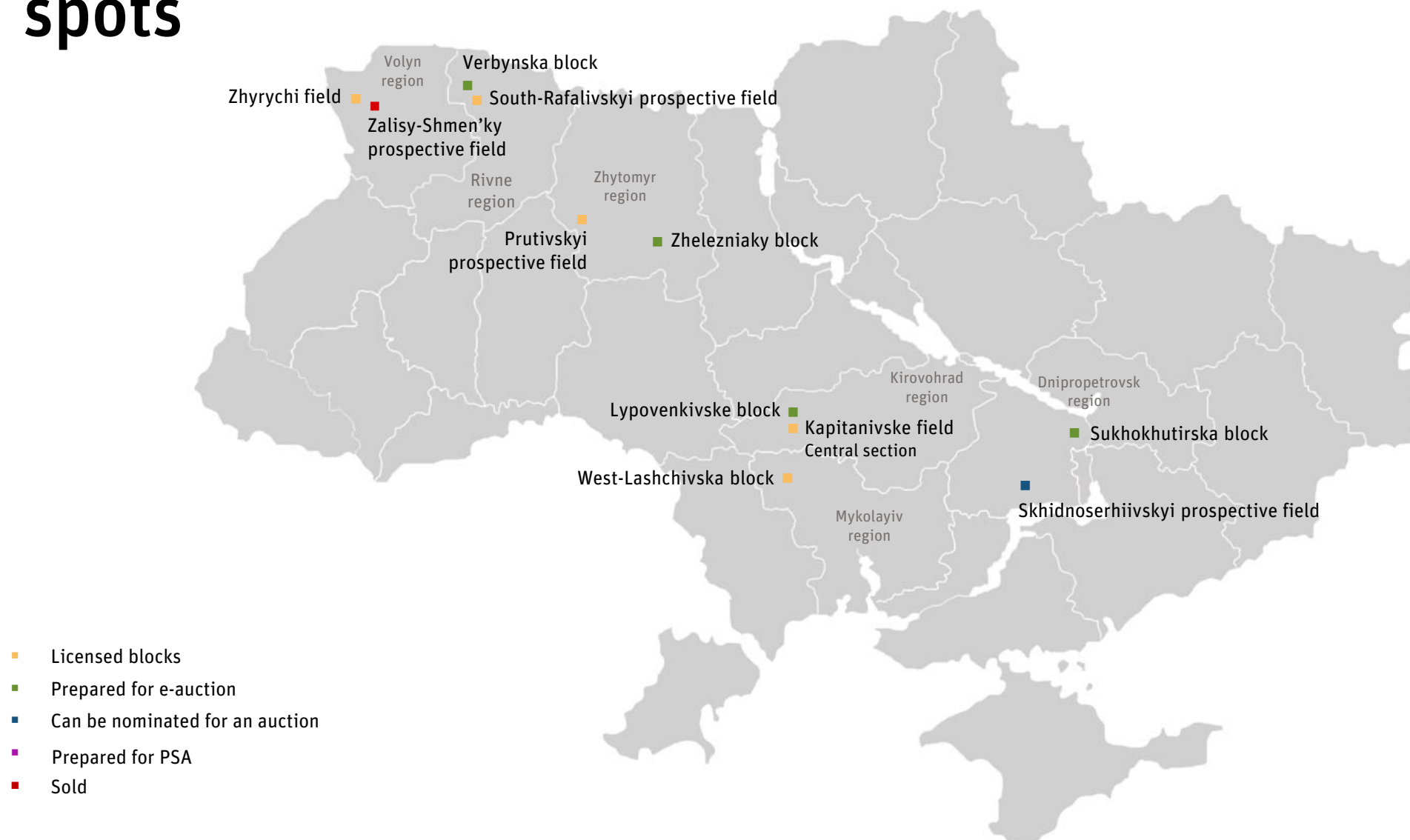
SUKHOKHUTIRSKA license



- ores of talc-magnesite
nickel, cobalt
- E&P license up to 20 years
- Dnipropetrovsk region
- 127 ha
- content of Ni – up to 0.5%
- ore reserves (thous. tons)
cat. C₂: talc-magnesite – 75739, Ni – 73
Co – 4

Open for nomination

Non-ferrous metal spots



Graphite, rare earth metals

- Graphite reserves are registered within six deposits, production is carried out within only one
- Novopoltavske phosphate and rare earth deposit is one of the largest phosphate ore deposits in the world, discovered in 1970, containing proved reserves of phosphate ore, and coproducts of rare earth elements, tantalum, niobium, strontium, magnetite
- Zirconium and scandium are coproducts and concentrated in sand or hard rock deposits in significant volumes, however there is no extraction
- Reserves of tantalum, niobium, beryllium are placed within six deposits, non-commercial production is carried out within Malyshevske and Vovchanske fields

HORODNIAVSKA license



- graphite
- production license
- Khmelnytskyi region
- 105 ha
- proved reserves of graphite
graphite ore (thousand
tons): cat. B – 28165
C₁ – 85225, C₂ – 16586
graphite oxide (thousand
tons): cat. B – 1736
C₁ – 4848, C₂ – 898

Sold for \$1.6 million
March, 2021

NOVOPOLTAVSKE license (mines Pivdenne, Pivniche)



- apatite, rare earth ores, tantalum ores,
niobium ores, strontium ores, uranium ores,
fluorine, magnetite
- production license
- Zaporizhzhia region
- 938 ha
- proved reserves cat. (thousand tons) of
apatite B+C₁ 859628/42310, C₂ 95858/4268,
strontium ores B+C₁ 859627/865, C₂ 95858/ 87,
rare earth ores B+C₁ 85962/1938, C₂ 95858/274,
tantalum ores, niobium ores – 'for official use only'

Open for nomination

KHMELIVSKA license



- graphite
- E&P license up to 20 years
- Khmelnytskyi region
- 143,3 ha

Open for nomination

ZOLOCHIVSKA license



- zirconium ores titanium ores
- E&P license up to 20 years
- Kharkiv region
- 780 ha
- measured resources (thousand tons): Zr – 87
rutile – 124

Is being prepared for e-auction

Rare earth minerals spots





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

ZHOVTOVODSKA license



- Dnipropetrovsk region
- 1150 ha
- 29 wells drilled,
total depth 7.4 thousand m
- gold content – avg 1.22–2.78 g/t
min. 0.8 g / t
niobium – 20–50 g/t
- measured, indicated resources
of gold (thousand tons):
 $P_1 - 16.5$, $P_2 - 12$, $P_3 - 11$

Sold for \$ 205 000
December, 2020

BALKA SHYROKA license



- E&P license up to 20 years
- Dnipropetrovsk region
- 200 ha
- 285 wells drilled, total depth –
92.5 thousand m; mine depth –
168 m
- gold content – avg 7.1 g/t,
min. 3.9 g/t
- measured, indicated resources
(thousand tons): $P_1 - 12.5$, $P_2 - 15$

Open for nomination

KVITKIVSKA license



- E&P license up to 20 years
- Odesa region
- 670 ha
- 25 wells drilled, total depth –
8.9 thousand m
- gold content – 0.1–14.7 g/t
indicated resources
(thousand tons): $P_2 - 40$
- Kvytkivska and Mayska blocks
can be considered as a single
investment project

Open for nomination

MAISKA license



- E&P license up to 20 years
- Odesa region
- 250 ha
- 177 wells drilled, total depth –
64,5 thsd m, mine depth – 204 m
- gold content – avg 3.4 g/t
- measured, indicated resources
(thsd tons): $P_1 - 22$, $P_2 - 19$

Open for nomination

Polymetallic spots



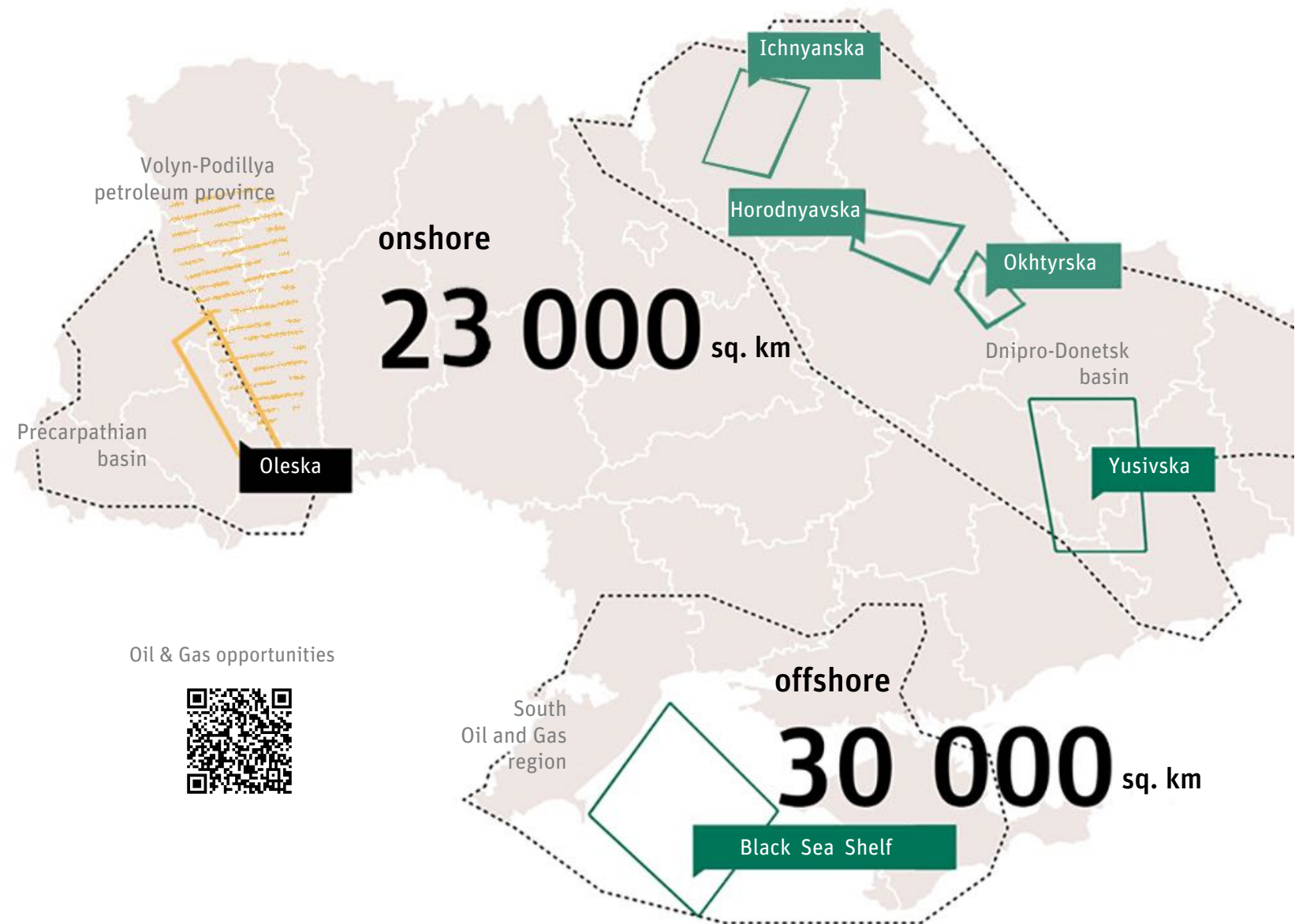
Hydrocarbons

Results

- 11 concession licenses were sold on e-auctions (2020-22)
- Signing of eleven PSAs
- Re-launch of Yuzivska PSA
- Unlock offshore potential in the Black Sea

Plans

- Re-launch of Oleska PSA
- Open new concession licenses for e-auctions
- Exploring Volyn-Podillya petroleum province



MAIORIVSKA block



- natural gas condensate
- production license for 20 years
- Poltava region
- 42 km²
- inferred resources of natural gas – 2755 million m³, of condensate – 172 thousand tons

Sold for \$30 million
November, 2022

BUDYSCHANSKO- CHUTIVSKA block



- hydrocarbons
- production license for 20 years
- Poltava region
- 175 km²
- oil reserves – 2,73 thousand tons, gas – 856 million m³
prospective resources of oil – 2006 thousand tons, gas – 20,587 million m³

Sold for \$23 million
August, 2020

50 HYDROCARBON BLOCKS



- natural gas liquids
- exploration & production license for 20 years
- 10 regions
- 6500 km²
- discovered & undiscovered reserves – 320 million tons BOE

Open for nomination

YULIIVSKA field (ZOLOCHIV block)



- natural gas, condensate
ethane, propane
butanes
- production license for 20 years
- Kharkiv region
- 14 km²
- discovered & undiscovered
reserves: natural gas –
1128 million m³
condensate – 251 thousand tons

Sold for \$4.3 million
April, 2021

SOUTH-RUSANIV license



- oil
natural gas
condensate
- exploration & production license
for 20 years
- Sumy region
- 310 km²
- inferred resources of
natural gas – 3.3 billion m³

Sold for \$11,5 million
October, 2021

PSA

OLESKA license



- hydrocarbons
- exploration & production
license, till 2063
- Lviv region,
Ivano-Frankivsk region
- 6300 km²
- contingent resources of
unconventional gas – 3 trillion m³
- «Nadra Oleska» LLC
is a license holder

Open for nomination

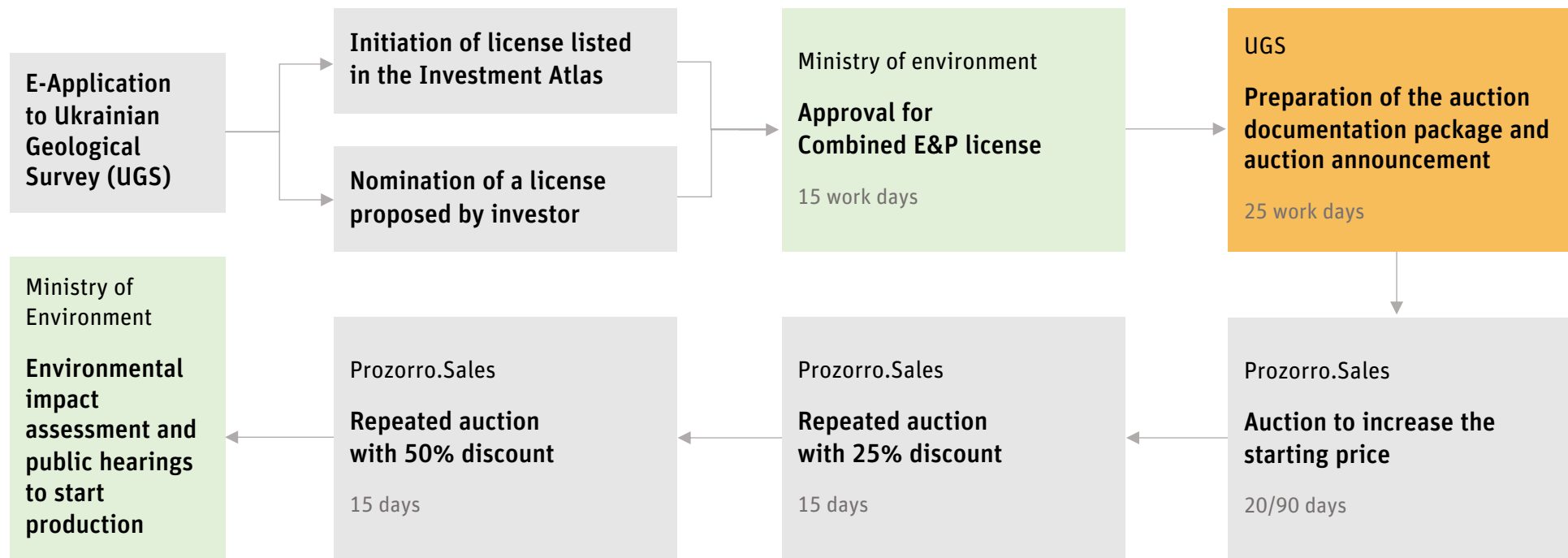
Geologic reports virtual data room

- The database contains descriptions of investment objects, information about land plots within the contours of deposits, as well as geologic reports
- 82 geologic reports consist of 401 books including 3 746 graphic materials
- Information about land plots is published with a list of cadastral numbers



Annexes

Obtaining a Special Permit (License) through E-auction



Winner:

1. Signs the protocol of auction (up to 6 working days)
2. Pays a fee to the exchange operator
3. An agreement on compensation of state expenses for exploration works is concluded (up to 20 working days)
4. Pays the fee to the state budget, concludes an agreement on terms and conditions of subsoil use, receives a license (up to 30 working days)

Cabinet of Ministers Resolution № 993 dated, September 23, 2020 (amendments as of July 26, 2023, # 749)

Ukrainian Government announced the Open Door Policy for foreign investors

Farm-in

Partnerships with
current license holders

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



The PSAs list of
Critical Raw Materials
blocks

The state facilitates sustainable development projects with the creation of maximum added value in Ukraine, which will contribute to its transition to a carbon-neutral economy and a digital future

Support of the Government of Ukraine

Projects with significant investments	Production sharing agreements	
	▪ Mining ▪ Processing ▪ Intermediate production ▪ Finished goods ▪ Recycling	

Licensed fields and open offers

Existing Concession licenses

Concession licenses offers

Lithium ores	Polokhivske field	Ukrliityvydobuvannya	production	2017–2037	Shevchenkivske field Balka Kruta block Dobra block	Donetsk Zaporizhzhia Kirovohrad	production exploration production
	Nickel, cobalt, copper chromium						
West Lashchiv block Zhyrychi field South Rafalivskiy prospective field Prutivskiy prospective field Kapitanivske field(South,Central sections) Karnaukhivska block Zalisy-Shmen’ky prospective field	VIP-Trader	production	2016–2026	Zheleznyaky block	Zhytomyr	exploration	
	Volynpryrodesurs	production	2017–2037	Lypovenkivske field	Kirovohrad	production	
	NorthWest Mining	exploration	2016–2021	Sukhohutirska block	Dnipropetrovsk	exploration	
	Colormet of Ukraine	exploration	2019–2024	Hrushkivske field	Kirovohrad	production	
	Mine Extraction LLC	production	2019–2032	Devladove field	Dnipropetrovsk	production	
	Metals Exploration Ukraine	exploration	2021–2026	Derenyuske field	Mykolaiv	production	
	Inter Aktyv	exploration	2022–2027	+ 5			
Tantalum, niobium, apatite-rare metal ores							
Vovchanske field Malyshevske field Mostove block Anadolske field	Demurinsky Mining and Processing Plant	exploration*	2002–2031	Lypnyazkyi prospective field	Kirovohrad	exploration	
	UMCC	production*	2007–2027	Tashlytskyi prospective field	Kirovohrad	exploration	
	Taurus Infinity	production	2019–2029	Novostankuvatske prospective field	Kirovohrad	exploration	
	RM Minings LLC	production*	2019–2034	Novopoltavske field	Zaporizhzhia	production	
Beryllium, zinc							
Perzhanska field	Perzhanska Ore Company	production	2019–2039	Horodetskyi prospective field Pokrovo-Kyriivskyi prospective field	Zhytomyr Donetsk	exploration exploration	
Zirconium, scandium, rare earth elements							
Yastrebitska block Mazurivske tecnogenic field (East s.)	CFR Group LLC	exploration	2019–2024	Azovske field	Donetsk	exploration	
	Azov-Mineraltekhnika	production	2021–2031	Zolochivska block	Kharkiv	exploration	
				Hurivskyi prospective field	Dnipropetrovsk	exploration	
				Starodubivskyi prospective field	Donetsk	exploration	
			Mazurivske field (North section)	Donetsk	exploration		
Molybdenum							
Chervona block	Rud Investium	exploration	2020–2025	Verbynska block Skhidnoserhiivskyi prospective field	Zhytomyr Dnipropetrovsk	exploration exploration	

* In production

Titanium: zircon-rutile-ilmenite-apatite placers, scandium						
Balka Kruta technogenic field	Koliorovi metaly	production *	2003–2033	Kropyvniian field	Zhytomyr	production
Vovchanske field	Demurinsky Mining and Processing Plant	production *	2002–2031	Vydyborz'ka prospective field	Zhytomyr	exploration
Yurivska block	Titanium-apatite group	exploration	2019–2024	Fedorivske field	Zhytomyr	production
Avramivska block	TsentrUkrGeologiya	exploration		Korchakiv prospective field	Sumy	exploration
Livoberezhne field	Zhytomyrburrozvidka	production	2013–2033	Bilovodskyi prospective field	Sumy	exploration
Trostryanetske field	Zhytomyrburrozvidka	production	2013–2033	Haidarivskyi prospective field	Kharkiv	exploration
Mezhyrichne field (Isakivska, South s.)	Mezhyrichensk MCC	production *	2002–2032	Khrapivshchyna prospective field	Sumy	exploration
Mezhyrichne field (B., E., O., S., Y. s.)	UMCC	production *	2015–2035	Yuriivsko-Roziivska block	Zhytomyr	exploration
Malyshevske field (C., E., W. sections)	UMCC	production *	2015–2043	Tarasivske field	Kyiv	production
Selyshchanska block	Zhytomyr	exploration	2021–2026	Stremyhorodske field	Zhytomyr	production
Malyshevske field(M.-A.,N-W sections)	Motronivsk MCC	production *	2004–2034	Nosachivske field	Cherkasy	production
Valky-Gatskivske field	Valki Ilmenite	production *	2001–2031	Malyshevskefield (North West sections)	Dnipropetrovsk	production
Byrzulivske field	Velta	production *	2007–2027	Verkhnie-Irshynske field	Dnipropetrovsk	production
Likarivske field	Dekart Minerals	production	2019–2039	Davydkivske field (South section)	Kharkiv	production
				Zlobytske field	Zhytomyr	production
				Irshanske field	Zhytomyr	production
				Lemnenske field	Zhytomyr	production
				Lemnenske field (West sections)	Zhytomyr	production
				Lemnenske field (East section)	Zhytomyr	production
				Torchynske field	Zhytomyr	production
				Krasnorichynske field	Zhytomyr	production
				Paromivske field	Zhytomyr	exploration
				+ 9		
Gold ore, polymetallic ores						
Muzhiivske field	Karpatska Rudna Company	production *	2012–2032	Zolota Balka field	Dnipropetrovsk	production
Sauliak field	Sauliak	production	2010–2030	Balka Shyroka block	Dnipropetrovsk	exploration
Serhiivske field	Stone processing company of Ukraine	production	2010–2030	Kvitkivska block (East, Central sections)	Odesa	exploration
Bobrykivske field	Donetskyi Kryazh	production	2013–2018	Maiska block	Odesa	exploration
Klyntsivske field	Lyra Mine Minerals	production	2019–2034	Dilovetska block	Zakarpattia	production
Berehivske field	Karpatska Rudna Company	exploration	2012–2024			
Kvasivske prospective field	Western Geological Explorational Company	exploration	2012–2022			
Zhovtovodska block	Spys Ukrayina	exploration	2021–2026			
Graphite						
Zavallivske field (Zarichna section)	Pobuzhzhya's Development LCC	production *	1996–2035	Burtynske field (Khmelivska section)	Khmelnyskyi	production
Zavallivske field (South-East section)	Zavally Grafit Kombinat	production	2019–2039	Mlynkivska prospective field	Kirovohrad	exploration
Balakhivske field (South section)	Ukrainian supply group	production	2019–2039	Troitske field	Zaporizhzhia	production
Burtynske field(Horodnyavska section)	Spys Ukrayina	production	2021–2041	+ 4		

International partners



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Investment Guide
UkraineInvest



UGS Annual Report 2023

