GREEN MINERALS

Capital Markets Day

Oslo

14 May 2024

Disclaimer

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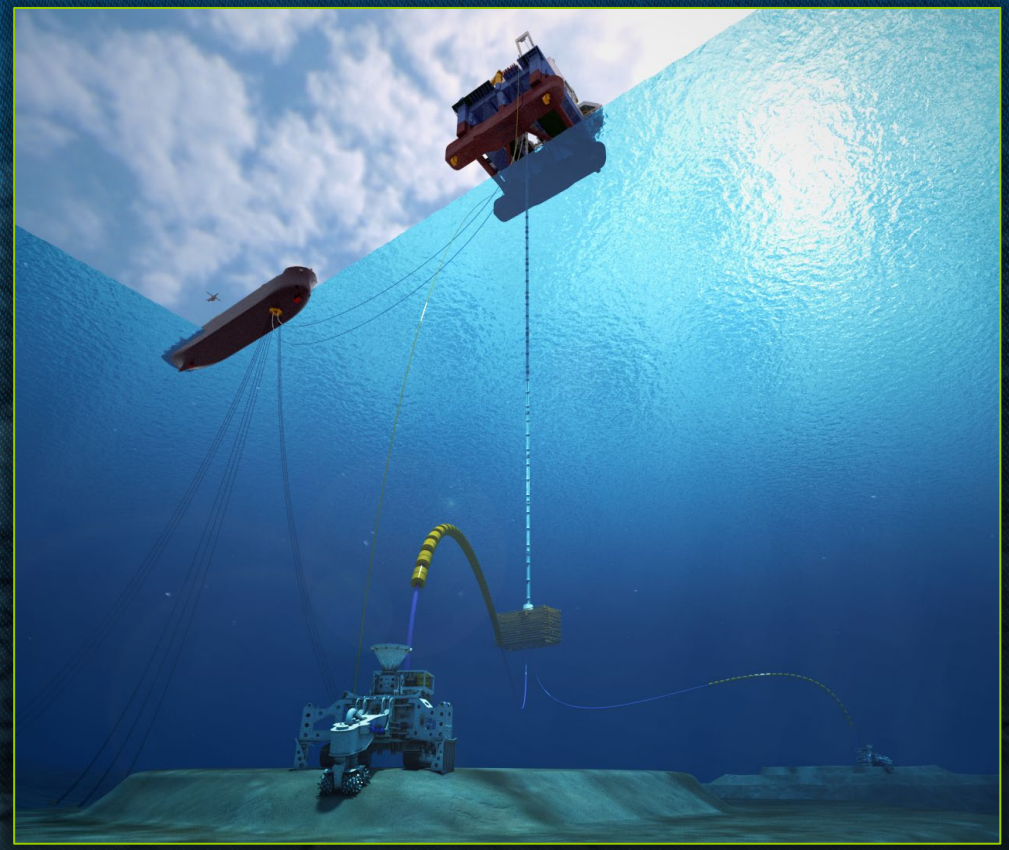
Welcome

Green Minerals as

- One of two DSM players listed globally
- Headquartered in Oslo
- Listed in Oslo under ticker GEM NO
- Market cap USD 8 mill
- Norway opened up for DSM on 9 january 2024
- GEM is approaching next phase - **license ownership**



Our team

Ståle Rodahl
Executive Chairman

- Joined SeaBird Exploration in 2019 as Executive Chairman and shortly after founded Green Minerals.
- Background from the financial industry for 30 years, amongst others as a hedge fund manager and in various executive positions in the Investment Banking industry in New York, London and Oslo in companies such as Alfred Berg, ABN Amro and ABG Sundal Collier.
- MSc with a major in Finance from the Norwegian Business School, BI with additional programs from London School of Economics (LSE) and NASD, New York.

Ståle Monstad
CEO

- Ståle Monstad has more than 25 years of experience within exploration and geological management. He started his professional career in the exploration department of Norsk Hydro, gaining extensive experience in concession application work on the NCS
- He also has experience from DNO and DNO International where he acted as Chief Geologist and Director Subsurface for more than 10 years
- Ståle Monstad joined Green Minerals from the position of Chief Geologist Aker BP/Senior Vice President Exploration Aker Energy

Maxime Lesage
Chief Engineer

- Maxime Lesage has worked for more than 10 years on complex subsea construction projects for the O&G industry.
- In 2020 he completed his PhD on the subject of Deep-Sea Mining systems which addressed the value chain of marine minerals with a focus on the Norwegian jurisdiction.
- As Green Minerals' Chief Engineer, he is driving the development of the Seafloor Massive Sulphides offshore mining system which combines O&G state-of-the art techniques and mining technologies needed for this new industry. Finally, he is also leading R&D projects with the company various academic partners.

Espen Simonstad
Sr. Advisor Geoscience

- Espen is a geologist with more than ten years experience from the Oil & Gas industry in Norway.
- He has vast experience from exploration, resource management, license management and application processes from the Norwegian Continental shelf. His experience comes from a blend of expertise from both governmental bodies and the private sector.

Angela Maekawa
ESG Lead

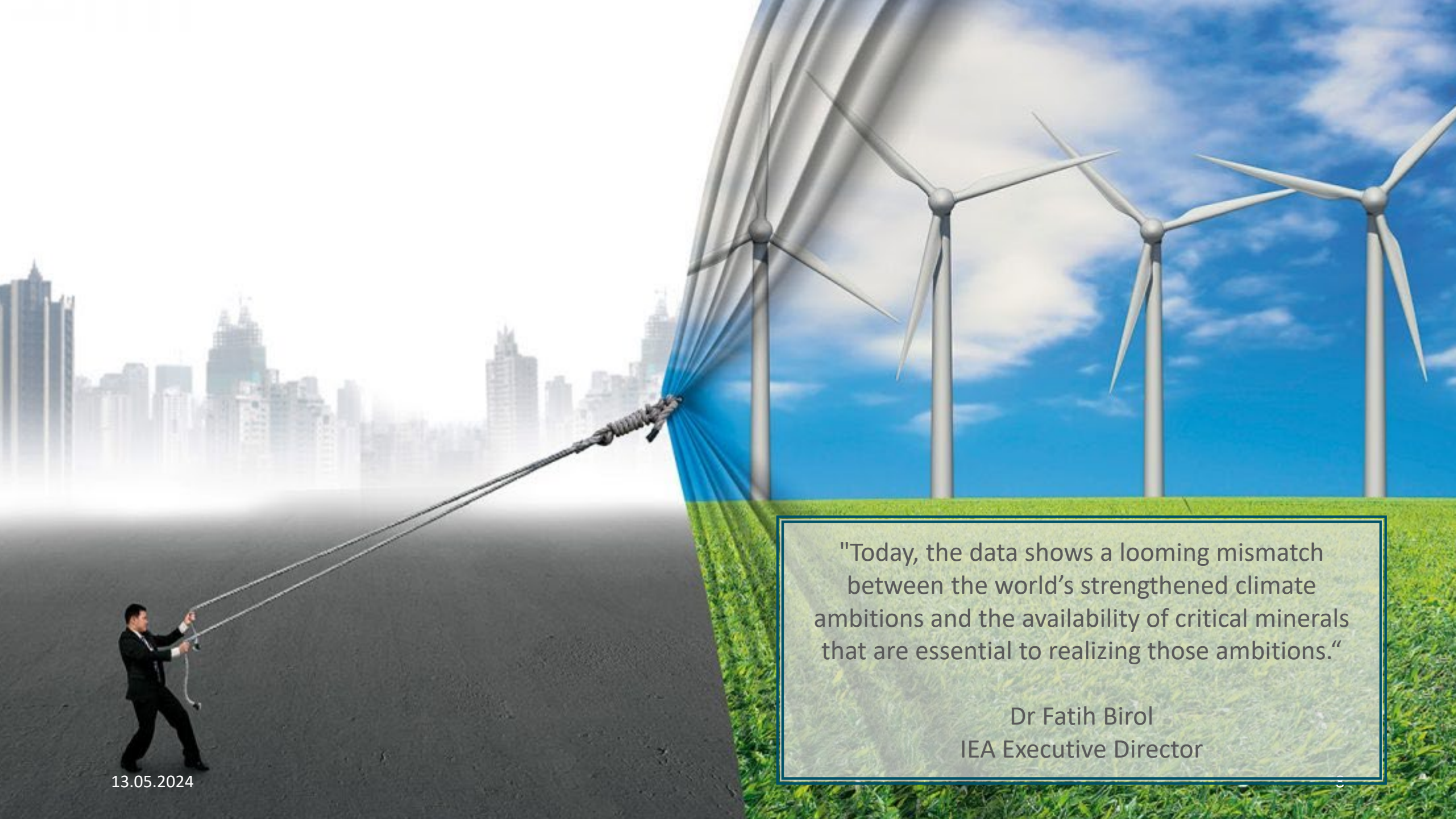
- Angela is ESG Lead at Green Minerals. She spearheads environmental, social, and governance initiatives, oversees the reporting process, ensuring compliance, and managing the business management system.
- Her background encompasses export operations, specializing in B2B marketing, logistics, supply chain management, and conducting internal audits.
- She holds an MBA in International Trade.

Ambition: to become a license holder in one of the worlds most attractive copper resources with the lowest use of capital possible.
Subsequently: deliver 1,5mt world class quality ore for off-take
Strategy: partnership model & asset light

Project status	• Norway opening 9 January 2024 • Production concept in place • Joint processing with terrestrial ore proven • GEM invited to nominate license area
Company in route to deliver on stated ambitions	• License holdership expected in Q1 2025 • First ore from pilot production expected in 2028 • Unmatched capital efficiency vs traditional onshore mining

License	• GEM holds USD 50m worth of exploration data
	  • License application expected in 2H 2024
	  • License award expected in Q1 2025
	  • Green Minerals is well-positioned for a license win and ready to execute on awarded acreage.

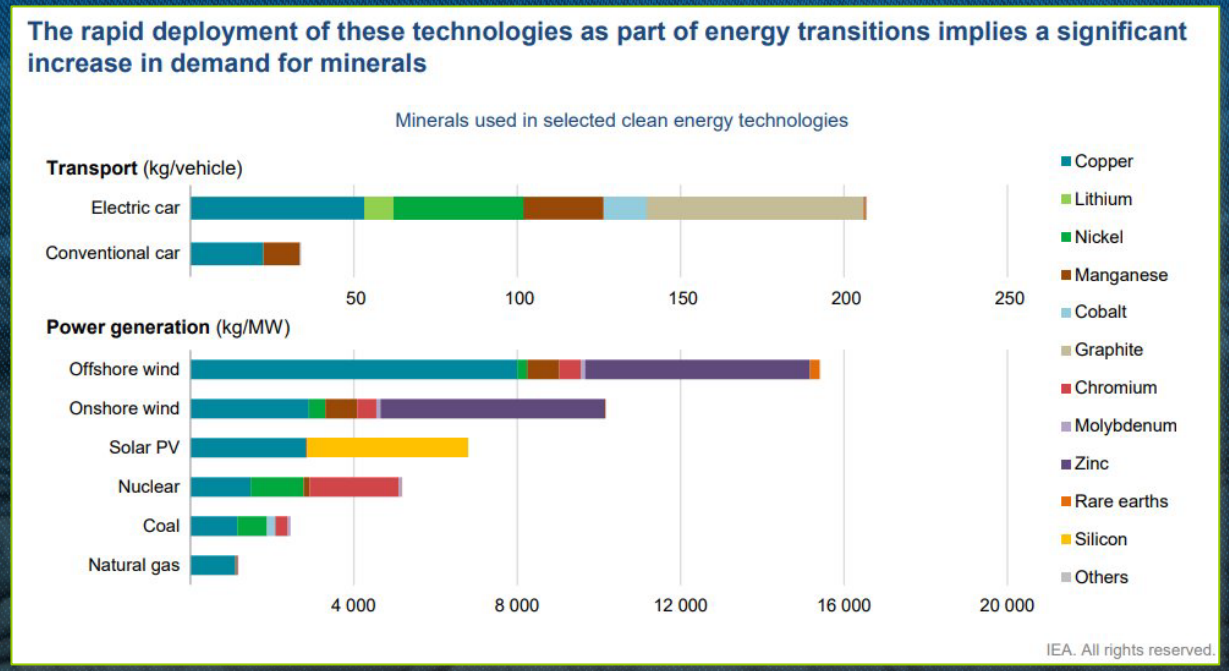
Backdrop



"Today, the data shows a looming mismatch between the world's strengthened climate ambitions and the availability of critical minerals that are essential to realizing those ambitions."

Dr Fatih Birol
IEA Executive Director

Electrification is key to meet the stated climate ambitions



The rapid deployment of these technologies as part of energy transitions implies a significant increase in demand for minerals.

Source: IEA (2021), World Energy Outlook 2021, IEA, Paris (link)

The world's largest offshore wind park Dogger Bank will have an installed capacity of 3,600 MW and will produce enough power for ~6 million UK homes. This development alone will consume ~30,000 tonnes of copper*

*According to IEA (2021), The Role of Critical Minerals in Clean Energy Transitions, construction of 1 MW offshore wind power consume ~8,000 kg copper

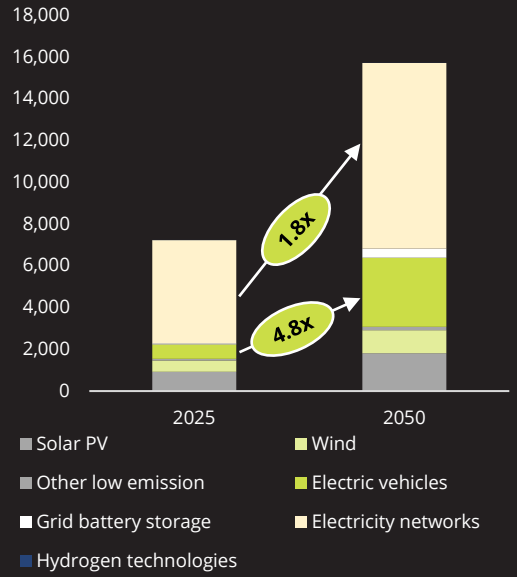
The green transformation is fueling demand for minerals

- Low-carbon technologies are driving a steep demand growth for marine minerals
- The «Stated Policies Scenario» scenario is driving a close to tripling in demand for minerals in 2050…
- …while the ambitious «Net Zero Emissions" scenario demands more than six times the 2020 level by 2050.

- Copper demand is rising the most in absolute growth, with about 9 Mt by 2050 compared to 2020 in the NZE scenario
- Current supply is not adequate for this growth, and long lead-times for new capacity rises the risk of supply lagging demand

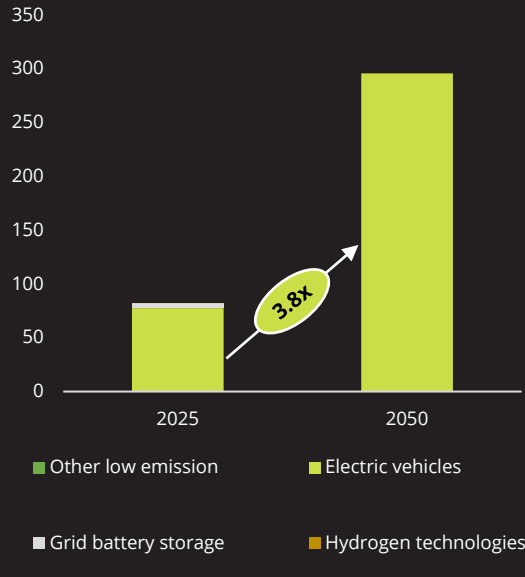
29
Cu
63.55
COPPER

thousand tonnes (kt)



27
Co
58.93
COBALT

thousand tonnes (kt)



Onshore ore grade is in structural decline

Visual overlay of actual copper extracted from the Palabora mine in South Africa (4,1 million tonnes).
Ore grade remaining reserves: 0,7%

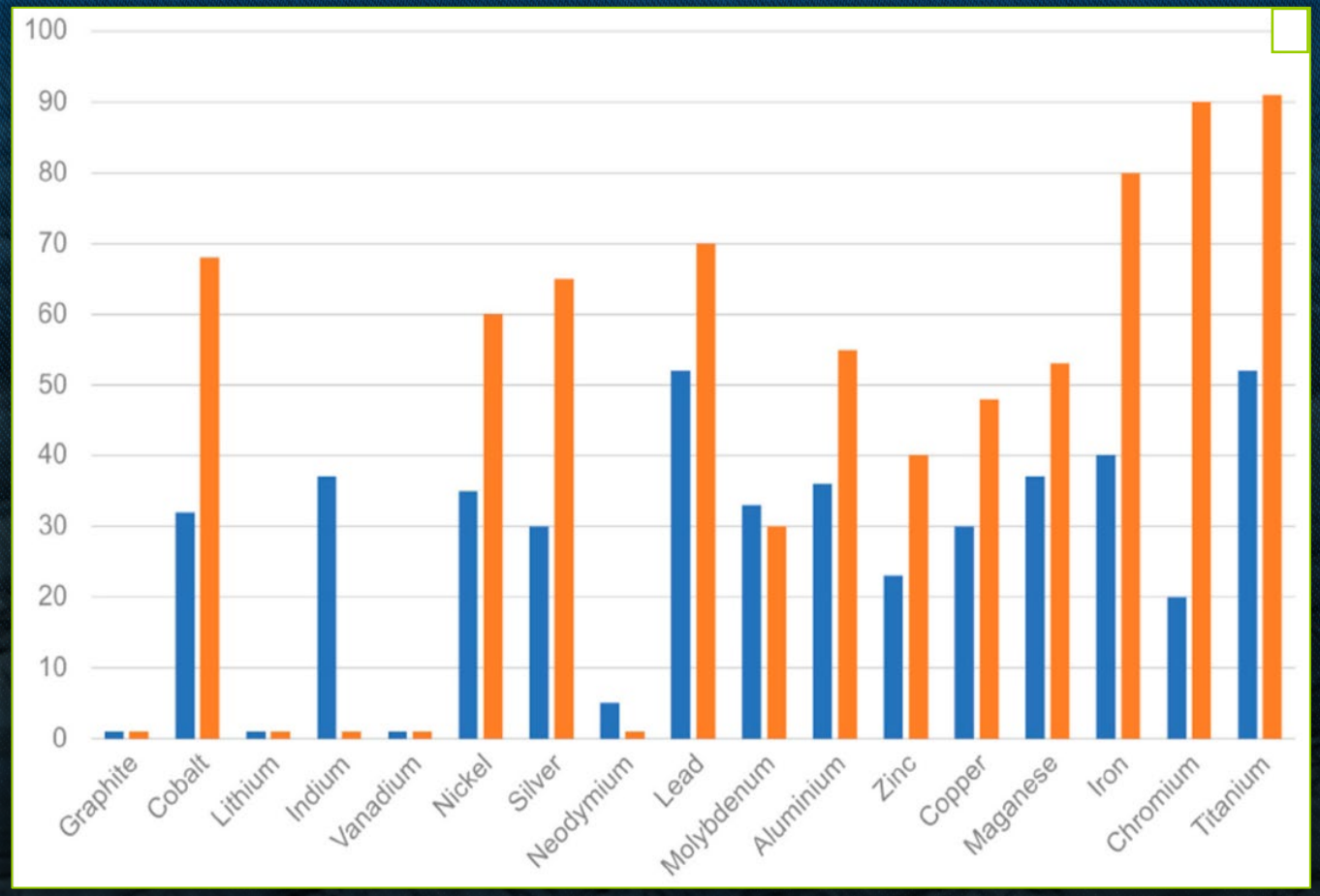
63,55
29 Cu
Copper

<0,8 %

- Similar to oil, the era for easy onshore copper is over
- The average ore grade is decreasing, resulting in:
  - Higher energy cost per unit produced
  - Growing waste production

Marine minerals could provide a sustainable source for critical minerals

Current recycling for a range of metals

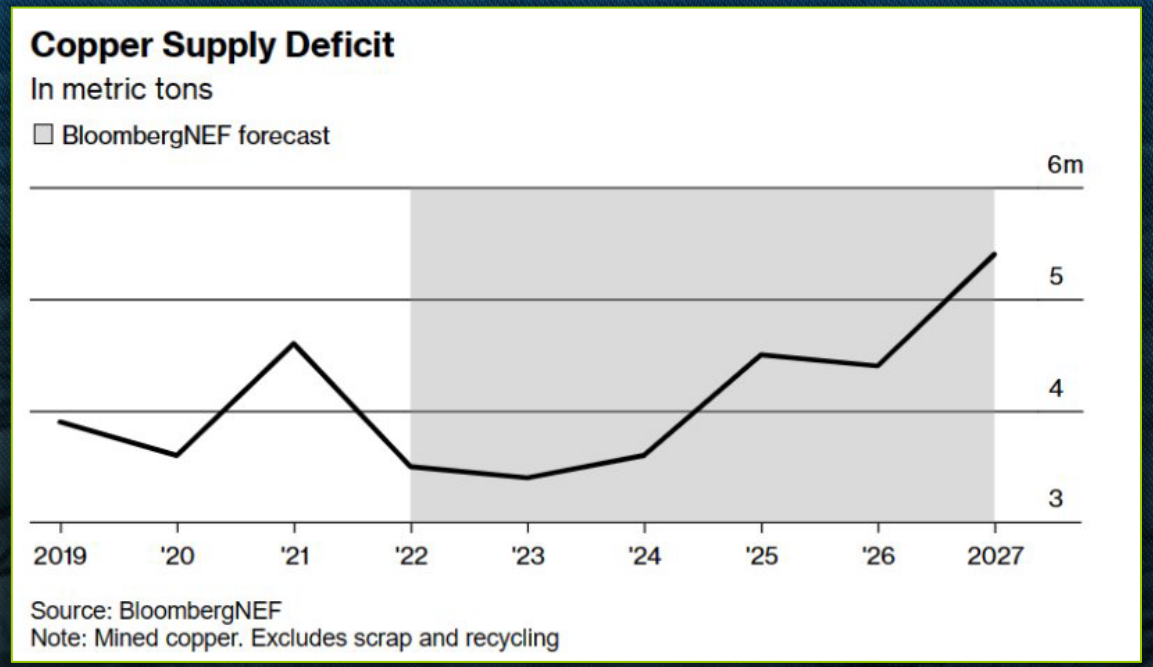


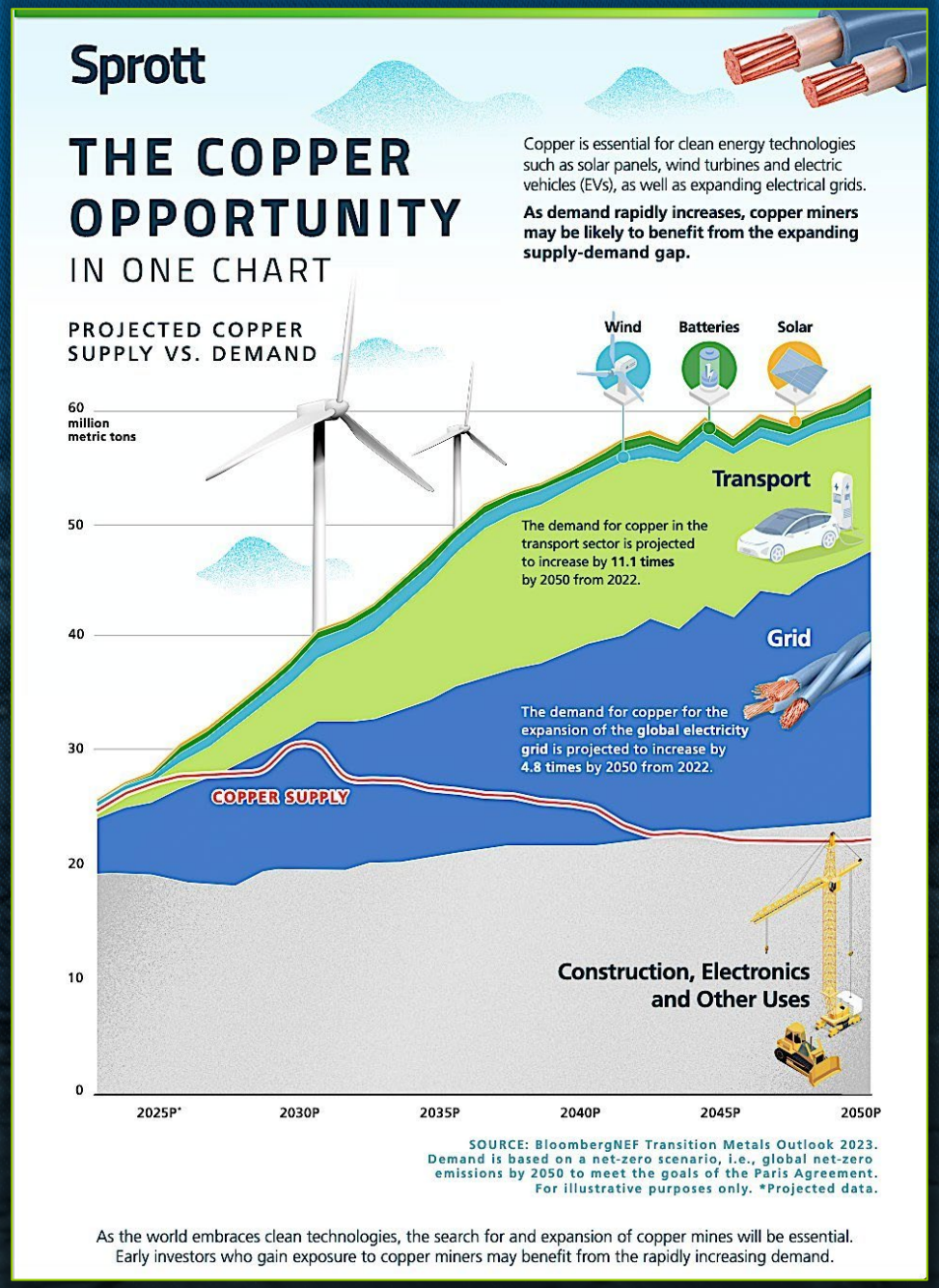
Herrington, R. J., 2024 Centre for Resourcing the Green Economy, The Natural History Museum,London.

The graph shows (in orange) the rates of the end-of-life recycling for a range of metals and (in blue) the percentage of current material demand that can be met from recycled stock.
The author's own compiled figures.

From: Herrington, R. J., 2024 Centre for Resourcing the Green Economy, The Natural History Museum, London.

Copper deficit driven by grid and transport

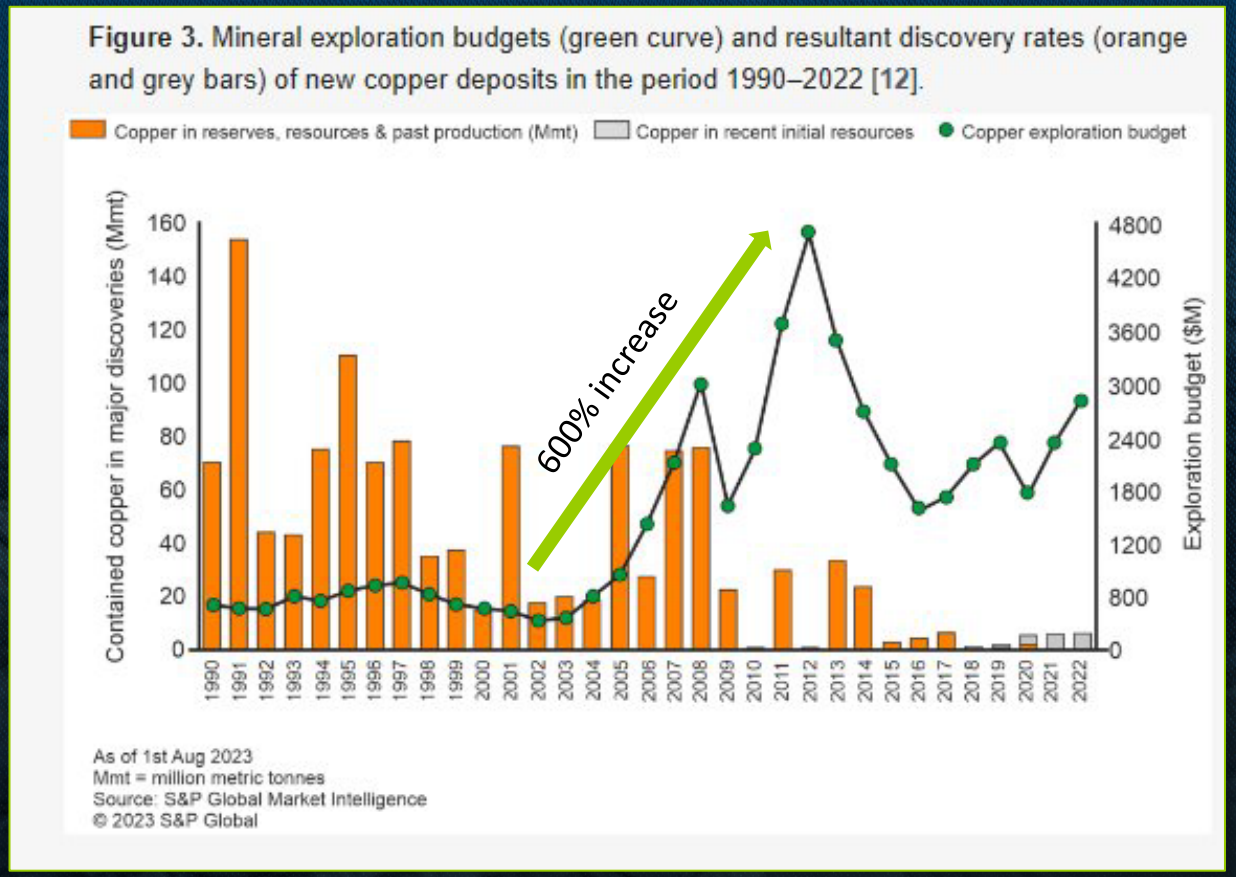




Increased investments into copper exploration

Mineral exploration budgets (green curve) and resultant discovery rates (orange and grey bars) of new copper deposits in the period 1990-2022

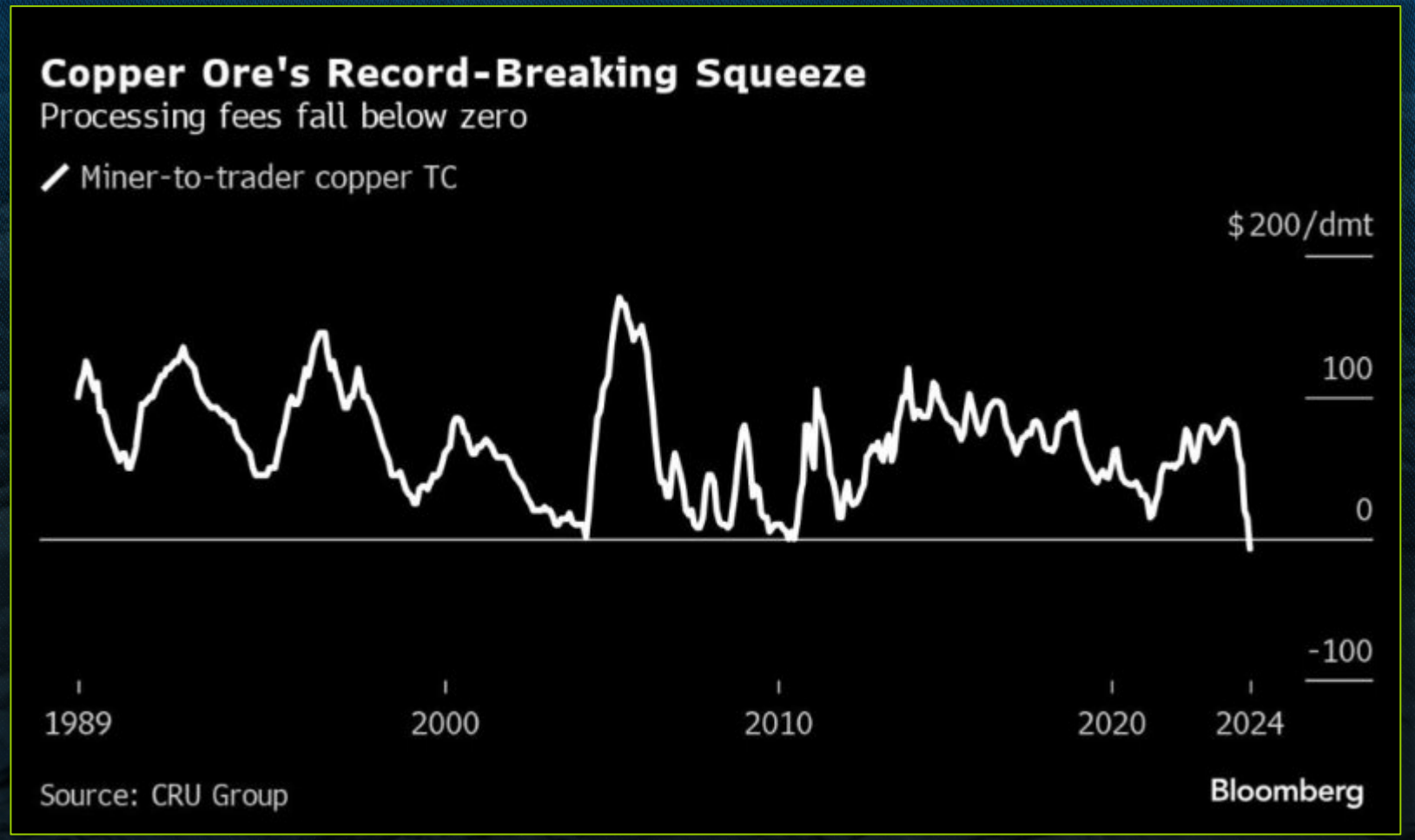
From: Herrington, R. J., 2024 Centre for Resourcing the Green Economy, The Natural History Museum, London.



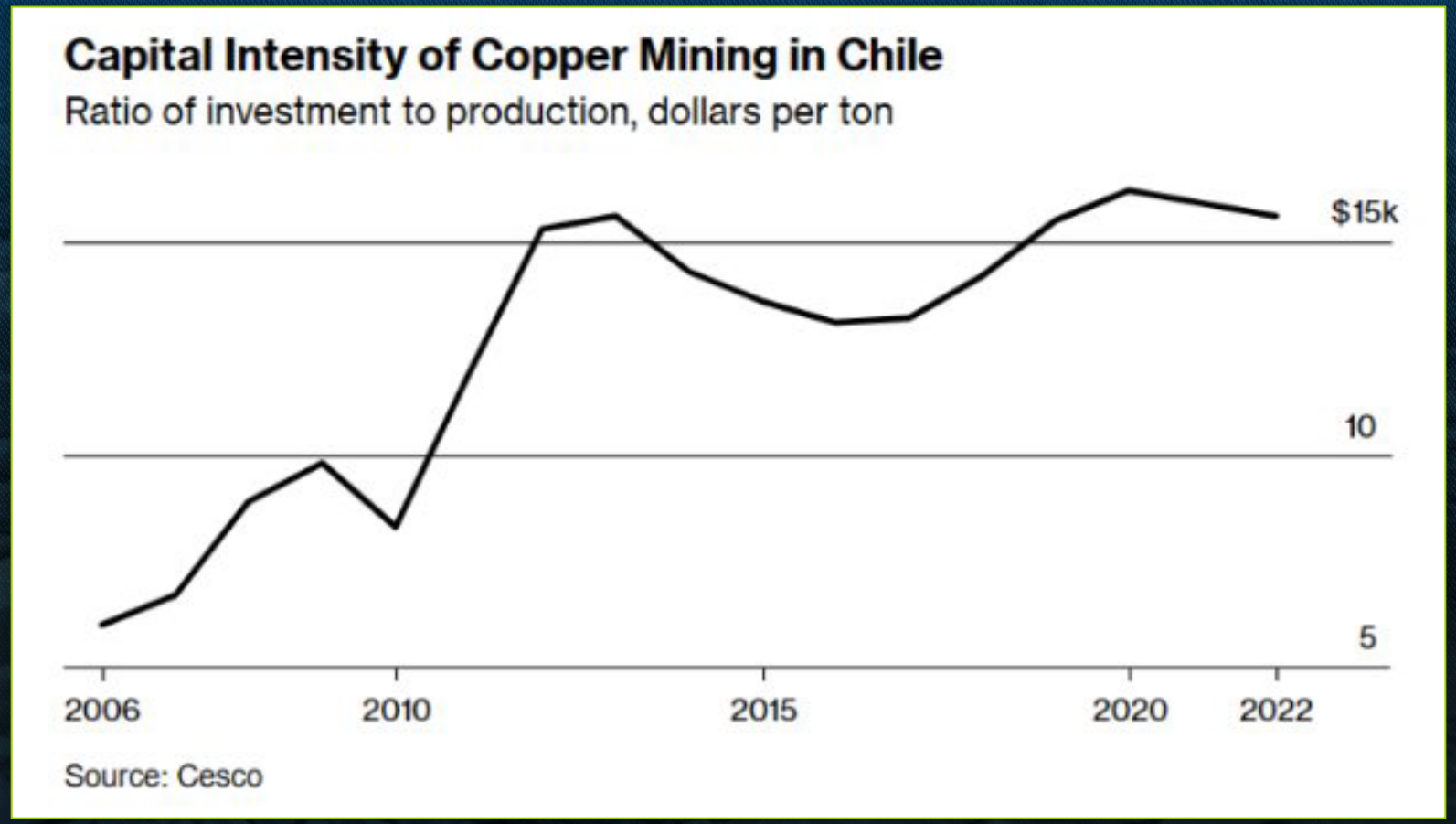
Herrington, R. J., 2024 Centre for Resourcing the Green Economy, The Natural History Museum,London.

Where will new supplies of copper come from?

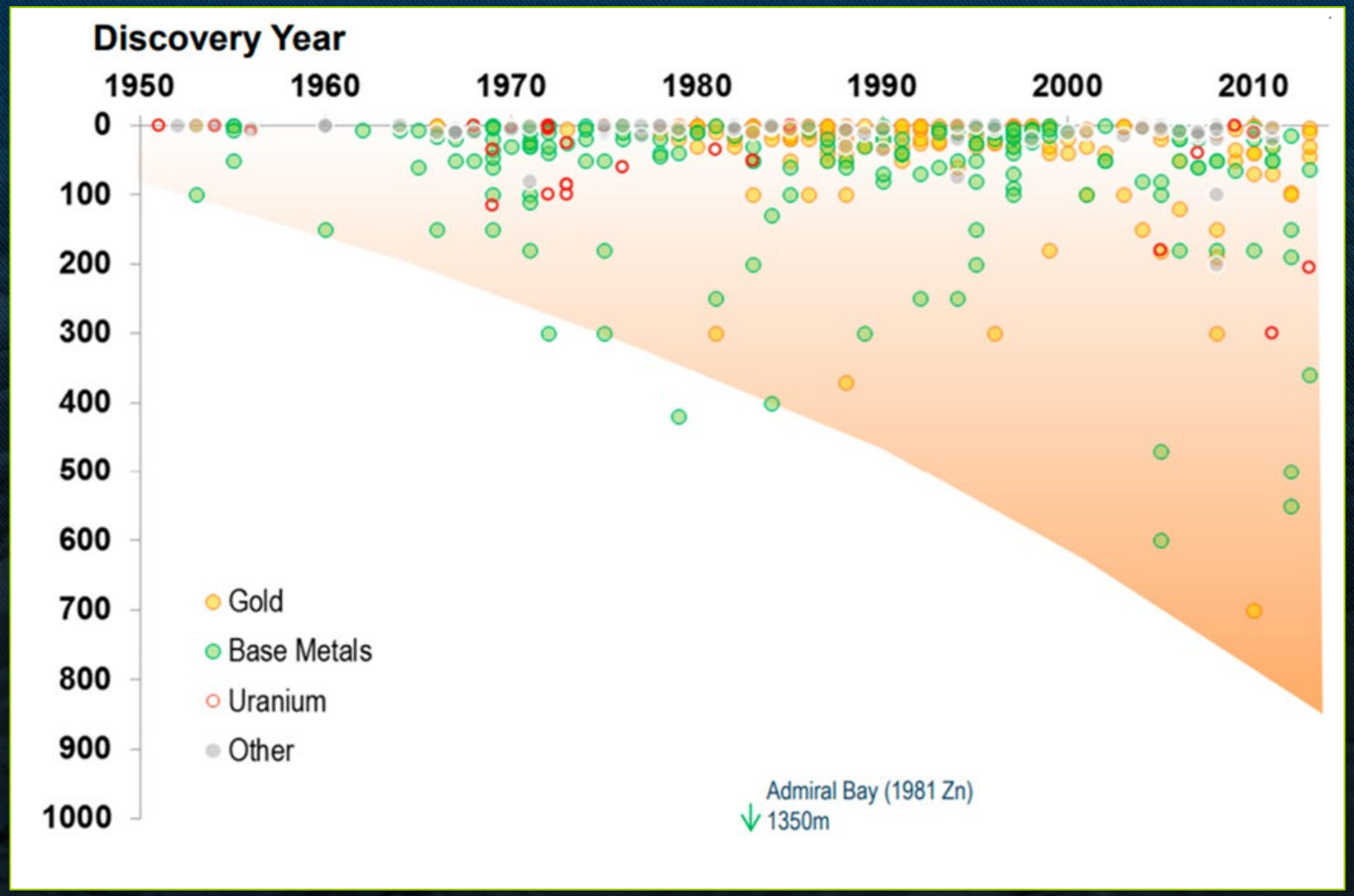
Shortage of copper ore



Lower ore grade – Higher Capital cost

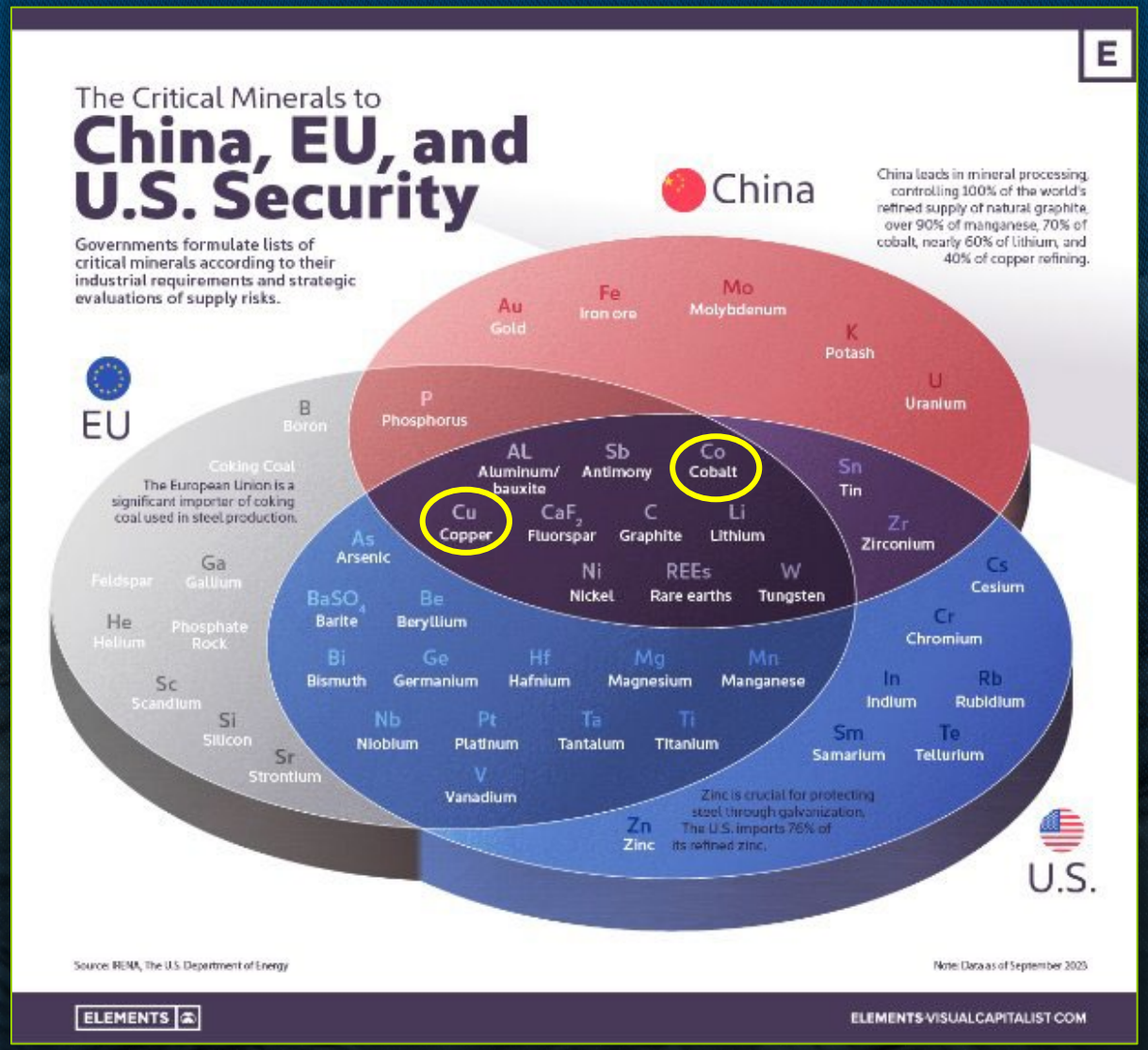


We have to dig deeper for metals



Herrington, R. J., 2024 Centre for Resourcing the Green Economy, The Natural History Museum,London.

Geopolitics



THE GEOPOLITICS OF ADVANCED ENERGY

Geostrategy demands an independent copper production

China uses its control of critical minerals for geostrategic purposes

RICE UNIVERSITY
News and Media Relations
Office of Public Affairs

Avery Ruxer Franklin - Apr. 12, 2021
POSTED IN: RICE NEWS > Current News > 2021

China positioning itself to dominate world's copper supply

China is positioning itself to dominate the global supply of copper, a material in high demand as the world transitions to alternative energy systems, according to experts from Rice University's Baker Institute for Public Policy.

"If China's dominance of rare earth element supplies is the global energy transition's 'elephant in the room,' then copper is the 800-pound gorilla," according to a blog post co-authored by the institute's Michelle Michot Foss, fellow in energy, minerals and materials; Steven Lewis, the C.V. Starr Transnational China Fellow; Gabriel Collins, the Baker Botts Fellow in Energy and Environmental Regulatory Affairs; and Jacob Koelsch, student research assistant in the institute's Center for Energy Studies.

China's significant state-owned or influenced copper production and processing capabilities, along with its substantial domestic demand and role as a global importer of copper concentrates, gives it substantial influence over the global copper market and prices.

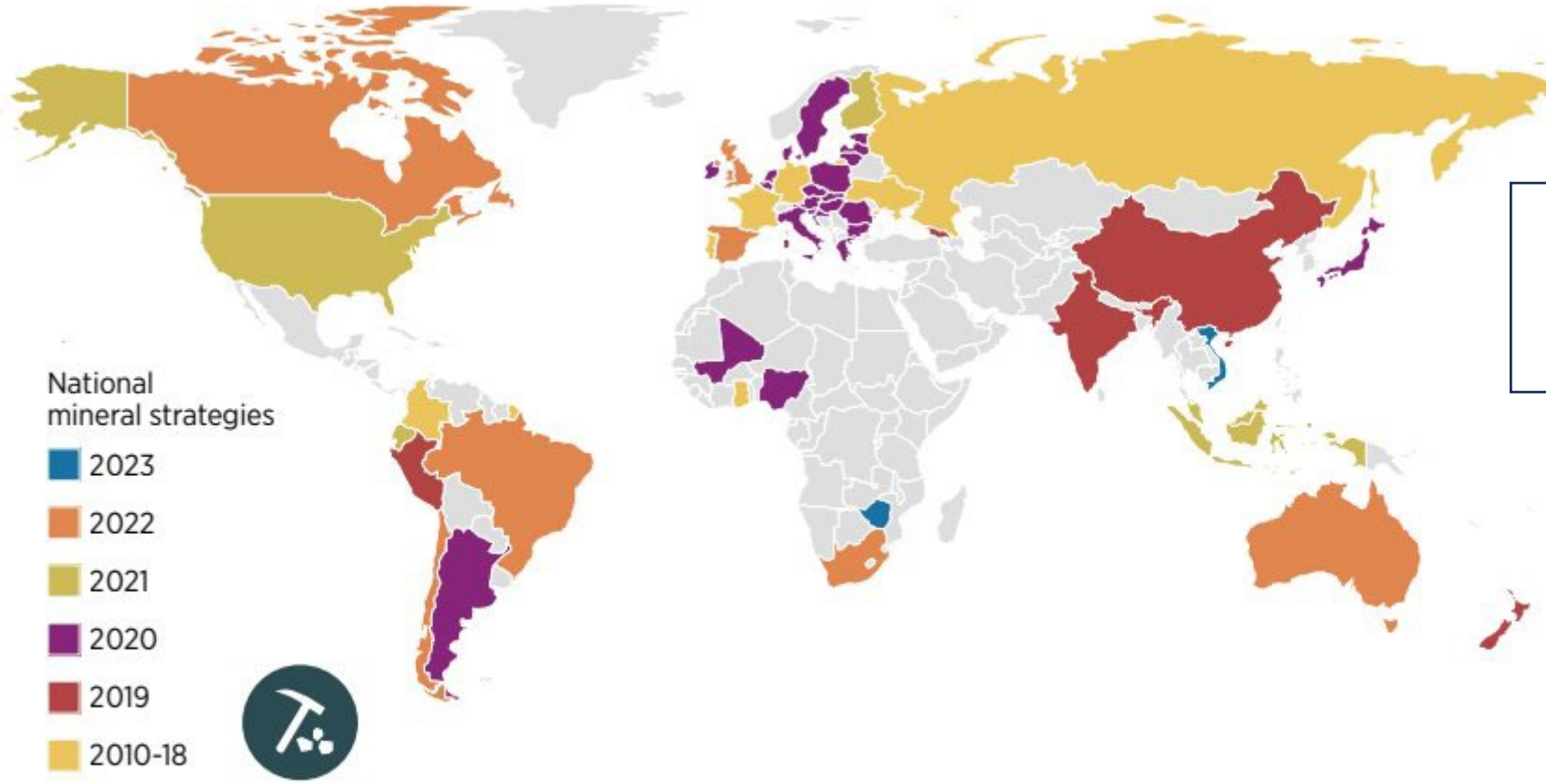
China to tighten exports of key battery material graphite
Reuters | October 20, 2023 | 8:25 am Battery Metals Intelligence China USA Graphite

Column: China ups critical minerals heat with graphite controls
Reuters | October 23, 2023 | 11:35 am Battery Metals Intelligence China USA Graphite

Battery makers hunt for graphite ahead of China controls
Bloomberg | October 26, 2023 | 03:37 CEST Technology Hyperdrive

Chinese overseas mining M&A deals

Countries that have adopted national mineral strategies, 2010-2023



Note: The map shows national critical material strategies, visions and policy documents. Mining codes or specific regulations were not retained.

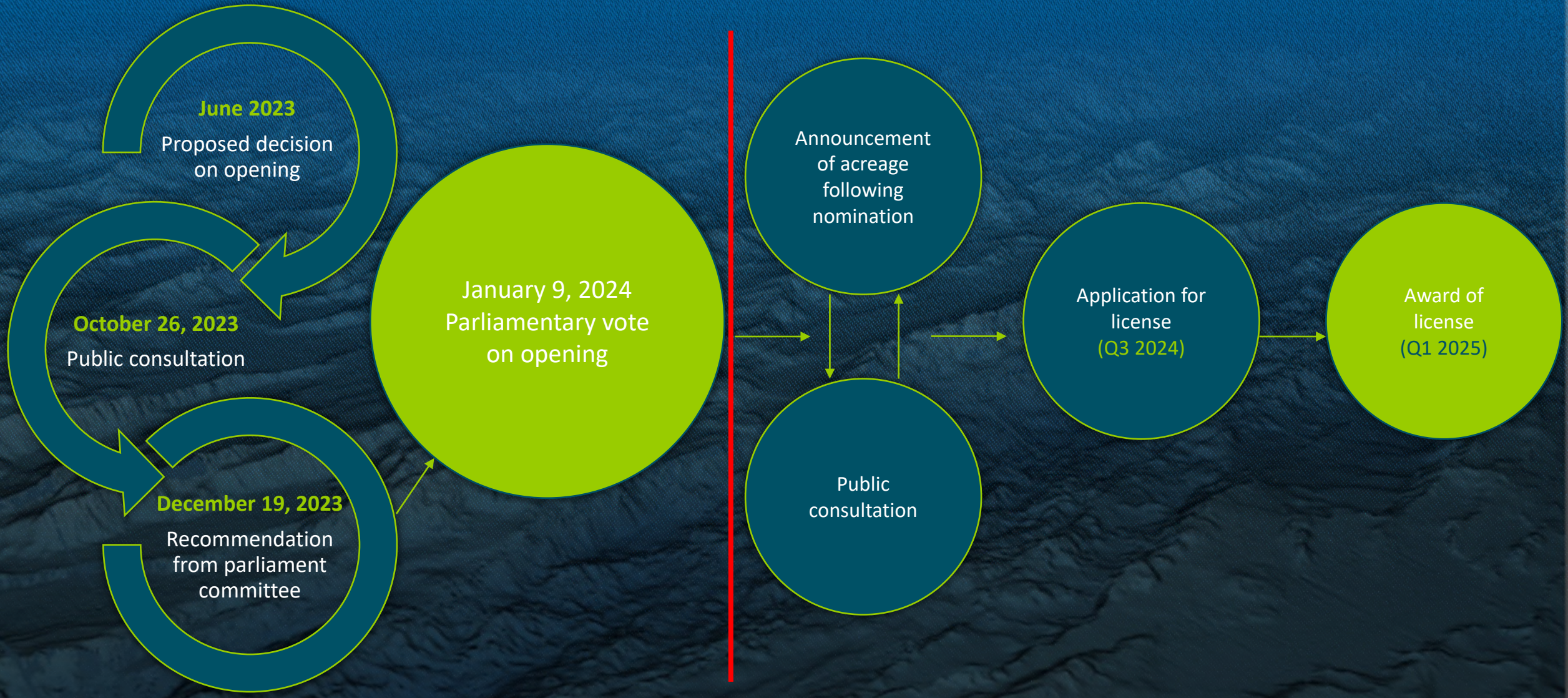
Disclaimer: This map is provided for illustration purposes only. Boundaries and names shown on this map do not imply any endorsement or acceptance by IRENA.

Herrington, R. J., 2024 Centre for Resourcing the Green Economy, The Natural History Museum,London.

Norway adopted its mineral strategy on June 21st, 2023

Process in Norway

Timeline license award



Nomination process

OSLO BØRS NewsWeb Contact us | Norsk

Green Minerals AS | Search message title | SEARCH | Empty search | Show advanced search

Green Minerals AS

Date/time
30.04.2024, 11:29:39

MessageID
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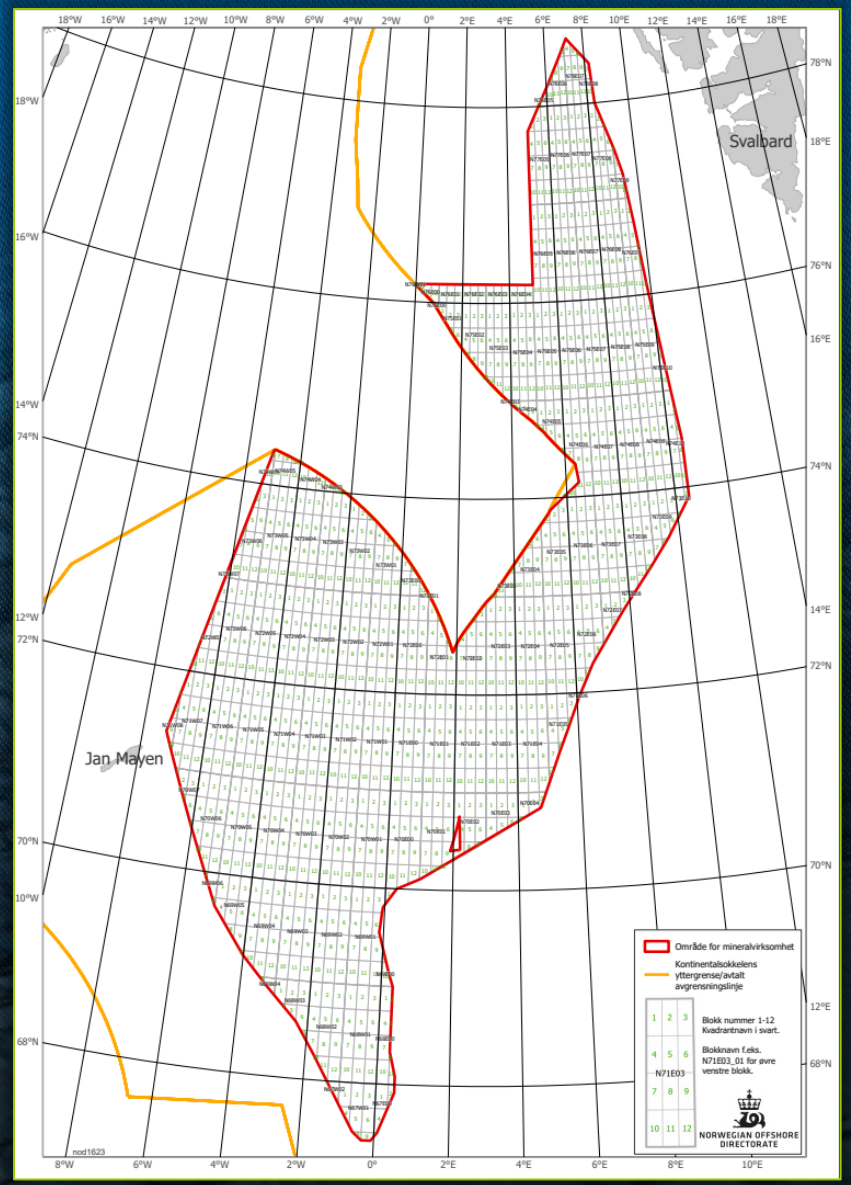
Instrument
GEM

Green Minerals invited to nominate blocks for 1st licensing round

30.4.2024 11:29:37 CEST | Green Minerals AS | Non-regulatory press releases

Oslo, Norway - 30 April 2024 - Green Minerals AS ("the Company") is pleased to share that the Company has received an invitation from the Norwegian Offshore Directorate to nominate blocks for the 1st licensing round for marine minerals within the Norwegian Exclusive Economic Zone. Thereafter, the Company expects to submit its application for license in Q3 2024 with licenses set to be awarded early in 2025.



Nomination deadline: May 21 @ 12:00

Support from the Norwegian Government

"Norway ought to engage in the exploration and extraction of seabed mineral resources, which have garnered increased attention due to rising global demand for critical metals. As these metals become increasingly sought after, Norway should seize the opportunity to contribute to meeting this demand, provided that our resources prove economically viable."

Oil & Energy Minister Terje Aasland
at Regjeringen.no, 22nd June 2023

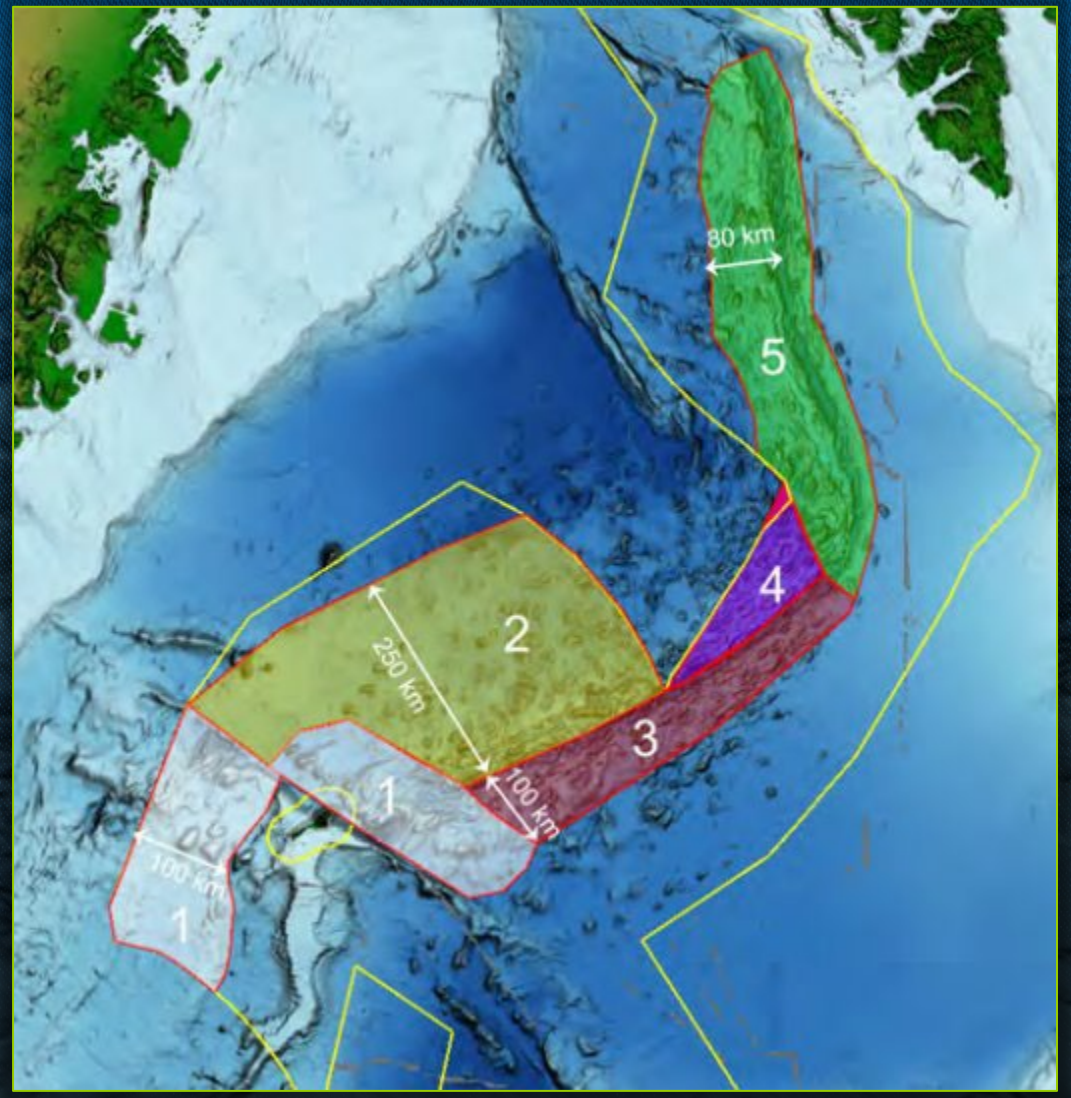
On seabed mining:

"Minerals will be needed for the green transition….we will never allow any exploration from the Norwegian sector that will be a threath to the environment, climate or nature. But we should find out what we have there (seabed minerals) and how it can be harvested in an appropriate way."

Prime Minister Jonas G. Støre
at OneOcean in Bergen, 15th April 2024:

A significant resource on a global scale

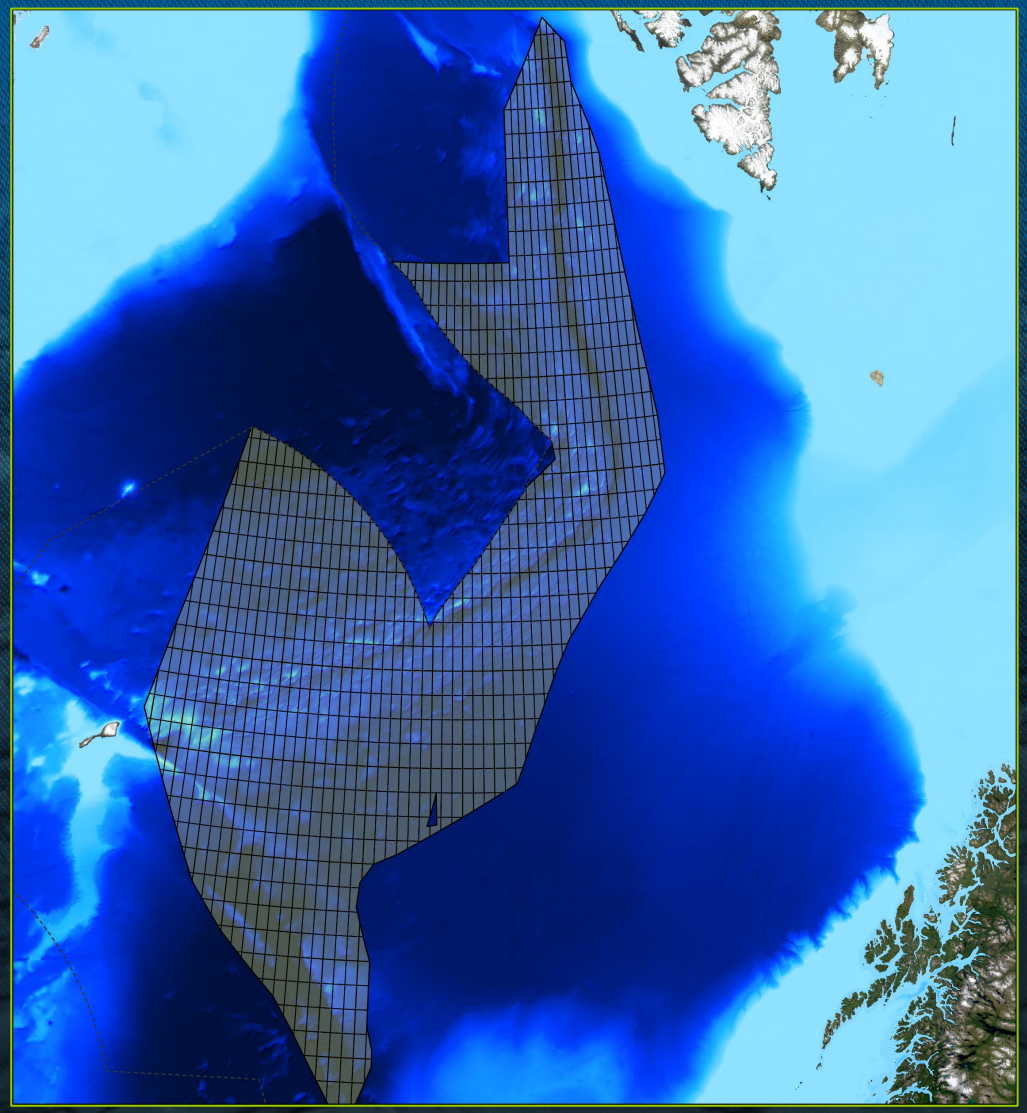
Metals	NPD (tons)	Global annual production (Tons)	NPD/Global prod.
Copper	38 100 000	21 000 000*	1.8x
Gold	2 317	3 090**	0.8x
Silver	85 200	24 000*	3.6x
Cobalt	1 000 000	170 000*	5.9x



Exploration

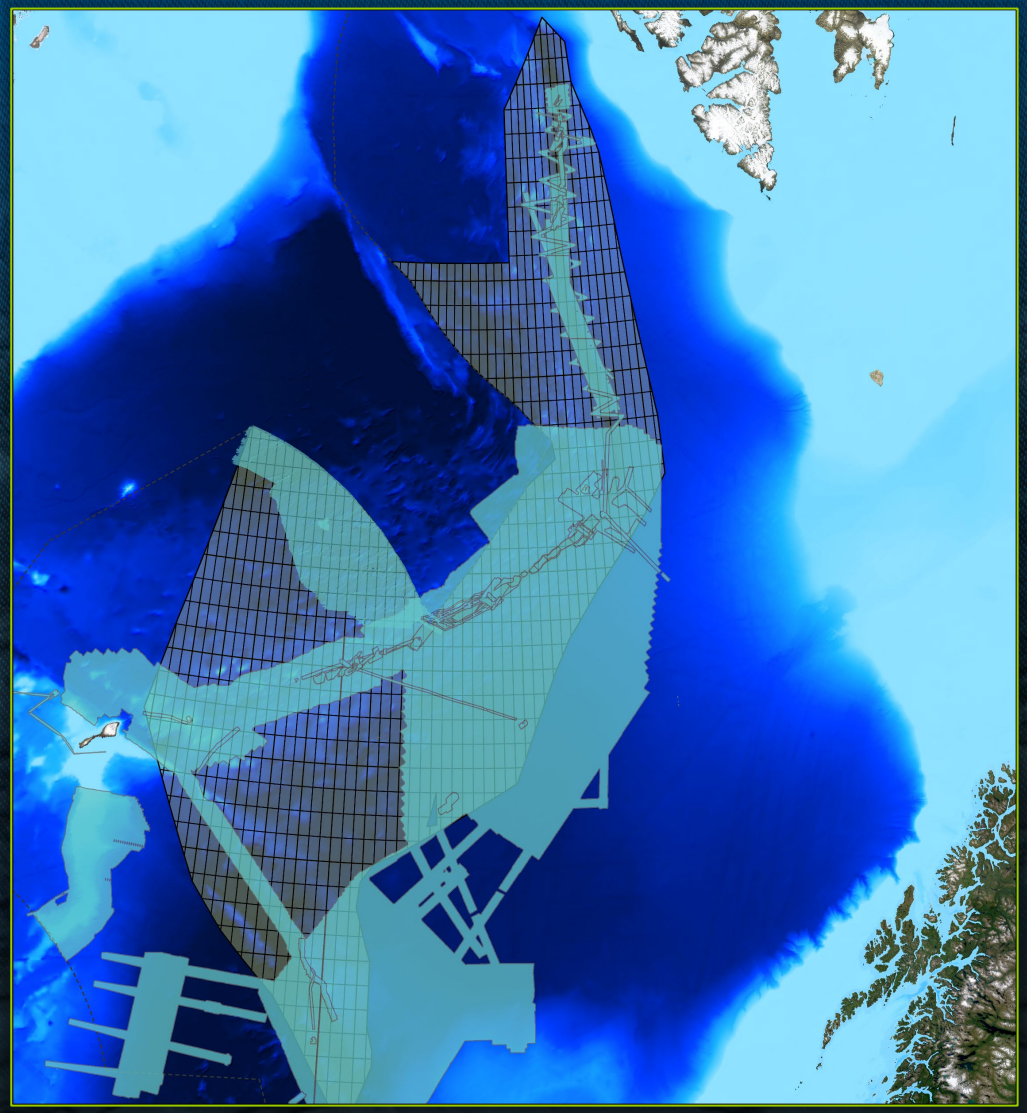
Opening

- 281 000 km2 opened for mineral activities with 80/20 in favor in Stortinget (Norwegian parliament)
- Green Minerals one of the recognized industrial actors invited to nominate acreage
- Nomination deadline May 21, 2024

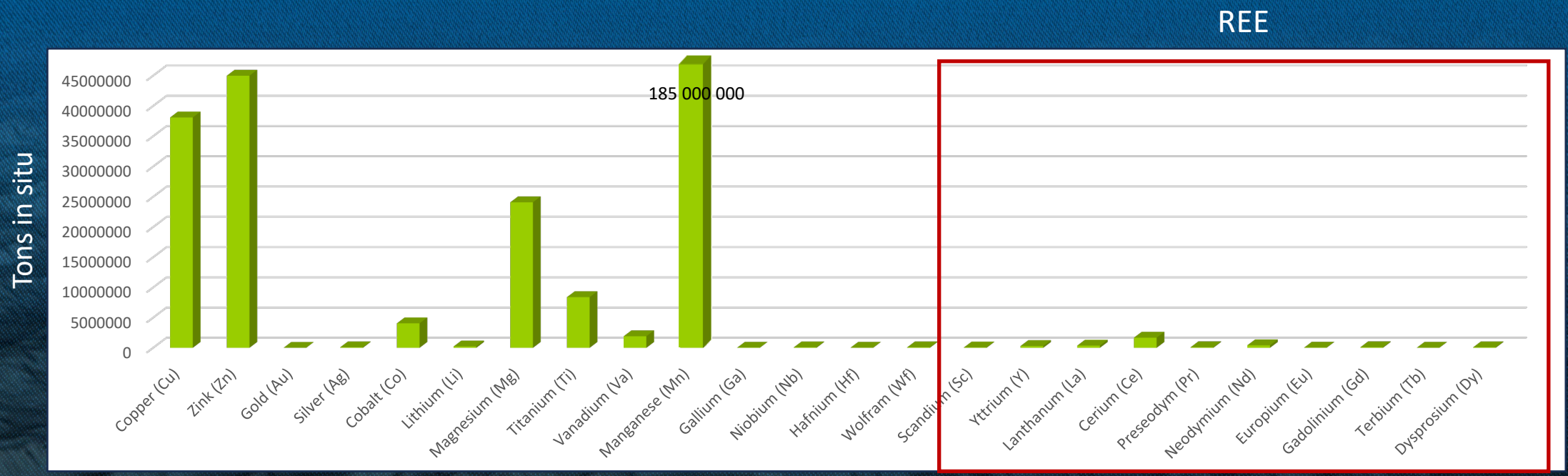


50M USD worth of exploration data

Year	Institution	Data	Area	Resolution (MBES)
1999/00	NPD	MBES (shipbased)	Norwegian Sea	~100 m
2010	NPD	MBES (shipbased)	Jan Mayen ridge	~100 m
2011	NPD/UiB	ROV	Jan Mayen ridge	
2012	NPD/UiB	ROV	Jan Mayen ridge	
2013	NPD/UiB	MBES (shipbased)	Vøring spur	~50m
2016	NTNU	ROV	Mohnsridge	1 m
2016	UiB/NPD	AUV	Mohnsridge	1-2m
2017	UiB/NPD	AUV	Mohnsridge	1-2m
2018	UiB/NPD	MBES (shipbased) & ROV-MBES incl sampling	Mohnsridge	~50m & 1m
2018	NPD	AUV & ROV	Mohnsridge	3 cm
2019	UiB	AUV & MBES	Mohnsridge	1 m
2019	NPD	AUV & ROV	Mohnsridge	1 m
2020	NPD	Drilling	Mohnsridge	
2020	UiB/NPD	MBES (shipbased)	Mohnsridge	~50 m
2020	UiT/NPD	MBES (shipbased)	Knipovitchridge	~50 m
2021	NPD	AUV & ROV	Knipovitchridge	0.5m
2021	UiT/NPD	MBES (shipbased)	Knipovitchridge	~50 m & 1-2 m
2021	UiB/NPD	MBES (shipbased) & ROV-MBES incl sampling	Mohnsridge	~50 m & 1-2 m
2022	UiB/NPD	MBES (shipbased) & ROV-MBES incl sampling	Mohnsridge	~50 m & 1-2 m
2022	UiB/NPD	MBES (shipbased) & ROV-MBES incl sampling	Knipovichridge	~50 m & 1-2 m
2022	Atlab3	Seismic and Electromagnetics	Mohnsridge	
2023	UiT/NPD	Seismic	Knipovichridge	
2023	NPD	AUV	Knipovichridge	1 m
2023	UiB/NPD	ROV sampling	Knipovichridge	
2024	UiT/Sodir	MBES (shipbased)	Greenland Sea	20 m
2024	UiB/Sodir	ROV sampling	Greenland Sea	



A significant resource



A significant resource – on a global scale

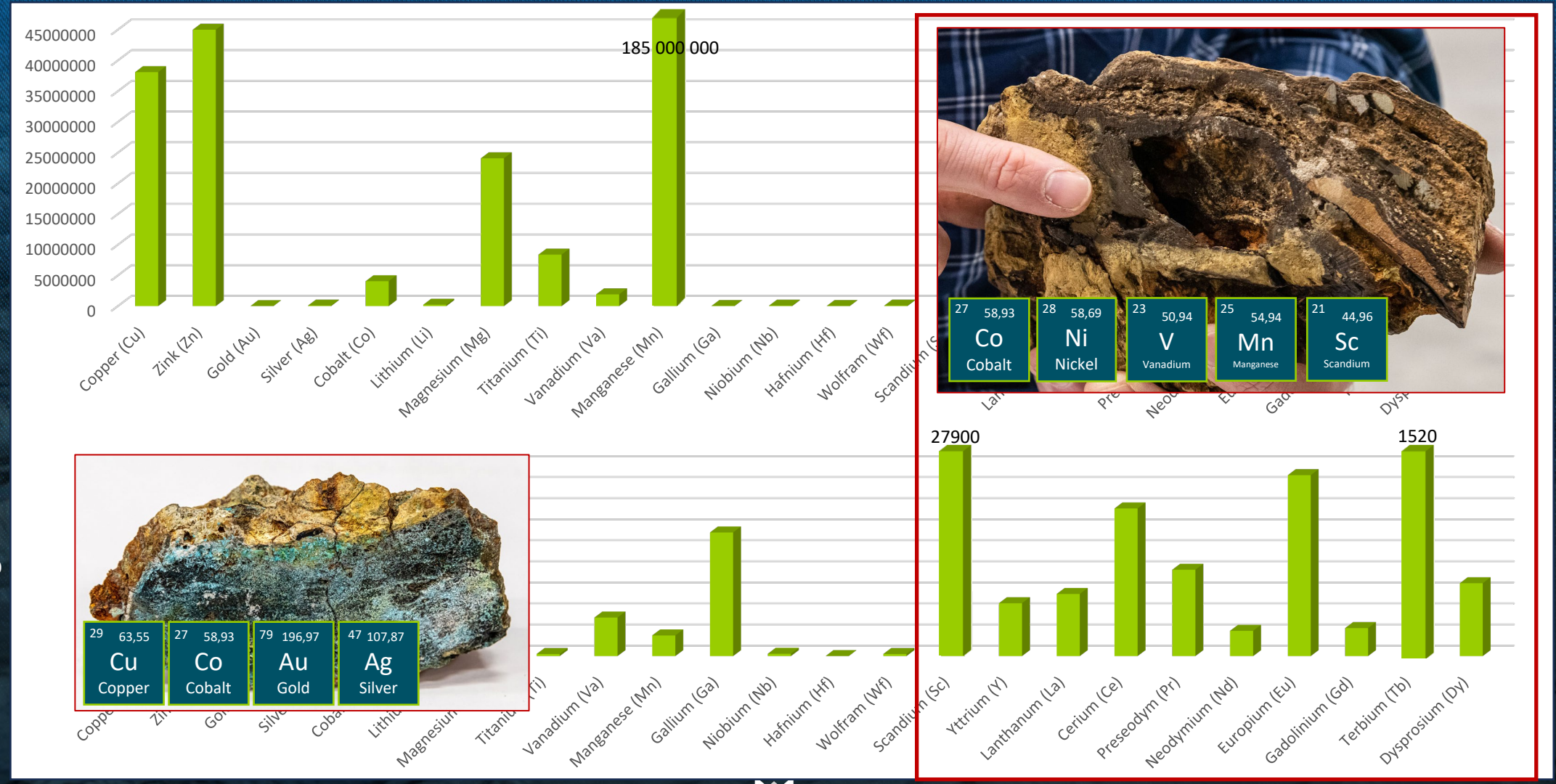
* Global extraction data not available

A significant resource – on a global scale

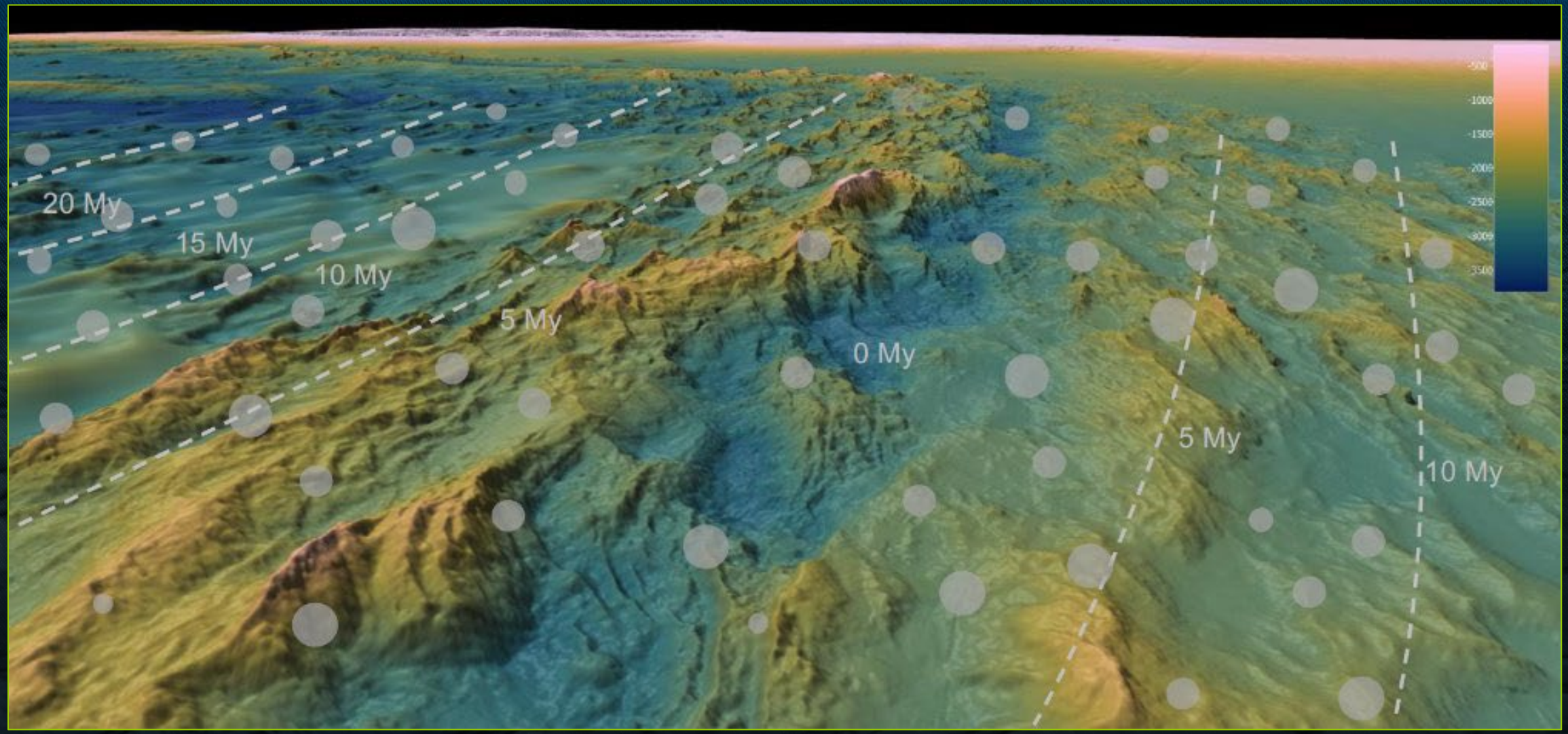
REE

Tons in situ

Years of global use

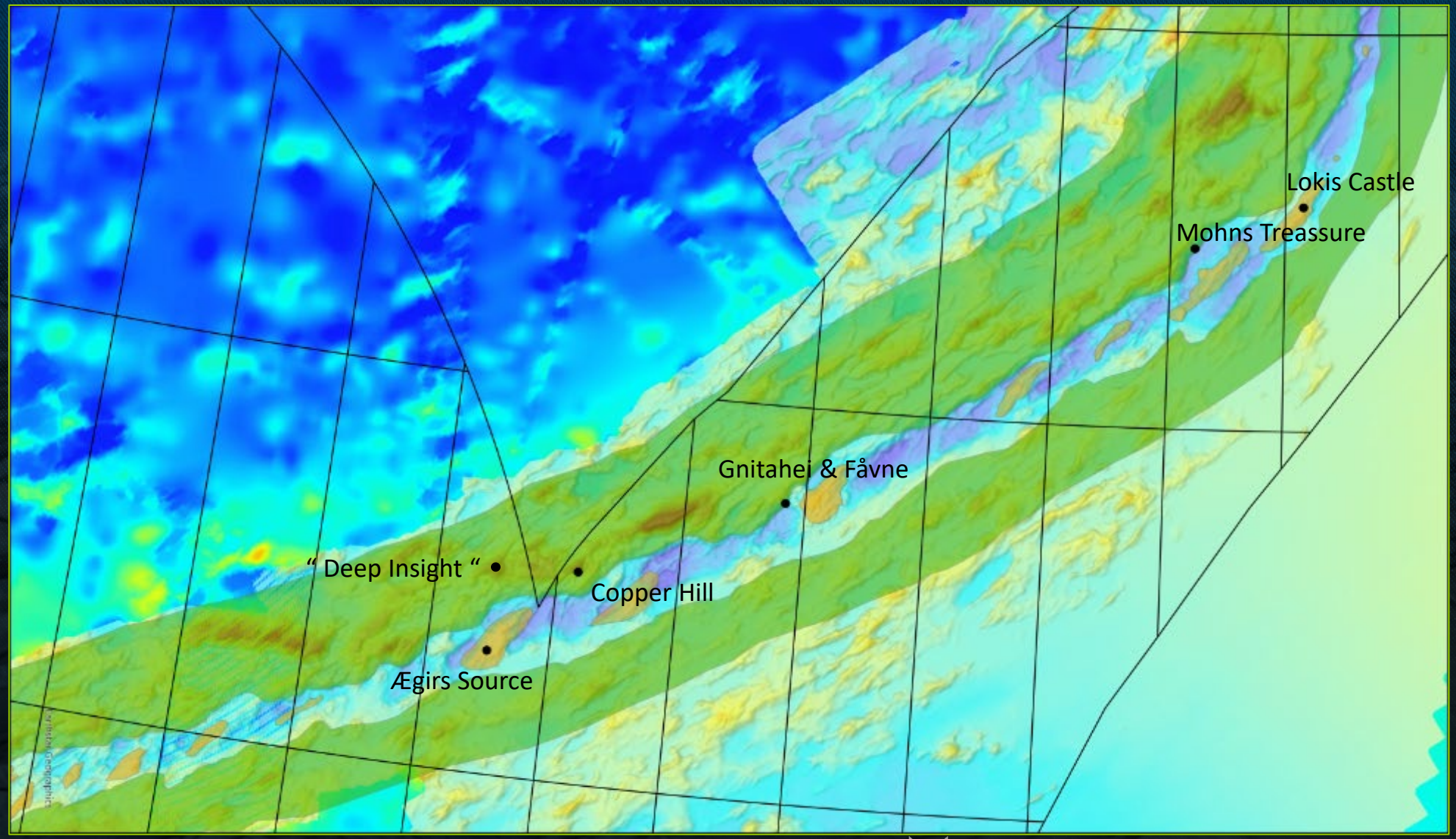


More than 50 000 deposits?



Source: Pedersen, R.B,. GCE Ocean Technology Conference 170424

Play models



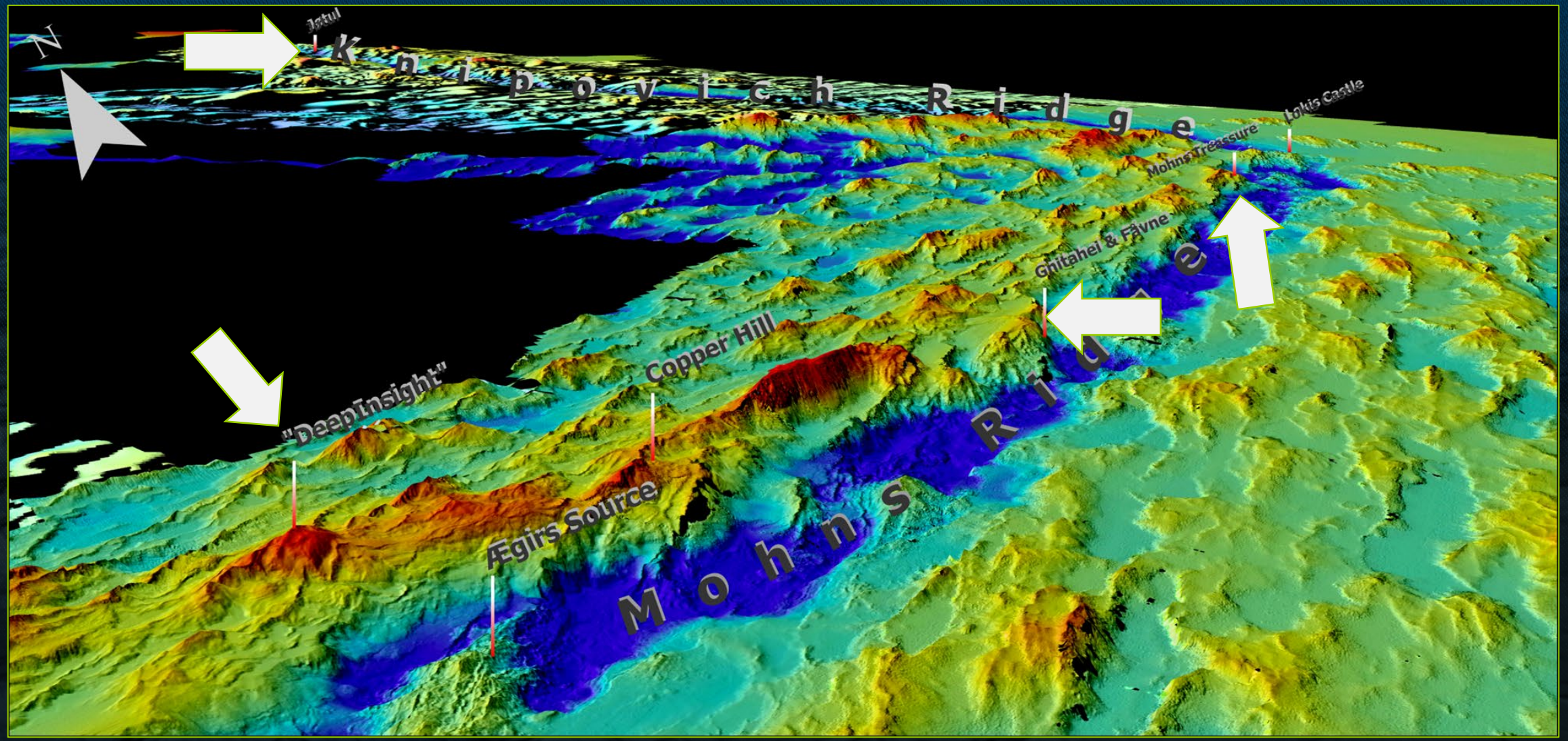
Two play models for SMS

- Axial deposits
- Flank deposits

- Axial deposits
- Short lived due to magmatic activity

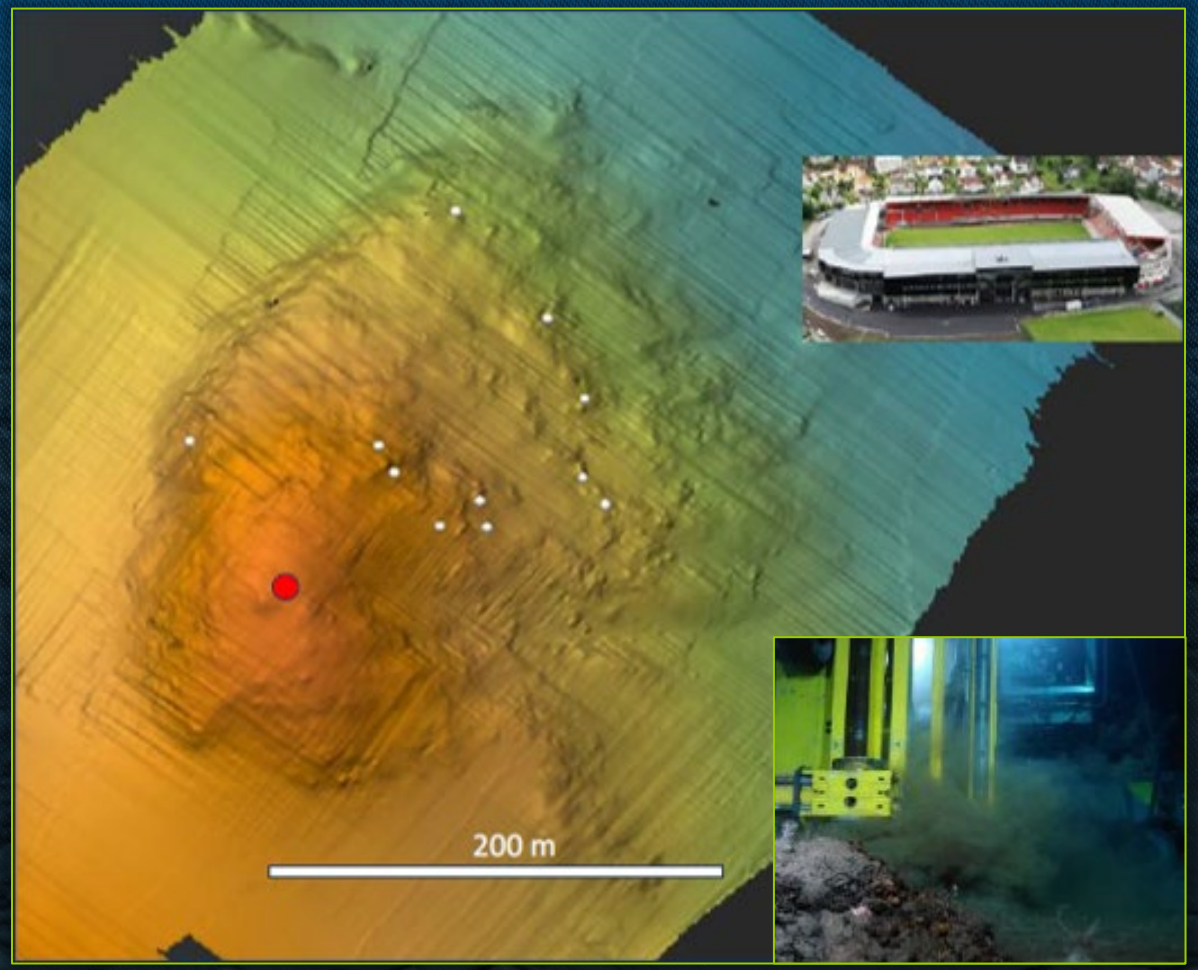
- Flank deposits
- Longer lived
- Potential of larger deposits
- Overburden by sediments not volcanics

Candidates for mining

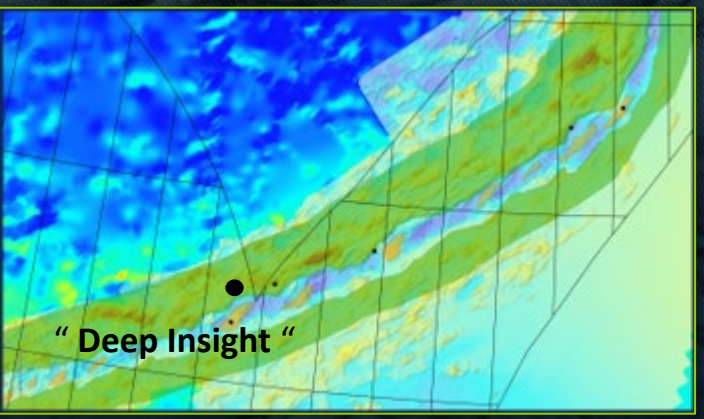


“Deep insight” - a major discovery?

- Discovered in 2023
- Water depth just below 1000 m
- Drillcores taken from 18 m depth
- Core measurements indicate copper-rich intervals
- One of the largest on Norwegian waters
- First estimates of 10-15 Mt ore



Source: Pedersen, R.B,. GCE Ocean Technology conference 170424



Gnitahei & Fåvne - discovered with remote sensing

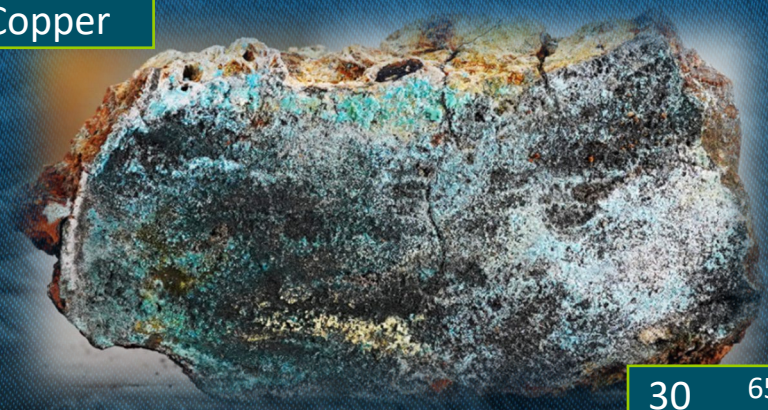
- Discovered using remote sensing technology
- Active and extinct
- Same heat source
- Good average Cu values
- Very good average values of Co

4,6 %

29 63,55
Cu
Copper

27 58,93
Co
Cobalt

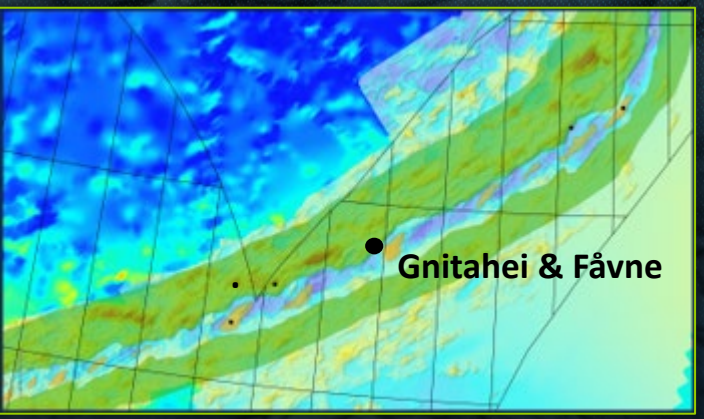
0,40 %

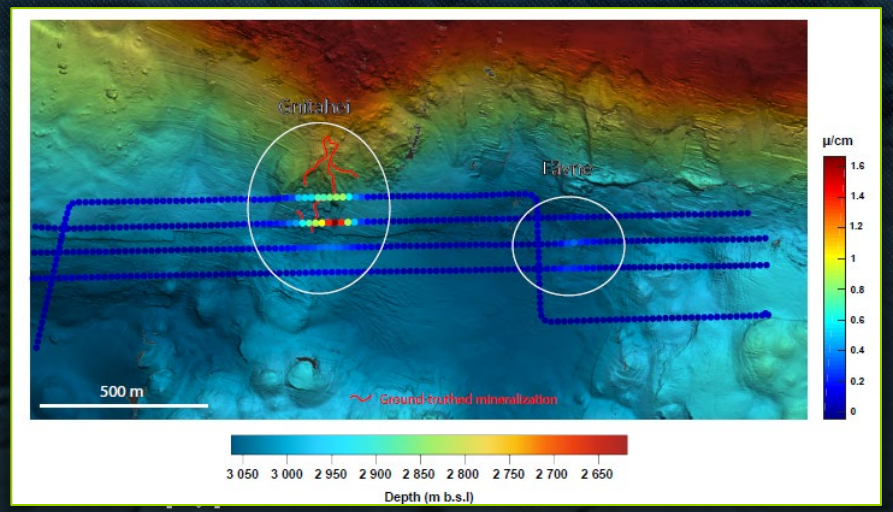


Slabbed sample of SMS from Mohns Ridge
Photo courtesy of NPD

30 65,39
Zn
Zinc

0,85 %

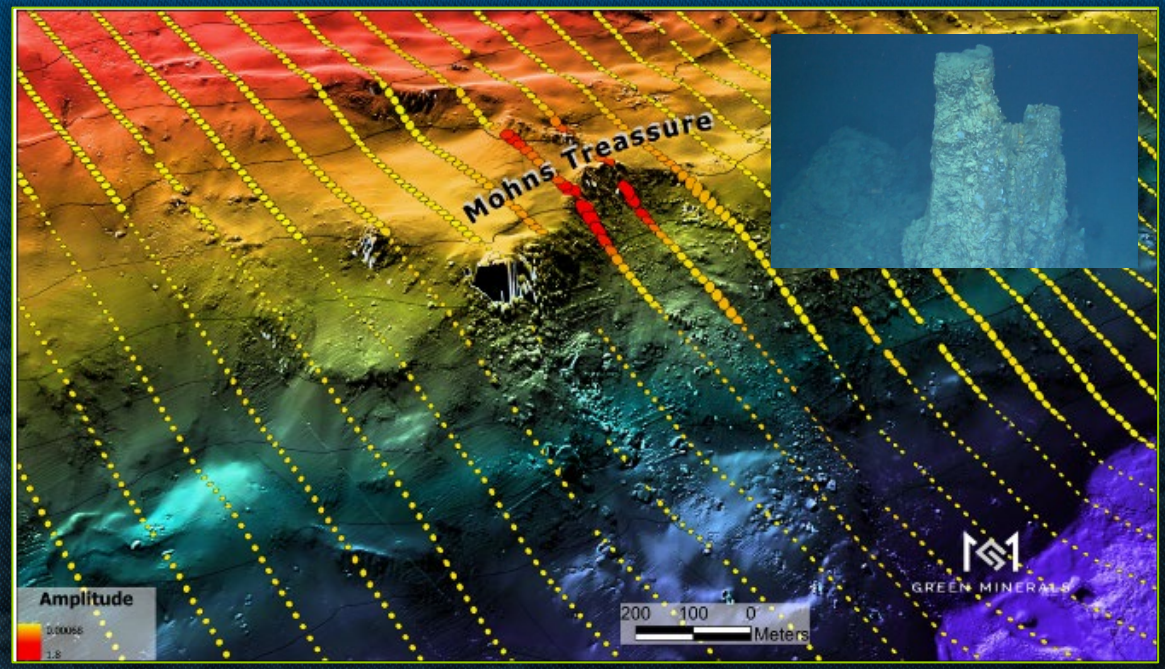


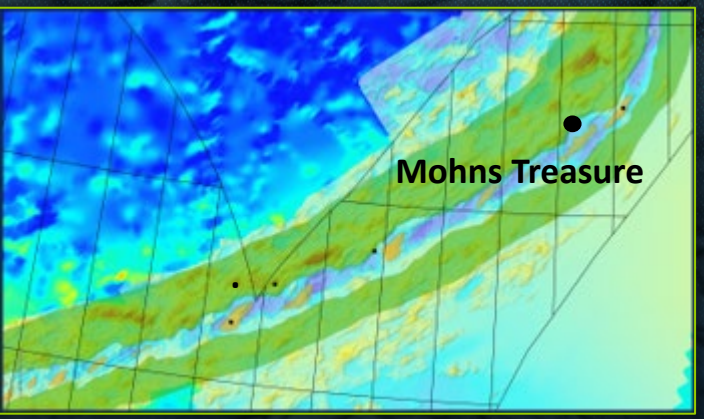


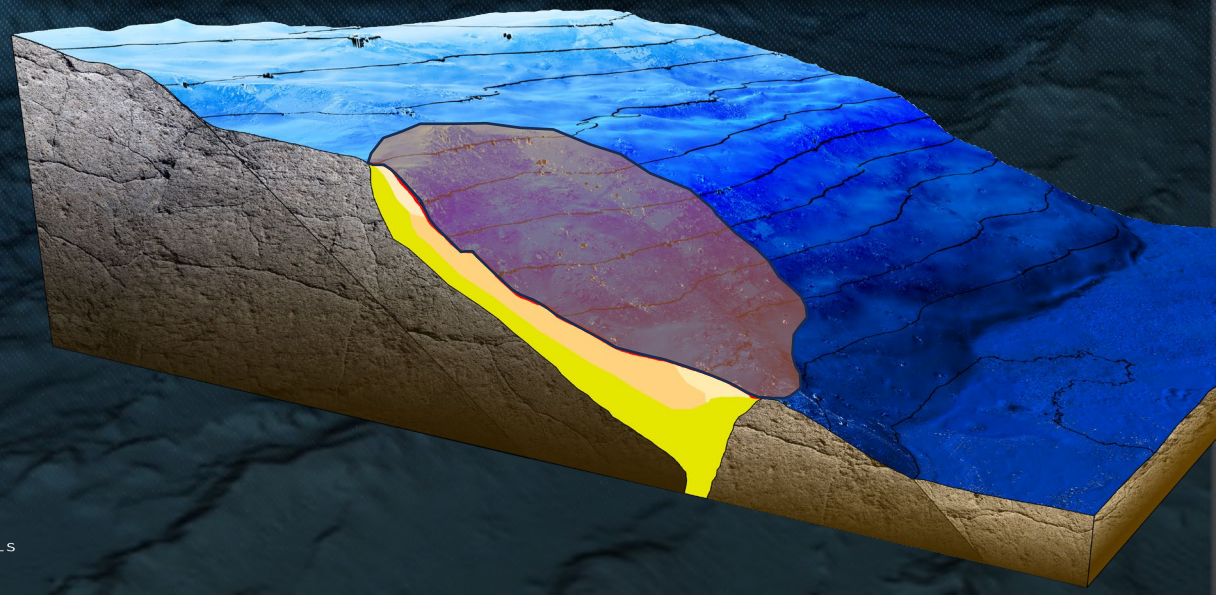
Source: Onstad., S.L., et al 2022., Detecting seaoor massive sulfide deposits along the Mohns Ridge using self-potential methods

Mohn's Treasure - well studied deposit

- Discovered by grab sample
- Samples with up to:
  - 14.3 % Cu
  - 0.19% Co
- Drilled by Norwegian Offshore Directorate
- The most studied deposit







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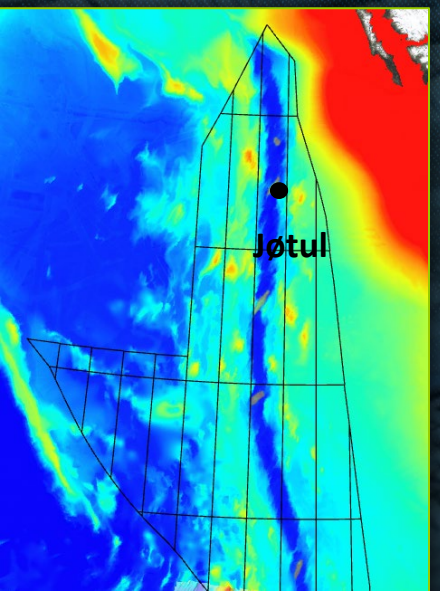
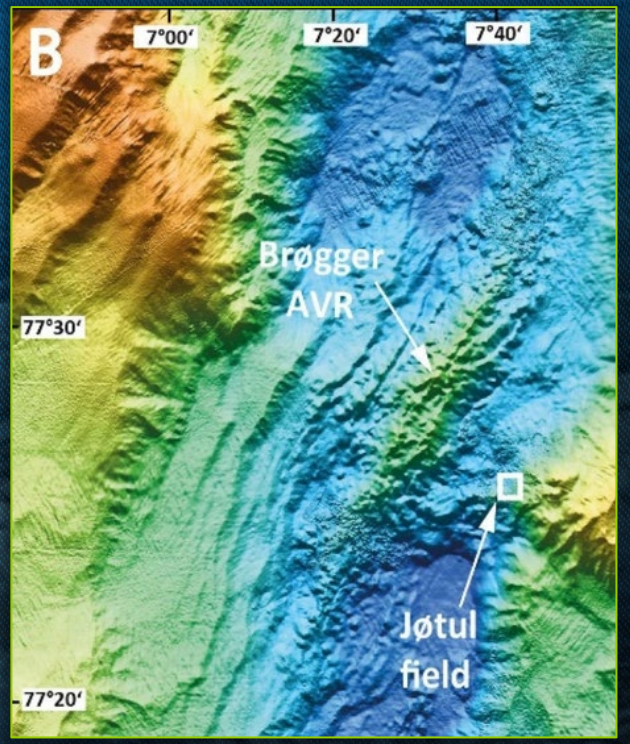
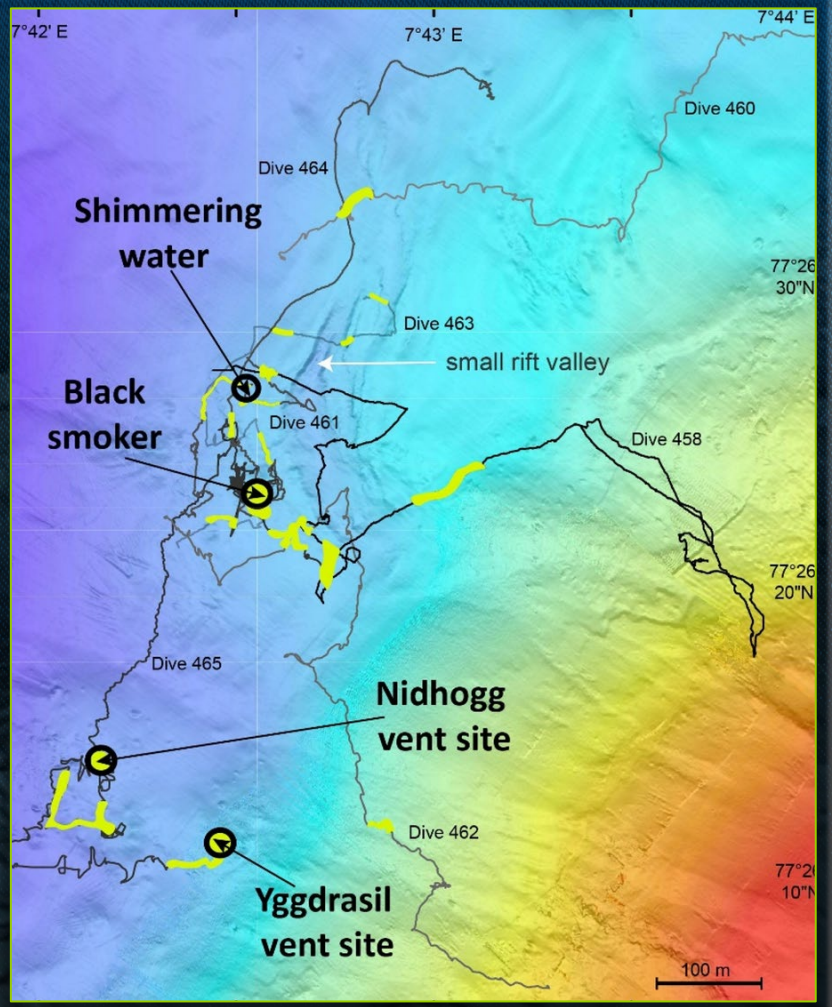
Jøtul - prospectivity confirmed along Knipovich ridge

- Discovered in 2022
- Large active field
- Several hydrothermal vents
- More 1000 m long and 200 m wide
- Samples with up to 29.5 % Cu
- First discovery of a vent site on the Knipovich ridge





Source: Discovery of the first hydrothermal field along the 500-km-long Knipovich Ridge offshore Svalbard (the Jøtul field) | Scientific Reports (nature.com)



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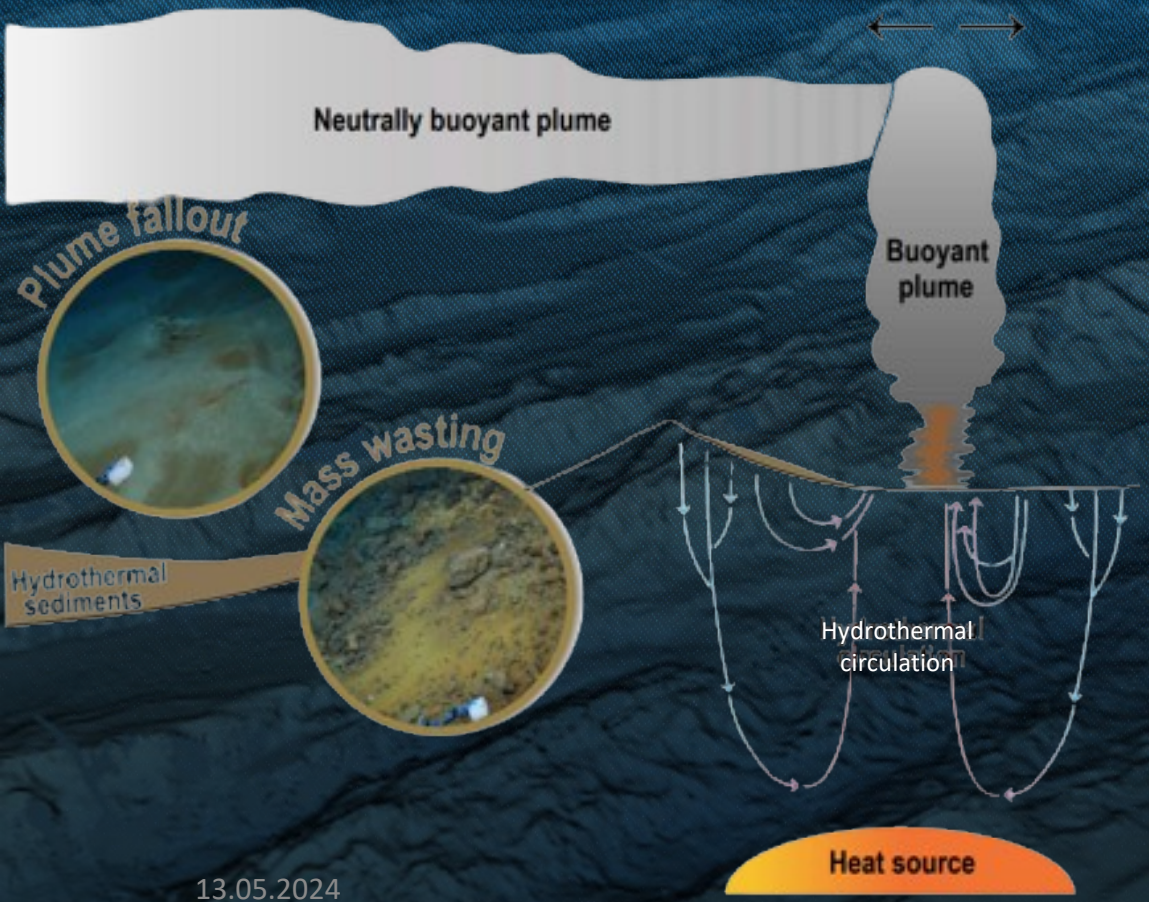
PhD Programs - adding exploration value

PhD Program 1:
New exploration technique. Using sediment cores as a vector to extinct SMS deposits.

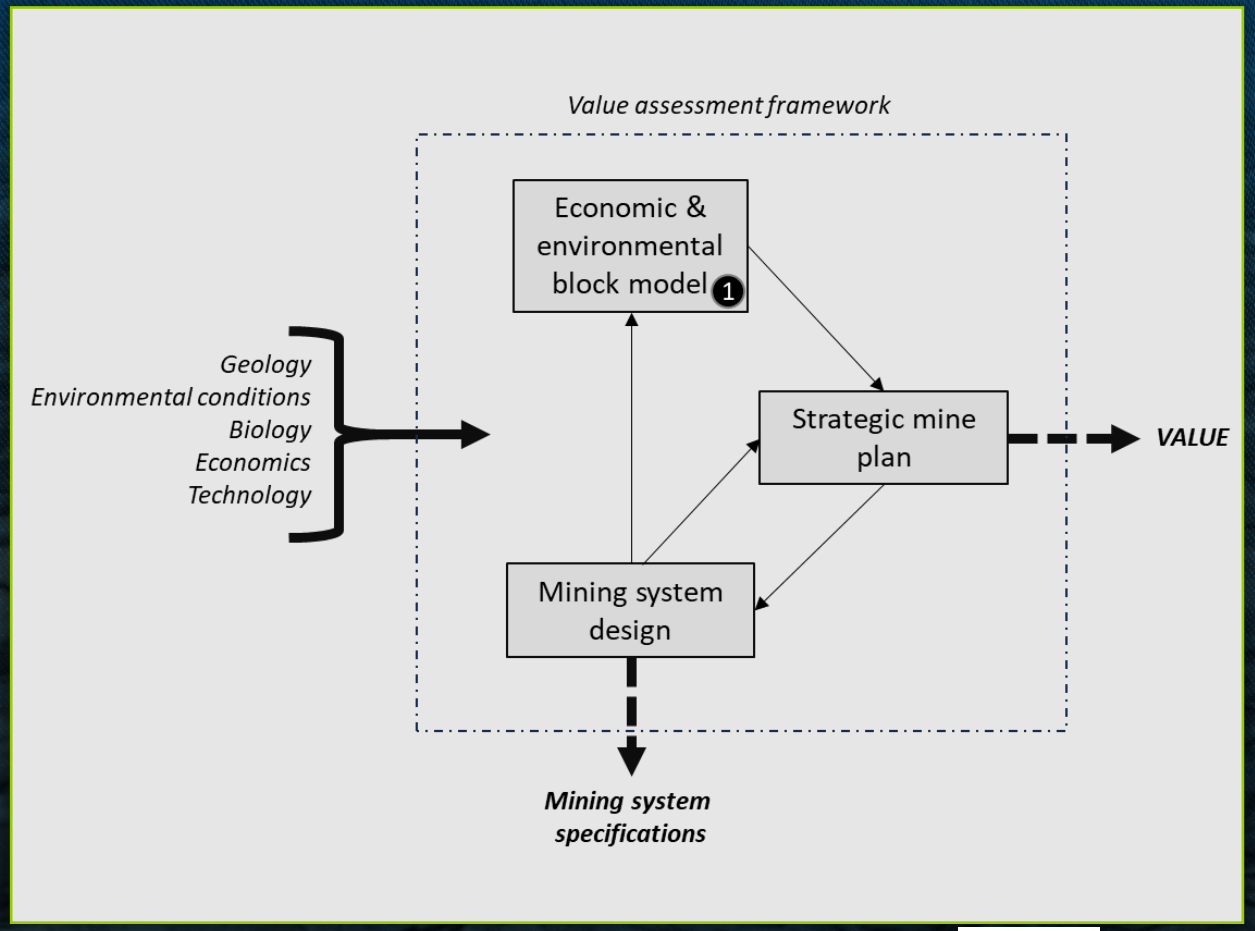


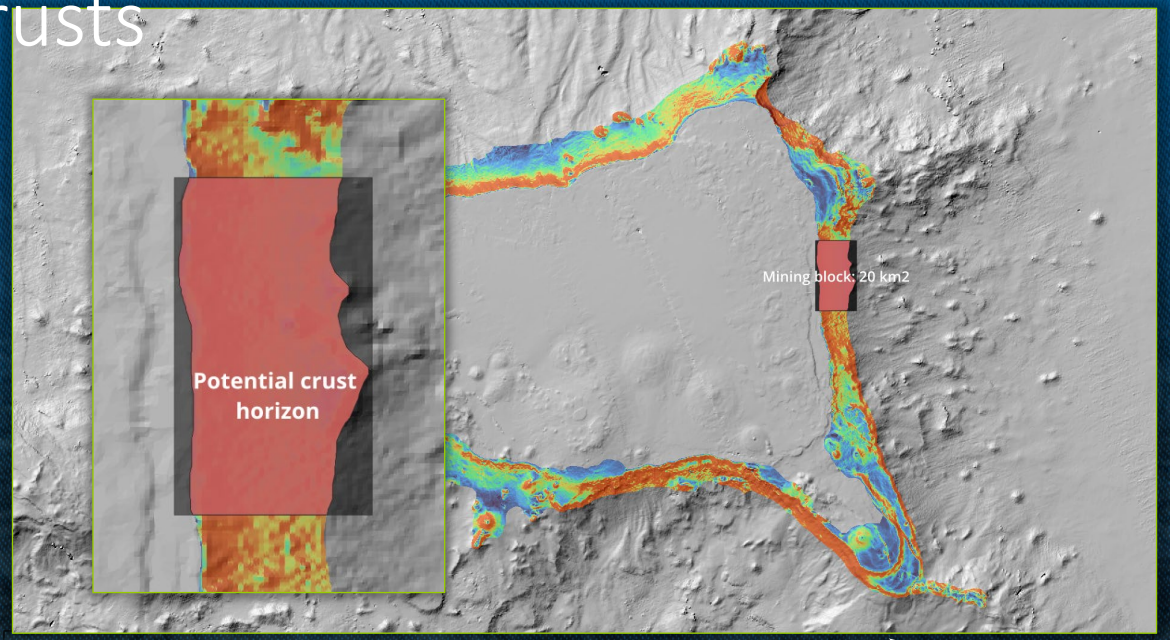
Modified from German and Sayfried (2014)

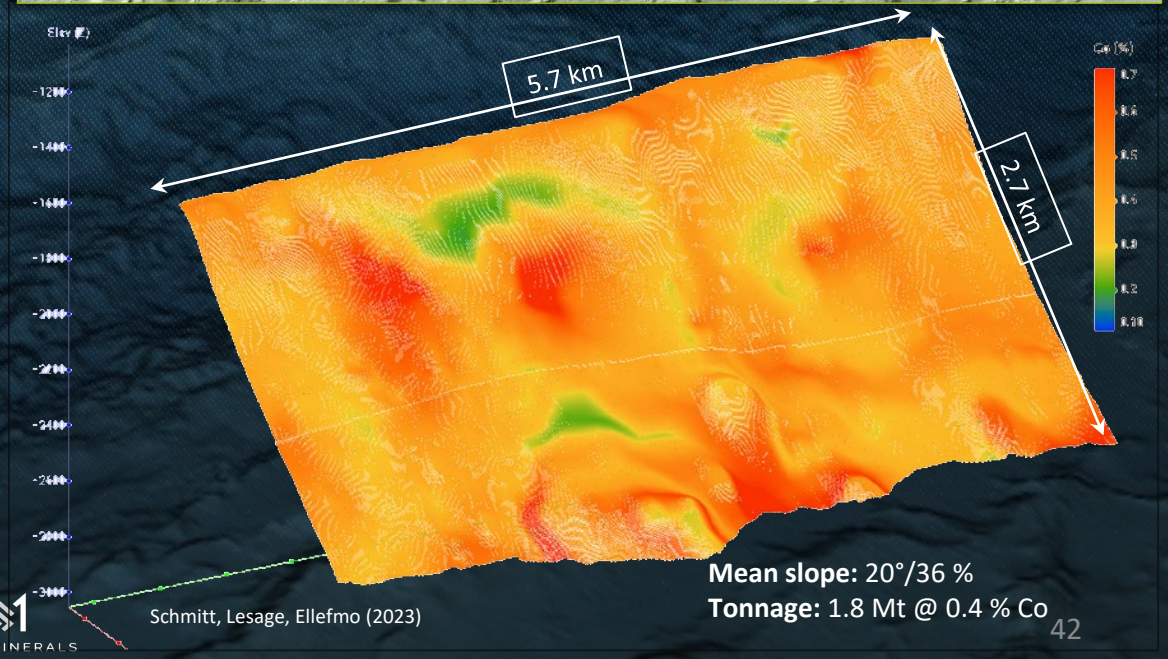
PhD Program 2:
Understanding iron hydroxides as a way to preserve mineralisation.

- FeOOH form as a product of weathering in seawater.
- FeOOH may form a trap/cap-rock that prevents deep weathering and unwanted remobilisation.
- FeOOH may be a tell-tale of preserved or lost in-situ value.
- FeOOH may be “ore” due to high Cu content

Assessing the value of Co-rich crusts







Schmitt, Lesage, Ellefmo (2023)

Mean slope: 20°/36 %
Tonnage: 1.8 Mt @ 0.4 % Co

https://www.ntnu.edu/sustainability/tripledeep

NTNU
Norwegian University of Science and Technology

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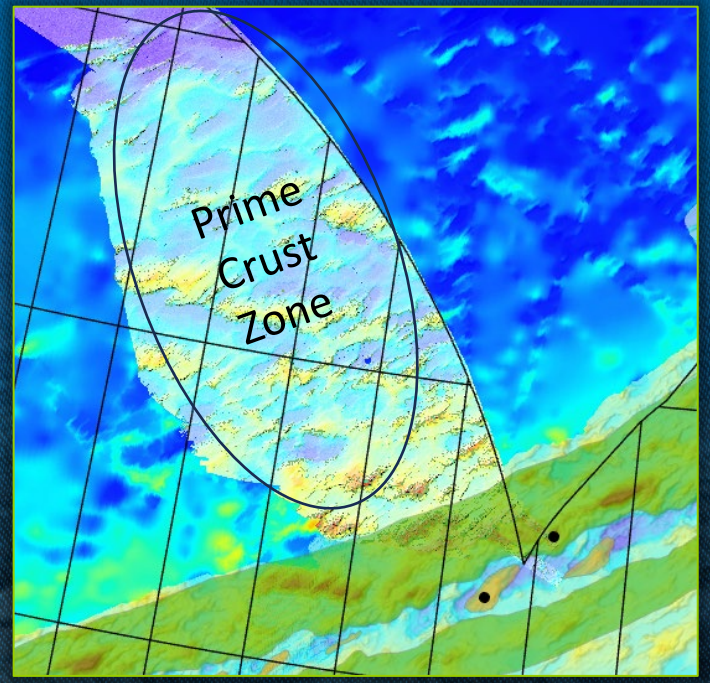
Co rich crust Norwegian Sea



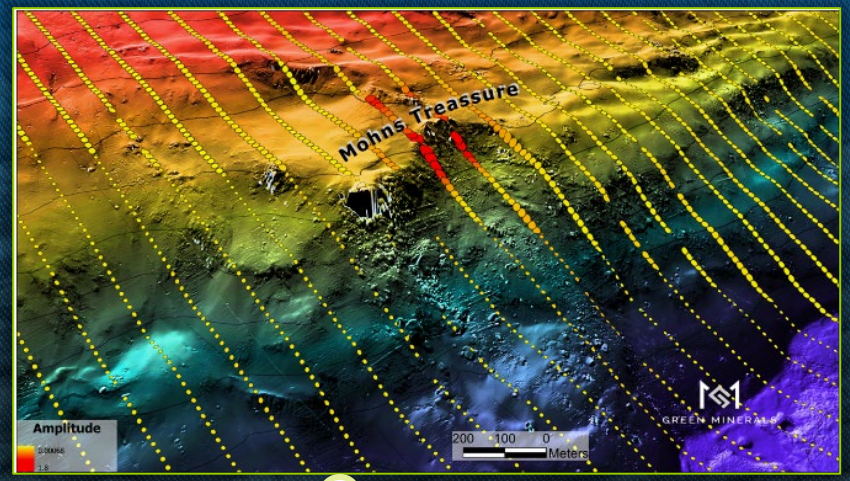
Concentration
Mn: 12.2 %
Co: 0.24 %
Ni: 0.20 %

30 cm thickness => kg/m2
Mn: 55 kg
Co: 0.16 kg
Ni: 0.9 kg

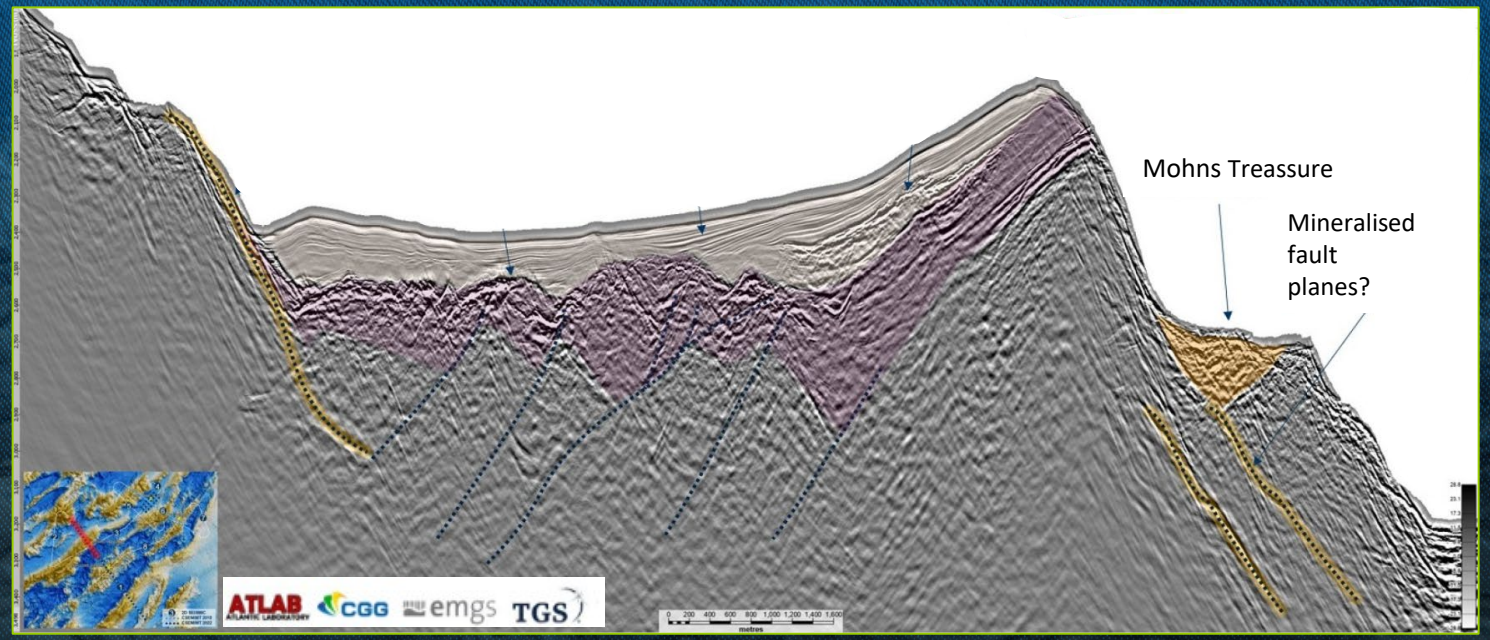
Nodules 15 kg/m2
Mn: 4.3 kg
Co: 0.04 kg
Ni: 0.21 kg

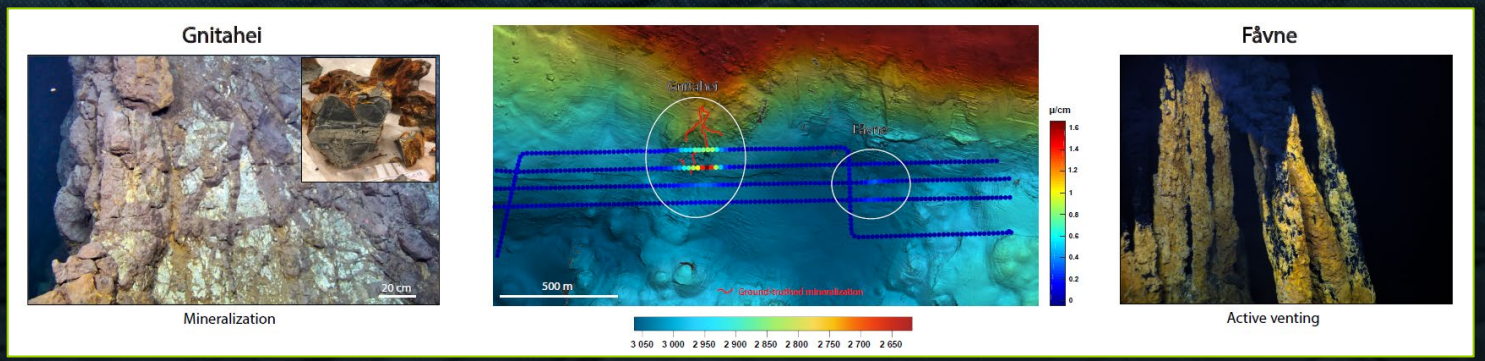
Source: Pedersen, R.B,. GCE Ocean Technology Conference 170424

Exploration technology



- Self Potential
- Seismic
- Electromagnetic
- Sampling
- Drilling





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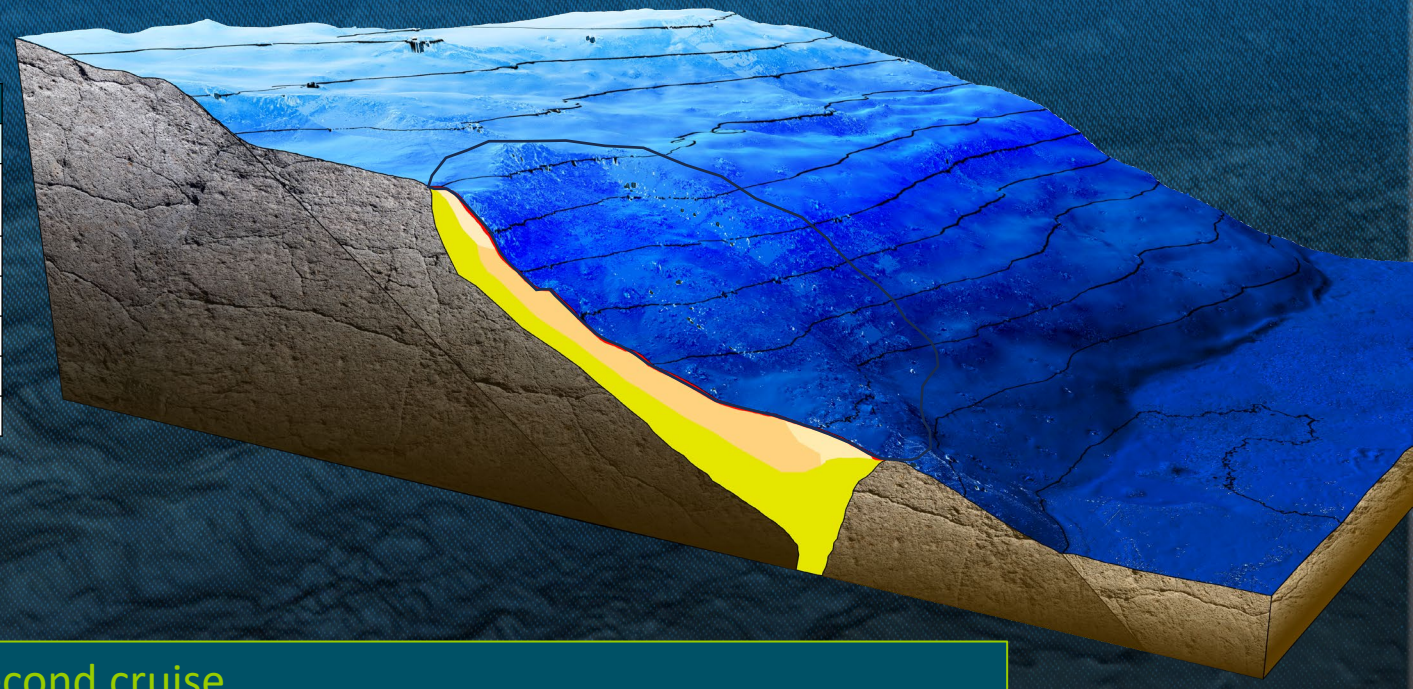
Source: Onstad., S.L., et al 2022., Detecting seaoor massive sulfide deposits along the Mohns Ridge using self-potential methods

Expected licence work

	2024				2025				2026				2027				2028			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
License Application																				
Award																				
First cruise																				
Second cruise																				
Mine planning																				
Pilot production																				



First cruise

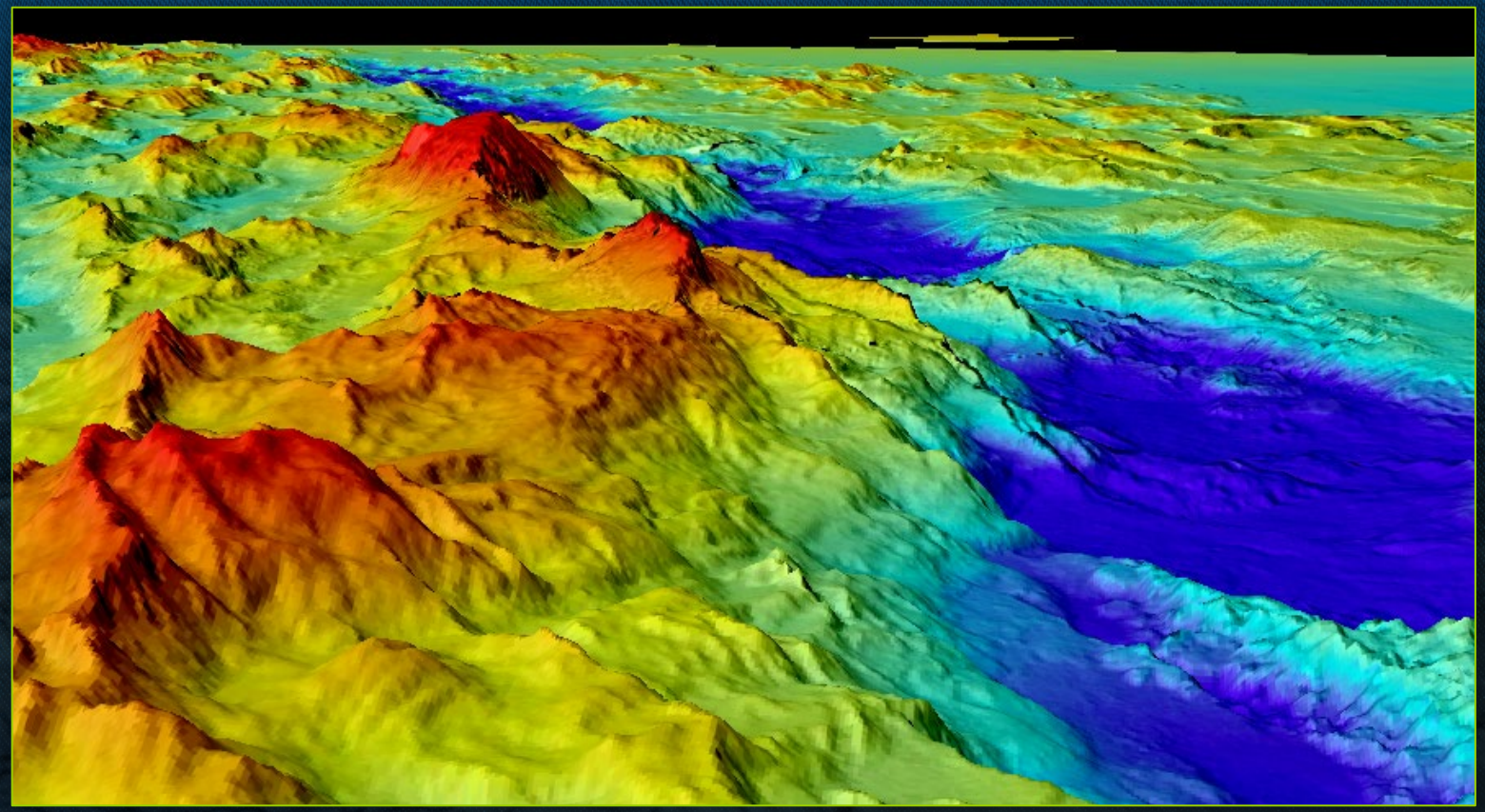
- Detailed bathymetric mapping
- Physical sampling
- Electromagnetic mapping
- Potential for coring
- Environmental data

Second cruise

- Extended mapping for added prospectivity
- Detailed coring of deposit
- Environmental data

Summary

- Several deposits confirmed
  - Active
  - Inactive
  - Extinct
- GEM exploration plan based on 50M USD data made available by Norwegian authorities
- Recent discoveries with very promising Cu concentrations.
- Green Minerals are ready to execute on awarded acreage!

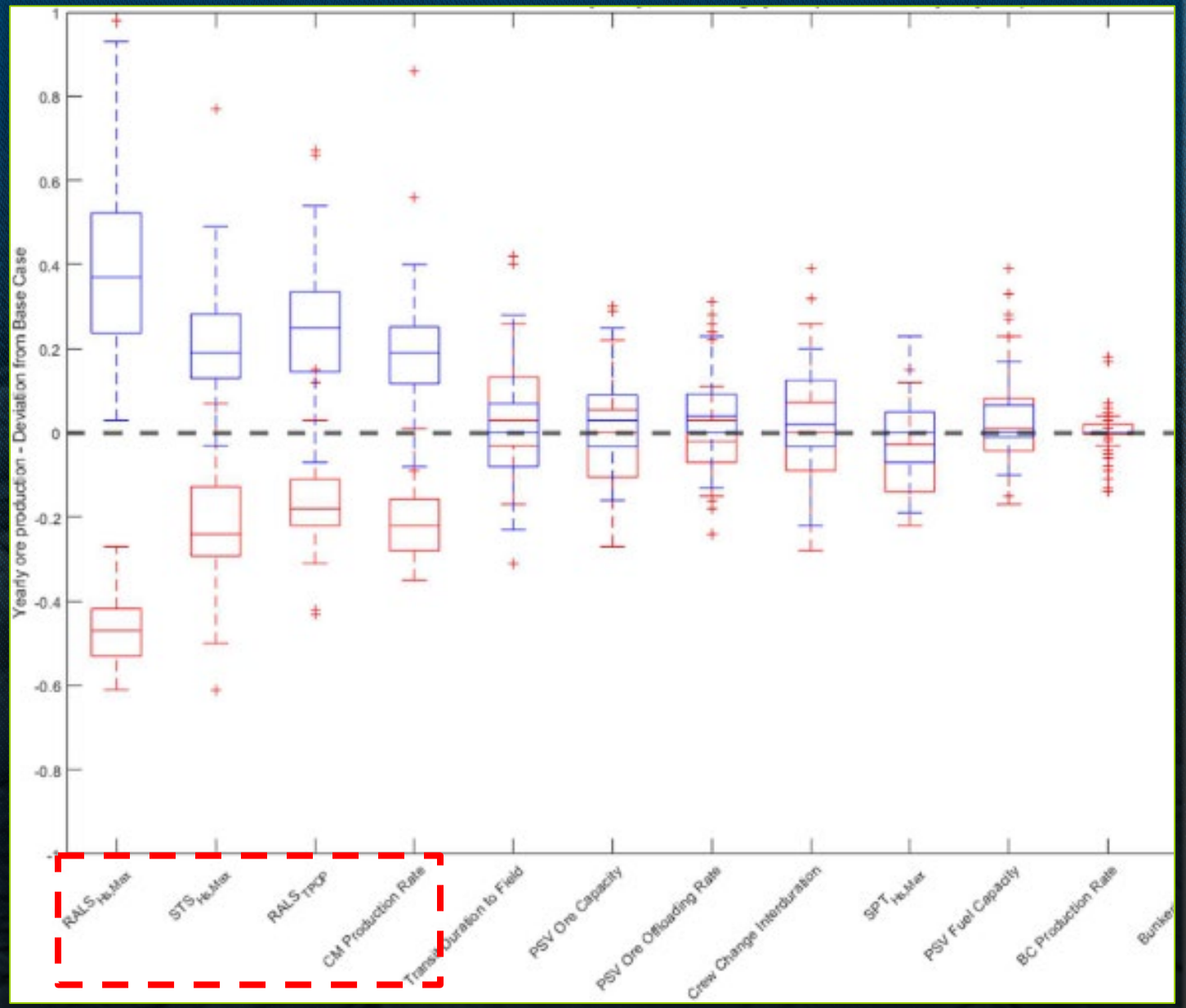


World class resource potential is available in the first licensing round!

Production

Key-levers for an efficient DSM system in Norway

- A weather-robust Riser System
- A weather-robust Ship-to-Ship System (ore offloading, personnel transfer, logistics)
- A system that lifts ore at a fast rate



Addressing systematically the DSM challenges

A weather-robust Riser System

- A stable platform: Semi-submersible instead of Drillship, possibility to moor
- A rapid-riser installation: bolt-free connections (<min per joint), field proven pipe-running systems (300m/hour – 10hrs)

A weather-robust Ship-to-Ship System

- Decreasing the need for such operations
- Decreasing the movement between the two floating assets
- Can we bypass the STS challenge:
  - Ore: does the ore needs to be stored on Mining Vessel
  - Personnel: do we need to transfer by light craft ? Is there a way to enable helicopter transfer? How to reduce the amount of personnel to transfer?

A system that lifts ore at a fast rate

- A system that can excavate at the desired rate (no ore mined = no ore to lift)
- A convection system that is highly available and field proven:
  - Slurry lifting using a pumping system instead of air lift
  - Container lifting seems difficult to scale-up

Partnership for responsible production

Concept Study on Harsh Environment Deep-Sea Mining System in progress. Completion expected end of May/early June.

OSI has delivered risers for Allseas/TMC (Nodules) and Japanese consortium (SMS).

SMD delivered mining machines for previous SMS mining projects.

OSI becomes shareholder in Green Minerals.

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Oil States

Marine operator

SMD

Subsea equipment

Global pump supplier

RISERTEC Riser Technology
A Division of Oil States Industries

Horizontal transportation

VIDEO

Concept for SMS mining system in Norway

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OSIMinerals™

Lifting principle

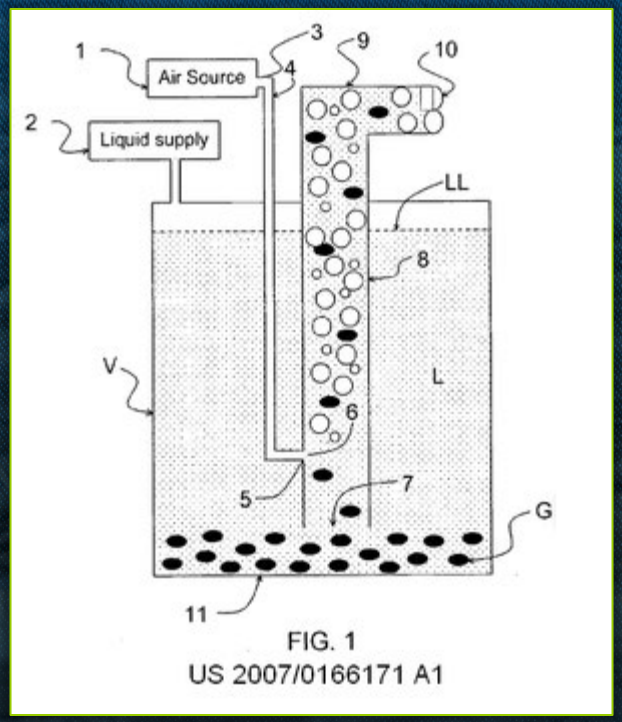


FIG. 1
US 2007/0166171 A1

- Air Lift has been used successfully in the 1970s (SEDCO)
- Has been used for the latest pilot mining test of TMC

BUT:

- -> Difficult to control (slugging)
- -> Requires large riser section in the top-part for sustaining air degassing
- -> Is more energy consuming that pump (estimated +50%)
- => Pumping solutions are considered for full-scale production

- The current concept is based on a pumping solution supported by surface equipment (only the PEC is subsea)
- -> proven technology designed by slurry experts from land mining
- -> enable stronger redundancy with several topside pump units
- -> enable easy maintenance and increased system availability (planned maintenance performed topside while mining operation is ongoing)

Riser Technology

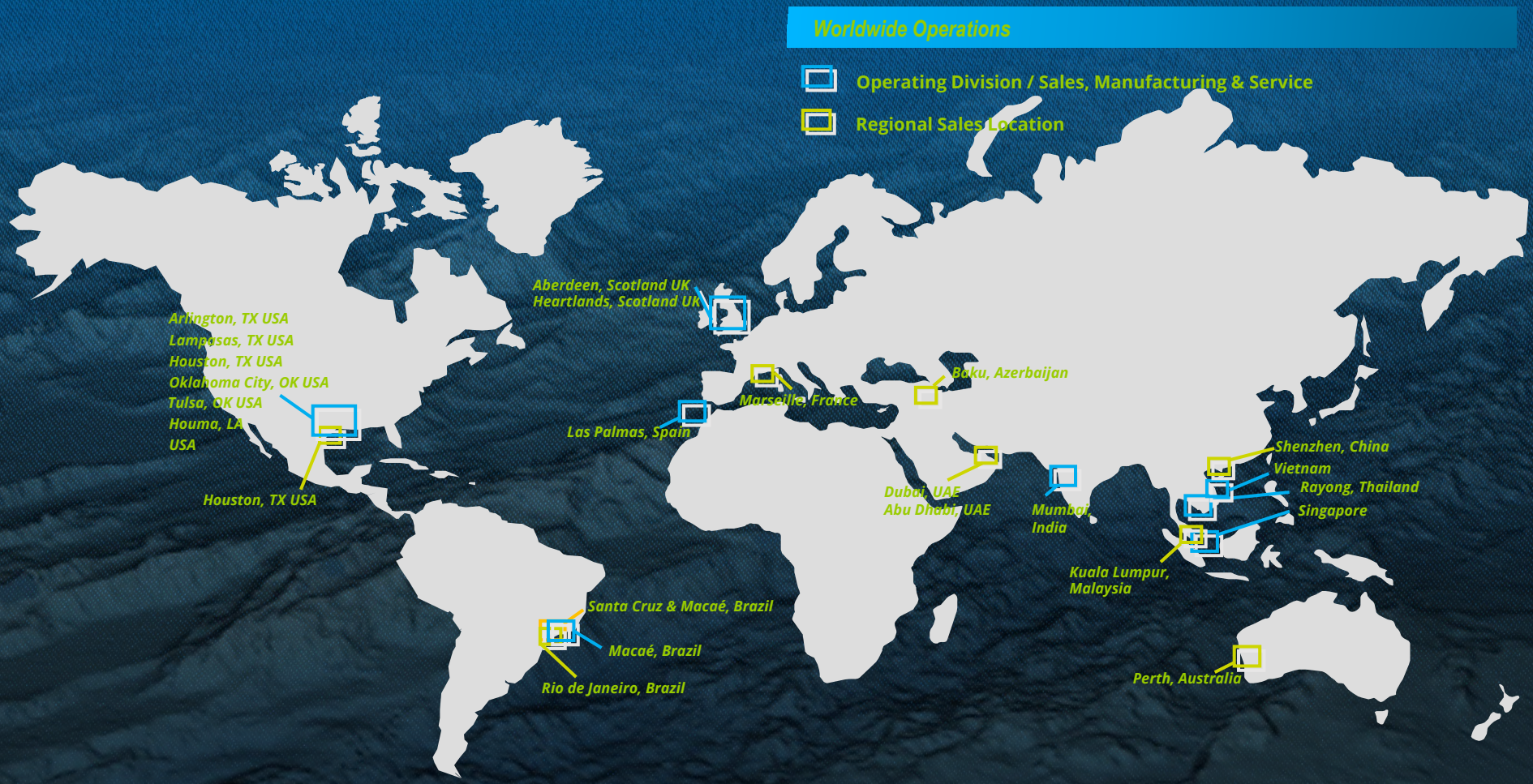
OSI Merlin™ Mineral Riser

- Field Proven Technology

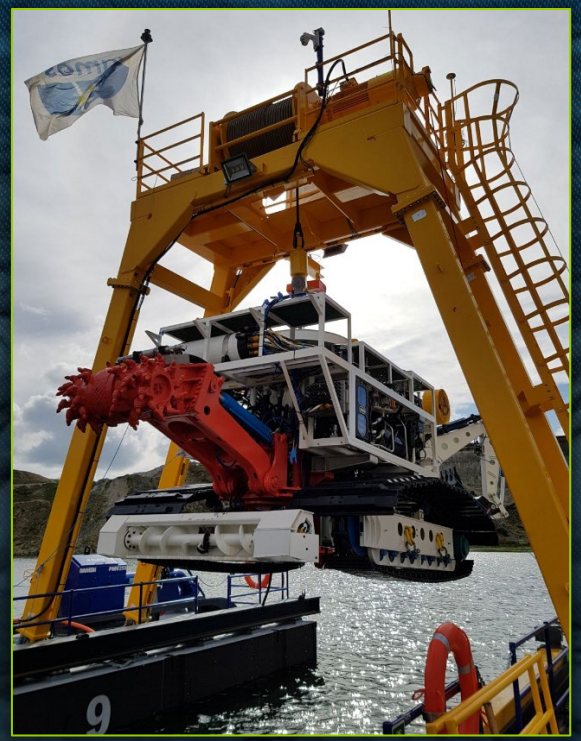
- OSI has delivered complex riser systems to the O&G industry for more than 35 years
- The Merlin hands-free system is already in use:
  - Japan (Cosmo Shoji)
  - JAMSTEC – Chikyu
  - TMC
- Quick assembly system that allows for high-availability has joint-connection takes seconds instead of minutes (typical clamp or bolted joints)
- Successfully field proven at 4,500 meters

JAMSTEC Mud Pilot Lifting 2470msw

OSI Global Network



Technology validation: Small Scale Mining (VAMOS)



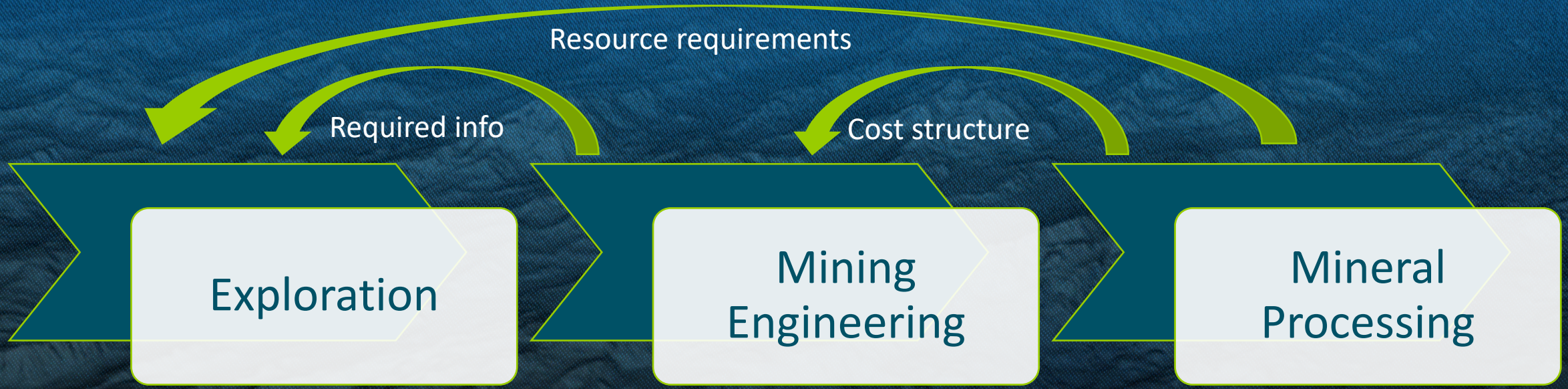
Typical Semi-Submersible considered for this study

Candidates:

- Cold stack rigs
- Qualified for harsh-environment
- Deck-Space to accommodate for equipment – typical size **85x75m** (extensions can be considered)
- Mooring capabilities

Processing

The value chain of marine minerals



Identify and define resources

Converts resources into reserves i.e. minable part of resources

Actually, transform ore (raw material) into valuable product (concentrate for smelters)

=> Understanding the feedback loops is necessary to support the anterior activities

SMS can optimize land production by valorising waste and extending LOM

- Orebody where grade < gradecutoff -> treated as waste
- Waste valorised as ore through blending with SMS “super-ore”
- Original pit
- Pit extension due to extended ore valorization through blending with SMS “super-ore”

Mineral Processing Primer and Rational

- Transformation of ore into a concentrate for smelting and refining (copper cathodes)
- Often connected to the mine site as it is “tuned” for the local ore
- Is a large CAPEX in the total investment which includes infrastructures and waste storage capacity (tailing ponds)
- Requires relatively constant ore feed
- Is rationalised over Life of Mine (LOM) e.g. MIT studies shows a 10-15years of production is necessary for nodule processing plant amortisation

⇒ Can we integrate the marine “super” ore into the land minerals value chain?:

- Can the “super” ore boost sub-economic ore?
- Can the “super” ore delay the Mine Closure?
- Must we invest in a new plant?
- Must we take the risk of ore delivery vs process stoppage?
- Can we capitalise on existing infrastructures and avoid developing on “virgin” soils

Others approach mineral processing the same way

TMC, SGS produce world's first nickel sulphate from seafloor polymetallic nodules

Staff Writer | April 23, 2024 | 9:58 am Battery Metals Mexico and Central America USA Cobalt Nickel

"The data collected will inform further engineering decisions to move this towards commercial scale, and TMC continues to expect that initial production will begin with a capital-light approach by leveraging the existing processing facilities of strategic partners."

SMS changes the paradigm – Stand-alone comparison

Typical land deposit

Ore grade 5x higher (expected)

Waste reduction up to **75%**
Tailings reduction up to **50%**

Expected SMS deposit

Orebody

Pit limit – gray is waste rock

BONUS – SMS Waste can be separated on seabed:

- No surface waste handling and storage
- No risk to land water source
- Energy efficient – no lifting of unvaluable material
- Seawater can act as a buffer – AMD risk low

Blendability study (SMS)-> Enabling our business strategy

Building a new processing plant means high CAPEX : long Life-Of-Mine (LOM) requirements

Need to discover several SMS deposits to sustain long production before making FID

Exploration time will be longer and expected revenues further in the future.

SMS ore are genetically related to other copper ores.

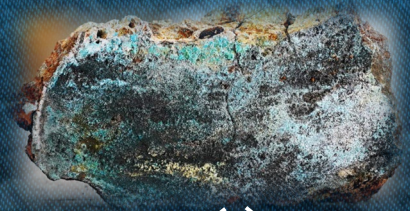
Business strategy: Integration of SMS ore in the existing copper processing flowsheet.

Reduction of consolidated resource portfolio

Reduction of exploration time and shorter route to first revenues

Win/win paradigm for existing aging mine by longer use of already spent CAPEX, and boosting of marginal ore

- 5-8000 tonnes/day ore to surface
- 1,5Mt ore/year



Existing facility

New facility

- 5 years production
- 7,5 Mt ore for project life

- 10-15 years production
- 15-22,5 Mt ore for project life

Blending: Terrestrial and marine copper ore

XRF analysis %, Terrestrial ore

S*	Cu	Ni	Fe	SiO2	CaO	Al2O3	MgO	Co	Zn	W
1,5	0,255	0,245	8,603	46,903	13,96	3,343	19,799	0,051	0,003	0,125

Low-grade Cu-Ni sulphide ore. The mineralogical analysis showed the main minerals as chalcopyrite, pentlandite, pyrrhotite and pyrite. The grain sizes are around 20-30 µm.

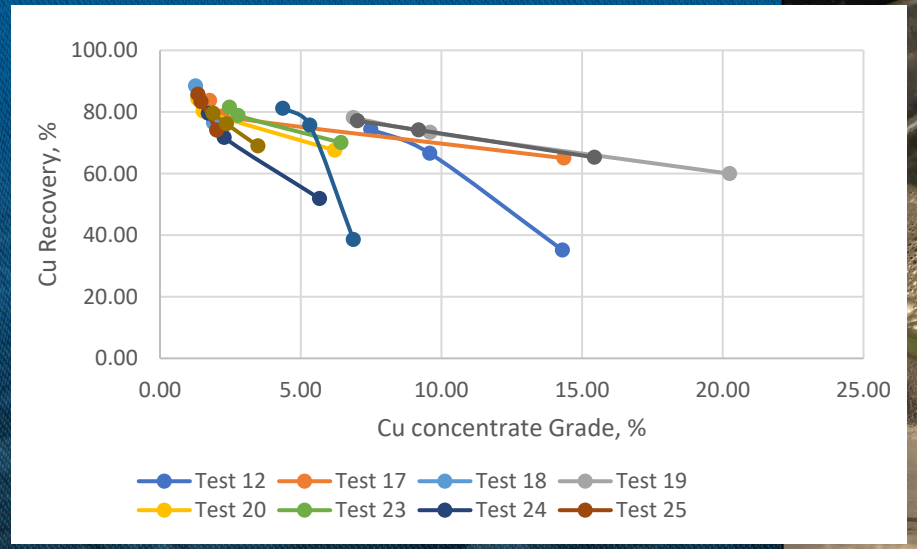
XRF analysis %, SMS ore

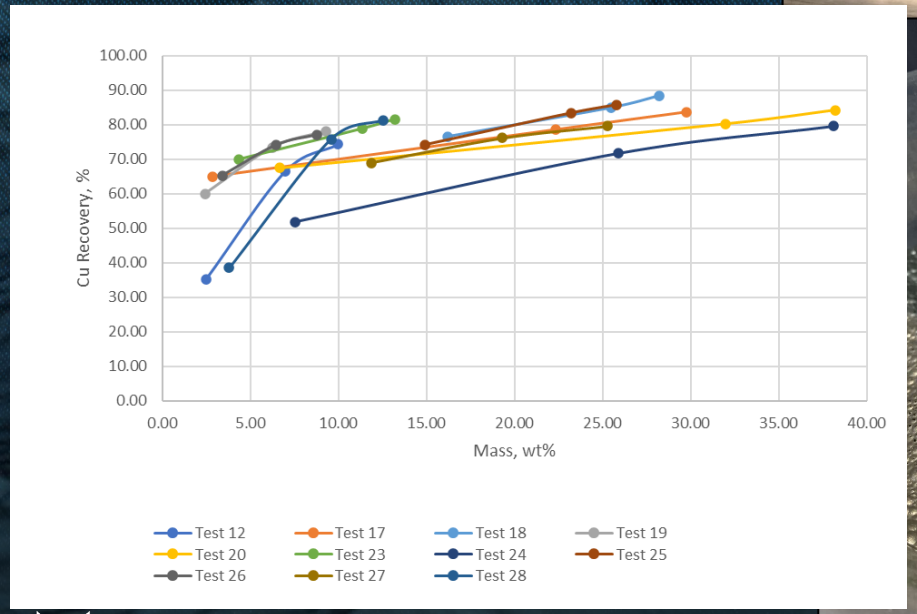
	S*	Cu	Fe	Zn	Co	Mo	Ag	W	Rh	Se
SMS-2	50,5	**1,79**	45,8	0,0069	0,207	0,0106	0,0032	0,128	0,0021	0,0074

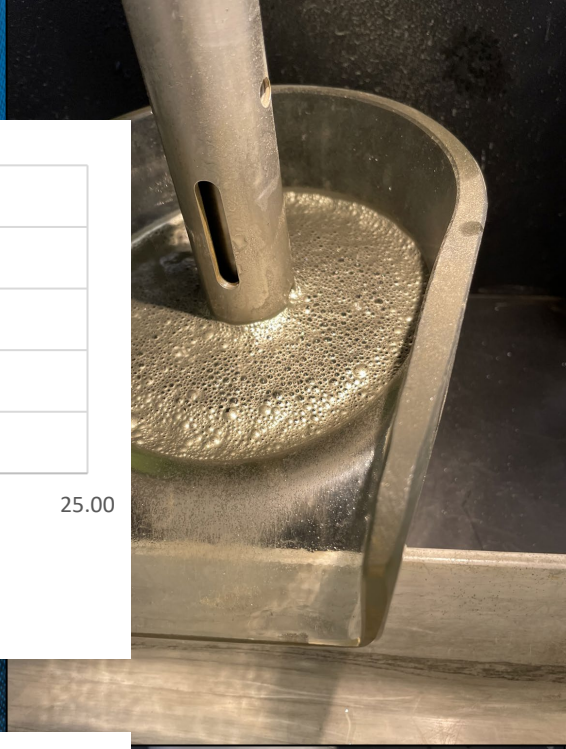
Sample contain high contents of S and Fe which are mainly carried by pyrite.

Blendability proven

- 15 tests with different:
  - VMS/SMS ratios
  - Commonly used Reagents for floatation/depression
- Same comminution (d80 - 35µm)
- => SMS can be floated together with other copper ores
- => SMS can be introduced within the same comminution
- Business plan for smaller reserves stands







ESG

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ESG

RESPONSIBILITY

TRANSPARENCY

CONTINUOUS IMPROVEMENT

Strong governance structure

- OECD
- UN Guidelines

Environment protection

Social impact

Stakeholder engagement

Due diligence

Reporting

Sustainability report

- GRI
- Reporting process
- Materiality

ESG Handbook for Marine Minerals

Reporting standards overview

Current	From 2025	From production year
GRI Global Reporting Initiative	ESRS (The European Sustainability Reporting Standards)- CSRD (Corporate Sustainability Reporting Directive) 	Science Based target SCIENCE BASED TARGETS DRIVING AMBITIOUS CORPORATE CLIMATE ACTION
UNGC	TCFD (Task Force on Climate-related Financial Disclosure) /IFRS (International Financial Reporting Standards) - ISSB (The International Sustainability Standards Board) TCFD TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES IFRS	
NORWEGIAN TRANSPARENCY ACT - Due diligence to identify and assess actual and potential adverse impacts on human rights and decent working conditions in companies and their supply chains.		

Environmental concerns

and Public opinion

Perception in the society

- Opening for exploration activity will provide important information on the deep sea and for DSM
  - Biological data
  - Potential environmental impact
  - Improved geological models
  - Technology development

Deep Sea Minerals need to be accepted as an enabler for the green shift

Perception vs reality

TU Ledige stillinger Nyhetsbrev Nyhetsstudio Video Abonner Logg inn Meny

EU kan punktere Norges drøm om gruvedrift på havbunnen

I et nytt direktiv om kritiske råvarer som EU er i ferd med å vedta, advares det mot å utvinne mineraler på havbunnen. Det kan bli kinkig for regjeringen.

På havbunnen ligger uante mengder nikkel, mangan, kobolt og kobber – mineraler som er viktige i produksjonen av blant annet elbiler, batterier og solcellepaneler. Norge, Japan og Cook-øyene kan bli de første landene som åpner opp for gruvedrift til havs. Men forskere advarer om ukjente miljøkonsekvenser. *Foto: Sam McNeil/AP/NTB*

Collapsed chimney of an extinct SMS from the Norwegian Mid Ocean Ridge, NPD

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SMS: Higher ore grade – Lower energy consumption

Indirect environmental impact

Decreasing Ore Grades in Global Metallic Mining: A Theoretical Issue or a Global Reality?

by Guiomar Calvo [1,*], Gavin Mudd [2], Alicia Valero [1] and Antonio Valero [1]

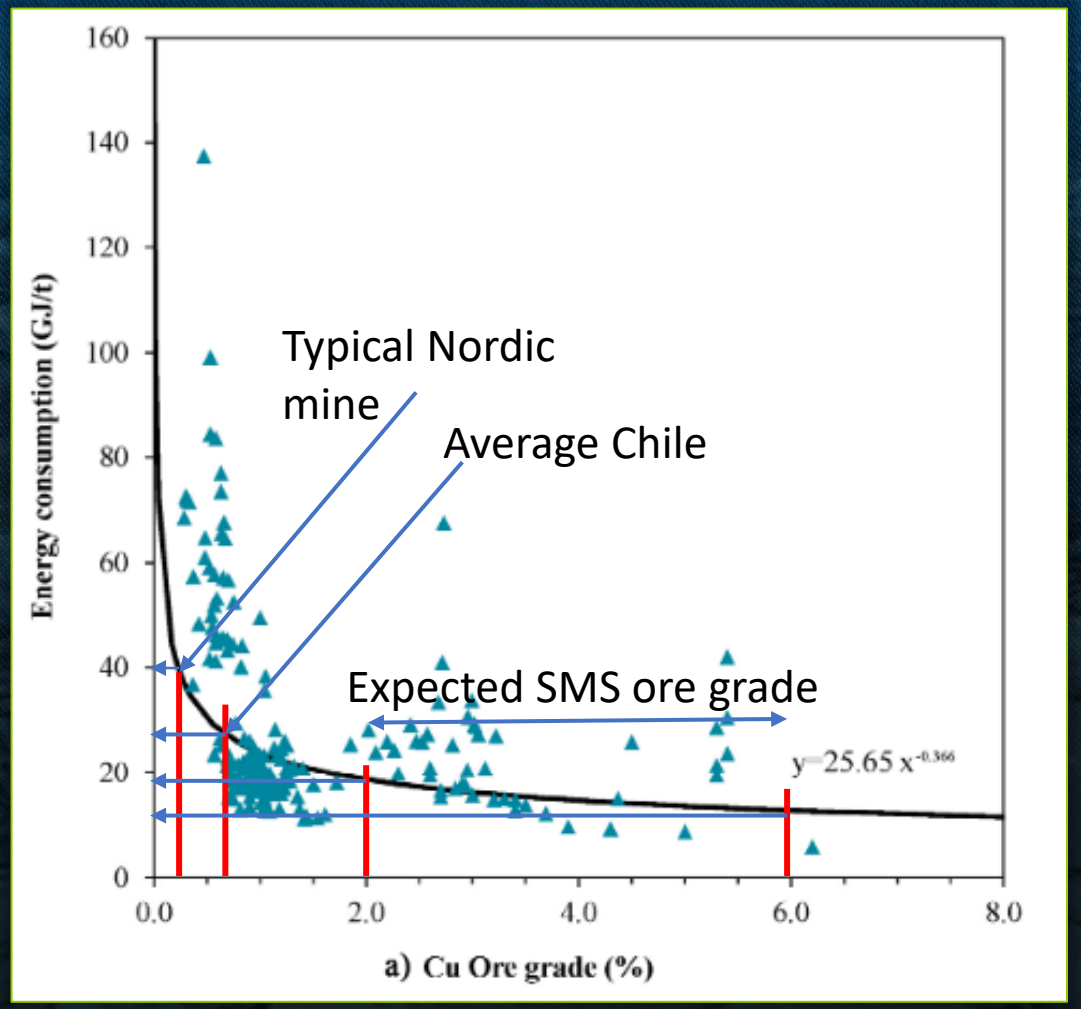
[1] Research Centre for Energy Resources and Consumption (CIRCE)—Universidad de Zaragoza, CIRCE Building —Campus Río Ebro, Mariano Esquillor Gómez, 15, 50018 Zaragoza, Spain

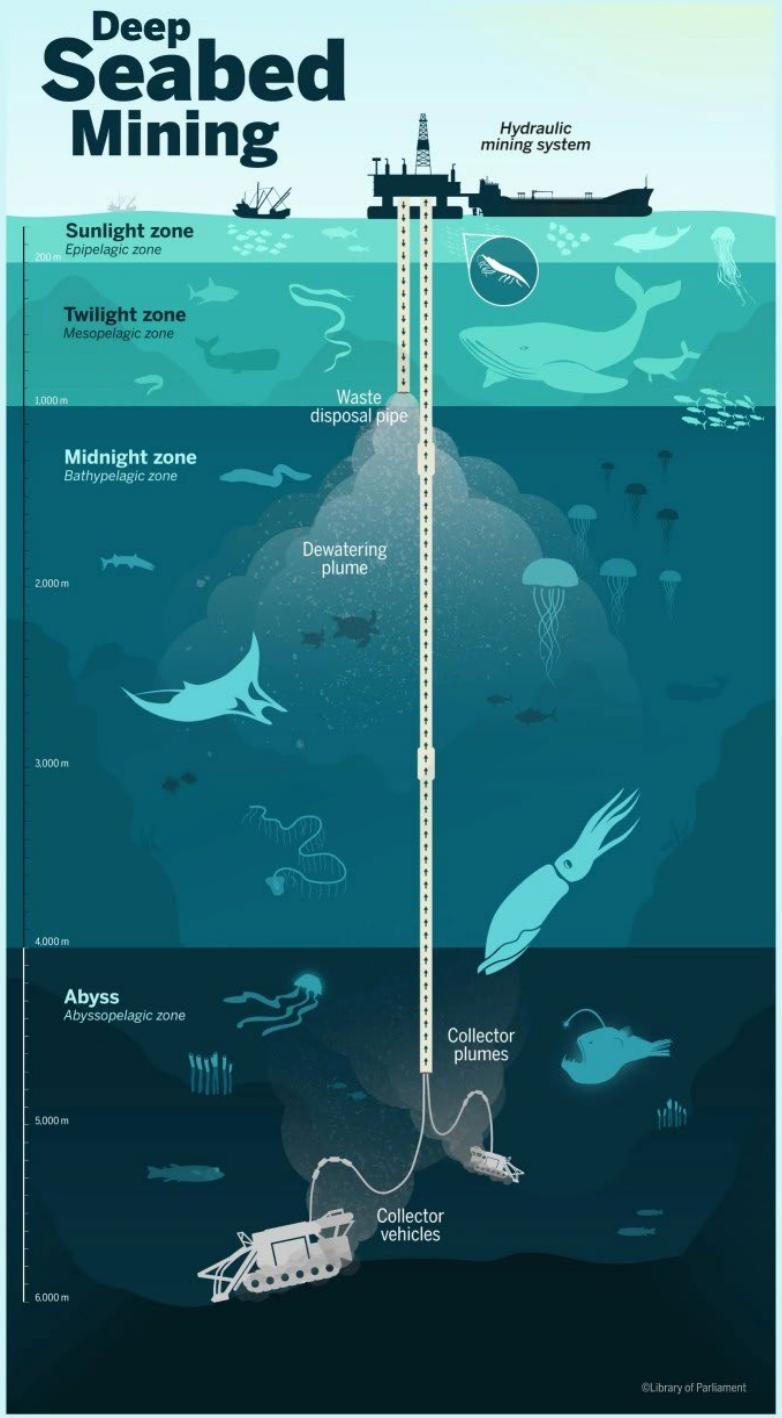
[2] Environmental Engineering, Department of Civil Engineering, Monash University, Wellington Rd, Clayton VIC 3800, Australia

* Author to whom correspondence should be addressed.

Resources **2016**, *5*(4), 36; https://doi.org/10.3390/resources5040036

Submission received: 29 September 2016 / Revised: 21 October 2016 / Accepted: 27 October 2016 / Published: 7 November 2016



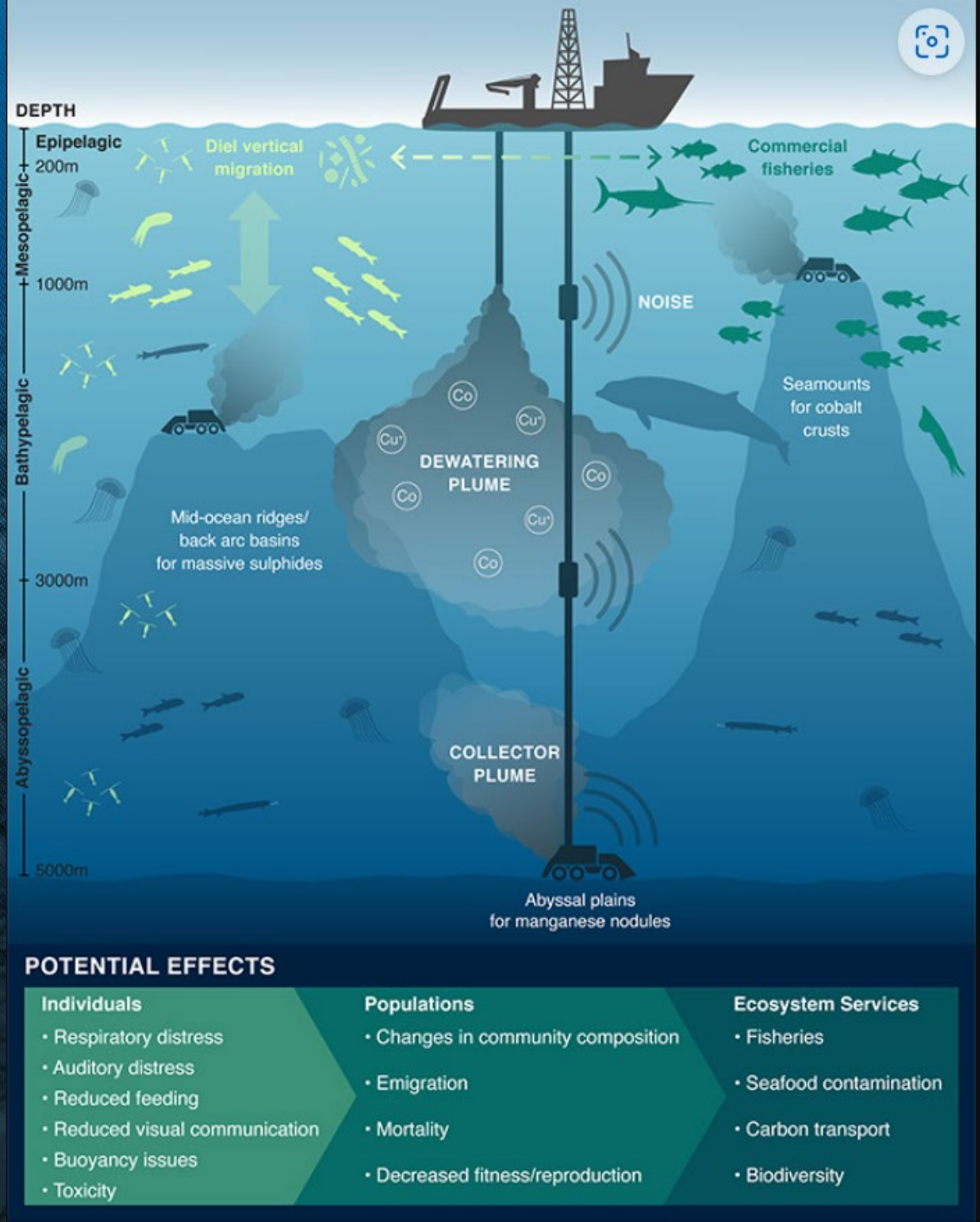


Direct environmental risks

- Sediment plumes
- Noise
- Light pollution
- Toxic waste
- Destruction of endemic ecosystems (Black smokers/ hydrothermal vents)

Images:
Library of Parliament (left)
Drazen et al., 2020 (right)

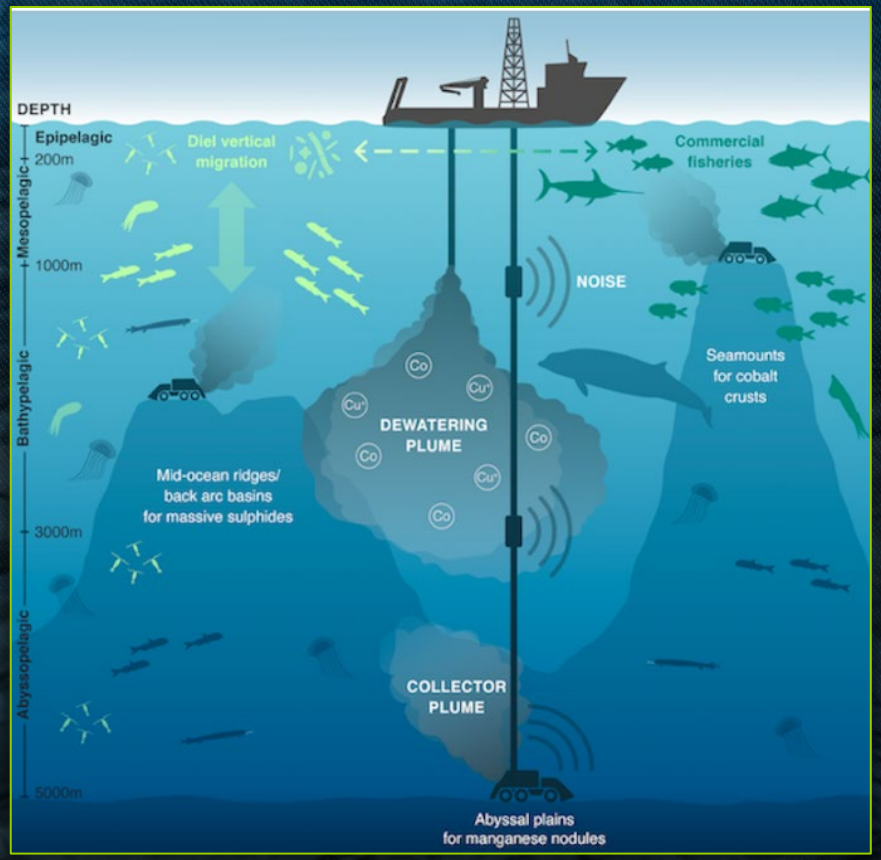
GREEN MINERALS



Sediment plumes

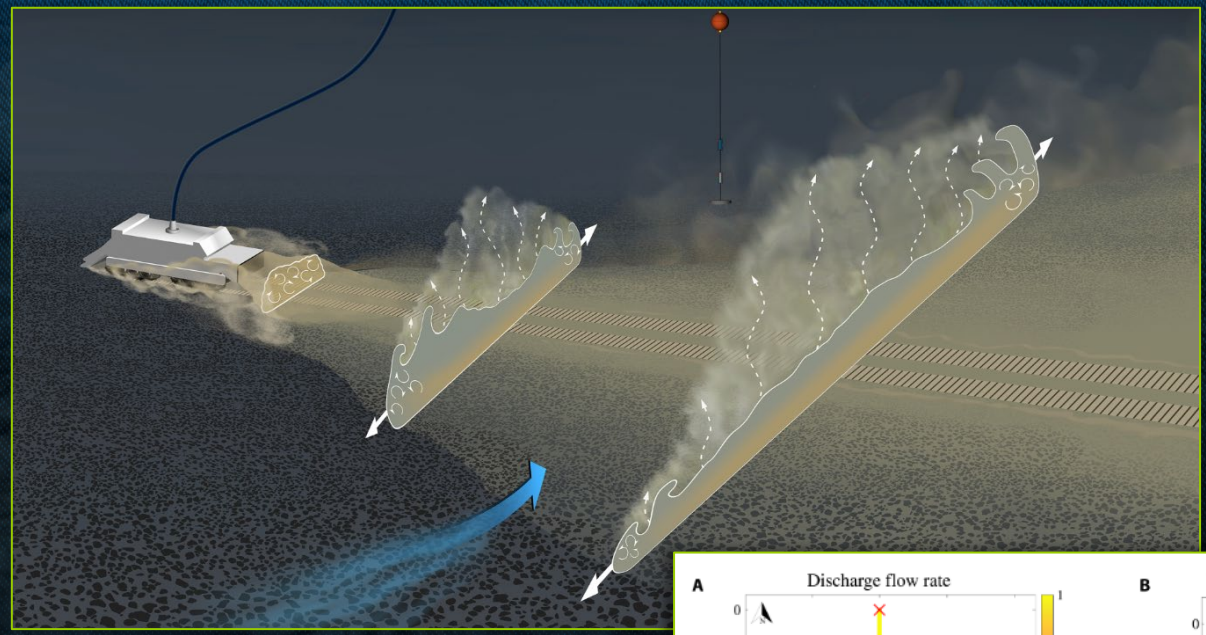
"The observations suggest that 92 to 98% of the sediment mobilized by the collector were below 2m at the time and location of the observations, with some local sediment deposition causing blanketing of nearby nodule fields (see fig. S6), while 2 to 8% of the sediment were 2m or more above the seabed. Over a longer time scale, vertical turbulent diffusion near the seabed is the mechanism by which some of the sediment in suspension below 2m could still be raised further above the seabed, in which case the amount of sediment dispersed away from the mining track could exceed the aforementioned 2 to 8%."

Hypotesis

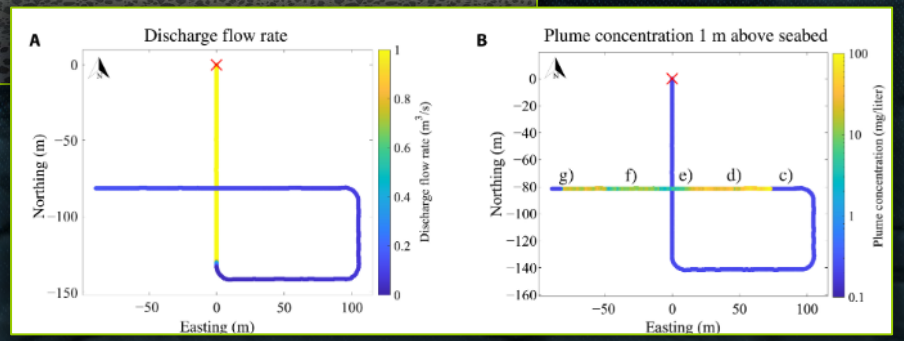


Drazen et al., 2020

Facts

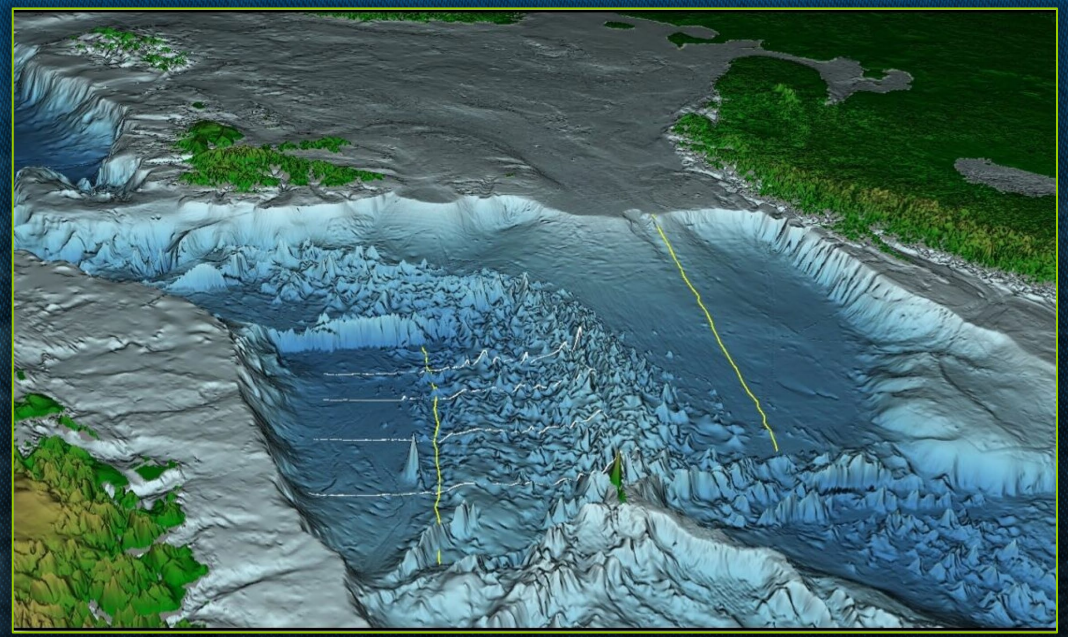


Muñuz-Royo et al., 2022



VIDEO

Copper mining: Direct (areal) environmental impact, land vs seafloor.

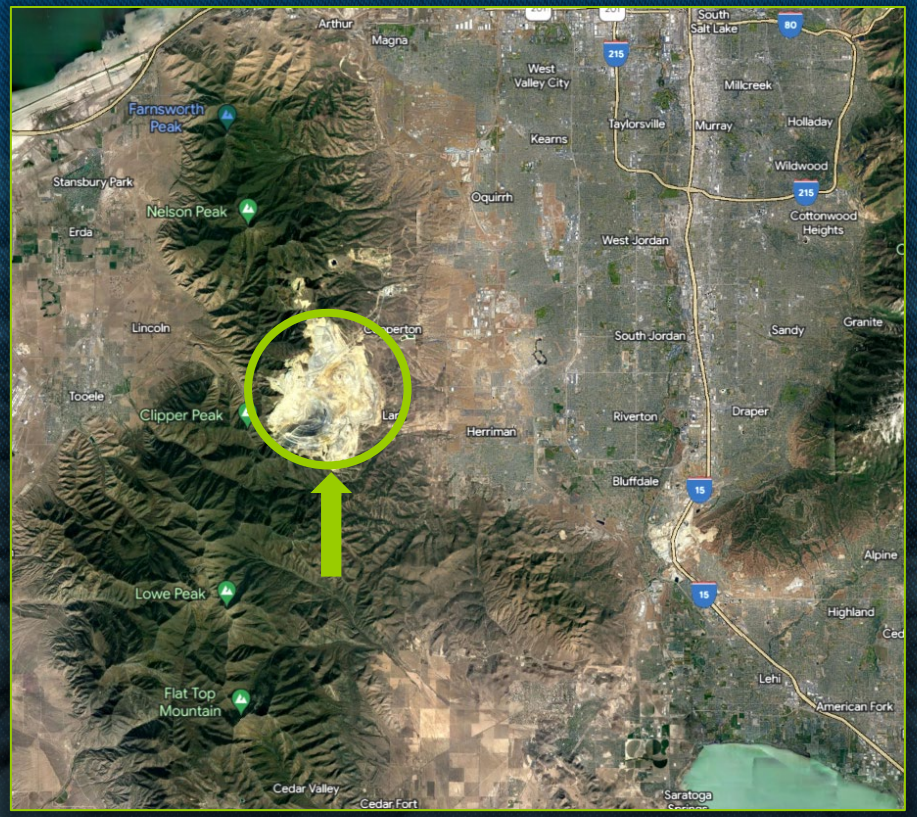


Utah vs Assessment area

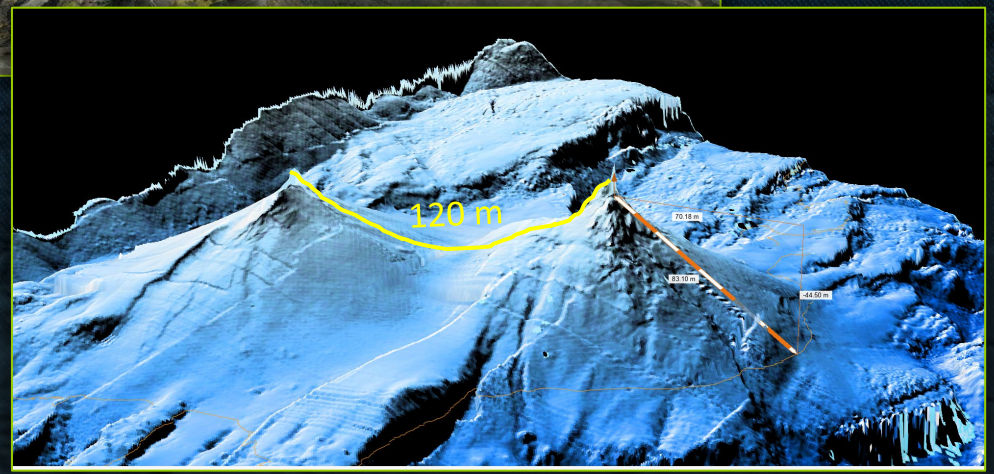
State of Utah, US: 220 000km²

Assessment area, Norway:~600 000km²

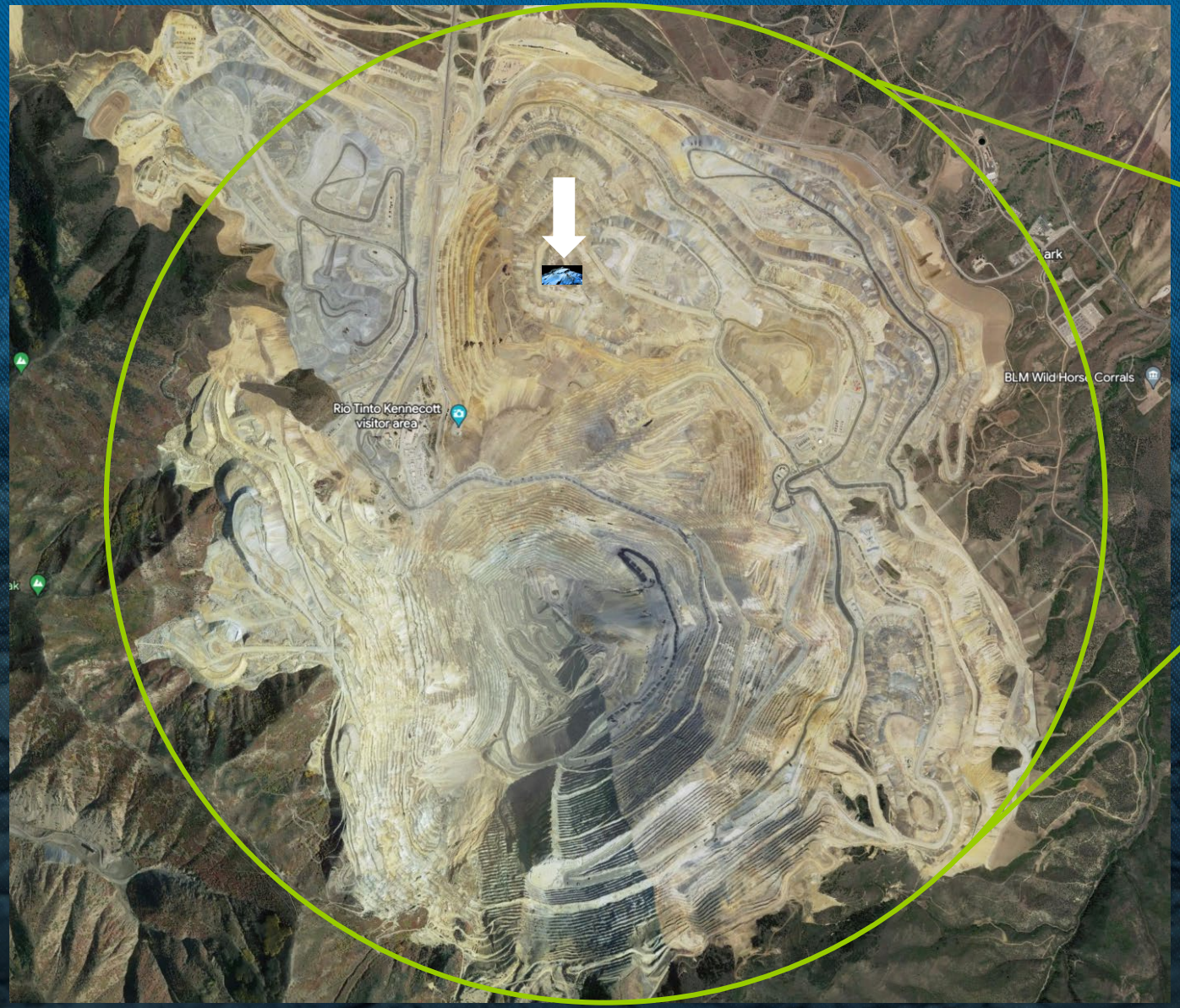
Butterfield Canyon/Bingham Canyon mining area vs Loki's Castle

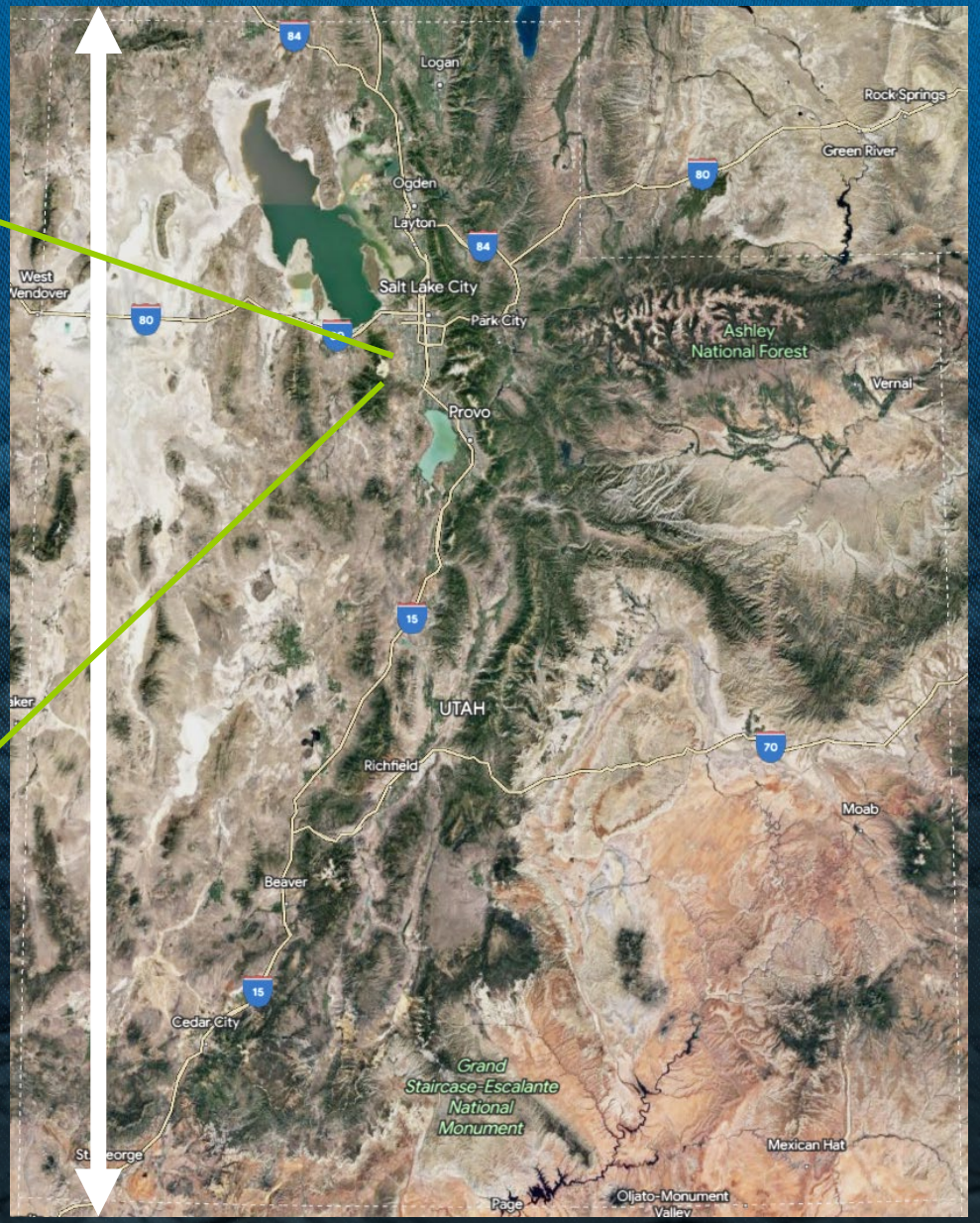


Open pit > 1km deep

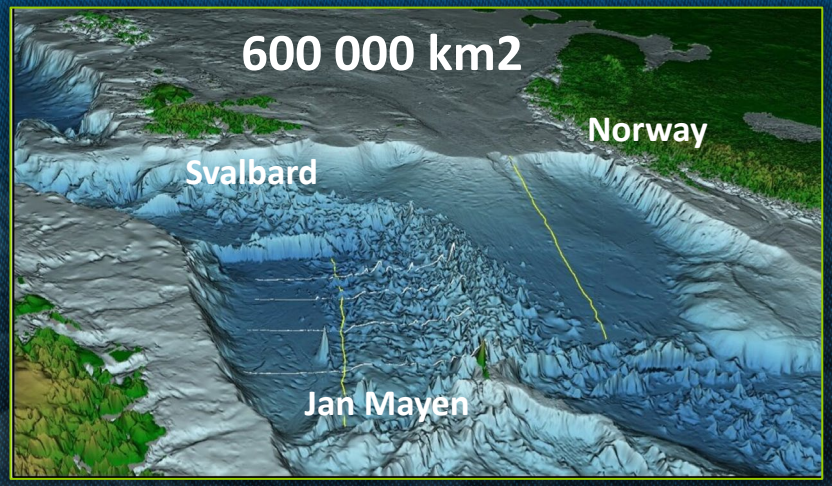


Loki's Castle: Depth of deposits ~100m


Rio Tinto Kennecott
visitor area
BLM Wild Horse Corrals


Logan
Rock Springs
Green River
Ogden
Layton
West
Vendover
Salt Lake City
Park City
Ashley
National Forest
Vernal
Provo
UTAH
Richfield
Moab
Beaver
Cedar City
Grand
Staircase-Escalante
National
Monument
Mexican Hat
Page
Oljato-Monument
Valley

Nordmarka, Oslo



Scaled according to area, an excavation site with a diameter of 300 m on the assessment area equals digging a hole with a diameter of 20 cm in Nordmarka.

Key metrics and investment case

SUPERIOR KEY METRICS DISRUPTING THE ECONOMICS OF TRADITIONAL COPPER MINING

Economics

- No infrastructure investment needed
- CAPEX per ton USD 17/t vs USD 30k/t onshore
- Pick up equipment and leave for next site --> zero sunk cost in mine
- Offshore oil&gas services business model
  - Capital efficiency
  - Asset light

Environmental

- 90% reduction in environmental footprint*
- Semi-closed loop HEDSM system
- No midwater plume, return water transported to the seafloor.
- No pumps creating noise along the riser-system.
- Sharply reduced overburden
  - Less waste
  - Less tailings

* Paulikas et. al., 2020 (for nodules)

Key metrics investment case

Targeting a world class copper resource

USD 50m of exploration data obtained from OD at zero cost

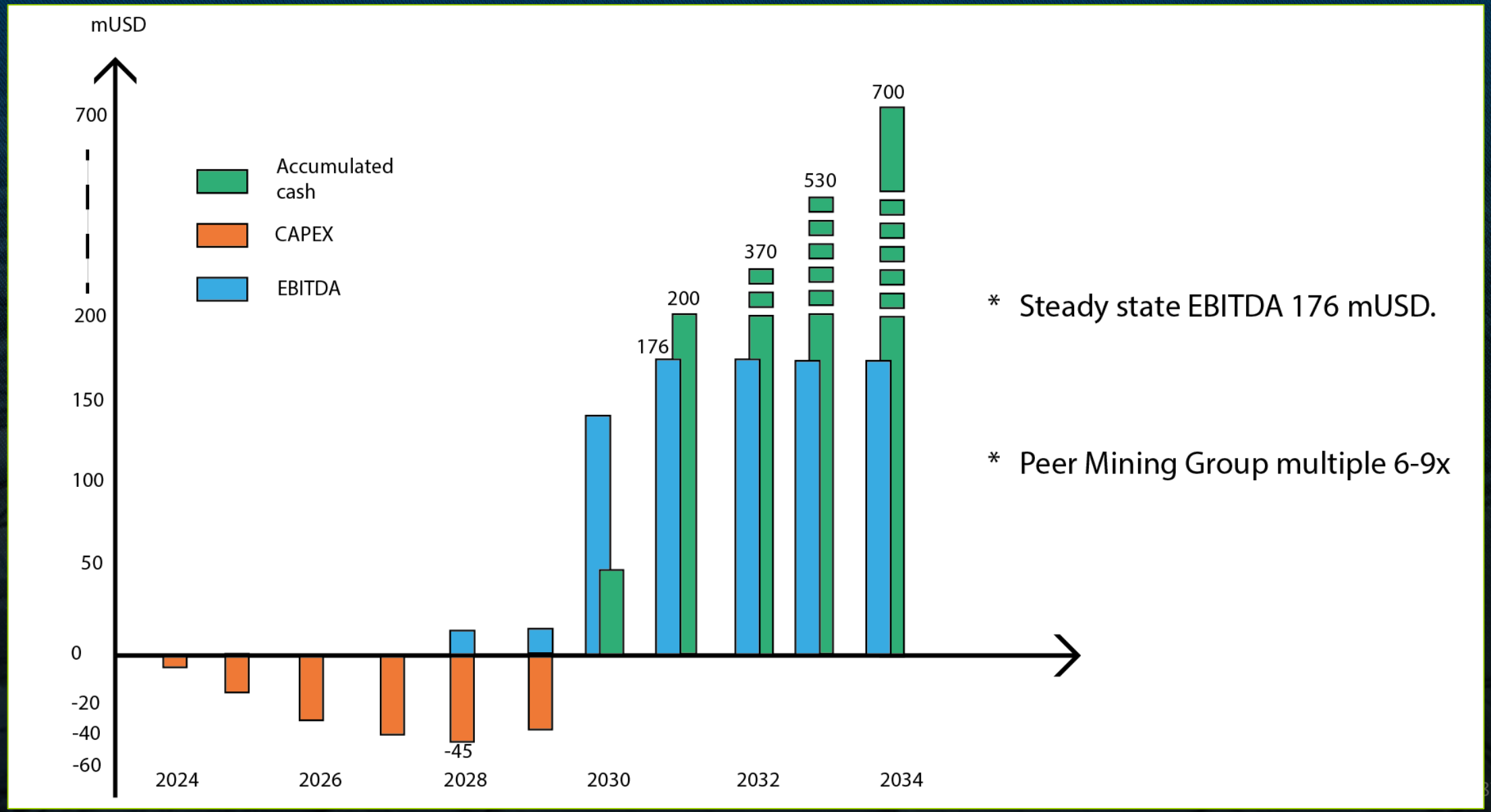
License exptected within the next few months

One GEM HEDSM system

- 1,5mt ore pa
- 5% avg copper ore grade
- USD 176m annual EBITDA
- <USD 50m max cash drawdown
- Payback time: 4 months pre-tax
- >300pc CROI pa pre-tax

USD 8 mill market cap

NCS one GEM HEDSM system – cash profile 2024-2034



Summary

GREEN MINERALS

Delivering on strategy – ready for next step

- Norway 9 January 2024 opening decision derisks business case
  - GEM invited to nominate license area
  - GEM in pole position for license win
- Production concept developed together with globally leading partners and ready
- VMS/SMS Processing study confirms business plan and adds significant industrial value to project
- Mining infrastructure in Nordics well developed - off-take agreements expected closer to first ore
- DSM metrics superior to traditional terrestrial mining
  - Business model
  - Economics
  - ESG
- Unusually strong investment case financially
  - USD 176 mill in annual EBITDA from one HEDSM system
  - Pre-tax CROI > 300pc pa
  - Pre-tax cash payback time 4 months
- Market cap USD 8 million

GEM is primarily a copper play. CCZ license MoU provides upside on other key battery metals.

Q&A

GREEN MINERALS

THANK YOU!