



EN Expand Oslo: NOM

**NORDIC
MINING**

Engerbø Rutile and Garnet

Updated Definitive Feasibility Study

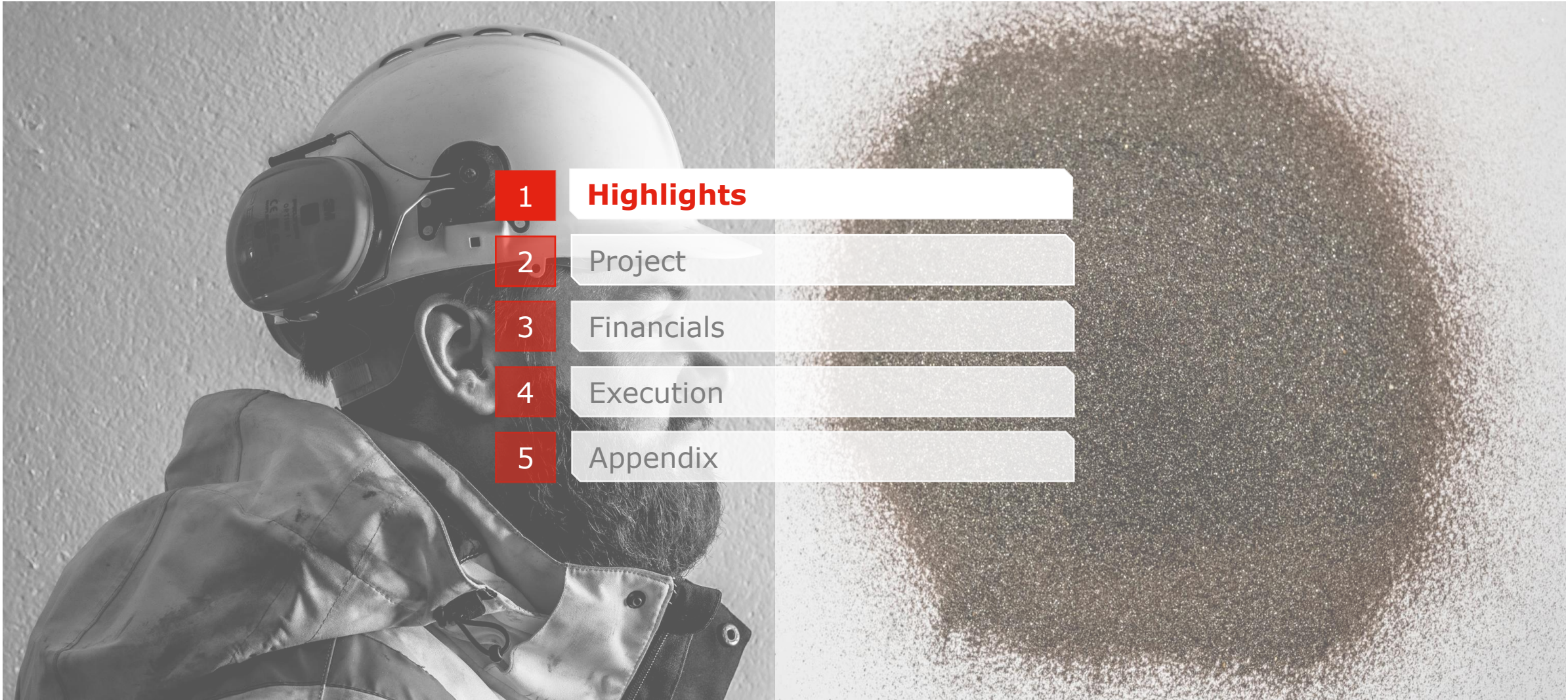
11 May 2021

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Agenda



- 1 **Highlights**
- 2 Project
- 3 Financials
- 4 Execution
- 5 Appendix

An aerial photograph of a pulp mill facility situated on a wooded hillside overlooking a body of water. A large cargo ship is docked at a pier in the foreground. The mill complex includes several large buildings, storage tanks, and a winding road. Five blue circular callouts are overlaid on the image, each containing a benefit of the facility.

**Reduced
CAPEX
and
financing
risk**

**Increased
market
resilience**

**Reduced
execution
risk**

**Improved
environmental
performance**

**Retained
financial
returns**

Sustainable project with robust project economics

An aerial photograph of an industrial facility, possibly a refinery or chemical plant, situated in a valley. The facility includes several large storage tanks, processing units, and a large ship docked at a pier in the foreground. The surrounding area is densely forested. Five green circular callouts are overlaid on the image, each containing a key performance indicator for the project.

**Plant
footprint
reduced by
over 40%**

**CO₂
emissions
reduced by
~80%**

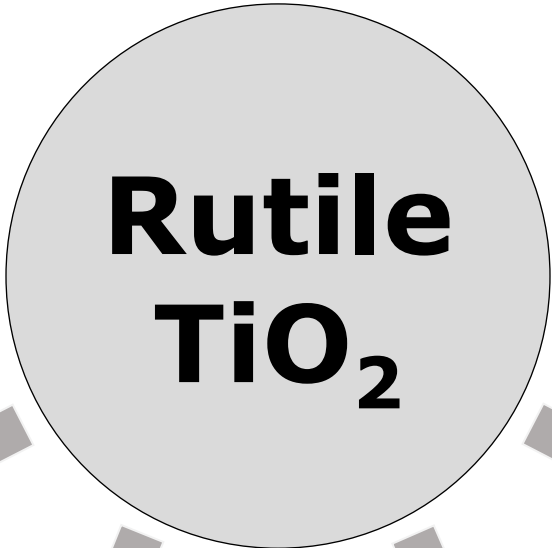
**Significant
CAPEX
reduction
(93 MUSD)**

**Post-tax
IRR of
19.8%**

**Post-tax
NPV @ 8%
of 260
MUSD**

A strategic position in the growing USD 15 billion TiO₂ market

Titanium, one of the most versatile elements with broad applications in multiple value chains



Rutile is the cleanest and purest form of TiO₂ and the only feedstock that can be used directly in production of environmentally friendly pigment and metal

Pigment ~89%



Ti-metal ~7%



Welding ~5%

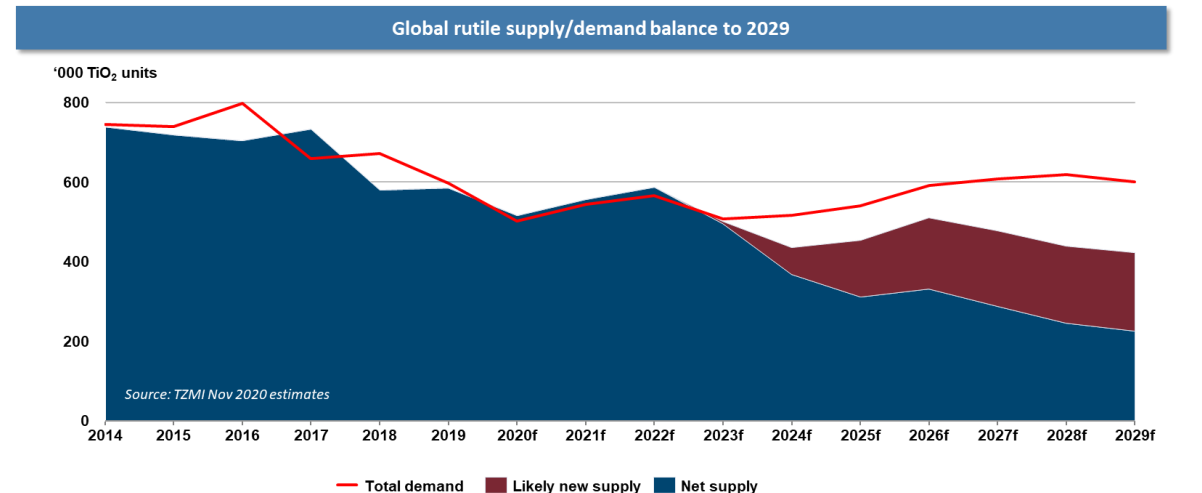
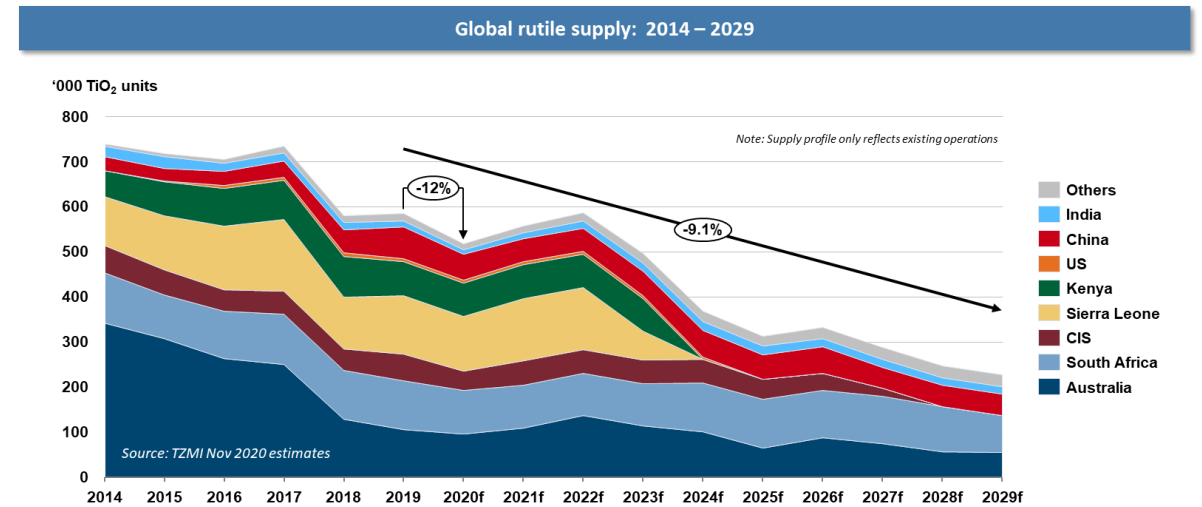


Renewable energy



Significant rutile supply deficit ahead

- Supply outlook indicates significant decrease in production
- Supply decline follows from resource depletion in Australia, Africa and CIS
- According to TZMI, a lasting supply deficit is expected from 2023
- High grade feedstock, including rutile, is vital to optimize output from pigment and metal production
- NM has a Heads of Agreement with a reputable Japanese trading house for bankable offtake and financing



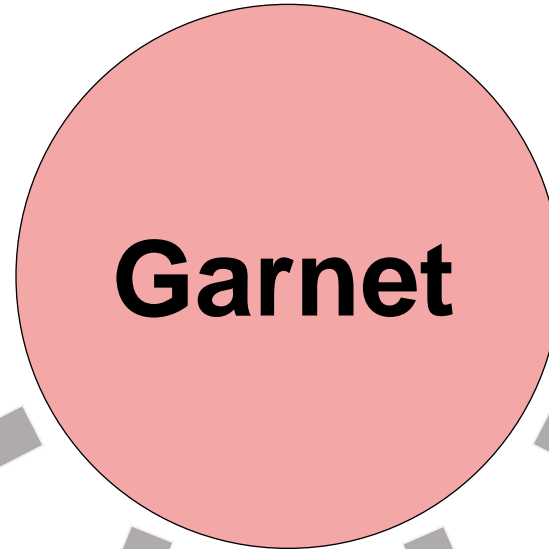
Industrial mineral with growing applications and environmental benefits

The only viable mineral for industrial waterjet cutting

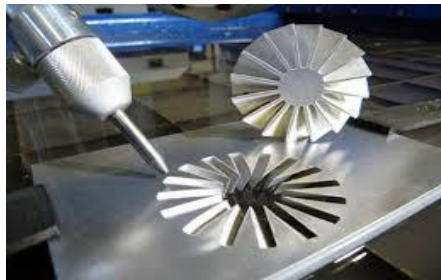
The waterjet technology has revolutionized the production processes for e.g. cars and aircrafts

Garnet is a completely inert mineral without health implications

Garnet is easily recyclable for multiple use as abrasive



Waterjet cutting ~50%



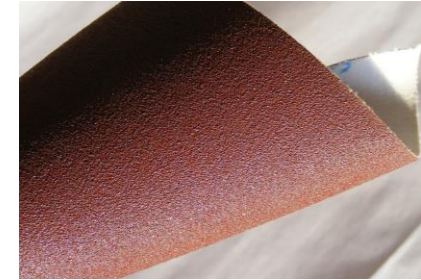
Sand blasting ~30%



Water filtration ~4%

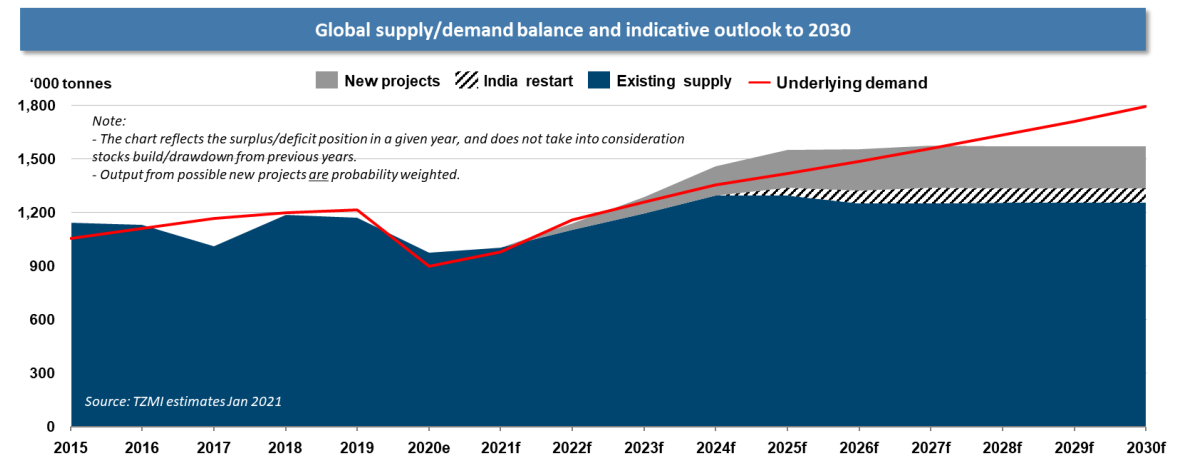
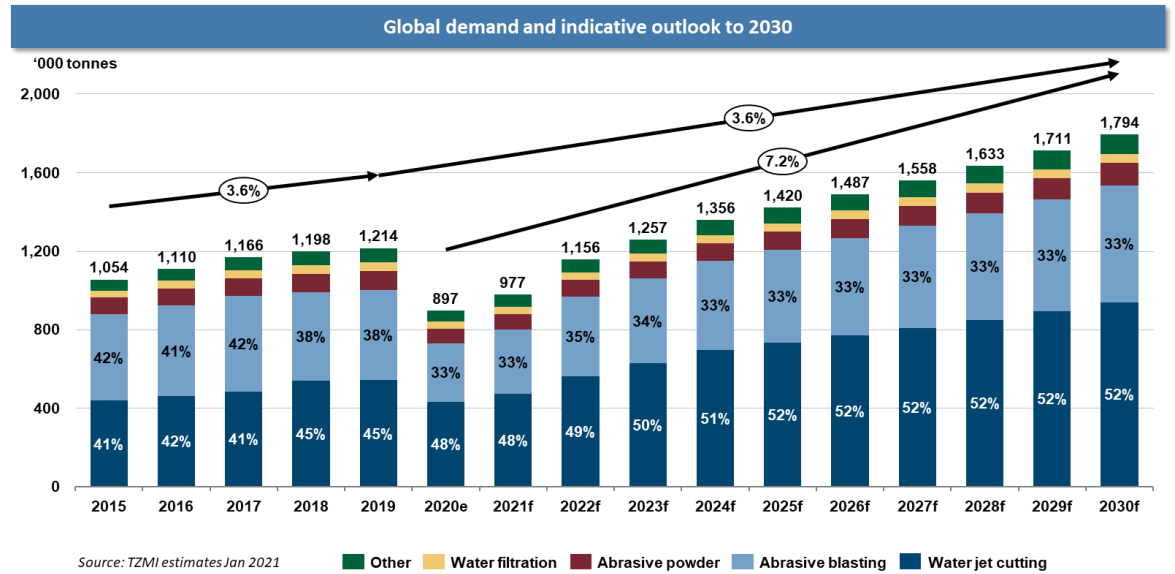


Abrasives/speciality ~15%



Strategic market position as first garnet producer in Europe

- Solid demand growth forecasted in the next decade
- Waterjet cutting is the driving application area
- The largest markets, US and Europe remain dependant on significant imports
- Engebø has logistical advantages to both Europe and US
- Discussions of long-term, bankable offtake arrangements are proceeding with selected marketing partners





Q3/2021

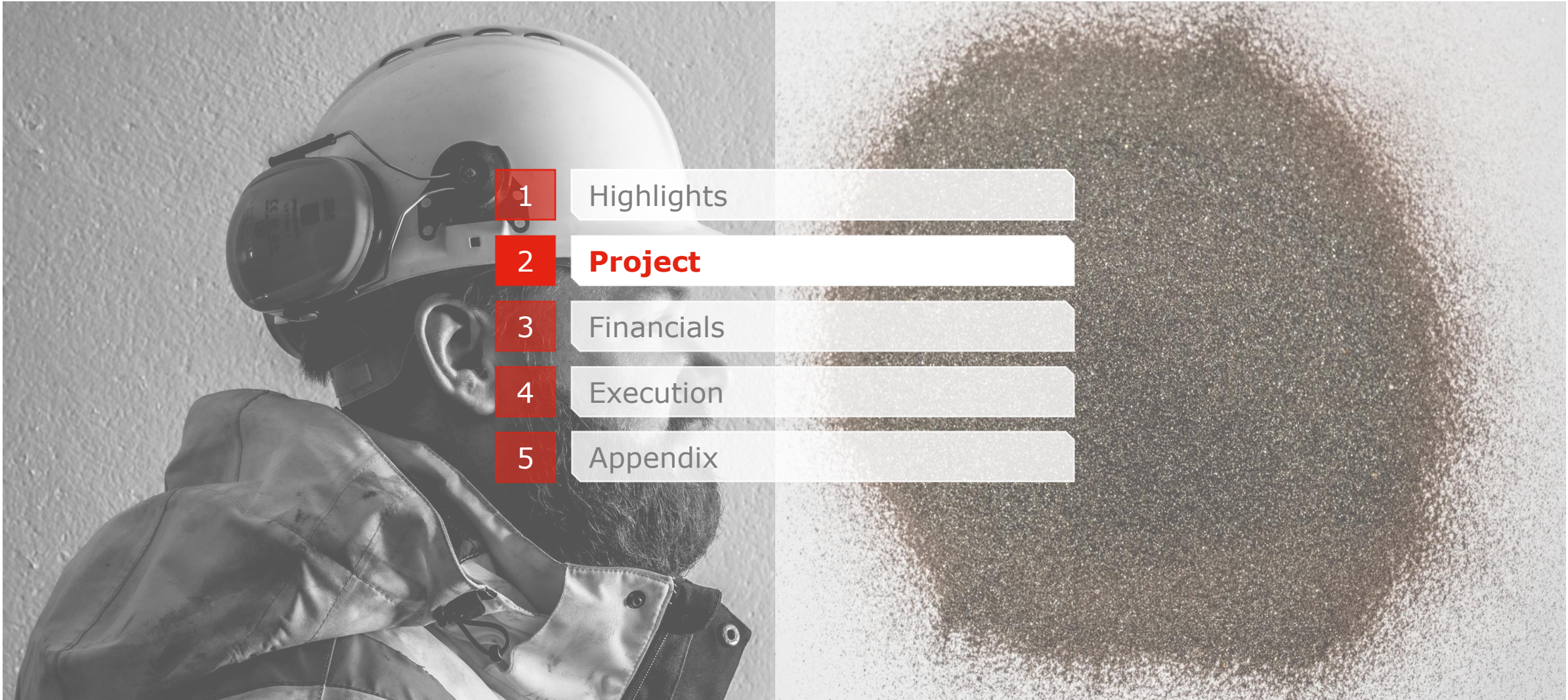
Q1/2024

Pre-construction
work & financing

Construction & commissioning

Production
ramp-up

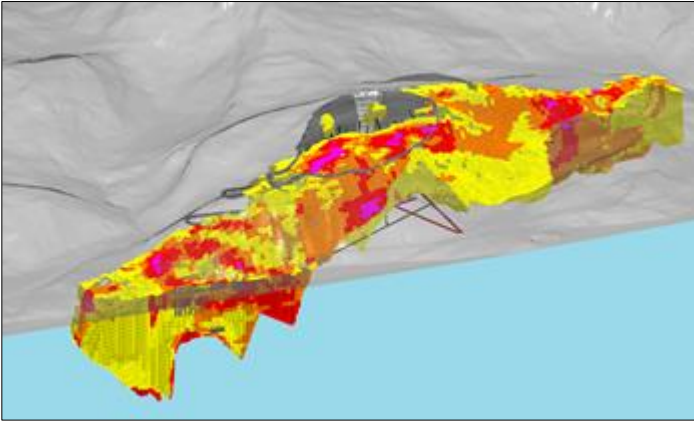
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Large, high-grade deposit with unique characteristics

Deposit



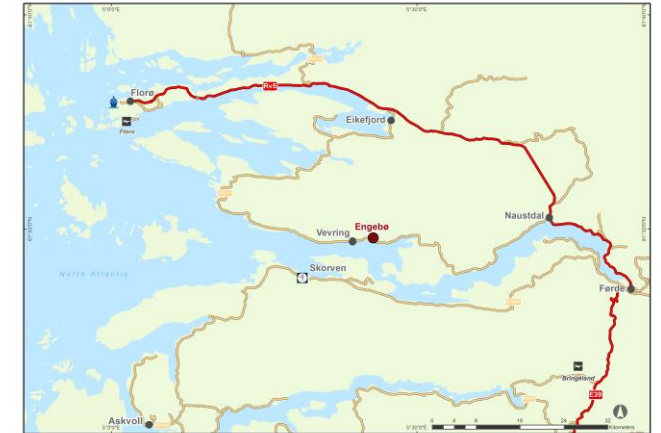
- 2.5 km eclogite ore body outcropping at surface
- Long mine life
- Extension to depth and to the east

Location



- Location by the North Sea with ice-free, deepsea quay
- Logistical advantages to Europe and overseas

Infrastructure

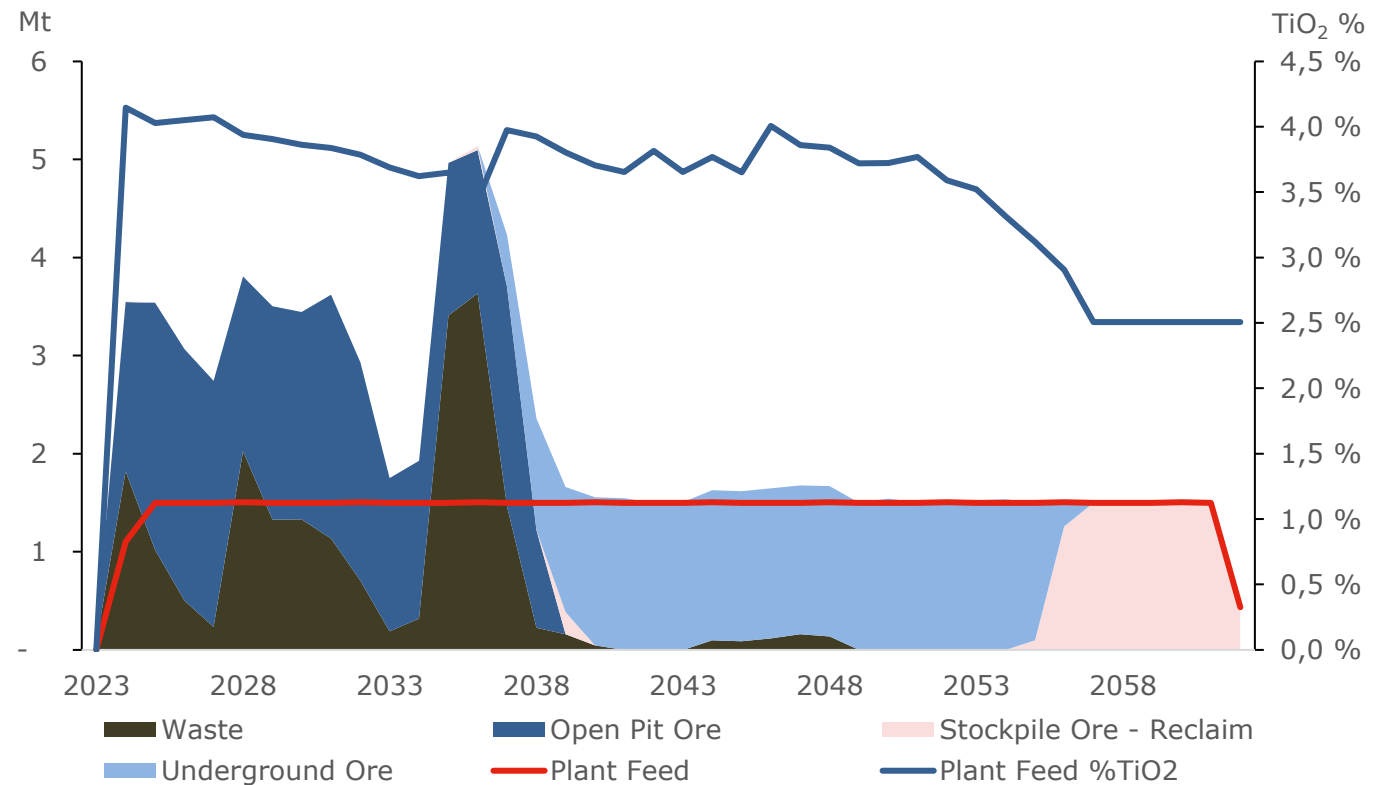


- 40 minutes drive from regional centre and two nearby airports
- Renewable hydroelectric power in close proximity
- Region of skilled, industrial labour with maintenance and service vendors available

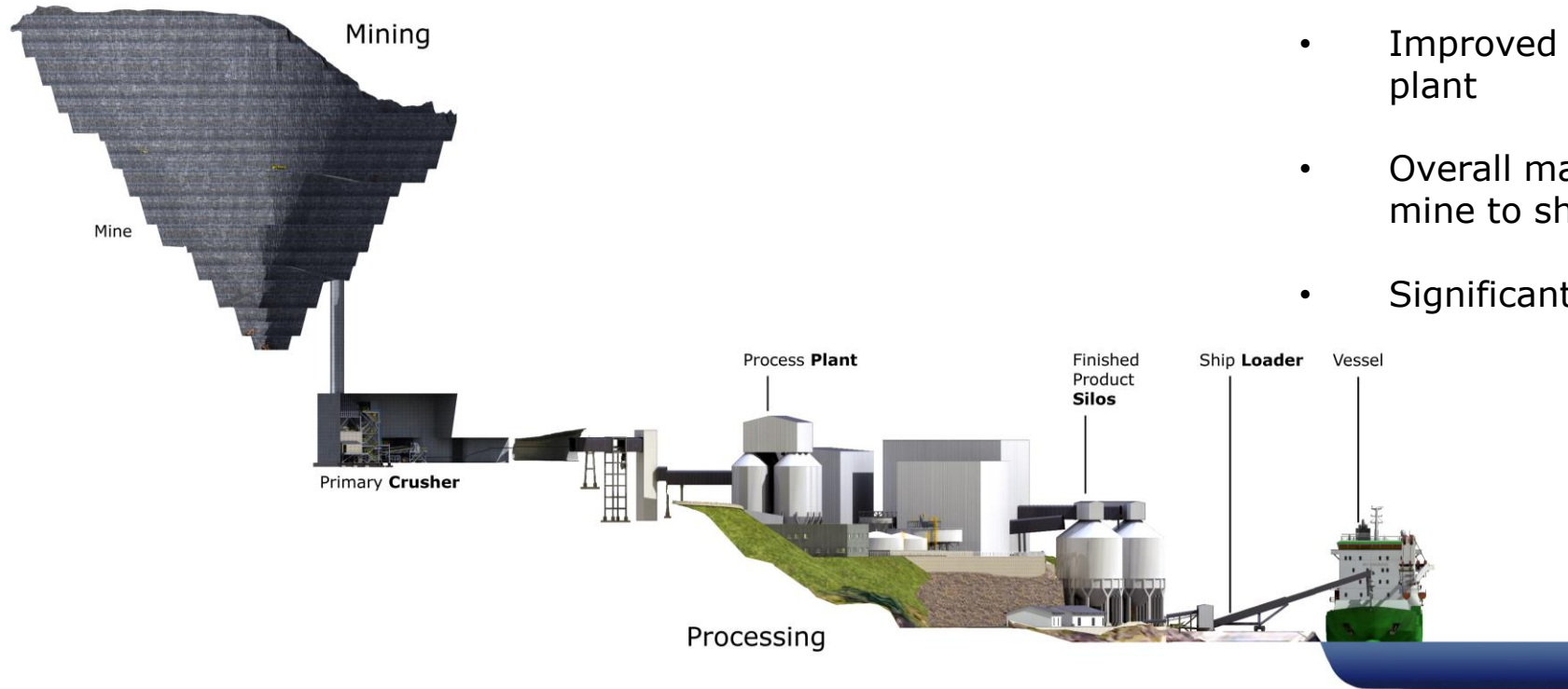
Improved Life of Mine schedule increases project value

- High-grading increases rutile (TiO₂) head grade
- Improved schedule for waste rock and stockpiling, with low open pit stripping ratio (waste to ore ratio) of 0.6
- Removes need for capital investment to transition from open pit to underground mining
- Life of Mine of ~39 years @ 1.5 Mtpa plant feed
- Probable extension of Life of Mine from large inferred resource (254.1 Mt)

Engerbø UDFS Life of Mine Schedule



Simplified underground infrastructure reduces capex



- Optimized mine access and pushback design
- New pit design enables reduced fleet size and reduces bench height and width
- Improved ore logistics from mine to process plant
- Overall mass flow supported by gravity from mine to ship
- Significant reduction of capex

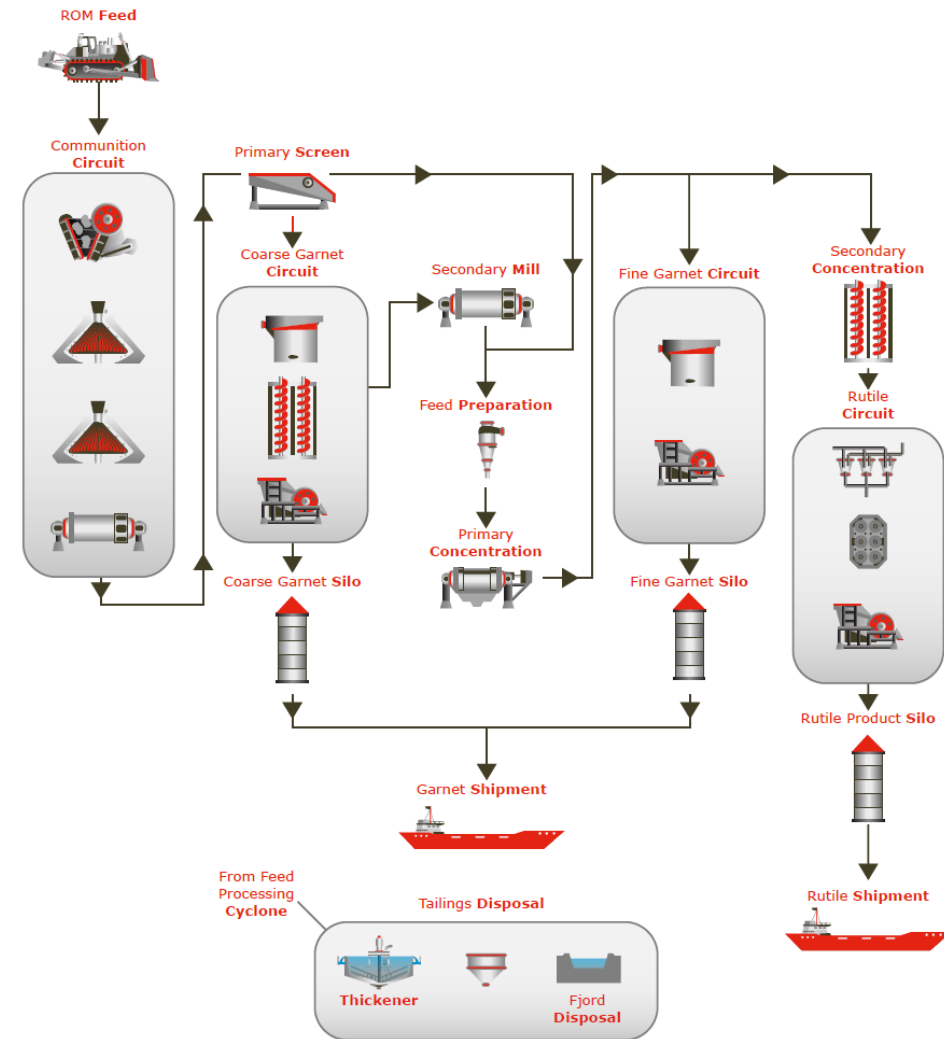
Fit-for-purpose plant layout reduces capex

- Stick-build methodology enables larger process buildings and compact plant layout
- Physical footprint of process plant reduced by over 40%
- Fit-to-purpose design to optimize use of land and infrastructure
- Reduction of civil and earthworks
- Reduction in total initial project investment of USD 93 million



Integrated process based on proven technology and extensive test work

- Integrated processing and production of high quality rutile and garnet
- Industrial scale test work of all critical process steps
- Limited rutile flotation with approved chemicals
- High grade rutile (95% TiO₂) with negligible level of radioactives
- Sub-angular almandine garnet tested to be in line with industrial reference qualities



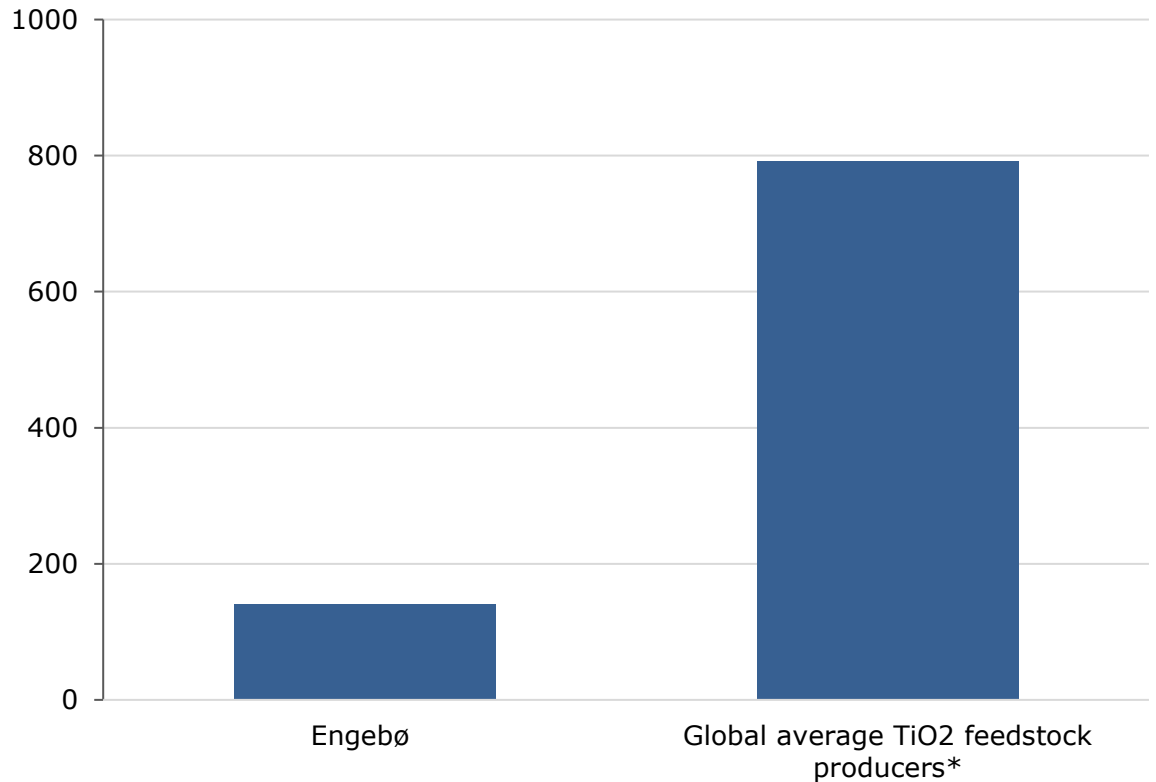
Towards a fossil free operation; electrification reduces CO₂ emission

- Use of electrical dryers will make the process plant free of CO₂ emissions and reduce operating cost
- Overall CO₂ emissions at low levels compared to the international TiO₂ feedstock industry
- Future development of e-vehicles and technology will enable a fossil free mining operation
- Focus on cost savings and safety by digitalization and automation



CO₂ equivalents from the operation

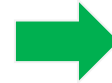
Kg CO₂e per tonne of TiO₂



ESG embedded in plans for construction and operation



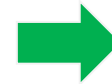
Climate responsibility



Use of electrical dryers instead of natural gas fueled dryers results in ~80% reduction of total CO₂ emissions



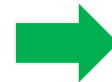
Environmental footprint



New process chemicals have been approved by the Environment Agency, confirming reduction by 99%. Process plant area reduced by over 40%



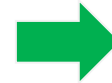
Safe and healthy work environment



Operational readiness from start of execution to prepare procedures for operations. Operation and Maintenance included in detailed engineering to secure a safe work environment

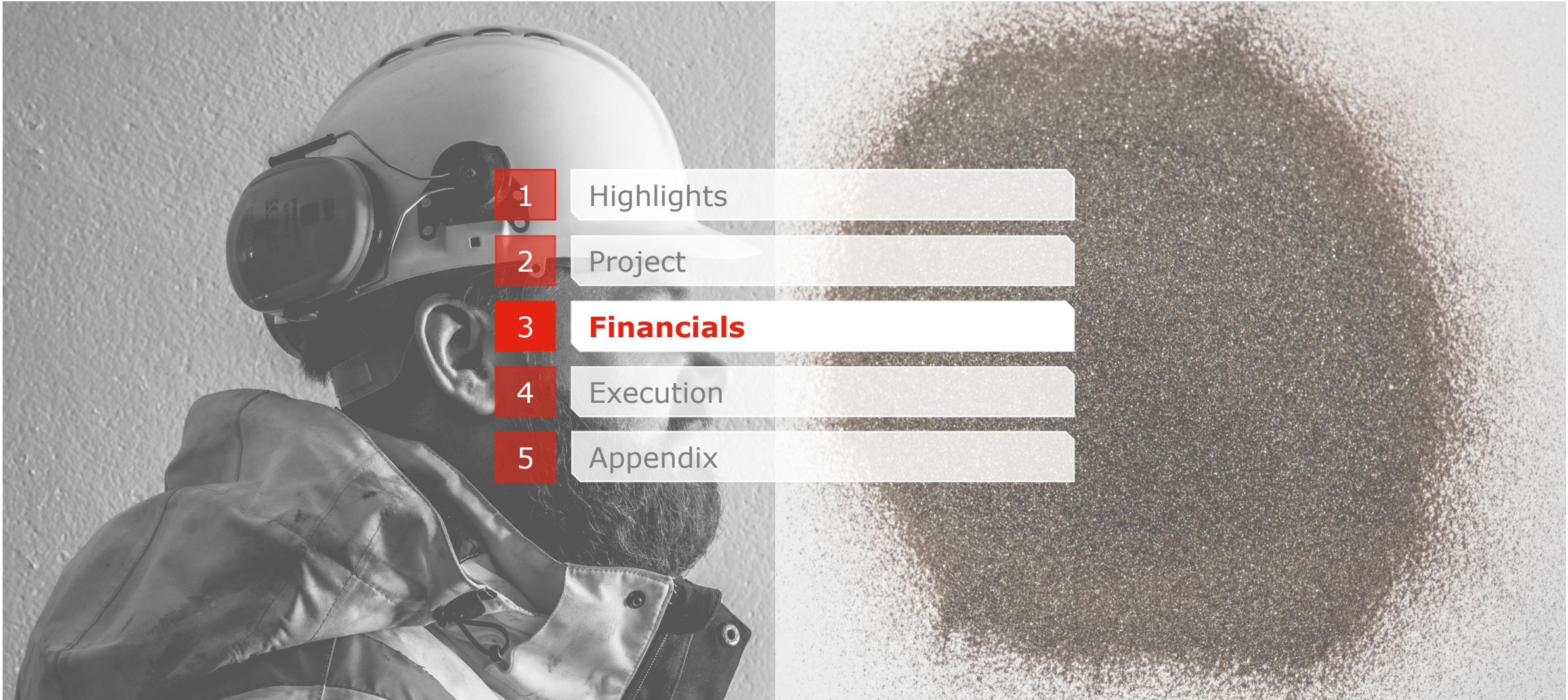


Social responsibility



Stakeholder Engagement Plan and local resource group established for improved dialogue and cooperation. Long-term local employer

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High-margin EBITDA of USD 2.1 billion over Life of Mine

UDFS Financial Dashboard¹

Post-tax IRR of **19.8%** and
NPV@8% **USD 260 million**

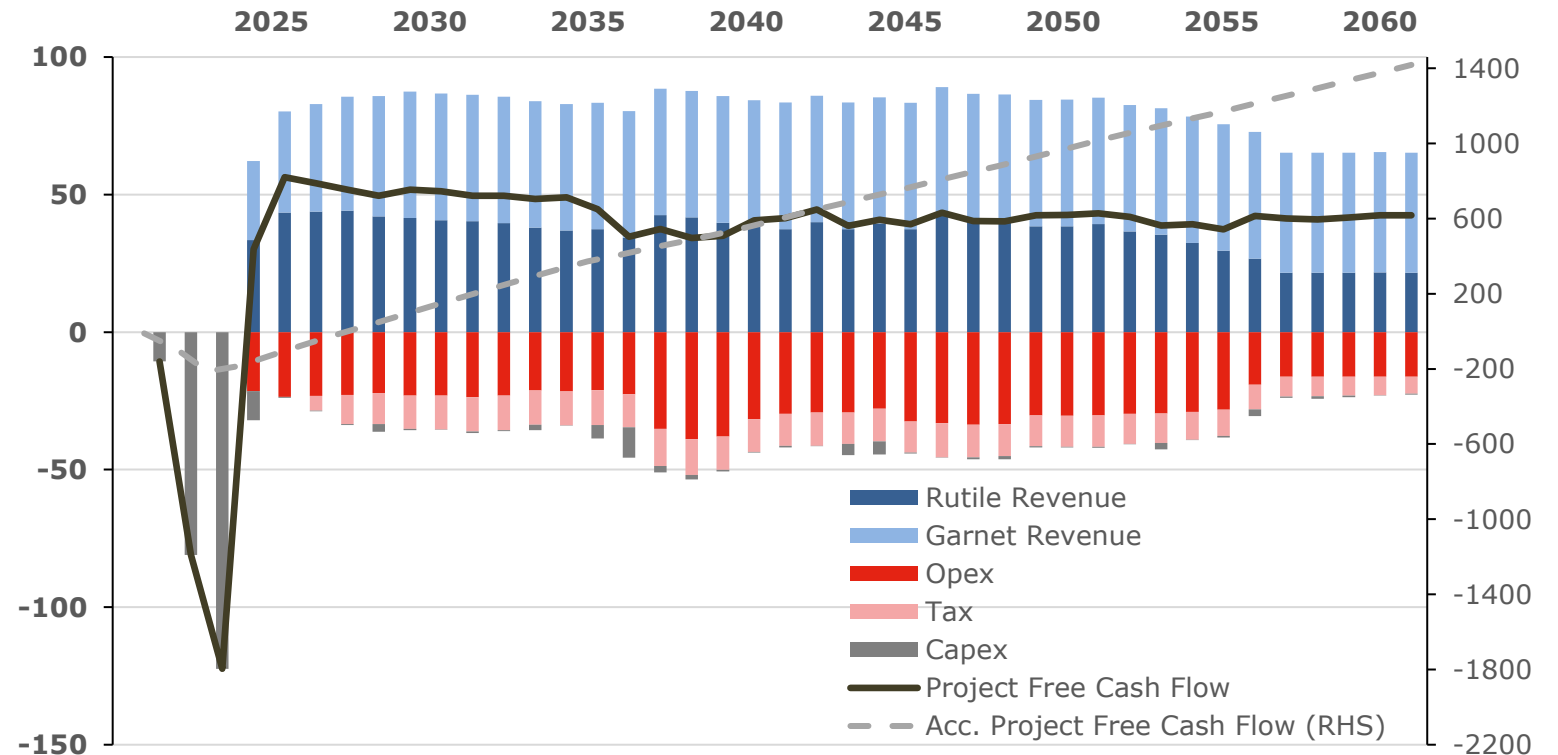
Life of Mine Operating Cash Flow
USD 1.7 billion

Free Cash Flow²
~ USD 51 million/annum

Payback Period **4.4 years**
Profitability Index **2.4x**

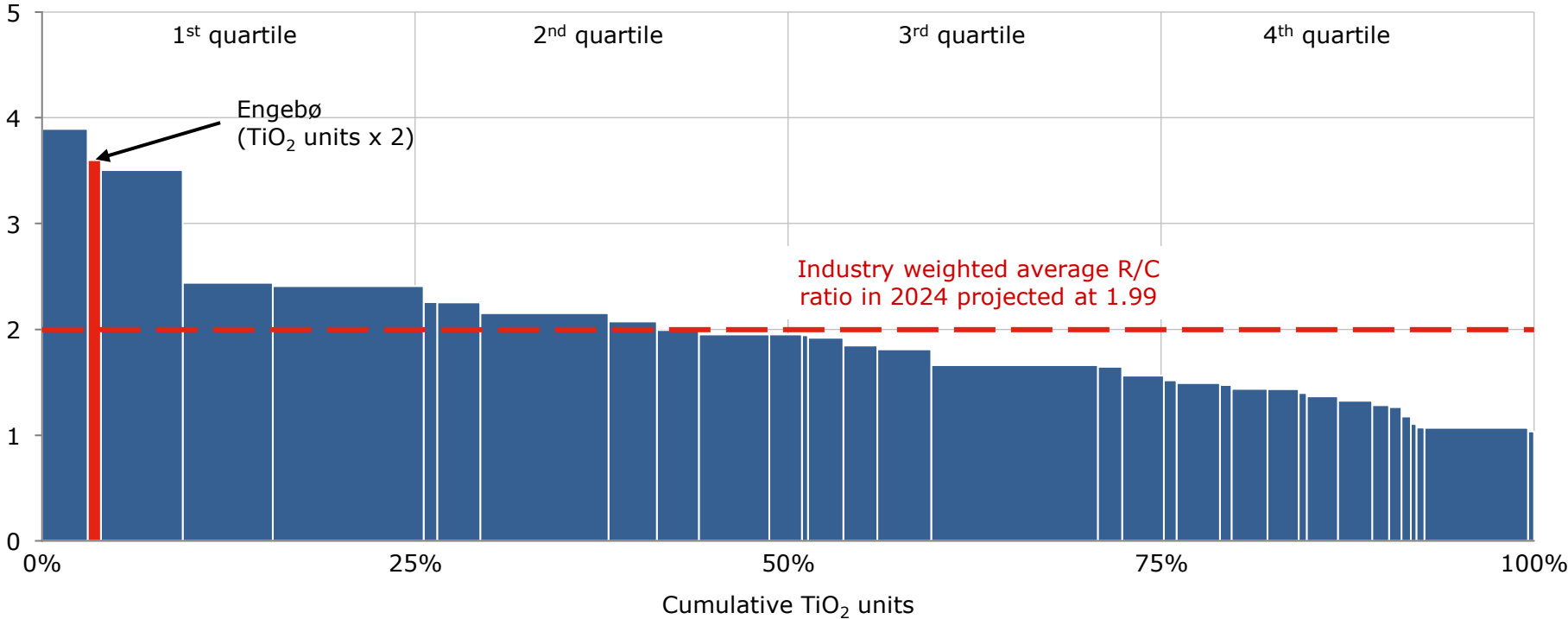
Industry leading R/C ratio³
3.6

Project Free Cash Flow (USD million)¹



Dual mineral revenues position Engebø in 1st quartile of the R/C curve

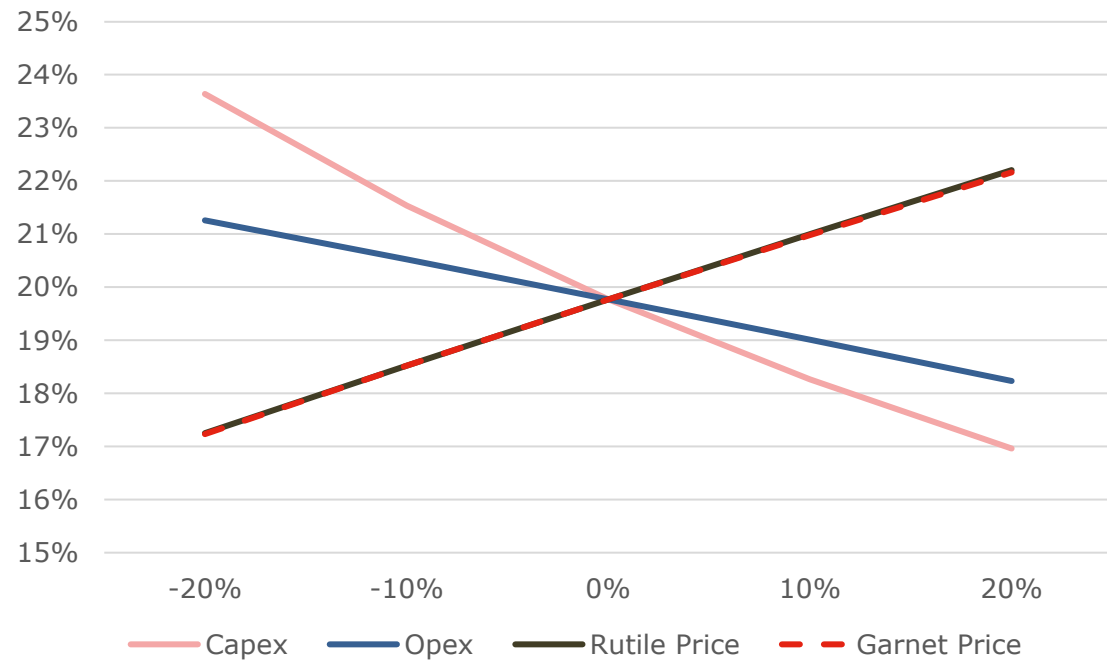
TZMI 2024 Industry Revenue-to-Cash Cost ratio curve (R/C Ratio)



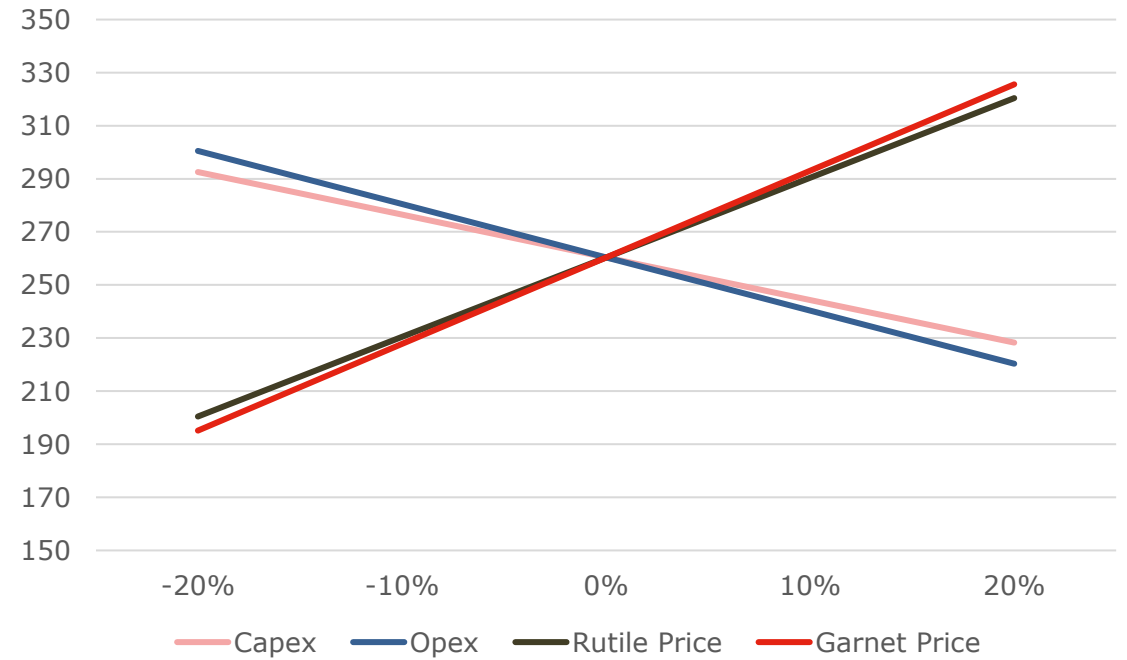
Engebø is positioned in the 1st quartile of the titanium feedstock industry R/C curve with a ratio of 3.6, compared to the projected industry average of 1.99 in 2024

Project optimizations improve financial resilience

Project IRR sensitivities (%)

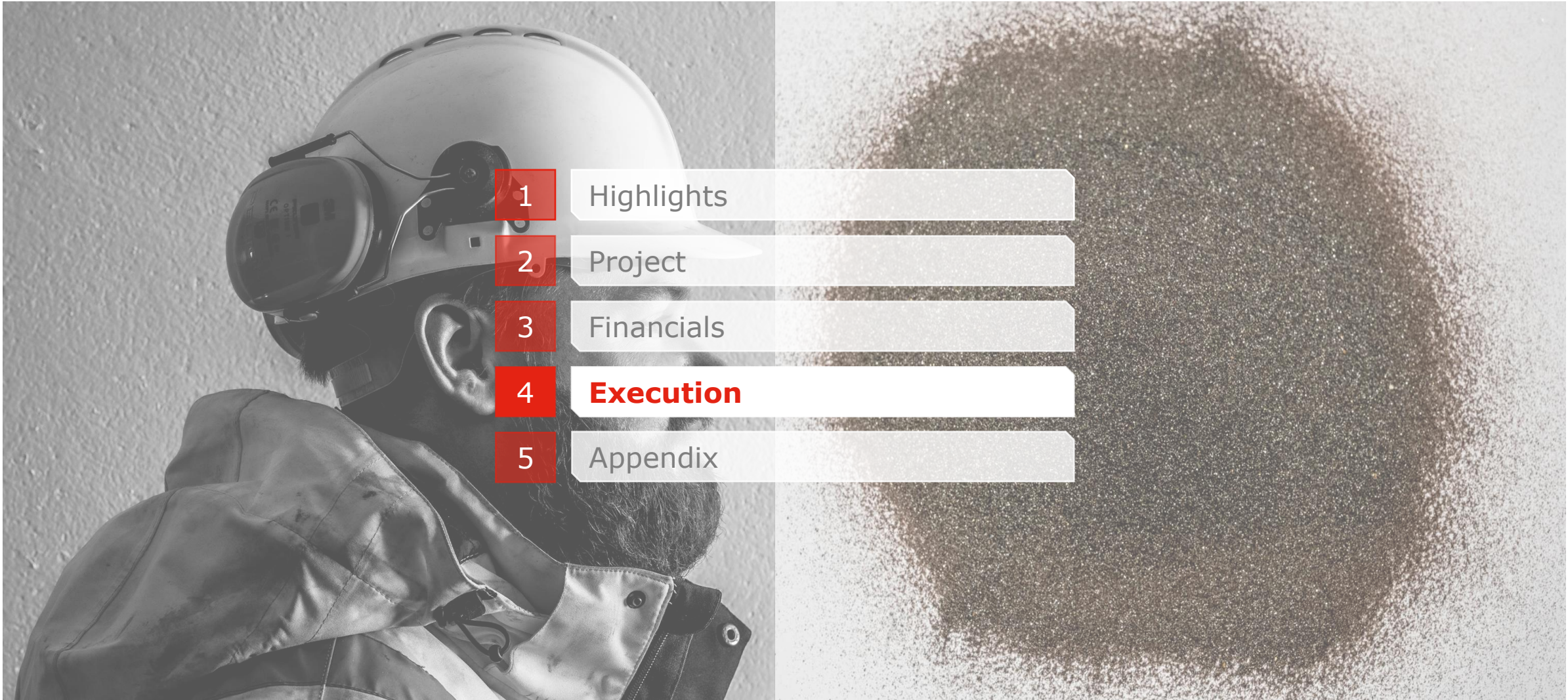


Project NPV sensitivities (USD million)



- The reduction in initial capex has reduced sensitivity to changes in capital cost
- Revised market assumptions for garnet has reduced price sensitivity

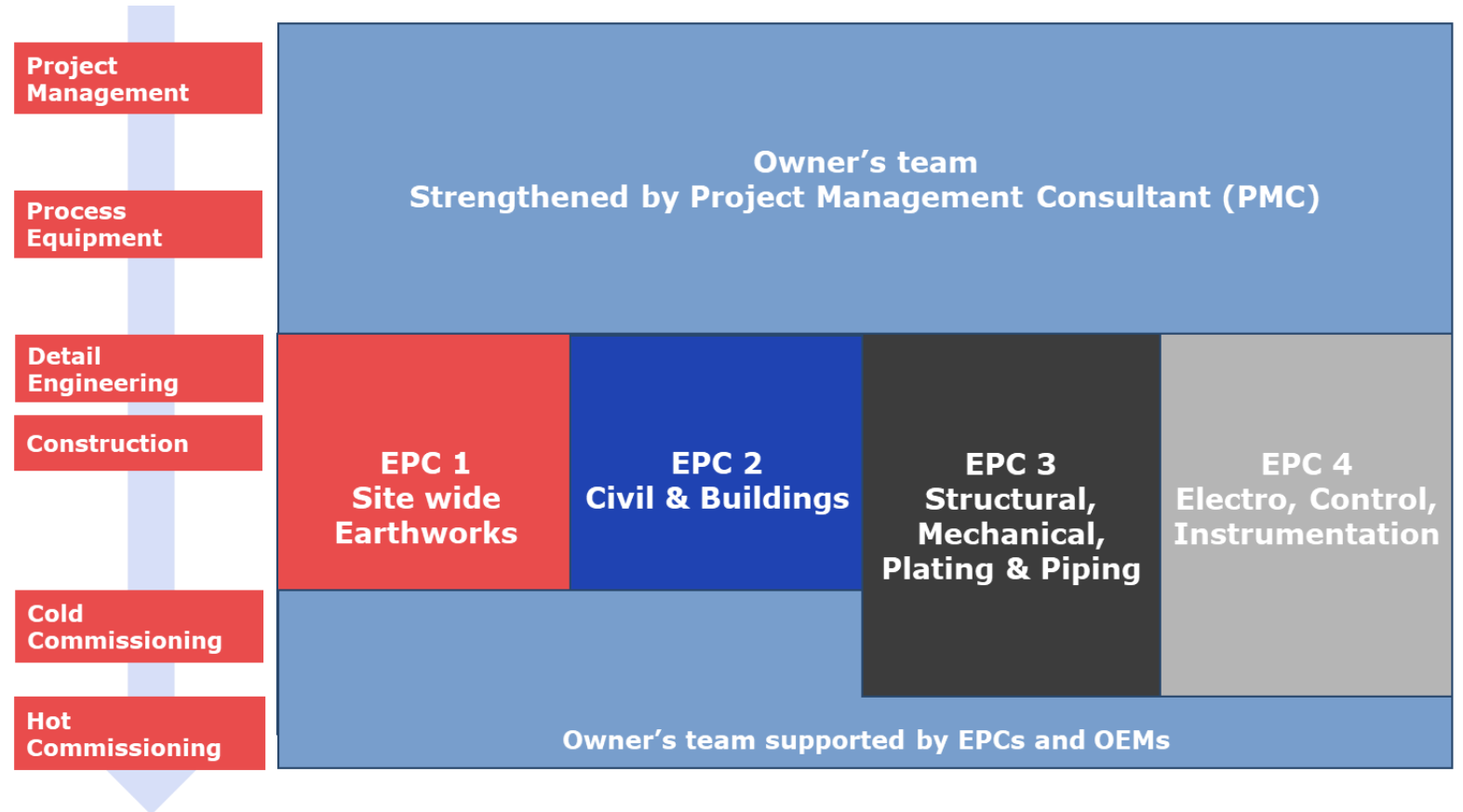
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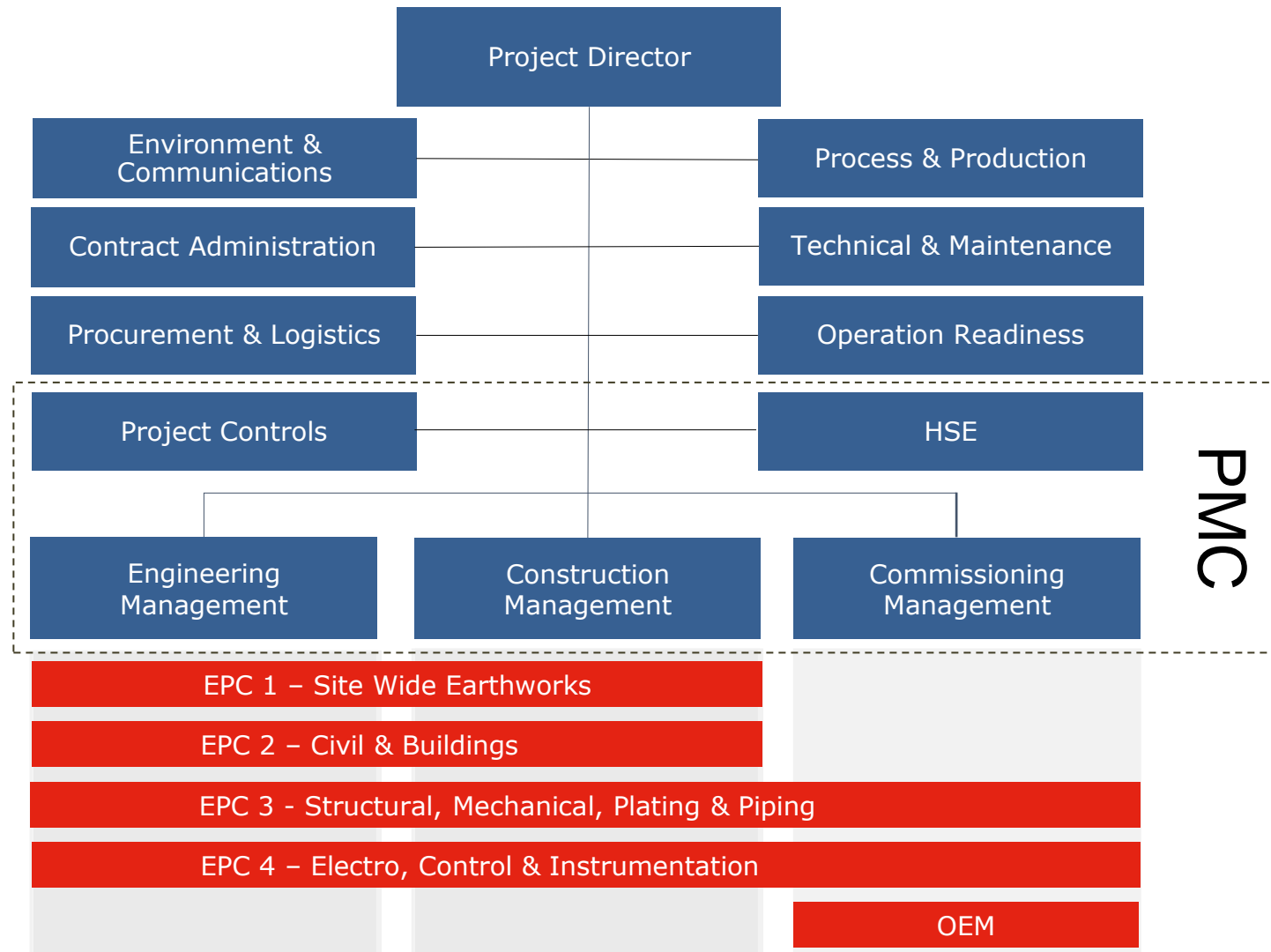
Lump-sum EPC contracts reduce execution and cost overrun risks

- Early engagement with potential EPC partners to bring new ideas and reduce risk
- Project structured in 4 major EPC contracts comprising over 70% of total capex
- EPC partnerships drive ownership and common project focus
- Owner's team responsible for procurement of process equipment, to be installed by EPC

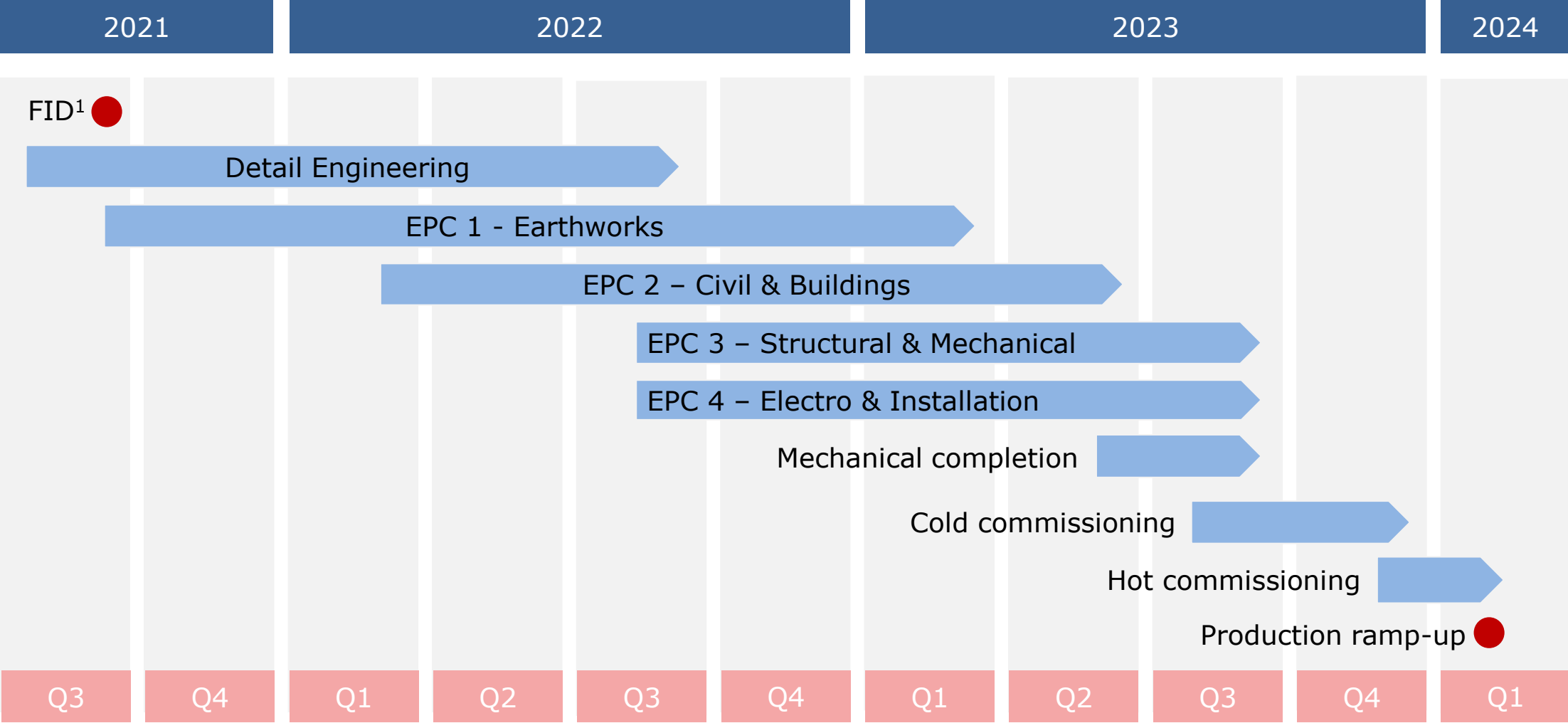


Lean project team strengthens control and reduces schedule risk

- Owner's team will be strengthened by experts from a reputable Project Management Consultant (PMC)
- PMC supports with assuring technical compliance by EPC to design criteria and technical specifications
- Roles and responsibilities defined according to one integrated team
- Focus on plans for commissioning and operational readiness from start of execution
- Key discipline positions from execution to continue into operations



Integrating FEED in construction shortens time to production



1) Final Investment Decision, timing dependant on closing of project financing

Acknowledgements

HATCH



Near-term activities

- Formalize partnerships with EPC Contractors
- Preparation for Owner's team build-up:
 - Recruitment of key project resources
 - Assigning PMC
- Project setup and planning with PMC and EPCs
- Defining pre-construction activities (Eg. design and engineering)
- Finalize offtake agreements with market partners
- Preparations for project financing

Questions?

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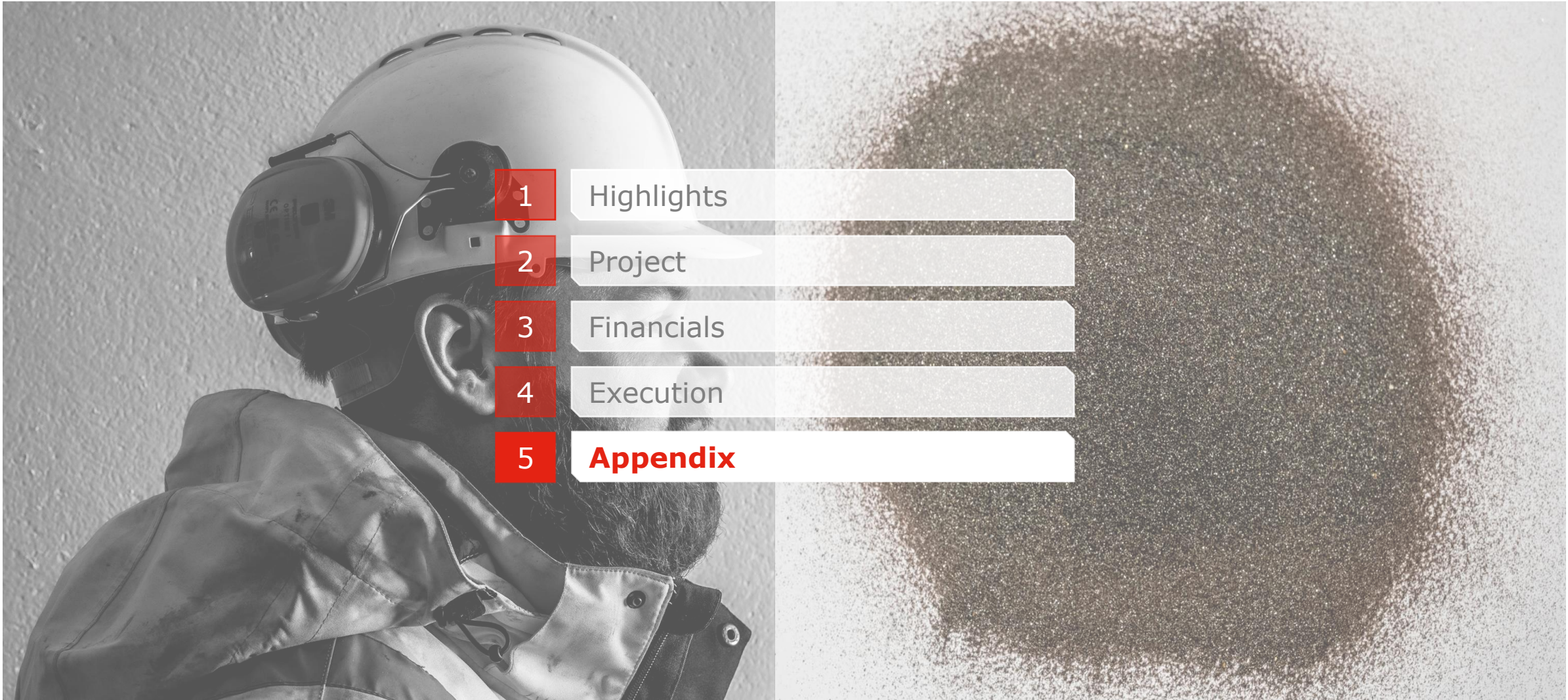
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Appendix #1 Mineral resources and ore reserves

Mineral resources (2% TiO₂ cut-off)

	Tonnes (Mt)	TiO ₂ grade (%)	Garnet grade (%)
Measured (M)	29.2	3.60	44.5
Indicated (I)	104.0	3.48	43.9
Total M&I	133.2	3.51	44.0
Inferred	254.1	3.15	41.3

Ore reserves

	Tonnes (Mt)	TiO ₂ grade (%)	Garnet grade (%)
Open Pit			
Proven (P)	19.33	3.56	44.25
Probable (Pr)	10.33	3.29	44.45
Total P&Pr	29.65	3.47	44.32
Underground			
Proven (P)	2.55	3.78	44.92
Probable (Pr)	24.75	3.66	44.42
Total P&Pr	27.30	3.68	44.47

Appendix #2 Key project figures and assumptions

Mining and Processing

Description	Units	Value
Open Pit Phase	Years	15
Total Open Pit Ore Production	Mt	29.7
Underground Phase	Years	19
Total Underground Ore Production	Mt	27.4
Stockpile Phase	Years	6
Total Project Lifetime	Years	39
Total Project Ore Production	Mt	57.1
Ore Grade – Rutile ¹	%	3.9
Rutile Recovery ¹	%	56.93
Ore Yield – Garnet ¹	%	12.49

Operating Costs

Description	Units	USD/Unit
Open Pit Mining - Waste ²	Waste Tonne	2.53
Open Pit Mining – Ore ²	Ore Tonne	2.48
Underground Mining ²	Mined Tonne	11.43
Processing	ROM Tonne	6.99
Sales, General and Administrative (SG&A)	ROM Tonne	2.23
Cash Cost ¹	ROM Tonne	14.4
Cash Cost ¹	Sales Tonne	95.9
Life of Mine Cash Cost	ROM Tonne	17.1
Life of Mine Cash Cost	Sales Tonne	113.6
All-In Sustaining Costs	ROM Tonne	14.9

Appendix #3 Key project financials

Project Economics¹

Description	Units	Value
Pre-tax NPV @ 8.0%	USD million	354.6
Pre-tax IRR	%	22.5
Post-tax NPV @ 8.0%	USD million	260.4
Post-tax IRR	%	19.8
EBITDA (Undiscounted)	USD billion	2.1
EBITDA-margin	%	67.6
Project Free Cash Flow (Undiscounted)	USD billion	1.4
Project Free Cash Flow ²	USD Million/Annum	51.1
Payback Period ³	years	4.4
Discounted Payback Period ³	years	5.9
Profitability Index (PI)	ratio	2.4

Pre-Production Capital Expenditure

Description	Units	Value
Initial Capital Expenditure for Open Pit and Processing Plant	USD Million	203.4
Capital Intensity for Open Pit and Processing Plant	USD/Tonne Production Capacity	860
Initial Capital Expenditure for Outside Battery Limit ("OBSL")	USD Million	12.6
Pre-Production Operating Expenditure	USD Million	1.8

Appendix #4 Board and Management

Board of Directors



Kjell Roland, Chairman

- Former CEO of Norfund
- Previous experience as partner and CEO in ECON Management AS and ECON Analysis
- Finance / economics background



Kjell Sletsjøe, Deputy Chairman

- Comprehensive international management experience from mining, coatings and construction industries as well as consulting
- Technical / financial background



Benedicte Nordang, Board member

- 20 years' experience from the offshore industry, including various management positions from Equinor ASA and Aker Marine Contractors
- Held board positions in the mining industry for more than 10 years, including for Nussir ASA and Wega Mining ASA



Antony Beckmand, Board member

- More than 20 years' experience in financial, commercial and corporate roles within the mining industry
- Currently CFO of Kalium Lakes Limited in Australia and has previous industry experience across a range of commodities, ia. CEO of Sydvaranger AS



Eva Kaijser, Board member

- More than 22 years of experience in the Swedish mining industry, including 11 years in Boliden
- Finance / industry background

Management



Ivar S. Fossum, CEO

- 15 years with Nordic Mining (since founding)
- 20 years experience from management positions in Norsk Hydro and FMC Technologies



Christian Gjerde, CFO

- Employed as of August 2020
- Broad management experience from NorgesGruppen ASA, Telenor ASA, and Yara International ASA. Experience from large-scale mining projects and operations in Brazil, Ethiopia and Finland.



Kenneth Nakken Angedal, Project Manager Engebø

- Employed as of August 2018
- Broad management and project coordination experience from various management positions in the ABB Group



Mona Schanche, VP Resource and Sustainability

- 13 years with Nordic Mining
- Geologist with broad mining background



Lars K. Grøndahl, Senior Advisor

- 15 years with Nordic Mining (since founding)
- Broad experience from various industrial management positions

Appendix #5 Responding to the need of critical minerals

- EU Commission has taken actions to make Europe's raw material supply more secure and sustainable
- EU's list of Critical Raw Materials reflects economic importance and supply challenges
- Titanium and Lithium are both on the list of critical raw materials
- Nordic Mining is a member of European Raw Material Alliance (ERMA)

