

Minerals for a sustainable future



Nordic Mining Investment Conference Helsinki, 17 April 2018



**NORDIC
MINING**

OAX: NOM

Exploration and production of high-end minerals and metals

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High-value assets in the Nordic Region



Titanium and Garnet



High Purity Quartz



Seabed minerals



Platinum, Palladium

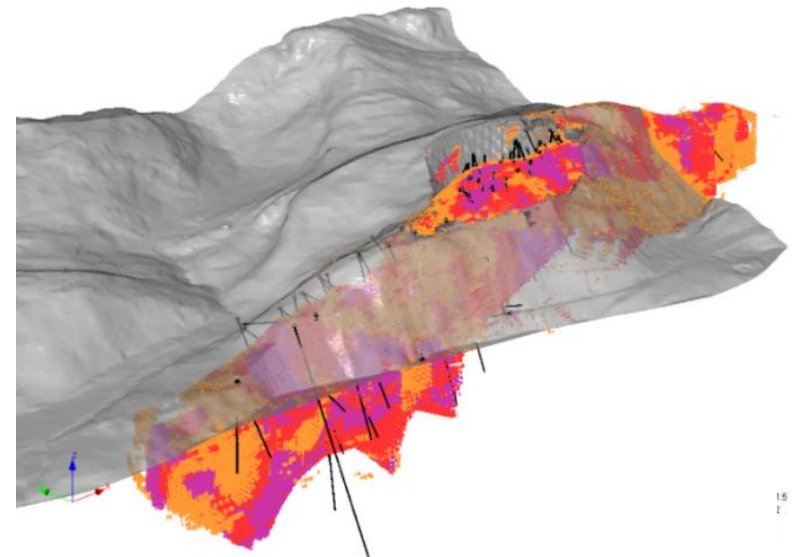


Lithium (22%)



Large eclogite deposit located at tidal waters

- ✓ Outcropping deposit with unknown extension to depth
- ✓ Geotechnically stable orebody allows for effective mining
- ✓ Low impurities, negligible content of heavy metals and radioactive elements
- ✓ Easy transition from open pit to underground mining



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High grade rutile and garnet mineralisation

Mineral resource and reserves classification*

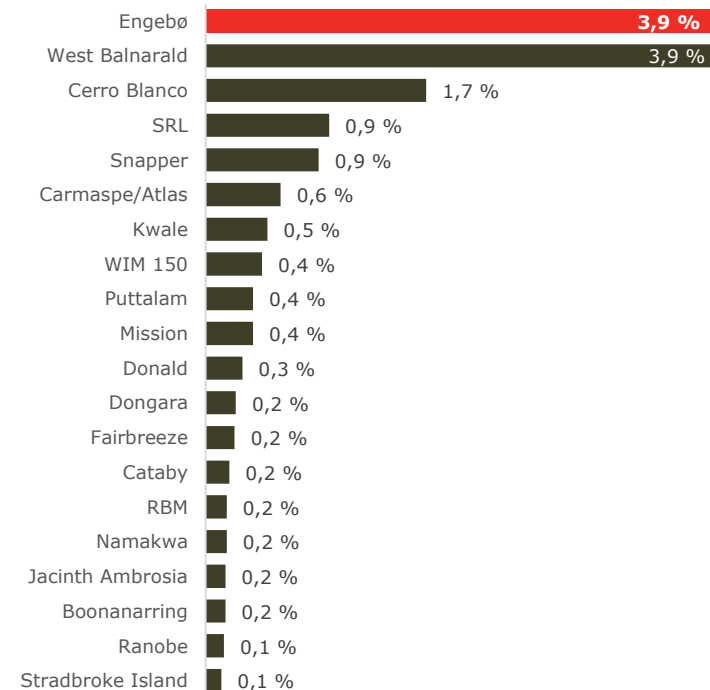
- ✓ Increased cut-off implies stronger financial performance in early mining years
- ✓ Large potential in inferred resources

	3% cut-off grade		
	Tonnage Mt	TiO ₂ %	Garnet %
Measured	15	3.97%	44.6%
Indicated	78	3.87%	43.6%
Measured & indicated	93	3.89%	43.7%
Inferred	138	3.86%	43.5%

	Ore reserves		
	Tonnage Mt	TiO ₂ %	Garnet %
Proven	10.194	3.81%	43.4%
Probable	31.702	3.35%	39.5%

Among the highest rutile grades

- ✓ Rutile grade for current producers and planned projects



* Resource estimates and reserve statement completed by Competent Person Adam Wheeler, corresponding to the guidelines of the JORC Code (2012 edition).



Rutile and garnet - unique mineral properties, increasing demand

Rutile (TiO₂)

Current world production: ~ 0.8 million tonnes



PIGMENT



WELDING RODS



TITANIUM



Tests have demonstrated that Engebø can produce 95% TiO₂ rutile suitable for pigment and titanium

Garnet

Current world production: ~ 1.4 million tonnes



WATERJET CUTTING



SAND BLASTING



ABRASIVES

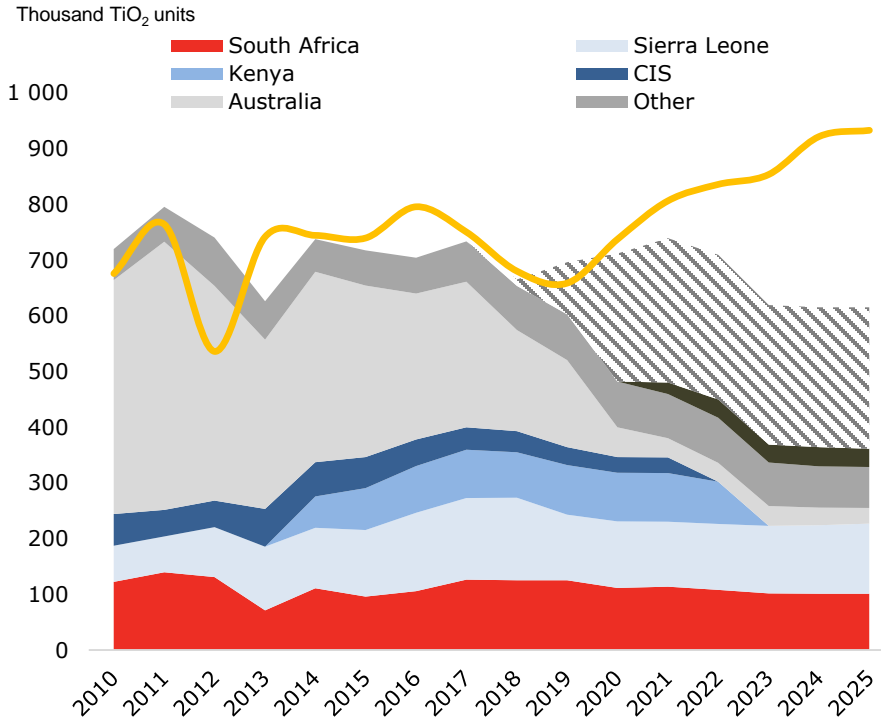


Tests have demonstrated that Engebø can produce coarse and fine garnet suitable for a broad range of applications



Rutile demand expected to grow with increasing prices

Global rutile demand is forecasted to outpace supply...



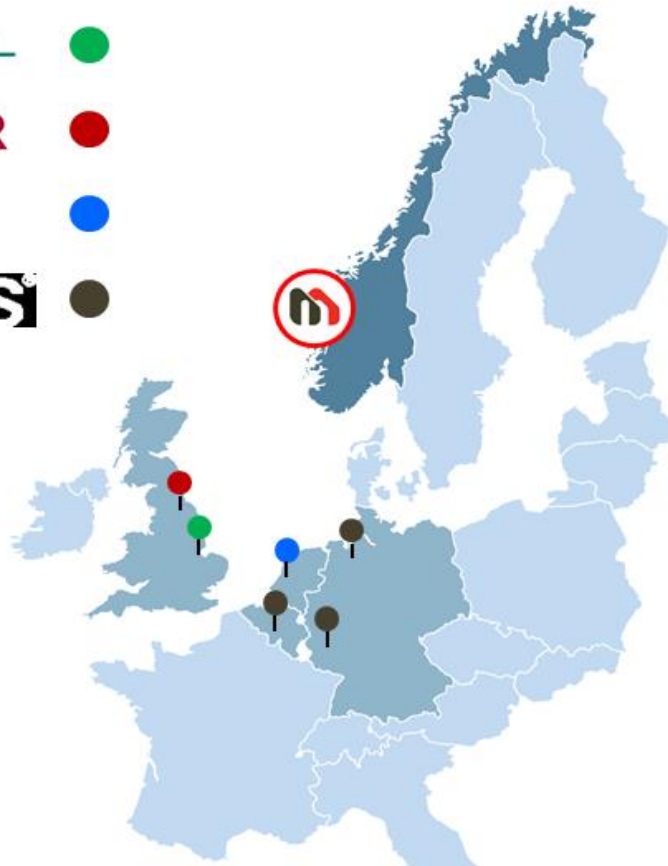
- Market conditions in the chloride pigment sector are improving and expected to result in a tighter market and in turn a rutile supply deficit
- Significant producers with depleting resources
- Some industry consolidation has taken place, e.g. with Iluka's acquisition of Sierra Rutile

...driving rutile prices up in the forecast period



- Since 2012 the global rutile market has worked through a supply overhang as chloride pigment producers embarked on a de-stocking cycle, which pushed rutile prices down
- Longer-term outlook indicates higher rutile prices. A significant supply deficit will develop if no new projects are commissioned

Export sales to Europe and overseas markets



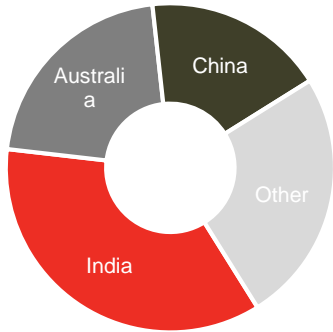
- ✓ The largest pigment manufacturers in Europe have chloride technology that benefits from high grade feedstock
- ✓ Several can consume Engebø's annual volume
- ✓ Plant-to-plant shipment
- ✓ Logistical and freight cost advantages



First European producer of Garnet

Garnet market and price assumption

Current world production

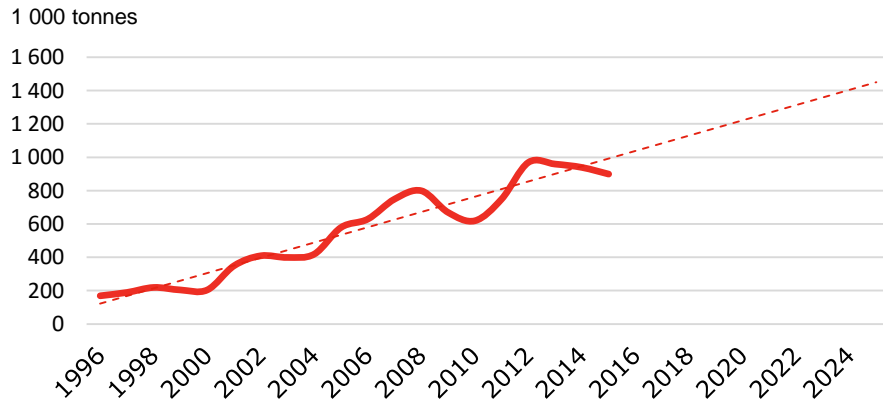


- Emerging mineral with strong growth in the waterjet cutting markets
- Currently no European production
- Engebø is one of few hard rock deposits with almandine garnet
- Engebø will produce commercial end-products:
 - 80 mesh waterjet
 - 100 mesh waterjet
 - 30/60 mesh blast market
- PFS garnet price assumption of USD 250/tonne in real terms based on a basket of the three products with roughly equal weighting

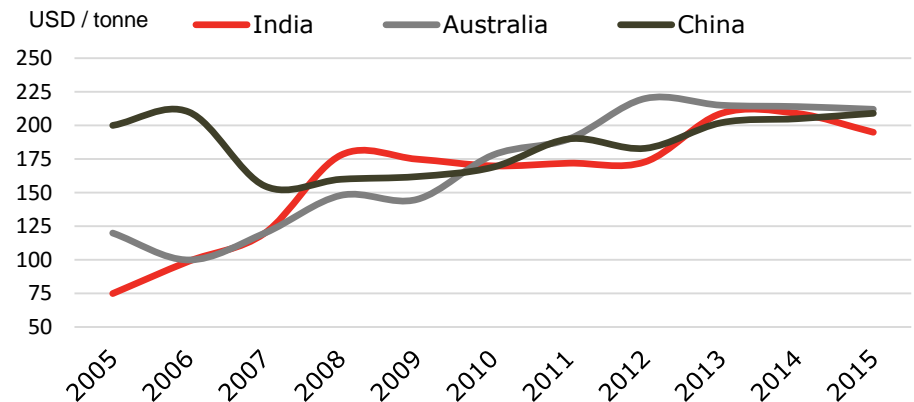
Estimated garnet price, Engebø PFS

Product / Case	Low price	High price
80 mesh waterjet	USD 267/t	USD 289/t
100 mesh waterjet	USD 267/t	USD 289/t
30/60 mesh grades	USD 289/t	USD 311/t
PFS garnet basket price	USD 250/t	

Estimated garnet consumption (excl. China)



Historical average garnet export prices (FOB)



Cooperation with the US Barton Group for garnet

The Barton Group

- ✓ Barton, family owned and founded in 1878.
- ✓ Leading US garnet producer and distributor
- ✓ Leading player in developing waterjet cutting technology
- ✓ Operates a garnet mine in the state of New York
- ✓ Supplies high-performance garnet abrasives in Western Europe, South America, Southeast Asia and China

Heads of Agreement

Nordic Mining entered into a Heads of Agreement with Barton Group, on the following main principles:

- ✓ Offtake agreement for North America
- ✓ Joint-venture agreement for other markets
- ✓ Financing of pre-construction project development
- ✓ Construction financing

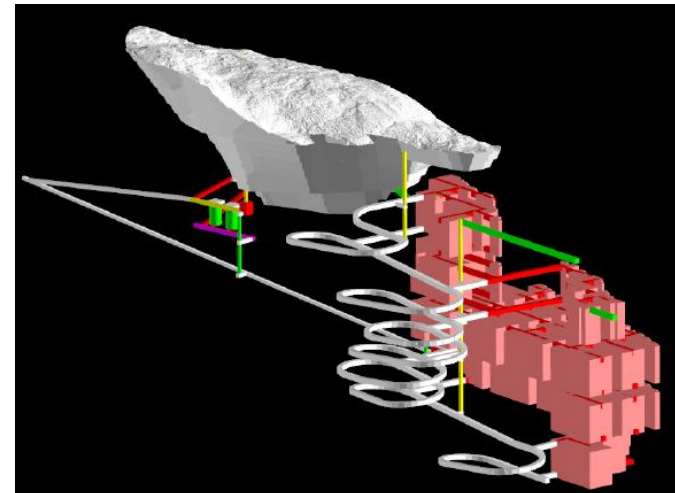


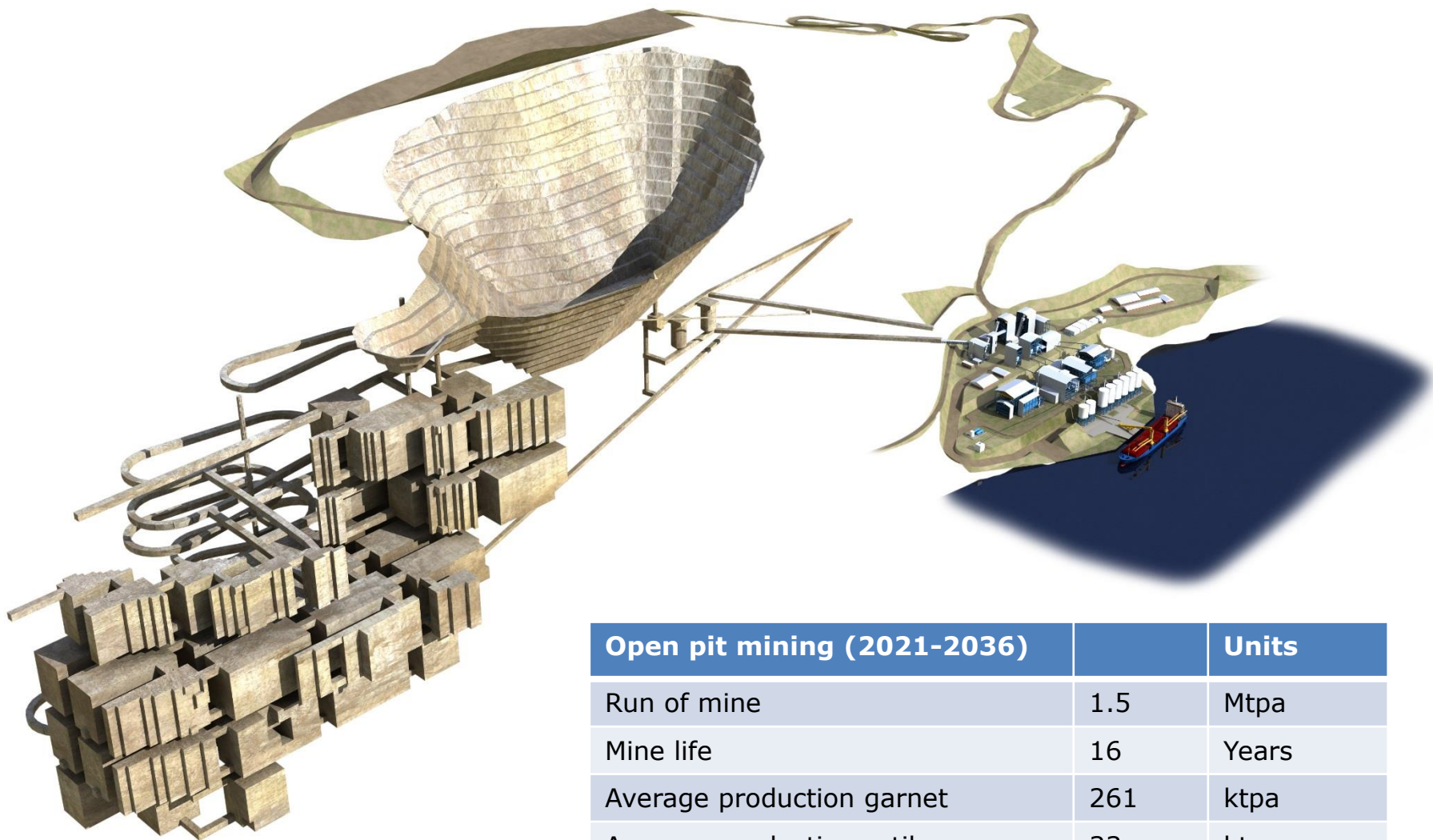
BARTON
Global leader in garnet abrasives



Favourable internal logistics

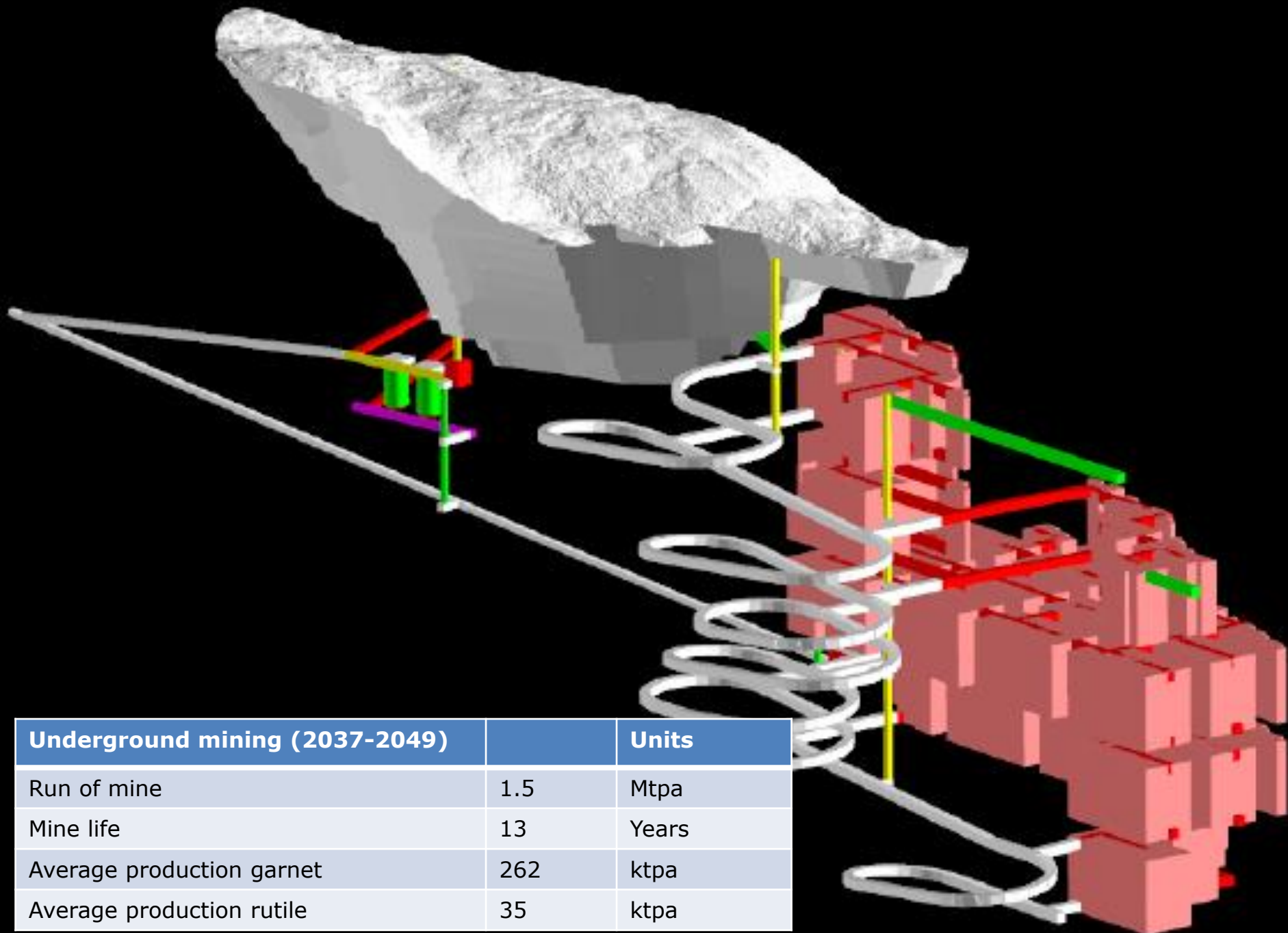
- ✓ 16 years open pit mining
- ✓ Rich ore in the early years
- ✓ Low stripping ratio
- ✓ Glory hole concept with underground crushing facility
- ✓ Underground silos enables storage and operational flexibility
- ✓ Minimum haulage distance
- ✓ Limited visual impact
- ✓ Open pit gives easy access to underground ore





Open pit mining (2021-2036)		Units
Run of mine	1.5	Mtpa
Mine life	16	Years
Average production garnet	261	ktpa
Average production rutile	33	ktpa
Strip ratio	1.34	Waste/ore





Underground mining (2037-2049)		Units
Run of mine	1.5	Mtpa
Mine life	13	Years
Average production garnet	262	ktpa
Average production rutile	35	ktpa

PFS process testwork; industrial scale equipment

- ✓ Comprehensive testwork has documented commercial products from rutile and garnet according to market specifications
- ✓ Testwork has demonstrated rutile recovery of approximately 60%



HATCH

ihc ROBBINS

JKtech
SMI
Technology Transfer

SGS


MINTEK

IMSV
ENGINEERING

CORE 

 **Mineral
Technologies**
A Downer Company



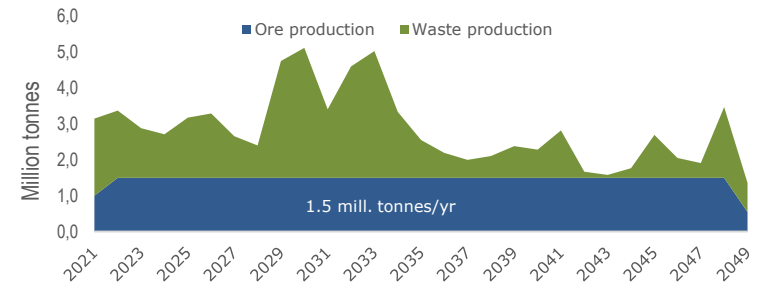
Lay-out of processing plant and shipping facilities



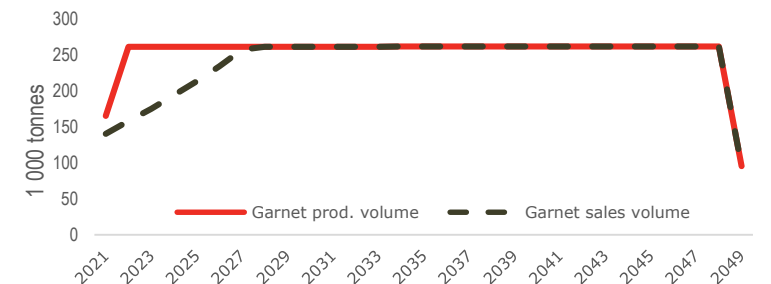
Key project assumptions

Assumptions	Value
Garnet price	USD 250/tonne
Rutile price	USD 1 070/tonne
Garnet sales (from ~2027)	261 000 tpa
Rutile sales (average)	32 500 tpa
Opex per sales tonne ¹⁾	USD 87 per tonne
Capex 2019-2021	USD 207 mill.
Open pit mining and comminution	26.8
Mineral processing and tailings handling	68.6
Infrastructure, storage and loadout	35.7
Indirects	41.8
20% contingency	34.2
Deferred capex 2033	USD 17 mill.
Underground mining and comminution	10.8
Indirects	2.7
25% contingency	3.4

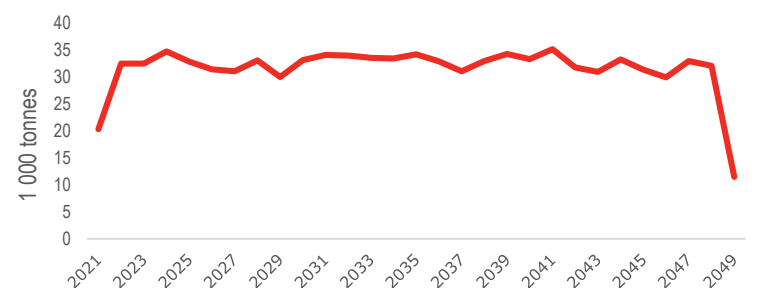
Mine production



Garnet sales and production volume



Rutile sales and production volume

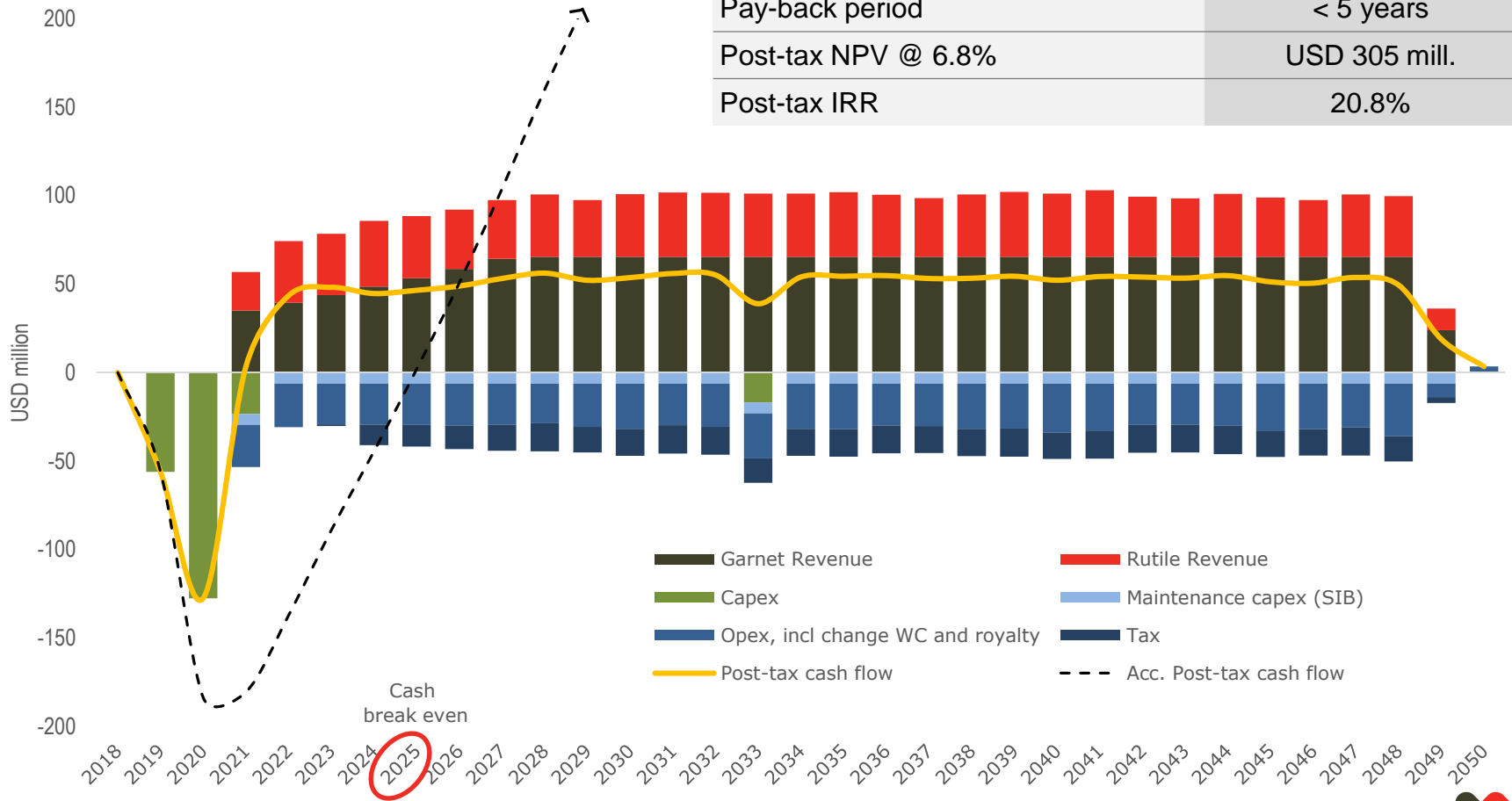


1) Based on total sales volume for rutile and garnet



Attractive project economics

Metric	Value
Pre-tax NPV @ 8%	USD 332 mill.
Pre-tax IRR	23.8%
Life of mine	29 years
Pay-back period	< 5 years
Post-tax NPV @ 6.8%	USD 305 mill.
Post-tax IRR	20.8%

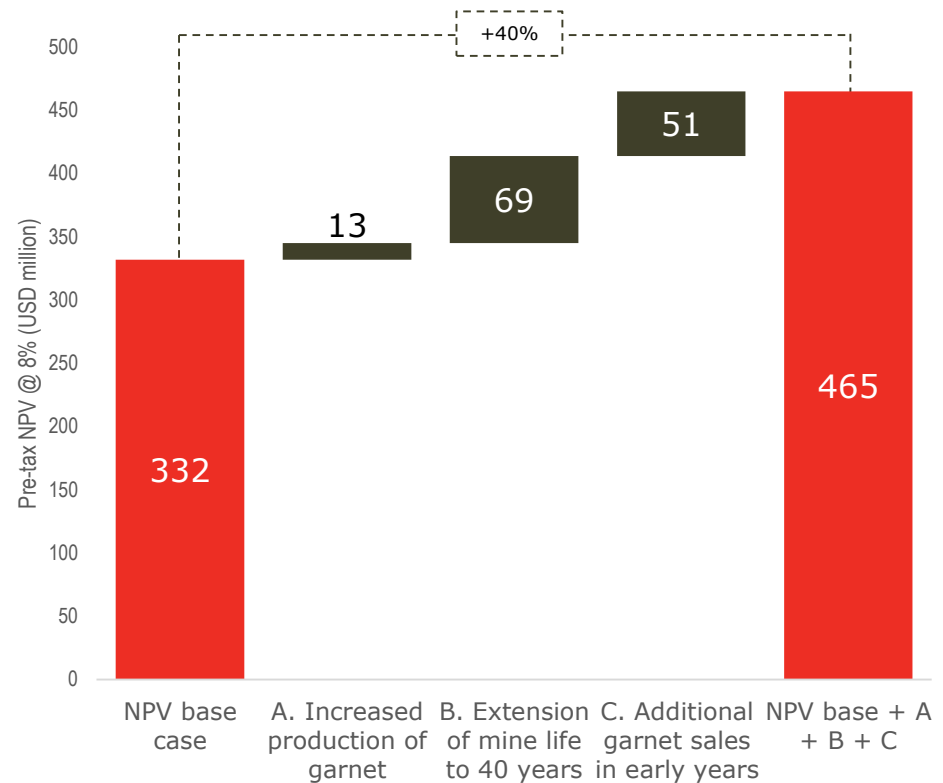


Post-tax cash margin of 55%



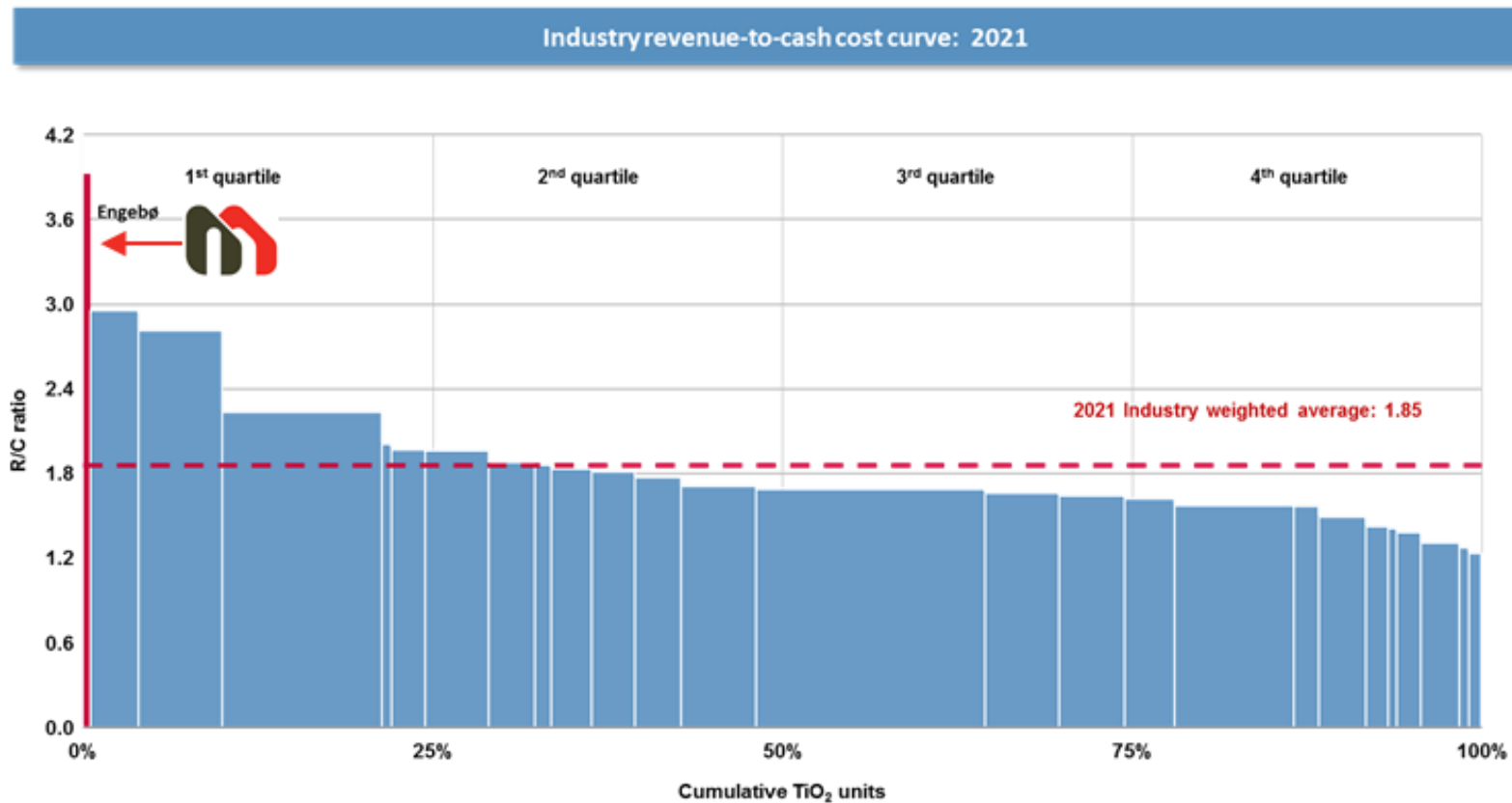
Large upside potential

- A.** Increased production of garnet to 300 000 tonnes/year
- B.** Extension of mine life to 40 years by including Inferred Resources
- C.** Additional garnet sales in early years



Competitive rutile revenue-to-cash cost position

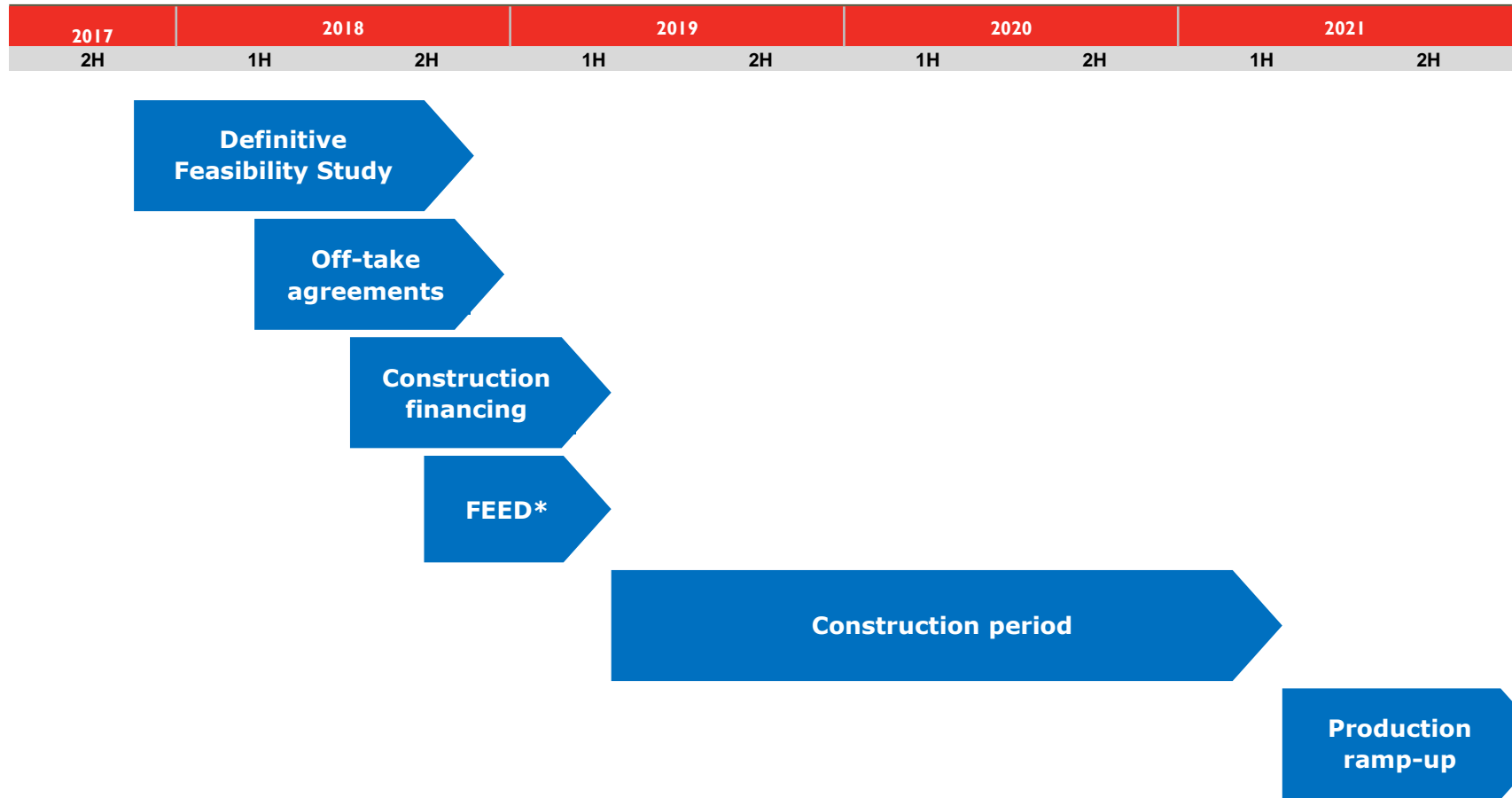
- ✓ The revenue-to-cash cost ratio is based on the first ten years of operations
- ✓ Engebø benefits from producing two high value products with low mining and processing costs



Source: TZMI



The way forward



* FEED: Front End Engineering & Design



Definitive Feasibility Study (DFS) targets project bankability

- ✓ Mining trade-off studies, mine design and schedule
- ✓ Processing testwork, ore variability and flowsheet optimisation
- ✓ Modularisation and logistical studies
- ✓ Procurement strategy and procurement operating plan
- ✓ Multi-disciplinary design and engineering work
- ✓ Project Execution Plan(PEP) and Construction Schedule
- ✓ Risk assessment
- ✓ Building "Owners team" including local project team
- ✓ Cooperation and anchoring with local society

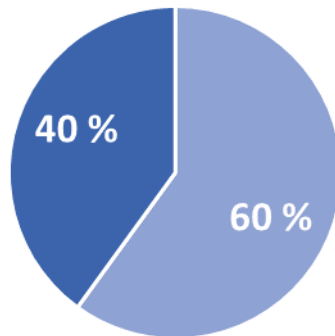


Indicative outline of construction financing

Key financing pre-requisites and time-line:

- ✓ Definitive Feasibility Study (bankable) Q4 2018
- ✓ Offtake agreements for rutile and garnet 2018

Tentative construction finance package; 60%/40% debt-equity



■ Debt ■ Equity

Sources of capital

- Equity (industrial partners, shareholders and others)
- Bank loans
- Bonds
- Streaming/Royalty
- Leasing
- Supplier credits
- Hybride instruments (i.e. convertible bonds)

Target to establish financing in H1 2019



Summary

- 1 The Engebø project – One of the world's largest rutile and garnet deposits**
 - Total of M&I of 93 mill. Tonnes (3% cutoff)
 - High grades: 3.9% rutile grade and garnet grade of 43%
 - Favorable logistics, stable political environment
- 2 Firm market outlook going forward**
 - Rutile – depleting existing resources resulting in supply deficit and tighter market
 - Garnet – emerging mineral with strong growth, no current European production
 - Lithium – exceptional growth of demand driven by the EV sector
- 3 Total project NPV of USD 332 million**
 - Phased development with CAPEX estimate of USD 207 mill. in first phase
 - Start-up in 2021 and later investments funded by operational cash flow
 - IRR of 20.8% and less than 5 years payback
- 4 Robust project economics**
 - Garnet price and volume impact cushioned by agreement with Barton Group.
 - High project flexibility
 - Low environmental footprint
- 5 22% ownership in lithium development company Keliber**
 - Early move into the highly attractive lithium market
 - Ongoing DFS and likely commercialization
 - Financial investment with potentially high return
- 6 Project de-risking and bankable Definitive Feasibility Study (DFS)**
 - The DFS includes plans for sale/offtake and basic engineering
 - Exploring several opportunities for construction financing
 - Partnered with blue chip professionals on DFS

THANK YOU!

Safety – Environment - Innovation



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