

# Company presentation

# March 2016









Exploration and production of high-end minerals and metals

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# Minerals for a sustainable future Platinum, Palladium Titanium - natural rutile High Purity Quartz Lithium Seabed minerals Developing high-value assets in the Nordic Region







# Board of Directors and Management

## **Board of Directors**



**Tarmo Tuominen, Chairman**Chief Supply Chain Officer in the Finnish mineral group Nordkalk. Geologist with broad mining experience. Chairman of the Geological Survey of Finland (GTK).



**Kjell Roland, Deputy chairman**CEO of Norfund, the Norwegian Investment Fund for Developing Countries. Roland holds a Master of Science in Economics from the University of Oslo, Norway. Roland has been a partner and CEO in ECON Management AS and ECON Analysis.



Mari Thjømøe, Board member
Extensive executive and board experience from oil and gas, finance and investment management (e.g. Statoil, Norsk Hydro and KLP). Thjømøe holds a Master of Science in Business Administration from the Norwegian School of Management (BI) in Oslo, Norway.



Hilde Myrberg, Board member
Extensive executive and board experience from oil and gas, power and consumer industries (e.g. Norsk Hydro and Orkla). Myrberg is a lawyer from the University of Oslo, Norway and has a MBA from INSEAD, France.



Tore Viana-Rønningen, Board member VP in Dag Dvergsten AS, Norway. Previous experience from Barclays Capital and Barclays Natural Resource Investments. Viana-Rønningen holds a Master of Science in Economics and Business Administration from the Norwegian School of Economics (NHH) in Bergen, Norway.

## Management



Ivar S. Fossum, CEO
Fossum holds a Master of Science in Mechanical
Engineering from the University of Science and
Technology in Trondheim, Norway. He has 20 years
experience from management positions in Norsk Hydro
(oil/gas and fertilizers) and FMC Technologies. Fossum
has a broad international experience and has been
general manager of Norsk Hydro East Africa Ltd. in
Nairobi, Kenya.



Lars K. Grøndahl, CFO
Grøndahl holds a Master of Science in Economics and
Business Administration from the Norwegian School of
Economics in Bergen, Norway. He has broad experience
from industrial management positions in i.a. Aker,
Scancem Group and HeidelbergCement.



Mona Schanche, Exploration Manager
Resource geologist from the University of Science
and Technology in Trondheim, Norway with 10 years
experience from the mining sector. She has previous
experience as project geologist in Titania (Kronos
Group), a major producer of pigment feedstock.



**Thomas B. Addison, MD Nordic Rutile**Mining Engineer from the University of Science and Technology in Trondheim, Norway. Addison has 30 years experience within mining and mineral processing for Elkem, SNSK, Orkla Exolon, Hanson Quarry Products Europe and Franzefoss Minerals.

Differentiated mining and industrial experience combined with extensive network

# Shareholder structure and share price development

## Largest shareholders\*

	Name of shareholder	No. of shares	%
1	NORDNET BANK AB (NOMINEE)	30 059 944	7,8 %
2	SKAGEN VEKST	17 148 181	4,4 %
3	NORDEA BANK PLC FINL. CLIENTS ACC. (NOMINEE)	14 404 790	3,7 %
4	NORDNET LIVSFORSIKRING	12 080 105	3,1 %
5	DYBVAD CONSULTING AS	10 011 148	2,6 %
6	DANSKE BANK A/S (NOMINEE)	7 183 550	1,9 %
7	OVE KLUNGLAND HOLDIN NIL	7 023 696	1,8 %
8	MAGIL AS	6 500 000	1,7 %
9	SNATI AS	6 000 000	1,6 %
10	CITIBANK N.A. S/A POHJOLA BANK PLC (NOMINEE)	5 682 542	1,5 %
11	INFOSAVE AS	5 144 863	1,3 %
12	LITHION AS	4 167 898	1,1 %
13	OLE KRISTIAN G. STOKKEN	3 736 721	1,0 %
14	AUDSTEIN DYBVAD	3 356 000	0,9 %
15	FEMCON AS	3 080 316	0,8 %
16	ADURNA INVEST AS	3 079 993	0,8 %
17	REIDAR JARL HANSEN	2 948 124	0,8 %
18	OLAV BIRGER SLETTEN	2 805 000	0,7 %
19	JON HOVDEN	2 622 000	0,7 %
20	FRANK MOLANDER	2 490 000	0,6 %
	Top 20 shareholders	149 524 871	38,8 %
	Others	235 979 934	61,2 %
	Total	385 504 805	100,0 %

## Share overview and share price development\*

## **Share overview**

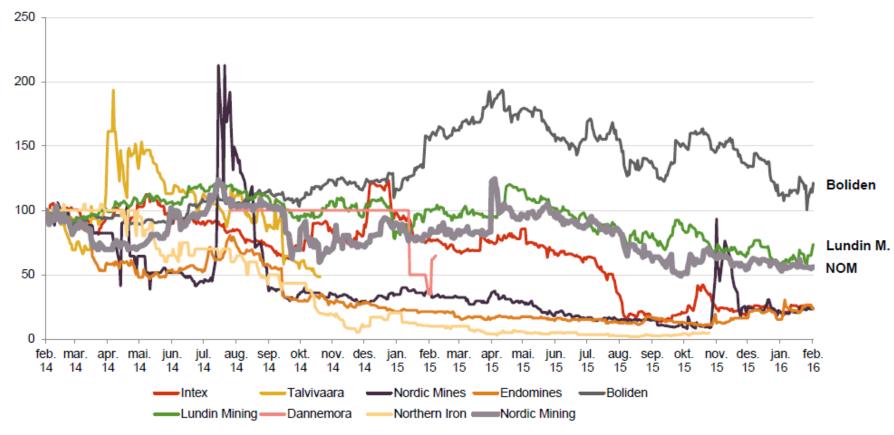
Stock symbol	NOM
Stock exchange	Oslo Axess
Number of issued shares	385 504 805
Owned by Norwegian shareholders	82%
Owned by international shareholders	18%
Owned by management	2.6%
Options	12 750 000
- of which owned by management	11 500 000
Fully diluted number of shares	398 254 805
Current share price (NOK)	0,64
Market capitalisation (NOKm)	247
Trading range last year (NOK)	0.40 - 1.28





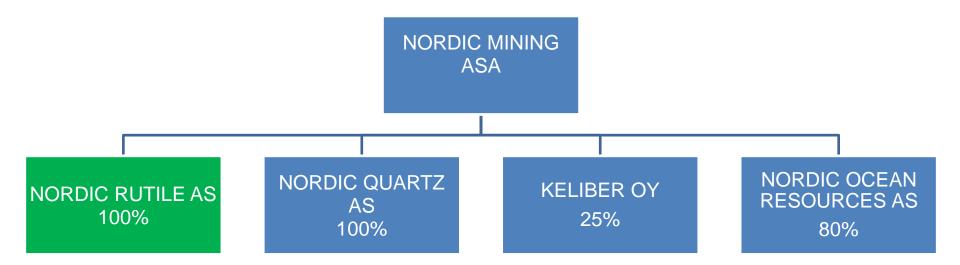
# 24 month performance vs peers in Scandinavia

# Kursutvikling peer gruppe siste 24 måneder (rebasert)

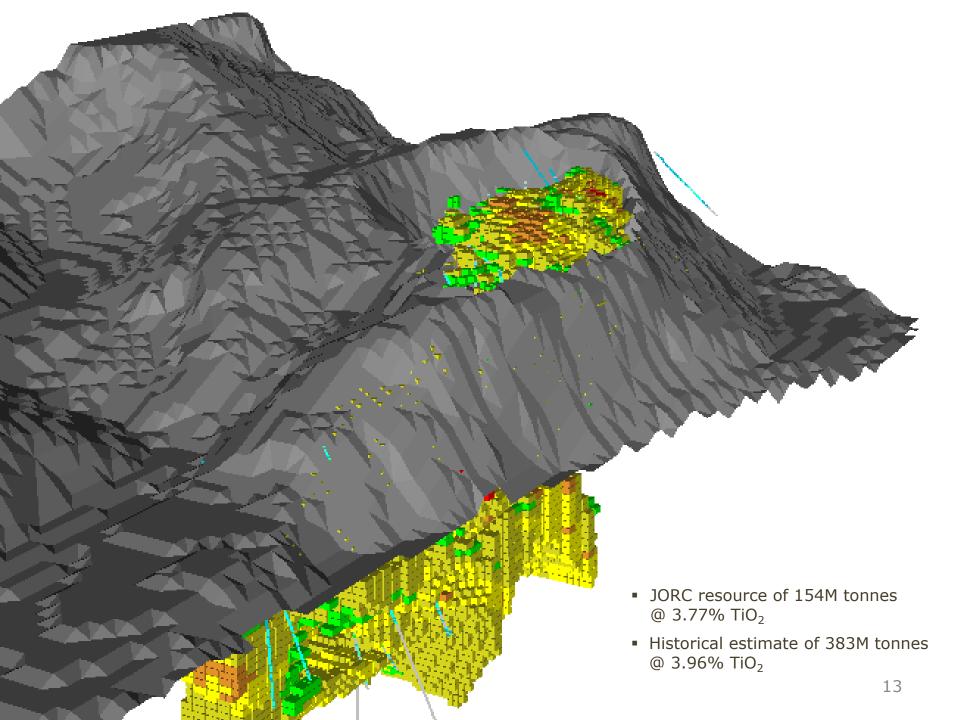


Source: Swedebank

# Nordic Mining Group



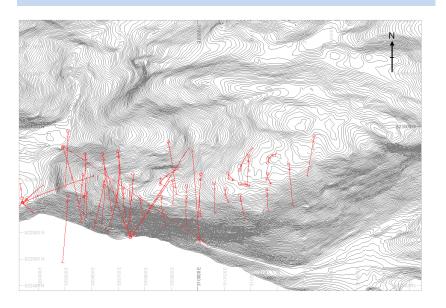






# Well-defined deposit

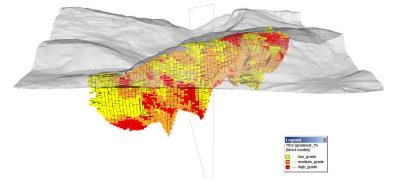
## Total of 50 exploration drill holes



- 50 drill holes (15,000 meters)
- 1,129 surface samples
- > 50 000 TiO2 analysis
- Block model ordinary kriging

### JORC Resource\*

Resource class JORC	Mill tonnes	TiO <sub>2</sub> % @ 3% cut-off
Indicated	31.7	3.77
Inferred	122.6	3.75
Total	154.3	3.77



- Planned drilling program of approx. 6,500 meters
- Open pit mining for 10 15 years,
   35 40 years underground mining
- Open pit strip ratio of 0.45:1 (waste/ore)



Considerable JORC compliant resource estimate with upside potential from additional drilling

# Engebø is among the largest rutile deposits in the world

## Rutile projects' grade and target production

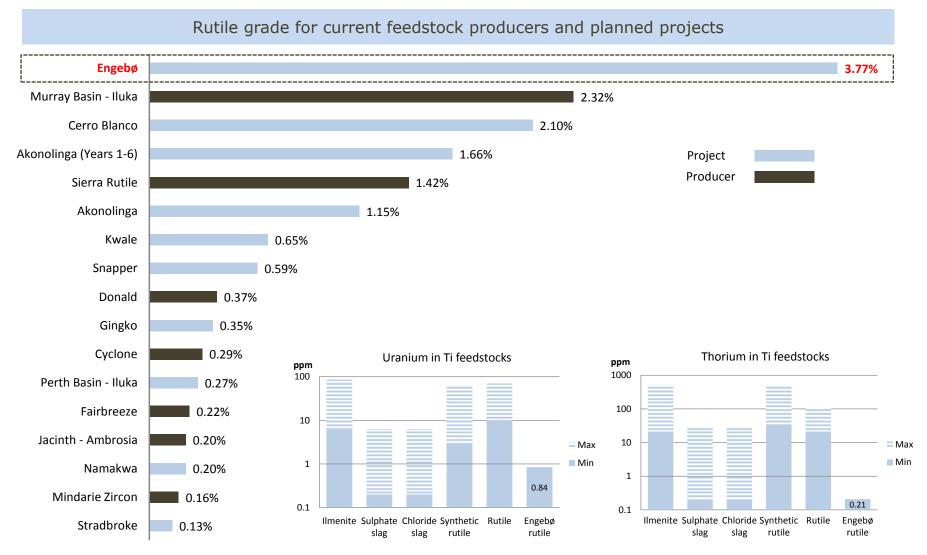


Size of bubble indicates resource size



Source: Company websites 16

# The highest rutile grade and lowest impurity content



High grade ore with low impurities brings processing benefits and premium pricing





# Garnet, by-product with benefits for the environment

- Preferred sand-blasting medium, replacing sand with contents of free silica
- Garnet is used as the primary cutting medium in water-jet cutting machines
- Annual global production of garnet is approximately 2 million tonnes
- Broad prices range depending of qualities
- Water-jet quality is typically sold for USD 445 per tonne delivered in Norway
- MOU signed with a reputable international industrial minerals producer







# The TiO<sub>2</sub> value chain from mine to consumer



## Mining

 Rutile is mined from ore or mineral sands producing a rutile concentrate



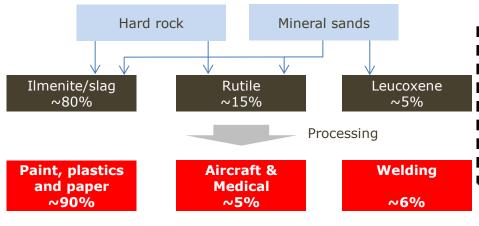
## **Processing**

- Rutile is processed through chlorination in reactors which produces TiO<sub>2</sub> pigment
- Optional metallurgical process to produce titanium and related alloys



#### End use

- Majority of TiO<sub>2</sub> feedstock is used in production of pigment for paints, plastics and paper
- Approximately 5% is used for titanium



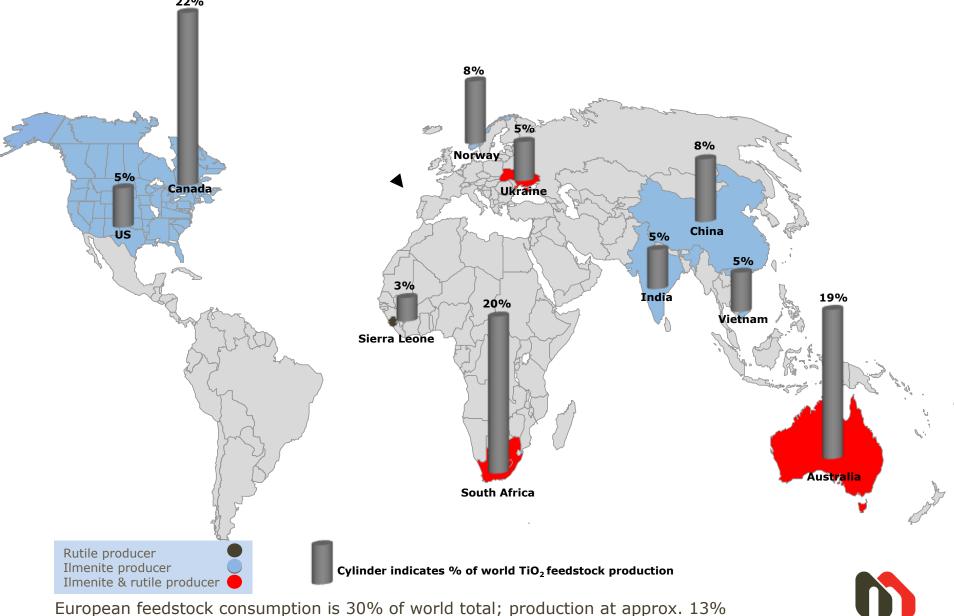
Natural rutile implies improved production and less waste vs ilmenite and other feedstock:

- I ✓ Lowest consumption of ore
  - ✓ Lowest consumption of chloride
- ✓ Less waste
- ✓ Lower production costs



TiO<sub>2</sub>; small part of total cost for end-use manufacturers with few viable substitutes



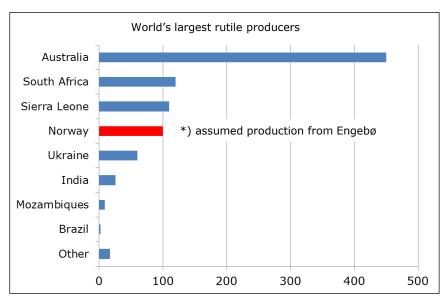


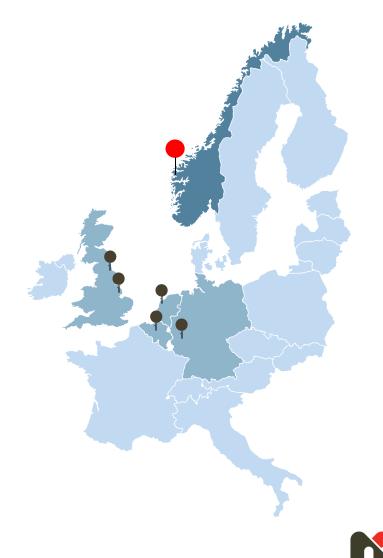
Source: TZMI 21

# European pigment majors will be future customers

## Regional, stable supply brings customer benefits

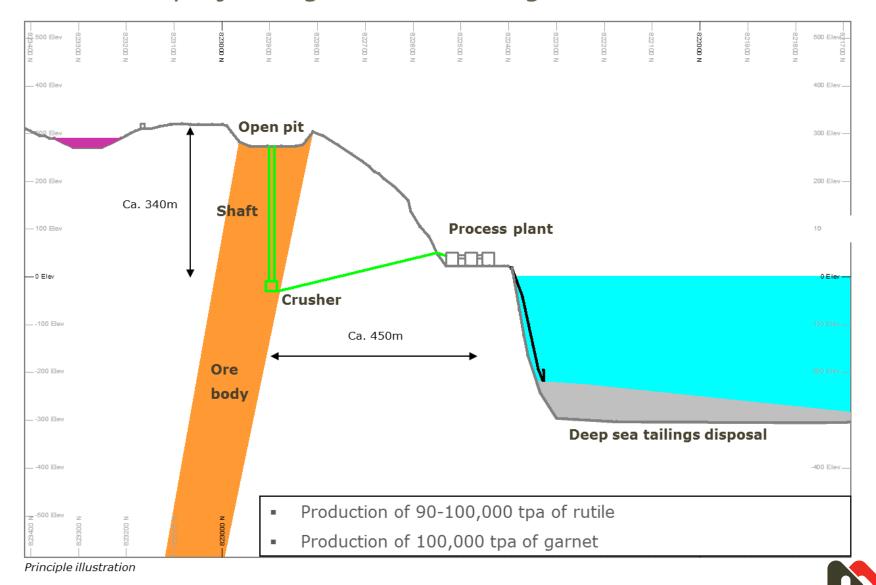
- Substantial freight reduction compared to existing supply
- Plant-to-plant shipment
- Simple logistics improve working capital, storage and planning
- Several European customers can each take Engebø's annual production







# Favourable project logistics and configuration



Efficient and area-tight concept, low transportation costs

# Preliminary key figures

Engebø key figures	
Life of mine	50 years
Open pit production	10 - 15 years
Underground	35 - 40 years
CAPEX	USD 300 million
NPV after tax @ 8% WACC	USD 466 million
IRR after tax	20.7 %
Payback time (CAPEX/EBITDA)	4.5 years
Break-even price for rutile (IRR = 0)	USD 370 per tonne



# Preliminary capital cost and OPEX estimates\*

Capex estimate	USDm
Royalties and land acquisition	13
Infrastructure and civil	83
Mine	17
Crushing facility	22
Wet process package	107
Dry process package	55
Laboratory and misc.	4
Total	300

OPEX estimates (open pit)	USD/t rutile
Ex. by-product credit	550
Incl. by-product credit	185

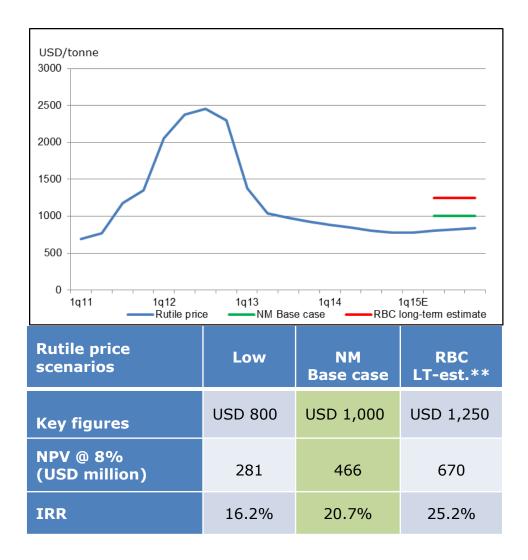
Peer comparison Sierra Rutile **	USD/t rutile
Incl. by-product credit 2014	646
Incl. by-product credit 2015est.	595-615

- The preliminary capital cost estimate includes approx. 20% contingency
- Capex review will be part of the continued project planning process
- Total construction time of 24 months
- Deep sea key already in place, ready to use

- Based on comparable operations in Norway and internationally
- By-product credits mainly from garnet which is produced without additional costs

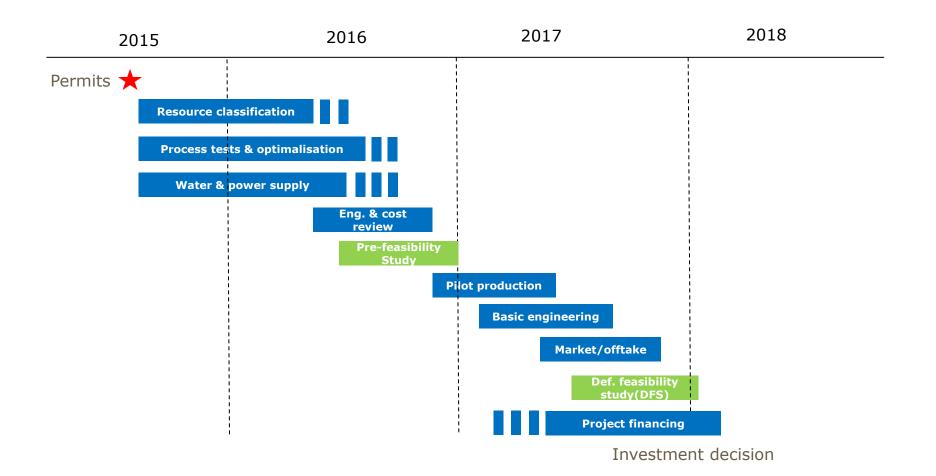


# Positive market outlook - robust project financials\*





# Project development – tentative timeline



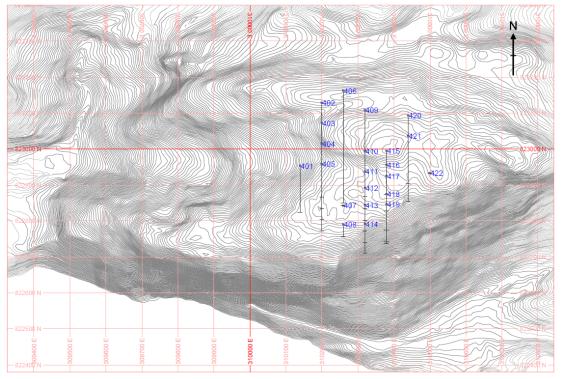


# Development activities towards PFS

Activity	Further description	Cost estimate
Resource classification	<ul> <li>Core drilling approx. 6,500 meters in the open pit zone, drill core analysis, geotechnical assessments</li> <li>Resource modeling and estimations in accordance with the JORC Code 2012</li> </ul>	USD 1.4 million
Process testwork and optimisation	<ul> <li>Further process tests and optimization of flowsheet</li> <li>Target: Increased rutile recovery and define cost-effective process solutions</li> <li>Reduce or avoid flotation?</li> </ul>	USD 2.0 million
Engineering and cost review	<ul> <li>Pre-engineering</li> <li>Updated estimates for Capex/Opex</li> </ul>	USD 0.5 million
Supply of process water and hydropower	<ul><li>Assessment of alternatives</li><li>Applications with supporting documentation</li></ul>	USD 0.6 million
Technical advisor and PFS coordination	Assessment of candidates ongoing	USD 1.5 million
Project management and overhead	<ul> <li>Lean project team; project leader and 2- 3 key persons</li> <li>General corporate overhead</li> </ul>	USD 3.4 million
Contingency	Approximately 10%	USD 0.9 million
Total		USD 10.3 million



# Core drilling program is ongoing



- Around 40 drill holes; approximately 6,500 meters, primarily in the open pit area – Finnish company Kati assigned
- Geotechnical assessments Wardell Armstrong assigned
- Resource modeling and estimations – Competent person Adam Wheeler

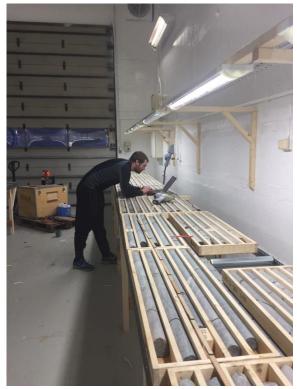




# Drilling program at Engebø ongoing



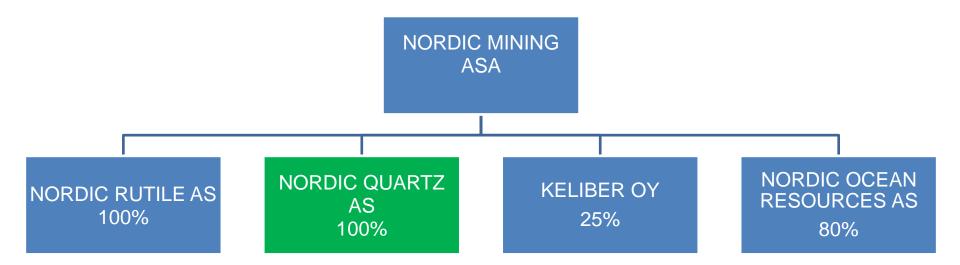








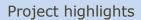
# Nordic Mining Group





# Nordic Quartz (100%) - Development in High Purity Quartz





- JORC compliant resource estimates of 2.9 million tonnes (indicated) and 1.3 million tonnes (inferred), with average quartz content of 65%\*
- Substantial volumes in massive quartz zones (>95% quartz content)\*
- Estimated NPV of USD 60 million @ 8% WACC in scoping study (2012) based on annual production of 5,000 tonnes of HPQ
- Demonstrated superior product quality for advanced applications/markets



## Key features

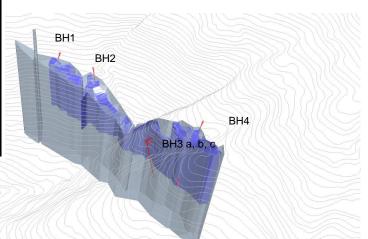
- Outcropping hydrothermal quartz deposit
- Low in critical elements as Ti, Al, Fe, P, Na, K, Li, B
- Ideally situated, close to infrastructure and port
- Small-scale mining operation for HPQ production;
   20 30,000 tonnes ore per year
- Limited environmental impact



Bringing a new long term supplier to the HPQ industry

# Completed core drilling has provided JORC resource estimate 6 holes drilled of a total of 600 meters

	tonnage ton	hydrothermal quartz %	hydrothermal quartz content ton
Indicated resources			
Transition zone	1 467 000	40	587 000
Semi-massiv zone	631 000	80	505 000
Massive quartz zone	<u>849 000</u>	<u>95</u>	<u>807 000</u>
	2 922 000	65	1 899 000
Inferred resources			
Transition zone	645 000	41	264 000
Semi-massiv zone	199 000	79	157 000
Massive quartz zone	<u>497 000</u>	<u>95</u>	<u>472 000</u>
	1 341 000	66	893 000





# Process tests has proven world class product quality



Quality	Total impurities (ppm)	SiO <sub>2</sub> %
Nordic Quartz	13	99.9987
IOTA Std	19	99.9981
IOTA 4	12	99.9988
IOTA 6	11	99.9989







# Scoping study\* reveals robust project financials

## Project highlights

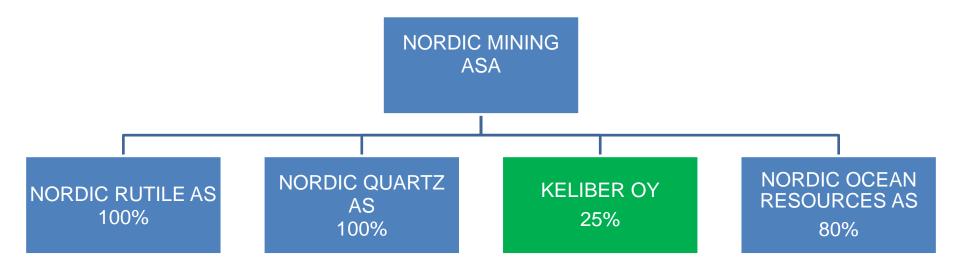
- Small-scale mining operation; 20,000 30,000 tonnes per year
- 30 40 employees
- Limited environmental impact
- High purity and high value products require advanced processing facilities

Key assumptions and figures	Units	Scoping study
Annual production/sales of HPQ	Tonnes	5,000
Average HPQ product price	USD/tonne	6,700
Operating cost	USD/tonne	4,000
CAPEX	USD million	49
NPV after tax @ 8% discount rate, 30 yrs LOM	USD million	60
IRR after tax	%	20.5
Pay-back time (CAPEX/EBITDA)	Years	4.3





# Nordic Mining Group





# Moving forward in high-grade lithium





- Estimated 6.2 million tonnes mineral resource at an average grade of 1.26 Li<sub>2</sub>O (JORC Code 2004/2012)\*
- Estimated 4.5 million tonnes ore reserves at an average grade of 1.10 Li<sub>2</sub>O in the proven and probable categories (JORC Code 2012)\*
- Region with promising exploration potential
- Cost efficient and environmentally friendly processing method
- Pre-Feasibility Study and EIA reporting scheduled in March 2016



## Key features

- Mining permit in place for the Länttä deposit
- Ideally located; close to processing industry cluster with excellent infrastructure and port facilities
- Demonstrated +99.9% Li-product suitable for advanced battery applications, i.a. for EV/HEV
- Expected high growth rate i.a. for HEV batteries;
   CAGR 15% for the period 2015 2019\*\*
- Price of lithium carbonate (LCE) is surging



Keliber targets to be the first producer in Europe of battery grade lithium carbonate

# **Mineral Resources and Future Potential**



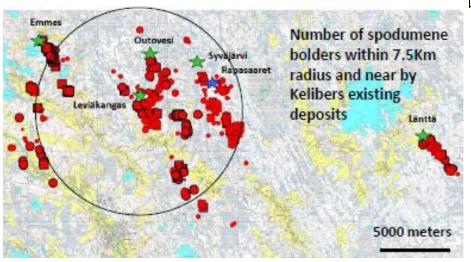
## Increased resources and good exploration potential

## > Successful exploration

Company's exploration drilling programs have resulted a 290 percent increase in Company's JORC compliant mineral resources during 2013 – 2015

## Exploration potential

The lithium province of Central Ostrobothnia covers over 500 square km and is one of the most significant areas of high potential of lithium in Europe



Mineral Resou <mark>rces</mark>					
Category	Deposit	kt	Li20%	Cut off	JORC
Measured	Länttä	433	1,12	0,50	2004
Indicated	Länttä	868	1,06	0,50	2004
	Syväjärvi	1 668	1,34	0,50	2012
	Rapasaari	1 956	1,25	0,50	2012
	Outovesi	289	1,49	0,50	2004
	Leviäkangas	190	1,13	0,50	2004
	Emmes	818	1,40	0,70	2012
	Total	5 789	1,28		
Measured and					
Indicated		6 222	1,26		
Inferred	Syväjärvi	73	1,58	0,50	2012
	Leviäkangas	271	0,90	0,50	2004
	Total	344	1,04		

The Mineral Resources (JORC JORC 2004 and 2012) Markku Meriläinen (MAusIMM) and Pekka Lovén (MAusIMM (CP) Outotec Finland Oy.



# **Estimated Ore reserves of Keliber Lithium Project**



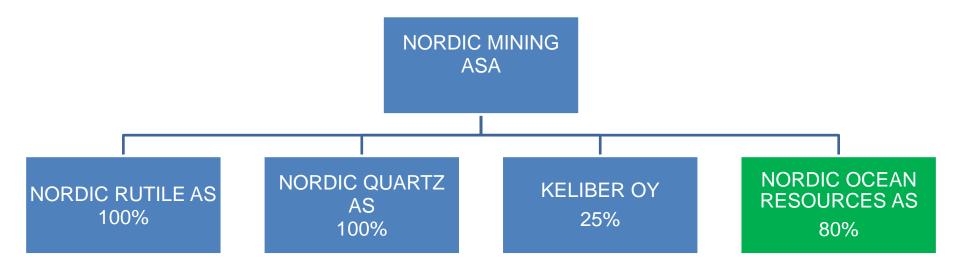
Ore Reserves				
Category	Deposit	kt	Li20%	JORC
Proven	Länttä	470	0,95	2012
Probable	Länttä	540	0,93	2012
	Syväjärvi	1 480	1,19	2012
	Rapasaari	1 750	1,09	2012
	Outovesi	250	1,20	
Proven and Probable		4 490	1,10	



The Ore Reserves (JORC JORC 2012) Markku Meriläinen (MAusIMM) and Pekka Lovén (MAusIMM (CP) Outotec Finland Oy. Ore Reserves are included in the Mineral Resources presented earlier.

Ore Reserves are sufficient for 16 years of production in a 6,000 tpa lithium carbonate scenario, and for more than 10 years in evaluated scenarios with increased capacity.

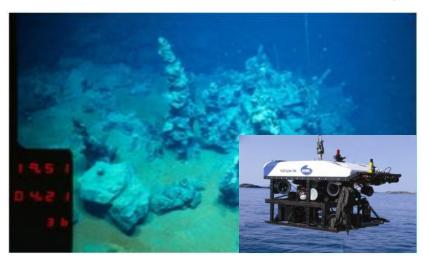
# Nordic Mining Group

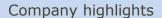




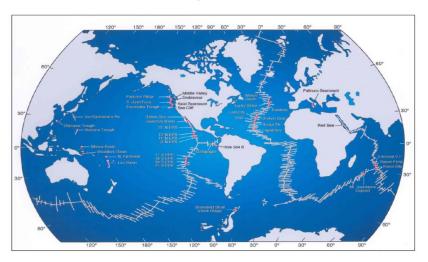
# **NORDIC OCEAN** NORDIC ULEHII RESOURCES AS (80%)

# Pioneer in seabed mineral exploration in Norway





- Nordic Ocean Resources (NORA) has taken a pioneering initiative for exploration of Norway's seabed mineral resources
- NORA has established in-house competence and excellent network with national and international companies and institutions
- NORA has participated in a pre-project for the first estimation of possible mineral resources in the Norwegian Economic Zone (EEZ)



## Company highlights

- NORA has applied for exploration licenses in the Norwegian Economic Zone, and has ambition to be the first company exploring for seabed minerals in Norway
- NORA participates in the MARMINE project having received NOK 25 mill. in grants from the Norwegian Research Council
- The MARMINE project will follow up the pre-project and contribute to the knowledge base for seabed mineral resources

Leveraging Norway's subsea technology

# Investment highlights

## Significant value potential

Sum of the project NPVs @ USD 550 million\*
 vs. market cap. below USD 30 million

## Titanium - Natural Rutile

- World class rutile deposit;
   50 years mine life and highest global TiO<sub>2</sub> grade
- Favourable location and logistics; competitive Capex/Opex
- Environmental permit for 50 years operation (zoning plan and discharge permit)

## High Purity Quartz

JORC compliant resource in green-tech mineral

## Lithium

- JORC classified ore reserves in the proven and probable categories; 4.5 million tonnes at an average grade of 1.10% Li<sub>2</sub>O
- Pre Feasibility Study scheduled in March 2016; expected to outline a profitable project



Titanium - Natural Rutile



High Purity Quartz



Lithium



Platinum, Palladium



Seabed minerals



