



# Building An Integrated Global Rare Earth Supply Business



**GREENLAND  
MINERALS LTD**



This presentation contains only a brief overview of Greenland Minerals and Energy Ltd (Greenland Minerals) and its respective activities and operations. The contents of this presentation may rely on various assumptions and subjective interpretations which are not possible to detail in this presentation and which have not been subject to any independent verification.

This presentation contains a number of forward looking statements. Known and unknown risks and uncertainties, as well as factors outside of Greenland Minerals' control, may cause the actual results, performance and achievements of Greenland Minerals to differ materially from those expressed or implied in this presentation.

To the maximum extent permitted by law, Greenland Minerals and its officers, employees and advisers are not liable for any loss or damage (including, without limitation, any direct, indirect or consequential loss or damage) suffered by any person directly or indirectly as a result of relying on this presentation or otherwise in connection with it.

The information contained in this presentation is not a substitute for detailed investigation or analysis of any particular issue and has been prepared without consideration of your objectives and needs and financial position. Current and potential investors and shareholders should seek independent advice before making any investment decision in regard to Greenland Minerals or its activities.

## **JORC Code (2012) Competent Person Statement – Mineral Resources and Ore Reserves**

*The information in this report that relates to Mineral Resources is based on information compiled by Mr Robin Simpson, a Competent Person who is a Member of the Australian Institute of Geoscientists. Mr Simpson is employed by SRK Consulting (UK) Ltd ("SRK"), and was engaged by Greenland Minerals and Energy Ltd on the basis of SRK's normal professional daily rates. SRK has no beneficial interest in the outcome of the technical assessment being capable of affecting its independence. Mr Simpson has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Robin Simpson consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.*

*The information in the statement that relates to the Ore Reserves Estimate is based on work completed or accepted by Mr Damien Krebs of Greenland Minerals and Energy Ltd and Mr Scott McEwing of SRK Consulting (Australasia) Pty Ltd.*

*Damien Krebs is a Member of The Australasian Institute of Mining and Metallurgy and has sufficient experience that is relevant to the type of metallurgy and scale of project under consideration, and to the activity he is undertaking, to qualify as Competent Persons in terms of The Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code, 2012 edition). The Competent Persons consent to the inclusion of such information in this report in the form and context in which it appears.*

*Scott McEwing is a Fellow and Chartered Professional of The Australasian Institute of Mining and Metallurgy and has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration, and to the activity he is undertaking, to qualify as Competent Persons in terms of The Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code, 2012 edition). The Competent Persons consent to the inclusion of such information in this report in the form and context in which it appears.*

The mineral resource estimate for the Kvanefjeld Project was updated and released in a Company Announcement on February 12<sup>th</sup>, 2015. The ore reserves estimate was released in a Company Announcement on June 3<sup>rd</sup>, 2015. There have been no material changes to the mineral resource estimate, or ore reserves estimate since the release of these announcements.

This presentation is authorised for release by the Board of Greenland Minerals Ltd

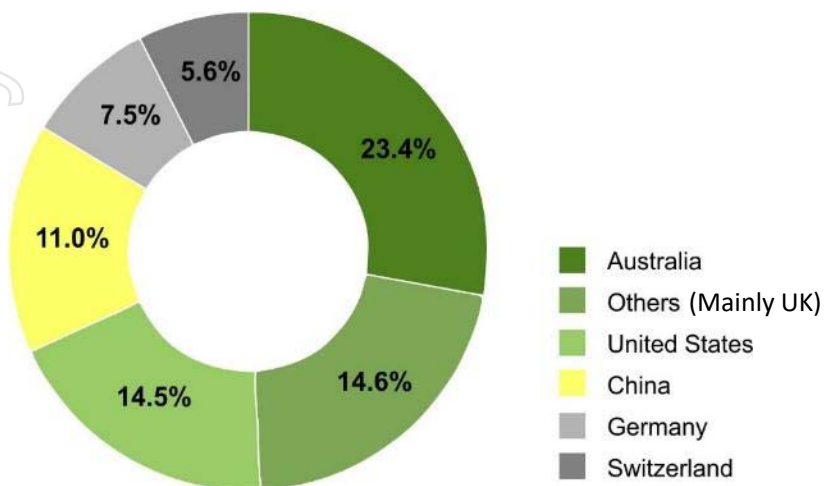


- **World-Class Asset:** Establishing an integrated global rare earth supply business through the development of the Company's 100% owned, world-class Kvanefjeld Rare Earth Project – the largest code compliant undeveloped rare earth deposit globally.
- **Rare Earths are Critical to Electrification:** EV's and wind turbines require rare earth magnets (Nd, Pr, Tb, Dy).
- **Unprecedented Demand Growth Expected for Rare Earths:** Demand for rare earths set for major growth estimated at ~9% CAGR over next 10 years against a backdrop of constrained supply providing the optimal development window.
- **Strategic Shareholder Base:** Shareholder and major rare earth international specialists Shenghe Resources provide strong technical support and value chain connectivity. Shenghe has recently played a central role in the restart of the Mountain Pass rare earth mine located in United States, the only operating rare earth mine in North America.
- **Extensive In-Country Experience:** Operating in Greenland for over 12 years with extensive technical studies, permitting advanced, strong in-country relations, advanced engagement with industry participants and end-users.

# Corporate Snapshot

## International Shareholder Base

CURRENT INVESTOR LOCATIONS



### Board

Non-Executive Chairman	Tony Ho
Managing Director	Dr John Mair
Non-Executive Director	Simon Cato
Non-Executive Director	Xiaolei Guo

### Top Shareholders

Shenghe Resources Holdings	125M shares
Tracor Limited	53M shares

12 MONTH SHARE PRICE PERFORMANCE



### Capital Structure

Shares outstanding	1,197 M
Market capitalization	<b>A\$360M</b> (@30 cents)
52 week low:	\$0.07
52 week high:	\$0.34

### Kvanefjeld Project Ownership - 100%

# Global Organisation

## Access to International Supply Chains

### Greenland

#### Main Greenland office – Nuuk

- Executive General Manager - Jørn Skov Nielsen
- Corporate Social Responsibility – Johannes Kyed

#### Operations base – Narsaq

- On-site Manager – Ib Laursen

### Technical Support

- Shenghe Resources Holding Co Ltd  
Chengdu, China

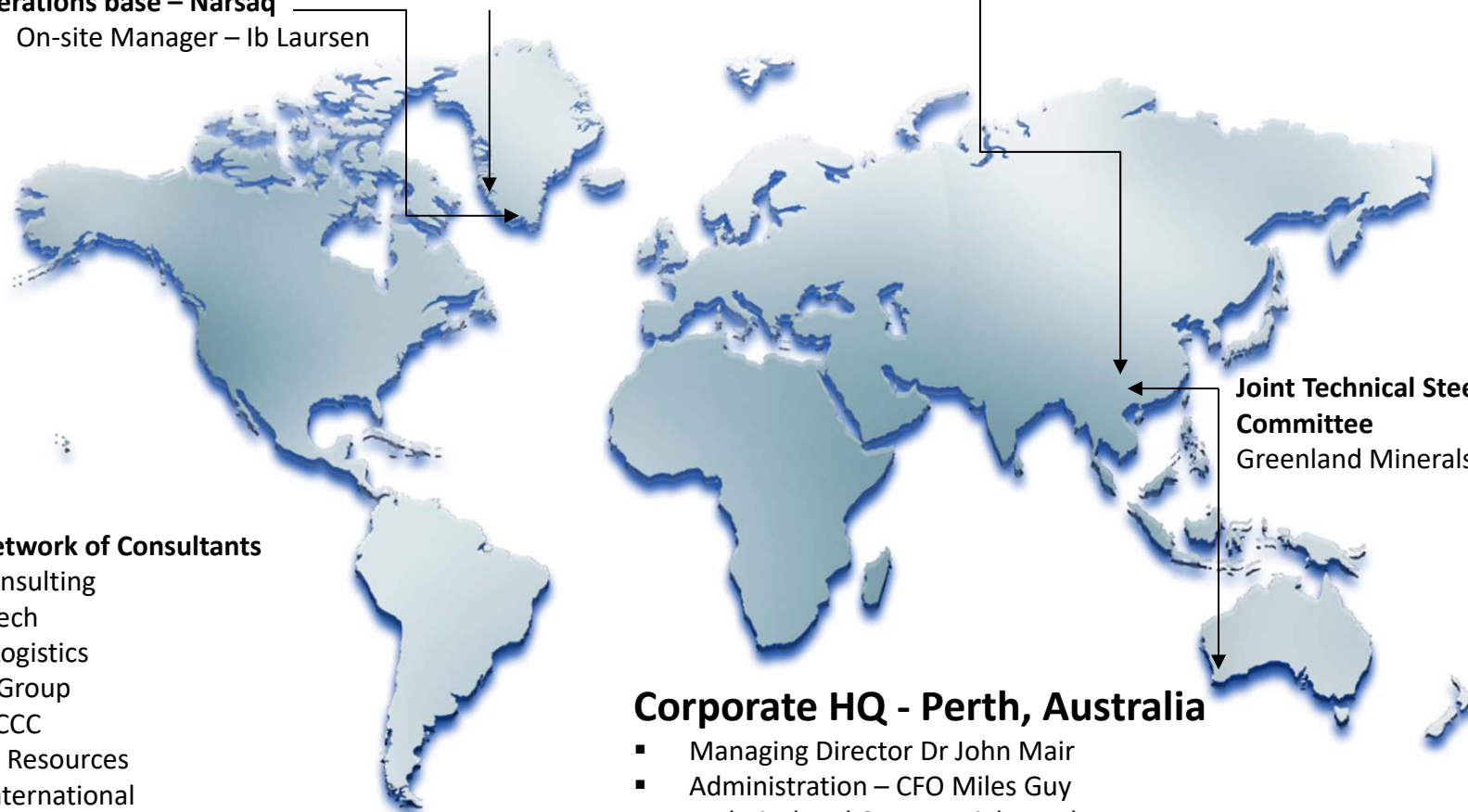
**Joint Technical Steering  
Committee**  
Greenland Minerals - Shenghe

### Corporate HQ - Perth, Australia

- Managing Director Dr John Mair
- Administration – CFO Miles Guy
- Technical and Commercial Development
- EIA, SIA management
- Data Management

### Global Network of Consultants

- SRK Consulting
- Tetra Tech
- Nuna Logistics
- Wood Group
- China-CCC
- Shared Resources
- GHD International
- Kohn Crippen Berger
- Arcadis
- Orbicon





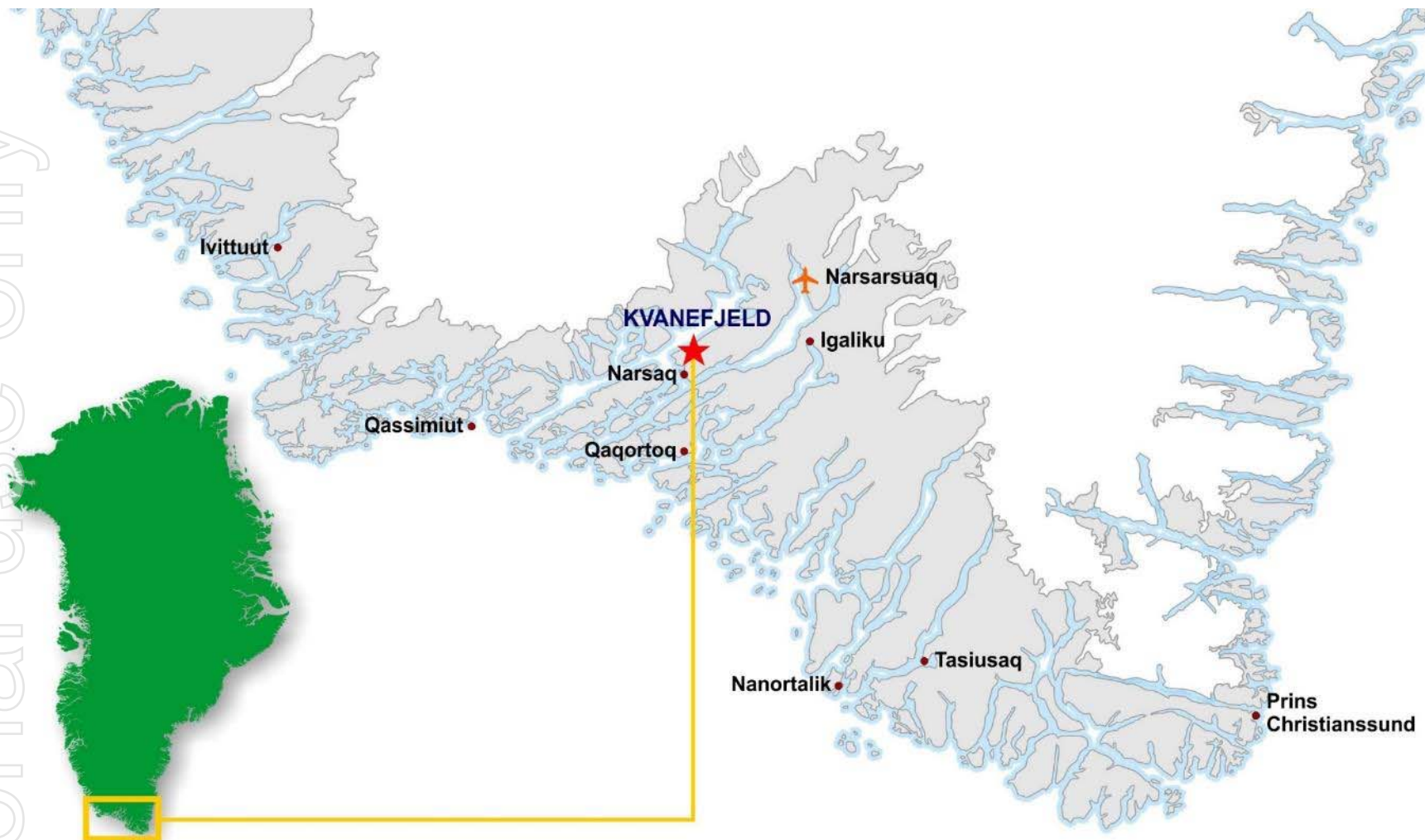
# World-Class Kvanefjeld Project

## Start Point of Major New Rare Earth Supply



- ☐ >1 billion tonne multi-element JORC resource, 108 Mt JORC ore reserve
- ☐ Initial 37 year mine life, scope for significant extension, expansion
- ☐ Close to existing infrastructure with year-round direct shipping access
- ☐ Simple configuration and processing, low technical risk
- ☐ Globally significant supplier of **Nd, Pr, Dy, Tb**, with U, Zn by-product credits
- ☐ Highly competitive economic metrics – long life, lowest cost quartile production
- ☐ Optimised by sector leader and major shareholder Shenghe Resources

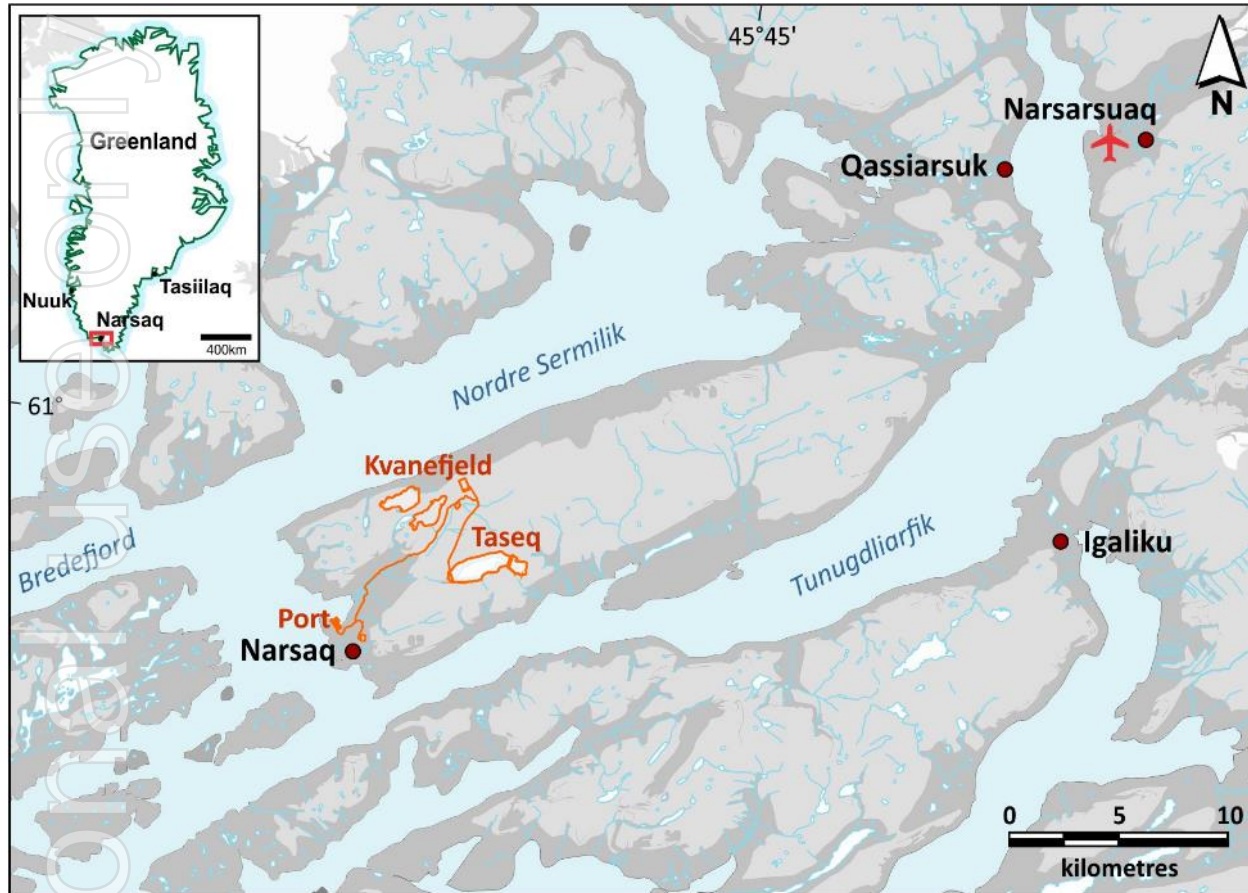
# Kvanefjeld Project Setting – Southern Greenland








**Kvanefjeld** is located near existing infrastructure in southern Greenland, with year-round direct shipping access, airport nearby, and a mild climate; an optimal location

# Kvanefjeld Project – Location and Access

## Deep water fjords provide direct shipping access



-  Narsarsuaq international airport is located 35km away, 4h 15m flight from Copenhagen
-  Project area features year-round direct shipping access, via deep water fjords that lead directly to the North Atlantic Ocean
-  Climatically – mildest part of Greenland with average temperate ranging from -2 to +10°C
-  Narsaq town, located approximately 8-10km from project area
-  Mining has taken place in southern Greenland for over 100 years: aluminium (cryolite), gold, base metal



# Kvanefjeld Project Setting – Narsaq Valley

- Direct shipping access to a world class ore body provides a major logistical advantage
- New industry and economic growth important to southern Greenland municipality

## Project Components:

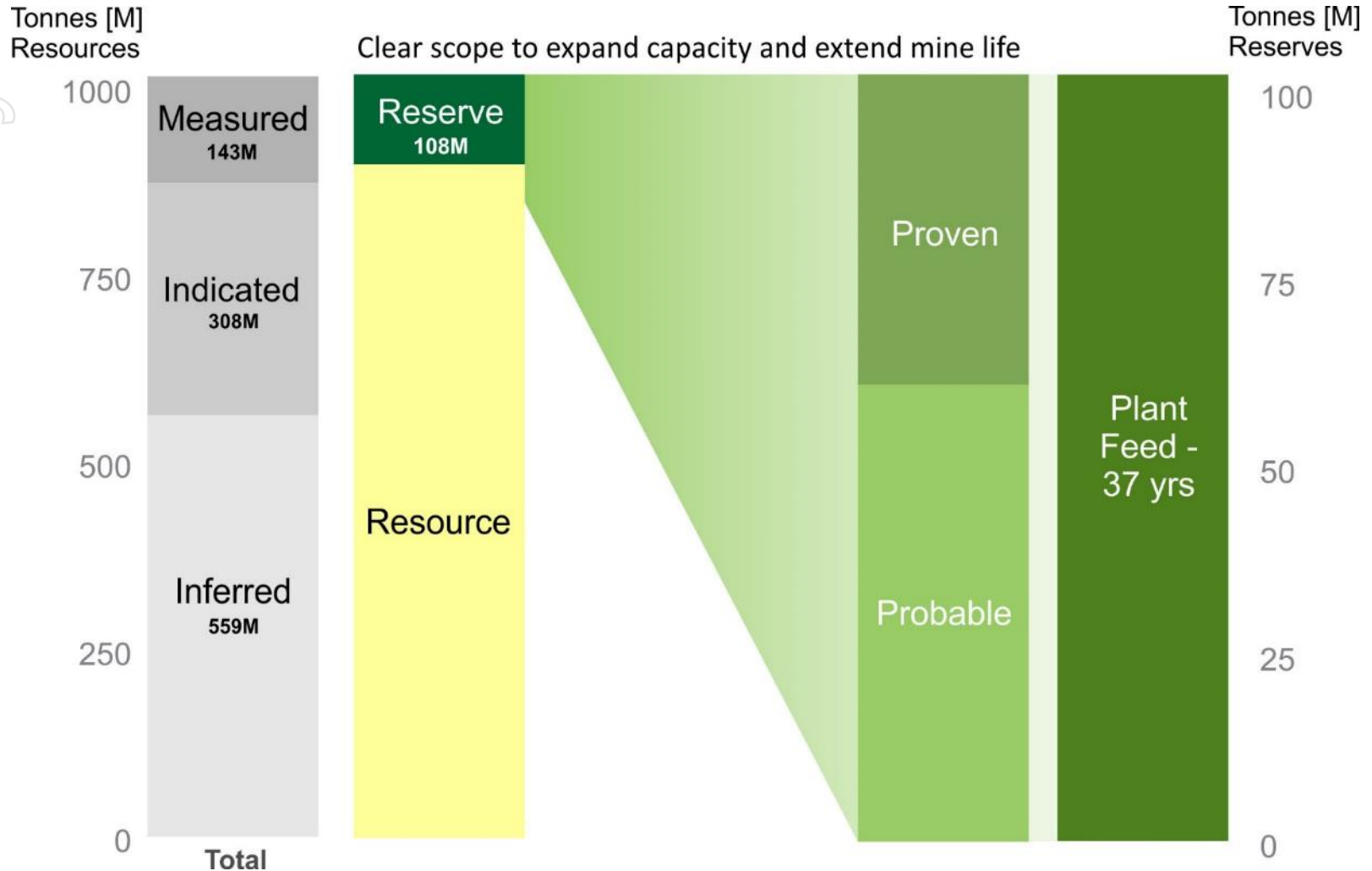
- Mine and concentrator (flotation circuit): REE mineral con, zinc con, fluorspar
- Atmospheric acid leach circuit & impurity removal: intermediate REE product, U by-product

**Kvanefjeld Plateau**  
(670 Mt Resource, 108 Mt Reserve)



# Vast Mineral Inventory

> 11Mt REO, 590Mlb's  $U_3O_8$ , 2.4Blb's Zn

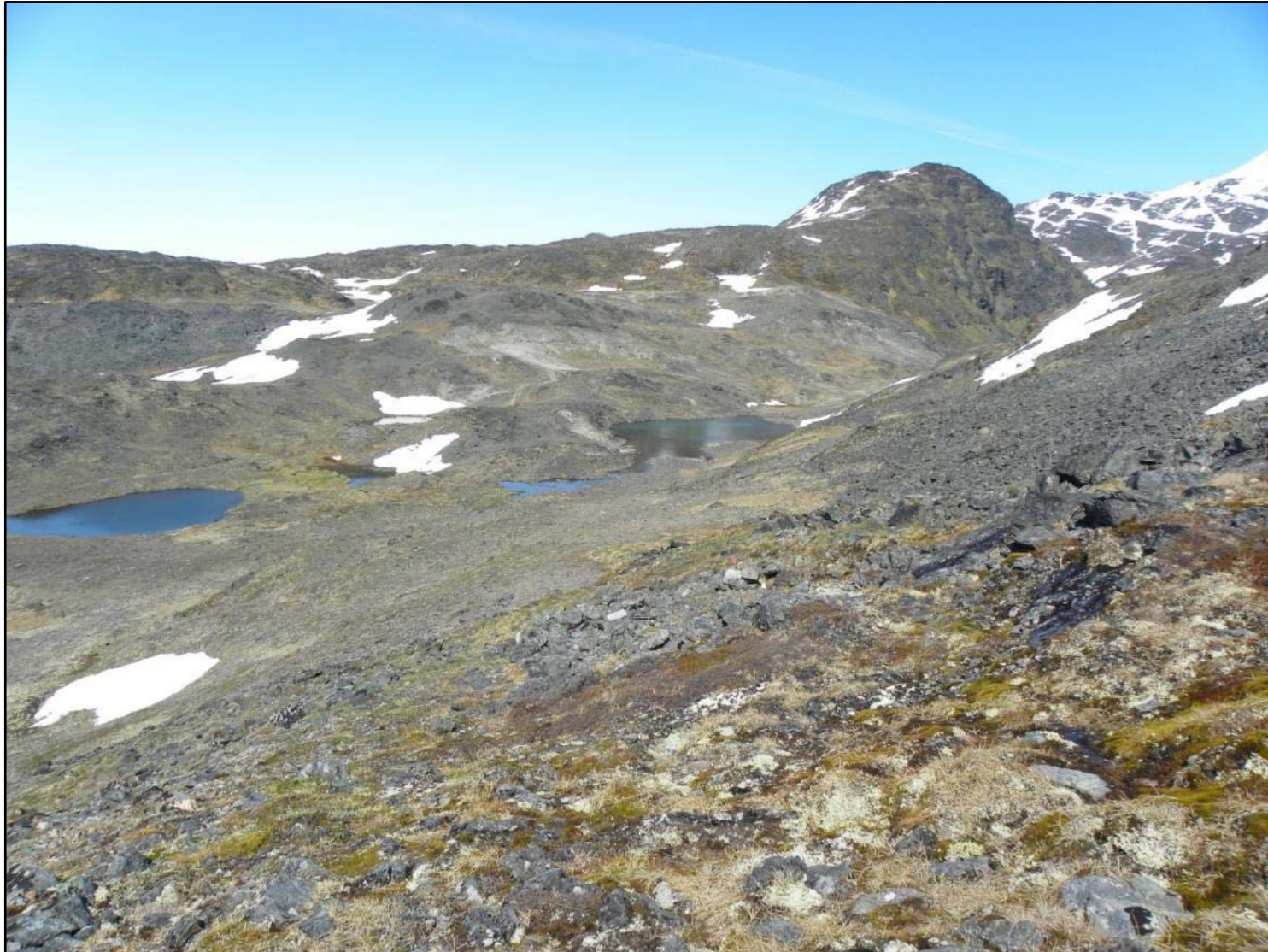


Mineral Resource Estimates and Ore Reserve Estimates are independently established by SRK Consulting  
Total resources across three zones: Kvanefjeld, Sørensen, Zone 3



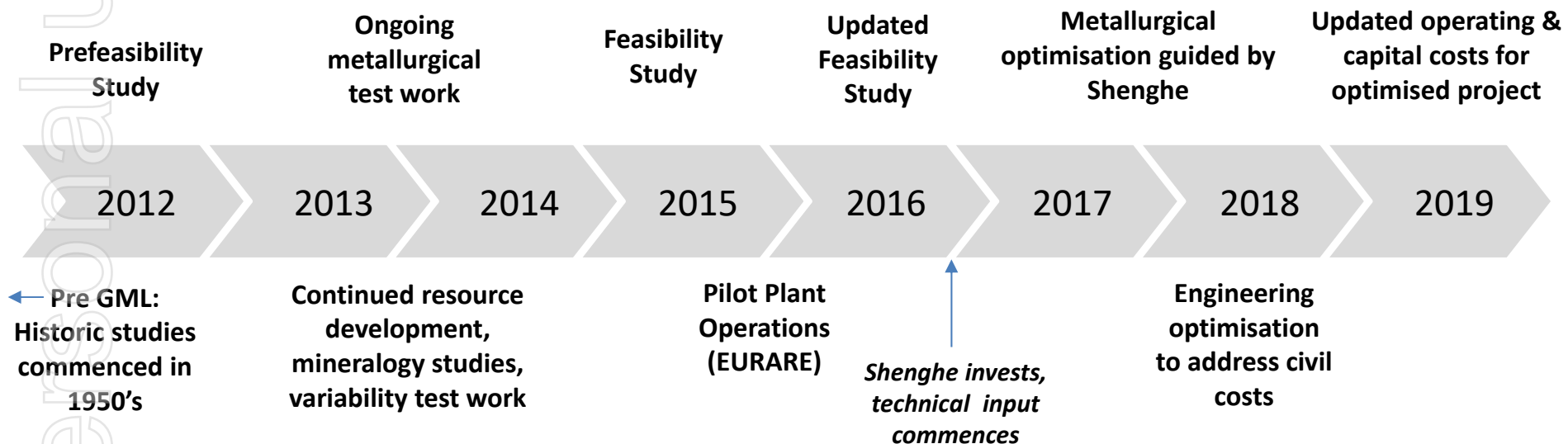
## Kvanefjeld Plateau – Mine Area

- Outcropping lujavrite (RE host rock) occurs throughout a broad natural bowl on the plateau
- <1:1 strip ratio over 37 years, quarry style operation progressing to open pit



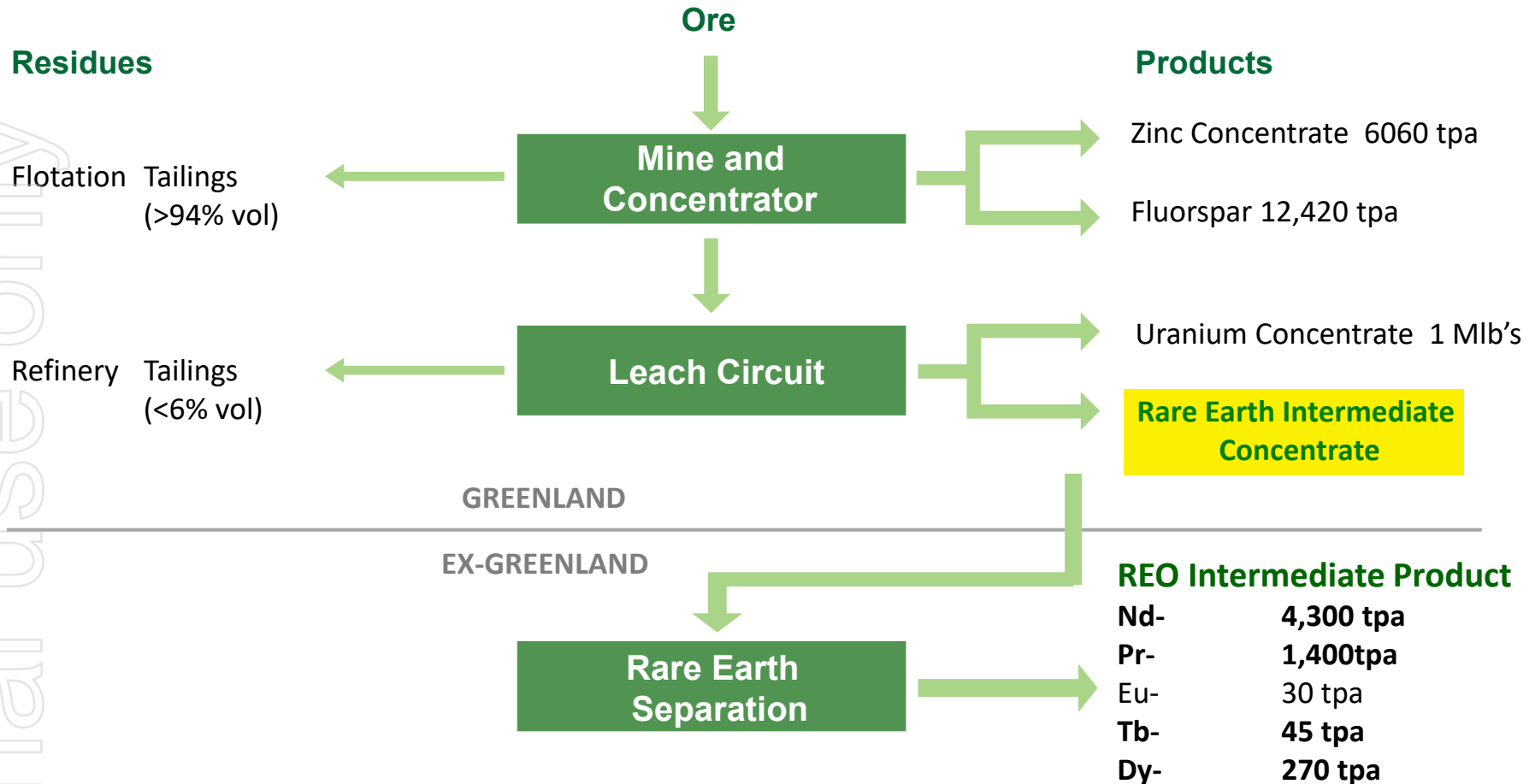
# Advanced Project Status

## Extensive Technical Development





# Process Flowsheet – Simple, Customised



Classification (JORC 2012)	Inventory (Mt)	REO (ppm)	U <sub>3</sub> O <sub>8</sub> (ppm)	Zn (ppm)
Proven	43	14,700	352	2,700
Probable	64	14,000	368	2,500
<b>Total</b>	<b>108</b>	<b>14,300</b>	<b>362</b>	<b>2,600</b>

**37 Year Mine Reserves at Kvanefjeld Deposit**  
(~10% of project resource base)

**JORC 2012: 1.01 Bt through 3 deposits contains**  
**11.13 Mt REO, 593 Mlbs U<sub>3</sub>O<sub>8</sub>, 2.42 Mt zinc**

# Optimised Feasibility Study 2019 Highlights Project Strengths



Capital costs reduced to US\$505M (inclusive of 15% contingency on direct and indirect costs)



Rare earth production of 32,100t/a REO in intermediate product



Inclusive of **5,692 t NdPr** oxide, **270 t Dy** oxide, **44t Tb** oxide



Initial 37 year mine life based on 108 Mt ore reserve

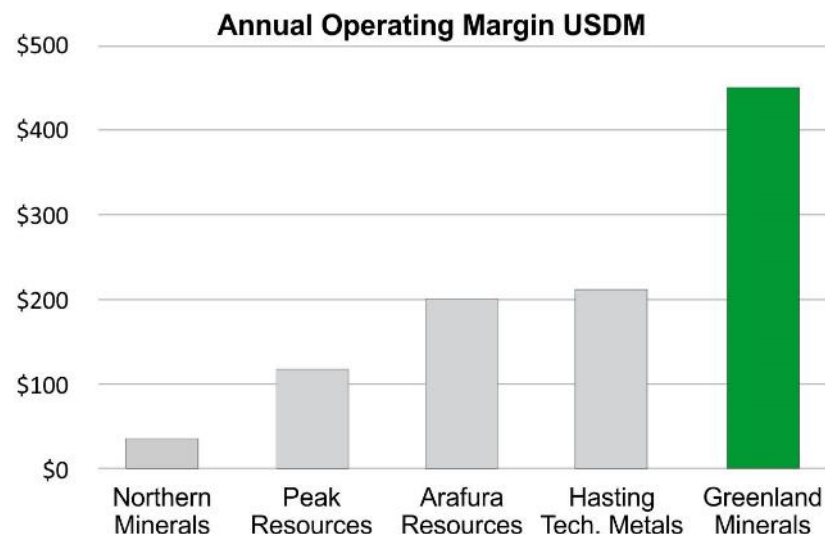
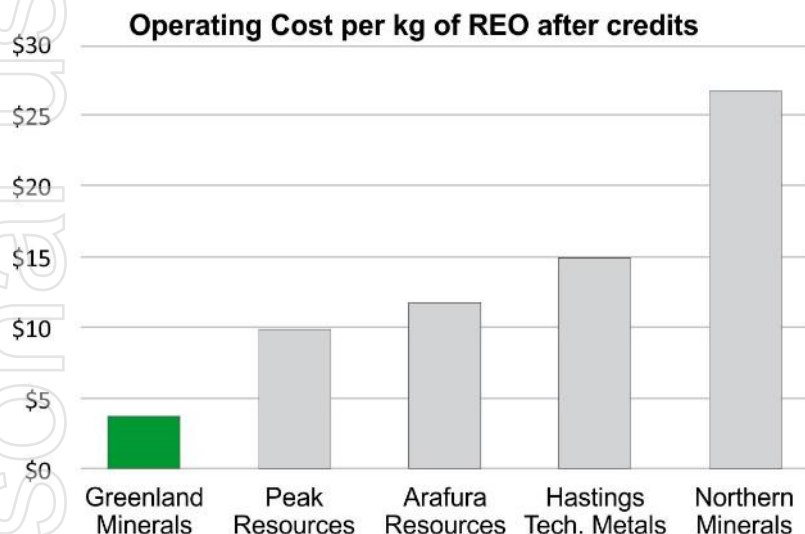
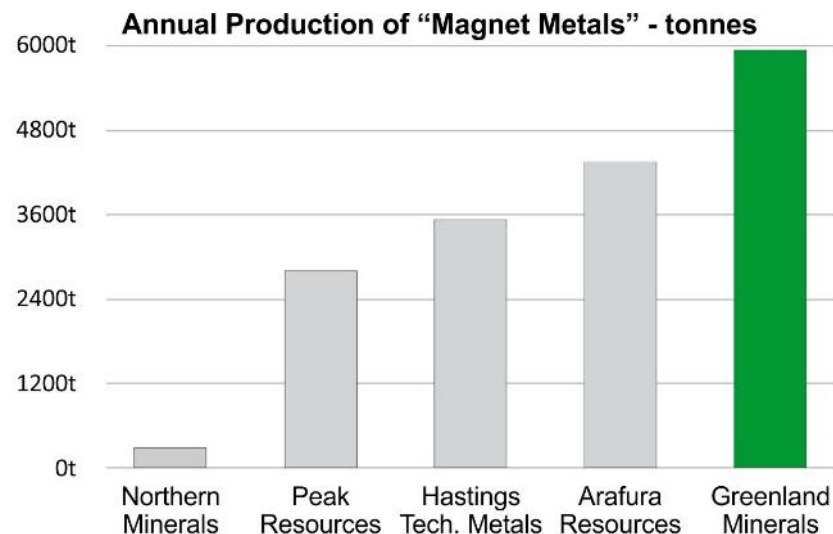
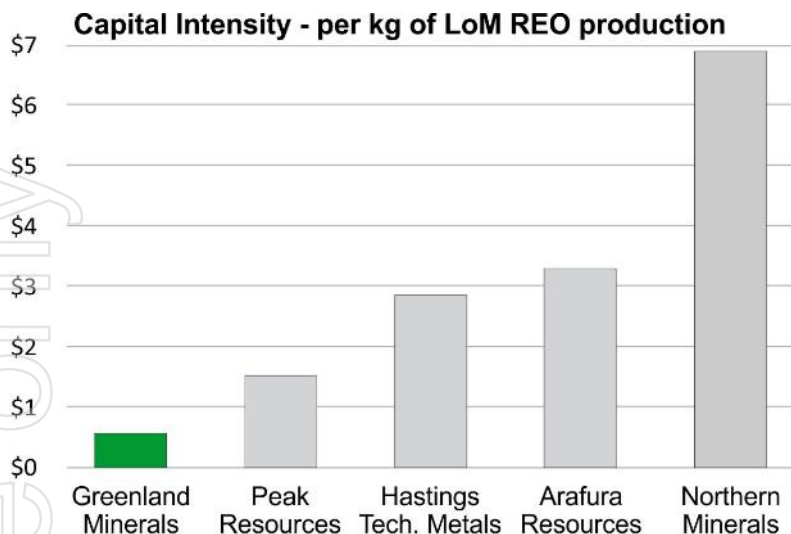


Simplest flow sheet of emerging RE projects – low technical risk



**Lowest operating costs** and **capital intensity** of emerging RE projects

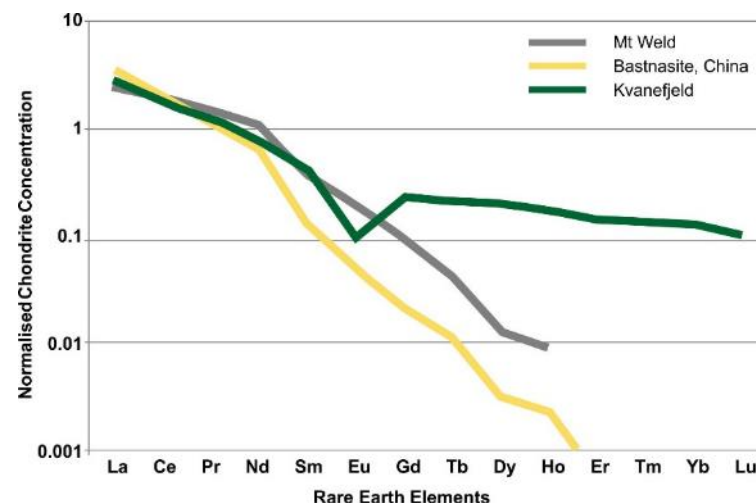
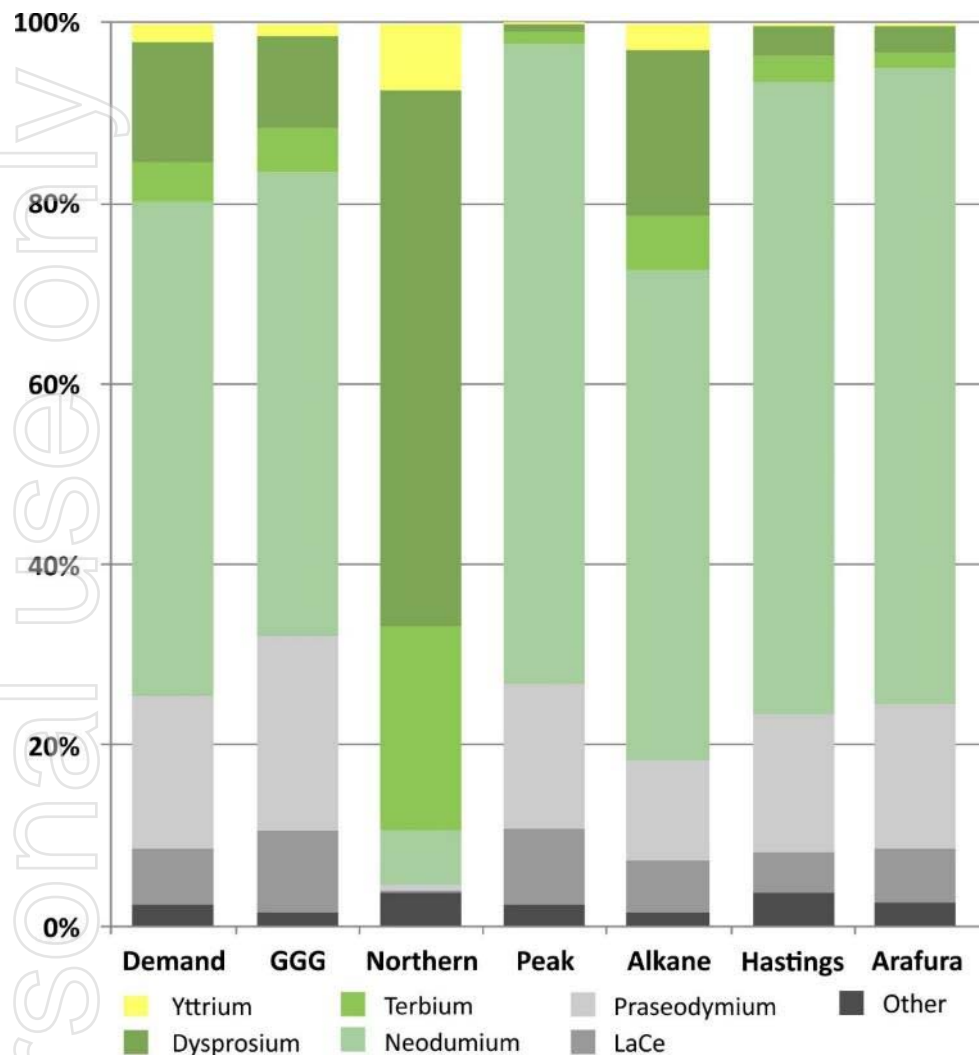
# A Sector Leading Development Opportunity



\* Consistent price forecasts used for all projects

# Kvanefjeld – A Complete Rare Earth Project

## Exposure To All Key Magnet RE's - Nd Pr Dy Tb



Source: ANSTO

Rare earth plot highlighting the enrichment across the rare earth spectrum. Kvanefjeld is compared to Mt Weld, and typical bastnasite (Mt Pass).

Kvanefjeld's enrichment across the RE spectrum creates a strong alignment with RE market, through exposure to Nd, Pr, Dy and Tb: a complete RE project.

Demand approximates the current rare earth market by value (volume x current price).  
Projected output value distribution of select ASX-listed companies



# Rare Earth Value Chain Integration – Path to Market



- Shenghe Chairman Mr Hu Zesong presented at the 2019 Confederation of Danish Industry's Greenland Conference
- GML – Shenghe updated Greenland, Danish governments on project status and development strategy
- With technical optimisation complete – focus on commercial development – Europe strategy



# European Industry – A Growing RE Demand Centre

## Actively Engaging Organisations and Industry

- Rare earths are critical to Europe's green industrial sector (EV's, wind turbines)
- European Commission launched the **European Raw Materials Alliance** in September 2020
- Greenland Minerals ideally placed to provide secure, stable supply of all critical magnet rare earths for European industry

### Company actively engaging:

- **Global Rare Earth Industry Association (REIA)** – funded by EIT Raw Materials GmbH
- **European Raw Materials Alliance** – develop resilient value chains for EU industry
- **European Rare Earth Resources** – focused on technical aspects of RE value chain



Kvanefjeld plateau

## Project Permitting - Review phase complete

### ✓ **Social Impact Assessment**

Reviewed, updated and accepted for public consultation

### ✓ **Environmental Impact Assessment**

EIA reviewed, accepted for public consultation: project meets Greenland guidelines & international standards, principles of Best Available Technology, Best Environmental Practice

## Thorough and rigorous approach to impact assessments:

### **Environmental Impact Assessment**

GHD (International), Orbicon (Denmark/Greenland), KCB, Arcadis, Danish Hydraulic Institute, Environmental Resource Management, DTU, Blue Water Shipping, Wood Group, **Shared Resources**: Overseen 2020 update

### **Social Impact Assessment**

**Shared Resources** (International), NIRAS (Denmark)

# Actionable Development Path Forward for 2021



- ☐ Major milestone – September 2020, EIA technical reviews complete; green light
- ☐ Project to be presented for public consultation – late 2020 to early 2021, with follow-up white paper to be completed in Q2 2021 [precursors to mining license]
- ☐ Commercial development, marketing and off-take
- ☐ Engagement of end-user industries – collaborators, strategic partnerships
- ☐ Down-stream processing strategy
- ☐ Conversion of optimised feasibility to DFS level



# Strong Foundation Set for Development Success

## Well-Positioned to Become An Integrated Global RE Supplier



- ☐ >1 billion tonne multi-element resource, largest REO inventory under JORC code
- ☐ Project optimised in conjunction with major shareholder and industry leader
- ☐ Highly efficient processing, lowest cost quartile production costs
- ☐ Regulatory framework in legislated by Greenland and Danish governments
- ☐ Permitting advanced, EIA & SIA reviews completed
- ☐ Developing a downstream processing strategy with Shenghe Resources
- ☐ Well-positioned for upcoming development window to meet RE demand surge

# Appendix



# Unprecedented Demand Growth for Magnet Rare Earths

## Legislation Driving Transition to EV's, Renewable Energy

**Step change in global trends will drive a major increase in demand for magnet RE's**

**Growth forecast across all categories (EV's, wind power, consumer appliances, electronics)**

**Increasing shift from hybrid EV's to battery EV's drive further NdFeB demand as greater use of RE-magnets in battery EV's (more Nd, Pr, Tb, Dy/vehicle)**

**Overall – to 2030 demand for magnet RE's (Nd, Pr, Tb, Dy) to increase by >150% requiring a 2x increase in global production to keep up**

**With limited new supply, and major Chinese producers expected to absorb greater costs, pricing of key magnet metals expected to rise steadily through the decade**

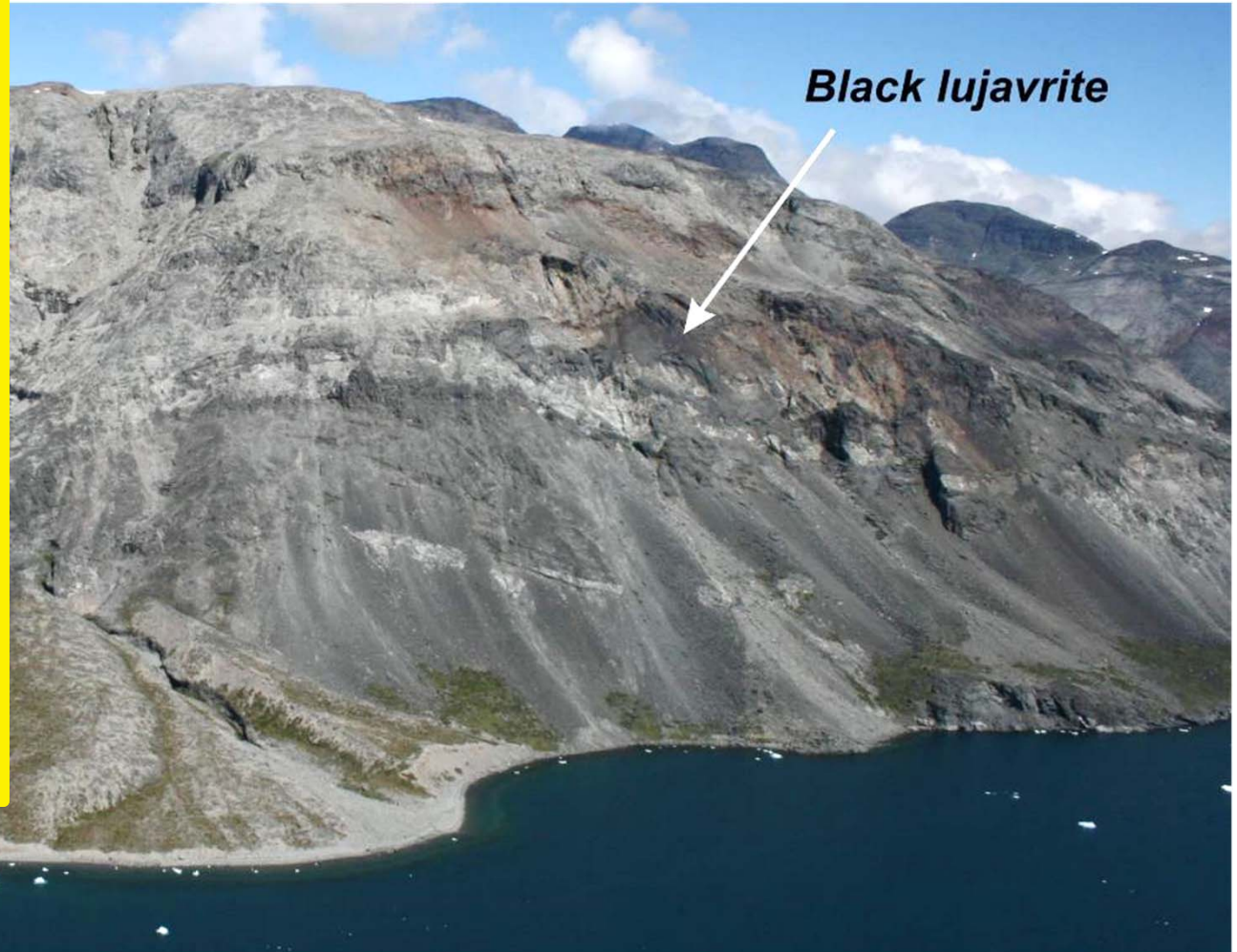
**Excellent development window for Kvanefjeld – a globally significant, cost-competitive supplier of all key magnet metals – Nd, Pr, Tb, Dy**



## Centred on a Multi-Billion Tonne Outcropping Ore Seam

The only known bulk occurrence of steenstrupine globally – a unique, non-refractory rare earth mineral, that is conducive to simple, low-cost processing, without complex mineral cracking.

Kvanefjeld will be a step change in global rare earth supply





# Statement of Identified Mineral Resources (JORC – Code Compliant 2012)

Multi-Element Resources Classification, Tonnage and Grade										Contained Metal				
Cut-off	Classification	M tonnes	TREO <sup>2</sup>	U <sub>3</sub> O <sub>8</sub>	LREO	HREO	REO	Y <sub>2</sub> O <sub>3</sub>	Zn	TREO	HREO	Y <sub>2</sub> O <sub>3</sub>	U <sub>3</sub> O <sub>8</sub>	Zn
(U <sub>3</sub> O <sub>8</sub> ppm) <sup>1</sup>		Mt	ppm	ppm	ppm	ppm	ppm	ppm	ppm	Mt	Mt	Mt	M lbs	Mt
Kvanefjeld - February 2015														
150	Measured	143	12,100	303	10,700	432	11,100	978	2,370	1.72	0.06	0.14	95	0.34
150	Indicated	308	11,100	253	9,800	411	10,200	899	2,290	3.42	0.13	0.28	172	0.71
150	Inferred	222	10,000	205	8,800	365	9,200	793	2,180	2.22	0.08	0.18	100	0.48
150	Grand Total	673	10,900	248	9,600	400	10,000	881	2,270	7.34	0.27	0.59	368	1.53
200	Measured	111	12,900	341	11,400	454	11,800	1,048	2,460	1.43	0.05	0.12	83	0.27
200	Indicated	172	12,300	318	10,900	416	11,300	970	2,510	2.11	0.07	0.17	120	0.43
200	Inferred	86	10,900	256	9,700	339	10,000	804	2,500	0.94	0.03	0.07	49	0.22
200	Grand Total	368	12,100	310	10,700	409	11,200	955	2,490	4.46	0.15	0.35	252	0.92
250	Measured	93	13,300	363	11,800	474	12,200	1,105	2,480	1.24	0.04	0.10	75	0.23
250	Indicated	134	12,800	345	11,300	437	11,700	1,027	2,520	1.72	0.06	0.14	102	0.34
250	Inferred	34	12,000	306	10,800	356	11,100	869	2,650	0.41	0.01	0.03	23	0.09
250	Grand Total	261	12,900	346	11,400	440	11,800	1,034	2,520	3.37	0.11	0.27	199	0.66
300	Measured	78	13,700	379	12,000	493	12,500	1,153	2,500	1.07	0.04	0.09	65	0.20
300	Indicated	100	13,300	368	11,700	465	12,200	1,095	2,540	1.34	0.05	0.11	82	0.26
300	Inferred	15	13,200	353	11,800	391	12,200	955	2,620	0.20	0.01	0.01	12	0.04
300	Grand Total	194	13,400	371	11,900	471	12,300	1,107	2,530	2.60	0.09	0.21	159	0.49
350	Measured	54	14,100	403	12,400	518	12,900	1,219	2,550	0.76	0.03	0.07	48	0.14
350	Indicated	63	13,900	394	12,200	505	12,700	1,191	2,580	0.87	0.03	0.07	54	0.16
350	Inferred	6	13,900	392	12,500	424	12,900	1,037	2,650	0.09	0.00	0.01	6	0.02
350	Grand Total	122	14,000	398	12,300	506	12,800	1,195	2,570	1.71	0.06	0.15	107	0.31

# Statement of Identified Mineral Resources (JORC – Code Compliant 2012)

Multi-Element Resources Classification, Tonnage and Grade										Contained Metal				
Cut-off (U <sub>3</sub> O <sub>8</sub> ppm) <sup>1</sup>	Classification	M tonnes Mt	TREO <sup>2</sup> ppm	U <sub>3</sub> O <sub>8</sub> ppm	LREO ppm	HREO ppm	REO ppm	Y <sub>2</sub> O <sub>3</sub> ppm	Zn ppm	TREO Mt	HREO Mt	Y <sub>2</sub> O <sub>3</sub> Mt	U <sub>3</sub> O <sub>8</sub> M lbs	Zn Mt
<b>Sørensen - March 2012</b>														
150	Inferred	242	11,000	304	9,700	398	10,100	895	2,602	<b>2.67</b>	0.10	0.22	<b>162</b>	0.63
200	Inferred	186	11,600	344	10,200	399	10,600	932	2,802	<b>2.15</b>	0.07	0.17	<b>141</b>	0.52
250	Inferred	148	11,800	375	10,500	407	10,900	961	2,932	<b>1.75</b>	0.06	0.14	<b>123</b>	0.43
300	Inferred	119	12,100	400	10,700	414	11,100	983	3,023	<b>1.44</b>	0.05	0.12	<b>105</b>	0.36
350	Inferred	92	12,400	422	11,000	422	11,400	1,004	3,080	<b>1.14</b>	0.04	0.09	<b>85</b>	0.28
<b>Zone 3 - May 2012</b>														
150	Inferred	95	11,600	300	10,200	396	10,600	971	2,768	<b>1.11</b>	0.04	0.09	<b>63</b>	0.26
200	Inferred	89	11,700	310	10,300	400	10,700	989	2,806	<b>1.03</b>	0.04	0.09	<b>60</b>	0.25
250	Inferred	71	11,900	330	10,500	410	10,900	1,026	2,902	<b>0.84</b>	0.03	0.07	<b>51</b>	0.20
300	Inferred	47	12,400	358	10,900	433	11,300	1,087	3,008	<b>0.58</b>	0.02	0.05	<b>37</b>	0.14
350	Inferred	24	13,000	392	11,400	471	11,900	1,184	3,043	<b>0.31</b>	0.01	0.03	<b>21</b>	0.07
<b>Project Total</b>														
150	Measured	143	12,100	303	10,700	432	11,100	978	2,370	<b>1.72</b>	0.06	0.14	<b>95</b>	0.34
150	Indicated	308	11,100	253	9,800	411	10,200	899	2,290	<b>3.42</b>	0.13	0.28	<b>172</b>	0.71
150	Inferred	559	10,700	264	9,400	384	9,800	867	2,463	<b>6.00</b>	0.22	0.49	<b>326</b>	1.38
150	<b>Grand Total</b>	<b>1010</b>	<b>11,000</b>	<b>266</b>	<b>9,700</b>	<b>399</b>	<b>10,100</b>	<b>893</b>	<b>2,397</b>	<b>11.14</b>	<b>0.40</b>	<b>0.90</b>	<b>593</b>	<b>2.42</b>

<sup>1</sup>There is greater coverage of assays for uranium than other elements owing to historic spectral assays. U<sub>3</sub>O<sub>8</sub> has therefore been used to define the cutoff grades to maximise the confidence in the resource calculations.

<sup>2</sup>Total Rare Earth Oxide (TREO) refers to the rare earth elements in the lanthanide series plus yttrium.

Note: Figures quoted may not sum due to rounding.