



PLATINA
RESOURCES LIMITED

ASX Code: PGM

Importance of Rare Earths and Scandium In Aerospace Technologies

Robert Mosig Managing Director CEO May 2015

SCANDIUM

21	44.956
2831	1.3
1539	
Sc	
[Ar]3d4s ²	
2.99	3

expecting big demand with
increased uses from a
consistent supply

Cautionary and Forward-Looking Statements

This presentation contains “forward-looking information” which may include, but is not limited to, statements with respect to the future financial or operating performance of Platina Resources Limited (“Platina”), its subsidiaries and its projects, the future price of platinum group metals (“PGM’s”), the estimation of mineral resources, operating and exploration expenditures, costs and timing of development of new deposits, costs and timing of future exploration, requirements for additional capital, government regulation, environmental risks, reclamation expenses, title disputes or claims and limitations of insurance coverage. Often, but not always, forward-looking statements can be identified by the use of words such as “plans”, “expects”, “is expected”, “budget”, “scheduled”, “estimates”, “forecasts”, “intends”, “anticipates”, or “believes” or variations (including negative variations) of such words and phrases, or state that certain actions, events or results “may”, “could”, “would”, “might” or “will” be taken, occur or be achieved. Forward-looking statements involve known and unknown risks, uncertainties and other factors which may cause the actual results, performance or achievements of Platina and/or its subsidiaries to be materially different from any future results, performance or achievements expressed or implied by the forward-looking statements. Such factors include, among others, general business, economic, competitive, political and social uncertainties; the actual results of current exploration activities; conclusions of economic evaluations; changes in project parameters as plans continue to be refined; future prices of PGM’s; possible variations of ore grade or recovery rates; failure of plant, equipment or processes to operate as anticipated; accident, labor disputes and other risks of the mining industry; and delays in obtaining governmental approvals or financing or in the completion of development or construction activities. Although Platina has attempted to identify important factors that could cause actual actions, events or results to differ materially from those described in forward-looking statements, there may be other factors that could cause actions, events or results to differ from those anticipated, estimated or intended. Forward-looking statements contained herein are made as of the date of this presentation and Platina disclaims any obligation to update any forward-looking statements, whether as a result of new information, future events or results or otherwise. There can be no assurance that forward-looking statements will prove to be accurate, as actual results and future events could differ materially from those anticipated in such statements. Platina undertakes no obligation to update forward-looking statements if circumstances or management’s estimates or opinions should change. Accordingly, the reader is cautioned not to place undue reliance on forward-looking statements.

Competent Person’s Statement

The information in this announcement that relates to the Owendale Indicated and Inferred Mineral Resource is extracted from the report entitled ASX Release “PGM Owendale Updated Resource Estimate” created on 3 October 2013 and is available to view on www.platinareources.com.au. The report was issued in accordance with the 2012 Edition of the JORC Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. The Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcement and, in the case of estimates of Mineral Resources, that all material assumptions and technical parameters underpinning the estimates in the relevant market announcement continue to apply and have not materially changed. The Company confirms that the form and context in which the Competent Person’s findings are presented have not been materially modified from the original market announcement.

Issued Capital	
ASX	PGM
Shares	140.9 Million
Options (listed)	82.6 Million
Options (unlisted)	3.5 Million
Share Price (18 Feb)	7.5c
Cash (31 Dec 2014)	\$0.52 Million
Market Capitalisation	\$9 Million

6 Month Price Chart



Major Shareholders	
Electrum Ltd	19.9%
Cairnglen Investments	11.6%
Yandal Investments	5.7%
Sino Portfolio Intl.	5.6%
HSBC Custody Nominees	5.8%
Top 10	56.3%

Directors & Management

Reg Gillard
BA, FAICD, FACPA, JP

**Non-Executive
 Chairman**

Rob Mosig
MSc, FAusIMM, FAICD

Managing Director

Brian Moller
LLB (Hons)

**Non-Executive
 Director**

Mark Dugmore
MSc, MAusIMM, MAIG

Exploration Manager



🌀 **Reg Gillard, Non-Executive Chairman – BA, FAICD, FACPA, JP**

- *Reg has more than 30 years' experience in the formation, governance and financial maintenance of exploration and mining companies throughout the world.*



🌀 **Robert W. Mosig, Managing Director – MSc, FAusIMM, FAICD**

- *Rob is a geologist with more than 30 years' experience in Platinum Group Metals, gold and diamond exploration within Australasia.*



🌀 **Brian Moller, Non-Executive Director – LLB (Hons)**

- *Brian is a corporate partner in the Brisbane-based law firm Hopgood Ganim where he has been a partner since 1983. He practices almost exclusively in the corporate area with an emphasis on capital raising, mergers and acquisitions.*



🌀 **Mark Dugmore, Exploration Manager – MSc, MAusIMM**

- *Mark is a geologist with more than 25 years' experience in gold and base metals exploration within Australia as well as internationally.*



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Getting Electricity From
Solid Oxide Fuel Cell

Enormous growth potential for scandium in 2 key markets

- **Aerospace/Transport**
 - Scandium Aluminium alloys
- **Energy/Electrical**
 - Scandium Stabilised Zirconium in Solid Oxide Fuel Cells (SOFC)

Periodic Table of the Elements

1 1H Hydrogen 1.008	2 He Helium 4.003	3 Li Lithium 6.941	4 Be Beryllium 9.012	5 B Boron 10.811	6 C Carbon 12.011	7 N Nitrogen 14.007	8 O Oxygen 15.999	9 F Fluorine 18.998	10 Ne Neon 20.180	11 Na Sodium 22.990	12 Mg Magnesium 24.305	13 Al Aluminum 26.982	14 Si Silicon 28.086	15 P Phosphorus 30.974	16 S Sulfur 32.06	17 Cl Chlorine 35.45	18 Ar Argon 39.948	19 K Potassium 39.098	20 Ca Calcium 40.078	21 Sc Scandium 44.956	22 Ti Titanium 47.88	23 V Vanadium 50.942	24 Cr Chromium 51.996	25 Mn Manganese 54.938	26 Fe Iron 55.845	27 Co Cobalt 58.933	28 Ni Nickel 58.693	29 Cu Copper 63.546	30 Zn Zinc 65.38	31 Ga Gallium 69.723	32 Ge Germanium 72.64	33 As Arsenic 74.922	34 Se Selenium 78.96	35 Br Bromine 79.904	36 Kr Krypton 83.8	37 Rb Rubidium 85.468	38 Sr Strontium 87.62	39 Y Yttrium 88.906	40 Zr Zirconium 91.224	41 Nb Niobium 92.906	42 Mo Molybdenum 95.94	43 Tc Technetium 98	44 Ru Ruthenium 101.07	45 Rh Rhodium 102.905	46 Pd Palladium 106.42	47 Ag Silver 107.868	48 Cd Cadmium 112.411	49 In Indium 114.818	50 Sn Tin 118.710	51 Sb Antimony 121.757	52 Te Tellurium 127.6	53 I Iodine 126.905	54 Xe Xenon 131.29	55 Cs Cesium 132.905	56 Ba Barium 137.327	57-71 Lanthanide Series	72 Hf Hafnium 178.49	73 Ta Tantalum 180.948	74 W Tungsten 183.84	75 Re Rhenium 186.207	76 Os Osmium 190.23	77 Ir Iridium 192.222	78 Pt Platinum 195.084	79 Au Gold 196.967	80 Hg Mercury 200.59	81 Tl Thallium 204.383	82 Pb Lead 207.2	83 Bi Bismuth 208.980	84 Po Polonium 209	85 At Astatine 210	86 Rn Radon 222	87 Fr Francium 223	88 Ra Radium 226	89-103 Actinide Series	104 Rf Rutherfordium 261	105 Db Dubnium 262	106 Sg Seaborgium 266	107 Bh Bohrium 264	108 Hs Hassium 277	109 Mt Meitnerium 268	110 Ds Darmstadtium 271	111 Rg Roentgenium 272	112 Cn Copernicium 285	113 Nh Nihonium 284	114 Fl Flerovium 289	115 Mc Moscovium 288	116 Lv Livermorium 293	117 Ts Tennessine 294	118 Og Oganesson 294
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Limited reliable supply of Sc, mostly as a by-product, means high prices in a very small 'high-end' market...

🌀 ***Current supply from by-products***

- *Most production as by-product (due to low concentration) from China, Ukraine*
- *No primary mine productionyet!*
- *Owendale laterite high-grade is potential new primary source. Grade is King!*

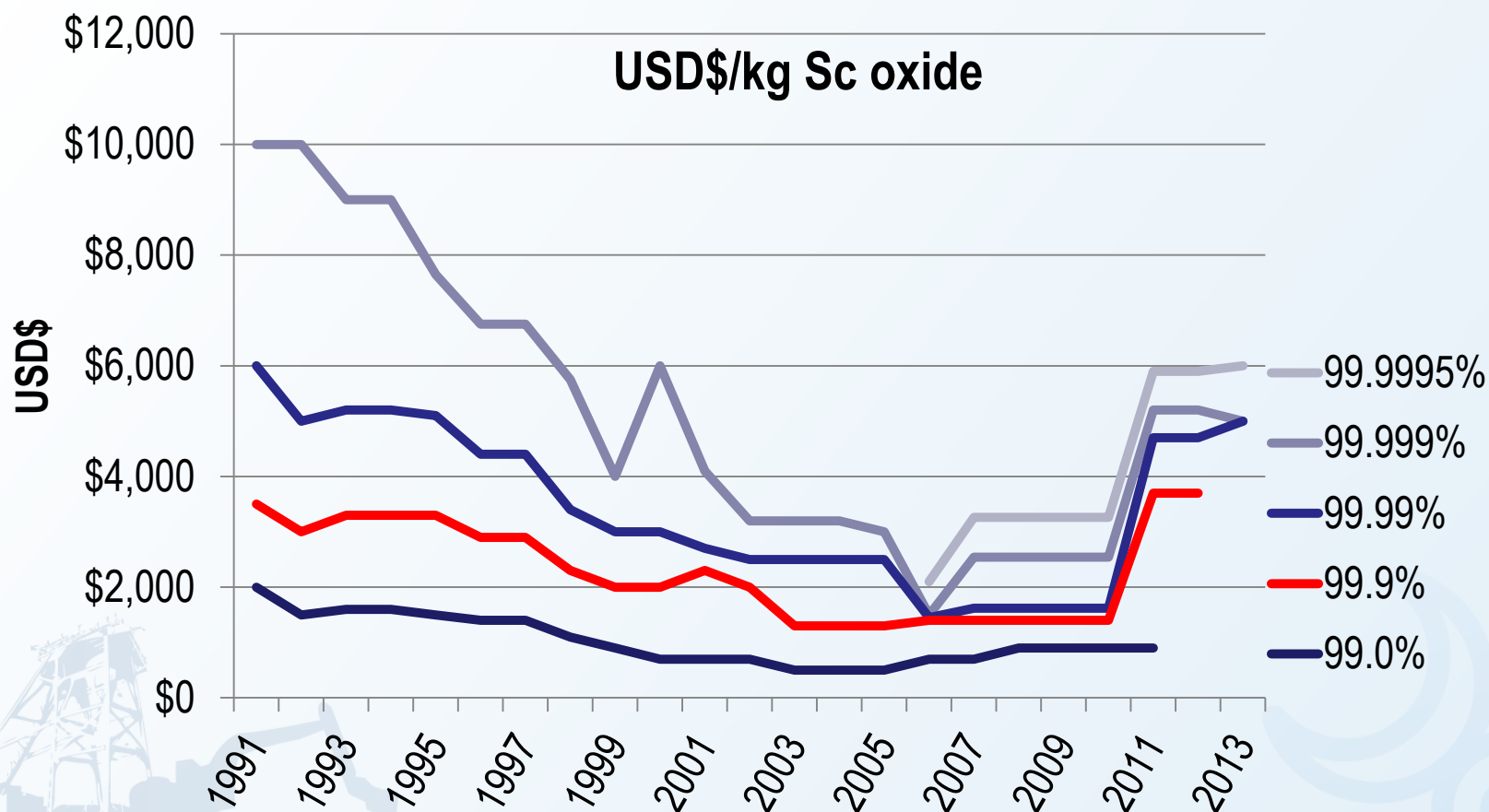
🌀 ***Demand is growing***

- *Sc-Aluminium alloys: aerospace components, sports equipment is leading use of Sc*
- *Electrical/Energy: growing future market for fuel cells (Solid Oxide FC)*
- *Lights: high-power metal halide lamps and lasers*

🌀 ***Price***

- *USGS quotes Sc_2O_3 as US\$3,700/kg for 99.9% purity (2012)*
- *Global scandium consumption ~10-15 tonnes pa*
- *Current high price prevents wider application. Owendale high-grade is key!*

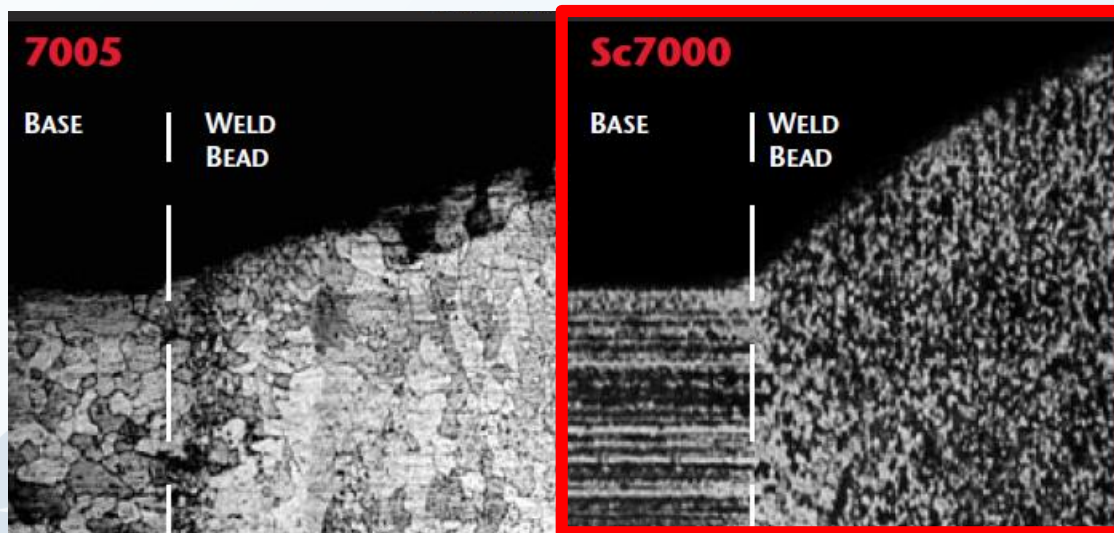
- Owendale, as the largest deposit with the highest Sc grade proposing to use proven conventional , high recoveries technologies will be able to be the price-setter to enable introduction of wider applications at a lower Sc price!*



Source: USGS. PFL Advisors

❧ *Sc-reinforced Al alloys represent new generation of high-performance alloys with advantages over other Al alloys*

- *Stronger (triples strength with as little as 0.5% Sc)*
- *Excellent corrosion resistance*
- *Strengthens welds and excellent weldability*
- *Limits excessive grain growth that occurs in heat-affected zone*
- *Lower density*
- *Reduces aircraft weights by 10-15% and operating costs significantly*



Significant grain refinement strengthens welds and eliminates hot cracks.

Sc dissolves in Al melt simply by reducing Sc_2O_3 directly in the melt.



CURRENT MARKET OUTLOOK (2014 – 2033)



WORLD FLEET TO DOUBLE IN SIZE OVER THE NEXT 20 YEARS
36,770 new airplanes / \$5.2 trillion



NEW AIRPLANES TO BE DELIVERED BY 2033 ▼



20-year demand for 31,358 new passenger and freight aircraft

20-year new deliveries of passenger and freight aircraft



Market Value of
\$4.6
trillion

Passenger aircraft (2-100 seats)
Jet freight aircraft (>10 tons)
Source: Airbus GMP



✪ Enormous growth potential for Sc

• Commercial aerospace

- Boeing & Airbus forecasting up to 36,770 new airplanes by 2033
- Estimate between 70 and 700 kg of Sc oxide is required per plane depending on aircraft size

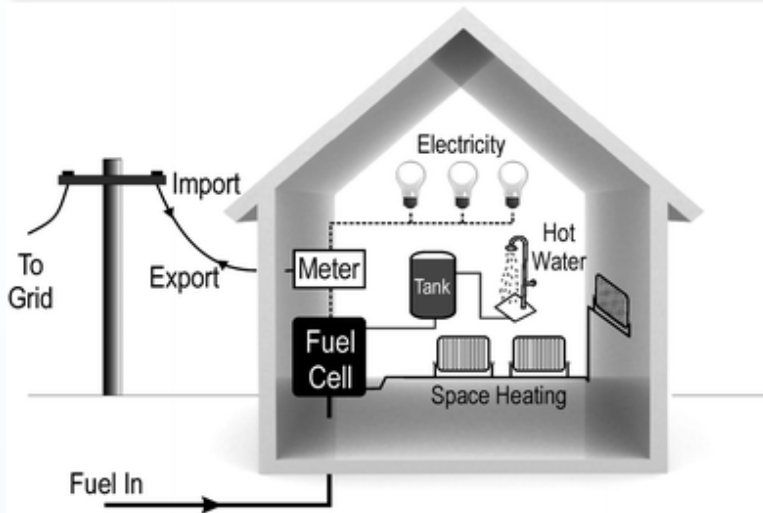
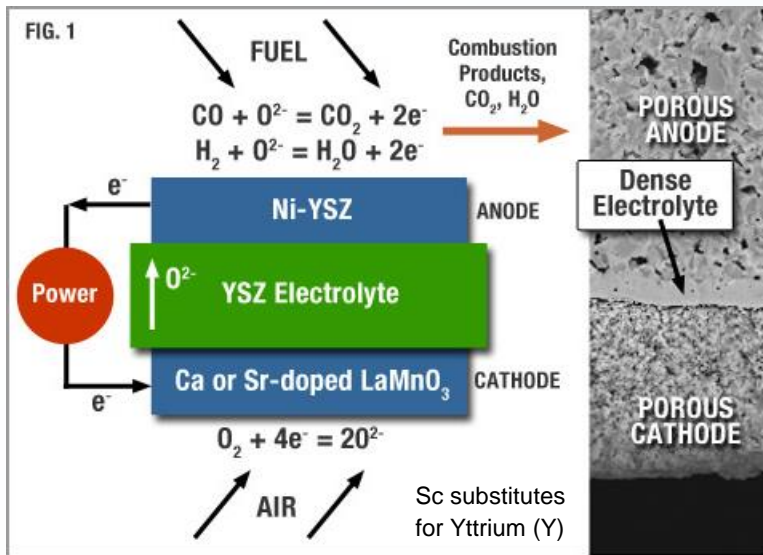
• Military aerospace

- Initial use in Russian aircraft
- Future use promising

• Commercial automotive

- Large potential market

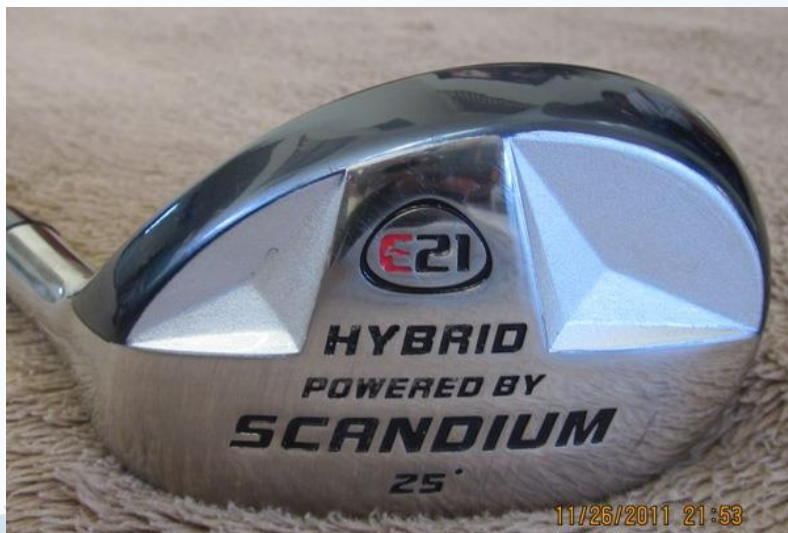
✪ **Potential annual market by 2025 maybe 250 tonnes* of Sc₂O₃**



- **Potential to -**

 - revolutionise the powering of the USA
 - replace the internal combustion engine
- A device that uses hydrogen and oxygen to create electricity
- Offers cleaner, more efficient, fuel-flexible, localised power alternatives
- Sc-stabilised zirconium (SSZ) used by Bloom Energy in electrolyte makes SOFCs more efficient
- Bloom Energy is the market-leading provider of SOFCs and customers include

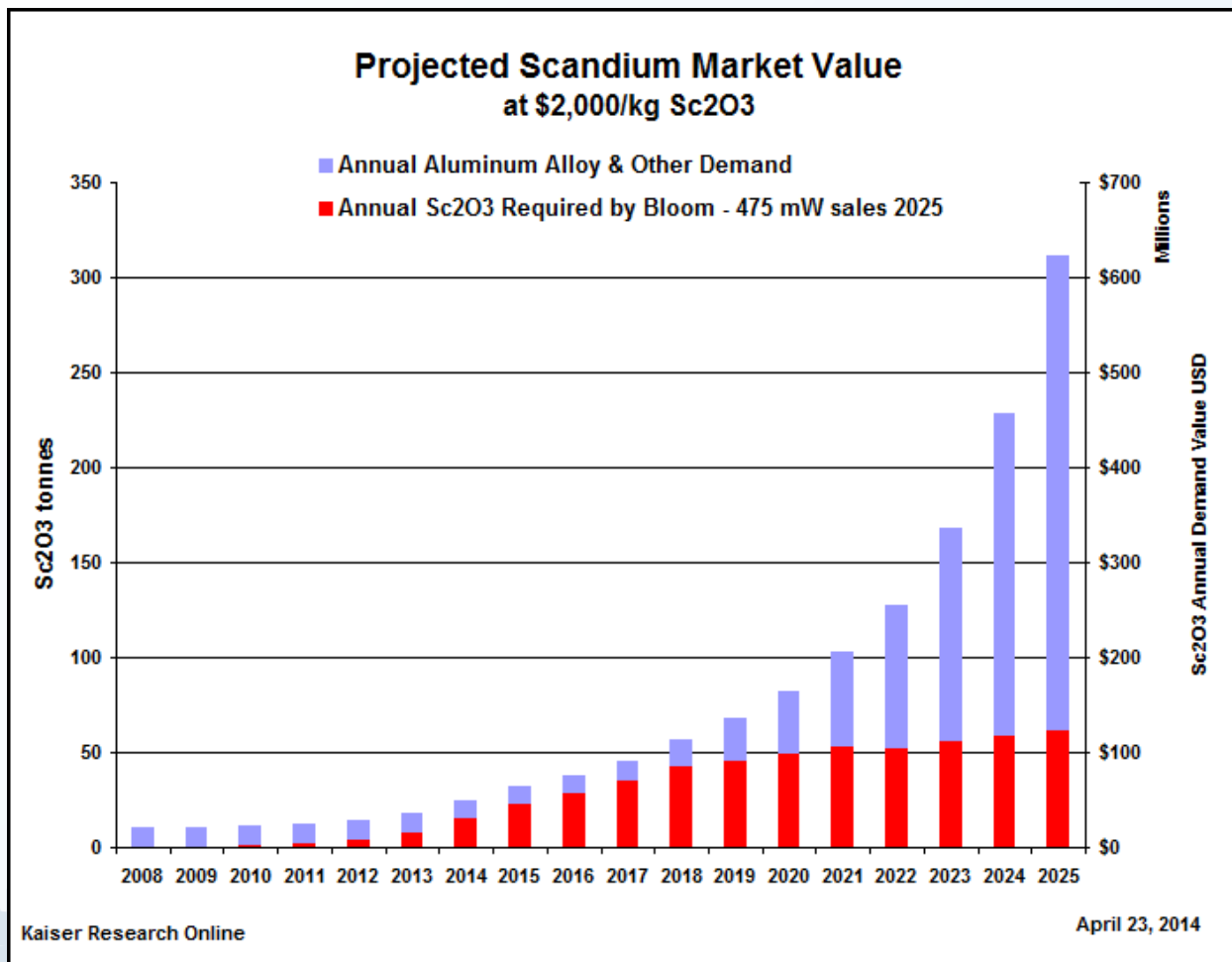
 - FedEx, Walmart, Target, Apple, Google, ebay, Yahoo, Bank of America, Honda, CocaCola, US Dept of Defence plus more...
- Potential annual market required by Bloom Energy by 2025 maybe 60 tonnes* of Sc₂O₃



Additional growth potential for Sc_2O_3 scandium oxide in other markets

- **Sporting equipment**
 - Golf clubs, bicycles, baseball bats.
Currently the leading use
- **Lighting**
 - High-power metal halide lamps and lasers
- **Additive Layer Manufacturing**
 - 3-D printed components
- **Electricity grid transmission**
 - High tension wires
- **Ship-building**
 - Good anti-corrosion properties

- *Potential annual demand for Sc2O3 in aircraft and SOFC markets could reach > 300 tonnes by 2025 (USD\$600 million market)*



Source: Kaiser Research

- Australian and Canadian projects are in early development stage and financing not expected to commence before 2015 in the best case
- Their total capacity is expected to reach 130 tonnes pa after 2015
- Russia has several less ambitious projects with estimated production of <5 tonnes pa

Investment Project	Production date	CAPEX	Annual Capacity
Platina Resources	2017	\$58 M*	30 t (99.9%)
Metallica Minerals	On hold	\$465 M*	50-65 t (99.9%)
EMC Metals	2016+	\$67 M*	36 t (90-99%)
Clean TeQ	2018	Unknown	Unknown
Orbite Aluminae Inc (Canada)	2015+	\$500 M	50 t Sc (red sludge)
ARMZ (Russia)	2012-2023	\$20 M	N/A
Sumitomo (Phillipines)	2014	\$550 M	0.24 t
Hydro-metall plant (Russia)	2012-2015	\$70 M	N/A
Kackanarsky GOK (Russia)	N/A	N/A	1 t Sc oxide (red sludge)
Energetichaskie (Russia)	2012-2014	\$20 M	1 t Sc oxide (red sludge)



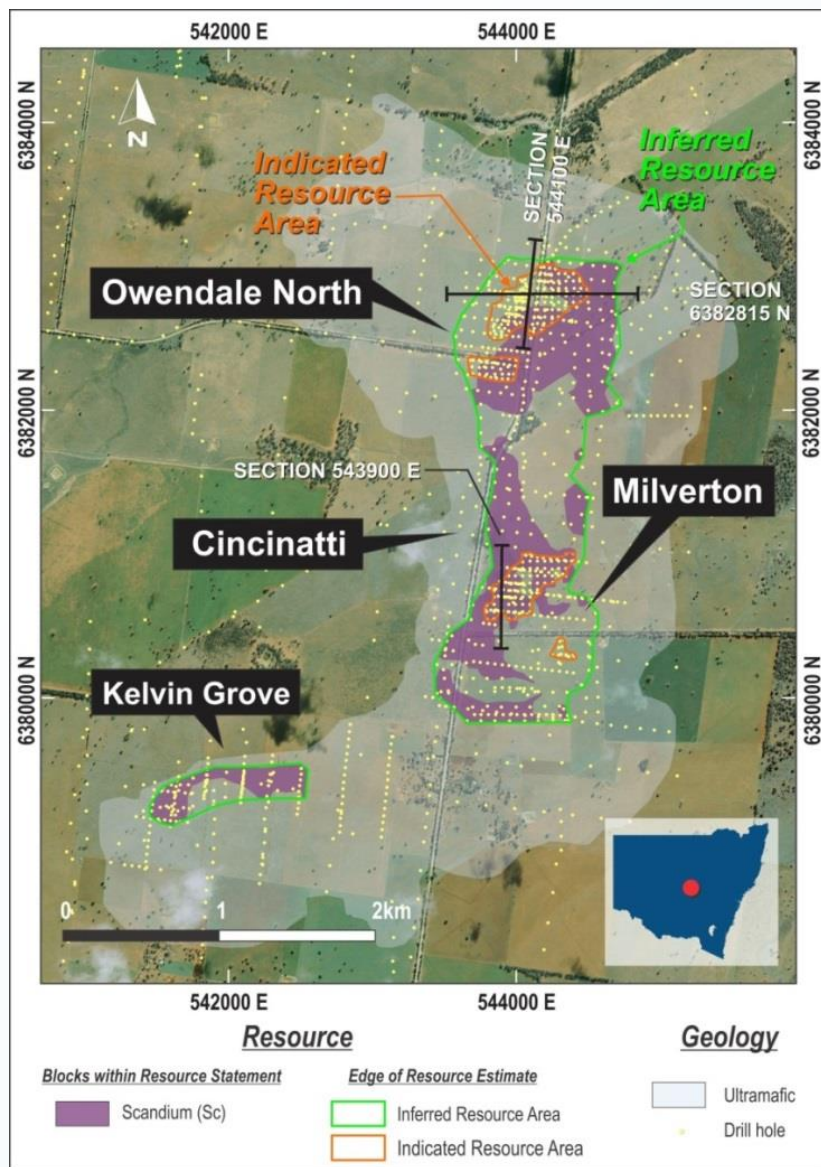


- ↻ ***Extremely high grade Scandium***
- ↻ ***Large near surface tonnage with additional ore available***
- ↻ ***Simple open pit mining***
- ↻ ***Close to water & power supplies***
- ↻ ***Favourable Capex and Opex***



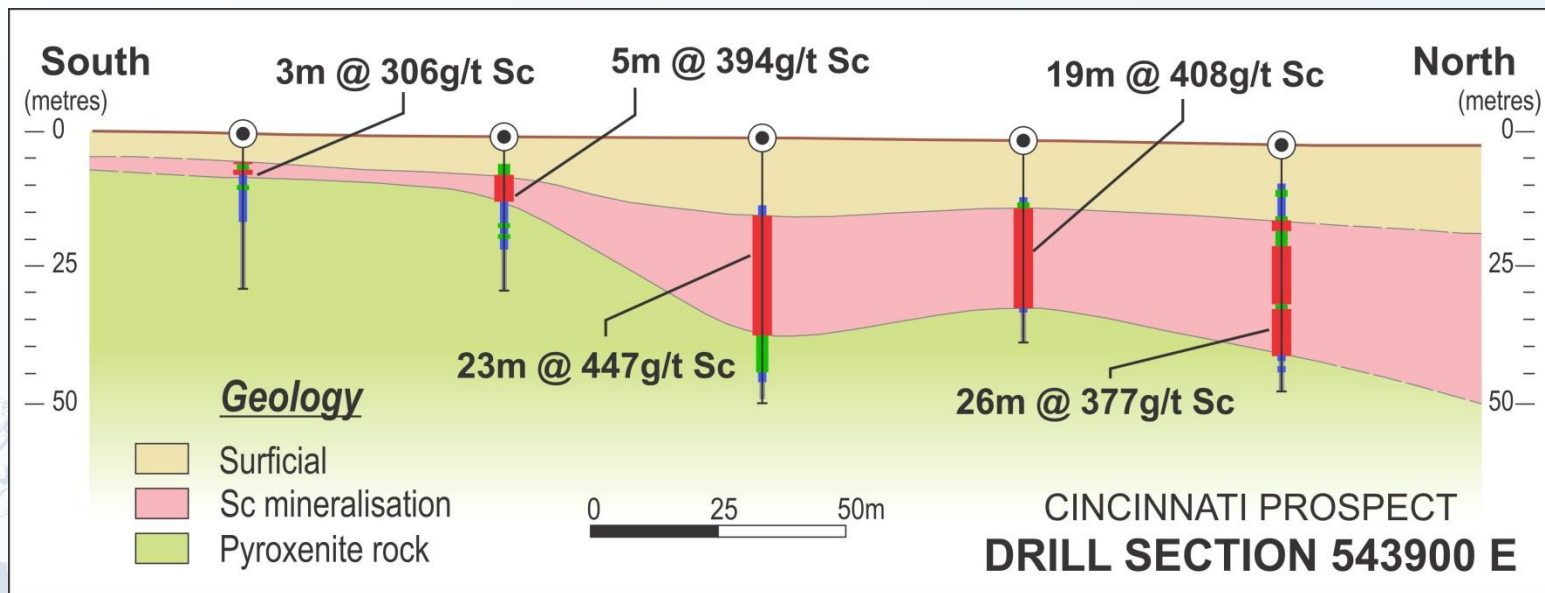
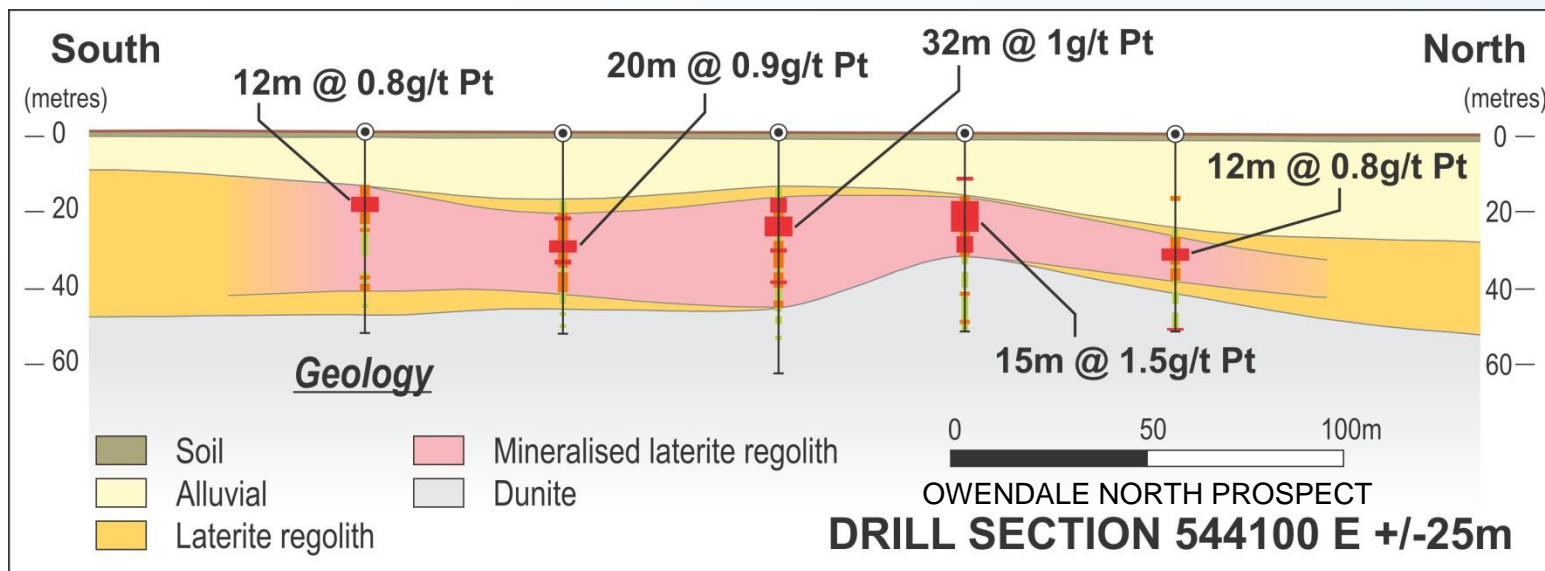
Resource Classification	Tonnage (Mt)	Pt g/t	Sc ppm	Ni %	Co %	Pt koz	Sc t	Sc ₂ O ₃ t	PtEq g/t
Indicated	4.2	0.53	401	0.13	0.06	72	1698	2605	0.93
Inferred	19.4	0.33	380	0.11	0.06	205	7385	11327	0.69
TOTAL	23.7	0.36	384	0.11	0.06	277	9083	13932	0.73

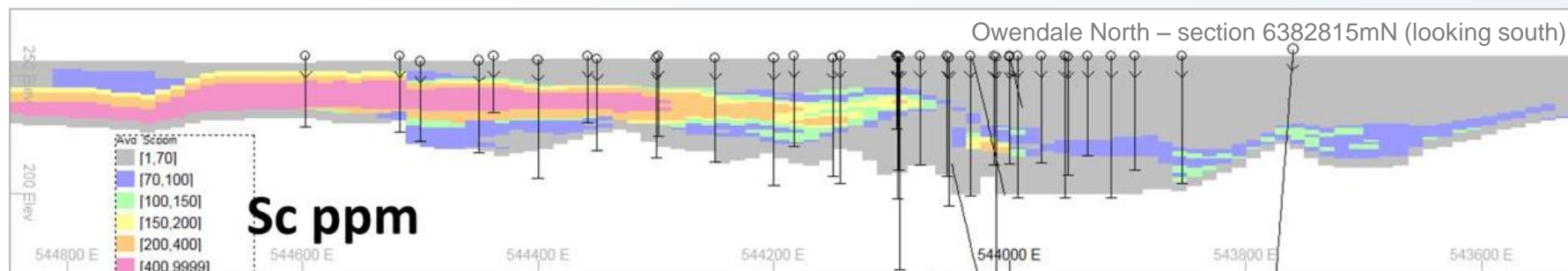
- World's largest, highest grade laterite-hosted scandium deposit proposing to use proven conventional technologies
9,100 tonnes of contained scandium metal (13,932 tonnes Sc₂O₃)
- Overlaps the platinum resource
- High-grade (>500 ppm Sc) portion can satisfy >100 years of world demand at current demand levels of 10-15 tpa



- Mineralisation hosted within a laterite profile of a weathered ultramafic sequence
- Extends from 1m to 55m depth
- Grade! Grade! Grade!
 - At high grade (500 ppm) cut-off, the resource supports significant annual production

Resource Ind & Inf	Mt	Pt g/t	Sc ppm	Ni %	Co %	Pt koz	Sc t	Sc2O3 t	PtEq g/t
TOTAL	2.3	0.37	557	0.17	0.09	27	1281	1965	0.94





• ***Simple mining operation on shallow resource***

- ***Open cut, low stripping ratio, ~50,000 tpa campaign***

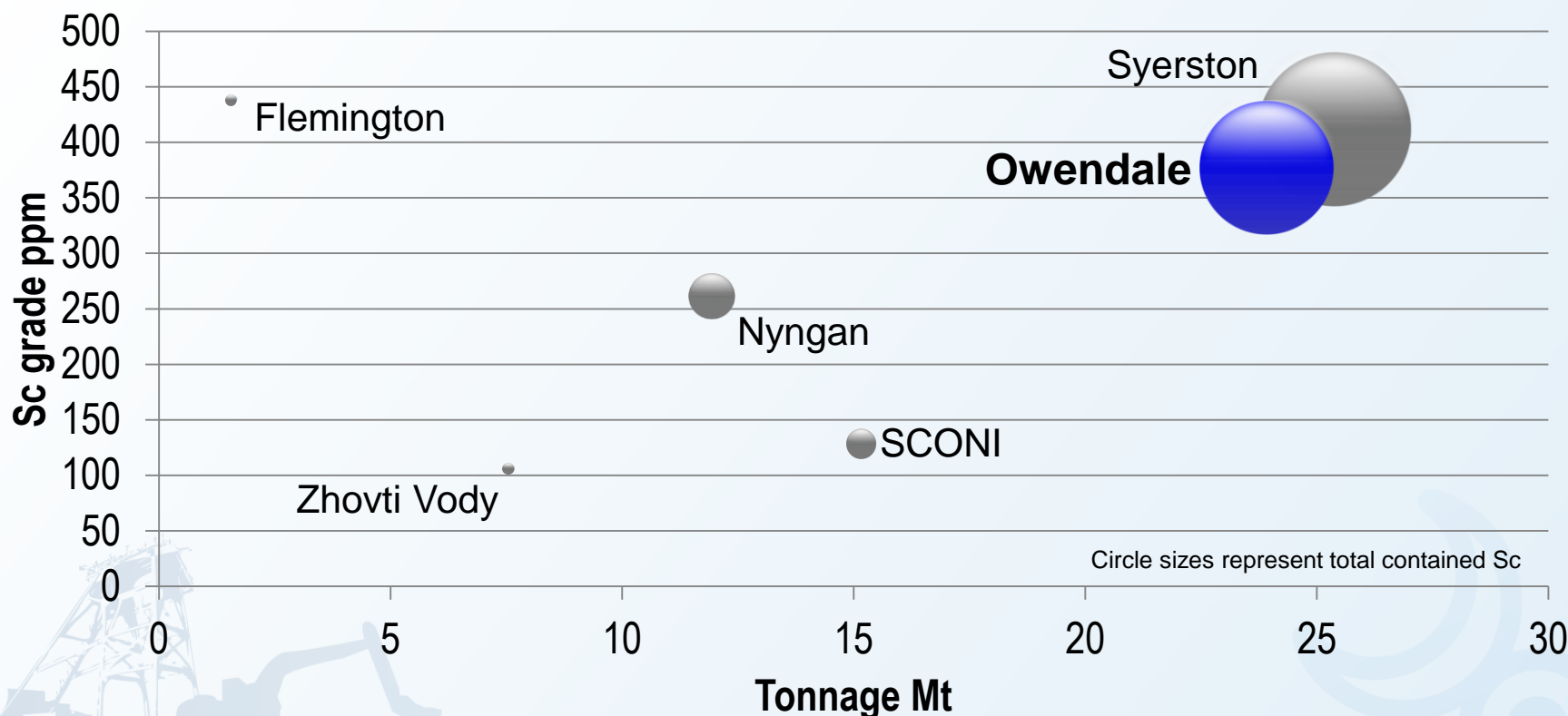
• ***Near surface high grade in horizontal deposit***

• ***Low operating costs***



- ❧ *Owendale has the highest grade of scandium proposing to use proven conventional, high recoveries technologies*

Scandium Projects – Resource Comparison



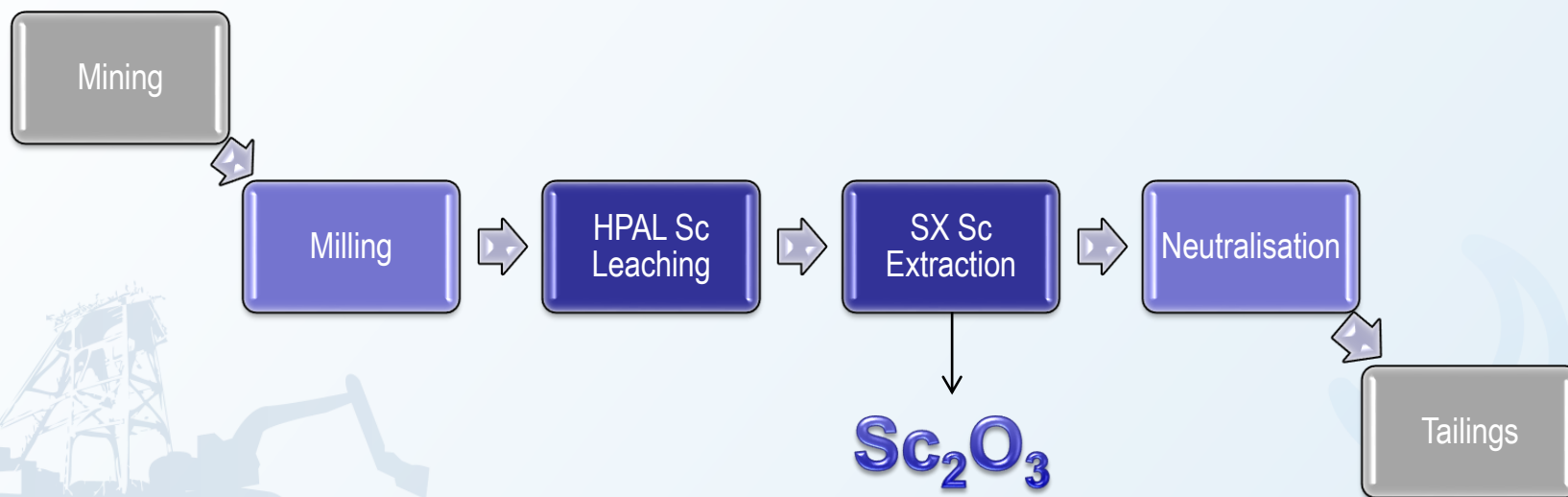
Flemington (Jervois Mining); Nyngan (Scandium International); SCONI (Metallica); Syerston (Clean TeQ).

Leaching

- *Industry standard High Pressure Acid Leach (HPAL)*
- *Expected 83% recovery*

SXEW

- *Industry available technology*
- *Low technology risk compared with other competitors*



Owendale Project Key Parameters	Scoping Study Result (AUD\$M)	Scoping Study Result (USD\$M)
Capital Cost estimate	\$75	\$58
Annual Revenue	\$77	\$60
Unit Cash Costs (per kg oxide)	\$740	\$577

Assumptions: AUD : USD 0.78. USD\$2,000/kg oxide. 30tpa Sc oxide production 99.9% purity

🌀 ***Offtake Agreements to be finalised by mid-year***

🌀 ***Prefeasibility and Feasibility Studies commencing Q2 2015***

Stage	Q1 15	Q2 15	Q3 15	Q4 15	Q1 16	Q2 16	Q3 16	Q4 16	Q1 17	Q2 17	Q3 17	Q4 17
Scoping Study												
Feasibility Study												
Offtake Agreement Finalisation												
Baseline Studies/ML application												
Project Funding												
Design & Construction												
Commissioning												
Production												

- ❧ ***Potentially world's largest, highest grade scandium project proposing to use proven, conventional high-recovery technology***
- ❧ ***9,100 tonnes Sc metal (13,392 tonnes Sc₂O₃) and over 0.5 Moz Pt.***
- ❧ ***Owendale - reliable, secure, stable, long term production will grow/enhance commercial applications of Sc***
- ❧ ***HoA for proposed supply of 20 tonnes scandium oxide (99.9% purity) to two major Chinese partners***
- ❧ ***New costings, scoping and prefeasibility studies based on updated resource and metallurgical flow sheet completed by Q2 2015.***
- ❧ ***The world's first scandium mine by 2017!***



PLATINA
RESOURCES LIMITED

ASX Code: PGM

Thank You

Website:

www.platinaresources.com.au

Head Office:

2 Boston Court, Varsity Lakes
QLD 4227, Australia

Phone:

+61 (0)7 5580 9094

Fax:

+61 (0)7 5580 9394

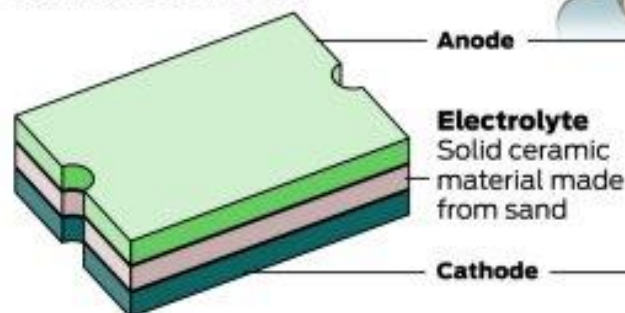
Email:

office@platinaresources.com.au

Bloom Energy fuel cell

Bloom's solid oxide fuel cell uses an electrochemical reaction between fuel and air to produce electricity without combustion.

Solid oxide fuel cell



The anode and cathode are made of special inks that coat the electrolyte.



Hand-size individual fuel cell produces 25 watts

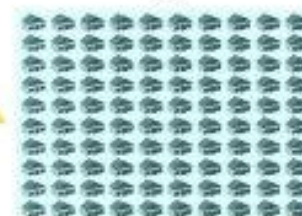


One Bloom Energy Server produces 100 Kw, enough power for:

Compact electricity production



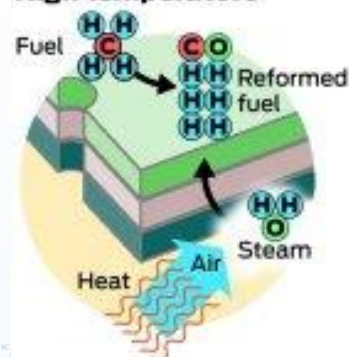
Office building (30,000 sq. ft.) or



About 100 average U.S. homes

How it works

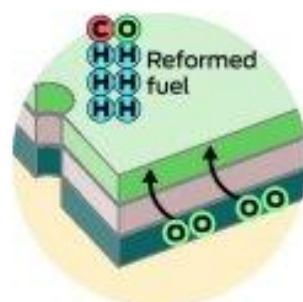
High temperature



① Heat mixes with air entering the cathode side to create steam. Steam mixes with natural gas, creating "reformed fuel."

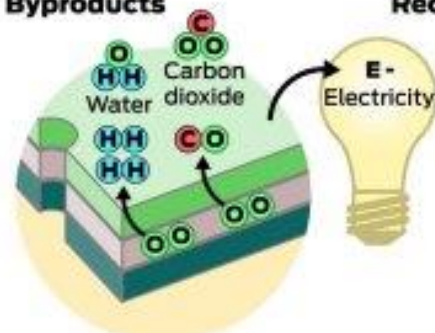
Source: Bloom Energy Corp.

Chemical reaction



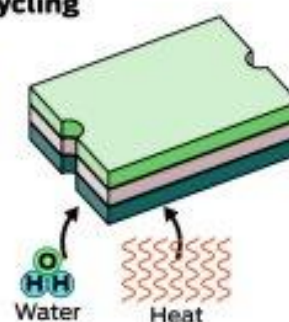
② Reformed fuel enters the anode side, attracting oxygen ions from the cathode side.

Byproducts



③ Oxygen ions combine with the reformed fuel to create water, small amounts of carbon dioxide and electricity.

Recycling



④ Water is recycled to produce the steam needed to make reformed fuel. Heat is also recycled as required by the fuel cell.

John Blanchard / The Chronicle