



A VERTICALLY INTEGRATED VANADIUM COMPANY

VANADIUM RESOURCES & BATTERY TECHNOLOGY DEVELOPER

INVESTOR PRESENTATION

Disclaimer

Certain statements contained in this presentation may constitute forward looking statements. Such forward-looking statements involve a number of known and unknown risks, uncertainties and other factors which may cause the actual results, performance or achievements of Protean Energy Limited (the Company) to be materially different from actual future results and achievements expressed or implied by such forward-looking statements. Investors are cautioned not to place undue reliance on these forward-looking statements. The information contained herein has been prepared solely for informational purposes and is not an offer to buy or sell or a solicitation of any offer to buy or sell any security or to participate in any trading strategy or to enter into any transaction.

Minerals Exploration in South Korea

This presentation may describe Measured, Indicated and/or Inferred Resources. Inferred Resources have a greater amount of uncertainty as to their existence and greater uncertainty as to their economic feasibility. It cannot be assumed that all or any part of any Inferred Resource will ever be upgraded to a higher category. The potential quantity and grade of the Daejon Uranium Project Conceptual Exploration Targets is conceptual in nature and there has been insufficient exploration to define a Mineral Resource and it is uncertain if further exploration will result in the determination of a Mineral Resource.

Exploration is an inherently risky proposition and investors are advised that most exploration projects fail to identify economic resources. The Company has at present not confirmed the economic viability of any resources at the project. The Company plans further drilling programmes and studies with the objective of confirmation of any deposits and ultimately completing a feasibility study to demonstrate the economics of the resources.

Competent Person Statement

The information contained in this ASX release relating to exploration results and Mineral Resources has been compiled by Mr Ian Glacken of Optiro Ltd. Mr Glacken is a Fellow of The Australasian Institute of Mining and Metallurgy and has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2004 and 2012 editions of the “Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves”. Mr Glacken consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

Research and Development

There are many risks inherent in the development of technology products like the V-KOR range of batteries, particularly as these products are in the pre-commercial stage of development. The development of the V-KOR Energy Storage System can be delayed or fail to demonstrate any benefit, or research may cease to be viable for a range of scientific or commercial reasons.

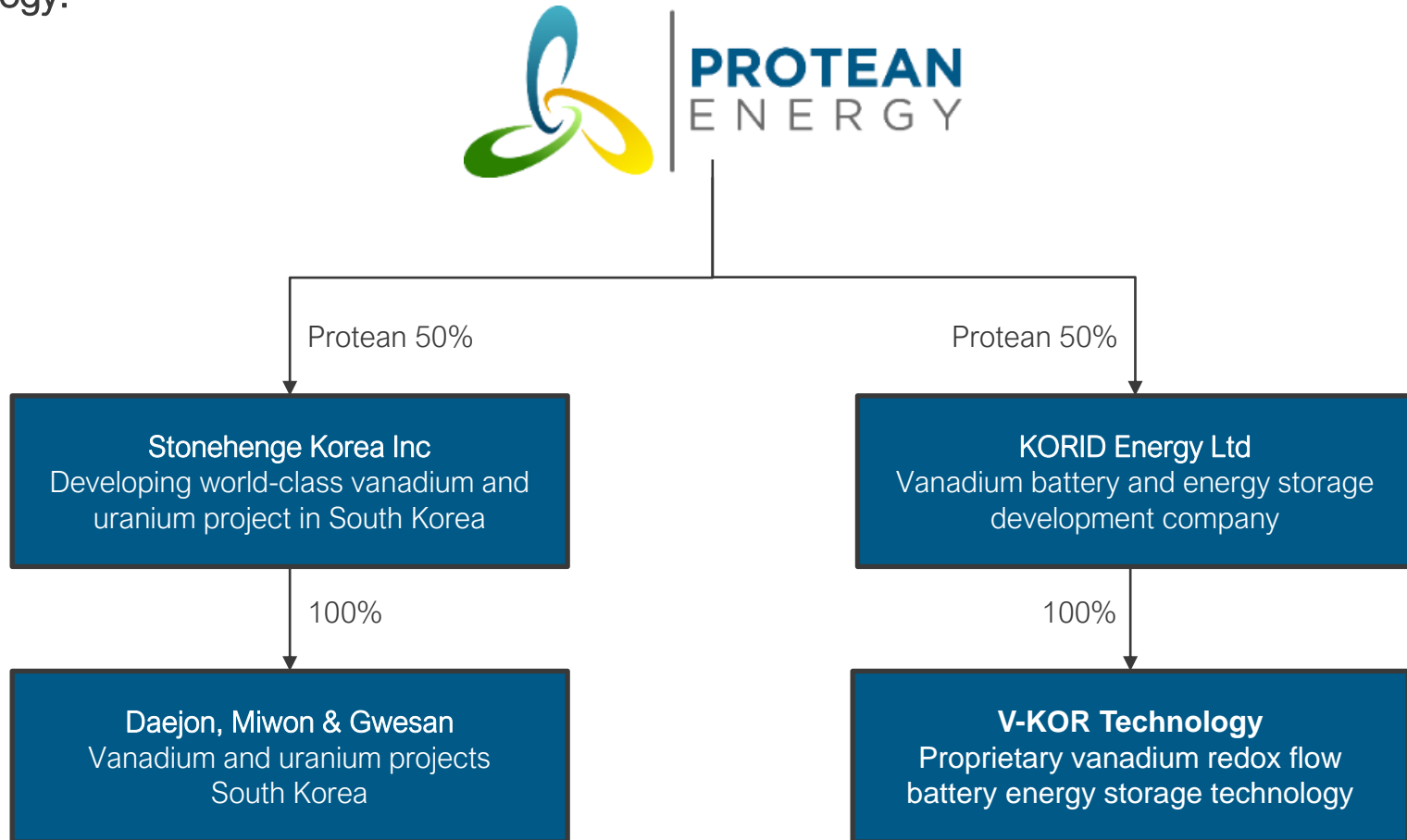
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1. Company Overview



Protean Energy Limited (ASX: POW) is a vertically integrated, vanadium resource and battery development company. The Company is focused on advancing its South Korean vanadium mineral projects and the commercialisation of the Company's vanadium battery and energy storage technology.



Market Capitalisation and Enterprise Value¹

Ordinary shares on issue	Number	299,200,841
Share price (19 Apr 18)	A\$/share	0.032
Market Capitalisation	A\$m	\$9.9m
Cash (as at 31 Mar 18)	A\$m	\$3.2m
Listed Securities (DST: Korean listed)	A\$m	~\$1.0m
Enterprise Value	A\$m	\$5.7m

Board of Directors

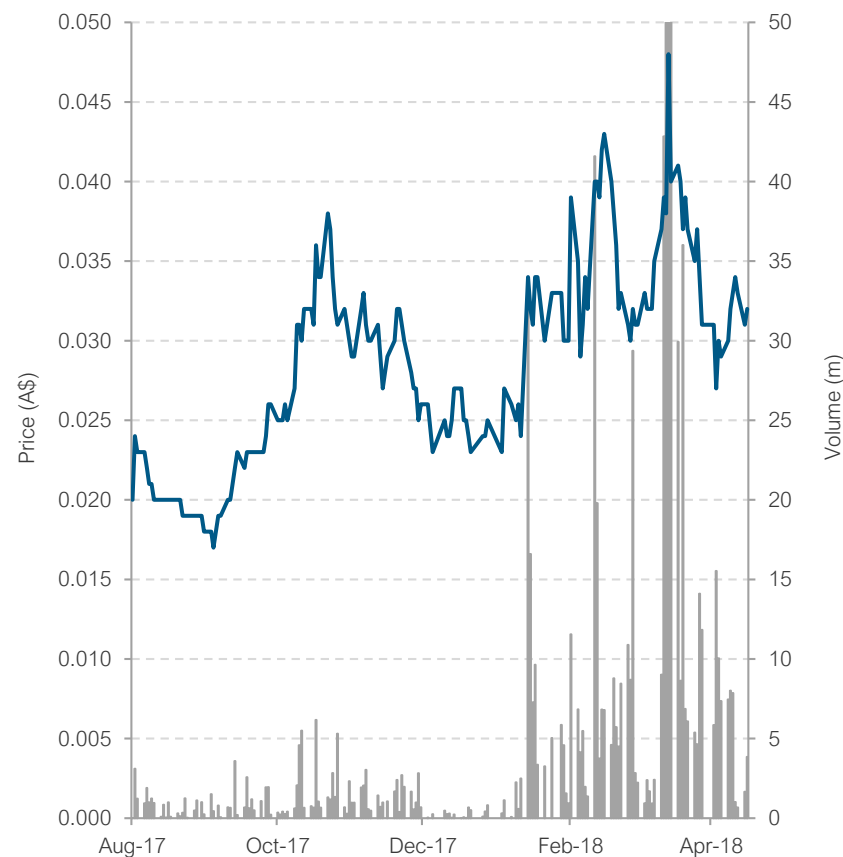
Name	Position
Bevan Tarratt	Non-Executive Chairman
Wayne Loxton	Non-Executive Director
Young Yu	Non-Executive Director
Dave Wheeler	Non-Executive Director

Notes:

1. Excludes 3,999,996 Performance Shares, 1,582,666 Performance Rights and 8,202,796 Unlisted Options.

Source: Bloomberg as at 19th April 2018, Company Announcements.

Share Price / Volume History (A\$; millions)



2. Investment Highlights



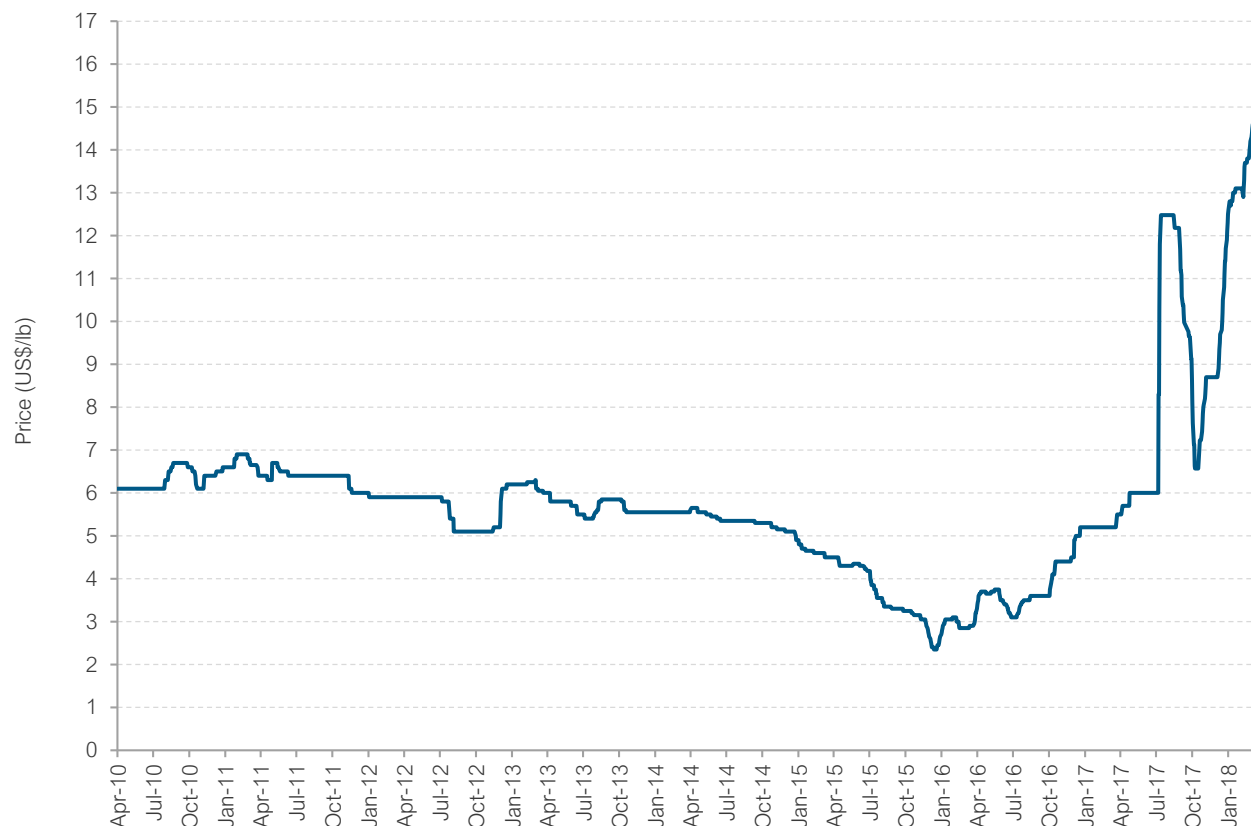
1	Vertically integrated vanadium company	<ul style="list-style-type: none"> Vertically integrated strategy with downstream vanadium resources and an advanced vanadium redox flow battery technology 	✓
2	Sediment hosted vanadium deposits	<ul style="list-style-type: none"> POW mineral assets are unique sediment hosted vanadium deposits Potentially suited to produce the high-purity vanadium pentoxide (V_2O_5) for emerging vanadium redox flow battery technology 	✓
3	Significant Resource expansion potential	<ul style="list-style-type: none"> Updated Mineral Resource Estimate due in Q2 2018 Exploration Target of between 70-90Mt @ 0.25-0.35% $V_2O_5$¹ The potential quantity and grade of the Exploration Target is conceptual in nature, there has been insufficient exploration to define a Mineral Resource, and it is uncertain if further exploration will result in the definition of a Mineral Resource Significant uranium credit associated with the deposit 	✓
4	Vanadium redox flow battery technology	<ul style="list-style-type: none"> First commercial V-KOR vanadium battery deployment is currently in transit from South Korea to Western Australia 	✓
5	Surging vanadium price	<ul style="list-style-type: none"> Vanadium pentoxide price up >175% in the last 12 months Best performing battery metal across CY2017 	✓
6	Well funded	<ul style="list-style-type: none"> Cash on hand of ~A\$3.2m and ~A\$1m in listed securities Heavily oversubscribed Placement completed in January 2018 	✓

¹The vanadium exploration targets is based on exploration results from the 2013 drilling at Chubu (refer to announcements 15 July and 13 November 2013) that demonstrated vanadium mineralisation through the black shales. The geology in the Okcheon belt consists of a meta-sedimentary sequence that comprises three formations, Wunkryori, Hwajeonri and Guryongsan. Stonehenge Korea will test the validity of the exploration target now that access to historical drill core has been obtained and the Company can analyse the core for vanadium mineralisation.

VANADIUM PRICE UP 175% IN THE LAST 12 MONTHS

Vanadium prices have recorded significant gains in the past 12 months. Future demand is expected to rise due to usage in energy storage, principally Vanadium Redox Flow Batteries (“VRFB”).

Vanadium Pentoxide Flake (US\$/lb) China 98% FOB



Bloomberg

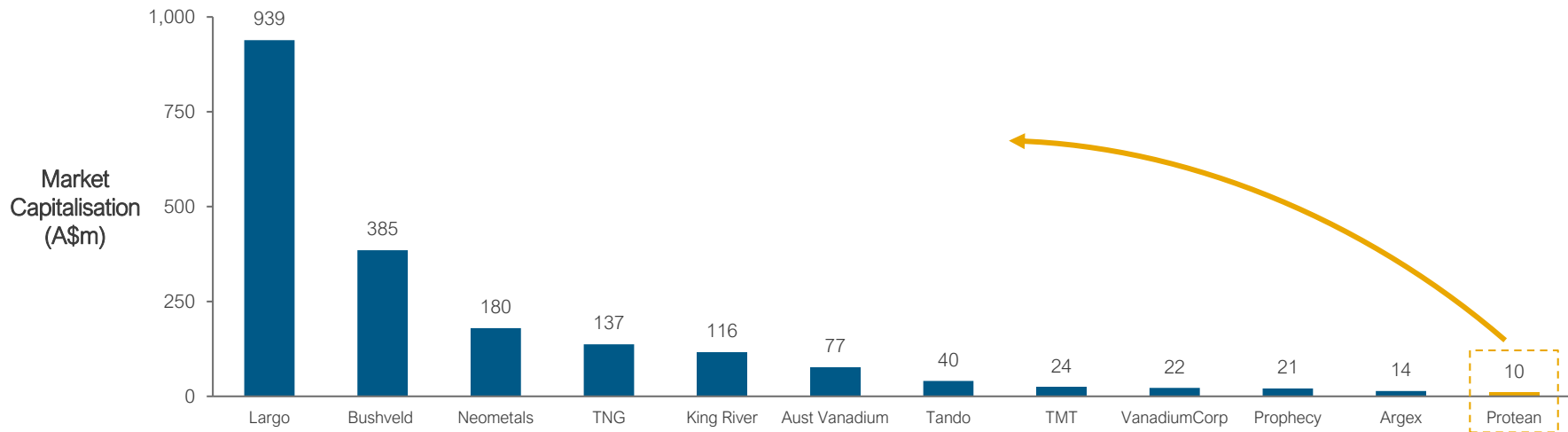
“I don’t think anyone would dispute that it’s (VRFB) superior to lithium-ion in large-scale grid applications” **Bloomberg**
(25 January 2018)

“We think there’s revolution coming in vanadium redox flow batteries... You’ll have to get into the mining business and produce ultra-pure vanadium electrolyte for those batteries on a massive scale”
Robert Friedland, May 2017

Source: Bloomberg as at 19th April 2018. Asian Metal Inc.

Protean is well placed for growth comparatively with listed vanadium peers.

Market Capitalisation of Vanadium Peers (A\$m)



Ticker	TSX: LGO	AIM: BMN	ASX: NMT	ASX: TNG	ASX: KRC	ASX: AVL	ASX: TNO	ASX: TMT	TSX: VRB	TSX: PCY	TSX: RGX	ASX: POW
Flagship asset	Maracas (100%)	Vametco (59%) & Mokopane (64%)	Barrambie (100%)	Mount Peake (100%)	Speewah (100%)	Gabanimtha (100%)	SPD (74%)	Gabanimtha (100%)	Lac Doré (100%)	Gibellini (100%)	La Blache (100%)	Daejeon, Gweson, Miwon (50%)
Sediment Hosted Deposit	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓
Country	Brazil	South Africa	Australia	Australia	Australia	Australia	South Africa	Australia	Canada	USA	Canada	Korea
Asset Stage	Producing	Producing	Feasibility	Feasibility	Scoping	Feasibility	Exploration	Feasibility	PEA	Feasibility	PEA	Exploration
Vertically Integrated?	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗	✗	✓

Source: Bloomberg as at 19th April 2018. Company announcements.

3. Korean Vanadium Projects



SOUTH KOREAN VANADIUM PROJECTS

Potential world-class sediment hosted vanadium and uranium projects.

- Protean, via its 50% interest in Stonehenge Korea Ltd (**SHK**) is advancing a unique suite of vanadium projects in Korea
- Daejon (22.8km²) is our flagship asset with further exploration ground held at Miwon (16.6km²) and Gwesan (24.8km²)
- Daejon is a sediment hosted shale vanadium project which has the potential to produce high purity vanadium pentoxide (V₂O₅)
- Approximately 5% of vanadium mineral occurrences are sediment hosted and 95% are magnetite hosted (as discovered in Western Australia, South Africa etc.)

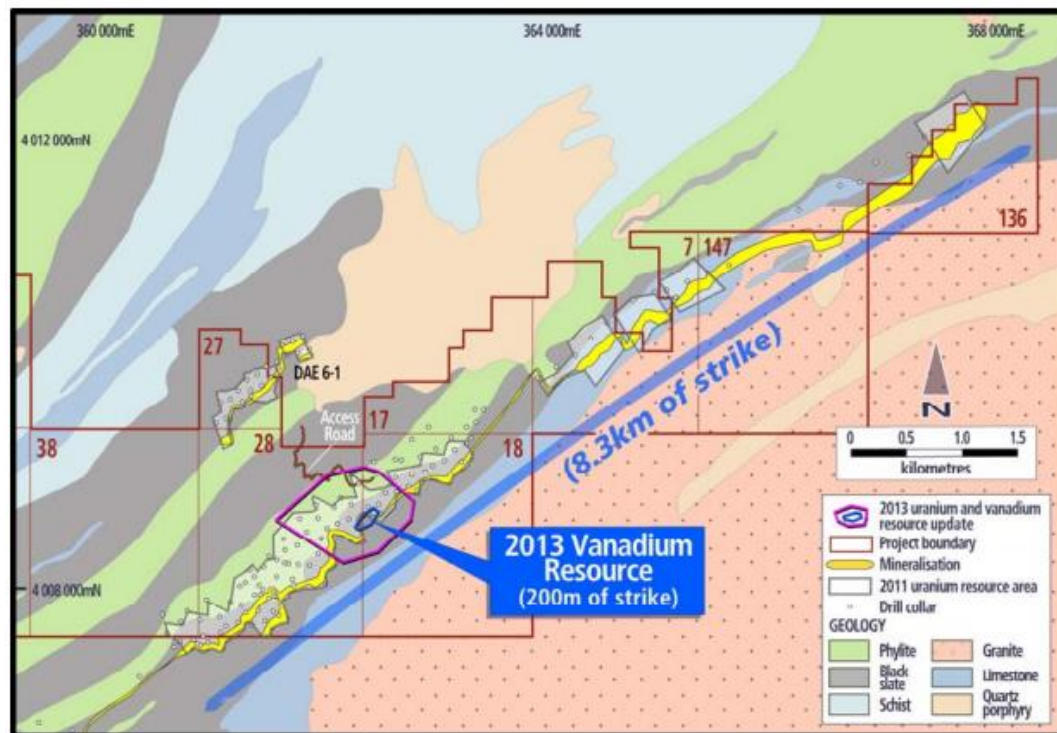
Protean Energy's South Korean Vanadium Projects



DAEJON PROJECT (50% INTEREST)

Daejon project strike length of ~8.3km with the current Mineral Resource Estimate covering just 200m (2.4%) of the known mineralized host rock strike length.

Daejon Project Area



✓ Mineral Resource (JORC-Code Compliant) interim upgrade anticipated Q2 2018

²These estimates were prepared and first disclosed under the JORC Code (2004). They have not been updated since to comply with the JORC Code 2012 on the basis that they have not materially changed since release

- Daejon is a unique sediment hosted shale/slate bed vanadium deposit which has the potential to produce high purity vanadium pentoxide (V_2O_5)
- Significant uranium credit associated with the deposit
- Access to 36,000m (>220 holes) of historical untested drill core. Drilled by the Korean Government in the 1970s and early 1980s
- Historical drill core was not systematically assayed for vanadium
- Maiden Mineral Resource Estimate² of 2.5Mt @ 0.32% V_2O_5
- **Vanadium Exploration Target of 70-90Mt @ 0.25-0.35% V_2O_5**
- The potential quantity and grade of the Exploration Target is conceptual in nature, there has been insufficient exploration to define a Mineral Resource, and it is uncertain if further exploration will result in the definition of a Mineral Resource

DAEJON: DRILL CORE STUDY (1/2)

Protean is currently undertaking non-destructive pXRF testing of mineralised sections of 36,000m of historical core stored at the Korean Institute of Geoscience and Minerals (“KIGAM”).

- To date the company has completed 9,377 pXRF readings of the total 28,000 planned
- Technical work targeting a resource over ~8.3km strike on target for completion in Q2 2018

Historical Daejon drill core (2013) owned by SHK



KIGAM core storage facility



DAEJON: DRILL CORE STUDY (2/2)

The KIGAM core analysis work program consists of data collection from the historical KIGAM core. This work is being completed across two stages.

Details	Stage 1	Stage 2
Number of high priority drill holes tested	42	35
Mineralised core tested	2,344m	2,315m
Stage	70% complete	Commenced mid-April 2018
Outcome of program	Completion of Stage 1 will enable the company to commence an interim Mineral Resource estimation of vanadium	Completion of Stage 2 will enable the company to calculate an updated JORC-Code Compliant (2012) vanadium and uranium resource over the entire 8,300m of estimated mineralisation strike length
Mineral Resource (JORC-Code 2012 Compliant) upgrades	Interim upgrade by Q2 2018	Further upgrade expected by Q3 2018

pXRF testing historical KIGAM Daejon drill core in Korea



Protean is preparing a mineralised sample from the Daejon Vanadium Project for testwork targeting the production of high purity, VRFB electrolyte grade, V_2O_5 of greater than 99.5%

Vanadium Extraction Testwork

- Previously announced results from pressure oxidation leach tests achieving average vanadium extraction of around 70%, as well as average uranium extraction of >92% across a range of samples (refer ASX release [24 Nov 2011](#))
- Bulk samples being utilised in the new metallurgical testwork programs. An initial review by Met-Chem Consultants has indicated a number of different processes that may be utilised to maximise vanadium extraction, and these are currently being assessed in a methodical manner

High Purity Vanadium Pentoxide Testwork

- In addition to the vanadium extraction testwork, the Company has recently commenced preparing a sample of mineralisation from the Daejon Project area with the aim of producing vanadium pentoxide precipitate with purity levels acceptable for use in vanadium redox flow battery (VRFB) electrolyte production
- The testwork is expected to take up to **6 weeks to complete with results available by the end of June 2018**
- Targeting the production of high purity, VRFB electrolyte grade, V_2O_5 of greater than **99.5%**

DAEJON: UPCOMING NEWS FLOW

Significant upcoming news flow following extensive historical core study work program.

Details	Stage	Timing
Approval by KIGAM to conduct pXRF assaying on historical core	✓	January 2018
Positive correlation between new pXRF assays and 2013 wet assays is confirmed	✓	January 2018
Commencement of KIGAM core pXRF testing program	✓	Commenced January 2018
Stage 1 pXRF test work 70% complete	✓	April 2018
Commencement of Stage 2 pXRF test work	✓	Commenced April 2018
Protean commence metallurgical test work targeting high purity vanadium pentoxide (V ₂ O ₅) precipitate (suitable for VRFB electrolyte)	✓	Commenced April 2018
Anticipated completion of Stage 1 of KIGAM pXRF test work	✓	Mid Q2 2018
Interim JORC-Code Compliant (2012) vanadium mineral resource (post Stage 1)	✓	By Q2 2018
Results from tests targeting high purity V ₂ O ₅ precipitate	✓	Mid June 2018
JORC-Code Compliant (2012) vanadium and uranium Resource over the entire 8,300m of estimated mineralisation strike length (post Stage 2)	✓	By Q3 2018
Commence vanadium off-take partner discussions	✓	H2 2018
Commence PFS on Daejon	✓	Q1 2019

4. V-KOR Battery



VANADIUM REDOX FLOW BATTERY TECHNOLOGY

Protean (50%) and its Korean partner, DST Co Ltd (50%), own 100% of KORID Energy Ltd. KORID is developing proprietary vanadium redox flow battery (VRFB) energy storage technology.

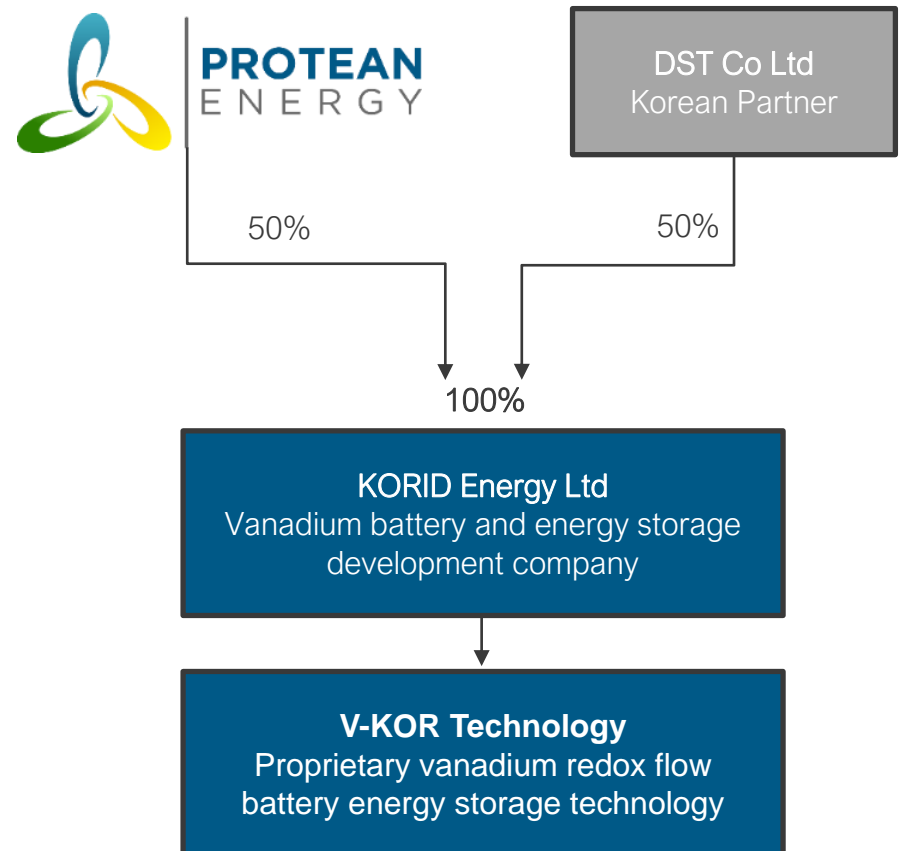
⚡ Protean and DST via KORID Energy are developing VRFB technology, known as V-KOR

⚡ V-KOR is a commercial ready technology that provides a rechargeable flow battery with the ability to store high levels of energy for longer and with a greater life expectancy than existing battery solutions

⚡ The V-KOR technology and batteries are fully scalable with built solutions from 2kW to 20MW and larger to suit customer specific requirements

⚡ The V-KOR range of batteries has been developed over the last ten years and the technology is protected by a suite of patents

Ownership of V-KOR Battery Technology



Vanadium Redox Flow Batteries are fast becoming a preferred choice for suppliers and there are a number of companies worldwide which are commercialising this technology.

- Redox flow batteries are rechargeable batteries that are charged and discharged by means of the oxidation-reduction reaction of ions of vanadium or the like.

Advantage over other systems include:

- ✓ Scalability
 - ✓ Lifespan of 20 years
 - ✓ Immediate energy release
 - ✓ Excellent charge retention (up to 1 year)
 - ✓ Suitability for grid connection
 - ✓ Ability to discharge 100% with no damage
 - ✓ Key feature of using only one element in electrolyte; V_2O_5
- This makes them useful for grid scale applications, including grid balancing, and storing energy from variable output sources, including wind turbines and solar cells

Vanadium redox flow battery technology

Sumitomo 60MWh power generation and storage facility, installed in Hokkaido, Japan



Bloomberg

“The dominant form of energy storage is lithium-ion technology, but there are advantages to vanadium-flow batteries. They last longer and can be charged and discharged repeatedly without any significant drop in performance”

Bloomberg (10 April 2018)

RECENT V-KOR DEVELOPMENTS

V-KOR battery currently in transit from South Korea for first deployment in Australia.

Illustrative V-KOR batteries (25kw/100kWh) being utilised for a solar operation



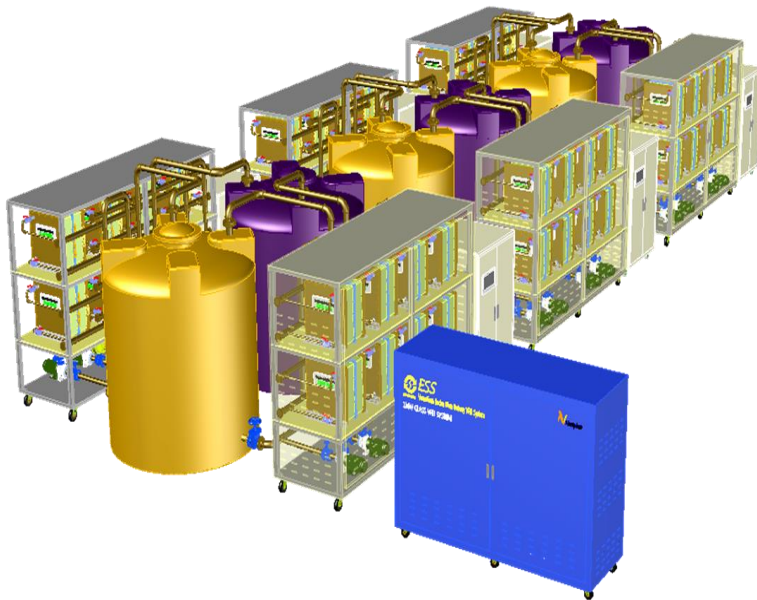
- ⚡ Vanadium V-KOR battery currently in transit from South Korea for first Australian deployment
- ⚡ Installation and trial of V-KOR battery to commence in May 2018
- ⚡ ~\$120,000 grant from a Korean government organisation, KETEP, is being utilised to fund the trial of the V-KOR vanadium battery (25kw/100kWh) in Western Australia

- ✓ The grant funding coincided with the Korean Ministry of Trade, Industry and Energy selecting V-KOR as a superior emerging technology with certification and 15 patents
- ✓ Deployment of the V-KOR vanadium battery trial in Australia is the first step towards capitalising on the global energy storage market opportunity for vanadium batteries

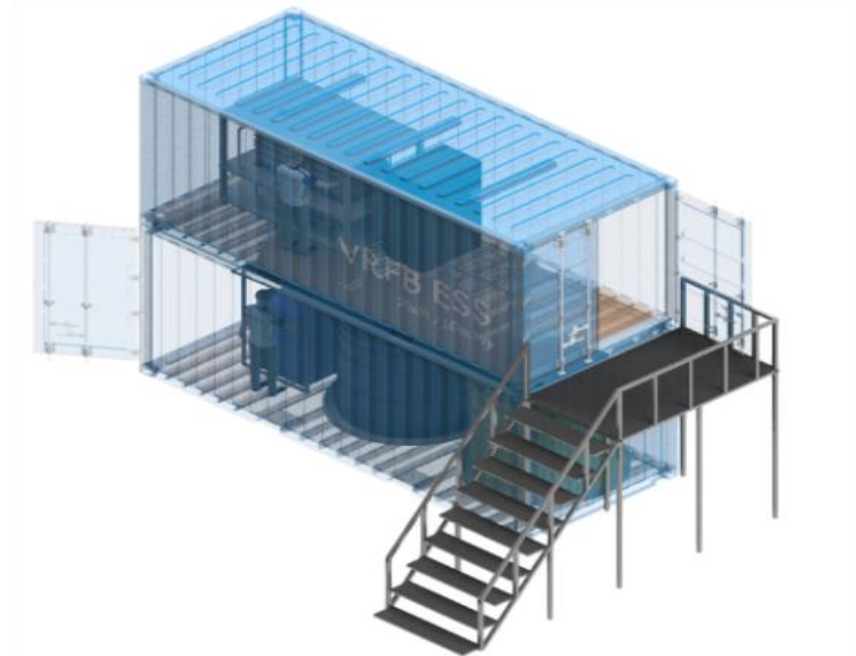
The V-KOR battery solutions are built to order for commercial, industrial and grid scale applications.

- V-KOR has been developed over the past five years and patents are granted to protect the design
- Four stack sizes of batteries have been developed to date including a 2.5kW, 5kW, 10kW and 25kW
- Technology is expected to drive the adoption of clean energy solutions

V-KOR: 3.6MW large scale grid battery concept



V-KOR: off-grid battery concept



V-KOR: SOLAR TESTING

Below shows a 50kW/200kWh unit being tested at the Korean Conformity Laboratories (KCL) in conjunction with a 20kW solar PV array.

Solar PV Array



Korean Conformity Laboratories (KCL)



V-KOR 50kW/200 kWh unit



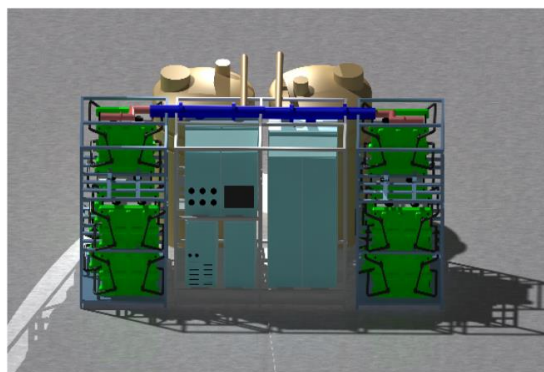
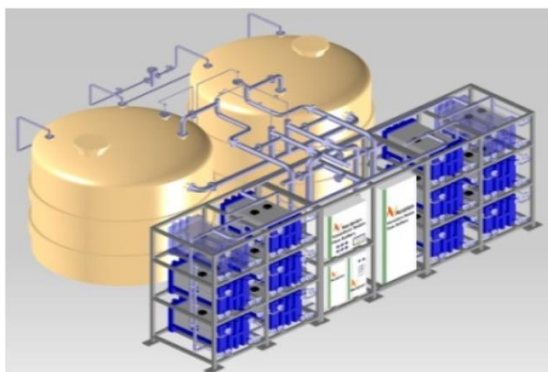
Testing of VRFB-ESS Korea Conformity Laboratories



Significant upcoming news flow as a result of first V-KOR installation project in Western Australia.

Details	Stage	Timing
Completion of acquisition of 50% interest in KORID Energy Ltd	✓	March 2017
V-KOR secures \$120,000 in grant funding from the Korean government	✓	June 2017
Announcement of 1 st V-KOR battery (25kW/100kWh) deployment in Western Australia	✓	April 2018
Installation of V-KOR battery in Western Australia	Battery in transit	May 2018
Release of Western Australia V-KOR battery trial terms	✓	H2 2018
Results of Western Australia V-KOR battery trial	✓	H2 2018

V-KOR: Mid scale system

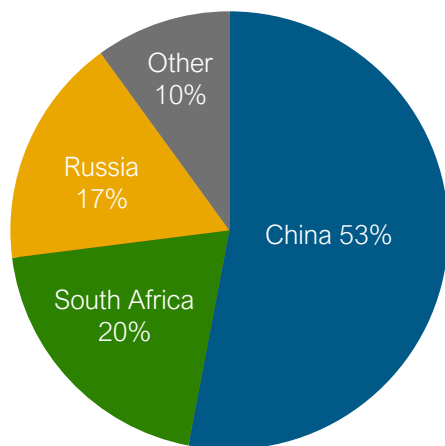


5. Vanadium Market

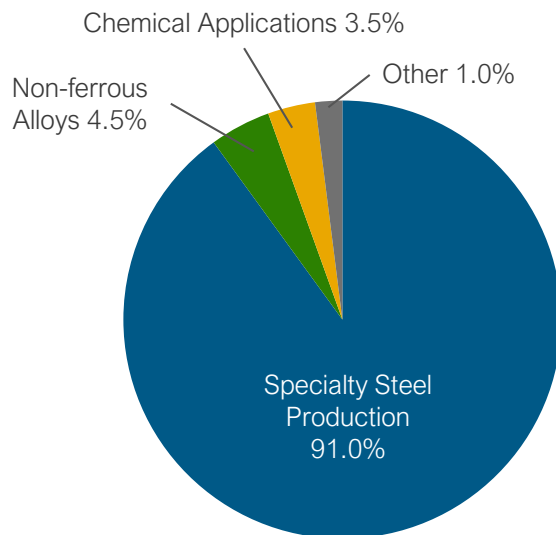


Protean intends to target the rapidly expanding markets for high-tech battery applications.

Global Supply (%)



Consumption (%)





- Concentrated global supply with China, South Africa and Russia making up 90%
- Total supply in 2014 of 168,325kt

- Main use of vanadium is in specialty steel production in the form of ferro vanadium (FeV)
- However, growth market is use in hi-tech chemical applications (e.g. VRFBs) and high strength aerospace alloys

- Significant growth is expected in high-tech chemical and alloy applications, particularly:
 - Vanadium Redox Flow Batteries
 - Vanadium master alloys used in the production of aerospace-grade titanium alloys and high-strength steels, (emergence of China's commercial jet industry)
- Require high purity V_2O_5 , which is limited in supply

Source: Roskill 2014.

Vanadium is mainly produced either in the form of vanadium pentoxide or ferro-vanadium.

Details	Vanadium Pentoxide	Ferro-vanadium
Image		
Chemical formula	V_2O_5	FeV
Vanadium content	55% ¹	80% ²
Sources	Vanadium-bearing ores, vanadiferous slag, spent catalysts, petroleum residues and power station ash	Vanadium pentoxide
Uses	Ferro-vanadium production, non-ferrous alloys (aviation), chemical applications (batteries, catalysts, pharmaceuticals, etc)	High strength steel
Pricing convention	US\$/lb V_2O_5	US\$/kg V in FeV
Current spot price ³	US\$15.2/lb	US\$67.5/kg

Notes:

1. Based on a molecular weight for vanadium of 50.9415g/mol and oxygen of 15.9994g/mol and a vanadium pentoxide purity of 98%.
2. Based on FeV80, a product containing 80% vanadium.
3. www.vanadiumprice.com

6. Appendix



VANADIUM RESOURCE ESTIMATE

Vanadium Exploration Target of between 70-90Mt @ 0.25-0.35% V₂O₅.

Mineral Resource Estimate @ 0.20% V₂O₅ cut-off¹

Category	Tonnes (Mt)	V ₂ O ₅ Grade (%)	Contained Metal (Mlbs)
Indicated Resources	2.3	0.321%	16.5
Inferred Resources	0.1	0.279%	0.8
Total	2.5	0.319%	17.3

Vanadium Exploration Target²

Tonnes (Mt)	V ₂ O ₅ Grade (%)	Contained Metal (Mlbs)
70 – 90	0.25% - 0.35%	385 - 695

Notes:

- These estimates were prepared and first disclosed under the JORC Code (2004). They have not been updated since to comply with the JORC Code 2012 on the basis that they have not materially changed since release.
- The potential quantity and grade of the Exploration Target is conceptual in nature, there has been insufficient exploration to define a Mineral Resource, and it is uncertain if further exploration will result in the definition of a Mineral Resource. The vanadium exploration targets are based on exploration results from the 2013 drilling at Chubu (refer to announcements 15 July and 13 November 2013) that demonstrated vanadium mineralisation through the black shales. The geology in the Okcheon belt consists of a meta-sedimentary sequence that comprises three formations, Wunkyori, Hwajeonri and Guryongsan. Stonehenge Korea will test the validity of the exploration target now that access to historical drill core has been obtained and the Company can analyse the core for vanadium mineralisation.

FERRO-VANADIUM PRICE

Corresponding increase in ferro-vanadium prices.

Ferro-Vanadium (US\$/kg) China 80% FOB



Source: Bloomberg as at 19th April 2018. Asian Metal Inc.



WWW.PROTEANENERGY.COM

**LEVEL 1, 89 ST GEORGE'S TERRACE
PERTH, WA, 6000**

**ADMIN@PROTEANENERGY.COM
+61 8 9481 2277**