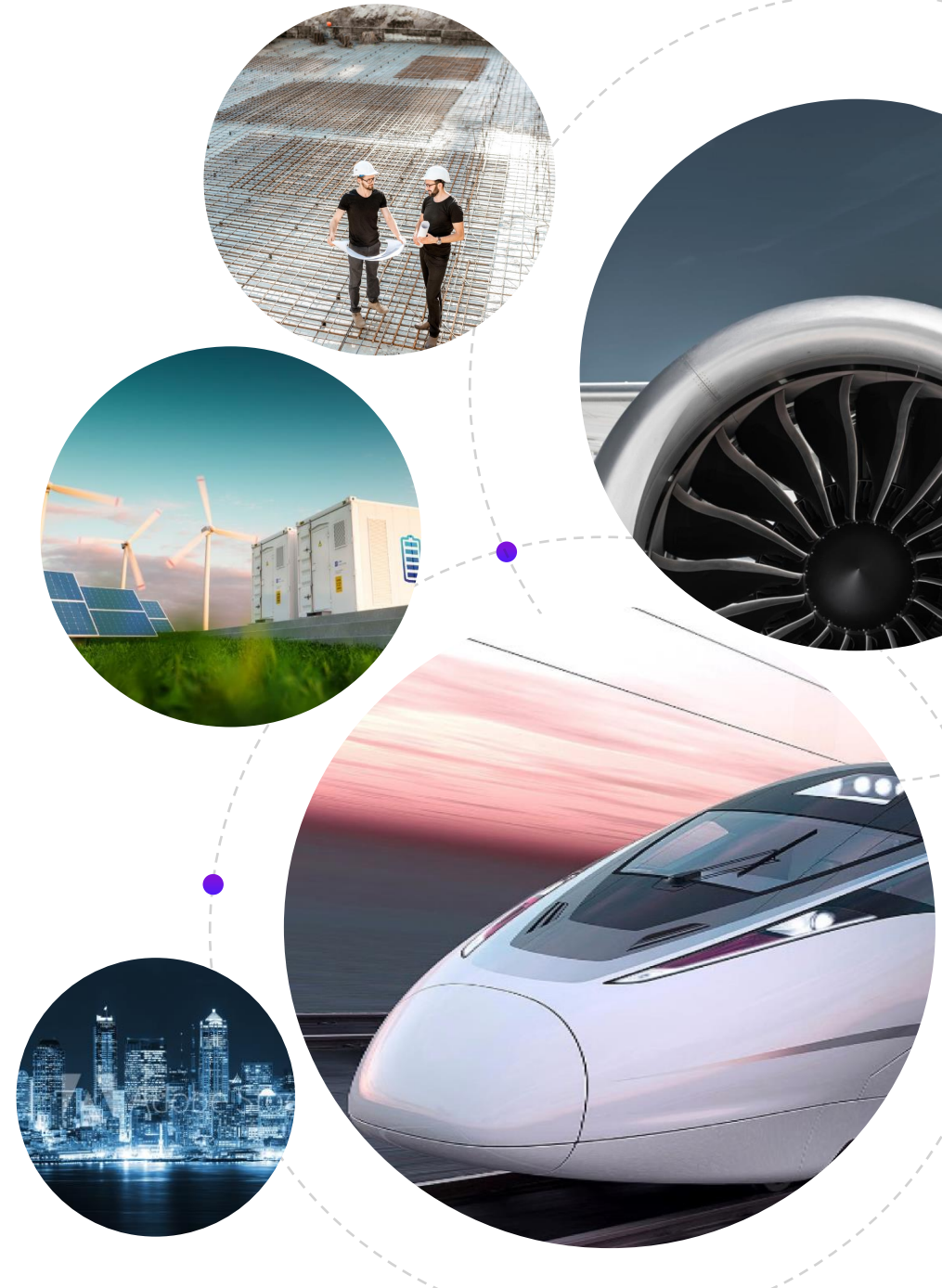




QEM Limited Dual Commodity Opportunity

ASX: QEM

QEC PRESENTATION
April 2021



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No Recommendation

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Competent Persons and Qualified Estimator Statements

The information in this announcement that relates to exploration results, mineral resource and contingent resource estimates for the Company's Julia Creek Project was first reported by the Company in its IPO prospectus dated 20 August 2018 and supplementary prospectus dated 12 September 2018 (together, the "Prospectus") and the subsequent resource upgrade announcement ("Resource Upgrade") dated 14 October 2019. The Company confirms that it is not aware of any new information or data that materially affects the information included in the Prospectus and Resource Upgrade, and in the case of estimates of Mineral Resources and Contingent Resources, that all material assumptions and technical parameters underpinning the estimates in the Prospectus and Resource Upgrade continue to apply and have not materially changed

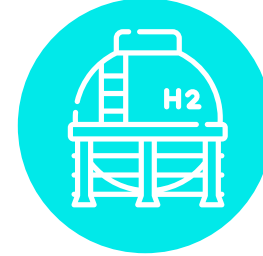
QEM Overview



QEM Limited (ASX:QEM) is developing the Julia Creek Vanadium + Shale Project



Targeting Dual commodities of transport fuels and vanadium pentoxide (V_2O_5)



Hydrogen strategy brought forward to meet Govt policy and industry needs



Transport fuels to support Australian resilience in post COVID economy



Globally significant JORC (2012) Indicated + Inferred Resource 2,760 Mt @ 0.30% V_2O_5



Vanadium defined as Critical Mineral by Australian and US Governments



783MMBL's of oil in the 3C category



Team that delivers

For Personal Use Only

The Team



Led by a team of highly successful and experienced mining professionals, with proven track record of mine development



John Foley
Chairman

- Extensive experience as current Chairman of; Precious Metal Resources Limited (ASX: PMR), Citigold Corporation Limited (ASX: CTO) and Carbon Credit Corporation (C3)



Gavin Loyden
Managing Director

- Company Founder, identified, acquired and began developing the Julia Creek Project
- Responsible for early capitalisation, initial exploration program and initial scoping study for QEM



Daniel Harris
Non-Executive Director

- Accomplished mining executive with 37+ years in all aspects of the resources sector
- Current independent Director Australian Vanadium (ASX:AVL), former CEO & COO- Atlantic (ASX: ATI), Former Director of Atlas Iron (ASX: AGO)
- Director of US Vanadium LLC

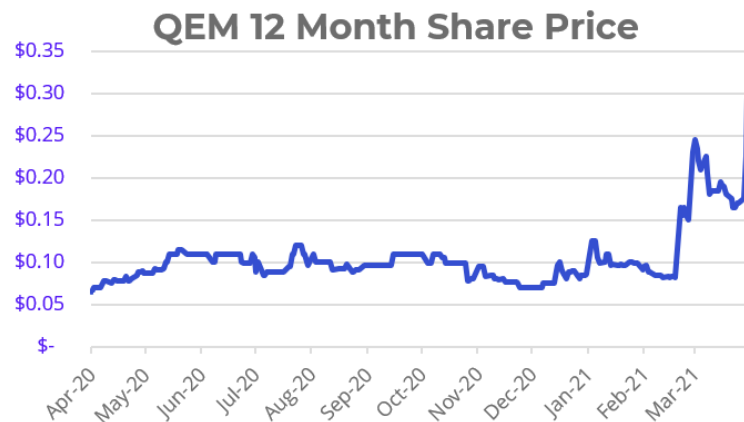


David Fitch
Non-Executive Director

- Experienced in strategic planning, commercial negotiations and business operations
- Formerly the COO and major shareholder of the Fitch group,
- Director of BioCentral Laboratories
- Largest shareholder of QEM

Corporate Overview

Clean Capital Structure and Shareholder Alignment



ASX Symbol: QEM	
Shares on Issue	100 million
Market Cap (26 March 2021)	\$24.5m
Share Price (26 March 2021)	\$0.245
Cash (as at 31 January 2021)	\$1.61m

Major Shareholders	
Directors	49.48%



\$24.5m Market Cap

Growth from \$5m IPO in
October 2018



Director Support

2.4m shares purchased by
Directors on market over
last 12 months



Alignment

Management alignment
with public shareholders.

Julia Creek Project



Opportunity for a World-Class Vanadium & Oil Shale Mine, with associated Hydrogen Strategy



Key Facts

- Shallow oil-bearing shale, mineralised with vanadium
- Tier-1 Mining Location
- Close to all infrastructure and services
- Associated Hydrogen production now accelerated
- Critical Minerals designation



Significant Resource

- Total JORC Inferred resource - **2,760 Mt**
- JORC Indicated area of **220Mt**
- Average content **V₂O₅ @ 0.30%**
- Oil component- **783MM Barrels** in 3C Category



Method

- Green Hydrogen generated on site using hybrid renewable power system
- Standard open cut method
- Low strip ratio
- Extraction methods being developed by QEM are safe, sustainable and environmentally friendly
- Test work to date shows up to **200%** yield achievable for oil extraction (based on Modified Fischer Assay- MFA)
- **90%** extraction rate for V₂O₅ through leaching



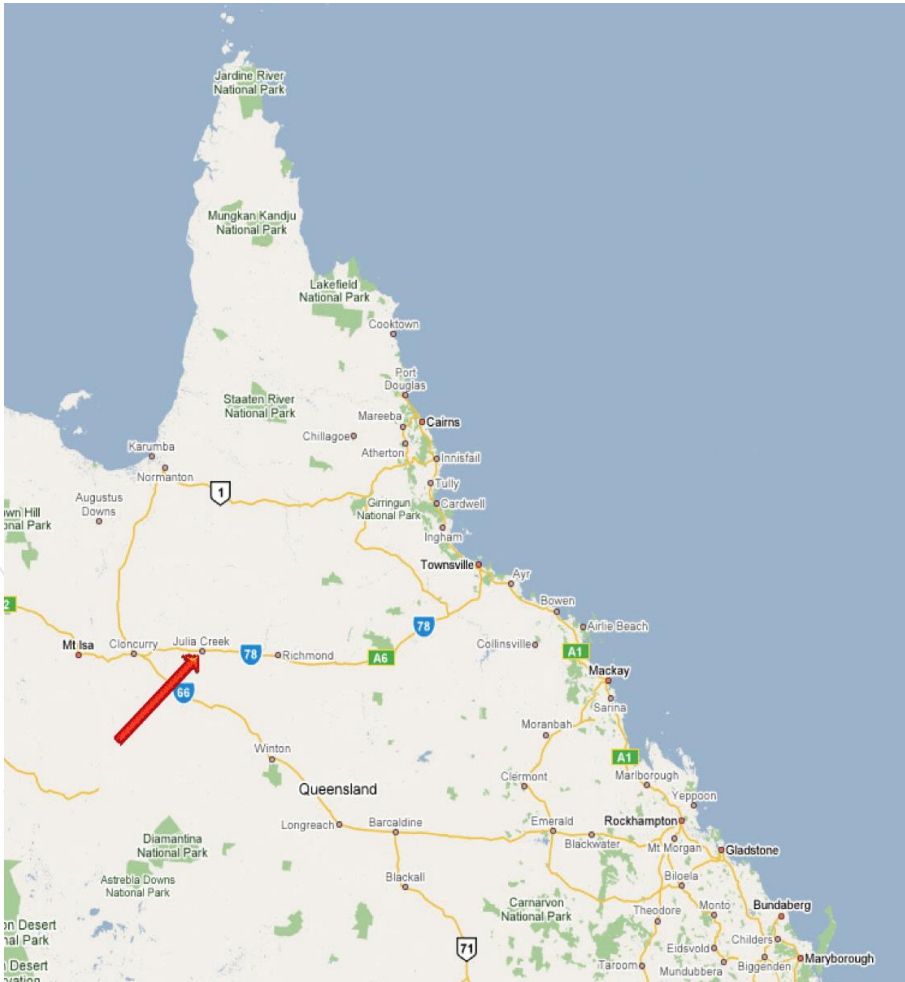
Confidential Use Only



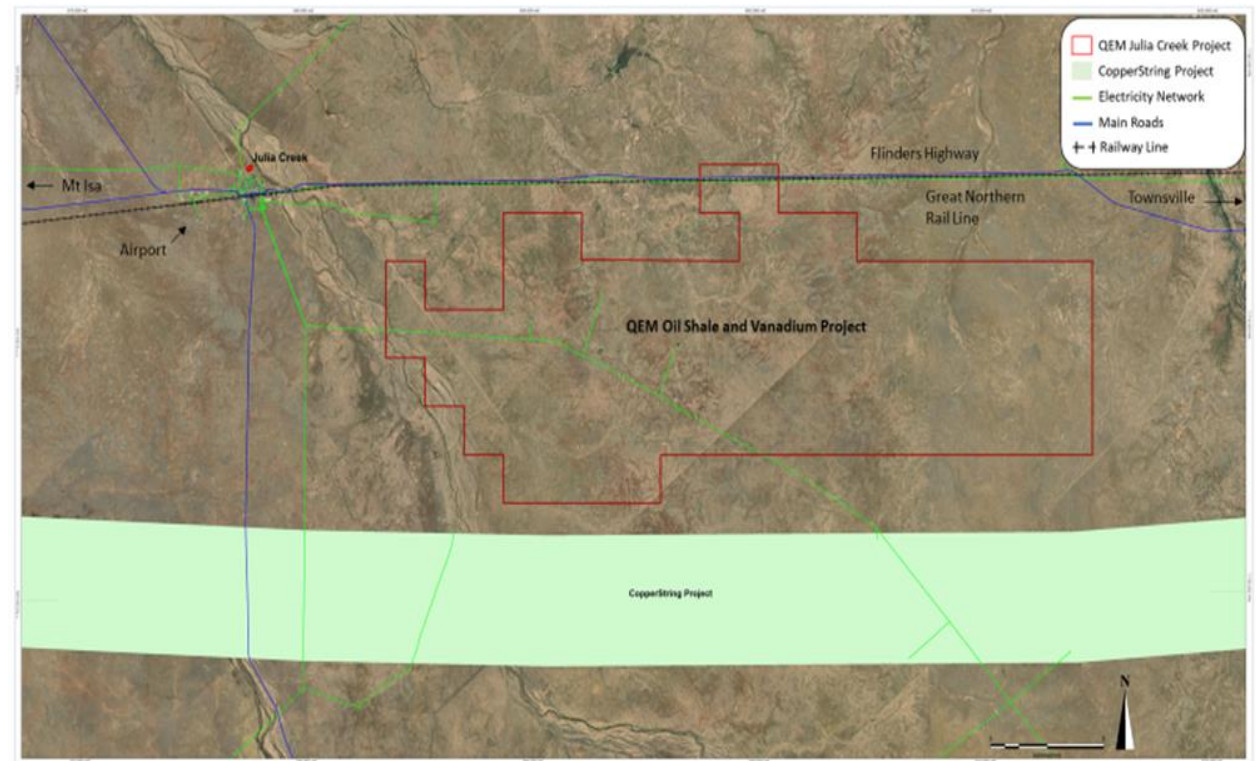
Julia Creek Project Location



Wholly-owned Exploration Tenements Covering 249.6km² in the Julia Creek Area, North Western Queensland



- Project located within the **North West Minerals Province (NWMP)**
- Access to all necessary infrastructure and services, including road and rail direct to the Port of Townsville (600km's) and Mt. Isa to the west (250 km's)
- Within the **Eastern Resource Development Corridor** recently established by the Federal Government



Hydrogen Strategy Accelerated



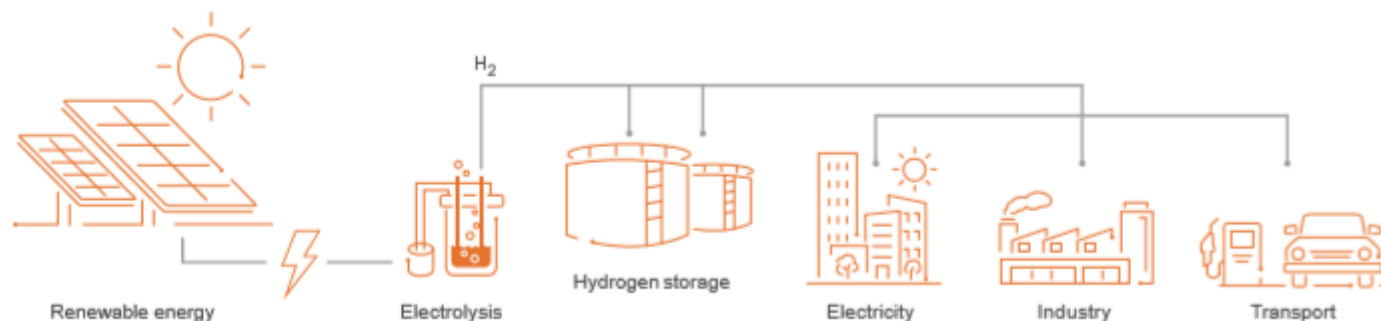
As an integral part of QEM's overall strategy to develop the Julia Creek Project, we seek to accelerate the hybrid solar/wind energy and hydrogen components of the project and bring them forward.

QEM has recently announced the appointment of DNV Australia to begin studies into the potential for a hybrid solar/wind project that can deliver to power a GREEN electrolyser for on-site hydrogen production.

It is envisioned that this hydrogen will be utilised within the QEM Julia Creek project for the upgrading of raw hydrocarbons into transport fuels, and to potentially create a hydrogen hub for the North West Minerals Province.

The solar/wind project could also deliver energy into the grid, while the balance of the Julia Creek project is being developed, subject to positive study outcomes, funding and government approvals. This aspect of the project could potentially financially underpin continued development of the Julia Creek project by QEM, prior to delivery of the main project.

Other mineral projects under development and regional communities may also benefit from the addition of a reliable, renewable energy supply and hydrogen for mining and transport fleets.



Source: https://www.dsdmp.qld.gov.au/_data/assets/pdf_file/0018/12195/queensland-hydrogen-strategy.pdf
Queensland Hydrogen Industry Strategy 2019–2024

Qld Hydrogen Industry Strategy



Strong Government Policy Commitment to Creating Hydrogen Industry

- Queensland State Government has a vision to back creation of a Hydrogen industry – specifically to support more jobs in regional Queensland (Queensland Hydrogen Industry Strategy 2019-2024)
- First minister for Hydrogen in Queensland appointed November 2020, \$19 million committed to state hydrogen strategy, and another \$5 million available in second round of Hydrogen Industry Development Fund announced on March 10, 2021
- Underpinned by Australia's National Hydrogen Strategy developed by the COAG Energy Council

“Vision: By 2030, **Queensland** is at the forefront of renewable hydrogen production in Australia, supplying an established domestic market and export partners with a safe, sustainable and reliable supply of hydrogen.”

- Queensland Hydrogen Industry Strategy 2019 - 2024

Sources:

https://www.dsdmp.qld.gov.au/_data/assets/pdf_file/0018/12195/queensland-hydrogen-strategy.pdf

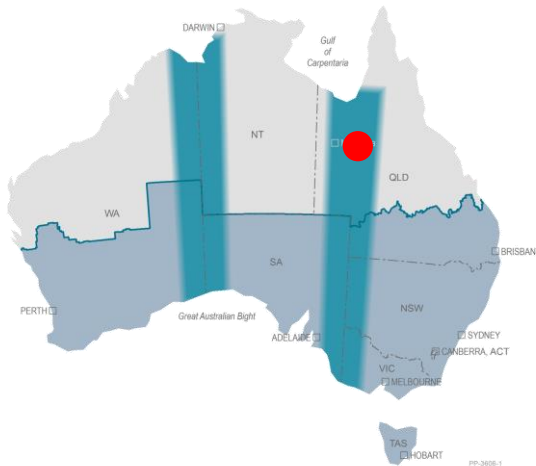
<https://www.industry.gov.au/sites/default/files/2019-11/australias-national-hydrogen-strategy.pdf>



Supportive Policy Environment



Development of Northern Australia and Resource Corridors Government Priority



Federal Government Resource Corridors
Julia Creek located in key corridor

- **Critical Minerals Facilitation Office**
- **Eastern Resource Corridor**
- **Queensland Hydrogen Industry Strategy**
- **Queensland Major Projects Facilitation**
- **Queensland Department of State Development**
- **\$1.5 Billion Copper String 2.0 project**



Vanadium is a new energy mineral – strategic significance as a Critical Mineral

- Along with lithium and rare earths, vanadium is a 'strategic metal' when building a new energy economy
- New economy minerals supported by Federal and Queensland governments
- Vanadium on the 'Critical Minerals List' for priority development and investment



Greater Fuel Resilience Needed

- Domestic sources of fuel are few, and local stocks are very low
- Julia Creek has the potential to contribute to local fuel supply needs for Agri, Mining & Defence

Government Funding Bodies

Government Backing Policy Aims with Funding Support

- **Northern Australian Infrastructure Facility (NAIF) \$2.47B** for infrastructure development in Northern Australia
- **Resources Technology and Critical Minerals Processing National Manufacturing Priority Roadmap \$1.5B** in funding for critical minerals processing development
- **The Clean Energy Innovation Fund (CEFC) \$200m** million in early-stage clean technology companies
- **Queensland Hydrogen Industry Strategy \$19m** in support funding for hydrogen projects in the state, particularly in regional areas, with additional \$5m announced recently to support feasibility studies.
- **Resources Community Infrastructure Fund \$100m** established by QLD Government
- **Exploring for the Future \$10m** expansion of the Government's program-focussed on new economy minerals such as vanadium
- **Queensland's Strategic Blueprint for North West Minerals Province (NWMP) \$39m** over four years.





Applications Of Vanadium



Vanadium Uses

Vanadium - The Versatile Element

Improves Steel Tensile Strength

Most widely used alloy to strengthen steel and HSLA.

Supports Fuel Efficiency

High strength to weight ratio makes vanadium a vital component in the automotive and aerospace industries

Weather Resistance

Vanadium alloys are naturally durable to extreme temperature and corrosion and are suitable for hydrogen storage & pipes (reduces failure due to hydrogen embrittlement)

Chemical & Catalysts

Catalysts, 'Smart Glass', sulphuric acid production, ceramics, dyes, cathodes for lithium batteries

Renewable Energy Storage

Vanadium Redox Flow Batteries (VRFB) are the preferred solution for large scale energy storage globally. Produces less 78% less CO₂ than LiB Cradle-to-gate, with recycling

Renewable Energy Storage

Building a Renewable Future



Vanadium Redox Flow Battery

	VANADIUM Redox	LITHIUM
Number of Cycles	100,000+ (20-30 yrs)	3000-10,000 (5-7 yrs)
Low Self-discharge	✓	X
Low Environmental Footprint	✓	X
Highly Expandable	✓	X
Generates Low Levels of Heat	✓	X
Charges & Discharges Simultaneously	✓	X
Can Release Energy Instantaneously	✓	X
Suitable for Connection to Power Grid	✓	X(Without Inverters)
Small Footprint	X	✓
CAN BE COMPLETELY RECYCLED	yes	no

Source: <https://www.energyandcapital.com/articles/the-best-thing-since-lithium/1531>
Mining Journal June 2018

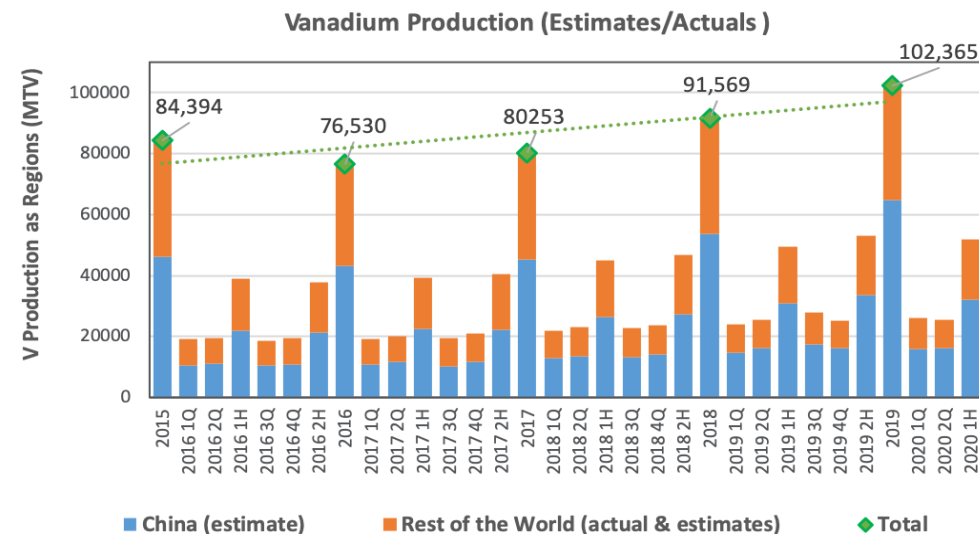


Vanadium Market

Set for growth

- Global Production 2020 ~ **102,000 MTV per year**
- Expected to grow by **28.31 thousand tons during 2020-2024.** (Source: Technavio Global Vanadium Market Report 2020-2024)
- Chinese market tightened due to increased steel production. **1Bt in 2020.**
- Vanadium was added to the '**US & Australian Strategic Metals List**' in 2018
- Long term average price for commodity grade V2O5 is \$8.86/lb USD (inflated to 2017 \$USD)
- Only 3 primary producers in the world today, outside of China and Russia.

2 in South Africa and 1 in Brazil



V2O5 Vanadium Pentoxide Flake 98% Price USD / lb

Europe : US\$8.00/lb ▲(+2.56%)

Mar 15, 2021



Graph Source: Vanitec <http://vanitec.org/vanadium/production-consumption>

Fuel Resilience

COVID-19 demonstrates supply chain risks

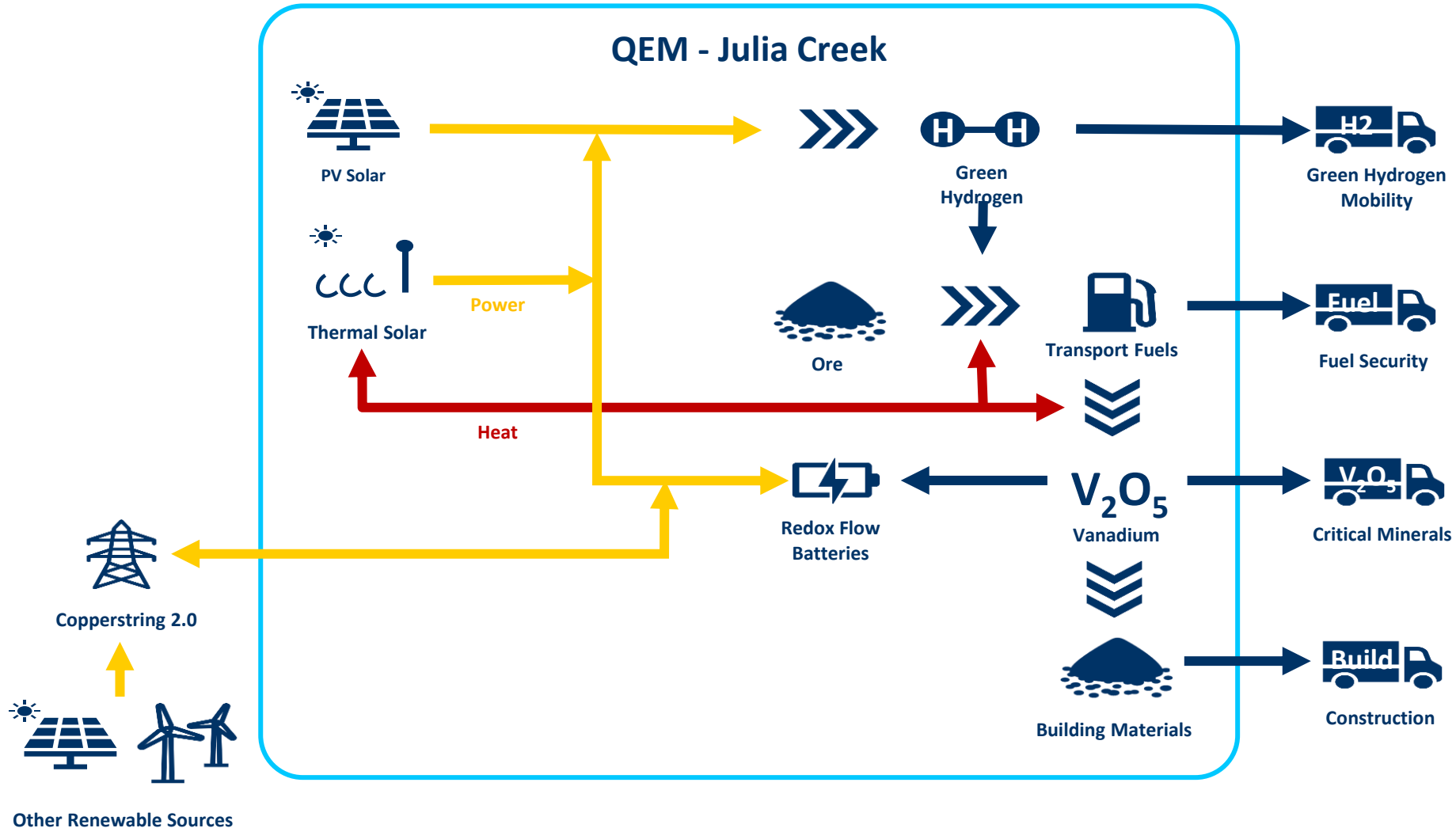


- Australia is an island nation that depends heavily on imported fuel
- Our current stockpile is critically low
- **30 days of petrol for automobiles**
- **20 days of diesel**
- **20 days of aviation fuel** (Australian Petroleum Statistics 2020)
- Australia's obligation as a member of the International Energy Agency (IEA) to hold at least 90 days of supply. Not held since 2012
- Greatly diminished refining capacity – 4 remain. All on “life support”
- Dependency on fuel imports for transport has grown from around **60%** in 2000 to over **93%** today
- COVID-19 has further exposed Australia’s lack of resilience in this area
- Government scrambling for solutions. Reserves in Texas = 3 Days supply. 8000kms away
- QEM considers this an opportunity.



Project Concept Design

Overview of process design

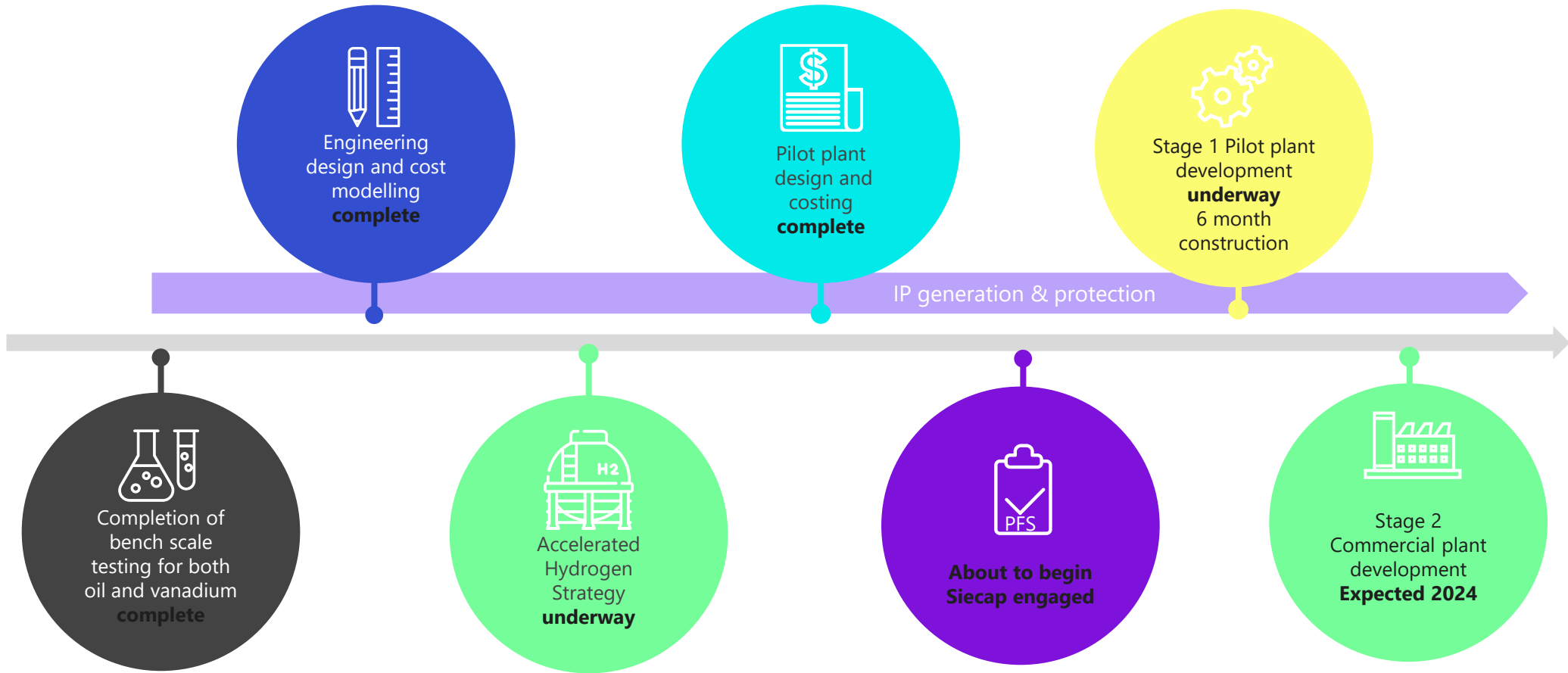


Prepared by



Development Strategy

Moving towards PFS in 2021



Right Project at The Right Time



Vanadium

QEM aims to become a leading supplier of high-quality vanadium pentoxide



Dual Commodity Deposit

Julia Creek in North Queensland allows production of both Vanadium (a Critical Mineral) and high-quality transportation fuels including Hydrogen



Transport Fuels + Hydrogen

QEM aims to provide innovative and environmentally friendly solutions that are important to our energy future

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Appendix – A

Julia Creek Resource



Julia Creek Resource Overview



Table 1: Summary of JORC Mineral Resource Estimate

Resource Class	Strat.Unit	Mass (Mt)	Average Thickness (m)	Total						
				Insitu Density (gm/cc)	V2O5 (wt%)	Cu (ppm)	Mo (ppm)	Ni (ppm)	Zn (ppm)	Al (ppm)
Indicated	CQLA	73	3.16	2.27	0.25	155	138	123	780	4752
	CQLB	67	2.97	2.24	0.28	182	168	142	890	5706
	OSU	40	1.94	2.08	0.33	223	153	191	1087	55317
	OSL	38	1.87	2.11	0.32	199	149	184	1015	55009
Inferred	CQLA	687	2.57	2.28	0.23	154	139	121	819	2854
	CQLB	874	3.33	2.15	0.38	220	221	201	1184	5323
	OSU	504	2.01	2.11	0.30	232	147	188	1148	62477
	OSL	481	1.98	2.13	0.29	212	134	171	1058	60316
Total		2,760		2.18	0.30	201	166	170	1043	26100

Note:

1. The estimate uses a minimum cut-off of 0.2% V₂O₅ for the oil shale units, and minimum cut-off of 0.15% V₂O₅ for the Coquina units.

2. The total resource tonnage reported is rounded to reflect the relative uncertainty in the estimate categories and component horizons may not sum correctly.

Table 2: Summary of SPE-PRMS Oil Resource

Strat.Unit	Mass (Mt)	Average Thickness (m)	Total		
			Oil Yield (L/tonne)	MMBarrels (insitu-PIIP)	MMBarrels 3C
CQL	1,701	5.93	44	446	401
OSU	544	2.01	72	231	208
OSL	518	1.97	63	193	174
TOTAL	2,760		53	870	783

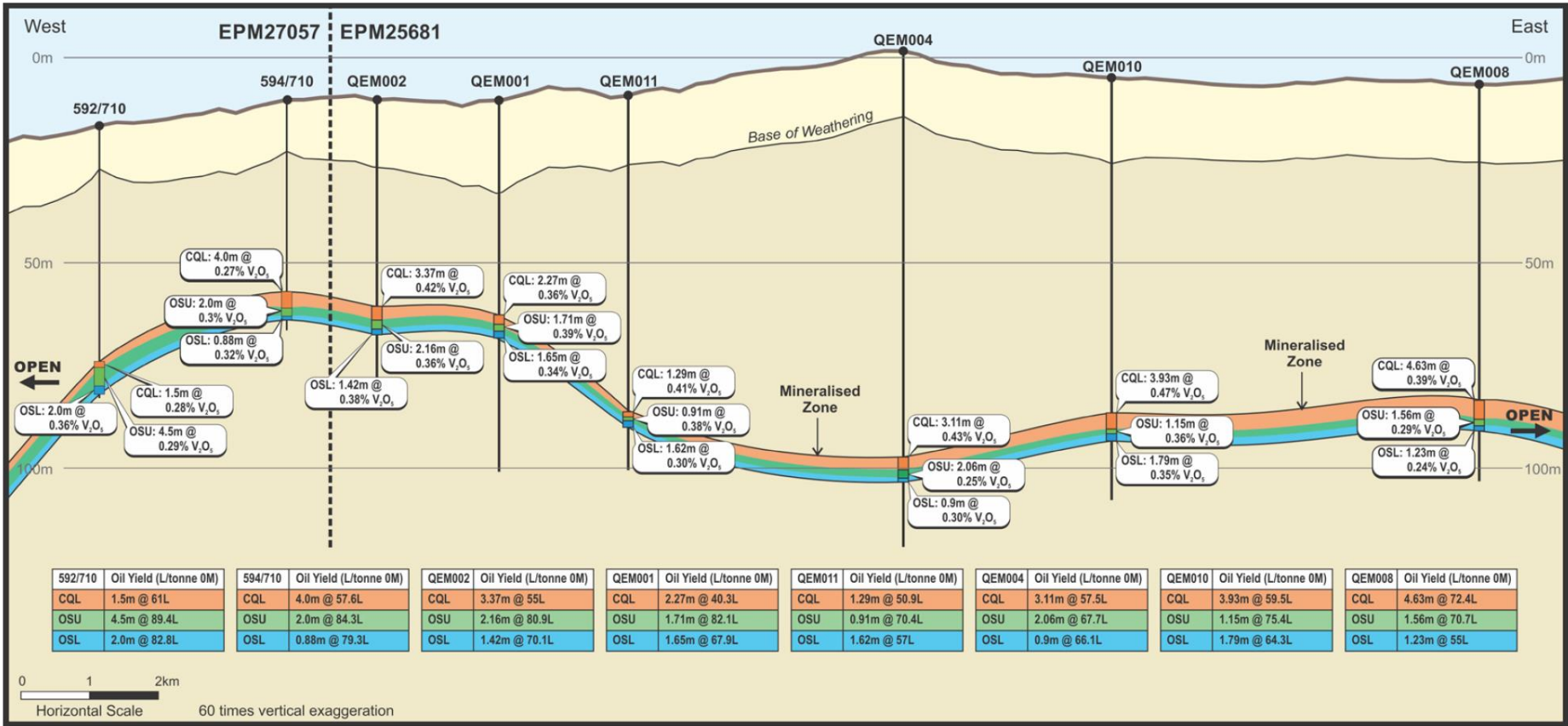
Note:

1. The total resource tonnage reported is rounded to reflect the relative uncertainty in the estimate and component horizons may not sum correctly.

Julia Creek Oil Yield



Cross Section the Julia Creek Oil Deposit.



Source: Measured Group The estimation methodology used is deterministic. The estimation is based on grids constructed for unit structure, thickness and oil grade parameters

Peer Comparisons



QEM's Julia Creek Vanadium Resource is one of the Largest on the ASX

Company	ASX Code	Project Name	Location	Total Resource Mt	V ₂ O ₅ %	Total V ₂ O ₅ Mt (Measured)	V ₂ O ₅ % (Measured)	Total V ₂ O ₅ Mt (Indicated)	V ₂ O ₅ % (Indicated)	Total V ₂ O ₅ Mt (Inferred)	V ₂ O ₅ % (Inferred)
King River Copper	KRC	Speewah Project	Wyndam Port, North West WA	4,712 Mt	0.30%	322 Mt	0.32%	1,054 Mt	0.33%	3,335 Mt	0.29%
QEM Limited	QEM	Julia Creek Project	North West QLD, Australia	2,760 Mt	0.30%	N/A	N/A	220 Mt	0.29%	2,540 Mt	0.31%
Horizon Minerals	HRZ	Richmond Vanadium Project	Richmond / Julia Creek, QLD	1,838 Mt	0.36%	N/A	N/A	430 Mt	0.50%	1408 Mt	0.33%
Vanadium Resources	VN8	SPD Project	South Africa	662 Mt	0.78%	92 Mt	0.77%	284 Mt	0.78%	285 Mt	0.77%
Neometals	NMT	Barrambie Project	Barrambie, WA	280 Mt	0.44%	N/A	N/A	187 Mt	0.46%	93 Mt	0.40%
Australian Vanadium	AVL	Australian Vanadium Project	Murchison Province, WA	208 Mt	0.74%	10.1 Mt	1.14%	70 Mt	0.72%	128 Mt	0.73%



Drilling at QEM's Flagship Julia Creek Project - May 2019

King River Copper: <https://www.asx.com.au/asxpdf/20190401/pdf/443ysh379b4xy3.pdf>
 Horizon Minerals: <https://www.asx.com.au/asxpdf/20200616/pdf/44jp422n1x1m0r.pdf>
 Vanadium Resources: <https://www.asx.com.au/asxpdf/20200429/pdf/44hbr074305tkn.pdf>
 Neometals: <https://www.asx.com.au/asxpdf/20190522/pdf/4458j3kk0nlpxq.pdf>
 Australian Vanadium: <https://www.asx.com.au/asxpdf/20200305/pdf/44fs1hgjl0mm5s.pdf>

Appendix – B

Government Policy Support



Government Backing: **NAIF**



Julia Creek within Northern Australian Infrastructure Facility coverage

NAIF is a Commonwealth Government agency established to facilitate economic growth by lending to infrastructure projects and businesses in northern Australia and helping to catalyse private sector investment.

NAIF is a \$5 billion development financier that provides loans to infrastructure projects in the Northern Territory, Queensland and Western Australia, in the last financial year, NAIF has made 11 Investment Decisions worth more than \$1.4billion

A key focus of any financing is to drive public benefit, economic and population growth and Indigenous involvement in northern Australia.

- NAIF can lend up to 100% of the debt and has a higher tolerance for the unique risks of investing in northern Australia including but not limited to, distance, remoteness and climate.

Government Backing: ARENA

ARENA fund has laid out Hydrogen project funding guidelines

ARENA Supports R&D in renewable hydrogen production, storage and use for energy, with the aim of delivering longer-term cost reductions and efficiency gains through innovative, disruptive technology developments.

- feasibility studies for projects involving 100+ MW electrolyzers
- commercial-scale deployments involving 10-40+ MW electrolyzers focused on industries and applications with large potential demand for hydrogen (e.g., ammonia production, power to gas, etc.) to drive the commercialisation of key component technologies
- demonstration-scale projects involving 1-10 MW electrolyzers demonstrating new applications such as transport or remote area power systems with onsite hydrogen production and fuel cells/turbines replacing diesel generation, to drive the commercialisation for key component technologies
- projects or activities that support the implementation of the National Hydrogen Strategy
- projects that demonstrate or address issues with the use of hydrogen in industrial processes currently using fossil fuels (e.g., hydrogen as a fuel in boilers, kilns or other process heating applications, hydrogen as a reducing agent in steel manufacture)
- subject to positive outcomes in financial and regulatory studies, QEM intends to seek financial support from the ARENA fund
- Source ARENA website



ARENA



Appendix – C

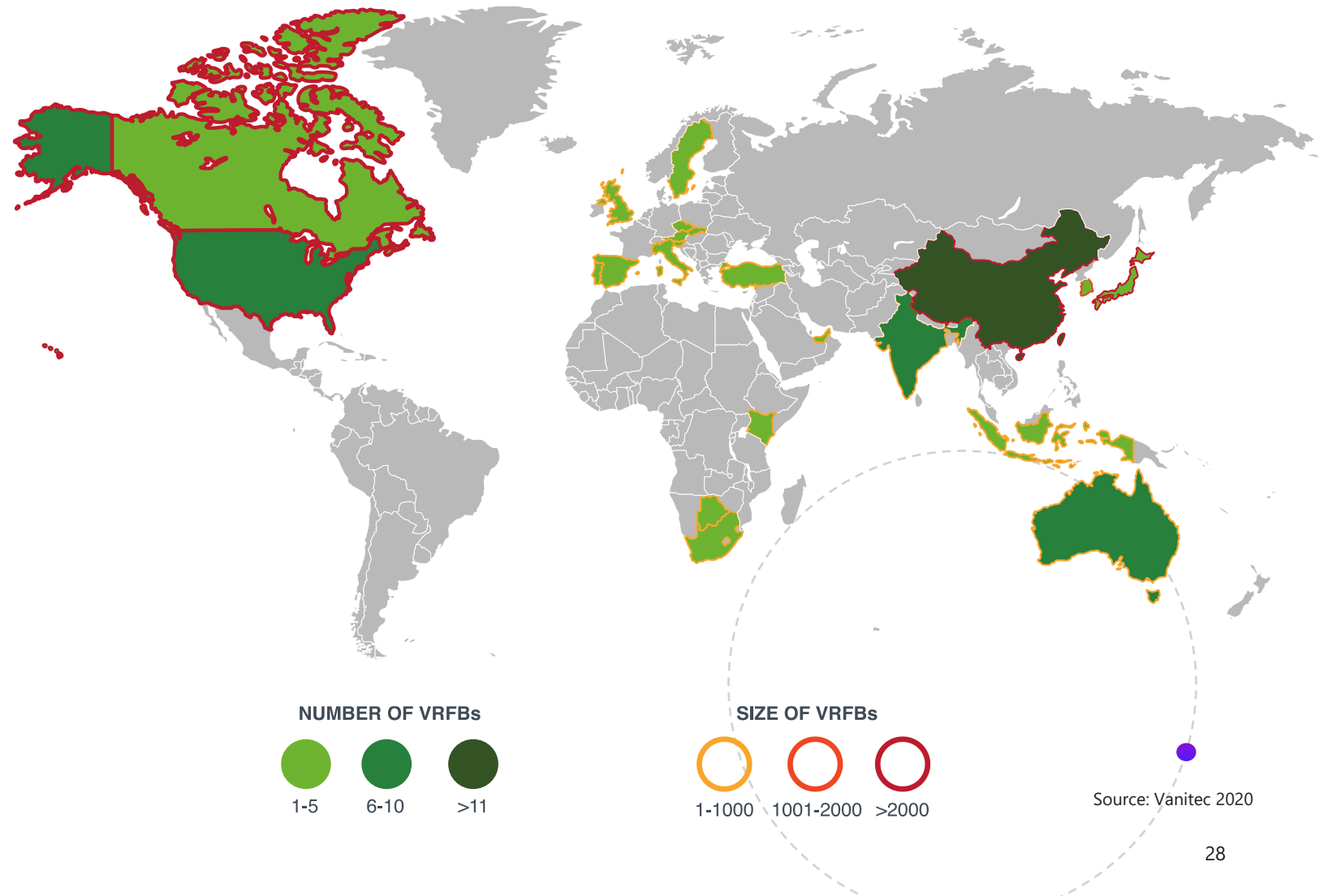
Vanadium Market



113 VRFB Installs Worldwide

39,664 kw of power, 209,800 kwh of energy

COUNTRY	VRFBs	kW	kWh
Australia	7	945	4629.90
Barbuda	1	3000	12000.00
Botswana	1	112	560.00
Canada	3	2500	10000.00
China	17	15825	48005.00
Czech Rep.	3	47	209.90
Denmark	3	40	260.00
Germany	15	1530	86190.00
India	4	155	740.15
Indonesia	2	400	500.00
Italy	5	631	2610.00
Japan	5	2330	7481.00
Netherlands	1	10	80.00
Portugal	5	5	60.00
Singapore	1	250	2000.00
Slovenia	1	10	45.00
South Africa	2	745	2950.00
South Korea	5	1250	4900.00
Spain	4	220	800.00
Sweden	1	800	1800.00
Switzerland	2	210	460.00
UK	5	805	5180.00
USA	17	7418	33173.70
Austria	1	14	84.00
Kenya	1	140	84.00
Slovakia	2	107	640.00
UAE	1	10	40.00



Construction

Stronger, safer buildings

- Vanadium plays an essential role as an alloy of steel to provide increased tensile strength, durability and weather resistance.
- Announced in February 2018, China revised steel rebar standards to limit the use of inferior strength steels in its ever-growing construction industry.
- Due to these revised standards, global demand for vanadium is set to increase, with this development expected to add between 10,000t to 15,000t of vanadium demand, and signs of an increase in demand is already evident in the market today.
- Global crude steel production reached 1,869.9 million tonnes (Mt) for the year 2019, up by 3.4% compared to 2018. (Source: <https://www.worldsteel.org/media-centre/press-releases/2020/Global-crude-steel-output-increases-by-3.4--in-2019.html>)

Australian Steel Industry

- ~5.3Mt of steel are produced in Australia annually. Australian Bureau of Statistics 2017-18.
- ~**100,000** people employed in the Australian steel industry
- Australia exports ~**800,000 tonnes a year.**
- Australian steel industry generates **\$29 billion** in annual revenue and is an essential part of the Australian economy.
- The Government of India is aiming to scale up steel production in the country to 300 MT by 2025 from about 90 MT in 2015-16.



Aerospace & Automotive

Vanadium and the future of transport



- **Aerospace** - Increased aircraft are required to service larger addressable air-travel market
- Both Boeing & Airbus both forecast annual global air traffic growth between 2016 and 2035 of nearly 5%. A titanium alloy containing 4% vanadium and 6% aluminium (Ti6Al4V) has been used extensively for blades, discs and casings of the compressors in many designs of the aero-engine gas turbine
- The development of new titanium alloys continues with the Vanadium component ranging from 8, 10 to 15%, which results in even higher strengths and the potential to make important contributions to weight reduction

Source: <http://www.nextsourcematerials.com/vanadium/about-vanadium/> Mining Journal June 2018

- **Automotive** – Today, 45% of **vanadium** goes into **cars**, and it is estimated that 85% will be **used** in manufacturing **auto vehicles** by 2025. This will reduce the weight of cars, thereby increasing their fuel efficiency and be able to meet fuel economy standards. (Source: Vanadium Corp)
- Engine components such as crankshafts and connecting rods are highly stressed and must withstand many cycles. Vanadium micro-alloyed forging steels are widely used for these parts, as well as other applications in the chassis, drivetrain, suspension and valve springs. (source: Vanitec.org)

Fuel Resilience



COVID-19 demonstrates supply chain risks

- Australia is an island nation that depends heavily on imported fuel — and our stockpile is critically low. The Government's Australian Petroleum Statistics published in April 2020 said this would amount to 30 days of petrol for automobiles, 20 days of diesel and 20 days of aviation fuel. (Courier Mail 5/07/2020)
- This is clearly in contravention of Australia's obligation as a member of the International Energy Agency (IEA) to hold at least 90 days of supply. Australia has not had 90 days supply since 2012.
- Australia is critically exposed to disruption in the supply of transport fuels and Australia's combined dependency on crude and fuel imports for transport has grown from around 60% in 2000 to over 93% today.
- COVID-19 has further exposed Australia's lack of resilience in this area.
- QEM considers this an opportunity. Advances in processing technologies of oil shale have been rapidly developing over the last few years and although the use of oil shale for energy goes back for generations, these advancements have now made processing oil from shale commercially viable and profitable.
- QEM is currently investigating a number of these environmentally friendly extraction technologies, with the aim of determining a potential method to produce liquid fuels from the Julia Creek resource.

