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Australian VANADIUM LIMITED

Kalgoorlie VBESS: Australia's need. WA's vision. AVL's capability.

Diggers and Dealers Mining Forum
August 2025

ASX:**AVL**

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Compliance & Cautionary Forward-looking Statements

The views expressed in this Presentation contain information derived from publicly available sources that have not been independently verified. No representation or warranty is made as to the accuracy, completeness or reliability of the information.

Forward Looking Statements

This Presentation may contain certain forward-looking statements with respect to matters including but not limited to the financial condition, results of operations and business of AVL and certain of the plans and objectives of AVL with respect to these items. These forward-looking statements are not historical facts but rather are based on AVL's current expectations, estimates and projections about the industry in which AVL operates and its beliefs and assumptions.

Words such as "anticipates," "considers," "expects," "intends," "plans," "believes," "seeks," "estimates", "guidance" and similar expressions are intended to identify forward looking statements and should be considered an at-risk statement. Such statements are subject to certain risks and uncertainties, particularly those risks or uncertainties inherent in the industry in which AVL operates.

These statements are not guarantees of future performance and are subject to known and unknown risks, uncertainties, and other factors, some of which are beyond the control of AVL, are difficult to predict and could cause actual results to differ materially from those expressed or forecasted in the forward-looking statements. Such risks include, but are not limited to resource risk, metal price volatility, currency fluctuations, increased production costs and variances in ore grade or recovery rates from those assumed in mining plans, as well as political and operational risks in the countries and states in which we sell our product to, and government regulation and judicial outcomes. For more detailed discussion of such risks and other factors, see the Company's Annual Reports, as well as the Company's other filings.

AVL cautions shareholders and prospective shareholders not to place undue reliance on these forward-looking statements, which relate only to events as of the date on which the statements are made.

ASX Listing Rule 5.23 *T*he information in this announcement relating to mineral resource estimates for the Australian Vanadium Project is extracted from the announcement entitled '39% Increase in High Grade Measured and Indicated Mineral Resource' released to the ASX on 7 May 2024. The relevant announcement is available on the Company's website www.avl.au. The Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcements, and that all material assumptions and technical parameters underpinning the estimates in the original 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 announcements.

Why the WA Government is providing $150m to support a 500MWh Kalgoorlie vanadium flow battery (Kalgoorlie VBESS)

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DOING WHAT'S RIGHT FOR WA

MEDIA RELEASE

WA Labor

Thursday, 30 January 2025

Australian-first battery project to reinforce Kalgoorlie's energy system

- Re-elected Cook Labor Government will invest $150 million in WA-made vanadium battery
- Project will further reinforce Kalgoorlie's energy system and create around 150 jobs
- Project to stimulate WA's emerging vanadium industry and create opportunities for local battery manufacturing in Kalgoorlie

Premier Hon Roger Cook MLA:

"*I want this project to be a catalyst to drive a new vanadium mining, processing and export industry for WA - to make more things here, diversify the economy and create the jobs of the future.*"

1. Boosting energy reliability in the Goldfields

- The Goldfields region relies on aging infrastructure and sits on the edge of the South West Interconnected System (SWIS)
- Kalgoorlie has recently experienced two major multi-day power disruptions due to weather impacts on the SWIS
- The VFB will provide 10 hours of backup electricity, strengthening local grid resilience against outages and extreme weather

2. Developing local vanadium supply chains and manufacturing

- WA is home to some of the world's largest vanadium deposits
- The government envisions the battery as a catalyst to spur downstream processing, local battery manufacturing, export and broader critical minerals development

3. Creating jobs and diversifying the regional economy

- Construction is projected to generate around 150 local jobs, with additional ongoing employment in manufacturing and export activities
- The project supports WA Labor's goal of diversifying Kalgoorlie's economy by fostering a value-added battery and critical minerals industry cluster, while reinforcing the Goldfield's energy system

Early leadership across full supply chain positions AVL to offer compelling solutions into the Kalgoorlie VBESS project

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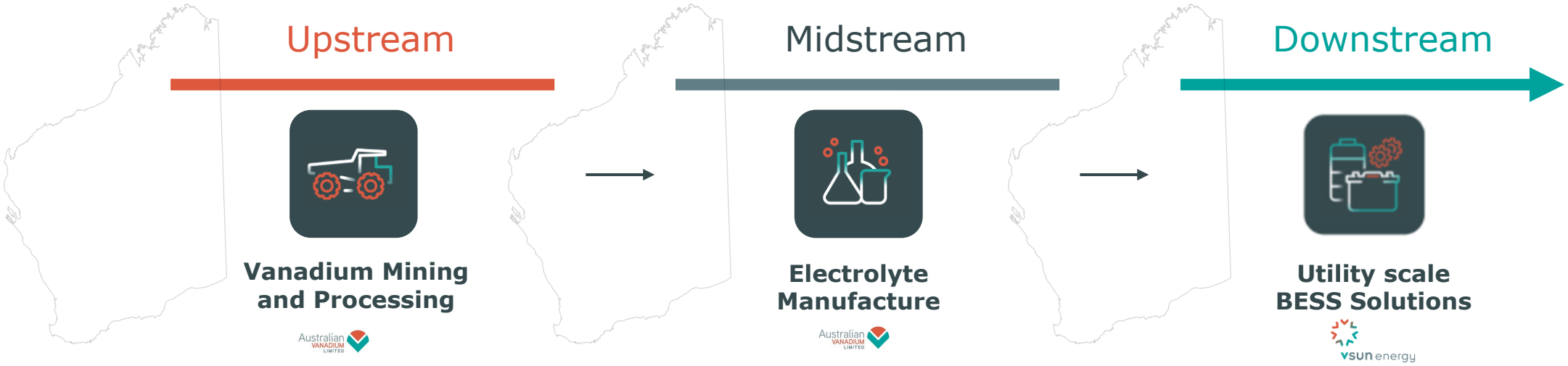

	Upstream	Midstream	Downstream
Asset	Australian Vanadium Project	Electrolyte manufacturing facility	VSUN Energy (100% AVL)
AVL advantage	High-grade project in Tier-1 jurisdiction – WA[1]	Established and operational facility	Vertically integrated to deliver cost competitive VFB storage solutions
Status	• Current focus on finalising optimised feasibility study (OFS) and remaining approvals, while securing offtake and funding	• Successfully deployed AVL electrolyte into operational VFB[2] • Electrolyte being qualified for utilisation with leading VFB OEMs • Advancing techno-economics on expansion options	• Commercial VFB BESS[3] projects and the development of Project Lumina positions VSUN Energy as leader in VFB BESS deployment in Australia[3] • VFB project with WA based Horizon Power has exceeded client expectations[5]

1. See ASX announcement dated 7 May 2024, '*39% increase in HG Measured and Indicated Mineral Resource*', 2. See ASX announcements dated 16 September 2024, '*Electrolyte Successfully Deployed in VFB for Horizon Power*', 3. VFB BESS: A battery energy storage system based on vanadium flow batteries, 4. See ASX announcement dated 6 November 2024, '*Realising AVL's Utility-Scale Vanadium Flow Battery Strategy*' and 9 May 2025 '*Project Lumina progress confirms improved competitiveness*',5. Seelinkedin.com/posts/horizon-power_exciting-progress-in-renewable-energy-storage-activity-7326176560657432577-IFwF/

Why VFB BESS is best positioned to meet demand for long duration storage

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Zero

Thermal event risk – VFB is a non-flammable technology

>99%

VFB commercial end-of-life reuse and recyclability[2]

Proven

Nearly 20-year history of grid-connected VFB BESS

Cost

VFB BESS competitive on a LCOS basis to lithium-ion BESS[1]

30+

Years

VFB BESS asset life

Australian

VFB technology invented at UNSW Sydney

Demonstration vanadium flow battery at Curtin University's WA School of Mines Kalgoorlie Campus, with Hon David Michael Minister for Mines and Goldfields-Esperance, Ali Kent MLA Member for Kalgoorlie and Graham Arvidson CEO AVL

1. LCOS: Levelised Cost of Storage. See dated ASX announcements dated 6 November 2024 '*Realising AVL's utility scale vanadium flow battery strategy*' and 9 May 2025 '*Project Lumina progress confirms improved competitiveness*'
2. Sumitomo Electric – sumitomoelectric.com/products/flow-batteries/features

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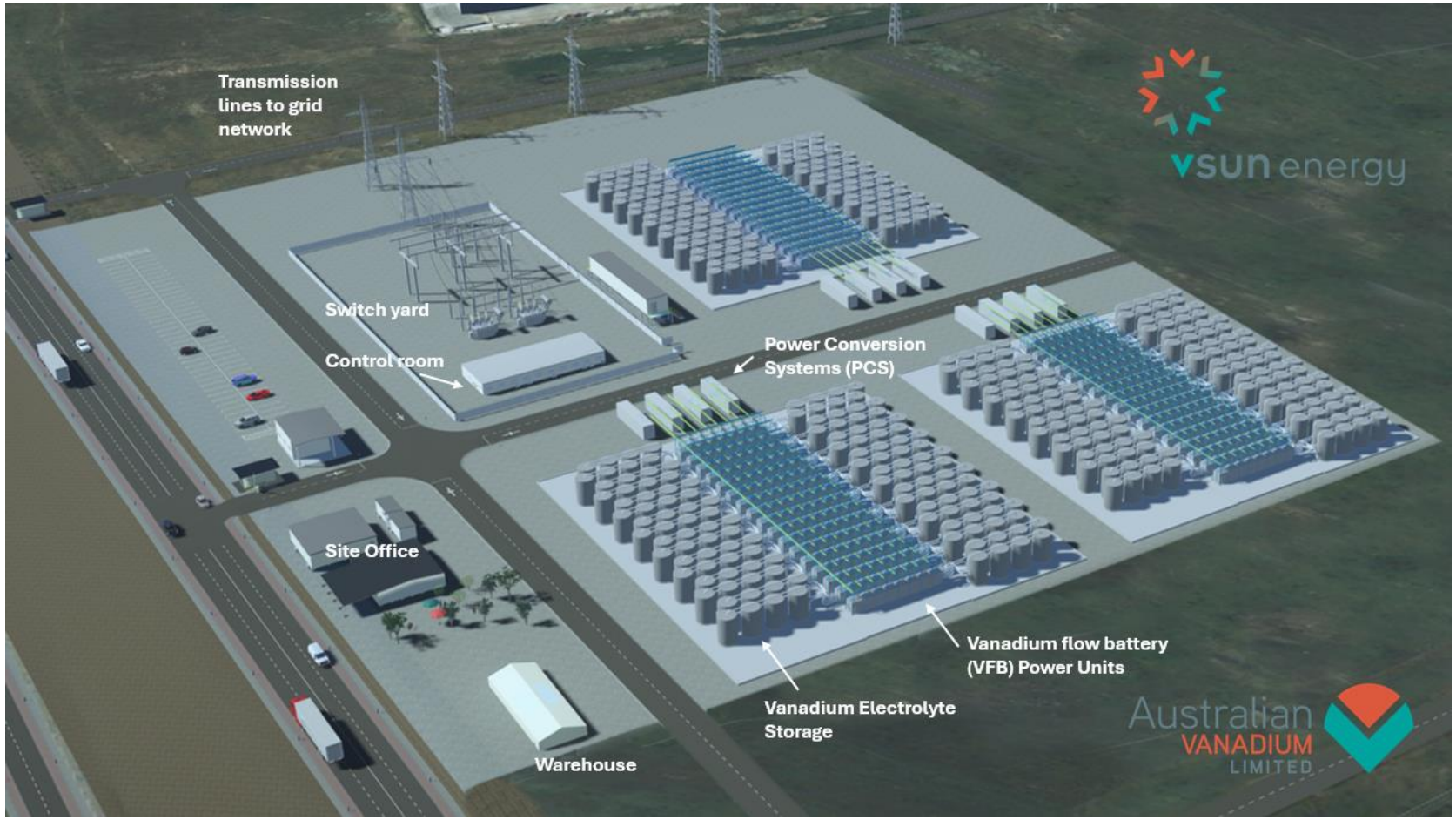
AVL has advanced a turnkey VFB BESS architecture tailored for Australian build-own-operate delivery



Example 50MW 10-hour (500MWh) VFB BESS Layout

- Simple and scalable supply chain: vanadium electrolyte, tanks, pumps, piping, power stacks
- Configuration optionality to meet specific land requirements
- Utilisation of industry standard inverters allows grid forming/firming, FCAS, black start, etc
- VFB BESS can do what lithium-ion BESS can do and more
- Targeting +70% local content
- Low-cost duration augmentation to match evolving market conditions

1. See ASX announcement dated 6 November 2024, *'Realising AVL's Utility-Scale Vanadium Flow Battery Strategy'* and 9 May 2025 *'Project Lumina progress confirms improved competitiveness'*

Early supply chain leadership and Lumina architecture enables AVL to maximise WA content

Indicative capital cost breakdown of AVL's Lumina solution for a 50MW/500MWh VFB[1]

Pumps, tanks, pipework
Off the shelf design allows for utilisation of local supply chains

EPCM & other
Utilisation & leverage of WA based EPC partners

Civils
Utilisation of local contractors and supply chain

Electrolyte
AVL has established commercial electrolyte production

Power stack
Potential to establish local manufacturing in Australia

Inverter and power control system
Limited manufacturing in Australia requires offshore purchase

Western Australian Content

Potential local content

Acknowledgement of AVL's early supply chain leadership and alignment

"We acknowledge AVL's early leadership in this sector, including progress on upstream vanadium processing at Tenindewa and work to develop domestic battery supply chains. AVL's integrated approach aligns well with the Government's ambitions to support significant local content and industrial development."

Hon Amber-Jade Sanderson MLA - Minister for Energy and Decarbonisation; Manufacturing; Skills & TAFE; Pilbara[2]

1. Based on internal capital costs analysis of Project Lumina 50MW/500MWh VFB BESS deployment
2. 1 August 2025 - Letter to Australian Vanadium, Hon Amber-Jade Sanderson MLA

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Kalgoorlie VBESS – update on expected timing and process

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Commitment to long duration energy storage, WA vanadium, and battery manufacturing

Competitive process commencing shortly

Vanadium Mining and Processing

Electrolyte Manufacture

Utility scale VFB BESS

*""This [Kalgoorlie VBESS] project reflects our commitment to strengthening regional energy resilience, **supporting long-duration storage solutions**, and **advancing Western Australia's vanadium and battery manufacturing industries**."*

*"The Government will shortly commence a formal Expression of Interest process for the Kalgoorlie VBESS. This process will ensure a transparent and competitive approach to delivering this strategically important project and provide a platform for all capable proponents to demonstrate their **value, readiness, and contribution to Western Australia's vanadium industry**."*

Hon Amber-Jade Sanderson MLA – Minister for Energy and Decarbonisation; Manufacturing; Skills and TAFE; Pilbara[1]

1. 1 August 2025 - Letter to Australian Vanadium, Hon Amber-Jade Sanderson MLA

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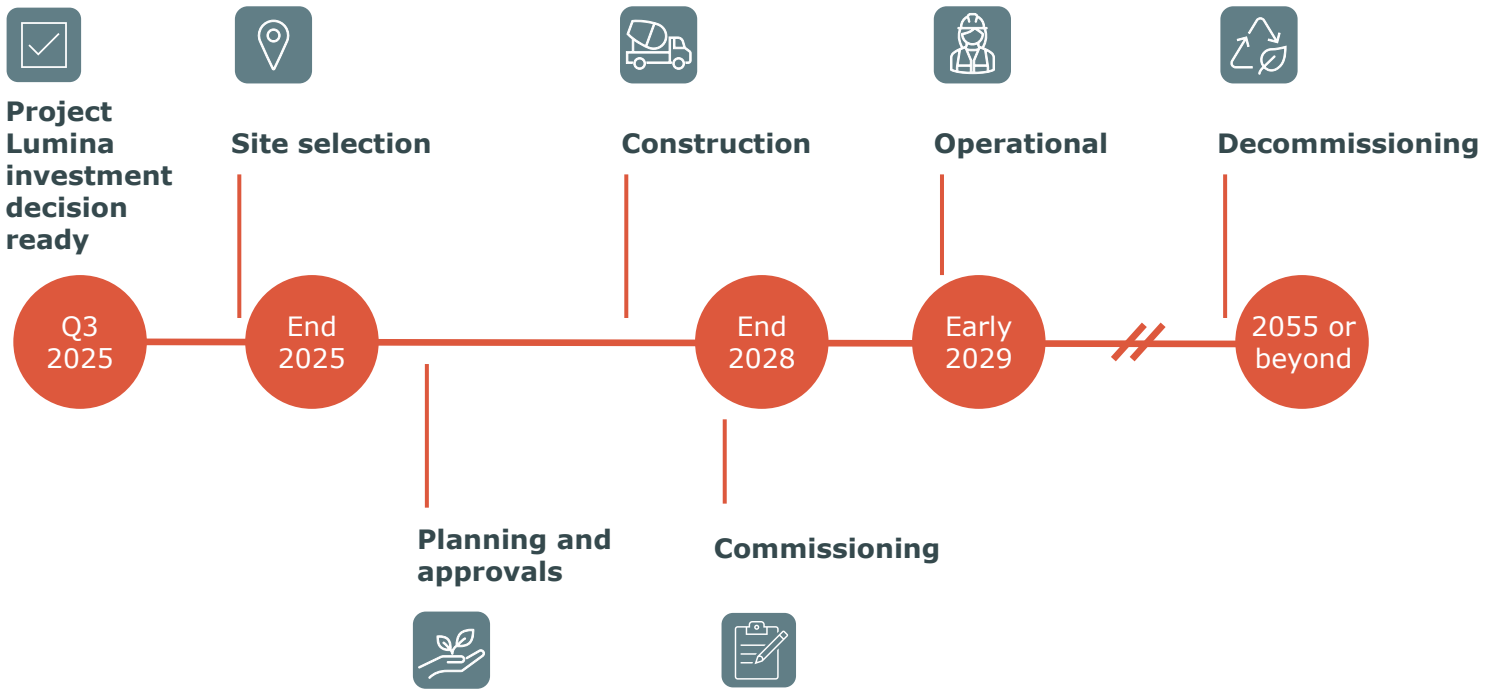
Indicative VFB BESS development timeframe



Kalgoorlie VBESS

AVL is well positioned to facilitate the deployment of the Kalgoorlie VBESS in line with the Government's time frame while maximising alignment to additional objectives:

- Technical and delivery readiness with Project Lumina advanced
- Established and proven local electrolyte manufacturing capability
- Advanced engagement with key early contractors and partner network
- Established presence in Western Australia and track record deploying VFBs
- Engagement with debt and equity funding solutions

The case for new upstream supply: a single utility scale VFB BESS unlocks globally significant demand for vanadium

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50MW/ 500MWh VFB BESS ~ **4kt** V_2O_5 demand[1] ~ **c.1.7%** Of global V_2O_5 supply[2]

"Western Australia, of itself, is going to have a strong demand for vanadium as part of our domestic market" [3]

- Premier Hon Roger Cook MLA

1. AVL internal, utility scale VFB BESS modelling
2. TTP Squared, Inc – 2024 global vanadium market size 133,000 metric tonnes vanadium (equivalent to 237kt V_2O_5)
3. https://www.businessnews.com.au/article/No-nickel-woes-for-vanadium-Cook

The Australian Vanadium Project delivers significant competitive advantage for future VFB deployment

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- A world class asset located in Western Australia, a Tier-1 mining jurisdiction
- Simple open pit mining with standard magnetite concentrator process
- Global vanadium MRE of 395.4Mt at 0.77% V_2O_5 including 104.5Mt at 1.12% V_2O_5 classified as Measured or Indicated[1]
- Optimised Feasibility Study underway, aimed at creating project with superior economics[2]
- Current focus on finalising remaining approvals, while securing offtake and funding
- Delivers local jobs and regional development

1. See ASX announcement dated 7 May 2024, '*39% increase in HG Measured and Indicated Mineral Resource*'
2. Refer ASX announcement 2 July 2024, '*Completion of First Phase of Optimised Feasibility Study*'

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Investment highlights

- Utilisation of proven technology to bring cost competitive and sustainable solutions into the looming long duration storage market
- AVL can deliver a WA centric supply chain targeting +70% local content
- AVL's Lumina VFB architecture delivers ability to expand storage in lock step with growing market requirements
- Ability to unlock WA's vanadium resource advantage

Join us as we seek to unlock Australia's long-duration energy storage revolution.

CEO Graham Arvidson and The Hon Anthony Albanese MP, Prime Minister of Australia, and The Hon Roger Cook MLA, Premier of Western Australia at AVL's electrolyte facility

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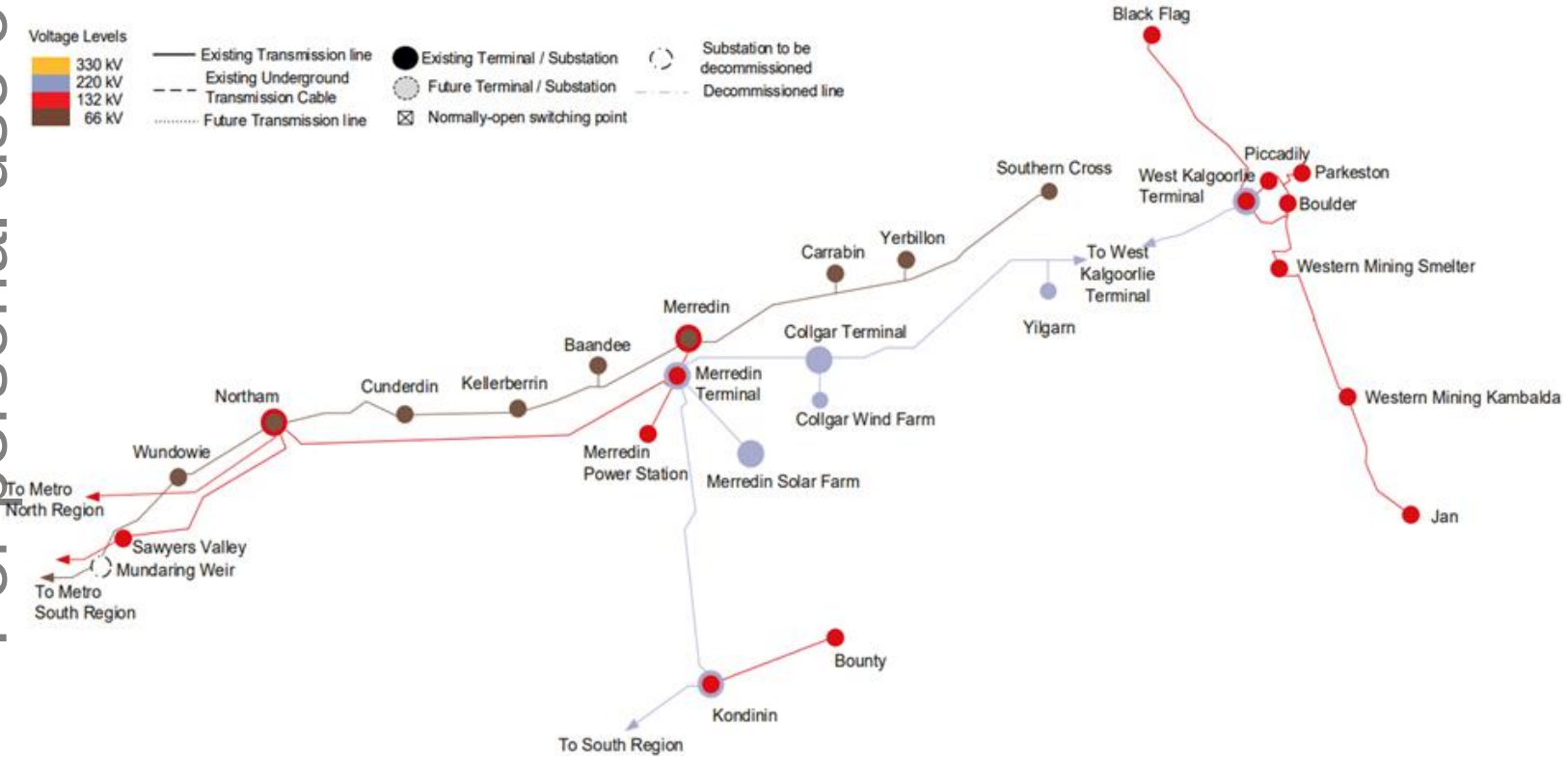
Kalgoorlie power infrastructure will benefit from the addition of a long duration battery energy storage system – Kalgoorlie "VBESS"

Kalgoorlie is connected to the SWIS power network by a single 650km transmission line which, due to its length has a higher risk of transmission related outages, leaving Kalgoorlie susceptible to power outages



Source: 'Goldfields Region Electricity Forum', Government of Western Australia, November 2024

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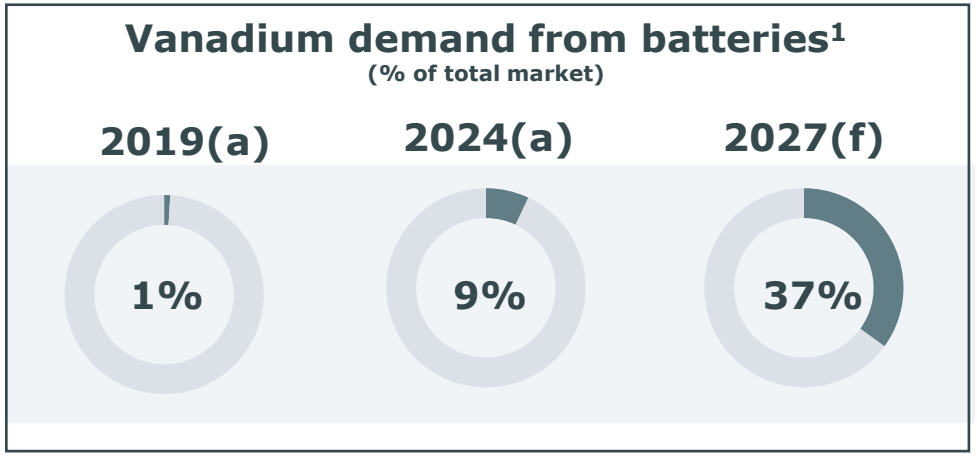
Vanadium 101

Demand

While current vanadium demand is largely driven use in steel, vanadium's growing role in the energy transition through vanadium flow batteries (VFBs) presents a significant opportunity to diversify beyond steel.

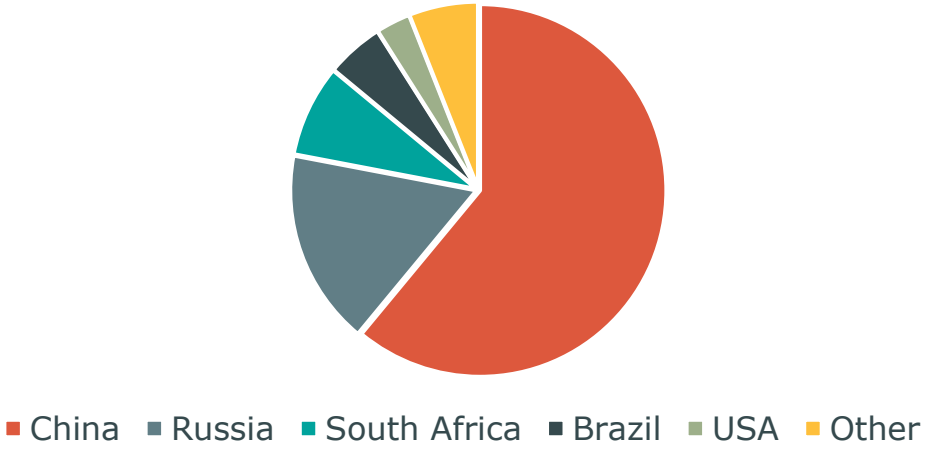


(a) actual (f) forecast

Supply

Global vanadium market of 133,000 MTV* in 2024. Over 75% of global vanadium supply currently sourced from China, Russia and South Africa.

Global Vanadium Supply[1]



* MTV is metric tonne unit of vanadium

1. US based vanadium market specialist, TTP Squared, Inc

Transitioning Australia's NEM[1] will not happen without rapid growth in longer duration energy storage

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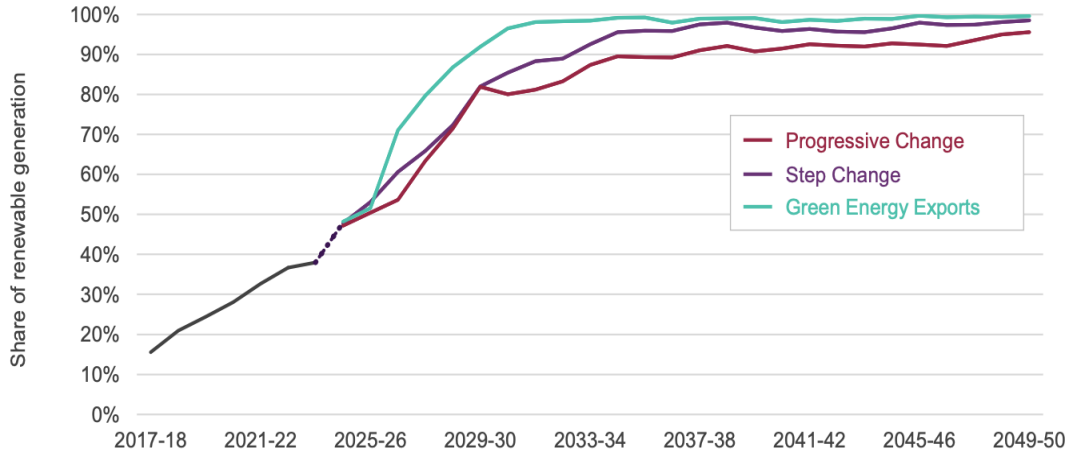
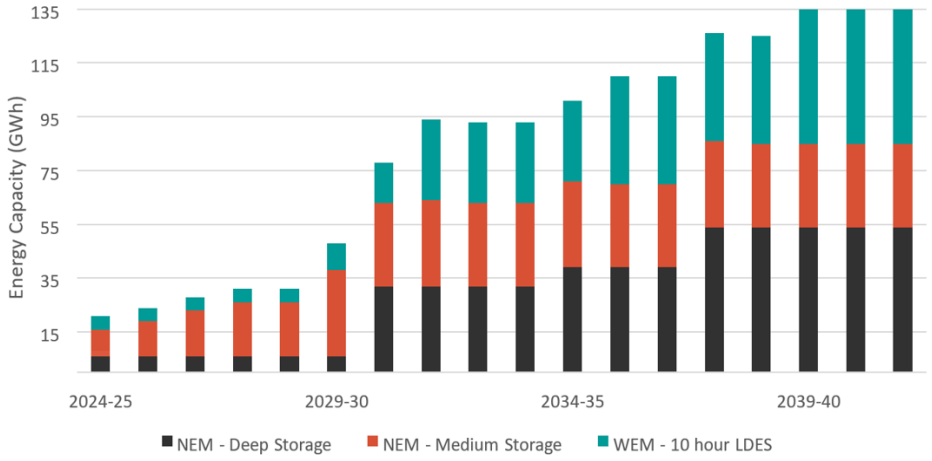
Generation from renewable sources – NEM (%)



Deep/medium energy storage (ex pumped hydro)



Renewable energy generation is set to rapidly increase …

… driving the need for long duration storage to stabilise the grid

Australia's addressable market for VFB BESS

120 GWh by 2040
(excluding pumped hydro)

Annual growth of 7 GWh over ~25 years

Implied average duration 11 hours
(excluding pumped hydro)

1. AEMO – Australian Energy Market Operator, NEM – National Electricity Market (the electricity market of the eastern and southeastern states of Australia), WEM – Wholesale Electricity Market (the electricity market of Western Australia's South-West Interconnected System – SWIS)

Source: AEMO, 2024 Integrated System Plan for the National Electricity Market

VSUN Energy – Advancing opportunities across five states

Growing government support for LDES[1] across Australia

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Western Australia – $150M funding for 50MW/500MWh 10-hour VFB BESS

Roger Cook & WA Labor

DOING WHAT'S RIGHT FOR WA

WA Labor

MEDIA RELEASE

Thursday, 30 January 2025

Australian-first battery project to reinforce Kalgoorlie's energy system

- Re-elected Cook Labor Government will invest $150 million in WA-made vanadium battery
- Project will further reinforce Kalgoorlie's energy system and create around 150 jobs
- Cook Government has secured additional gas back-up generation for the Goldfields and is well underway with the process to replace West Kalgoorlie Power Station by 2026
- Project to stimulate WA's emerging vanadium industry and create opportunities for local battery manufacturing in Kalgoorlie

New South Wales – support for storage projects of at least 8 hours

NSW GOVERNMENT

NSW powers ahead with biggest energy storage tender

nsw.gov.au/media-releases/nsw-biggest-energy-storage-tender Printed: 31 May 2024

Published: 31 May 2024

Released by: Minister for Energy and Climate Change

NSW has opened the largest energy storage tender in NSW history, seeking new long-duration storage projects to boost electricity reliability and keep the lights on in NSW.

These projects will help ensure a steady and reliable supply of energy around the clock. They will play a significant role in the NSW Government's transition to renewable energy, which will deliver reliable and affordable power to households and businesses at the same time as driving down emissions to meet our net zero targets.

Long-duration storage projects can bid for financial support under the new NSW Electricity Infrastructure Roadmap Tender 5 which is now open. This tender offers support for up to 1 gigawatt of projects, which can each release energy into the NSW grid for at least 8 hours.

Federal Government support packages target 4-hour projects

Australian Government

The Capacity Investment Scheme

The Capacity Investment Scheme (CIS) Tender 3 – National Electricity Market (NEM) – Dispatchable (CIS Tender 3) Stage A has closed, and Project Bids are being assessed.

About the Tender

Tender 3 is a competitive process to secure dispatchable capacity in the National Electricity Market (NEM).

The Tender is seeking an indicative target of 4 GW of four-hour equivalent dispatchable capacity, or 16 GWh of dispatchable capacity, that will be operational before 31 December 2029.

1. LDES: Long duration energy storage

Vanadium: delivering positive economic outcomes for Western Australia

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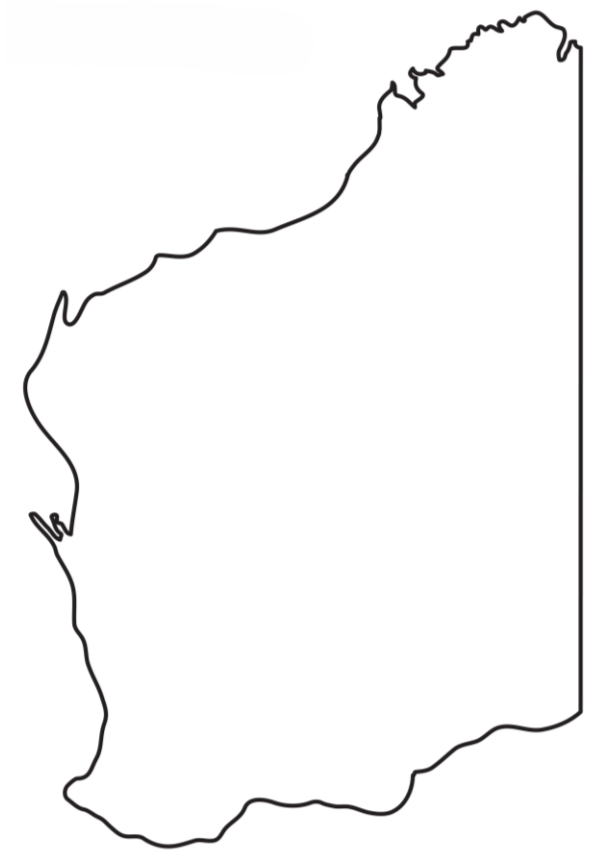

Benefits for Western Australia	Vanadium
1 Growing or improving industrial capability	✓
2 Helping industry pursue value-adding opportunities	✓
3 Improving economic diversity	✓
4 Crowding-in private finance	✓
5 Decarbonisation	✓
6 Creating secure jobs and a skilled, adaptable workforce	✓
7 Boosting supply chain resilience	✓
8 Commercialising Australian innovation and technology	✓
9 Sustainability and circular economy principles and solutions	✓
10 Regional development	✓

VFB adoption in China is already at GWh scale
Australia has all the right ingredients to be a fast follower

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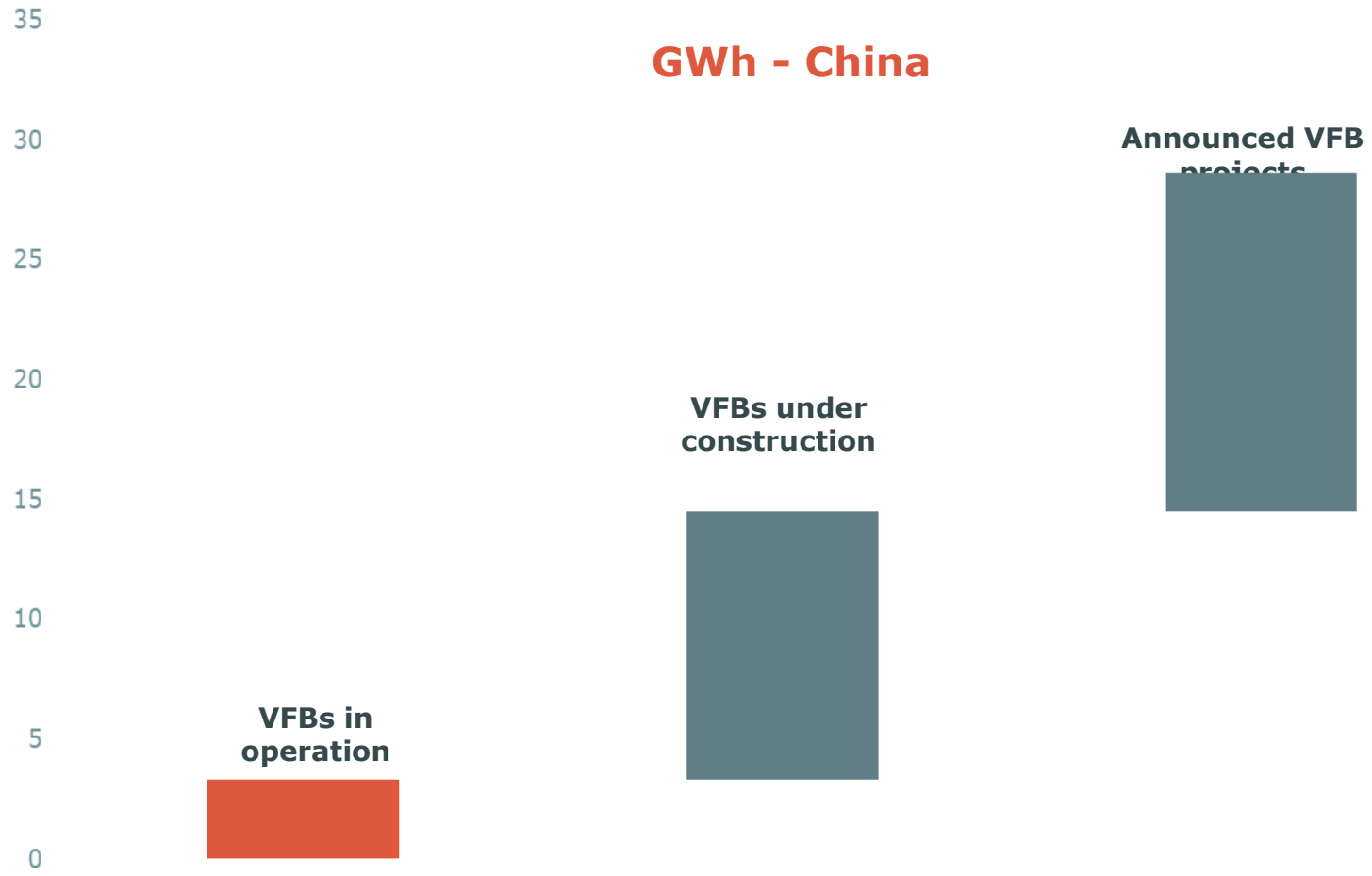

Source: https://vanitec.org/vanadium/map and China Iron & Steel Research Institute Group (CISRI) VTC Workshop 23 October 2024

Vanadium flow batteries are now proven at scale globally, gigafactory manufacturing capacity continues to expand

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400MWh

700MWh

400MWh

400MWh

400MWh

RKP fully automated gigafactory – 1GWh

Announced Gigafactories

Date Gigafactory Announced	Capacity (per year)
January 2023	1GWh
February 2023	4GWh
March 2023	1GWh
April 2023	4GWh
September 2023	2GWh
November 2023	1GWh
December 2024	1GWh
March 2024	2GWh
May 2024	1GWh
June 2024	4GWh
October 2024	3GWh
December 2024	2.5GWh
December 2024	2GWh
December 2024	0.5GWh
January 2025	2GWh
January 2025	4GWh
Total	**35GWh**

Source: Vanitec – www.vanitec.org/latest-from-vanitec/category/news/

Matching duration to the market:
Extending duration is as simple as adding tank capacity

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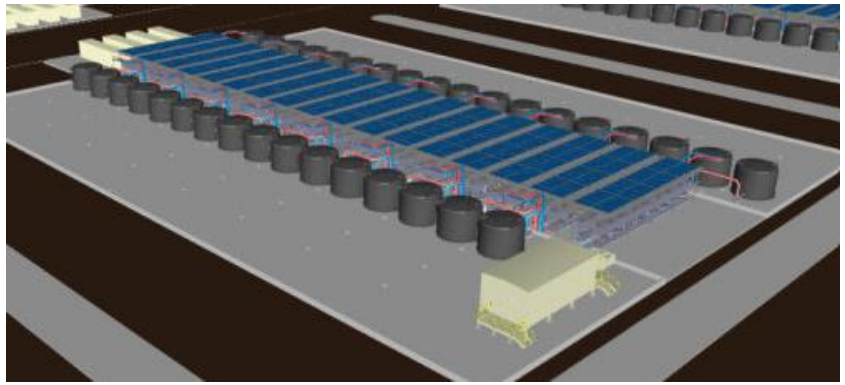
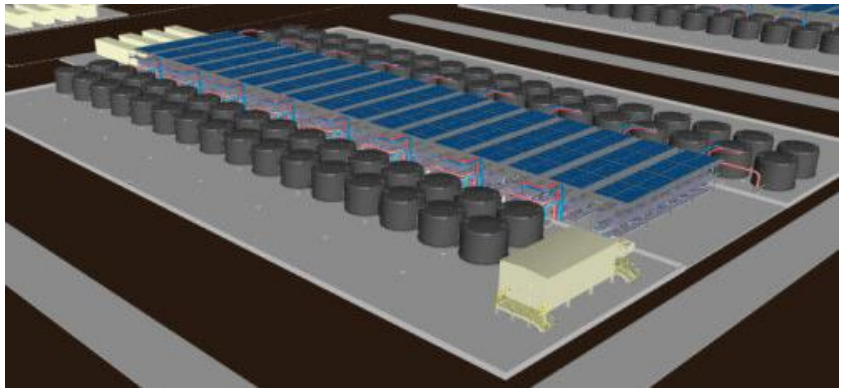
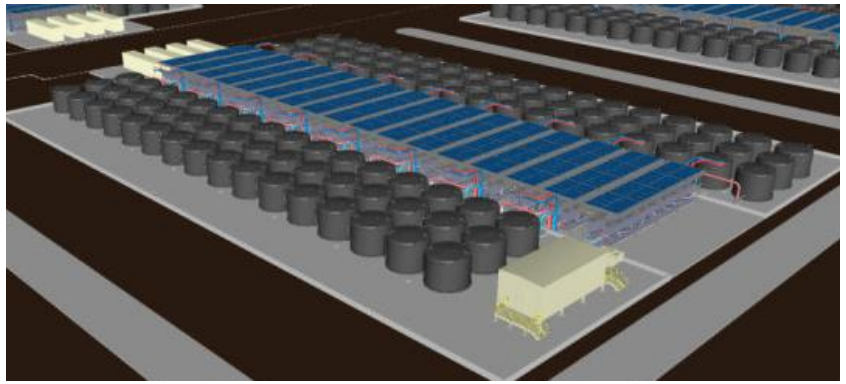
2 Hour Duration



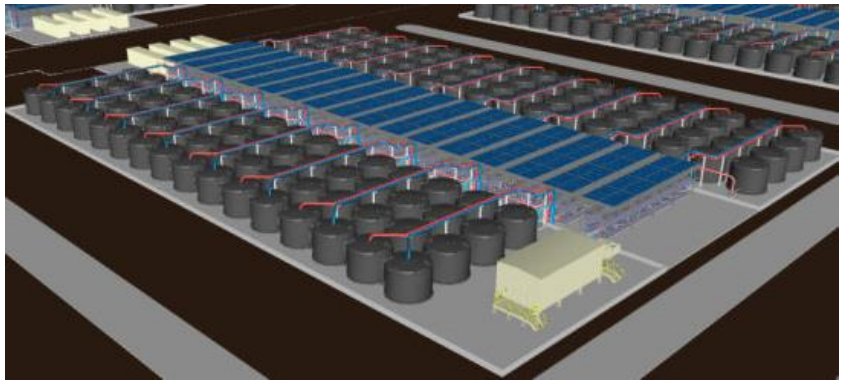
4 Hour Duration



6 Hour Duration



8 Hour Duration



- Deconstructed approach to VFB BESS deployment allows for low capital intensity duration expansion – as simple as adding additional tanks filled with vanadium electrolyte
- Future proofs the VFB BESS to allow for capacity additions as market pricing signals mature
- Ability to expand beyond 12 hours

Grant funding and approvals support

- AVL was awarded a $49 million grant under the Australian Government's Modern Manufacturing Initiative Collaboration Stream (**Grant**)[1]
- The Grant enables AVL to pursue opportunities to minimise project execution risks through enhanced project definition, such as full detailed engineering of key infrastructure and project approvals
- AVL has received initial two tranches of the Grant totalling $24.5 million[2]
- Continued progression of workstreams at the Australian Vanadium Project has the potential to unlock the remaining funds under the Grant
- AVL will continue to engage with State and Federal Agencies such as NAIF, ARENA, CEFC and National Reconstruction Fund Corporation to maximise utilisation of government and grant funding for the development of critical minerals and clean energy projects
- AVL recently secured EPA approval for the Gabanintha Vanadium Project which forms part of the Australian Vanadium Project[3]
- AVL's Australian Vanadium Project recently secured Green Energy Major Project status from the WA Government[4]
- AVL recently secured development approval for it's processing hub from the Western Australian Planning Commission (WAPC)5
- Recent approval of the Critical Minerals Production Tax Incentive (CMPTI) can materially improve competitiveness of Australian based vanadium projects

1. See ASX announcement dated 30 May 2023, '*$49 Million Government Grant Agreement Executed*', 2. See ASX announcement dated 20 June 2024, '*$14.7 Million Received from Federal Grant*', 3. See ASX announcement dated 13 January 2025, '*AVL Secures EPA Approval for Gabanintha Vanadium Project*', 4. See ASX announcement dated 29 January 2025, '*Green Energy Major Project Status Granted*

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Significant deliverables in advancing the Australian Vanadium Project towards FID

Delivered

- ☑ Bankable Feasibility Study (pre-merger basis)[1]
- ☑ Mining leases approved[2]
- ☑ Completion of large-scale process plant pilot programs[3]
- ☑ Australian Government grant for up to $49 million[4]
- ☑ Merger to deliver project synergies[5]
- ☑ Combined Mineral Resource Estimate update[6]
- ☑ Significant EPA approval received[7]
- ☑ Green Energy Major Project status to support streamlined approvals outcomes[8]
- ☑ **WAPC approves development application for Australian Vanadium processing hub[10]**

Upcoming catalysts

- ☐ Complete integrated OFS[9] targeting Q3 CY2025
- ☐ Progress approvals including full EPA approval and Traditional Owner agreement
- ☐ Secure bankable offtake to support project finance
- ☐ Deliver Final Investment Decision

1. See ASX announcement dated 6 April 2022, '*Bankable Feasibility Study for Australian Vanadium Project*'
2. See ASX announcement dated 31 August 2020, '*Mining Lease Granted for Australian Vanadium Project*'
3. See ASX announcement dated 8 June 2021, '*High Vanadium Extractions Confirmed in Pellet Leach Pilot*'
4. See ASX announcement dated 30 May 2023, '*$49 Million Government Grant Agreement Executed*'
5. See ASX announcement dated 1 February 2024, '*Successful Implementation of AVL and TMT Merger*'
6. See ASX announcement dated 7 May 2024, '*39% Increase in HG Measured and Indicated Mineral Resource*'
7. See ASX announcement dated 13 January 2025, '*AVL Secures EPA Approval for Gabanintha Vanadium Project*'
8. See ASX announcement dated 29 January 2025, '*Green Energy Major Project Status Granted*'
9. See ASX announcement dated 2 July 2024, '*Completion of First Phase of Optimised Feasibility Study*'
10. See ASX announcement dated 6 August 2024, '*Council Support for Vanadium Processing Site Near Geraldton*', businessnews.com.au/article/WAPC-approves-Australian-Vanadium-s-450m-plant

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Mineral Resource Estimate

Zone	Category	Mt	V_2O_5 %	Fe %	TiO_2 %	SiO_2 %	Al_2O_3 %
HG	Measured	30.6	1.14	46.3	12.9	7.4	6.2
	Indicated	74.8	1.11	47.5	12.6	7.0	5.7
	Inferred	67.9	1.06	45.3	12.1	9.0	6.6
	Subtotal	**173.2**	**1.09**	**46.5**	**12.5**	**7.8**	**6.1**
LG	Indicated	61.8	0.55	26.1	7.1	26.6	16.3
	Inferred	142.5	0.48	24.9	6.6	28.9	15.2
	Subtotal	**204.3**	**0.50**	**25.3**	**6.8**	**28.2**	**15.5**
Transported	Inferred	17.9	0.65	31.0	7.3	24.1	14.4
	Subtotal	**17.9**	**0.65**	**31.0**	**7.3**	**24.1**	**14.4**
Total	Measured	30.6	1.13	46.3	12.9	7.4	6.2
	Indicated	136.6	0.85	37.8	10.1	15.8	10.5
	Inferred	228.2	0.66	31.4	8.3	22.6	12.6
	Subtotal	**395.4**	**0.77**	**34.8**	**9.3**	**19.1**	**11.4**

Note: Totals may not add up due to rounding

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Investment highlights

Australia's grid continues to transition to renewables

- Increases the need for medium-to-long duration storage solutions capable of supporting energy grids
- Growing government support for long duration storage in Australia

VFBs provide a proven, economic solution for utility scale energy storage

- VFB rapid uptake into GWh scale energy storage systems
- Led by China, with over 20GWh of announced VFB projects

Ability to capture downstream value

- Competitive levelised cost of storage (LCOS) of VFBs as solution for high growth long duration energy storage market
- VFBs display operational advantages vs Li-ion

Commercial partnerships in place

- De-risked execution of Project Lumina
- AVL is well positioned to deliver investment ready utility scale VFB BESS solutions

World class Australian Vanadium Project

- Project provides supply chain scalability and security for VFBs
- Advancing toward investment decision – permitting, offtake, financing

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