



Investing in Energy Strategy & Infrastructure

Investment Discussion Materials

Future IM/Pact 2025 Investment Competition

September 2025



Brian Park



Isabella Ye



Tricia Woo



Vinson Chen



Executive Summary

We suggest a portfolio combining renewable energy, storage solutions and grid technology



QUESTION

How can QIC Ventures position Queensland to lead the next wave of digital and energy transformation in the new AI era?

ANALYSIS

Queensland is uniquely positioned to capture at the convergence of AI-driven digital demand and the global energy transition, with abundant renewable resources, supportive government policies and expanding infrastructure. Providing QIC Ventures a strong platform to back scalable energy, storage and grid technologies.

STRATEGY

Renewable Energy

Legislated targets of 70% renewables by 2032 and 80% by 2035 create a clear runway for large-scale renewable energy investments

Batteries & Storage

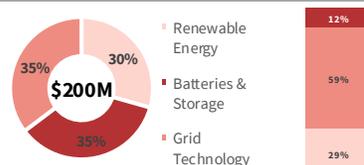
Curtailment pressures make storage solutions vital to capture value from Queensland's renewables and vast vanadium deposits

Grid Technology

Strengthening grid technology enables control of the energy value chain whilst safeguarding resilience against rising AI-driven demand

IMPLEMENTATION

Portfolio



Potential Partnerships



Investment Lifecycle

Deploy capital across various stages (VCDF → EAF → BIF → PEI), supported by QIC's other arms.

Risk & Mitigation

Manage execution and cost risks through staged deployment, partnerships, and diversification.

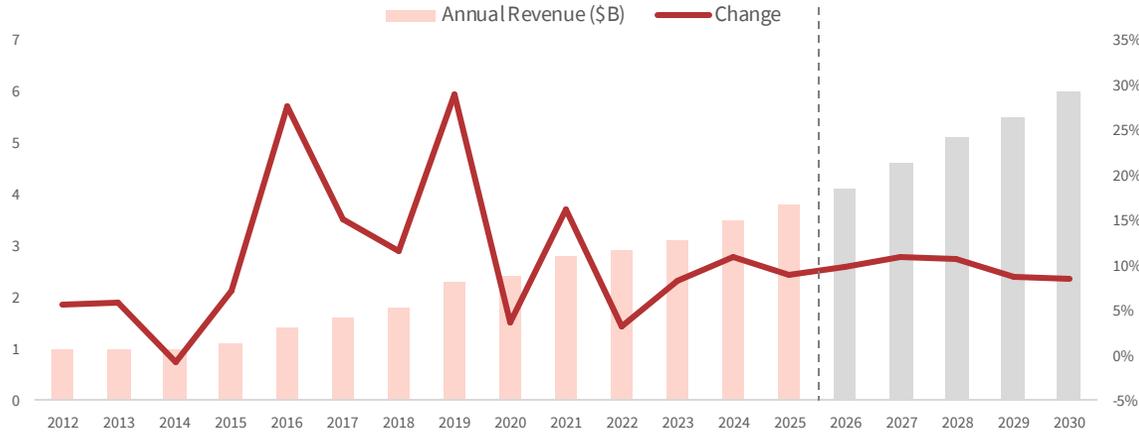
Macroeconomic Analysis

Hyperscaler demand meets renewable policy mandates



Industry Landscape

Cloud Hosting and Data Processing Services in Australia, IBIS World



Operational Metrics and Performance

\$3.8B Revenue	\$339.6M Profit	2,132 Businesses	7,212 Employees
9.4% YoY	7.3% YoY	3.3% YoY	9.8% YoY

2020-2025

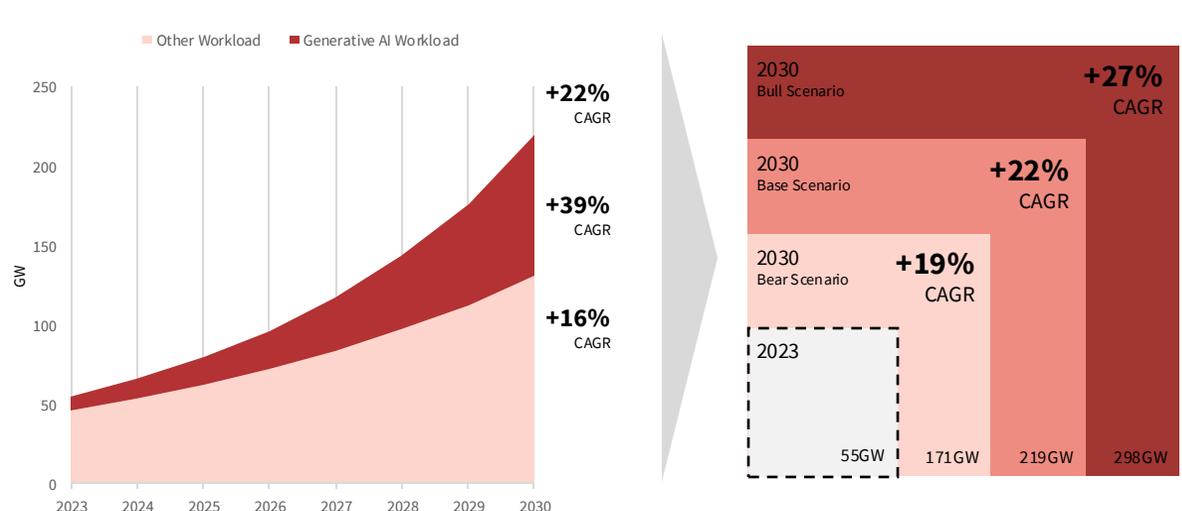
Drivers of Growth

Digitalisation & Data Growth E-commerce, streaming, and remote work lift storage and processing needs, creating steady demand pull.	Outsourcing & Compliance Firms are shifting IT off-premise to certified providers to cut costs and meet cybersecurity regulations.	AI/GPU Surge The surge in AI-training and inference push higher rack densities and frequent hardware refreshes.
---	--	---

Hyperscaler Investment into Australia

Company	CAPEX	Commentary
	A\$20B	Amazon is expanding Australian DC capacity and renewable backed power , directly aimed at servicing AI workload .
	A\$5B	Microsoft is rolling out a multi-year program to expand to ~29 DC sites and add major AI compute capacity .
	A\$1B	Google's Digital Future Initiative and new subsea routes boost cloud connectivity and resilience for low-latency .
	—	Oracle launched a sovereign Government & Defence cloud region, complementing regulated and sensitive workloads .

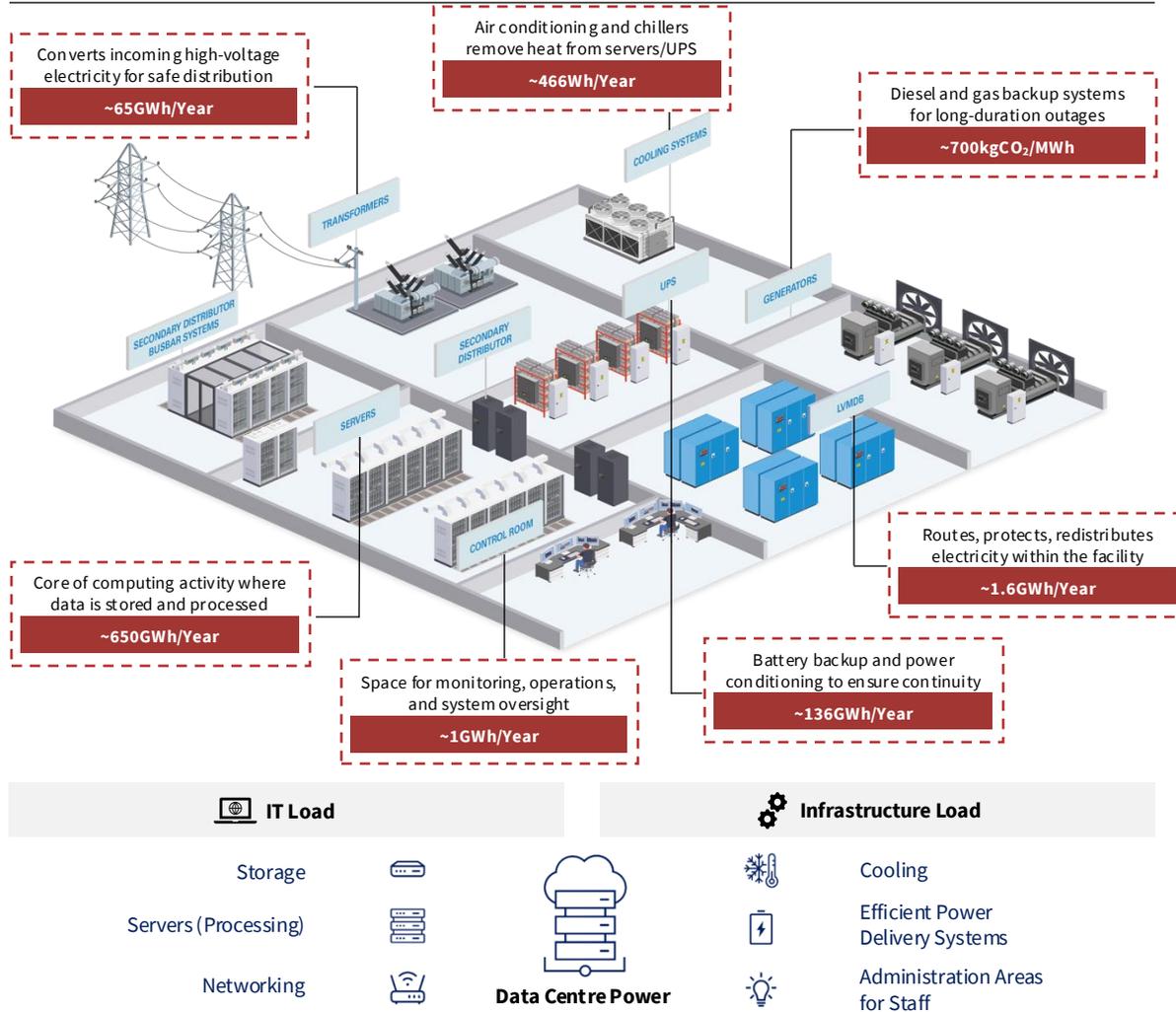
Global Demand for Data Centre Capacity (GW)



Data Centre Power Consumption

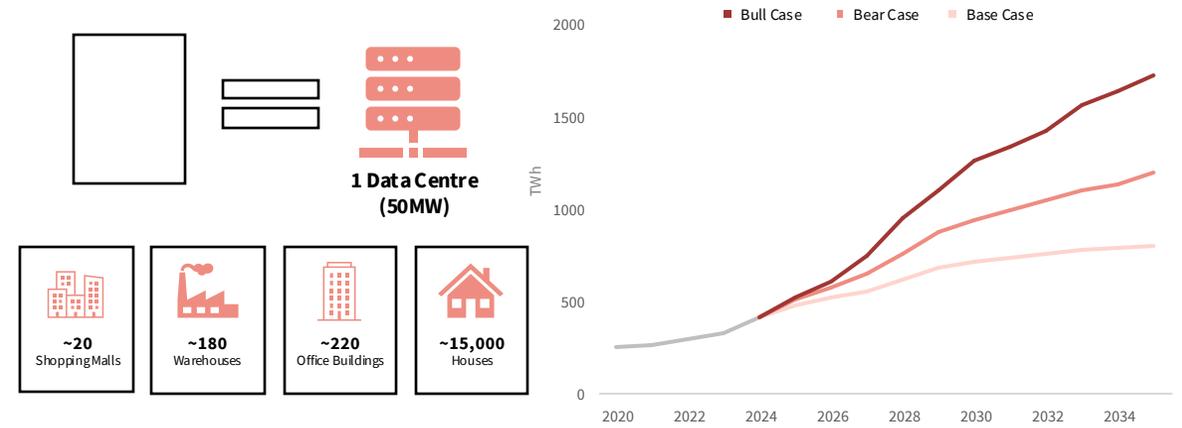
Data centre loads surge while grid mix stays fossil-heavy, driving emissions risk

Anatomy of a Data Centre



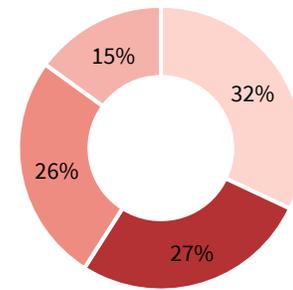
Skyrocketing Demand for Energy

“A request made through **ChatGPT** consumes **10x** the **electricity** of a **Google** search.”



Supply Choice Drives Emissions

Data Centre Power Mix (IEA, 2024)



Electricity Source	Global Average CO ₂ Intensity (g CO ₂ /kWh)	Global Average Level Cost (USD/MWh)
Coal	960	80
Gas CCGT	360	80
Gas GT	620	220
Solar PV	0	60
Wind	0	50 - 110
Hydro Power	0	80

Queensland's Energy Advantage

A unique mix of policy, resources, and infrastructure drives renewable leadership



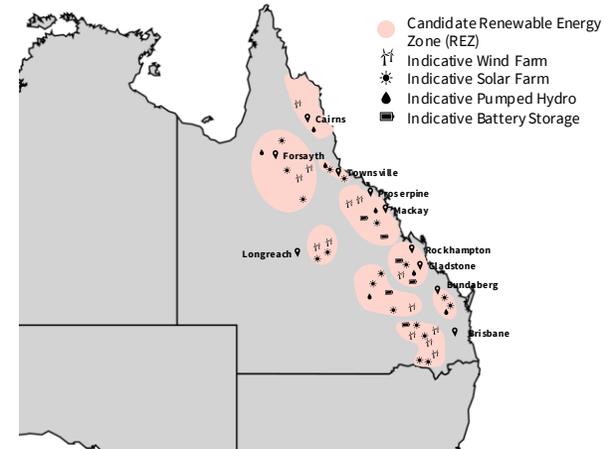
Queensland Specific Initiatives

- 
SuperGrid Infrastructure Blueprint
 Coordinates REZs/transmissions/storage so large loads can plug into expanding low-carbon supply
- 
Bioenergy & Innovation Programs
 Pilot programs (\$4M waste-biomass initiative) fostering dispatchable renewables & green fuels innovation
- 
Clean Co Corporate PPAs
 State-owned retailer enabling green PPAs like BHP's BMA sites move to 100% renewable sources from 2027
- 
Strategic Public Ownership
 Unique position of **100% public ownership** of transmission and deep storage- Qld has "unprecedented control"

Prime Positioning

- 
Solar Leadership
 - Queensland holds **35%** of Australia's **total solar generation capacity**
 - Over **4.1GW** of **rooftop solar** is **already installed** across the state
 - Generates up to **3x** more **midday solar** than **consumed locally**
- 
SuperGrid Infrastructure
 - **\$62B** SuperGrid **connects** Queensland's **renewable zones** with **25,000MW capacity**
 - Requires **6,000MW storage capacity** across **1,500km transmission backbone**
 - Government policy **supports** distributed storage via **incentives** and **VPP programs**
- 
Pioneer-Burdekin Project Collapse
 - Cancelled **5GW** pumped hydro project created **immediate storage shortfall**
 - \$37B cost blowout demonstrated financial risks of **mega-hydro projects**
 - **Government** pivoted to **smaller distributed** storage projects over schemes

Clean Power Commitments



- Northern QLD CREZ — 6,120MW**
 Upgrades between Cairns and Townsville deliver ~500MW in the FNQ FEZ, anchored by the 157MW Kaban Wind Farm.
- Central QLD CREZ — 8,090MW**
 Gladstone Grid Reinforcement funded by \$365M to establish the Banana Range and Fitzroy REZs to back wind projects.
- Southern QLD CREZ — 10,795MW**
 Brings 1,500MW in the Southern Downs, anchored by 1,026 MW MacIntyre/Karara precinct (\$2B) with Tarong West and Wambo.

Energy (Renewable Transformation & Jobs) Act 2024

- 70% by 2032**
- 80% by 2035**
- 100% Renewable Energy to Large Government Sites by 2030**
- 
Solar Energy
 QREZs and 1,500km SuperGrid scale solar with \$500M batteries with 100% smart meters integrating rooftop PV.
- 
Hydro Energy
 Borumba Hydro will deliver ~2,000MW long-duration storage with up to 24hrs discharge to firm 24/7 clean power portfolios.
- 
Bio Energy
 A \$4M program grows waste-biomass into dispatchable renewable power and heat.

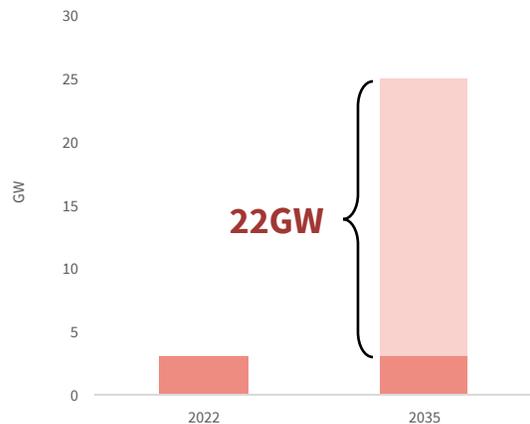
Investment Rationale 1 — Accelerating Queensland’s Renewable Transition

Queensland’s energy transition, backed by policy mandates and hyperscaler demand, creates a premium runway for renewable developers



Filling the 22 GW Shortfall

Renewable Capacity Required to Meet Targets



Company	Data Centre Capacity (MW)	Net Zero Target Year	Renewable Electricity Target
Meta	970	2030	100% renewable since 2020
Google	8960	2030	100% renewable since 2017
Amazon	7660	2040	100% renewable since 2023
Microsoft	6970	2030	100% renewable since 2025
Equinix	1850	2030	100% renewable by 2030
Tencent	1760	2030	100% green by 2030
Apple	1240	2020	100% renewable since 2018

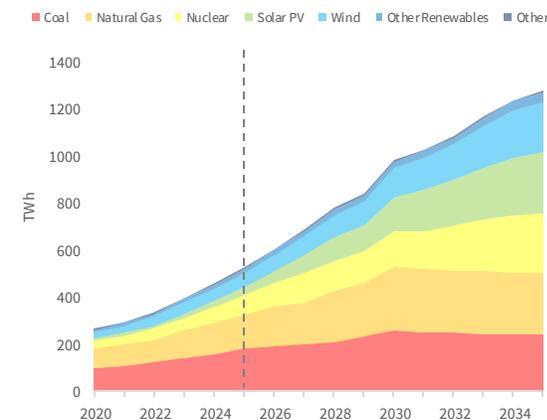
Data Centres Driving Renewable Energy Demand

2 TWh of energy saved
by hyperscaler and co-location data centres. Without, on-premise services would use 67% more electricity, enough to power **260k homes**.

100% Renewables By 2030
Major data centres have committed to 100% renewables by 2030.

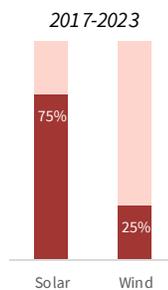
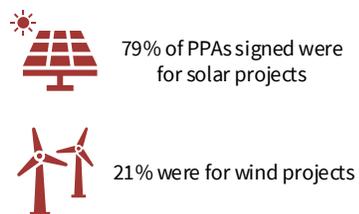
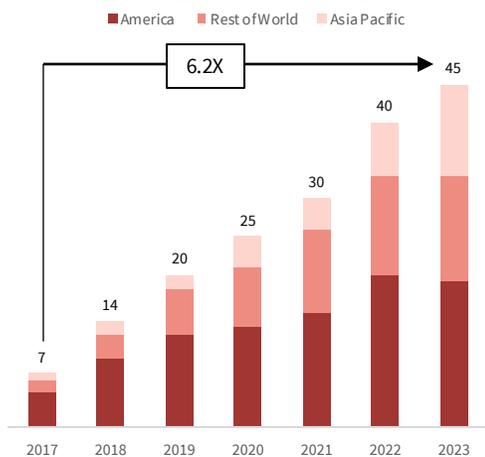
Nearly Half
of global power purchase agreements in 2022 were signed by data centre operators, accelerating renewable projects.

Sources of Global Electricity Generation for Data Centres, IEA



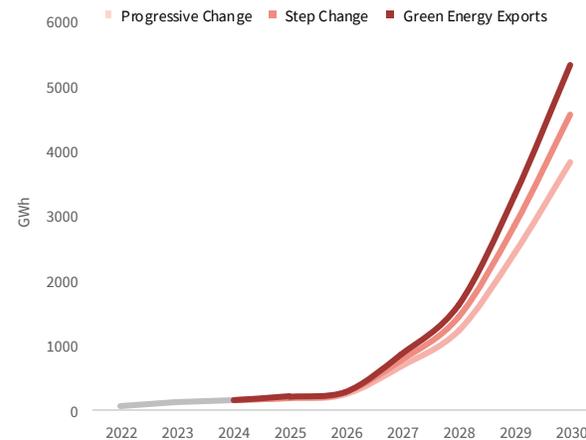
Corporate PPAs for Clean Energy Growth

Global Renewable Energy Power Purchase Agreements, Mandala

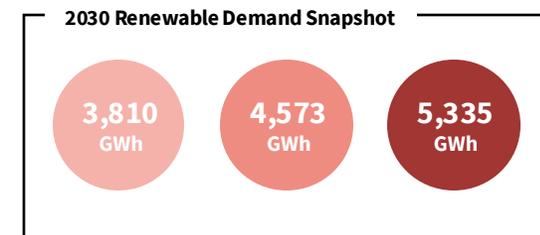


Renewable Energy for Data Centre Market Sizing

Projected Renewable Energy Consumption by Queensland Data Centres



“The energy transition is a factor in everything QIC’s direct lending platform touches.”
— Evan Nahnsen, QIC’s Head of Private Debt



Investment Rationale 1 – Asset Recommendation

Our portfolio companies provide scalable, integrated solutions to meet Queensland’s surging renewable demand



Sunshine Hydro



Delivers continuously dispatchable clean energy by integrating pumped hydro, wind and green hydrogen.



100% 24/7 Renewable Energy

Ambitious long-duration storage to power industry, backed by AESOP real-time optimisation software.



Superhybrid™ Closed-Loop System

Seamless integration of pumped hydro, wind/solar, and hydrogen production to ensure firm energy supply.



~4 Mt CO₂e Abated Annually

Djandori Gun-1 (Flavian) planned to deliver baseload energy and green H₂ from 2028, lowering climate impact.



20% First Nations Equity

Partnerships ensure cultural respect, jobs, and shared value — First Nations group holds 20% equity option.



\$967M

Revenue

2035 Projection

\$135M

EBITDA

14% Margin

\$92M

NOPAT

By 2035

\$25M

Investment

12.5% Portfolio

35%

IRR

Project Level

Key Revenue Assumptions

Wind Generation

600 MW wind capacity generating ~3,153 GWh annually, underpinning consistent electricity growth.

Pumped Hydro Storage

600 MW capacity with ~2,375 GWh annual production, providing firming and dispatching green energy.

Hydrogen Production

216 MW electrolysis producing ~2,375 tonnes per year, scaling as green hydrogen demand grows.

Renewable Energy Partners



Development, construction, and operation of utility-scale solar and wind farms, supported by PPAs and merchant sales.

Solar
1,800 MW



Hopeland Solar Farm

Wind
5,400 MW



Proserpine Wind Farm

Hydro
1,250 MW



Capricornia Pumped Hydro

Battery
15,000 MW



Ulinda Park Battery

\$690M

Revenue

2035 Projection

\$205M

EBITDA

30% Margin

\$141M

NOPAT

By 2035

\$25M

Investment

12.5% Portfolio

27%

IRR

Project Level

Key Revenue Assumptions

Capacity Growth

Portfolio scales to ~2.2 GW by 2035, underpinning long-term revenue expansion.

PPA & Merchant Mix

Secure PPAs and merchant generation diversify income alongside stable cashflows.

Electricity Prices

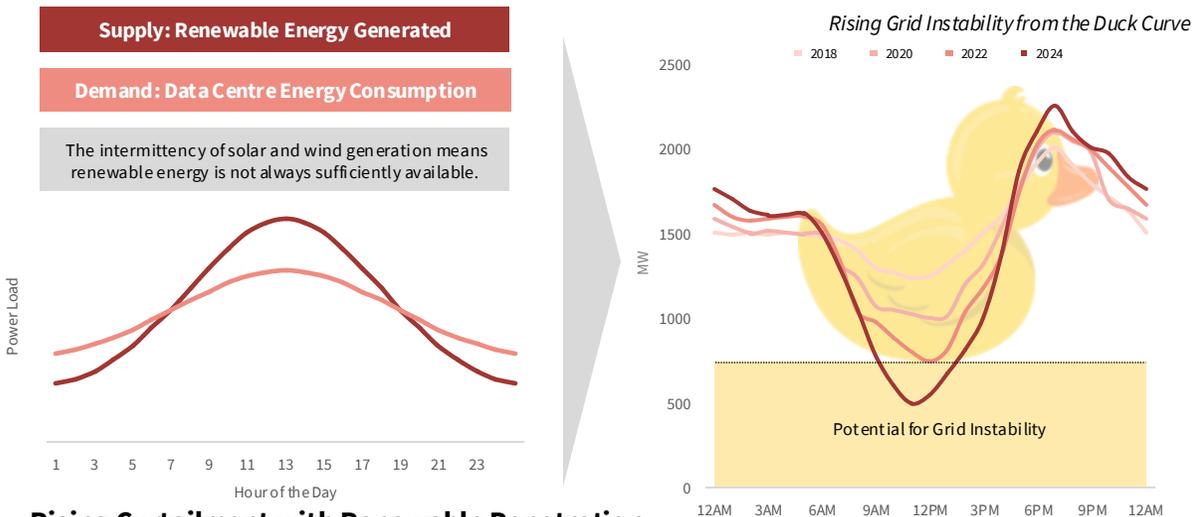
Rising wholesale electricity prices drive stronger project economics and higher revenues.

Investment Rationale 2 – Queensland’s Energy Storage Imperative

Turning Queensland’s renewable energy surplus into grid-scale storage solutions

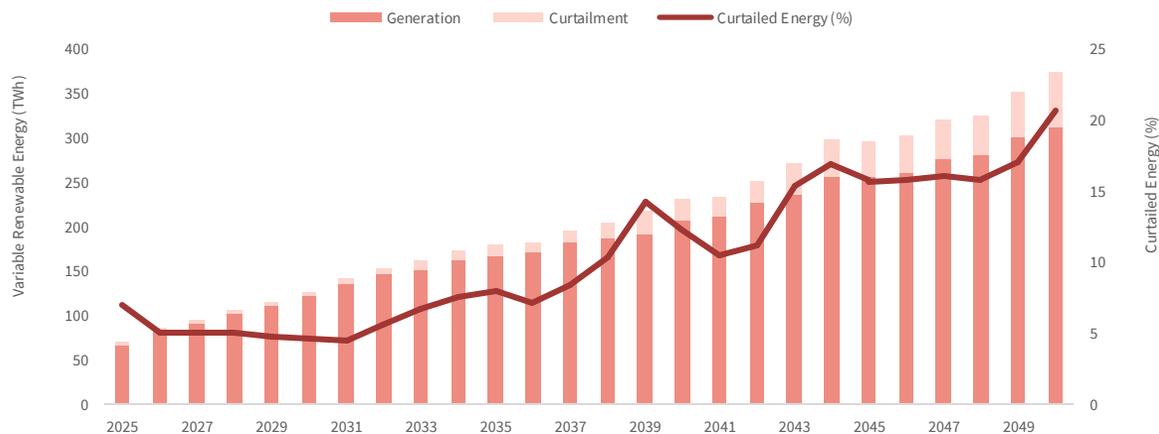


Renewable Growth Outpacing Storage Capacity



Rising Curtailment with Renewable Penetration

NEM Variable Renewable Generation and Curtailment (Step Change)



The Curtailment Crisis

“Curtailment occurs when renewable energy is available but cannot be used because the grid is oversupplied, congested, or unable to store it.”

4.5 TWh of solar and wind energy curtailed in 2024

Spot prices were negative 14% of the time in 24Q2

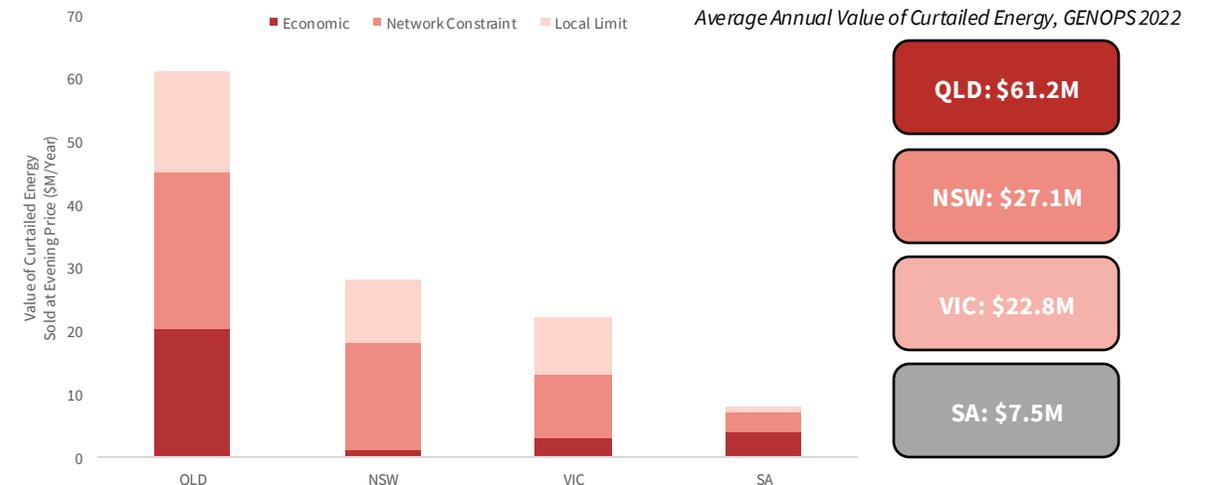
10% of utility renewables wasted annually (growing)

Some solar plants have >25% curtailment rates

Reducing Curtailment by 1% Globally can Save



Cost of Curtailment in Australia



Investment Rationale 2 – Asset Recommendation

Our portfolio companies provide next-generation systems for cleaner, more reliable storage



Critical Minerals Group



Australia's leading vanadium battery supply chain company.

The Vanadium Advantage

- **25+ year** lifespan vs **10-year lithium**
- **100%** capacity retention over **14,000** cycles
- **No degradation** during **charge/discharge**
- **Fully recyclable** vanadium electrolyte
- Inherently **safer** than **lithium**

Secure Efficient Supply
high quality and reliable products.

Downstream Manufacture
adding value with electrolyte facilities, HPA production, and molybdenum processing.

Sustainable Delivery
centering environmental and social responsibility

Market Leaders
setting industry standards through leadership, innovation and strategic partnerships.



\$1.11B	\$229M	\$158M	\$20M	24%
Revenue	EBITDA	NOPAT	Investment	IRR
2035 Projection	21% Margin	By 2035	10% Portfolio	Project Level

Key Revenue Assumptions

Vanadium Pentoxide (V₂O₅)

Annual 10,000 TPA output from Lindfield mine underpins \$310-350M revenue, driving strong cashflows.

High Purity Alumina (HPA)

Premium 4N+ purity alumina sales (~\$15,000/t) generate ~\$627M, materially boosting project NPV.

Molybdenum Trioxide (MoO₃)

~400 TPA molybdenum by-product offsets vanadium costs, improving margins and supporting positive IRR.

Relectrify



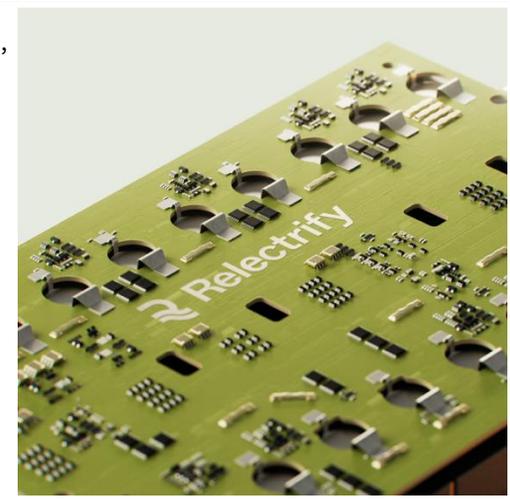
Delivers smarter, longer-lasting, and more affordable BESS.

Cell-level control improves **battery life** by to **30%**

Inverter-less design reduces system cost by **20-30%**

Maximised energy use through **adaptive optimisation**

Second-life battery ready enabling **sustainable storage**



\$162.3M	\$62.4M	\$41M	\$40M	17%
Revenue	EBITDA	NOPAT	Investment	IRR
2035 Projection	38% Margin	By 2035	20% Portfolio	Project Level

Key Revenue Assumptions

Integrated Units Growth

Battery adoption grows to 1,123 integrated units by 2035, scaling revenue to \$162M annually.

Hardware Sales Expansion

Hardware units rise to 12,338 by 2035, creating diversified revenue streams and supporting IRR.

Battery Market Growth

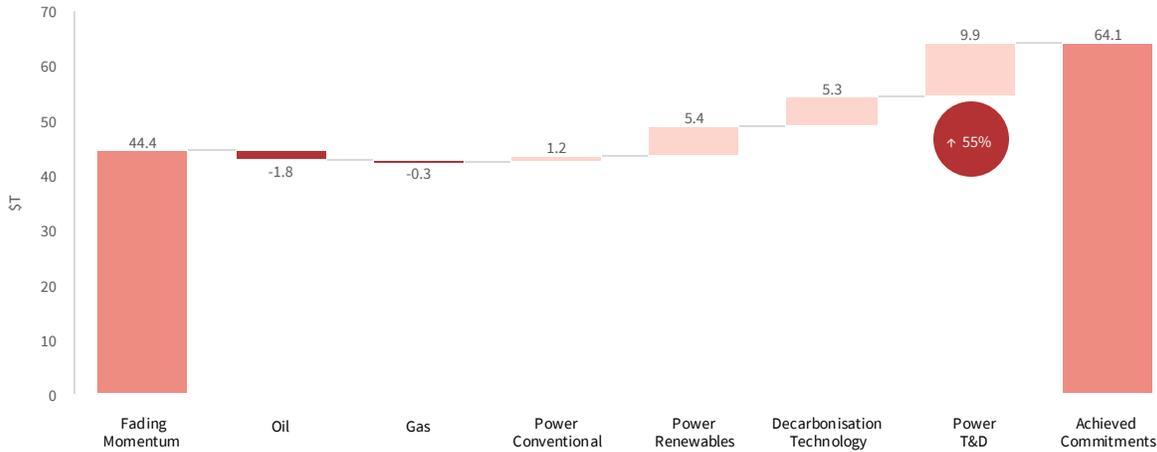
Australian battery market grows 15% annually, underpinning integrated sales strategy and profitability.

Investment Rationale 3 – Strengthening Queensland’s Grid

Modernising Queensland’s grid to capture value across the energy chain and safeguard stability under AI-driven demand

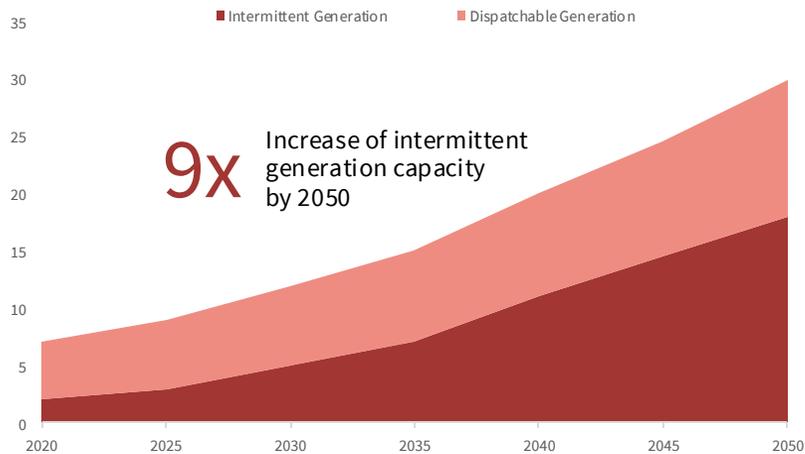
Large Investments Into Power Transmission and Distribution

Cumulative Investments for 2021-2040, McKinsey



Accommodation for Increased Energy Sources & Demand

Global Power Installed Capacity (TW)



Intermittent Challenge
Renewables lack flexibility, making it harder to maintain a stable supply.

Grid Constraint
Traditional grids cannot absorb surging renewable volumes without urgent storage and orchestration.

Unlocking Value Across the Value Chain

- Electricity demand is set to **double** by 2050, driven by **electrification** and buildout of **AI/data centres** and other **digital infrastructure**.
- Intermittent renewables will **increase 9x** by 2050, creating **volatility** and **stress** on legacy grids.
- Despite **rising R&D** spend, system average interruption duration index (**SAIDI**) has **not fallen**.
- This creates **long-term contracted revenue** opportunities in **distributed storage** and **AI-enabled grid orchestration** – assets resilient to policy, hyperscaler and regional demand shifts.

Energy Value Chain



Reliability at Risk

Average Cost of IT Downtime = \$5,600/Min (Gartner)

Tier I
99.671% Uptime
28.8 Hours Downtime

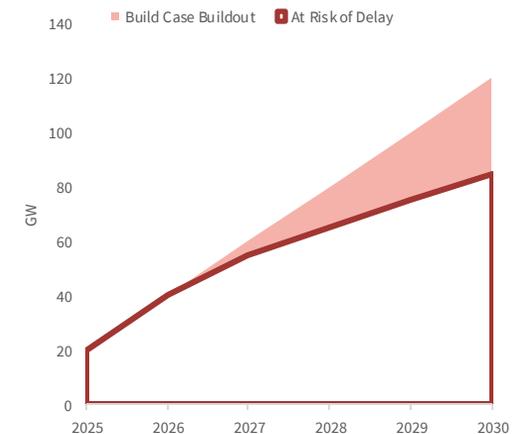
Tier II
99.741% Uptime
22.0 Hours Downtime

Tier III
99.982% Uptime
1.6 Hours Downtime

Tier IV
99.995% Uptime
26.3 Minutes Downtime

“Even a **small period of downtime** can cause a **loss of productivity, revenue, and customer satisfaction.**”

Global Data Centre Capacity Additions & Capacity at Risk of Connection Due to Grid Constraint



Investment Rationale 3 — Asset Recommendation

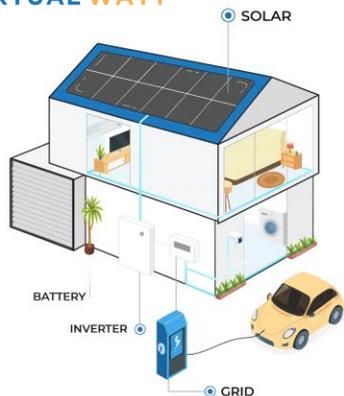
Our portfolio companies provide advanced storage and optimisation to unlock grid efficiency and resilience



Virtual Watt



Subscription-based platform offering VPP aggregation, energy market trading, and system integration.



- Aggregates** distributed solar, batteries, and EVs into one VPP.
- Optimises** energy dispatch using AI and IoT to reduce costs.
- Trades** energy in wholesale market, profiting off price spreads.
- Provides **grid services** like frequency control and stabilisation.

\$147M	\$132M	\$91M	\$25M	38%
Revenue	EBITDA	NOPAT	Investment	IRR
2035 Projection	90% Margin	By 2035	12.5% Portfolio	Project Level

Key Revenue Assumptions

- Customer Growth**
Strong adoption curve expands user base, scaling subscription revenues and trading volumes.
- Energy Arbitrage Revenue**
Price spreads create recurring income by optimising energy dispatch into peak markets.
- VPP Market Expansion**
Larger aggregated capacity boosts revenue via frequency control and grid-balancing services.

RedEarth Energy Storage



Distributes battery systems that stabilise and optimise the grid.

- Australian Made Systems**
Designed and built locally, ensuring quality and energy security.
- On-and-Off Grid Flexibility**
Supports households, businesses, and remote communities.
- Private Power Plant**
Turns excess rooftop solar into income, reducing grid reliance.
- Grid Stabilisation Role**
Aggregated batteries act as a virtual power plant to balance supply.

Hardware
Australian-Made Energy Storage Solutions

RedEarth manufactures on-grid, off-grid, and hybrid storage systems that are modular and scalable, ensuring customers get a storage system tailored to their energy needs.

Software
Your Own Private Power Plant

Rooftop solar can generate 3x more power than households consume. RedEarth software lets users store and monetise excess solar, transforming homes into private power plants.

\$188M	\$26M	\$16M	\$35M	25%
Revenue	EBITDA	NOPAT	Investment	IRR
2035 Projection	14% Margin	By 2035	17.5% Portfolio	Project Level

Key Revenue Assumptions

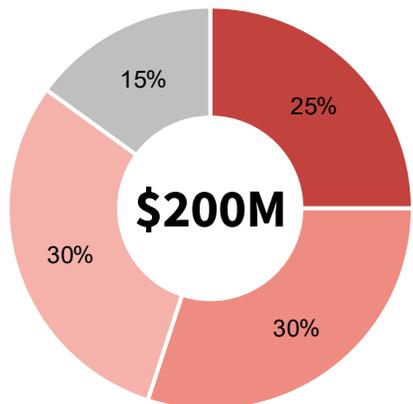
- Residual Market Growth**
Adoption of small-scale BESS (Troppo, BlackMax, Gecko) drives ~66% of revenue in early years.
- Commercial & Industry Demand**
Larger systems (Dingo, PowerOasis) expand share of sales, providing higher-margin recurring contracts.
- BESS Market CAGR**
Australian BESS market projected to grow at 12.5% annually, underpinning steady revenue.

Portfolio Allocation

Utilising Markowitz & Barbell strategies for portfolio optimisation

Investment Sectors & Portfolio Distribution

1	2	3
Renewable Energy <ul style="list-style-type: none"> Queensland Energy & Job Plan - pathway to achieve QRET Positions Qld for clean industrial growth & supports new jobs 	Batteries & Storage <ul style="list-style-type: none"> Data centres & digital infra demand 24/7 reliable power Storage solutions need to deliver on demand 	Grid Technology <ul style="list-style-type: none"> Smooths fluctuations, reducing curtailment DER can capitalise on QLD's highest rooftop solar penetration
SUNSHINE HYDRO Renewable Energy Partners \$25M IRR: 35%	Critical Minerals Group RedEarth ENERGY STORAGE \$20M IRR: 24%	VIRTUAL WATT RedEarth ENERGY STORAGE \$25M IRR: 38%
\$25M IRR: 27%	\$40M IRR: 17%	\$35M IRR: 25%



- Renewable Energy
- Batteries & Storage
- Grid Technology
- Reserves

Weighted IRR = 26.7%

- Validates Business Models and Accelerates Project Feasibility
- Supports Follow-On Rounds (Series B/C) and Strategic Growth



- Invest
- Reserves

Investment Strategies

Markowitz Optimisation Framework	Barbell Strategy Implementation
<ul style="list-style-type: none"> Diversified across renewables, storage, and grid tech reduces unsystematic risk Captures Queensland's energy build-out upside while protecting against delays 	<ul style="list-style-type: none"> Asymmetric payoff design with steady yield, high growth, and hedge protection Ensures downside protection with unlimited upside potential

Low Risk Hedge High Risk

Low Risk	Series B	Scale Up	Pre IPO	
Medium Risk	Scale Up			
High Risk	Seed	Series A		

Connecting QIC's Investment Lifecycle

Leveraging Queensland's stability and QIC's global scale to back clean energy from seed to expansion



Stages

 <p>Seed Stage</p>	<p>VCDF & Accelerator Programs</p> <ul style="list-style-type: none"> • QIC supports startup accelerators, seeding 80+ Qld businesses since 2016 from seed to expansion • 50% of battery startups fail to scale without seed/accelerator support • Strategy: Support battery/grid startups by using venture capital funds & accelerator programs, overcoming the early challenges of renewable energy intermittency
 <p>Early Stage</p>	<p>QIC Ventures / Early Acceleration Fund (EAF)</p> <ul style="list-style-type: none"> • EAF invests in promising startups to speed up commercialisation • Aligns with QIC's approach of supporting through to Fund II to accelerate clean energy start-ups • Strategy: Anchor early-stage storage innovators that enable higher solar & wind uptake as penetration rises to ~1.5%
 <p>Growth Stage</p>	<p>Business Investment Fund (BIF)</p> <ul style="list-style-type: none"> • BIF provides growth capital to established companies to scale globally reflecting QIC's scaling of infrastructure platforms such as 40% stake in Powering Australia Renewables (PowAR) • Grid-scale battery demand growing 30% CAGR to 2030 (IEA, 2023) • Strategy: Scale firms to stabilise renewable-heavy grids, avoiding curtailment
 <p>Expansion Stage</p>	<p>QIC PE / Global Network — \$10 Billion Network</p> <ul style="list-style-type: none"> • Utilise QIC's private equity to leverage international networks such as Accel and Sequoia to connect local companies with global capital • Strategy: Connects QLD to the global network and expands world wide

QIC's Unique Position

 <p>Government-Backed Stability</p> <ul style="list-style-type: none"> • Queensland Government ownership ensuring patient capital and stability • A130B+ AUM enabling large-scale co-investment opportunities • Sovereign backing reducing risk and enabling counter-cyclical investing 	 <p>Institutional Credibility</p> <ul style="list-style-type: none"> • 30+ years of institutional management track record since 1991 establishment • International presence with offices in six major financial centres • 120+ institutional clients demonstrating trusted partnership capabilities
--	---

Leveraging QIC's Other Arms

 <p>Real Estate</p>	 <p>Infrastructure</p>	 <p>Private Debt</p>
<ul style="list-style-type: none"> • Deploy behind-the-meter batteries at QIC retail and offices • Roll out EV charging hubs in shopping centres and carparks • Repurpose sites for green data centres and AI campuses <p>Creates real-asset case studies, cuts OpEx, and accelerates adoption of new technology.</p>	<ul style="list-style-type: none"> • Finance grid-scale storage and renewable-firming projects • Integrate battery solutions into transport/logistic assets • Co-own sovereign green data hubs with long-term offtakes <p>Provides scale-up capital and long-term ownership, creating natural exits for venture investments.</p>	<ul style="list-style-type: none"> • Provide asset-backed lending to storage and renewables • Underwrite battery solutions into transport/logistics assets • Offer working capital loans to scale-ups (Series B/C) <p>Lowers financing costs, diversifies exposure, and supports growth beyond equity funding.</p>

Potential Partnerships

Scaling QIC's \$200m with National 'Green Banks'



Companies & Organisations

Clean Energy Finance Corporation (CEFC)



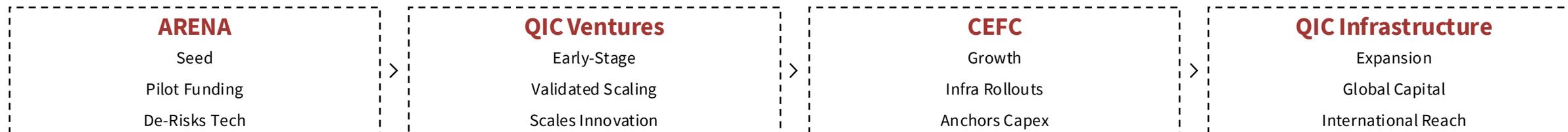
- Australia's government- owned "Green Bank" with **\$32+ Billion capital** dedicated to accelerating the energy transition across renewables, storage and clean tech.
- Recently invested **\$100m** into solar, battery and EV charging infrastructure at Bunnings, showing appetite for large-scale, visible rollouts.
- Provides **scale, credibility & bankability**, allowing the \$200m venture capital to focus on growth equity in innovative scale-ups while CEFC anchors the heavy infrastructure.

Australia Renewable Energy Agency (ARENA)



- Independent statutory agency tasked with funding **early-stage renewable innovation and pilot projects**, de-risking technology before commercial rollout.
- Co-funded landmark projects such as the **Kidston Pumped Hydro Project (Qld)** and the **Vanadium flow battery plant (Townsville)** – first of its kind in Australia.
- Builds a **pipeline of validated start-ups & projects**, positioning QIC Ventures to back companies that have already cleared technical and regulatory hurdles.

Aligning Partners Across the Investment Lifecycle



Impact



De-Risking

QIC leverages ARENA & CEFC to reduce early-stage technology and financing risks.



Capital Efficiency

200M investment from QIC is enhanced through co-funding, allowing bigger impact with limited capital.



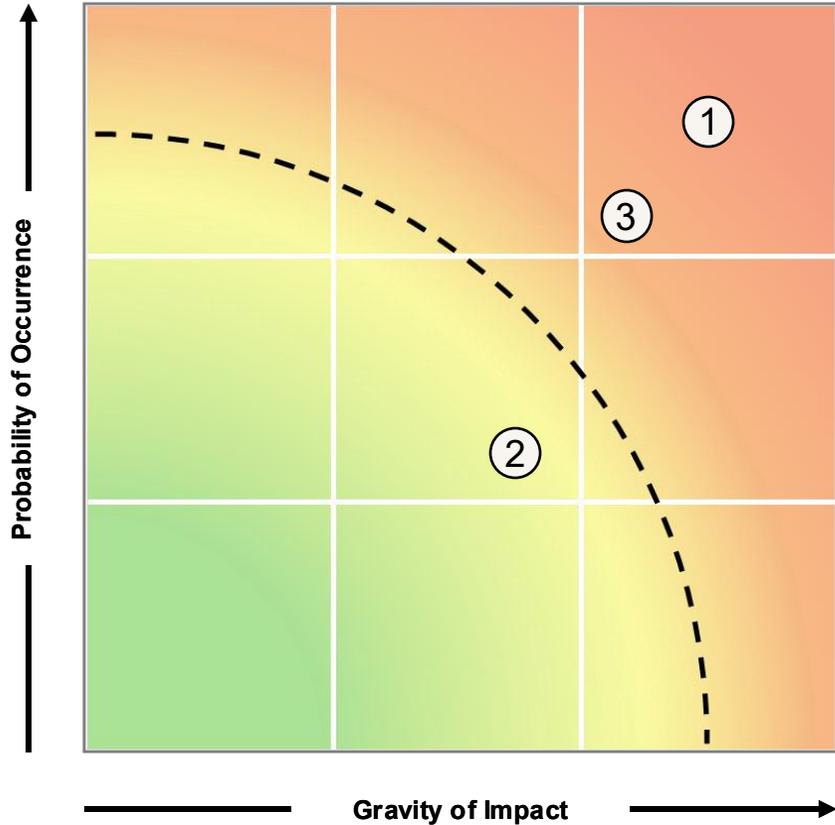
Enhance Position

Positions QLD as global leader in renewable digital transformation through innovation & rollout.

Risks & Mitigants

Proactively identifying and mitigating risks to safeguard execution, returns and stakeholder alignment

Catalyst and Risk Matrix



Challenges and Risks

Renewable Energy	<p>1</p> <p>Transmission and Interconnection Slippage REZ queue congestion and delayed SuperGrid build out can delay commercial operation date (COD)</p>
Battery & Storage	<p>2</p> <p>Integration and Compliance Different parties (manufacturers, installers, operators) may not align on system controls, testing requirements and compliance checks during project delivery</p>
Grid Technology	<p>3</p> <p>Market Access and Regulatory Changes Alterations to enablement, verification or what VPP's can sell and for what price can limit revenue and performance</p>

Mitigants

<p>Stakeholders Impacted:</p> <ul style="list-style-type: none"> • Developers & investors: Face delays of COD affecting financing timelines and project returns • Grid Operators & Regulators: Manage congestion risks and system reliability
<p>Mitigants:</p> <ul style="list-style-type: none"> • Engage early with transmission planners and regulators to secure REZ queue positions and accelerate approvals • Spread exposure across multiple Renewable Energy Zones to avoid over-concentration in congested transmission nodes
<p>Stakeholders Impacted:</p> <ul style="list-style-type: none"> • OEMs & Technology Providers: Face penalties or reputational risk if systems fail compliance tests • Investors & Operators: Incur delays and cost overruns due to bottlenecks
<p>Mitigants:</p> <ul style="list-style-type: none"> • Standardise testing protocols and control interfaces across OEM's to minimise mismatches • Enable independent commissioning managers to validate compliance prior to final grid connection
<p>Stakeholders Impacted:</p> <ul style="list-style-type: none"> • VPP Operators & Retailers: Revenue could be constrained by what can be sold and at what price • Investors & Financers: Face reduced cash flow certainty due to regulatory uncertainty
<p>Mitigants:</p> <ul style="list-style-type: none"> • Maintain proactive regulatory engagement (AEMO, policymakers) • Secure long term availability/offtake contracts that hedge against volatility



Queensland's Advantage

World-class renewable sources, supportive policy, and hyperscaler demand create a premium runway

Investment Rationale

Three-pronged strategy: Renewables, Storage and Grid Optimisation to unlock growth and resilience

Portfolio Strategy

\$200M strategic allocation across varying risk opportunities using Markowitz optimisation

Decision

QIC Ventures can catalyse Queensland's transition, leveraging partners and broader platform to scale

*Investing in Queensland's Clean Energy Future — Creating Lasting **Future IM/Pact***

APPENDIX

Main Deck

1. [Title Slide](#)
2. [Executive Summary](#)
3. [Macroeconomic Analysis](#)
4. [Data Centre Power Consumption](#)
5. [Queensland's Energy Advantage](#)
6. [Investment Rationale 1 \(Pt.1\)](#)
7. [Investment Rationale 1 \(Pt.2\)](#)
8. [Investment Rationale 2 \(Pt.1\)](#)
9. [Investment Rationale 2 \(Pt.2\)](#)
10. [Investment Rationale 3 \(Pt.1\)](#)
11. [Investment Rationale 3 \(Pt.2\)](#)
12. [Portfolio Allocation](#)
13. [Investment Lifecycle](#)
14. [Potential Partnerships](#)
15. [Risks & Mitigants](#)
16. [Conclusion](#)

Appendix A

General

19. [Global Responses](#)
20. [Rise of Data Centres](#)
21. [Ecosystem Mapping](#)
22. [Technology & Deployment Risk](#)
23. [Quinbrook Supernode](#)
24. [Implementation Timeline & KPIs](#)
25. [Partnership Impact](#)
26. [Risk & Mitigation — General](#)
27. [Risk & Mitigation in Practice](#)
28. [Risk & Mitigation \(Energy\)](#)
29. [Risk & Mitigation \(Battery & Storage\)](#)
30. [Risk & Mitigation \(Grid Technology\)](#)
31. [Stakeholder Analysis](#)
32. [QIC Ventures](#)
33. [QIC Ventures: Portfolio Snapshot](#)
34. [CenTrio Energy](#)
35. [Gilmour Space \(Pt.1\)](#)
36. [Gilmour Space \(Pt.2\)](#)
37. [Sunshine Hydro Deep Dive](#)
38. [Sunshine Hydro Pumped Hydro](#)
39. [REP Deep Dive](#)
40. [CMG Deep Dive](#)
41. [Reelectrify Deep Dive](#)
42. [Virtual Watt Deep Dive](#)
43. [RedEarth Deep Dive](#)
44. [QIC's Real Estate Test Beds](#)
45. [Curtailment in QLD \(Pt.1\)](#)
46. [Curtailment in QLD \(Pt.2\)](#)
47. [System Security & Wholesale Price](#)

Appendix B

Financials

49. [Market Sizing A&M](#)
50. [Energy MS — Progressive Change](#)
51. [Energy MS — Step Change](#)
52. [Energy MS — GEE](#)
53. [Data Centre Energy Demand \(Pt.1\)](#)
54. [Data Centre Energy Demand \(Pt.2\)](#)
55. [Queensland Energy Consumption](#)
56. [Portfolio Modelling Summary](#)
57. [Portfolio Modelling A&M](#)
58. [Sunshine Hydro Assumptions](#)
59. [Sunshine Hydro Model](#)
60. [REP Assumptions](#)
61. [REP Model](#)
62. [CMG Assumptions](#)
63. [CMG Model](#)
64. [Reelectrify Assumptions](#)
65. [Reelectrify Model](#)
66. [Virtual Watt Assumptions](#)
67. [Virtual Watt Model](#)
68. [RedEarth Assumptions](#)
69. [RedEarth Model](#)
70. [Portfolio Sensitivity Testing \(Pt.1\)](#)
71. [Portfolio Sensitivity Testing \(Pt.2\)](#)

Queensland Investment Corporation

APPENDIX A: General

Global Response

A unique mix of policy, resources and infrastructure drives renewable leadership



Global Response



Corporate PPAs to Green DC Load: Microsoft's 15-year PPA with FRV's Walla Walla Solar Farm (~350MW) is contracted to help power its Australian data centres.



Hyperscalers Shifting to 24/7 Clean-Power: Google's NV Energy tariff for 115MW of Fervo geothermal and Microsoft's CFE agreement with Constellation for 24/7 use of clean energy.



District-Heating from Waste Heat: Microsoft and Fortum will route heat from new DC into Espoo's district network, targeting 40% of local heating demand with zero-carbon heat.



Growth Gated by Green Supply: The Green Data Centre Roadmap unlocks >300MW of near-term capacity tied to stricter efficiency standards and clear power sourcing.

Infrastructure and Technology

1

Grid Updates

- US: Needs to x2 transmission capacity by 2035 to meet clean energy goals
- EU: €584 billion grid investment required by 2030;
- China: Building out Ultra High Voltage (UHV) lines; invested \$77 billion in 2023 on grid upgrades alone.

2

Batteries & Storage Boom

- Global grid-scale battery storage expected to grow 10x by 2030, reaching 1,200 GW
- US: Added 8.7 GW of new storage in 2023, doubling total capacity

3

Heat & Efficiency Innovations

- Finland: Microsoft + Fortum routing waste heat from new DCs into Espoo district network meeting 40% of local heating demand with zero-carbon heat
- Denmark: Over 70% of households connected to a district heating (Global network)

Global Growth in Energy Innovation: There is a clear uprise in innovation and demand for energy infrastructure and technology.

Corporate and Demand Drivers



- Hyper scalers account for 40% of PPA capacity (2017-2022); 17 GW in 2024 alone
- Amazon plans to be 100% renewable by 2025, reaching net-zero emissions by 2040
- Google is investing \$3 billion in renewable energy, securing a 20-year hydro PPA for 670 MW in Pennsylvania, the largest corporate hydro deal globally
- Microsoft has committed around \$10 billion toward renewables via Brookfield. enough to power 1.8 million homes.

Global PPA Market

Corporations have now signed a total of 198 GW in energy deals since 2008, surpassing the energy generation capacity of nations like France or the UK

Data Centre Demand

Data centres led the charge, with over 17 GW of clean energy contracts signed in 2024. This makes up nearly 60% of all corporate clean energy deals in the U.S

Future Trajectory

Data centres are projected to drive 300 TWh/year of additional clean energy by 2030, up from ~200 TWh/year contracted as of end-2024

Investment and Capital Flows

Global Capital Flows

- **Clean energy investment** hit USD \$1.8 trillion in 2023
- Renewables + storage = >80% of new global power investment
- **Grid investment:** \$330 billion globally in 2023, but needs to double by 2030 (IEA World Energy Outlook).
- **Private equity & infra funds** now dominate new capital flows e.g. BlackRock's \$12.5B Global Infrastructure Fund focused on renewables/storage.

Regional/Corporate Investment Trends

- **Australia:** \$25 billion annual investment needed to meet 82% renewables by 2030 (Clean Energy Council).
- **Asia-Pacific:** Sovereign wealth funds (Temasek, GIC, CPP) allocating heavily into battery & storage plays.
- **Hyper scalers (Amazon, Google, Microsoft):** committed billions into renewable PPAs → Amazon is world's largest corporate buyer of clean energy (30 GW+ contracted).
- **Green bonds & sustainable finance:** \$4.5 trillion issued globally since 2007, with 20% linked to energy transition projects.

Rise of Data Centres in Queensland

Queensland is rapidly transforming into a strategic cloud and AI infrastructure gateway



General Overview



Market Growth

- Australia's market is projected to grow from \$6.3B to \$9.5B (2023-2028)
- Queensland is emerging as the fastest-growing regional hub



Demand Surge

- 1.5 – 4.9 GW additional electricity demand projected by 2035 by data centres
- Brisbane and Sunshine Coast are key anchors for new edge facilities



Economic Impact

- Multi-billion dollar projects delivering thousands of jobs and foreign inflows
- Positions Queensland as a digital infrastructure gateway for Asia-Pacific

Major Projects and Development



Quinbrook Supernode

- **\$2.5B** development with **four hyperscaler data centres** with **800MW battery**
- Next to **South Pine substation** for **direct renewable power integration**
- Targets hyperscalers with **net-zero aligned, long-term leases**



NEXTDC's Maroochydore Expansion

- Proposed **6MW, five-storey SC2 facility**, next to existing SC1
- Central to Sunshine Coast's **submarine cable connectivity** and **smart-city ambitions**
- **Supports** data growth for **2032 Brisbane Olympics**



Amazon's \$20B National Investment

- **\$20M** committed (2025-2029) to **Australian data centre buildout**
- Includes **solar farms** in QLD to **power local operations**
- **Expands AWS's** AI, enterprise, and government cloud services

Energy and Infrastructure



Renewable Energy Zones

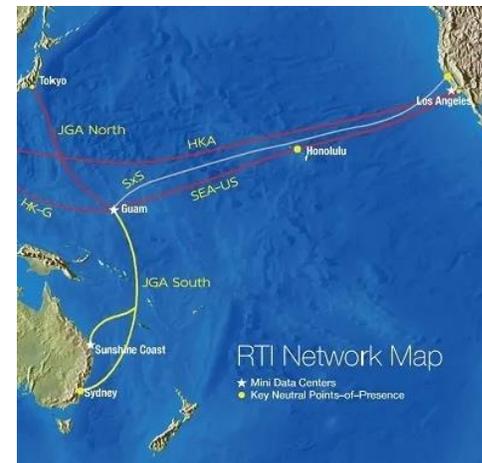
- **12** planned **REZs** across Queensland with **Western Downs** and **Southern Downs** already active
- Connecting **22GW** of new **renewable energy** to the grid by **2035**
- Enables **24/7 green supply** critical for hyperscaler **sustainability commitments**
- Strengthens **grid reliability** by **clustering generation** near demand centres



Western Downs Green Power Hub

- **Largest operating solar farm** in Australia with **400MW capacity**
- Paired with a **1,080MWh battery system** to **store** excess solar
- Supplies **clean electricity directly** into SE Queensland's grid
- Demonstrates how data centres can be **matched with renewable baseload solutions**

Sunshine Coast Subsea Cable – Second Landing



Direct Global Connectivity



Provides Queensland's only direct international subsea link, bypassing Sydney for faster Asia-Pacific access.

Low Latency Advantage



Deliver higher bandwidth and significantly reduced latency, critical for data centres and cloud.

Economic Impact



Expected to inject hundreds of millions into QLD economy, enabling jobs and smart-city growth.

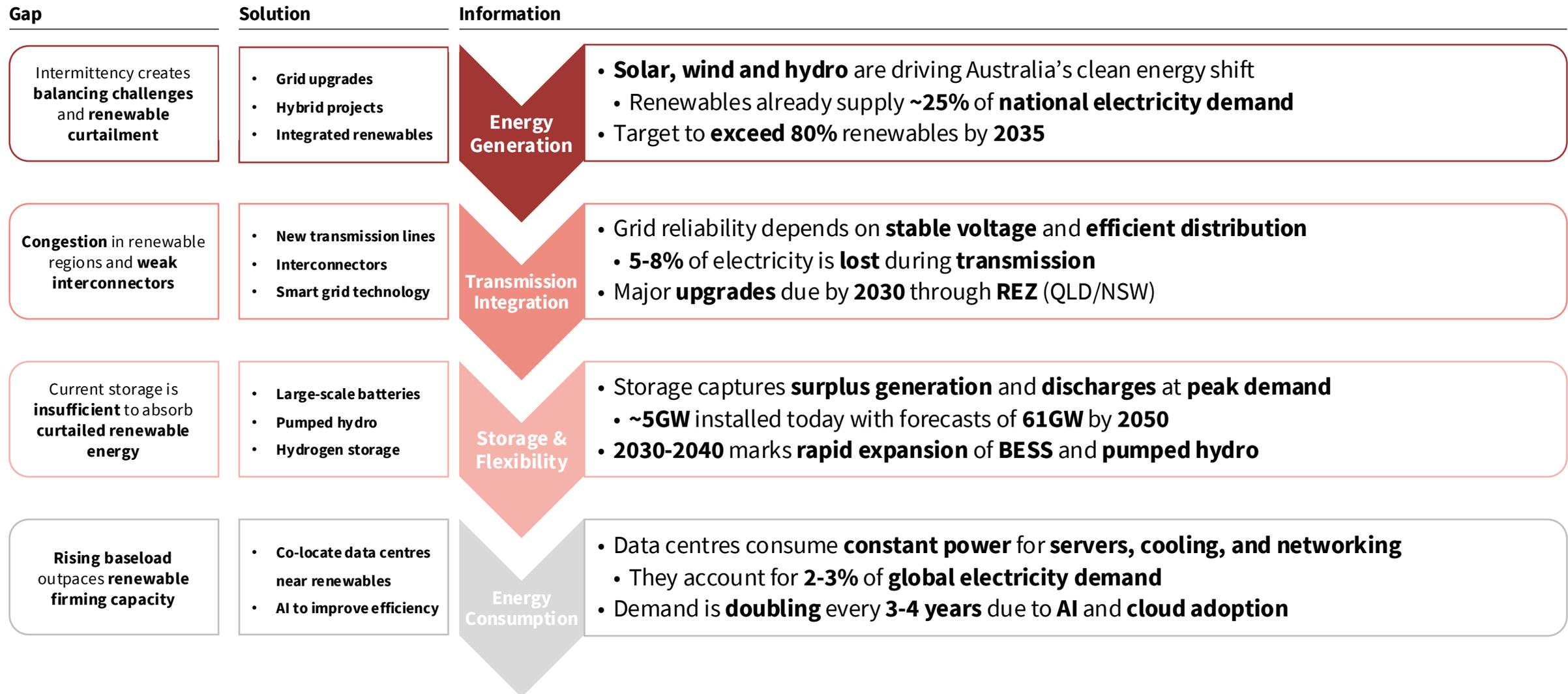
Resilience & Redundancy



Second landing improves network reliability and diversity, reducing single-point failures.

Ecosystem Mapping

Highlighting gaps and opportunities for Queensland's digital future



Case Study: Technology & Deployment Risk – Hornsdale Power Reserve

Demonstrating how staged rollouts and proven partnerships de-risk new technologies at scale

The Main Risk

We have identified the main risk to be technology & deployment uncertainty.

- New battery, grid orchestration, or software solutions may underperform at scale.
- For QIC, this risk is most relevant when backing early-stage companies transitioning into large infrastructure rollouts.
- Failure at scale risks stranded capital, lost offtake confidence, and reputational damage.

Why This Matters for QIC

Portfolio Context

Backing innovators like RedEarth, Endua, and Sunshine Hydro requires moving from pilot → commercial → infra scale.

Investor context

PE & Infra arms face exposure if scaling fails; hyperscalers and industrial offtakers rely on consistent delivery.

Systemic context

The Qld Energy & Jobs Plan requires firm, reliable technology deployment to reach 70% renewables by 2032.

Mitigation Applied



Staged Deployment

Neoen and Tesla deliberately launched Hornsdale at 100 MW to prove technical feasibility before committing more capital. Once reliability and grid benefits were demonstrated, capacity was expanded to 150 MW in 2020, reducing scale-up risk.



Proven Partnerships

Neoen, an experienced renewable developer, partnered with Tesla, a global leader in battery storage technology. This partnership combined local market expertise with best-in-class technology, ensuring credibility with regulators and investors.



Performance KPIs

Deployment was structured with measurable outcomes, such as providing Frequency Control Ancillary Services (FCAS) and stabilising the South Australian grid. Milestones were met before expansion funding was released.

Case Study: Hornsdale Power Reserve Background & Risk

Background: In 2017, the world's largest lithium-ion battery (100MW) was launched by Neoen and Tesla in South Australia.

Risk Encountered: Significant scepticism around whether the new battery technology could stabilise the grid and deliver at scale. Thus, the risk of political blowback and investor loss if performance failed.



Outcomes & Impact



Cost Savings

The system delivered ~\$116 million in savings on grid services in its first year alone, showing rapid payback and strong economic value.



Grid Stability

Hornsdale demonstrated batteries could respond in milliseconds, far outperforming gas plants in stabilising frequency and reducing blackout risk.



Scaling Success

Expansion to 150 MW/194 MWh validated the staged rollout approach, proving scalability once reliability was established.



Global Proof Point

The project became a benchmark for large-scale batteries worldwide, showing that staged capital deployment with proven partners can de-risk first-of-kind technology and build investor confidence.

Case Study: Quinbrook Supernode

Australia's largest battery storage campus

Project Overview

Strategic Vision

World's first integrated renewable energy ecosystem combining data centres, 8-hour battery storage, and 24//7 clean power delivery.

Site Specifications

30 hectares, non-flood-prone location adjacent to Queensland's central electrical hub.

Strategic Advantage

Unparalleled power supply access and redundancy at Queensland's central electrical hub.

-  **8 Hours**
World's First Real Duration
-  **\$1.4B**
Total Investment
-  **Brendale**
South Pine Switchyard
-  **275kV**
Grid Connection

Technological Breakthrough

EnerQB Innovation (CATL Partnership)

- First genuine 8-hour lithium-ion battery globally
- More competitive than pumped hydro alternatives
- Designed for rapid deployment across multiple sites

Quintrace Platform

- Real-time grid carbon intensity calculation
- Revenue and emissions optimisation
- ESG "Best Carbon Accounting Software 2024"

24/7 Clean Power Capability

- Supports two 8-hour manufacturing shifts entirely on solar power

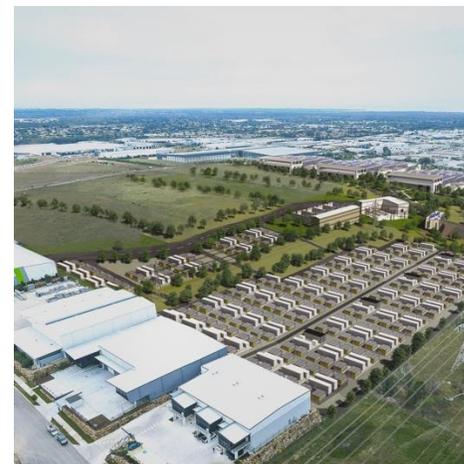


Supernode Data Centre



- **30-hectare Brendale campus** next to South Pine switchyard (central grid node)
- Planned for **4 hyperscale data centres** with up to **800 MW** grid power capacity
- **Three high-voltage** connections ensure redundancy and low-cost renewable power access
- Integrated with "Torus" dark fibre cable, offering **low-latency international connectivity**

Supernode BESS



- Total Capacity: ~760 MW / 3 GWh**
- Stage 1: **250 MW / 1,000 MWh** (Origin Energy)
 - Stage 2: **270 MW / 856 MWh** (Origin Energy)
 - Stage 3: **260 MW / 1,240 MWh** (Stanwell)
- A\$1.4B+** investment, with **A\$722M** debt financing secured for Stage 1 & 2.
- Provides **grid stability, renewable firming,** and **revenue stacking** via tolling agreements.

Implementation Timeline

Phased execution with measurable outcomes to de-risk and scale QIC's \$200M portfolio



Phased 12-18month Rollout Plan

Months:	0-2	3-4	5-6	7-8	9-10	11-12	13-14	15-16	17-18
Finalise portfolio allocation (\$200M split, reserves locked)	█								
Confirm partner due diligence & establish governance framework	█	█							
Legal structuring + SPV creation for investments		█							
Early-stage engagement with Qld gov programs & incentives		█							
Initial capital deployment 85% (20-30% into Sunshine Hydro, REP etc.)		█	█						
Stakeholder reporting to QIC + ESG compliance checks			█						
Pilot funding tranches released (validate feasibility, off-take agreements)			█	█					
Portfolio rebalancing review (test against Markowitz)			█	█					
Growth stage scaling for storage/grid tech ventures			█	█	█				
Formal ESG impact reporting (carbon abatement, QRET alignment).				█	█				
Onboard strategic co-investors (e.g., CEFC, ARENA)					█	█			
Deploy follow-on investments in Series B/C rounds from reserved 15%						█			
Technology performance validation						█			
Optimisation phase: reallocate reserves, double down on top performers							█		
KPI assessment to refine long-term investment strategy								█	█

KPIs

Financial Returns

- Target IRR > 25% **blended** across the portfolio (tracked quarterly)
- Capital deployment rate: **85% deployed** by month 3, **100% by month 6**

ESG & Impact

- **Carbon abatement potential:** quantify tonnes of CO₂ avoided per investment
- % of capital aligned with QRET 2030 targets

Portfolio Diversification

- Maintain **risk-weighting balance** (59% steady growth, 29% high growth, 12% hedge)
- Limit sector concentration: no >40% in any single asset class

Partnerships & Ecosystem

- Number of strategic co-investors onboarded (e.g. Clean Energy Finance Corporation, ARENA)
- At least **2+ follow-on rounds** with syndicate partners within 6 months

Innovation & Scale

- Find >3 **grid-scale storage pilots** and >2 **digital/grid tech proofs of concept**
- Validate technology performance benchmarks (e.g. 95%+ availability for storage assets)

Partnership Impact

Validating QIC's ability to scale with national 'green banks'



Clean Energy Finance Corporation (CEFC)

Neoen Hornsdale Big Battery (SA): Invested **\$160m** to expand Australia's largest battery, proving large-scale storage bankability and unlocking grid stabilisation revenue streams.

Bunnings EV Charging Rollout: Backed a **\$100m+** into EV charging infrastructure across retail sites, showing appetite for high-visibility national rollouts.

Scale Effect: Demonstrates CEFC's role as an *infrastructure anchor*, freeing QIC Ventures to focus on high-growth equity plays.



Australian Renewable Energy Agency (ARENA)

Kidston Pumped Hydro (Qld): Early-stage funding support, de-risking the project which later secured **>\$700m in private capital**.

Vanadium Flow Battery (Townsville): Co-funded Australia's first of its kind, validating long-duration storage tech pre-commercialisation.

Track Record: Over **600 pilot projects funded**, positioning ARENA as the *pipeline builder* for validated start-ups and scalable innovations.



Key Takeaways



CEFC + ARENA provide **bankability, scale, and risk reduction**, enabling QIC's \$200m to achieve **greater impact with less risk**.



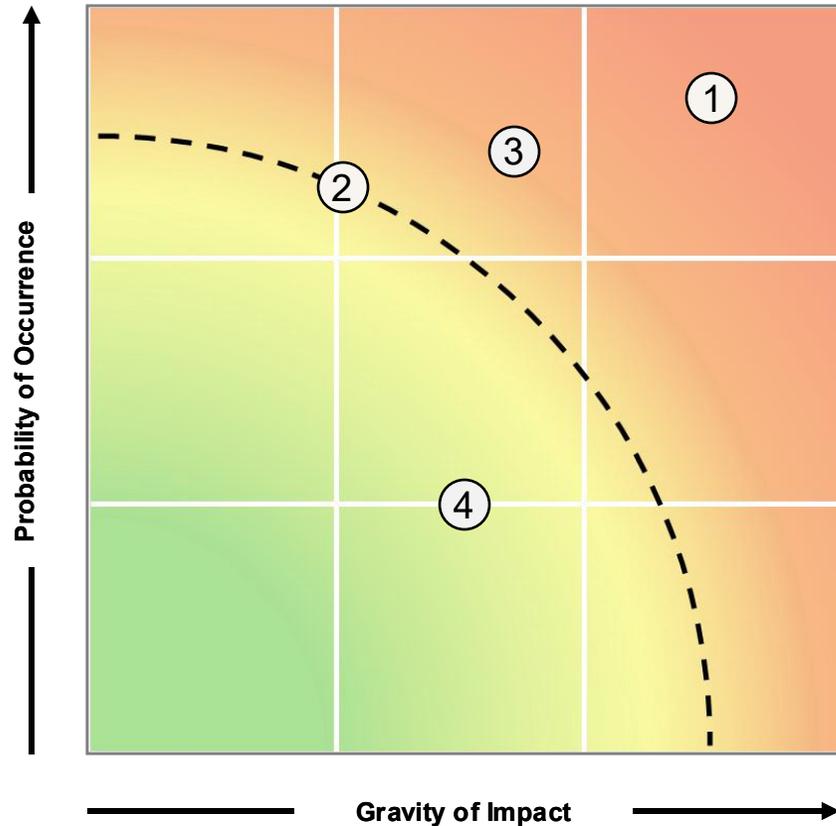
These precedents prove our thesis: **national green banks anchor capital-intensive infrastructure while QIC scales innovative ventures into global markets**.

Risks & Mitigants – General

Proactively identifying and mitigating risks to safeguard execution, returns and stakeholder alignment



Catalyst and Risk Matrix



Challenges and Risks

Commercial & Execution Risks	1 Technology & Deployment Uncertainty New grid software, renewable platforms or storage technology may underperform at scale
	2 Bottlenecks & Workforce Constraints Shortages in skilled engineers, long lead times for HV equipment and supply chain disruptions can stall projects
Systemic & Policy Risks	3 Regulatory & Market Uncertainty Evolving frameworks for grid services, PPA and energy transition policies may disrupt revenue models
	4 Capital & Cost Shocks Rising interest rates, capex overruns and global commodity swings could compress returns

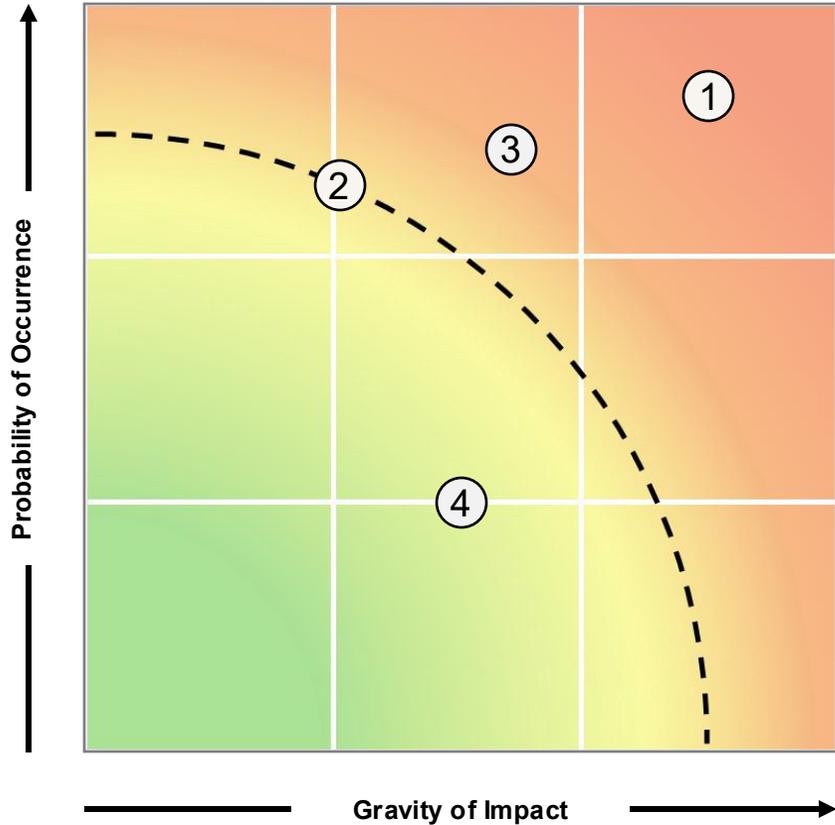
Stakeholders Impacted and Mitigants

<ul style="list-style-type: none"> Portfolio companies face execution/delivery risk QIC Ventures & PE/Infra arms face capital exposure if projects overrun Offtakers (hyperscalers, industrial users) face risk of supply unreliability
<ul style="list-style-type: none"> Stage-gated capital deployment tied to KPIs Pilot projects to validate tech before large rollouts Partnerships with proven operators to leverage established track records
<ul style="list-style-type: none"> Qld Government as the Energy & Jobs Plan promises 100k new jobs Local Communities/First Nations Groups that rely on workforce & training EPC Contractors & Suppliers face project delays & higher costs
<ul style="list-style-type: none"> Engage bulk procurement agreements Secure labour via Talent pathways (e.g. NZAON model), EPC partnerships Undergo flexible project phasing
<ul style="list-style-type: none"> Regulators as they must enforce the Renewable Transformation Bill QIC Investors/Clients as risk policy shifts affects returns Industry Partners as PPAs/offtake may be harder to secure without clarity
<ul style="list-style-type: none"> Active engagement with regulators and industry movers Diversify exposure across markets Build optionality into contracts, structure flexible PPAs/offtake
<ul style="list-style-type: none"> QIC LPs (pension/super funds) for returns are reduced if capex blows out Financiers (NAIF, CEFC, banks) may have to loan underperformance Portfolio Companies as higher WACC results in potential funding shortfalls
<ul style="list-style-type: none"> Co-funding with CEFC/ARENA/NRF concessional finance to reduce WACC Hedge commodity exposure and syndicate co-investors Enforce strict project cost controls

Risks Mitigation in Practice: Evidence-Backed Precedent

Real-world examples and quantified insights to reinforce our risk management approach

Catalyst and Risk Matrix



Challenges and Risks

Commercial & Execution Risks	1	Technology & Deployment Uncertainty New grid software, renewable platforms or storage technology may underperform at scale
	2	Bottlenecks & Workforce Constraints Shortages in skilled engineers, long lead times for HV equipment and supply chain disruptions can stall projects
Systemic & Policy Risks	3	Regulatory & Market Uncertainty Evolving frameworks for grid services, PPA and energy transition policies may disrupt revenue models
	4	Capital & Cost Shocks Rising interest rates, capex overruns and global commodity swings could compress returns

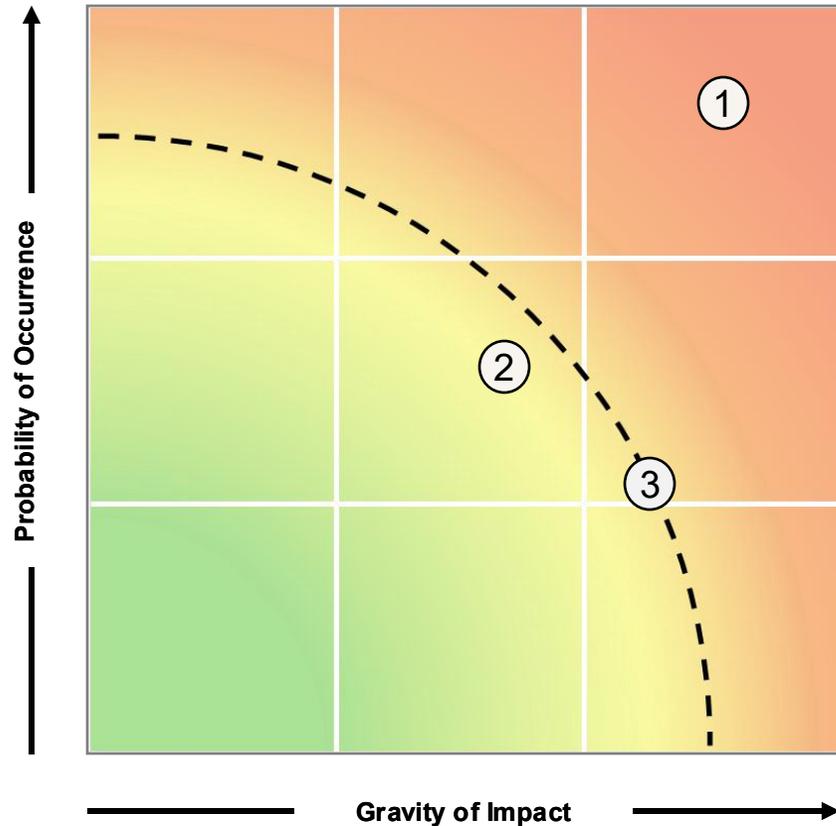
Evidence and Mitigations in Practice

- Hornsdale Power Reserve delivered ~\$116 million in energy grid savings in 2019 via fast frequency services.
- Staged rollouts
Example: Hornsdale began as a 100 MW pilot, scaled to 150 MW after performance validation.
- Snowy Hydro's "Snowy 2.0's" cost doubled (~\$5.9B to \$12B) due to labour shortages and tunnelling delays
- Mitigate via resilient labor planning, e.g., engaging training programs and scaling skilled workforce pipelines tied to state policy (Qld Energy & Jobs Plan aligning over 100k new jobs).
- Spain's retroactive solar tariff cuts slashed confidence and halted installations, leading to legal and financial fallout.
- Employ flexible offtake and diversified long-term PPAs; QIC's CenTrio infrastructure model locks in municipal offtake to mitigate policy volatility.
- Lithium costs surged >400%, increasing battery costs over 25% YoY globally.
- Leverage concessional financing: CEFC committed A\$160 million to Neoen's Victorian Big Battery, enabling financial close and competitive pricing.

Risks & Mitigants — Renewable Energy

Proactively identifying and mitigating risks to safeguard execution, returns and stakeholder alignment

Catalyst and Risk Matrix



Challenges and Risks

1 Transmission and Interconnection Slippage
REZ queue congestion and delayed SuperGrid build out can delay commercial operation date.

2 Mega Project Delivery and Capex Overrun
Complex infrastructure builds face tunnelling/terrain risks and inflation, straining budgets and schedules

3 Social Licensing and Land Access Friction
Local opposition or cultural-heritage issues can slow approvals or force redesigns

Stakeholders Impacted and Mitigants

Stakeholders Impacted

- Project developers with delayed revenue due to COD
- Investors & financiers due to return delays
- Grid operators job instability due to stranded capacity

Mitigants

- Prioritise projects with secured grid connection agreements and diversify portfolio across REZs to avoid concentration in congested region
- Stagger construction and energization to align with transmission milestones
- Stage investments to align with REZ/ SuperGrid rollout timelines.

Stakeholders Impacted

- Developers and EPC contractors due to reputational risk and delayed revenue
- Investors because of reduced IRR
- Governments due to delays in meeting renewable targets

Mitigants

- Structure contracts with fixed-price EPC agreements and risk-sharing mechanisms such as performance guarantees.
- Diversify across project scales by balancing with low risk projects
- Active cost control via digital project monitoring and contingency buffers.
- Supply chain hedging

Stakeholders Impacted

- Local communities (visual, environmental, cultural heritage concerns)
- Indigenous/First Nations groups (land rights, heritage sites)
- Regulators & policymakers (pressure to resolve disputes, potential delays)

Mitigants

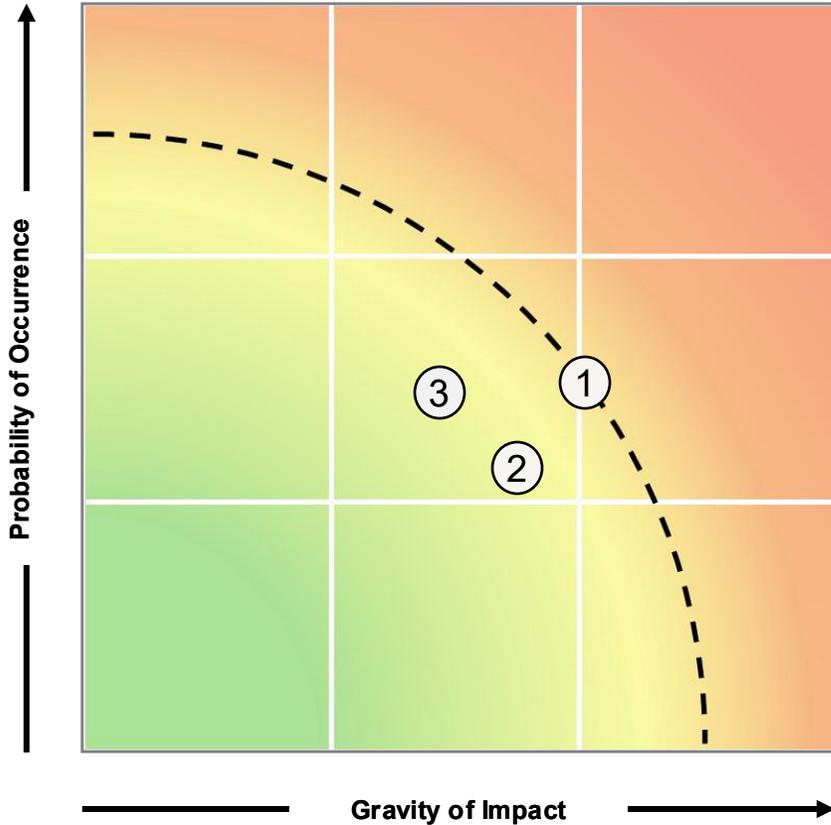
- Early and transparent community engagement reports.
- Partner with Traditional Owners through co-ownership or benefit-sharing models.
- Environmental and cultural heritage assessments integrated early into project design.

Risks & Mitigants — Battery & Storage

Anticipating and addressing risks to protect execution, value creation, and stakeholder alignment



Catalyst and Risk Matrix



Challenges and Risks

- 1 Integration and Compliance**
 Controls and handover points impose bottlenecks if models don't match or tests are failed
- 2 Performance and Under-delivery Risks**
 If round-trip efficiency, availability or cycle life fall short of specs, this jeopardises firming obligations
- 3 Regulatory Tightening & Shifts**
 If codes/standards shift or there are increased fire safety rules this will raise costs and can delay approvals

Stakeholders Impacted and Mitigants

- Stakeholders Impacted**

 - EPC contractors and integrators (delays in handover)
 - Regulators and AEMO (system stability concerns)
 - Developers and investors (COD delays and cost overruns)
- Mitigants**

 - Early alignment with AEMO, DNSPs and government regulations on testing, compliance and system integration standards
 - Select experienced system integrators with strong track records
 - Run pre-commissioning simulations to identify mismatches early
- Stakeholders Impacted**

 - Investors & financiers (revenue below forecast, lower IRR)
 - Grid operators (firming capacity compromised)
 - Offtakers/retailers (exposed if storage underperforms against contracts)
- Mitigants**

 - Deploy independent engineering reviews and rigorous acceptance testing pre-COD
 - Use OEM (manufacturer) warranties and performance guarantees
 - Diversify portfolio across chemistries (e.g., lithium-ion, flow batteries) to reduce single-technology risk
- Stakeholders Impacted**

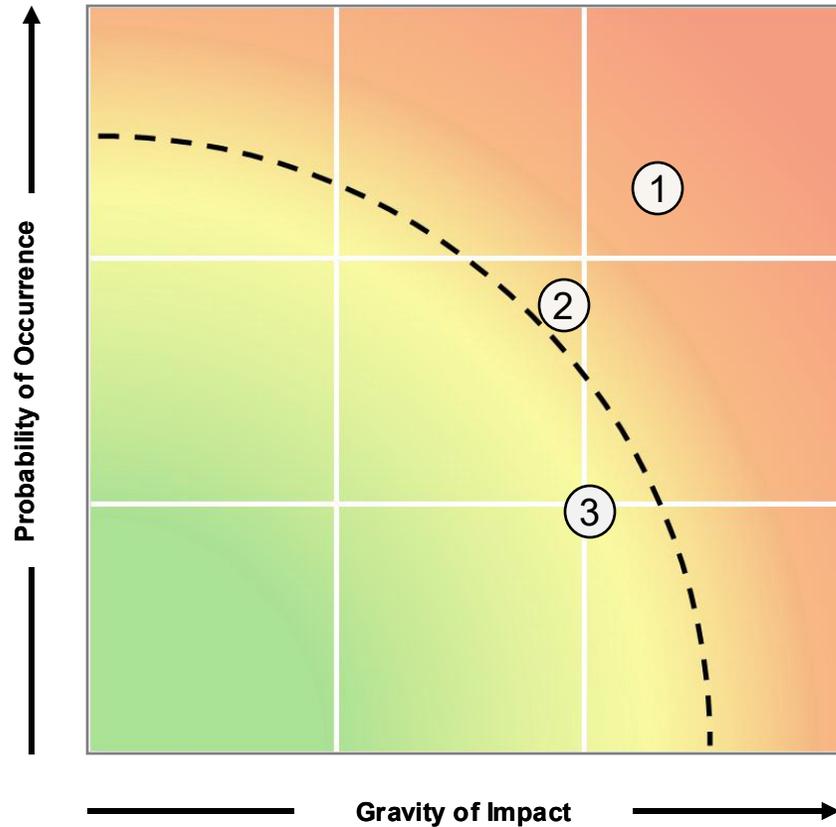
 - Regulators (responsible for safety compliance)
 - Developers and EPC contractors (face design changes and higher costs)
 - Local communities (concerned about fire safety and environmental impact)
- Mitigants**

 - Proactive engagement with regulators to anticipate code changes
 - Design flexibility into projects (modular systems, fire suppression, spacing).
 - Participate in industry working groups to influence and stay ahead of evolving standards
 - Ensure robust insurance coverage and compliance frameworks

Risks & Mitigants — Grid Technology

Proactively identifying and mitigating risks to safeguard execution, returns and stakeholder alignment

Catalyst and Risk Matrix



Challenges and Risks

- ① **Market Access and Regulatory Changes**
Alterations to enablement, verification or what VPP's can sell and for what price can limit revenue and performance
- ② **Forecasting and Dispatch Underperformance**
If load, price of solar/wind forecasts miss goals, this degrades earnings from FCAS and energy arbitrage
- ③ **Cybersecurity and Critical Infrastructure Tightening**
Tougher OT/IT security obligations and incidents can drive downtime, cost spikes and insurance constraints

Stakeholders Impacted and Mitigants

- Stakeholders Impacted:**

 - Developers & VPP operators (exposed to rule changes)
 - Investors (policy uncertainty undermines cashflows)
 - Regulators & policymakers (pressure to balance market access with security)

Mitigants:

 - Maintain active regulatory engagement (submissions, working groups with AEMO & AER)
 - Build compliance flexibility into systems (eg software upgrades)
 - Secure long-term offtake or availability contracts
- Stakeholders Impacted:**

 - Investors & financiers (earnings volatility)
 - Grid operators (AEMO) if dispatch errors affect system balance
 - Retailers/offtakers relying on firming services

Mitigants:

 - Invest in advanced forecasting platforms
 - Co-locate storage with renewables to smooth variability
 - Enter contracts/PPAs that de-risk merchant volatility through hedging
- Stakeholders Impacted:**

 - Project developers & operators (responsible for compliance costs)
 - Investors (exposed to downtime and liability)
 - Customers/offtakers (face disruptions from outages)

Mitigants:

 - Implement industry best-practice cybersecurity frameworks (ISO 27001, NIST)
 - Cyber insurance coverage to transfer catastrophic risk
 - Partner with specialist OT/IT providers to ensure compliance alignment

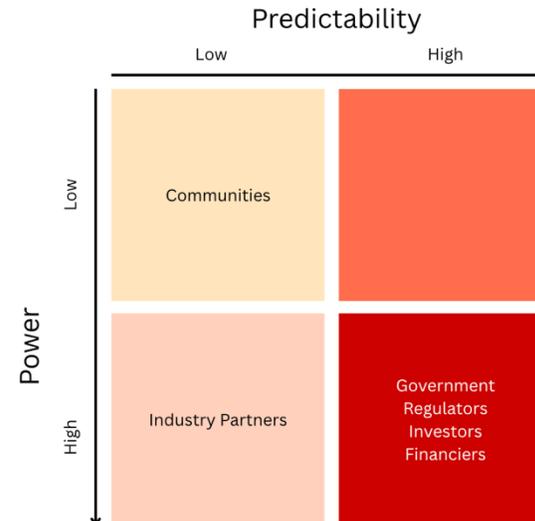
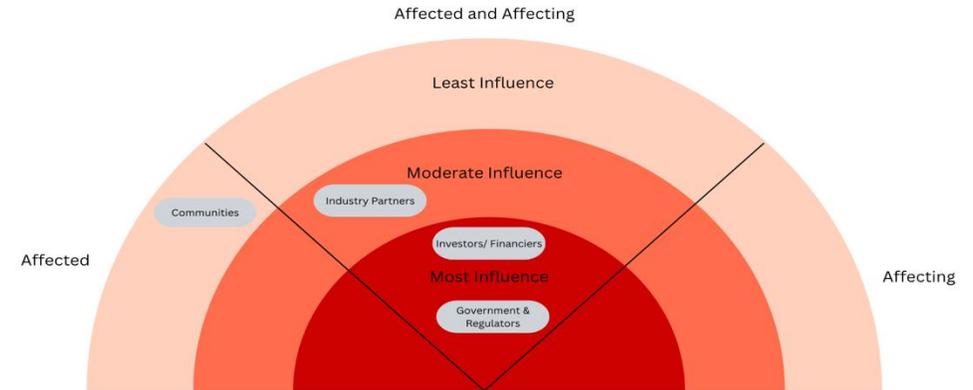
Stakeholder Analysis

Understanding stakeholders to navigate power and predictability

Stakeholders

<p>Government & Regulators</p>	<ul style="list-style-type: none"> • QLD Government, QRET, Queensland Conservation Council • Oversee Approvals and set compliance. Create infrastructure policies • High power and influence on investment through policy guidelines. • Highly impacted by project's alignment with guidelines
<p>Industry Partners</p>	<ul style="list-style-type: none"> • CEFC, ARENA • Scale up investment potential • High power and influence due to partnership • Moderately impacted by project's success
<p>Investors & Financiers</p>	<ul style="list-style-type: none"> • Hyper scalers, Global Investors, Private Investors • Provide capital, influence project scale, returns and risk appetite • High power and influence on investment due to support of project • Highly impacted by project outcome
<p>Communities</p>	<ul style="list-style-type: none"> • Landholders, First Nations, local councils, and workforce • Uses energy, provide land access, social licence & labour for projects • Low power and influence on investment due to limited power • Least affected by project

Analysis



Power is concentrated with **government, regulators, and financiers**, making policy clarity and capital access critical. **Industry partners** drive scale, while **communities**, though lower in influence, are vital for social licence and workforce support. This highlights the need for QIC to balance top-down engagement with bottom-up alignment.

QIC Ventures

Proving Australia's ability to scale world class start-ups across various industries



Identity & Mandate

- Venture arm of Queensland Investment Corporation (QIC)
- Mandate: Invest in high-growth tech companies (Seed to Series C+) and scale Australian innovation globally
- Position: Bridges Queensland's innovation ecosystem with QIC's **A\$100B+ global institutional platform**.
- Goal: Turn local ventures into globally competitive companies.

Portfolio

Companies in Portfolio from inception (2016) vs now (2025)



- QIC Ventures has built a portfolio of >80 high-growth Australia tech firms since formation in 2106, with growing deal velocity.
- Positioned within QIC's broader Private Equity platform (managing AS8.5B in allocations), it can effectively scale startups with growth capital, ecosystem support & later-stage capital pathways.
- Through the Queensland Venture Capital Development Fund (VCDF), QIC also plays an ecosystem-building role, strengthening local VC infrastructure and accelerator pipelines.

QIC Ventures Alignment with QIC's Broader Arms



Ventures seed sovereign climate-tech (Endua, SwarmFarm)



Scale-up supported by PE/Infra



Financed long-term by Private Debt

Impact Examples

VALD

What is it: A global suite of human-measurement systems used by elite sport, military and healthcare industries

QIC's Role: Co-led a \$25M capital raise alongside Vistara Growth (Nov 2022)

Strategic fit for QIC: Promotes innovative, data driven hardware and software technology within the health/AI analytics space.

Effect: Again proves the ability to scale Queensland backed scale ups into >100 countries



SwarmFarm Robotics

What is it: Lightweight autonomous field robots and open platform that enable third-party apps for mowing, spraying and precision farming tasks

QIC's Role: QIC made multiple investments into SwarmFarm. Their 3rd investment, Feb 2025 aimed particularly to scale the new Darling Downs manufacturing hub

Strategic fit for QIC: Reinforces QIC's environmental investments, that also have strong technological innovation and are rooted in sovereign capability

Effect: Validates climate positive investments and QIC's ability for repeated funding and scaling capital intensive projects



QIC Ventures: Portfolio Snapshot

Backing frontier innovation across sustainability, deep tech, and scalable SaaS - proving capacity to scale high-impact ventures



Energy & Sustainability

hydrogen-based long-duration storage

biodegradable coatings for paper/cardboard

directly aligned with IT2 + IT1

plastic recycling and circular economy

autonomous agri-robots reducing chemical and energy usage

decarbonising advertising workflows

Deep Tech & Infrastructure-Adjacent

MODNPODS
MODULAR LIVING
modular, sustainable housing solutions

gelomics
3D cell culture technologies
3D cell culture biotech (innovation frontier)

GILMOUR SPACE
sovereign space launch + orbital infrastructure

QIC's venture-to-scale narrative
*case study 2

SaaS / Data / Digital Infrastructure

QIC's ability to scale recurring revenue software models:

skedulo
workforce management SaaS (enterprise scale)

One Model
workforce analytics platform

VALD
human performance & health analytics SaaS

Dataweavers
enterprise data management SaaS

Attekus
cloud-based compliance SaaS

Fintech & Platforms

QIC backs platforms across fintech, ESG supply chain, and industrial services - diversifying risk and showcasing dealflow capacity

Jacobi
investment management software

cake.
cap table management & ESOP software

Paypa Plane
payments & direct debit SaaS

muval
moving services marketplace

BUILDSAFE
construction safety equipment provider

FairSupply
Data to Decision. Your ESG partner.
supply chain transparency & ESG compliance

Case Study: QIC's Active Ownership of CenTrio Energy

How QIC scaled CenTrio into North America's leading clean district energy provider through active ownership and ESG leadership



Background

QIC acquired CenTrio (formerly Enwave Energy USA) in **2021**, alongside Igneo Infrastructure Partners.

- Provides integrated **cooling, heating & electricity**
- Operates one of the largest district energy portfolios in the US, serving 370+ customers across 140+ million square feet in Chicago, Denver, Houston, Los Angeles, and Seattle.
- Largest independent **pure-play** district energy platform in the United States.
- A leader in district energy, dedicated to sustainability and maintaining a **99.9% reliability record**



Value Drivers



Infrastructure Innovation – Chicago

Built North America's largest carbon-free ice battery system, cutting **35,000 MT CO₂ annually**, saving **250M+ gallons of water**, and earning the **2023 Global District Energy Climate Award**.



Renewable Integration – Denver

Operates North America's largest sewer-heat recovery system, sourcing **90% of heating/ cooling from recycled energy**, abating **2,600 MT CO₂e** yearly & winning **2023 IDEA Innovation Award**.



Scalability

District energy networks can **decarbonise entire campuses and cities** by sharing generation resources, enabling **economies of scale and efficiency**.

Active Governance & ESG

ESG Program & Targets

- Launched ESG & Sustainability Program in 2022, hiring a **Chief Sustainability**
- 2022: began drafting a **Decarbonization Implementation Strategy**, to target **carbon neutrality by 2050**.
- 2023: Finalised a Sustainable Infrastructure Plan & Implementation Strategy, creating sustainable district energy practices within decarbonization roadmaps.

Formalised KPIs & Reporting

- Set short/long-term targets for its **GHG Scope 1 & 2 emissions profile**, utilising Greenhouse Gas Protocol.
- Also aim for **water reductions** based on 4% process efficiency and loss-reduction improvements per year from 2027-2050.
- 2023 Sustainability and Impact Report utilised an ESG platform to share results & drive improvement

ESG Credibility

- **Exceeded industry peer scores** in inaugural Global Real Estate Sustainability Benchmark (GRESB) assessment report
- Won three major national and international awards in Sustainability in 2023

Board & ESG Delivery

- The **CSO** presents quarterly to the Board of Directors, ensuring sustainability is a key focus at leadership level.
- Also established an Advanced Technology Working Group in 2023 to educate internal experts in emerging decarbonization technologies, showing a commitment to technical decarbonisation strategies.

QIC's Capabilities

Active Ownership: CenTrio's ESG success reflects QIC's hands-on governance. A dedicated CSO, board reporting, and sustainability working groups institutionalised decarbonisation, embedding ambitious net-zero targets and pioneering practices into daily operations.

Replicable Playbook: CenTrio shows how advanced technologies (ice batteries, sewer heat recovery) paired with ESG governance can deliver firm, green energy. This systematic approach offers a template for portfolio firms like Sunshine Hydro to secure offtakes, scale projects & align with global ESG mandates.

Strategic Fit: QIC manages over \$125B across infrastructure, private equity, real estate, venture, and private debt. CenTrio's large-scale, long-duration, ESG-focused infrastructure is highly aligned with QIC's core capabilities, blending growth capital with long-term ownership.

Proof Point: CenTrio's deployment of North America's largest sustainable energy systems, its substantial CO₂ abatement, and multiple international awards demonstrate QIC's ability to back innovators, institutionalise sustainability frameworks, & scale impactful solutions aligned with UN SDGs.

Case Study: Gilmour Space Technologies - QIC-Backed Launch to Orbit

QIC Ventures partners with founders to scale innovation from lab to launch pad



Background

Founded on the Gold Coast QLD, by Adam & James Gilmour.

Mission: Build Australia's first domestic orbital rockets (Eris launch vehicles) serving small satellite markets from Bowen Orbital Spaceport.

In 2024, QIC led a **A\$55M Series D round**, accelerating Eris rocket manufacturing and Bowen spaceport operations



QIC's Active Engagement

Capability	QIC's Role
Capital Anchor	Led A\$55M Series D raise to provide scale-up capital that accelerated their rocket manufacturing, testing programs and launch capability.
Strategic Connectivity	Positioned Gilmour to benefit from sovereign mission, local partnerships, and space regulation wins.
Governance & Scaling	Support in scaling manufacturing and launch program while integrating with QIC's global investor network.

Value Drivers



Sovereign Launch Capability

Enabled the first Australian commercial orbital launch license; bridges national capability gaps.



Industrial Scale-Up

Funding enabled onshore manufacturing, testing infrastructure, and workforce expansion (projected from ~100 to 300+ staff by 2027).



Strategic Supply Chain Development

Local supply chain and policy alignment catalysed via Bowen launch facility and ABCD investment.

QIC's Capabilities



Innovation Frontier

Illustrates how QIC can back ambitious Australian tech, creating new high-value sectors.



Venture-to-Scale Pulse

Similar playbook: seed capital → follow-ons → integration into infrastructure – can be applied to your renewable portfolio



National Impact

Anchoring sovereign space tech mirrors Sunshine Hydro & REP's role in fueling Qld's energy sovereignty.

Case Study: Gilmour Space Technologies' Projects Deep Dive

Seeding sovereign launch and scaling a Queensland space platform



Eris Orbital Launch Vehicle (Hybrid Propulsion)

What it is: 23m, three-stage small-sat launcher using proprietary **hybrid** engines; dedicated and rideshare to LEO for small satellites.

2024–25 milestones: QIC led **A\$55m Series D** to accelerate manufacture, testing and first launches; Bowen site and launch licensing in place. First test flight occurred in 2025 (short flight; data captured; next flight planned).

Why it matters: Establishes **Australia's first domestic orbital launch capability** for commercial/defence smallsats—critical sovereign infrastructure.

How QIC helps: Capital anchor and signalling (lead of Series D) to ramp manufacturing & test cadence; institutional governance and credibility with customers and regulators.



Launch Services & Rideshare (Commercial Pipeline)

What it is: Dedicated and **rideshare** offerings on Eris; early MoUs/agreements with payload brokers and customers (e.g., **CST** up to 50 kg; **Space Machines** support; **Space BD** channel into Japan/APAC).

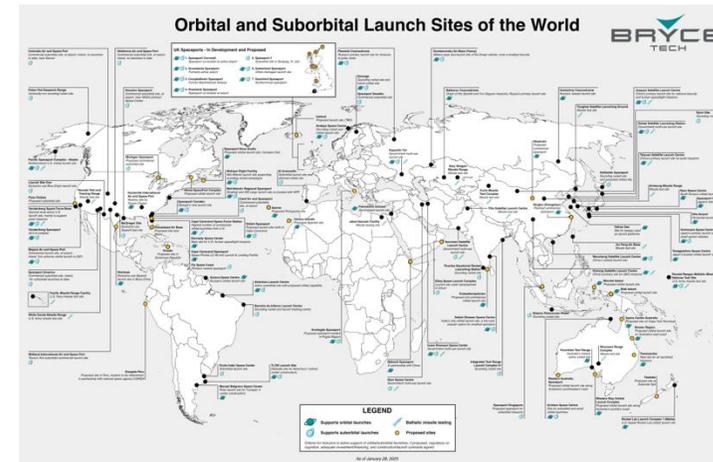
Why it matters: Early customer funnel de-risks revenue and validates market demand; expands addressable market in APAC.

How QIC helps: Signal boosts commercial go-to-market; helps formalise service levels, pricing, and delivery milestones to institutional standards.

Orbital Launch Timeline



Bowen Orbital Spaceport (North Qld)



What it is: Australia's **first licensed orbital launch facility** at Abbot Point/Bowen, operated by Gilmour.

Why it matters: Creates national launch access and schedule control; Southern Hemisphere inclinations; platform for recurring revenue (integration, range services).

How QIC helps: Financing credibility to complete site works & operations; strengthens “sovereign access” narrative with gov'ts & primes.

ElaraSat Satellite & Platform

What it is: Gilmour is developing **ElaraSat**, its first in-house satellite, while also offering a **dedicated smallsat bus platform** for third-party payloads. It complements the launch - positioned for government/defence and commercial smallsat missions (LEO from 2025).

Why it matters: This dual strategy combines **mission demonstration (ElaraSat)** with a **commercial bus product**, enabling customers—government, defence, and commercial—to access turnkey satellite solutions integrated with Gilmour's launch services.

How QIC helps: Provides capital and governance to **productise the bus platform**, manage ElaraSat as a proof-of-capability mission, and align both with institutional-grade delivery milestones.



Sunshine Hydro Deep Dive

AI-enabled infrastructure developer: combining long-duration storage, green fuels & and social partnerships for QLD's future



Company Overview

Brisbane-based Australian renewables technology and engineering company, founded in 2016.

- **Vision:** Deliver **100% renewable, 24/7 energy** to decarbonise industry and transport, in harmony with nature and First Nations communities.
- **Core Focus:** Building **Superhybrid™ infrastructure projects** that produce **firm, green energy 24/7, 365 days a year**. They integrate wind, solar, and sustainable biomass with long-duration energy storage, electrolysers, and green fuels production.
- **Value Creation Model:** Develops projects from design to FEED, secures power purchase agreements (PPAs) for renewable inputs, off-take agreements for energy and green fuel outputs, and **strategically sells down** stakes to recycle capital. Also advises on third party Superhybrids and licenses its AESOP™ software.
- **Innovation Edge:** Proprietary AESOP™ optimisation software models millions of energy-market scenarios to design bankable projects, optimise dispatch, and maximise returns.

Key Projects & Activities

Djandori Gung-i Superhybrid Project

Overview: Located near Miriam Vale (Central Qld) in a Renewable Energy Zone

Scale & Components: 1.8 GW wind, 600 MW pumped hydro (18h storage), 300 MW electrolysis, 50 MW liquefaction, 50 MW hydrogen fuel cell → ~65 tonnes of green hydrogen/day.

Timeline: Targeting FID in 2025, commissioning 2028–29.

First Nations Partnership: 20% equity option (FNGEG); MoU with Gidarjil & BMRG for cultural, social, and economic benefits.

Impact: Abates ~4 Mt CO₂ annually (~2.5% of QLD's emissions).

Pipeline Context: One of >70 projects under development, including 300 MW PHES (NSW) and 600–800 MW "Juliette" project near Gladstone.

Proprietary Technology

AESOP™ (Advanced Energy Storage Optimising Program) software, developed since 2016, is the cornerstone of their Superhybrid™ systems

- **Functionality:** AESOP™ uses historic, live, and forecast data to determine the optimal use of renewable energy every five minutes, orchestrating multiple assets (pumped hydro, electrolysers, wind, solar)
- **Roles:** It guides the **design of assets and commercial contracts** and subsequently **optimizes operations** to maximize profitability and reliability
- **Digital Twin:** Runs in real-time as a "Digital Twin" for advanced development projects to gather performance data
- **Market Advantage:** By simulating millions of dispatch scenarios, AESOP™ de-risks investment decisions, secures stronger financing terms, and provides Sunshine Hydro with a unique competitive edge in delivering firm, low-cost renewable power.

Broader Project Portfolio

A portfolio of **70+ projects** at various stages of development across Australia and internationally.

- Includes a **300 MW pumped hydro project in North NSW**.
- A **600-800 MW "Juliette" project near Gladstone** co-located with a wind farm

Capital Raising

Raised **\$0.5M crowdfunding** and **\$51.8M (Series A, June 2024)** from wholesale investors for project development. Also seeking support from financiers like NAIF and CEFC.

R&D Training Partnerships

Collaborated with **CQUniversity** to develop and trial a **Mini Superhybrid™ technology initiative**.

- Serves as a research testbed for long-duration storage and renewable energy, aiming to establish **deeper training capabilities** for technologies.
- Supports **Gladstone's** ambition to become a **future sustainable green fuels hub**.

Sunshine Hydro Deep Dive — Pumped Hydro

The backbone of Queensland's renewable future

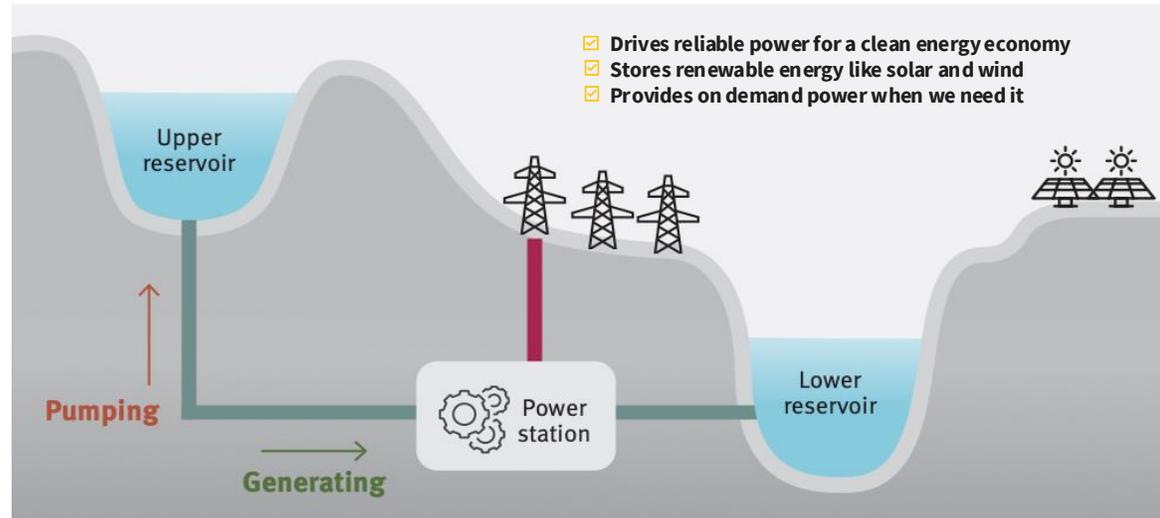
How does Pumped Hydro work?

Pumped hydro acts like a giant battery.

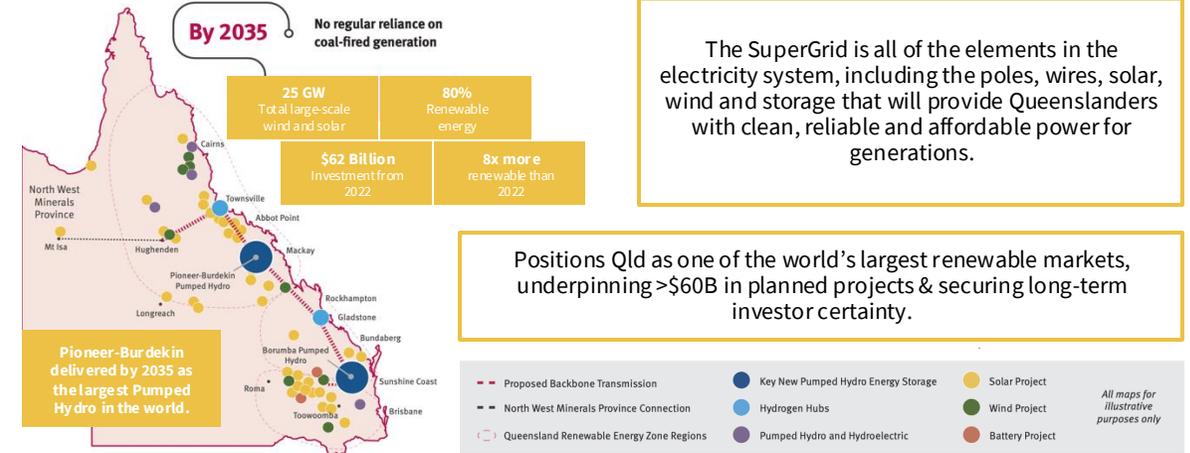
- It uses electricity from the grid or nearby renewables to pump water from a lower reservoir into an upper reservoir when energy prices are low
- When energy is needed, water is released from the upper reservoir into the lower reservoir, generating energy as it passes through a turbine
- Hydroelectricity can be generated almost immediately and at any time, so power can be fed into the grid when it is needed.

Two sites in Queensland:

- Borumba close to both central and southern Queensland
- Pioneer-Burdekin the battery of the north - the largest in the world

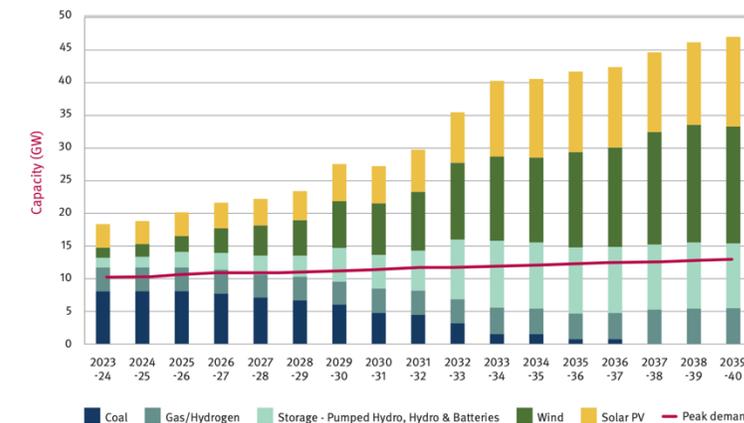


What is the Queensland Supergrid?



Queensland: A clear plan to transfer to Renewables

Queensland Energy & Jobs Plan capacity mix (GW)



Queensland's generation mix will transform over time to include more wind, solar, and storage to ensure we always have enough energy to meet Queensland's energy demand including at peak times.

Renewable Energy Partners Deep Dive

Queensland-rooted developer building >10GW pipeline of wind, solar, and hybrid projects to deliver scale for the state's energy transition



Company Overview

Brisbane based renewable energy developer focused on community, commercial and utility scale projects.

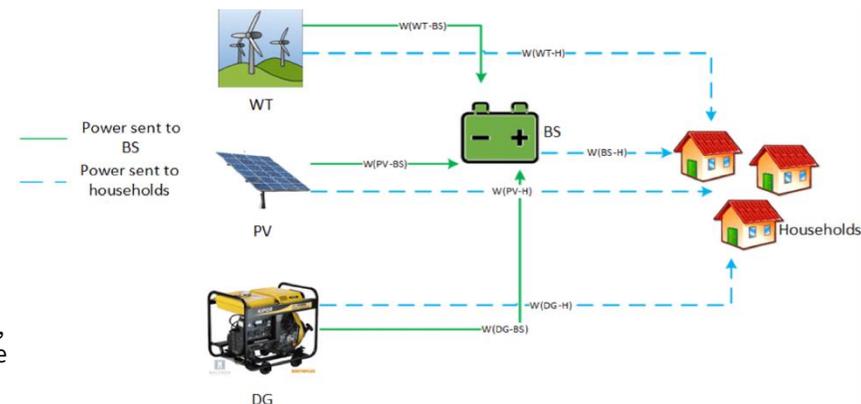
- **Mission: Speed up the transition into renewable energy** by deploying solar, wind and storage projects in partnership with landholders, councils and communities.
- **Core Focus:** To develop solar farms, wind projects and hybrid storage assets that contribute to QLD's renewable energy targets. REP specialises in site identification, landholder engagement, approvals and grid connection.
- **Value Creation Model:** Identifies viable sites and then develops them to attract investors and capital partners. They leverage community ownership models and ventures to strengthen their social license. Monetisation is through strategic partnerships with large energy players and project equity sales.

Proprietary Overview

REP focuses on hybrid renewable and storage integration to reduce issues of curtailment.

Functionality: They offer digital project planning tools for grid modelling, land optimisation and permitting to attract investors.

Roles: They leverage local, community backed finance and ownership to accelerate approvals.



Key Projects & Activities

Capricornia Renewable Energy Hub

Overview: One of Australia's largest proposed integrated renewable projects, located in Central QLD in a REZ.

Scale & Components: 1.5GW solar generation capacity, 800MW wind capacity, 300/1200MWh Battery Storage System → designed to deliver firm renewable energy to grid.

Timeline: Approval progression mid-2020s and first stage construction targeted 2026-27.

Impact: Significantly contributing to QLD's 70% renewable target by 2032 and expected to generate enough electricity to power 700000/year.

Pipeline Context: Part of REP's broader multi-GW project pipeline across QLD and compliments other REZ aligned developments such as Northern QLD solar/ wind hybrids.

Partnerships and Social Impact

REP leverages community partnerships, building a local focus.

- Often partners with regional councils, landholders and local cooperatives to co-develop renewable projects
- The company works with traditional owners and first nations groups to ensure their project opportunities also respect cultural values.
- Collaborate with CQUniversity to support skills in development in renewable construction.

Capital Raising

Actively raising equity and debt for multiple project phases and is eligible for co-financing/support from CEFC and ARENA. Recent partnership with institutional investors to implement the delivery of large-scale renewable projects.

Broader Project Portfolio

Holds over 10GW of renewable energy generation capacity and 15,000MWh BESS in development

- Wandoan Hybrid Project – estimated power 172,000 homes
- Merrawindi Wind farm- 48 turbines powering 180,000 homes

Critical Minerals Group Deep Dive

Market-to-mine vanadium integration for scalable energy storage and swift cash flow



Company Overview

Critical Minerals Group (CMG) is focused on energy storage solutions, leveraging vanadium flow batteries (VFBs).

- CMG's model is **vertically integrated**, spanning **upstream** (mining), **midstream** (vanadium electrolyte production), and **downstream** (energy storage solutions) to create a complete value chain.
- The company employs a **"market-to-mine" strategy** to ensure a balanced supply-demand dynamic, optimal pricing, prioritize early cash flow, mitigate risk, and enable sustainable, demand-led growth

Partnership Support

CMG has strong partnership and support from cornerstone investor Idemitsu Australia. The company has also secured \$4.8 million in gov grants from local, state and federal levels for electrolyte production and supply chain development. Key industry collaborations include EPC contractors (Sedgman, Van-Tech) and battery manufacturers (Invinity, Sumitomo, Cellcube)

Key Projects & Activities

Lindfield Vanadium Project

World-class Asset: Holds a JORC resource of 713Mt at 0.32% V_2O_5 , positioning CMG as a major player in the global vanadium supply chain.

Operations: Characterised by shallow mining with a low strip ratio & simple operations.

Location: Benefits from an ideal location close to existing infrastructure including Julia Creek, main highways, rail, power, and water.

Target Production: Expected to produce 10,000 tonnes of V_2O_5 & 400 tonnes of molybdenum trioxide annually, which is sufficient to generate approx 1.3 GWh of energy.

Development Timeline: Currently in feasibility studies, with Bankable Feasibility Study (BFS) expected to be complete by Q4 2026 and operations commencing in 2029

Vanadium Electrolyte Manufacturing Facility

Location: Developing the first in South East Queensland (SEQ)

Capacity: Phase 1 involves a 1 million litre/year facility (approx. 20 MWh), with planned expansion up to 10 million litres/year (approx. 200 MWh).

Timeline: Production and cashflow are anticipated in Q1 2026.

V_2O_5 Sourcing: Initially, V_2O_5 will be sourced from third-party suppliers (e.g., Glencore, Largo) before transitioning to CMG's own Lindfield project production

Battery Energy Storage System

Market Opportunity: Deliver energy storage solutions, to enhance economic efficiency of renewable energy, load balancing etc

Project Scope: Projects range from 250kWh to 40MWh, addressing a broad market.

Timeline: BESS solutions are on track to generate cashflow in 2026.

Customer Engagement: Discussions have commenced with various clients.

Proprietary Approach

Core Technology: Solutions built around **vanadium flow batteries (VFBs)**, which are highly suited for grid-scale, long-duration energy storage, a critical component of Australia's clean energy transition.

Integrated Supply Chain: Business model allows CMG to control the process from vanadium pentoxide extraction/processing, to vanadium electrolyte manufacturing, to BESS solutions. This increases efficiency, scalability & leverage internalised cost margins, reducing reliance on external suppliers.

BESS Total Package Solution: Comprehensive solution for renewable assets, covering project origination, funding, technical design, economic modelling, EPC management, supply of components, software, and ongoing operations and maintenance (O&M)



Relectrify Deep Dive

CellSwitch™ technology revives second-life EV batteries for high-performance, inverterless C&I energy storage



Company Overview

Focus: Pioneering **modular 36 kW / 120 kWh second-life battery energy storage systems (BESS)**.

Innovation: Integrates **CellSwitch™** (Relectrify's cell-level control technology) with **retired Nissan Leaf EV battery packs** to create self-contained units that directly output AC power. **Mission:** Validating the **feasibility and cost-effectiveness of using second-life batteries** for energy storage.

Key Distinction: Achieved **world-first certification** for an 'inverterless' battery system at commercial and industrial (C&I) scale, meeting stringent International Electrotechnical Commission (IEC) standards for on-grid deployment in Australia



Proprietary Technology

CellSwitch™ – an advanced cell-level battery management and inverter technology.

Functionality: Combines **power electronics and advanced control software** to manage each cell individually. Dynamically selects active cells, generating **AC power directly without a traditional inverter**.

Key Benefits:

- **Increased Usable Capacity:** Extracts more 20% increase in usable capacity from second-life battery packs by overcoming the "weakest cell" limitation of conventional systems.
- **Enhanced Cell Balancing:** Resolves State of Charge (SoC) spreads of over 50% between cells within just two hours during charging.
- **Fault Tolerance:** Enables the system to electrically isolate faulty or underperforming cells while maintaining normal operation and extending operational life.
- **Optimised Performance:** Manages energy flow at the cell level to maximize each cell's utilization, leading to better efficiency and reliability.
- **Grid Compliance:** Ensures compliance with harmonic current limits specified by grid codes

Key Projects & Activities

Second-Life Battery Trial

Project: 4.5 year pioneering trial supported by ARENA.

Product: ReVolve® – the modular 36 kW / 120 kWh BESS developed for the trial.

Milestones:

- **Product Development (2020-2021):** Initial design, prototype with Counties Energy (NZ), public unveiling, and initiation of formal certification.
- **Certifications & Initial Deployments (2022-2023):** Achieved **world-first certifications** for an 'inverterless' second-life BESS. Deployed **8 ReVolve units** at customer sites in Australia and the US.
- **Final Deployments & Completion (2024-early 2025):** Full fleet of **15 trial units installed across three countries** (Australia, New Zealand, Japan).

Outcomes:

- **Energy Delivery:** Collectively delivered **over 240 MWh of stored energy** with a combined 49,600 hours of runtime.
- **High Availability:** Most ReVolve units maintained an **availability rate above 98%** in real-world C&I applications (solar shifting, peak demand reduction, EV charging, peer-to-peer sharing).
- **Degradation:** Estimated annual capacity fade rate of **2.0% to 3.0%**, consistent with expected rates for BESS.
- **Operational Expertise:** Gained significant product development and deployment experience, establishing in-house expertise for future certification and product design

Partnerships & Social Impact

Key Partners: ARENA, Counties Energy (NZ), Meridian Energy (NZ), Nissan (customer for sustainability initiatives).

Environmental Impact: Promotes **circular economy principles** by repurposing EV batteries, reducing e-waste & lowering embodied energy per cycle.

Early Adoption: Appealed to early adopters in manufacturing, energy retail, agriculture, and local government sectors driven by **strong sustainability mandates and innovation goals**.

Virtual Watt Deep Dive

Turning distributed assets into a dispatchable grid power



Company Overview

Virtual Watt is a Brisbane based energy services company operating a Virtual Power Plant (VPP) platform that connects distributed solar and battery systems to the National Energy Market (NEM).

Mission: Lead the transition to net zero by maximising value from distributed renewable energy assets and support grid stability via an advanced VPP platform.

Core Focus: Offer platform services that integrate residential and commercial solar panels and battery assets into a centralised VPP. They focus on households, businesses and energy service providers (white-label solutions) in Queensland participating in the NEM.

Value Creation Model: Monthly subscription plans that offer grid-market access, energy scheduling and trading services. Further, Virtual Watt can earn returns from participating in the NEM through energy arbitrage and Frequency Control Ancillary Services (FCAS).

Proprietary Approach /Tech

Enables distributed solar, batteries and EV's to operate as a unified power plant.

Functionality: Software platform that remotely orchestrates distributed solar and battery resources via API or IoT devices, enabling energy optimisation and trading on the NEM. They also a wide range of inverters and batteries such as ABB, Alpha Ess, Sungrow etc, ensuring versatility and broad compatibility.

Roles: They engage households and businesses as asset owners. Additionally they partner with installers, battery manufacturers and energy providers through sales partnerships and white-label offerings.



Key Projects & Activities

Flagship Initiative: The VPP Platform

- Aggregates DER (Distributed Energy Resources) systems to trade excess energy, lower electricity costs and stabilise the grid.
- This is through a tiered subscription plan (VW Standard, VW Boost, VW Energetic) with various capacities, pricing structures, battery/PV capacity threshold, usage allowances and daily market participation credits.

VW Standard \$79 monthly	VW Boost \$99 monthly	VW Energetic \$129 monthly
Minimum Solar PV Capacity: 6.6 kW Minimum Battery Capacity: 10 kWh Annual Usage Allowance: 4500 kWh (Grid import - excludes control load) Excess Usage Rate: 33.70 c/kWh	Minimum Solar PV Capacity: 10 kW Minimum Battery Capacity: 15 kWh Annual Usage Allowance: 6000 kWh (Grid import - excludes control load) Excess Usage Rate: 33.70 c/kWh	Minimum Solar PV Capacity: 13.2 kW Minimum Battery Capacity: 20 kWh Annual Usage Allowance: 8100 kWh (Grid import - excludes control load) Excess Usage Rate: 33.70 c/kWh
Market Participation Credit: \$0.5 per day (The daily credit applies only when your battery is online.) + Sign up Promotion - \$120 a year for the first 12 months	Market Participation Credit: \$0.5 per day + Sign up Promotion - \$120 a year for the first 12 months (The daily credit applies only when your battery is online.)	Market Participation Credit: \$0.5 per day + Sign up Promotion - \$120 a year for the first 12 months (The daily credit applies only when your battery is online.)
Demand Pass-through Fees*: \$5.13/\$8.0 peak kw/month (Charged by your network provider, varies based on your assigned network tariff.)	Demand Pass-through Fees*: \$5.13/\$8.0 peak kw/month (Charged by your network provider, varies based on your assigned network tariff.)	Demand Pass-through Fees*: \$5.13/\$8.0 peak kw/month (Charged by your network provider, varies based on your assigned network tariff.)
Get Started	Get Started	Get Started

Partnerships and Social Impact

- Offers white-label VPP and back-office services to renewable energy businesses (installers, retailers)
- Onboards hardware partners (battery/inverter suppliers, IoT device providers)
- Enables householders to reduce bills and earn income, & supports grid flexibility and reliability by supplying energy during peak periods

Capital Raising

There are currently no public filings regarding capital raises or current investors. This suggests pre-seed/early funding phase

RedEarth Energy Storage Deep Dive

Powering energy independence through Australian-made modular battery storage



Company Overview

Brisbane-based energy storage company focused on residential, commercial and industrial battery solutions. They design, manufacture and assemble systems locally to deliver reliable & scalable storage.

- **Mission: Enable energy independence and accelerate the clean energy transition** by providing modular, Australian-made battery storage systems.
- **Core Focus:** To deliver flexible energy storage solutions including off-grid, hybrid, and grid-connected systems, as well as innovative technologies like the *Microgrid-in-a-Box (MIB)* to create “Private Power Plants.”
- **Value Creation Model:** Manufactures and assembles battery systems locally in Brisbane, ensuring quality control and Australian standards compliance. Value is created by combining modular design (scalability), proprietary software (energy monitoring and trading), and tailored products for residential, commercial, and industrial needs. Monetisation is achieved through direct product sales, grid-services participation, and strategic partnerships with global technology providers and investors.

Key Projects & Activities

Microgrid-in-a-Box (MIB)

Overview: World’s first fully integrated system combining solar, battery storage, and bidirectional EV charging into a single modular platform.

Scale & Components: Up to 30 kW power output and ~100 kWh storage. Flexible operation modes (solar inverter, storage, EV charger) activated through software.

Timeline: Launched in June 2025; commercial rollout planned for 2026 across Aus, NZ, China, Europe.

Impact: Expected to reduce household energy costs by up to 60% while enabling customers to earn income by trading and providing grid services.

Pipeline Context: Developed through partnership with German firm ambibox (electronics/EMS) and China’s Nebula (manufacturing).

Broader Project Portfolio

Residential Solutions: *BlackMax*, *BushChook*, *HoneyBadger*, modular systems for homes, cabins, and rural properties.

Hybrid Systems: *DropBear* scalable on/off-grid solution with ~57 kWh capacity.

Commercial & Industrial: Containerised *BushPig* and *BushPiglet* which are large-scale backup and storage for business operations.

Capital Raising

Funding History: Raised \$12M in pre-IPO funding in 2021

Use of Funds: Expanded Brisbane manufacturing, scaled R&D

Partnerships & Social Impact

Global Alliance: Partners with *ambibox* (Germany) and *Nebula* (China)

Community Impact: Enables households & businesses to cut bills and earn revenue

Social License: Builds trust through Australian manufacturing, community-focused solutions, and reliability.

Proprietary Approach

Australian Manufacturing and Scalability

All systems are designed and assembled using high-quality, locally sourced components, tailored for Australian conditions and user needs. The architecture is modular to allow for future scalability.

Troppo Battery Modules

RedEarth’s Troppo LFP (LiFePO₄) battery modules, the first Australian-made batteries approved by the Clean Energy Council, enable scalable storage (e.g., 4.1 kWh per module), used across their integrated systems.

Cloud-Based Monitoring & Control

Systems include remote monitoring via mobile/web apps and can even be managed directly by RedEarth (e.g., via 4G), providing end-to-end support and ease of use.

“Private Power Plant” Platform

Proprietary software enables households and businesses to generate, use, store, and trade energy effectively turning rooftops into revenue-generating power assets.

QIC's Real Estate Test Beds

Leveraging QIC's real estate portfolio as a test bed for energy portfolio



Rollout of Smart Connected Solar with Yurika Energy

Overview: QIC partnered with Yurika, Energy Queensland's renewables business, to install large-scale, behind-the-meter rooftop solar power systems across several of QIC's major Australian shopping centres

Scale & Components: The partnership integrated smart metering, 24/7 monitoring, and the capability to incorporate future technologies like battery storage and electric vehicle charging stations

Timeline: The first phase involved installing solar systems at five major shopping centres: Robina Town Centre, Logan Hyperdome, Grand Central, Domain Central (all in Queensland), and Watergardens in Melbourne

Test Bed Role: Trial advanced integrated clean energy tech on live retail sites

Impact: The project delivered greater financial savings, improved environmental performance, and reduced electricity grid consumption for QIC's retail portfolio

Onsite Solar Contribution

Overview: QIC has scaled rooftop solar across its real estate portfolio as a cornerstone of its decarbonisation strategy

Timeline: Progressive rollout since 2019; expansion ongoing across retail and mixed-use assets

Test Bed Role: Demonstrates viability of large-scale behind-the-meter renewables across commercial real estate assets, informing integration with storage and EV infrastructure

Impact: Significant reduction in grid electricity consumption and material emissions supporting QIC's net zero goals

>4,000 Homes

QIC's solar rollout now generates the equivalent annual electricity usage of more than 4000 homes (30,000 MWh)

FY23

Onsite solar provided 15% of QIC real estate's direct energy use avoiding 12,300 tonnes of scope 2 emissions

FY24

Onsite solar expanded to **18%** of direct energy usage, generating approximately 30,000 MWh clean energy across portfolio

QIC's Town Centre Portfolio – Partnership with CEFC

Overview: QIC's Town Centre Fund portfolio, supported by CEFC, is targeting net zero emissions by 2028. The fund invests in energy efficiency and renewable technologies across shopping centres to cut emissions and improve resilience

Scale & Components: Upgrades include solar PV, battery storage, LED lighting retrofits, HVAC improvements, and smart metering with real-time analytics

Timeline: Initiatives have been progressively rolled out since 2020, with net zero targeted by 2028 across all centres in the fund

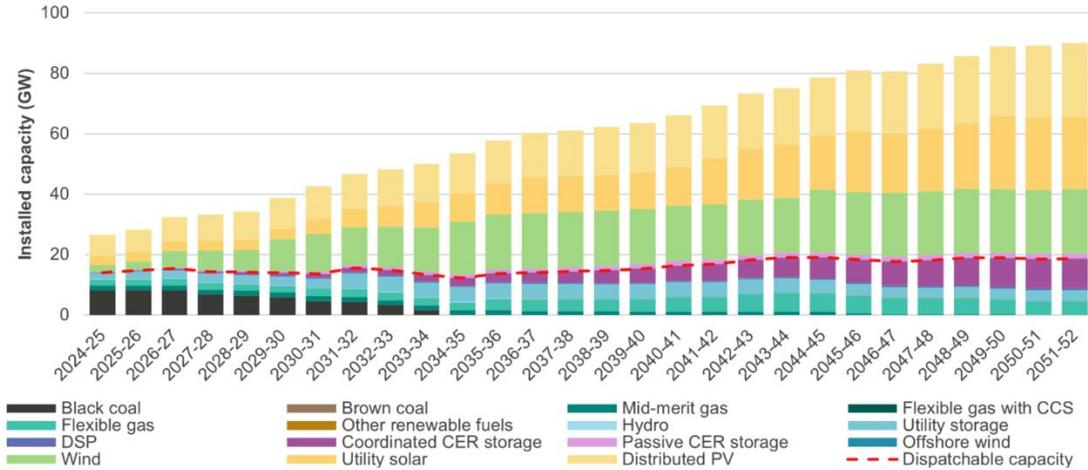
Test Bed Role: Pilot integration of battery storage with onsite renewables and energy efficiency measures to manage peak demand, cut costs, and trial resilience strategies

Impact: Reduced exposure to grid volatility and peak demand charges and collected data to refine broader portfolio rollouts

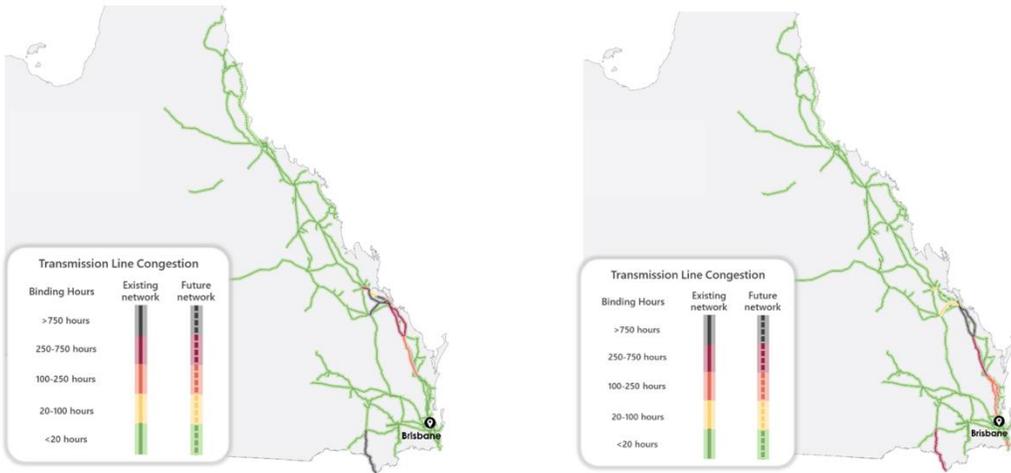


Curtailment in Queensland (Pt.1)

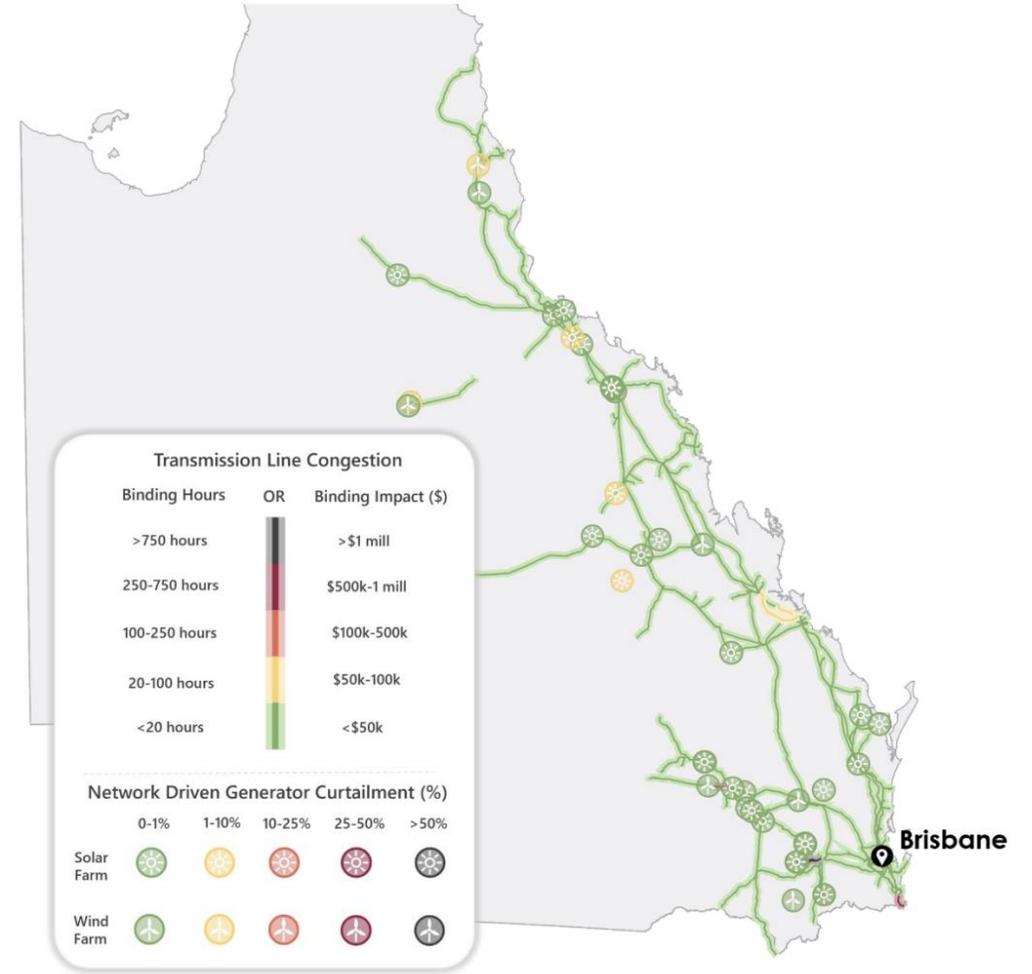
Forecast Capacity (Step Change)



Projected Network Congestion in Queensland (Near Term - Left, Medium Term - Right)



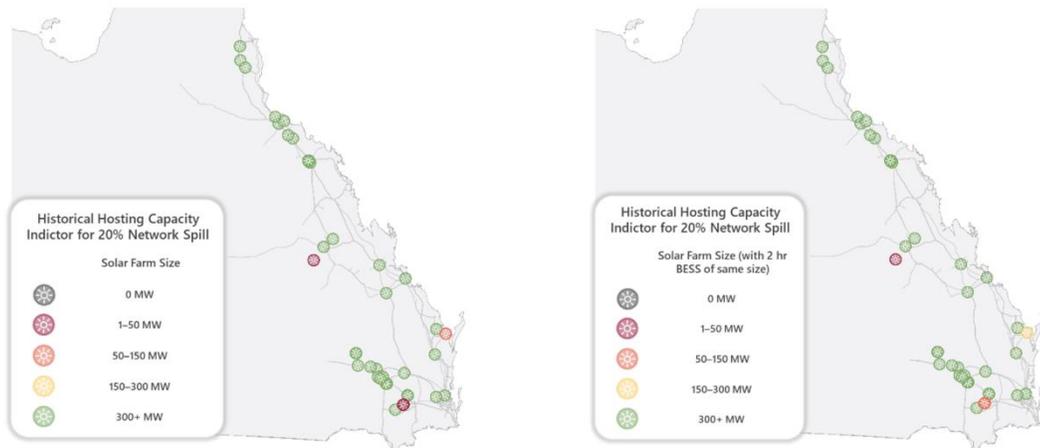
Congestion and Curtailment (2024)



Curtailment in Queensland (Pt.2)

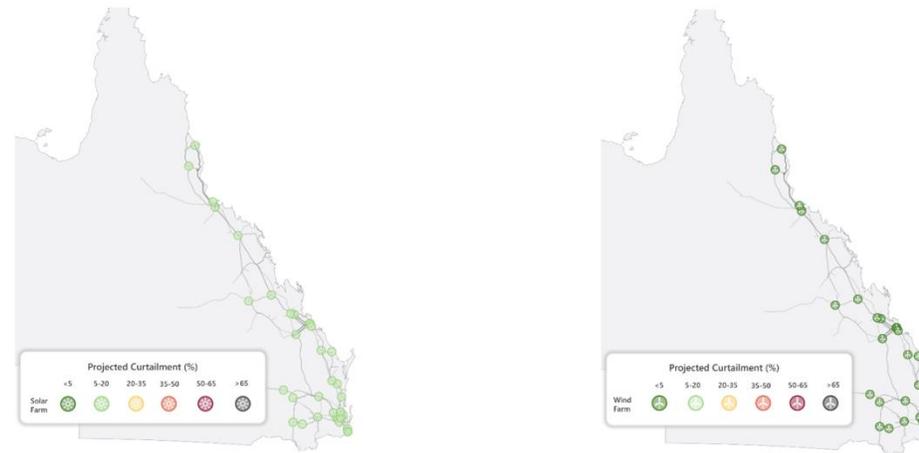
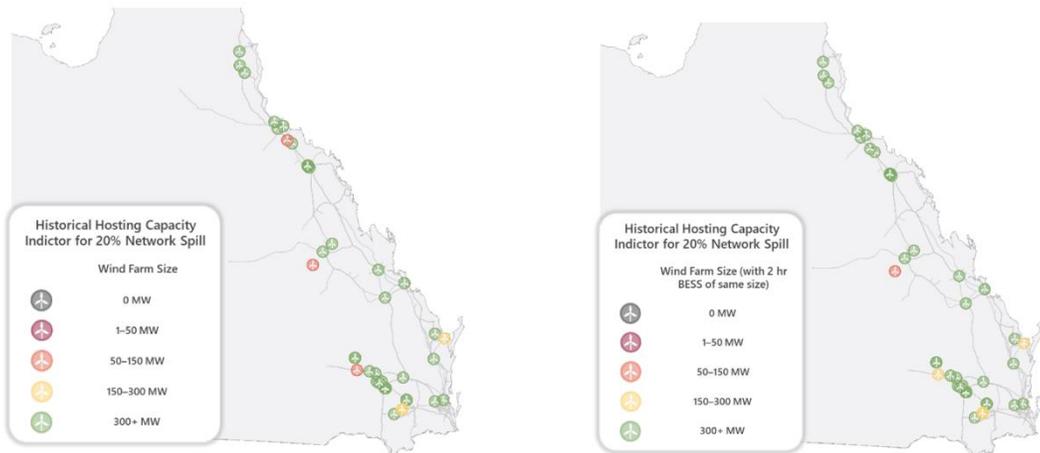
Historical Hosting Capacity Indicator (Solar - Left, Hybrid Solar/BESS - Right)

Projected Curtailment Outcomes in Near Term (Solar - Left, Wind - Right)



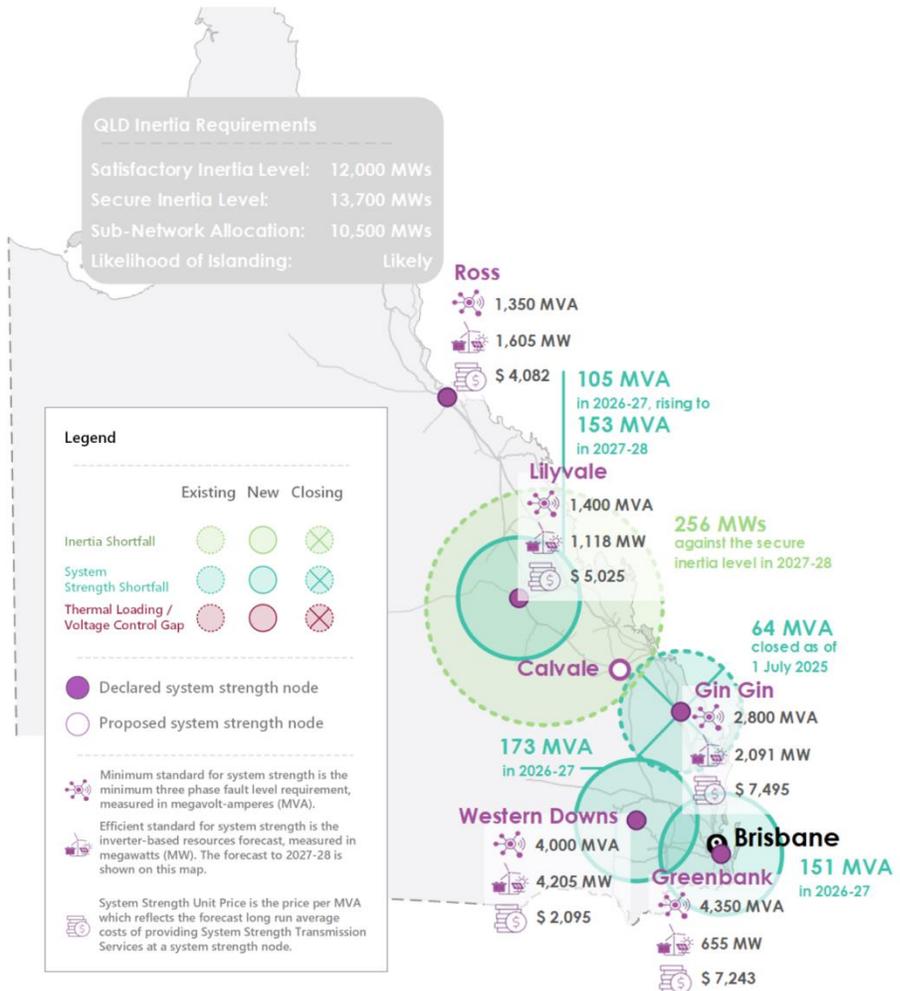
Historical Hosting Capacity Indicator (Wind - Left, Hybrid Wind/BESS - Right)

Projected Curtailment Outcomes in Medium Term (Solar - Left, Wind - Right)

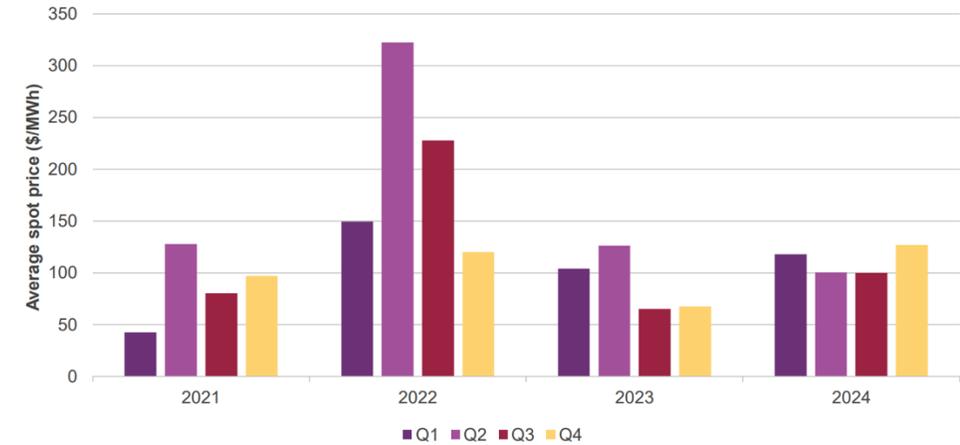


System Security Shortfalls and Wholesale Price Indicators in Queensland

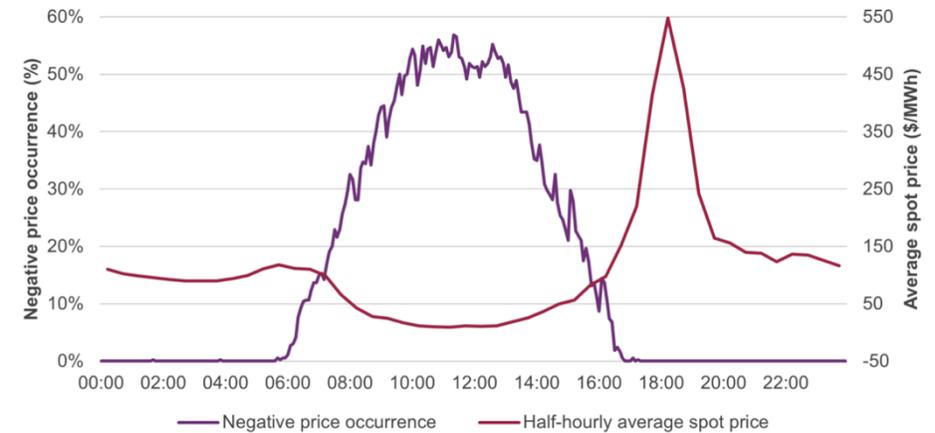
System Security Needs



Average Spot Prices Quarterly since 2021



Negative Price Occurrence and Half-Hourly Average Spot Price



Queensland Investment Corporation

APPENDIX B: Financials

Market Sizing Assumptions & Methodology



Queensland Market Sizing Assumptions & Methodologies

Investment Material for QIC

Data Sources

Primary Sources	Description	Application	Notes
AEMO ELI Report 2024	Economic Limits to Generation	Curtailment Forecasting	Official Regulator Data
WattClarity Analysis	Real-Time Market Dynamics	Price Impact Modelling	Independent Market Analysis
CEFE Battery Reports	Battery Technology Trends	Cost Curve Development	Government Financing Body
Queensland Energy Markets	Historical Demand and Growth	Base Case Projections	User Provided Dataset
AEMO ISP 2024	Scenario Frameworks	Long-Term Planning	System Operator Planning
Clean Energy Council	Renewable Capacity Data	Generation Production	Industry Association

Renewable Energy Zones (REZ) Identification & Mapping

Name	ID	NEM Region	NTNDP Zone	ISP Sub-Region	Regional Cost Zones	Primary Technology	Transmission Zones	Constraint Risk	Development Status
Far North QLD	Q1	QLD	NQ	NQ	Low	Solar/Wind	North Queensland	Low	Active
North Qld Clean Energy Hub	Q2	QLD	NQ	NQ	Low	Solar/Wind/Hydro	North Queensland	Medium	Priority
Northern Qld	Q3	QLD	NQ	NQ	Low	Solar	North Queensland	Medium	Active
Isaac	Q4	QLD	NQ	CQ	Low	Solar/Wind	Central Queensland	Low	Active
Barcardine	Q5	QLD	CQ	CQ	Medium	Solar/Wind	Central Queensland	High	Priority
Fitzroy	Q6	QLD	CQ	CQ	Low	Solar	Central Queensland	Medium	Planning
Wide Bay	Q7	QLD	CQ	SQ	Low	Solar	South Queensland	Medium	Active
Darling Downs	Q8	QLD	SWQ	SQ	Low	Solar/Wind	South Queensland	Low	Active
Banana	Q9	QLD	CQ	CQ	Medium	Solar	Central Queensland	Medium	Planning

AEMO ISP Scenarios

Scenario	Description	Policy Context	Renewable Growth Rate	Curtailment Rate	Key Characteristics
1 Progressive Change	Current Trajectory with Moderate Renewable Growth	Existing Commitments with Gradual Policy Strengthening	1.0x Baseline	1.0x Baseline	Business-as-Usual Development Pace
2 Step Change	Accelerated Decarbonisation with Strong Policy Support	Strong Policy Settings and Coordinated Planning	1.5 Baseline	1.2x Baseline	Rapid but Managed Renewable Deployment
3 Green Energy Exports	Maximum Renewable Development and Large Scale Energy Exports	Aggressive Policy Support	1.8 Baseline	1.8x Baseline	Export-Driven Massive Renewable Expansion

Key Economic Assumptions

Parameter	Current Value	Source
Solar Capacity	24%	IASR Queensland Average
Wind Capacity	32%	IASR Queensland Average
Base Electricity Price	\$85/MWh	Queensland FY25 Average
Evening Price Premium	3.2x	Historical 5PM - 9PM vs 10AM - 2PM Ratio
Battery Duration	4 Hours	Standard for Intraday Arbitrage
Battery Cost (FY23)	\$400/kWh	ACIL Allen Research
Battery Cost (FY30)	\$200/kWh	Technology Learning Curve
Annual Capacity Growth	12%	AEMO ISP Assumptions
CO2 Intensity Factor	1.81 kg/kWh	Queensland Grid Emission Factor
Network Curtailment	0%	AEMO ELI - REZ Upgrades Planned
Average PUF Value	1.3	Uptime Institute

Calculation Methodologies

Curtailment Calculation

Network Curtailment = Physical Grid Constraints (Transmission Limits, System Strength)
 Economic Curtailment = Market-Driven Constraints (Negative Pricing, Dispatch Limitations)
 Total Curtailment = Network + Economic Curtailment Rates

Renewable Capacity Estimation

Base Capacity (FY23) = REZ-Specific Solar and Wind Capacity from IASR Assumptions
 Annual Growth Rate = 12% Base Growth * Scenario Multiplier (1.0x, 1.5x, 2.2x)

Generation Calculation

Site Load = IT Load * PUE Value
 Annual Energy Consumption = Site Load * Hours in Year (8760)
 Curtailed Energy = Total Generation * Curtailment Rate

Economic Valuation

Base Electricity Price = \$85/MWh (FY25 Queensland Average)
 Evening Premium = 3.2x Base Price (5PM - 9PM vs 10AM - 2PM Differential)
 Battery Storage Value = Curtailed Energy * Evening Price * 2.8x Multiplier
 Revenue Lost = Curtailed Energy * Base Price

Battery Sizing

Required Power (MW) = Curtailed Energy (GWh) * 1000 / (4 Hours * 365 Days)
 Required Energy (MWh) = Required Power * 4 Hours Duration

Energy Market Sizing – Progressive Change



Queensland Energy Demand Market Sizing											
Investment Material for QIC											
Year ended 30 June	Unit	FY22A	FY23A	FY24A	FY25E	FY26E	FY27E	FY28E	FY29E	FY30E	
Active Case Scenario		1-Jul-21	1-Jul-22	1-Jul-23	1-Jul-24	1-Jul-25	1-Jul-26	1-Jul-27	1-Jul-28	1-Jul-29	1-Jul-29
		30-Jun-22	30-Jun-23	30-Jun-24	30-Jun-25	30-Jun-26	30-Jun-27	30-Jun-28	30-Jun-29	30-Jun-30	30-Jun-30
	Progressive Change	364	364	365	364	364	364	365	364	364	364
		2022	2023	2024	2025	2026	2027	2028	2029	2030	
Executive Summary											
Queensland Data Centre Energy Demand											
Total IT Load	TWh	62.40	62.80	63.20	63.20	69.20	169.20	269.20	469.20	669.20	
Average PUE		1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	
Total Site Load	TWh	0.7346	0.7393	0.7441	0.7441	0.8071	1.8583	2.9095	5.0119	7.1143	
% of Total Energy Consumption		1.45%	1.49%	1.44%	1.45%	1.59%	3.65%	5.75%	10.01%	16.66%	
Queensland Energy Consumption											
Total Energy	TWh	50.58	49.60	51.70	51.25	50.92	50.89	50.56	50.09	42.70	
Non-Renewable Energy	TWh	45.52	42.16	41.36	38.44	35.64	33.08	30.34	27.55	21.35	
Renewable Energy	TWh	5.06	7.44	10.34	12.81	15.28	17.81	20.22	22.54	21.35	
Queensland Data Centre Energy Fuel Mix											
Non-Renewable Energy	GWh	661.13	628.42	595.24	558.04	564.99	1207.91	1745.71	2756.56	3557.16	
Renewable Energy	GWh	73.46	110.90	148.81	186.01	242.14	650.41	1,163.81	2,255.37	3,557.16	

Energy Market Sizing – Step Change



Queensland Energy Demand Market Sizing										
Investment Material for QIC										
Year ended 30 June	Unit	FY22A	FY23A	FY24A	FY25E	FY26E	FY27E	FY28E	FY29E	FY30E
Active Case Scenario		1-Jul-21	1-Jul-22	1-Jul-23	1-Jul-24	1-Jul-25	1-Jul-26	1-Jul-27	1-Jul-28	1-Jul-29
		30-Jun-22	30-Jun-23	30-Jun-24	30-Jun-25	30-Jun-26	30-Jun-27	30-Jun-28	30-Jun-29	30-Jun-30
	2 Step Change	364	364	365	364	364	364	365	364	364
		2022	2023	2024	2025	2026	2027	2028	2029	2030
Executive Summary										
Queensland Data Centre Energy Demand										
Total IT Load	TWh	62.40	62.80	63.20	63.20	69.20	169.20	269.20	469.20	669.20
Average PUE		1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Total Site Load	TWh	0.7346	0.7393	0.7441	0.7441	0.8071	1.8583	2.9095	5.0119	7.1143
% of Total Energy Consumption		1.45%	1.49%	1.44%	1.45%	1.59%	3.65%	5.75%	10.01%	16.66%
Queensland Energy Consumption										
Total Energy	TWh	50.58	49.60	51.70	51.25	50.92	50.89	50.56	50.09	42.70
Non-Renewable Energy	TWh	45.52	42.16	41.36	37.58	33.95	30.53	26.97	23.38	17.08
Renewable Energy	TWh	5.06	7.44	10.34	13.67	16.97	20.36	23.59	26.71	25.62
Queensland Data Centre Energy Fuel Mix										
Non-Renewable Energy	GWh	661.13	628.42	595.24	545.64	538.08	1114.99	1551.75	2338.90	2845.73
Renewable Energy	GWh	73.46	110.90	148.81	198.41	269.04	743.33	1,357.78	2,673.03	4,268.59

Energy Market Sizing – Green Energy Exports



Queensland Energy Demand Market Sizing											
Investment Material for QIC											
Year ended 30 June	Unit	FY22A	FY23A	FY24A	FY25E	FY26E	FY27E	FY28E	FY29E	FY30E	
Active Case Scenario	Green Energy Exports	1-Jul-21	1-Jul-22	1-Jul-23	1-Jul-24	1-Jul-25	1-Jul-26	1-Jul-27	1-Jul-28	1-Jul-29	1-Jul-29
		30-Jun-22	30-Jun-23	30-Jun-24	30-Jun-25	30-Jun-26	30-Jun-27	30-Jun-28	30-Jun-29	30-Jun-30	30-Jun-30
		2022	2023	2024	2025	2026	2027	2028	2029	2030	
Executive Summary											
Queensland Data Centre Energy Demand											
Total IT Load	TWh	62.40	62.80	63.20	63.20	69.20	169.20	269.20	469.20	669.20	
Average PUE		1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	
Total Site Load	TWh	0.7346	0.7393	0.7441	0.7441	0.8071	1.8583	2.9095	5.0119	7.1143	
% of Total Energy Consumption		1.45%	1.49%	1.44%	1.45%	1.59%	3.65%	5.75%	10.01%	16.66%	
Queensland Energy Consumption											
Total Energy	TWh	50.58	49.60	51.70	51.25	50.92	50.89	50.56	50.09	42.70	
Non-Renewable Energy	TWh	45.52	42.16	41.36	36.73	32.25	27.99	23.59	19.20	12.81	
Renewable Energy	TWh	5.06	7.44	10.34	14.52	18.67	22.90	26.97	30.89	29.89	
Queensland Data Centre Energy Fuel Mix											
Non-Renewable Energy	GWh	661.13	628.42	595.24	533.24	511.18	1022.08	1357.78	1921.24	2134.30	
Renewable Energy	GWh	73.46	110.90	148.81	210.81	295.95	836.25	1,551.75	3,090.69	4,980.03	

Energy Market Sizing – Data Centre Energy Demand (Pt.1)



Queensland Energy Demand Market Sizing										
Investment Material for QIC										
Year ended 30 June	Unit	FY22A	FY23A	FY24A	FY25E	FY26E	FY27E	FY28E	FY29E	FY30E
Active Case Scenario	1 Progressive Change	1-Jul-21	1-Jul-22	1-Jul-23	1-Jul-24	1-Jul-25	1-Jul-26	1-Jul-27	1-Jul-28	1-Jul-29
		30-Jun-22	30-Jun-23	30-Jun-24	30-Jun-25	30-Jun-26	30-Jun-27	30-Jun-28	30-Jun-29	30-Jun-30
		2022	2023	2024	2025	2026	2027	2028	2029	2030
Data Centre Energy Demand										
Total IT Load	<i>MW</i>	62.4	62.8	63.2	63.2	69.2	169.2	269.2	469.2	669.2
NextDC B1	<i>(Operational)</i>	2.25	2.25	2.25	2.25	2.25	2.25	2.25	2.25	2.25
NextDC B2	<i>(Operational)</i>	12	12	12	12	12	12	12	12	12
NextDC SC1	<i>(Operational)</i>	0.2	0.6	1	1	1	1	1	1	1
Equinix BR1	<i>(Operational)</i>	15	15	15	15	15	15	15	15	15
Polaris Data Centre	<i>(Operational)</i>	20	20	20	20	20	20	20	20	20
Fujitsu Eight Miles Plains Data Cent	<i>(Operational)</i>	2	2	2	2	2	2	2	2	2
iSeek Brisbane Airport Data Centre	<i>(Operational)</i>	6	6	6	6	6	6	6	6	6
iSeek Townsville Data Centre	<i>(Operational)</i>	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Pulse DC	<i>(Operational)</i>	2	2	2	2	2	2	2	2	2
Edge Centres EC11	<i>(Operational)</i>	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Edge Centres EC20	<i>(Operational)</i>	1	1	1	1	1	1	1	1	1
Quinbrook SuperNode	<i>(Planned)</i>	0	0	0	0	0	100	200	400	600
NextDC SC2	<i>(Planned)</i>	0	0	0	0	6	6	6	6	6
Average PUE		1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
NextDC B1	<i>(Operational)</i>	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61
NextDC B2	<i>(Operational)</i>	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34
NextDC SC1	<i>(Operational)</i>	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
Equinix BR1	<i>(Operational)</i>	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39
Polaris Data Centre	<i>(Operational)</i>	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Fujitsu Eight Miles Plains Data Cent	<i>(Operational)</i>	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
iSeek Brisbane Airport Data Centre	<i>(Operational)</i>	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
iSeek Townsville Data Centre	<i>(Operational)</i>	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Pulse DC	<i>(Operational)</i>	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Edge Centres EC11	<i>(Operational)</i>	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Edge Centres EC20	<i>(Operational)</i>	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Quinbrook SuperNode	<i>(Planned)</i>	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
NextDC SC2	<i>(Planned)</i>	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2

Energy Market Sizing – Data Centre Energy Demand (Pt.2)



Queensland Energy Demand Market Sizing											
Investment Material for QIC											
Year ended 30 June	Unit	FY22A	FY23A	FY24A	FY25E	FY26E	FY27E	FY28E	FY29E	FY30E	
Active Case Scenario	1 Progressive Change	1-Jul-21	1-Jul-22	1-Jul-23	1-Jul-24	1-Jul-25	1-Jul-26	1-Jul-27	1-Jul-28	1-Jul-29	
		30-Jun-22	30-Jun-23	30-Jun-24	30-Jun-25	30-Jun-26	30-Jun-27	30-Jun-28	30-Jun-29	30-Jun-30	
		2022	2023	2024	2025	2026	2027	2028	2029	2030	
Total Site Load		83.86	84.40	84.94	84.94	92.14	212.14	332.14	572.14	812.14	
NextDC B1	(Operational)	3.62	3.62	3.62	3.62	3.62	3.62	3.62	3.62	3.62	
NextDC B2	(Operational)	16.08	16.08	16.08	16.08	16.08	16.08	16.08	16.08	16.08	
NextDC SC1	(Operational)	0.27	0.81	1.35	1.35	1.35	1.35	1.35	1.35	1.35	
Equinix BR1	(Operational)	20.85	20.85	20.85	20.85	20.85	20.85	20.85	20.85	20.85	
Polaris Data Centre	(Operational)	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00	
Fujitsu Eight Miles Plains Data Cent	(Operational)	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	
iSeek Brisbane Airport Data Centre	(Operational)	7.80	7.80	7.80	7.80	7.80	7.80	7.80	7.80	7.80	
iSeek Townsville Data Centre	(Operational)	1.56	1.56	1.56	1.56	1.56	1.56	1.56	1.56	1.56	
Pulse DC	(Operational)	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	
Edge Centres EC11	(Operational)	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	
Edge Centres EC20	(Operational)	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	
Quinbrook SuperNode	(Planned)	0.00	0.00	0.00	0.00	0.00	120.00	240.00	480.00	720.00	
NextDC SC2	(Planned)	0.00	0.00	0.00	0.00	7.20	7.20	7.20	7.20	7.20	
Energy Consumption	<i>MWh</i>	734591.70	739322.10	744052.50	744052.50	807124.50	1858324.50	2909524.50	5011924.50	7114324.50	
	<i>GWh</i>	734.59	739.32	744.05	744.05	807.12	1858.32	2909.52	5011.92	7114.32	
	<i>TWh</i>	0.73	0.74	0.74	0.74	0.81	1.86	2.91	5.01	7.11	
Energy Price	<i>\$/MWh</i>	162.06	147.97	87.80	109.54	81.90	117.85	109.01	101.22	103.91	
Annual Spend	<i>\$M</i>	119.05	109.40	65.33	81.50	66.10	219.01	317.18	507.31	739.22	

Energy Market Sizing – Queensland Energy Consumption



Queensland Energy Demand Market Sizing											
Investment Material for QIC											
Year ended 30 June	Unit	FY22A	FY23A	FY24A	FY25E	FY26E	FY27E	FY28E	FY29E	FY30E	
		1-Jul-21	1-Jul-22	1-Jul-23	1-Jul-24	1-Jul-25	1-Jul-26	1-Jul-27	1-Jul-28	1-Jul-29	1-Jul-29
Active Case Scenario	1	30-Jun-22	30-Jun-23	30-Jun-24	30-Jun-25	30-Jun-26	30-Jun-27	30-Jun-28	30-Jun-29	30-Jun-30	30-Jun-30
	Progressive Change	364	364	365	364	364	364	365	364	364	364
		2022	2023	2024	2025	2026	2027	2028	2029	2030	
Queensland Energy Consumption											
Progressive Change											
Total Energy	TWh	50.58	49.60	51.70	51.25	50.92	50.89	50.56	50.09	42.70	
Non-Renewable Energy		45.52	42.16	41.36	38.44	35.64	33.08	30.34	27.55	21.35	
% of Total		90%	85%	80%	75%	70%	65%	60%	55%	50%	
Renewable Energy		5.06	7.44	10.34	12.81	15.28	17.81	20.22	22.54	21.35	
% of Total		10%	15%	20%	25%	30%	35%	40%	45%	50%	
Step Change											
Total Energy	TWh	50.58	49.60	51.70	51.25	50.92	50.89	50.56	50.09	42.70	
Non-Renewable Energy		45.52	42.16	41.36	37.58	33.95	30.53	26.97	23.38	17.08	
% of Total		90%	85%	80%	73%	67%	60%	53%	47%	40%	
Renewable Energy		5.06	7.44	10.34	13.67	16.97	20.36	23.59	26.71	25.62	
% of Total		10%	15%	20%	27%	33%	40%	47%	53%	60%	
Green Energy Exports											
Total Energy	TWh	50.58	49.60	51.70	51.25	50.92	50.89	50.56	50.09	42.70	
Non-Renewable Energy		45.52	42.16	41.36	36.73	32.25	27.99	23.59	19.20	12.81	
% of Total		90%	85%	80%	72%	63%	55%	47%	38%	30%	
Renewable Energy		5.06	7.44	10.34	14.52	18.67	22.90	26.97	30.89	29.89	
% of Total		10%	15%	20%	28%	37%	45%	53%	62%	70%	

Portfolio Modelling Executive Summary



QIC QUEENSLAND RENEWABLE ENERGY PORTFOLIO BOTTOM-UP FINANCIAL MODEL - INVESTMENT COMPETITION

PORTFOLIO OVERVIEW

Company	Sector	Technology Focus	Investment (AUD M)	% of Portfolio	Stage	Risk Profile	Expected IRR	Key Driver
Sunshine Hydro	Renewable Energy	Pumped Hydro + Hydrogen	25	15%	Series A	HIGH	35%	Bottom-up DCF model
REP	Renewable Energy	Solar Development	25	15%	Scale Up/Growth	LOW	27%	Bottom-up DCF model
Critical Minerals Group	Batteries & Storage	Vanadium Batteries	20	12%	Scale Up	HEDGE	24%	Bottom-up DCF model
Relectrify	Batteries & Storage	Battery Management Systems	40	24%	Series B	LOW	17%	Bottom-up DCF model
RedEarth Energy	Grid Technology	BESS Systems	35	21%	Scale Up/IPO	LOW	25%	Bottom-up DCF model
Virtual Watt	Grid Technology	VPP Technology	25	15%	Seed	HIGH	38%	Bottom-up DCF model
TOTAL PORTFOLIO			170	100%			26.70%	

SECTOR ALLOCATION

Renewable Energy	50	29%
Batteries & Storage	60	35%
Grid Technology	60	35%
High Risk	50	29%
Low Risk	100	59%
Hedge	20	12%
Start Up	50	29%
Scale	120	71%

Portfolio Modelling Assumptions & Methodology



MARKET ASSUMPTIONS & KEY INPUTS				
<i>All assumptions based on AEMO, Queensland Government, and industry reports</i>				
SECTION	PARAMETER	VALUE	UNIT	SOURCE/JUSTIFICATION
Market Pricing				
	Electricity Price 2025	81.9	AUD/MWh	AEMO Queensland average spot price 2024
	Electricity Price Growth	3.50%	%	Queensland Energy Plan 2024-2030
	Capacity Factor (Hydro)	85%	%	CMES Energy Futures Report
	Round Trip Efficiency (Hydro)	81%	%	ARENA Report
	Capacity Factor (Wind)	20%	%	CMES Energy Futures Report
	Green Hydrogen Price 2025	18.7	AUD/kg	ARENA Cost Assessment of Hydrogen Production
	Green Hydrogen Price 2030	9.1	AUD/kg	ARENA Cost Assessment of Hydrogen Production
	Vanadium Price	35	AUD/kg	Vanadium market reports Q1 2024
	Battery Storage Price	350	AUD/kWh	BNEF Battery Price Survey 2024
Financial				
	Risk-Free Rate	4.31%	%	RBA 10-year bond yield (Bloomberg)
	Market Risk Premium	7%	%	Australian equity market historical premium
	WACC (High Risk)	12%	%	Early-stage renewable energy ventures
	WACC (Low Risk)	8%	%	Established renewable developers
	WACC (Hedge/Medium)	10%	%	Mixed risk profile investments
	Corporate Tax Rate	30%	%	Australian corporate tax rate
	Depreciation Rate	10%	%	Standard for energy infrastructure
Market Growth				
	Renewable Capacity Growth	15%	%/year	Queensland Renewable Energy Target
	Battery Market Growth	25%	%/year	BNEF Energy Storage Outlook
	VPP Market Growth	35%	%/year	AEMO Virtual Power Plant Demonstrations
	Hydrogen Demand Growth	40%	%/year	National Hydrogen Strategy
Operational				
	Operation & Maintenance (O&M) Wind	233299	AUD/MW	AEMO Report
	O&M (Hydro)	80000	AUD/MW	AEMO Report (Fixed and variable included together)
	O&M (Hydrogen)	2.04	AUD/kg H2	AEMO Report
	O&M (Solar)	25000	AUD/MW	
	Capacity Utilization	90%	%	Operational efficiency target
	Grid Connection Cost	2	AUD M/MW	AEMO connection cost estimates
	Development Timeline	3	years	Typical renewable project development

Sunshine Hydro Model Assumptions



SUNSHINE HYDRO - SUPERHYBRID PUMPED HYDRO + HYDROGEN

BOTTOM-UP UNIT ECONOMICS MODEL

INVESTMENT SUMMARY

QIC Investment	25 AUD Million	Source: Portfolio allocation
Technology	Superhybrid Pumped Hydro Storage + Green Hydrogen Production	

UNIT ECONOMICS FOUNDATION

	Value	Unit	Calculation/Source
PHYSICAL INFRASTRUCTURE			
Investment Allocation	25	AUD	
Pumped Hydro Capacity	600	MW	Djandori Gung-i Superhybrid Capacity
Hydrogen Production	65	tonnes/day	Sunshine Hydro Report
Wind Production Capacity	1800	MW	Djandori Gung-i Superhybrid Capacity

OPERATIONAL PARAMETERS

Hydro Capacity Factor	85%	ratio	Linked to assumptions
Round-Trip Efficiency	75%	ratio	ARENA Report
Wind Production Factor	20%	ratio	CMES Energy Futures Report

UNIT PRODUCTION CALCULATIONS

Annual Pumped Hydro Generation	3350.70	GWh/year	Capacity × CF × Round Trip Efficiency x hours per year
Annual Hydrogen Production	23725	tonnes H2/year	Production x No. Days
Annual Wind Generation	3153.6	GWh/year	Wind Capacity x Production Factor x Hours

REVENUE STREAMS (Bottom-up)

Electricity Price 2025	81.9	AUD/MWh	Linked to assumptions
Price Growth Rate	3.50%	ratio	Linked to assumptions
Hydrogen Price 2025	18.7	AUD/kg	Linked to assumptions
Hydrogen Price 2030	9.1	AUD/kg	Linked to assumptions

UNIT COSTS

O&M Costs (Wind)	233299	AUD/MW	Linked to assumptions
O&M Costs (Hydro)	80000	AUD/MW	Linked to assumptions
O&M Costs (Hydrogen)	2.04	AUD/kg H2	Linked to assumptions

ASSUMPTIONS

Corporate Tax Rate	30%		Linked to assumptions
--------------------	-----	--	-----------------------

Sunshine Hydro Model



FINANCIAL PROJECTIONS (AUD Millions)											
	0	1	2	3	4	5	6	7	8	9	10
	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Electricity Price (AUD)	81.9	85	88	91	94	97	101	104	108	112	116
Wind Revenue				143	237	307	317	329	340	352	364
Wind Capacity (MW)				900	1440	1800	1800	1800	1800	1800	1800
Annual Wind Generation (GWh/year)				1576.8	2522.88	3153.6	3153.6	3153.6	3153.6	3153.6	3153.6
Hydro Revenue				152	252	326	337	349	361	374	387
Pumped Hydro (MW)				300	480	600	600	600	600	600	600
Annual Pumped Hydro (GWh/year)				1675	2681	3351	3351	3351	3351	3351	3351
Hydrogen Revenue				154	209	216	216	216	216	216	216
Hydrogen Production (tonnes/day)				33	52	65	65	65	65	65	65
Annual Hydrogren Production (tonnes)				11863	18980	23725	23725	23725	23725	23725	23725
Hydrogen Price (AUD/kg)	18.7	16.8	14.9	12.9	11.0	9.1	9.1	9.1	9.1	9.1	9.1
Total Revenue				449	698	849	871	894	917	942	967
Operating Costs				416	666	832	832	832	832	832	832
Wind O&M				368	589	736	736	736	736	736	736
Pumped Hydro O&M				24	38	48	48	48	48	48	48
Hydrogen O&M				24	39	48	48	48	48	48	48
EBITDA	0	0	0	33	32	16	39	62	85	110	135
(-) Depreciation				3,125	3,125	3,125	3,125	3,125	3,125	3,125	3,125
EBIT	0	0	0	30	29	13	35	58	82	107	132
(-) Tax				9	9	4	11	18	25	32	40
NOPAT	0	0	0	21	21	9	25	41	57	75	92
(+) Depreciation				3,125	3,125	3,125	3,125	3,125	3,125	3,125	3,125
FCF	0	0	0	24	24	12	28	44	61	78	96
Cumulative CF	0	0	0	24	48	60	88	132	193	270	366
Project Cash Flows	-45	0	0	24	24	12	28	44	61	78	96
PROJECT IRR	35%										

Justification

Commissioned 2028, 0.5, 0.8 then full capacity

Commissioned 2028, 0.5, 0.8 then full capacity

Commissioned 2028, 0.5, 0.8 then full capacity

Renewable Energy Partners Model Assumptions



RENEWABLE ENERGY PARTNERS (REP) - SOLAR DEVELOPMENT

BOTTOM-UP UNIT ECONOMICS MODEL - SOLAR PROJECT DEVELOPMENT

INVESTMENT SUMMARY

QIC Investment 25 AUD Million Source: Portfolio allocation
BUSINESS MODEL Solar Farm Development → Construction → Operation (Build-Own -Operate Model)

SOLAR DEVELOPMENT - UNIT ECONOMICS

	Value	Unit	Calculation/Source
--	-------	------	--------------------

SOLAR PERFORMANCE

Capacity Factor	20%	ratio	ARENA Report
-----------------	-----	-------	--------------

WIND PERFORMANCE

Wind Production Factor	20%		CMES Energy Futures Report
------------------------	-----	--	----------------------------

HYDRO PERFORMANCE

Capacity Factor	85%	ratio	Linked to assumptions
Round Trip Efficiency	81%	ratio	ARENA Report

DEVELOPMENT COSTS (Bottom-up)

Development Fee	89701	AU\$/MW	Windlab Case Study (ASX Release)
-----------------	-------	---------	----------------------------------

REVENUE MODEL

PPA Price	60	AUD/MWh	PwC PPA Report
PPA Coverage	80%	ratio	
Merchant Coverage	20%	ratio	
LGC Price	22	AUD/MWh	Clean Energy Regulator Report
Electricity Price 2025	81.9	AUD/MWh	See Assumptions
Price Growth Rate	3.5%	%	See Assumptions

OPERATIONS & MAINTENANCE

O&M Costs (Wind)	177233	AUD/MW	Linked to Assumptions
O&M Costs (Hydro)	80000	AUD/MW	Linked to Assumptions
O&M Costs (Solar)	25000	AUD/MW	Linked to Assumptions

ASSUMPTIONS

Corporate Tax Rate	30%	%	See Assumptions
--------------------	-----	---	-----------------

Projects	Construction	Commercial Ops	Capacity
Warrego Solar Far	2028	2029	180MW
Karma Wind Farm	2026	2029	600MW
Proserpine Wind Fa	2026	2029	900MW
Wandoan Wind Far	2026	2029	500MW
Capricornia Energy	2032	2035	750MW
Wambo Wind Farm	2023	2025	506MW
Hopeland Solar Far	2025	2027	250MW
Milli Wind Farm			400MW
Yuleba Wind Farm			300MW

Renewable Energy Partners Model



RENEWABLE ENERGY PARTNERS FINANCIAL MODEL (AUD Millions)											
	0	1	2	3	4	5	6	7	8	9	10
	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Revenue From Projects	38	77	97	117	287	392	464	467	471	475	690
Operational Capacity Factor	0.5	1	0.5	1	0.5	0.8	1				
Solar Projects Capacity (MW)	0	0	125	250	340	394	430	430	430	430	430
Warrego Solar Farm & Battery					90	144	180	180	180	180	180
Hopeland Solar Farm			125	250	250	250	250	250	250	250	250
Solar Annual Generation (MWh/year)	0	0	219000	438000	595680	690288	753360	753360	753360	753360	753360
Wind Projects Capacity (MW)	253	506	506	506	1506	2106	2506	2506	2506	2506	2506
Karma Wind Farm					300	480	600	600	600	600	600
Prosperpine Wind Farm					450	720	900	900	900	900	900
Wandoan Wind Farm					250	400	500	500	500	500	500
Wambo Wind Farm	253	506	506	506	506	506	506	506	506	506	506
Wind Annual Generation (MWh)	443256	886512	886512	886512	2638512	3689712	4390512	4390512	4390512	4390512	4390512
Other Projects Capacity (MW)											375
Capricornia Energy Hub											375
Other Annual Generation (MWh)	0	0	0	0	0	0	0	0	0	0	2261723
Total Annual Generation (MWh)	443256	886512	1105512	1324512	3234192	4380000	5143872	5143872	5143872	5143872	7405595
PPA Revenue Breakdown											
Contracted Annual Generation (MWh)	354605	709210	884410	1059610	2587354	3504000	4115098	4115098	4115098	4115098	5924476
PPA Revenue	21	43	53	64	155	210	247	247	247	247	355
Merchant Revenue Breakdown											
Annual Generation for Merchants (MWh)	88651	177302	221102	264902	646838	876000	1028774	1028774	1028774	1028774	1481119
Electricity Price	81.9	85	88	91	94	97	101	104	108	112	116
Merchant Revenue	7	15	19	24	61	85	104	107	111	115	171
LGC Revenue	10	20	24	29	71	96	113	113	113	113	163
Total Revenue	38	77	97	117	287	392	464	467	471	475	690
Solar O&M	0	0	3.125	6.25	8.5	9.85	10.75	10.75	10.75	10.75	10.75
Wind O&M	45	90	90	90	267	373	444	444	444	444	444
Hydro O&M	0	0	0	0	0	0	0	0	0	0	30
Total O&M Costs	45	90	93	96	275	383	455	455	455	455	485
EBITDA	-7	-13	4	21	12	9	9	12	16	20	205
(-) Depreciation	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
EBIT	-9	-15	1	18	9	6	6	10	14	18	202
(-) Tax	-3	-5	0	6	3	2	2	3	4	5	61
NOPAT	-6	-11	1	13	6	4	4	7	10	12	141
(+) Depreciation	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
FCF	-4	-8	4	15	9	7	7	9	12	15	144
Cumulative CF	-4	-12	-8	7	16	23	30	39	51	66	210
Project Cash Flows	-29	-8	4	15	9	7	7	9	12	15	144
PROJECT IRR	27%										

CMG Model Assumptions



CRITICAL MINERALS GROUP LIMITED (CMG) - INVESTMENT SUMMARY

BOTTOM-UP UNIT ECONOMICS MODEL - VANADIUM BATTERY SOLUTIONS

INVESTMENT SUMMARY

QIC Investment 25 AUD Million Source: Portfolio allocation

BUSINESS MODEL Mining → V2O5 → Electrolyte → VRFB Manufacturing

SOLAR DEVELOPMENT - UNIT ECONOMICS

	Value	Unit	Calculation/Source
ASSUMPTIONS			
Corporate Tax Rate	30%	%	See Assumptions
Working Capital	17%	of revenue	NYU Stern
Vanadium Price	7	\$/L	CMG Report
Revenue per MWh	1	A\$/MWh	CMG Report
Maximum production (tonnes)	8500	tonnes	CMG Report
Price V2O5 (2025 A\$/kg)	31		CMG Report
Annual price growth	2%		Inflation Targets
EPC Costs as % of revenue	70%		CMG Report

CMG Model



CRITICAL MINERALS GROUP (AUD Millions)											
	0	1	2	3	4	5	6	7	8	9	10
	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Vanadium											
Vanadium Revenue Production	0	1	1	1	5	5	5	6	8	9	10
Vanadium Revenue	0	7	7	7	35	35	35	44	53	61	70
BESS											
Projects	0	2	3	5	7	10	14	18	24	30	36
Avg Project Size (MWh)	0	1	3	5	7	9	12	14	16	18	20
Total Capacity (MWh)	0	2	9	26	51	94	162	246	379	537	720
BESS Revenue	0	2	9	26	51	94	162	246	379	537	720
Mining											
Capacity Utilisation	0%	0%	0%	0%	25%	50%	80%	100%	100%	100%	100%
Production Tonnes	0	0	0	0	2125	4250	6800	8500	8500	8500	8500
Price (A\$/kg)	31	32	32	33	34	34	35	36	36	37	38
Mining Revenue	0	0	0	0	71	145	237	303	309	315	321
Total Revenue	0	9	16	33	158	275	434	592	740	913	1111
Mining Expenses											
Fixed Costs (A\$M)	8	12	15	18	20	25	30	30	30	30	30
Variable Costs (A\$/kg)	15	15	15	15	15	16	16	16	17	17	17
Total Variable Costs	0	0	0	0	33	66	108	138	141	144	146
Total Mining Expenses	8	12	15	18	53	91	138	168	171	174	176
Vanadium Expenses											
Fixed Costs (A\$M)	2	3	3	4	4	5	5	6	6	7	7
Variable Costs (A\$/kg)	16.0	16	17	17	17	18	18	18	19	19	20
Total Variable Costs	0	16	17	17	87	88	90	115	141	167	195
Total Vanadium Expenses	2	19	20	20	91	93	95	120	147	174	202
BESS Expenses											
EPC Costs (A\$M)	0	1	7	18	36	66	113	172	265	376	504
Total BESS Expenses	0	1	7	18	36	66	113	172	265	376	504
Total Opex	10	32	41	57	179	250	347	461	582	723	882
EBITDA	-10	-23	-25	-24	-21	25	88	132	157	190	229
(-) Depreciation	3	3	3	3	3	3	3	3	3	3	3
EBIT	-13	-26	-27	-26	-24	22	85	129	155	187	226
(-) Tax	4	8	8	8	7	7	26	39	46	56	68
NOPAT	-9	-18	-19	-18	-17	16	60	91	108	131	158
(+) Depreciation	3	3	3	3	3	3	3	3	3	3	3
(-) Capex	7			50							
FCF	-13	-16	-17	-66	-14	18	62	93	111	134	161
Cumulative CF	-13	-28	-45	-111	-125	-107	-45	48	159	293	454
Project Cash Flows	-38	-16	-17	-66	-14	18	62	93	111	134	161
Project IRR	24%										

Reelectrify Model Assumptions



RELECTRIFY - ENERGY MANAGEMENT + BATTERY DEVELOPMENT

BOTTOM-UP UNIT ECONOMICS MODEL - BATTERY DEVELOPMENT -> HARDWARE & COMPLETE SYSTEM SALES

INVESTMENT SUMMARY

QIC INVESTMENT 40 AUD Million Source: Portfolio allocation
BUSINESS MODEL Revenue: Hardware (BMS + Inverter Tech) & Complete System Sales

ENERGY RETAIL - CUSTOMER ACQUISITION

	Value	Unit	Calculation/Source
CUSTOMER BASE SIZING			
Electricity companies	5	MWh	Reelectrify Test Report
Battery growth (5 year)	25%		Ibisworld
Battery growth (5-10 year)	15%		National Energy Market

RETAIL PRICING & MARGINS

Hardware Price	55	USD/kWh	ARENA Report (Reelectrify)
Integrated Systems Price	160	USD/kWh	ARENA Report (Reelectrify)
Conversion Rate USD:AUD	1.54	ratio	
Average No. Integrated Units (2025)	10		Reelectrify Test Report
Average No. Hardware Only (2025)	20		Reelectrify Test Report
Integrated Unit Growth (1-3y)	100%	%	Market Average (Tesla Battery, Enphase)
Hardware Only Growth (1-3y)	200%	%	Market Average (Tesla Battery, Enphase)
Integrated Unit Growth (4-6y)	70%	%	Market Average (Tesla Battery, Enphase)
Hardware Only Growth (4-6y)	100%	%	Market Average (Tesla Battery, Enphase)
Growth rate (6-10 year)	30%	%	

REVENUE STREAMS

Electricity Price (2025)	81.9	AUD/MWh	Linked to assumptions
Electricity Price Growth	3.50%	%	Linked to assumptions
GP margin	48.35%	%	Using Enphase as a proxy
SG&A as % of revenue	9.90%		Fluence Energy as proxy

ASSUMPTIONS

Corporate Tax Rate	30.00%	%	Linked to assumptions
--------------------	--------	---	-----------------------

Reelectrify Model



INTEGRATED FINANCIAL MODEL (AUD Millions)

	0	1	2	3	4	5	6	7	8	9	10
	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Average No. Integrated Units	10	20	40	80	136	231	393	511	664	864	1123
Average No. Hardware Units	20	60	180	540	1080	2160	4320	5616	7301	9491	12338
Companies Capacity (MW)	20	25	31	39	49	61	70	81	93	107	123
Total Revenue	0.08	0.25	0.78	2.56	6.10	14.64	32.48	48.56	72.59	108.53	162.25
Revenue Integrated Units	0.05	0.12	0.31	0.77	1.64	3.48	6.80	10.16	15.19	22.71	33.96
Revenue Hardware Units	0.03	0.13	0.48	1.79	4.47	11.17	25.68	38.40	57.40	85.82	128.30
Gross Profit	0.04	0.12	0.38	1.24	2.95	7.08	15.70	23.48	35.10	52.47	78.45
SG&A	0.01	0.02	0.08	0.25	0.60	1.45	3.22	4.81	7.19	10.74	16.06
EBITDA	0.03	0.10	0.30	0.98	2.35	5.63	12.49	18.67	27.91	41.73	62.39
(-) Depreciation	4	4	4	4	4	4	4	4	4	4	4
EBIT	-3.97	-3.90	-3.70	-3.02	-1.65	1.63	8.49	14.67	23.91	37.73	58.39
(-) Tax	-1.19	-1.17	-1.11	-0.91	-0.50	0.49	2.55	4.40	7.17	11.32	17.52
NOPAT	-2.78	-2.73	-2.59	-2.11	-1.16	1.14	5.94	10.27	16.74	26.41	40.87
(+) Depreciation	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
FCF	1.22	1.27	1.41	1.89	2.84	5.14	9.94	14.27	20.74	30.41	44.87
Cumulative CF	1.22	2.49	3.90	5.79	8.63	13.77	23.72	37.98	58.72	89.13	134.00
Project Cash Flows	-38.78	1.27	1.41	1.89	2.84	5.14	9.94	14.27	20.74	30.41	44.87
PROJECT IRR	17%										

Virtual Watt Model Assumptions



VIRTUAL WATT - INVESTMENT SUMMARY

BOTTOM-UP UNIT ECONOMICS MODEL - VPP AGGREGATOR

INVESTMENT SUMMARY

QIC Investment 25 AUD Million Source: Portfolio allocation

BUSINESS MODEL Subscriptions → IoT/API Integration → VPP Aggregation → Energy Market Trading

VIRTUAL WATT - UNIT ECONOMICS

	Value	Unit	Calculation/Source	
ASSUMPTIONS				
VW Standard	8	kW	Virtual Watt	
VW Boost	12.5	kW	Virtual Watt	
VW Energetic	17	kW	Virtual Watt	
Customer Churn	10%	%	AngelList	
Corporate Tax Rate	30%	%	Linked to assumptions	
Energy Arbitrage Revenue	85	AUD/MWh		Customer Split
VW Standard (AUD)	79	AUD/monthly	Virtual Watt	65%
VW Boost (AUD)	99	AUD/monthly	Virtual Watt	25%
VW Energetic (AUD)	129	AUD/monthly	Virtual Watt	10%
Fixed O&M Costs	15	M	Invinity Energy Systems	

Virtual Watt Model



VIRTUAL WATT (AUD Millions)											
	0	1	2	3	4	5	6	7	8	9	10
	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
New Customers	2,000	5,000	8,000	11,000	13,000	15,000	17,000	19,000	20,000	21,000	22,000
growth (%)	-	150%	60%	38%	18%	15%	13%	12%	5%	5%	5%
Cumulative Customers	2,000	7000	15000	26000	39000	54000	71000	90000	110000	131000	153000
Customer Churn	-	6300	13500	23400	35100	48600	63900	81000	99000	117900	137700
Revenue Build											
VW Standard 8kW											
No. Customers	1300	4095	8775	15210	22815	31590	41535	52650	64350	76635	89505
Average MW	10	33	70	122	183	253	332	421	515	613	716
Price	79	79	79	79	79	79	79	79	79	79	79
Standard Revenue	1	4	8	14	22	30	39	50	61	73	85
VW Boost 12.5 kW											
No. Customers	500	1575	3375	5850	8775	12150	15975	20250	24750	29475	34425
Average MW	6	20	42	73	110	152	200	253	309	368	430
Price	99	99	99	99	99	99	99	99	99	99	99
Boost Revenue	1	2	4	7	10	14	19	24	29	35	41
VW Energetic 17kW											
No. Customers	200	630	1350	2340	3510	4860	6390	8100	9900	11790	13770
Average MW	3	11	23	40	60	83	109	138	168	200	234
Price	129	129	129	129	129	129	129	129	129	129	129
Energetic Revenue	0	1	2	4	5	8	10	13	15	18	21
Total Average MW	175,638	553,260	1,185,557	2,054,965	3,082,447	4,268,003	5,611,634	7,113,339	8,694,081	10,353,860	12,092,676
Total Revenue	2	7	14	25	37	52	68	87	106	126	147
(-) O&M Costs	15	15	15	15	15	15	15	15	15	15	15
EBITDA	-13	-8	-1	10	22	37	53	72	91	111	132
(-) Depreciation	3	3	3	3	3	3	3	3	3	3	3
EBIT	-15	-11	-3	7	20	34	51	69	88	108	130
(-) Tax	5	3	1	2	6	10	15	21	26	33	39
NOPAT	-11	-8	-2	5	14	24	36	48	62	76	91
(+) Depreciation	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
FCF	-8	-5	0	8	16	27	38	51	64	78	93
Cumulative CF	-8	-13	-13	-5	11	38	76	127	191	269	363
Project Cashflows	-33	-5	0	8	16	27	38	51	64	78	93
IRR	38%										

RedEarth Energy Model Assumption



REDEARTH ENERGY - BESS SYSTEMS MANUFACTURING

BOTTOM-UP UNIT ECONOMICS MODEL - BATTERY STORAGE SYSTEMS

INVESTMENT SUMMARY

QIC Investment 35 AUD Million Source: Portfolio allocation

BUSINESS MODEL BESS Manufacturing → System Integration → Installation Services

BATTERY DEVELOPMENT - UNIT ECONOMICS

	Value	Unit	Calculation/Source
--	-------	------	--------------------

SALES ASSUMPTIONS

	Value	Unit	Calculation/Source
Residential			
RedEarth Troppo 4.1 kWh	50%		
RedEarth BlackMax 4.1 kWh	25%		
RedEarth Gecko	15%		
RedEarth BushChook 3 phase 16.4 kWh	5%		
Commercial			
Dingo 29.9 61.4kWh	4%		
PowerOasis 100kva (1250 kWh)	1%		

BESS ASSUMPTIONS

BESS CAGR 2025-2034	12.50%	Exactitude Consultancy
BESS CAGR 2025-2030	21%	BloombergNEF

FINANCIAL ASSUMPTIONS

2023 Revenue	20M	AFR
Gross Profit Margin	29%	CATL Energy Storage as proxy
SG&A as percent of revenue	15%	Tesla Energy & Storage as proxy
Corporate Tax Rate	30%	Linked to assumptions

CURRENT REDEARTH PRODUCTS

Products	Price (AUD)
Residential	
RedEarth Troppo 4.1 kWh	3490
RedEarth BlackMax 4.1 kWh	11099
RedEarth Gecko	22890
RedEarth BushChook 3 phase 16.4 kWh	14680
Commercial	
Dingo 29.9 61.4kWh	77439
PowerOasis 100kva (1250 kWh)	996877

RedEarth Energy Model



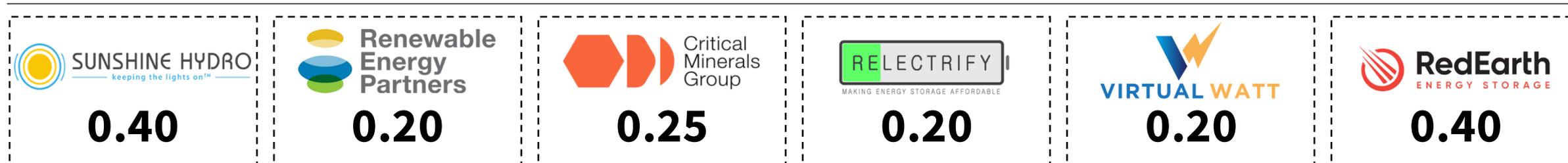
REDEARTH ENERGY FINANCIAL MODEL (AUD Millions)

	0	1	2	3	4	5	6	7	8	9	10		
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Total Revenue	20	29	35	42	51	62	74	90	107	126	146	167	188
<i>growth (%)</i>	<i>66%</i>	<i>44%</i>	<i>21%</i>	<i>21%</i>	<i>21%</i>	<i>21%</i>	<i>21%</i>	<i>21%</i>	<i>19%</i>	<i>18%</i>	<i>16%</i>	<i>14%</i>	<i>13%</i>
Gross Profit			10	12	15	18	21	26	31	36	42	48	54
(-) SG&A			5	6	8	9	11	14	16	19	22	25	28
EBITDA			5	6	7	9	10	12	15	18	20	23	26
(-) D&A		▲	3.5 ▲	3.5 ▲	3.5 ▲	3.5 ▲	3.5 ▲	3.5 ▲	3.5 ▲	3.5 ▲	3.5 ▲	3.5 ▲	3.5
EBIT			1	2	4	5	7	9	11	14	17	20	23
(-) Tax		▲	0 ▲	1 ▲	1 ▲	2 ▲	2 ▲	3 ▲	3 ▲	4 ▲	5 ▲	6 ▲	7
NOPAT			1	2	2	4	5	6	8	10	12	14	16
(+) D&A			3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
FCF			4	5	6	7	8	10	11	13	15	17	19
Cumulative CF			4	10	16	23	31	41	52	65	81	98	117
Project Cash Flows			-31	5	6	7	8	10	11	13	15	17	19
IRR	25%												

Portfolio Sensitivity Testing (Pt.1)

Determining the most efficient portfolio to maximise returns and minimise risks

Volatility



Synthesised Covariance Matrix

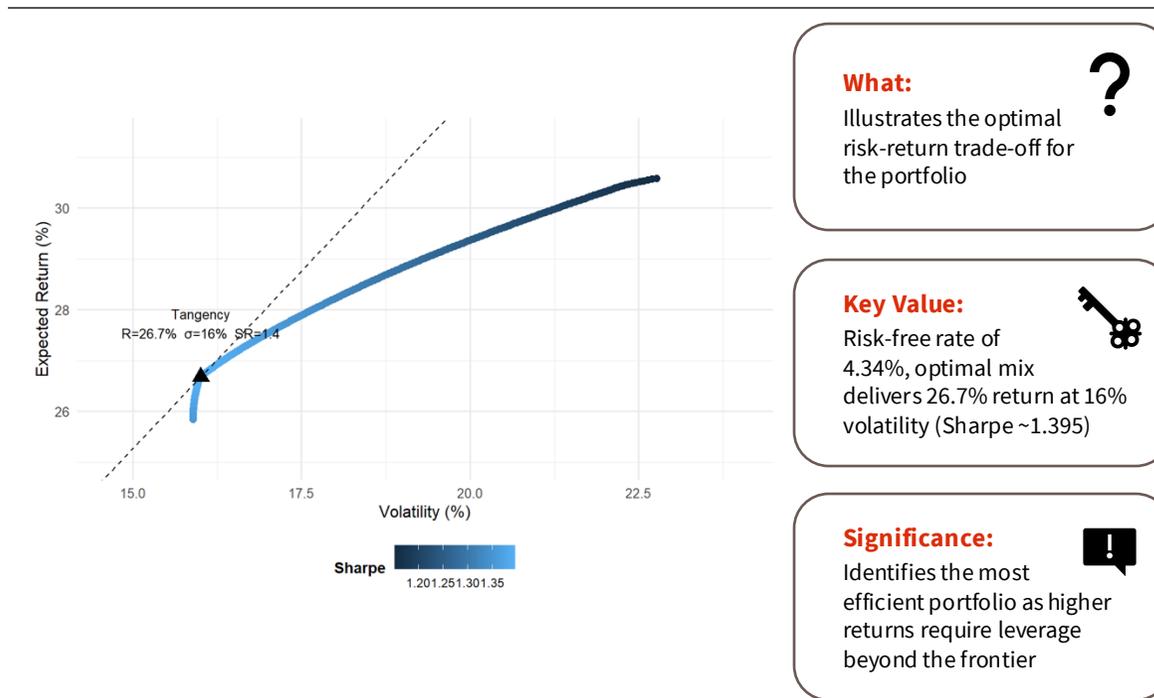


What: ?
Shows how company returns co-move, revealing diversification benefits.

Key Value: 🔑
30% constant correlation assumed, with volatilities ranging 20-40%

Significance: !
Lower covariance pairs reduce portfolio risk and improve stability

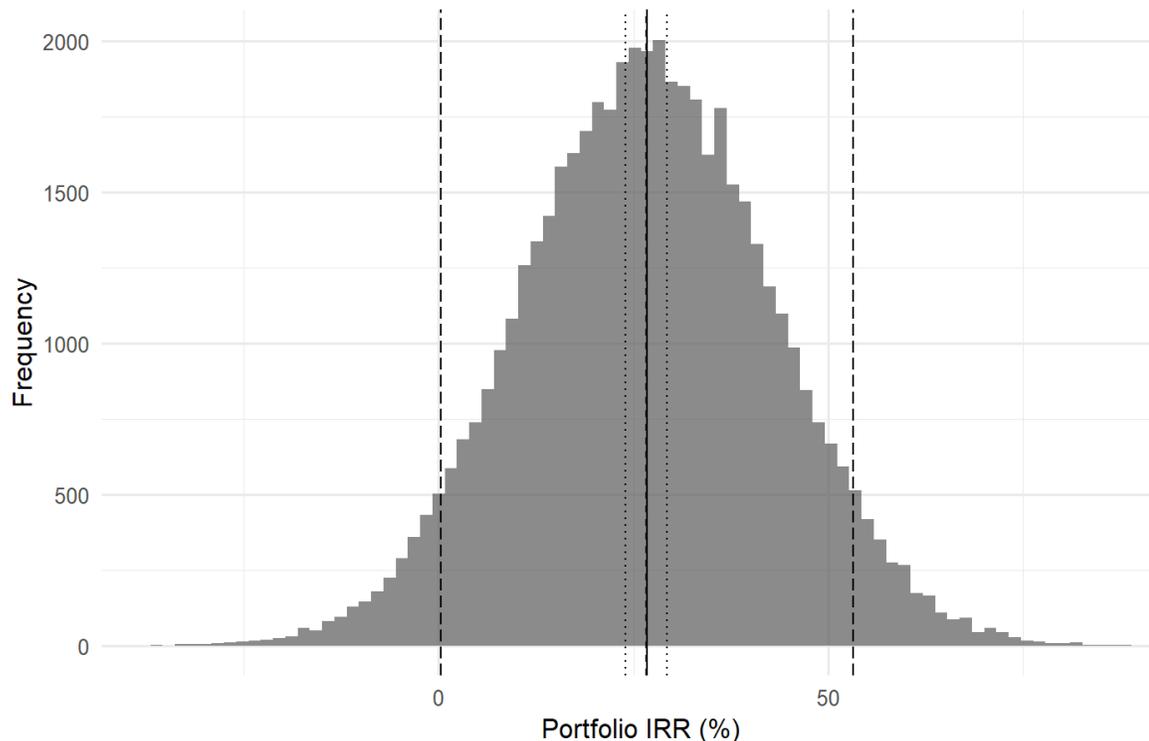
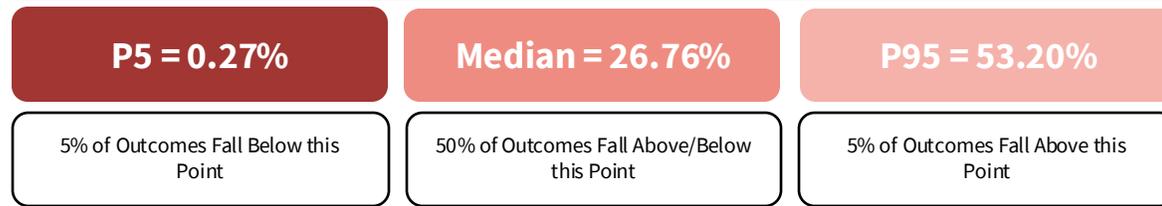
Portfolio Efficient Frontier



Portfolio Sensitivity Testing (Pt.2)

Calculating an expected range of returns, based on Monte Carlo simulations

Portfolio IRR Distribution (Monte Carlo)



Key Insights

24.01%

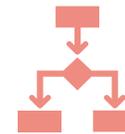
Bear Case

26.68%

Bear Case

29.35%

Bull Case



Method:

We conducted 50,000 Monte Carlo simulations on the portfolio's IRR to generate a probabilistic distribution of the outcomes.



Assumptions:

The simulation applied $\pm 10\%$ IRR multipliers to each company, with variances adjusted to match their individual risk profiles.



Interpretation:

The results indicate that the portfolio consistently achieves IRRs above 20% in most scenarios, demonstrating resilience with limited downside risk.