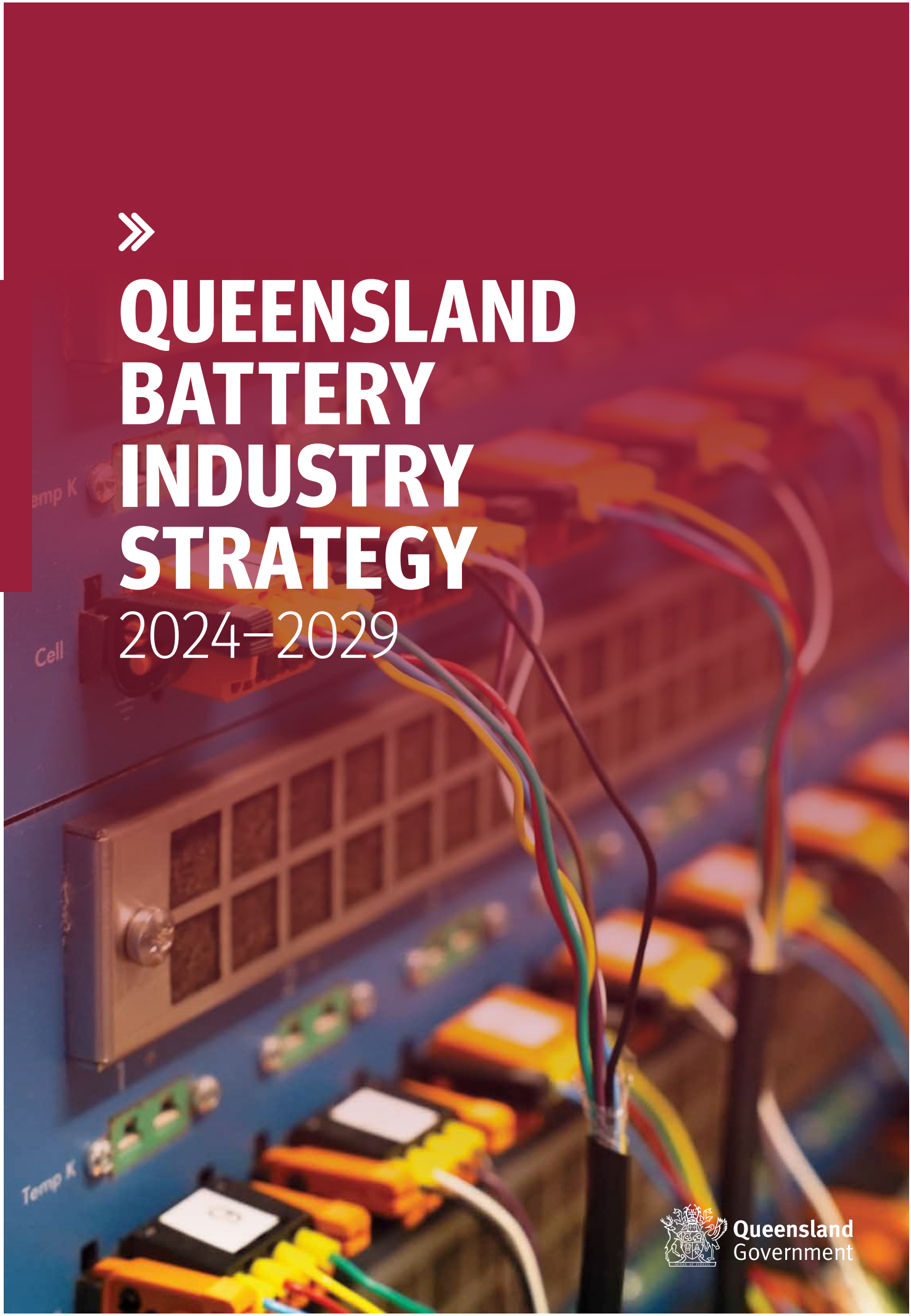
QUEENSLAND BATTERY INDUSTRY STRATEGY

2024–2029



Queensland Government

ACKNOWLEDGEMENT OF COUNTRY

The Department of State Development and Infrastructure (DSDI) acknowledges the Country and people of Queensland's First Nations. We pay our respect to Elders past, present and emerging.

We acknowledge the continuous living culture of First Nations Queenslanders – their diverse languages, customs and traditions, knowledges and systems. We acknowledge the deep relationship, connection and responsibility to land, sea, sky and Country as an integral element of First Nations identity and culture.

This Country is sacred. Everything on the land has meaning and all people are one with it. We acknowledge First Nations peoples' sacred connection as central to culture and being.

We acknowledge the stories, traditions and living cultures of First Nations peoples and commit to shaping our state's future together. DSDI recognises the contribution of First Nations peoples and communities to the State of Queensland and how this continues to enrich our society more broadly.

Queensland Government

The Queensland Government is committed to providing accessible services to Queenslanders of all cultural and linguistic backgrounds. If you have difficulty understanding this publication and need a translator, please call the Translating and Interpreting Service (TIS National) on telephone 131 450 and ask them to contact the Queensland Department of State Development and Infrastructure on (07) 3452 7100.

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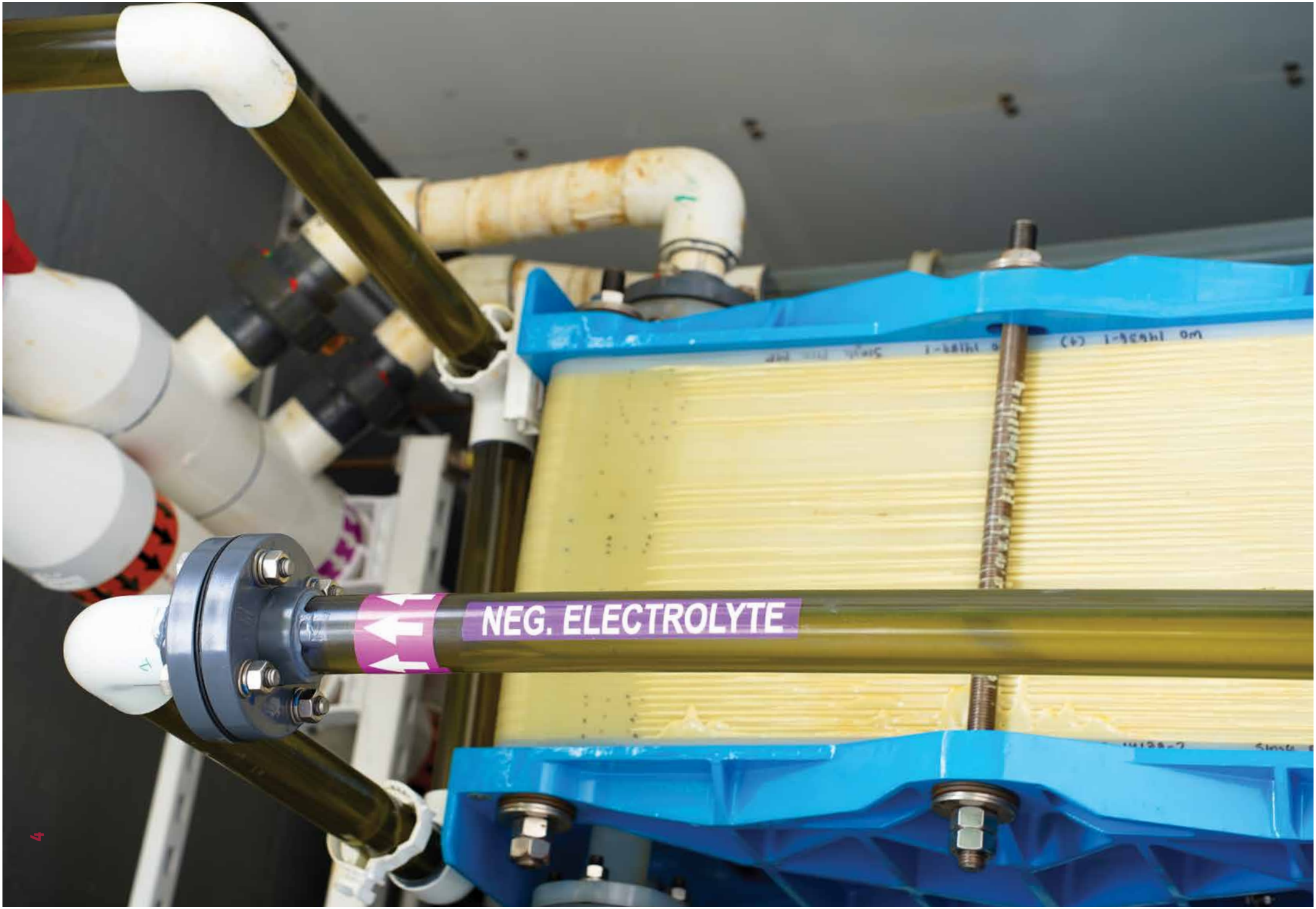
CONTENTS


NEG. ELECTROLYTE

FOREWORD

Now is the time for Queensland to capitalise on this emerging industry to extract greater value from our critical minerals and capitalise on our manufacturing strengths, create jobs and economic growth for our community.

The five-year multi-technology Queensland Battery Industry Strategy builds upon existing commitments and input from industry-wide consultation, supporting supply chain development in the manufacture of advanced battery materials, cells, pack assembly, installation and recycling.

Our Queensland New-Industry Development Strategy (QNIDS) identifies the battery industry as a priority sector with the potential to generate up to $1.3 billion of economic activity and 9,100 jobs by 2030[1].

There has already been significant progress and substantial investment made to support battery manufacturing, including investment in battery projects across the state.

The three major themes within the Queensland Battery Industry Strategy consider research findings and valuable industry and stakeholder input. In particular, the importance of collaboration is reflected in the actions and implementation plan.

Importantly, Queensland's regions will play a major role in successfully delivering this strategy, with huge dividends expected through the creation of new jobs and more economic growth and long-term prosperity.

Working with our partners at local and national government level, Queensland will focus on building out the battery industry supply chain to meet global demand for high quality battery materials and grow local cell manufacturing capabilities.

Our Queensland Battery Industry Strategy provides a clear pathway to a more efficient, sustainable, and decarbonised energy future.

1 Queensland Battery Industry Opportunities Discussion Paper, January 2023.

SEIZING THE BATTERY INDUSTRY OPPORTUNITY

As global economies decarbonise, energy systems are rapidly transforming, bringing with them new economic and industry development opportunities which have the potential to deliver high value jobs and investment for Queensland.

The Queensland New-Industry Development Strategy identifies batteries as a priority industry with the potential to support the state's ambitious renewable energy targets.

This can be achieved by building upon Queensland's critical minerals and mining expertise and by attracting value-adding investment in mineral refining, processing and advanced material and cell manufacturing.

Through strong partnerships between industry and government, Queensland is in an enviable position to grow a sustainable battery supply chain to meet local and domestic demand for stationary storage to support renewable energy use and for specialist applications like defence and mining. This could translate to more than 9,100 jobs and contribute $1.3 billion to our economy by 2030[2].

The Queensland Battery Industry Strategy outlines how government will work with business, industry, and research institutes to realise these opportunities and create a diverse and dynamic battery sector to support Queensland's transition to reach zero net emissions by 2050.

Over the next five years, the strategy will benefit from approximately $570 million* in investment to position Queensland to be at the forefront of battery technology development and commercialisation.

As the foundations of the battery industry are established, Queensland will begin to carve out a role in the manufacture of medium duration batteries and other niche, high performing technologies as well as becoming a preferred supplier of advanced battery materials to markets located throughout Europe, North America, and Association of Southeast Asian Nations (ASEAN) countries.

2 Queensland Battery Industry Opportunities Disucssion Paper, January 2023.

**new and existing funding*

Queensland is already a leader in battery technology development, independent testing and environmental, social and governance (ESG). Over the next five years our state will drive the development of national standards. This role will act as a force multiplier for Queensland's industry and help to influence ethical and sustainable battery production globally.

The strategy targets approximately $570 million in new and existing funding, across three key themes:

THEME 1

$275M

INNOVATE AND COMMERCIALISE

THEME 2

$92.2M

INVEST, INTEGRATE AND GROW

THEME 3

$202.5M

POSITION AND PROMOTE

Queensland is resource rich and home to many of the minerals used globally in battery cathodes, anodes and electrolytes. With emerging capabilities in cell manufacturing and battery pack assembly, further opportunities exist for integration into global value chains.

This strategy also identifies responsible battery stewardship including battery reuse, repurposing and recycling which is playing an increasingly important role in battery markets globally.

Cross-sector collaboration is crucial if the state is to grow a commercially successful and safe end-to-end battery value chain in Queensland.

Underpinned by a robust governance structure, this strategy sets a clear path for government, industry and academia to coordinate both existing and new initiatives that will pave the way for future investment and unlock significant social, environmental and economic benefits to Queensland, particularly across our regions.

ABOUT THE STRATEGY

Research commissioned by the Queensland Government highlighted the opportunity for Queensland to play a lead role in the mining and refining of battery minerals and the production of advanced battery materials.

By growing our capabilities in these areas, Queensland could target global export opportunities, leveraging the state's strong reputation as a reliable and responsible trade partner.

Development of the Queensland Battery Industry Strategy signals the importance of this sector and sets the foundation for its growth over the next five years.

The Queensland Battery Industry Strategy is also a key action of the Queensland Government's Queensland Energy and Jobs Plan and the Queensland Resources Industry Development Plan, which identifies the integral role that energy storage will play in Queensland's transition to renewables by 2030.

The strategy aligns with the Queensland Government's commitments in the North West Minerals Province and the strong focus on investment attraction activities outlined in the Queensland Critical Minerals Strategy.

In 2022, the Queensland Government commissioned an independent analysis of Queensland's battery industry potential. The analysis highlighted the opportunity for Queensland to play a lead role in the mining and refining of battery minerals and the production of advanced battery materials. While Queensland already mines battery minerals, there are acknowledged gaps in industry capability further along the battery value chain. Converting raw materials to battery cell manufacture is a missing link.

The analysis highlighted that Queensland's comparative advantages provide a strong foundation for our battery industry to grow over the next decade. The size and speed of this growth will be influenced by collaborative investment and targeted efforts by industry, all levels of government and the university sector.

The research identified the need to foster existing industry development, to capture demand within Queensland, while also providing support for alternative technologies.

Following input from industry and community stakeholders, this strategy focuses on growing a local and specialised industry, while also ensuring that the industry is ready to leverage its competitive advantages when new market opportunities arise.

The Battery Industry Opportunities for Queensland discussion paper was released in January 2023, marking the start of a three-month consultation process to determine views on market opportunities and actions to support industry growth.

> A common thread among the 45 stakeholder submissions was the need for genuine partnerships across government and industry sectors to address market challenges.

The Queensland Government recognises the importance of collaboration between all levels of government, academia and industry to develop a diverse and integrated battery supply chain and support business investment that creates jobs and builds further commercial supply and demand for Queensland minerals, battery precursor materials and zero emissions technology.

SUPPORTING QUEENSLAND'S ENERGY TRANSITION

The Queensland Energy and Jobs Plan presents long-term opportunities for the battery industry to support reliable renewable energy in Queensland.

As Queensland progresses toward its renewable energy target, firming and energy storage of intermittent renewable energy sources will be critical to the zero net emissions transition. The Queensland Energy and Jobs Plan includes initiatives to support the battery industry.

Invest in energy storage

Queensland needs a mix of energy storage to create flexible and reliable renewable energy systems that can safely store the excess energy produced so that customers can have secure and reliable electricity. Detailed analysis of Queensland's energy storage is underway, which will inform the development of the Queensland Energy Firming and Storage Strategy.

Funding of $200 million is already being invested into distribution scale batteries by government-owned Energy Queensland, which includes network and pole-mounted batteries to help provide system reliability. Under the Queensland Renewable Energy and Hydrogen Jobs fund, an additional $500 million has been committed for Queensland's publicly owned energy businesses to invest in battery projects that maximise local content. This will support deployment of network batteries of different scales that will benefit the abundant solar energy in the system and local manufacturing.

Deliver a smarter grid that benefits all Queenslanders

Households are increasingly choosing to install and use storage assets such as batteries and electric vehicles. By connecting to the electricity distribution network, these customer energy resources (CER) are creating more dynamic power systems.

Provide support for households to manage their energy bills

The Queensland Government has committed to delivering a $60 million new household program, which includes incentives for households to boost the uptake of household batteries and other smart technology, enabling Queenslanders to manage electricity demand and costs.

Grow the renewable supply chain

Through the Queensland Energy and Jobs Plan, $11.6 million has been committed to build capacity in the manufacturing sector and encourage local content to supply future renewable energy projects. This will bolster Queensland's supply chain resilience and target opportunities for local content in future clean energy projects, including battery energy storage systems.

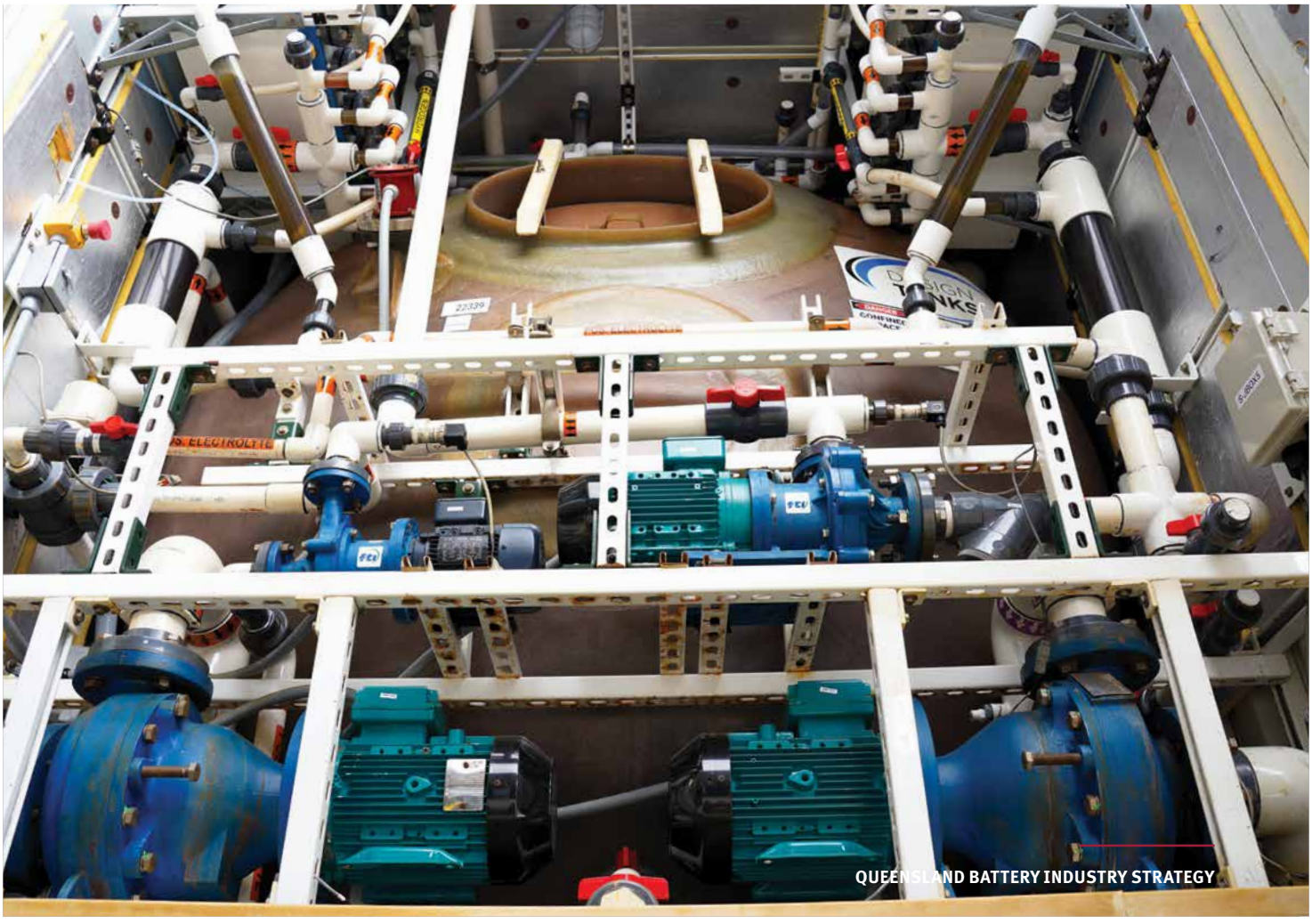
A CO-ORDINATED APPROACH TO MAXIMISING QUEENSLAND'S CRITICAL MINERALS POTENTIAL

Released in June 2023, the Queensland Critical Minerals Strategy positions Queensland as a global leader in delivering the critical minerals the world needs to move to a zero net emissions future. The strategy oversees $245 million of investment to move faster and smarter, maximise investment, build value chains, and foster research and ESG excellence. This complements the $68 million Queensland Resources Industry Development Plan and the $75 million Queensland Resources Common User Facility, being built in Townsville.

The facility is the first of its kind for Australia and will accelerate the development of critical mineral commercial mining projects, promote investment in advanced mineral manufacturing opportunities, and support supply chain and industry development.

The Queensland Critical Minerals Strategy has strong links to the Queensland Battery Industry Strategy, driving further development of our upstream critical minerals mining and processing strengths.

The Queensland Battery Industry Strategy focuses on extracting greater value from our minerals through investment in advanced material and cell manufacturing, pack assembly, deployment and recycling.



CRITICAL MINERALS INVESTMENT

$245 MILLION

IN QUEENSLAND CRITICAL MINERALS STRATEGY

$68 MILLION

IN QUEENSLAND RESOURCES INDUSTRY DEVELOPMENT PLAN

$75 MILLION

TO BUILD THE QUEENSLAND RESOURCES COMMON USER FACILITY

THE QUEENSLAND BATTERY INDUSTRY STRATEGY IMPLEMENTATION SUMMARY

THEME 1 INNOVATE AND COMMERCIALISE

Unlock barriers to battery technology development and commercialisation by providing industry with access to shared infrastructure, testing and certification services and world-class research expertise.

ACTIONS

1.1 Expand battery technology innovation to enable market entry for Queensland products.

1.2 Influence the development of national standards to drive battery technology development and deployment.

1.3 Integrate and co-locate the research strengths of Queensland's universities to accelerate and scale domestic battery manufacturing.

THEME 2 INVEST, INTEGRATE AND GROW

Support the build-out and integration of Queensland's battery supply chain to increase industry capabilities and local content.

ACTIONS

2.1 Build out supply chain capabilities to respond to emerging opportunities.

2.2 Increase local content in Queensland's battery value chain.

2.3 Support the development of a transparent and responsible battery value-chain in Queensland.

THEME 3 POSITION AND PROMOTE

Drive local battery manufacturing investment and promote Queensland's capabilities to national and international markets.

ACTIONS

3.1 Strengthen industry networks and identify strategic partnerships to grow Queensland's battery supply chain.

3.2 Activate projects to accelerate development of battery technologies and the production of precursor and advanced materials.

QUEENSLAND'S BATTERY STRENGTHS

An abundance of key minerals, openness to trade, strong ESG practices, and a stable economic and political landscape in Australia create the favourable conditions to attract further investment into Queensland's battery industry.

Our unique attributes extend beyond what's underground. We are Australia's gateway to Asia and beyond, offering existing strategic regional infrastructure (road, rail and ports) along with advanced manufacturing and chemical processing expertise.

Queensland is already home to Century Yuasa, one of the world's largest lead-acid battery manufacturers. Across other technologies, we also have a thriving eco-system of battery businesses which operate in different parts of the value-chain. Some are developing the next-generation of energy storage technologies while othere are investing in pack and system innovation, the manufacture of advanced battery materials and battery recycling.

A diversified Queensland battery industry will require a skilled workforce of university graduates, tradespeople, and highly skilled technical experts. With the industry expected to grow substantially year on year, the availability of appropriately skilled workers will need to be addressed.

The Queensland Government is actively developing new processing and manufacturing capabilities to cement the state's role in a responsible, safe and sustainable global battery value-chain.

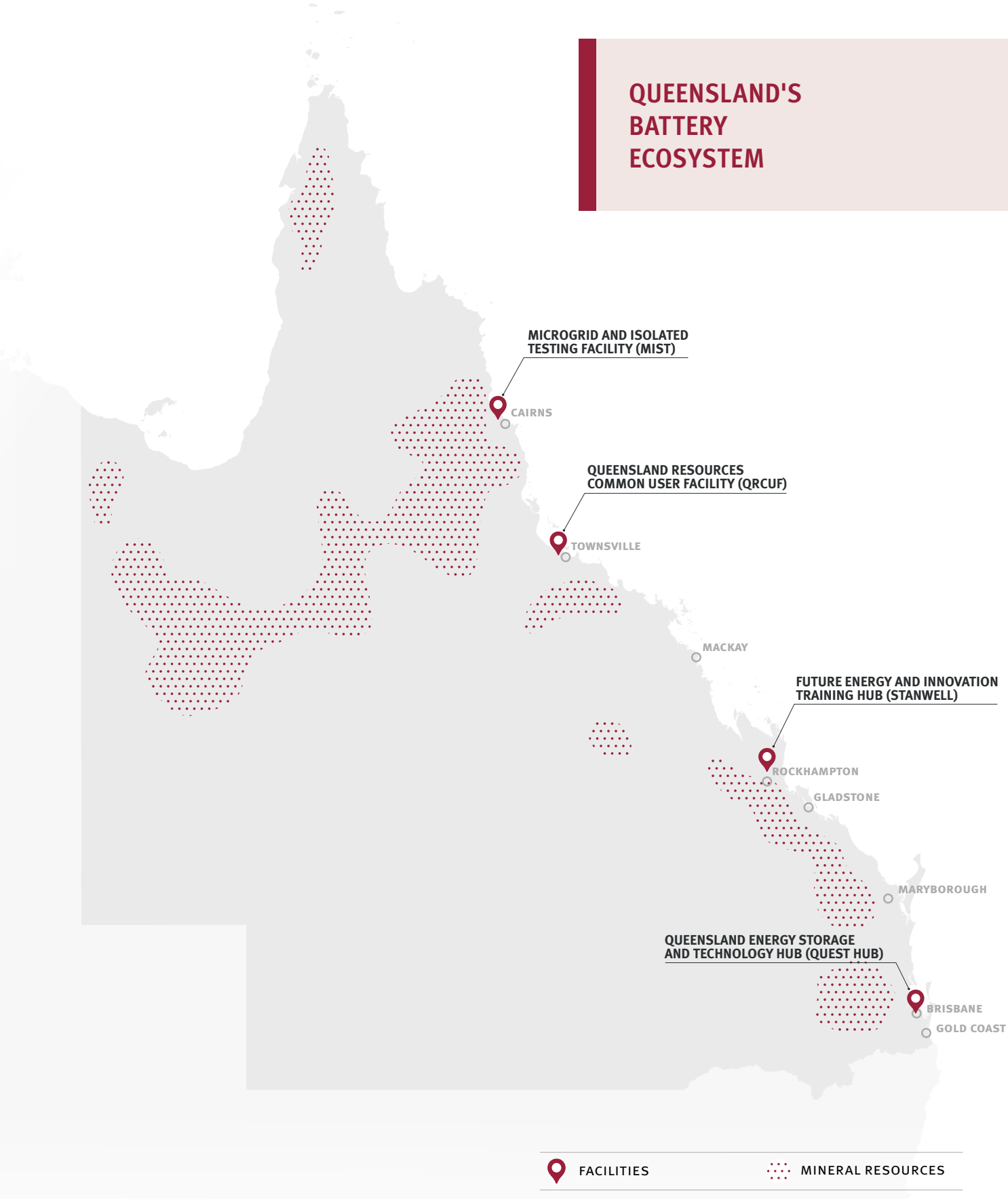
GLOBAL MARKET

Queensland is poised to be a preferential supplier of advanced materials and batteries to secure supply chains in Europe and North America.

Australia also has an extensive network of free trade agreements with key players in the battery mineral sector, including Korea, Japan, Europe, the U.S. and ASEAN countries.

- Battery minerals
- R&D networks
- Supporting infrastructure
- METS capabilities
- Skilled workforce
- Strategic location
- Strong, safe and supportive regulatory framework
- Collaborative and responsive

QUEENSLAND'S BATTERY ECOSYSTEM



QUEENSLAND'S BATTERY VALUE-CHAIN NOW AND INTO THE FUTURE

Queensland currently has a diverse range of battery industry participants, largely in the feasibility and pre-commercialisation stage. Similarly, emerging capabilities in the manufacture of precursor materials provide the foundation for development of the battery value-chain.

Queensland's rich endowment of critical minerals—including key battery minerals such as vanadium, bauxite, graphite, copper, cobalt and nickel—combined with technical capability and a supportive commercial and institutional environment provide the framework for a sustainable battery industry.

More than 70 known mineral occurrences and historical mines of major battery minerals have been identified in Queensland across three major mineral hubs. These are:

NORTH WEST MINERALS PROVINCE

including all of Queensland's vanadium oxide deposits, plus occurrences of cobalt and graphite

NORTH EAST MINERALS PROVINCE

around 40 per cent of Queensland's nickel and some cobalt occurrences

CENTRAL QUEENSLAND REGION

around 60 per cent of Queensland's known nickel and nearly all of the state's cobalt deposits.

Developing a circular battery economy

The Queensland Battery Industry Strategy complements a concerted effort by the Queensland Government, industry and other stakeholders towards a "circular" value chain and commitment to a sustainable energy future.

Research and development of advanced battery technology, along with a commitment to responsible battery stewardship paves the way for Queensland to create a circular economy for battery material.

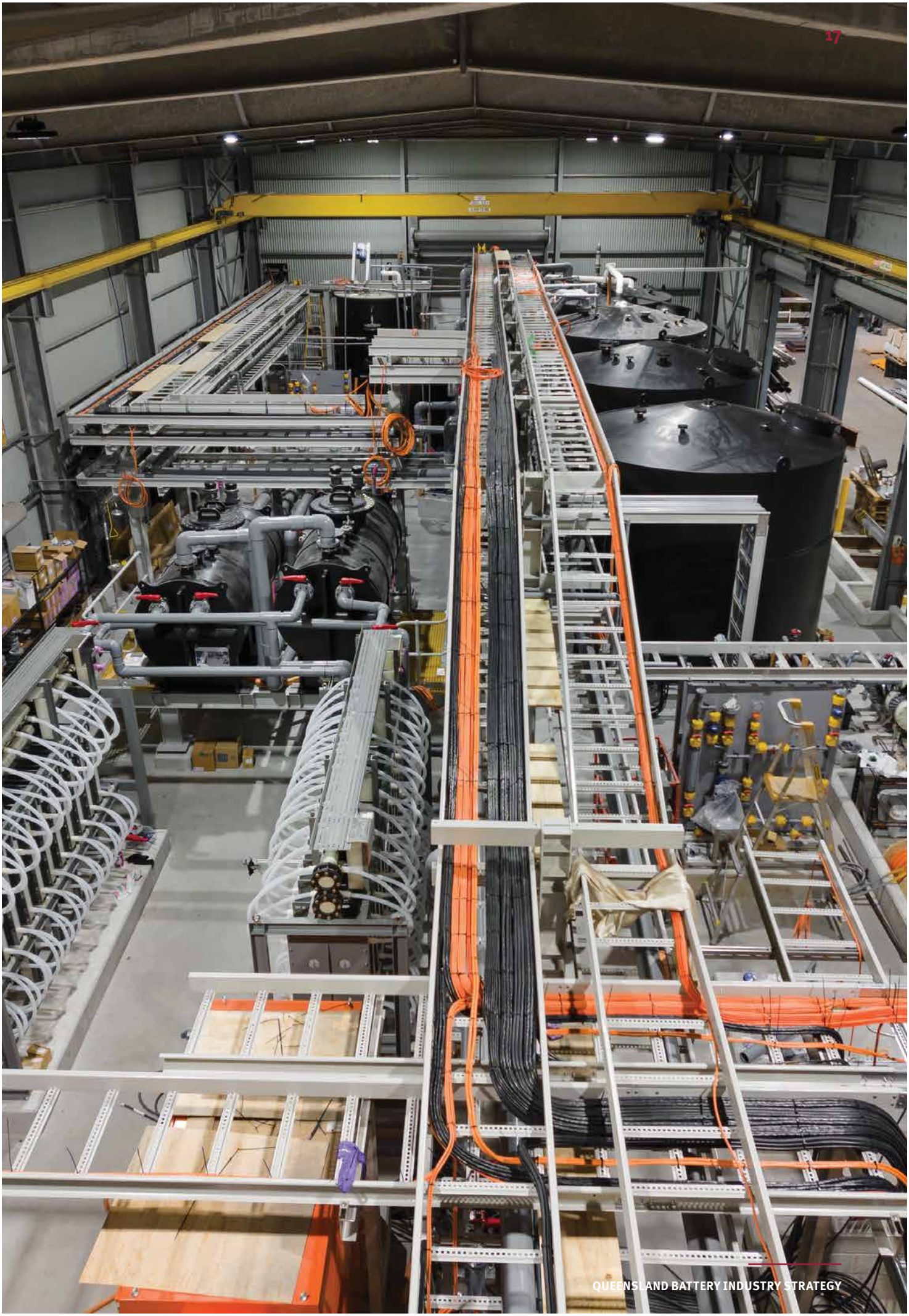
We can look to the success of Queensland based lead-acid battery manufacturer, Century Yuasa. Ninety-eight per cent of a used lead acid battery is recyclable[3] and the company participates in a circular economy having launched a nationwide recycling program in 2008. Century Yuasa aims to increase the recycling rate of used lead acid batteries year on year, providing an aspirational target for other battery technolgies

Advances in re-use, recycling and repurposing are creating the potential for an efficient circular economy across other battery types. Technology is also being adopted to identify and trace batteries throughout their lifecycle via a digital "battery passport".

The recovery of nickel, cobalt and lithium from batteries will be essential to the battery metal supply chain to maintain a rate of worldwide transition to a low-carbon future.

Disposal of degraded rechargeable batteries to landfill results in potential lost value. It also creates significant environmental and health risks. Residual charge in spent batteries can also initiate fires in landfill facilities and subsequent safety and public concerns with the battery industry. Early safety and logistics planning will support the sustainability of recycling and repurposing industries.

3 Century Yuasa, 2024



STRATEGY ACTIONS

THEME 1
INNOVATE AND COMMERCIALISE

INVESTMENT
$275M

Theme 1 actions will unlock barriers to battery technology development and commercialisation by providing industry with access to shared infrastructure, testing and certification services and world-class research expertise.

Supporting industry to overcome the late-stage barriers to bringing innovative battery technology to market will cement Queensland's role as a leader in the development of a sustainable and diverse industry that can support Australia's transition to a low-carbon future.

Actions in Theme 1 will pursue the establishment of a nationally significant battery industrialisation centre in Queensland that builds on the battery services and research capabilities of the Advanced Battery Facility (ABF) and the newly established Queensland Energy and Storage Technology (QUEST) Hub.

Adopting the learnings of similar precincts internationally, these actions will contribute to extracting more value from Queensland's critical minerals and emerging battery value chain helping to reduce Australia's reliance on imports and developing the skilled workforce our industry needs to grow.

ACTIONS	**1.1** Expand Queensland's battery testing and certification capabilities to enable market entry for Queensland products.
LEAD	Queensland Government, in partnership with Queensland University of Technology (QUT) and industry partners
TIMEFRAME	**2024-2029**

Queensland has world-class battery testing and R&D services delivered through the ABF at QUT's Banyo Pilot Plant Precinct. The ABF was established with funding from the Automotive Australia Cooperative Research Centre in 2017.

With the rapid transition to renewable energy, demand for safe, high-performing battery technologies will continue to rise. The Queensland Government is investing $15 million over four years to establish the QUEST Hub.

QUEST Hub will be co-located with the ABF, enabling QUT to undertake targeted research activities which will value-add to Queensland critical minerals to build robust supply chains in partnership with industry, enabling local manufacturing of battery products.

Working closely with industry partners, QUT will leverage existing testing and certification capabilities of the ABF to deliver an expanded program of projects which bridges the gap between university research and pilot scale processing to enable large-scale commercial operation. These projects will help to support the development of a diverse battery value-chain in Queensland by growing further expertise in battery materials development (e.g. vanadium electrolyte and cathode materials), system deployment, certification, destructive testing, and pilot scale cell manufacturing.

Alongside this will be the use and development of appropriate standards to ensure the safety of the chemicals and other materials for Queensland workers and the community.

OUTCOMES

- Brisbane becomes Australia's gateway to the battery industry with more battery businesses choosing to invest in South East Queensland to be close to world-class testing and certification services.
- More university students access formal training pathways which provide battery-specific qualifications.
- QUEST Hub graduates are in high demand due to their exposure to pilot-scale process development for scale up and translation of early-stage research to commercial outcomes.
- Queensland leads pre-deployment testing of large-scale battery energy storage systems nationally, helping companies and their customers to make informed investment decisions.
- Proponents commercialising lithium-ion cell formats have access to electrochemical performance testing, benchmarking and qualification, enabling them to develop safer, higher-performance technologies and bring their products to market sooner.

ACTIONS	**1.2** Influence the development of national standards to drive battery technology development and deployment.
LEAD	Queensland Government
TIMEFRAME	**2024 onwards**

Supporting the establishment of national battery standards will be crucial if Australia is to influence market preferences and cement its role as a preferred supplier of battery materials globally and establish domestic cell manufacturing capabilities.

Through its existing battery testing and certification infrastructure, Queensland is ideally placed to host a national battery standards and testing body.

The Queensland Government will work with subject matter experts and the Australian Government to influence the development of national battery standards that are practical, effective, and relevant to Queensland's advanced material and battery manufacturing sectors. In addition to overseeing the development of battery standards, the Queensland Government will investigate options to invest in independent battery testing and materials characterisation services so that battery technology proponents can be supported throughout their commercialisation journey.

OUTCOMES

- Australian material, cell and battery pack assemblers have clear standards to guide their manufacturing processes and product development.
- Markets hold Australian batteries in high regard due to their superior safety and performance attributes, which meet or exceed international standards.
- Queensland and Australian manufacturers are engaging in conversations internationally to influence market preferences and supply chain relationships.
- Battery proponents can obtain independent verification of their product's performance and safety, helping them to secure new customers and market opportunities.
- Assessment of battery safety through failure mode assessment and development of strategies to mitigate potential failures.

CASE STUDY
QUEST Hub

The ability to prototype, scale and prove-out battery materials, cells and systems is critical to battery product commercialisation and the growth of battery industries. QUEST Hub will provide access to these key capabilities through the establishment of world-class research, development and testing facilities that will enable industry to innovate, value-add and translate new ideas to real-world outcomes.

ACTIONS	**1.3** Integrate and co-locate the research strengths of Queensland universities to accelerate and scale domestic battery manufacturing.
LEAD	Queensland Government, in partnership with the Australian Government Department of Industry Science and Resources (DISR) and a consortium of Queensland universities.
TIMEFRAME	**2024-2029**

Consultation emphasised the important role that a battery industrialisation centre can play in growing a battery ecosystem.

Learning from similar approaches overseas, an Australian Battery Industrialisation Centre (ABIC) will provide a national hub for manufacturing, innovation, collaboration, training and skills development, battery R&D and commercialisation activities.

The ABIC has the potential to be the transformational piece of the Australian Government's Australian Made Battery Precinct by providing a concentration of commercial, pilot-scale manufacturing and educational services that will encourage industry to co-locate, form strategic partnerships, and invest in larger-scale battery manufacturing over time.

Establishing an Australian Made Battery Precinct is an action under the Australian Made Battery Plan, where the Australian Government committed to providing up to $100 million in equity funding*, as announced in May 2022. Delivery of the precinct is subject to agreement between the Queensland and Australian governments. The ABIC will include the functions of existing Queensland Battery investments, including QUEST Hub, together with flexible spaces for pilot-scale battery manufacturing.

Drawing on the combined research strengths of QUT, the University of Queensland, Griffith University, James Cook University and Central Queensland University, the ABIC will engage with industry participants to bolster the growth of Australia's battery capabilities.

To progress this proposal, DSDI is leading the development of a business case to assess the demand and viability of establishing the ABIC. The business case will consider locations for the ABIC and how the centre accelerates battery industry investment and links to university research facilities and manufacturing hubs in places such as Gladstone and Townsville.

Subject to the outcomes of the business case, the Queensland Government will match the Australian Government's investment of up to $100 million in the ABIC.

OUTCOMES

- ABIC is established and operational.
- Cross-disciplinary qualifications and vocational training programs are delivering the highly skilled workforce that industry needs.
- University resources are focused and optimised to support industry through a coordinated program of research and commercialisation initiatives.
- Existing Queensland Government investments are maximised drawing upstream parts of the national battery supply chain down to midstream value-adding segments.
- Industry proponents are accessing independent testing and pilot-scale manufacturing equipment under commercial arrangements. Companies are using this equipment to test and optimise their products and manufacturing processes, enabling them to prioritise commercial production offsite, and invest in ongoing R&D.
- End users are connecting with manufacturers to design material and cell specifications. This is accelerating commercialisation and assisting manufacturers to secure early off-take agreements.

**Subject to investment decisions*

STRATEGY ACTIONS

THEME 2
INVEST, INTEGRATE AND GROW

INVESTMENT
$92.2M

Theme 2 actions will support the build out and integration of Queensland's battery supply chain to increase industry capabilities and enable greater local content.

Queensland's battery industry is emerging. Industry analysis and consultation highlighted the need to deepen the value chain and stand-up industry.

Theme 2 actions will help develop sovereign capability, reducing our reliance on imported inputs. In turn, the Queensland supply chain will scale over time to realise new local, national and international opportunities.

Through incremental and targeted support to industry, Theme 2 actions will help to increase local content and better position Queensland businesses to secure early supply arrangements. Projects that address supply chain gaps, leverage existing Queensland Government investments such as the Queensland Resources Common User Processing Facility or ABIC, and have the potential to stimulate additional downstream investment, will be prioritised.

The Queensland Government offers a range of support programs to businesses. Theme 2 actions acknowledge the need for a more tailored and flexible approach to support the growth of the battery industry. Actions will bridge the gap between smaller project activation programs and larger initiatives directed at more established businesses and industries.

CASE STUDY
Lava Blue

Lava Blue's collaborative research with QUT to support mineral processing capabilities at Queensland Pacific Metals (QPM), and Brisbane-based vanadium developers Vecco Group and Critical Minerals Group, is helping to advance the development of Queensland's battery ecosystem.

In 2018, Lava Blue began working with QUT to develop a process for production of High Purity Alumina (HPA) from sapphire-bearing kaolin clay deposits in North West Queensland. HPA is the essential material on which all light emitting diodes (LEDs) are manufactured, and is used in lithium-ion batteries to coat battery separators and battery materials to improve the performance and safety of cells.

All of Lava Blue's commercial partners are aiming to add HPA as a valuable co-product to their mineral processing developments. Vecco Group, for instance, is planning to recover aluminium from the waste stream generated from their vanadium processing and produce HPA — turning a waste stream into a high value commercial product.

Strategic partnerships such as this one, demonstrate Queensland's potential to build an integrated battery supply chain which brings forward new commercial and value-adding opportunities for the state's critical minerals.

ACTIONS	**2.1** Build out supply chain capabilities to respond to emerging opportunities.
LEAD	Queensland Government
TIMEFRAME	**2025 onwards** The Queensland Government will work with industry to address supply chain deficits or to support proponents to utilise common user manufacturing, testing and R&D services offered by QUEST Hub, or, once operational, the ABIC. The type of support measures to be provided will be guided by the outcomes of the detailed business case on the ABIC. They may include direct grants or facilitation support where battery proponents require assistance to: • purchase specialised equipment, componentry or reference materials (e.g. precursor materials or electrolyte) for use at the ABIC • contribute towards ABIC user charges for testing or pilot-scale production • employ ABIC graduates • establish ongoing operations within the precinct surrounding the ABIC • manufacture prototypes for refinement and validation at ABIC and partner with facilities such as Energy Queensland's Microgrid Isolated System Testing (MiST) facility in Cairns and the Stanwell-owned Future Energy Innovation Testing Hub (FEITH) in central Queensland. Tailored assistance measures will complement other industry support programs, such as the Critical Minerals and Battery Technology Fund and the Industry Partnership Program. The ABIC business case will consider the types of assistance that could be provided as well as recommend a preferred administration model that will align with the governance and operation of the ABIC.
OUTCOMES	• More businesses utilise the ABIC leading to earlier collaboration and stronger supply chain partnerships. • Accelerated capability uplift—technologies and businesses fill supply chain gaps and commercial pathways are established for other Queensland battery value-chain participants. • Local content increases as more businesses work in collaboration to overcome supply chain challenges. • Battery industry proponents obtain access to suitably qualified employees who are supported by universities. • ABIC graduates secure direct placement with a local business where they can rapidly develop experience and more specialised knowledge.

ACTIONS	**2.2** Increase local content in Queensland's battery value chain.
LEAD	Queensland Government
TIMEFRAME	**Underway**

Cost, supply certainty and timing challenges associated with sourcing battery materials and componentry from overseas significantly impact smaller battery manufacturers.

While battery manufacturing requires specialised inputs, it is expected there may be some componentry that could be sourced or manufactured locally, instead of relying on imports.

In some cases, this could mean that local companies may be able to pivot their local manufacturing processes to make battery components, and potentially start filling gaps in the supply chain.

To capture this opportunity, Department of Regional Development, Manufacturing and Water (DRDMW) is undertaking a Battery Componentry Study that will identify the manufacturing requirements and capability of Queensland's manufacturers to produce components. The study will investigate new battery technologies and their inputs to identify opportunities for Queensland manufacturers to engage in battery supply chains.

In parallel and in partnership with the Advanced Materials and Battery Council (AMBC), DRDMW is developing an Australian Battery Supply Chain Database. The Advanced Battery Facility in Brisbane will also provide advice on identified key inputs and components required in the manufacture of batteries to support the database.

The database will be national, live and 'open source' so that emerging battery technology companies will be able to identify business and supply chain opportunities to support domestic production. Manufacturers outside of the battery industry will also be able to use the database to identify new customers and markets, and to connect with the battery industry and investors.

The database will also assist government and manufacturers to realise local content supply chain objectives. For example, increasing Queensland content in battery cells and packs will also make our batteries more competitive as customers will inevitably adopt procurement policies which prioritise local content and high ESG credentials.

OUTCOMES

- Increased supply chain resilience, leading to new regional jobs and manufacturing investment.
- An understanding of the strengths and gaps in the battery supply chain, leading to greater collaboration between local manufacturers to bridge gaps and seize new opportunities in fast-growing segments.
- Increased local content in battery manufacturing.
- Local industry and battery manufacturers have a single and common industry-wide understanding and point of knowledge of the entire supply chain through which to connect, helping to optimise industry resourcing.
- A comprehensive database that is guided by industry experts and regularly updated as market opportunities evolve.

ACTIONS	**2.3** Support the development of a transparent and responsible battery value-chain in Queensland.
LEAD	Queensland Government
TIMEFRAME	**2025-2028**

As our economy electrifies and cell manufacturing scales, the volume of scrap and spent batteries is going to increase dramatically. Providing early, proactive leadership is critical to responsibly manage the reuse, recycling and remanufacture of batteries on our horizon. The Queensland Government already leads a range of policy initiatives to divert waste from landfill and increase recycling. However, when it comes to batteries, diversion from land fill is only part of the recycling puzzle. Battery recycling will require co-ordination across all parts of the value chain to successfully close the loop and ensure enhanced safety in the battery recycling industry.

Through this action the Queensland Government will:

- undertake a study to investigate the forecast volume and supply chain requirements needed to support a circular battery value-chain in Queensland.
- progress precinct planning for recycling of renewable energy products (including batteries).
- consult with industry and local government on policy mechanisms to establish battery recycling in Queensland, including consideration of national and international stewardship schemes.
- accelerate development of a circular battery value-chain.

Consultation with stakeholders will inform the types of projects that will be supported through this funding. Examples may include:

- trials to repurpose Electric Vehicle batteries for stationary storage applications
- the establishment of battery processing facilities in Queensland, including trials to automate battery dismantling and processing
- a pilot to showcase supply chain transparency and ESG reporting using block chain technology
- technology trials to recover target minerals from processed battery material.

OUTCOMES

- Battery manufacturers are designing their products with end-of-life in mind.
- Commercial models are identified to enable the collection, repurposing and redeployment of electric vehicle batteries for use in stationary storage applications.
- Industry is confidently investing in battery recycling R&D based on forecast volume, clear government policy and market opportunity.

STRATEGY ACTIONS

THEME 3
POSITION AND PROMOTE

INVESTMENT
$202.5M

Actions in Theme 3 will drive local battery manufacturing investment and promote Queensland's capabilities to national and international markets.

Queensland's critical minerals, advanced manufacturing and battery technology expertise provides a strong platform on which to position the state as Australia's battery manufacturing leader.

As more parts of the global economy electrify, market opportunities are rapidly evolving. To secure these opportunities, Queensland needs to quickly establish a foothold in the market by capitalising on our reputation as a reliable and stable trading partner.

It will take time for our battery supply chains to develop end-to-end capabilities however, there are near-term 'wins' for Queensland's taking. The key will be to position and promote the industry to supply into key markets as early as possible.

Theme 3 actions focus on attracting and facilitating investment in Queensland's battery supply chain. Companies will have a single point of contact in the Queensland Government for coordinated project facilitation support, with potential assistance to identify government support programs, regulatory and approval pathways, access to land, and introductions to complementary businesses.

In partnership with industry, Theme 3 actions will look to strengthen industry networks and provide coordinated advocacy and collective marketing of Queensland's battery capabilities and ESG credentials.

CASE STUDY
Feline

Feline is Australia's only lithium-ion cell manufacturer which is based on the Gold Coast. Feline focuses on advancing lithium-ion battery technologies by integrating smarter and safer components that create higher performance while maintaining safety standards.

Feline is establishing a battery manufacturing pilot project which will advance commercialisation of a novel, next-generation lithium-ion battery chemistry. Collaborating with both private and public sectors, Feline provides the battery industry with a competitive advantage by integrating their high performance, next-generation batteries into niche applications while maintaining safety.

ACTIONS	**3.1** Strengthen industry networks and identify strategic partnerships to grow Queensland's battery supply chain.
LEAD	Queensland Government
TIMEFRAME	**2024-2029** DSDI will establish Batteries Queensland, a central point of contact for industry to connect with relevant Queensland Government agencies and battery industry support programs. Batteries Queensland will work closely with industry and across government to facilitate new investment and to promote and realise supply chain development opportunities and increased local content targets. Batteries Queensland will strengthen industry networks by facilitating events in partnership with peak bodies and research institutions. These events will provide battery proponents with an opportunity to build relationships with potential supply chain partners and customers, and connect with policy makers. The events will be conducted annually and coincide with the development and release of an industry intelligence report that will showcase Queensland's battery industry capabilities, market and supply chain announcements, employment and industry skills updates, and promotion of ESG credentials and investment opportunities. The report will help to guide implementation of the strategy, ensuring that its actions and priorities target support where it is required. The report will also be used to market Queensland's battery opportunities to potential customers and investors globally. Due to the strong links to critical minerals and mineral processing, Batteries Queensland will work closely with the Queensland Critical Minerals Office to facilitate development of Queensland's supply chains.
OUTCOMES	• Industry and government are connecting to share intelligence on the investment pipeline, new supply chain relationships and capabilities. • Industry is being supported to identify new market opportunities early, helping them to combine resources and improve their competitiveness. • Queensland Government is using its relationships with industry to inform new policy and adapt implementation accordingly.

ACTIONS	**3.2** Activate projects to accelerate development of battery technologies and the production of precursor and advanced materials.
LEAD	Queensland Government
TIMEFRAME	**2024-2025**

The Queensland Critical Minerals and Battery Technology Fund's primary goal is to position our state at the front of the queue with the capacity and capability to meet global demand for decarbonisation. The fund helps meet growing demand for clean energy technologies by supporting Queensland industry to:

- deliver economic growth in Queensland
- create Queensland-based jobs
- support private infrastructure development to allow the growth of the critical minerals sector within Queensland
- mine or refine critical minerals or manufacture advanced battery materials using critical minerals in Queensland.

Under the scheme, two streams of financial assistance are available:

1. Government grants of up to $2 million (delivered and administered by Queensland Treasury in partnership with DSDI and Department of Resources). Eligible expenses could include project activation studies, including feasibility studies, pilot projects, manufacturing capability and early operational programs for the development and manufacturing of critical minerals, battery technology and advanced materials in Queensland.
2. Government equity and/or debt investment up to $30 million for growth-stage businesses looking to scale-up activity (delivered and administered by QIC). This stream is targeted to mining companies with a proven JORC-compliant resource requiring support through early development stages to the development phase, critical minerals, and advanced materials sector businesses with product and/or process development and other emerging critical minerals and advanced materials businesses which are in the process of ramping up.

OUTCOMES

- Current gaps or emerging opportunities in the critical minerals, battery technology and advanced materials sectors and supply chains in Queensland will be addressed.
- Increased supply chain capability to contribute to national and global metal refining, mineral processing and battery manufacturing projects, helping to support decarbonisation and the clean energy transition.
- New jobs as industry brings forward investments.

SUPPORT FOR INDUSTRY PROJECTS

Launched in 2021, the Queensland Government's Queensland Jobs Fund brings together flagship industry development programs to boost the state's industry footprint, create jobs and strengthen Queensland's economy. As part of the fund, the Industry Partnership Program (IPP) is investing $415.5 million to continue to grow and create jobs across several priority industry sectors such as hydrogen, biofutures, biomedical, resource recovery and recycling, batteries, critical minerals processing, and renewable energy manufacturing.

Funds will be made available from programs across the Queensland Jobs Fund to accelerate renewable energy and battery manufacturing projects. This funding will target supply chain gaps and enhance industry growth.

The IPP offers a range of flexible incentives that facilitate cross-sectoral opportunities, unlocking growth supply chains, and having a broad impact on the economy. Together with the Queensland Government's state-wide network of regional offices, Batteries Queensland will provide coordinated case management of applicants to provide support and facilitation assistance throughout the application and assessment phases.

The assistance offered through the IPP are tailored to suit each project. The types of assistance may include:

- leveraging external co-funding programs to maximise support available to projects
- payroll tax reimbursement
- financial incentives such as cash reimbursement grants or interest-free loans.

Industry Partnership Program

STRATEGY IMPLEMENTATION

The diagram below shows the governance framework that has been established to guide implementation of the strategy over the next five years.

Many of the initiatives outlined in this strategy are already underway. Batteries Queensland will drive the implementation of the strategy, leading actions in partnership with other Queensland Government agencies and key industry stakeholders.

Queensland Government agencies involved in the strategy's implementation will report on progress through an inter-departmental committee. Overtime, implementation priorities may change in response to specific industry development opportunities. For information on the implementation of the Queensland Battery Industry Strategy visit:

statedevelopment.qld.gov.au

ROLE: **DECISION**

QUEENSLAND GOVERNMENT

ROLE: **STRATEGIC ADVICE**

BATTERY INTERDEPARTMENTAL COMMITTEE

ROLE: **STRATEGY IMPLEMENTATION/INVESTMENT FACILITATION**

BATTERIES QUEENSLAND (DSDI)

ROLE: **INDUSTRY ADVISORY**

INDUSTRY STAKEHOLDERS

QUEST HUB

AUSTRALIAN MADE BATTERY PRECINCT (AMBP) / AUSTRALIAN BATTERY INDUSTRIALISATION CENTRE (ABIC)
(under consideration)

statedevelopment.qld.gov.au

Queensland Government