

# PRODUCING BATTERY METALS TO POWER AUSTRALIA'S ECONOMIC TRANSFORMATION

.....  
TOWNSVILLE ENERGY CHEMICALS HUB  
(TECH) PROJECT



**QPM'S TECH PROJECT  
IS THE FIRST STEP  
TO ESTABLISHING A  
SUSTAINABLE BATTERY  
MANUFACTURING  
SUPPLY CHAIN IN  
AUSTRALIA.**



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## About QPM

Queensland Pacific Metals is an Australian company listed on the Australian Securities Exchange (ASX:QPM). The company is focused on developing the 100% owned Townsville Energy Chemicals Hub (TECH) Project.

QPM's goal is to ensure customers are confident they are buying the cleanest and most environmentally attractive battery chemicals in the world.

Innovative technology, low-cost production and responsible management of resources, together with a socially and world-leading environmental technology all contribute to QPM's goal of making the planet cleaner, greener and sustainable.

## Project Summary

The TECH Project will be a low-cost, modern and sustainable eco-refinery, processing high-grade laterite ore imported from New Caledonia to produce carbon negative nickel sulfate and cobalt sulfate used in the production of lithium ion batteries for the EV sector, as well as other valuable co-products.

To realise this opportunity, QPM needs:

- Utility infrastructure connected to the Lansdown Eco Industrial Precinct
- Equity funding from the Queensland and Australian Governments, as occurs in other countries with which Australia competes.

**QPM will deliver innovation in critical mineral processing and ship low-cost world-first environmentally sustainable products essential for the transition to Net Zero by 2050.**

# Key Benefits



**\$1 billion annual economic benefit to Townsville.**



**Reducing Australia's GHG emissions by almost 1 million tonnes of CO<sub>2</sub>-e annually.**



**\$700 million in taxes generated in first 5 years of operations.**



**New technology process means no tailings and no process liquids discharge.**



**New infrastructure to support other new industry opportunities.**



**Supporting downstream battery production opportunities including spend battery recycling.**



**Making Australia a market leader in green energy technology.**

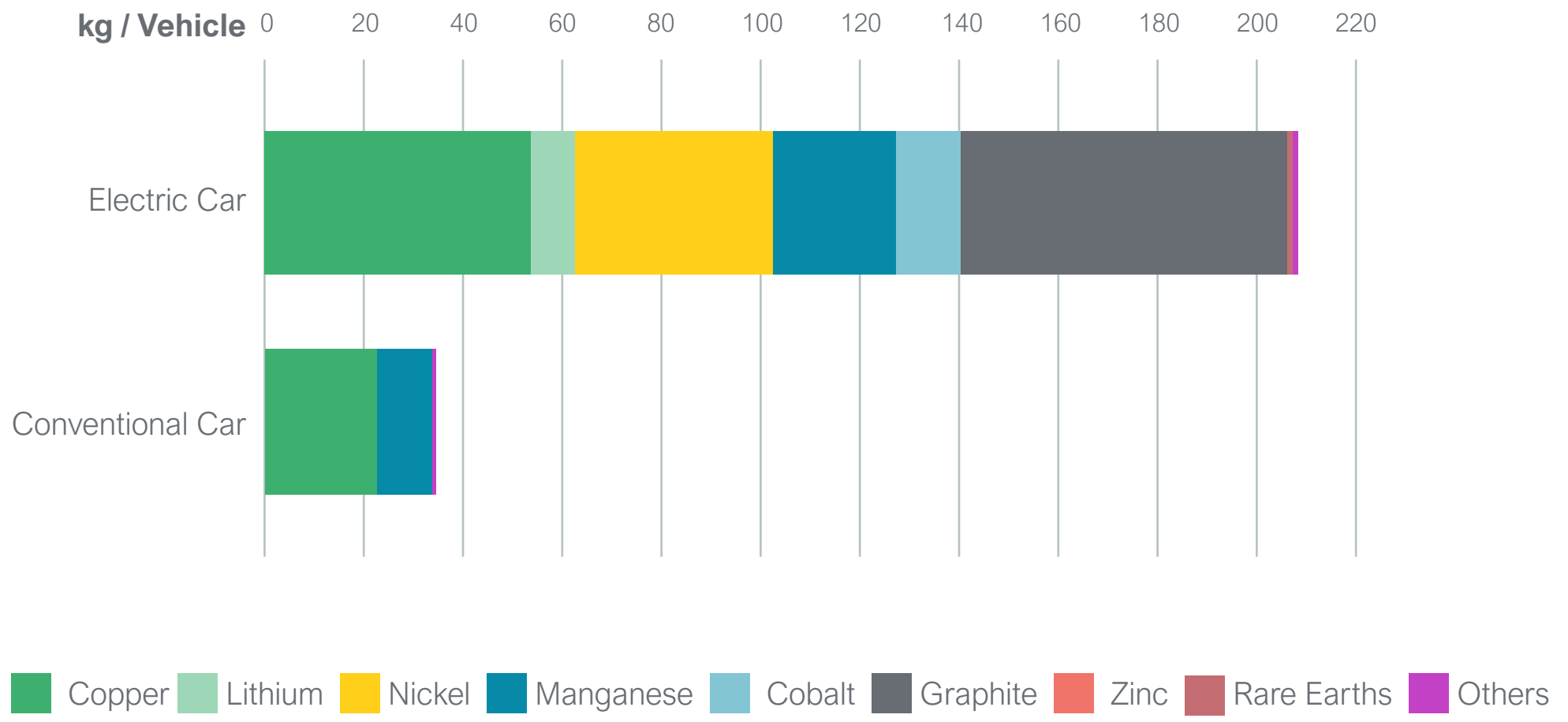


**Delivering the investment needed to meet Net Zero targets.**

# THE NEED TO REDUCE EMISSIONS IS DRIVING GLOBAL DEMAND FOR GREEN METALS

Transport accounts for 20% of global GHG emissions. Reducing emissions from transport requires a step-change in transport technology and rapid uptake of electric vehicles. The transition from petrol to electric vehicles is driving demand for components that require multiple different critical minerals.

## Minerals used in electric cars compared to conventional cars



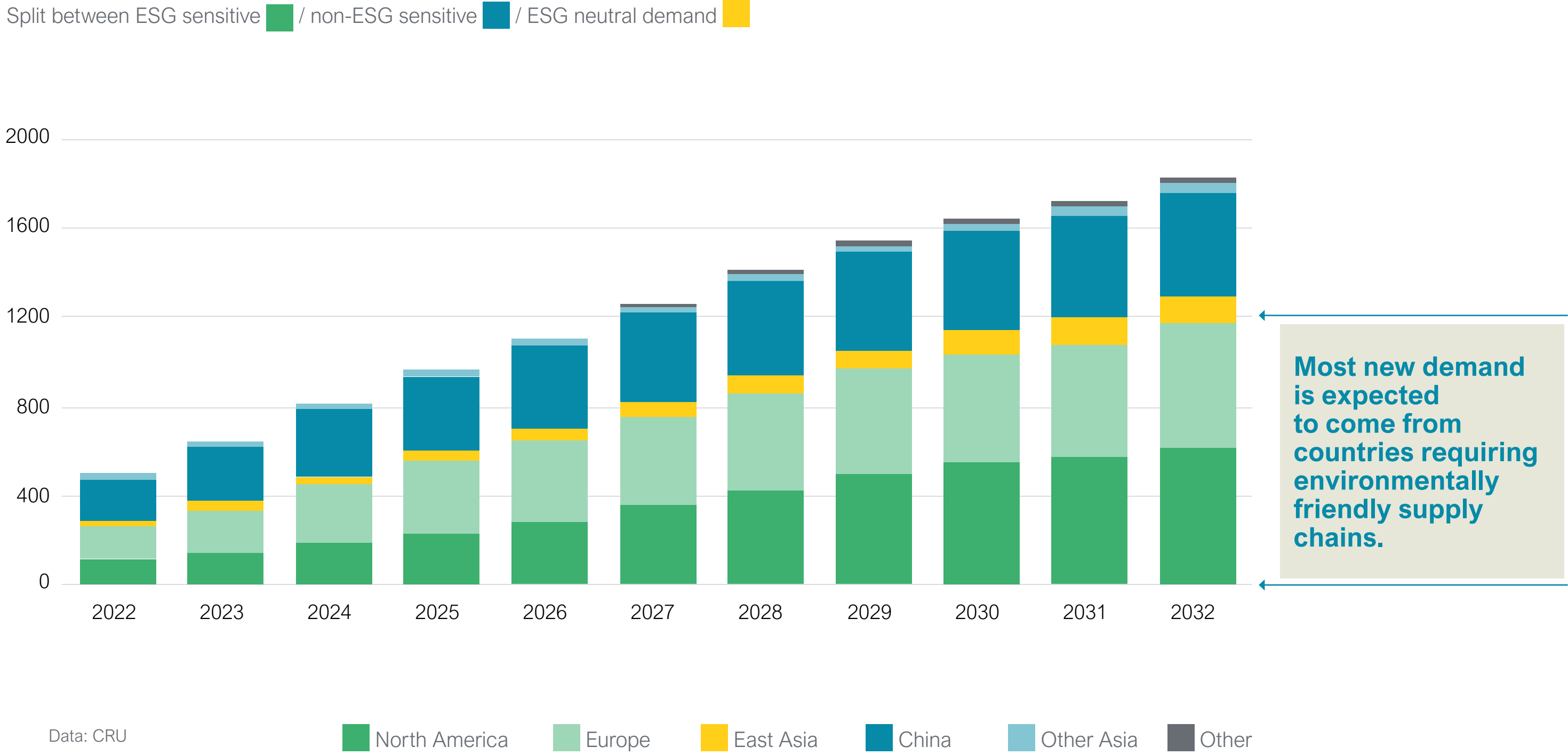
**68% of new EV batteries rely on nickel-based components.**

Each EV needs 6 times more critical minerals and copper than a internal combustion equivalent.

More EVs will require more nickel, copper, cobalt and lithium.

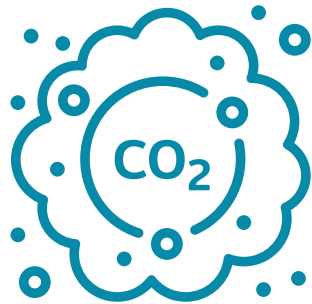
## Demand for EV batteries is expected to increase 400% in 10 years, driving demand for nickel, cobalt and aluminium.

Figure: NiSO<sub>4</sub> demand at battery end-use level by ESG sensitivity (kt Ni).



# CURRENT SUPPLY CHAINS CANNOT MEET GLOBAL DEMAND FOR GREEN METALS

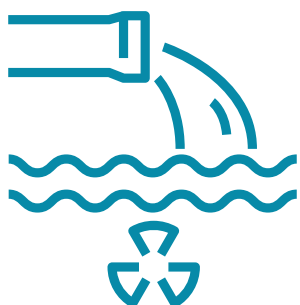
Existing supply chains have poor ESG credentials, with most nickel and cobalt extraction and production located in countries with terrible environmental, labour relations and land-owner track records.



High carbon emissions



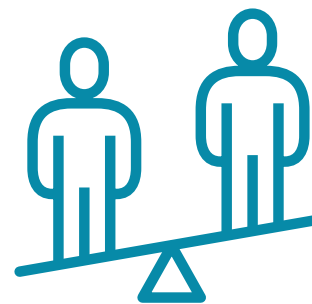
Production of residue & dangerous tailings



Water pollution



Lack of biodiversity protections



Political uncertainty

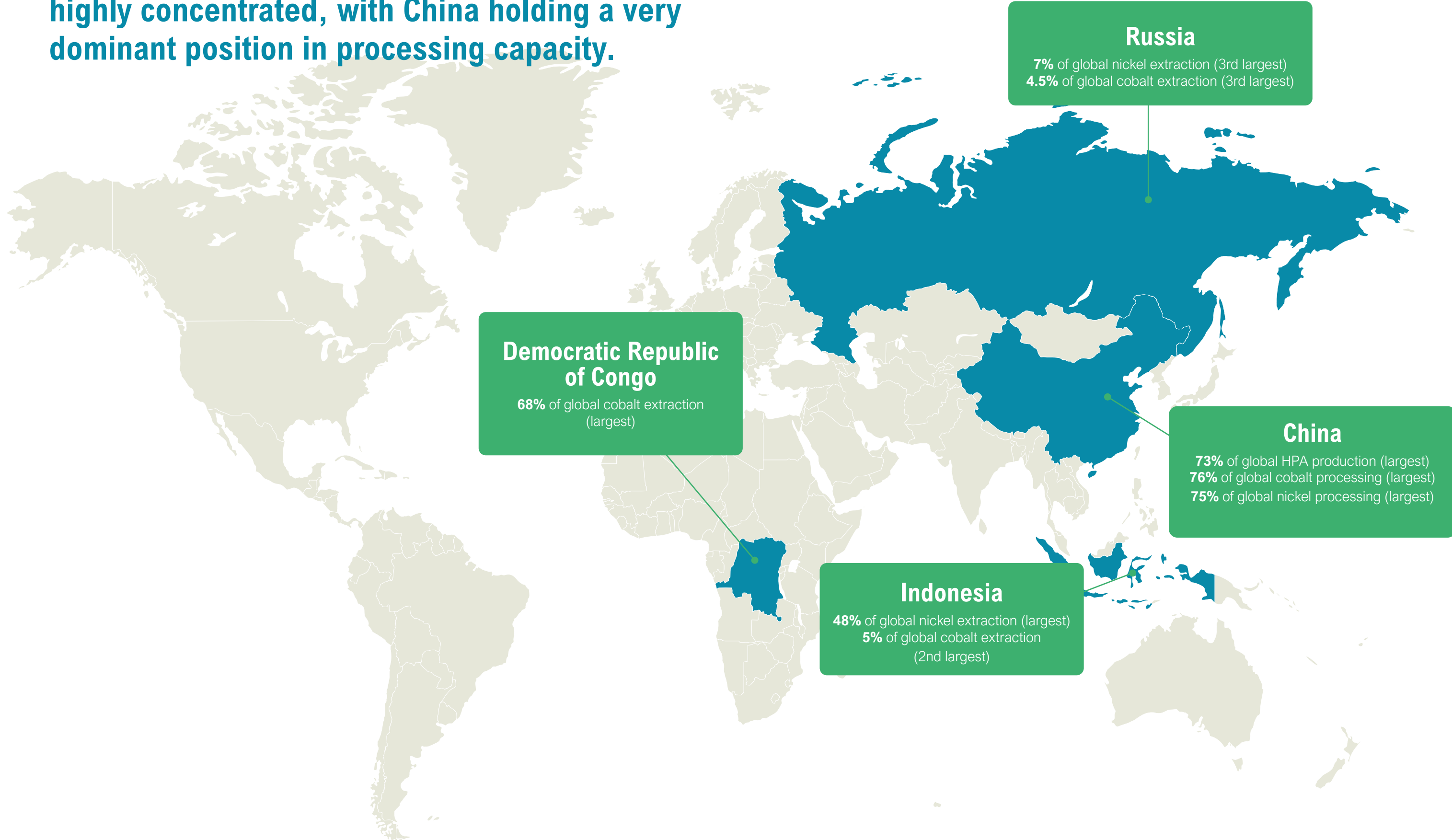


Dubious labour practices



Poor treatment of land-owners and traditional owners

Global nickel, cobalt and HPA supply chains are highly concentrated, with China holding a very dominant position in processing capacity.



# AUSTRALIAN INNOVATION CAN DELIVER GREEN MINERALS FOR EV BATTERIES

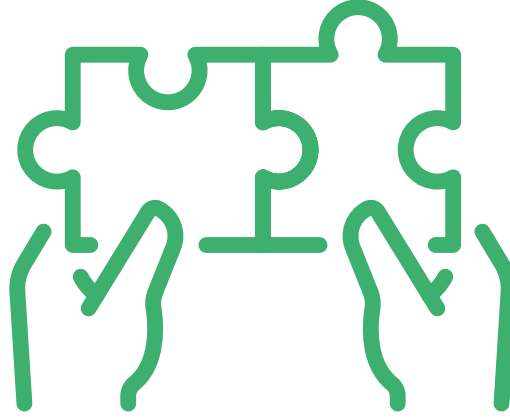
Queensland Pacific Metals (QPM) is an Australian company focused on supplying sustainable, high-purity critical minerals to support global decarbonisation.

By employing the Direct Nickel Process™ developed with the CSIRO, QPM will be able to produce green battery chemicals that are:



## SAFER

by not needing to heat acid to dangerously high temperatures under hazardous pressures.



## SIMPLER

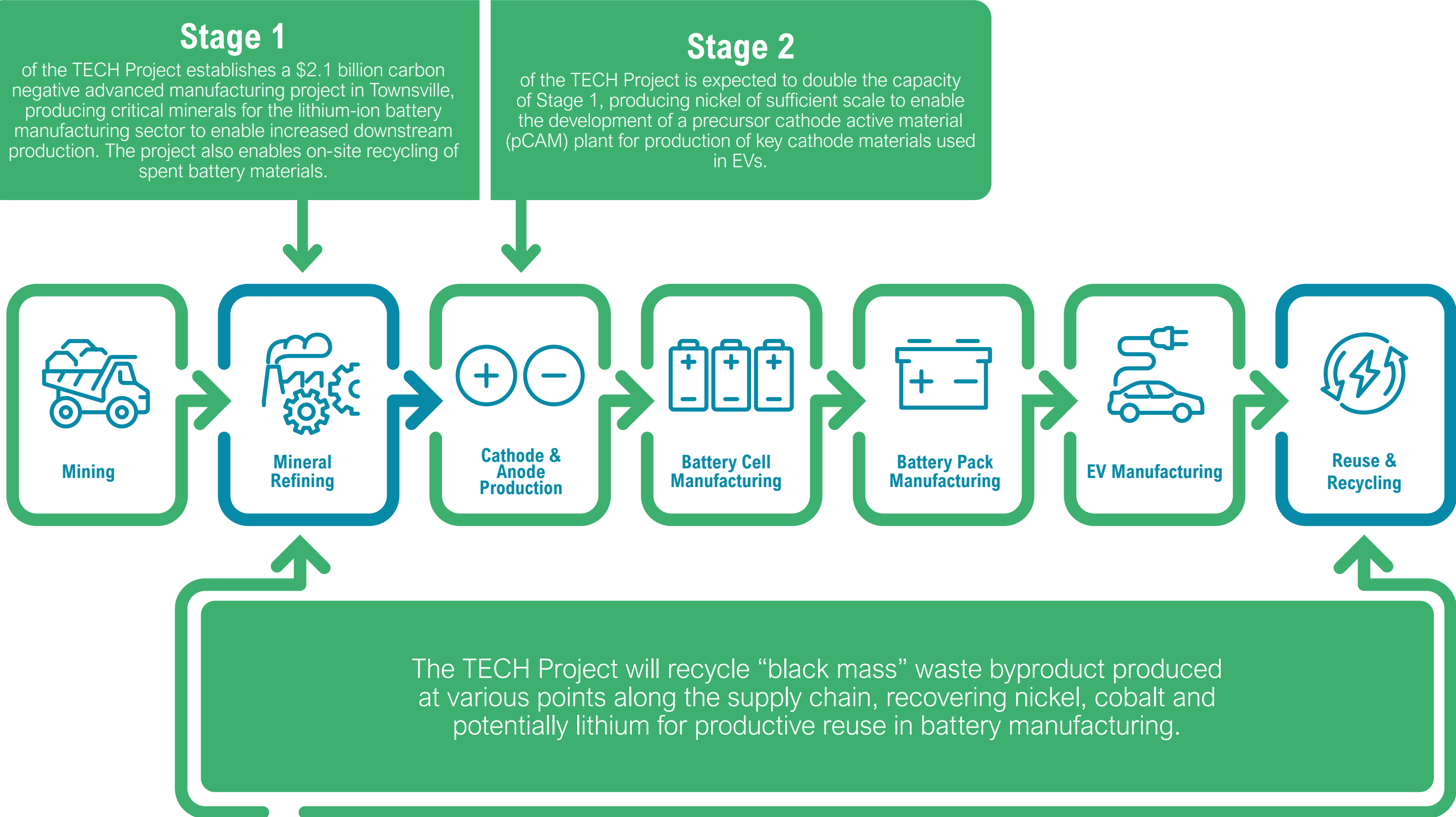
processing the entire ore body to produce a range of critical minerals (nickel, cobalt, high purity alumina, magnesia and iron).



## GREENER

by recycling over 98.5% of nitric acid and not producing tailings or process liquids discharge.

## The TECH Project will enable the development of a local Australian battery supply chain.



# REALISING THE VISION FOR GREEN MANUFACTURING



## The Australian Government's Modern Manufacturing Strategy

The Strategy is the Australian Government's action plan to make Australia a globally recognised, high-quality and sustainable manufacturing nation, with a renewed focus on competitiveness and growth.

QPM's TECH Project delivers on key manufacturing priorities outlined in the strategy, including:

- Resources technology: Implementation of the Direct Nickel Process in the production process.
- Critical Minerals Processing: Establishment of a critical minerals refinery.
- Recycling and Clean Energy: Zero solids waste and no tailings dam, contributing to a circular economy.



## Queensland New-Industry Development Strategy

The Strategy outlines the Queensland Government's approach to support sustainable economic growth by unlocking the opportunity presented by new global demand driven by decarbonisation.

QPM's TECH Project aligns with multiple industry priorities of the Strategy, including:

- Critical mineral processing, manufacturing and product development.
- Battery industry development.
- Circular economy including resource recovery and recycling.



## Critical Minerals Strategy 2023-2030

The national Strategy establishes a framework to grow Australia's minerals sector, setting out how the Australian Government will work with an array of key stakeholders to seize strategic opportunities.

QPM's TECH Project directly aligns with the objectives of the Strategy to:

- Create diverse, resilient and sustainable supply chains through strong and secure international partnerships.
- Build sovereign capability in critical minerals processing.
- Create jobs and economic opportunity, including for regional and First Nations communities.

# TRANSFORMATIVE ECONOMIC GROWTH FOR NORTHERN AUSTRALIA



## North Queensland Regional Plan

The Plan provides a 25-year framework to guide growth and support future jobs in the local government areas of Burdekin, Charters Towers, Hinchinbrook, Palm Island and Townsville.

QPM's TECH Project delivers on key actions and opportunities outlined in the Plan, including:

- Planning for an encouraging new industrial expansion areas (and allied infrastructure) capable of supporting growth in advanced manufacturing and other emerging industries.
- Embracing new technologies, circular economy principles and global best practices in sustainability.



## Our North, Our Future: White Paper on Developing Northern Australia

The White Paper aims to support ongoing economic development and investment in Northern Australia to build a strong and prosperous economy in the region.

QPM's TECH Project delivers on a significant investment into the Northern Australia region, raising business and community investor confidence and interest for future developments. The groundbreaking nature of the project's economic and environmental outcomes provide strong reputational benefits to Townsville and Northern Australia.



## Our North, Our Future: 2021-2026 Targeted Growth

The Paper aims to build on the progress made by the White Paper on Developing Northern Australia by targeting specific growth opportunities to leverage strengths of Northern Australia and achieve a sustainable economy.

QPM's TECH Project leverages the regional strengths found within the Mount Isa to Townsville priority master plan, including:

- Global links supported by connectivity and infrastructure investments, such as Townsville Port.
- Expansion of manufacturing and processing industries.

# LEVERAGING TOWNSVILLE'S COMPETITIVE ADVANTAGE IN MINERALS PROCESSING

The TECH Project involves the design, construction and operation of a sustainable, high-purity critical minerals refinery located within Townsville City Council's Lansdown Eco-Industrial Precinct.

The TECH Project will import high quality ore from New Caledonia to Townsville, to be processed with captured waste mine gas in a cutting-edge circular manufacturing process that produces no dangerous tailings waste.



**Available heavy industrial land**



**Circular economy potential**



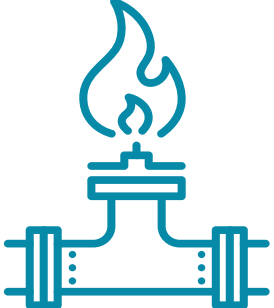
**Quality transport connectivity**



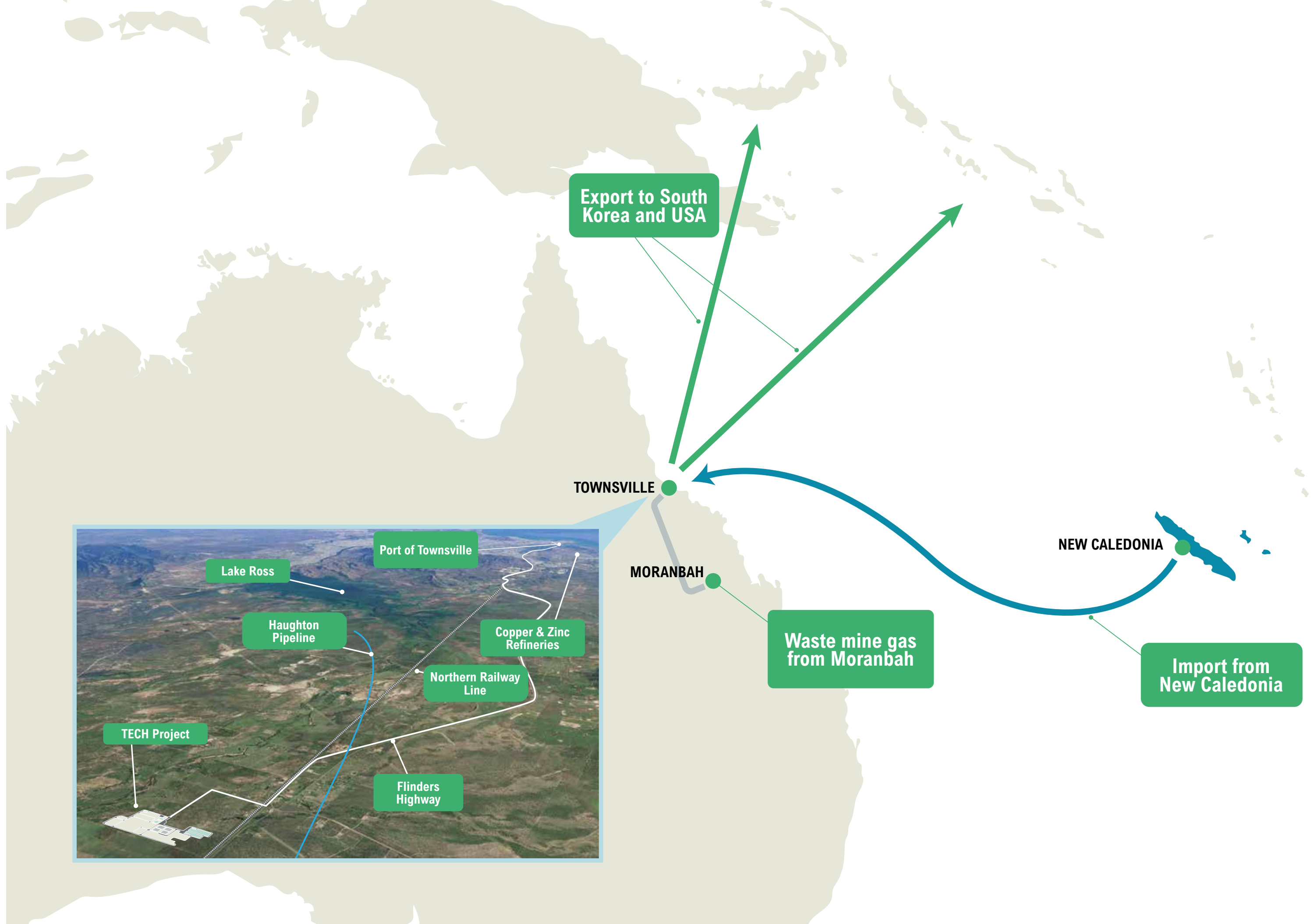
**Available raw water supply**



**Large and skilled workforce**



**Adjacency to NQ Gas Pipeline**





# THE TECH PROJECT IN DETAIL

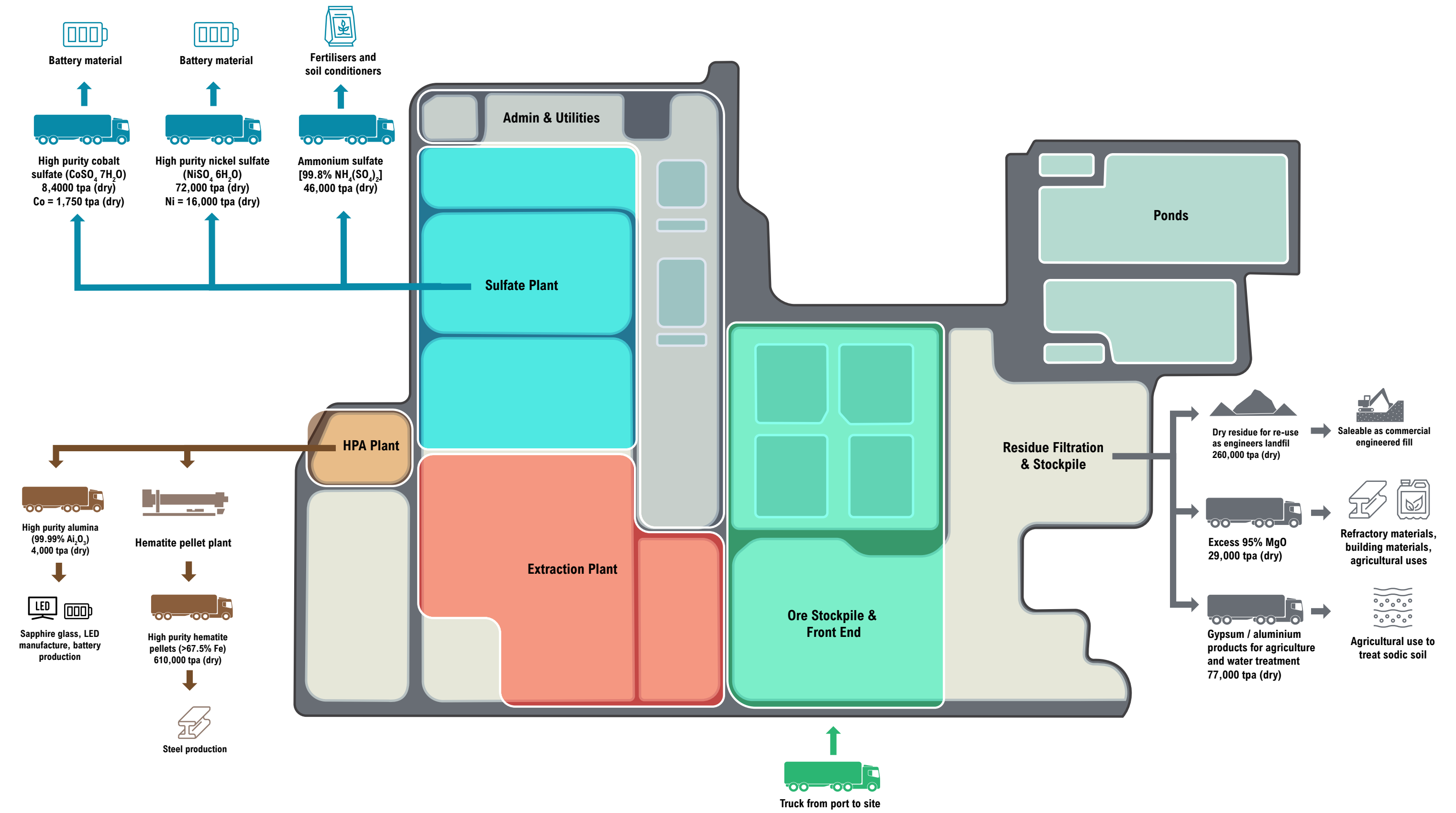
The TECH Project will produce a number of critical minerals essential for global technology needs, particularly within emissions reduction, advanced manufacturing and defence.

## The key products from the plant include:

- Nickel sulfate and cobalt sulfate (for lithium ion batteries)
- High purity alumina (for LEDs, microchips and sapphire glass)

## The co-products generated include:

- Hematite pellets (for steel production)
- Ammonium nitrate, ammonium sulfate, gypsum and magnesia (as fertilisers and soil conditioners)
- Zinc sulfate (supplying Sun Metals Zinc Refinery in Townsville)
- Engineered fill (to support local construction industry - displacing quarried materials)




# TRANSFORMING METALS MANUFACTURING IN AUSTRALIA WITH THE DNi PROCESS™

The TECH Project will employ the proprietary Direct Nickel Process (DNi Process™). The DNi Process™ is a patented nickel processing technology developed in Australia in collaboration with the CSIRO. Owned by the Altilium Group, QPM has obtained the rights to use the DNi Process™ from Altilium and, via Australian R&D, has made significant improvements to commercialise the technology.

Area	Direct Nickel Process as implemented by the TECH Project	High Pressure Acid Leach (HPAL) – Existing and New Indonesian Plants
Ore Feed	✔ Full lateritic ore profile	✘ Only limonite or low Mg saprolite
Acid Consumption	✔ 20 - 30 kg of nitric acid per tonne of dry ore processed	✘ 250-500 kg of sulfuric acid per tonne of ore processed
Acid Recovery	✔ ≥ 98.5% of the nitric acid is recycled	✘ All reagents consumed and converted to waste products
Co-Products	✔ Hematite, Magnesia, Ammonium Sulfate. All valuable metals recovered from the ore.	✘ Ammonium Sulfate. Other metals are wasted as tailings.
Tailings Dam	✔ No	✘ Yes
Waste Materials	✔ None – The silica residue from leach is suitable as an engineered fill material. Represents approximately 25% of the original mass.	✘ Tailings requires neutralisation, containment and indefinite monitoring. For every 1 tonne of ore processed, HPAL produces 1.4 - 1.5 tonnes of tailings.
Liquids Discharge	✔ Zero process liquids discharged.	✘ Significant process water (often untreated) discharged into oceans.
GHG Emissions	✔ NEGATIVE 39.5 tonnes CO <sub>2</sub> -e per tonne of nickel (cf world > 20 kg/tonne) i.e. net >59.5 tonnes CO <sub>2</sub> e better	✘ 19 tonnes CO <sub>2</sub> -e per tonne of nickel

The DNi Process™ is a patented nickel processing technology developed in Australia in collaboration with CSIRO.



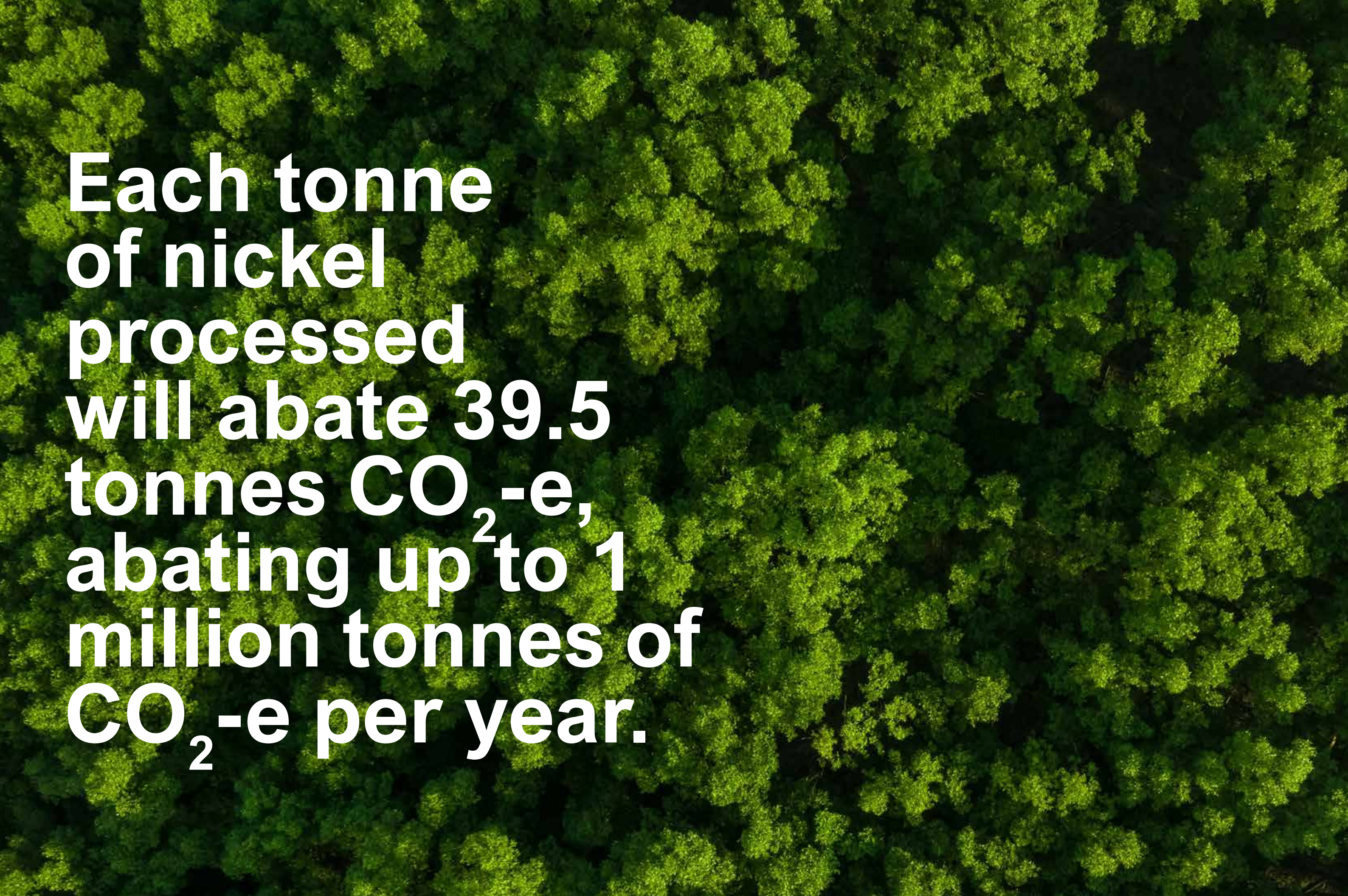
## ZERO EMISSIONS MANUFACTURING

Metal refining and processing accounts for approximately 10% of global greenhouse gas (GHG) emissions. In 2021, over 12.7 million tonnes of GHG emissions were attributable to production of non-ferrous metals in Australia.

The TECH Project will directly reduce total carbon emissions in Australia by harvesting waste metallurgical coal mine gas from mines in the Northern Bowen Basin for productive use. This gas would otherwise be flared or directly emitted into the atmosphere as a fugitive emission of methane.

At peak production, the TECH Project will abate at least 989,000 tonnes of CO<sub>2</sub>-e emissions per annum.

Traditional processes for refining nickel laterite ore such as High Pressure Acid Leach (HPAL) produce 19 tonnes of CO<sub>2</sub>-e, per tonne of nickel processed.



**Each tonne  
of nickel  
processed  
will abate 39.5  
tonnes CO<sub>2</sub>-e,  
abating up to 1  
million tonnes of  
CO<sub>2</sub>-e per year.**



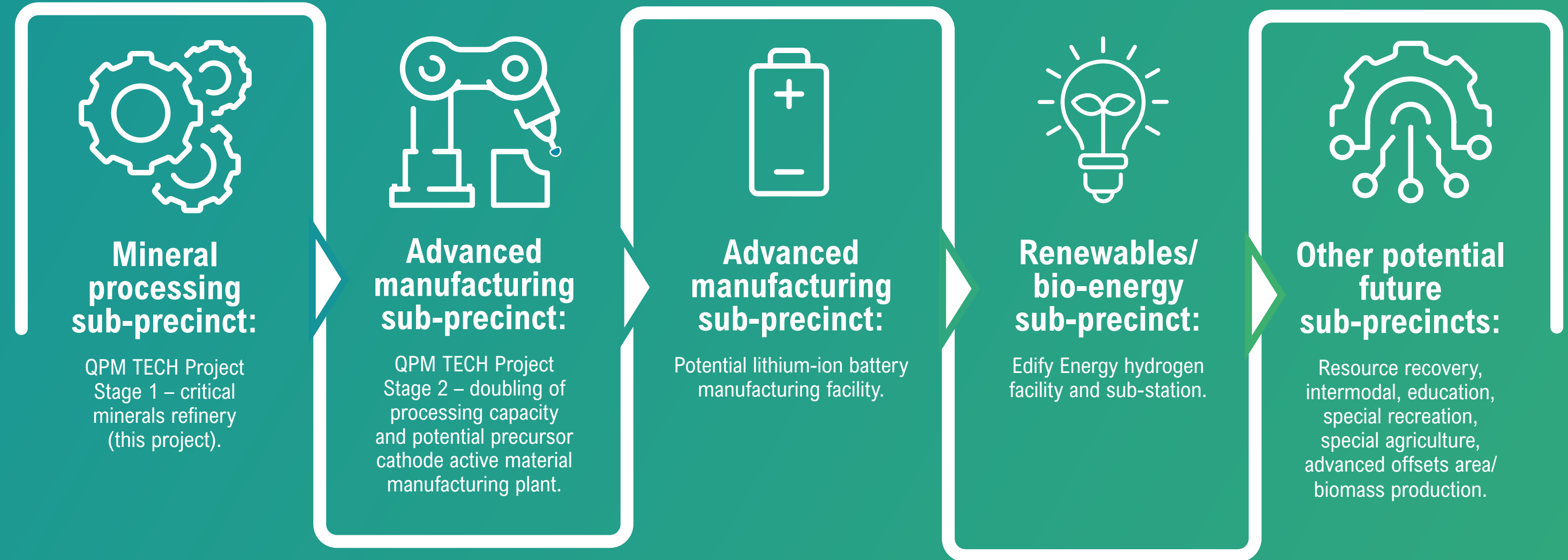
## ENABLING A THRIVING ECO-INDUSTRIAL LANDSCAPE

The Lansdown Eco-Industrial Precinct (LEIP) will be Northern Australia's first environmentally sustainable advanced manufacturing, technology and processing hub, funded under the Townsville City Deal.

The LEIP is located within the Townsville City Council Local Government Area, roughly 40km south of the Townsville Port on the Flinders Highway.




## Future development pathway for the Lansdown eco industrial precinct



# STRATEGIC BENEFITS OF THE PROJECT

## Pacific Partnerships


QPM has secured binding ore supply agreements with four significant mining companies in New Caledonia, for up to 2.1 million wet metric tonnes of nickel laterite ore per annum for QPM. These agreements secure QPM's ore supply requirements for the TECH Project.




**Ore supply agreement:** 1 million wmt  
**Term:** 5 years (plus 5-year extension subject to mutual agreement)



**Ore supply agreement:** 200,000 wmt  
**Term:** 10 years




**Ore supply agreement:** 600,000 wmt  
**Term:** 10 years




**Ore supply agreement:** 300,000 wmt  
**Term:** 10 years

### Benefits to New Caledonia



Rise in economic activity via increased exports



Provides miners a customer for the fraction of the limonite ore body that often otherwise goes to tailings or waste



Reduced reliance on China as a trading partner



Strengthening bilateral relations with Australia and balancing trade inequalities

### Benefits to Australia



Secure supply for the TECH Project



Enabling growth in advanced manufacturing



Facilitating a reduction in carbon emissions




Strengthening bilateral relations with the Pacific and improving trade inequalities

## Other Partnerships

The TECH Project will deliver on key actions detailed in statements of diplomatic partnerships established between Australia and various other nations, while also diversifying global production of critical minerals and associated supply chains.

### Australia-United States Climate, Critical Minerals and Clean Energy Transformation Compact




Promote responsible, sustainable and stable supply of critical minerals.



Drive the development of emerging battery technologies

### Australia-Republic of Korea Comprehensive Strategic Partnership



Ensure supply chain resilience for critical minerals



Accelerate the development of technologies to reduce carbon emissions




Implement technology-led approaches to grow economies and create jobs

### Quad Statement of Principles on Clean Energy Supply Chains in the Indo-Pacific



Diversify clean energy supply chains in the Indo-Pacific



Supporting future clean energy workforce needs










Interoperability in technical standards, policies and measures

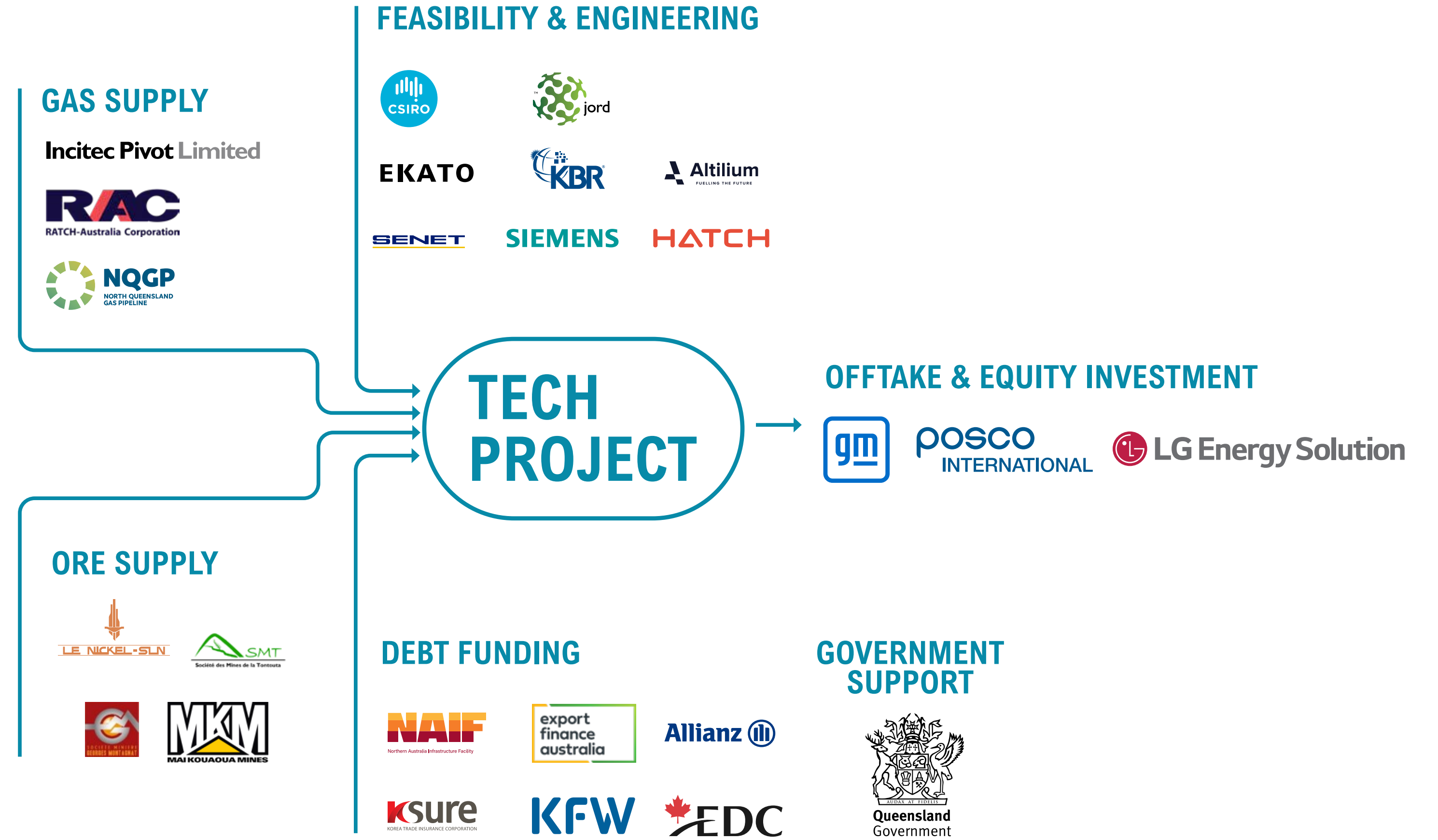


Cooperation to drive towards ESG practices for clean energy supply chains

# TECH PROJECT REACHING MAJOR MILESTONES

The TECH Project has reached a number of key milestones with its project partners:

-  Rights obtained to use the CSIRO-developed DNi Process™ from Altilium.
-  Binding ore supply agreements with New Caledonian miners for up to 2.1 million wet metric tonnes of ore per annum.
-  Recently announced acquisition of gas producing asset with sufficient reserves for minimum 10+ years of TECH Project operation.
-  Hatch leads engineering with key design undertaken by major equipment partners, including performance guarantees on equipment.
-  100% nickel and cobalt for Stage 1 and Stage 2 of the TECH Project committed to Korean and USA EV battery manufacturers. All customers hold equity interest in QPM.
-  A\$1.4+ billion secured in conditional debt commitments from potential financiers.
-  “Significant Investment Project” and “Prescribed Project” status granted by Queensland Government (one of the first companies to receive this).



# ECONOMIC BENEFITS

The TECH Project will deliver a major boost to the Townsville and North Queensland economy with benefits extending throughout Queensland and Australia.

## Construction of the plant will include:



### \$2.1B

Capital expenditure at the Lansdown Eco-Industrial Precinct



### 578 FTE

Jobs per year benefit over a three-year construction program



### \$962M

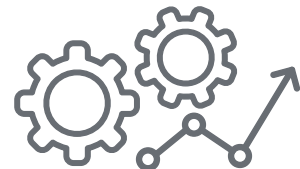
Spend on regular plant maintenance to 2055

## Operational benefits of Stage 1 of the project to Townsville will include:



### \$1B

Increase in annual economic output



### 30%

Increase in local manufacturing activity



### 335 FTE

Directly employed in high-skill positions in Townsville (80% processing employees)

The TECH Project is economically desirable.

For every \$1 of cost, it generates \$1.61 of benefits (undiscounted).

# CONTRIBUTION TO GOVERNMENT REVENUES

The TECH Project will deliver considerable additional taxation revenue to the Queensland and Australian governments, totaling over \$3.9 billion over the life of the project.



**\$3.1B**

Australian Government net additional taxation revenue.



**\$831M**

Queensland Government net additional taxation revenue.

**FIRST FIVE YEARS OF STAGE 1**

**Australian Government**

**\$585M**

Australian Government net additional taxation revenue.

**Queensland Government**

**\$149M**

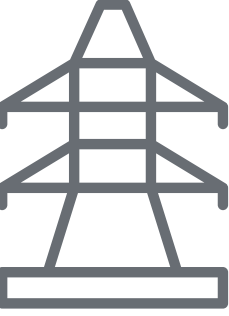
Queensland Government net additional taxation revenue.

The TECH Project will also generate significant revenue for Government Owned Corporations every year, including:



# ASK OF GOVERNMENT

Realising the TECH Project vision requires the following support from government:



## Precinct Enabling Infrastructure

The Lansdown Eco Industrial Precinct is a greenfield development, led by Townsville City Council. Some enabling works have commenced, but critical transport (road and rail), telecommunications, construction camp and electricity transmission network upgrades are still required to support both the TECH Project and other proponents in the precinct.



## Equity Investment

QPM has secured A\$1.4 billion in conditional debt commitments from a range of debt providers, including concessional debt finance from Korea and Canada. All offtake partners are equity investors in the company. However, to realise the investment, the Queensland and Australian Governments need to take an equity stake in the project – potentially through the Queensland Investment Corporation or the National Reconstruction Fund. This is essential to compete with other countries in which these businesses can be built.



# ENGAGING WITH THE LOCAL COMMUNITY

QPM's strategy concerning sponsorships is to foster youth engagement in sports at all levels, focusing on low entry barriers. To this end, QPM has adopted the Woodstock Horse Sports Club, The Challenge Games, and the Townsville Table Tennis Association as local groups they currently sponsor annually.

With annual sponsorships, QPM has sponsored the Cannonballs U18 Indigenous rugby league team to attend the Murray Games in Brisbane in 2022 and supported the Woodstock State School in funding their 'Small Town Culture' music video showcasing the attributes of growing up in a small town in Australia. In addition, in 2023, QPM sponsored Table Tennis Queensland to bring the Junior Table Tennis Championships to Townsville in April.



**U18 Townsville Cannonballs Rugby League Team  
Qld Murri Carnival in Brisbane 28-30 September 2022**

**Back Row**

Adrian Sandy, Elijah Tapau-Taylor, Izreal Osea, Tajshon Messa-Santo, Tremaine Priestley

**Middle Row**

Adrian Sandy Snr (Coach), Thomas Sailor, Jayden Henaway, Xavier Hellyer, Vivian Nathaniel, Hansen-Murdoch, Izaya Leedie

**Front Row**

Riwah Walden, Cody Graham, Riley Dempsey, Terry Conners, Allan Wharton, Jack Prior, Jamaine Stanley, Rayzarlin Pearson

**In Front**

Stewart Hagan (Queensland Pacific Metals)  
Eddie Smallwood (Gudjuda Reference Group)

# OPPORTUNITIES FOR FIRST NATIONS

## First Nations representatives have been central to the development of QPM's Indigenous Engagement Strategy.

The TECH Project will support the employment of Indigenous persons. AEC Group estimates that the Project will support an average of 25 skilled Indigenous FTE jobs per annum in Townsville and 29 across the entirety of Northern Queensland.

The traditional owners of the Lansdown site, which will host the Project, are the Bindal People.

To achieve best practice, QPM has entered into a Cultural Heritage Management Plan with the Bindal People.

QPM has completed a cultural survey of the TECH Project site, including the Bindal People in the process and adopted all survey recommendations.

In addition, QPM has entered into a Head of Agreement with the Bindal People to identify and promote any opportunities for Indigenous employment, training and skills development.

The TECH Project's Independent Environmental and Social Consultant has commented positively on QPM's level of engagement with traditional owners.

QPM has committed to an agreement regarding employment, training, apprenticeships and other opportunities for Indigenous people and will work with traditional owners to define the skills required for the positions and identify suitable candidates.



Townsville Project Manager, Stewart Hagan second from left, with representatives of the Bindal People





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