

I am humbled to be presenting on the land of one of the oldest continuous cultures in the world and I pay my respects to the traditional custodians and elders of this country and I acknowledge the 60,000 years of First Nations knowledge and their continuing connection to land, sea and community.

Building the NWMP Supply Chain & Infrastructure Corridor

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QEC TECH SUMMIT

August 2022



MOUNT ISA TO TOWNSVILLE ECONOMIC DEVELOPMENT ZONE



The Dynamic North West Mineral Province

Nothing else on earth
measures up



MOUNT ISA TO TOWNSVILLE ECONOMIC DEVELOPMENT ZONE





The North West Minerals Province is one of the world's richest mineral producing areas containing copper, lead zinc as well as major phosphate deposits and strong rare earth potential.





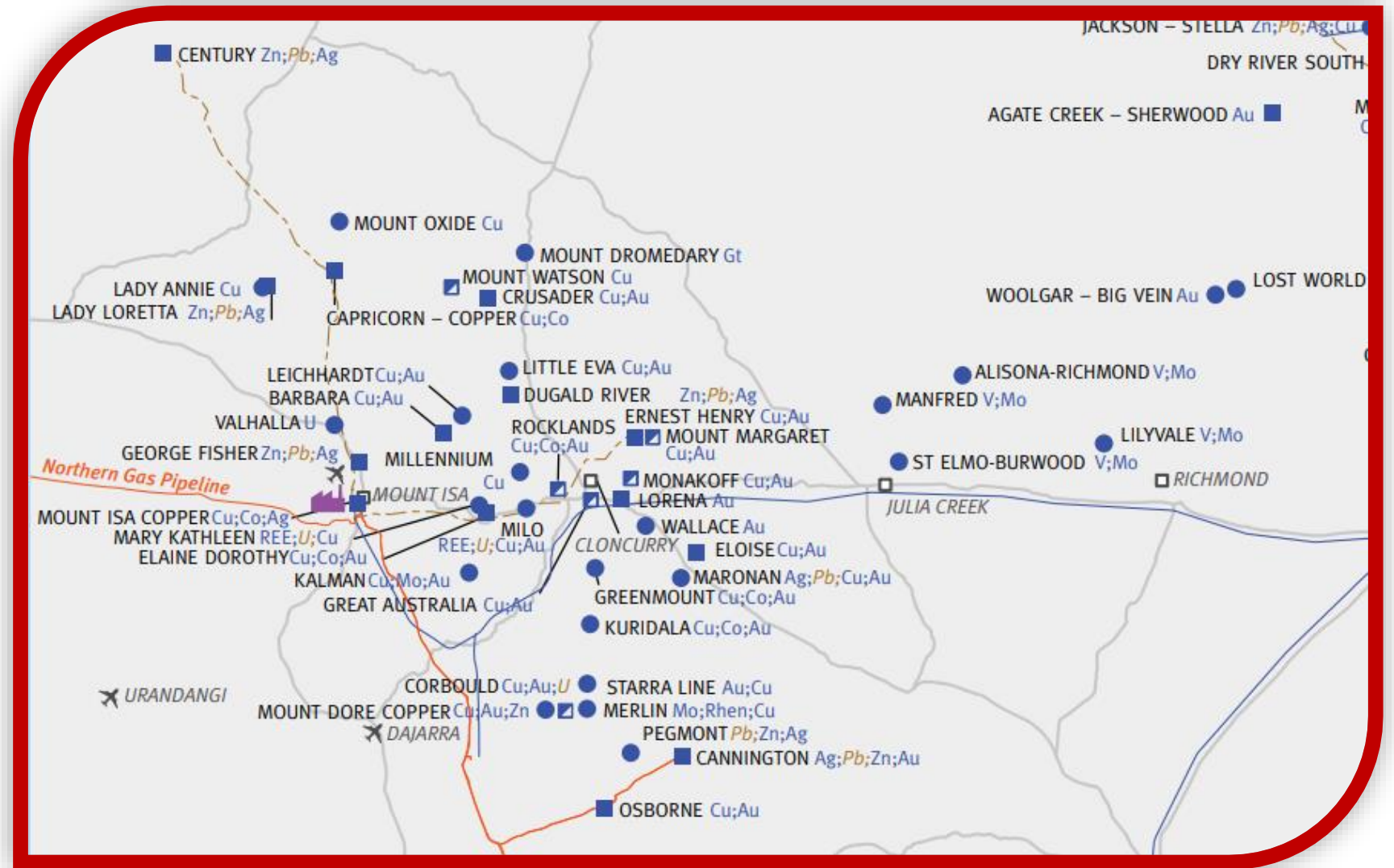
Positive economic supply chain impacts along the entire North West corridor including zinc and copper refineries in Townsville as well as Port of Townsville



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Together with existing mining operations, the NWMP is well positioned to meet new economy mineral demand as the world continues to shift towards renewables.



Current Proponents



MITEZ
ECONOMIC DEVELOPMENT



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Mount Isa Mines produces copper at Enterprise and X41 underground mines.

Zinc assets consist of George Fisher underground mine and Lady Loretta underground mine.

A copper concentrator, zinc-lead concentrator and filter plant, copper smelter and lead smelter operate at Mt Isa, processing ore to produce copper anode, lead bullion and concentrates. Products are railed to Townsville for further refinement.

Ernest Henry Mine includes a shaft underground mine and copper concentrator producing a copper-gold concentrate that is transported to MIM for smelting.

Copper Refineries P/L is an electrolytic copper refinery in Townsville producing copper cathode.

Cathode is trucked to Port.

Glencore concentrate product is exported from the Port together with third party fertiliser through Glencore's Berth 8 shiploader. Processed lead and copper cathode are loaded at NSS's Berth 3.



12%
of Port
trade





Mineral concentrates

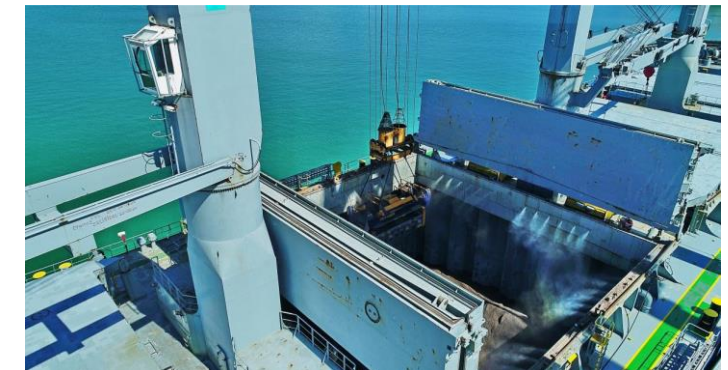
Dugald Rive mine is 100% owned by MMG and predominantly produces zinc concentrate, with by-products including lead and silver.

Concentrates are loaded into 1/2 and 3/4 height containers and transported by triple road train to Cloncurry container hub (80 km from Dugald River). Containers are then railed to Stuart container hub in Townsville.

Containers are trucked from Stuart to Port via the Port access road, ready for loading by rotainer crane into a bulk cargo vessel. A misting system is used to control dust when loading concentrates.



5%
of Port
trade





Mineral concentrates

South 32's Cannington mine is one of the world's largest producers of silver and lead.

Zinc and lead concentrate are transported by road to storage and rail-loading facilities at Yurbi (15km east of Cloncurry), loaded onto rail and transported to Port.

At the Port, rail wagons are unloaded by rotary tippler and concentrate is conveyed to a 40,000 tonne capacity storage shed. Concentrate is loaded for export through South 32's Berth 11 ship loader.



4%
of Port
trade



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Mineral concentrates and Refined zinc

Sun Metals Zinc Refinery is an Australian subsidiary of Korea Zinc, the largest zinc and lead producer in the world.

The refinery sources raw materials from the NWMP and overseas to produce high grade zinc metal. Low grade zinc concentrate and copper cake are also produced and exported.

Sulphuric acid, a secondary product, is sold to IPL as an input to fertiliser production. Depending on markets sulphuric acid can also be imported or exported.

The refinery expansion will be completed in 2022 and includes a new electrolysis building, ferric oxide facilities, and leaching and purification areas allowing annual production of zinc to increase by almost 25%.

Sun Metals are the biggest containerised exporters at Port of Townsville. Road transport is used to Port.



9%
of Port
trade



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ECONOMIC DEVELOPMENT



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Over 30 major commodities traded through Townsville Port



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Transport & Logistics



MITEZ
ECONOMIC DEVELOPMENT



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Mount Isa Rail Line

Over 1,000 km of track from Townsville to Mount Isa including the Phosphate Hill branch.



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Mineral concentrate, fertiliser, mining inputs, refined metals and cattle are all moved on the Mount Isa Line + the InLander



Mount Isa Rail Line

- critical link from the North West Minerals Province to the Port of Townsville
- Major driver of economic activity along the North West Corridor
- Carries bulk zinc, copper, lead, silver, fertiliser to Port for export
- Alternative rail proposed from time to time (Mt Isa to Darwin/inland rail to Wyndham)
- First mile, last mile challenges for junior miners and emerging projects to Port
- A number of LGAs working on Multi-User Rail Load-Out facilities
- Containerised freight stops at Stuart terminal 12km from Port
- “*Neglected*”, “*state of disrepair*”
- Requires upgrades and serious infrastructure investment
- Maintenance and capital asset renewal funded from QR revenue (no direct support from Govt)
- Most expensive corridor for above rail access in the country – path charge and variable charge
- Capacity for low-value/high-volume phosphate projects



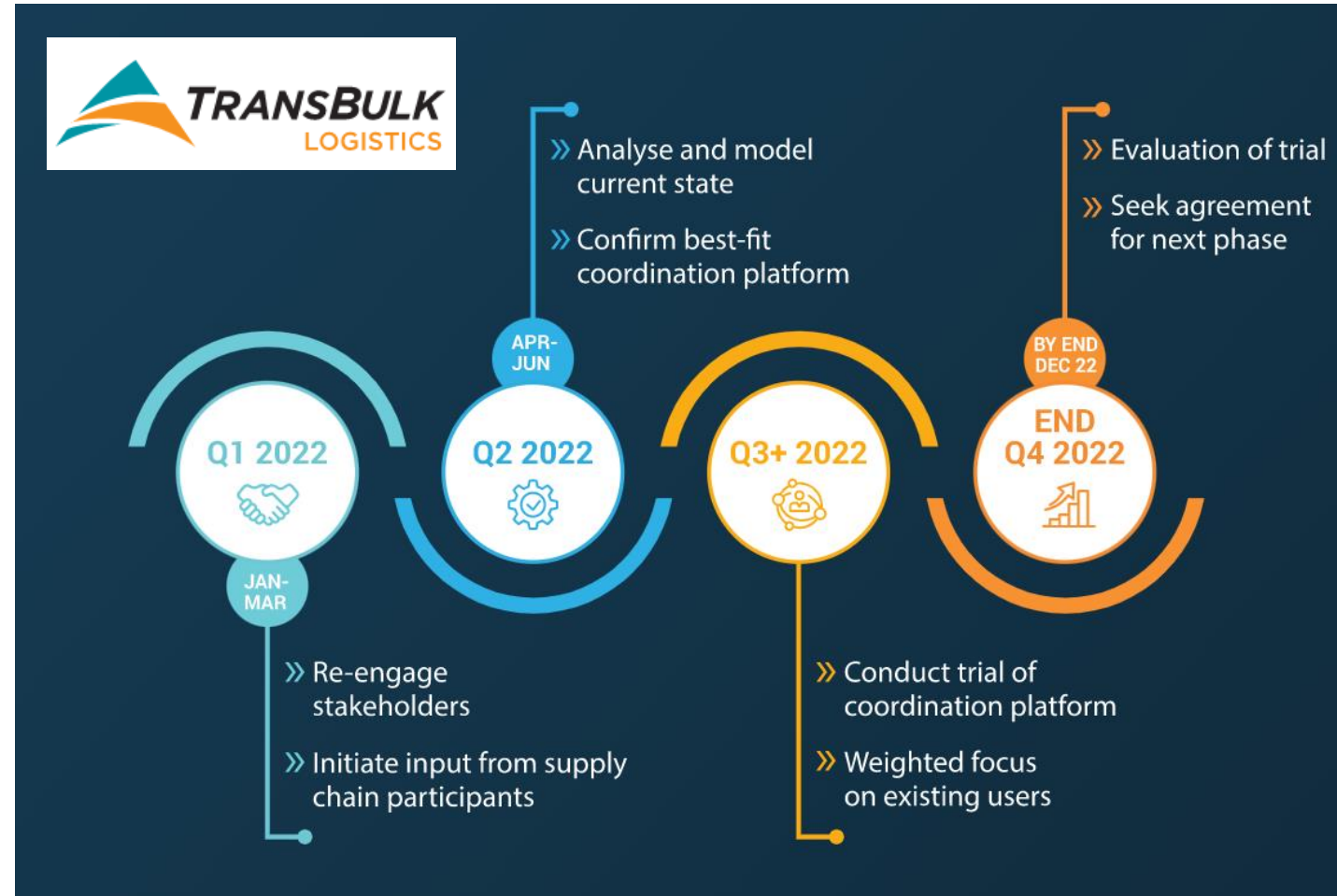
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Independent Logistics Coordination Trial

A \$1.8m proof of concept trial to find best model for collaboration and coordination to complement existing initiatives to:

- Reduce costs
- Increase efficiencies
- Higher utilisation rates
- Take more freight off roads
- Unlock new investment
- Give junior miners and new ventures access and efficiencies like large resource companies



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TEARC



8.3 km of track connecting the connecting the Mount Isa Line to the North Coast rail line directly into Port of Townsville, through the TSDA parallel to the Port Access Road, accommodating 1,000-metre trains.



The Townsville Port Access Road, a designated heavy vehicle route, provides road train access to the Port of Townsville around the clock, avoiding residential streets and without the need for permits. The direct link to the Port has markedly increased freight efficiencies particularly with Triple Road Train access.



MOUNT ISA TO TOWNSVILLE ECONOMIC DEVELOPMENT ZONE





Mineral concentrate, sulphuric acid, isotainers, containers and live cattle are all moved by road.





The Truck Staging Area at the Port entrance has capacity for 20 triple road trains to assemble at any one time easing congestion and improving safety on Port roads.





Port Expansion Project

\$1.8B

6 outer harbour berths

30 year staged development



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Land & Energy



MITEZ
ECONOMIC DEVELOPMENT



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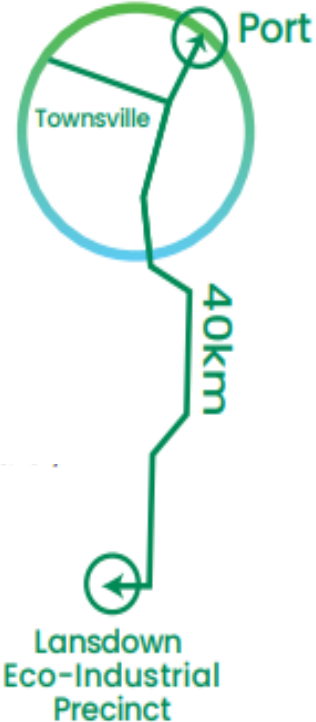
Council Lansdown Precinct: LEIP

Developed on a 2,200ha land parcel south of Townsville at Calcium with access to rail, road, water, power and natural gas.



Lansdown
Eco-Industrial Precinct

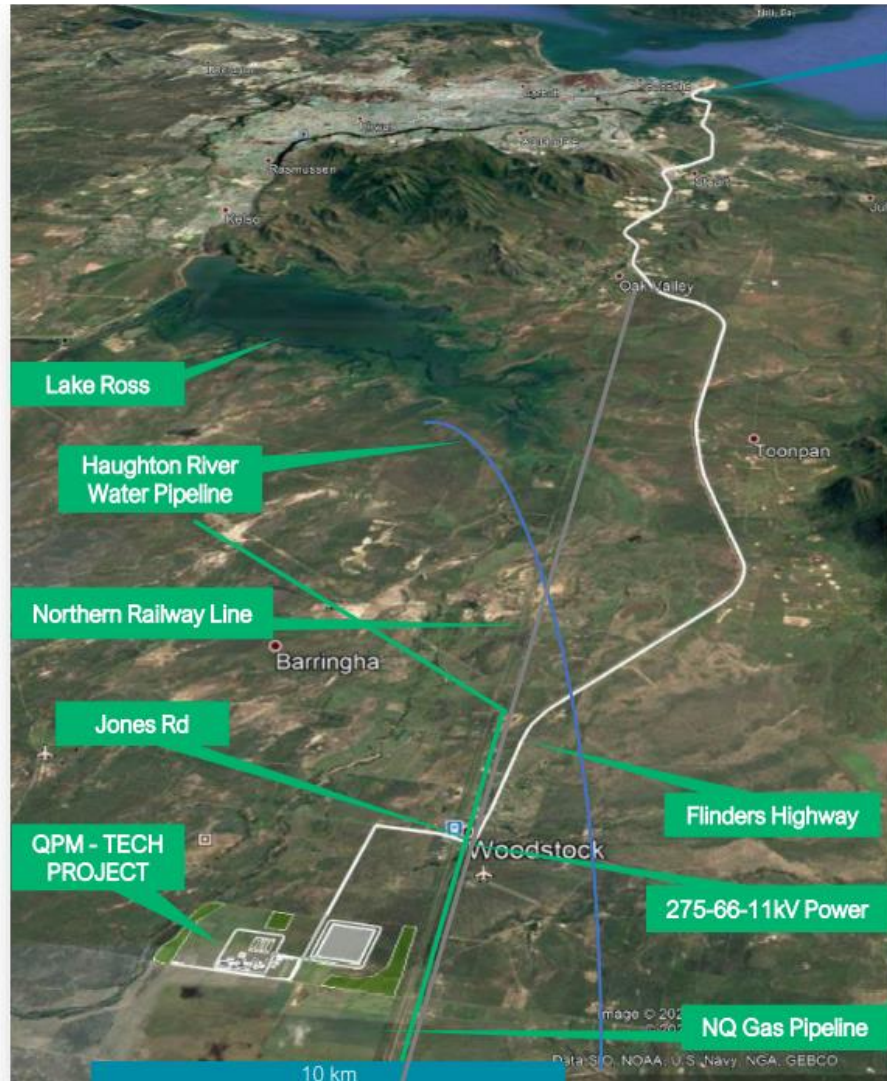
Northern Australia's foremost eco-industrial precinct for **advanced manufacturing, processing, technology** and **emerging industries.**



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Council Lansdown Precinct: QPM Anchor Tenant



TOWNSVILLE PORT



Ideal site (290 Ha) allocated to QPM in the Lansdown Eco-Industrial Precinct

- Water pipeline 12 km away
- Gas pipeline (35 PJ/y capacity – we need 10 - 12 PJ/y)
- Electric transmission lines (275kV, 66kV and 11kV)
- Fibre optic communications
- Existing Ross River (140 MW) and future Edify (400MW) solar arrays
- Road train access to Townsville Port (Flinders Highway)
- Rail line
- Environment - gently undulating grazing land, sparsely wooded
- Zoned heavy industrial
- Cultural Heritage Management Agreement signed
- Skilled workforce and attractive lifestyle location



QPM: Conceptual Project Layout



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Townsville State Development Area

4,900ha of land dedicated for industrial development currently home to Aurizon intermodal facility, Glencore refinery, Origin Energy generator plant, PN rail freight terminal, Sun Metals refinery.



Situated on the junction of the Bruce & Flinders Highways (triple road train access) with direct connections to rail networks and 8km south of the Port of Townsville.



MOUNT ISA TO TOWNSVILLE ECONOMIC DEVELOPMENT ZONE



Townsville State Development Area



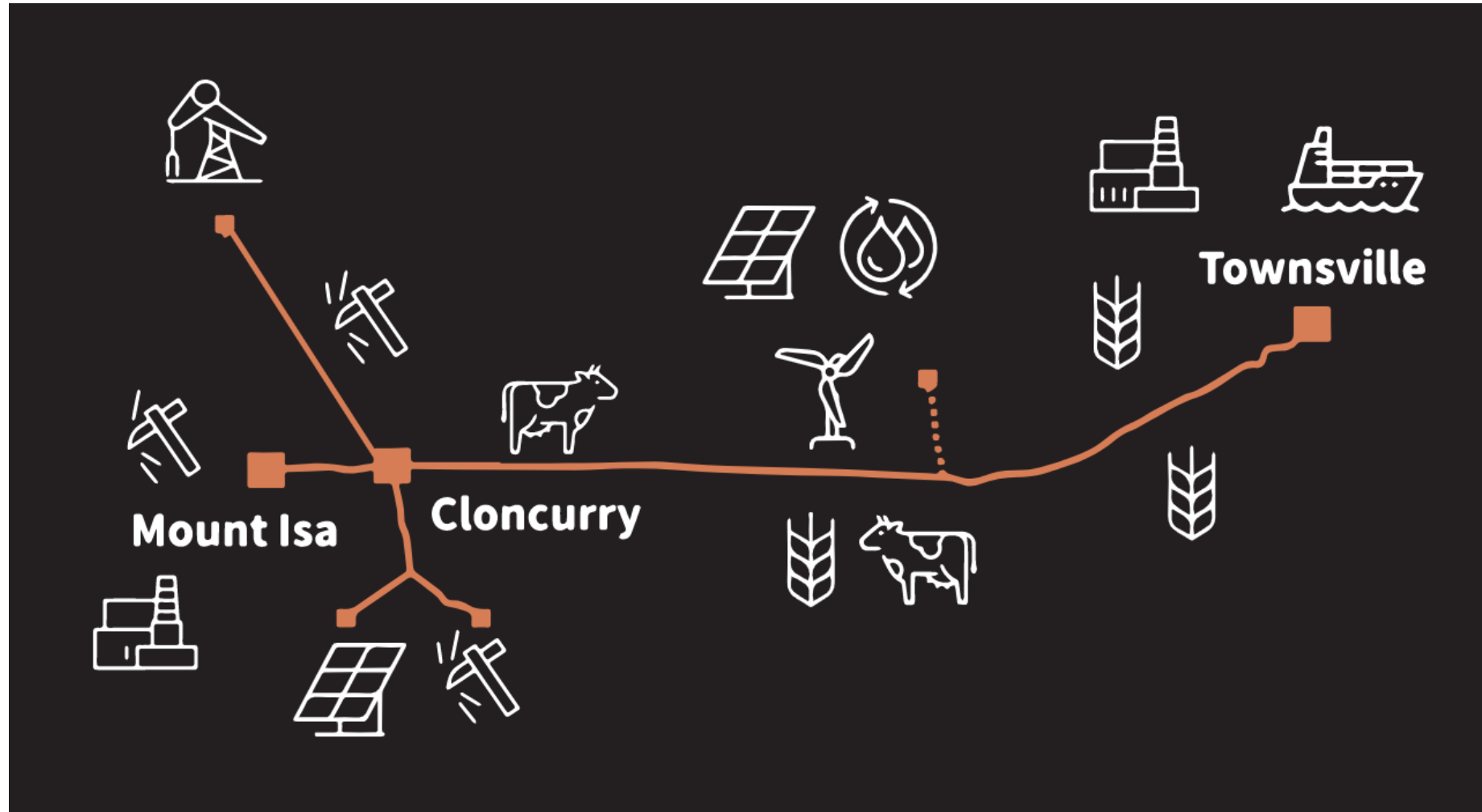
Industrial Park development almost completed with:

- Type 2 road train access in and out of the estate
- Serviced lots from 2ha to 10ha+
- Pre-lease and design and construct opportunities
- Bio-security opportunities for sea freight



Copper String 2.0

A 1,000km high-voltage network line that will connect the businesses and communities of the North West Minerals Province to the National Electricity Grid.



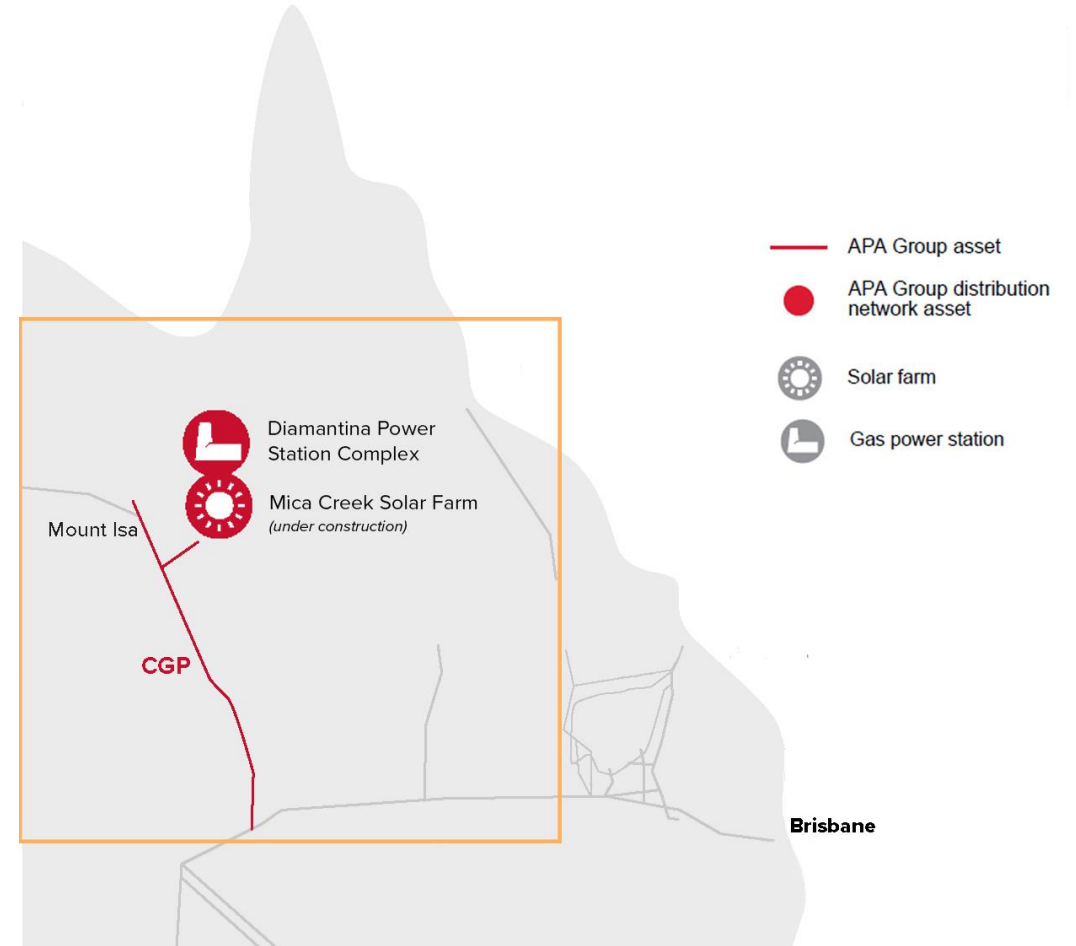
APA

APA owns and operates the Diamantina Power Station, on-demand natural gas-fired electricity comprising 242 MW power generation from combined cycle gas turbines.

APA operates the X41 and Daandine Powers Station, gas fired engine/generator assets.

APA also owns and operates the Carpentaria Gas Pipeline which includes:

- 840km pipeline between Ballera and Mt isa (including Mt Isa lateral), and
- 96km Cannington Lateral pipeline



APA is developing an 88MW solar farm at Mica Creek operational by mid 2023. It is fully contracted with 15 year off take agreements with both MMG and Glencore.



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Kennedy Energy Park



- World's first utility-scale hybrid wind, solar and storage project
- Located in Flinders Shire
- Jointly owned by Windlab and Eurus Energy
- Commenced sending power to the grid 2021

43 MW of wind

| 15 MW of solar panels

| 2MW/4MWh of battery storage



Potential Projects & Proponents



MITEZ
ECONOMIC DEVELOPMENT



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Vanadium

- NWMP globally significant supplier of high-quality vanadium
- Behind China and Russia, Australia holds third largest deposits of Vanadium
- Battery sector driving vanadium demand growth
- Markets developing rapidly for vanadium pentoxide as main ingredient of electrolytes in vanadium flow battery
- V flow battery:
 - stores large amounts of energy indefinitely as metal charges/discharges reliably cycle on cycle
 - lifespan of 20 years
 - immediate energy release
 - suitable for grid and off-grid settings
 - guaranteed uninterrupted power supply ideally suited for wind/solar farms, industrial and utility-scale applications, remote/regional area supply or to provide backup power.



Vanadium



Saint Elmo Project



Julia Creek Vanadium & Oil Shale Project



Debella Vanadium & HPA Project



Richmond Vanadium
Joint Venture





- Working on the Project, east of Julia Creek, since 2014 when exploration revealed significant amounts of vanadium
- 20 year mine life
- Containerised vanadium and alumina exports
- Declared a prescribed project in February 2020



- A Resource Upgrade in March 2022, of this Julia Creek project, saw a 64% increase in size of JORC Resource making it one of the single largest Vanadium deposits in the world today
- pilot plant built
- renewables PFS complete
- advanced pilot program begins





- Developing the Debella Vanadium + HPA Project near Julia Creek
- Project contains a high-grade resource
- Targeting initial production in 2023
- Primarily producing a high purity vanadium pentoxide product, vanadium electrolyte and high purity alumina for the battery markets



- The scale of the project, between Julia Creek and Richmond, with a global Mineral Resource of 1.8B tonnes vanadium pentoxide suggests one of largest in the world
- Updated PFS was released in March 2022 detailing a 20-year initial mining operation with an annual production capacity of 790,000 tonnes
- Declared a coordinated project in May 2022



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Nickel & Cobalt Sulphate

- Growing adoption of electric vehicles critical in driving demand growth in recent years
- In particular the growing demand for lithium-ion batteries for electric vehicle market
- Sulphates key raw material used in the production of cathodes for lithium-ion batteries.
- 70% of cobalt sulphate supply comes from Democratic Republic of the Congo where fears about political instability and the challenges of ethical sourcing combine to supercharge supply concerns.



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Nickel & Cobalt Sulphate



Queensland
Pacific Metals

TECH Project



Sconi Project



- Importing bulk nickel ore from New Caledonia
- Building sealed bulk intermediate storage shed at Port of Townsville
- Processing in Battery Metals Refinery at Council's Lansdown Precinct
- Producing battery grade chemicals for lithium ion battery market
- First imports expected July 2023
- Exports of containerised nickel and cobalt sulphate, HPA and Magnesia as well as Hematite





- Developing nickel/cobalt manufacturing facility
- Patented leaching process refines intermediate nickel/cobalt products (MHP) to produce nickel/cobalt battery materials
- Large scale Demonstration Plant acquired in Europe and producing commercial quantities to underpin investor confidence
- Engaging with NAIF, CEFC & Private investors



- Developing a cobalt-nickel-scandium Sconi project near Greenvale
- 30 year mine life with 75 million tonne ore reserve
- Plans to process ore into advanced battery precursor chemicals on one single site
- Processing plant to be commissioned in 2024/2025



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-- Thank You --



Advocate for the region

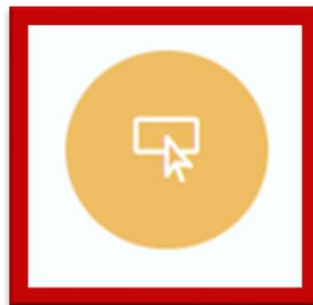


Collaborative and inclusive engagement



Leverage funding

Facilitate the delivery of optimal impact, sustainably sound, economic growth initiatives that will create employment opportunities and raise prosperity.



Deliver projects

Empower members with access to practical resources and a strong network of like-minded professional peers to pursue opportunities in our region.

