

**ASX RELEASE
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GHG Report Confirms TECH Project's Low CO₂ Emissions

Highlights

- **TECH Project estimated CO₂ emissions is 36% lower than industry average calculated by the Nickel Institute for nickel sulfate production**
- **Potential for CO₂ emissions to be further reduced and to have net-negative CO₂ emissions if gas supply is derived from vented/flared gas at existing Queensland coal mines**
- **Findings based on report prepared by Minviro**
- **QPM positioning the TECH Project to be a world leader in sustainable nickel production**

Queensland Pacific Metals Ltd (ASX:QPM) ("**QPM**" or "**the Company**") is pleased to announce the findings of an interim report into greenhouse gas ("**GHG**") intensity of the TECH Project.

GHG Report

QPM commissioned Minviro, an international company specialising in life cycle assessment of mining and mineral processing projects, to prepare an interim report on the GHG emissions for the TECH Project. Minviro's approach to calculation of GHG emissions is a 'cradle to gate' approach which encompassed:

- Mining of ore in New Caledonia through to processing of ore to final products;
- Transportation of final products (nominally Asia); and
- Transportation relating to reagents required for the TECH Project.

The inputs for Minviro's emissions calculation were taken from QPM's Pre-Feasibility Study for the TECH Project, scaled up in accordance with QPM's recently announced expansion plans (1.2-1.5Mtpa) and adjusted for subsequent optimisation work undertaken by QPM. Recent spot level pricing was used to calculate the value of co-products into nickel equivalent units.

Minviro calculated the TECH Project's CO₂ emission level to be 3.4kg CO₂ per kg nickel sulfate. The TECH Project is 36% lower than the industry average calculated by the Nickel Institute which stands at 5.4kg CO₂ per kg nickel sulfate¹.

It is important to note that the Nickel Institute calculations do not consider any production from China. If China production was included, the industry average would likely be higher.

1 – Sourced from Life Cycle Data June 2020 <https://nickelinstitute.org/media/4901/lifecycledata-summary-update2020.pdf>

CO₂ Reduction Potential for TECH Project

One of the opportunities identified by Minviro in its report is the potential for the TECH Project to receive further CO₂ credits, which would reduce the level of its emissions. QPM has been assessing



a number of gas supply options for the project, some of which include utilising gas which is either flared or vented ahead of mining at existing coal operations in Queensland.

Coal mines de-gas areas for safety ahead of mining. Gas largely consists of methane, which is 34 times worse for the atmosphere in terms of global warming than CO₂. Flaring of gas is the process of burning it so that it is CO₂ released into the atmosphere rather than methane. Venting of gas is just the direct release of gas into the atmosphere.

When in operation, the TECH Project could utilise gas which would otherwise be flared or vented and receive CO₂ credits for this. The level of gas consumption for the TECH Project is significant and as a result, there is potential for the TECH Project to be a net-negative CO₂ emitter depending on the proportion of flared/vented gas and the credits which can be applied to QPM under international standards for Life Cycle Assessment.

As QPM firms up its gas supply and more information on the production of this gas supply becomes available, Minviro will update its assessment of GHG emissions for the TECH Project.

Nickel Matte – A CO₂ Intensive Input for Nickel Sulfate

QPM notes the recent announcement by Tsingshan Holding Group to sell 100,000 tonnes of nickel matte, an intermediate product which contains 70-75% nickel. Nickel matte can be produced from nickel pig iron or ferronickel as a higher nickel content product. Nickel pig iron is produced from pyrometallurgical processing, which is the highest CO₂ emitter of all nickel production, as shown below.

	1kg Class 1 Ni (>99.8% Ni)	1 kg Ni in FeNi (27% Ni in FeNi) Nickel Pig Iron / Pyrometallurgical	1kg Ni Sulfate (22.3% Ni in NiSO ₄)	1kg Ni metal in Ni Sulfate (4.48 kg Ni Sulfate)
Global warming potential (kg CO ₂ eq)	13	45	5.4	24.2 ²

Figure: CO₂ emissions for various nickel products (source: Nickel Institute¹)

2 – Calculation = 5.4 / 22.3%

The table above shows that the industry average for production of nickel pig iron is already 45kg CO₂ per kg contained nickel in nickel pig iron. Further processing into nickel matte and ultimately into nickel sulfate will further increase CO₂ emissions making this a highly carbon intensive option for batteries, which goes against the principles of the western electric vehicle industry.

Furthermore, the processing of nickel matte into nickel sulfate or firstly nickel metal (prior to conversion into nickel sulfate) is a complex, capital intensive process that is undertaken at very few places in the world. This includes Sumitomo Metal Mining's Nihama refinery in Japan and Jinchuan's refinery in China. Therefore, even if nickel matte became an accepted and mainstream intermediate to produce nickel sulfate, significant capital investment would be required to increase downstream refining capacity.



QPM CEO Stephen Grocott commented,

“We have been positioning the TECH Project to be a world leader in sustainable nickel production, with our zero liquids discharge, potential to be zero-solids discharge and no requirement for a tailings dam. The Minviro report adds another feather in the cap for the TECH Project, positioning it as a low GHG emissions project with the potential to be net-negative. We are pleased that not only are we leading the way, we have further opportunities for improvement which will be pursued in our feasibility study. The exceptional greenhouse gas life cycle analysis data makes the TECH project even more attractive to investors who supply the European, north Asian and North American battery supply chain”

This announcement has been authorised for release by the Board.

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