Adrian Gebers
Director, Production Tax Incentives Unit
Corporate and International Tax Division
Treasury, Langton Crescent
Parkes ACT 2600

12 July 2024

RE: CRITICAL MINERALS PRODUCTION TAX INCENTIVE

Dear Adrian,

Calix welcomes the Australian Government's policies designed to capitalise on Australia's comparative advantages in a decarbonising global economy, including the Critical Minerals Production Tax Incentive (CMPTI) and Future Made in Australia package, in addition to the opportunity to provide feedback.

Introduction to Calix

Calix Limited (ASX: CXL) is an Australian environmental technology company solving global challenges in industrial decarbonisation and sustainability.

Calix's patented core platform technology is ideally suited to help mineral processing enter the electric age. Our indirect heating approach is compatible with renewable sources of energy and alternative fuels. Separating the heat source from the chemical reaction enables the efficient use of green hydrogen in place of conventional, carbon intensive reducing agents, as well as the efficient capture of any unavoidable process CO_2 emissions.

Calix is applying its technology to the decarbonisation of a number of essential and hard-to-abate sectors. These include cement and lime, iron and steel, alumina, lithium and other critical minerals. Renewably powered at-mine processing can also enhance recovery of ore and create near zero-waste products, enable a significant reduction in the total global CO_2 footprint of minerals, and capture and create more value from domestic mineral and renewable energy resources.

Joint Venture for sustainable processing of lithium

In a Joint Venture (JV) with Pilbara Minerals (ASX: PLS), Calix is applying its electric calcination technology to produce a sustainable and concentrated lithium phosphate salt at Pilbara Minerals' Pilgangoora Operation.

The JV aims to develop an innovative 'mid-stream' process that can reduce the carbon-energy intensity, waste and cost associated with lithium production, while also capturing more value from the mineral resource.

An innovative mid-stream product

The mid-stream process being deployed by the JV at Pilbara Minerals' Pilgangoora Operation will see spodumene concentrate beneficiated from ~5-6% (Li_2O w/w) and 94-

95% waste to lithium phosphate, a lithium-rich chemical salt, at >98% purity. This process aims to increase the lithium content of the product over six times, from less than 3% for spodumene concentrate to 18% for pure lithium phosphate. It also aims to produce a product with potential for 100% utility, as phosphate is an important input in lithium-iron-phosphate (LFP) batteries, for example.[1]

Additionally, a mid-stream processing strategy has the potential to unlock remote hard-rock assets that may otherwise be unviable due to challenges such as long distances to export infrastructure or customers.

Reducing emissions

Calcination is one of the most energy intensive steps in the lithium battery materials supply chain. Electrification can enable this energy intensity to be decoupled from carbon-intensity to produce premium, low-carbon products.

An independent Life Cycle Assessment calculated that when using 100% renewable electricity, Calix's electric calcination technology could reduce the carbon emissions intensity of spodumene calcination by more than 90% when compared with using coal as the primary source of thermal energy in rotary kiln calcination, and by more than 80% when compared with the use of natural gas.[2]

A concentrated mid-stream product, such as the product being developed by the Calix and Pilbara Minerals JV, would also avoid the transport of waste associated with spodumene concentrate, potentially streamlining supply chains, reducing transport costs and delivering further emissions savings.

Increased utilisation of mineral resources

An additional advantage of processing minerals at the mine site is the potential to increase the utilisation of the mineral resource and reduce waste.

Fines and ultra-fines are the spectrum of the mined material with a small particle size. Fines are often incompatible with conventional thermal processing, where flue gases can simply blow the fine material out of the calciner. Alternatively, fines can be pelletised or agglomerated, however, this adds a potentially cost-prohibitive processing step. As a result, fines are often considered too difficult or expensive to handle and consigned as waste.

Electric calcination and Calix's flash calcination technology is ideally suited to processing small particle sizes, enabling the use of fines that would otherwise be discarded as waste. As such, electric calcination at the mine site offers significant potential to provide greater recovery and utilisation of the mineral resource, as well as improved operating margins, ultimately helping spodumene producers move down the battery materials value chain.

Steps to commercialisation

Market engagement with participants in the battery and chemicals supply chain has encouraged the pursuit of the mid-stream product and confirmed that it has strong

[1] Calix ASX Announcement. FINAL INVESTMENT DECISION FOR MID-STREAM DEMONSTRATION PLANT. 2 Aug 2023

[2] Calix ASX Announcement. FINAL INVESTMENT DECISION FOR MID-STREAM DEMONSTRATION PLANT. 2 Aug 2023

potential to be an improved lithium feedstock for the lithium chemicals industry.

A demonstration plant, with a full production capacity of more than 3,000 tonnes per year of concentrated lithium-phosphate salt product from a feedstock of around 27,000 tonnes per year of spodumene – including lower grade fine spodumene concentrate – passed its Final Investment Decision in FY24. The demonstration plant's estimated construction costs of $104.9m will be partially funded with a $20m Australian Government grant.

Successful demonstration of the mid-stream process may lead to its commercialisation, with the JV able to license the technology to Pilbara Minerals' commercial scale plants and the global spodumene processing industry.

Supporting flexible pathways downstream

Calix notes that the Department of Industry, Science and Resources (DISR) will develop a list of specific outputs resulting from the refinement and processing of the 31 relevant minerals within the scope of the CMPTI, and welcomes the opportunity to participate in additional consultations to help define processed critical minerals eligible for the CMPTI.

Whilst highly supportive of the CMPTI, we would like to take this opportunity to emphasise the importance of retaining flexibility for critical mineral producers to identify optimal pathways to move downstream and capture greater value from Australian mineral resources.

We strongly advocate for a broader definition of eligible lithium products than that outlined in the Critical Minerals Production Tax Incentive consultation paper.

Electrification of mineral processing and global decarbonisation tailwinds provides a unique opportunity for Australia to combine its comparative advantage in mineral and renewable resources in unique ways, developing innovative processes and defining new processing routes from the raw material to final product.

The Future Made in Australia agenda seeks to attract and enable investment in this opportunity to make Australia a renewable energy superpower, adding value to our resources and strengthening economic security.

Calix and Pilbara Minerals' mid-stream process is strongly aligned with the policy intent of the Future Made in Australia package and Australia's Critical Minerals Strategy. It would be incongruous for its low-carbon intensity concentrated lithium salt product to not be eligible for the CMPTI, given the stated aim of the CMPTI is to support the kind of activity being undertaken by the Calix and Pilbara Minerals JV.

Eligibility for CMPTI is likely to be a material consideration for future investment to progress the application of the mid-stream technology to commercial scale production.

Consistent with our JV partner, Calix is highly supportive of the policy intent outlined by the CMPTI and Future Made in Australia package. We would welcome the opportunity to discuss its implementation with you and the DISR.

Yours sincerely,

Phil Hodgson
Managing Director & Chief Executive Officer
Calix Limited

About Calix

Calix Limited (ASX: CXL) is an environmental technology company solving urgent global challenges in industrial decarbonisation and sustainability.

Calix's unique patented core platform technology delivers efficient indirect heating of raw materials to enable renewably powered mineral processing and efficient capture of unavoidable industrial emissions.

With strong and increasing demand driven by global commitments to net-zero emissions, Calix is applying its core technology to the decarbonisation of cement, steel and alumina, sustainable processing of critical minerals, direct air capture of atmospheric carbon dioxide, and sustainable environmental products.

Each application of the technology is being deployed through a proven licensing, joint-venture and spin-out model. Subsidiary businesses focused on a specific application and target market accelerate commercialisation and enable a flexible equity funding model to support exponential growth.

Leveraging its core platform technology and a global network of partners, Calix is urgently developing multiple environmental businesses that deliver positive global impact. Because there's only one Earth.

www.calix.global

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