



# Australian Securities Exchange Notice

**ILUKA**

18 February 2016

## **Additional Investment in Metalysis Limited**

Iluka Resources Limited (Iluka) advises that it has committed an additional £6 million (A\$12.2 million) to its investment in the private, UK based, Metalysis Limited with an undertaking to commit a further £4 million (A\$8.1 million) before 15 July 2016. The additional £10 million in total is expected to take Iluka's interest from 20.8 per cent to 28.8 per cent.

Iluka's additional investment, together with an investment of £10 million by UK based, Woodford Patient Capital Trust, will support Metalysis' commercialisation process.

The position in Metalysis is a part of Iluka's alliancing and new ventures approach. Metalysis is seeking to develop a single stage process for a low cost, low environmental impact, transformation of various metals into powder form.

David Robb, Iluka's Managing Director stated: "If Metalysis can commercially produce titanium metal powder direct from rutile and synthetic rutile, at materially lower cost than current technologies, then a dramatic expansion in demand for titanium metal and titanium alloys could be expected. The application of titanium powder in 3D printing also presents potentially significant opportunities in a rapidly expanding market. Such developments would be positive for high grade titanium dioxide feedstock demand."

Following the total investment Iluka will have the right to appoint two directors to the Board of Metalysis. Iluka currently has one Director (Mr Gavin Rezos, who is a non-executive director of Iluka) and has had one executive (Mr Chris Cobb) as a Board observer.

Mr Robb added: "Iluka is encouraged by the progress made by Metalysis towards commercialisation of its solid state metal powder technology. The company is also pleased at the increased focus on titanium as the core element of the Metalysis strategic plan, with a goal to accelerate commercialisation and licensing of its technology."

Iluka's support for Metalysis has been both financial and technical, with an example of the latter aspect being test work involving the addition of other elements to synthetic rutile which allow customised titanium metal alloys to be produced.

Iluka's equity position in Metalysis now requires the company to equity account for its interest.

**Refer attached Metalysis information related to current investment stage of the company. Also available on [www.iluka.com](http://www.iluka.com)**

### **Investment market and media inquiries:**

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Global Licensing - 3D Printing Consumables

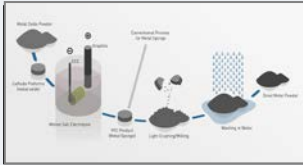
Prepared by Iluka Resources from MetalYSIS Information

February 2016

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# Summary

Founded in 2001, Metalysis has developed and acquired its own IP based on the Fray Farthing Chen (“FFC”) process invented at Cambridge University. It is a proven electrochemical process to produce low cost, high-value metal powders largely focused on titanium.



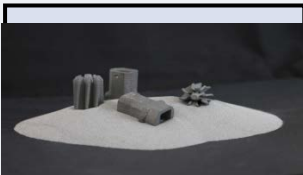
- Disruptive across the Periodic Table, materially lower OPEX and CAPEX, applies to 41 elements
- Ability to produce novel alloys difficult to produce using conventional melting routes, access to major new markets
- Environmentally cleaner and lower production costs relative to conventional processes eg Kroll



- Industrial manufacturing unit in South Yorkshire (in production with 50 employees)
- Proven Metalysis process in conversion of rutile sand directly into titanium powder
- Proven process in small scale industrial production of conventional titanium and tantalum powders
- Commenced commercialisation of its technology, including signing the first licence agreement



- Fresh and bought in related IP from BHP Billiton and QinetiQ - currently 29 patent families
- Attracted significant strategic interest:
  - Iluka currently c.21% (c. 28% post current investment) shareholder, a significant mineral sands industry participant
  - GKN and VW major development projects



- Existing shareholders (including VCs) have provided significant funds (£50m+)
- Monetisation through licensing agreements, titanium focus
- Product sales generating revenues and accelerating licensing discussions
  - significant use in the 3D printing market
- Strategic partnerships to drive licensing

# Private Financing – Clear Path to IPO

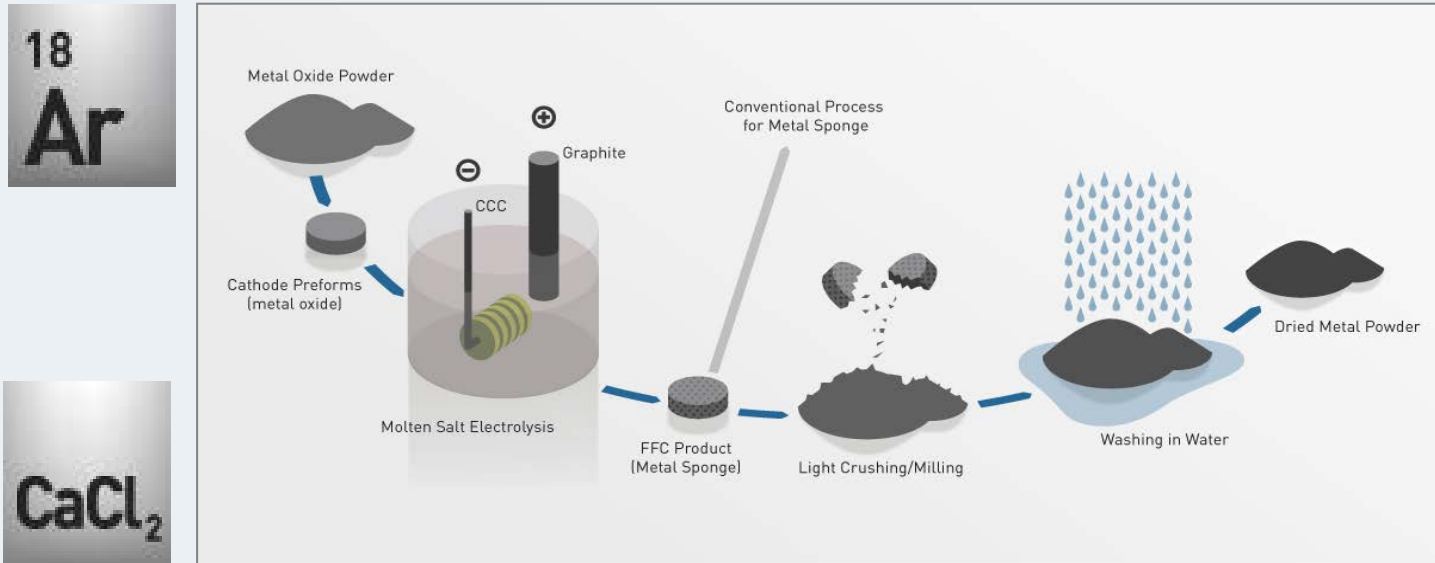
The business plan targets further accelerated development and roll-out of titanium.

Company expected to IPO subject to advancement of business plans and market conditions.

The business plan includes a number of targets:

- At least two new development contracts in addition to VW and GKN
- Further focus to the strategic goal of titanium and titanium alloys
- Significant customer traction - advanced pipeline of opportunities
- Material and growing revenue stream
- Pathway to breakeven and cash generation (<2 years)

# The Metalysis Process



- Electrolysis processes are regarded as highly efficient
- Relatively low temperature operation and lower energy consumption
- Inexpensive components for electrolysis – cheap, readily available salt and carbon
- No toxic gases used
- Powder feed to powder product

# The Metalysis Process

Metalysis technology has potential to revolutionise industrial manufacturing and reshape metals processing

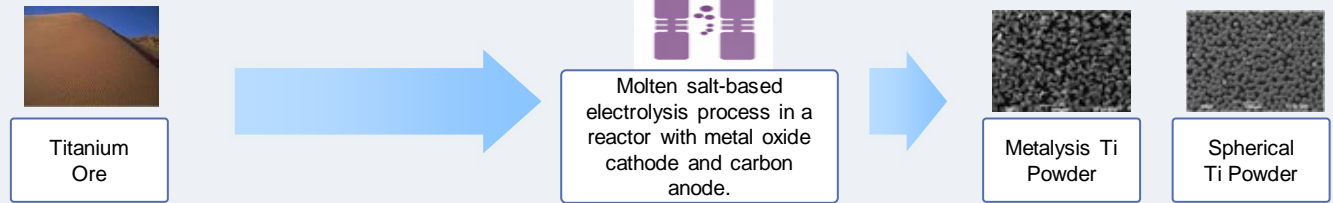
Volume usage of high-value metal powders in industrial manufacturing held back by cost of manufacture

## Conventional Multi-step Process to Powder (Kroll process)



Metalysis technology simplifies and can dramatically reduce the cost of metal powder production

## Reduced step Metalysis Process directly to Powder



>50% embodied energy saving

## How much energy\* does it take (on average) to produce 1 kilogram of :-

Titanium (from ore concentrate using Kroll process)	Titanium (using the Metalysis process)
145-165 kWh/kg	66-90 kWh/kg

*Metalysis process in scale production expected to produce Titanium using less than 50% of current energy input required for Kroll process*

# Titanium Opportunity – 21<sup>st</sup> Century Structural Material of Choice

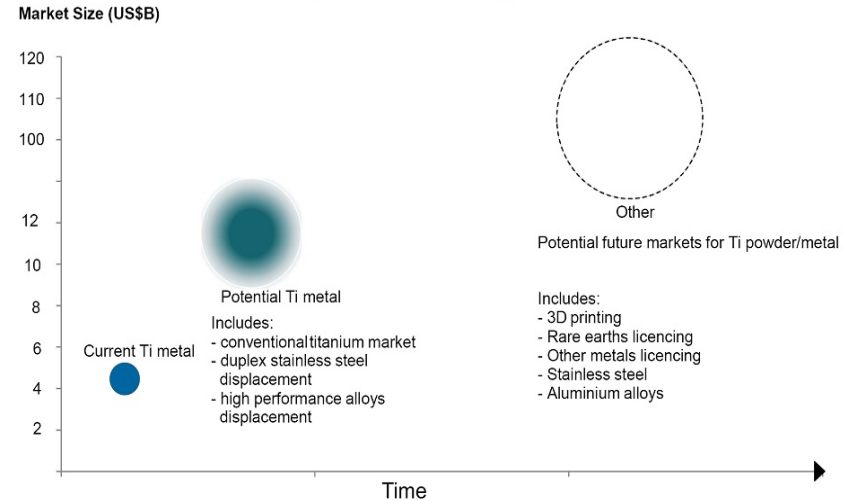
## Current Market

- In 2013, 143,000 tonnes of milled titanium products were produced (market value approx. US\$5 billion)
- Industrial applications are growing fastest with wide application uses across military, aviation, shipping, oil & gas, automotive, power generation and desalination
- The titanium price is currently c.US\$19,000/tonne which is c.10x the cost of aluminium, although it has no exchange traded price – hence price trends remain relatively opaque
- Evidence of the growing importance of titanium has been demonstrated by Alcoa's acquisitions in the space over the last year (RTI, Tital)

## Growth Potential

- The main barrier to a broadening of the market for titanium is the cost of production
  - the metal offers superior strength and lightness to aluminium but crucially it offers extreme resistance to corrosion
- Titanium produced by the Kroll process is currently around significantly more expensive than stainless steel
- Lower cost titanium metal could compete with:-
  - high performance alloys (US\$6.82 bn market in 2013)
  - some applications of stainless steel (\$110 bn market in 2013)

## Key Markets – Global Significance



Source: Metalysis, TZMI, Roskill, Iluka research

“Titanium is the best structural metal there is, it's lightweight, it's strong and it lasts forever because it does not corrode. I see Titanium potentially displacing stainless steel.”

*Dr. James Klausner*

*Head of the METALS programme run by US DoE Research Arm*