



Manufacturing innovation made reality

# **The Supersonic Opportunity Additive Manufacturing Company**

November 2022



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# Titomic is the only “Cold Spray Additive” public company

Titomic offers one of the fastest, most scalable, cost competitive and energy efficient additive manufacturing and coating technologies in the world.

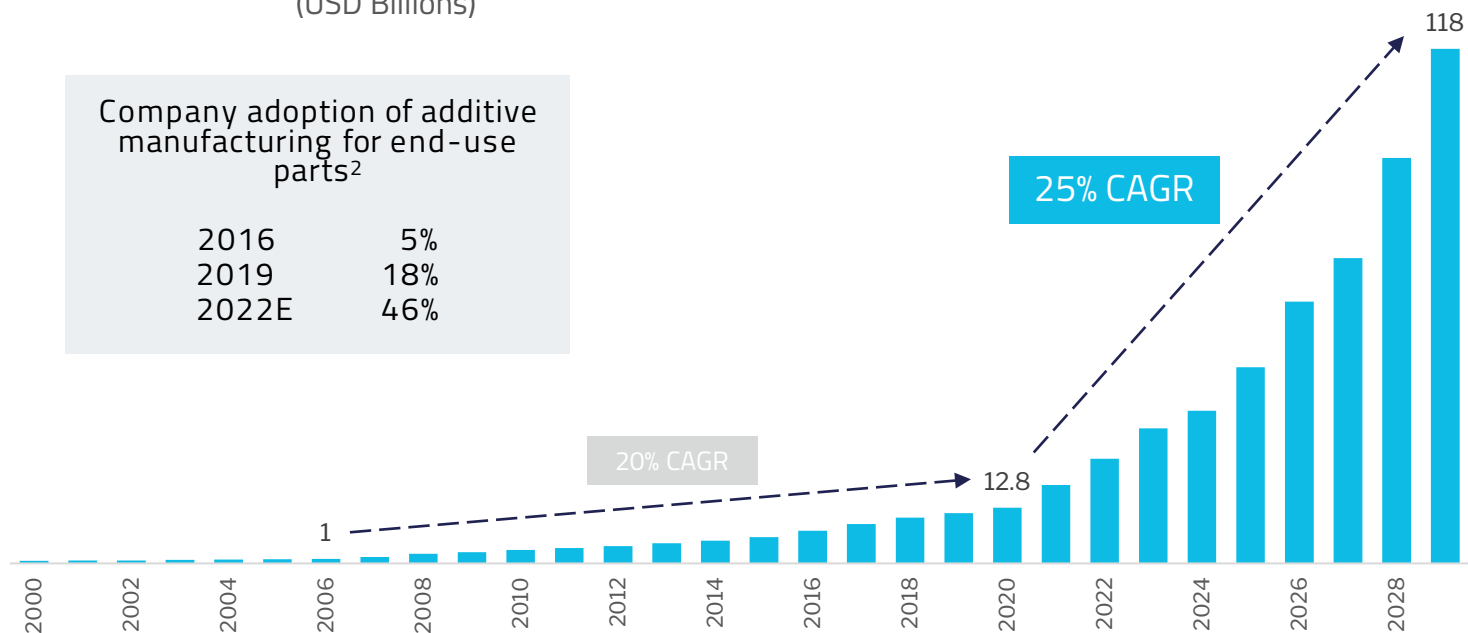
1. Large and expanding addressable market	<ul style="list-style-type: none"><li>• Additive market estimated to grow 11x up to \$146B in the next decade</li><li>• Transition from prototyping to mass production</li><li>• Macro-economic challenges in supply-chain and manufacturing provide strong tailwinds</li></ul>
2. World-class leadership team	<ul style="list-style-type: none"><li>• Senior executives in both the management team and the board</li><li>• Extensive scientific and engineering backgrounds</li><li>• Diverse and experienced board across primary target industries</li></ul>
3. Industry-leading innovative technology	<ul style="list-style-type: none"><li>• Superior additive technology for speed, size, sustainability and materials</li><li>• Ability to secure end-to-end supply-chain including metal powders</li><li>• Fast growing technology ready for industrial use in less than two years</li></ul>
4. Fast growing customer interest in key markets	<ul style="list-style-type: none"><li>• Established footholds in key geographic locations (U.S, Europe, Australia)</li><li>• Fast growing customer demand driven by supply-chain and geopolitical needs</li><li>• Distinct product portfolio supporting growth in multiple, adjacent markets</li></ul>
5. Distinct, repetitive revenue streams	<ul style="list-style-type: none"><li>• Joint-venture and subscription models supporting recurring revenue streams</li><li>• Long-term business outlook drives margin improvements as business scales</li><li>• Organic growth funded with capital raise</li></ul>
6. Industry consolidation allowing inorganic growth	<ul style="list-style-type: none"><li>• Ownership of entire solutions stack made possible by consolidating small, existing players</li><li>• \$80m inorganic revenue identified in three countries</li></ul>



# Additive manufacturing to grow over 11x in the next decade

## Additive Manufacturing Market Size<sup>1</sup>

(USD Billions)



1. Source: Wohlers Report 2020

2. Source: "3D printing: hype or game changer?" Ernst & Young Global Report 2019.

## Evolution of the AM Market

### Additive 1.0

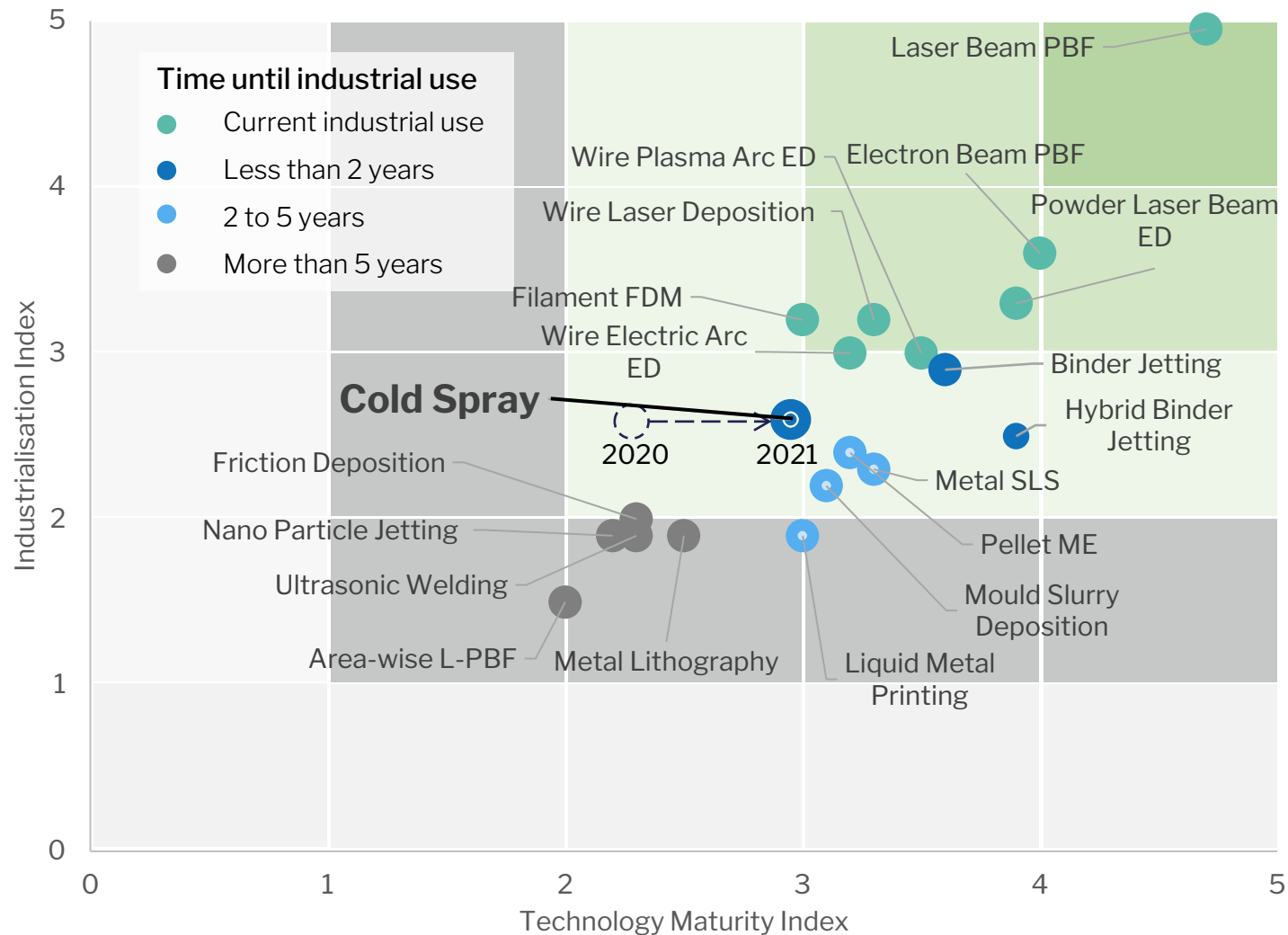
- Key players now off-patent, leaving them with minimal differentiation and commoditized technology
- Significant loss in market share to open source and low-cost providers
- Have not participated in market growth due to focus on design and rapid prototyping

### Additive 2.0

- Additive 2.0 innovation is being driven by VC-funded, emerging players across printers, materials and parts businesses
- New players are driving advances in speed, accuracy, material variety and build volume/size
- Focus on mass production and end-use parts is driving market growth (certain industries ahead in maturity curve)



# Metal Additive Manufacturing Maturity Index



Source: AMPower 2022 Report

Cold Spray continues to mature towards widespread industrial use in AM

Note that this chart is for AM only and not coatings, where Cold Spray is already experiencing widespread industrial use

PBF: Powder Bed Fusion  
L-PBF: Laser Powder Bed Fusion  
ED: Energy Deposition  
SLS: Selective Laser Sintering  
FDM: Fused Deposition Modelling  
ME: Material Extrusion



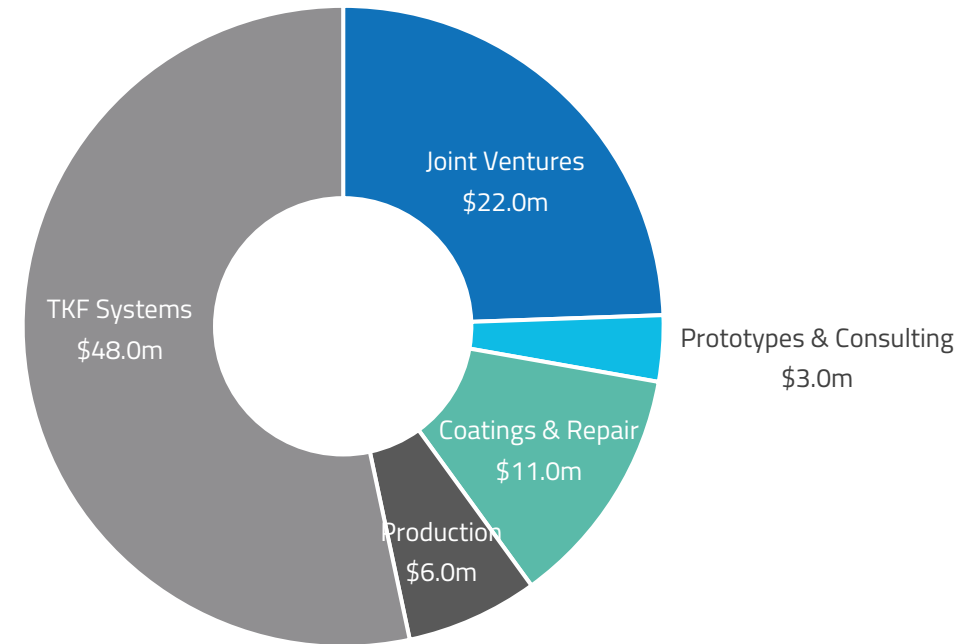
# Sales Pipeline

Significant sales opportunity pipeline at 18x FY22 revenue

Expected sales revenues from orders received or to be expected

Repkon Joint Venture	\$7.6m
Neos Joint Venture	\$2.4m
Glass Mould Coating Solution	\$1.1m
D523/D623 Repair & Coating Machines	\$0.7m

Unweighted Funnel





# Cash flow and balance sheet

Statement of Cash Flows	FY21	FY22	FY23 Qtr 1
Customer & Grant Receipts	1,908	5,929	1,075
Operating cash flows	(9,037)	(10,161)	(4,115)
Investing cash flows	(25)	(1,962)	(734)
Financing cash flows	(449)	11,324	0
Net cash flow	(9,512)	(799)	(3,774)

Statement of Financial Position	30 June 2021	30 June 2022	30 Sept 2022
Cash	7,946	7,108	3,333
Current assets (incl Cash)	11,084	10,847	7,019
Non-current assets	2,505	3,971	2,965
<b>Total Assets</b>	<b>13,589</b>	<b>14,818</b>	<b>9,984</b>
Current Liabilities	2,977	4,739	4,176
Non-current liabilities	1,170	2,667	2,792
<b>Total liabilities</b>	<b>4,147</b>	<b>7,406</b>	<b>6,968</b>
<b>Total Equity</b>	<b>9,442</b>	<b>7,413</b>	<b>3,016</b>

- FY22 Cash receipts of \$5.9m include \$3.0m receipts from customers and \$2.9m grant income. Receipts of \$1.1m in FY23 Q1 are related to customer sales.
- FY23 Q1 Operating cash outflow of \$4.1m includes \$1.1m for machine builds, \$1.6m staff costs and \$0.3m marketing costs.
- FY23 Q1 Investing cash outflows of \$0.7m relates to business acquisitions in FY22.
- Stable balance sheet with no debt.

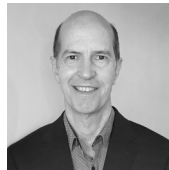


# Leadership with proven industry experience



**Herbert Koeck**

Managing Director



**Jon Nield**

Chief Financial Officer



**Colin Horman**

Chief Operating Officer



**Klaas Rozema**

General Manager Titomic Europe



**Bruce Colter**

General Manager Titomic USA



**Max Osborne**

Head of Engineering



**Neil Matthews**

Head of Business Development  
Coating and Repairs



**Dominic Parsonson**

Head of Sales



**Chris Healy**

Legal Counsel  
Company Secretary



**Michael Rochford**

Head of HR



Titomic holds a combined 165 years of Cold Spray Technology experience in the Staff and Board





# Board directors with global coverage and experience



**Humphrey Nolan**  
Non-Executive Chairman



**Herbert Koeck**  
Managing Director



**Mira Ricardel**  
Non-Executive Director



**Dag Stromme**  
Non-Executive Director



**Richard Willson**  
Non-Executive Director



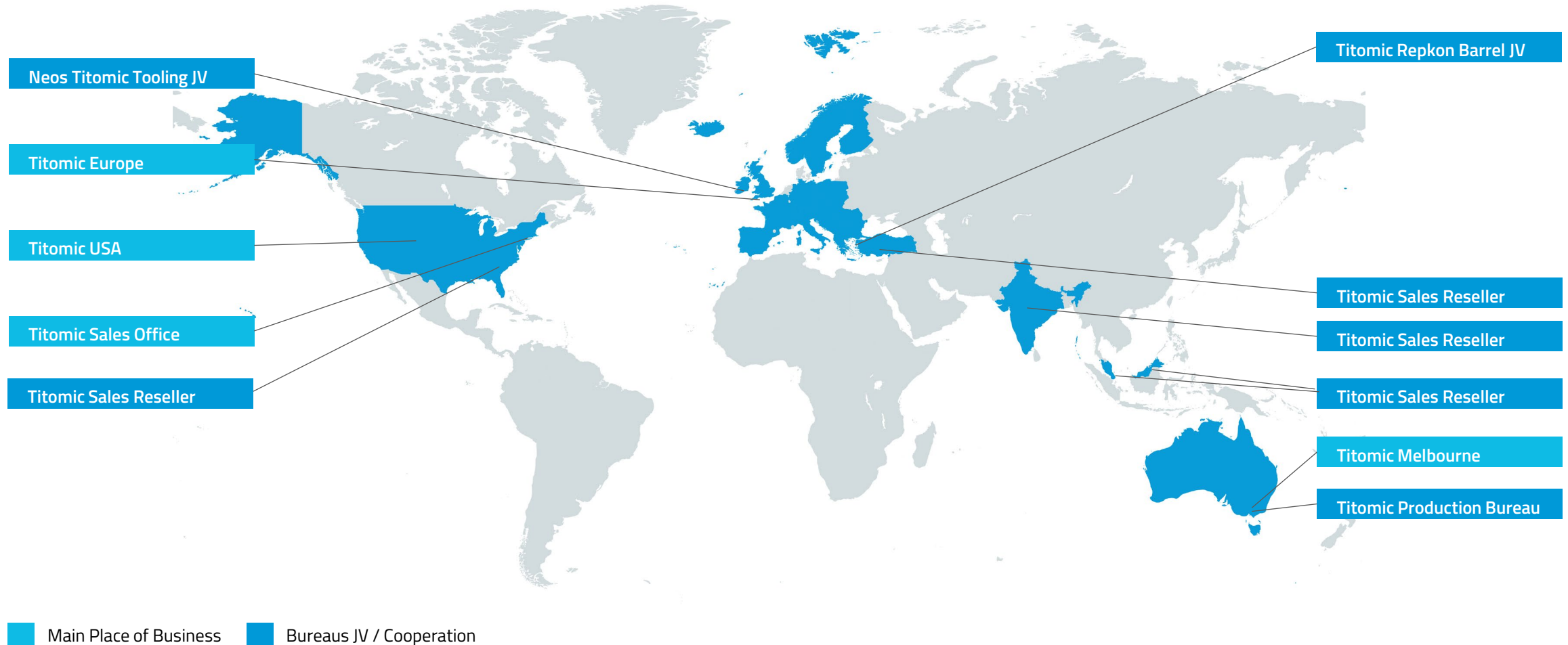
**Andreas Schwer**  
Non-Executive Director





# Taking our technology to the world – Global footprint

Global production, supply and service network to meet our customer's needs.



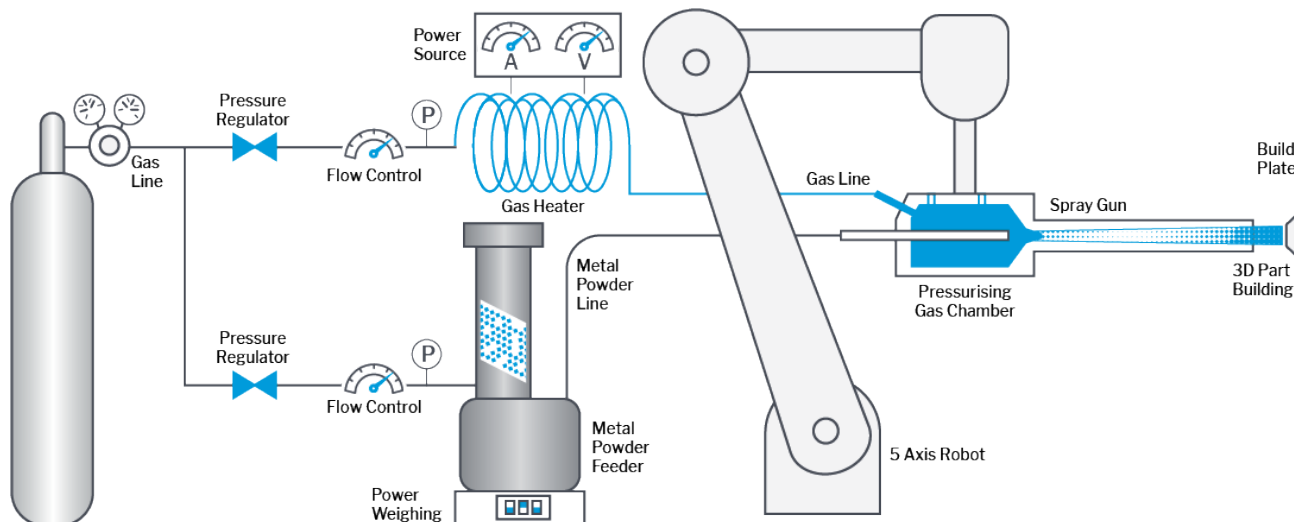


# Superior speed and size

## Titomic Kinetic Fusion (TKF)

- Exclusive rights to commercialise a form of cold spray additive manufacturing developed with CSIRO
- This process, called Titomic Kinetic Fusion (TKF), employs cold spray technology using compressed gas to accelerate metal powder particles at supersonic speed, which bond together to form a layer upon impact

## The TKF process



## Key attributes of the TKF process

### Speed

- Up to 3x faster than other Additive Manufacturing (AM) processes

### Size

- Highly Scalable
- Up to 9m x 3m x 1.5m

### Sustainable

- Less energy use and material waste

### Cost effective

- Ability to use wide range of metal powders
- Cost competitive grade metal powders of dissimilar particle sizes and irregular shapes

### Multiple Metals

- Build with almost any metal in a powder form
- Unique ability to combine different materials in a single part



# Existing diverse and customisable machine portfolio



**TKF 9000**

- High pressure Cold Spray additive manufacturing and coating
- Demonstration of Titomic's ability to engineer and construct bespoke AM systems
- Build volume of 40.5m<sup>3</sup>
- Deployed in the Titomic Melbourne Production Bureau



**TKF 1000**

- High pressure Cold Spray additive manufacturing and coating
- Designed for prototyping and low volume production tasks
- Build volume of 0.75m<sup>3</sup>
- 1<sup>st</sup> gen system operating at Titomic Melbourne Bureau
- 2<sup>nd</sup> gen system under construction for TWI (UK)



**ISB Series**

- Low pressure Cold Spray coating
- Robotic or linear coating system
- Automated loading and unloading of parts
- Utilises D523 core cold spray system
- Ideal for R&D deployment or as a base for customised automated coating systems



**D523**

- Low pressure Cold Spray coating
- Modular portable repair system
- Designed for robotic or manual repair and coatings
- Deployable for in-field repairs

# Our rapidly growing trusted global customer base







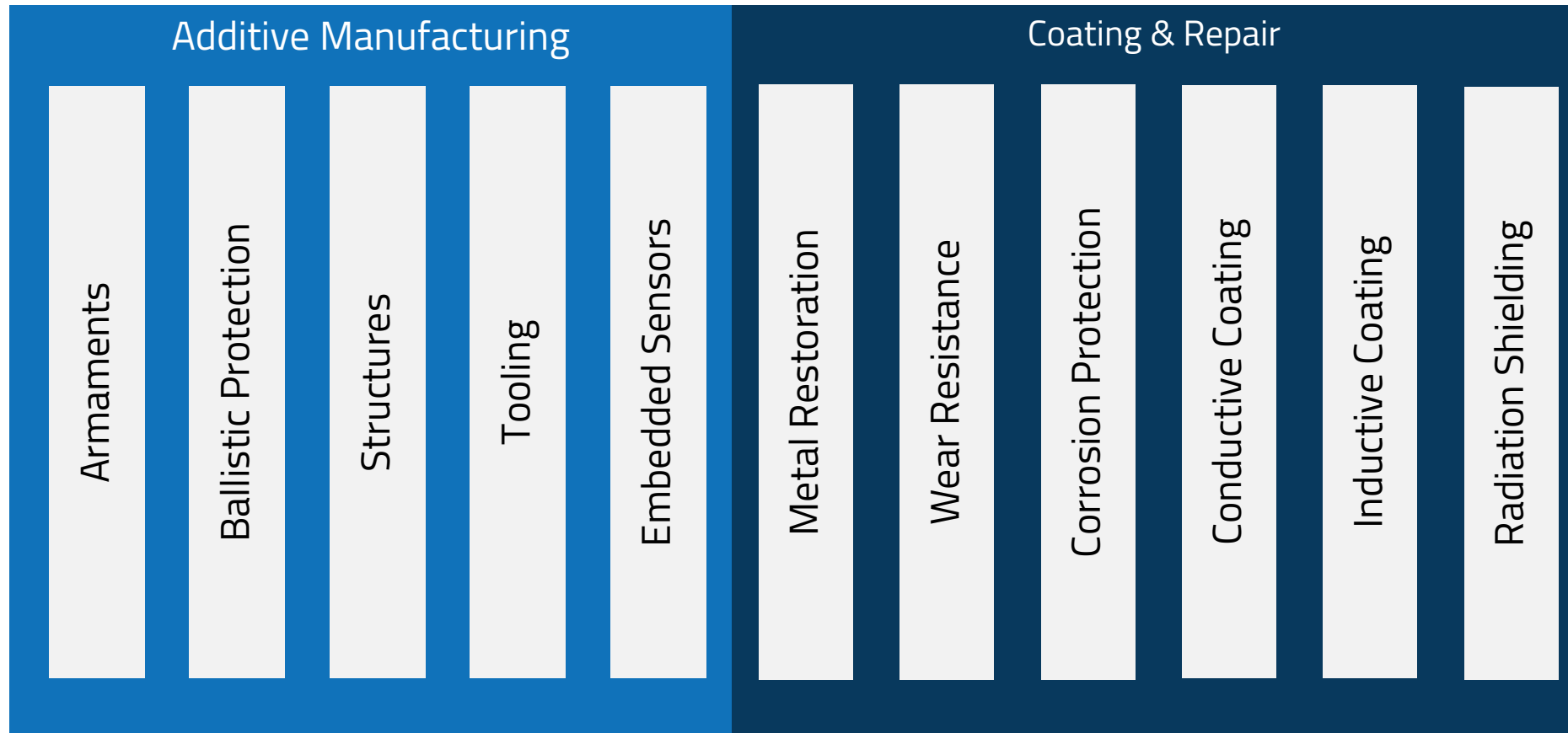
# Five distinct fast growing revenue streams

1. Machine Sales	2. Joint Ventures	3. Workflow Solutions	4. Application Development	5. Resellers
Broad range of machine solutions <ul style="list-style-type: none"><li>TKF 1000</li><li>TKF Custom</li><li>ISB Series</li><li>D Series</li></ul>	<ul style="list-style-type: none"><li>Building industry capability for manufacturing</li><li>Fast access to existing markets</li></ul>	<ul style="list-style-type: none"><li>Automated solutions to maximise uptime</li><li>Improved manufacturing productivity and efficiencies</li></ul>	<ul style="list-style-type: none"><li>Development, prototyping and testing for strategic application pillars</li></ul>	Territory Coverage <ul style="list-style-type: none"><li>India</li><li>Middle East</li><li>Singapore</li><li>Malaysia</li><li>USA</li></ul>
Service, Maintenance, Materials (powders), Consumables, Consulting				
<ul style="list-style-type: none"><li>TWI</li><li>D&amp;C Coating</li><li>Lufthansa</li><li>Flohe</li></ul>	<ul style="list-style-type: none"><li>Repkon JV</li><li>Nèos JV</li></ul>	<ul style="list-style-type: none"><li>Vetropack</li><li>Gallo Glass</li><li>Brauntell</li></ul>	<ul style="list-style-type: none"><li>Boeing</li><li>Fleet Space</li><li>Thales</li><li>Royal Australian Navy</li><li>Airbus</li><li>Inovor</li><li>BAE Systems</li><li>Triton</li><li>...</li></ul>	<ul style="list-style-type: none"><li>Shree Rapid</li><li>Repkon</li><li>Alliance</li><li>MSI-Viking</li></ul>



# Strategic Application Pillars

Disciplined and focused execution





# Proven track record of execution

Performance to plan with progress across focus applications

Category	Application	Prior to FY2022	FY2022	FY2023	FY2024	FY2025	FY2026	FY2027
Additive Manufacturing	Armaments	Validate Technology	Custom system design	JV Production				
			JV Agreement with Repkon	JV Setup	Custom system install			
	Tooling	Validate Technology	JV Agreement with other partners	Custom system design	JV Production			
			JV Agreement with Neos	JV Setup	Custom system install			
	Ballistic Protection	Initial development tests	Identify specific target applications	Performance improvements	Customer Articles			
			MIL & NATO standards testing	STANAG Lvl2 Pass	Customer Prototypes			
Coating and Repairs	Structures	Develop TKF Systems	Key customer engagement	Key customer demonstrators				
			Sale of TKF 1000 to TWI	Titanium material testing and specifications				
	Embedded Sensors	Prototype Bytepipe	Test with Industry Partner	Refine design, in-field testing				
	Wear Resistance	Develop Glass Mould Coating System	Installed at Vetropack	System commissioned, production deployment				
		New material solutions (carbides)	Customer use cases, material selection & performance testing	Field trials				
	Repairs & Corrosion		Acquire Dycomet	Titomic Europe integration	D523 Production Scale-up			
			Hire Neil Matthews	D523 Global Re-launch	Defence and new industry use cases			
	Energy	Develop Silver coating for busbars						
		Develop copper spray for MWT solar panels						
	Inductive & Conductive Coating		Validate Materials					
			Validate solution efficacy					
	Radiation Shielding	Award of Space Grant		Commercial customers				
		Demo and test Rad. Shielding		1st parts delivered	First parts launched			





# Armaments

Titomic enabling high performance barrels

## Value Proposition

- Unique manufacturing solution for high performance barrels
- The process combines the TKF system and Repkon's patented free flowforming technology
- Enabling better material selection for:
- Improved erosion and corrosion resistance
- Improved strength to weight ratios
- Higher velocity rounds



Repkon's flowforming technology

## Progress

- Repkon JV signed
  - Demonstrator barrels supplied
  - Qualification of demonstrators underway
  - Machine 1 design completed
  - Machine 2 design in progress
- Further JVs to be explored globally

## Market

- Revenue will be in the JVs (equity accounted)
  - Likely to commence from late 2023
- Revenues of up to \$50 - 55m to FY27



Barrels

Targeting the Defence Industry



# Ballistic Protection

Titomic enabling lighter, monolithic protection

## Value Proposition

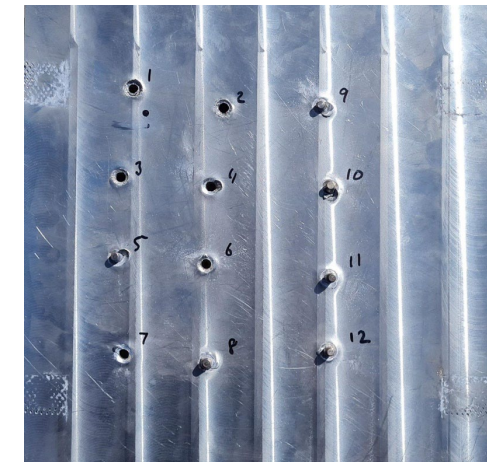
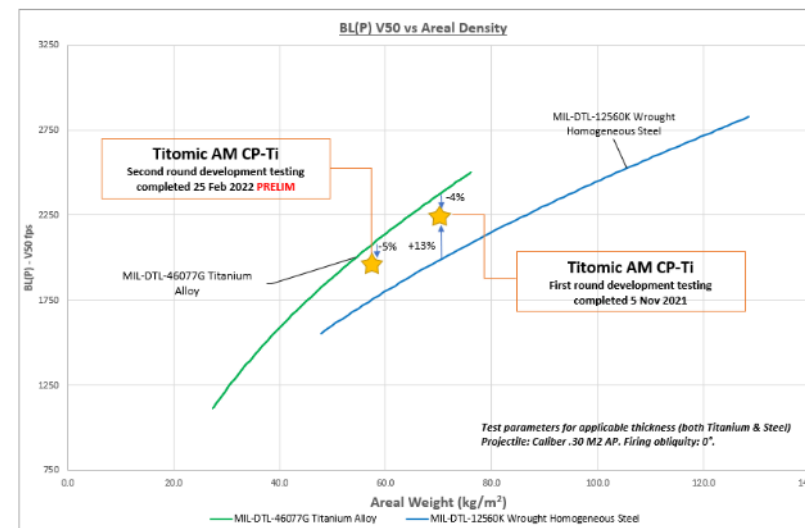
- Affordable and lightweight titanium armour
- Near net shape manufacturing
- Monolithic structures – weldless assembly
- Tailored performance with multi-material architectures
- Weight reduction enables
  - Increased speed, range and space

## Progress

- STANAG and MIL standard benchmark testing
- Mechanical performance optimization
- Engaged with 2 defence primes on projects

## Market

- New and upgrade of
  - Armoured vehicles
  - Naval vessels
  - Lightly armoured aircraft/helicopters



Manufacturing  
made sustainable

# Structures

For lighter stronger titanium components

## Value proposition

- Affordable titanium structures
- Near-net shape manufacturing
- Low-cost HDH titanium powder
- Melt-free manufacturing process
- Energy, emissions & environmental benefits

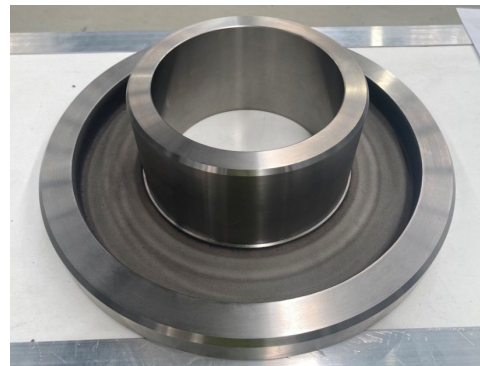
## Progress

- Material optimisation completed for CP Titanium
- Engineering projects underway for technical and manufacturing processes
- High value-added applications identified
- Samples with major customer for application approval

## Market

- High end steel manufacturing
- Existing Titanium manufacturing

Titanium Ring Partially machined



Titanium Ring 1.4m diameter



Seamless Titanium Tank



## Structures

Exploiting Titomic's technology and cost benefits for lightweight, rapidly manufactured solutions







# Tooling

Titomic enabling a simplified supply chain

## Value Proposition

Offers numerous benefits for our partners and customers

- Improved lead times
- Near net shape – Minimal post-production and machining
- TKF process makes Titanium tooling a viable option (stronger, thinner, lighter, corrosion resistant)
- Reduced welding, assembly and lead times
- Multi-material solutions, for improved heat distribution
- Ability for embedded sensors, heating and cooling

## Progress

- Neos JV agreement signed
  - Demonstrator faceplates supplied
- Machine design completed and quotation submitted
- Further JVs being explored globally (4 additional players already in pipeline)

## Market

- Revenue will be in the JVs (equity accounted)
  - Likely to commence from mid 2023
- Revenues of up to \$55-65m to FY27



Invar Face Plates



Invar Repair



Titanium Tooling

## Tooling

Targeting the Aerospace & Defence Industries



# Coating & Repair

Titomic extending asset life

## Value Proposition

- Unique material solutions for repair
- Ability to restore geometries
- Repair in-situ
- Cold solid state repair process – no hot work
- Increase of functionality

## Progress

- Proven process and materials
- Mature solutions platform
- Global sales network with off-the-shelf solution
  - Growing quickly with resellers added regularly

## Market

- Corrosion costs the global economy up to an estimated \$2.5 trillion annually
- The cost of corrosion remediation in Australia is estimated at \$78b annually



**Finished Surface**

**Repaired Surface**

**Worn Surface**

Coating and Repair

Targeting Mining, Oil & Gas, Transport and Marine Industries



# Radiation Shielding

Targeting the space industry



# Radiation Shielding

Titomic creating tailored, cost-effective shielding

## Value Proposition

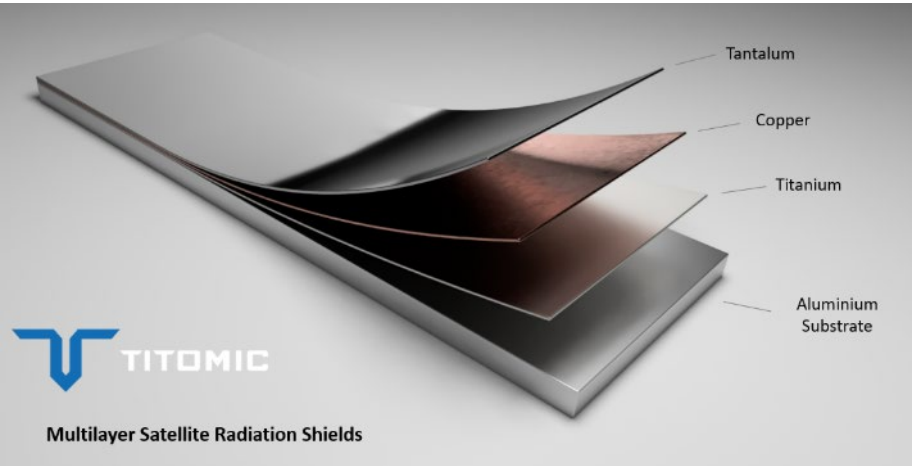
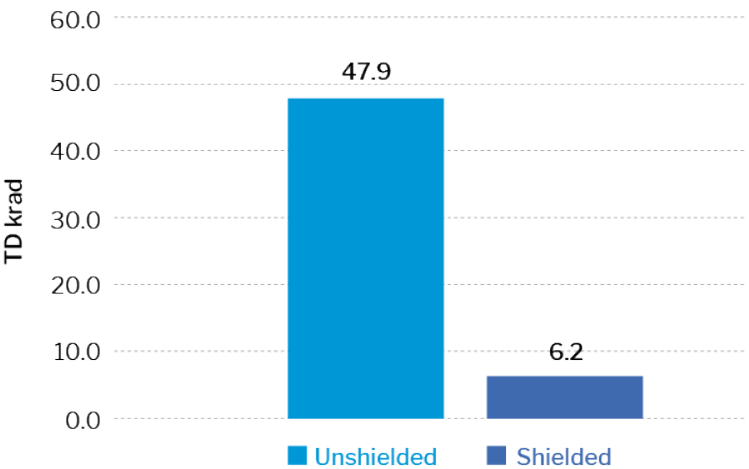
- Extending life of satellites
- Mission specific tailored designs
- Weight efficient shielding
- Cost-effective

## Progress

- Capability to analyse and model missions
- Design shields for corresponding dose requirements
- Proven manufacturing capability
- First satellite with Titomic radiation shielding to be launched early 2023

## Market

- Applications across a broad range of satellite platforms
  - High growth area







# Wear Resistance

Titomic maximising uptime

## Value Proposition

- Extending the life of equipment
- Restoring damaged parts to original
- Replacing worn-out or corroded metal parts
- Portable in-field repairs in compact areas

## Progress

- Installation of first automated commercial production machine
- Extending material portfolio to expand applications to adjacent use cases
- Engagement of more customers globally

## Market

- Glass packaging industry worth \$51b growing at CAGR 4.4%
- Revenue will flow from sales of powder, nozzles, consumables and servicing



## Glass Equipment Coatings

Targeting glass manufacturing industries

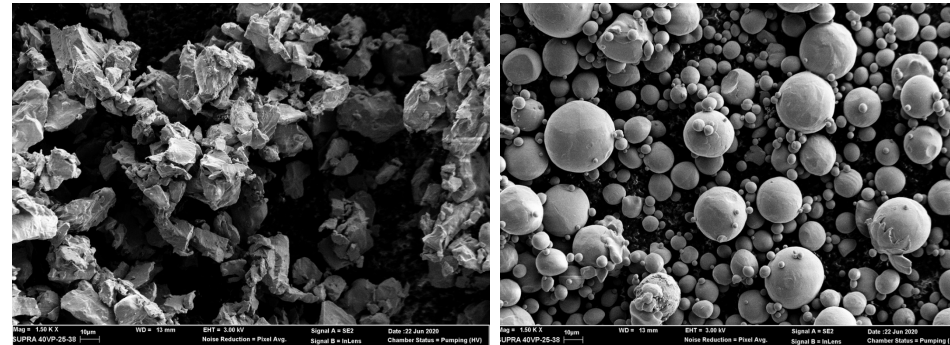


# Unique powder supply for lower cost titanium

## Cost effective and clean

Our TKF process can use hydride-dehydride (HDH) titanium powders to cut the cost and boost the performance of titanium parts.

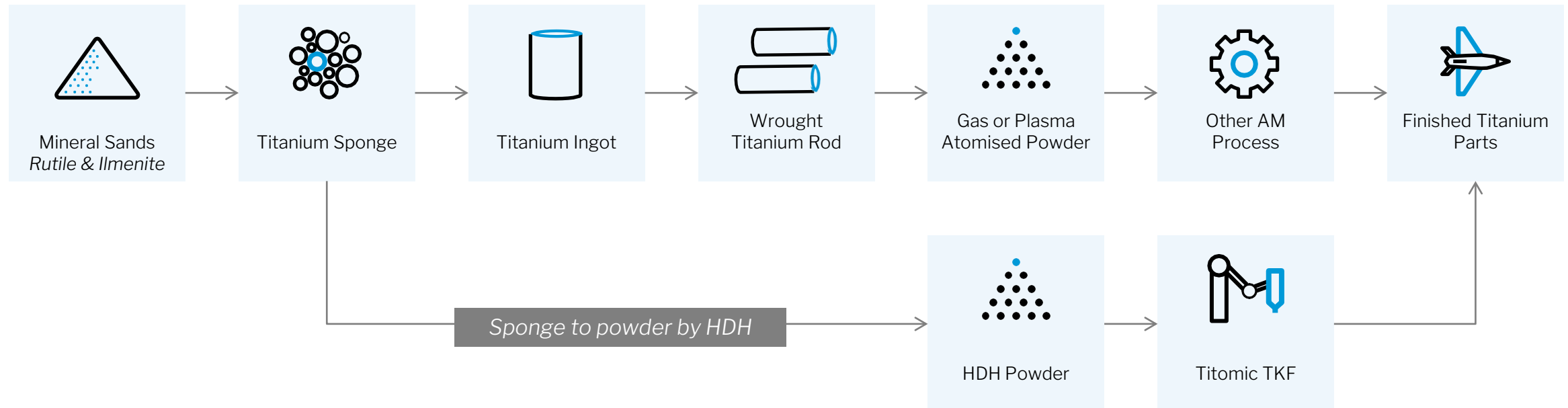
This clean hydrogen technology has low carbon emissions as compared to gas atomised powders and wrought titanium products.



SEM micrographs

Right: Spherical titanium powder

Left: Irregularly shaped HDH titanium powder





# Unlocking unprecedented potential

## Large & expanding market

- Strong tailwind with additive manufacturing market set to **grow by 29% to 2025<sup>1</sup>**
- Buoyed by rapid prototyping, faster turnaround, less waste and lower emissions<sup>2</sup>
- Reduced costs and risks **fuelling fourth industrial revolution**

## Global foothold

- Transitioning to formal **joint venture partnerships** with shared risks and rewards
- **Set to scale globally** across aerospace, defence and other high-value markets
- Expansion underway with signed agreements in the US, Europe, Middle East and Australia

## Unparalleled expertise

- New board of directors and management team with **strong industry, government and capital markets experience**
- **Deep scientific pedigree** including Technical Advisory Committee with **world-renowned scientists**

## Proven process & industry leading technology platform

- **Pioneering patented technology** co-developed with the CSIRO, Australia's national science agency
- Strong cost advantage within Titanium alloys with patent protection
- **Overcomes challenges** like long lead times, limited scalability and excess waste seen in traditional manufacturing

## Compelling business model with attractive financial business profile

- Partnership manufacturing model with clients to deliver attractive unit economics with added benefit of sale of consumables and services
- Unique powder supply to reduce risk as well as cost of titanium parts while **boosting performance**
- **Operating leverage** will drive profitability

<sup>1</sup> AMPower Report 2021

<sup>2</sup> CSIRO study of Cold Spray vs Electroplating





# TITOMIC

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