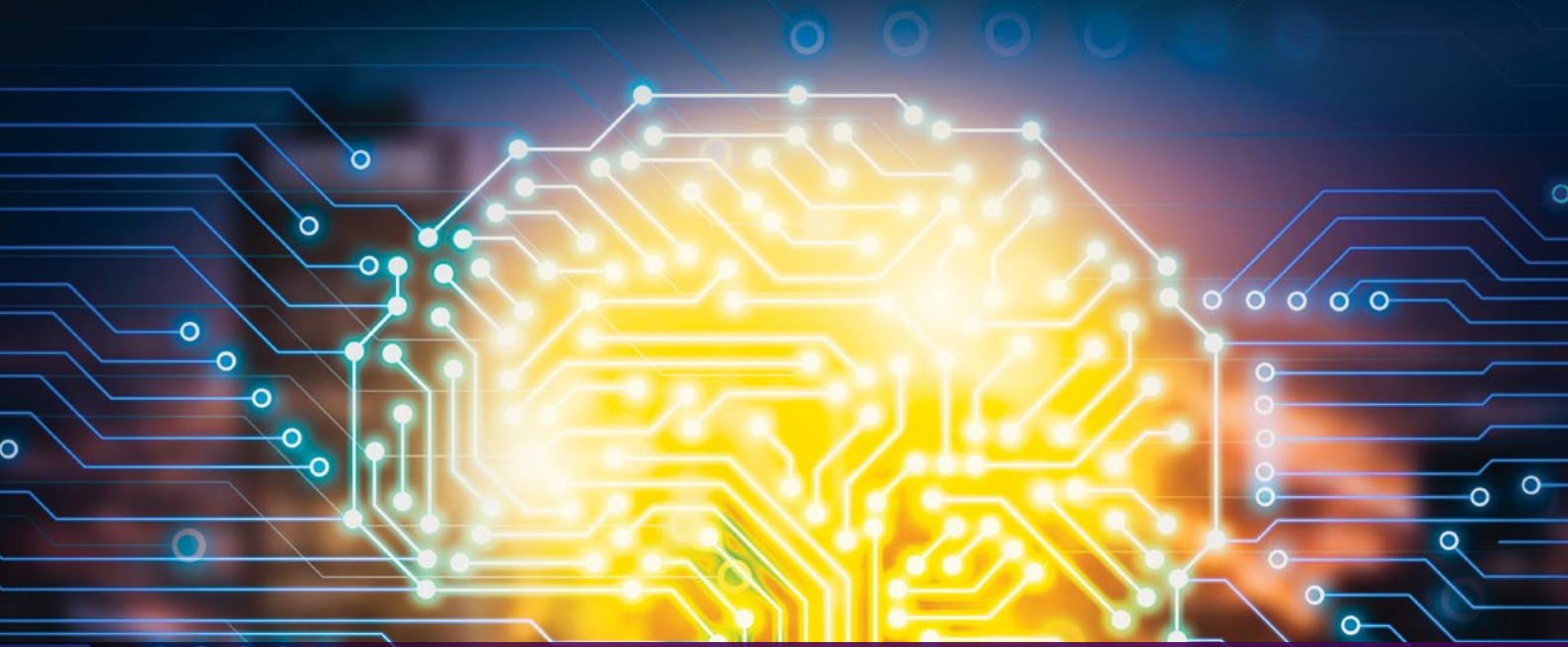


ADVANCED MANUFACTURING GROWTH CENTRE

PROJECTS REPORT
JUNE 2019

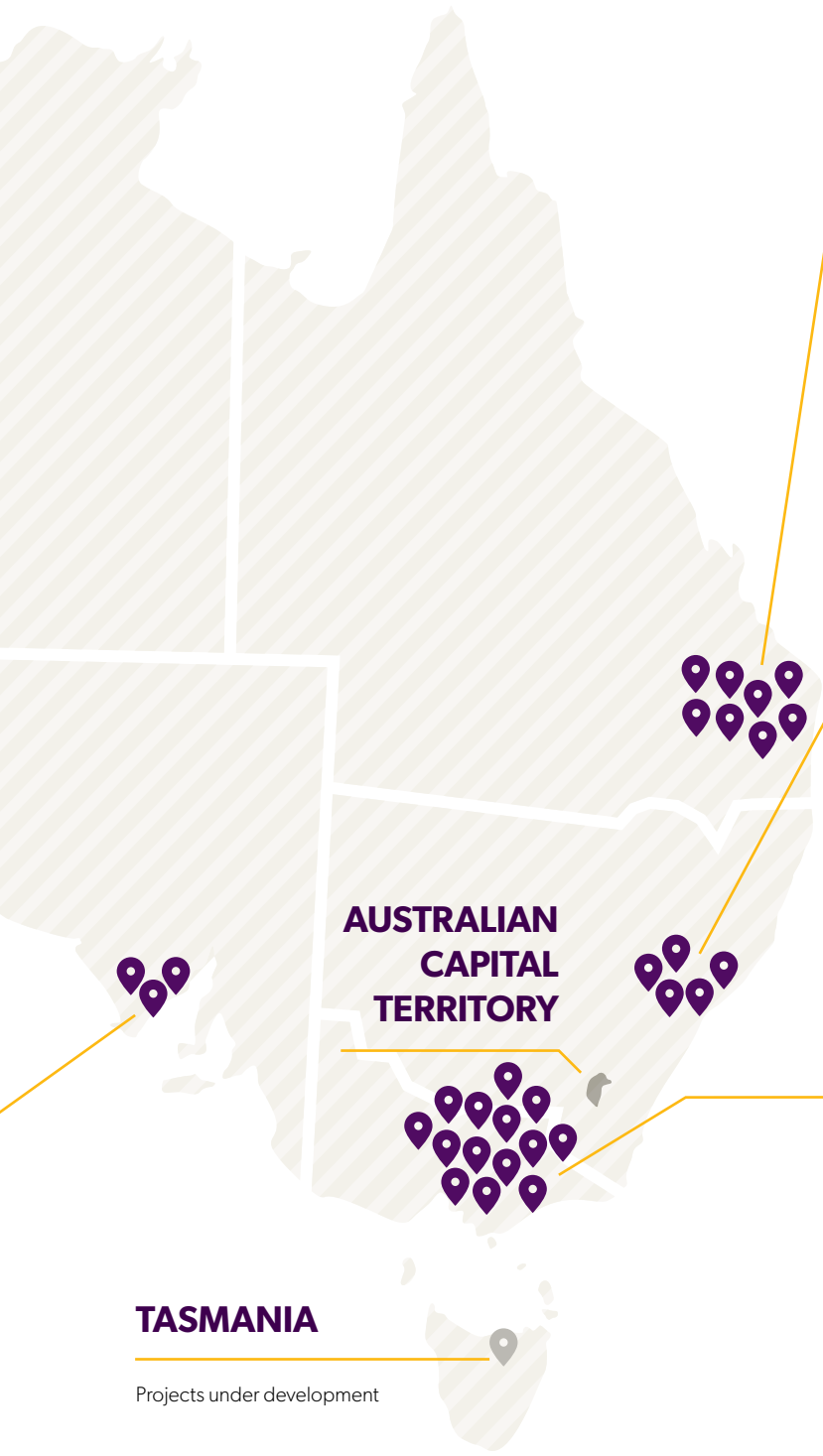
AMGC
ADVANCED MANUFACTURING
GROWTH CENTRE LTD

~1215
jobs projected

$27.1 million
committed (AMGC, industry and in kind)

$281–290
million in estimated revenue generated

EXPECTED OUTCOME OF OUR PROJECTS



QUEENSLAND

$10.1 million total

Digitisation for Manufacturing SMEs	**MOVUS**
Digitised Manufacturing Value Chain	**B&R Enclosures**
MRI Coil Set	**Magnetica**
Remote Monitoring Software	**Smartline Machinery**
Customised Orthotics	**iOrthotics**
Plastic Bottle Redesign	**Evolve**
Innovative Crutch Wear AMESRF	**Cast Equipment and Chain Product**
AI Robotic Welding Technology	**IR4 Pty Ltd**

NEW SOUTH WALES

$4.4 million total

Development of a prototype road tanker unit	**Omni Tanker**
Customised Prescription Eyewear	**Dresden Optics**
Flight Simulator	**SynFlyt**
Conveyor Table and Motion-Control System	**Rotacaster Wheel**
Concrete Column Building System AMESRF	**Ozwall Manufacturing**

AUSTRALIAN CAPITAL TERRITORY

VICTORIA

$8.9 million total

Full Customisable 3D-printed bicycle	**Bastion Cycles**
Product lifestyle management system	**HSV**
Corrugated Metal Sheet Bending	**Formflow**
Integrated CNC Robot	**ANCA**
Water Purification Unit	**Adidem**
Carbon Composite Cycle Wheels	**36T**
High-Strength Aluminium Alloy	**Volgren Australia**
Carbon Fibre Reinforced Geopolymer Concrete	**Austeng**
Carbon Fibre Composite Fender	**Quickstep Holdings Limited**
World-Leading Composite Manufacturing Process	**Sykes**
Value from Solid Wine Waste (AMESRF)	**Viridi Innovations**
Predictive Machine Health Monitoring	**Asahi Holdings Australia Pty Ltd**
I4.0 Readiness Audits and Implementation	**Bosch/AMTIL**
Advanced Fibre Bandages	**Cytomatrix**

TASMANIA

Projects under development

FOREWORD FROM THE MANAGING DIRECTOR

Established by the Australian Government in 2015, the Advanced Manufacturing Growth Centre (AMGC) is an industry-led, not-for-profit organisation. AMGC is strengthening the development of a world-leading, dynamic, export-focused advanced manufacturing sector in Australia. Our goal is to drive innovation, productivity, and competitiveness.

To achieve this goal, AMGC supports outstanding projects that are commercialising innovation. We utilise these projects to illuminate best practice strategies that are accelerating manufacturing in Australia, paving the way for other companies and research institutions to model these practices.

As illustrated in this second Projects Report, AMGC is currently facilitating more than 40 projects across the nation, with over $27.1 million of AMGC and in-kind funding committed. It is expected that over $281 million in revenue, and more than 1215 jobs will be generated by these projects.

Since the publication of our first Projects Report in August 2018, several of our projects are now complete, achieving significant impact and growth as a result. For instance, Quickstep's Carbon Fibre Composite Fender project (page 2) created 30 new highly-skilled jobs and has seen Quickstep enter previously unattainable and geographically diverse markets. Similarly, FormFlow's Corrugated Metal Sheet Bending project (page 20) forged a world-first patented technology, and is likely to generate up to $30 million per annum in revenue and create over 65 new skilled jobs across its supply chain.

Our project pipeline has grown over the last 12 months to include an Industry 4.0 audit by Bosch, Asahi's development of a machine health monitoring system that can predict unplanned stoppages, and a global supply chain integration project with BAE Systems, among others.

AMGC continues to work jointly with industry and research partners to accelerate all these projects. In doing so, we strive to encourage deeper collaboration for greater commercial outcomes, increase connections into global supply chains, promote development of advanced skills, and foster knowledge sharing.

If Australia is to remain a strong manufacturing nation, we must build competitive, resilient companies equipped to weather changing economic conditions. Australian businesses must seize the opportunities available to carve out a real point of difference, to create innovative products, and to apply advanced knowledge, processes and business models. Australian manufacturers must compete effectively within the global marketplace to generate long-term success.

To help, AMGC recently launched a free-to-use Manufacturing Academy in May 2019. AMGC distilled its research insights, supported by tangible evidence of project examples (such as those in this report), into a concise, easily digestible format. By accessing the Manufacturing Academy, Australian manufacturers can delve into real-world project examples and discover – from their peers – what has delivered successful commercialisation and innovation outcomes.

We are eager to share our project stories to inspire Australian manufacturers, and to demonstrate to Australian industry how, they too, can compete on the world stage.

Dr Jens Goennemann
Managing Director
Advanced Manufacturing Growth Centre Ltd

ANCA 2018

PROJECT EVALUATION CRITERIA

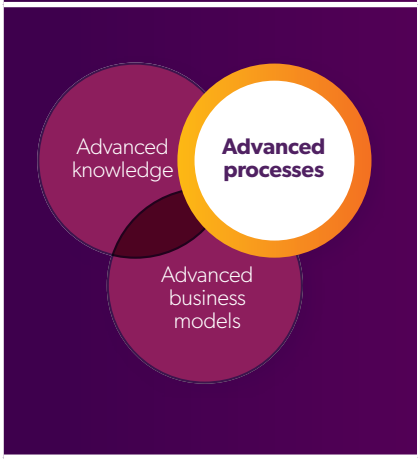
Success in Australian manufacturing is less about what you make but how you make it; Advanced Characteristics and skills development are strongly linked to success. This is why AMGC uses Advanced Knowledge, Advanced Processes and Advanced Business Models as the primary frame of reference when evaluating projects.

AMGC projects are industry led and seek to demonstrate the following advanced characteristics:

ADVANCED KNOWLEDGE

Projects should enable Australian manufactures to become **Innovation Leaders** through increased demonstration of Advanced Knowledge characteristics, in areas such as:

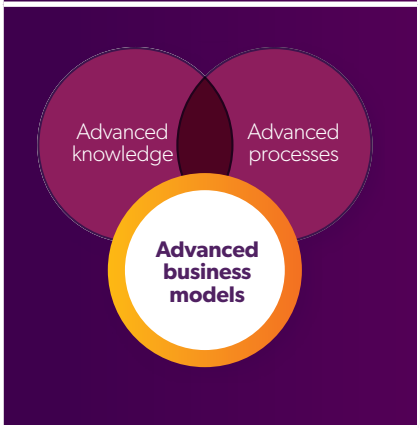
- Increasing R&D expenditure
- Increase collaborations with other firms/Research institutions
- Increase the use of STEM skills.



ADVANCED PROCESSES

Projects should enable Australian manufacturers to become **Process Winners** through increased demonstration of Advanced Process characteristics, in areas such as:

- Increase capital intensity expenditure
- Increase new operational processes
- Increase ICT and technology asset intensity.



ADVANCED BUSINESS MODELS

Projects should enable Australian manufacturers to lift the value of their products by acting as **Niche Players or Service Champions** through increased demonstration of Advanced Business Models characteristics, in areas such as:

- Increase new goods offered
- Increase trade intensity (exports)
- Increase new service offerings.

AMGC
ADVANCED MANUFACTURING GROWTH CENTRE LTD

The Advanced Manufacturing Growth Centre is an industry-led, not-for-profit organisation that supports the development of a world-leading advanced manufacturing sector in Australia. It is run by an independent board and management team of industry experts.

AMGC's role is to unlock new commercial opportunities and drive innovation in Australian manufacturing. It does this by fostering collaboration between industry enterprises and the scientific and research community.

The key to AMGC's success is the strength of its membership. The opportunity to join AMGC's membership program is open to manufacturers of all sizes, and to universities and other research institutions – at no charge.

Joining brings immediate entry into a vibrant ecosystem of like-minded participants who care about developing a more innovative, globally competitive manufacturing sector.

AMGC uses projects to demonstrate best practice strategies to advance manufacturing in Australia and pave the way for other companies and research institutions to model these practices with similar initiatives.

CONTENTS

COMPLETE

CARBON FIBRE COMPOSITE FENDER

Quickstep

A low-cost carbon fibre composite fender for the European automotive market

This project seeks to demonstrate the Quickstep production system for making carbon fibre fenders for a European automotive original equipment manufacturer (OEM). Quickstep's proposed method offers simplified tooling, quicker production from material to finished part, and less capital investment compared to traditional alternatives.

The AMGC project has seen Quickstep qualify to supply composite fenders for a German OEM, with a request for quote scheduled for mid 2018. The concept has attracted interest from other luxury European and British car makers.

Quickstep's position as a leader in technology depends on its collaboration with universities and other industry partners, as they work to develop solutions for global value chains. Quickstep has collaborated with Deakin University on this automotive project since November 2015. During this time 11 of the university's PhD candidates have worked on the Quickstep manufacturing process, now known as the Quickstep Qure Process.

The impact of the project is significant. The potential export value has been estimated at $25 million and it could generate 30 new high-skilled jobs as production scales.

MILESTONES

1/2/17	AMGC approval
31/3/17	Design tooling to facilitate flexible process solutions
31/7/17	Development of automated preforming technology
30/9/17	Development of the isothermal Quickstep Qure Process
21/6/18	Selection of material systems and development of smart designs to allow for rapid curing cycles

CONTRIBUTIONS: Government – $250,000 | Industry – $317,003 | In Kind – $789,583

IMPACT

- Increased spending on R&D to develop an advanced process for layup, curing and tooling
- Collaboration with Deakin University and Special Patterns to develop and validate the advanced process
- Development of new equipment
- Increased trade intensity with global automobile manufacturers
- Access to previously unattainable and geographically diverse export markets

GROWTH

- $25 million in export potential
- Entry to previously unattainable markets

JOBS

- 30 new high-skilled jobs

PROJECT PARTICIPANTS

Quickstep

DEAKIN UNIVERSITY AUSTRALIA

Special Patterns
Giving Shape to Innovation

PLASTIC BOTTLE REDESIGN

Intensive and fast tracked design project with the objective of reshoring the manufacturing of their customer's plastic injection moulded bottle range to Australia

Marco Engineering, as part of The Evolve Group, is partnering with a customer and the University of Queensland in a fast-tracked project to redesign and relaunch a range of plastic bottle products.

This AMGC project seeks to counter the trend of growing imports by demonstrating how Australia's high-skilled labour can provide design modifications, resulting in:

- A higher-quality product for the customer
- A more efficient manufacturing process requiring less rework
- An enhanced safety reputation for the customer, based on the 'Made in Australia' provenance.

The final product will be the world's first 100% leakproof plastic bottle under most conditions, including position and temperature. In addition to reflecting a modern design language, Marco Engineering will use root cause analysis to improve features and benefits while enhancing usability, reliability, longevity and value for money.

Marco Engineering is working with its customer from the initial concept stages, so it has the opportunity to ensure the product and manufacturing process benefit the company, the customer, the distribution partners and the consumer. By designing and then harnessing these efficiencies, the products Marco Engineering works on have an inherent advantage over those manufactured offshore.

MILESTONES

14/2/18	AMGC approval
15/6/18	Product and manufacturing process design completed
19/10/18	Prototype developed
30/9/19	Tooling completed
31/10/19	Quality control parameters established
31/12/19	Commercial manufacturing process completed

CONTRIBUTIONS: Government – $221,000 | Industry – $221,000

Advanced knowledge

Advanced processes

Advanced business models

IMPACT

- Advanced processes achieved through greater access to STEM skills, competing on value not on cost
- Higher spending on R&D to keep production on shore
- Increased marketing spend to relaunch bottles to the market
- Increased collaboration with the University of Queensland on the product redesign
- Higher product value based on many production factors

GROWTH

- $300,000 in estimated sales in 2018, as customers transition from manufacturing in China
- $20 million per year in sales, in 2019 and thereafter

JOBS

When the project is operating at full capacity:

- Two engineers
- Six robotic operators
- Six automated packaging operators
- 30 semi-skilled logistics and plant operators

PROJECT PARTICIPANTS

The EVOLVE group

The University Of Queensland AUSTRALIA

HIGH-STRENGTH ALUMINIUM ALLOY

VOLGREN
A Marcopolo Company

Validation and demonstration of a high-strength aluminum alloy, for future integration into the manufacturing value chain of global bus manufacturers

Volgren and other project participants identified an opportunity to commercialise their research on super high strength aluminium alloys to reduce the weight of bus bodies and chassis.

Research undertaken by Deakin University and Clean TeQ has developed high-strength aluminium alloys containing small amounts of scandium, a rare earth metal that has the ability to substantially increase the strength of aluminium and therefore reduce overall vehicle weight. The resulting product is key to the next generation of lightweight aluminium electric vehicles.

This project will allow Volgren to use the patented technology in manufacturing buses. This gives Volgren a competitive advantage both domestically and internationally, and an entry into electric vehicle manufacturing, where weight is a major factor, and many sectors where strength to weight ratios of alloys are critical.

Compared to traditional aluminium alloys, the new product delivers:

- 20% increase in strength
- 30% reduction in weight
- 25% reduction in component cost
- Enhanced corrosion resistance
- Reduced fuel and energy costs as a result of reduced vehicle weight
- Reduced carbon emissions as a result of reduced vehicle weight.

MILESTONES

1/11/17	AMGC approval
31/1/19	Composition and process parameters of microstructures confirmed
30/6/19	Extrusion process optimised
31/8/19	Prototype components for product validation produced and tested

CONTRIBUTIONS: Government – $150,000 | Industry – $150,000 | In Kind – $375,000

IMPACT

- Advanced knowledge as a result of high-strength alloy R&D
- Growth in the patent portfolio
- Research collaboration with academic and industry partners to develop complex new products
- An increase in the number of staff members with STEM skills
- Better energy efficiency due to the reduced weight of bus bodies and chassis
- Increased trade intensity and more geographically diverse export markets

GROWTH

- Potential to generate significant new revenue and skilled employment for Australian manufacturing ahead of global licensing and ongoing R&D opportunities

JOBS

- 50 to 60 new employees expected at Volgren as a result of successfully commercialising the new alloy
- 140 jobs expected at Clean TeQ as the mine goes into operational production mode

PROJECT PARTICIPANTS

VOLGREN
A Marcopolo Company

CLEAN TEQ
Powering innovation

HESS

DEAKIN
UNIVERSITY AUSTRALIA

CUSTOMISED ORTHOTICS

iOrthotics

A mass-manufacturing process for customised orthotics

iOrthotics has invested in new printing technology, overcoming the limitations of its existing system and bringing larger markets within reach.

This project will allow iOrthotics to expand into the US market and create new areas for Australian manufactured goods, as a prelude to other overseas opportunities.

Using 3D printing within a fully digitised supply chain allows iOrthotics to reach new areas that previously used subtractive production techniques.

To achieve these expansion goals, iOrthotics and its project participants will scale up its new manufacturing processes. This will involve:

- Digitising the ordering process, including a portal that allows customers to submit their requests for fully digitised orthotics
- Developing a laboratory QR or barcode system to track the status of all orders
- Integrating digitised patient foot scans into the iOrthotics core system
- Refining the design to further reduce use of materials and consumables.

3D printing orthotics with the HP Jet Fusion printer is a first step in building new knowledge about how to 3D print other related plastic products. When this project is completed, iOrthotics will have an export-ready product for sale in global markets.

MILESTONES

1/11/17	AMGC approval
25/5/18	Digitisation of order-entry process completed
11/1/19	Laboratory QR/barcoding system completed to track all orders and order status
30/4/19	Digitised patient foot scan integrated into iOrthotics core system
14/5/19	Production optimisation to reduce material/consumables completed
20/6/19	Final product for export to the US market

CONTRIBUTIONS: Government – $195,250 | Industry – $195,250 | In Kind – $60,000

IMPACT

- Advanced processes as a result of increased ICT intensity, including digitisation of the ordering process and integration of digital foot scanning
- Increased capital intensity by acquiring new manufacturing equipment that allows for large-scale production of customised orthotics
- Increased collaboration between industry partners for integrating advanced manufacturing technologies
- Increased trade intensity and access to geographically diverse export markets
- Elevation of services to represent a larger share of total revenue

GROWTH

- Exporting ~20,000 devices to the North American markets of Canada and USA
- ~40,000 devices for domestic supply with exponential growth

JOBS

- Seven high-skilled manufacturing personnel
- Two software engineers
- Four logistics personnel

PROJECT PARTICIPANTS

iOrthotics

evok3d 3d printing solutions

hp

The University Of Queensland AUSTRALIA

COMPLETE

WATER PURIFICATION UNIT

WATER SOURCE AUSTRALIA

A cloud-connected potable water purification unit for remote communities and disaster relief

Maintaining and servicing water purification units in remote communities is challenging and expensive. The Water Source solution is tackling this issue through collaborative research with Monash University, and product development with Bosch Engineering.

The AMGC project seeks to commercialise a potable water purification unit that is compatible with the Internet of Things (IoT) and does not require consumables, such as chlorine or replacement filters throughout its operating lifespan of more than 10 years.

The unit will be remotely monitored and controlled through a cloud-based, IoT-connected platform with inbuilt artificial intelligence (AI) software. This combination of features establishes a valuable and unique position for Water Source in the global water purification market.

Water Source has developed a diverse business model that aims to deliver multiple benefits to its users. For example, the water purification unit can provide remote Indigenous communities with potable water, while a bottling plan incorporated in the unit establishes a source of income for the community.

On conclusion of this project, Water Source will have a market-ready product. This will provide a reliable potable water supply for domestic and small-scale commercial situations in remote communities, developing nations, defence settings and other challenging environments.

The impact of this project is significant. Potential mid-term export value has been estimate at $20 million in new revenue and it could lead to the creation of 15 high-skilled jobs.

MILESTONES

1/3/17	AMGC approval
30/11/17	Development of processes and responses regarding the operation and effectiveness of the ozone cycle
1/3/18	Final manufacturing design
26/4/18	Development of the unit's IoT management systems

CONTRIBUTIONS: Government – $250,000 | Industry – $516,150

IMPACT

- Increased ICT intensity by remotely monitoring and controlling the unit via a cloud-based, IoT-connected platform
- Advanced knowledge development through increased research collaboration with Monash University and product development with Bosch Engineering
- A complex new product that provides potable water for domestic and small-scale commercial situations, and does not require consumables
- Increased trade intensity and access to geographically diverse export markets, including remote communities, developing nations and other challenging environments

GROWTH

- $20 million (medium term)
- $100 million (long term)

JOBS

- 15 high-skilled jobs (medium term)
- 150 high-skilled jobs (long term)

PROJECT PARTICIPANTS

WATER SOURCE AUSTRALIA

BOSCH

MONASH University

DIGITISED MANUFACTURING VALUE CHAIN

Short interval decision making via an Industry 4.0 application

This project seeks to achieve a profound shift away from large-scale, production-centric manufacturing of commodity products, towards a more customised, smart and competitive manufacturing model. This new approach is backed by highly skilled individuals, and is more responsive to the rapidly changing needs and priorities of global value chain partners.

This project applies Industry 4.0 principles and technologies, embracing agility and delivering superior customer experience as a demonstration of the AMGC Sector Competitiveness Plan. In doing so, it aims to influence Australian manufacturing much faster than had previously been possible.

The technology aspect of this project involves collecting real-time manufacturing data and transforming it into meaningful analysis and visualisations. Project partners collaborate on designing and implementing digital technologies including smart sensors, location tracking devices, analytics, digital workflows and scheduling, and data visualisation tools.

B&R Enclosures is working with its project partners to develop a competitive advantage by enhancing decision-making capabilities across the manufacturing value chain. This will allow B&R Enclosures and every link in its value chain to more effectively respond to changing customer needs.

The project will result in an enhanced customer experience and accelerate participants' export growth into new and existing markets.

MILESTONES

1/8/17	AMGC approval
31/8/18	Design and development of the data collection system
29/1/19	Data validation, integration and output
29/5/19	Development and implementation of decision-making tools

CONTRIBUTIONS: Government – $245,000 | Industry – $245,000 | In Kind – $580,000

IMPACT

- Increased information and communications technology (ICT) intensity by applying Industry 4.0 principles and technologies
- Advanced knowledge acquired by collaborating with other manufacturers to develop a competitive advantage across the manufacturing value chain
- An increase in the number of staff members with science, technology, engineering and mathematics (STEM) skills
- Smarter inventory management

GROWTH

- $15 million by 2020

JOBS

- More than 25 jobs

PROJECT PARTICIPANTS

B:R

arrow energy go further

Complete Wiring

RedButton group

The University Of Queensland AUSTRALIA

REMOTE MONITORING SOFTWARE

Smartline MACHINERY

Accelerated development of CleanPath software to provide remote monitoring of Smartline endoscope drying cabinets

Smartline is developing its CleanPath data system which provides digital cleaning validation to help hospitals comply with the new hygiene standards.

The air systems in Smartline's cabinets use patented technology to ensure that endoscopes used in colonoscopy and gastroscopy hospital operations are dried and stored correctly. These well-designed cabinets are already a proven brand in several markets even with only basic data functions attached.

This project exemplifies how ICT can enable high-quality servitisation of data transmitted by software, allowing Smartline technicians in Australia to provide analysis to remote or overseas clients. The Smartline value proposition provides an aspirational benchmark for other Australian manufacturing entities. When the project is complete, Smartline will share the concept of this servitisation model based on Australia's cost advantages and high-skilled labour.

This project will demonstrate to the Australian manufacturing sector how to develop and commercialise leading intellectual property. It will enable Smartline and its project partners to transform their technology and businesses into global competitors. The project will take Smartline from being a basic cabinet manufacturer to being at an advanced level of Industry 4.0 integration. Manufacturing digitally enabled equipment for use in hospitals represents a significant shift towards competing on value and at scale.

MILESTONES

1/11/17	AMGC approval
30/11/17	Software product evaluated
31/12/17	System development detailed
8/6/18	CleanPath system development completed
15/7/19	Data management and cleaning validation processes completed
30/7/19	Field testing completed
30/9/19	Product marketed, evidenced by first commercial sales

CONTRIBUTIONS: Government – $150,000 | Industry – $150,000 | In Kind – $40,000

IMPACT

- Creation of a world's-first patented technology that improves sterilisation and storage of endoscopes in hospitals
- Advanced knowledge achieved through increased ICT intensity, including the ability to remotely monitor the performance of sterilisation equipment
- An advanced business model achieved through services having a greater share in total revenue, enabled by remote monitoring services and maintenance
- A greater number of staff members with STEM skills

GROWTH

- $11.5 million (25% in CleanPath software sales) over the next four years
- $25 million per year ($6.25 million from CleanPath software) with a 5% market share in the US

JOBS

- 15 high-skilled manufacturing personnel
- Three software engineers and data analysts

PROJECT PARTICIPANTS

Smartline MACHINERY

HealthTag

DASSAULT SYSTÈMES VIRTUAL SHIPYARD

innodev

Industry 4.0 maturity program to raise the global digital supply chain readiness of Australian manufacturing SMEs in preparation for future naval shipbuilding, mining and energy project participation

The Dassault Systèmes Virtual Shipyard is the first national level Industry 4.0 capability development program in Australia, benchmarked against world's best practise approaches.

This project identifies and bridges digital capability gaps of 14 SMEs looking to advance their Industry 4.0 capabilities and improve their readiness to participate in major future manufacturing opportunities such as Australia's Future Submarine program.

The project will facilitate critical knowledge transfer from global experts to the University of Adelaide, TAFE South Australia and University of South Australia to build curriculum for future independent training delivery.

AMGC is co-funding the provision of ICT support and 12 months of post-training access to cloud-based infrastructure to enable participating SMEs to embed their new-found skills into standard day-to-day operations.

Upon conclusion of the project, the SMEs will have gained the skills necessary to integrate themselves into global value chains, and will have applied those skills within their own companies on real manufacturing projects.

The project will provide the Australian manufacturing sector a tangible demonstration of increased digital capability and advances the Australian manufacturing eco-system towards achieving a world class Industry 4.0 capability to exploit global value chain opportunities in multi-billion-dollar defence, mining, health, water and energy industries.

CONTRIBUTIONS: Government – $534,152 | Industry – $534,152

MILESTONES

14/11/17 — AMGC approval

ICT Support to training facility and cloud hosted software environment.

12 months post-training partially-subsidised access to cloud-hosted 3D Experience software platform.

To support:

- SME Business Value Assessments
- SME hands-on training in up to 12 digital capabilities using the Dassault Systèmes 3D Experience software platform
- SME self-learning programme

See over for project participants

IMPACT

- Higher information and communication technology (ICT) intensity and increased SME digital capability to increase opportunities for global supply chain participation within major projects
- More collaboration with other manufacturers during the AMGC project
- Higher manufacturing digital literacy as a result of training on the Dassault Systèmes 3D Experience platform
- Newer equipment and systems as a result of integrating the Dassault Systèmes platform into SME manufacturing operations
- Larger geographical reach and increased potential for accessing global value chains using the Dassault Systèmes platform
- Multiple future I4.0 tertiary education options via University curriculum development supported by Dassault Systèmes during the Virtual Shipyard project

GROWTH

- Curriculum developed by University of Adelaide, TAFE South Australia and University of South Australia with assistance from Dassault Systèmes as part of the Virtual Shipyard project will help grow Australia's high-skilled workforce ready for I4.0 jobs required by global supply chains to deliver future naval ships and submarines, mining, health and energy sectors
- Participating SMEs will have the digital literacy of relevance to global primes, enabling them to more easily participate in digital supply chains for major projects

JOBS

- SMEs are expected to create new high skilled jobs, enabled by increased efficiencies driving increased revenue streams in new and existing markets

PROJECT PARTICIPANTS

innodev

DASSAULT SYSTEMES

APC Technology

B&R

VERSENG GROUP

LogiCamms

MINCHAM AVIATION

REDARC

SUDEL
PRECISION ON ANY SCALE

AXIOM
PRECISION MANUFACTURING

CENTURY ENGINEERING

CODAN

Rowlands METALWORKS

ENTECH ELECTRONICS

IPACS

KADEGO

Government of South Australia
Department for Industry and Skills

University of South Australia

THE UNIVERSITY of ADELAIDE

tafeSA

COMPLETE

CORRUGATED METAL SHEET BENDING

FormFlow

A manufacturing process for bending corrugated metal sheets, and its commercialisation through global value chain partners

FormFlow worked with its project partners to develop a patented process for bending corrugated metal sheets, which has the potential to realise new market opportunities in the $1 billion per annum global sheet metal market.

This project seeks to overcome deficiencies in corrugated sheet metal roofing constructions by eliminating:

- Caps and flashing, which reduces building costs and improves visual appeal
- Gaps and drafts, improving insulation
- Gaps where moisture can enter during severe tropical storms
- Gaps where dirt or animals can enter a structure
- Gaps that facilitate ember attack during bushfires.

In addition to the corrugated metal sheet bending process, FormFlow has designed a business model based on manufacturing and then licensing FormFlow bending machines to sheet metal manufacturers. This enables other manufacturers to include bends in customised sheet metal orders.

By developing and validating the FormFlow machine for installation and integration in the sheet metal manufacturing process, FormFlow has created intellectual property that will deliver manufacturing revenue, employment and return on investment.

MILESTONES

10/11/17	AMGC approval
15/11/17	FormFlow machine operating environment and process engineering requirements identified and confirmed
20/11/17	Detailed design of the FormFlow machine developed and validated
15/12/17	Commercial FormFlow machine version 1.0 built and tested
31/7/18	Reference sites developed using products created on the FormFlow machine
31/10/18	FormFlow licensing model and technology integration plan established
31/3/19	FormFlow licensing model and technology integration plan realised

CONTRIBUTIONS: Government – $250,000 | Industry – $250,000 | In Kind – $75,000

IMPACT

- Introduction of a world's-first patented technology
- Increased collaboration with local manufacturers to develop advanced knowledge in steel bending production process
- Advanced processes achieved through integrating the technology with sheet metal manufacturing
- Elevation of services to represent a larger share of total revenue

GROWTH

- $10–15 million per year in licensing revenue generated by FormFlow
- Austeng will generate revenue through services, including contract manufacturing of bending machines, after sales services, machine maintenance and staff training
- Potential for $20–30 million per year (medium term) by taking a 2–3% stake in the global sheet metal roofing industry

JOBS

- Five to 10 skilled jobs at FormFlow, including research engineers
- Five skilled jobs at Austeng
- 50 jobs across domestic project partners and prospective future partners

PROJECT PARTICIPANTS

FormFlow DEAKIN UNIVERSITY AUSTRALIA Austeng

CARBON FIBRE REINFORCED GEOPOLYMER CONCRETE

Austeng

Production of a pedestrian bridge and validation of new construction material for the global supply chain

Victorian engineering firm Austeng is leading an AMGC project to develop a world's first construction industry innovation. The project involves members of the Advanced Fibre Cluster Geelong, Carbon Nexus and Rocla.

Combining Austeng's experience in polymer concrete projects with the world-class carbon fibre expertise of the Carbon Nexus research facility has allowed for the creation of a high-value product for use across the global construction industry.

Geopolymer and carbon fibre offers superior thermal stability, corrosion resistance and durability than concrete, plus it is rust-proof, acid-resistant, salt-resistant and thermally stable up to high temperatures. Austeng's Managing Director Ross George calls it "a cure for concrete cancer". This project is the first in the world to combine carbon fibre and geopolymer in concrete.

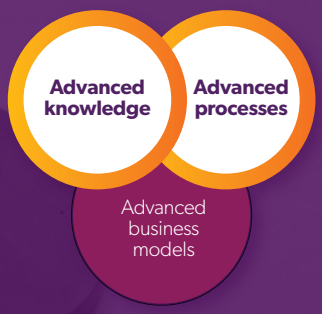
In addition to the product itself, Austeng will offer post-production design services based on this unique composite material.

According to IBISWorld research, the Australian concrete products market is worth $2 billion. It has already been estimated that Austeng's new material could capture up to 1% of this ($20 million) and enter the export market.

MILESTONES

15/11/17	AMGC approval
1/12/18	Bridge beam design
1/12/18	Computer modelling and optimisation
31/7/19	Manufacture and testing of a 'sleeper beam'
30/9/19	Modelling review in light of testing
30/10/19	Manufacture and testing of bridge beam

CONTRIBUTIONS: Government – $50,000 | Industry – $85,000 | In Kind – $35,000



IMPACT

- Increased spending on R&D to validate complex new product for the construction industry
- Advanced knowledge achieved through collaboration with Carbon Nexus and members of the Advanced Fibre Cluster Geelong
- Better energy efficiency and performance than cement

GROWTH

- $20 million plus export revenue in early earnings forecast
- Carbon fibre will be domestically manufactured
- There is a patent pending on the solution

JOBS

- 10 jobs (medium term) as a result of commercialisation

PROJECT PARTICIPANTS

Austeng Rocla CARBON nexus carbon fibre & composite research CITY OF GREATER GEELONG

COMPLETE

CUSTOMISED PRESCRIPTION EYEWEAR

Dresden

Implementing an automated production system to scale-up manufacturing of mass-customised prescription eyewear for a global consumer market

Dresden Optics and its project participants are developing a fully automated production system to scale up the manufacturing output of Dresden's market proven prescription eyewear product.

The collaborative partnership between Dresden and Astor Industries seeks to improve production processes and enable mass customisation of spectacles manufactured from recycled material. This project is the first step in realising Dresden's advanced business model over the next 18 months.

The primary objective is to increase production volume by implementing an automated robotic system that will double current production from 400 units to 800 units per day.

When this project is complete, Dresden will have established a fully automated production system. The enhanced manufacturing capability will reduce operating costs, improve production efficiency and reduce resource inputs, including materials and electricity requirements.

MILESTONES

15/12/17	AMGC approval
15/3/18	Robotic system design completed
31/10/18	Robotic equipment commissioned and installation completed
30/11/18	Programming robotic functions for automated manufacture completed
31/12/18	Digital integration with materials handling system completed
31/1/19	Testing, refinement and validation of the robotic system
30/6/19	Fully operational robotic sub-cell production completed

CONTRIBUTIONS: Government – $250,000 | Industry – $250,000 | In Kind – $467,000

IMPACT

- Increased collaboration with local manufacturers using recycled plastic materials in the production of eyewear frames
- Advanced processes and knowledge, achieved through higher spending on R&D to validate the performance of the recycled plastic materials
- Higher ICT intensity via increased robotic technologies
- Increased trade intensity and access to geographically diverse export markets, including India and North America
- Increased marketing expenditure

GROWTH

- 33,000 units in 2017
- 412,500 units by 2022
- 5,235,000 units by 2027

JOBS

- Five to 10 high-skilled jobs between Dresden and Astor Industries
- Around 300 jobs at Dresden as increased production results in more retail stores

PROJECT PARTICIPANTS

Dresden

ASTORINDUSTRIES

ELEMENTAL MANUFACTURING

CONSONIC

UNSW AUSTRALIA

MRI COIL SET

MAGNETICA

Optimisation of MRI coil set manufacture to achieve scale

Magnetica is developing and supplying customised coil sets and components to provide extremity musculoskeletal (MSK) scans for wrists, hands, elbows, knees, ankles and feet.

With AMGC's support, Magnetica is able to bring their coil set manufacturing from the TRL4 prototype level to TRL9, indicating that the system is proven and production-ready for full commercial deployment. This project will allow Magnetica to manufacture coil sets in Australia and distribute the manufactured goods to the global supply chain via the marketing arm of its OEM partner.

The challenge of manufacturing multiple coils economically while meeting customer demand for manufacturing at scale requires Magnetica to optimise two critical elements of the coil manufacturing process, RF coil testing and gradient coil potting.

Magnetica is collaborating with its OEM on test plans, test methods and criteria for commercial RF coils; validation of production volumes; and pricing strategies for gradient coils. The company will collaborate with University of Queensland to access the unique RF and gradient testing facilities at the university's biomedical imaging facilities. In doing so, Magnetica will contribute to the body of knowledge around coil design available to the Australian manufacturing sector.

MILESTONES

1/1/18	AMGC approval
25/5/18	Pilot system architecture defined and pilot testing completed
31/8/18	Hardware design and value stream mapping completed
22/2/19	Integrated system software and hardware architecture defined and testing completed
31/7/19	Automated manufacturing equipment installed, integrated and validated to enable supply of finished coils
30/11/19	Coil testing/coil plotting

CONTRIBUTIONS: Government – $269,825 | Industry – $269,825 | In Kind – $44,000

IMPACT

- Advanced knowledge achieved through development of complex new product for global markets
- Increased collaboration with industry and researchers to develop compact and portable MSK scanner
- Growth in the patent portfolio
- Increased product value density and greater trade intensity to geographically diverse export markets
- Greater number of staff members with STEM skills

GROWTH

- $10.32 million in the next four years

JOBS

- One engineer
- Five high-skilled technicians for the project

PROJECT PARTICIPANTS

MAGNETICA

THE UNIVERSITY OF QUEENSLAND
AUSTRALIA

INTEGRATED CNC ROBOT

ANCA
CNC Grinding Machines

Transitioning a locally developed prototype of an integrated CNC Robot to production ready status

ANCA Machine Tools, in collaboration with its project partners, seek to commercialise a locally developed prototype robotic and digital control system for computer numerical control (CNC) grinding and milling machines. The project aims to replace limited-functionality pneumatic solutions that are currently integrated with many CNC machines. This will enable full automation of common production so that users can achieve unsupervised 24/7 CNC operating capabilities.

The prototype robotic system integrates with ANCA CNC machines and should have broad market appeal in other industries such as pharmaceuticals and food production. The robotic solution is a flexible alternative to traditionally operated CNC machines, aligned with Industry 4.0 technologies. Real-time production data will be available for use within enterprise resource planning (ERP) systems, while the programmable robot's flexibility will help optimise production and enable rapid reconfiguration between manufacturing tasks.

When the project is completed ANCA, and its subsidiary companies will be equipped to provide an integrated robotic solution to its customers and establish a new robot export industry for Australia.

MILESTONES

22/1/18	AMGC approval
6/7/18	Final product design review completed
12/10/18	Product validation, testing and adjustments completed
28/3/19	Process validation completed and first commercial product produced
31/7/19	Volume production achieved and product launch completed

CONTRIBUTIONS: Government – $325,000 | Industry – $325,000 | In Kind – $145,836

IMPACT

- Sustained competitive advantage achieved by developing a specialised production robot for ANCA CNC machines
- Increased collaboration with industry partners to test and optimise the development of innovative products and services
- Advanced processes achieved through flexibly programming the robot's operations to optimise production and enable rapid reconfiguration between manufacturing tasks
- Increased ICT intensity by integrating real-time production data with legacy ERP systems
- Greater number of staff members with STEM skills

GROWTH

- The robotic solution can be used by other industries within Australia and around the world
- ANCA will manufacture the first generation of the product in Australia. Once ANCA reaches high-volume production, the first-generation product will be manufactured in ANCA's Taiwan facility while ANCA Australia develops the second generation

JOBS

- More than 100 Swinburne University engineering students placed at ANCA through the industry-based learning program, many of whom have gone on to full-time employment with ANCA

PROJECT PARTICIPANTS

ANCA CNC Grinding Machines · ANCA motion · suttontools · Total Precision · Harmonic Drive · Swinburne University of Technology

CARBON COMPOSITE CYCLE WHEELS

36T

Upscaling of 36T's manufacturing capability and commercialisation of a 'multi-material' bicycle wheel via global value chain partners

36T has developed patented multi-material technology for manufacturing highly optimised bicycle components.

This AMGC project seeks to scale-up 36T's manufacturing processes and production capabilities. Success will be demonstrated by taking a prototype multi-material bicycle wheel through to commercialisation.

To validate its manufacturing processes, 36T will produce an 'off-tool' sample, which represents the starting point for commercial production of a high-performance cycle wheel for elite and enthusiastic cyclists. The multi-material wheel is 30% lighter than a standard wheel, without compromising component strength, aerodynamics or material integrity.

The project involves developing a robotic manufacturing cell to produce multi-material products. It will culminate with testing and validating the 'off tool' samples, at which point 36T will be production-ready.

Following validation of 36T's manufacturing capability, the company will pursue opportunities in adjacent growth sectors to position 36T as an international leader in multi-materials manufacturing. In addition to bicycle wheels, 36T will exploit its technical leadership and production capability across other global value chains, including in the defence, automotive and consumer products.

MILESTONES

5/2/18	AMGC approval
16/3/18	Detailed plans for the robotic manufacturing cell designed, costed and confirmed
27/4/18	Robotic manufacturing cell, machining setup and testing completed
24/8/18	Production and testing of tooling completed
30/6/19	Testing and validation of 'off tool' sample completed. Team training on production processes completed

CONTRIBUTIONS: Government – $175,000 | Industry – $267,000 | In Kind – $45,400

IMPACT

- Advanced processes through increased ICT intensity and increased use of robotic production
- Advanced knowledge achieved through increased collaboration with university researchers in developing complex new products
- Increased diversity applying multi-materials technology across multiple product segments, services offering and geographies
- More collaboration with other manufacturers
- A greater number of staff members with STEM skills

GROWTH

- $12–$15 million in global sales by 2020

JOBS

- 13 to 20 full-time positions at 36T
- Five to 10 (or more) positions in 36T's supply chain

PROJECT PARTICIPANTS

36T BASTION baum PASSION PRECISION PERFORMANCE DEAKIN UNIVERSITY AUSTRALIA PLASTOOL zedtex

WORLD LEADING COMPOSITE MANUFACTURING PROCESS

Development of a customised software package that facilitates the design and manufacture of complex components with a reduced occurrence of defects

This project seeks to address a global challenge among composite manufacturers by aiming to reduce the occurrence of defects arising when resin shrinks during composite manufacturing, and improve the quality of the surface finish when composite materials come out of the mould. Successful execution of this project will lower the failure rate of complex components, reduce manufacturing cycle times, and enhance capabilities in modelling and simulating composite materials.

Understanding how to control and eliminate this fundamental problem will create a sustained competitive advantage. The technical leadership will increase international recognition of Australia's composite manufacturing industry.

The project is developing a customised software package that enables complex components to be designed and manufactured without these shrinkage issues. These components will be used in the production of Sykes Boats and Carbon Revolution Wheels.

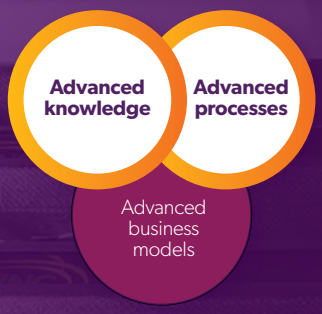
The project will help ensure Australian composite manufacturers remain globally competitive. The tools, knowledge and protocols developed during this project will improve Australia's composite manufacturing value offering, enabling the design and manufacture of complex composite solutions at a quality and consistency not available elsewhere.

If successful, this project will demonstrate how the Australian manufacturing sector can develop and commercialise a new, world-leading composite manufacturing process using customised software and Australian ingenuity. The industry-wide impact will continue through Deakin University's engagement with project participants and other firms seeking to adopt advanced processes in complex composite manufacturing. The university will provide ongoing education for postgraduate students, covering advanced process for complex composite manufacturing.

MILESTONES

8/3/18	AMGC approval
30/9/18	Preliminary experimental and modelling benchmark
30/11/18	Software package development
30/6/19	Validation of model using laboratory scale composites
31/10/19	Development of new protocols and demonstration

CONTRIBUTIONS: Government – $80,000 | Industry – $80,000 | In Kind – $474,166



IMPACT

- Increased spending on R&D to develop software that improves understanding of and reduces the occurrence of resin shrinkage
- Increased research collaboration with Deakin University, to reduce the occurrence of defects
- Manufacturing process development with Carbon Revolution which provides specific expertise in composite manufacturing
- Advanced processes achieved by implementing new manufacturing techniques that reduce defects and the need for repairs
- Growth in the patent portfolio

GROWTH

- $4–5 million per year in new sales

JOBS

- Five to 10 high-skilled jobs

PROJECT PARTICIPANTS

SYKES

CARBON REVOLUTION

Geelong Advanced Fibre Cluster

DEAKIN UNIVERSITY AUSTRALIA

FLIGHT SIMULATOR

SynFlyt

Scaling production of flight simulator for the global pilot training market

SynFlyt has developed a patented prototype Category B flight simulator and is aiming to manufacture 250 units over the next three years for the global civil aviation flight training and simulation market. The flight simulator includes remote monitoring capabilities, so performance data from each unit is collected and analysed to enable ongoing improvements and predictive maintenance. Specifically, the simulator collects mechanical data to identify motion control issues, then the SynFlyt software is upgraded remotely to continually improve performance and user experience.

Most flight training schools cannot afford to purchase a flight simulator, which typically costs over $130,000 plus setup, software and ongoing servicing. SynFlyt has developed a zero-cost placement model for flight training schools. Instead of selling them simulators, SynFlyt charges student pilots directly via debit or credit card at $65 per hour. The cost to pilots is dramatically reduced, for example, from $350 per hour in a Cessna, to $65 per hour in a SynFlyt simulator set up as a Cessna cockpit. The return on investment for each placed simulator is approximately 30 months.

On conclusion of this project, SynFlyt will have a market ready flight simulator for sale to domestic and international customers, and will have validated its manufacturing processes to begin full rate production.

SynFlyt and the project participants will become innovation leaders through collaborative R&D and higher spending on R&D; more collaboration with research institutions and industry; greater intensity of STEM skills; and better-qualified employees.

MILESTONES

2/4/18	AMGC approval
27/4/18	Tooling completed
11/6/18	Setup of production facility
7/8/18	Specification on production processes and operations plans
27/10/19	First 10 simulators produced
21/11/19	Implementation of ERP/CRM system

CONTRIBUTIONS: Government – $279,550 | Industry – $279,550 | In Kind – $25,000

IMPACT

- Sustained competitive advantage achieved through increased spending on R&D to manufacture a flight simulator for pilot training
- Increased ICT intensity achieved through remote monitoring of performance data for ongoing improvements and predictive maintenance
- Advanced business model achieved through services representing a greater share of total revenue, enabled by SynFlyt's placement model
- Growth in the patent portfolio
- Greater number of STEM-qualified employees

GROWTH

- $33 million in revenue per year by the end of year three

JOBS

- 20 high-skilled jobs

PROJECT PARTICIPANTS

SynFlyt ryman composites MDA UNSW AUSTRALIA

CONVEYOR TABLE AND MOTION-CONTROL SYSTEM

Developing a 'Smart Factory' conveyor table and motion control system for global logistics applications

Rotacaster and the project participants will design, develop, and install a 'smart factory' conveyor table and digital control system for Tesla at its Gigafactory battery plant in Sparks, Nevada. The project participants will use Rotacaster's patented omniwheel to create a modular, servo-driven conveyor transfer system. The conveyor transfer system is capable of handling large and heavy objects, such as Tesla vehicle batteries.

This project aims to achieve a shift from large production-centric manufacturing to customised, smart and competitive manufacturing that is backed by collaborative research and development (R&D) together with highly skilled workers. This project will deliver an R&D asset, associated intellectual property (IP) and a commercial product. It will create a world-class reference site in form of Tesla's battery factory, which will help Rotacaster to sell smart factory solutions to other large companies around the world that operate sophisticated factories and logistics hubs.

Rotacaster's solution will be modularised to accommodate the use of 'plug and play' components with Internet of Things (IoT) functionality. This will give customers more flexibility and create an advantage over large, expensive, single-system solutions. Rotacaster's digital control system integrates with existing production systems and responds to live factory data for tracking and recording product movement.

MILESTONES

28/5/18	AMGC approval
13/8/18	Technical report of design guidelines completed
31/10/18	Production and verification of prototype for testing
30/6/19	Commercial design of conveyor table finalised
31/7/19	Production of market ready conveyor table completed
30/8/19	Installation of conveyor table at customer site completed

CONTRIBUTIONS: Government – $211,122 | Industry – $211,122 | In Kind – $101,700

IMPACT

- Increased spending on R&D and collaboration with research institutions to design, produce and test a prototype of the conveyor table and digital control system
- Higher ICT intensity through the integration of a digital control system
- Digitisation of the conveyor table enables Rotacaster to gain a greater share of services in total revenue

GROWTH

- Rotacaster has the potential to take a $1.15 – $2.3 million share of the Australian Market and $85 – $170 million share of the global market

JOBS

- Five to 10 high-skilled jobs

PROJECT PARTICIPANTS

rotacaster D+I AUSTRALIS ENGINEERING TESLA celluveyor UTS UNIVERSITY OF TECHNOLOGY SYDNEY

VALUE FROM SOLID WINE WASTE

Viridi

Drawing value from solid wine waste by developing and demonstrating a small-scale pilot plant and designing an industrial-scale production plant

This project seeks to validate a semi-continuous production process for transforming solid wine waste into high-value compounds. Once the process is validated, the project participants will produce plans for an industry-scale production plant.

The Viridi Innovations 'waste to value' technology enables on-site processing of solid wine waste to produce tartaric acid and grape sugar. These are both key ingredients in the global food manufacturing value chain. Applying this technology to large-scale wine production improves production flexibility and generates better environmental outcomes.

Viridi's business model involves partnering with progressive wine producers, such as project participant Accolade Wines, to reduce their key input costs and share the value generated by selling excess product to other customers. The market demand for tartaric acid alone is expected to be US$3.16 billion by 2022.

On conclusion of the project, the project participants will have validated the 'waste to value' production process and produced designs for an industrial-scale application.

MILESTONES

7/5/18	AMGC approval
2/10/18	Design and costing for demonstration plant completed
30/11/18	Production of demonstration plant completed
31/7/19	Testing of demonstration plant completed
30/9/19	Concept design for industrial scale pilot plant completed
31/12/19	Cost report of industrial scale pilot completed
31/3/20	Detailed design documentation for industrial scale pilot plant completed

CONTRIBUTIONS: Government – $145,000 | Industry – $145,000 | In Kind – $48,000

IMPACT

- Higher spending on R&D to design, construct and test a small-scale demonstration plant in collaboration with Swinburne University
- Larger patent portfolio
- Collaboration with Austeng to produce plans for an industrial-scale pilot plant
- Larger geographical reach by offering the Viridi technology to international wine producers

GROWTH

- The Viridi process has the potential to unlock more than $600 of value per tonne of solid wine waste
- The potential gross value – addressing only the top five wine producers in the top five global wine producing regions (less than 4% of global wine waste production) – is more than $500 million per annum

JOBS

- 10 medium to high-skilled jobs

PROJECT PARTICIPANTS

Viridi

Swinburne University of Technology

Austeng

Accolade Wines

INDUSTRY 4.0 DIGITISATION OF SME INFRASTRUCTURE

Dematec Automation

Industry 4.0 realisation via digitisation of existing SME Manufacturing Infrastructure and IIoT augmentation of manufacturing equipment being locally manufactured by Australian SMEs

Dematec Automation and 17 small-to-medium sized Australian manufacturers from across the country will demonstrate how Industrial Internet of Things (IIoT) sensors can instrument existing manufacturing equipment to elicit valuable real-time operational data and identify opportunities for optimisation of manufacturing operations. Several SME Manufacturers will augment their manufacturing equipment product offerings with IIoT to introduce or increase servitisation opportunities.

The 17 manufacturers service a diverse range of industry sectors including metal fabrication, materials handling, textiles, chemicals, concrete, hydraulics, joinery, marine, masonry and packaging. They will each become case studies that help other manufacturers in allied sectors readily identify the potential return on investment for digitalising legacy manufacturing plant and equipment and bringing their operations into the Industry 4.0 context.

The project spans Western Australia, South Australia, Victoria, Tasmania, Australian Capital Territory, New South Wales and Queensland, and is associated with the Department of Industry, Innovation and Science's Entrepreneurs' Programme.

Digitisation of manufacturing equipment offers immediate and long-term benefits, not just limited to analysis of current operational workflows and resource utilisation. It is a critical step in achieving high-value-add product offerings such as detailed traceability throughout the manufacturing process and therefore opportunities for servitisation through predictive maintenance offerings. It supports the adoption of digital supply chain transparency and the optimisation of manufacturing resources at a supply chain level.

MILESTONES

15/5/18	AMGC approval
30/11/18	Deployment and handover of monitoring system equipment for sites 1–3
30/4/19	Deployment and handover of monitoring system equipment for sites 4–6
30/7/19	Deployment and handover of monitoring system equipment for sites 7–9
31/10/19	Deployment and handover of monitoring system equipment for sites 10–12
31/1/20	Deployment and handover of monitoring system equipment for sites 13–17
31/2/20	Case studies complete

CONTRIBUTIONS: Government – $248,470 | Industry – $248,470

IMPACT

- Higher spending on R&D during the AMGC project
- Increased ICT intensity by integrating IIoT technology on existing infrastructure
- More automation as a result of integrating IIoT technology on existing infrastructure
- Better energy efficiency as a result of enhanced analytics
- Case studies across multiple manufacturing sectors

GROWTH

- Better efficiencies garnered from hi-fidelity, real-time knowledge and analytics of manufacturing plant and equipment will enable better utilisation of capital infrastructure
- Dematec will achieve deployment of their IIoT systems infrastructure to a broad range of sectors
- Increased value offerings via integration of IIoT within manufactured product lines will help secure and improve market position for manufacturers offering B2B products

JOBS

- High-skilled jobs will be devoted to further development of Dematec's IIoT systems infrastructure during this project
- Better understanding of capital infrastructure utilisation for participating SMEs

PROJECT PARTICIPANTS

DematecAutomation **+ Ecosystem of 17 SMEs to be announced**

INNOVATIVE CRUTCH WEAR

Mine site testing of innovative crutch wear on hoist chains for mining dragline machines

Cast Equipment & Chain Products Pty Ltd (CECP) have invented and patented a new chain system which is part of the immense Dragline Bucket assembly. Dragline machines remove overburden and dig out clean coal, iron ore or other resources at mines. This CECP chain will revolutionise the chain business globally by significantly increasing the life expectancy of chains, improving productivity, saving on maintenance costs and reducing downtime for the mining sector, locally and globally.

Limited trials of these drag chains were undertaken, which verified the 50% reduction in wearability of the crutch design. This current project aims to prove the commercial viability of the chains, resulting in the eventual sale of trial chains.

The technology for dragline chains has not changed in more than 40 years. This Australian patented invention demonstrates advanced processes with technical leadership in designing a 400+ BN removeable crutch system.

Drag chains used in the Australian mining industry are currently imported from US companies such as Columbia and cost $100 million annually. This project will provide an opportunity for a local manufacturer to reshore a portion of this market back to Australia.

MILESTONES

15/5/18	AMGC approval
8/1/19	Foundry designs drafted
20/6/19	Patterns completed and samples manufactured
31/8/19	Sample metallurgical test completed
31/10/19	Sets 1 and 2 chains manufactured
31/12/19	First eight week trial completed
30/2/20	Set 3 chains manufactured
30/4/20	Second eight week trial completed
31/5/20	Third eight week trial completed

CONTRIBUTIONS: Government – $398,941 | Industry – $398,941 | In Kind – $4,800,000

IMPACT

- Higher spending on R&D and collaboration with research institutions to validate designs
- Greater share of services in total revenue by charging a leasing or rental fee per bank cubic metres

GROWTH

- $43.2 million per annum with a potential 10% market share

JOBS

- This project will generate additional jobs for 10 staff members at CECP, five at White Industries, six at Alfabs and three UQ graduates

PROJECT PARTICIPANTS

CECP GLENCORE THE UNIVERSITY OF QUEENSLAND AUSTRALIA WHITE ALFABS

CONCRETE COLUMN BUILDING SYSTEM

Validation of a prototype system for manufacturing and installing structural concrete columns in multi-storey buildings

This project seeks to validate a prototype system for installing structural concrete columns in multi-storey commercial building projects. The core activity of this project includes refinement of product design, comprising interlocking steel and plastic components that form a concrete mould for weight bearing columns, then demonstrating the construction system via a multi-storey building project managed by Piety.

Ozwall Manufacturing has developed a patent pending concrete column building system where pre-fabricated steel moulds are used to accelerate the concrete pouring process. The construction time of multi-storey buildings is reduced through the combined utilisation of prefabricated products, enhanced processes and a service orientated business model.

The steel columns are produced by using roll formed steel components and a patented system of plastic connecting clips. The unique design profile of the roll formed steel components allows a modularised system that achieves any desired column size, shape and structural engineering specifications.

Achievement of these two steps will enable the Ozwall Manufacturing IP to be commercialised in terms of manufacturing revenue, employment and investment. The project will provide Ozwall with the necessary manufacturing processes and equipment to begin low rate production and marketing of the concrete column building system to the construction industry. The OZM system will scale globally via licensing and service agreements to construction firms.

MILESTONES

11/6/18	AMGC approval
6/7/18	Confirm process engineering requirements with project partner
13/8/18	Produce CAD files of final product design and patent filing completed
15/10/18	Produce roll form tooling, equipment and components
30/6/19	Production, installation and testing of prototype products
30/8/19	Licensing model and product specification manual completed

CONTRIBUTIONS: Government – $159,725 | Industry – $159,725 | In Kind – $10,000

IMPACT

- Higher spending on R&D to refine the design of the steel columns and plastic components to improve performance
- Larger patent portfolio
- Collaboration with The University of Wollongong to test the structural performance of the profiled metal columns
- Newer equipment which is required to manufacture the steel column components

GROWTH

- $15 – $20 million per annum in manufacturing revenue and $1 million in licensing revenue
- $200 million per annum from taking a 1% stake in the global formwork industry (medium term)

JOBS

- Additional five to 10 skilled jobs at Ozwall Manufacturing, including appointment of research engineers in two – 3 years
- An additional >50 jobs across domestic supply chain in two – 3 years

PROJECT PARTICIPANTS

OZWALL PIETY THP Metsquare Pty. Ltd UNIQUE ENGINEERING GROUP UNIVERSITY OF WOLLONGONG AUSTRALIA

INDUSTRY 4.0 PILOT

BOSCH

AMTIL Connect. Inform. Grow.

Industry 4.0 audit of 12 manufacturing SMEs to assess their readiness to integrate digital technology into their manufacturing processes

This pilot project is designed to help 12 Australian manufacturers, operating in a diverse range of industry segments, to improve their knowledge and adoption of Industry 4.0 technologies. This will provide a compelling demonstration to the wider Australian manufacturing sector of the benefits and pitfalls of integrating a fully integrating digital technology into operations and production processes.

Bosch has developed an audit tool that identifies technological capability gaps preventing SMEs from embracing Industry 4.0. The tool makes recommendations on how these companies can transition their businesses to the digital manufacturing era. Implementation recommendations may span the breadth of Industry 4.0 topics and will not be tied to specific proprietary technology platforms.

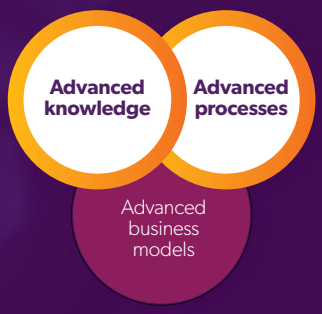
Implementation projects will assist companies to expand their technology capabilities and develop advanced characteristics. Depending on the site, these could include embracing highly integrated robotics, digitalisation of production processes, development of cyber-physical systems and high levels of automation. The implemented solutions will always be in line with the SME's business goals and ambitions delivered through IIoT and Industry 4.0 digital solutions.

After project completion, all SMEs will have taken steps to implement digital technologies that allow them to increase their contribution to global value chains. These SMEs will also serve as reference sites for three years and feature as Industry 4.0 case studies – made available to the broader manufacturing industry via site visits, AMGC's website, as well as via social media and partner channels.

MILESTONES

1/8/18	AMGC approval
21/12/18	First eight SME Industry 4.0 readiness audits completed
31/7/19	Remaining seven SME Industry 4.0 readiness audits completed
31/7/19	Implementation projects commence
31/8/19	First six implementation project completed
31/10/19	Remaining implementation projects completed
30/11/19	12 case studies completed

CONTRIBUTIONS: Government – $273,700 | Industry – $273,700



IMPACT

- Higher spending on R&D to transition their legacy equipment to the digital manufacturing era
- Increased ICT intensity using the Industry 4.0 audit tool outcomes
- More collaboration with other manufacturers by producing case studies and facilitating site visits
- More automation through implementation projects

GROWTH

- After project completion, all SMEs will have taken steps to implement digital technologies that allow them to increase their contribution to global value chains. These SMEs will also serve as reference sites for three years and feature as Industry 4.0 case studies – made available to the broader manufacturing industry via site visits, AMGC's website, as well as via social media and partner channels

JOBS

- New and highly skilled jobs are expected to be created as Industry 4.0 principles are implemented, allowing manufacturers to increase their contribution to global value chains

PROJECT PARTICIPANTS

BOSCH

AMTIL Connect.Inform.Grow.

+ Ecosystem of 12 SMEs to be announced

PREDICTIVE MACHINE HEALTH MONITORING

Development and pilot of a machine health monitoring system that can predict unplanned stoppages

This project seeks to improve factory productivity by reducing unplanned production line stoppages and downtime. This is a costly major global industry challenge and source of frustration for management, customers and shop floor teams. Asahi Beverages and the project participants plan to co-develop and pilot a machine health monitoring system.

The project aims to minimise unplanned stoppages and downtime by developing a data-driven approach and machine learning algorithms, working towards moving from preventive maintenance to predictive maintenance.

As a result of this project, manufacturers will be able to forecast future production line stoppages. This will assist them to plan preventive maintenance routines, and extend the working life and utilisation of their assets through increased monitoring of actual equipment condition. Maintenance teams can switch from performing reactive and preventive tasks to undertaking value-adding and strategic activities. Asahi Beverages aims to increase production line throughput and efficiency, including overall productivity.

Asahi Beverages is confident that its experience will serve as an inspiring case study for Australian SMEs seeking to implement new predictive maintenance technologies. The company will open its doors for site visits and industry education sessions during the lifespan of the project and following its successful completion. It is hoped Australian manufacturers will gain valuable insights to digitalise their operations and implement Industry 4.0 practices, a key marker of competitiveness in today's internet-driven world.

MILESTONES

1/12/18	AMGC approval
30/6/19	Development of data model and design data collection
22/8/19	Data collection and development of predictive tool
5/10/19	Process capture for second machine
7/12/19	Development of data model and design
20/3/20	Development and implementation of predictive algorithm

CONTRIBUTIONS: Government – $119,250 | Industry – $119,250 | In Kind – $10,425

IMPACT

- Increased ICT intensity through the integration of the monitoring system
- Collaboration with project participants to develop and pilot the system
- Increased capital efficiency by preventing unplanned stoppages
- Better energy efficiency via the use of sensors

GROWTH

- Asahi Beverages aims to increase production line throughput and efficiency, including overall productivity

JOBS

- Maintenance teams can switch from performing reactive and preventive tasks to undertaking value-adding and strategic activities

PROJECT PARTICIPANTS

Asahi Chelgrave Contracting ofs Operations Feedback Systems Swinburne University of Technology

GLOBAL SUPPLY CHAIN INTEGRATION

BAE SYSTEMS

Increasing Australian SME Manufacturers' ability to Digitally Integrate into Global Supply Chains

This project will identify and explore options for establishing a practical, openly published specification for trusted digital interoperability between supply chain participants. A prototype implementation will be explored and proven using the F-35 Joint Strike Fighter Australian manufacturing supply chain. Successful implementation within the aeronautical domain is expected to lead to broader adoption of the approach within the Hunter Class Frigate program, JORN, and throughout the Defence industry and beyond.

Manufacturing, business and information technology experts from Advanced Focus and Flinders University will work with BAE Systems, their F-35 supply chain partners Axiom and RUAG Australia, Special Processing Centre of Excellence, and a cross-section of SME Manufacturers from BAE Systems' broader supply chain to derive a practical digital information exchange approach.

Increased supply chain transparency between supply chain participants promises to deliver faster issue identification and resolution, improve trust relationships between customers and suppliers, provide a collective understanding of supply chain priorities, support improved risk management, and enable resource utilisation. Significant savings are expected across the supply chain via the elimination of paper-based processes that will become digital and dynamic, improving timeliness and minimising errors, rework and delays.

This project's value in demonstrating real-time, cross-enterprise manufacturing status and digital supply chain management goes beyond advanced Defence manufacturing. Both direct and indirect transfer of this technology into other key Australian industries such as mining, agriculture and construction sectors is anticipated. These sectors have similar challenges with real-time transparency of upstream and downstream supply chain, materials, people and tools.

MILESTONES

13/12/18	AMGC approval
8/2/19	Initial workshops and site visits
8/3/19	Current state value stream map
8/4/19	Future state defined
31/7/19	Solution options developed
31/7/19	Stage one report
6/9/19	Selection of solutions providers
12/11/19	Protype implementation available for trial
4/2/20	Prototype solution within subset of supply chain assessed
20/5/20	Demonstration of bi-directional supply chain transparency

CONTRIBUTIONS: Government – $362,650 | Industry – $362,650

IMPACT

- Demonstrated bi-directional supply-chain transparency between Australian F-35 manufacturers
- Reduced supply chain transactional costs for Australian F-35 SME manufacturers
- Prototype specification outlining a viable, non-proprietary approach to supply chain digitisation
- Recommendations for progressing the prototype specification into a potential de-facto standard via either a standards body or an industry consortia
- Recommendations for potential broader roll-out of the validated supply-chain digitisation approach to other defence projects such as the Hunter Class Frigate and JORN upgrade, and beyond defence
- Case study illustrating a global Prime collaborating with Australian SME Manufacturers and academia to achieve mutually beneficial and tangible outcomes in relation to the Australian F-35 manufacturing value chain

GROWTH

- Knowledge gained via this project will contribute to a longterm goal to devise a freely available, broadly adopted, open standard that will aim to remove the burden on manufacturers having to adopt expensive proprietary commercial solution offerings in order to achieve inter-company digital supply chain interoperability

JOBS

- This project will demonstrate that greater transparency amongst manufacturing supply chain partners has mutual benefits, and illustrates viable pathways for digital transformation and cost effective participation of Australian SMEs within global supply chains.

PROJECT PARTICIPANTS

BAE SYSTEMS · ADVANCED FOCUS · AXIOM PRECISION MANUFACTURING · Flinders UNIVERSITY · RUAG

ADVANCED FIBRE BANDAGES

CYTO MATRIX

Advanced Fibre for targeted delivery of bio-active molecules to treat chronic wounds

The project will utilise short polymer fibre (SPF) biomaterial manufactured via a novel, patented method developed at Deakin University's Institute for Frontier Materials with commercial partners (HeiQ Australia and Cytomatrix). Unlike the conventional electrospinning method of manufacturing polymer fibers, this novel manufacturing method is highly efficient, is extremely versatile both in terms of the dimensions of the fibre produced and the possible polymer composition and is gentle enough that it does not damage biological molecules. This means that biological molecules can be incorporated into biodegradable SPF during manufacture. These biologicals are then slowly released from the SPF at a specific target site such as a chronic wound.

Granulocyte-macrophage colony-stimulating factor (GM-CSF) plays an important role in wound repair, as well as being an immune stimulating factor that causes migration of immune cells to wound sites. Clinical studies have demonstrated that local application of GM-CSF promoted wound healing of burns and chronic ulcers. GM-CSF is slowly released from SPF over time and remains biologically active. The process of incorporation into SPF actively protects GM-CSF, increasing its stability compared to GM-CSF in solution giving it enhanced longevity. This project will investigate and optimise the incorporation and release profile of GM-CSF in SPF manufactured from two other biocompatible polymers, such as gelatine and chitosan. These unique, functionalised SPF will be the basis for new healthcare products to enter the global chronic wound care market, reducing the financial burden on the healthcare system and the frequency of antibiotic use in chronic wound care.

The initial product will be focused on promoting self-healing of chronic wounds, which will reduce the financial burden on the healthcare sector and reduce the use of antibiotics and therefore the development of antibiotic resistance bacteria, and generate significant revenue and employment within Victoria.

MILESTONES

1/1/19	AMGC approval
30/5/19	Optimise uptake of biological molecules
31/9/19	Optimise manufacture of SPF of suitable bio-based polymers
31/12/19	Investigate release profile and activity of biological modules on SPF fibres

CONTRIBUTIONS: Government – $50,000 | Industry – $50,000 | In Kind – $159,366

IMPACT

- Higher spending on R&D to enable development of the biological application
- Larger patent portfolio

GROWTH

- The initial product will be focused on promoting self-healing of chronic wounds, which will reduce the financial burden on the healthcare sector and reduce the use of antibiotics and therefore the development of antibiotic resistance bacteria. Chronic wound care is a large and rapidly growing sector due to the increase in the proportion of the population developing diabetes and living longer, both high risk factors of chronic wound development

INTELLECTUAL PROPERTY

- Patented method developed at Deakin University's Institute for Frontier Materials

PROJECT PARTICIPANTS

CYTO MATRIX

DEAKIN UNIVERSITY AUSTRALIA

WEAR PLATE SENSING SYSTEM

Davies
Smart never wears out

Commercialisation of a prototype wear plate sensing system for the global mining industry via a servitisation business model

Wear plates are the armour plating of the mining industry and are used to protect the mining assets (fixed and mobile plant) from wear and degradation due to high volumes of ore flowing over their surface. Wear Plate Maintenance, which comprises the assessment and replacement of wear plates, is a major element of the operating costs of all global mining operators with up to $400 million/year spent on wear plate replacement alone across Australia.

Davies has developed a wear sensing system (WearSense) that captures live measurement data, such as: wear, temperature and other characteristics of wear plates. This enables real time condition-based wear management that improves productivity, safety and profitability. The Davies technology replaces manual procedures for measuring wear plate degradation.

Project participants will collaborate to trial the Davies WearSense system in an operational environment with major mining company partners. This will enable Davies to optimise the product hardware specifications and test the software interface. Once the final product hardware specifications are known, Davies will develop production ready manufacturing processes and procedures.

The Davies software platform will provide real time wear data and an analytical service and platform to predict wear maintenance requirements, which will enable mining companies to utilise condition-based wear management. This in turn, will enable mining companies to plan for more efficient and less costly maintenance shut-downs. The Davies technology enables a new and enhanced level of service, which is not currently available through any other technology provider.

The project will assess the potential for broadening the commercialisation of the Davies IP to other markets where the management of surface wear is critically important. When successful, this project will provide the Australian manufacturing sector a tangible demonstration of the development and commercialisation of leading IP across global markets.

MILESTONES

19/11/18	AMGC approval
30/3/20	Commercialisation model and integration plan complete

CONTRIBUTIONS: Government – $227,000 | Industry – $227,000 | In Kind – $266,000

IMPACT

- Increased ICT intensity via utilisation of Industry 4.0 principles and IoT technologies.
- Greater capital intensity
- Greater share of services in total revenue by providing data driven maintenance services to mining companies

GROWTH

- DWPS estimates sales of the sensing system to the Australian mining companies can generate significant revenue growth in the medium to long term. Major customers would include the major hard rock mining operators in Australia eg Rio Tinto, BHP, Roy Hill etc. DWPS also estimates that additional revenue through partner OEMs in other mining markets could add additional licensing revenue and additional service income to support the global roll out of the DWPS sensing system

JOBS

- An additional 10 to 15 skilled jobs at DWPS including software and research engineers
- An additional >50 jobs across domestic project partners and prospective future partners

PROJECT PARTICIPANTS

Davies
Smart never wears out

The University Of Queensland
AUSTRALIA
Create change

AI ROBOTIC WELDING TECHNOLOGY

Development of a demonstration cell that showcases artificial intelligence technology

This project seeks to develop a demonstration cell in conjunction with its project partners, that showcases how IR4's artificial intelligence technology can be used to develop flexible automation solutions applicable across various industries.

Rheinmetall have engaged with IR4 in the development of the demonstration cell at SSS Manufacturing's premises, to validate that the AI automation technologies developed by IR4 has the ability to automate specific production processes for the Land 400 build program. The first 25 combat vehicles will be built in Germany, and after successful commissioning of the demonstration cell proposed in this project application, it is envisaged that in early 2019 Rheinmetall would look to engage with IR4 for the implementation of the derived solution into their manufacturing facility in the MILVEHCOE in Queensland and with the success of this implementation, Unterluess, Germany. This turn-key solution will include a gantry system with one welding robot and one pick and place robot utilising IR4 software.

Further opportunities for the application of these technologies also exist across an array of industries and applications which will also be considered as part of this project.

SSS Manufacturing currently operates this technology under license from IR4 to fabricate robotically welded structural steel. The automation solution uses the systems artificial intelligence to calculate in real time, the most efficient way to process the sections presented for fabrication. As a result, SSS Manufacturing has realised a greater than 70% reduction in the labour content required to fabricate steel sections.

This translates to customer benefits that include improvements in cost, traceability, quality consistency, scheduling and ease of implementation of design changes.

MILESTONES

1/9/18	AMGC approval
30/9/18	Project specified, interfaced defined, benchmarks established
31/12/19	Software developed
30/6/19	Hardware design development
28/7/19	Hardware fabrication
30/9/19	Integration and testing
30/11/19	Demonstration

CONTRIBUTIONS: Government – $333,744 | Industry – $333,744 | In Kind – $210,000

IMPACT

- Increased spending on R&D to develop IR4 software
- Higher ICT intensity
- Larger patent portfolio
- More staff with STEM skills
- Increased levels of automation

GROWTH

- After successful commissioning of the demonstration cell proposed, it is envisaged that in early 2019 Rheinmetall would look to engage with IR4 for the implementation of the derived solution into their manufacturing facility

JOBS

- Five to 10 full time engineering and development staff within IR4

PROJECT PARTICIPANTS

IR4 · rexroth A Bosch Company · FARO · QUT · RHEINMETALL DEFENCE · SSS MANUFACTURING

DIGITISATION FOR MANUFACTURING SMES

MOVUS
SMARTER MACHINES

Acceleration of innovative IIoT technology take-up by 50 Australian manufacturing SMEs that rely on continuous processes or machine-based production for their normal business operations

MOVUS FitMachine® provides 24/7 monitoring of the key equipment parameters and sends early alerts on equipment malfunction, therefore significantly reducing costs by minimising unplanned downtime, and reducing the need for manual routine machine inspections.

By installing MOVUS FitMachine sensors on business-critical and less reliable equipment, SMEs can immediately experience the benefits of Condition-Based Maintenance (CBM), an advanced maintenance regime that until now was unaffordable to SMEs.

The industrial sensor is magnetically attached to electrically powered equipment, making installation simple, with no need for tools or specialised knowledge.

FitMachine collects data on equipment temperature, vibration and acoustics, transmitting it to their secure cloud server. The cloud processes the data and provides equipment condition information 24/7 via the MOVUS Dashboard. MOVUS and the project participants will provide 50 Australian manufacturing SME's with 50% discount on the subscription of the FitMachine 'Starter Kit' for the duration of 12 months. The 'Starter Kit' is comprised of 10 sensors, and an associated WiFi/4G gateway, as well as a smartphone/tablet application and access to the MOVUS Platform and Dashboard.

Business owners and plant & production managers get real-time visibility of their equipment – knowing when they are on, understanding their utilisation, watching their condition and degradation closely. This allows them to repair the equipment earlier and to plan downtime if needed, allowing maintenance staff to focus on proactive tasks rather than reacting to failures or following OEM preventive maintenance schedules.

MILESTONES

15/3/19	AMGC approval
15/4/19	Project setup completed
30/6/19	National market research and marketing campaign
31/10/19	Installation of systems 1–10
31/3/20	Installation of systems 11–20
31/8/20	Installation of systems 21–30
31/1/21	Installation of systems 31–40
30/4/21	Installation of systems 41–50
30/6/21	Project completed and case studies documented

CONTRIBUTIONS: Government – $250,000 | Industry – $500,000 | In Kind – $62,300

IMPACT

- Project participants can immediately experience the benefits of CBM by getting equipment visibility and utilisation 24/7
- Participants usually realise return on investment in the first six months
- Start Industry 4.0 Journey through the use of the MOVUS sensors
- More collaboration with other manufacturers
- Better energy efficiency

GROWTH

- AUD $477,000

JOBS

- Six full time employees

PROJECT PARTICIPANTS

MOVUS SMARTER MACHINES

AiGROUP

ilab

intellidesign smart solutions®

DEVELOPMENT OF A PROTOTYPE ROAD TANKER UNIT

Development of a prototype road tanker unit for validation and commercialisation in the US market

Omni Tanker has identified a need for road-tankers with improved chemical resistance in the USA. Currently the demand for road tankers in USA is being serviced by road tankers referred to as fibre reinforced (FRP) tankers. FRP tankers contain an internal lining, which is comparable to the linings used in traditional Australian road tankers.

The objective of this project is to design and produce a prototype road-tanker, then undertake a field-trial in the US that enables Omni Tanker to validate and commercialise its technology in the US market. This project will re-design the Omni Tanker product to satisfy US regulations, and establish US supply chain partners for final assembly of the road-tanker in market. On completion of this project Omni Tanker will have validated the prototype in an operational environment and demonstrated low rate production.

The patented Omni Tanker vessels offer the following advantages over traditional tankers:

- Extended road tanker life
- Significantly reduced maintenance costs and downtime due to eliminating the need for vessel relining, which is a requirement for stainless steel vessels
- Light weight resulting in payload uplift via significant fuel savings over the life of the vehicle.

This project will develop the manufacturing tools, processes, supply chain partners and certification required to commercialise its patented technology in the US market. On completion of this project, Omni Tanker will have the capability in place to begin full rate production for the US market.

MILESTONES

26/11/18	AMGC approval
28/4/19	CAD design of road tanker
30/3/19	Application of US special permit
30/6/19	Identification and selection of US supply chain partners
31/9/19	Manufacture of protype unit
31/12/19	Delivery of field trial unit to customer

CONTRIBUTIONS: Government – $250,000 | Industry – $365,000 | In Kind – $225,000

Advanced knowledge

Advanced processes

Advanced business models

IMPACT

- Larger patent portfolio
- Smarter inventory management by allowing two-way loading of different class 8 chemicals
- Better fuel efficiency by light weighting the vehicle
- Larger geographical reach through new revenue export

GROWTH

- Omni Tanker's US variant will be a usable and viable option for Australian transport operators of highly corrosive liquids
- Omni Tanker's patented technology can be transferred into other products and adjacent industries
- Omni Tanker is uniquely positioned to commercialise their patented technology into the $230M p.a. US chemical tanker market

JOBS

- This project will enable Omni Tanker to transform its business into a global concern and therefore increase Australian employment

PROJECT PARTICIPANTS

Omni TANKER · BRENNTAG · NATC · UNSW AUSTRALIA · U.S. COMMERCIAL SERVICE United States of America Department of Commerce

FULL CUSTOMISABLE 3D-PRINTED BICYCLE

BASTION

Development of the world's first mass-customisable premium bicycle and establishment of in-house additive manufacturing capabilities

Bastion Cycles aims to become a world leader in the application of additive technologies for manufacturing premium bicycles by developing the world's first fully-customisable 3D-printed bicycles for domestic and international customers.

This project will enable Bastion and the project partners to achieve a valuable and highly differentiated market position by offering superior products that leverage Bastion's technical leadership in manufacturing lattice structures using Titanium alloys. This project also represents a gateway for the spill-over of Bastion's technology into other markets and mainstream products.

To achieve this objective Bastion Cycles together with the project partners must complete the following:

1. Establish domestic in-house additive manufacturing capabilities and skills.
2. Redesign, test and certify mass-customisable bicycle components.
3. Develop mass-customisable carbon fibre components using 3D printed plastic moulds.
4. Design and manufacture new Bastion bicycle model for commercialisation.

On completion of this project, Bastion and the project participants will have established the additive manufacturing capability, knowledge and skills to commercialise fully-customisable premium bicycles.

This project will serve as a case study on how Australia SMEs can establish additive manufacturing capabilities for manufacturing mass-customisable products in a high-value global market. The capabilities, knowledge and skills developed in this project are transferable to other industries that consume high-strength, light-weight components, i.e., aerospace, defence, automotive, marine and recreational sports.

MILESTONES

26/11/18	AMGC approval
30/6/19	Equipment testing and optimisation completed
31/8/19	Design and development with overlapping joints
31/10/19	Integration of electronic wiring and hydraulic hoses
31/3/20	Testing and optimisation completed
31/12/20	Development of carbon fibre components
30/4/21	Aerodynamic profile development completed
31/7/21	New bicycle design and development completed

CONTRIBUTIONS: Government – $306,750 | Industry – $306,750 | In Kind – $134,800

IMPACT

- Greater share of services in total revenue
- Newer equipment to establish domestic in-house additive manufacturing capabilities and skills
- Increased automation
- Bastion's technology has significant potential to transfer to other markets

GROWTH

- Forecasted sales growth of 330% through the additional models from 60 bicycles per year in FY18 to over 200 bicycles per year in FY20
- Long term potential to produce over 1,000 units p.a., generating revenue in excess of $10m p.a.
- Re-shoring additive manufacturing capability will increase efficiency and gross profit margins on additively manufactured components by 40–50%
- Projected sales growth will also generate significant new work for project partners

JOBS

- Five to 10 new jobs will be created over the next two years with a further 10 forecast beyond 2020

PROJECT PARTICIPANTS

BASTION
RENISHAW apply innovation™
MONASH University
baum PASSION PRECISION PERFORMANCE
PROVA CUSTOM ENGINEERED CYCLES
BIKES BY STEVE
riderfit. cycling performance
Cycling AUSTRALIA

LITHIUM ION BATTERY MODULE – AMESRF

energy renaissance

Design of a safe, hot-climate lithium-ion battery (LiB) module and associated automated advanced manufacturing production process

Energy Renaissance is leading the development of a purpose-built LiB manufacturing factory called 'Renaissance One', which will eventually leverage Australia's competitive advantage in abundant natural resources of lithium. The LiB manufacturing factory will produce batteries for industrial battery energy storage application such as solar farms, defence assets, mine sites, utilities, commercial and industrial applications, etc.

Energy Renaissance is seeking to exploit a market niche for safe LiBs in hot-climate operating environments. This project will bridge the gap between new product development and manufacturing of Australian made battery energy storage solutions.

This project comprises two key areas, as follows:

1. Design of LiB components for hot-climate conditions
2. Design of automated production processes for manufacturing LiBs

Australia is the only country in the world that has all the mineral components required for LiB manufacture:

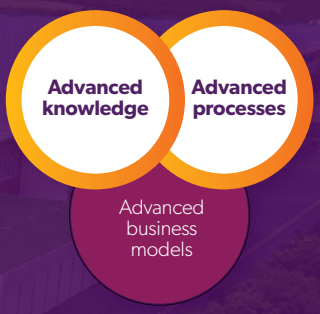
- Lithium – Australia is the lowest cost producer and has 20% of worlds reserves
- Lithium carbonate is now being manufactured in Perth and in NT (within 18 months)
- Battery Grade Graphite – Concentrate manufactured in South Australia.

The following items are mined in Australia but currently sent overseas for processing: Copper, Cobalt, Nickel, Aluminium, Manganese. When demand by Australian LiB manufacturers is sufficient, these minerals will be processed in Australia. At that point, input costs for the manufacture of LiBs in Australia will be considerably reduced and as a result, it is conceivable that Australia will become a manufacturing powerhouse for LiBs, utilising domestic commodities.

MILESTONES

1/5/19	AMGC approval
31/7/19	Product design of battery modules and racks
30/9/19	Virtual reality product module completed
31/12/19	Training and knowledge transfer completed
31/3/20	Production line layout and industrial automation specification completed
31/7/20	Specification of production processes completed

CONTRIBUTIONS: Government – $246,625 | Industry – $246,625 | In Kind – $155,00



IMPACT

- Increased spending on R&D
- More collaboration with other manufacturers to develop hot-climate LiB
- More advanced manufacturing and automation

GROWTH

- Based on Energy Renaissance's view of the evolving market demand, their projections for battery orders in Australia in 2019–20, 2020–21 and 2021–22 respectively are 200MWh, 712MWh and 984MWh

JOBS

- 20 full time employees during this project, including a Plant Manager, QC Engineer, IA Engineer, Project Manager and Line Engineer

PROJECT PARTICIPANTS

energy renaissance · Cadenza INNOVATION · CSIRO · ABB

PRODUCT LIFESTYLE MANAGEMENT SYSTEM

Digitalisation of manufacturing process and SME supply chain integration

This project aims to introduce a digital manufacturing environment, centred around a digital-twin, which enables advanced manufacturing processes and improved collaboration, increased responsiveness and flexibility between the various supply chain partners that contribute to the HSV end-product.

HSV has identified a range of process improvements that must be implemented to enable product line expansion and to take advantage of export opportunities. HSV and the project participants will implement a state-of-the-art Product Lifecycle Management (PLM) system. The resulting platform provides a digital collaborative working environment that enhances the design and production of a vehicle and its components. The project will deliver the following operational advantages to HSV:

- Improved design efficiency and production preparation processes
- Improved product design integrity due to new technology
- Enhanced services between suppliers and customers due to improved business model
- Improved compliance monitoring and adherence due to improved external collaboration capabilities.

To realise these opportunities, HSV must now implement the PLM system as well as the necessary changes to internal processes and supply chain partner integration.

AMGC and the project participants will conduct a series of five workshops (one in each mainland capital city) entitled "How to apply Digitalisation as a strategy for process improvement and enhanced supply chain integration".

The workshops will be presented and hosted by AMGC and the workshops will note that attendees will not be tied to a specific proprietary technology platform.

The intended output of the workshops is to increase the uptake of digital technologies in Australian manufacturing firms via peer-to-peer knowledge sharing of HSV's experience in implementing the PLM system, as well as educating SME's on the benefits of digitisation and enhanced supply chain integration.

MILESTONES

1/6/19	AMGC approval
15/6/19	Phase 1 of software implementation
30/6/19	Phase 2 of software implementation
15/7/19	Testing of Engineering Change Notice software
31/7/19	Testing of digital mock-up system
15/8/19	Production and supplier integration completed
31/8/19	HSW production testing and feedback
31/10/19	Delivery of 5 SME workshops completed

CONTRIBUTIONS: Government – $392,295 | Industry – $392,295 | In Kind – $635,190

IMPACT

- Increased ICT intensity
- Increased collaboration with other manufacturers
- HSV anticipates an increase of 350–500 new components per product line, with these components being designed and manufactured by Australian component suppliers
- Benefits also extend to supply chain partners that develop new products for HSV in the new digital-twin working environment, which enables SME's to enhance their new product development capabilities

GROWTH

- On completion of the PLM system implementation, HSV and its Australian supply chain will be positioned to evolve beyond what is seen, in global terms, as a local, bespoke engineering firm, to become a viable low-volume Australian manufacturer of premium automotive products for both domestic and export markets

JOBS

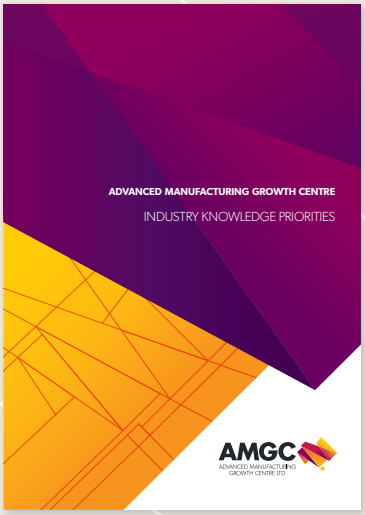
- Over the past three years HSV has grown staff numbers from just under 300 to over 500

PROJECT PARTICIPANTS

HSV · HOLDEN · SIEMENS · SWINBURNE UNIVERSITY OF TECHNOLOGY

OUR PUBLICATIONS

Sector Competitiveness Plan 2017



Industry Knowledge Priorities

A New Definition for a New Era – Defining Advanced Manufacturing Report

Innovation and Science Australia Submission 2017

Submission to the Department of Industry, Innovation and Science 2017

Building Resilience in Australian Manufacturing 2018

Skills Report 2018 – The New Face of Manufacturing

Projects Report 2018

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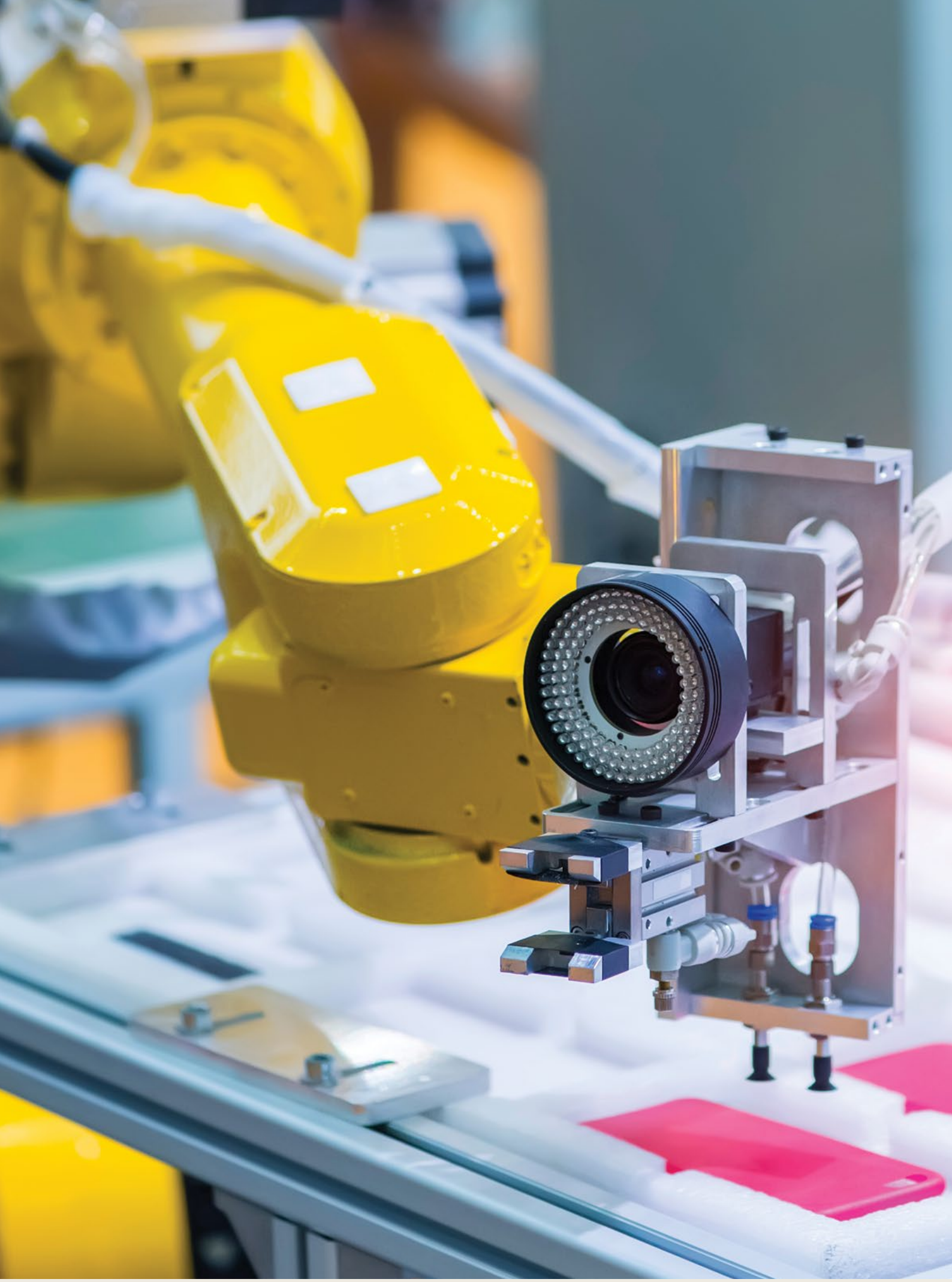

Australian Government
Department of Industry, Innovation and Science

Industry Growth Centres