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**STRATEGIC**  
ELEMENTS



**ASX Code** SOR  
**Market Capitalisation** \$120m  
**Cash at Bank** Approx. \$5.5m.

**AGM Presentation** 22 September 2021  
**Managing Director** Charles Murphy

# The Company



Strategic Elements **generates 100% owned ventures** from combining teams of leading scientists or innovators in the technology and resources sectors.

## 1. The Australian Federal Government has registered Strategic Elements as a Pooled Development Fund with a mandate to back Australian innovation.

- The aim of the Pooled Development Funds programme is to increase the supply of capital to Australian small and medium-size enterprises (SMEs).
- PDFs are venture capital funds registered under the Pooled Development Funds Act 1992
- PDFs and their shareholders receive tax benefits on the capital gains and income derived from their investment. This is to help compensate for the higher risk of investing in SMEs.

## 2. However the Company does not operate like a typical venture fund.

- The Company does not seek to hold a large portfolio of investments minority 10-20% stakes. Instead it seeks to venture generate 100% owned companies in collaboration with teams of leading scientists or innovators.
- Access to \$50M+ of institutional technical infrastructure and equipment, government grants and R&D cash back \$\$ significantly reduces up front expenditure.
- SOR sole funds initial development of each subsidiary whilst remaining open to a 'strategic investor'.
- SOR seeks returns through a trade sale or listing of a subsidiary, a licensing deal or income generated from a subsidiary.

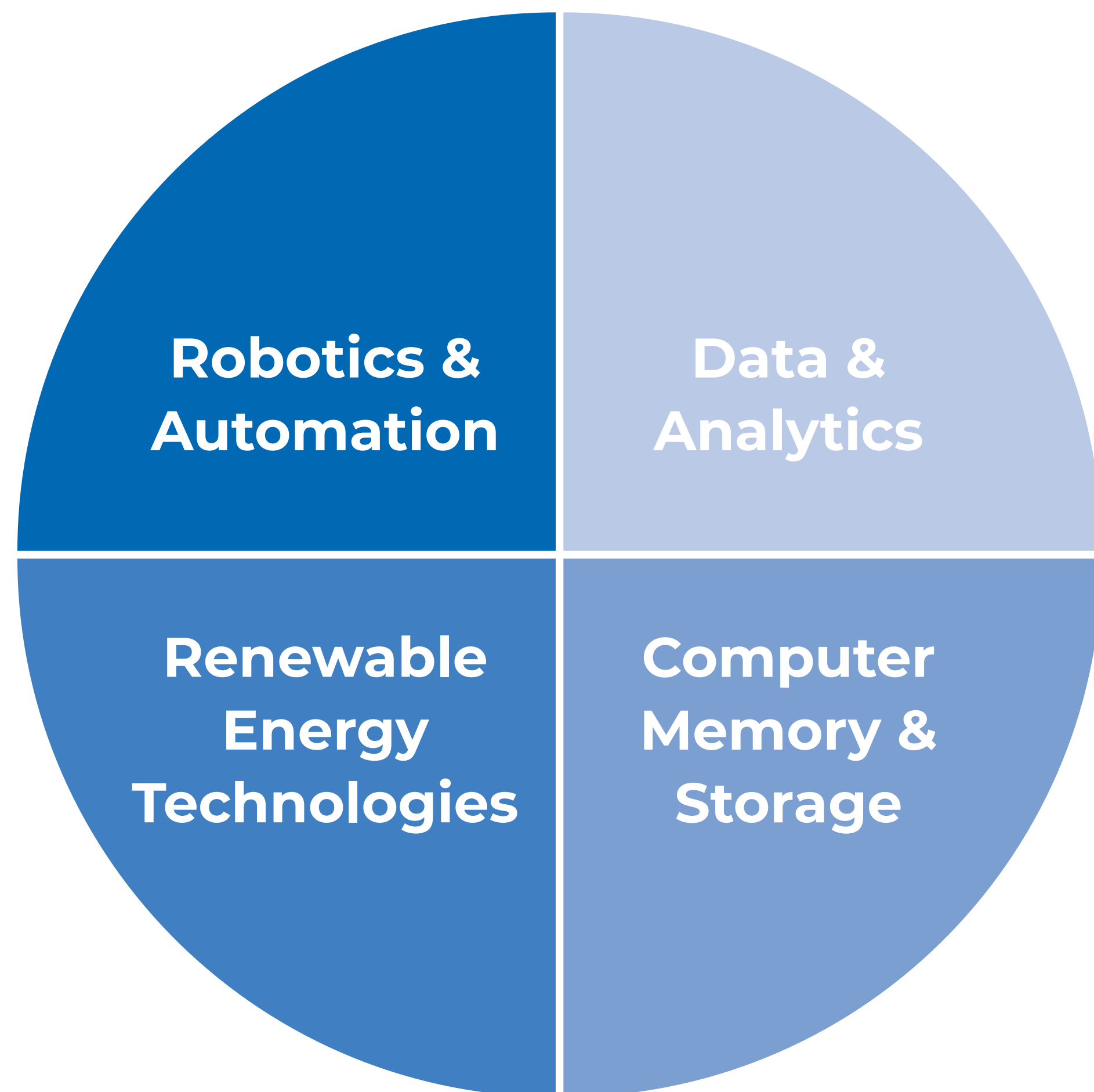
**High risk – high reward resources and technology innovation**



# Sector Focus



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**The Company is developing technologies being driven by four of the largest themes.**

- 1. Robotics and automation** technology for mining, security, agriculture, transport. Collaboration with Fortune 100 Company 'Honeywell' for Autonomous Security Vehicles. Collaborating with Defence Science Technology Group (DSTG), part of the Australian Department of Defence. Further agreements with UWA and CSIRO.
- 2. Self-charging battery** technology in collaboration with the UNSW. Uses humidity in air to generate electricity. Extremely small, thin, light weight, flexible, environmentally friendly battery cells.
- 3. Transparent flexible memory** technology working with the UNSW, and VTT (Finland). Enabling flexible plastic and glass surfaces to store and process data instead of needing silicon chips.
- 4. Data related** technology acquisition/development has been noted by the Company as its next potential area for venture generation. The Company has formed an entity to hold any interests in the data sector, however nothing material has been concluded to date.

**The technologies are 100% owned and held in subsidiary companies.**

# Developing revolutionary electronic ink technologies for the **battery** and **computer memory** sectors.



The Company is developing printable computer memory and self-charging battery technologies with an international team of world leading development partners.

## 1. What is printed electronics?

Printed electronics has the potential to transform the electronics industry whereby electronic devices are printed onto surfaces such as plastic and glass using traditional printing methods and advanced functional inks rather than on rigid silicon.

## 2. Thin, lightweight, flexible

Printed electronics is based on the combination of new materials and cost-effective, large-area production processes to enable new applications which are not possible to create with (only) conventional silicon electronics.

A **key advantage** of printed electronics is the ability to make thin, lightweight and flexible electronic products.

## 3. Markets for Printed – Flexible – Transparent – Sensors

Printed, flexible and organic electronics will grow from **\$31.7 Billion in 2018 to \$77.3 billion in 2029.**<sup>1</sup>



# Battery Ink Technology

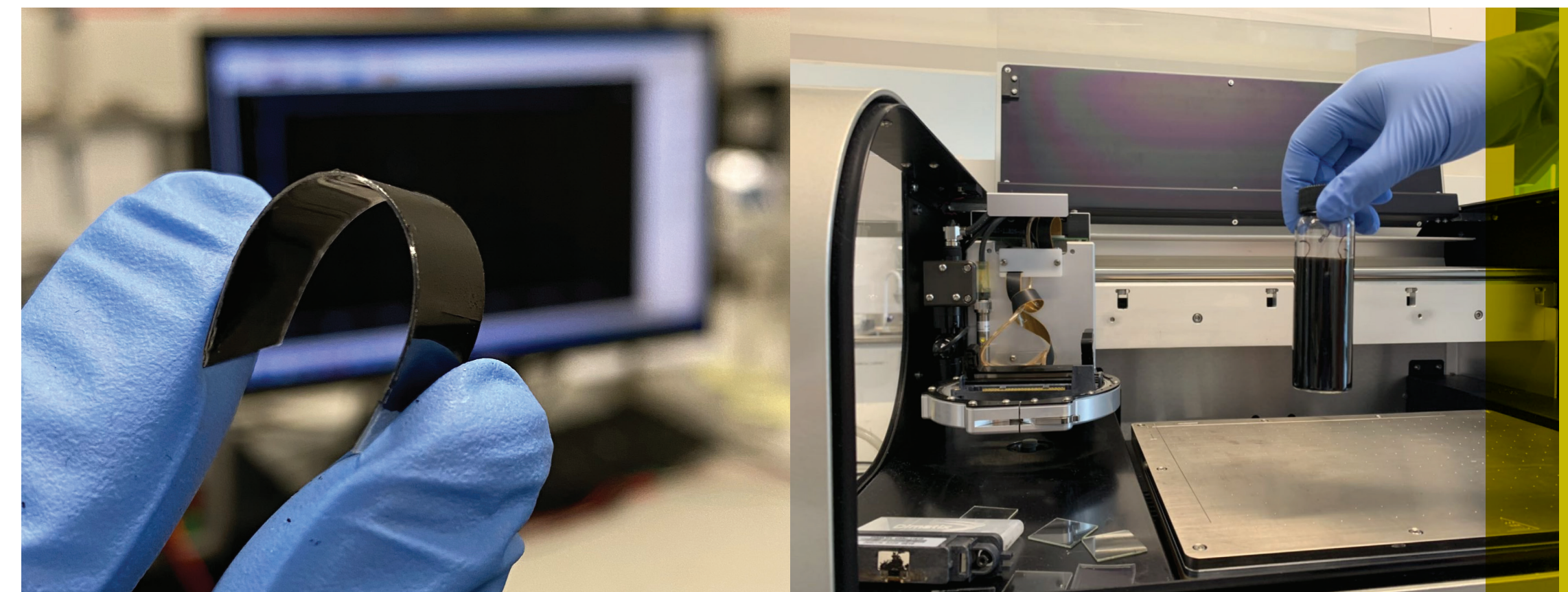


**Wholly owned venture Australian Advanced Materials Pty Ltd (AAM) is developing a self-charging battery technology with a world leading material science team at the University of New South Wales.**

**Battery Ink cells can be used to directly power a device or work as a compliment to an existing battery to extend device life.**

- The advanced graphene oxide based Battery Ink enables extremely small, thin and light weight battery cells to be printed onto plastic. The battery cells are designed to be powered solely by moisture (humidity).
- Hybrid electric generator battery cell fabricated with a printable ink. Environmentally friendly, renewable, and cost-effective method of harvesting energy from moisture.
- Being developed by integrating significant existing IP from the Company's Nanocube Memory Ink technology with an advanced graphene oxide material.

**Collaboration with the University of New South Wales who has deep experience in electronic inks, energy harvesting and storage over the past 10 years.**



# Battery Ink Technology



## 1. Initial Market Focus

The initial market focus remains on wearables and Internet of Things (IoT) related devices as they have lower performance requirements such as current, duration, voltage. Current solutions are still relatively bulky and require manual charging or replacement of battery cells.

## 2. Electronic Skin Patch Market

Currently observing a rapid growth attributed to surging usage of wearable health monitoring devices. Moreover, electronic skin patches compared to conventional wearable devices are lighter, smaller, comfortable, and less invasive.

Benefits such as the thin, lightweight, flexible, environmentally friendly, non-flammable nature of the battery cells make it an ideal candidate for the electronic skin patch segment.

**Electronic skin patch sector forecast to surge from USD 10B market in 2019 to USD 40B by 2030.<sup>2</sup>**

**Global IoT battery market forecast to grow from USD 8.7B in 2019 to USD 15.9B in 2025.<sup>3</sup>**



## 3. Development

The team has consistently demonstrated the ability to set and achieve key performance benchmarks in technological development.

Recent milestone in producing milliamp-range current output is significant as it increases the potential array of applications that could be powered by the technology.

**Significant further improvement in performance is expected over Q4 2021 as the Battery Ink becomes increasingly optimised for use in screen printing equipment.**

Secondary work has also commenced to test battery cell size and product architecture for additional electronic market segments that require higher power output.

# AxV Automation and Robotics Platform

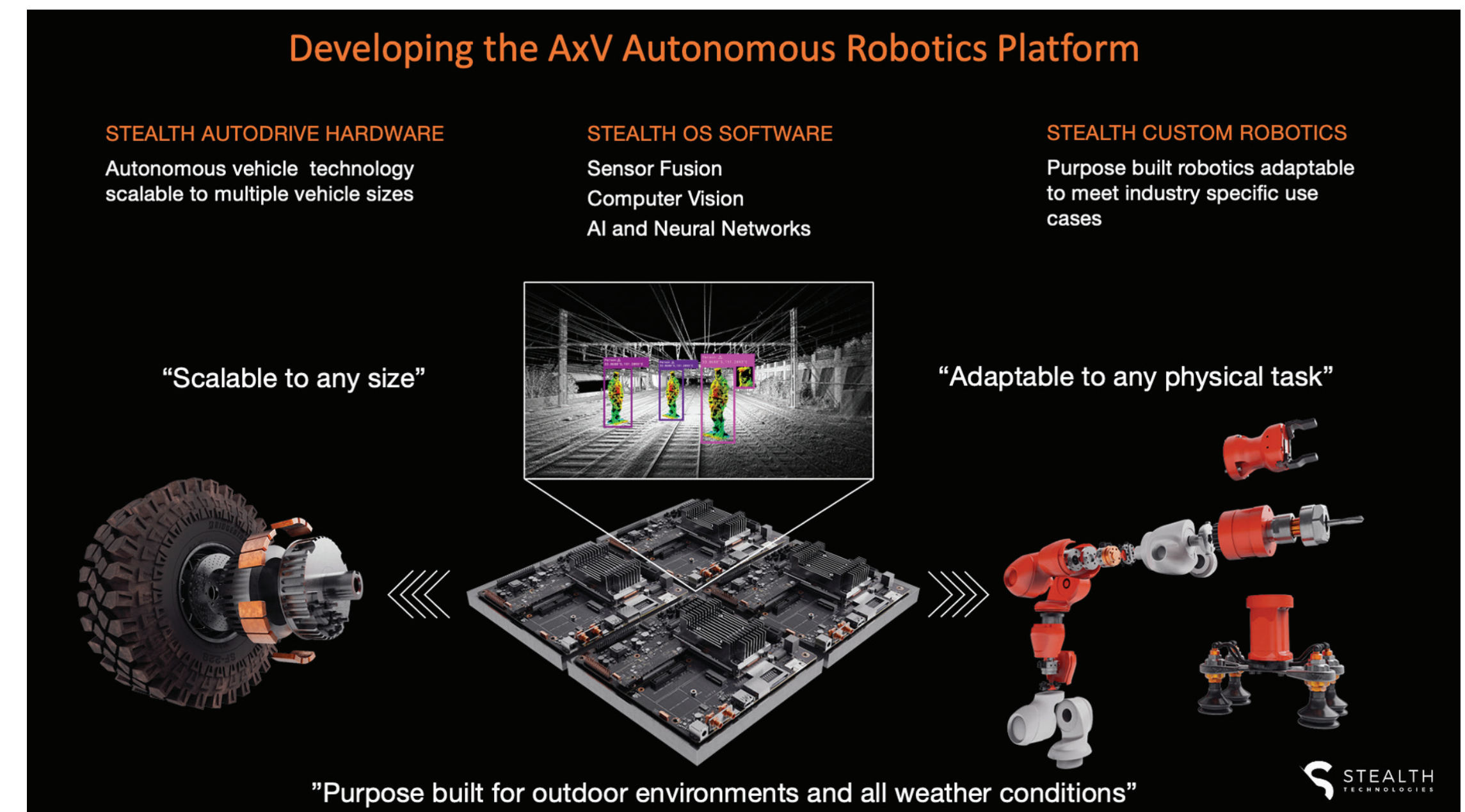


**100% owned Stealth Technologies Pty Ltd is developing an automation and robotics platform (AxV Platform) to automate tasks currently performed manually by humans or semi-autonomously by machines.**

**The Company has developed a mobile automation and robotics platform and is deploying it across multiple sectors.**

- The Company has an experienced in-house team of international award winning PhD and Masters qualified research engineers with deep capabilities in artificial intelligence, computer vision and robotics (hardware and software).
- Collaboration with Fortune 100 Company 'Honeywell' for Autonomous Security Vehicles. Collaborating with Defence Science Technology Group (DSTG), part of the Australian Department of Defence. Agreements with UWA and CSIRO.

**Powerful new automation technologies such as machine learning, artificial intelligence (AI) and advanced robotics are starting to transform the global economy.**



# AxV Platform Across Multiple Sectors



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## Security

1. Stealth Technologies has developed the first 'Autonomous Security Vehicle' (ASV) of its kind anywhere in the world.
2. The ASV is designed to automate perimeter security and will be deployed to increase the security of the perimeter and reduce human involvement in testing and patrols.
3. The Company has been collaborating with global Fortune 100 software-industrial company 'Honeywell' to build autonomous security vehicles for the correctional sector.

**The global perimeter security market forecast US\$282.26 Billion by 2025.<sup>4</sup>**

## Defence

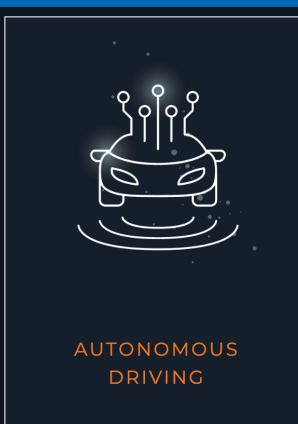
1. Designing and delivering an autonomous drone carrying vehicle that automates detection and sensing of chemical, biological, radiological and nuclear (CBRN) agents.
2. Collaborating with Defence Science Technology Group (DSTG), part of the Australian Department of Defence to build the solution and conduct a live demonstration to Army.

**CBRN Defence US\$16.2 Billion in 2020 projected US\$21.9 Billion by 2027.<sup>5</sup>**

## Agriculture

1. Developing technology to automate capture and integration of multiple types of data and produce 3D location maps of agricultural weeds.
2. 3D Mapping of agricultural weeds will enable farmers to apply modern agronomy to weed management.
3. Collaborating with Australian Herbicide Resistance Initiative. World leading global researchers in herbicide resistance and its management in cropping systems.

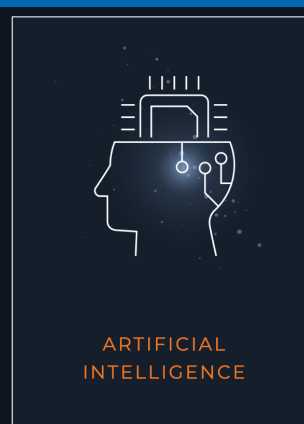
**Estimated annual cost of weeds in Australia AUD\$3.3 billion. USA at USD\$34.5 billion annually.<sup>6</sup>**



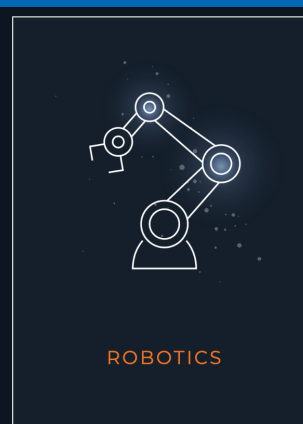
AUTONOMOUS DRIVING



COMPUTER VISION



ARTIFICIAL INTELLIGENCE



ROBOTICS

**Autonomous vehicle technology scalable to multiple vehicle sizes. Sensor fusion, computer vision, artificial intelligence and neural networks. Purpose built robotics adaptable to meet industry specific use cases. Built for outdoor environments and all weather conditions.**



# Memory Ink Technology



## Transparent Printable Memory

The Nanocube Memory Ink is a transparent ink containing billions of nanometre scale particles. When printed onto a glass or plastic surface and assembled with electrodes they operate as computer memory.

## Memory is largest traditional sector

The memory component is the heart of all electronics and is the largest sector of the traditional silicon semiconductor sector. Even though Printed Electronics is experiencing significant growth, it is being held back by lack of ongoing development of printed memory.

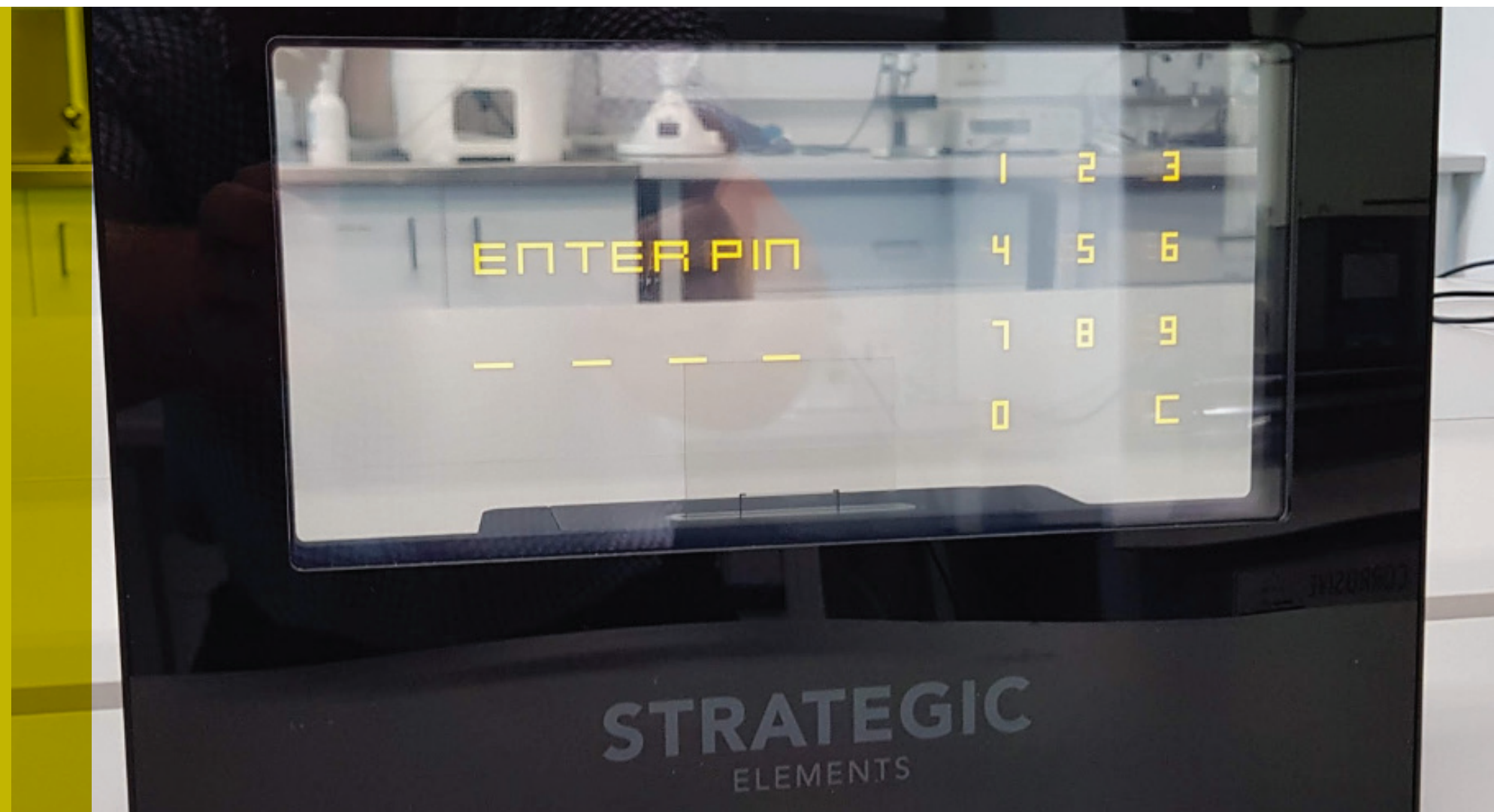
## World Leading Development Team

- UNSW is globally recognised as a leading research institution in Materials Science and Engineering.
- Research and development work in collaboration with teams from VTT Finland. Recognised global leader in development and production of printed electronics.
- AAM is also a member of PrintoCent a select consortium of approx. 40 global printed electronics companies. Participation in potential end customer collaborations and networking with large global companies.

**The Nanocube Memory has been continually developed by the Company and the University of New South Wales during the year.**

**Rapid success of the Battery Ink led the Company to divert resources away from the Nanocube Memory to escalate the Battery Ink development. More recently, COVID has also impacted development.**

**The Company is in discussion with potential overseas development partners that may be able to conduct certain aspects of the Nanocube Memory development to supplement the existing team.**



# Innovation in Mineral Exploration



The Company has two wholly owned subsidiaries focused on innovation related to mineral exploration. The Company is particularly interested in minerals used in critical high technology sectors such rare earths, lithium, copper, gold and nickel.

## Strategic Materials Pty Ltd

100% owned Company holds permits over the entire historic Golden Blocks Mines permit in New Zealand. The Company is seeking to apply modern technology to a historic goldfield that has been left completely untouched by modern exploration.

Examples include LIDAR to conduct detailed mapping, drones to conduct underground mapping of adimits, stopes and geology and enhanced data capture.

**The Company is working with environmental consultants to study the impacts of drilling and other forms of exploration. It also continues to consult with local affected parties and regulatory bodies.**

## Maria Resources Pty Ltd

100% owned Company collaborating with Dr Franco Pirajno on applying new geological models to unexplored terrains.

Maria Resources is investigating the Leviathan project for copper-gold-rare earths mineralisation related to volcano-intrusive complexes. Maria Resources is the recipient of an WA Govt. Exploration Incentive Scheme (EIS) for the Leviathan project for \$150,000 in matched funding to be utilised toward drilling costs at Leviathan.

**Maria Resources is currently reviewing technical aspects of the program before committing to drilling.**

# Key Milestones



**A number of key milestones are expected in the Battery Ink technology and AxV Platform in Q4 2021.**

## **Battery Ink Technology**

By achieving the 5mA current output and 220 mAh capacity, the technology could potentially provide enough power for a majority of skin patch applications. The additional power and capacity can potentially double the device life of electronic skin patches, hence devices can be used for longer, requiring less frequent changes.

The team will continue to work on the battery ink formulation and printing parameters to optimise the power output, capacity and duration of the battery ink to meet current commercial offerings for the large, global skin patch market.

**Goal to produce over 5mA of current output with a total capacity of 220mAh in Q4, 2021.**

## **AxV Platform Technology**

Honeywell negotiation ongoing for an expanded partnership on Autonomous Security Vehicles. Working with Honeywell will greatly assist commercialisation of the AxV Platform.

**Goal to finalise agreement to further develop and commercialise the ASV in Q4 2021.**

Second generation ASV II design including upgraded sensor fusion stack and drone launch and land system.

**Goal to finalise engineering design of the ASV II in Q4 2021.**

Trial program with up to 10 farms utilise the Stealth technology agriculture solution during the harvesting season.

**Goal to complete multiple farm trial in Q4 2021.**

## Forward Looking Statements

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## References

- 1 Flexible, Printed and Organic Electronics 2019-2029, IDTechEx, 2019
- 2 Electronic Skin Patches 2020-2030, IDTechEx, 2020
- 3 Battery Market for IoT, MarketandMarkets, 2020
- 4 Global Perimeter Security Market, DataIntel, 2019
- 5 CBRN Defense - Global Market Trajectory & Analytics 2021
- 6 Annual Costs of Weeds in Australia, Centre for Invasive Species Solutions, 2018