



## SOR Moisture Powered Battery Marches to Milliamps

Western Australia – May 20<sup>th</sup> 2021 - Strategic Elements Ltd (ASX:SOR) has announced several critical new development milestones for its **moisture powered self-charging battery**. Recent engineering success has accelerated development towards a demonstrator powering **Bluetooth** communications **and** a prototype battery pack producing **over a milliamp** of electrical current.

The advanced graphene oxide based ink enables **extremely small, thin and light weight battery cells** to be printed onto surfaces such as glass and plastic. The battery cells are designed to be **powered and self-charged solely by moisture** (humidity). Moisture from humidity in the air and graphene oxide are a readily available, environmentally friendly source of energy compared to alternatives based on lithium.

- The first new milestone is a demonstration of the Battery Ink technology powering an electronic device equipped with **multiple sensors** and **Bluetooth Low Energy Communication**. The ability to power connectivity is vital to enable wireless sensor networks. E.g. enabling wearable and IoT devices to send data to other devices with greater computing and display capabilities (e.g. mobile phones, computers). Milestone set for 2<sup>nd</sup> Quarter 2021.
- The second new milestone will mark the most significant demonstration of the technology's potential to date. The Company's goal is to print a prototype **battery pack** producing **over a milliamp of electrical current** solely from moisture (humidity). Achieving milliamp range is recognised as a significant achievement in battery technology development as it dramatically expands the range of devices a battery can potentially power. Milestone set for 3<sup>rd</sup> Quarter 2021.

*Managing Director Charles Murphy said "we have experienced substantial improvement in Battery Ink power output over the past few months. Bringing forward the milliamp demonstration milestone is a highly ambitious goal that will establish the Battery Ink as a leading printable battery technology if it can be achieved. Just as important in the near term is developing an ink that is able to be screen printed as this would open new avenues to potentially scaling the technology rapidly and significantly".*

### Current Screen Printing Development

The Company previously announced<sup>1</sup> a goal to develop a **screen printable** battery ink prototype in the 2<sup>nd</sup> Quarter of 2021. Screen printing originated in China (around AD 221) as a way of transferring designs onto fabrics. In the early part of the 20th century squeegees were introduced as a way of pulling ink through the screen mesh.

Global electronics companies have since adopted the technique to print large sheets of miniature electronic components (down to micrometre size) on materials such as plastic. It is now an established low cost **industrial scale** manufacturing method to print large batches of miniature electronics. Therefore the screen printing technique is ideally suited to provide a method for potential industrial scale manufacturing of miniature Battery Ink cells. **The Company is pleased to confirm it is currently on track to complete this milestone in the 2<sup>nd</sup> Quarter of 2021.**

### Alternative Energy Battery Development

The Company previously announced<sup>2</sup> successful development capability to scale down the Battery Ink cells in size. Through scaling more batteries can be assembled in the same space leading to increased density of power output. The recent materials engineering success has further enhanced the potential for an ongoing substantial increase in power output. If a screen printable Battery Ink is successfully produced in the 2<sup>nd</sup> quarter of 2021 the Company will proceed to investigate pathways to generating a **significantly larger amount of power output than has been contemplated to date.**

<sup>1</sup>Announced 28/01/21 <sup>2</sup>Announced 31/03/21

### **Highly Skilled Team and Collaboration**

The Battery Ink is being developed by integrating significant existing ink formulation and printed electronics intellectual property from the Company's Nanocube Memory Ink technology with an advanced graphene oxide material. Development is being conducted under an Australian Research Council part-funded collaboration between the Company and The University of New South Wales (announced 30/7/20).

The group at The University of New South Wales (UNSW) have developed deep experience in printed electronic inks, energy harvesting and storage over the past 10 years and are applying that experience in development of the Battery Ink technology. UNSW School of Materials Science and Engineering is ranked #1 in Australia for material science. The group has attracted over \$20M AUD in research funding. UNSW have a number of partnerships and collaborate with leading companies such as Boral, Hitachi Chemical, One Steel and many more. The Material Science and Research group at UNSW has world-class infrastructure and equipment geared towards advanced materials engineering and fabrication.

### **About the Company**

The Australian Federal Government has registered Strategic Elements as a Pooled Development Fund with a mandate to back Australian innovation. The Company operates as a venture builder where it generates high risk-high reward ventures and projects from combining teams of leading scientists or innovators. Investors in SOR potentially pay no tax on capital gains from selling their SOR shares as the Company operates under the Pooled Development program setup to encourage investment into innovation.

### **Through its 100% owned subsidiaries the Company has been:**

- Collaborating with giant US Fortune 100 Company Honeywell to build autonomous robotic security vehicles for the correctional justice sector<sup>3</sup>.
- Collaborating with the Australian Herbicide Resistance Initiative on applying autonomous technologies to agriculture<sup>4</sup>.
- Working with CSIRO and has licensed world leading CSIRO technology that enables robots to work together in teams<sup>5</sup>.
- Developing printable electronic inks for neuromorphic computing and RRAM memory applications under a grant with the University of New South Wales<sup>6</sup>.
- Developing a self-charging electrical generator battery technology with University of New South Wales<sup>7</sup>.

More information on the Pooled Development Program is available on the Company's website. The Company is listed on the ASX under the code "SOR".

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*This announcement was authorised for release by Strategic Elements' Board of Directors.*

<sup>3</sup>Announced 16/10/2020 <sup>6</sup>Announced 30/12/2020

<sup>4</sup>Announced 19/10/2020 <sup>7</sup>announced 01/12/2020

<sup>5</sup>Announced 12/11/2020