

# AnteoTech Technical Data Presented at AABC Europe 2024

## 14th Advanced Automotive Battery Conference, 13 -16 May 2024

**BRISBANE, AUSTRALIA, May 16 2024:** AnteoTech Ltd (ASX: ADO) (**AnteoTech** or the **Company**) a revenue stage company, providing solutions for the clean energy and life sciences markets using proprietary applied materials technology is pleased to announce that Manuel Wieser, Chief Technology Officer has provided a podium presentation at the 14<sup>th</sup> international Advanced Automotive Battery Conference (AABC) in Strasbourg, France, on Wednesday 15 May 2024 at 11.20am, local time.

### About the 14th International Advanced Automotive Battery Conference

The international Advanced Automotive Battery Conference is a leading industry event held twice annually in Europe and the USA. This year the European event will be held over four days in Strasbourg, France and will host a global audience of leading battery technologists and their key suppliers to present and discuss development trends, breakthrough technologies and predictions of the market. The event will focus on the next generation of electric vehicle batteries at a time where European nations and international automotive original equipment manufacturers (OEMs) are investing significantly in vehicle electrification and eMobility.

<https://www.advancedautobat.com/aabc-europe/battery-chemistry#ManuelWieser26000>

### Conference Presentation & New Data

In a conference session dedicated to Lithium Battery Chemistry, Manuel Wieser, provided AnteoTech's Podium Presentation titled "**Binders vs. Structural Additives—The Key to Maximum Silicon Anode Performance**" – **refer attached**. This Presentation focuses on binder chemistries and innovative structural additives, such as Anteo X™, and their crucial role in achieving a long cycle life in silicon-containing anodes.

In addition to addressing the performance enhancing benefits of Anteo X in silicon-containing anodes, the presentation included a Case Study that provides further information regarding the recently achieved 1,000 cycle milestone. The Case Study details collaboration with a development partner where AnteoTech has generated data confirming that a high silicon anode incorporating Anteo X has demonstrated:

- 1,000+ charge and discharge cycles while maintaining over 70% of the cells starting capacity;
- greater than 26% (200+ cycles) improvement in battery performance

This performance represents a significant improvement upon the customer's existing benchmark at the same 70% threshold value.

Over the course of the four-day conference, AnteoTech senior management will hold a number of industry and partnering meetings. This will be followed by additional customer site visits and meetings across Europe.

AnteoTech CEO and Managing Director David Radford said: *"We are again thrilled to be invited to present at this premier industry event, which is testimony to the growing EV industry recognition of the importance and benefits of increasing silicon in battery anodes. In an increasingly competitive and data led industry, we believe this new dataset further underpins the AnteoTech value proposition, and I look forward to meeting with our current partners and potential customers to provide a first-hand account of our recent technical progress."*

This announcement has been authorised for release by the Management of AnteoTech Ltd.

- ENDS -

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**Company and Partnering enquiries:** David Radford, CEO, on + 61 7 3219 0085

For further information, please check our website [www.anteotech.com](http://www.anteotech.com)

### About AnteoTech Ltd (ASX:ADO)

AnteoTech is a revenue-stage company that provides solutions for the clean energy and life sciences markets using our proprietary applied materials technology. In the rapidly growing clean energy market, our lead product Anteo X™, has been proven to provide significant improvement in anode performance and the Company has partnered with global suppliers to the lithium-ion battery manufacturing industry. The portfolio includes a proprietary high silicon anode, made with unrefined silicon which offers advantages of size, weight and cost. The Life Sciences division services the Point-of-Care and In vitro diagnostics markets; from global diagnostics companies to technology developers. The unique characteristics of AnteoBind™ provides strong advantages in bioconjugation to rapidly speed up testing procedures and improve accuracy.

### AnteoTech - Social Media Policy

AnteoTech is committed to communicating with the investment community through all available channels. Whilst ASX remains the prime channel for market sensitive news, investors and other interested parties are encouraged to follow AnteoTech on Twitter ([@AnteoTech\\_](#)), LinkedIn. Subscribe to AnteoTech Latest News emails - visit our website at [www.anteotech.com](http://www.anteotech.com) and subscribe to receive our email alert service.

### Forward Looking Statements

This Announcement may contain forward-looking statements, including estimates, projections and other forward-looking information (**Estimates and Projections**). Forward-looking statements can generally be identified by the use of forward-looking words such as “expect”, “anticipate”, “likely”, “intend”, “should”, “could”, “may”, “predict”, “plan”, “propose”, “will”, “believe”, “forecast”, “estimate”, “target”, “outlook”, “guidance” and other similar expressions within the meaning of securities laws of applicable jurisdictions and include, but are not limited to, indications of, or guidance or outlook on, future earnings or financial position or performance of AnteoTech. The Estimates and Projections are based on information available to AnteoTech as at the date of the Announcement, are based upon management’s current expectations, estimates, projections, assumptions and beliefs in regards to future events in respect to AnteoTech’ business and the industry in which it operates which may in time prove to be false, inaccurate or incorrect. The Estimates and Projections are provided as a general guide and should not be relied upon as an indication or guarantee of future performance. The bases for these statements are subject to risk and uncertainties that might be out of control of AnteoTech and may cause actual results to differ from the Announcement. No representation, warranty, or guarantee, whether express or implied, is made or given by AnteoTech in relation to any Estimates and Projections, the accuracy, reliability, or reasonableness of the assumptions on which the Estimates and Projections are based, or the process of formulating any Estimates and Projections, including that any Estimates and Projections contained in this Announcement will be achieved. AnteoTech takes no responsibility to make changes to these statements to reflect change of events or circumstances after the release.



# **BINDERS vs. STRUCTURAL ADDITIVES: THE KEY TO MAXIMUM SILICON ANODE PERFORMANCE**

**Manuel Wieser**  
*Chief Technology Officer*

15 May 2024

14<sup>th</sup> AABC Europe - Strasbourg, France

# DISCLAIMER

## AABC Europe 2024 – Strasbourg, France

### **IMPORTANT INFORMATION**

The purpose of the presentation is to provide an update of the business of AnteoTech Ltd (ASX:ADO) (AnteoTech). These slides have been prepared as a presentation aid only and the information they contain may require further explanation and/or clarification. Accordingly, these slides and the information they contain should be read in conjunction with past and future announcements made by AnteoTech and should not be relied upon as an independent source of information. Please contact AnteoTech and/or refer to the Company's website for further information. The views expressed in this presentation contain information derived from publicly available sources that have not been independently verified. No representation or warranty is made as to the accuracy, completeness or reliability of the information.

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# ANTEOTECH – CLEAN ENERGY TECHNOLOGY DIVISION

Commercialising technologies that enhance the storage and management of energy across multiple sectors

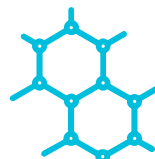
Established and growing business



## Publicly listed company (ASX)

- Highly experienced leadership team delivering commercial outcomes
- Based in Brisbane, Australia

Proprietary technology platform



## CET - Lithium-ion battery technologies

- Anteo X™ binder additive
- Silicon anode formulation know-how
- Ultra-high silicon anode technology

Developing solutions for high impact sectors



## CET - Capabilities

- Deep experience in developing silicon anode designs of >20wt% silicon active material
- Performance optimisation of silicon anode designs
- Anteo X production facility (early 2024)



# THE MARKET IS DEMANDING RAPID COST REDUCTION

Market demands for cost reductions yet simultaneous desire for increased energy density is creating a challenging scenario

- To increase the energy density of anodes the role of silicon needs to evolve from additive to main component
- But the increase in silicon content often comes at a significant additional cost



**Low cost**



**Stable performance**



**Managed expansion**

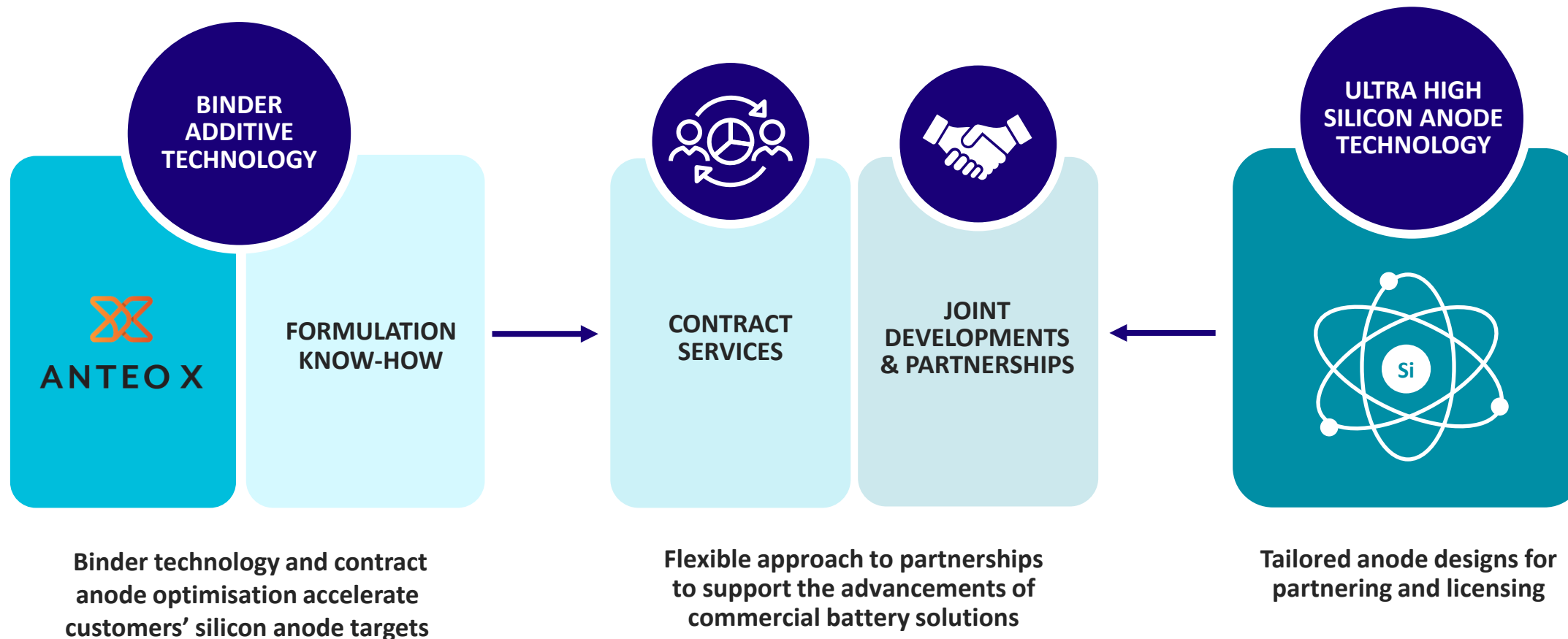


**Existing supply chains**



# TECHNOLOGY PLATFORMS AND PARTNERSHIPS

Combining AnteoTech’s silicon-enabling products and anode design know-how to create pathways to smaller, lighter and cheaper lithium-ion batteries



# Anteo X™

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Binder additive for high silicon anodes



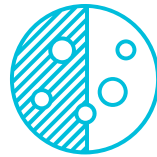


# THE SILICON CHALLENGE FROM A BINDER PERSPECTIVE

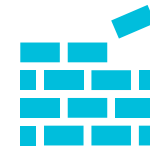
Binders form an integral part of electrodes, and act by facilitating:



Particle dispersion



Electrode homogeneity



Structural integrity



Conductive network

**(1)** More silicon in the anode generally means more expansion and contraction of electrode structure

**(2)** This stress largely falls on the binder to compensate

➤ **To advance silicon anode technology we also need advanced binders!**

➤ **We also need advanced anode formulation know-how to optimise performance and cost!**

# ANTEO X™ BINDER ADDITIVE TECHNOLOGY

Anteo X cross-links the battery binder and creates a uniform 3D network structure in the electrode improving electrochemical and mechanical performance



## Cycle life

Extended cycle life for high silicon content anodes  
Can reduce structural expansion of the anode



## Ease of use

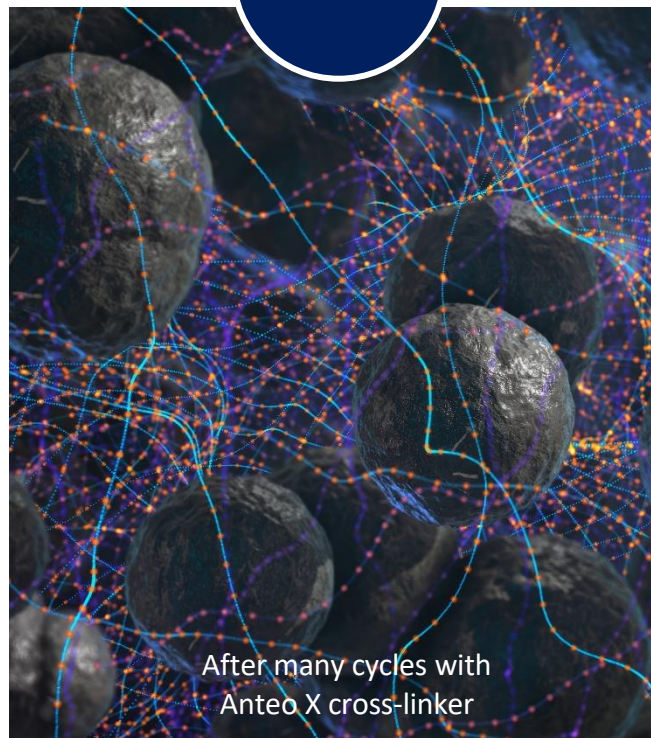
Aqueous solution (non-hazardous)  
Easily transported & stored  
Broad binder compatibility  
Integrates into electrode manufacturing process



## Anode optimisation

Can help to optimise inactive material fraction  
Optimise CNT content (impacts \$/Wh)  
Optimise binder content (impacts \$/Wh)

WITH  
ANTEO X



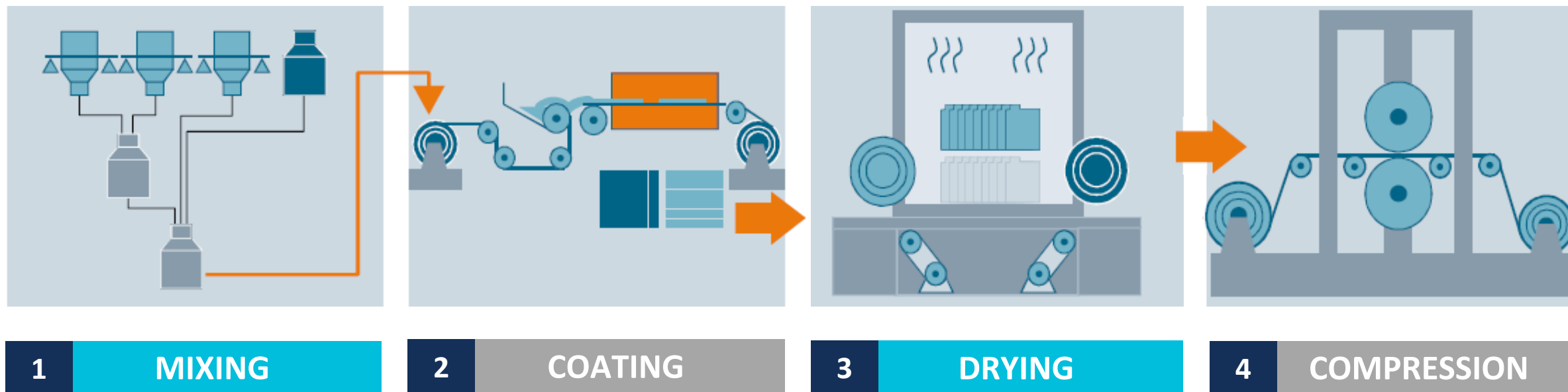
WITHOUT  
ANTEO X



# ANTEO X™ BINDER ADDITIVE TECHNOLOGY

Anteo X designed with the intent to not change any parameters on existing manufacturing processes

- (1) Integrates seamlessly with Mixing Step (1) and activates during Drying Step (3)
- (2) Added to the process as the final component



Source: Siemens AG

# Silicon-carbon composite and Graphite anode optimisation

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## Case study – Part 1

# SILICON ANODE — ACTIVE % VS. INACTIVE %

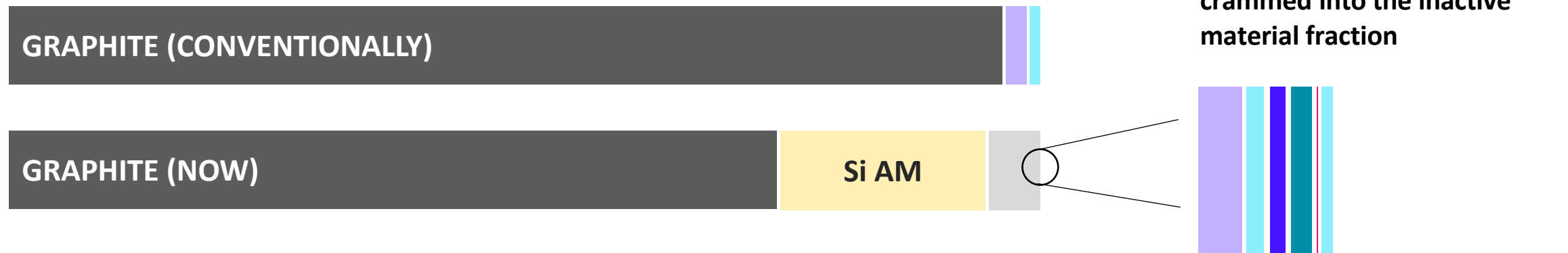
Deep experience and capabilities in silicon anode development and designs

## Optimising the inactive material fraction matters

- Optimisation of <5wt.% of the anode composition can create substantial performance and cost advantages
- Incorporation of silicon AMs into anodes triggered the uptake of advanced components for the inactive material fraction
- Provides companies with more levers to improve performance but also makes formulation development more time-consuming

## Partnering for acceleration

- Expertise in formulation development across range of binders and conductive/structural additives
- Anteo X binder additive technology improves silicon integration and stabilisation
- Flexible approach to partnerships to support the advancements of commercial battery solutions

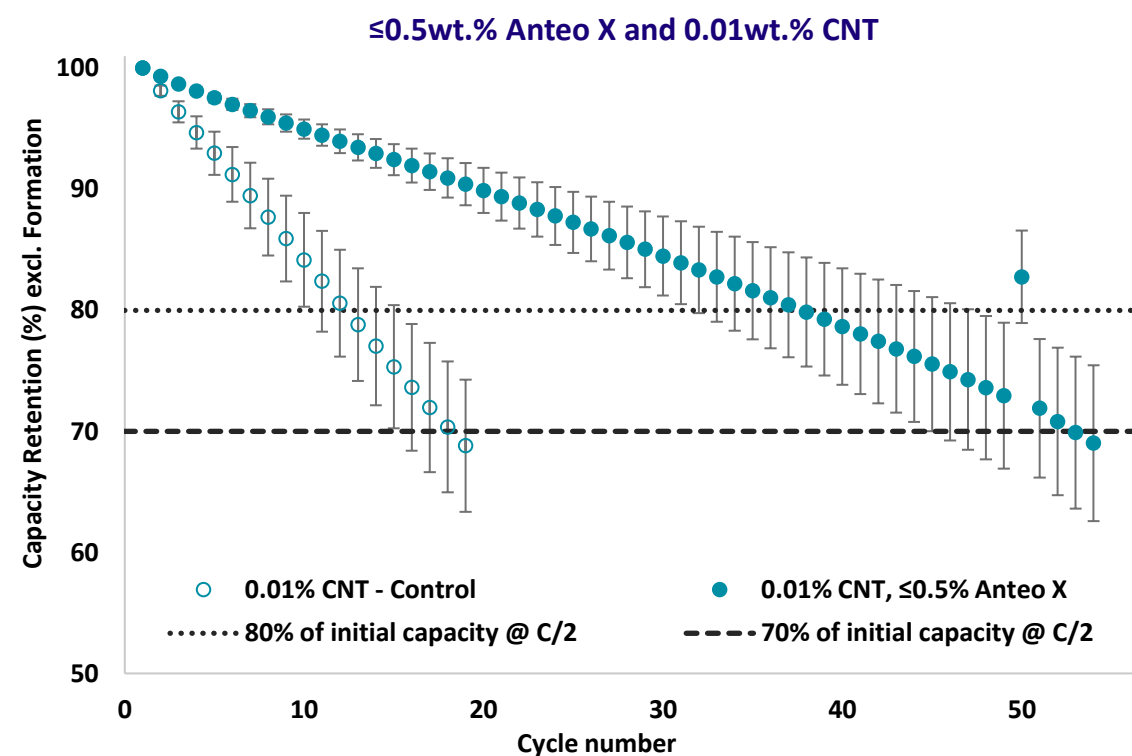
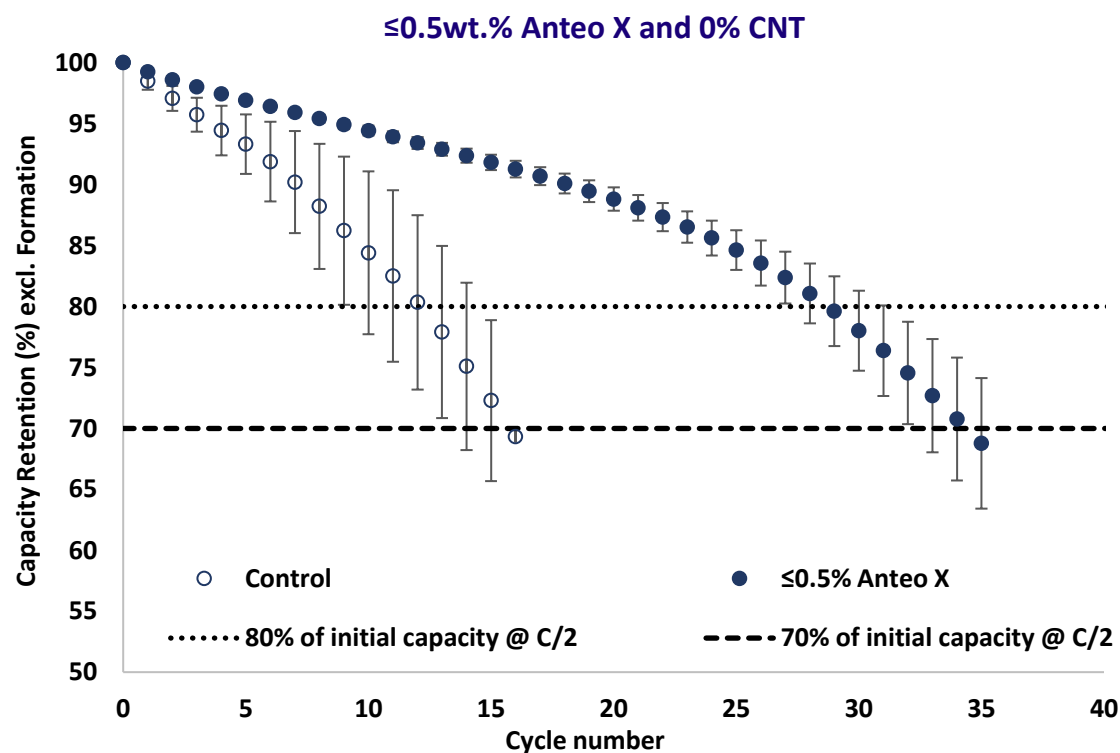


# SILICON CARBON COMPOSITE ANODE – 750 mAh/g

## Clear impact of Anteo X addition on silicon anode performance

(1) Baseline experiment to evaluate response of anode system to the change in one parameter

- Anode coating capacity at C/2: ~620 mAh/g paired with NCM532 cathode: 3.8 mAh/cm<sup>2</sup>
- Binder type: CMC/SBR
- Total binder: 3%

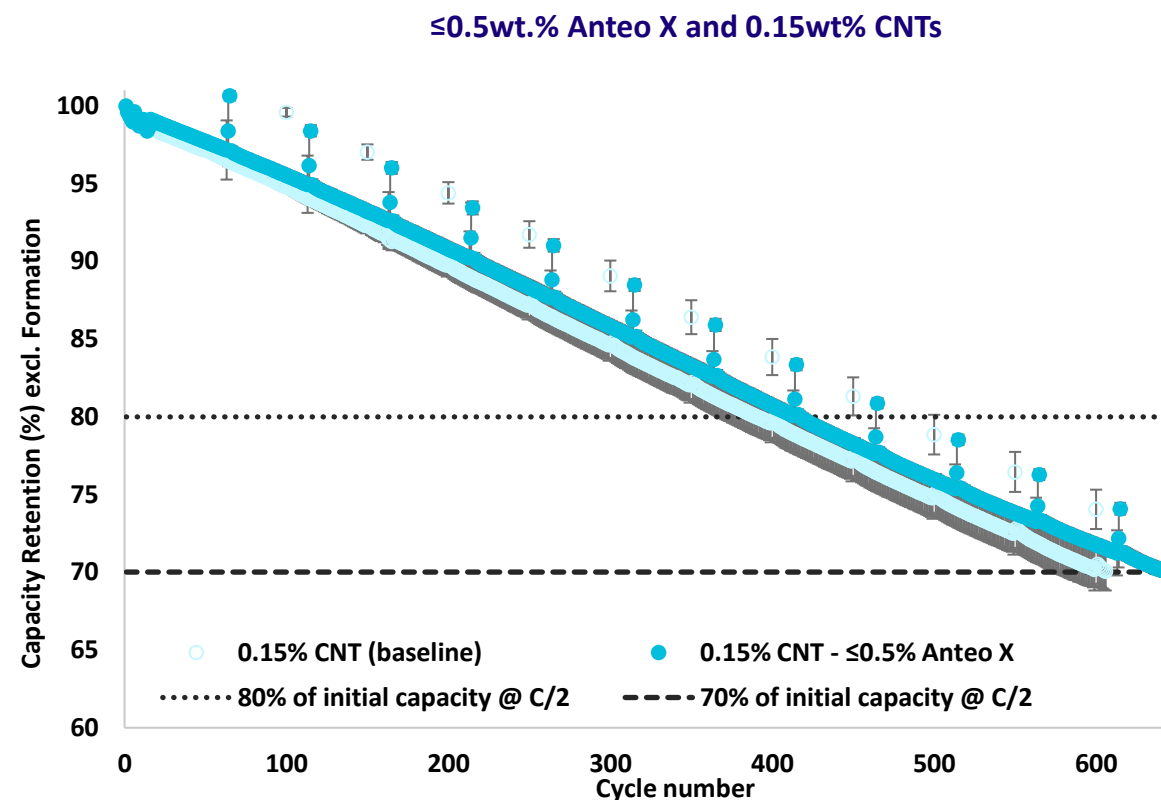
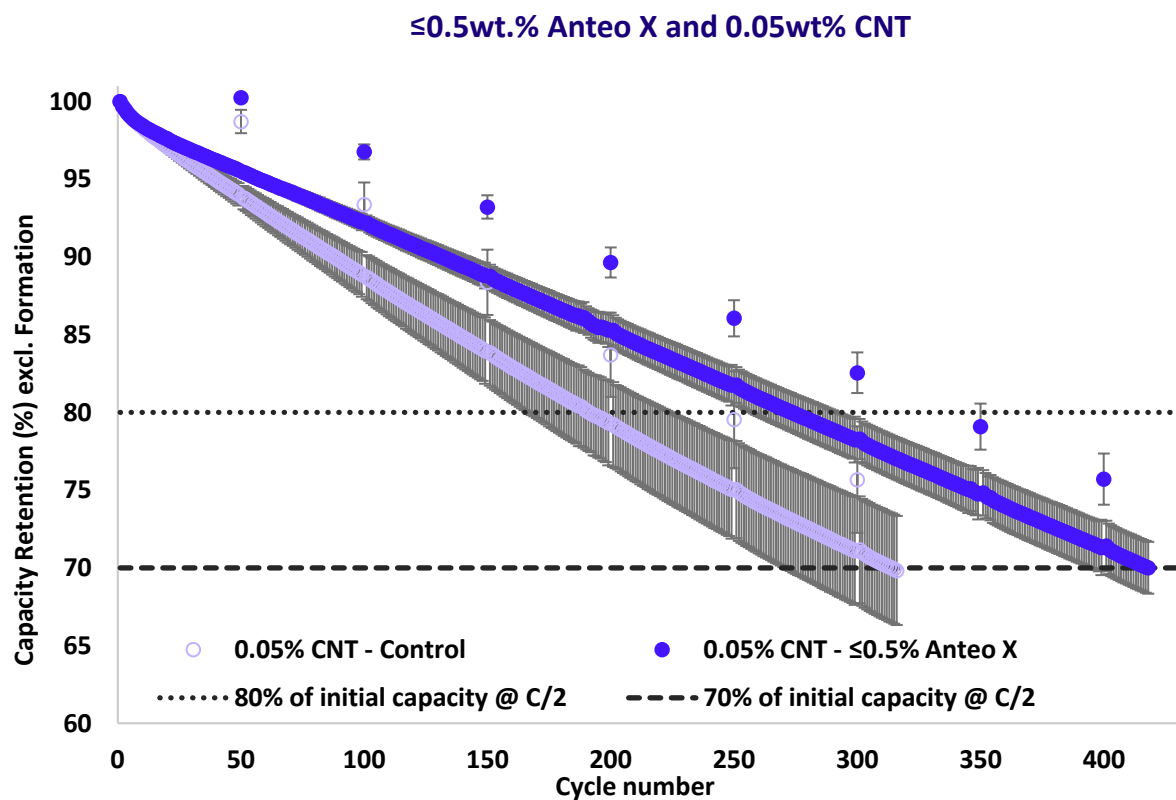


# SILICON CARBON COMPOSITE ANODE – 750 mAh/g

## Clear impact of Anteo X addition on silicon anode performance

(1) For the same anode configuration, the CNT content was increased to 0.05% and 0.15%

- 0.05% CNT: Addition of Anteo X increased capacity retention by **35%** at 80% capacity retention
- 0.15% CNT: Addition of Anteo X increased capacity retention by **7%** at 80% capacity retention

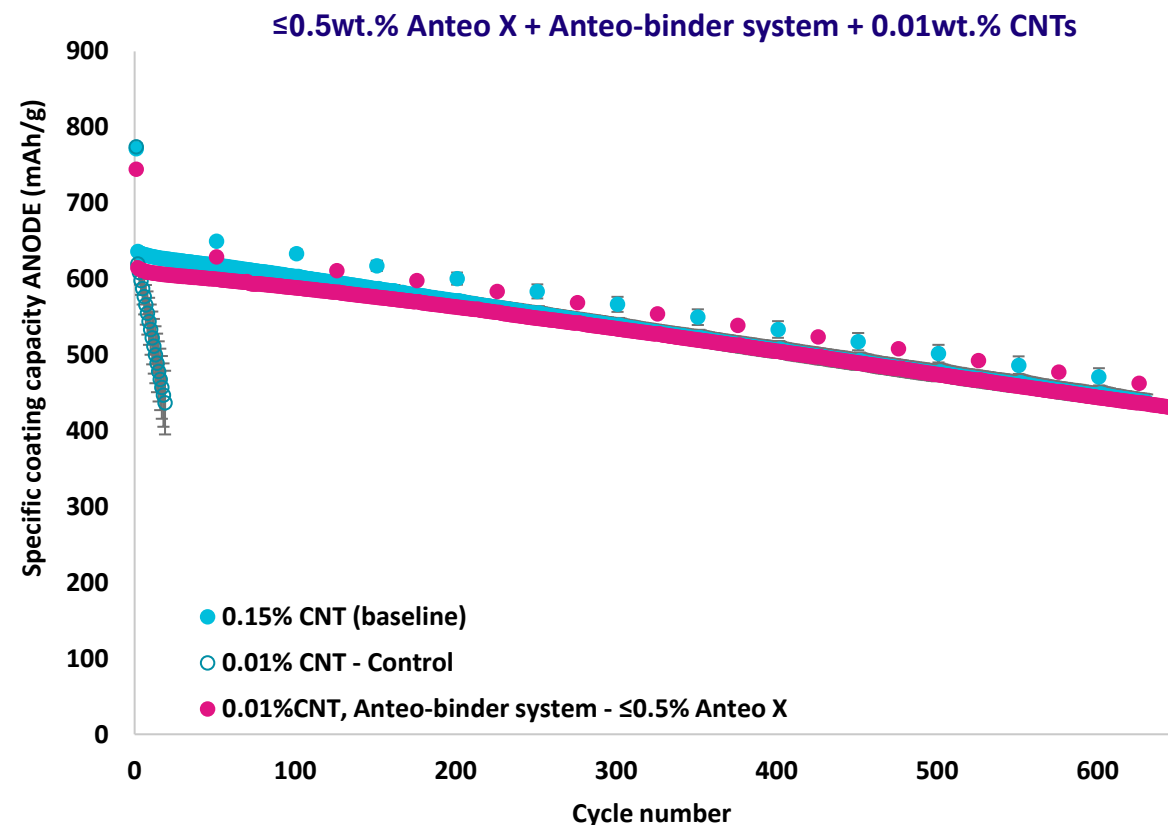
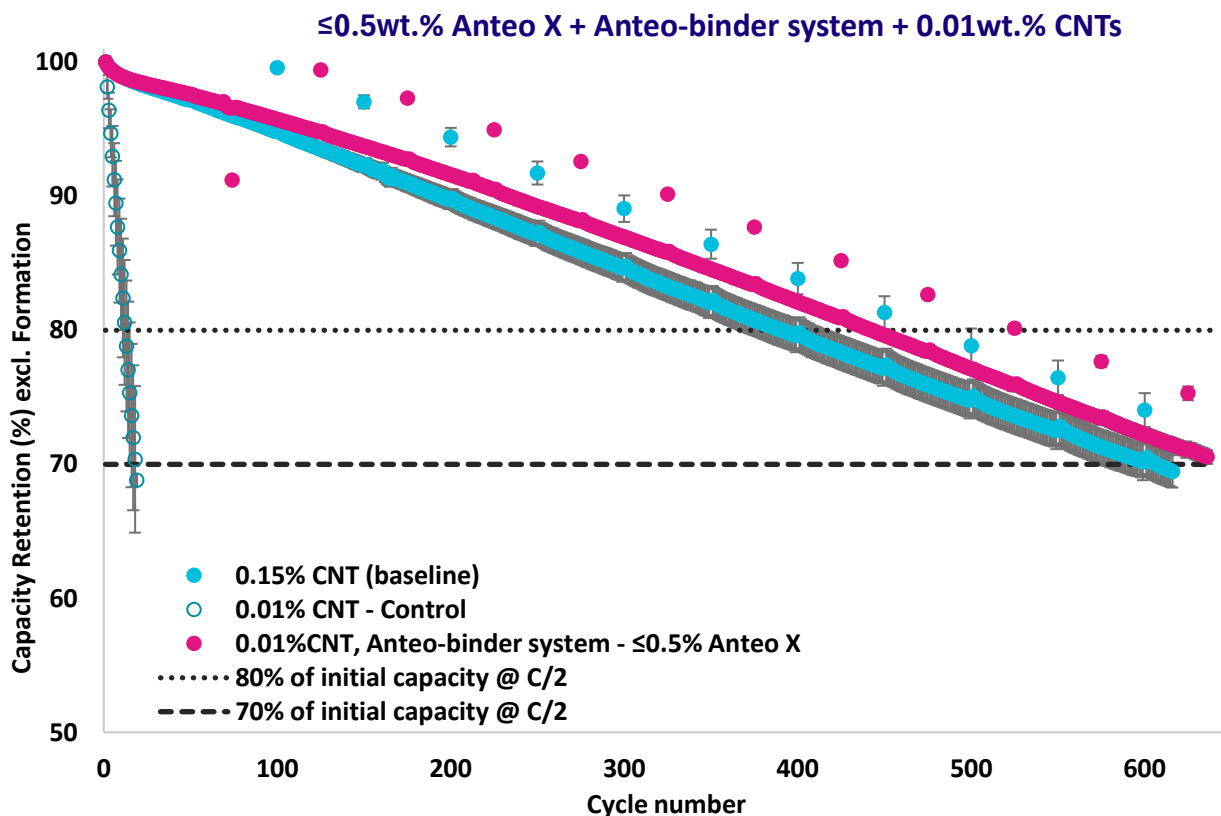


# SILICON CARBON COMPOSITE ANODE – 750 mAh/g

## Clear impact of Anteo X addition on silicon anode performance

(1) Maximum performance plus potential cost savings enabled by balanced binder composition paired with Anteo X

- **10%** difference in capacity retention at cycle 440
- **15-fold** reduction in CNT content while increasing anode performance





# Silicon-carbon composite and Graphite anode optimisation

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## Case study – Part 2

# SCALED-UP Si/C ANODE FORMULATION – 600 mAh/g

Potential cost savings by optimizing the inactive material fraction of the anode

NMC 532: 3.8 mAh/cm<sup>2</sup>

Electrolyte: 10%FEC

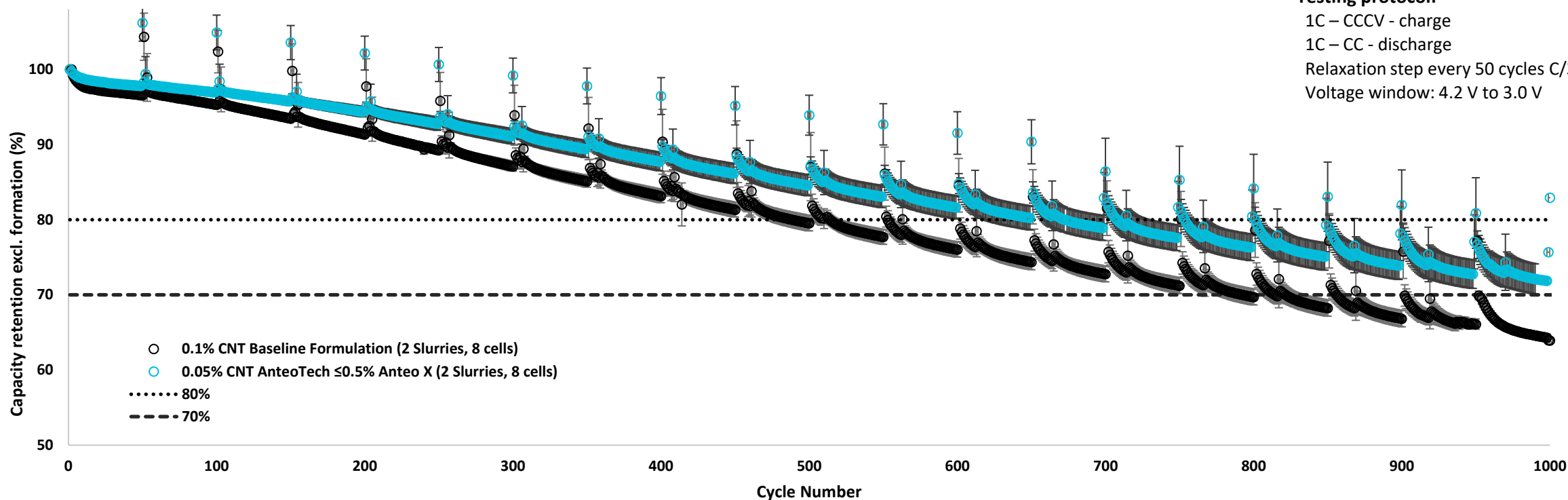
Testing protocol:

1C – CCCV - charge

1C – CC - discharge

Relaxation step every 50 cycles C/3

Voltage window: 4.2 V to 3.0 V

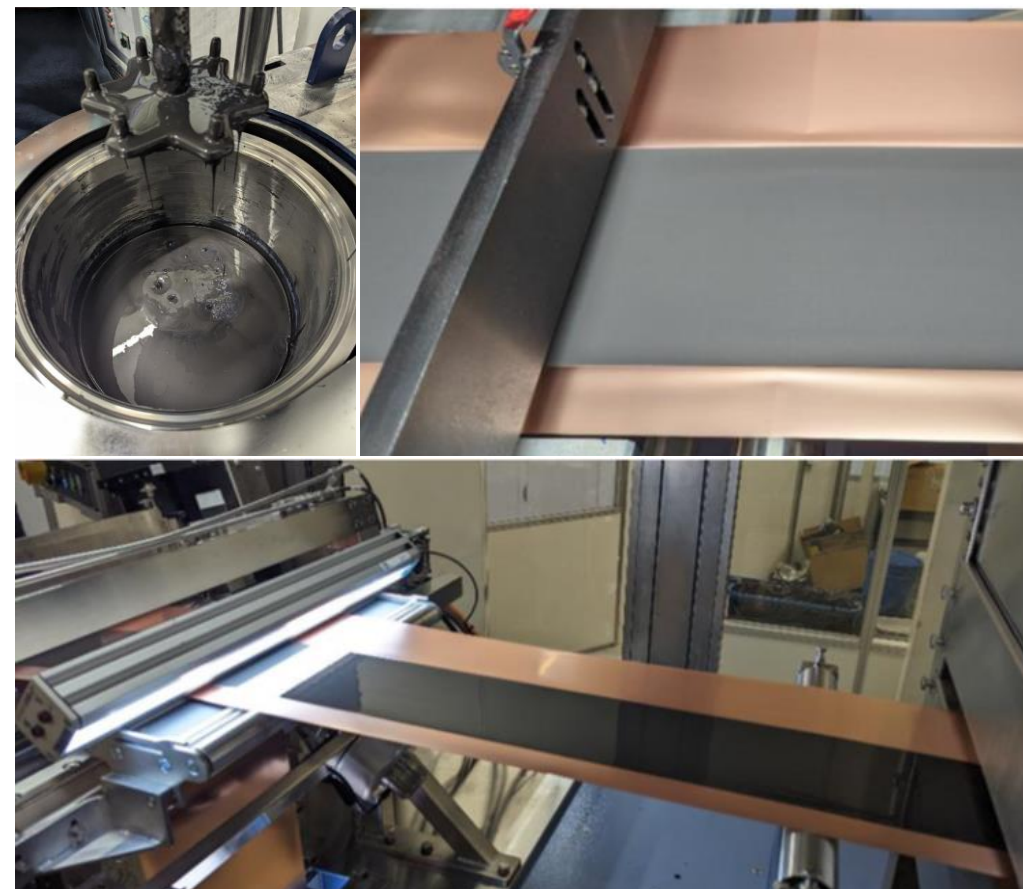
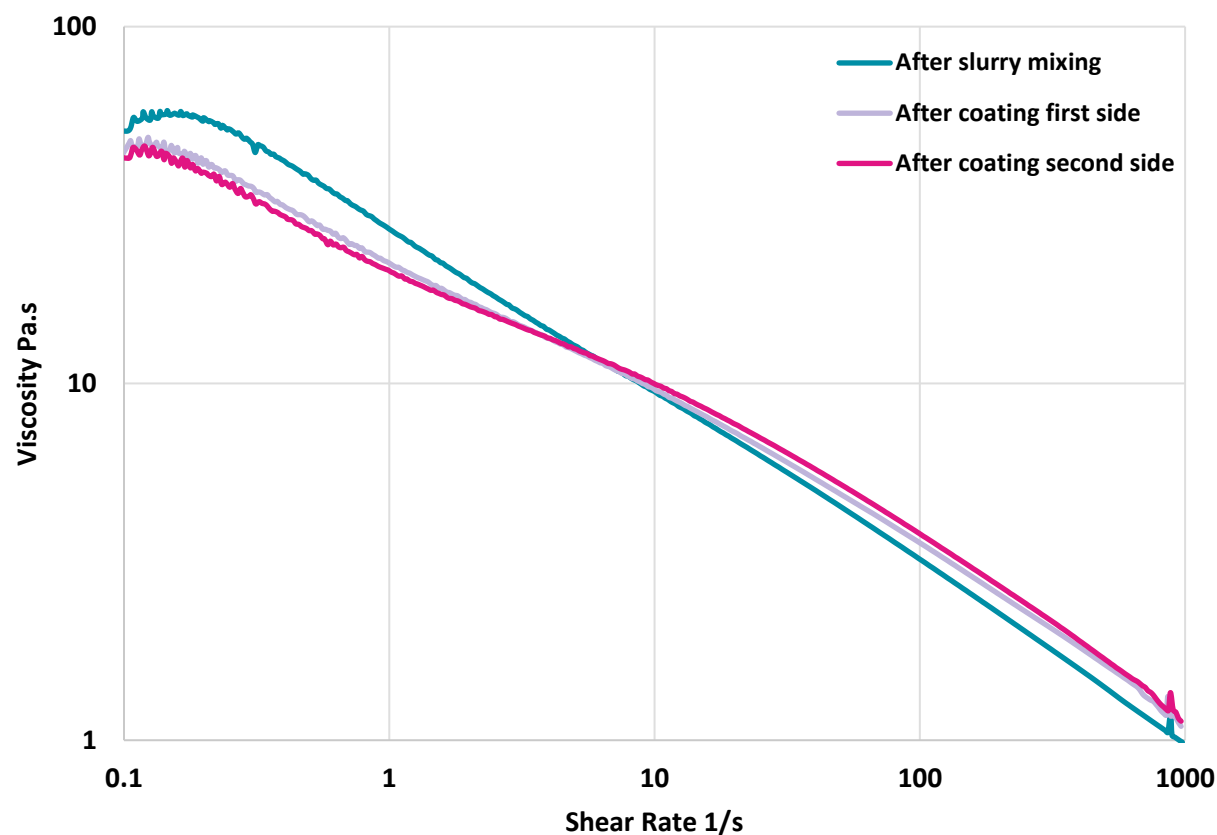


	Initial Capacity (mAh/g)	Second Cycle capacity (mAh/g)	Initial Coulombic efficiency (%)	Cycle Number 80% capacity retention excluding formation	Cycle Number 70% capacity retention excluding formation	Final Capacity at Cycle 1000 (mAh/g)
Baseline Formulation	603	467	84.68	489	793	287
0.05wt.% CNT ≤0.5wt.% Anteo X	603	474	86.00	674	>1000 (@71.85%)	340
<b>Improvement</b>	-	8	1.32	<b>185 (38% increase)</b>	<b>&gt;207 (&gt;26% increase)</b>	53

# ANTEO X™ BINDER ADDITIVE TECHNOLOGY




Anteo X designed for ease of integration into existing manufacturing processes

- (1) Confirmed scalability of Anteo X use in larger-scale manufacturing process
- (2) Stable pot-life and slurry rheology throughout process duration



## ANTEO X™ – SUMMARY

Binders, Anteo X and CNTs work together to achieve superior performance, scalability and economics

-  Binders as well as structural additives play critical roles in enabling silicon anode performance
-  Anteo X and CNTs both work as structural additive by forming networks and providing connectivity
-  Anteo X can be used to optimise the amount of CNTs in the anode formulation

# ANTEOTECH – CLEAN ENERGY TECHNOLOGY DIVISION

Commercialising technologies that enhance the storage and management of energy across multiple sectors

## Anteo X

Product development completed



Successfully trialled in R2R manufacturing runs  
Stable slurry rheology  
ISO9001 conforming product development

## First Anteo X Revenues

Anteo X paired with optimised anode



Anteo X in tailored anode sold to major EV manufacturer  
Evaluations underway for Anteo X to be a performance enhancer in their next-gen battery

## Contract Services – Si Anode

Optimisation of inactive material fraction



Delivery of optimised performance and economics for silicon anodes  
Customer projects completed

## Anteo X Production Facility

Located at Brisbane, Australia HQ



Facility completed February 2024  
20,000 litre annual capacity  
Scale-up to 80,000 litres at nominal cost

## Ultra-High Silicon Anode

650 cycles @ 80 % capacity retention



AnteoTech proprietary Ultra-High Silicon Anode development program, utilising low grade unrefined silicon

## First Scaled-up Production

Ultra high silicon anode



Production of proprietary double sided Ultra-High Silicon Anode  
Testing indicates that anode performance is easily reproduced at scale



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