AI-Enhanced High Energy Density and High Power Density Li-Metal and Li-ion Batteries

Accelerate the world's energy transition through material discovery and battery management

Investor Presentation
March 2025

SES

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Evolving from R&D to Revenue Generating Businesses Ahead of Schedule…

Automotive OEM Partnerships Deepen in Li-Metal and Open for First Time in Li-Ion EV

- Global EV battery shipment is expected to grow from 974 GWh in 2024 to 3,758 GWh in 2030[1]
- New AI-enhanced electrolyte generated new battery development contract from partners and consideration for Li-ion programs
- B-Sample Li-metal testing is on track with completion of Site Acceptance Test; recently passed the GB38031-2020 global EV industry safety test for our 100Ah Li-Metal cells, a major step towards C-samples and SOP for EV

AI-Driven Material Discovery Enabled Creation of New Li-Ion Cell for Robotics and Li-Ion EV, Extended Uses in Drones and UAM, and Capital-Efficient Contract Manufacturing to Achieve Scale

- AI-Enhanced 2170 cylindrical cell announced at CES is standard for leading humanoid robotics applications
- New 2170 cylindrical cell is also standard for multiple existing Li-ion EV platforms
- Molecular Universe electrolyte development is a breakthrough for both Li-metal and high-silicon Li-ion technologies
- New AI-enhanced electrolyte is a direct drop-in replacement for all 2170 cells, enabling SES AI to adopt a capital-efficient model to achieve manufacturing scale and potentially create new sources of revenue for outsourced R&D

Additional Market Opened by AI Solutions for Battery Energy Storage is Expected to Amount to 10X the Size of EV Market[5]

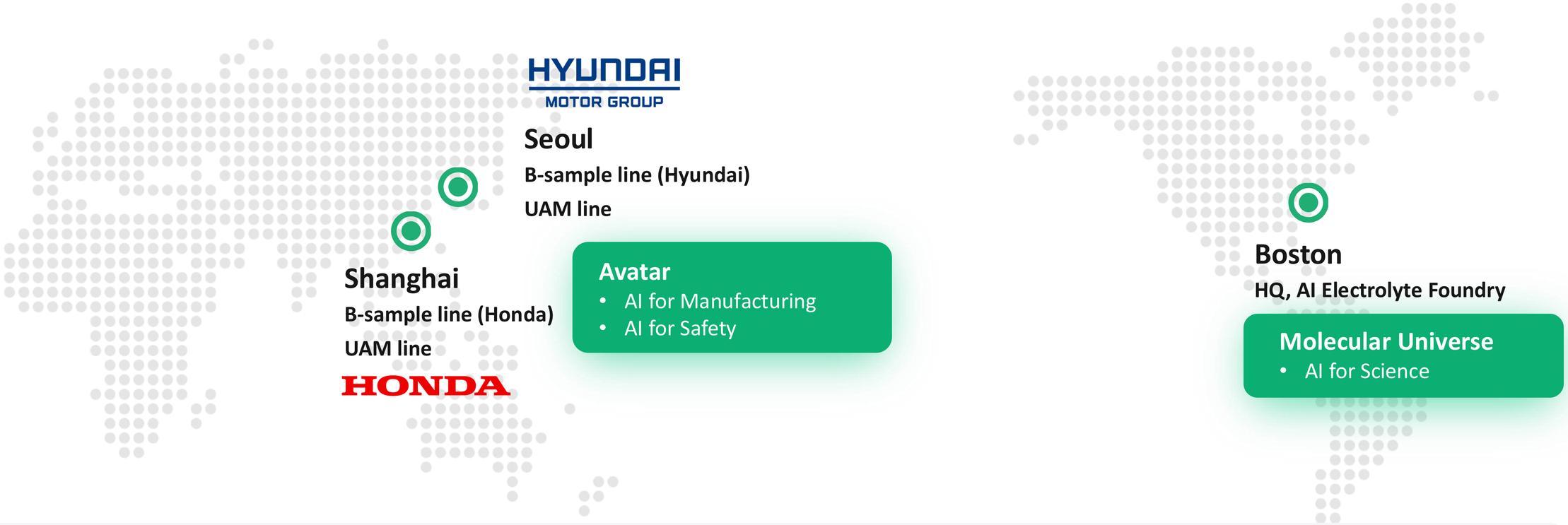
- Global ESS battery shipment is expected to grow from 300 GWh in 2024 to 1,400 GWh in 2030[2]
- MOU with AISPEX is first opportunity to enter fast-growing energy storage sector with targeted focus on distributed ”behind the meter” (7x expected market growth from 2024 to 2030)[3] and data center customers (30x expected market growth from 2024 to 2030)[4]

Significant Milestone Reached with Revenue in Fourth Quarter and Accelerated Revenue Ramp in 2025

- Booked $2M in revenue in Q4 2024 and expect $15M-$25M in revenue in 2025 with deployment of capital-efficient model leading to liquidity runway expected to extend into 2028

Source:
1. & 2 & 3 & 4 : CATL’s A1 Prospectus, GGII Report
5. Meticulous Research. (2023, June). Battery Energy Storage System Market - Global Forecast to 2030

…And Continuing Our Existing Development Plans for EV and UAM



2012
Est. (MIT spinoff)

Start Hermes

2017
Start Avatar

2021
Sign world's first EV A-sample (GM, Hyundai, Honda)
Start Apollo

2022
NYSE listing (NYSE: SES)

2023
Sign world's first EV B-sample

Start Prometheus

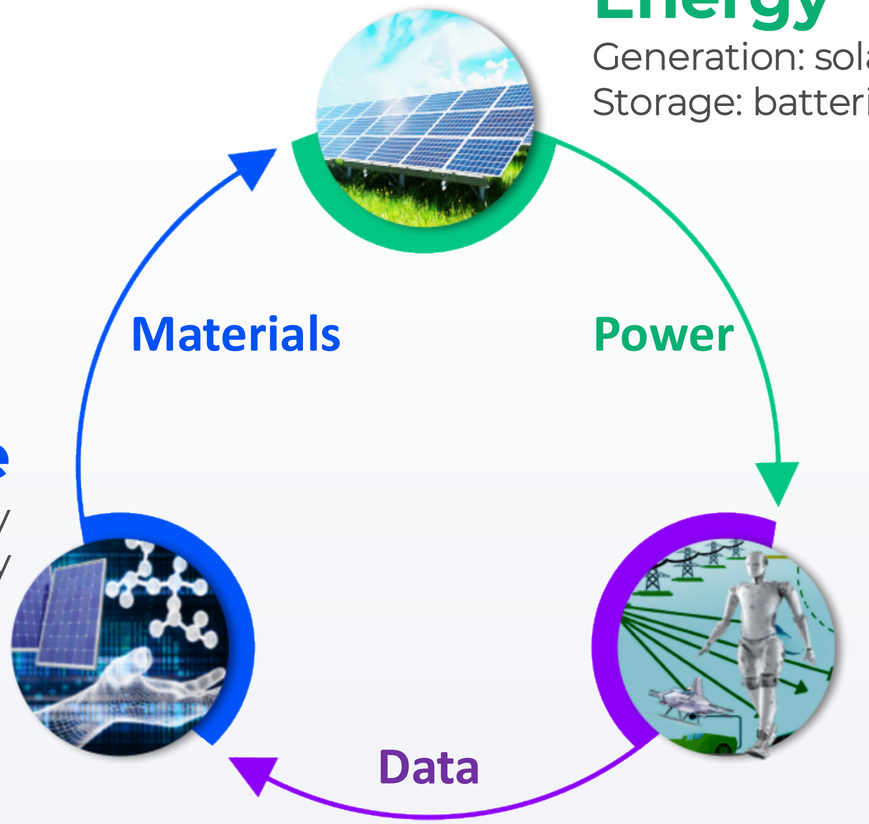
2024
Build 2 EV B-sample lines and 1 UAM line

2025
Goal to sign world's first EV C-sample

Target to ship UAM cells and modules

2026
Target to sign world's first EV SOP

…While our Material Discovery Opens New Energy Transition Markets



Proprietary Full-Chain R&D System with Focus on Upstream Material Discovery and Downstream Battery Safety

Upstream

Material Discovery

(Molecular Universe)

- Map of Molecular Universe
- AI-enhanced Electrolyte

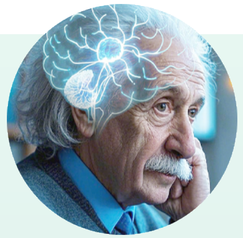
Downstream

AI4Manufacturing + AI4Safety

(Avatar)

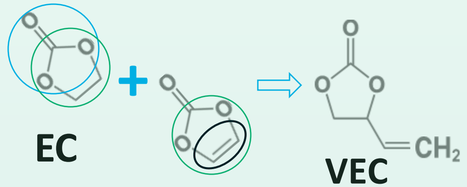
- Battery Management System
- Prognostics Safety System

AI for Science is finding the best electrolytes for Li-Metal and Li-ion batteries…



Human Scientist

AI Agent



All small molecular properties 10^{11}

All battery, material science and physical chemistry related papers and books 10^{6}

All SES data

AI/ML model development and training

New molecules 10^{3}

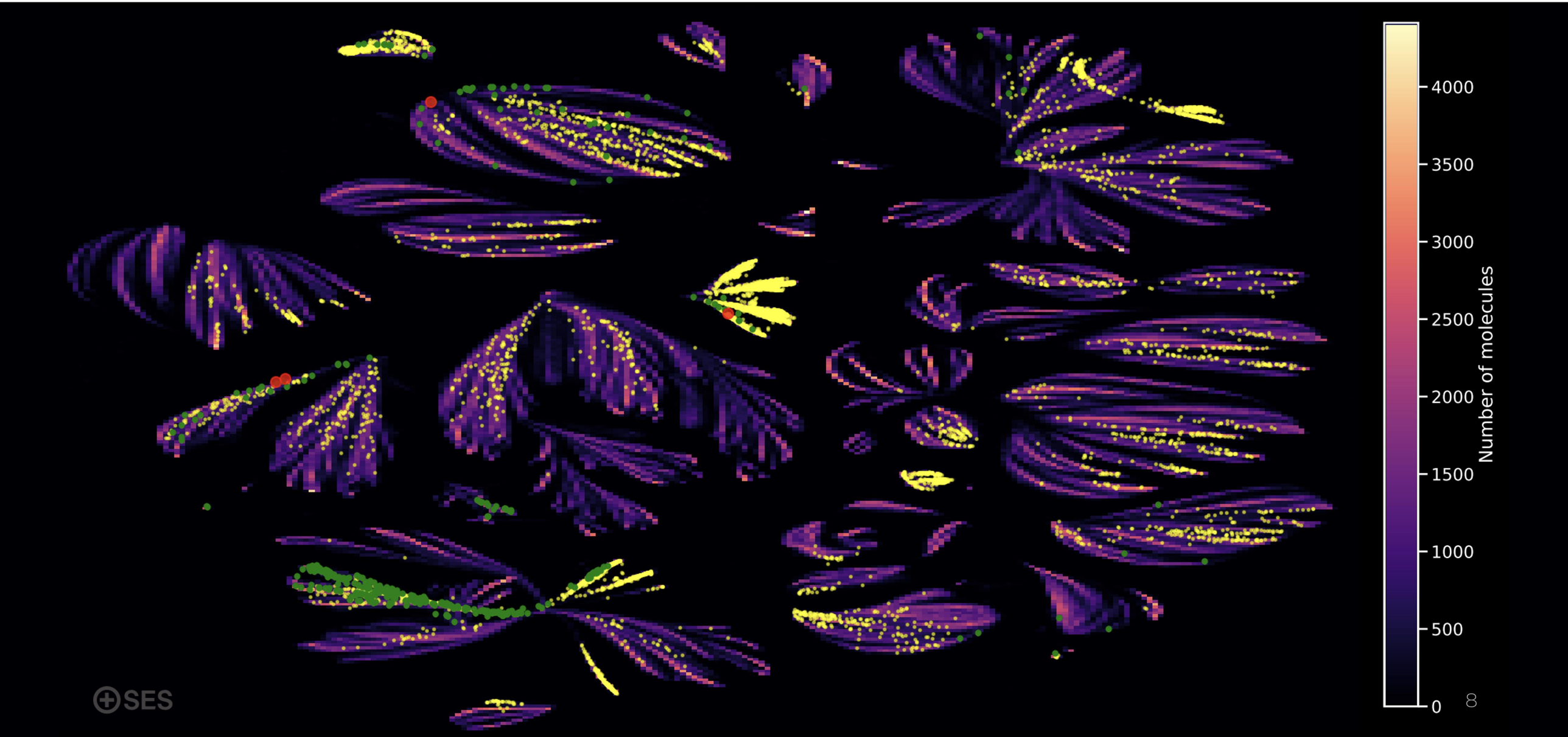
Electrolyte Foundry molecule synthesis and electrolyte formulation

Battery testing and Validation (A-sample, B-sample, C-sample, SOP)

End-to-end capability

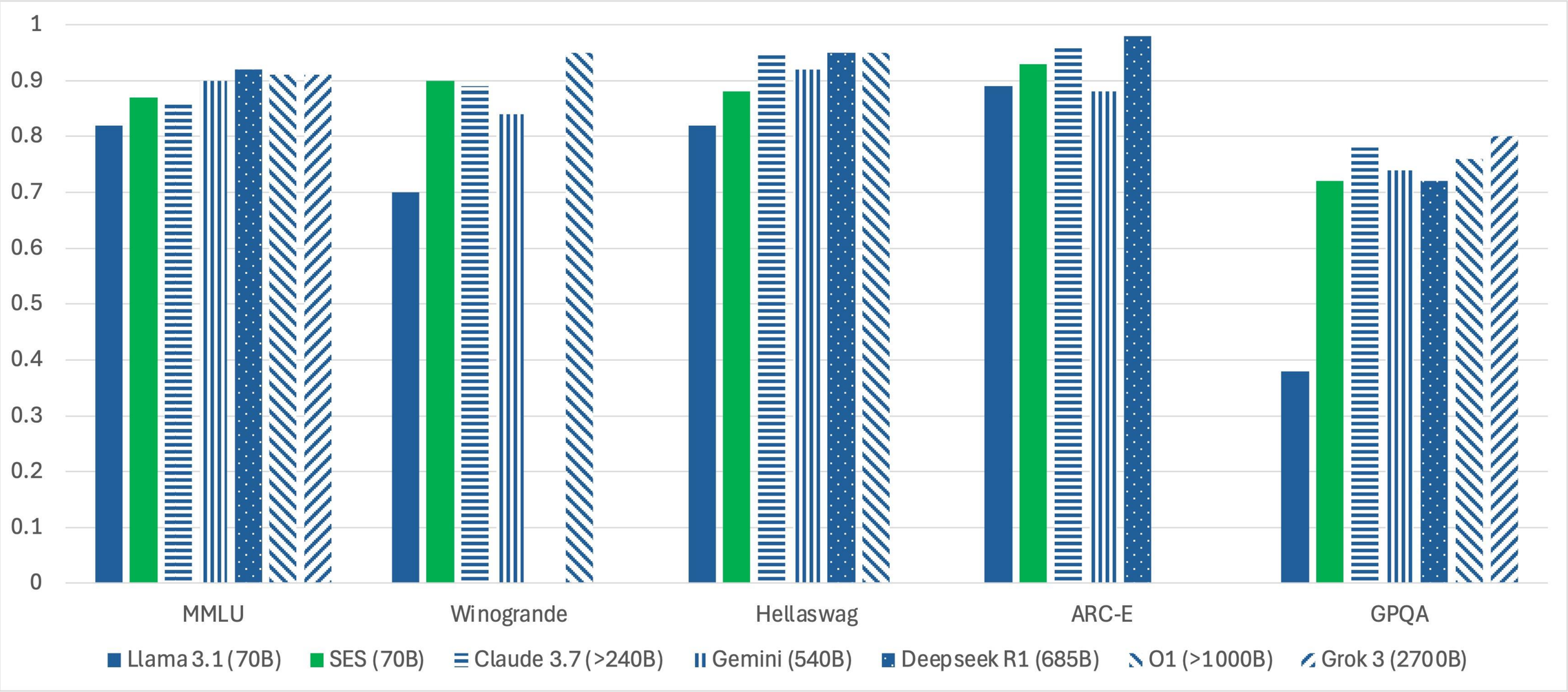
Map of the Molecular Universe

A treasure map showing all possible molecules for all battery chemistries, taking the “luck” out of material discovery

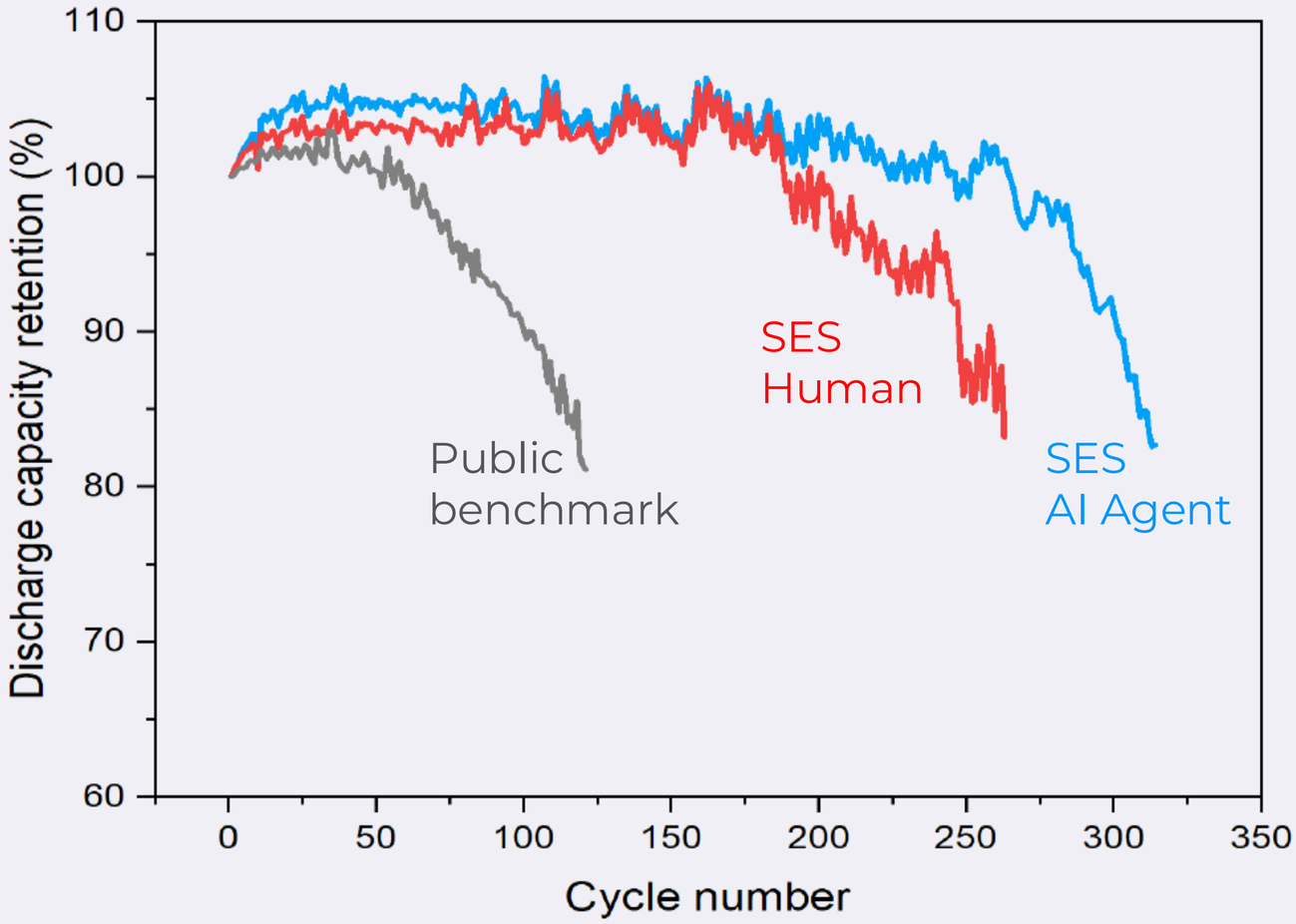


Battery-Specific Large Language Model

A domain specific LLM trained on a cost-effective small model but achieves similar scores as much larger and more expensive models



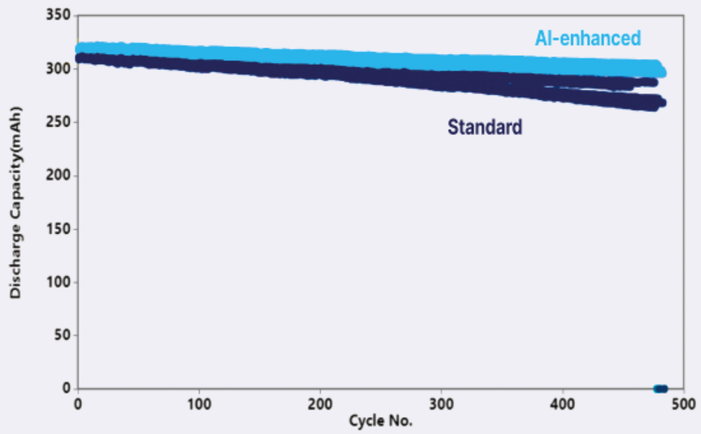
AI for Science is validating greater cycle life in Li-Metal…



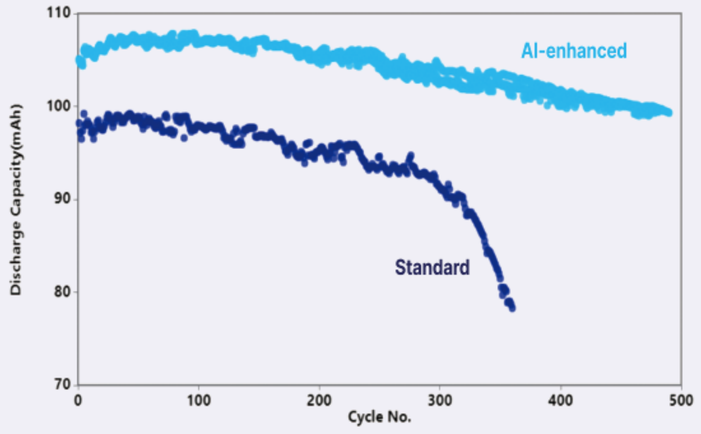
Enhances Li-Metal cycle life by >20%

…enhancing Li-ion cycle life by 100%...

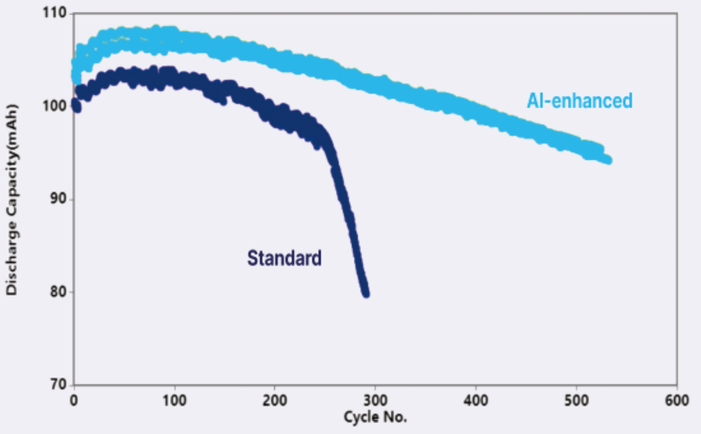
12% Si



30% Si

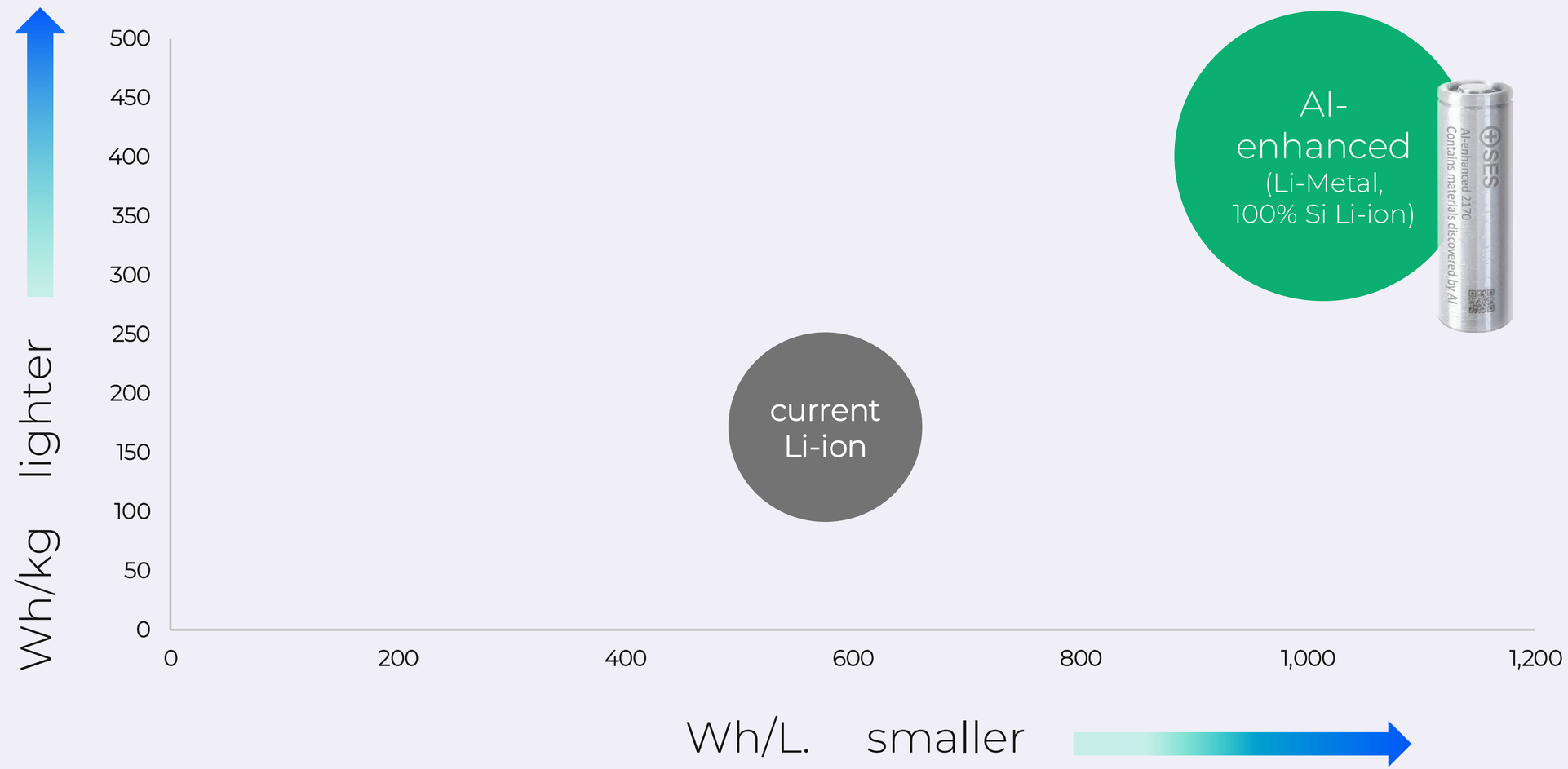


100% Si



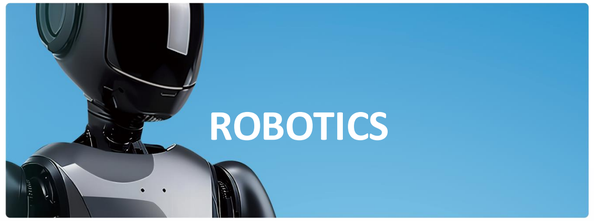
Enhances 100% Si Li-ion cycle life by >100%

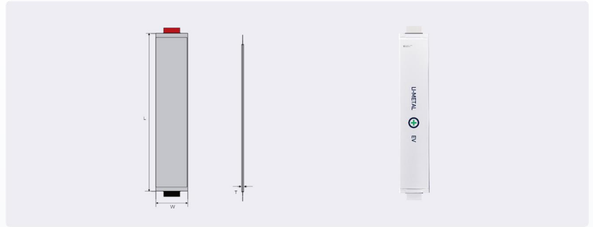
…and creating AI-enhanced batteries with double the energy density of traditional Li-ion

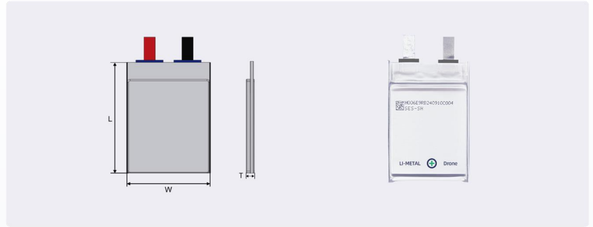


SES AI-enhanced cells are now applicable to both Li-Metal and Li-ion across many applications…

…including EVs, UAMs, Drones, Robotics and Many More







SPECIFICATIONS

Capacity	Typical	105.8 Ah
Energy	Typical	403 Wh
Cell Voltage	Nominal	3.81V
	Charge	4.3V
	Discharge	2.5V
Charge Current	Typical	35.2A (C/3)
Temperature	Discharge	-30 to 60 °C
	Charge	0 to 45 °C
Internal Resistance	ACIR(1kHz @ 30 % SOC)	≤ 0.6 mΩ
	DCIR (200A/10s)	≤ 0.8 mΩ
Weight		1009 ± 7 g
Packaging		Pouch
Chemistry		NMC/Li Metal
Energy Density	Gravimetric	400 Wh/kg

DIMENSIONS

Size	L	582 ± 1.0 mm
	W	110 ± 1.0 mm
	T (@ 30% SOC)	7.3 ± 0.5 mm

SPECIFICATIONS

Capacity	Typical	31.7 Ah
Energy	Typical	122 Wh
Cell Voltage	Nominal	3.83V
	Charge	4.3V
	Discharge	2.5V
Charge Current	Typical	10.5A (C/3)
Temperature	Discharge	-30 to 60 °C
	Charge	0 to 45 °C
Internal Resistance	ACIR(1kHz @ 30 % SOC)	≤ 1.2 mΩ
	DCIR (63.5A/10s)	≤ 2 mΩ
Weight		321 ± 2.5 g
Packaging		Pouch
Chemistry		NMC/Li Metal
Energy Density	Gravimetric	378 Wh/kg

DIMENSIONS

Size	L	310 ± 1.0 mm
	W	100 ± 1.0 mm
	T (@ 30% SOC)	6.0 ± 0.5 mm

SPECIFICATIONS

Capacity	Typical	4.2 Ah
Energy	Typical	16.0 Wh
Cell Voltage	Nominal	3.8V
	Charge	4.3V
	Discharge	2.5V
Charge Current	Typical	1.4A (C/3)
Temperature	Discharge	-30 to 60 °C
	Charge	0 to 45 °C
Internal Resistance	ACIR(1kHz @ 30 % SOC)	≤ 6 mΩ
	DCIR (16.5A/10s)	≤ 20 mΩ
Weight		43.6 ± 1.0 g
Packaging		Pouch
Chemistry		NMC/Li Metal
Energy Density	Gravimetric	372 Wh/kg

DIMENSIONS

Size	L	71.5 ± 1.0 mm
	W	48.5 ± 0.5 mm
	T (@ 30% SOC)	6.6 ± 0.5 mm

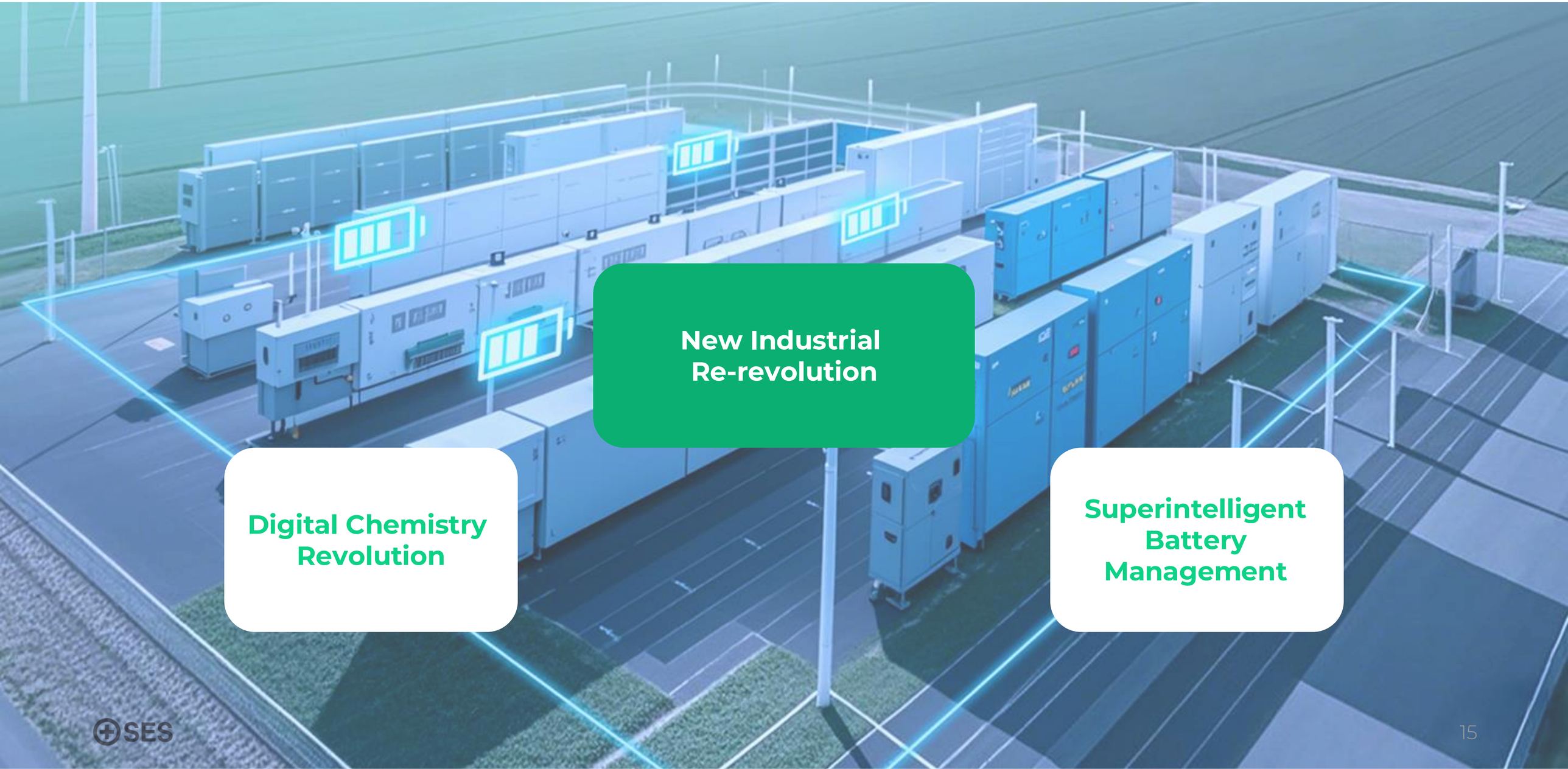
SPECIFICATIONS

Capacity	Typical	5.8 Ah
Energy	Typical	20.5 Wh
Cell Voltage	Nominal	3.6V
	Charge	4.2V
	Discharge	2.5V
Max. Charge/Discharge Rate		+1C / -3C
Temperature	Discharge	-20 to 60 °C
	Charge	0 to 50 °C
Internal Resistance	ACIR (1kHz @ 30 % SOC)	≤20 mΩ
	DCIR (50%SOC, 10s, 25°C)	≤30 mΩ
Weight		70.0 ± 2.0 g
Chemistry		NMC/C+Si
Energy Density	Gravimetric	>290 Wh/kg
	C/5 discharge @25°C, 100% DoD	
Cycle Life	+C/2/-1C, 2.75-4.2V @25°C, 80% SoH	800

DIMENSIONS

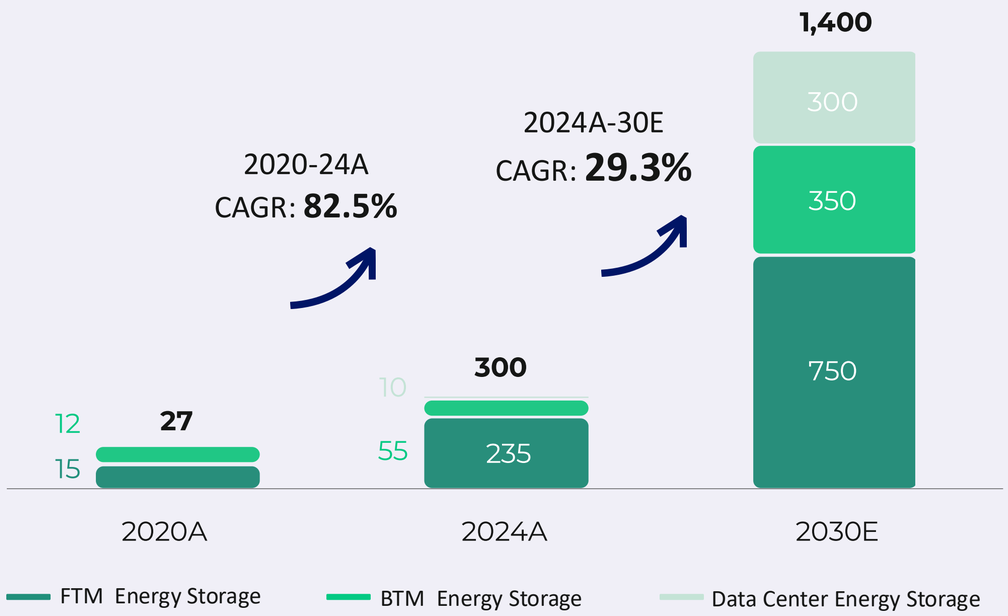
Size	D	21.15 ± 0.15 mm
	L	70.45 ± 0.25 mm

The Most Exciting New Market Opening for SES AI is in Battery Energy Storage

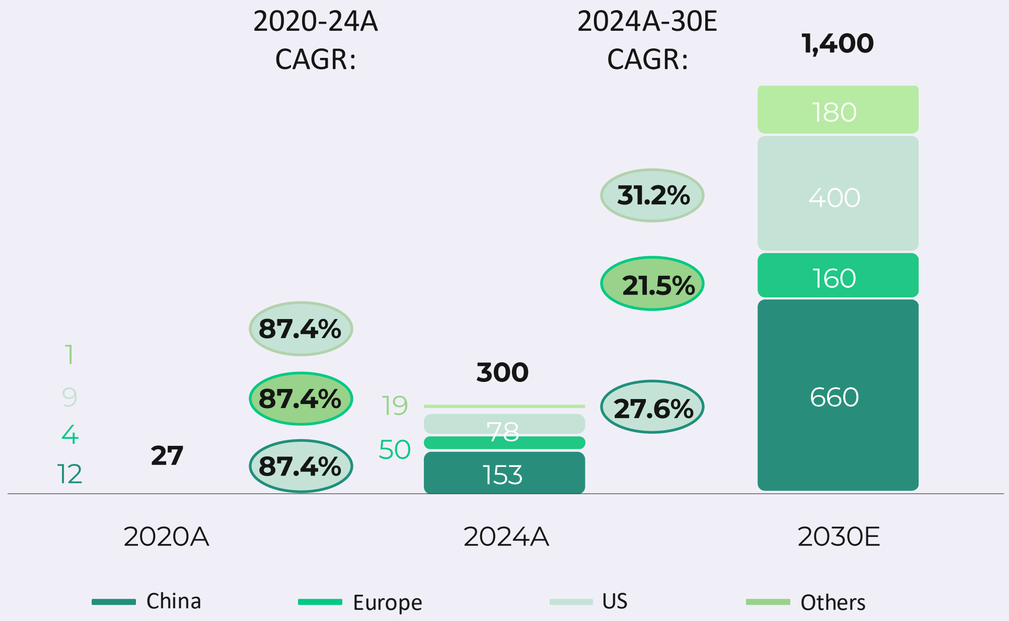


We See Huge Growth Potential Driven by Behind-the-Meter and Data Center Customers in the US

Global ESS Battery Shipments - by Application (GWh)



Global ESS Battery Shipments - by Region (GWh)



Source: CATL's A1 Prospectus, GGII Report

We Reached a Major Milestone Ahead of Schedule with Revenue in Q4 2024, with an Even Stronger Year Projected in 2025

Fourth Quarter 2024 Financial Highlights

Revenue: $2 million

Operating Expense: $31 million

Cash Flow: Utilized $12.3 million and invested $0.2 million

Liquidity: $263 million

Full-Year 2024 Financial Summary

Total Cash Usage:

$78 million (below guidance of $80 to $95 million)

- Operational cash usage of $66 million
- Capital expenditures of $12 million

2025 Financial Guidance[1]

Revenue Outlook:

Between $15 and $25 million

Planned Spending:

Between $70 and $80 million

Cash Management:

Expected Liquidity runway into 2H 2028

Note: 1. As of February 25, 2025

We Have a Plan in Place to Accelerate our Growth in 2026-2027

Business model enhancements are expected

- Heavy focus on selling AI models and core battery materials
- Contract manufacturing and selling of cells using our AI-enhanced electrolyte in newly opened markets

Focus on hiring to pursue greater expansion of revenue opportunities in 2025-2027

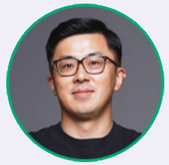
- Prioritizing AI scientists, sales and marketing teams to execute GTM strategies in the new verticals of BESS and drones/robotics

Continuing our evolution away from an R&D only battery technology company

- Extending to multiple battery chemistries and multiple platforms
- Leveraging our AI technology and AI-enabled electrolytes to generate revenue in a capital-efficient model

APPENDIX

Battery <> AI for Science & Safety (Our Team)



DR. QICHAO HU

Founder, Chairman & CEO

HARVARD UNIVERSITY MIT

Forbes 30 Under 30

MIT Technology Review Innovators Under 35

PhD in Applied Physics from Harvard

BS in Physics from MIT

JING NEALIS

Chief Financial Officer

view SUNPOWER

18 years of finance experience, including at public companies.

Previously worked at View, SunPower, Shunfeng, Suntech Power and Deloitte.

DR. HONG GAN

Chief Science Officer

BROOKHAVEN NATIONAL LABORATORY ENEVATE

25 years of battery R&D experience.

Key contribution in silicon-based Li-ion and Li-S technologies.

PhD in Chemistry from Uni. of Chicago and Postdoc from Uni. of Rochester.

DANIEL LI

Chief Manufacturing Officer

A123 SYSTEMS

15 years of experience working in the lithium-ion battery industry, including in senior roles at A123.

Rich experience and perspective in cell engineering, manufacturing, quality, management and operation.

DR. KANG XU

Chief Scientist

U.S.ARMY

MRS Fellow, ECS Fellow, emeritus ARL Fellow and one of the world leading researchers in electrolyte materials and interfacial science.

Published more than 350 papers in this field, with an h-index of 118, and has been recognized with many awards for the discovery of new electrolyte materials and understanding of the fundamental mechanisms.

DR. WINSTON WANG

SVP of Product Development

DJI

Managed battery R&D at DJI. Responsible for DJI's key drone smart battery and power systems launch.

PhD in Mechanical Engineering from the University of Hong Kong.

KYLE PILKINGTON

Chief Legal Officer

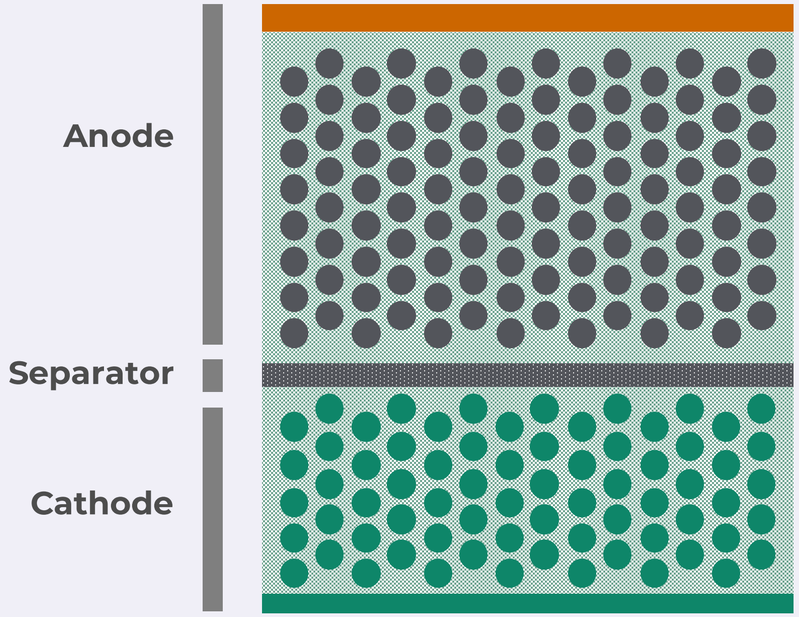
IGT SULLIVAN & CROMWELL

16 years of international legal experience, including in capital markets, securities law, corporate governance and M&A.

Previously worked at International Game Technology, Sullivan & Cromwell, Gibson Dunn and Baker McKenzie.

Why Li-Metal

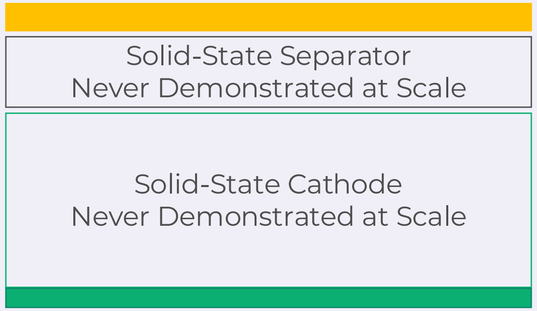
Conventional Li-ion



✗ Energy Density

✓ Manufacturability

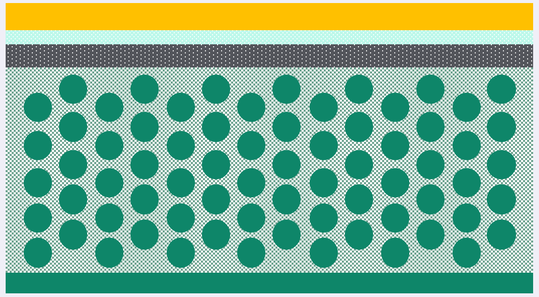
All-Solid-State **Li-Metal**



✓ Energy Density

✗ Manufacturability

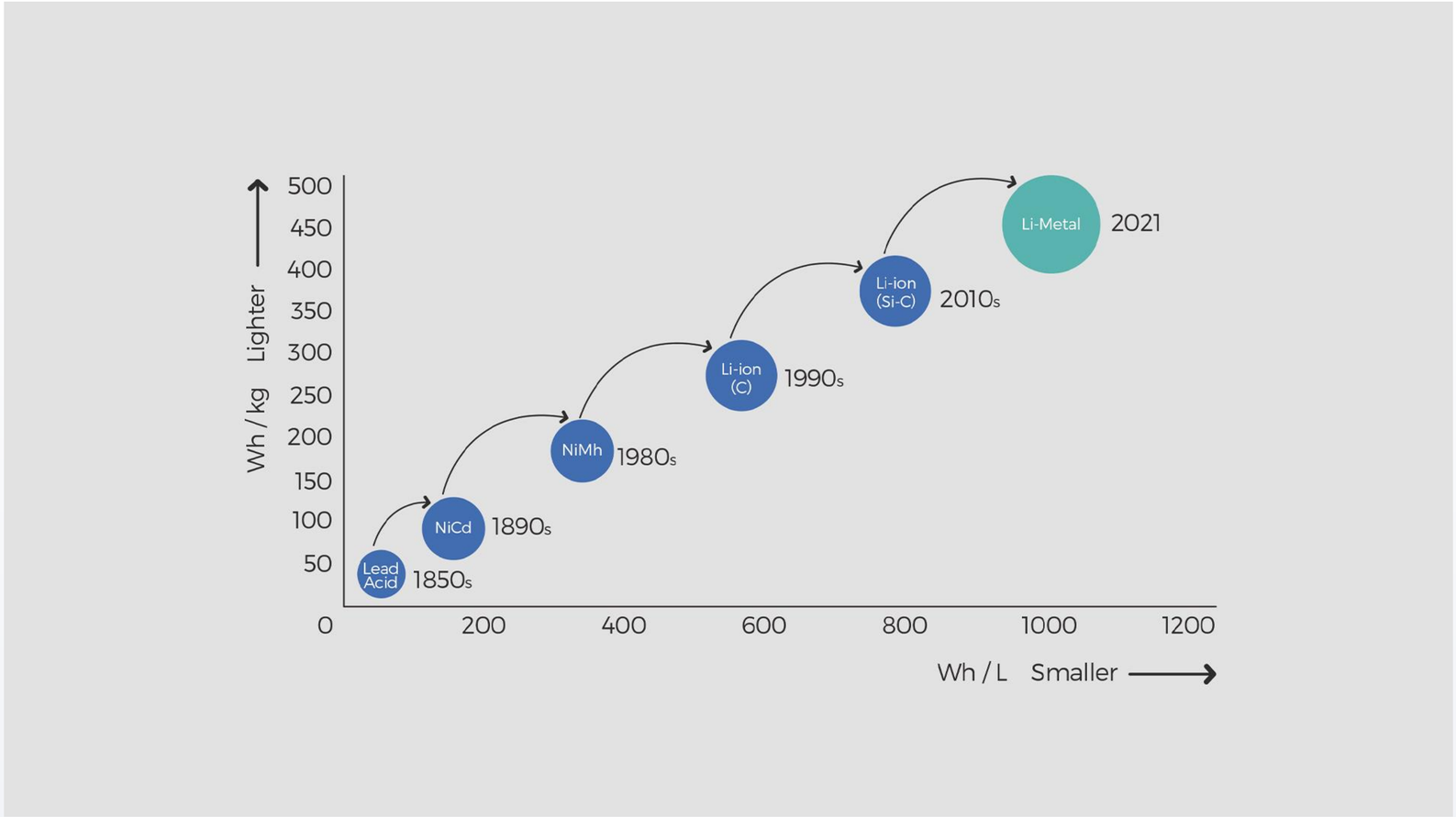
SES Li-Metal



✓ Energy Density

✓ Manufacturability

A step-change from Li-ion batteries



Transistor areal density: 2X every 18 months

Battery energy density: 2X every 30 years

Li-Metal batteries

DENSER
>400 Wh/kg and 1,000 Wh/L, providing longer range for EVs and eVTOLs

SCALABLE
Manufacturable at scale using existing Li-ion processes

LIGHTER
Ultra-thin Li-Metal anode reduces battery weight

SMARTER
AI-powered algorithm monitors battery health

Superior Technology, Safety and Manufacturability

UN38.3 & GB38031 (50Ah & 100Ah Cell)

UN38.3 试验概要

LITHIUM CELLS OR BATTERIES TEST SUMMARY
IN ACCORDANCE WITH SUB-SECTION 38.3
OF UN MANUAL OF TESTS AND CRITERIA

NO. CQCIT2206J0297

样品描述(Sample Description)：
电池名称(Cell/battery Name)：
可充电二次锂电池芯
Rechargeable lithium battery cell
质量(Mass)：
0.51kg
规格参数(Specification Parameter)：
■锂离子电池/电芯 3.82 V 47.4 Ah 181 Wh
□锂金属电池/电芯 ____ V ___ Ah ___ g
物理形状(Physical Description)：
袋装电池 Pouch Cell
型号(Model Numbers)：
37B0582

委托单位(Applicant)：
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Zhaoxian road 1581, Jiading district, Shanghai
021-59901136
victorsun@ses.ai
www.ses.ai

样品生产厂商(Sample Manufacturer)：
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SES AI(Shanghai) Co., Ltd
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Zhaoxian road 1581, Jiading district, Shanghai
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CQC Intime Testing Technology Co., Ltd.
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East Taihu Technology and Finance City, No.1368 Wuzhong Dadao Road, Wuzhong Economic Development Zone, Suzhou, Jiangsu.
0512-66303623 cqc_jszlb@126.com
http://www.cqc-it.com

样品测试信息(Sample Test Information)：
试验报告编号(Test Report Number)：
20220706J18449
试验报告签发日期(Date of Test Report)：
2022-09-06
所用《试验和标准手册》版本(Edition of UN Manual of Tests and Criteria Used)：
《关于危险货物运输的建议书 试验和标准手册》第七版修订 1 第 38.3 节
Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, ST/SG/AC.10/11/Rev.7/Amend.1/Section 38.3
所进行的试验及其结果(即：通过/未通过)一览表(List of Tests Conducted and Results(Pass/Fail))：

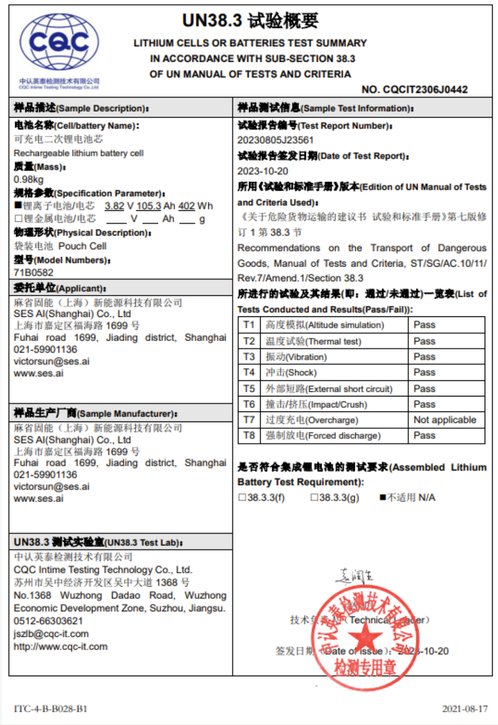
T1	高度模拟(Altitude simulation)	Pass
T2	温度试验(Thermal test)	Pass
T3	振动(Vibration)	Pass
T4	冲击(Shock)	Pass
T5	外部短路(External short circuit)	Pass
T6	撞击/挤压(Impact/Crush)	Pass
T7	过度充电(Overcharge)	Not applicable
T8	强制放电(Forced discharge)	Pass

是否符合集成锂电池的测试要求(Assembled Lithium Battery Test Requirement)：
□38.3.3(f) □38.3.3(g) ■不适用 N/A

技术负责人（Technical Controller）
签发日期（Date of issue）：2022-09-06
检测专用章

ITC-4-B-B028-B1 2021-08-17

50 Ah
UN 38.3: Passed



UN38.3 试验概要

LITHIUM CELLS OR BATTERIES TEST SUMMARY
IN ACCORDANCE WITH SUB-SECTION 38.3
OF UN MANUAL OF TESTS AND CRITERIA

NO. CQCIT2306J0442

样品描述(Sample Description)：
电池名称(Cell/battery Name)：
可充电二次锂电池芯
Rechargeable lithium battery cell
质量(Mass)：
0.98kg
规格参数(Specification Parameter)：
■锂离子电池/电芯 3.82 V 105.3 Ah 402 Wh
□锂金属电池/电芯 ____ V ___ Ah ___ g
物理形状(Physical Description)：
袋装电池 Pouch Cell
型号(Model Numbers)：
71B0582

委托单位(Applicant)：
麻省固能（上海）新能源科技有限公司
SES AI(Shanghai) Co., Ltd
上海市嘉定区福海路 1699 号
Fuhai road 1699, Jiading district, Shanghai
021-59901136
victorsun@ses.ai
www.ses.ai

样品生产厂商(Sample Manufacturer)：
麻省固能（上海）新能源科技有限公司
SES AI(Shanghai) Co., Ltd
上海市嘉定区福海路 1699 号
Fuhai road 1699, Jiading district, Shanghai
021-59901136
victorsun@ses.ai
www.ses.ai

UN38.3 测试实验室(UN38.3 Test Lab)：
中认英泰检测技术有限公司
CQC Intime Testing Technology Co., Ltd.
苏州市吴中经济开发区吴中大道 1368 号
No.1368 Wuzhong Dadao Road, Wuzhong Economic Development Zone, Suzhou, Jiangsu.
0512-66303621
jszlb@cqc-it.com
http://www.cqc-it.com

样品测试信息(Sample Test Information)：
试验报告编号(Test Report Number)：
20230805J23561
试验报告签发日期(Date of Test Report)：
2023-10-20
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T3	振动(Vibration)	Pass
T4	冲击(Shock)	Pass
T5	外部短路(External short circuit)	Pass
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T7	过度充电(Overcharge)	Not applicable
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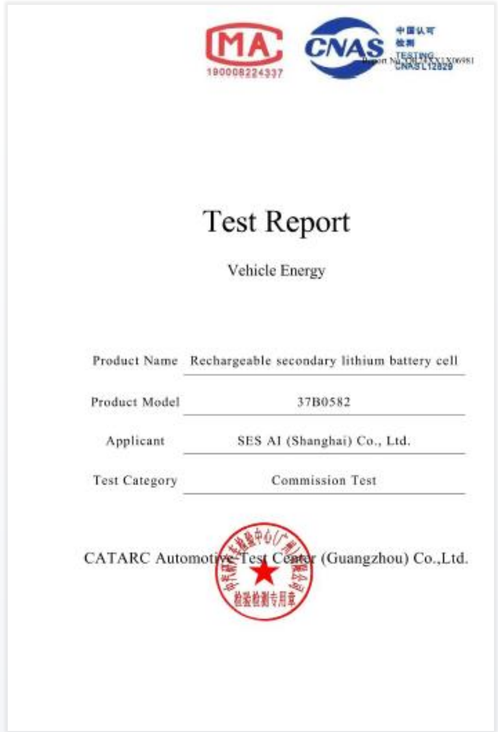
是否符合集成锂电池的测试要求(Assembled Lithium Battery Test Requirement)：
□38.3.3(f) □38.3.3(g) ■不适用 N/A

技术负责人（Technical Controller）
签发日期（Date of issue）：2023-10-20
检测专用章

ITC-4-B-B028-B1 2021-08-17

100 Ah
UN 38.3: Passed



MA 190008224337 CNAS 中国认可 检测 TESTING CNAS L12829

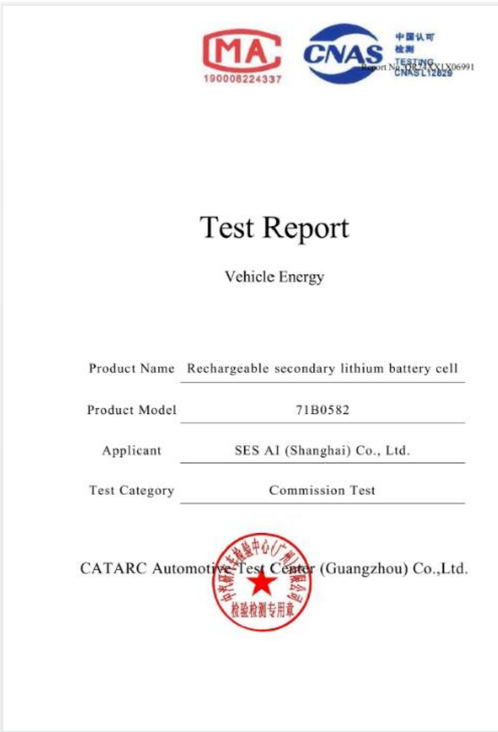
Test Report

Vehicle Energy

Product Name	Rechargeable secondary lithium battery cell
Product Model	37B0582
Applicant	SES AI (Shanghai) Co., Ltd.
Test Category	Commission Test

CATARC Automotive Test Center (Guangzhou) Co.,Ltd.
检验检测专用章

50 Ah
GB38031: Passed



MA 190008224337 CNAS 中国认可 检测 TESTING CNAS L12829

Test Report

Vehicle Energy

Product Name	Rechargeable secondary lithium battery cell
Product Model	71B0582
Applicant	SES AI (Shanghai) Co., Ltd.
Test Category	Commission Test

CATARC Automotive Test Center (Guangzhou) Co.,Ltd.
检验检测专用章

100 Ah
GB38031: Passed

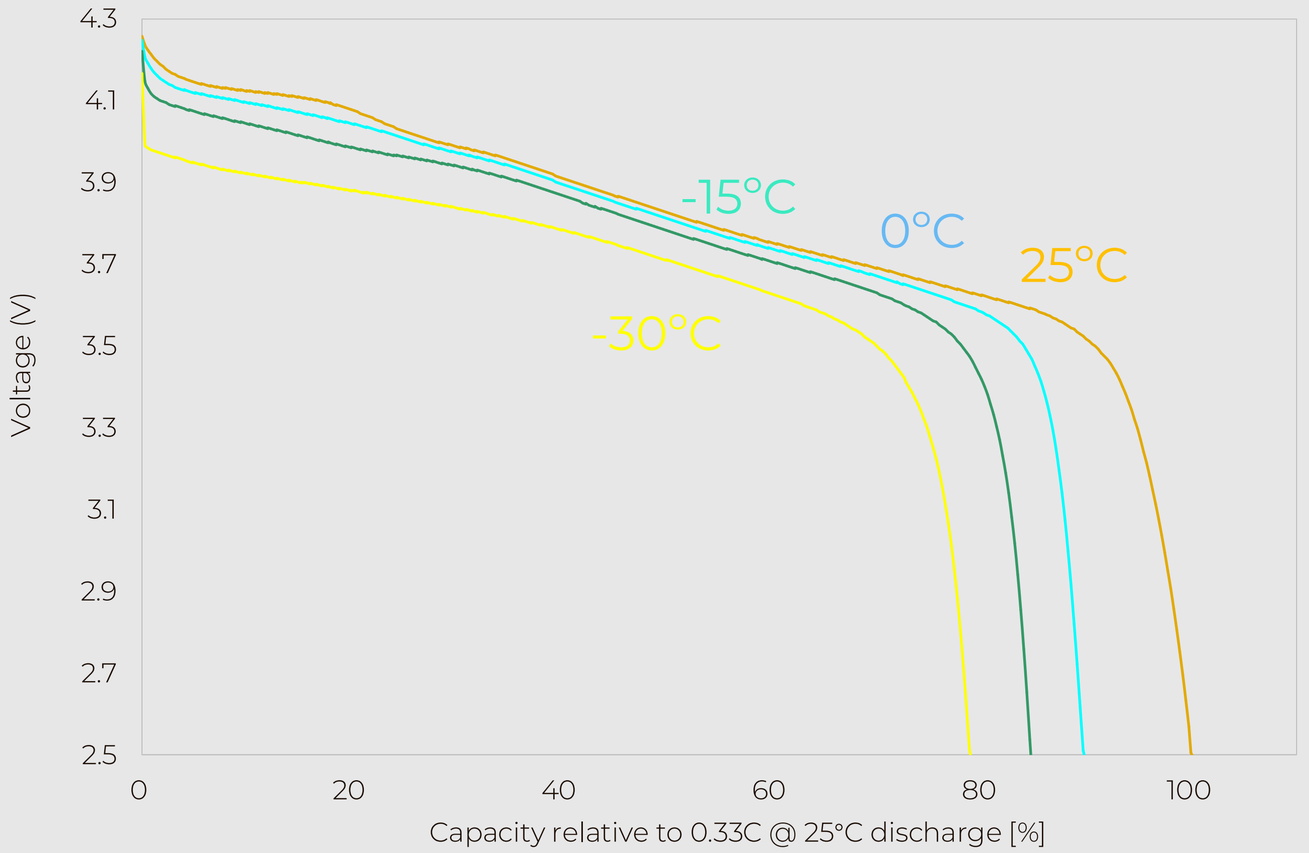
Cell Test Data Summary Table (4Ah vs. 33Ah vs. 100Ah)

	Cell Type	4.2Ah (25+ layer) at 25ºC Drone Design	33Ah (25+ layer) at 25ºC UAM Design	105.8Ah (32+ layer) at 25ºC EV Design
Room Temperature (25℃) Energy Density	Low power C/20	>375 Wh/Kg	> 391 Wh/Kg	> 399 Wh/Kg
	Low power C/10	375 Wh/Kg (= 700 Wh/L at SOC 0%)	391 Wh/Kg (= 742 Wh/L at SOC 30%)	399 Wh/Kg (= 862 Wh/L at SOC 30%)
	Medium power C/3	-	382 Wh/Kg	390 Wh/Kg (= 842 Wh/L)
	Medium power 1C	339 Wh/Kg	363 Wh/Kg	370 Wh/Kg
	High power 3C	-	344 Wh/Kg	351 Wh/Kg
	High power 5C	321 Wh/Kg	-	-
Low Temperature (0℃) Energy Density	Low power C/10	324 Wh/Kg	-	-
	Medium power C/3	-	334 Wh/Kg	346 Wh/Kg
	Medium power 1C	298 Wh/Kg	-	-
	High power 5C	282 Wh/Kg	-	-
Lifetime (Ch-Dch)	C/10 – C/3	600 cycles (80% retention)	440 cycles (80% retention)	>300 ongoing
	C/3 – C/3	300 cycles (80% retention)	> 220 cycles (80% retention)	>250 ongoing
	C/5 - 1C	700 cycles (80% retention)	> 520 cycles (80% retention)	-
	SES 30 protocol - C/3 charge - UAM protocol between SOC80 to SOC50	2000 ~2100 (80% retention)	1800 ~ 1900 (80% retention)	
	SES 50. 1 protocol - C/3 charge - UAM protocol between SOC100 to SOC50	800 ~ 900 (80% retention)	700 ~800 (80% retention)	
Fast Charging	Charge at 4C	80% in <15min	80 % in <15 min	-
Safety	Thermal	Electrolyte is stable with Li above Li melting point	PASS TEST	PASS TEST
	Nail Penetration	PASS TEST	PASS TEST	PASS TEST
	Overcharge	PASS TEST	PASS TEST	PASS TEST
	External Short Circuit	PASS TEST	PASS TEST	PASS TEST
Certification		UN38.3	UN38.3	UN38.3
Manufacturability		**(highly similar process to Li-ion)**		
Tested Operating Temperature		-30 °C to 60 °C	-30 °C to 60 °C	-10 °C to 45 °C

Low Temperature Performance (100Ah Cell)

Excellent performance in **cold weather**

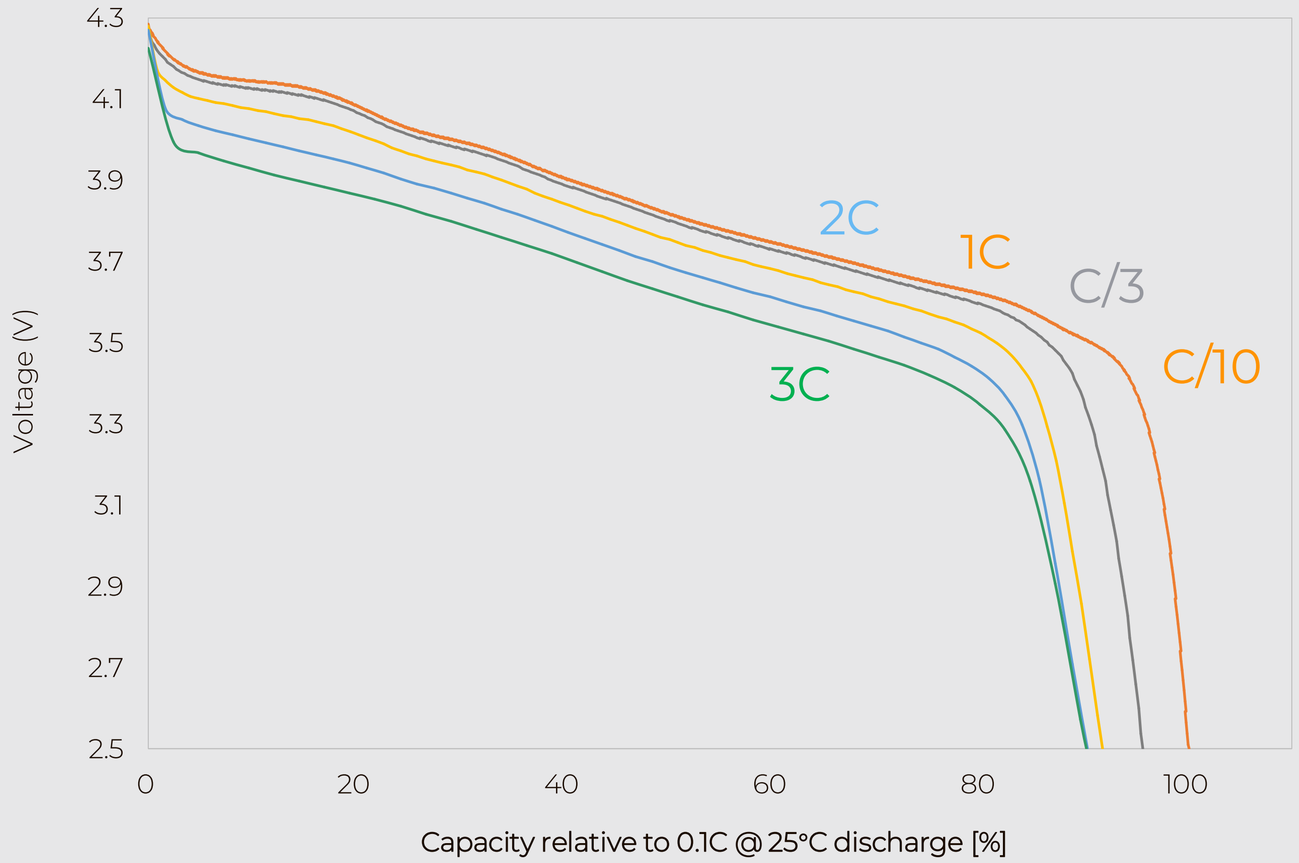
Retains 80% capacity (C/3 at 25°C) even at -30°C



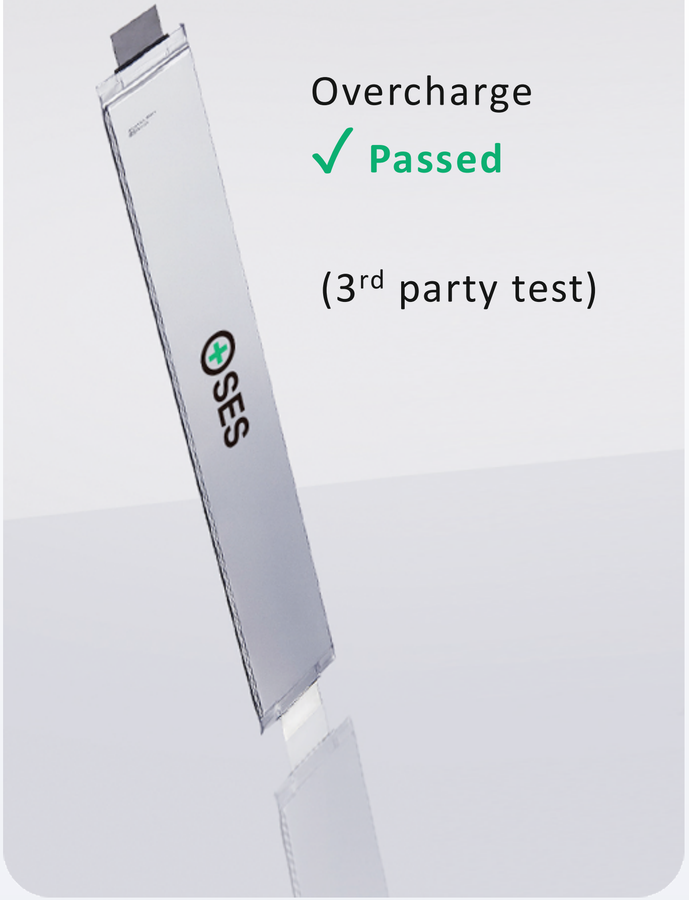
High Power Performance (100Ah Cell)

Excellent performance in **high power requirements**

Retains 90% capacity (C/3 at 25°C) even at 3C



Safety Performance (100Ah Cell)

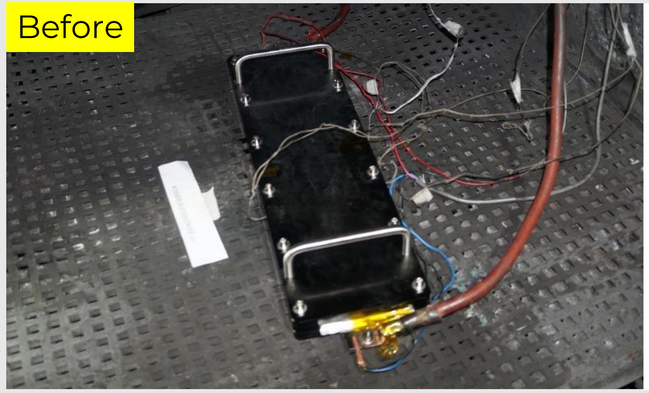


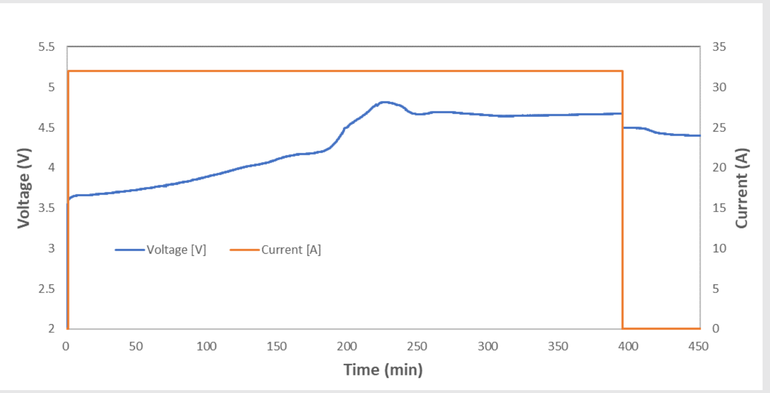
Overcharge

✓ **Passed**

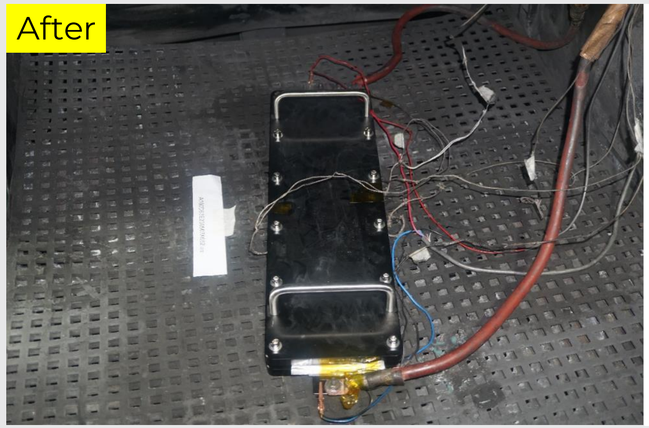
(3rd party test)

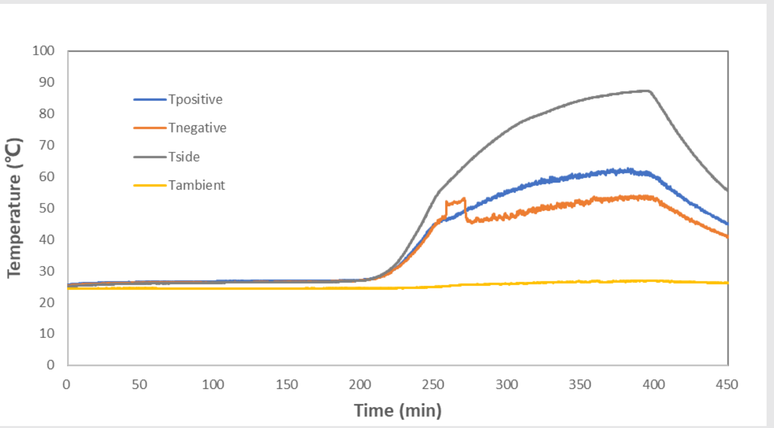
Before





After



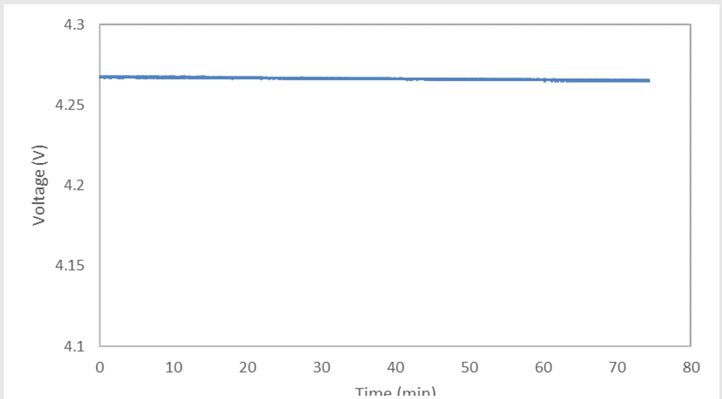


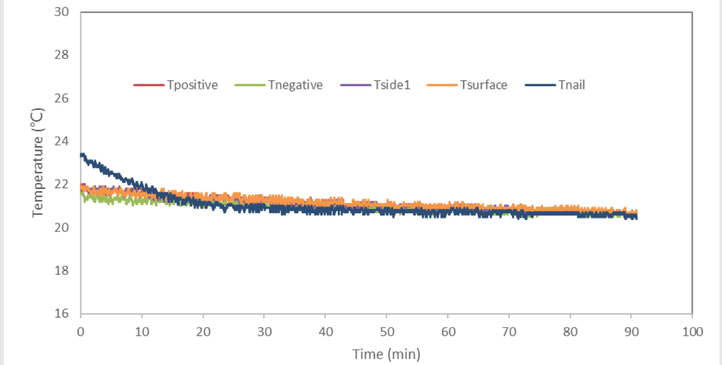
Safety Performance (100Ah Cell)

Nail Penetration

✓ Passed

(3rd party test)





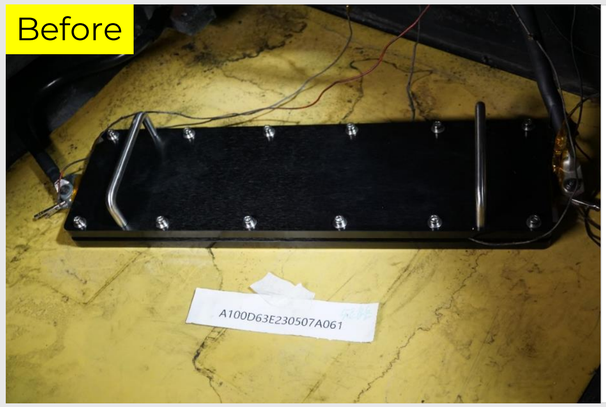
Safety Performance (100Ah Cell)

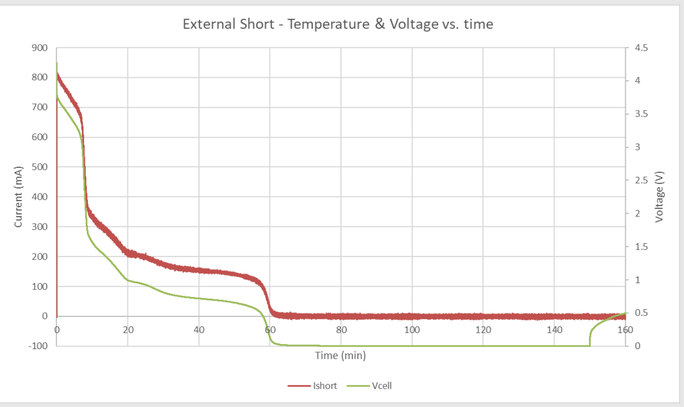
External
Short Circuit

✓ **Passed**

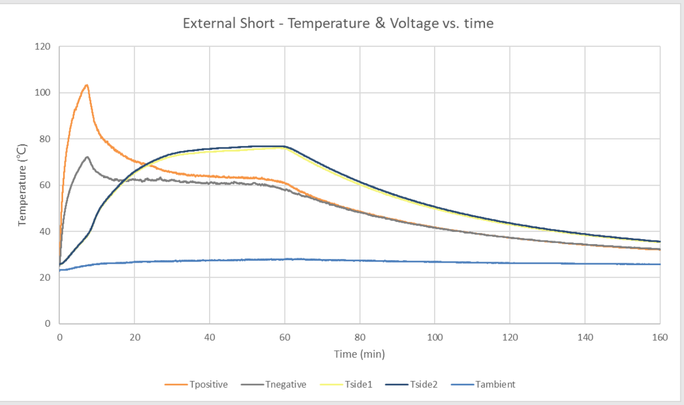
(3rd party test)

Before

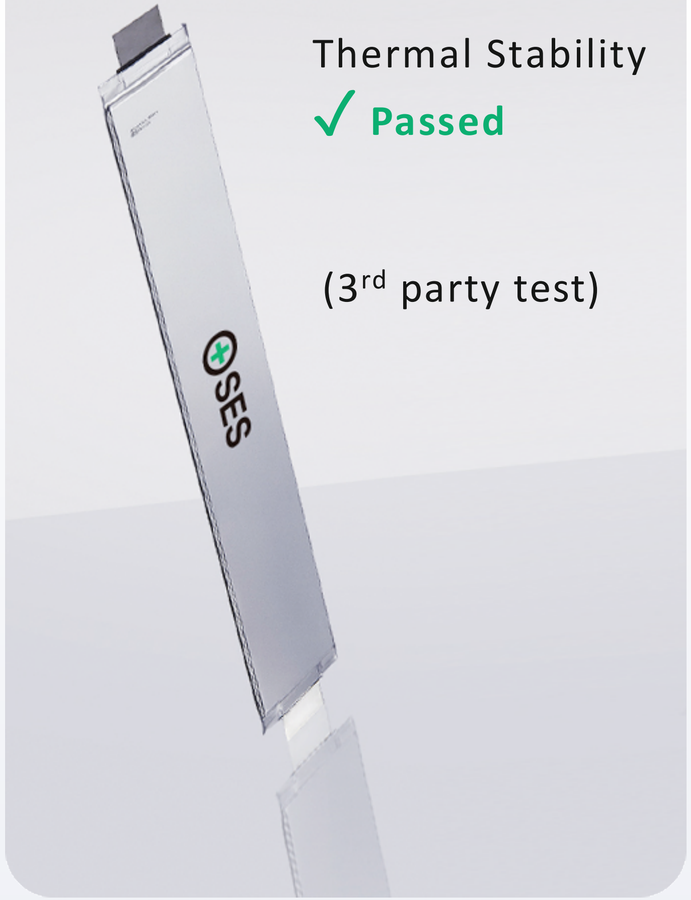




After



Safety Performance (100Ah Cell)

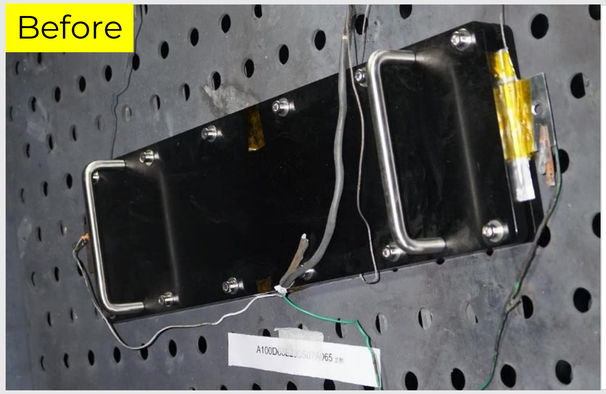


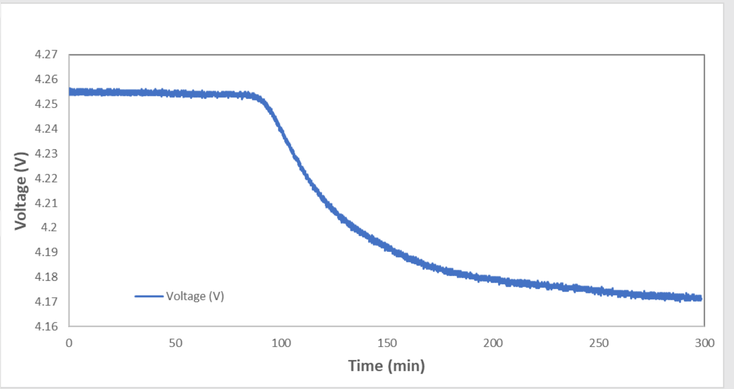
Thermal Stability

✓ **Passed**

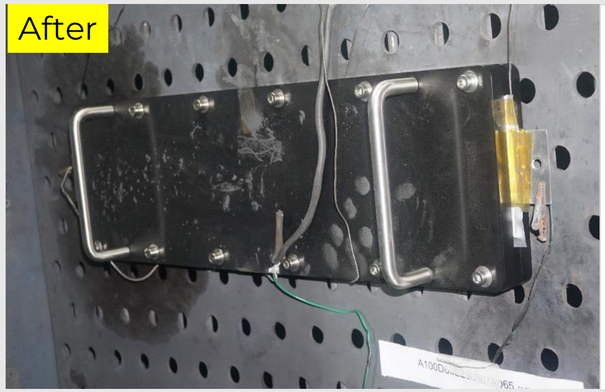
(3rd party test)

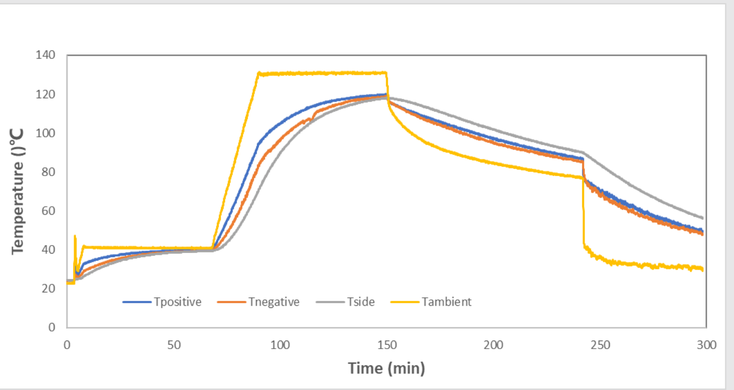
Before





After





Avatar: AI for Manufacturing + AI for Safety

Avatar: AI for Manufacturing + AI for Safety combined can lead to ~100% safety prediction

	2022	2023	**2024**
Cell manufacturing quantity	<1,000 per year	500-1,000 per month	**>1,000 per month per line**
Quality check points per cell	200	600	**1,500 (incl. imaging data)**
Avatar AI incident prediction accuracy	<60%	92%	**~100%**

Amount of training data:

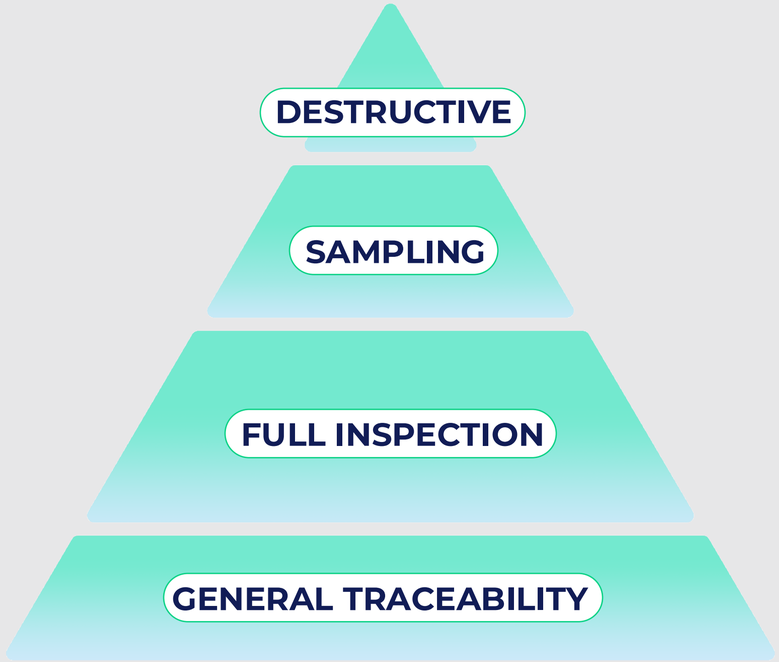
>15,000 Li-Metal cells

>3,000 Li-ion cells

Avatar: AI for Manufacturing + AI for Safety combined can lead to ~100% safety prediction

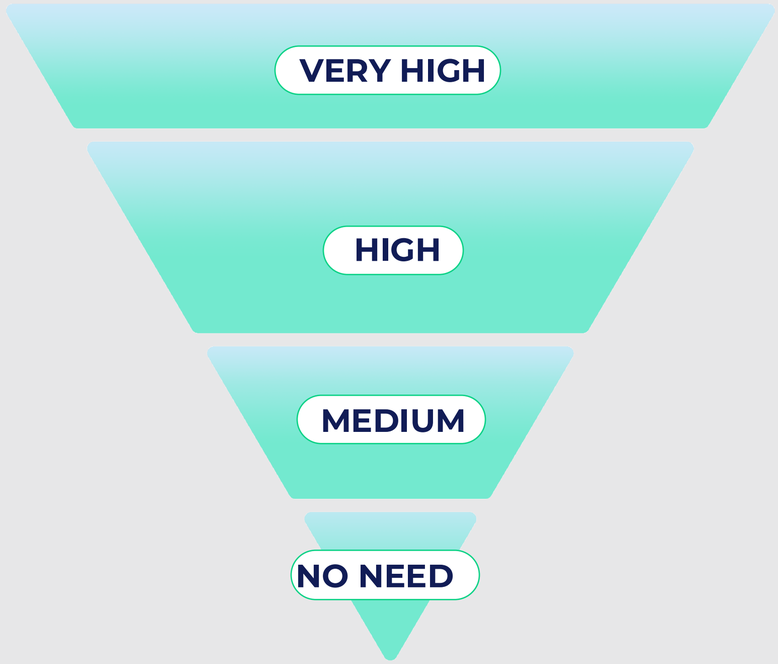
Traditional quality control

(type of detection vs. sample size)

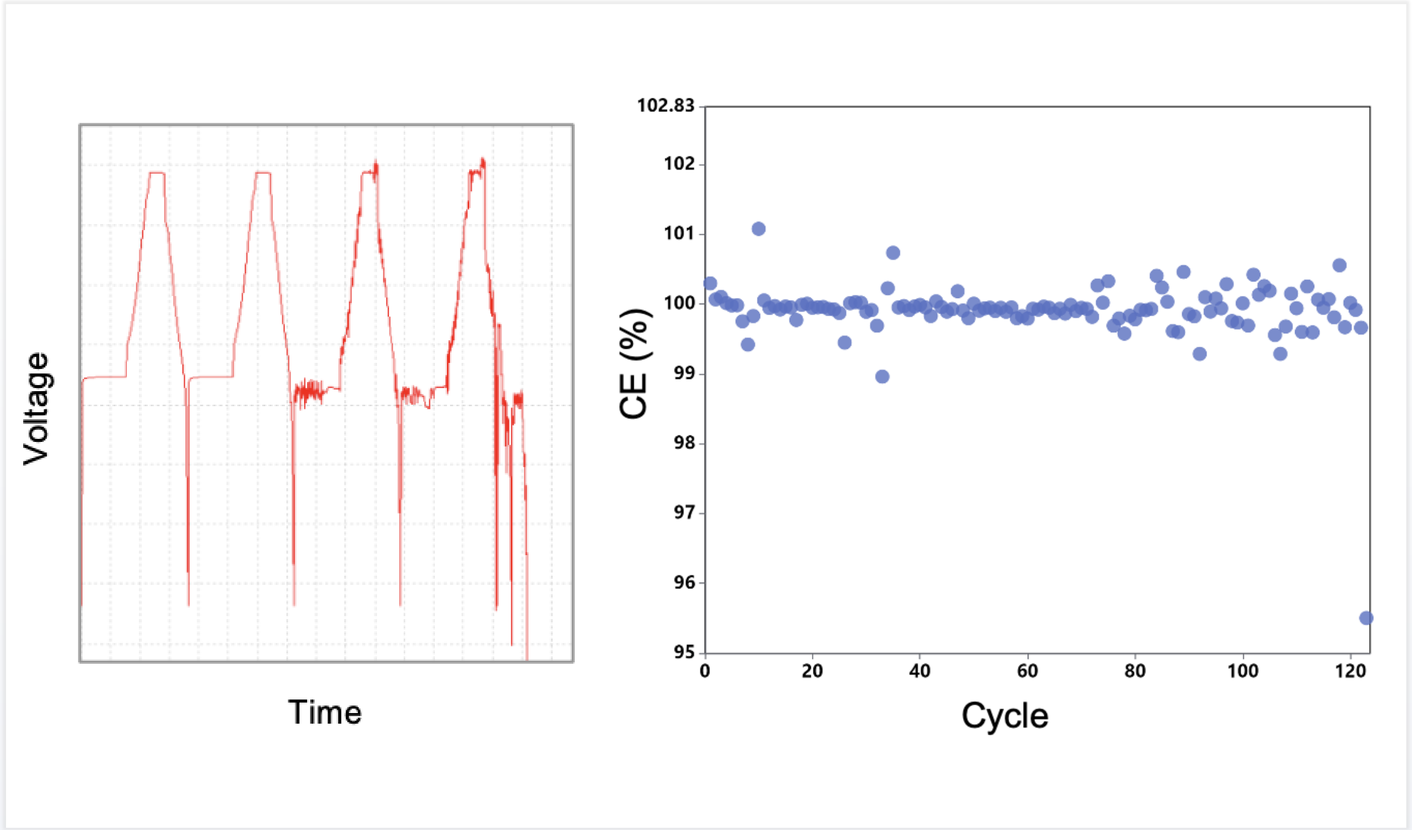


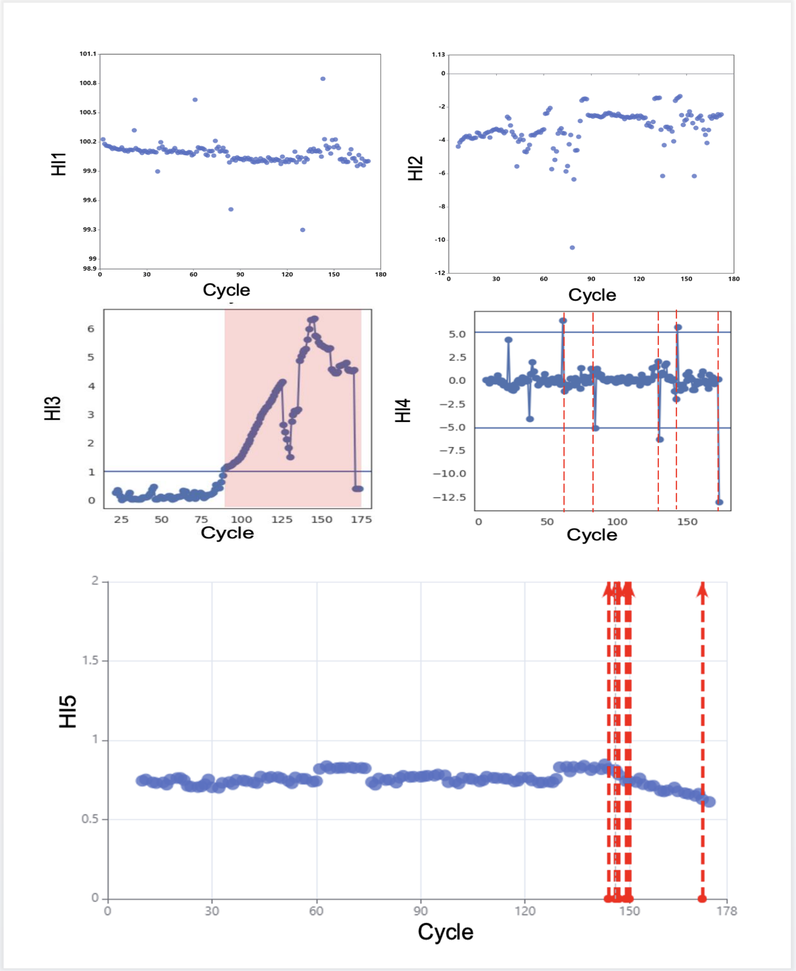
Effectiveness of AI

(need for AI prediction)

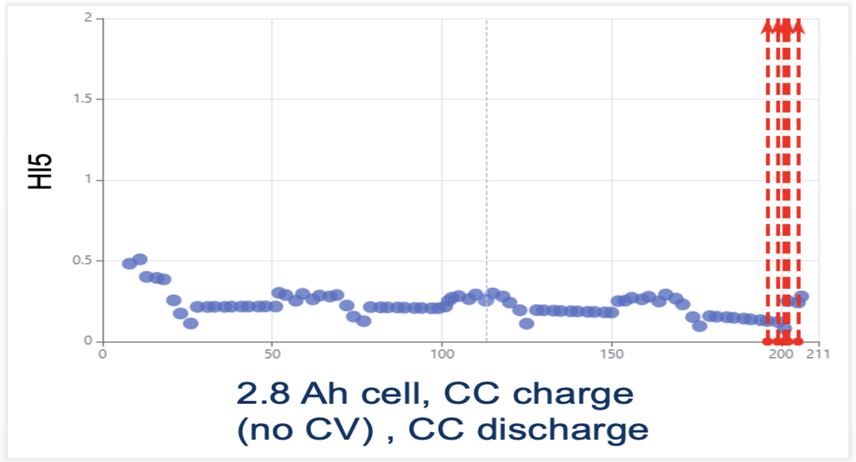


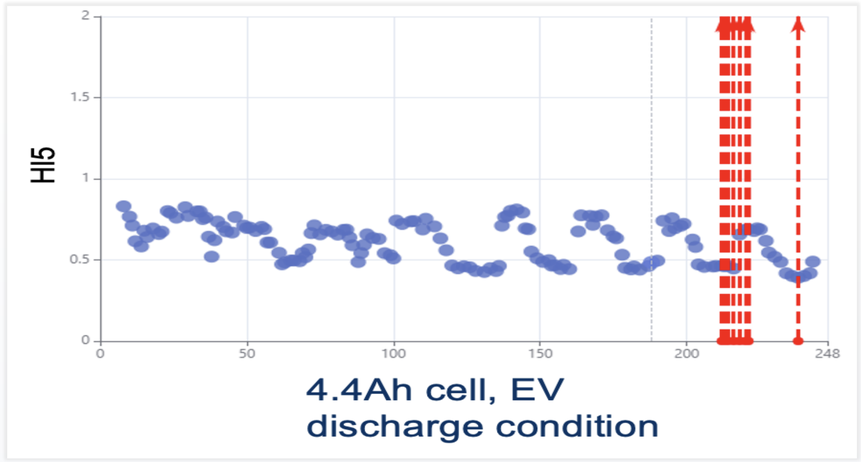
Avatar: AI for Safety (AI-based models are more accurate than physics-based models, one example)

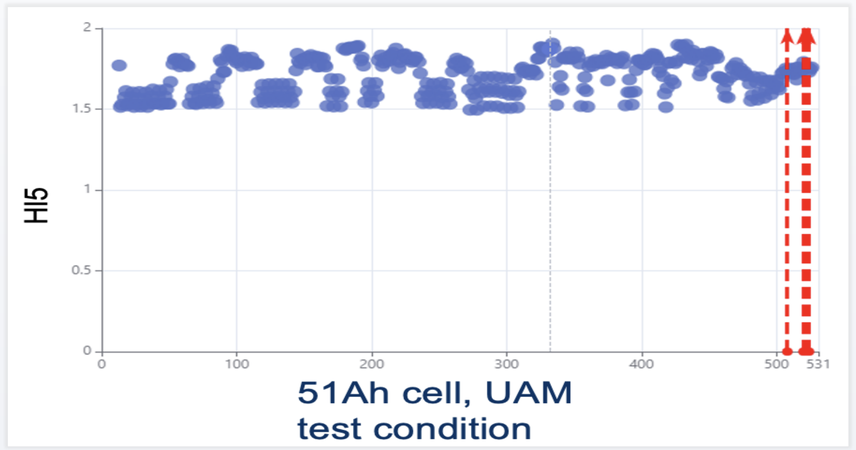


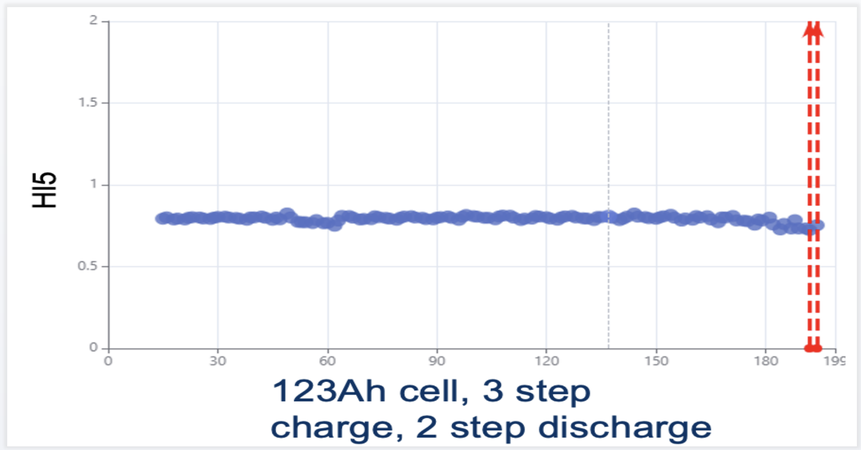


Avatar: AI for Safety (AI-based models are more accurate than physics-based models, more example)










SES
All-in on AI™