
QuantumScape®

Forward-Looking Statements

This presentation contains forward-looking statements within the meaning of the federal securities laws and information based on management's current expectations as of the date of this presentation. All statements other than statements of historical fact contained in this presentation, including statements regarding QuantumScape's future development of its battery technology, the business strategy, addressable market, anticipated benefits of its technologies, and performance of its batteries, plans and objectives for future operations and products are forward-looking statements. When used in this presentation, the words "may," "will," "estimate," "expect," "plan," "believe," "potential," "predict," "target," "should," "would," "could," "continue, "can," "project," "intend," the negative of such terms and other similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain such identifying words. These forward-looking statements are based on management's current expectations, assumptions, hopes, beliefs, intentions and strategies regarding future events and are based on currently available information as to the outcome and timing of future events.

These forward-looking statements involve significant risks and uncertainties that could cause the actual results to differ materially from the expected results. Many of these factors are outside QuantumScape's control and are difficult to predict. Factors that may cause such differences include, but are not limited to ones listed here. QuantumScape faces significant barriers in its attempts to produce a solid-state battery cell and may not be able to successfully develop its solid-state battery cell. Building high volumes of multilayer cells in commercially relevant area and with higher layer count requires substantial development effort. QuantumScape could encounter significant delays and/or technical challenges in replicating the performance seen in its single-layer and early multilayer cells, in achieving the high quality, consistency and throughput required for commercial production and sale, and in developing a cell architecture that meets all the technical requirements and be produced at low cost. QuantumScape has encountered delays and other obstacles in acquiring, installing and operating new manufacturing equipment for automated and/or continuous-flow processes, including vendor delays and other supply chain disruptions and challenges optimizing complex manufacturing processes. QuantumScape may encounter delays in hiring the engineers it needs to expand its development and production efforts, delays in building out QS-0, and delays caused by the COVID-19 pandemic. Delays in increasing production of engineering samples have slowed QuantumScape's development efforts. These or other sources of delay could delay our delivery of A-samples and B-samples. Delays or difficulties in meeting technical milestones could cause prospective customers and joint venture partners not to purchase cells from our pre-production line or not to proceed with a manufacturing joint venture. QuantumScape may be unable to adequately control the costs associated with its operations and the components necessary to build its solid-state battery cells at competitive prices. QuantumScape's spending may be higher than currently anticipated. QuantumScape may not be successful in competing in the battery market industry or establishing and maintaining confidence in its long-term business prospects among current and future partners and customers. QuantumScape is at an early stage of testing its battery technology for use in consumer electronics applications and may discover technical or other hurdles that impede its ability to serve that market. QuantumScape cautions that the foregoing list of factors is not exclusive. QuantumScape cautions readers not to place undue reliance upon any forward-looking statements, which speak only as of the date made.

This presentation contains projections with respect to QuantumScape, namely, forecasted estimates of cell-level energy and power density, active materials cost, and cost implications of inactive materials. Such projections constitute forward-looking information and is for illustrative purposes only and should not be relied upon as necessarily being indicative of or predictive of actual future results. The assumptions and estimates underlying such projections are inherently uncertain and are subject to a wide variety of significant business, economic, competitive and other risks and uncertainties that could cause actual results to differ materially from those contained in the projections. Actual results may differ materially from the results contemplated by the projections contained in this presentation, and the inclusion of such information in this presentation should not be regarded as a representation by any person that the results reflected in such projections will be achieved.

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Contact QuantumScape investor relations: ir@quantumscape.com

4 Key Premises Behind the QuantumScape Opportunity

- **Combustion powertrains are being replaced by battery-electric powertrains**
  BEV share of global light vehicle market grew from ~3% in 2020 to ~10% in 2022*

- **Anode-free lithium-metal technology can offer compelling benefits over conventional lithium-ion batteries**
  QuantumScape has shown an architecture with the potential for greater energy density, and published data showing the ability to charge 10–80% in 15 minutes with a noncombustible separator

- **QuantumScape can scale up layer count while maintaining cycling performance**
  QuantumScape has successfully scaled up single-layer lab cells to multilayer prototype cells without significant degradation to cycling performance (capacity retention)

- **QuantumScape can scale up production to industrial levels**
  Consolidated QS-0 production line under development

*Source: Wall Street Journal, 2023

QuantumScape by the Numbers

$2B+ of Capital Investment
$500M+ spent on development to date

12 Years of R&D Investment

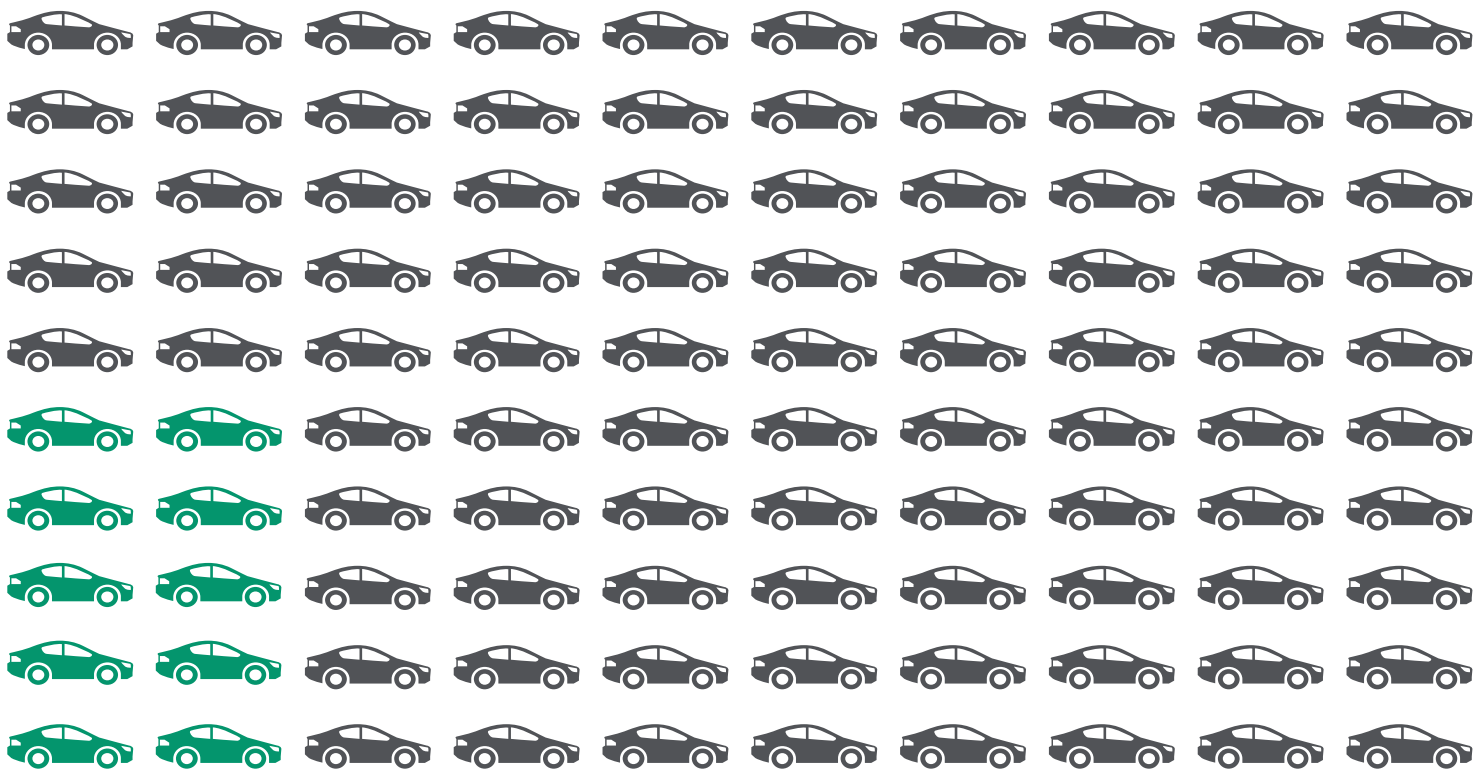
800+ Employees
World-class next-gen battery development team

300+ Patents and Patent Applications
Materials, use and process

6 Commercial Agreements with Automotive OEMs

Deep Partnership with Volkswagen Group
Strategic investor, JV partner and board representation

EVs Currently ~10% of Global Light Vehicle Market*



*Source: Wall Street Journal, 2023

Customer Requirements for Mass-Market Adoption

Energy / Capacity
>300-mile range

Fast Charging
10-80% charge in <15 min

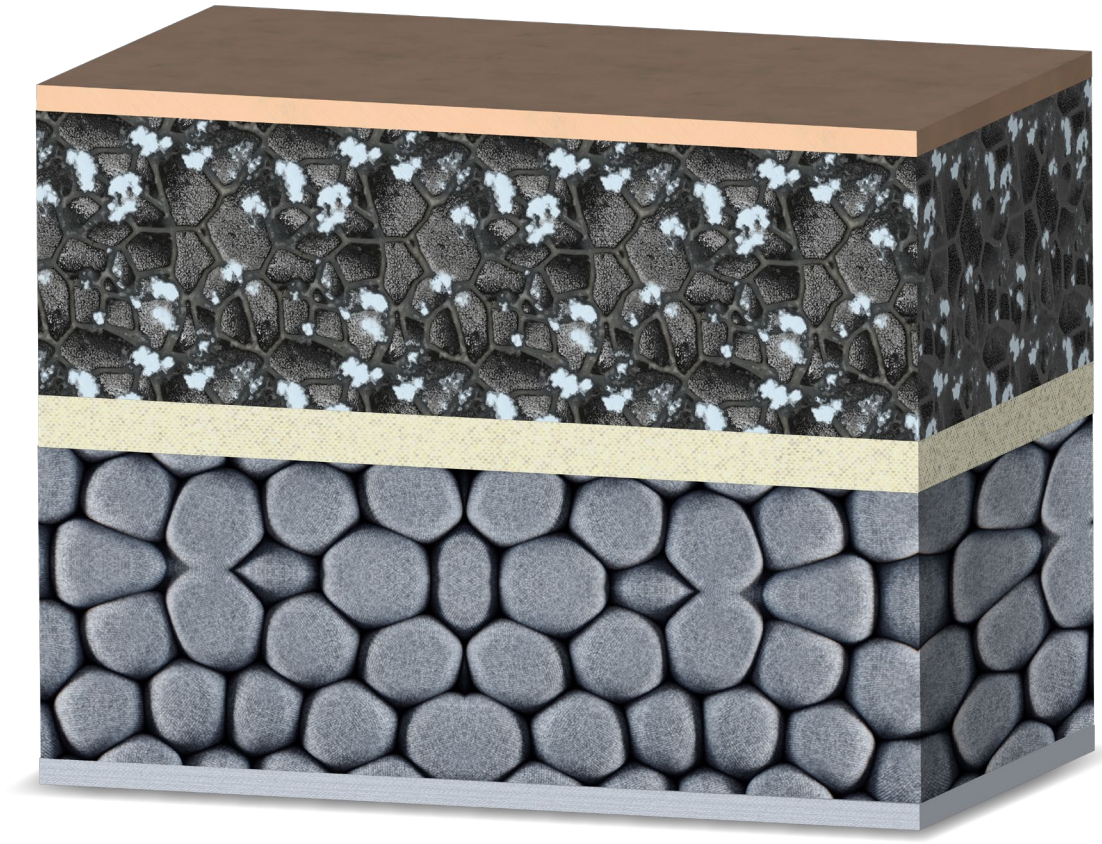
Safety
Solid, non-oxidizable separator

Battery Cycle Life
>12 years, >150,000 miles

Cost
< $30,000, 300-mile EVs

Conventional Lithium-Ion Battery Architecture

Hosted anode: graphite / silicon



Anode Current Collector

Graphite / Silicon Anode

Liquid Electrolyte

Porous Separator

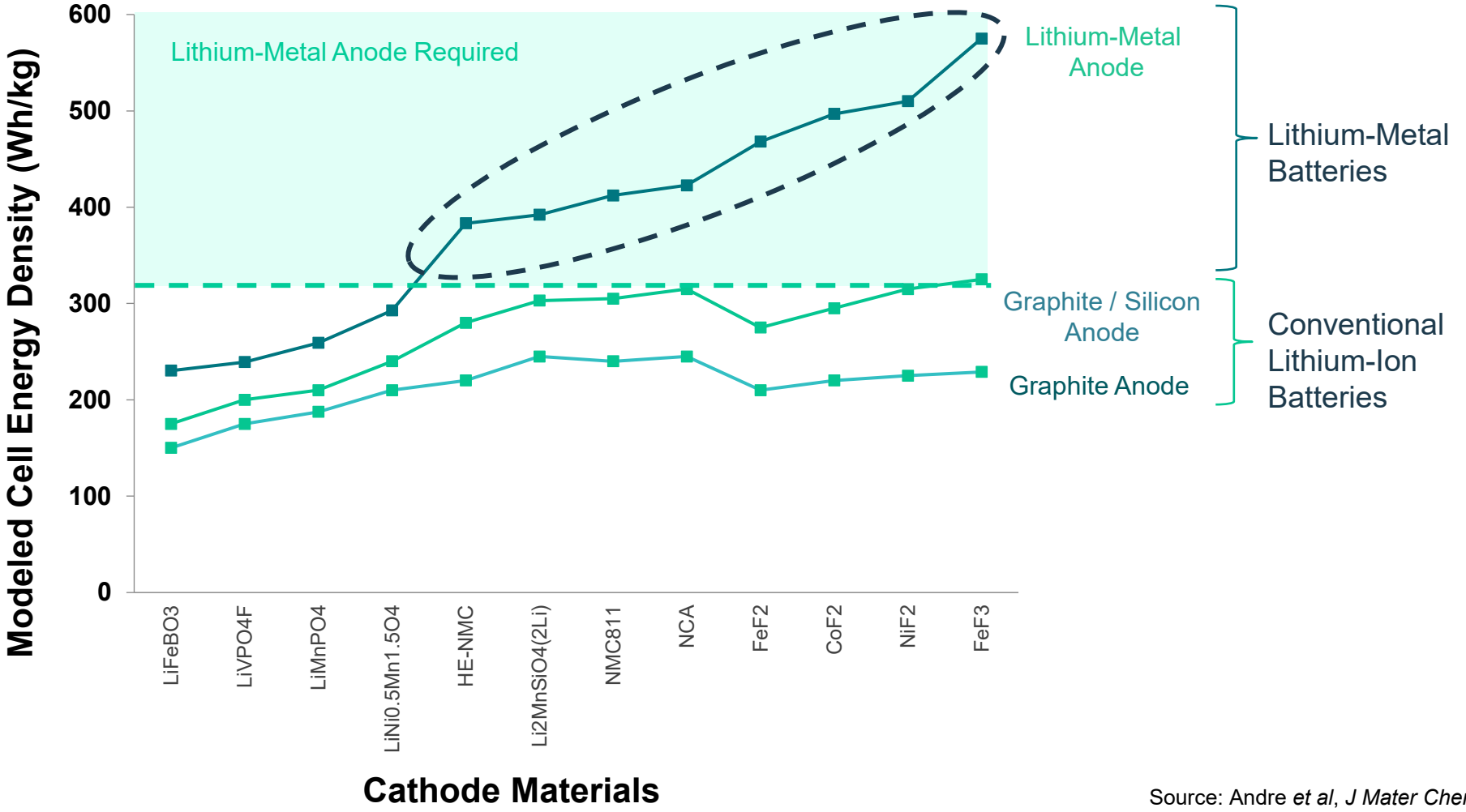
Cathode Active Material

Liquid Electrolyte

Cathode Current Collector

Lithium-Metal Anode is Required for High Energy Density

And lithium-metal anode requires a solid-state separator



Key Takeaways

Lithium-metal anode necessary to achieve high energy density

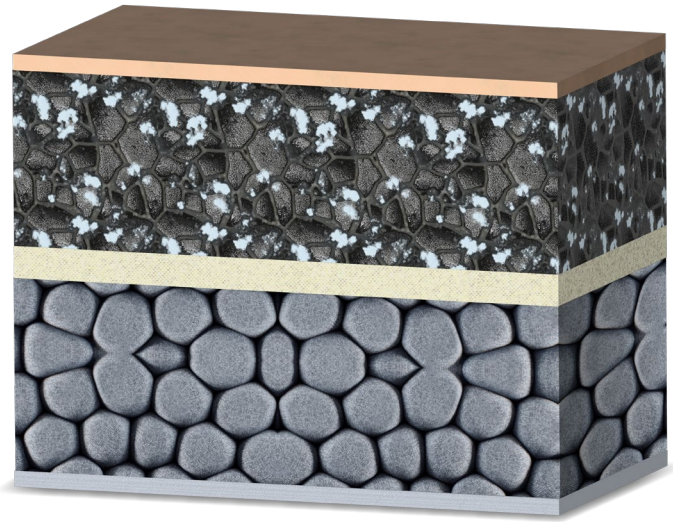
Lithium metal cannot be used without a solid-state separator

Source: Andre *et al*, *J Mater Chem A*. (2015) 6709
Note: Modeled cell specific energy is based on traditional cell designs and architectures

QuantumScape Anode-free Architecture

Improved energy density, fast charging and safety

Conventional Li-ion Battery



Anode Current Collector

Graphite / Silicon Anode

Liquid Electrolyte

Porous Separator

Cathode Active Material

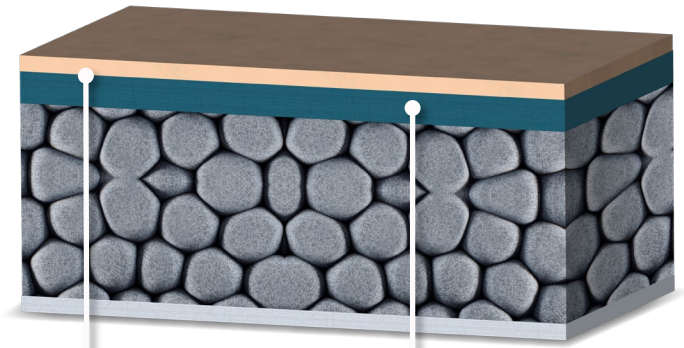
Liquid Electrolyte

Cathode Current Collector

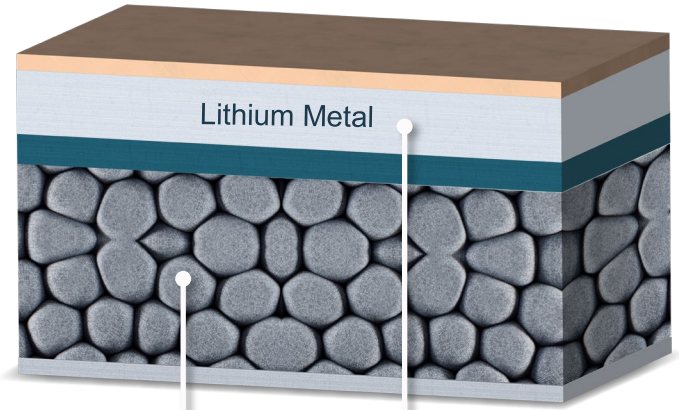
QuantumScape Solid-State Battery

Discharged

(as manufactured)



Charged



Anode-free Manufacturing

Anode-free cell design with lithium plated during charge cycles

Solid-State Separator

Ceramic electrolyte with high dendrite resistance

Cathode Agnostic

Compatible with conventional and advanced cathode materials

Lithium-Metal Anode

High-rate cycling of a lithium-metal anode

Lithium-metal architecture can address multiple requirements

Energy	Significantly increases volumetric and gravimetric energy density by eliminating graphite/silicon anode host material
Fast Charge	Enables <15-minute fast charge (10-80%) by eliminating lithium diffusion bottleneck in anode host material
Safety	Eliminates organic separator. Solid-state separator is nonflammable and noncombustible
Cycle Life	Improves cycle life by reducing capacity loss at anode interface
Cost	Eliminates anode host material and related manufacturing costs

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Previous Attempts Have Been Unsuccessful

		Lithium-Metal Anode				
		Organics			Inorganics	
Separator / Electrolyte Requirements		Liquids	Gels	Polymers	Sulfides	Oxides
1	Conductivity *Fast charge*	✓	✓	X	✓	✓
2	Separator-Anode ASR *Power, temperature*	X	X	X	✓	X
3	Low (lithium metal) and high-voltage stability *Power, temperature, cycle life*	X	X	X	X	✓
4	Dendrite resistance *Power, temperature, cycle life*	X	X	X	X	X

Separator also must be thin and continuously processed at low cost over large area

Other Separators May Compromise Test Conditions to Perform

	Compromise	Impact
Revert to Hosted Anode	Reversion to Carbon / Silicon Anode or Excess Lithium	Low Energy
Compromised Test Conditions or Performance	Low Current Density while Charging • <3 mA/cm^2 or <1C-rate	Slow Charge
	Low Cycle Life • <800 cycles	Shorter Battery Life
	Limited Temperature Range • >30 °C	Cost Complexity
	High Pressure • >5 atm	Energy Density Cost

Challenge: The “AND” Requirements Test

Historically, solid-state batteries haven’t been able to meet all simultaneously

No single accepted standard test since batteries have different requirements and operating conditions are so varied

For EV market, a good start is a ***simultaneous*** test of:

Can be combined as current density

Charging Rate
- At least 1C-rate, >3 mA/cm^2
- <~40 min 10-80% SOC

Cathode Loading
- ≥3 mAh/cm^2
- High active-to-inactive material ratio

Operating Temperature
- ≤30 °C
- Doesn’t require power source to heat up

Cycle Life
- 800 cycles
- Equivalent to 240,000 miles for 300-mile range car

Anode Excess Material
- Anode-free
- High energy density; reduced transformation cost

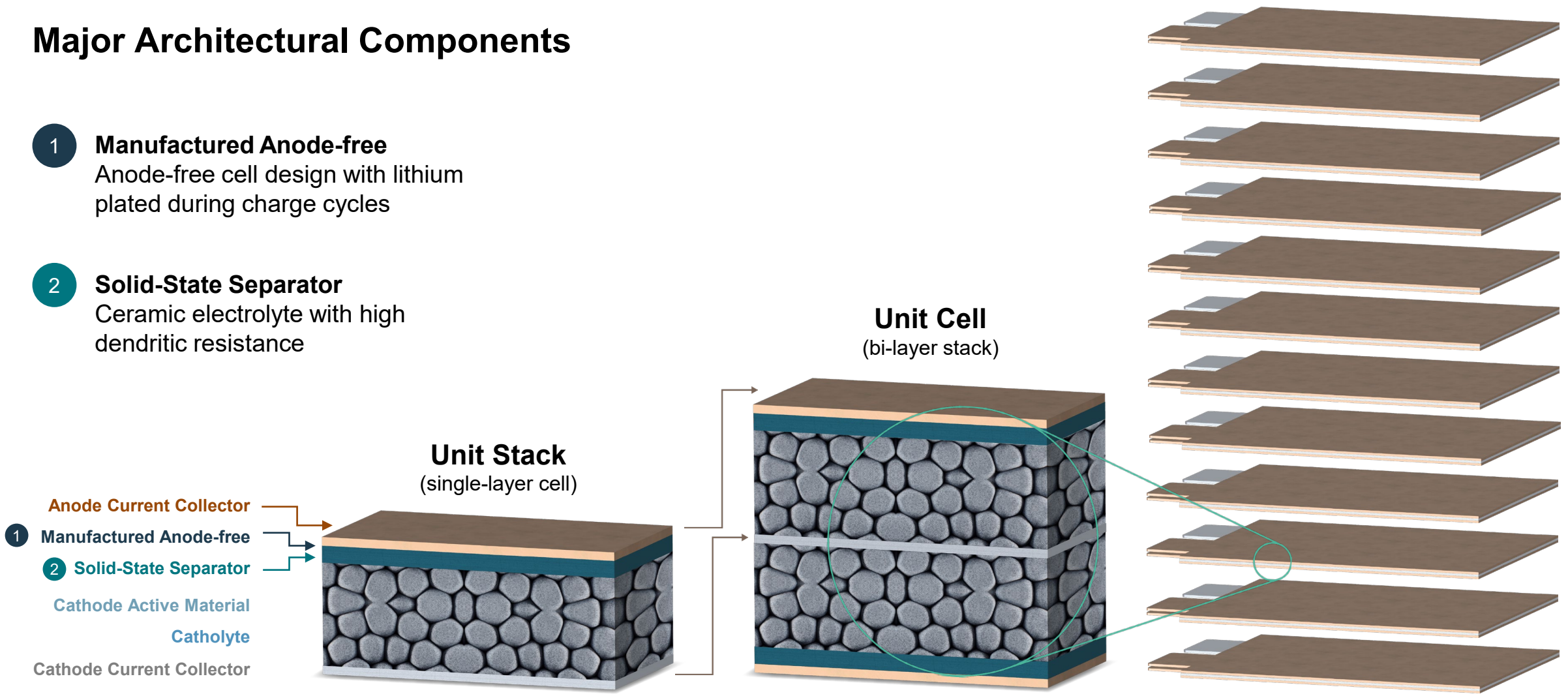
Pressure
- <5 atm
- No bulky or complicated mechanical system

Multilayer Progress

Major Architectural Components

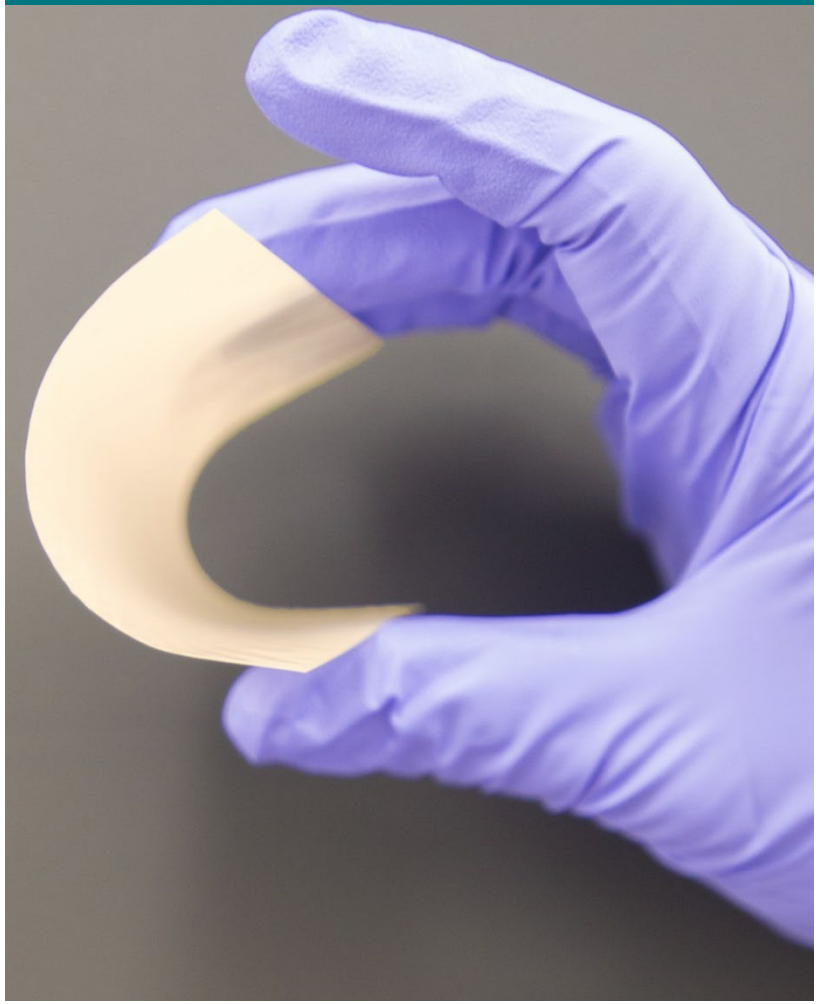
1 **Manufactured Anode-free**
Anode-free cell design with lithium plated during charge cycles

2 **Solid-State Separator**
Ceramic electrolyte with high dendritic resistance



QuantumScape Material & Cell

CERAMIC SOLID-STATE SEPARATOR



SINGLE-LAYER CELL

MULTILAYER CELL PROTOTYPE

Note: The area of a single-layer cell ranges from 60x75 mm to 70x85 mm, roughly the area of a playing card. A multilayer cell prototype is roughly the size of a deck of playing cards.

The *Gold Standard* Test*

Captures key requirements <u>simultaneously</u> under what we believe are uncompromised test conditions

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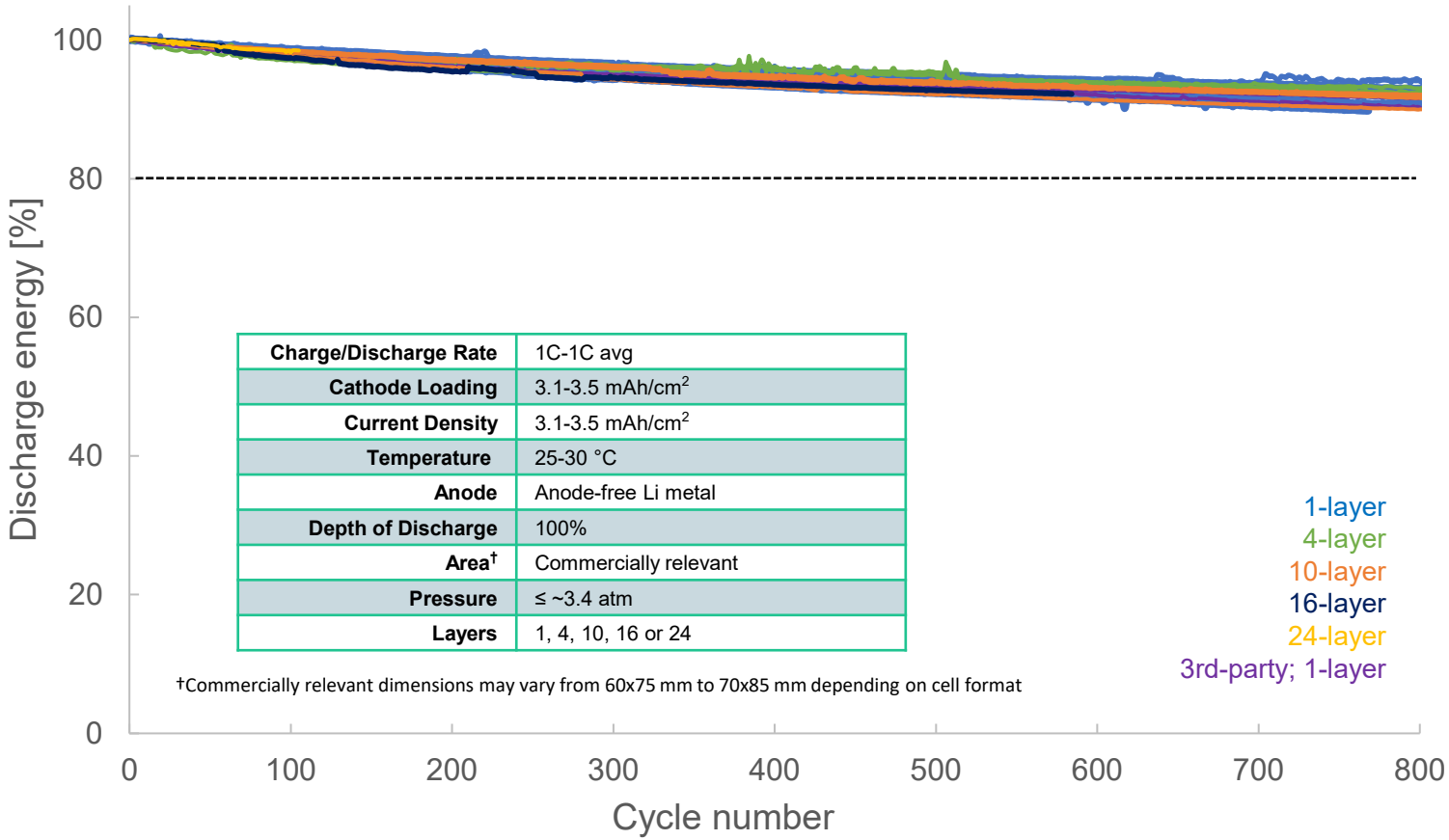
4-,10-,16-, 24-Layer Capacity Retention Mirrors Single-Layer Cycling Performance

Cycle Energy Retention vs Cycle Count

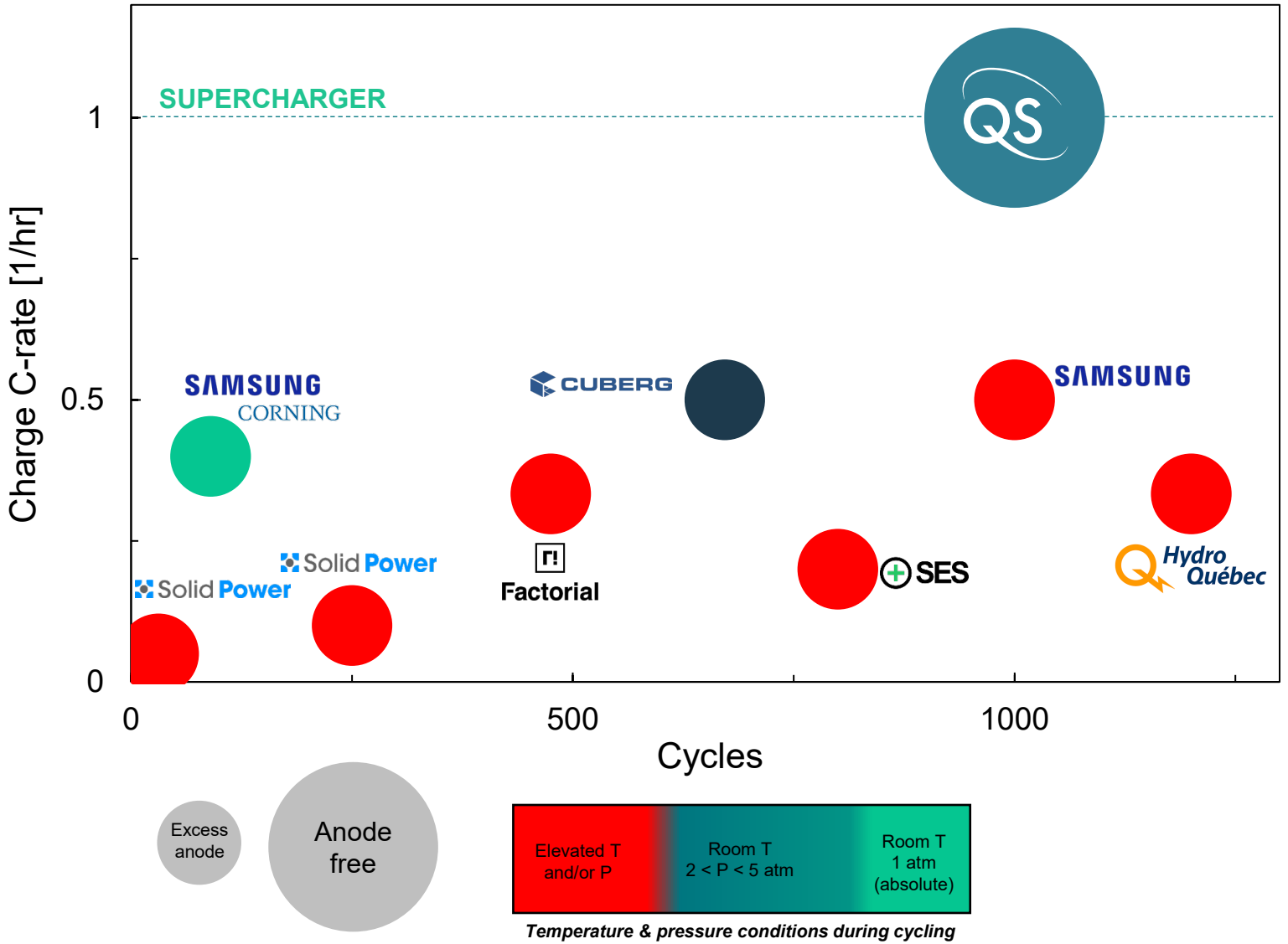


Charge/Discharge Rate	1C-1C avg
Cathode Loading	3.1-3.5 mAh/cm^2
Current Density	3.1-3.5 mAh/cm^2
Temperature	25-30 °C
Anode	Anode-free Li metal
Depth of Discharge	100%
Area†	Commercially relevant
Pressure	≤ ~3.4 atm
Layers	1, 4, 10, 16 or 24

†Commercially relevant dimensions may vary from 60x75 mm to 70x85 mm depending on cell format

*Our *gold-standard* test conditions include: average charge/discharge rates of 1C or faster, temperatures of 25 °C, 100% depth of discharge, and externally applied pressure of no more than ~3.4 atmospheres, all simultaneously.

Summary of Published Results with Lithium-Metal Anodes



Compromised Test Conditions

Low Charging Current Density
Slower than supercharger

Excess Lithium
Low energy density

Low Cycle Life
< 800 cycles

Limited Temperature Range
Elevated only

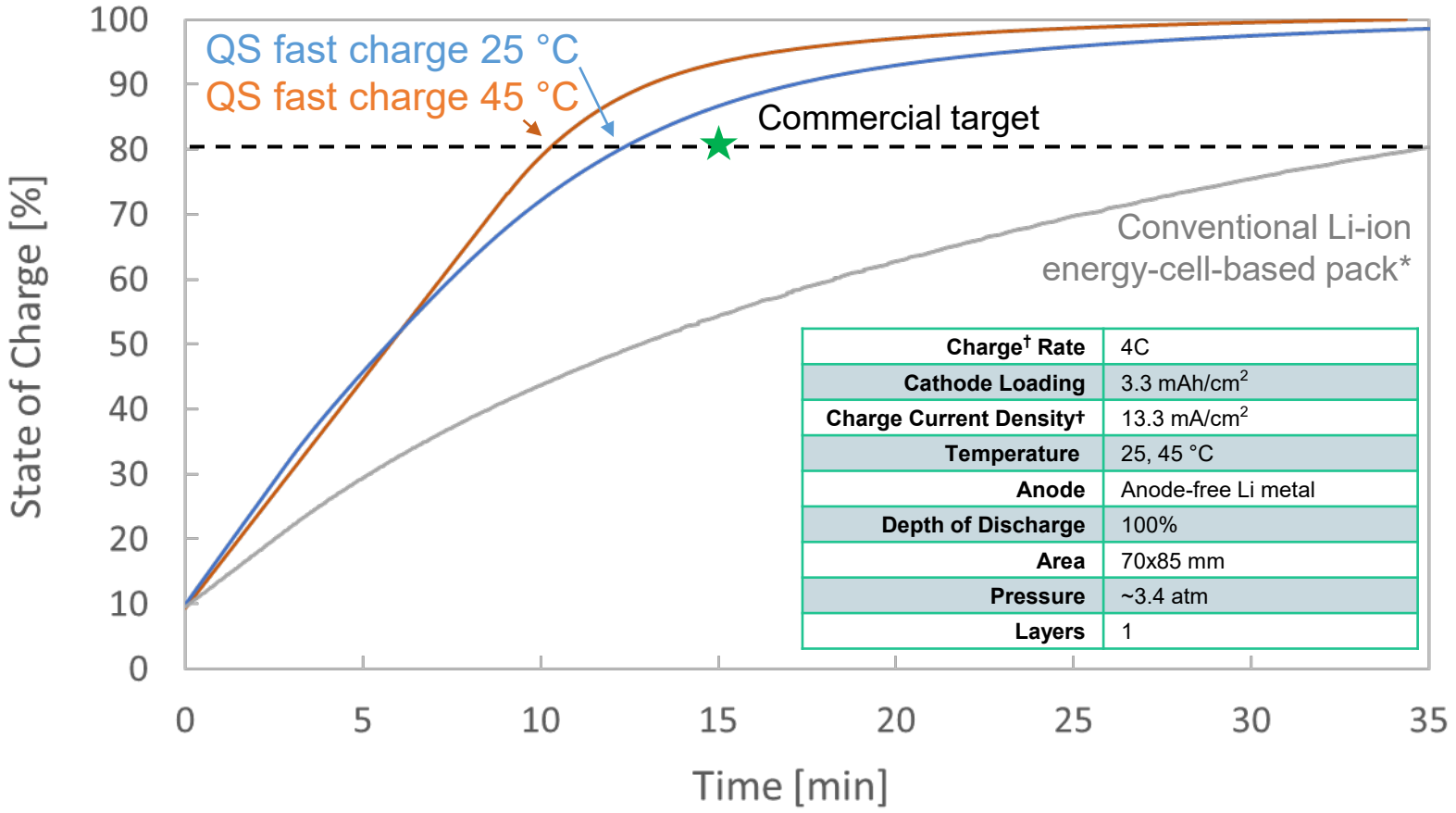
High Pressure
Above 5 atm

The data presented above is made as of March 31, 2023, and is based on information that we have been able to obtain, infer or derive from publicly disclosed materials. This information will likely change over time and we do not make any representations as to the accuracy/completeness of the competitive data presented, nor any claims about the actual performance of competitors' cells. We do not undertake any obligation to update this chart to reflect events or circumstances after the date they were made, whether as a result of new information, except as may be required under applicable laws.

Fast Charging

10-80% charge in
<15 minutes

Fast Charging Results



Charge† Rate	4C
Cathode Loading	3.3 mAh/cm^2
Charge Current Density†	13.3 mA/cm^2
Temperature	25, 45 °C
Anode	Anode-free Li metal
Depth of Discharge	100%
Area	70x85 mm
Pressure	~3.4 atm
Layers	1

*Source: cleantechnica.com

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Repeated Fast Charging

>80% energy retained after >400 consecutive fast charging cycles

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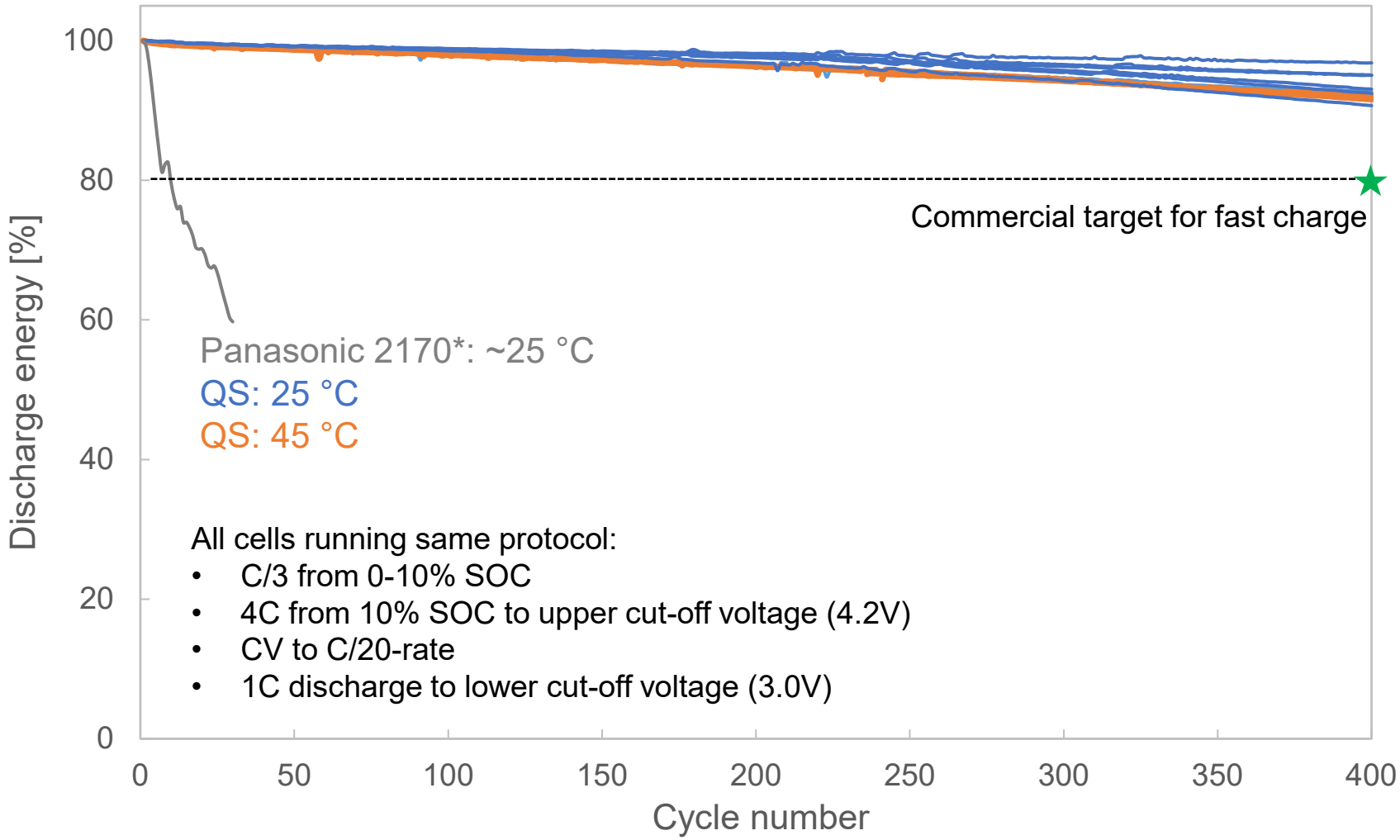
Repeated Fast Charging



*From QS testing of cylindrical Panasonic 2170 cell; provided for illustrative purposes only and should not be relied upon as necessarily being indicative or representative of actual performance of all lithium-ion energy cells from such third-party's product line or of automotive lithium-ion energy cells in general.

1 atm Cycling

- >800 cycles
- >80% energy retained
- Ø externally applied pressure

Consumer Electronics

Batteries with low to zero externally applied pressure can operate without bulky or heavy pressure-applying components – an advantage for consumer electronics applications that typically prioritize compact and lightweight battery systems for portable devices.

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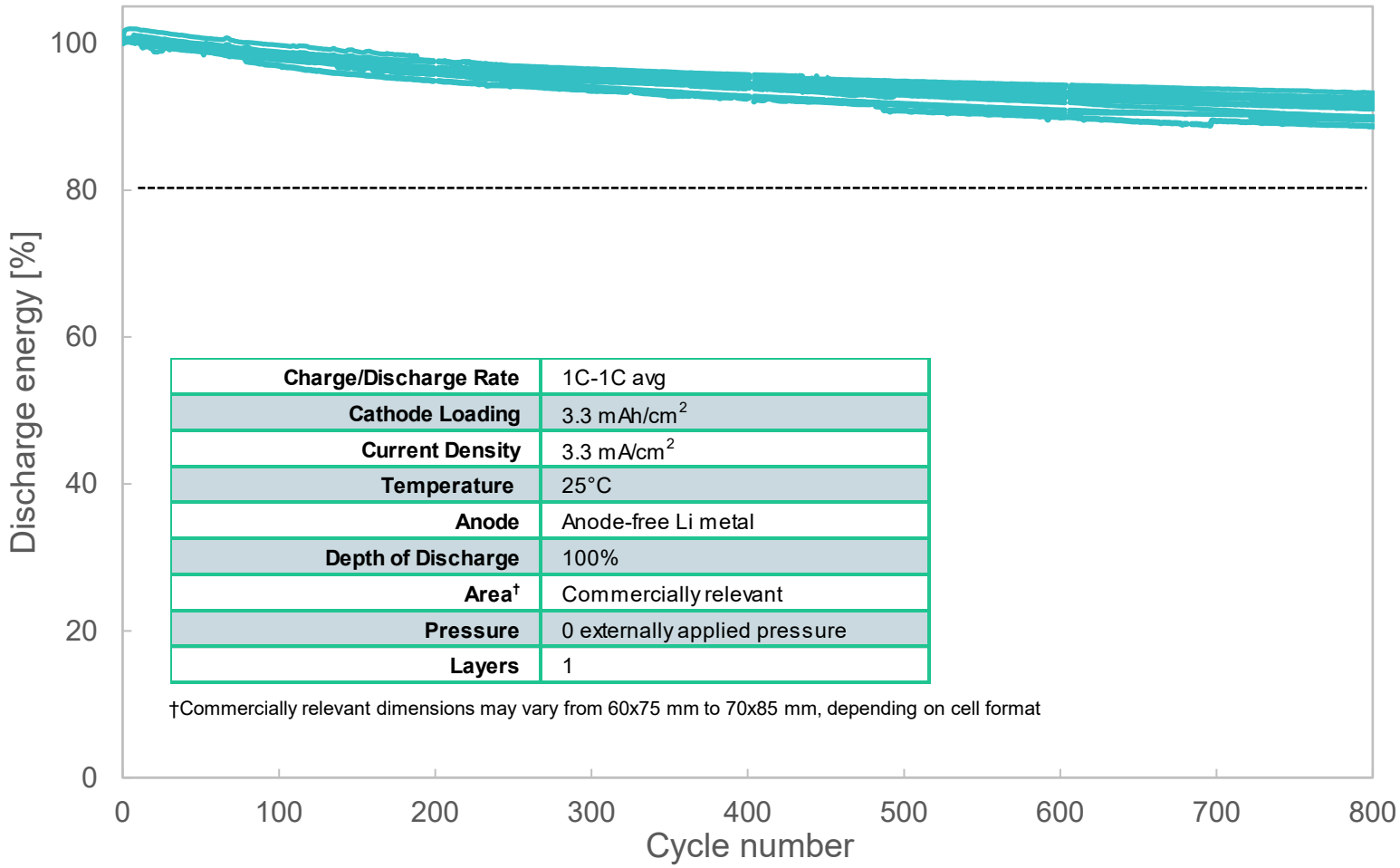
Cycling Without Externally Applied Pressure

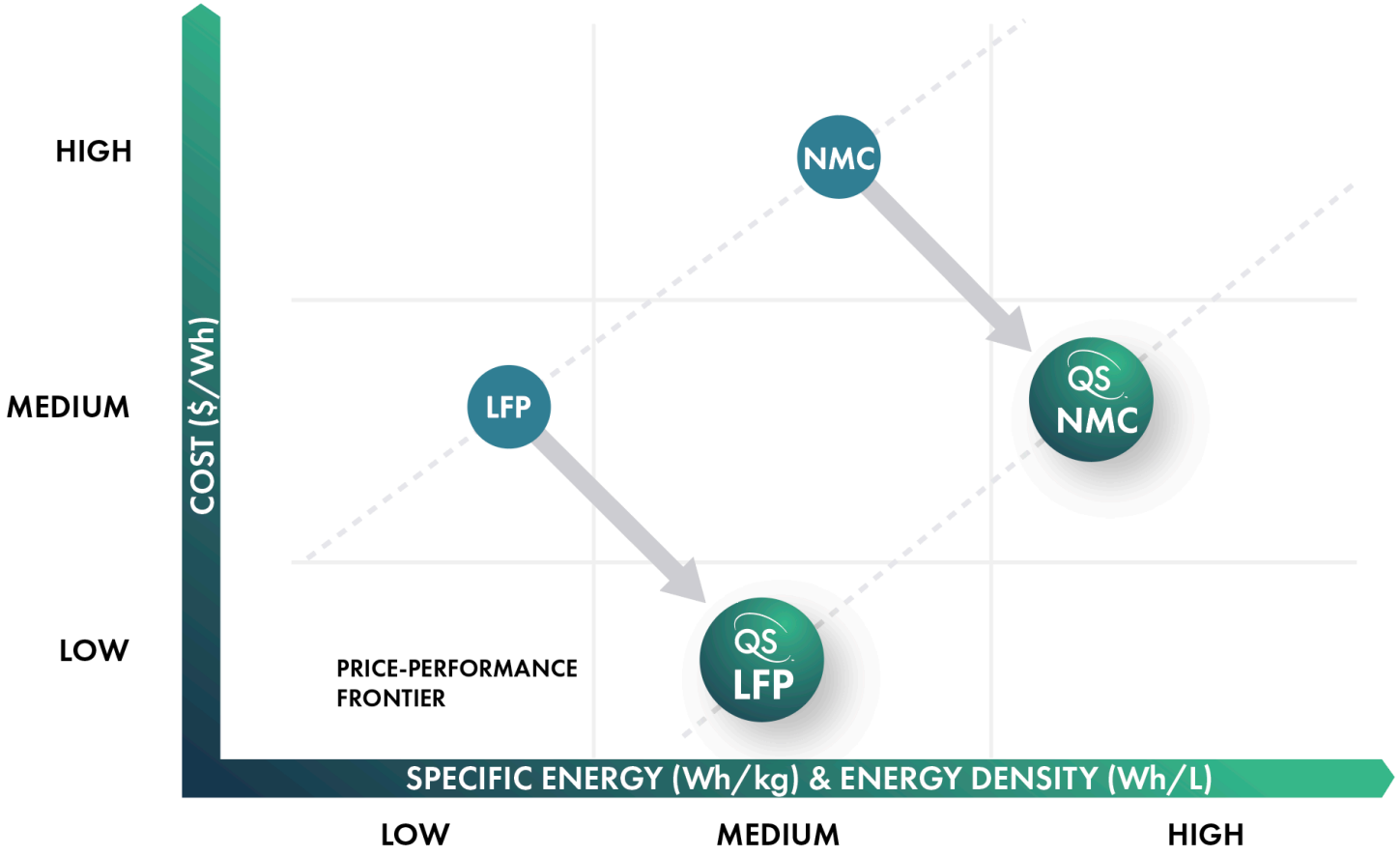


Charge/Discharge Rate	1C-1C avg
Cathode Loading	3.3 mAh/cm^2
Current Density	3.3 mA/cm^2
Temperature	25°C
Anode	Anode-free Li metal
Depth of Discharge	100%
Area†	Commercially relevant
Pressure	0 externally applied pressure
Layers	1

†Commercially relevant dimensions may vary from 60x75 mm to 70x85 mm, depending on cell format

Shifting the Price-Performance Frontier

Lithium-metal batteries can shift EV price-performance frontier to lower cost and higher energy density



Based on QuantumScape internal analysis

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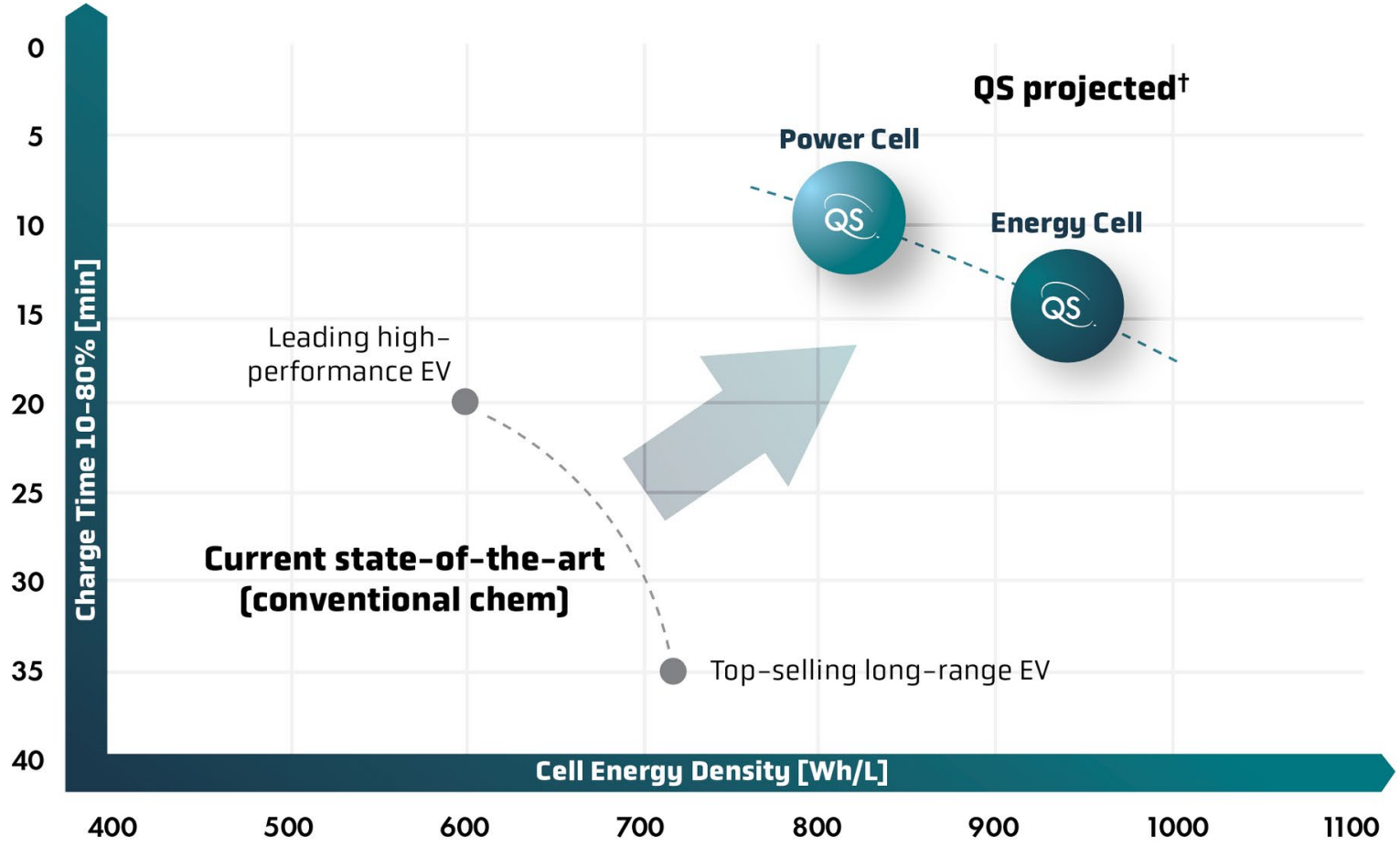
Shifting the Energy-Power Performance Frontier

Lithium-metal batteries can shift EV energy-power frontier to improve charging times and range



Li-ion data: http://lacey.se/science/cell-plot/

†Projections based on QS target energy and power density for commercial product, QS estimates and model assumptions

Customer Relationships

- Contracted with 6 automotive OEMs* for cells out of QS-0
  - Volkswagen Group
  - 2nd Top-10 OEM*
  - 3rd Top-10 OEM*
  - 2 established global luxury OEMs*
  - Pure-play EV company
- Signed agreement with Fluence, a leader in stationary energy storage systems, for cells out of QS-0
- Engaged with leading global consumer electronics companies

Select Brands

QuantumScape & Volkswagen Group

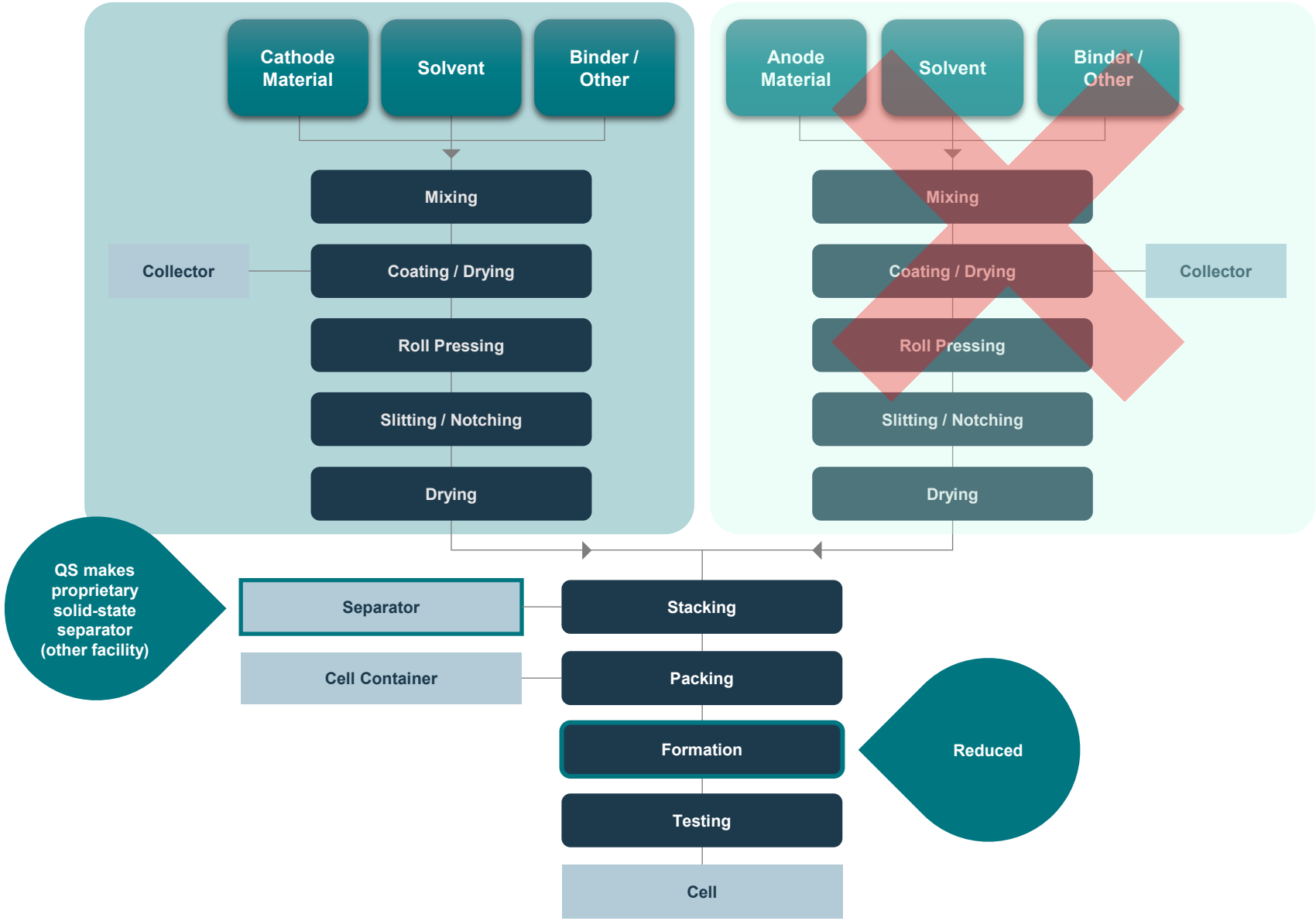
- Partnership since 2012
- Representation on the QS board of directors
- Formed 50/50 JV to accelerate commercialization of QS' solid-state batteries, with capacity ramping to 21 GWh/yr
- Close collaboration with VW Battery Center of Excellence
- VW has tested multiple generations of QS cells and has publicly validated performance at automotive power levels
- Non-exclusive: VW has first priority to cells, but QS allowed to explore commercial opportunities with other partners

"[Solid-state] is the end game for lithium-ion battery cells."

– Frank Blome, (former) Head of Battery Cell and System, Volkswagen Group Components (VW Battery Day, 2021)
Current CEO of VW's PowerCo

*See www.ir.quantumscape.com/sec-filings for further details

Our technology eliminates anode materials & related manufacturing costs



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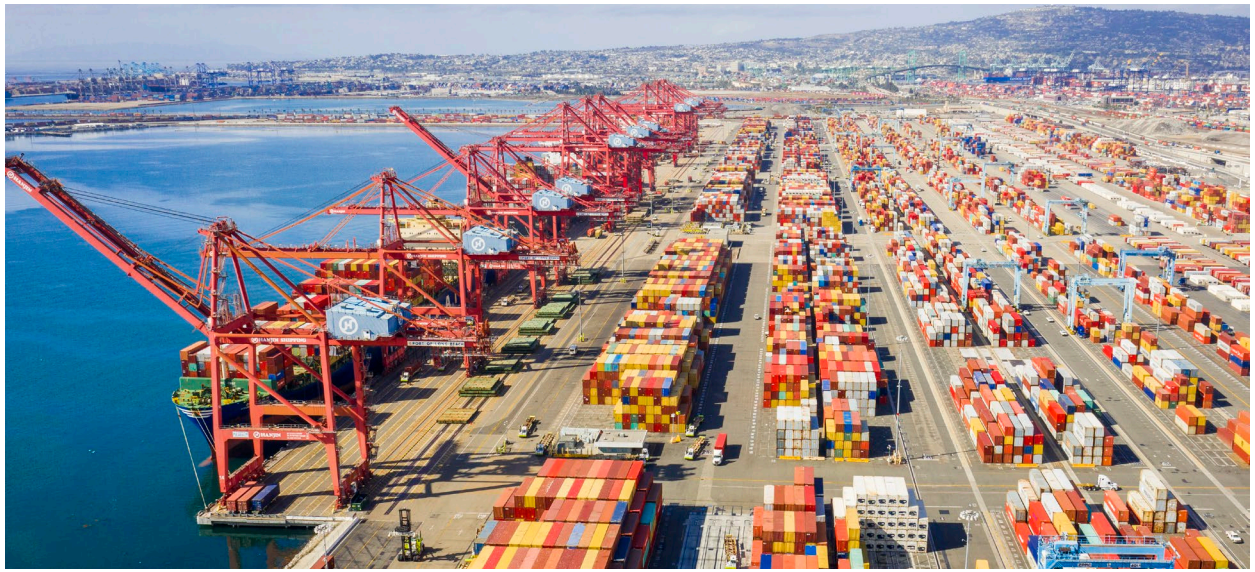
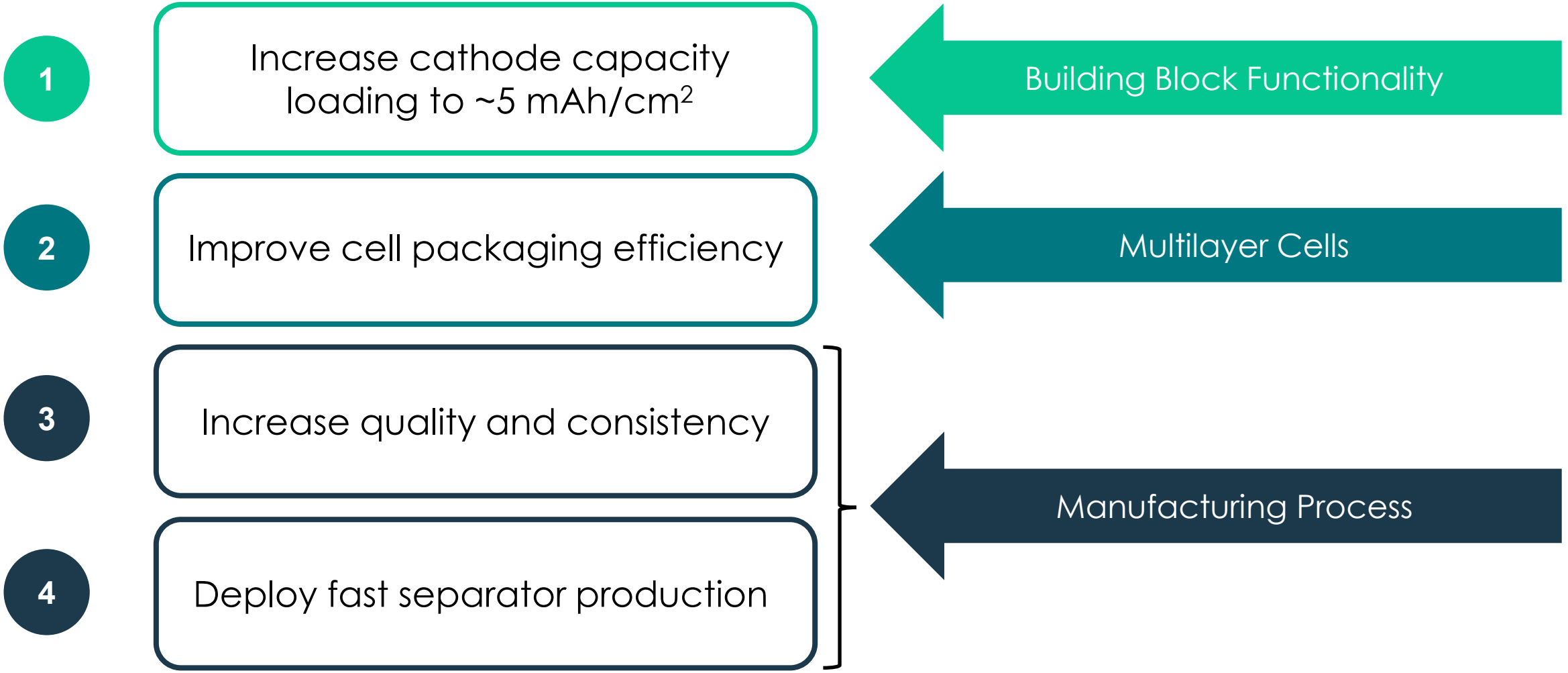
Abundant Materials and Established Supply Chains



Separator precursor materials are abundant and widely used in other industries

Supply chains served by well-established and diverse materials and chemicals firms

QuantumScape 2023 Goals

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