



# VOLTOVATION

POWER THE FUTURE: SAFE, SUSTAINABLE, SOLID

**Powering a safe & sustainable future  
with the help of solid state batteries**

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**Course:** S41036. Disruptive Technologies

**Professor:** Lee Howell

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**Location:** The University of Geneva

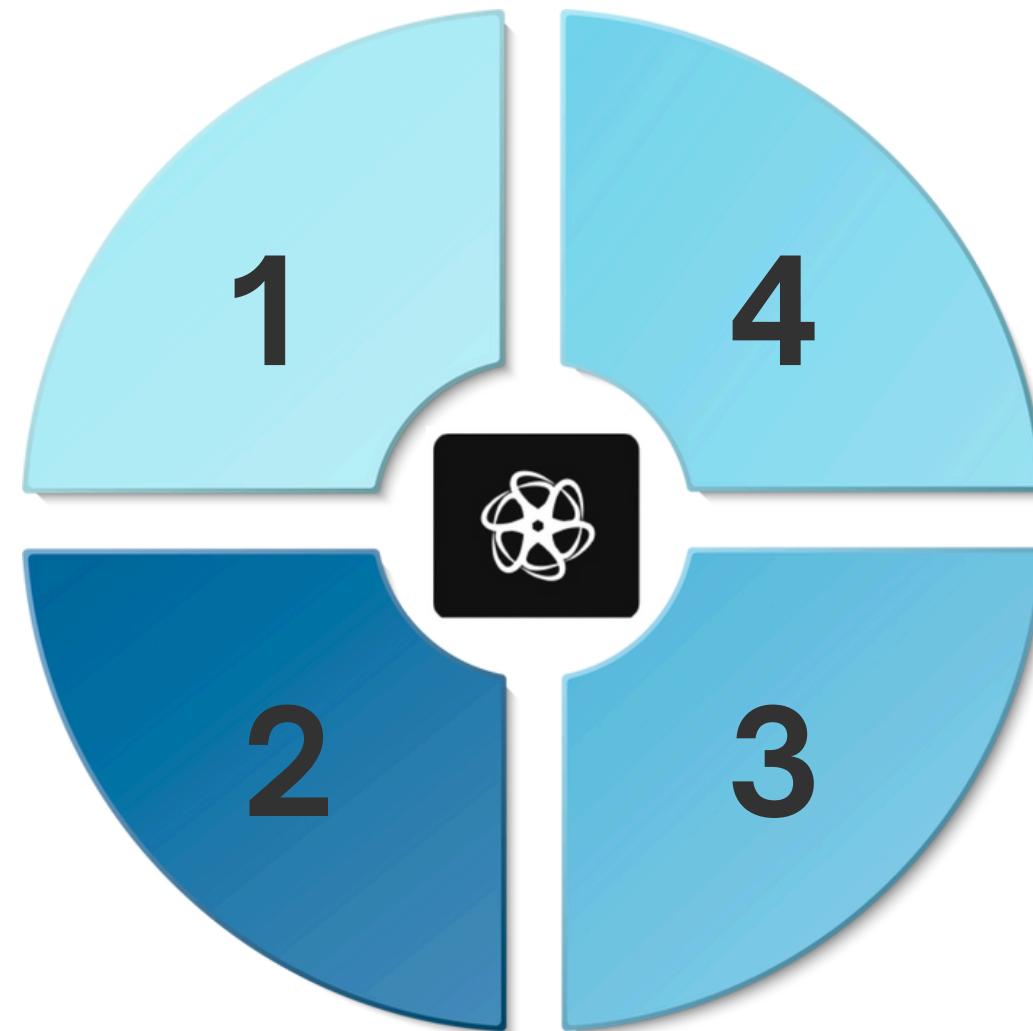




# Today's Agenda

1. Problem Statement & Creating the Big Opportunity
2. Identifying the Disruptive Solution
3. Introducing the Market Opportunity
4. Describing the Competitive Landscape
5. Framing the Call to Action
6. References
7. Annex

# 1. Introduction: Problem Statement



Identifying a problem worth solving by Voltovation (Source: Based on lecture by Prof. Howell, 2025, March 24, Slide 4).

## 1. Target Audience Pain Points

- **Target Audience (TA):** Electric Vehicle (EV) Manufacturers
- **TA's Pain Points:**
  - short battery life
  - safety risks from flammable lithium-ion batteries
  - environmental concerns due to unsustainable materials

## 2. Recurring Problems

- Lithium-ion batteries dominate but are prone to:
  - overheating
  - limited energy density
  - rely on scarce & ethically questionable materials (ex: Cobalt)

## 3. Emerging Trends

- Increasing
  - global EV sales (ex: 17M in 2024)
  - demand for safer & longer-lasting batteries
  - renewable energy storage needs that are reliable (Source: Reuters, 2025)

## 4. Our Passion

- **Voltovation** delivers sustainable energy storage that:
  - reduces carbon emissions
  - enhances safety &
  - aligns with our goals for social & environmental good



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# 1. Introduction: Creating the Big Opportunity



## Market Potential:

- Predicted changes in the global solid-state battery market size:
  - 2024: \$ 98.96M
  - 2025: \$ 119M
  - 2032: \$ 1,359M

(Source: Fortune Business Insights, 2025)



## Sustainability Impact:

- Solid-state batteries:
  - use non-flammable solid electrolytes
  - reduce fire risks
  - enable recyclable designs which support the circular economy



## Financial Returns:

- High initial margins in luxury EV markets will offer strong returns (ex: Tesla, BMW, BYD, Zeeker, etc.)

## Global Push:

- Government incentives show strong policy support:
  - U.S.: \$88M FY 2025
  - China: \$830M (solid-state tech)

(Sources: U.S. DOE, 2025;  
Battery Technology, 2024)



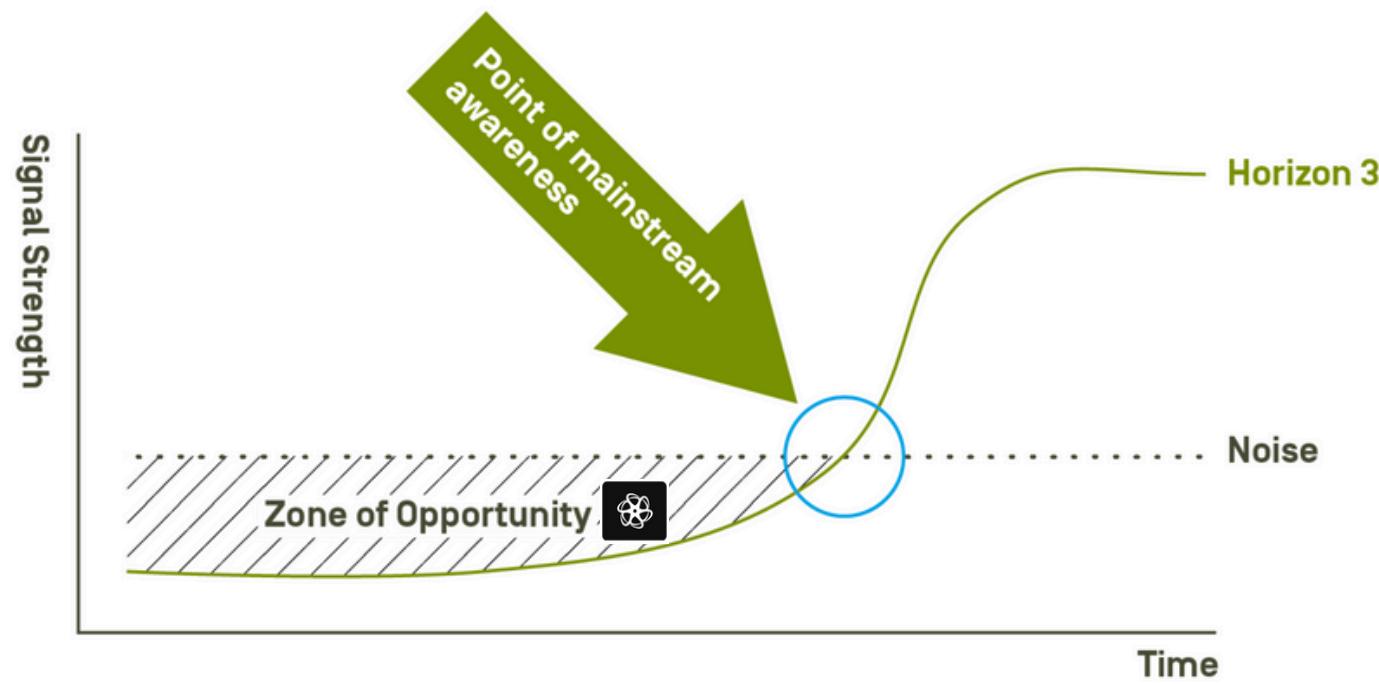
## The Opportunity: Voltovation's solid-state batteries

- Address demand for:
  - safe
  - high-performance
  - sustainable energy storage
- Unlock financial & environmental value for impact investors



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## 2. Identifying the Disruptive Solution



Graph to help understand where the Zone of Opportunity is located for Voltovation, based on signal strength and time of a new technology adoption by a company (Source: Howell, 2025, April 7, Slide 3).

### Why Solid-State Batteries?

- Higher energy density
- Enhanced safety
- Improved temperature tolerance

### Voltovation's Scaling Strategy:

- Phase 1: Targeting luxury EVs
- Phase 2: Scaling to mass markets

### Zone of Opportunity:

- Now is the time to invest before mass adoption

### The Solution:

- Voltovation's solid-state batteries are the disruptive technology to power a safer & sustainable future
- Early investment in our company will offer investors high returns, as the market matures in the long-term

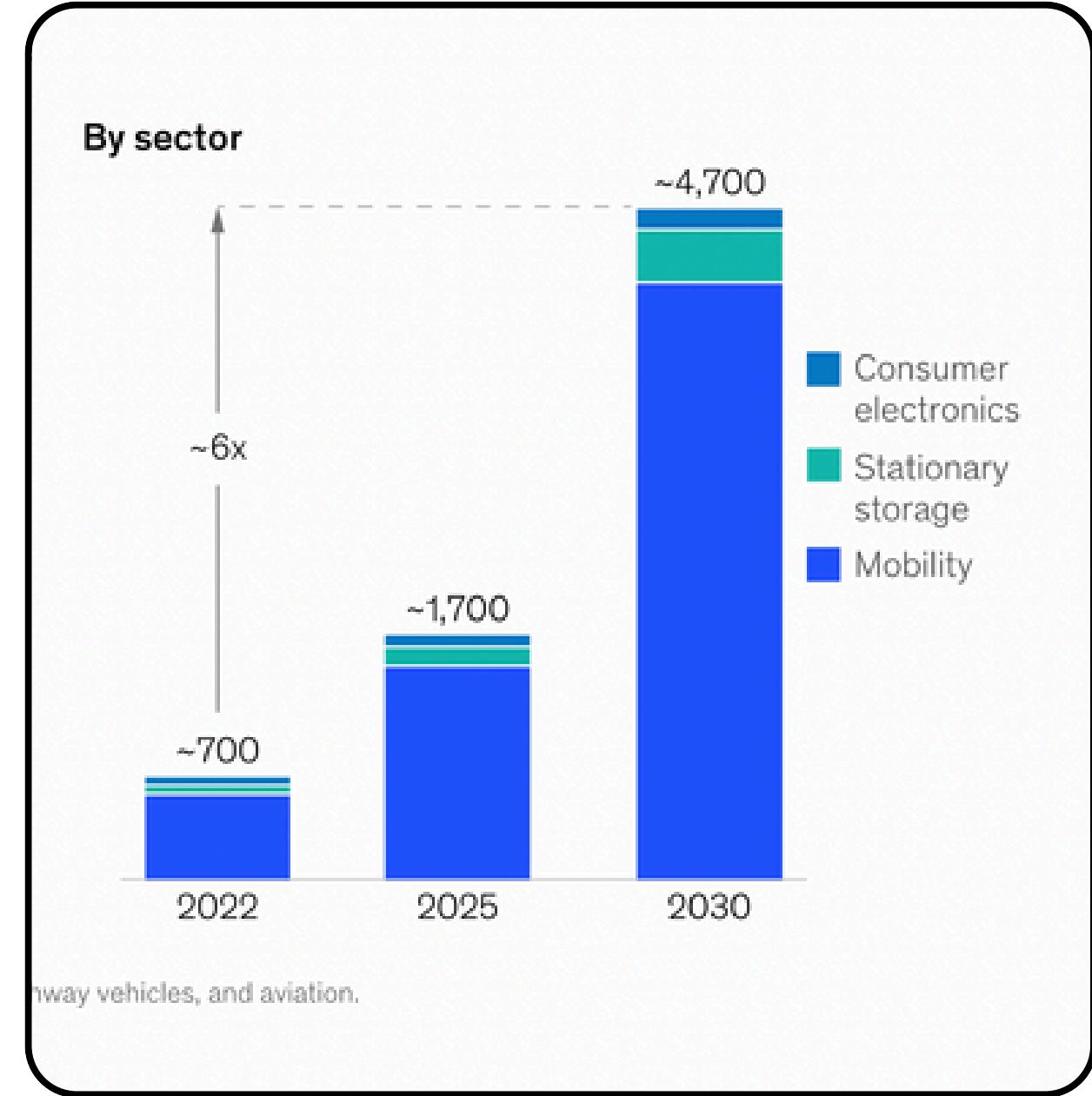
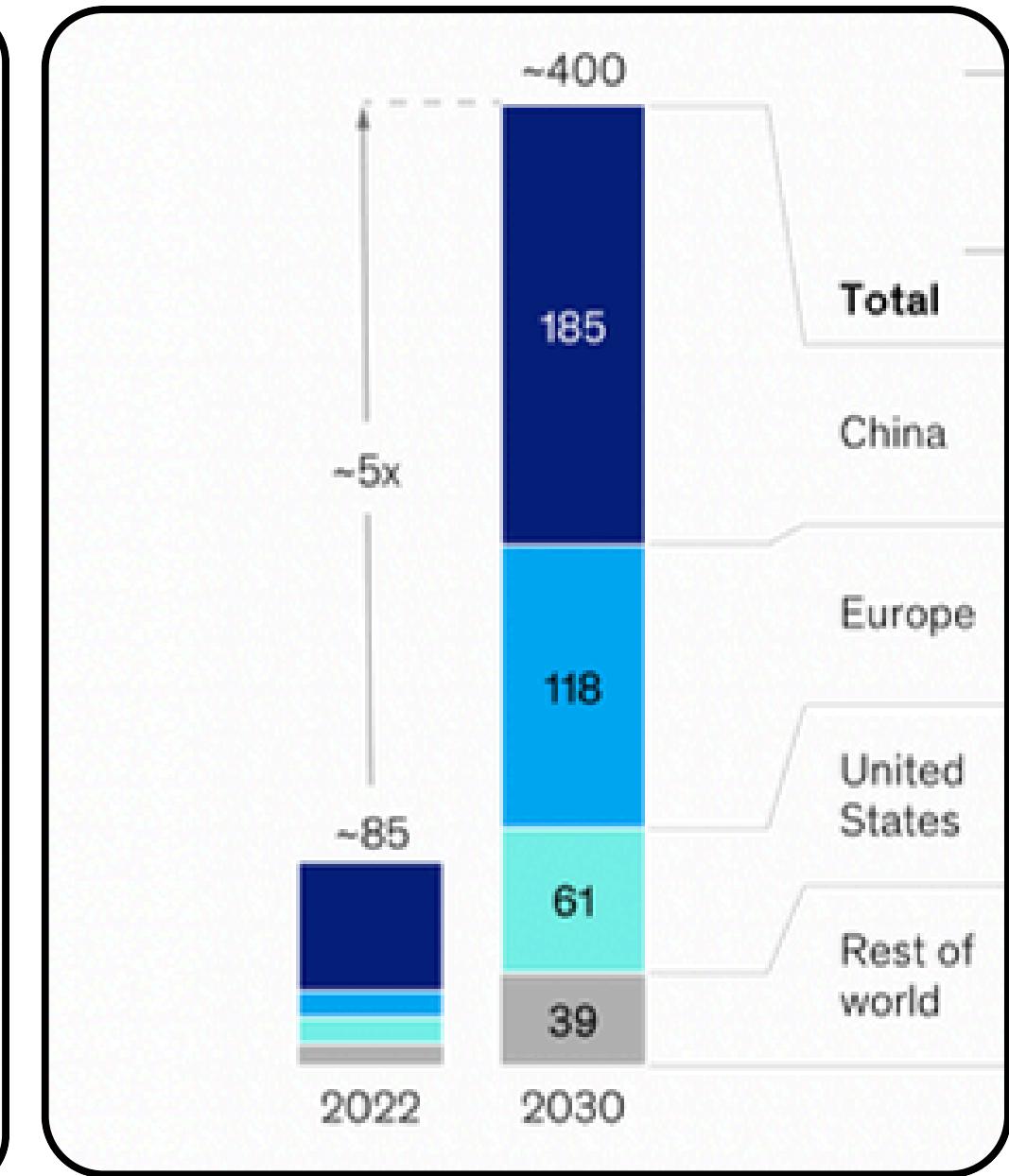
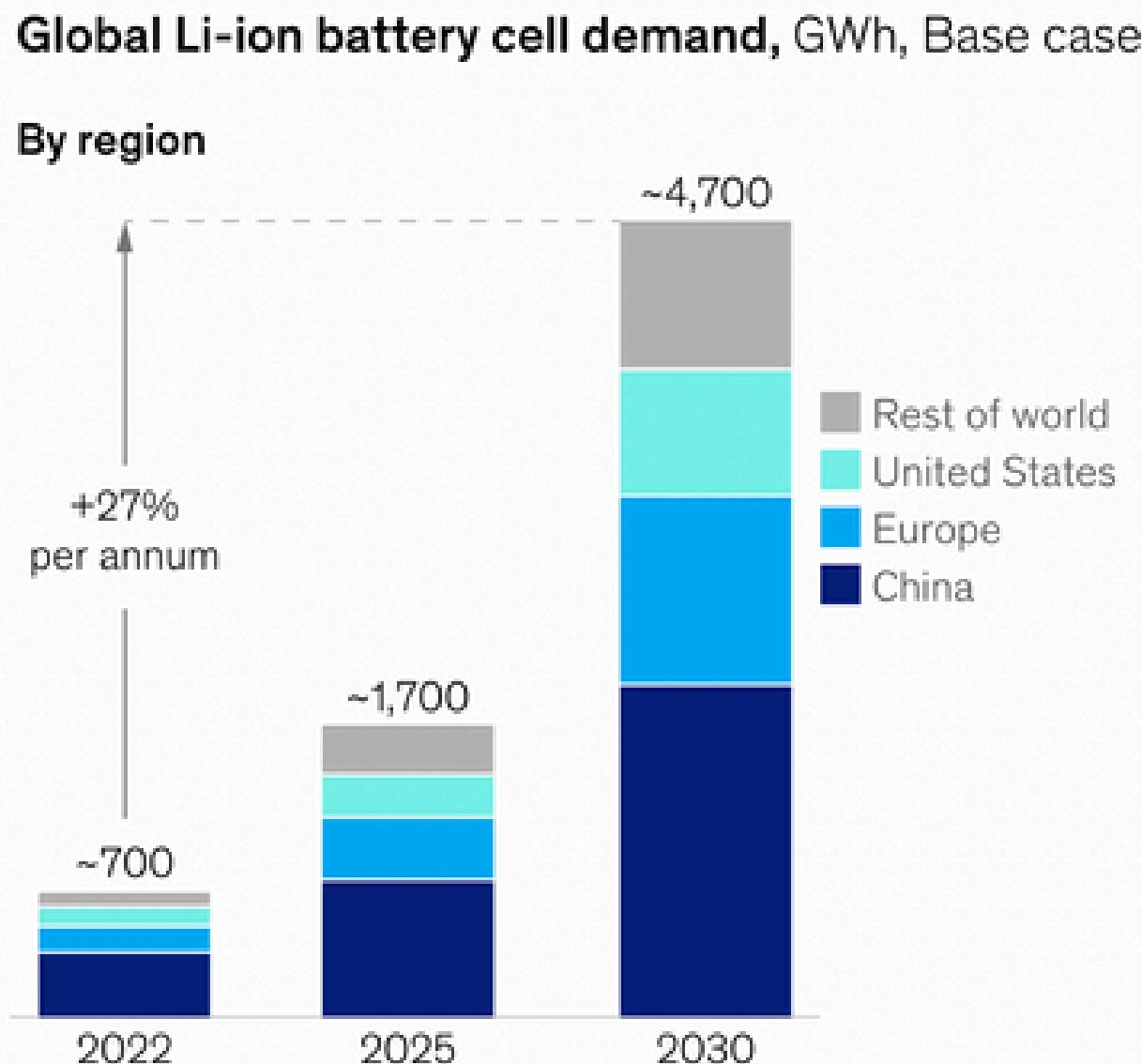


### 3. Market Opportunity- Current battery status of Luxury EVs?

ELECTRIC VEHICLE	BATTERY TYPE	NUMBER OF CELL	NOMINAL VOLTAGE	BATTERY NAME/REFERENCE	CHARGE SPEED
Tesla Model Y	Lithium-ion	108	340V	CATL LFP60	57 km/h
Hyundai IONIQ 5 84 kWh RWD	Lithium-ion	384	697 V	N/A	53 km/h
Ford Mustang Mach-E GT	Lithium-ion	376	N/A	N/A	44 km/h
BMW i4 eDrive40	Lithium-ion	N/A	399 V	N/A	59 km/h
Volkswagen ID.7 Pro S	Lithium-ion	312	383 V	N/A	57 km/h
Cadillac Lyriq 600 E4	Lithium-ion	288	350 V	GM Ultium 103Ah	84 km/h
BYD DOLPHIN 60.4 kWh	Lithium-ion	126	403 V	BYD BLADE	54 km/h
Zeekr 001 Performance AWD	Lithium-ion	110	N/A	CATL QILIN	95 km/h



### 3. Market Opportunity-The \$400B Battery Revolution, Untapped Potential



Source: [McKinsey & Company](#)

Li-ion battery demand is expected to grow by about 27 percent annually to reach around 4,700 GWh by 2030.

Li-ion battery demand by 2030- By Sector.  
**Majority of Li- Ion battery comes from Mobility**



### 3. Market Opportunities- Need for solid state batteries?

01

**Thermal Management**  
(Source :[CTIF](#))



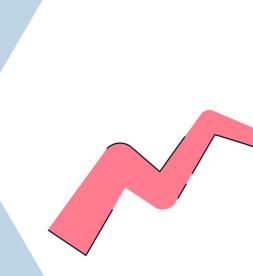
02

**Lithium Extraction**  
i. Salt Flat Brine  
ii. Open-pit mining  
(Source :[Greenly](#))



03

**As demand grows,  
so does the impact**  
(Source :[Greenly](#))



04

**Land Degradation  
and habitat loss**  
(Source :[Greenly](#))



**Water depletion and  
contamination**  
(Source :[Greenly](#))



05

**Recycling: less than  
10%, could lead to  
\$603m to 3.1 b loss**  
(Source :[Hamilton Locke](#))



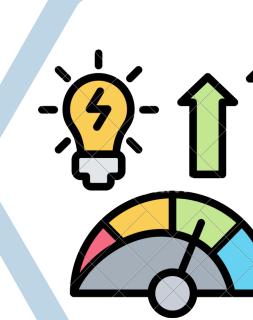
06

**Carbon footprint  
and energy  
consumption**  
(Source :[Greenly](#))



07

**Cobalt and nickel-  
comes with heavy  
environmental cost**  
(Source :[Greenly](#))



08



### 3. Market Opportunity-How Voltovation is different?

01

**Use of sodium based solid electrolytes batteries**



02

**Environment Friendly (Alignment with GBA Principle)**

(Annex 2)



03

**Low production cost**

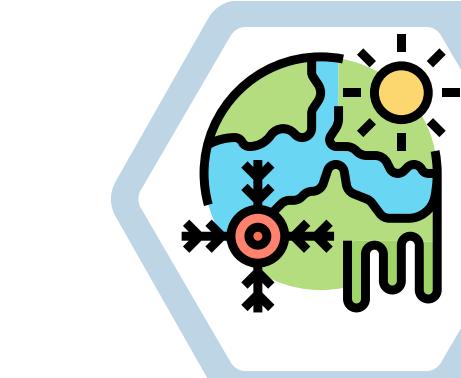
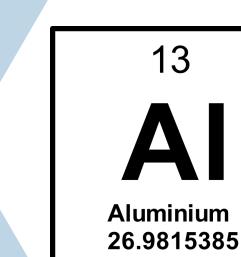
(Source :[Linkeln](#))



04

**Uses aluminium (Three fold cheaper than copper)**

(Source :[GEP](#))



**Abundant resources**

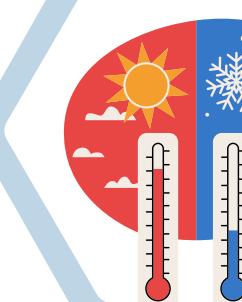
(Source :[GEP, Apricum](#))

05



**No lithium, cobalt, nickel or other difficult-to-obtain minerals**

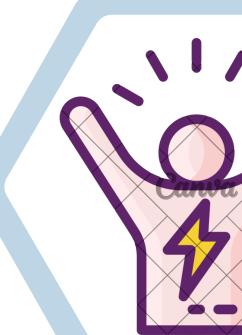
06



**Higher operating temperature range**

(Source :[GEP](#))

07



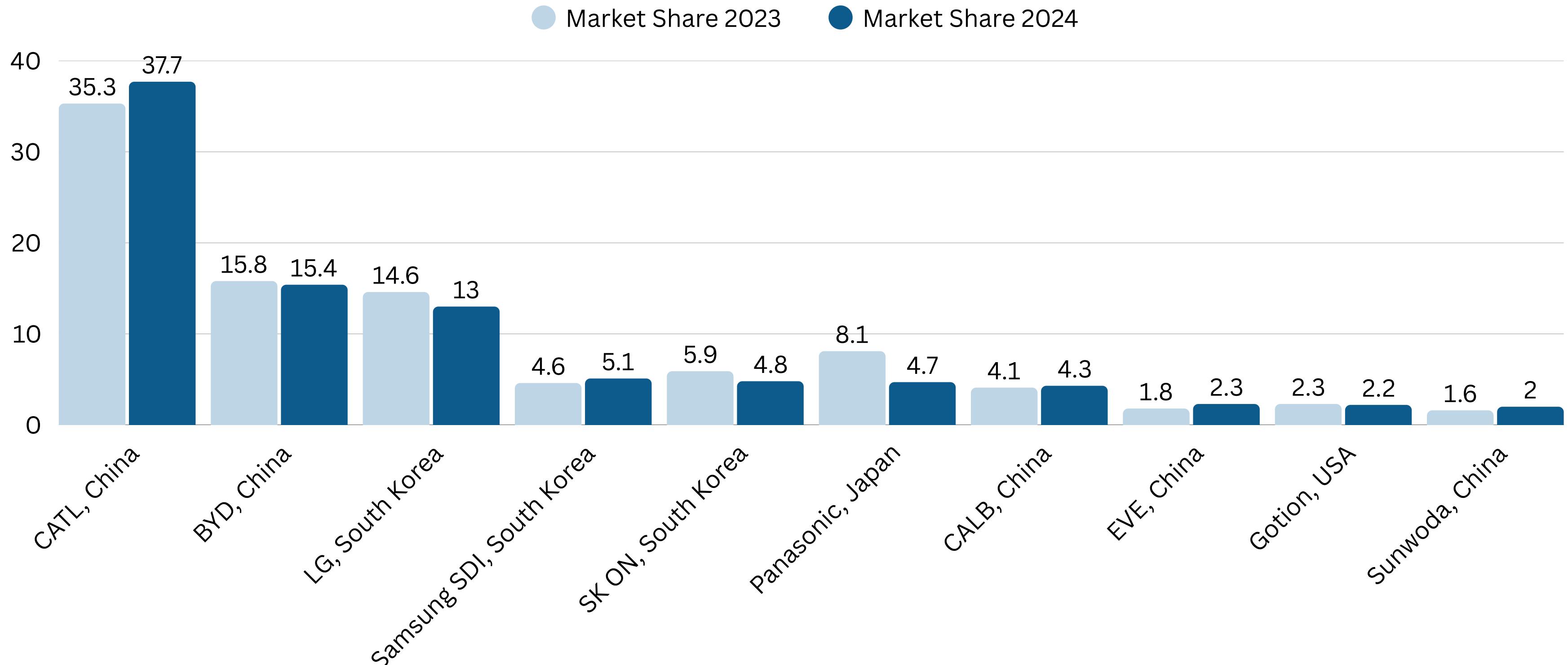
**High energy density and fast charging capabilities**

(Source :[Linkeln](#))

08



## 4. Competitive Landscape: Lithium-ion



Top 10 EV lithium ion battery suppliers in 2024, (Source: [SNE Research](#))

## 4. Competitive Landscape: Solid State Battery Developers

COMPANY	TECHNOLOGY	ENERGY DENSITY	TIMELINE
CATL	Condensed State Battery	500 Wh/kg	Full commercialize by 2030
BYD	High-nickel ternary cathode, a silicon-based anode, and a sulfur-based electrolyte	exceeding 280 Wh/kg	Equip around 40,000 vehicles with SSB by 2030.
QUANTUMSCAPE	Anode Free -solid-state lithium metal batteries	Electrode capacity of 3.1 mAh/cm <sup>2</sup>	Large Scale production by 2030
EVE ENERGY CO., LTD. (EVE)	Sulfide and halide-based solid electrolytes	400 Wh/kg	scale up production and establish as a major supplier (Domestic+International)
SAMSUNG SDI	High-nickel cathodes and sulfide-based electrolytes	400 Wh/kg	Full-scale mass production by 2027
SOLID POWER	Sulfide-based solid electrolytes	560 Wh/kg	Full-scale mass production by 2030

Top Solid State Battery Developers (Source: [Manlybattery](#))

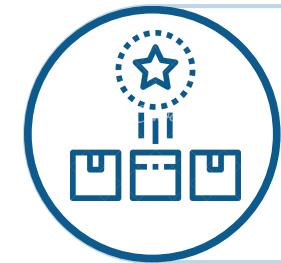


## 4. Competitive Landscape-Challenges and our strategies to mitigate them

- Established players with strong patents and market share.



- Product Differentiation



- High R&D costs



- Collaborate with universities for low-cost R&D.



- complex manufacturing processes



- leverage existing capabilities and knowledge to avoid starting from zero

- selecting suitable solid electrolytes for stable anode-electrolyte interfaces



- Combining different materials to enhance performance

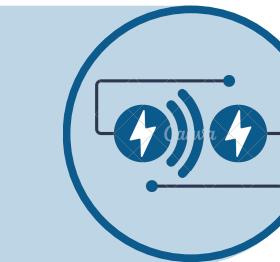
- Na dendrite growth



- Modification using solid state electrolyte



- High charge-transfer impedance



- Optimizing the interface between the solid electrolyte and the electrode materials

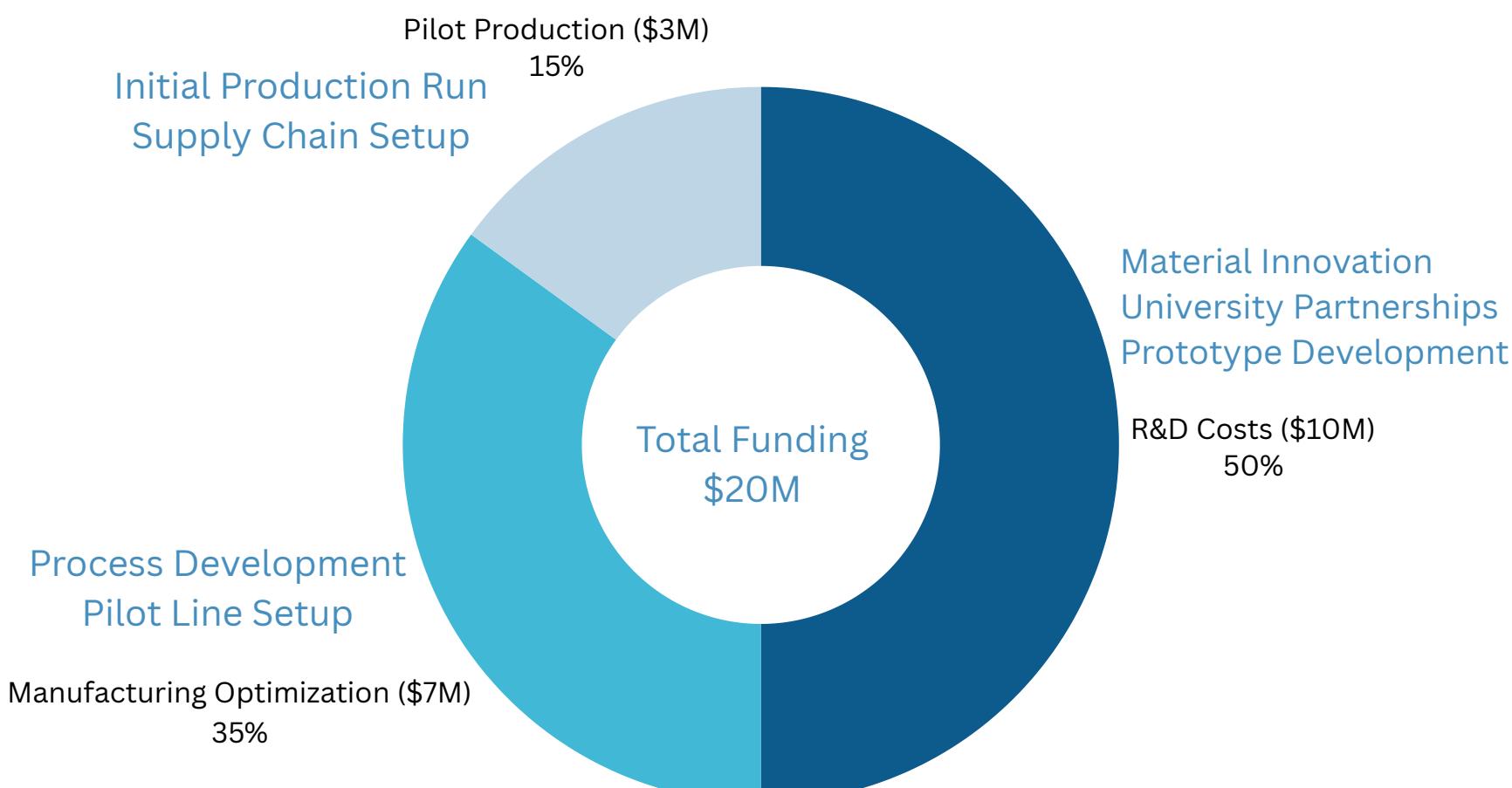




## 5. Call to Action

### What We're Asking For

- **\$20M Investment:** To accelerate R&D, optimize manufacturing, and launch pilot production of solid-state batteries.
- **Strategic Alliances:** Partnerships with luxury EV brands (e.g., Tesla, BMW) and leading universities for innovative R&D.
- **Policy Engagement:** Advocacy to secure government incentives (e.g., \$830M China, \$88M U.S.) for solid-state tech.



### What This Enables

- **\$1.36B Market Access:** Leadership in the solid-state battery market by 2032, targeting high-value luxury EVs.
- **Safety Breakthrough:** Non-flammable, high-density batteries (500 Wh/kg) transforming EV performance.
- **Sustainable Innovation:** Cobalt-free, recyclable batteries reducing emissions and enabling a circular economy.





## 5. Call to Action Why Now?

This is a once-in-a-decade moment.

The future needs bold action — and Voltovation delivers!



**This New Membrane Technology In Solid-State Batteries Could Make EVs Safer And More Efficient**



European Policy Mandates

Storage requirements in EU Green Deal



EV Transition Accelerating

15+ countries set ICE phase-out dates by 2035



Consumer Demands Shifting

73% increase in sustainability-based purchasing



Renewable Intermittency Challenge

Grid stability requires 200GWh new storage by 2030



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# Thank You

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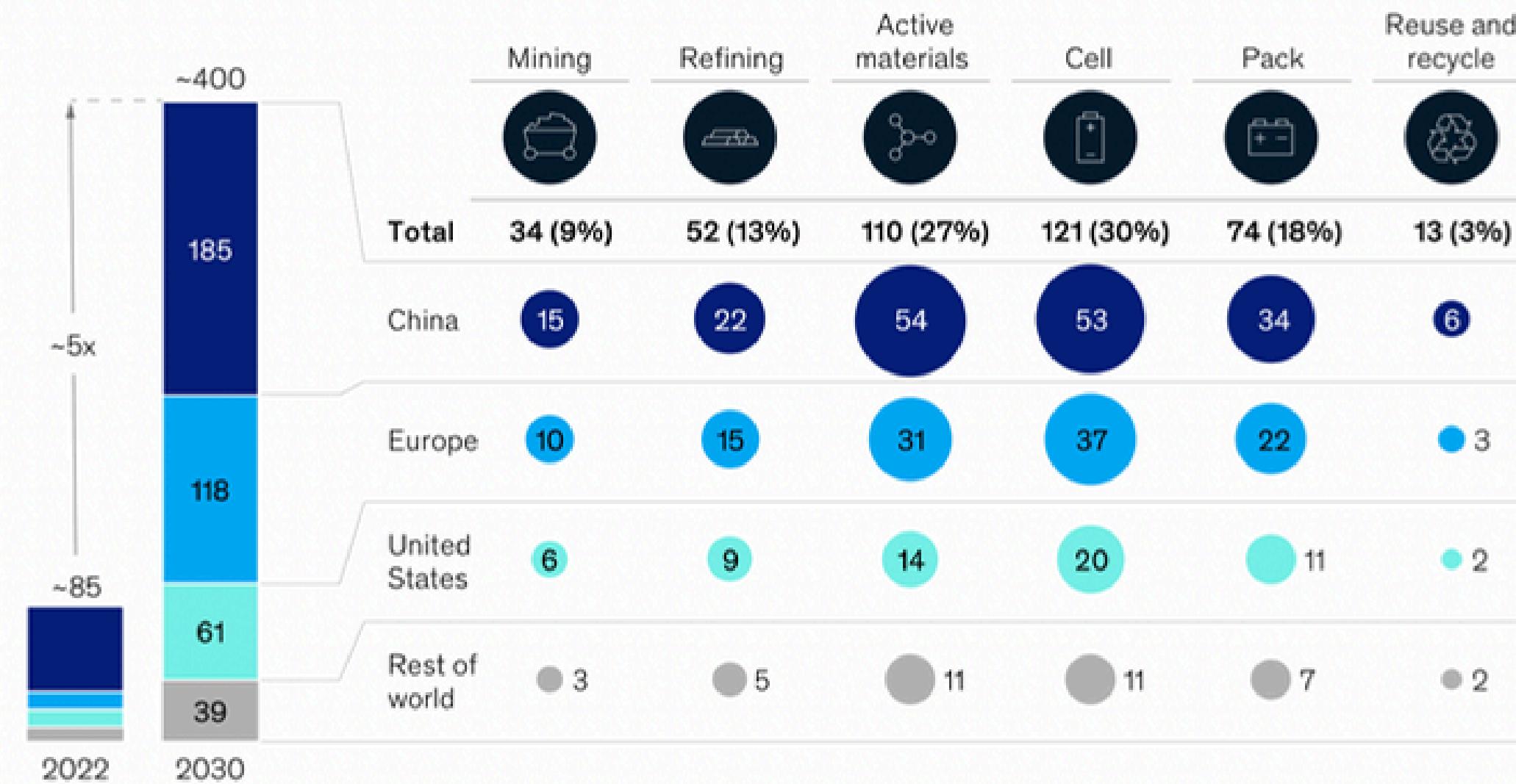
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# ANNEX1

Our model projects that the Li-ion battery value chain will provide revenue opportunities of over \$400 billion by 2030.

Revenues, base case 2030, \$ billion



Source: McKinsey Battery Insights, 2022



## ANNEX 2

### 10 GBA principles for a sustainable battery value chain, adopted by 42 organizations on 23 Jan. 2020



Establish a circular battery value chain as a major driver to achieve the Paris Agreement



- 1 Maximizing the productivity of batteries in their first life
- 2 Enabling a productive and safe second life use
- 3 Ensuring the circular recovery of battery materials

Establish a low-carbon economy in the value chain, create new jobs and additional economic value



- 4 Ensuring transparency of greenhouse gas emissions and their progressive reduction
- 5 Prioritizing energy efficiency measures and substantially increase the use of renewable energy as a source of power and heat when available
- 6 Fostering battery-enabled renewable energy integration and access with a focus on developing countries
- 7 Supporting high quality job creation and skills development

Safeguard human rights and economic development consistent with the UN Sustainable Development Goals



- 8 Immediately and urgently eliminating child and forced labour, strengthening communities and respecting the human rights of those employed by the value chain
- 9 Fostering protection of public health and the environment, minimizing and remediating the impact from pollution in the value chain
- 10 Supporting responsible trade and anti-corruption practices, local value creation and economic diversification

