

Business Breakthrough Barometer 2024

Batteries



World Business
Council
for Sustainable
Development

BAIN & COMPANY 



29 October, 2024



Key messages

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- **Battery companies report strong progress on decarbonization targets, with over 40% considering their ambitions to surpass governments'**
 - Almost 90% of the battery sector state they are on track or ahead of committed decarbonization targets
 - 43% of business see themselves as more ambitious than government on the net-zero transition in their key markets
- **Battery manufacturers are experiencing an explosion in manufacturing capacity over the last year**
 - Nearly 8TWh of capacity have been announced to be deployed by 2025
 - The surge in battery production could unlock large-scale deployment opportunities across sectors
- **The production pipeline is largely driven by Chinese investment, and is leading to concerns over rising trade tensions**
 - In H1 2024, China announced over 800 GWh of projects, strengthening their supply-side BEV export strategy
 - In contrast, European manufacturers are facing a more difficult market, which have led to 40% of pipeline capacity being delayed or cancelled
 - The outlook for battery supply chains is uncertain – Major economies like the US are introducing stronger trade protectionism and subsidy schemes to shore up domestic production
 - 80% of surveyed companies emphasized the need for stronger international coordination in the battery sector, expressing concern that geopolitical risks could undermine the opportunities from greater trade integration and supply-side advancements
- **Despite trade frictions, businesses believe that the increase in supply and cost reductions will have disruptive effects across demand sectors**
 - Prices have plummeted as Chinese manufacturers face difficulties in finding buyers
 - This price drop has pushed LFP packs to \$75/kWh, 25% below the price point needed for EV-to-ICE price parity, creating enormous potential for mass-market BEVs
 - Electrification is gaining traction in shipping, with a 50% increase short distance vessels such as ferries and cruise liners adopting battery electric propulsion.
 - But there is uncertainty about the sustainability of these prices, as margins are squeezed to near-zero, and the Chinese government is taking steps to rationalize investments



Key messages

2/2

- Auto OEMs are expected to feel the bulk of the impact, with the lower-cost Chinese LFP batteries primarily benefitting mass-market BEVs
 - In the US and Europe BEV uptake has so far been concentrated in the medium and premium segments
 - But availability of mass market EVs could now take off, albeit recent tariffs on Chinese batteries and BEVs could slow momentum
 - Businesses are also optimistic about the potential for BEV adoption outside traditional markets, such as Latin America, Africa, and Southeast Asia, where current battery prices look set to bring BEV costs below those of ICE vehicles
- The surge in battery supply is also fuelling growth in the energy storage market
 - Approximately 370 GWh of battery energy storage system (BESS) projects have been announced, indicating strong sentiment for future growth
 - Companies expect the BESS sector to become one of the use cases for growing battery production
 - BESS operators do not typically engage in long-duration offtake agreements common among auto OEMs, and tend to be more price sensitive and less concerned about energy density
 - Lower battery prices opens up significant potential for large scale deployment and greater integration of cheap renewables into power grid. However, battery suppliers remain cautious, given challenges in securing regulatory approval and financing for storage projects.
- Looking ahead, businesses are optimistic about the outlook for battery production as supply chain pressure has eased
 - The easing of supply chains has contributed to notable price declines for key raw materials over the last 12 months, including a 20% drop in Nickel and Cobalt prices and an impressive 70% reduction in Lithium costs
 - These developments signal promising news for the ongoing electrification push and the broader adoption of battery technologies
- Companies cite consumer misconceptions on reliability, difficulties in scale up, and raw mineral shortages as key battery deployment barriers
- Business point to policy interventions within financing support, trade barrier reduction, and simplified permitting as top priorities for government

Battery companies report strong progress on decarbonization targets, with over 40% considering their ambitions to surpass governments'



87%

Almost 90% of the battery sector state they are on track or ahead of committed decarbonization targets

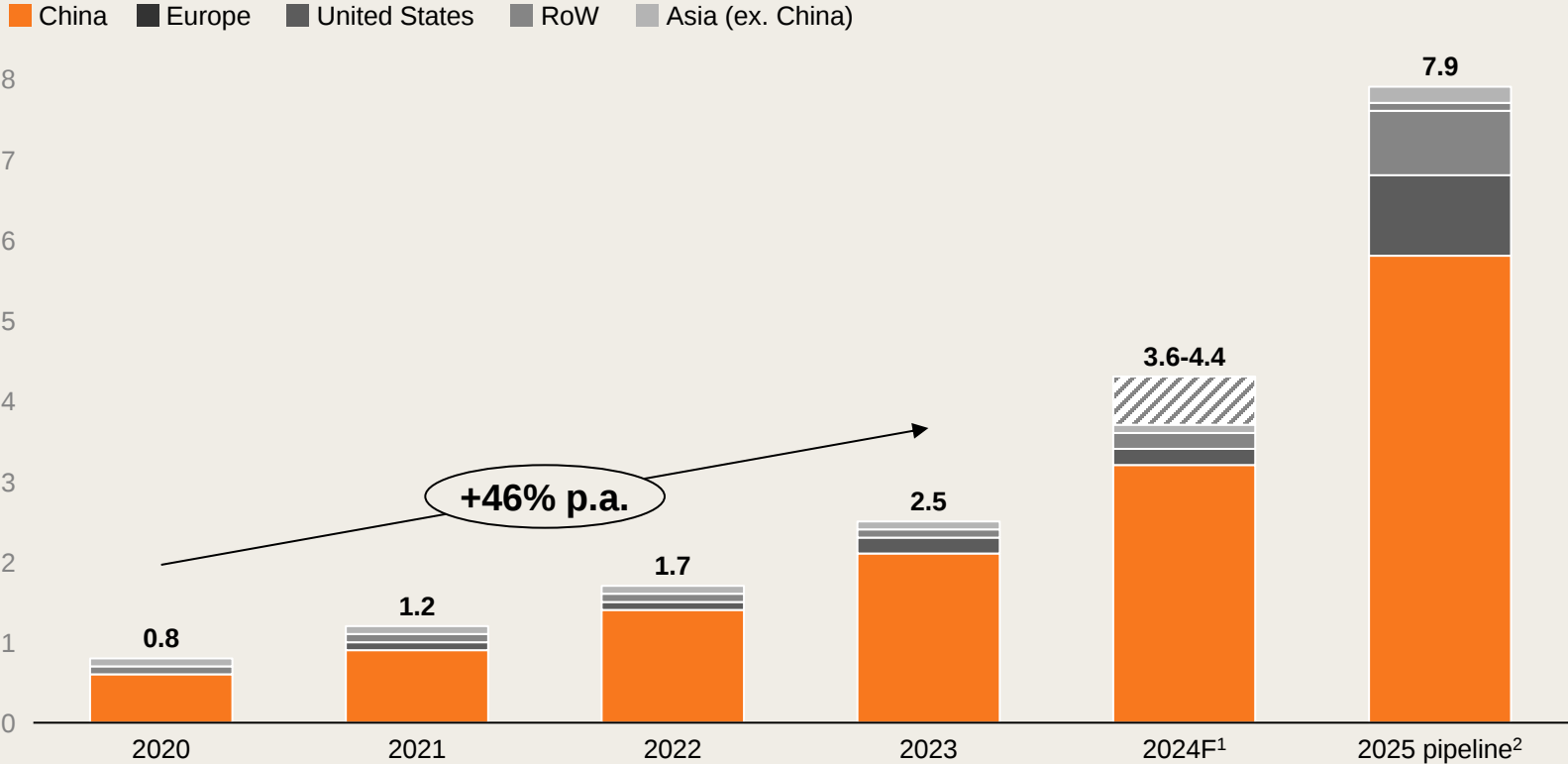
43%

43% of business see themselves as more ambitious than government on the net-zero transition in their key markets

Source: Business Breakthrough Barometer Sector Survey (N=250)

Battery manufacturers are experiencing an explosion in manufacturing capacity over the last year

Lithium-ion battery manufacturing capacity and pipeline by largest producers (TWh, 2020-'25F)



Note: 1) Forecast ranged using lowest as growth between 2020-'23 and highest as annual growth required to reach 2025 pipeline capacity; 2) As of April 2024
Source: IEA; BBC; Bloomberg; Company websites; BNEF; Business Breakthrough Barometer Sector Survey (N=250); Business interviews; Bain analysis

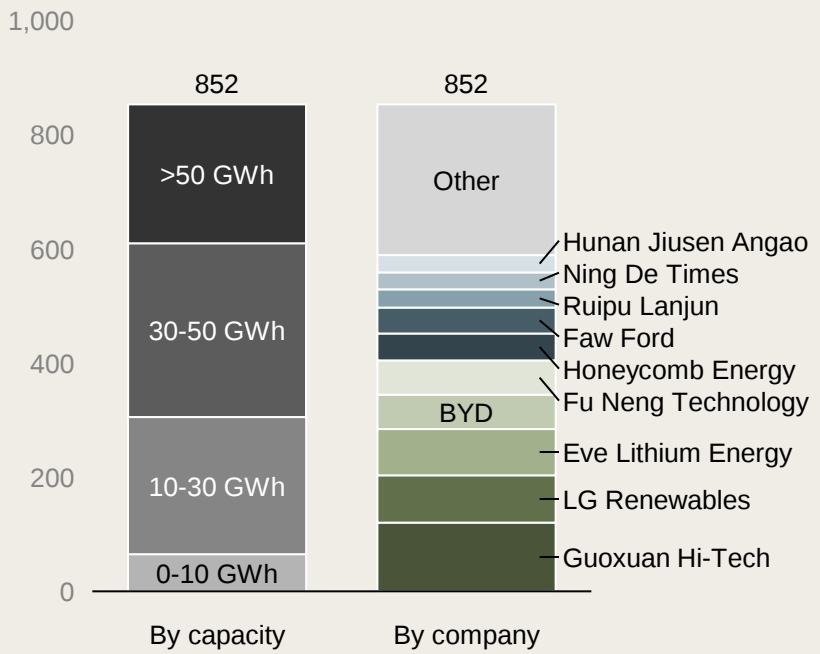
- Nearly 8TWh of capacity have been announced to be deployed by 2025
- The surge in battery production could unlock large-scale deployment opportunities across sectors



The production pipeline is largely driven by Chinese investment, and is leading to concerns over rising trade tensions

In H1 2024, China announced over 800 GWh of projects, strengthening their supply-side BEV export strategy

Chinese battery project pipeline announced during first half of 2024 (GWh, As of 2024H1)



In contrast, European manufacturers are facing a more difficult market, which have led to 40% of pipeline capacity being delayed or cancelled

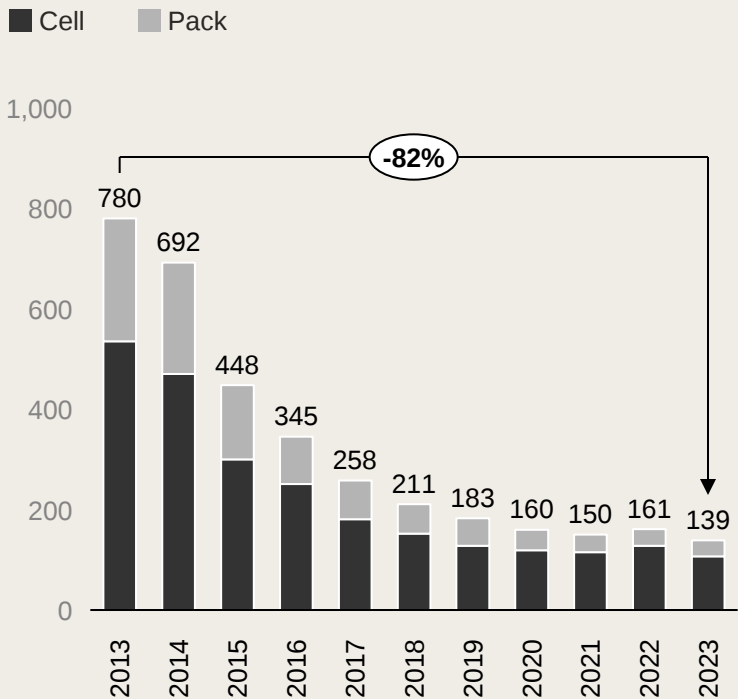
COUNTRY	COMPANIES	STATUS	CAPACITY (GWH)	DRIVER
	Ford and LG Energy Solution (LGES)	Cancelled	25 - 45	Slowed EV adoption
	SVOLT Brandenburg	Cancelled	16	EV and regulatory uncertainty
	Northvolt	Cancelled	100	Not stated
	AMTE Power	Cancelled	10	Financial troubles
	Italtvolt	Cancelled	45	Financial troubles
	PowerCo	Delayed	40	Slowed EV adoption
	ACC	Delayed (on hold)	40	Slowed EV adoption and oversupply
	ACC	Delayed (on hold)	40	
	SVOLT Saarland	Delayed	24	EV and regulatory uncertainty
	Northvolt	Delayed	60	Difficulties scaling production
Total			~410	

- The outlook for battery supply chains is uncertain – Major economies like the US are introducing stronger trade protectionism and subsidy schemes to sure up domestic production
- 80% of surveyed companies emphasized the need for stronger international coordination in the battery sector, expressing concern that geopolitical risks could undermine the opportunities from greater trade integration and supply-side advancements

Source: Company websites; Business Breakthrough Barometer Sector Survey (N=250); Business interviews; Bain analysis

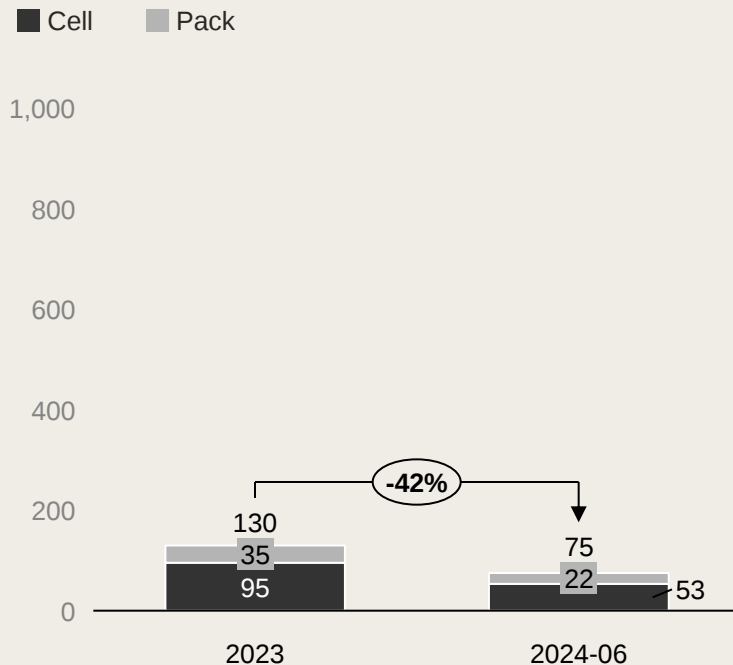
Despite trade frictions, businesses believe that the increase in supply and cost reductions will have disruptive effects across demand sectors

Global volume-weighted average lithium-ion battery pack and cell price split (\$/kWh¹, 2013-2023)



Note: 1) Real 2023 for 2013-2023
Source: BNEF; Business Breakthrough Barometer Sector Survey (N=250); Business interviews; Bain analysis

Chinese lithium-ion LFP | volume-weighted average battery pack and cell price split (\$/kWh, 2023-2024/06)



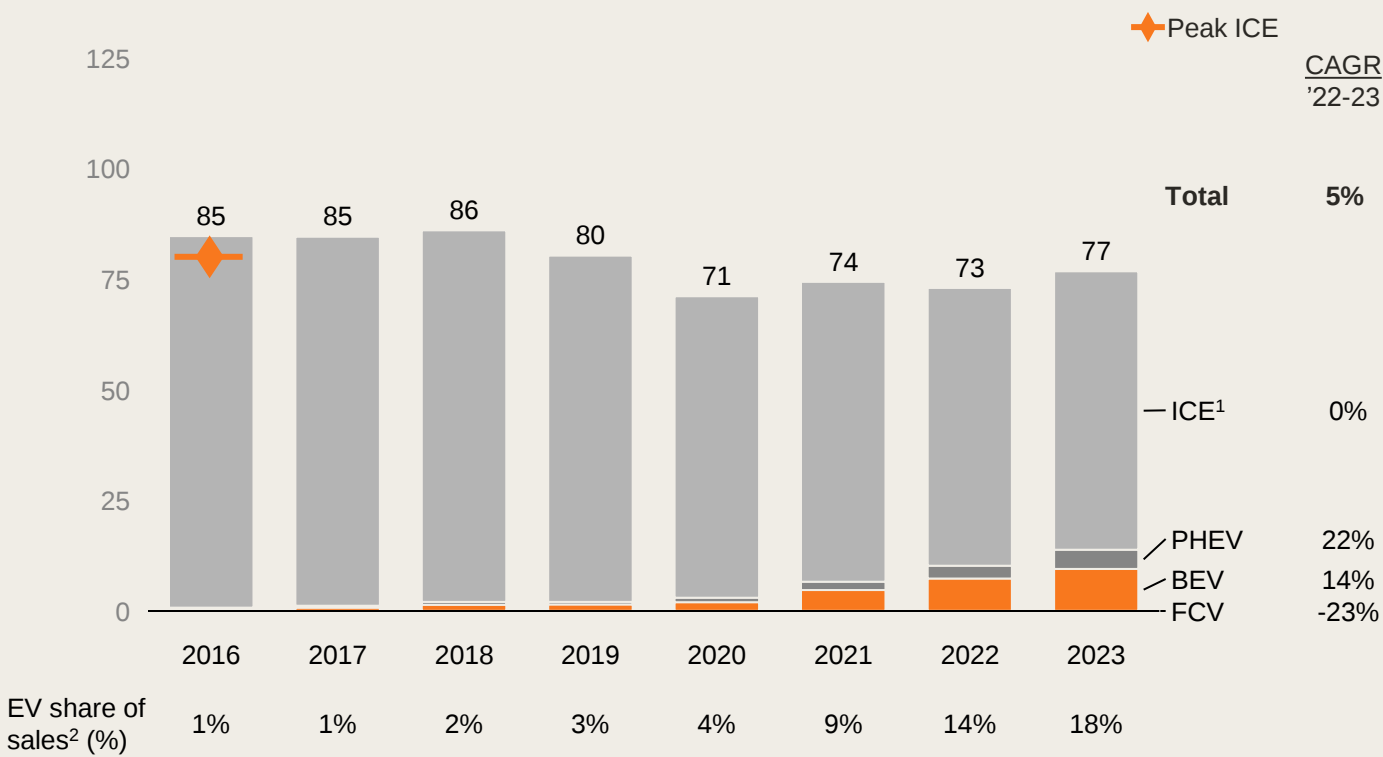
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- Electrification is gaining traction in shipping, with a 50% increase short distance vessels such as ferries and cruise liners adopting battery electric propulsion.
- But there is uncertainty about the sustainability of these prices, as margins are squeezed to near-zero, and the Chinese government is taking steps to rationalize investments

None of the battery players in China, particularly tier 2 players, is utilizing plant capacity much above 50%.

HEAD OF BATTERY STRATEGY,
AUTO MANUFACTURER #5

The automotive sector is expected to feel the bulk of the impact, with the lower-cost Chinese LFP batteries primarily benefitting mass-market BEVs

Global LDV sales by engine type (in M units, 2016-2023)



Note: 1) Incl. MHEV & HEV; 2) EV share = BEV + PHEV + FCEV
Source: IHS Markit/ S&P Mobility (Jan 2024); Bain EV Market Model; Business Breakthrough Barometer Sector Survey (N=250); Business interviews; Bain analysis

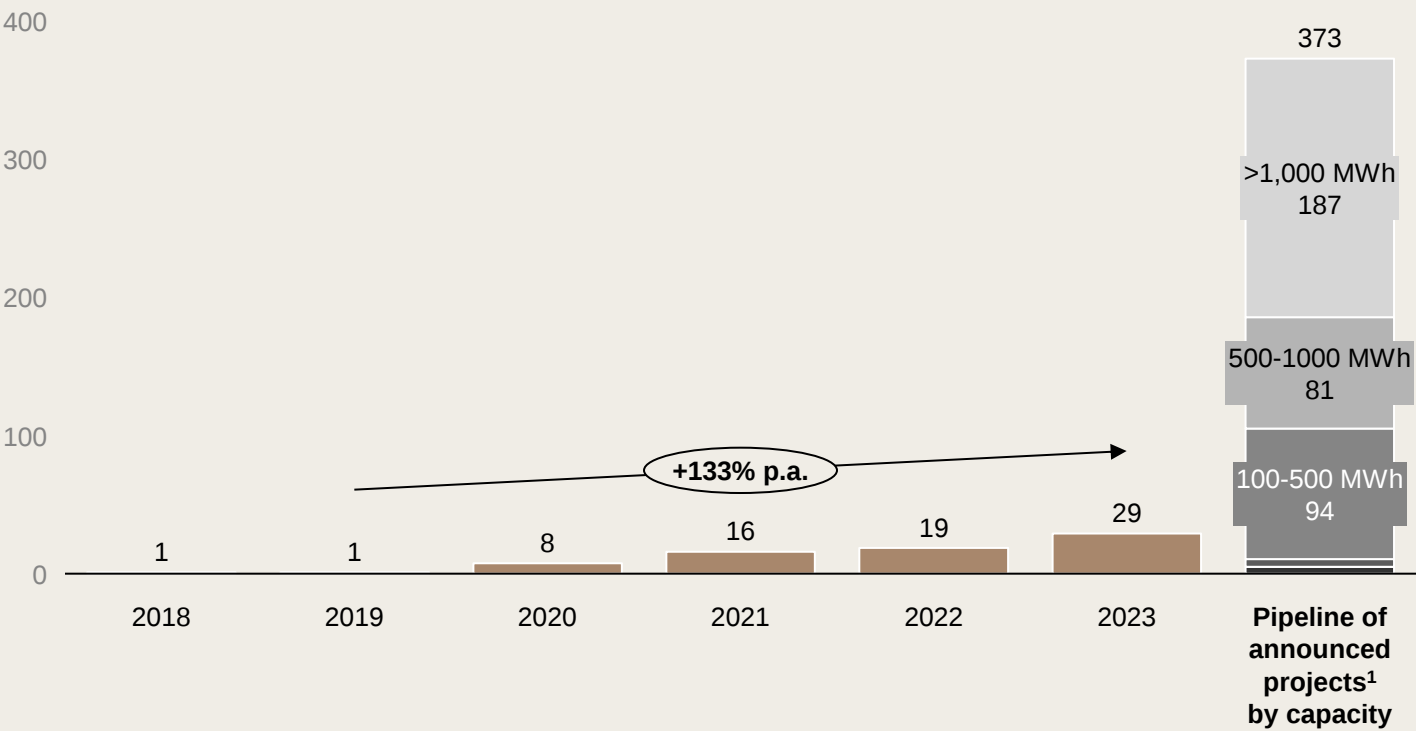
- In the US and Europe BEV uptake has so far been concentrated in the medium and premium segments
- But availability of mass market EVs could now take off, albeit recent tariffs on Chinese batteries and BEVs could slow momentum
- Businesses are also optimistic about the potential for BEV adoption outside traditional markets, such as Latin America, Africa, and Southeast Asia, where current battery prices look set to bring BEV costs below those of ICE vehicles

The reality of the [battery] oversupply from China, but also the pricing, could very well be a benefit in terms of providing access to entire countries and societies that cannot afford it otherwise

POLICY LEADER, EMERGING ECONOMY

The surge in battery supply is also fuelling growth in the energy storage market

Annual installed battery energy storage capacity and announced pipeline of projects (GWh, 2018-'23)



Note: 1) As of June 2024, estimated start year not stated;
Source: S&P Global; EIA; BNEF; Company websites; Business Breakthrough Barometer Sector Survey (N=250); Business interviews; Bain analysis

- Companies expect the BESS sector to become one of the use cases for growing battery production
- BESS operators do not typically engage in long-duration offtake agreements common among auto OEMs, and tend to be more price sensitive and less concerned about energy density
- Lower battery prices opens up significant potential for large scale deployment and greater integration of cheap renewables into power grid. However, battery suppliers remain cautious, given challenges in securing regulatory approval and financing for storage projects.

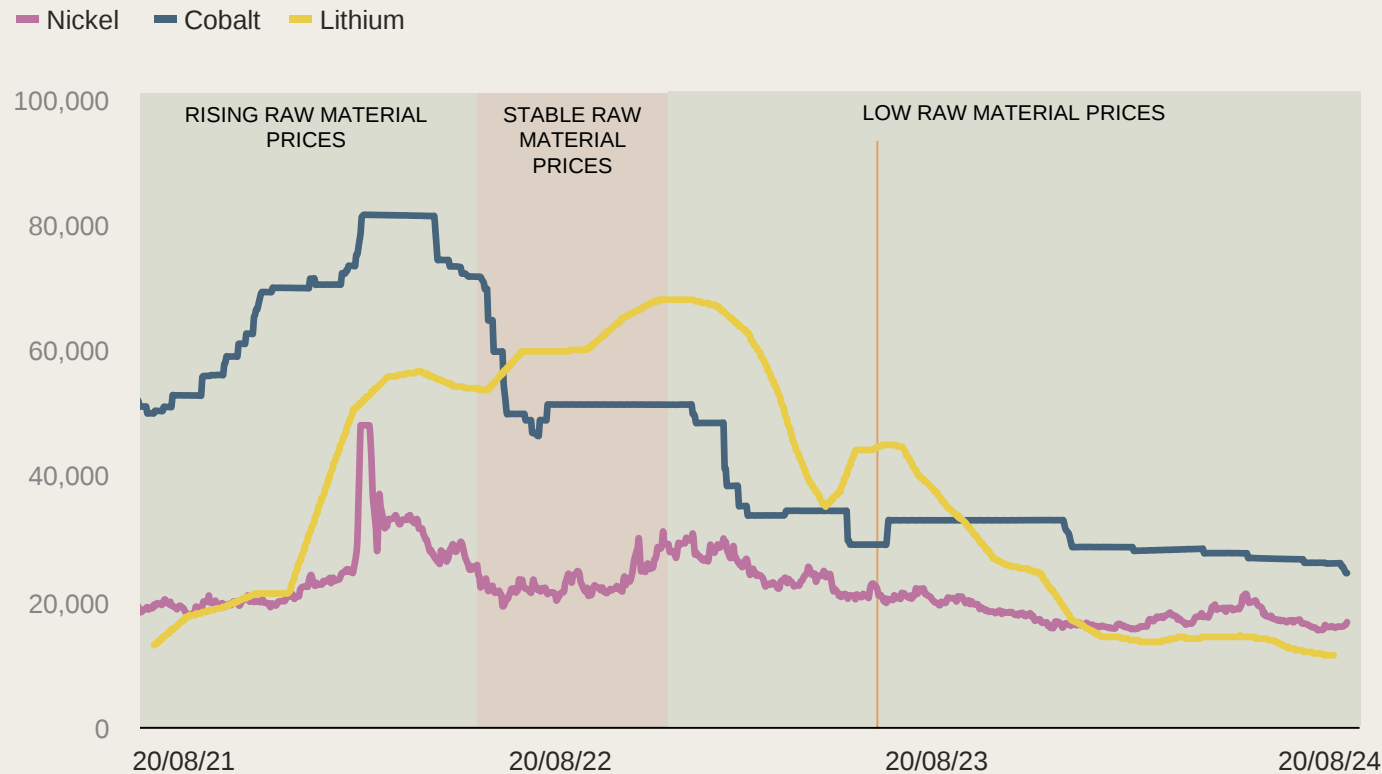
Grid has very, very short buying times.

If the US interconnect queue was not as long as it is, you could put a lot more storage on the grid at a very low cost

CEO,
BATTERY TECHNOLOGY PROVIDER

Looking ahead, businesses are optimistic about the outlook for battery production as supply chain pressure has eased

Lithium, cobalt, nickel price development last 3 years (\$/toe, as of 20/08/24)



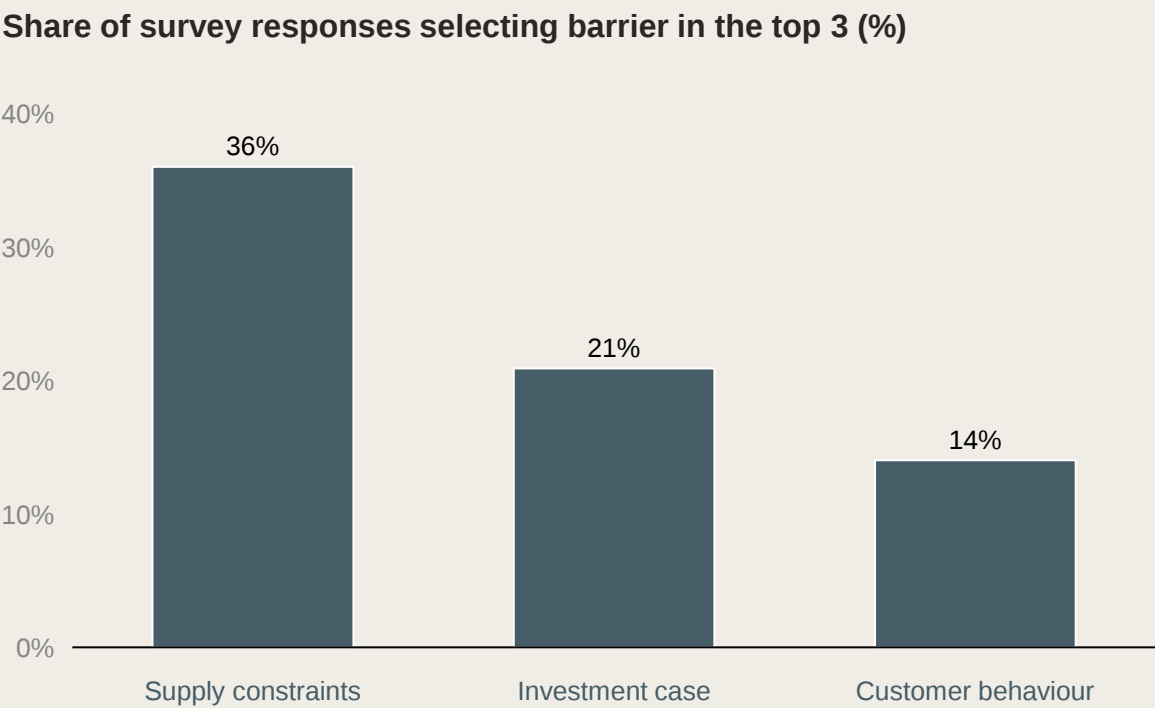
Source: S&P Global; Analyst reports; Bain analysis

- The easing of supply chains has contributed to **notable price declines for key raw materials** over the last 12 months, including a 20% drop in Nickel and Cobalt prices and an impressive 70% reduction in Lithium costs
- **These developments signal promising news for the ongoing electrification** push and the broader adoption of battery technologies



Companies cite consumer misconceptions on reliability, difficulties in scale up and raw mineral shortages as key battery deployment barriers

Which of the following do you view as the sector's largest barriers for accelerating investment in the development and deployment of batteries?
Please select the top 3 most impactful barriers



SUPPLY CONSTRAINTS

- Scaling up production to achieve economies of scale while maintaining required quality remains a significant challenge for manufacturers, with over 10% of planned European capacity being delayed due to quality issues
- Although supply constraints on securing key minerals (e.g. lithium) have lessened, it remains a key concern of business in the long-term for scaling deployment



INVESTMENT CASE

- Companies point to recent uncertainty around EV demand as key barrier for investing into further supply, this is further complicated by recent trade uncertainties with multiple tariffs being put in place
- As projects are highly dependent on scale to enable required economics, recent cost inflation have significant impact on project viability



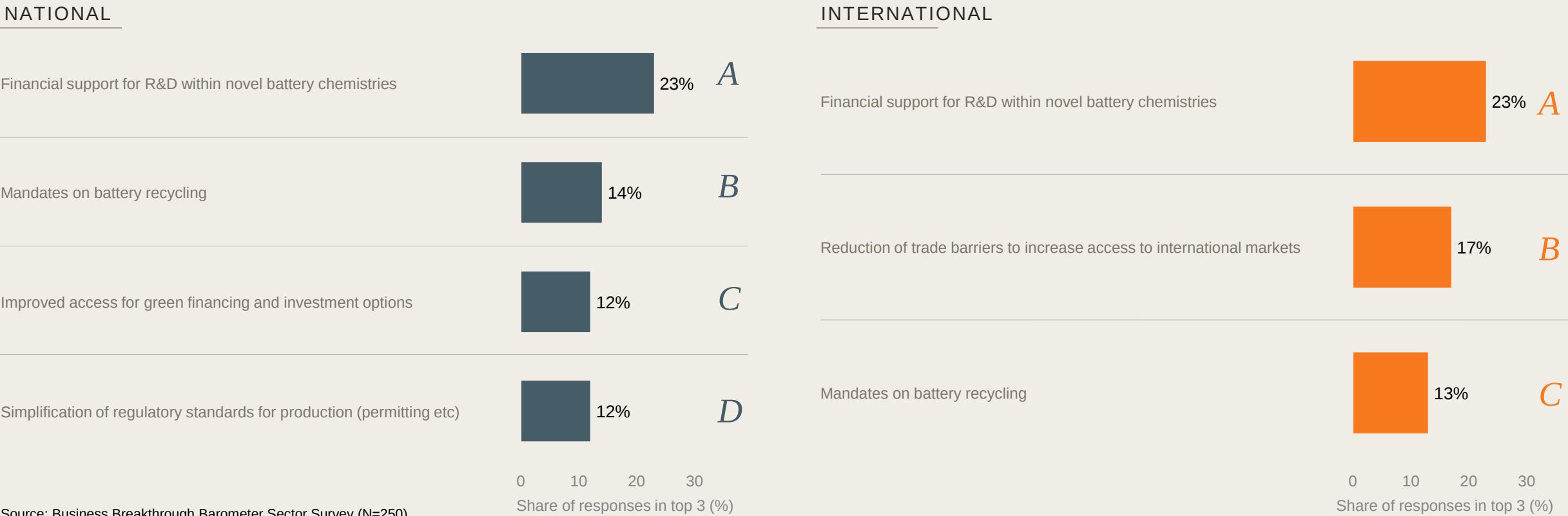
CUSTOMER BEHAVIOUR

- Companies still cite there are considerable misconceptions on battery reliability among consumers holding back adoption, however according to leading auto manufacturers this is more driven by lack of charging infrastructure rather than range of the vehicles themselves

Source: Business Breakthrough Barometer Sector Survey (N=250); Business interviews; Bain analysis

Sector sees key policy in R&D support, reduction of trade barriers, battery recycling, improved access to financing and simplifying permitting

WHAT ARE THE TOP THINGS REGULATORS SHOULD FOCUS ON IN THE NEXT 12 MONTHS TO ACCELERATE INVESTMENT IN THE DEVELOPMENT AND DEPLOYMENT OF KEY TECHNOLOGIES AND SOLUTIONS TO ENABLE THE NET ZERO TRANSITION WITHIN THE BATTERY SECTOR?



Source: Business Breakthrough Barometer Sector Survey (N=250)



Business point to policy interventions within R&D support, investment stability, and simplified permitting as top priorities for government

Policy focus

National

International



/ CONFIDENTIAL - DRAFT

 Increasing **R&D support for novel battery technology** to accelerate further performance gains in for example BEV range or unlock novel use cases such as long-term battery storage

 Establish a **stable investment environment** for battery manufacturers with defined vision and commitments to domestic production of strategic industries, supported by a clear policy framework

 **Simplifying regulatory standards for production** to increase confidence in construction timelines as several key projects have been delayed due to lengthy permitting processes

Thank *You*



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