

# Manufacturing of Batteries in ASEAN

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June 14, 2023



# ASEAN countries are moving towards net-zero, ~\$100 bn opportunity arises from low carbon mobility and clean power

## ASEAN countries are making Net Zero Commitments

### In policy document



Laos



Singapore



Cambodia



Thailand



Vietnam

### Declaration/ pledge



Malaysia<sup>1</sup>



Indonesia



Brunei

### Proposed/ Target under discussion



Myanmar

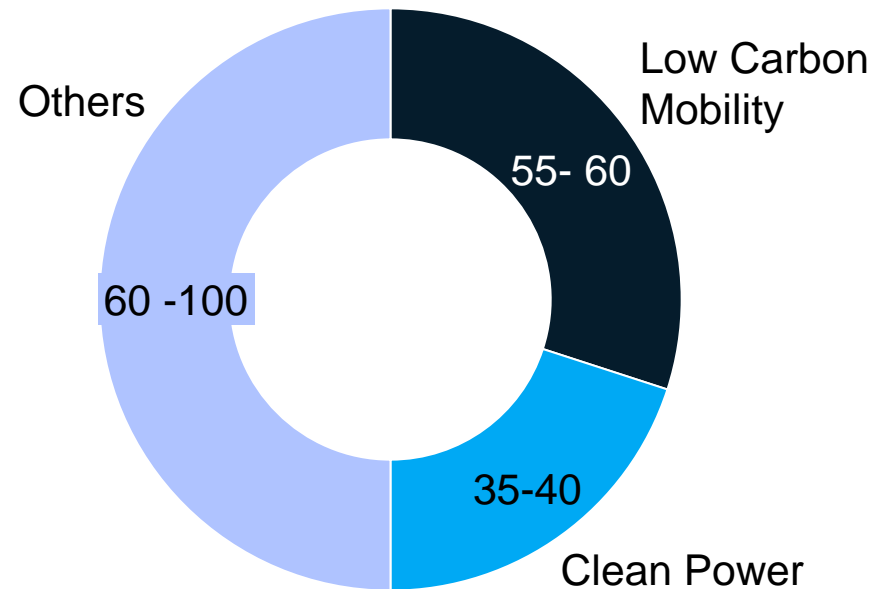


Philippines<sup>2</sup>

1. Carbon neutral target
2. Reduction v. BAU target
3. Energy sector only

4. Defined as (annualized) revenue pools across the themes which is distinct from and smaller than capex investment pools which apply across the lifetime of projects. For example, the clean power revenue pool is estimated by taking the LCOE of renewable energy generation sources (\$/MWh) multiplied by the installed capacity by 2030, assuming 25 year project lifespan

## 2030 ESTIMATED SUSTAINABILITY REVENUE POOLS<sup>4</sup>, \$B



Electrification of vehicle power trains – 2W and 4W  
 Charging infra and energy services  
 EV financing and maintenance  
 Fleet electrification

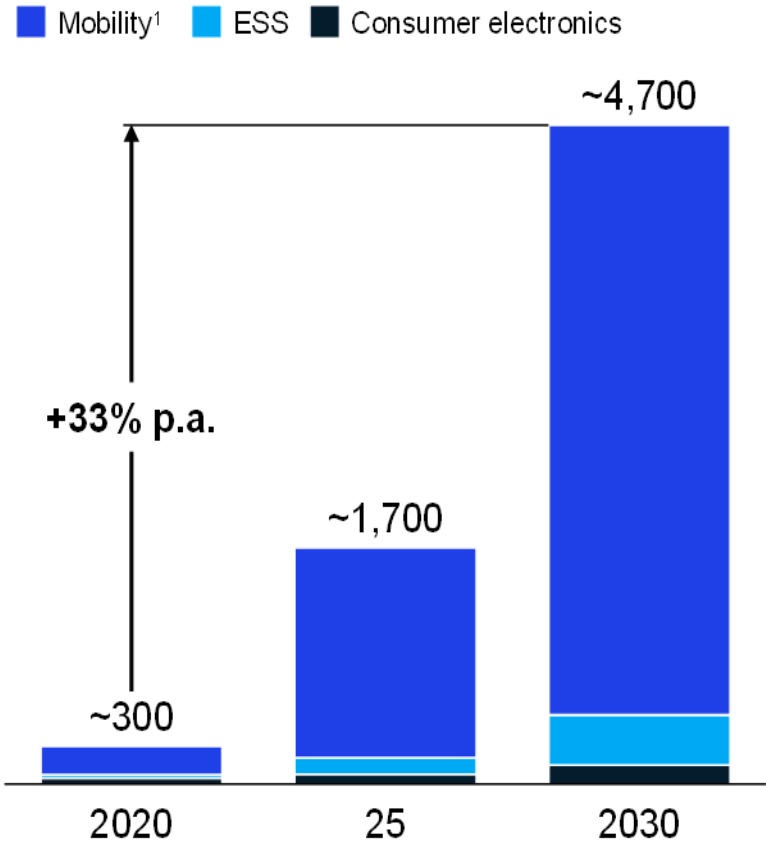
Renewable power generation (solar PV, wind, geothermal, hydro)  
 Microgrids and resiliency  
 Flexibility and energy storage

High efficiency buildings  
 Industrial decarbonization  
 Hydrogen  
 Low Carbon agriculture  
 Bio-energy  
 CCUS, NCS

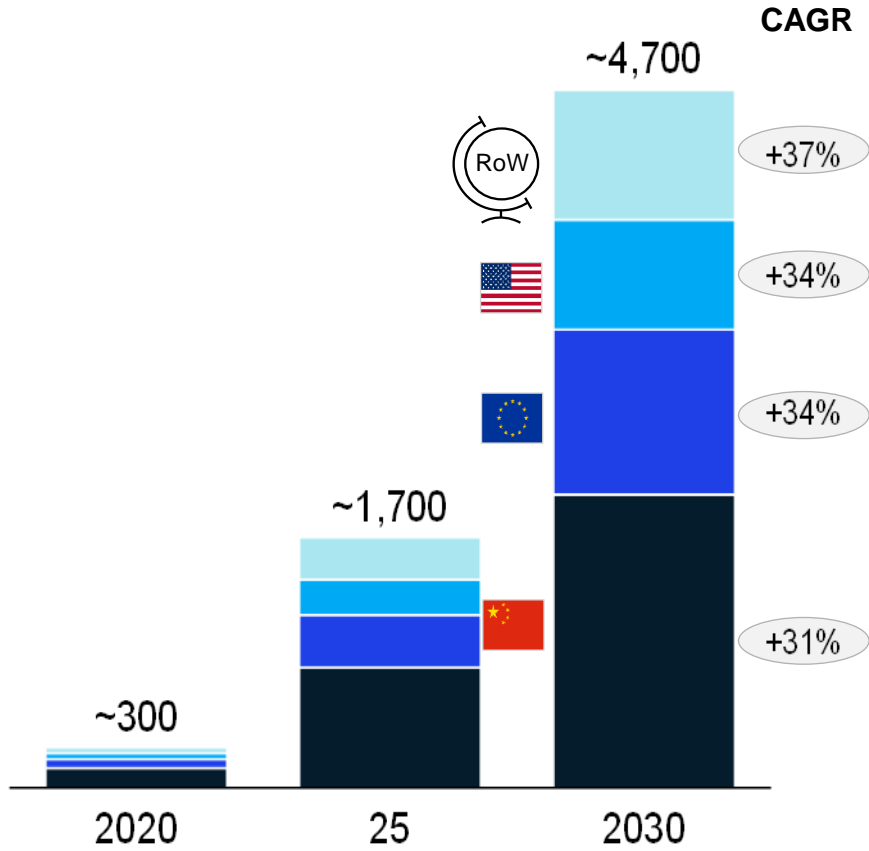
# Li-ion battery demand is expected to grow by ~33% p.a. reaching 4.7 TWh by 2030, while most demand is concentrated in China (~40%)

2022 Q4 Base case

Global Li-ion battery cell demand by sector, 2020-2030, GWh



Global Li-ion battery cell demand by region, 2020-2030, GWh



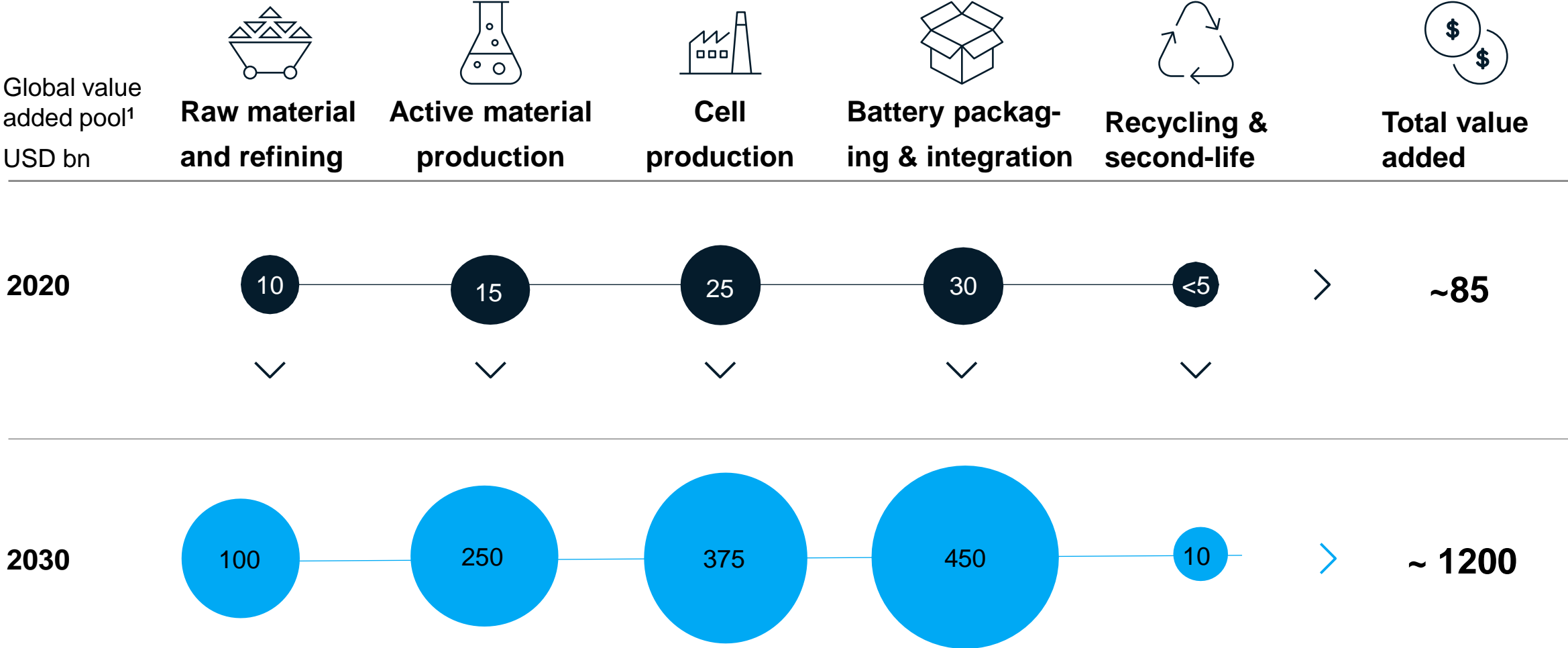
### Key insights

- ~ 90% of demand driven by the mobility sector
- ~40% of demand to come from the China market
- Significant growth in US & EU due to regulation and localization

**~18 x**  
growth in GWh battery demand from 2020 to 2030

1. Incl. Passenger cars, Commercial vehicles, 2-3 wheelers, off highway vehicles and aviation

# Large growth of revenue pools along battery value chain expected with revenue for cell production reaching USD 375 bn by 2030



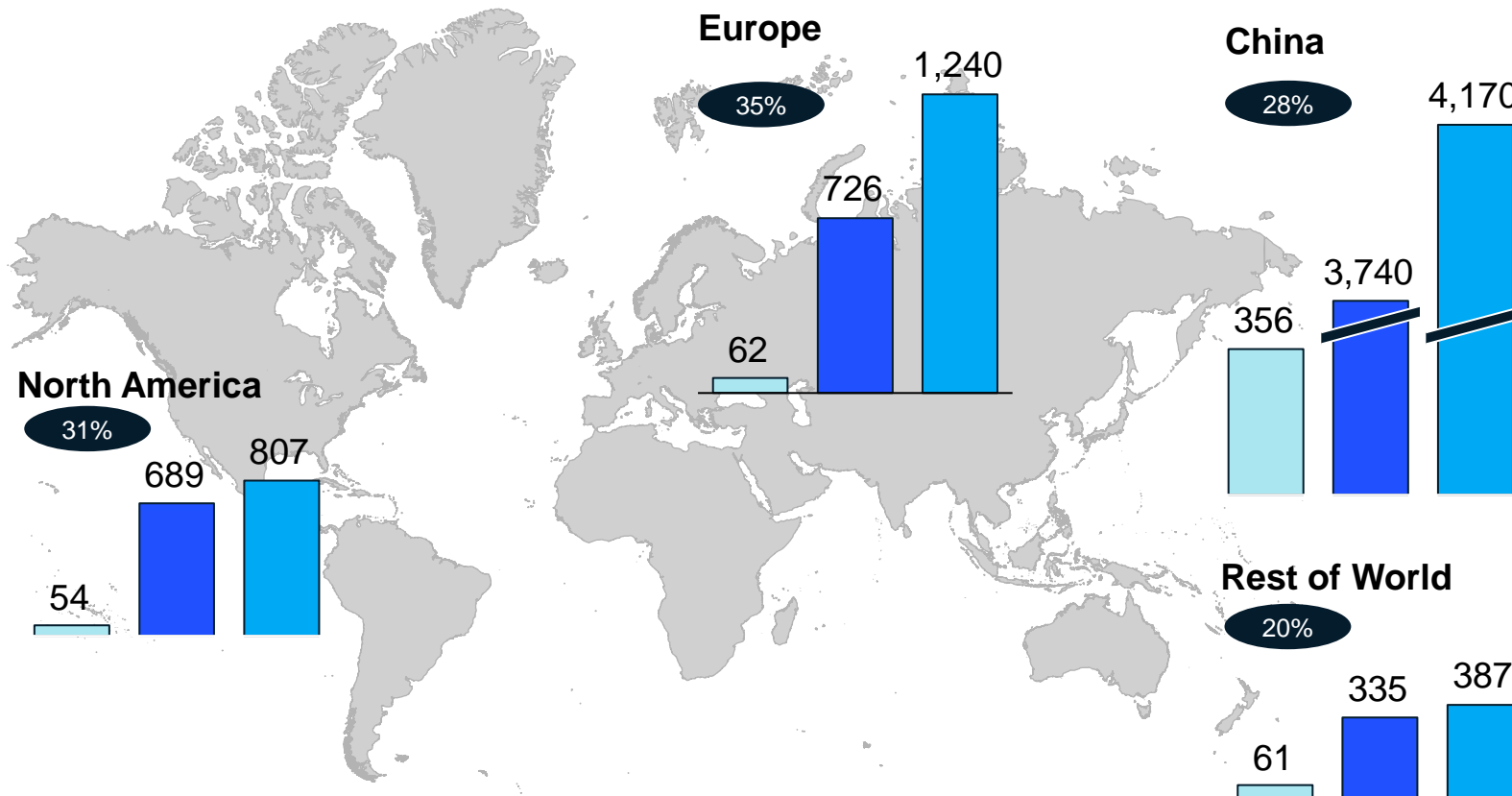
1. Each value pool calculation is irrespective of the previous value chain step (not cumulative)

Source: McKinsey Battery Insights, Securities research, Expert interviews, Yano Research, Press search

# Fast growth of announced battery production capacity (CAGR 30%) with increasing share of Europe and North America

X% CAGR, 2020-30    2020    2025    2030

## Announced battery production capacities, GWh, 2020 - 2030



## Key insights




Announced **battery supply reaching 6.6 TWh** by 2030, exceeding expected battery demand (~4.8 TWh)

**Fastest growth in production capacity in Europe (CAGR 35%) and North America (CAGR 31%)** driven by localization trends

**China to remain largest producer of battery cells** with share of ~60%, followed by Europe (~20%) and North America (~10%)

# Localization of battery production is incentivized by different regulations around the globe

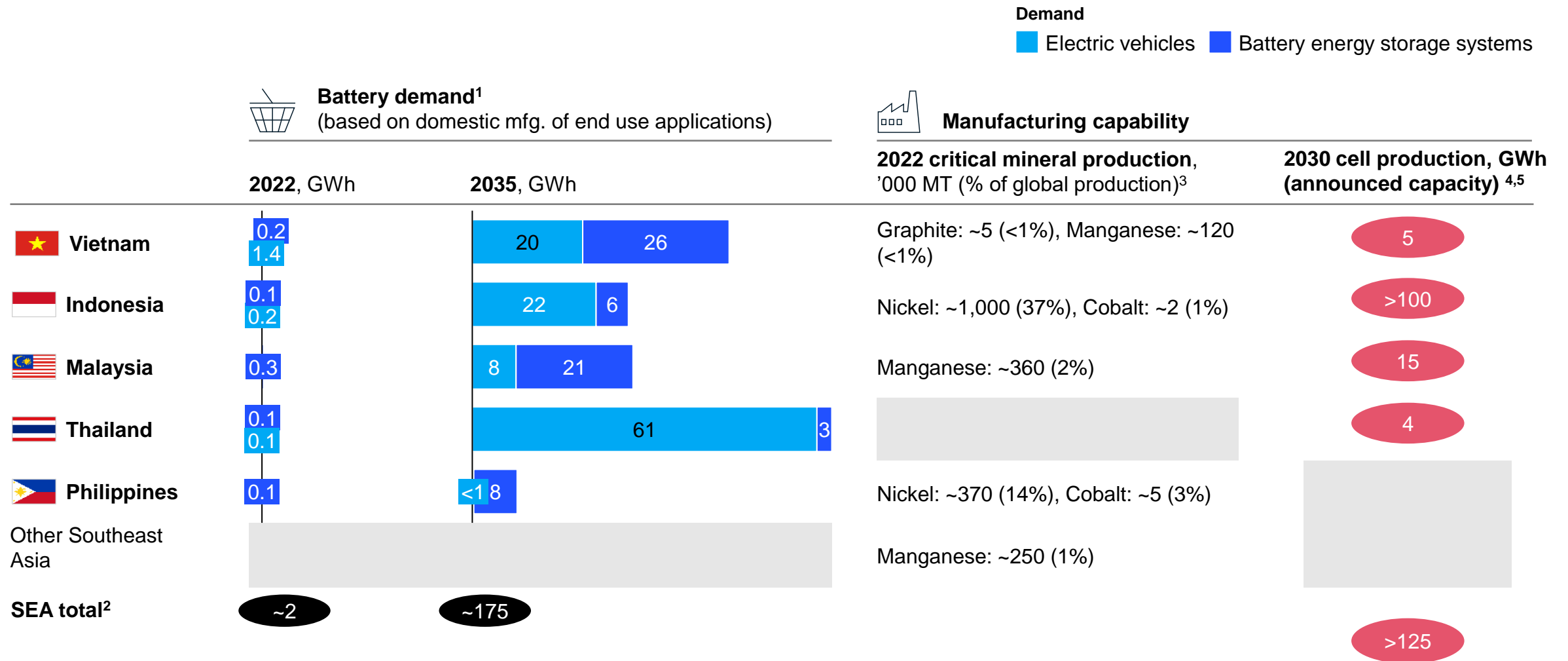
Not exhaustive

Incentive program	 Inflation reduction act (IRA)	 Product Linked Incentive (PLI)	 Access to raw materials (i.e., Nickel)
Description	<p>Provides subsidies to EV buyers, given that a <b>predefined share of battery raw materials and battery manufacturing was done in the US</b> or a country with free-trade agreement</p> <p>Additional <b>tax credit for cell, module, and active material producers</b> manufacturing in the US</p>	<p><b>Subsidy for up to 50GWh of cell production</b> for participating companies. Amount of subsidy tied to <b>share of domestic value creation and technical performance of cells</b> (i.e., cell energy density and cycle life)</p>	<p><b>Limiting exports of large domestic nickel resources</b> (e.g., through export bans and taxes) <b>to incentivize local downstream processing</b>. Setting up <b>local battery production</b> in JV with leading global incumbents and <b>government owned battery company</b></p>

Sample players setting up production



# Demand expected to accelerate in some Southeast Asian economies post 2025; >125 GWh of cell capacity announced



1. EV demand is estimated based on company announcements on production plans, analysis of historic growth, customer demand, regulatory trends and EV cost projections in a current trajectory scenario. BESS demand is estimated bottom up (for residential), least cost optimization for meeting power requirement, and company announcements on production plans; 2. Cambodia, Myanmar, Laos, Singapore, Brunei are excluded due to limited battery demand, mineral reserves, and production output; 3. Thousands of metric tonnes (MT); 4. Based on company announcements where information on capacity output and start of commercial operations are known; does not account for delays and unrealized plans. Excludes any unannounced projects / future developments as of Feb 2023; 5. Limited production across SEA in 2023 with the exception of Vietnam (2k MT cathodes)

# Strong momentum from manufacturers, however 5 key success factors needs to address their pain points

Not exhaustive

Player type  Foreign player  Local player

## Example of announced projects

### Indonesia

**Cells**  
(10GWh; planned)

**Mining, processing, cathodes, cells, recycling**

### Thailand

**Cells and modules**  
(1GWh; planned)

**Cells (1GWh)**

### Vietnam

**Cathodes**  
(2k tonnes)

**Packs**  
(5GWh; planned)

### Malaysia

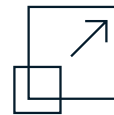
**Cells**  
(capacity not announced; planned)

**Cells**  
(capacity not announced; planned)

### Philippines

**Packs**  
(capacity not announced)

## Manufacturer's pain point



**Scale of domestic demand:** Only selected countries have strong domestic EV market demand, driven by government policy to sustain 1-2 giga factories



**Export potential:** Clear aspiration to serve exports, however, poor ESG standards may be a barrier



**Cost competitiveness:** Selected countries have nickel reserves and availability of upstream partners with established plan for upcoming refining capacity and tax benefits; however limited talent availability, equipment suppliers, lack of infrastructure leads to higher costs.



**Policy support :** Room for improvement in policy development transparency and a comparatively lower world Bank score on ease of doing business

## Key success factors



**Early aspiration alignment at national level** to go "all-in"



**Government's role in proactively initiating and promoting policies** that stimulate demand and encourage manufacturing investment



**End to end value chain integration** – to enhance cost competitiveness



**Partnership development with global players** – allowing further global market expansion and operation improvement



**Continuous policy evaluation** to ensure effectiveness of implementation



## Recap of key messages



**Li-ion battery demand is growing globally by ~30% CAGR 2020-2030**, driven by rapid electrification of mobility and increasing need for stationary storage, expected to reach total **market size of ~4,7 TWh by 2030**

There is **an increasing trend toward localizing battery value chain**, reducing the dependency of battery imports driven by subsidies (e.g., US IRA, Indian PLI scheme) and securing privileged access to raw materials (e.g., access to Nickel in Indonesia)

Battery demand expected to accelerate in some Southeast Asian economies post 2025; **>125 GWh of cell capacity** announced from ~1 GWh today

**Key success factors** e.g. government's proactive approach and alignment at national level, end to end value chain integration, partnership with established players needed to be implemented to **address manufacturers concerns on scaling the battery production capacity**