Threats and opportunities from e-mobility for auto parts manufacturers in Southeast Asia

21 July 2022

FUTURE MOBILITY ASIA
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CX X

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VC X

Value Chain Transformation

EX

Enterprise Transformation

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Expanding corporate capabilities with the help of digital technology

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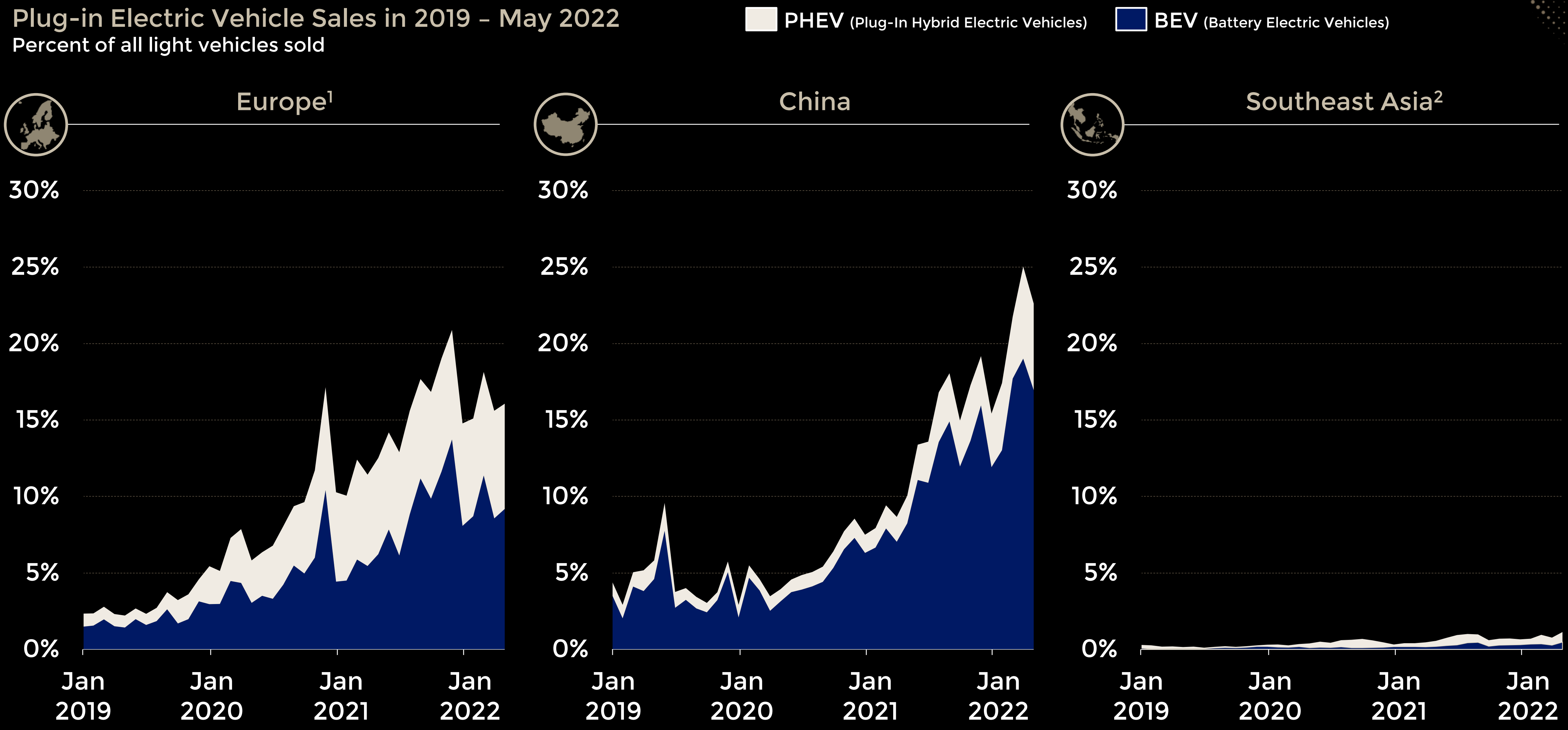
Contents

1 | Current EV market situation: EV adoption hampered by limited supply

EV adoption is rapidly accelerating – but not in Southeast Asia



1 Based on data from Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Poland, Portugal, Romania, Russia, Slovakia, Spain, Sweden, Switzerland, Turkey, UK, Ukraine

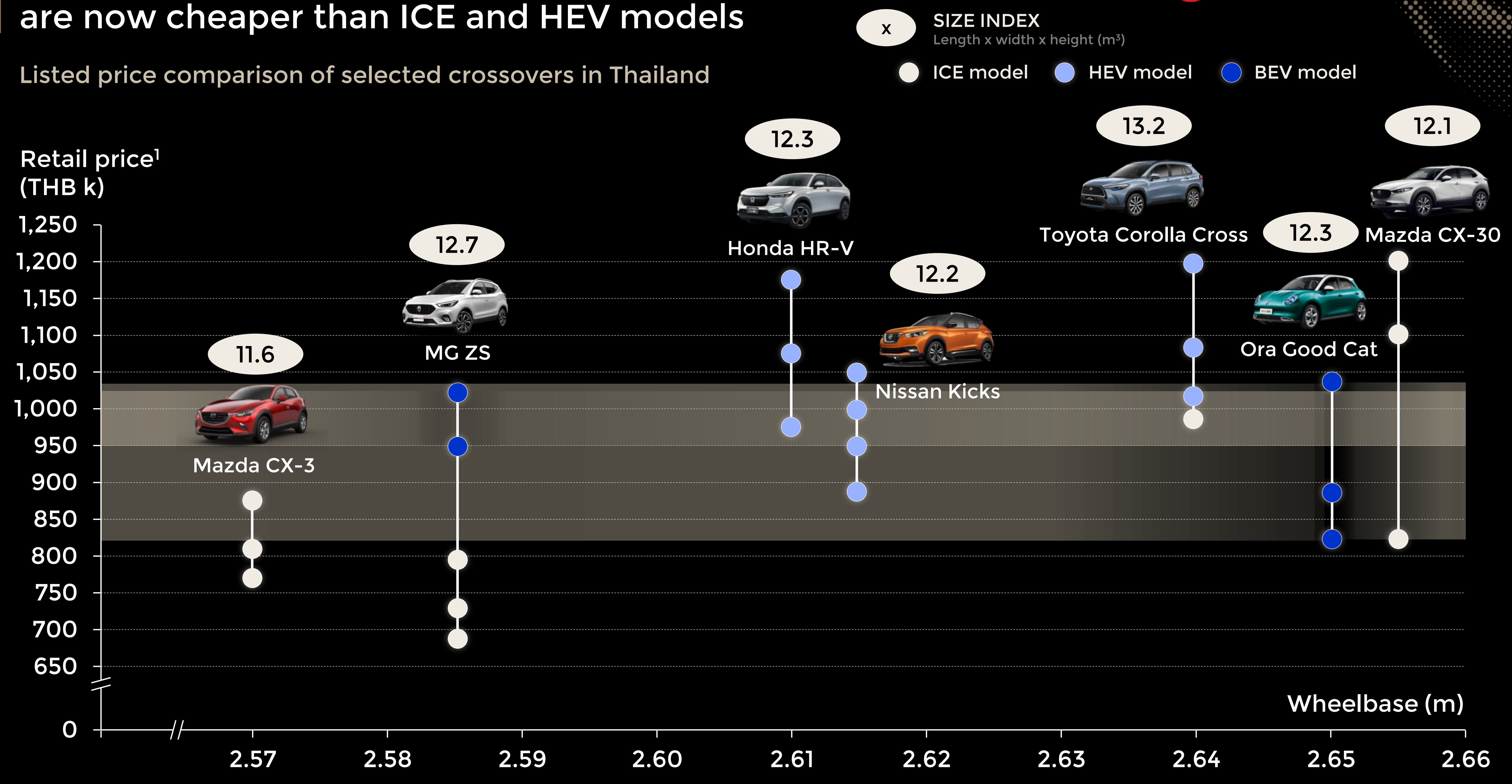
2 Based on data from Indonesia, Malaysia, Thailand, Philippines and Singapore

 Source: EV Volumes, ABeam Consulting analysis

In Thailand, thanks to the government incentives, some BEV are now cheaper than ICE and HEV models

THAILAND

Listed price comparison of selected crossovers in Thailand



1 Price after government incentives for BEVs

 Source: Vehicle OEM websites, ABeam Consulting analysis

Even for vehicles based on the same vehicle platform, the TCO of BEV for new buyers can already be very close to that of ICE

THAILAND

Total Cost of Ownership (TCO) – 5 years and 80,000 km[1]

THB k

x DIFFERENCE VS. ICE

MG ZS 1.5 X+ (ICE)

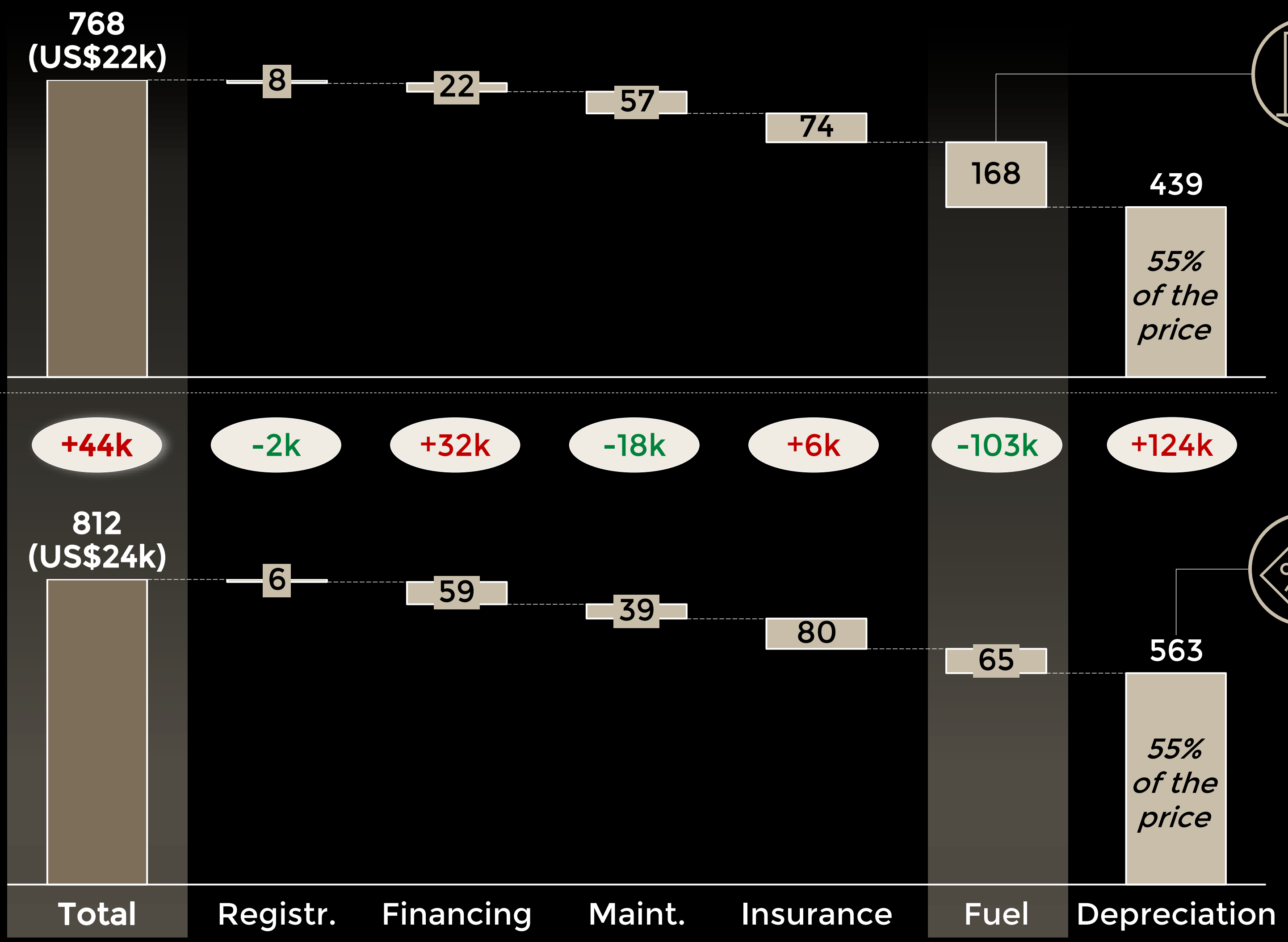
Listed price:
THB 799k (~US$23k)

- Power: 114 PS
- Fuel tank: 48 l
- Max range: ~700km

MG ZS EV X (BEV)

Listed price (after incentives):
THB 1,023k (~US$30k)
THB 224k (28%) more than ICE

- Battery: 50.3 kWh
- Max range: 403km (NEDC)
- Power: 177 PS
- Extra content vs. ICE:
  - Home charger
  - ADAS



>150% higher fuel cost for ICE vehicles

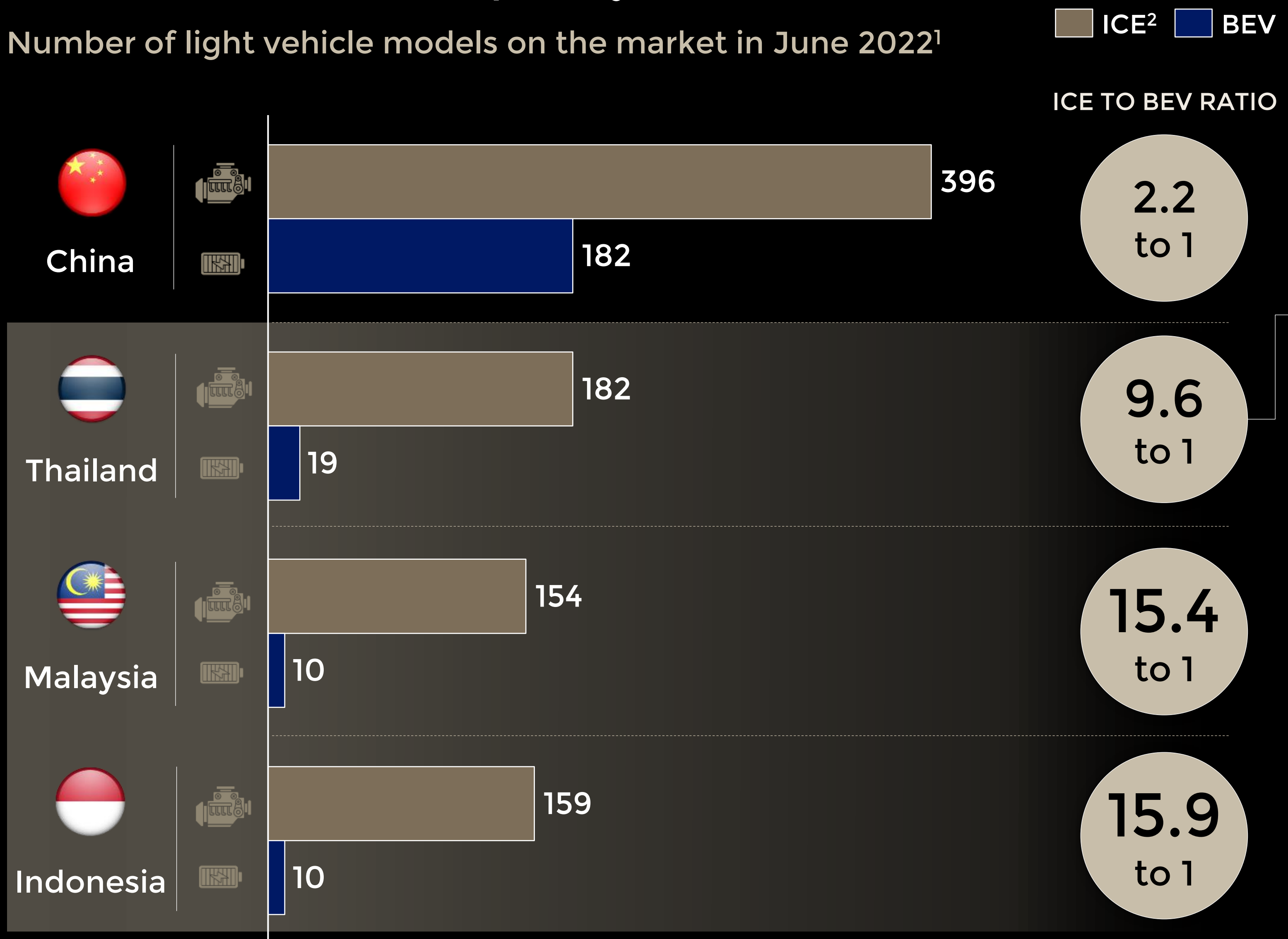
>25% higher due to higher upfront cost (in the future BEV expected to depreciate at a slower rate)

1 Key assumptions | Financing: 0.9% interest for ICE and 1.99% for BEV with 25% down payment for 48 months; Fuel cost per 100km: ICE – THB 210 (7 litres x THB 30), BEV – THB 81 (15kWh x THB 5.4)

 Source: MG website, ABeam Consulting analysis

The key factor hampering EV adoption in Southeast Asia is a limited supply, which should be temporary

Number of light vehicle models on the market in June 2022[1]



BEV sales suspension (e.g. GWM and MG in Thailand) due to supply shortage

Outlook in Southeast Asia

- New brands entering (e.g. NETA, BYD, Geely)
- Mass-market brands launching new BEVs (e.g. Toyota)
- Semiconductor shortage will ease
- Significant government incentives introduced recently

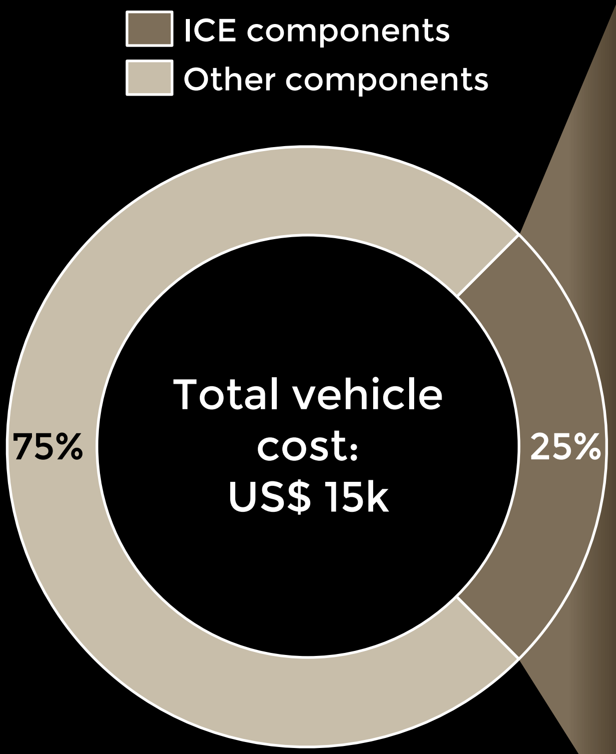
1 Does not include models that are not officially imported
2 Nameplates (models) with at least one ICE engine derivative (pure ICE or hybrid)

 Source: Vehicle OEM websites, EV Volumes, ABeam Consulting analysis

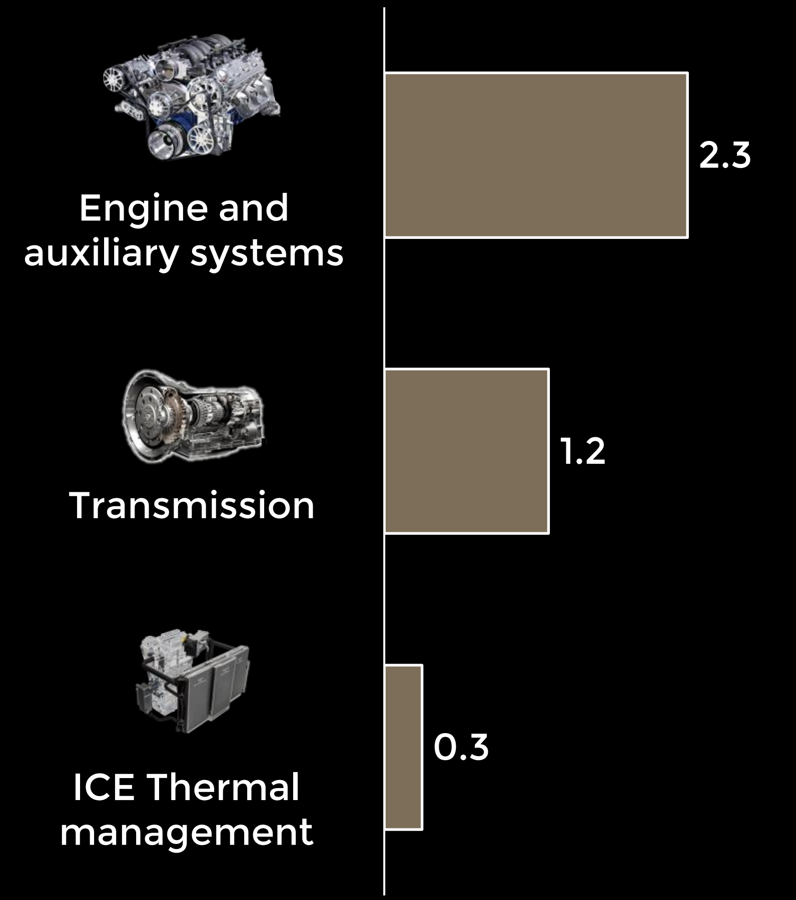
2 | E-mobility: how big is the threat and how big is the opportunity?

ICE components account for approximately 25% of the direct vehicle cost

Direct cost of ICE vehicle in Southeast Asia[1]
US$ k



ICE components value
US$ k



Impact magnitude for Thailand (illustrative example)

Thailand's ICE component industry size is over **US$8 Bn** per year (pre-Covid)

>350 suppliers (over 20 % of all suppliers in Thailand) produce ICE components

>200,000 people employed in ICE component manufacturing[2]

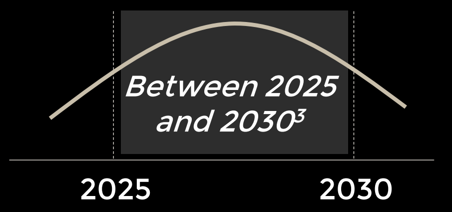
1 Assuming a crossover vehicle, does not include dealer and OEM margin and OEM indirect costs such as SG&A and Capex
2 Includes ICE component manufacturing conducted by suppliers and vehicle OEMs

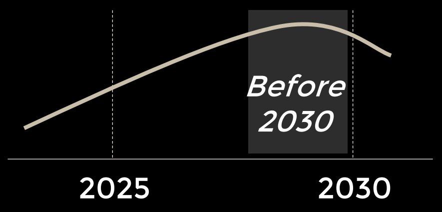
 Source: Thailand Automotive Institute, Ministry of Commerce in Thailand, ABeam Consulting analysis

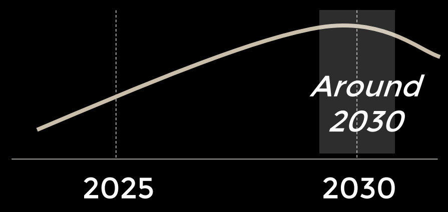
In the short-term, the ICE powertrain industry may gain from the move to more stringent emission standards, but longer-term ICE content decrease is inevitable

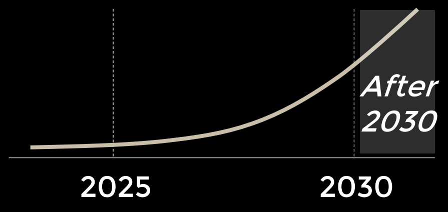
Overview of selected powertrain trends related to clean mobility in the light vehicle segment in Southeast Asia

	NEW EMISSION STANDARDS FOR ICE	HYBRIDIZATION (HEV)[1]	PLUG-IN HYBRIDIZATION (PHEV)	FULL ELECTRIFICATION (BEV)
FUTURE EXPECTATIONS	✓ Possible implementation of EURO V or VI standard in the 2020s in Indonesia, Thailand, the Philippines ✗ Likely, no EURO VII implementation	✓ More hybrid models among Japanese OEMs ✗ Limited offering from other OEMs	✓ More PHEVs from premium and mass-market OEMs	✓ Most OEMs expected to have BEVs in their portfolio by 2030
TYPICAL IMPACT ON ICE CONTENT VALUE PER VEHICLE	~0%[2] Gasoline engines +5-10%[3] Diesel engines	-15-25% *smaller engine core, cylinders, pistons*	-0-5% *most PHEV models have smaller fuel tanks but keep large engines*	-100%
PEAK MARKET ADOPTION (As the share of all powertrains)	Between 2025 and 2030[3]	Before 2030	Around 2030	After 2030









1 Does not include mild hybrids 2 Additional compliance cost for EURO 5 vs. EURO 4 3 Showing peak of adoption for EURO V and VI engines

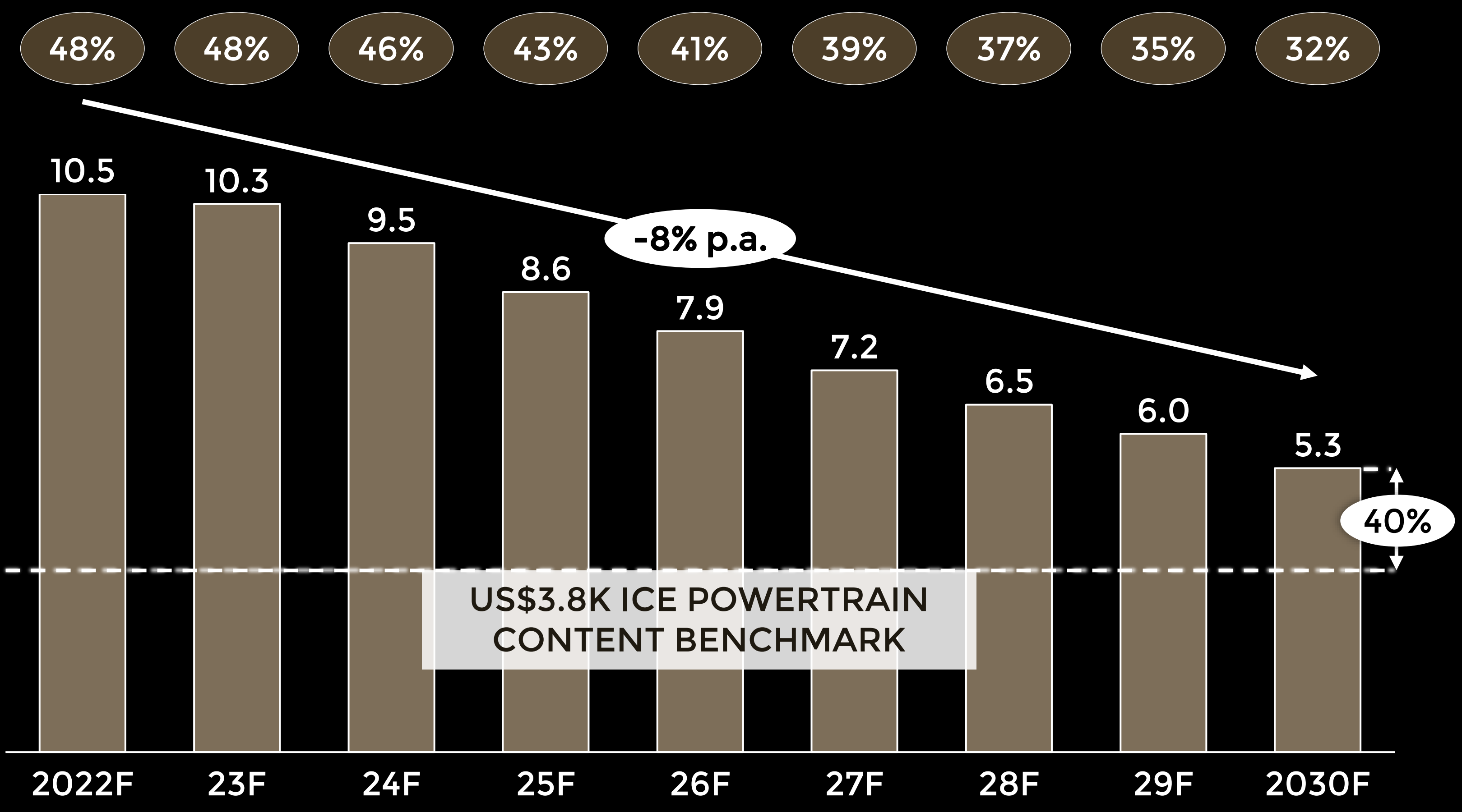
 Source: ICCT, ABeam Consulting analysis

Over time, BEV content value per vehicle will decrease, but even in 2030 it will be ~40% higher than the current ICE powertrain content

BEV powertrain related content per vehicle[1]

2022 US$k, based on a crossover with a 50 kWh battery

x SHARE IN THE DIRECT COST OF THE VEHICLE[1]



Key questions - examples

- What share of the BEV powertrain content will be insourced vs. outsourced?
- How to achieve high localization rates in Southeast Asia?
- What markets within and outside of Southeast Asia can be tapped into for BEVs?

BEV powertrain offer an opportunity for suppliers and vehicle OEMs to increase their revenues

1 Does not include dealer and OEM margin and OEM indirect costs such as SG&A and Capex, assumes no inflation and fixed other equipment content and prices for illustrative purposes

 Source: HSBC, BNEF, ABeam Consulting analysis

New entrants are making large investments in the EV supply chain already

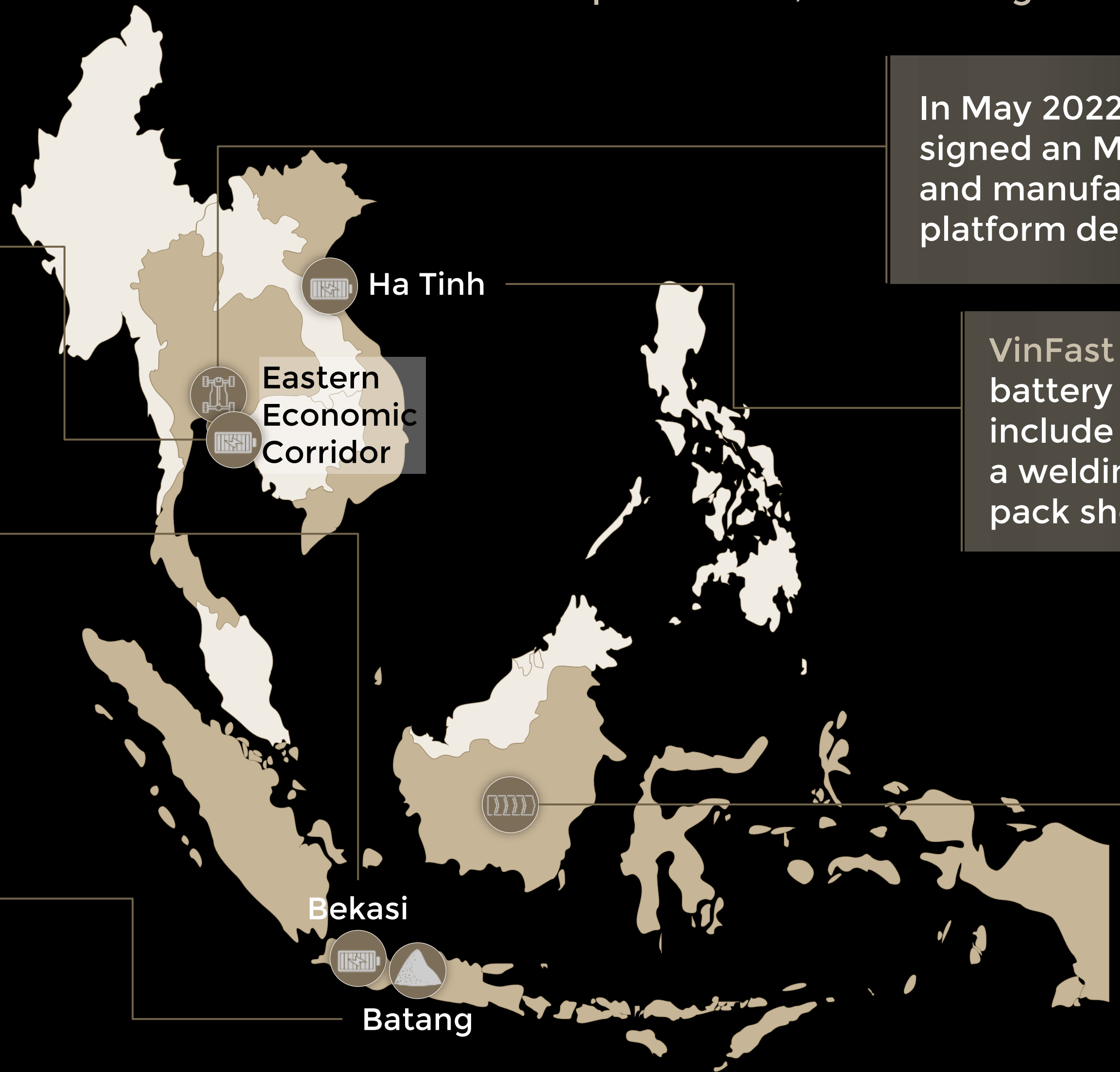
Major (over US$150M) investments in Southeast Asia related to EV powertrain, excl. mining and ore processing

Investment size in US$

$0.2Bn — In December 2021, Energy Absolute opened a 1 GWh EV battery cell plant

$1.1Bn — In 2021, LG Energy Solution and Hyundai Motor Group began construction of a 10 GWh EV battery cell plant

$2.4Bn — LG Energy Solution to build a factory to produce 220kt of precursor and 42kt of cathode per year to supply the battery plant in Bekasi



In May 2022, PTT and Foxconn signed an MoU to jointly develop and manufacture a vehicle platform dedicated to EVs — $1.0Bn

VinFast is building an EV battery pack factory that will include a casting shop, a welding shop and battery pack shop in Phase 1 — $0.2Bn

Framework agreement in April 2022 between CBL, ANTAM and IBI[1] to invest in an integrated EV battery project in various locations in Indonesia — $6Bn[2]

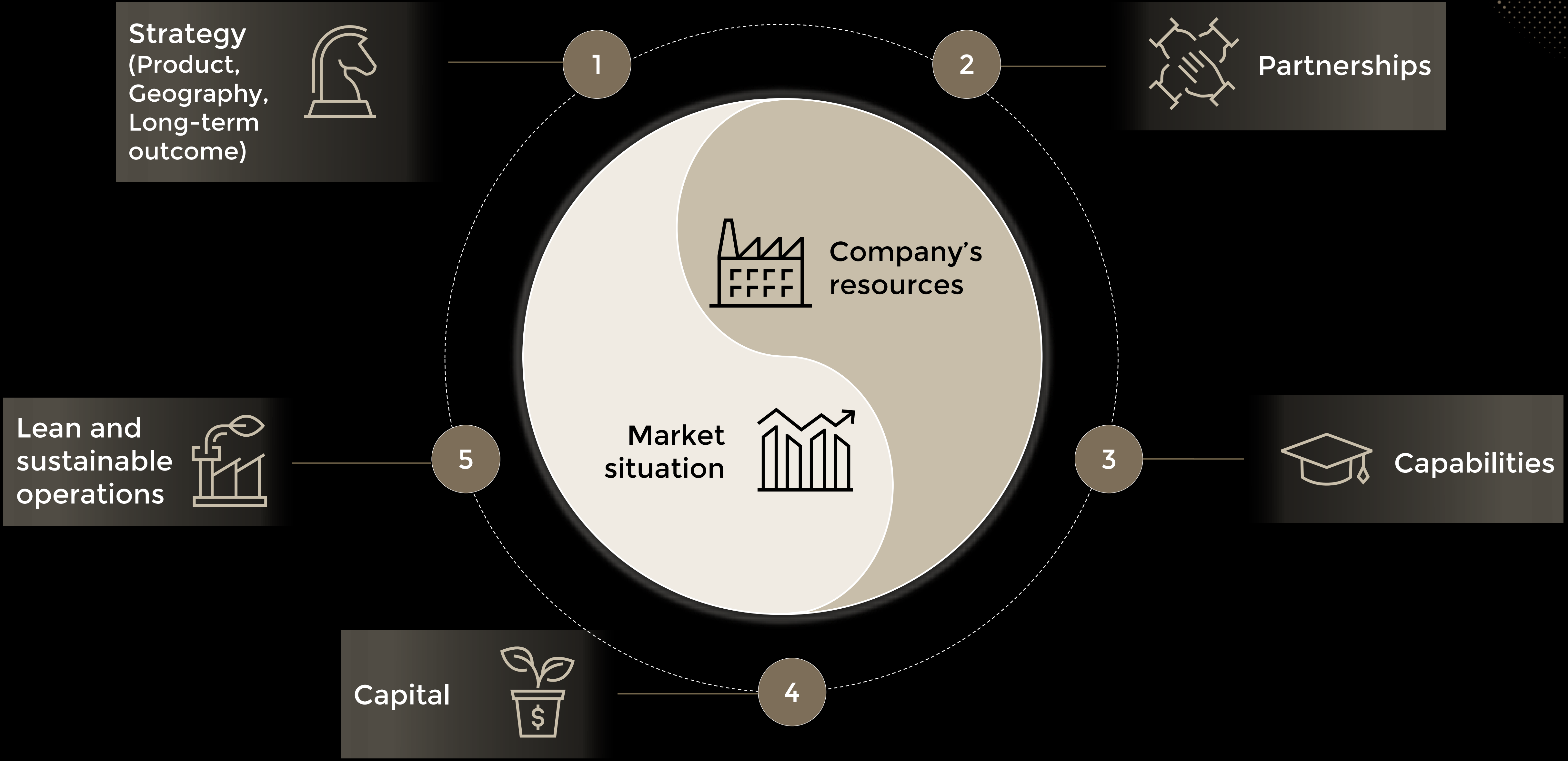
1 CBL – Ningbo Contemporary Brunp Lygend Co., Ltd. (subsidiary of CATL), ANTAM - PT Aneka Tambang, IBI - PT Industri Baterai Indonesia

2 Including investments in nickel mining and processing

 Source: Press, ABeam Consulting analysis

3 | How can parts manufacturers adapt?

Five-step framework for auto parts manufacturers when considering business transformation



 Source: ABeam Consulting

There is no single solution – parts suppliers can play many 'cards'

ILLUSTRATIVE

Examples of actions taken by automotive suppliers

Example	Steps supported
Innovation Unit: Japanese spark plug supplier established a venture lab to co-create new ventures and to invest in start-ups in the areas of EV charging, solid state batteries, ADAS systems and power inverters	Strategy; Capability building; Partner-ships
M&A: German exhaust systems supplier has diversified into a supplier of battery housing and fuel tanks for hybrid vehicles, redox flow batteries and electrical and sensor technologies	Capability building; Partner-ships
CO2 targets and collaboration with sub-suppliers: German ICE powertrain components supplier set to become carbon neutral by 2030 and to make its supply chain carbon neutral by 2040 and it will monitor for compliance with sustainability requirements	Lean and sustainable operations
Digital supply chain: Japanese supplier implemented digital supply chain management system to automate processes and increase end-to-end visibility which resulted in cost reduction	Lean and sustainable operations

 Source: ABeam Consulting

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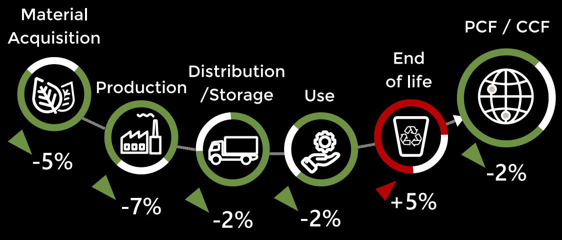

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