

Asahi**KASEI**

# Separator Business Briefing

Construction of plant in Canada for Hipore  
wet-process lithium-ion battery separator

**Asahi Kasei Corp.**  
April 25, 2024

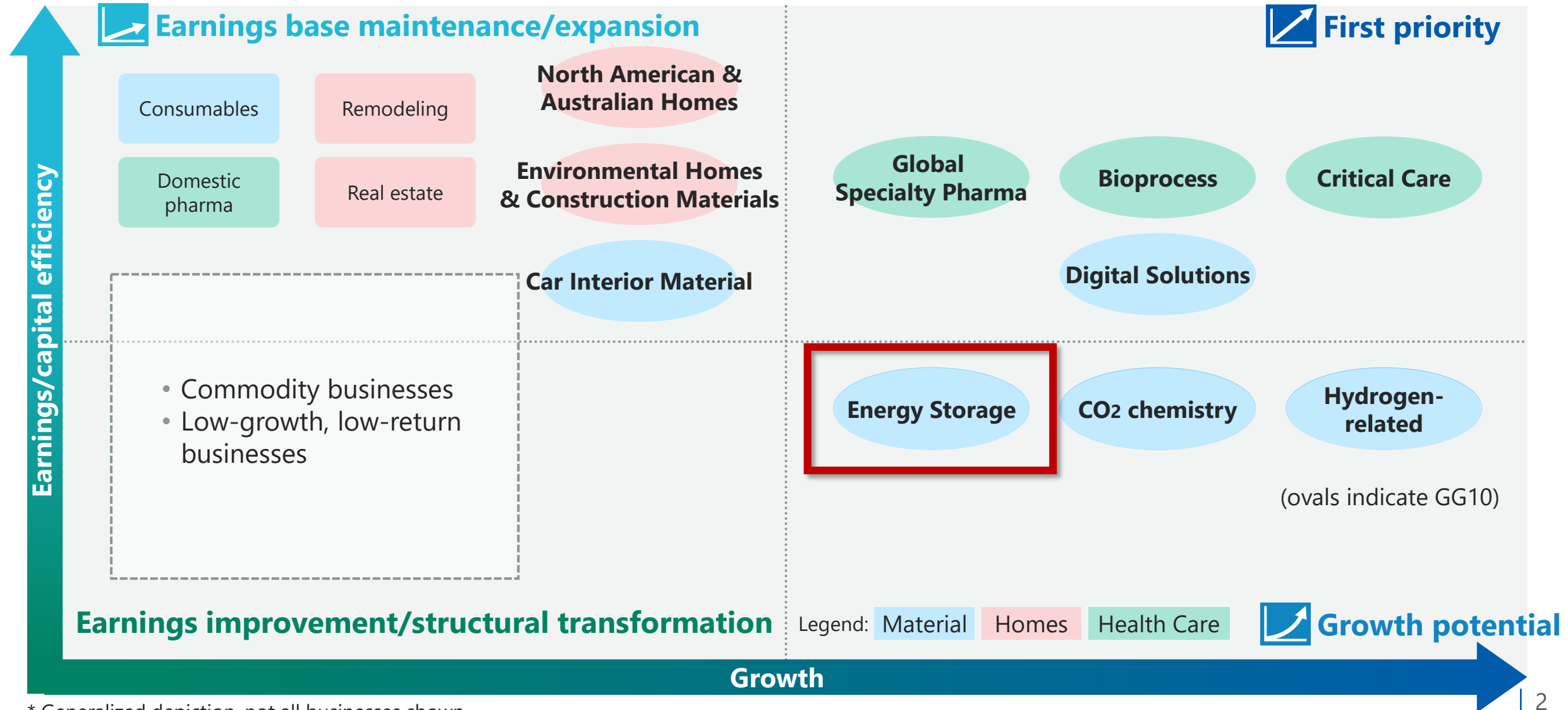


## **Contributing to carbon neutrality through maximum use of intangible assets such as accumulated core technology for membranes**

1. Asahi Kasei has decided to construct an integrated plant in Canada for base film manufacturing and coating of Hipore wet-process Lithium-ion battery (LIB) separator; in 2031, the fifth year of the plant's operation, Hipore sales are expected to be ¥160 billion with an operating margin of  $\geq 20\%$
2. Total investment will be approximately ¥180 billion; in addition to joint investment by the Development Bank of Japan and Honda Motor, financial support will be received from the federal government of Canada and the provincial government of Ontario, allowing Asahi Kasei to attain adequate production scale in accordance with market expansion while controlling investment risk
3. As medium- to long-term growth is forecasted in the North American xEV market, Phase 2 and Phase 3 investments are anticipated; extremely earnest inquiries have been received from vehicle manufacturers and battery manufacturers, and Asahi Kasei considers it vital to assuredly meet the growing demand
4. North American market share of 30% or more is targeted through Phase 3
5. Moving forward, various solution-oriented businesses will be promoted leveraging Asahi Kasei's accumulated battery-related technology in the Energy Storage business centered on separators

# Position of separator business in the business portfolio\*

The separator business is the core of Energy Storage, one of the 10 Growth Gears (GG10) businesses to drive future growth



## Leading technological innovation based on long history as a pioneer in each type of separator

### LIB separator

#### Hipore wet-process separator

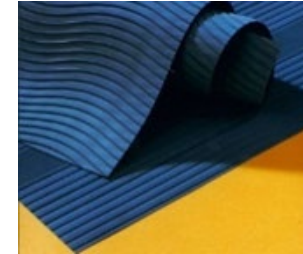


#### Celgard dry-process separator<sup>1</sup>



### Lead-acid battery separator

#### Daramic<sup>1</sup>



#### Characteristics

Over 40 years of history;  
Hipore flourished as separator for LIB invented by  
Asahi Kasei Honorary Fellow Akira Yoshino in 1985

High performance and safety;  
safety and performance further  
enhanced by coating

Well-balanced cost and performance;  
high lithium-ion permeability

Business started in the 1930s;  
polyethylene separator  
developed in 1972

#### Main applications

Consumer electronics

Automotive

BEV (NMC<sup>2</sup>)

BEV (LFP<sup>3</sup>)

HEV

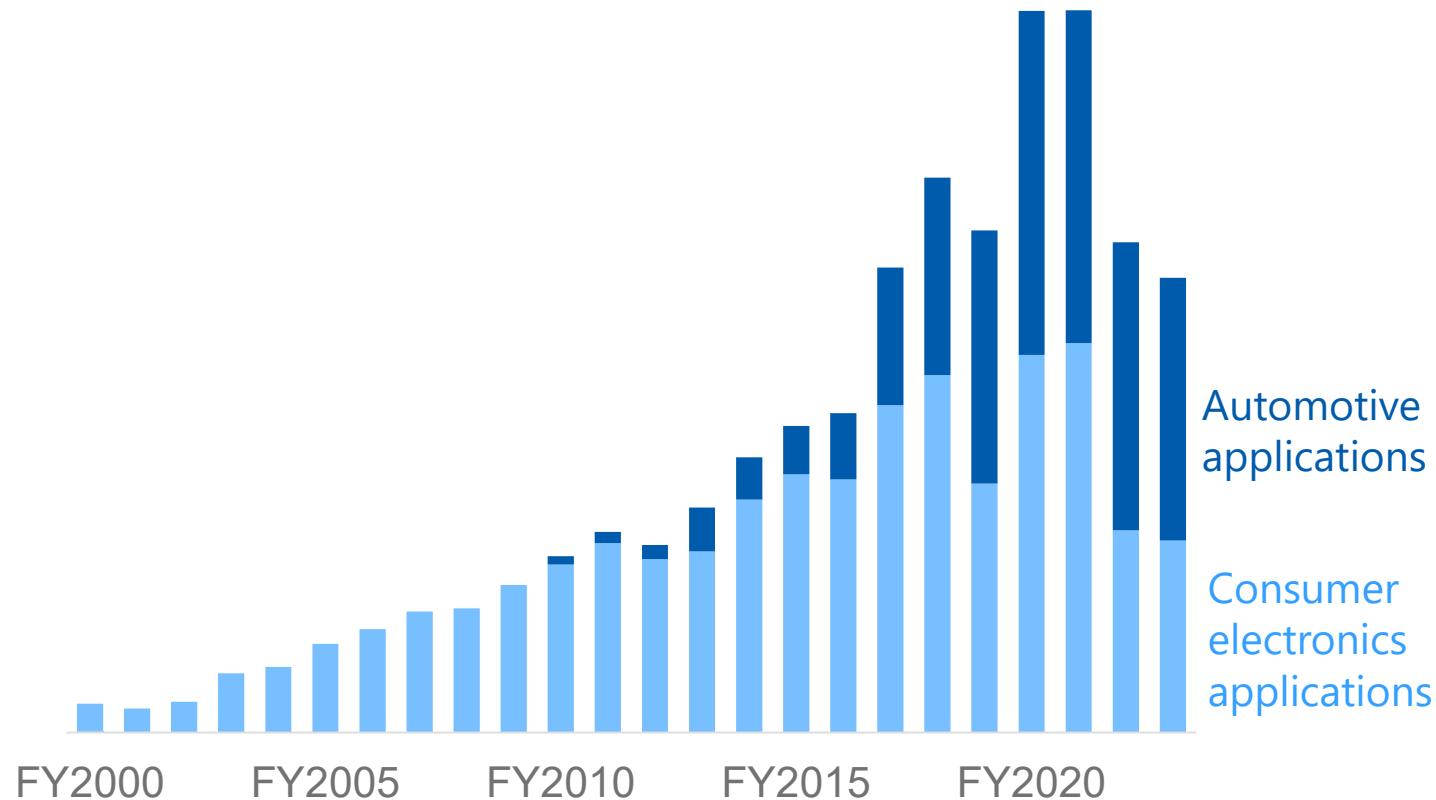
ESS<sup>4</sup>

Automobiles, etc.

<sup>1</sup> Celgard and Daramic acquired with Polypore in 2015. <sup>2</sup> Batteries using nickel-manganese-cobalt cathodes. <sup>3</sup> Batteries using lithium iron phosphate cathodes. <sup>4</sup> Energy storage system

**Hipore volume has expanded, but current situation is challenging with sluggish demand in consumer electronics and delay in expansion of automotive applications**

## Hipore shipment volume\*



\* Forecast as of February 2024 shown for FY2023

## Current status

Delay in shift to automotive applications due to solidity of business foundation in consumer electronics

Dependence on specific customer demand due to inadequacy of coating capacity to fully expand to automotive customers

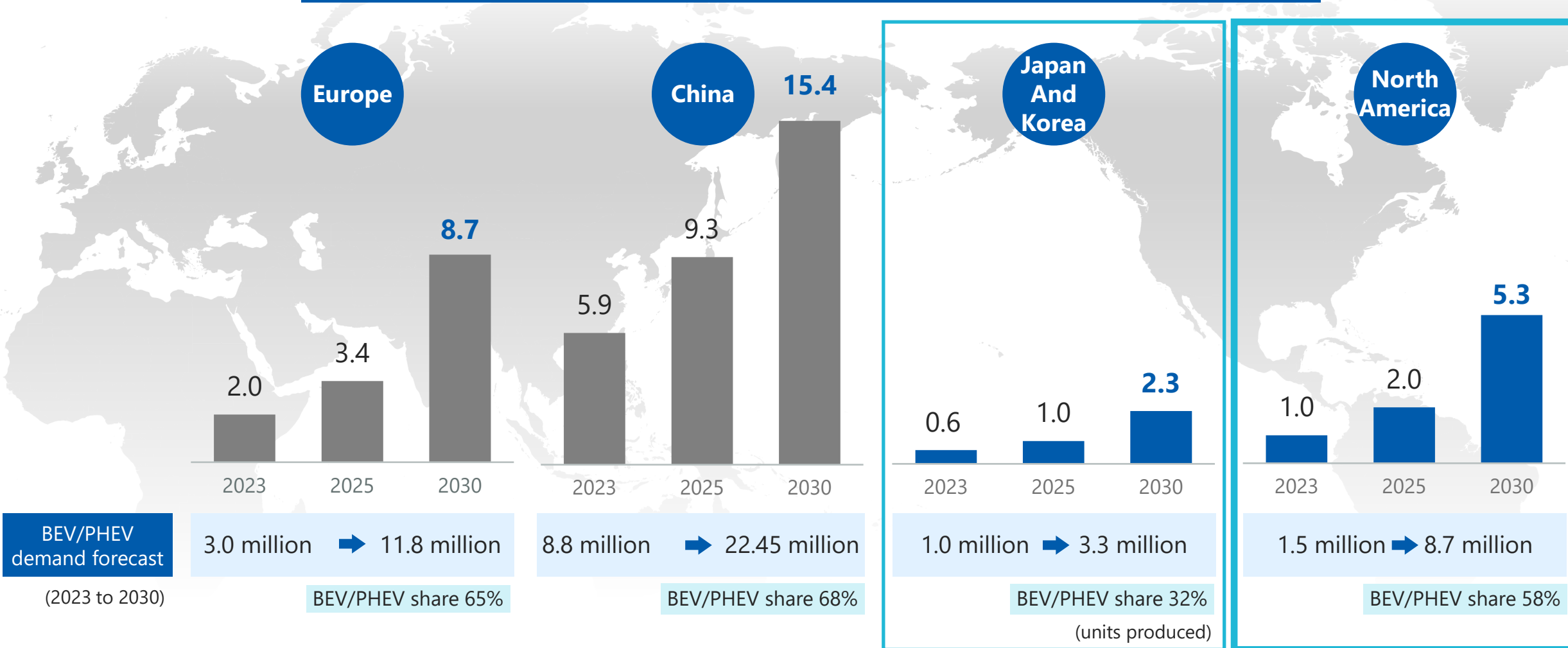
Susceptibility to environmental changes such as COVID-19, Russia-Ukraine situation, semiconductor shortages, etc.

Sales volume decreasing in FY2022 and FY2023

Main target is North America where rapid expansion of BEV/PHEV market is forecasted

## LIB separator market forecast (estimated by Asahi Kasei)

(billion m<sup>2</sup>)



Asahi Kasei's target



# Trend in LIB manufacturers in North American market

## LIB manufacturers significantly increasing production capacity focused on xEV market growth in North American market

- ◇ Alliance with vehicle manufacturer
- ◆ LIB manufacturer independently

LIB manufacturer	Location	Capacity	Start of mass production
LG Energy Solution	Ohio, U.S.	35 GWh	◇ Operational / GM
	Tennessee, U.S.	50 GWh	◇ Operational / GM
	Michigan, U.S.	35 GWh	◇ 2025 / GM
	Georgia, U.S.	30 GWh	◇ 2025 / Hyundai
	Ohio, U.S.	35 GWh	◇ 2025 / Honda
	Michigan, U.S.	40 GWh	◆ Operational
	Arizona, U.S.	40 GWh	◆ 2025
Samsung SDI	Indiana, U.S.	30 GWh	◇ 2026 / GM
	Ontario, Canada	45 GWh	◇ 2024 / Stellantis
	Indiana, U.S.	33 GWh	◇ 2025 / Stellantis
	Indiana, U.S.	33 GWh	◇ 2027 / Stellantis
SK on	Tennessee, U.S.	43 GWh	◇ 2025 / Ford
	Kentucky, U.S.	43 GWh x 2	◇ 2025 / Ford
	Georgia, U.S.	35 GWh	◇ 2025 / Hyundai
	Georgia, U.S.	22 GWh	◆ Operational
PowerCo	Ontario, Canada	≤90 GWh	◇ 2027 / VW
TBMNC	North Carolina, U.S.	≥30 GWh	◇ Not disclosed / Toyota
Panasonic	Nevada, U.S.	43 GWh	◇ Operational / Tesla
	Kansas, U.S.	30 GWh	◆ 2025
AESC	Kentucky, U.S.	30 GWh	◆ 2025
	South Carolina, U.S.	30 GWh	◆ Not disclosed
	Tennessee, U.S.	10 GWh	◆ Operational

**Significant business opportunity in North American market where rapid demand growth and establishment of new supply chains are forecasted**

**Spread of EVs and fostering of related industries supported by governmental clean energy policies**

**Rapid EV market expansion**

Some sluggishness but North American EV market share forecasted to reach 58% in 2030

**Promoting production of EVs, LIBs, and their components in the region**

Favorable treatment of products made in the region; subsidies of plant investment, tax incentives for EV purchase

**North American market is a significant business opportunity for Asahi Kasei**



**Fulfilling our Group Mission of contributing to life and living for people around the world by enabling **carbon neutrality****

**Aiming to obtain market share of **30%** or more in **North America** where rapid market expansion is forecasted over the medium- to long-term as a **leading supplier of LIB separators** for the xEV market in North America, Japan, and South Korea**

## Maximum utilization of accumulated technology, know-how, and customer relationships

### Asahi Kasei's strengths

#### Customer relationships

- High ability to respond to customer needs through accumulated know-how
- Product development based on high degree of coordination

#### Productivity

- High production speed (approximately double the industry standard for both base film and coating processes\*)

#### Quality and performance

- Diverse lineup of coated membranes
- Quality for improved battery yield
- Contributing to extended battery service life with uniform pore structure

#### Environmental consciousness

- Non-fluorinated coating
- High rate of recycling process materials

### Measures for North American business

Leveraging various means to build North American business; not following conventional path

Thorough low-cost production

Vertical and horizontal alliances based on technological advantages

Achieving adequate production scale in accordance with market expansion

With North American business platform established, promoting solution-oriented businesses leveraging accumulated battery-related technology

\* Asahi Kasei estimate

## Investment decision for an integrated plant in Ontario, Canada, for the base film manufacturing and coating of Hipore wet-process LIB separator

### Outline of the investment

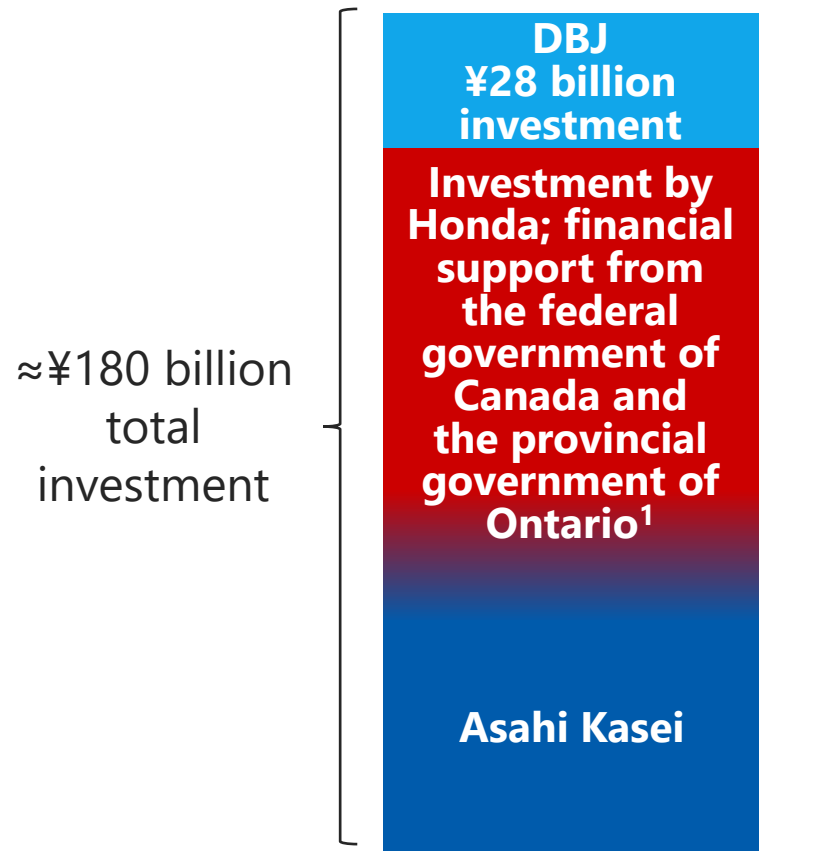
Location	Ontario, Canada
Plant overview	Integrated plant for base film manufacturing and coating
Total investment	Approximately ¥180 billion*
Production capacity	Approximately 700 million m <sup>2</sup> per year (as coated film)
Start of operation	Commercial start-up scheduled in 2027

\* At rate of ¥145 per US\$



**Achieving adequate production scale in accordance with market expansion while controlling investment risk by utilizing other companies' capital and government financial support**

## Breakdown of funding



<sup>1</sup> Financial support from the federal government of Canada and the provincial government of Ontario, in addition to support under the September 2023 memorandum of understanding between Canada and Japan concerning battery supply chains

## Investment configuration



<sup>2</sup> Company name scheduled to change

**Basic agreement for cooperation on manufacturing battery separators for automotive applications in Canada for xEV market in North America**

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- JV to supply separator with performance required for vehicle batteries in era of electrification
- Achieving stable plant operation by securing demand from Honda EVs while controlling investment risk



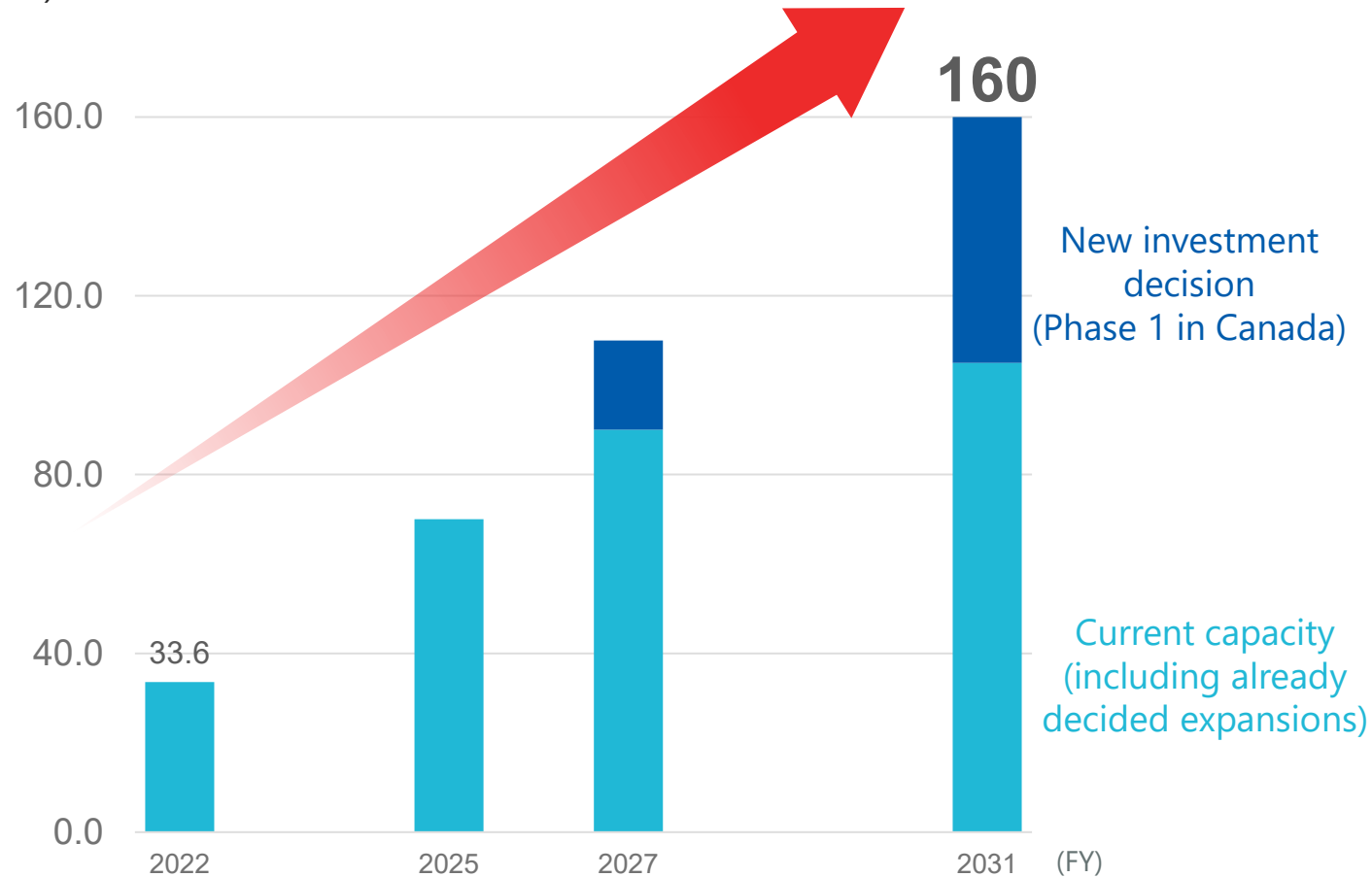
# HONDA

- Achieving high performance EVs utilizing high-quality separators for automotive batteries
- Achieving a stable procurement configuration for separators with high business competitiveness by manufacturing in North America

**Targeting net sales of ¥160 billion and operating margin of  $\geq 20\%$  in fiscal 2031, the fifth year of the new plant's operation**

## Sales outlook for Hipore business

(¥ billion)



## Medium-term outlook (fiscal 2031)

Sales

**¥160 billion**

Operating margin

**$\geq 20\%$**

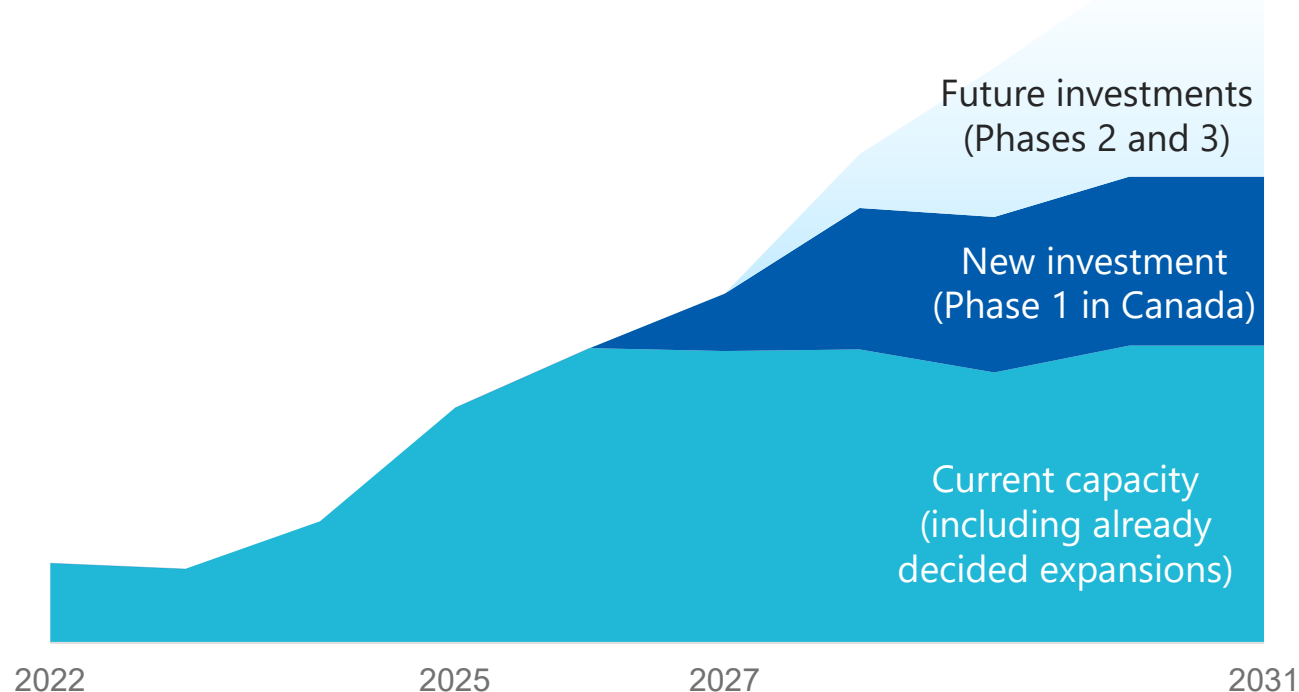
(1USD = ¥145)



## Considering Phase 2 and Phase 3 investments anticipating strong demand in the North American market

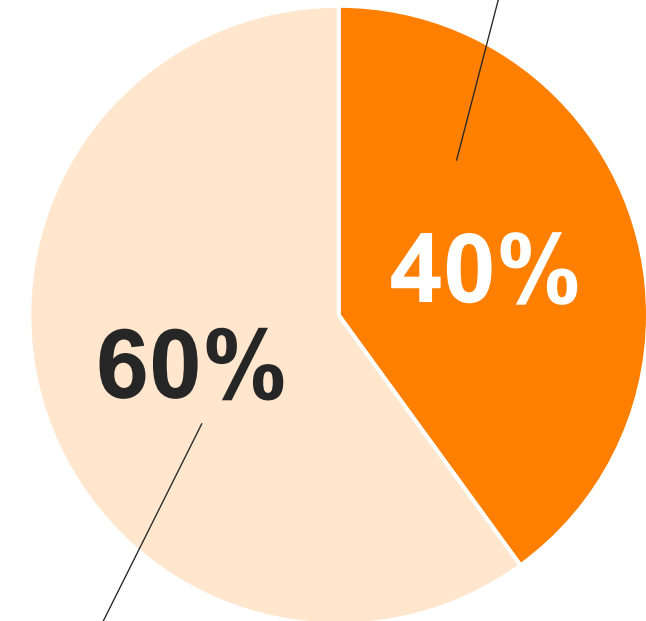
### Medium- to long-term outlook for Hipore sales volume

- Increased sales volume in North American market through the current production capacity from fiscal 2024
- Start of new coating lines in the U.S., Japan, and South Korea from fiscal 2026 (press release issued on October 31, 2023)
- Start of the Phase 1 plant in Canada from fiscal 2027; considering Phase 2 and Phase 3 investments anticipating strong demand in North American market



### Status of Hipore evaluation by main North American customers

Completion of customer evaluation and discussions proceeding for long-term supply



Customer evaluation proceeding smoothly

**Achieving our Group Mission of contributing to life and living for people around the world by enabling carbon neutrality**

**Abundant intangible assets such as human resources, core technologies, know-how, and customer relationships** accumulated through membrane-related businesses

**Contribution to carbon neutrality**  
by supplying high performance LIB separators for xEVs

Alkaline water electrolysis



Membrane process chlor-alkali electrolysis



**LIB separator (microporous polyolefin film)**



Virus removal filter (hollow-fiber membrane)



Separation and filtration membranes for water treatment, etc. (hollow-fiber membrane)



**Development based on the core technology of phase separation**



## *Creating for Tomorrow*

### THE COMMITMENT OF THE ASAHI KASEI GROUP:

To do all that we can in every era to help the people of the world make the most of life and attain fulfillment in living.

Since our founding, we have always been deeply committed to contributing to the development of society, boldly anticipating the emergence of new needs.

This is what we mean by “Creating for Tomorrow.”

#### Disclaimer

The forecasts and estimates shown in this document are dependent on a variety of assumptions and economic conditions. Plans and figures depicting the future to not imply a guarantee of actual outcomes.

