



# 1<sup>st</sup> International Workshop on Lithium-Ion Battery Technology

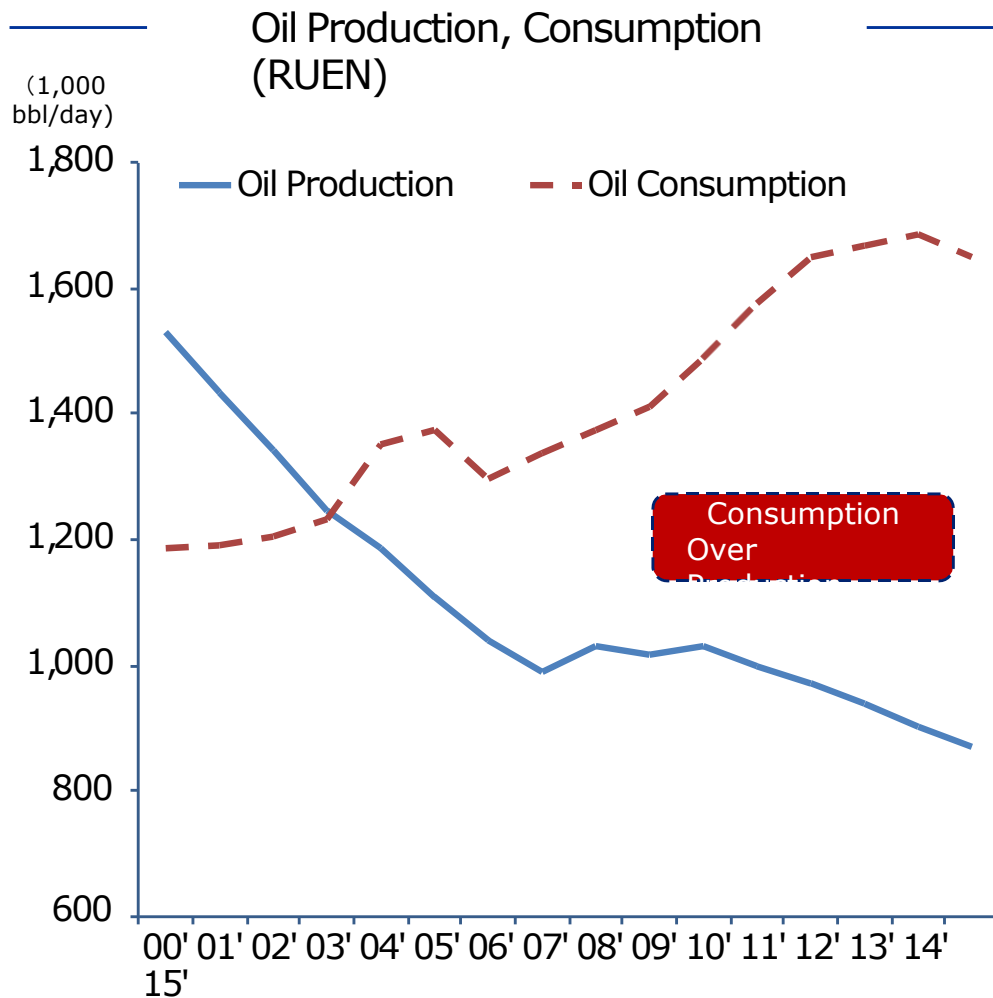
## PROSPECT & PENETRATION OUTLOOK OF ELECTRIC VEHICLE IN INDONESIA



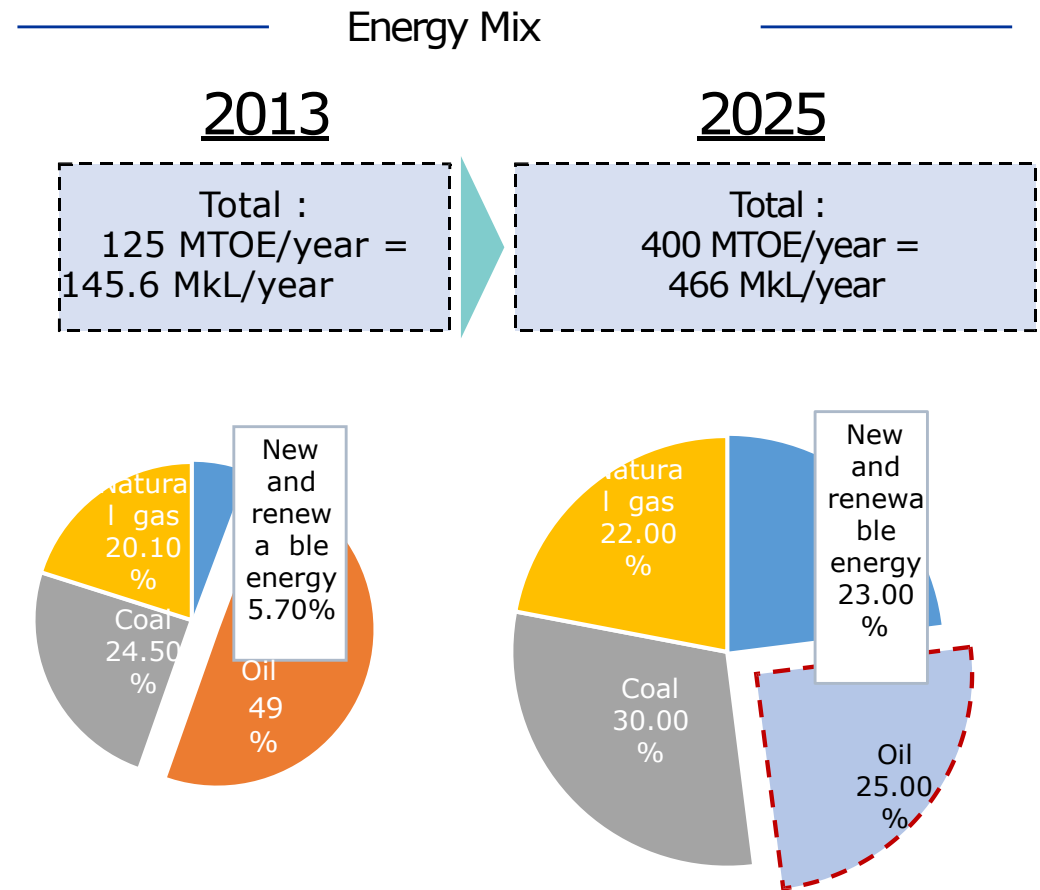
Oleh :  
I Made Dana Tangkas  
Presiden Institut Otomotif Indonesia  
Chairman PII - BKTi  
CEO IBIMA

## Indonesia Energy Issue and Energy Mix

Indonesia is already net importer of oil since 2003 and in order to solve this issue, government announced "Energy Mix" direction in 2014 to reduce the oil.



Source: Badan Pusat Statistik



Source: Ministry of Energy, RUEN

## (Aug 2019) BEV Presidential Decree Signed by President Jokowi

On 5<sup>th</sup> August, President Jokowi signed to BEV Presidential Decree and showed will to provide incentive to promote BEV.

### President's Interview



Date

- Signing – 5<sup>th</sup> Aug
- Interview – 8<sup>th</sup> Aug

Place

- ASEAN Secretariat Building, Jakarta (Interview)

Source: Local media

### Disclosed Contents and Direction

|                       |                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------------------|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Content               | Purpose                    | <ul style="list-style-type: none"> <li>• To <u>promote BEV in Indonesia Automotive market</u> and develop BEV industry</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                       | Local contents requirement | <ul style="list-style-type: none"> <li>• <u>BEV industry</u> have to fulfill <u>minimum localization ratio</u> <ul style="list-style-type: none"> <li>✓ 35% by 2019, 80% by 2025 (4W)</li> </ul> </li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                       | Incentives                 | <ul style="list-style-type: none"> <li>• Central government and regional government can provide <u>fiscal &amp; non fiscal incentive</u> for BEV</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| President's Direction |                            | <ul style="list-style-type: none"> <li>✓ <u>The regional government with big budget</u> needs to start giving incentive for BEV development <ul style="list-style-type: none"> <li>✓ Exempted from Odd-even regulation</li> <li>✓ Exempted from parking fee</li> <li>✓ Subsidy for bus &amp; taxi operators to buy BEV</li> </ul> </li> <li>✓ <u>MOI is directed to clarify the followings:</u> <ul style="list-style-type: none"> <li>✓ <u>Automotive development roadmaps</u></li> <li>✓ Calculation method for localization ratio</li> <li>✓ Condition of IKD and CKD</li> <li>✓ Time limit and quota for CBU import</li> </ul> </li> </ul> |

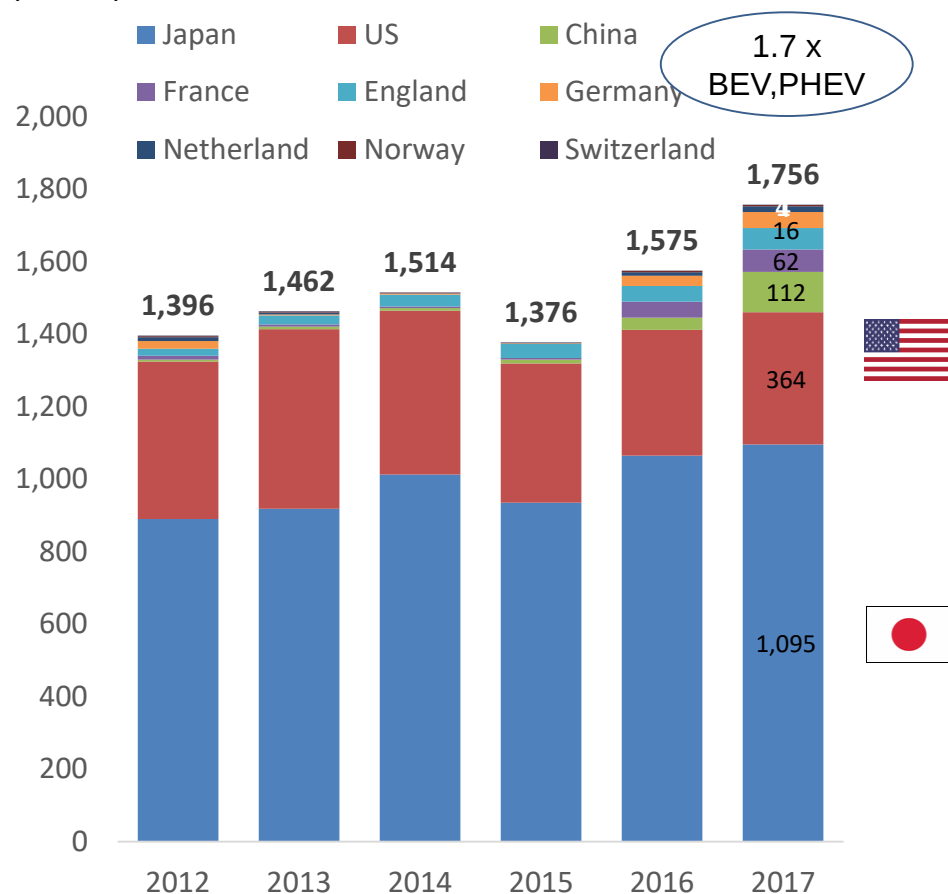
# World HEV Market General Review



**HEV market is still 1.7 times as BEV and PHEV market. Japan is leading country of HEV market in the world.**

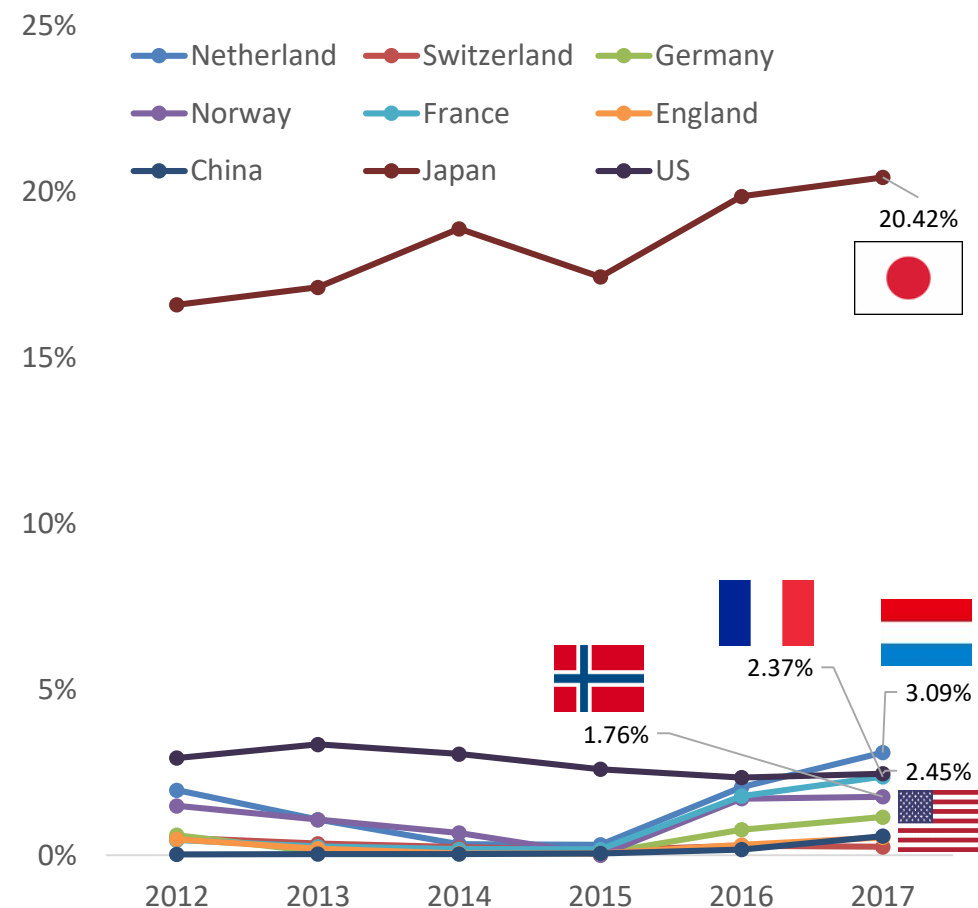
## HEV Sales (2012 - 2017)

(K Units)



Source: Marklines

## HEV Share (2012 - 2017)



Source: Marklines

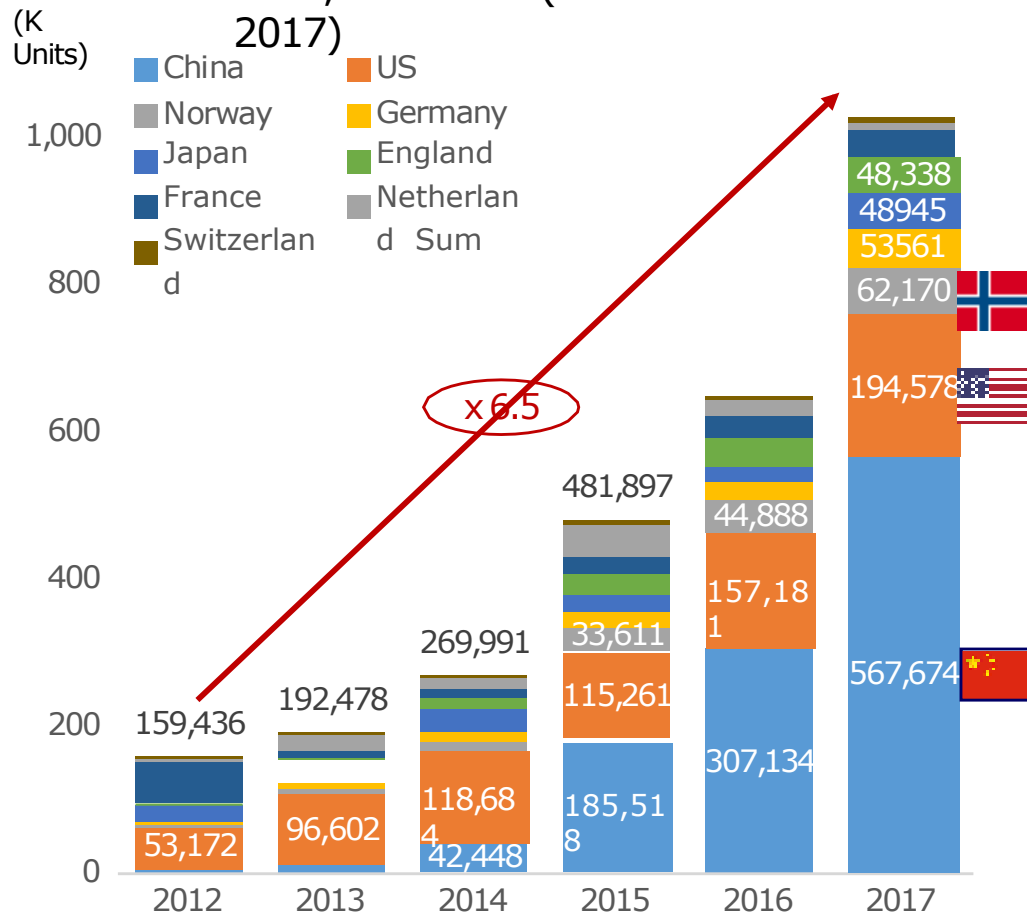
# World PHEV BEV Market General Review



BEV, PHEV

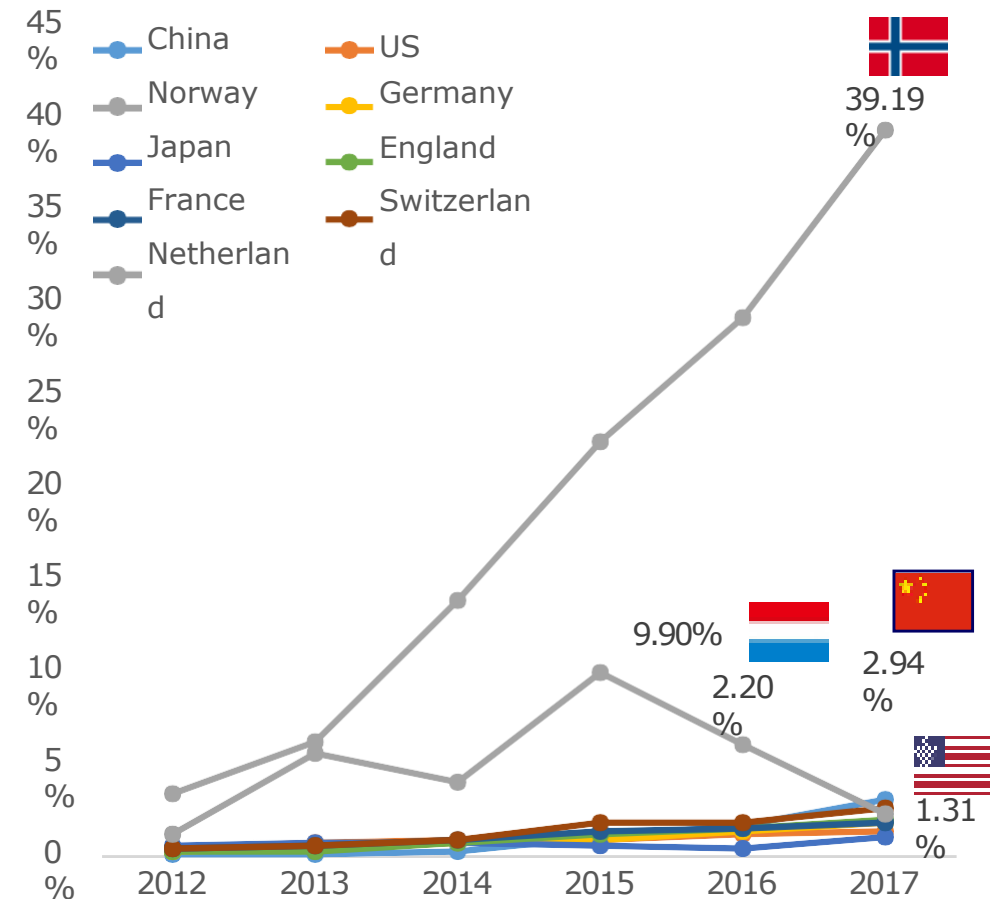
PHEV/BEV market expand 6 times in the last 5 years. China become the largest EV market and Norway has the biggest PHEV/BEV share in the world.

PHEV, BEV Sales (2012 - 2017)



Source: Marklines

PHEV, BEV Share in Each Country (2012 - 2017)

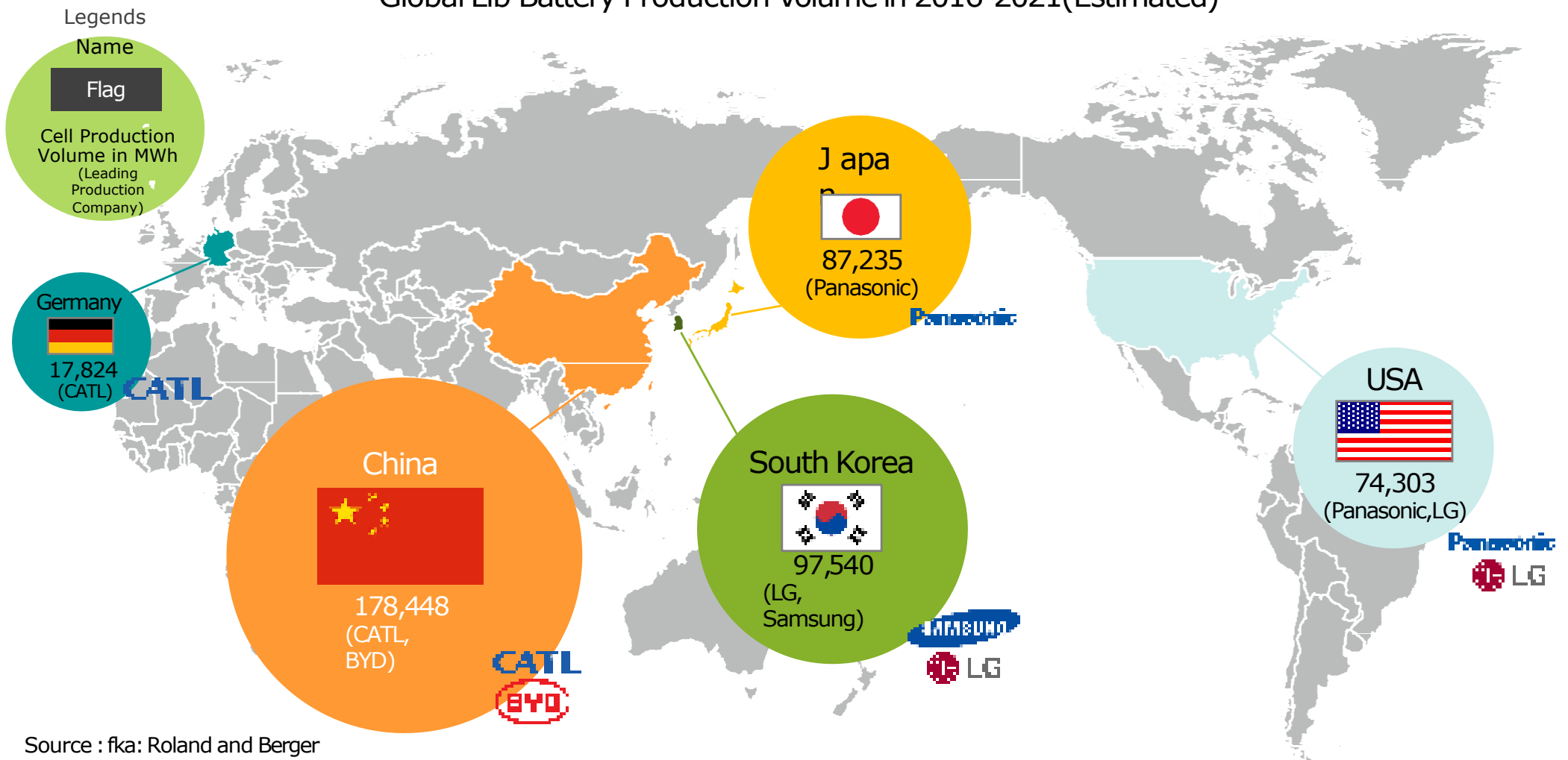


Source: Marklines, EAFO

# Global Battery Production Volume

Recently, the battery production is concentrate in the East Asia, which is leaded by China, Japanese and Korea makers and still under utilization

Global Lib Battery Production Volume in 2016-2021(Estimated)

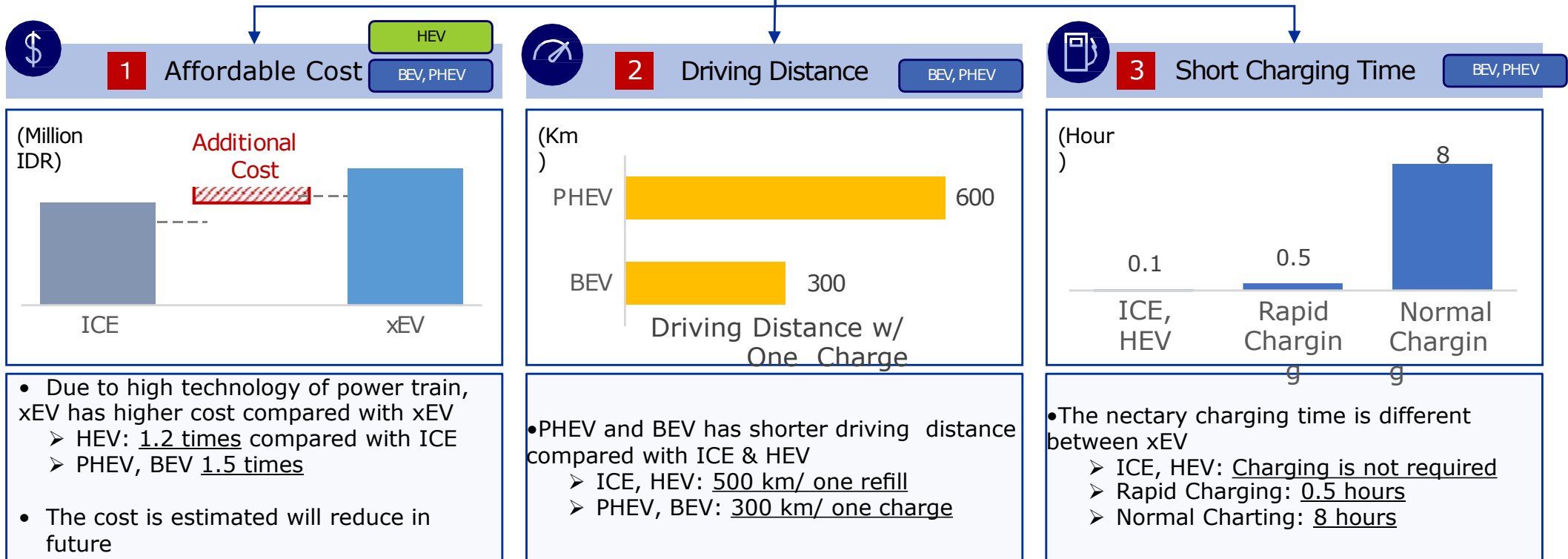


## Penetration Challenge for xEV Product

Cost, driving distance, and charging time are all key considering points for xEV penetration in Indonesia.

### Penetration Requirement

3 Key Challenges lead Customer shifting from ICE to xEV

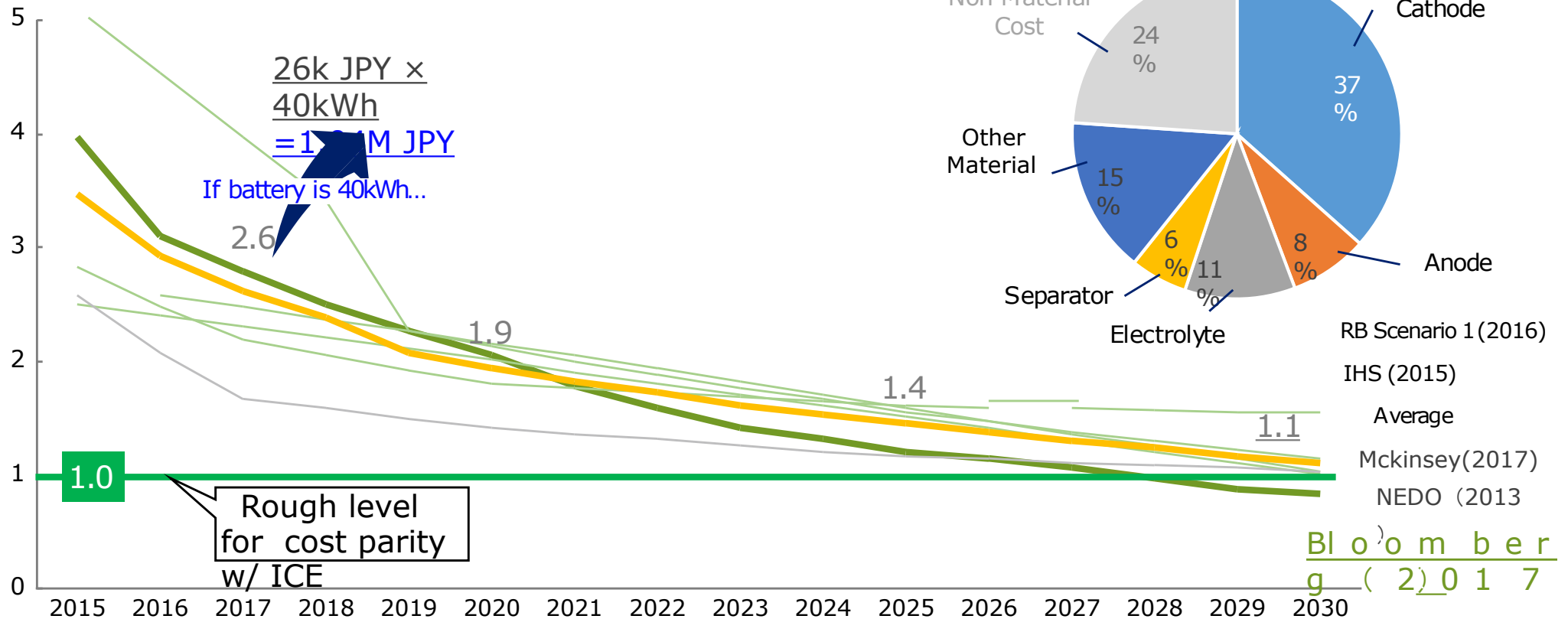


# Lithium Ion Battery Cost Outlook

Several reports developed by think-tank & consulting firm, lithium ion battery price gap will reduce 50% in the most appropriate condition.

Estimation based on Original Price

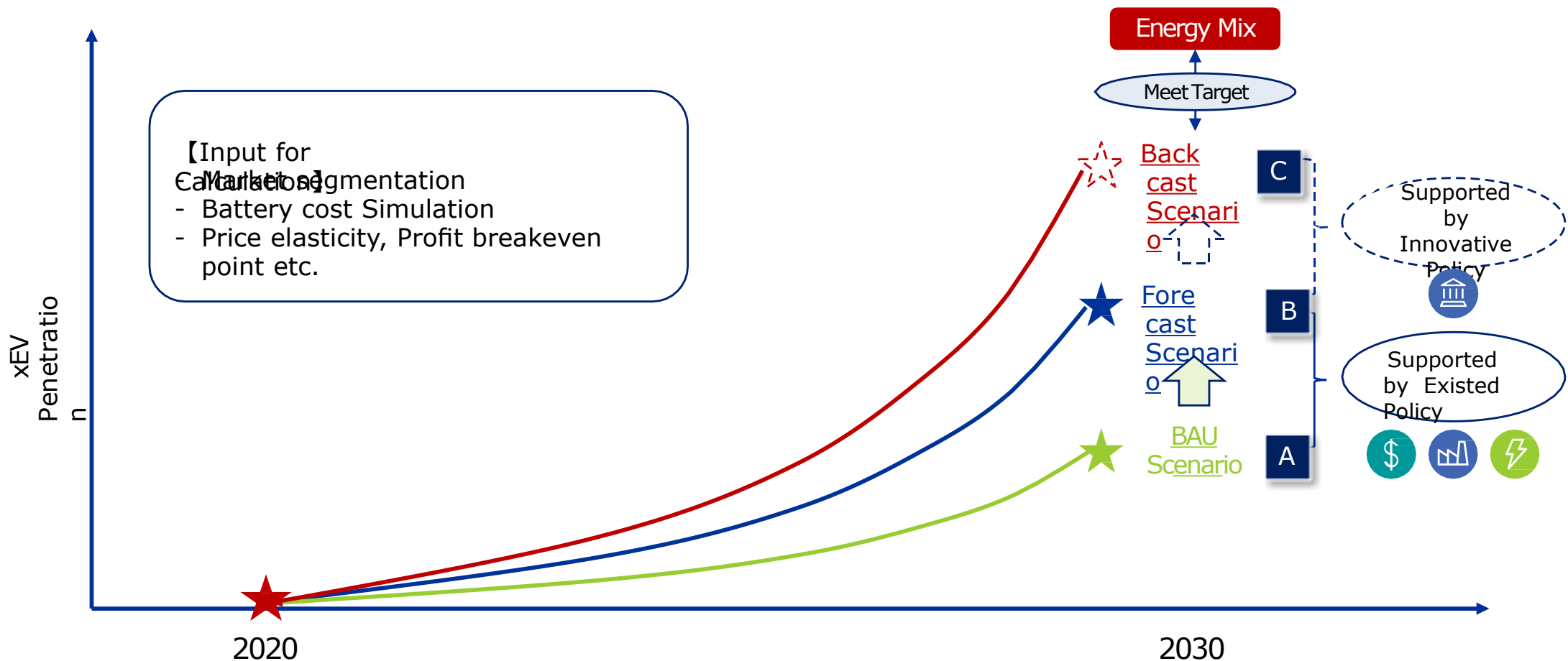
Battery Cost  
(10k JPY/kWh)



## xEV Market Simulation Image

To gain insight how automotive industry can meet with government target, we develop xEV market simulation and scenario targeting 2020-2030.

### Output Image



## Variation of Calculation Logic

Variety of scenarios have been prepared based on following incentive conditions

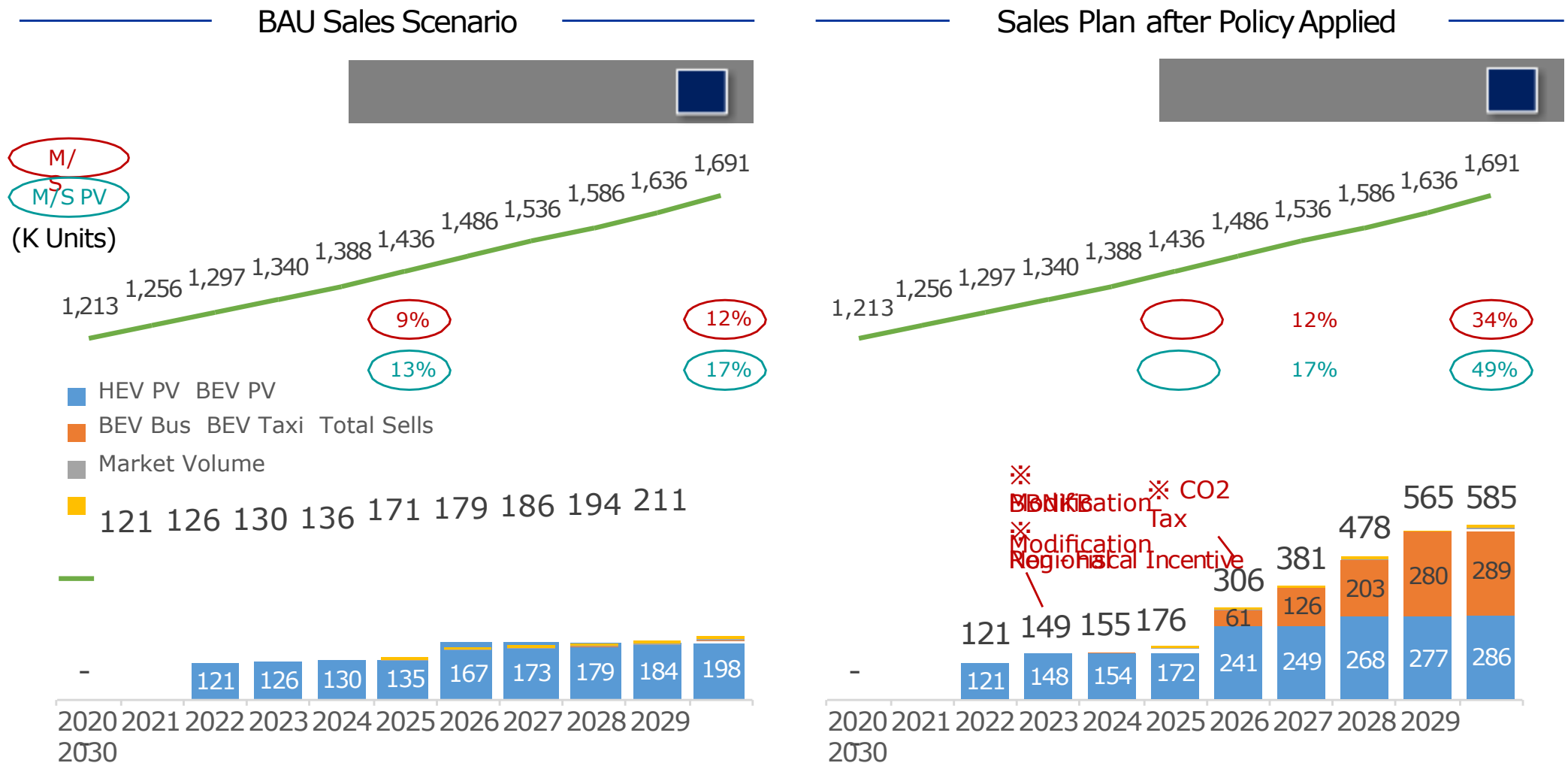
|                   |                                                   | Scenario Pattern                                                                                |                                                                                                 |                                                                                                   |
|-------------------|---------------------------------------------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
|                   |                                                   | A                                                                                               | Incentive Scenario (with BBNKB) B                                                               | C                                                                                                 |
| Basic Information | Description                                       | Do not provide any incentives for xEV development                                               | Provide incentives that do not impact law revision                                              | Provide large incentives that impact law revision                                                 |
|                   | Price Gap for BEV↔HEV↔ICE (B-Segment 2030 in USD) | <div> <div>16.4</div>ICE           <div>16.9</div>HEV           <div>18</div>BEV         </div> | <div> <div>16.4</div>ICE           <div>15.4</div>HEV           <div>16</div>BEV         </div> | <div> <div>16.4</div>ICE           <div>15.4</div>HEV           <div>14.8</div>BEV         </div> |
| Incentives        | BBNKB Exemption (ICE 12.5%)                       | Same BBNKB apply for all xEV (Both HEV & BEV are 10%)                                           | Reduction of BBNKB for BEV (HEV 10%, BEV 7.5%)                                                  | Large Reduction of BBNKB for BEV (HEV 10%, BEV 5%)                                                |
|                   | Non Fiscal Incentive (Odds-Even)                  | No Non-fiscal Incentive                                                                         | Exemption of Odd-Even Regulation is Applied to xEV (Approx 17M IDR of reduction effect)         |                                                                                                   |
|                   | CO2 Tax Revision                                  | CO2 Revision will be conducted (ICE tax will Increase for 2%)                                   |                                                                                                 |                                                                                                   |
|                   | Charging Station Subsidy                          | No Charging Station Subsidy                                                                     | Charging Station Subsidy is available (10M IDR of reduction effect)                             |                                                                                                   |

Note: Battery Price for BEV is approx. 4.4k USD

# xEV Sales Target (Comparison between Scenario A & B)

B)

The incentive Scenario B says BEV will start penetration from 2026 and in total will achieve 585k units in 2030.

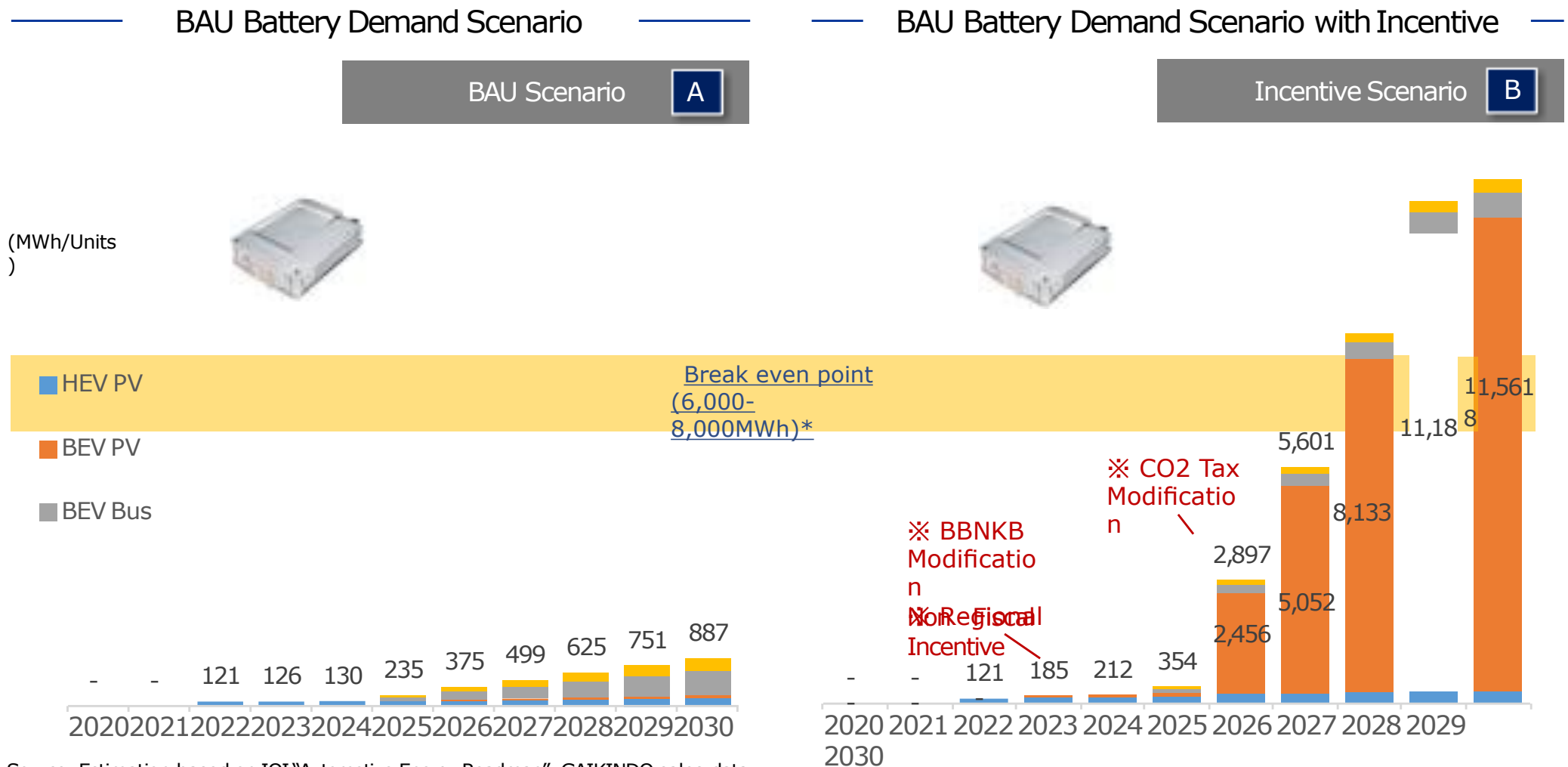


Note: PV = Total PV Market - LCEV - Non Sedan  
 Source: Estimation based on IOT "Automotive Energy Roadmap", GAIKINDO sales data  
 Note: the simulation is based on the condition that infrastructure catch up with global leading countries' condition



## Lithium Ion Battery Production Target (Total)

Based on incentive scenario B, Indonesia is possible to attract Battery industry in 2028, due to possible to achieving break even point.



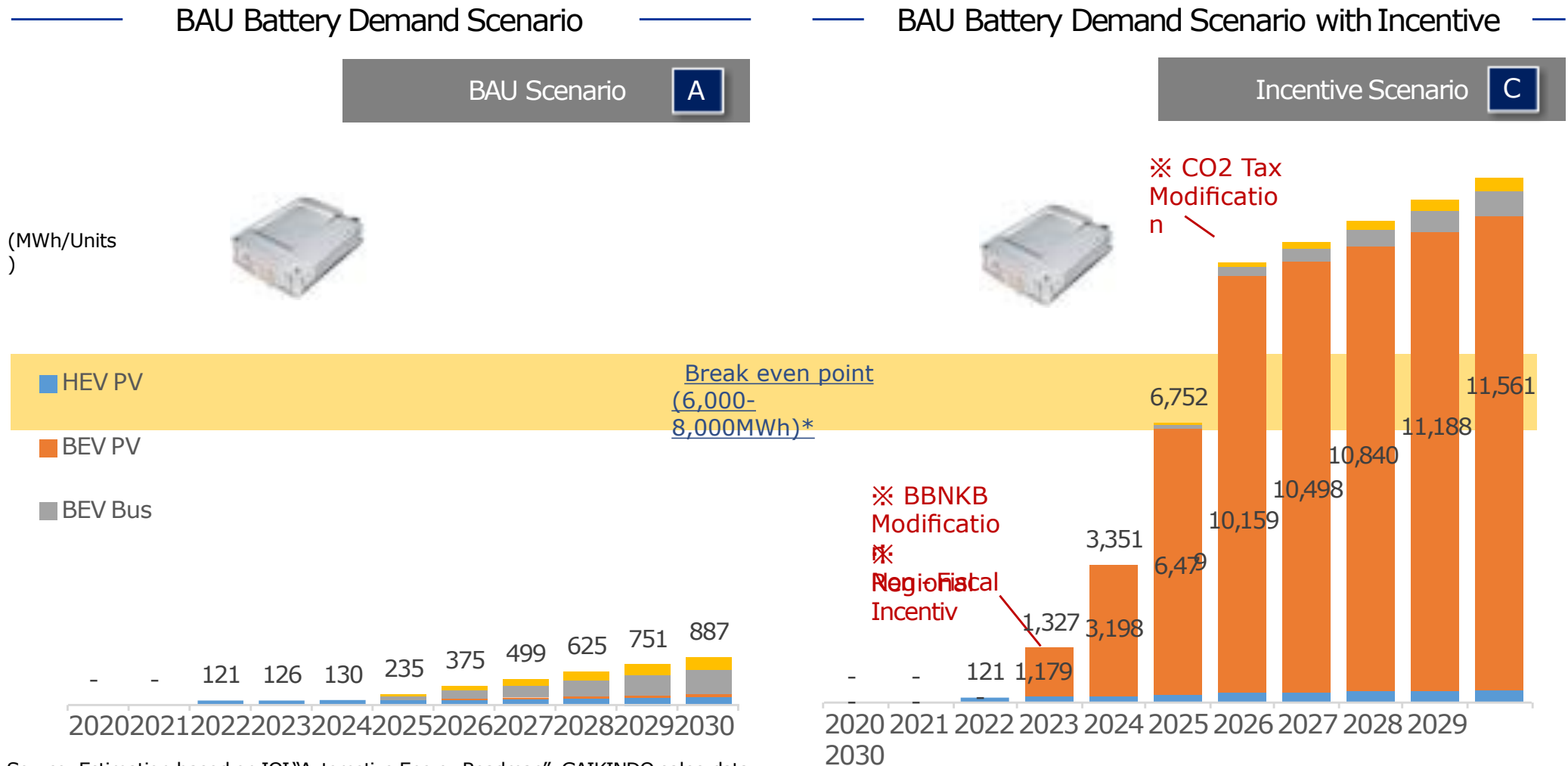
Source: Estimation based on IOI "Automotive Energy Roadmap", GAIKINDO sales data

Note: PV = Total PV Market - LCEV - Non Sedan, The simulation is based on the condition that infrastructure catch up with global leading countries' condition

\*Based on interview result with China and Korea battery manufacturer company, break even point for small battery manufacturer

## Lithium Ion Battery Production Target (Total)

Based on incentive scenario C, Indonesia is possible to attract Battery industry in 2026, due to possible to achieving break even point.



Source: Estimation based on IOI "Automotive Energy Roadmap", GAIKINDO sales data

Note: PV = Total PV Market - LCEV - Non Sedan, The simulation is based on the condition that infrastructure catch up with global leading countries' condition

\*Based on interview result with China and Korea battery manufacturer company, break even point for small battery manufacturer

## Suggestion on "How to penetrate xEV Industry in Indonesia"

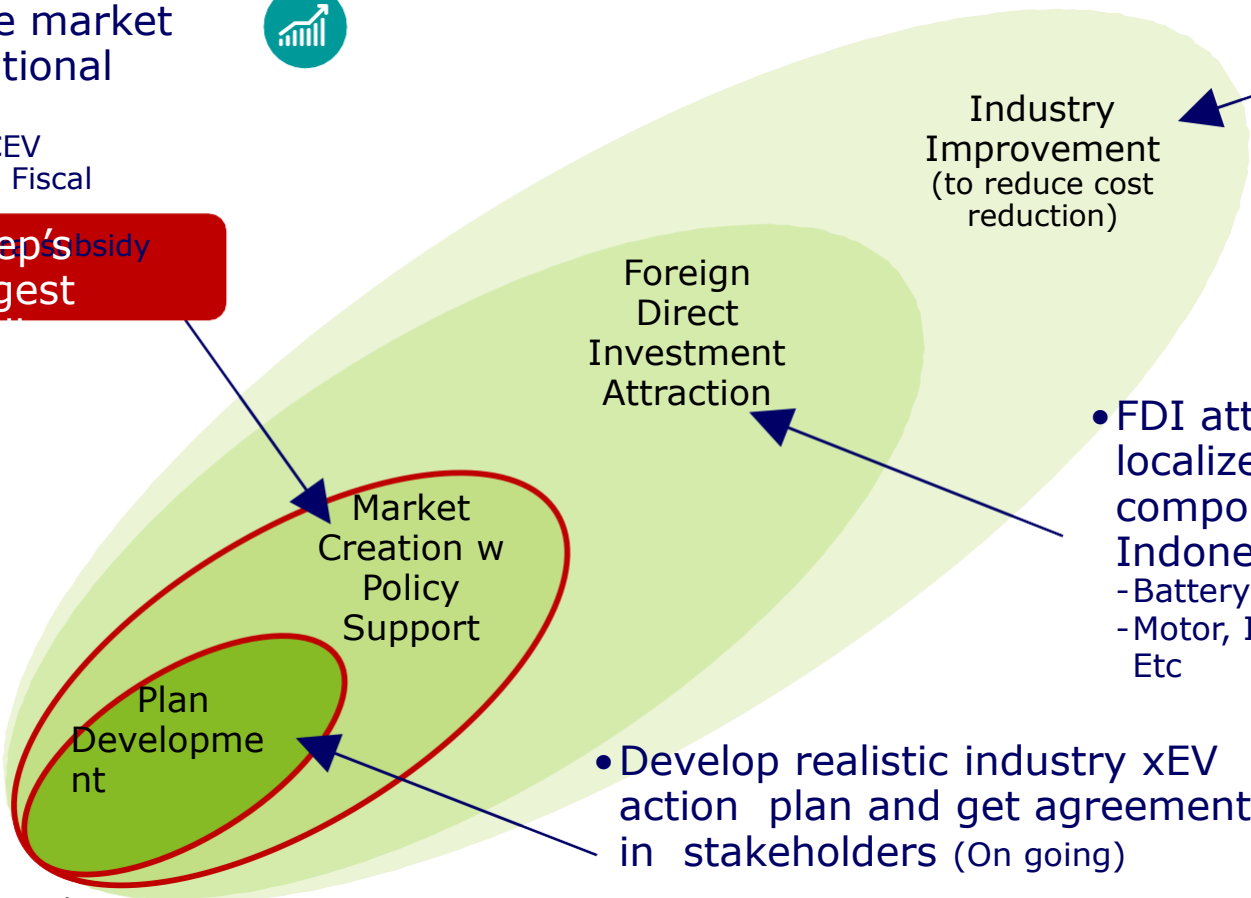
We have several ideas/suggestions on how to penetrate xEV market in Indonesia and would like to share with you about our idea.

Suggestion from  
IOI

- Create the market with additional policy

-CO2 Tax, LCEV  
-BBNKB, Non Fiscal Incentive  
-Create a subsidy etc.

Next Step's  
Biggest



Industry Improvement  
(to reduce cost reduction)

- Localization enhancement to increase competitiveness
  - Realize the battery cost reduction curve with pass production and improvement
  - Develop supplier industry



- FDI attraction to localize the key component in Indonesia
  - Battery cell, Battery Pack
  - Motor, Inverter, Sensor, Etc



- Develop realistic industry xEV action plan and get agreement in stakeholders (On going)



## 【Necessary Consideration Point】 Smooth Industry Shifting

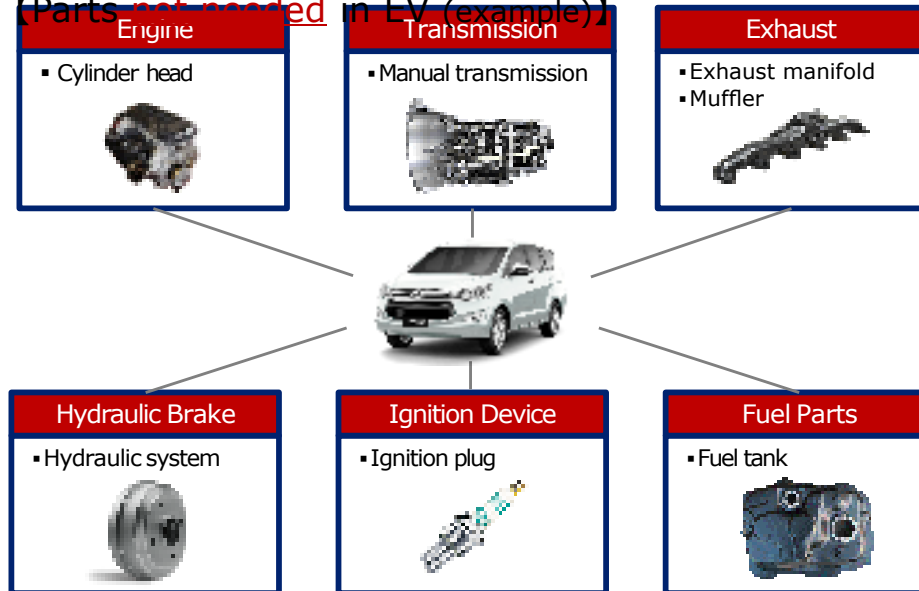


The number of the parts of EV is less than the ICE vehicle. At the same time, EV also need to produce new parts like battery, motor etc.

### Disappearing Parts in EV

- The number of vehicle parts is estimated around 30,000 parts, and parts number of EV will be around 20,000. (Especially the engine related parts is not necessary in the EV)

#### 【Parts ~~not needed~~ in EV (example)】



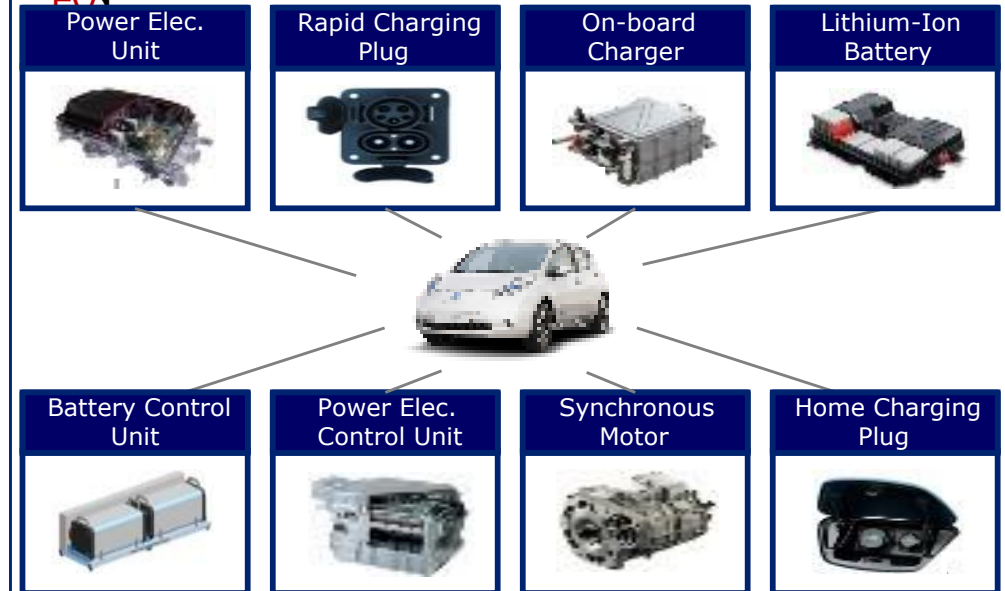
How to maintain exist investment, employment?

How to realize Smooth Industry Shift

### New Necessary Parts in EV

- As the other hand, inside EV we need the new parts like power electricity, Rapid charging plug.

#### 【Parts Necessary for EV】



How to attract Capital intensive and develop supply chain

## Example : Supply Chain for Automotive Battery Pack

Automotive Battery Industry consists of several components and required integration within the supply chain (from Raw Material, Modul and finally Battery Pack)

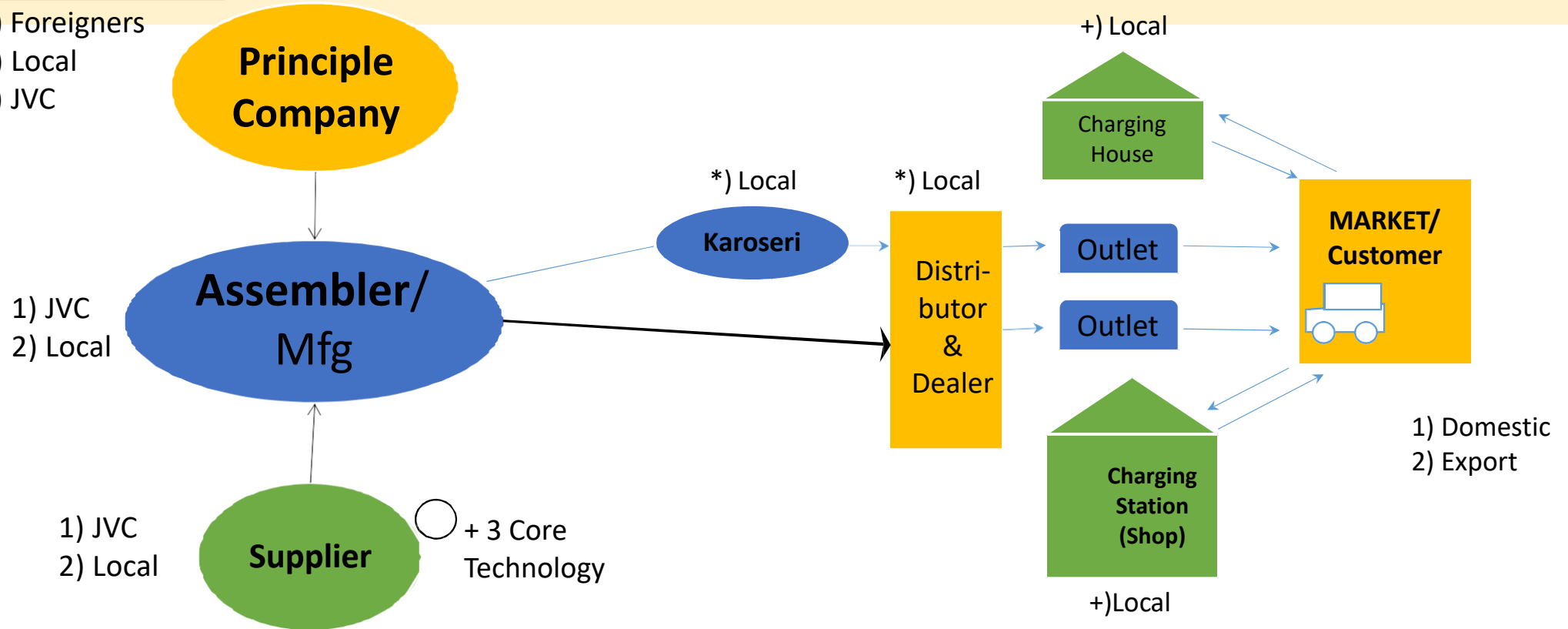
### Supply Chain for Vehicle BatteryPack



# Industrial Flow/ Business for Electric Vehicle

## TYPE OF INVESTOR

- 1) Foreigners
- 2) Local
- 3) JVC



# EV Development Center, Test and Evaluation

