

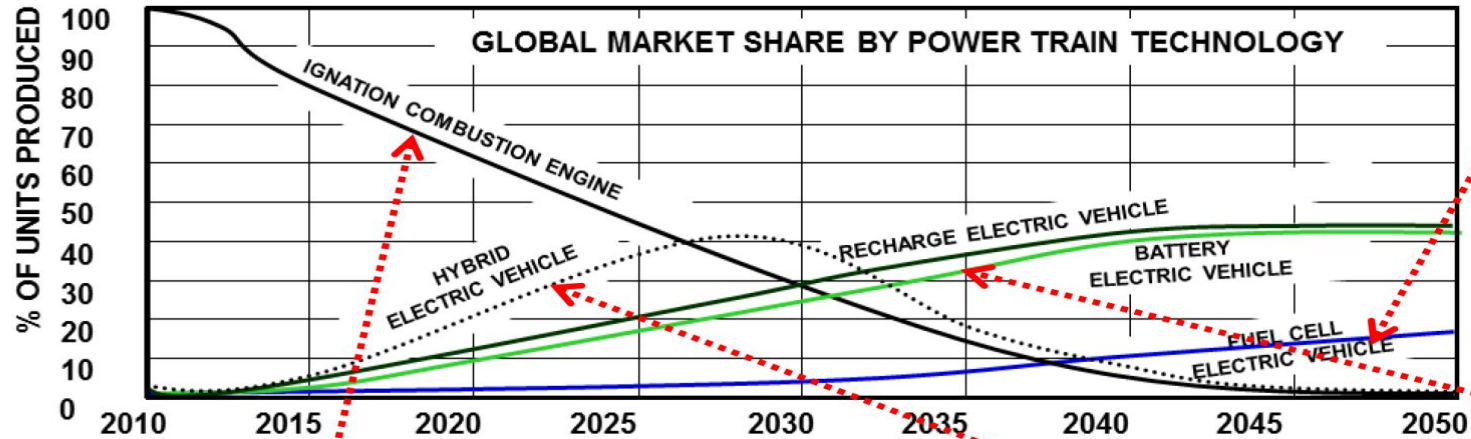
# Electrified Vehicle Trend and Its Challenge



Garuda Room, ICE BSD  
Jakarta, 23 July 2019

# A. Background : Global Market Share by Power Train Technology

## POWER TRAIN TECHNOLOGY



## FUEL CELL VEHICLE

Comp. Industry  
of Fuel Cell + Motor



Hydrogen  
Economy

● Fuel Cell Vehicle

## ICE VEHICLE

Engine  
Component Industry



Alternative-Fuel :

- Bio-Ethanol
- Bio-Diesel
- CNG

## HYBRID VEHICLE

Comp. Industry  
of Engine + Motor



Price  
Competitiveness

- HEV
- PHEV

## ELECTRIC VEHICLE

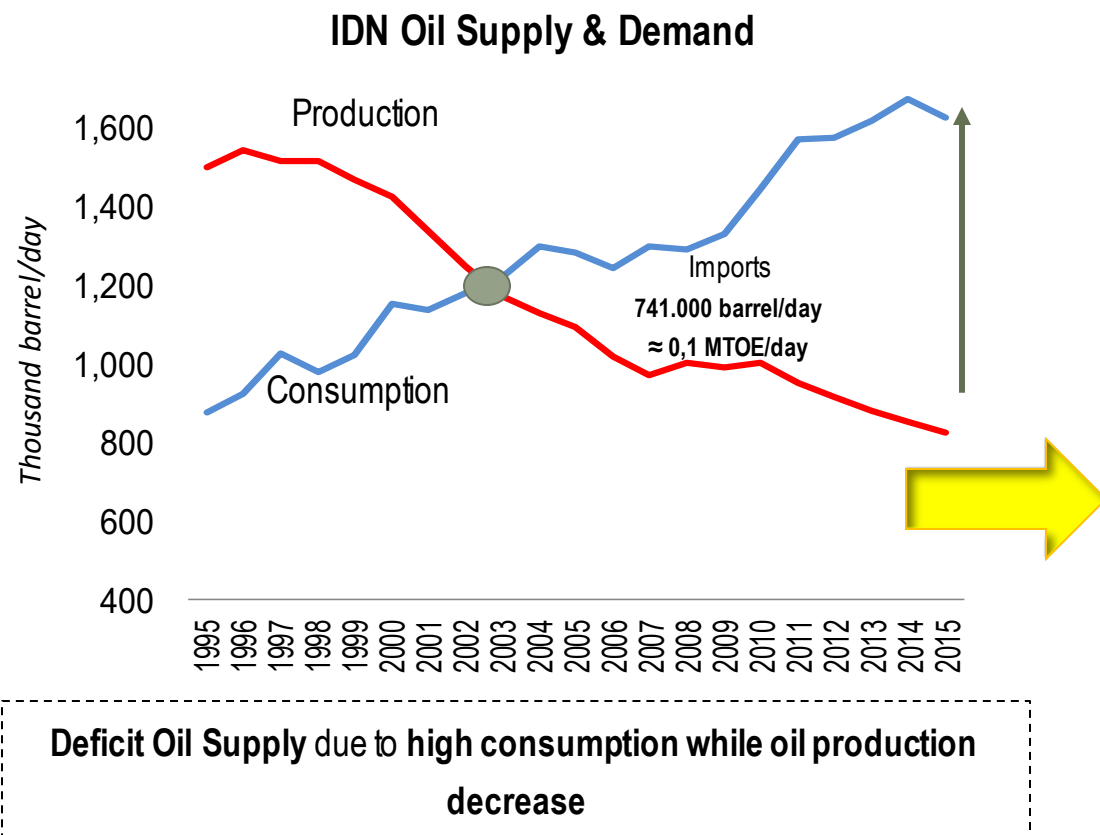
Comp. Industry  
of Battery + Motor



Small Scale  
Production

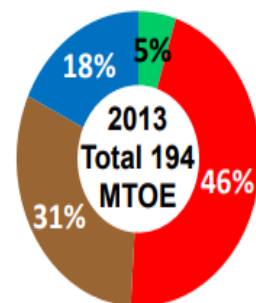
- Battery Electric vehicle

## ❑ IDN Energy Deficit Condition Trigger National Energy Policy

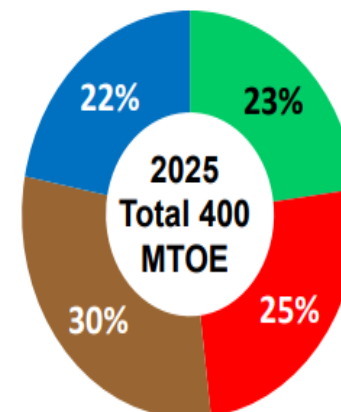


## Energy Mix (KEN & RUEN)

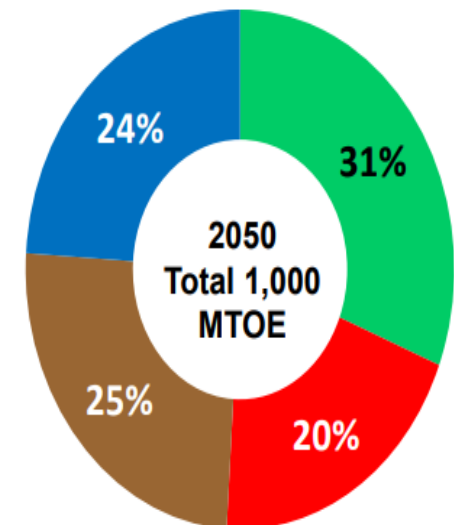
■ New and Renewable Energy  
■ Oil  
■ Gas  
■ Coal



PP Capacity: 51 GW  
 Energy Consumption: 0.8 TOE/capita  
 Electricity Consumption: 776 KWh/capita



PP Capacity: 115 GW  
 Energy Consumption: 1.4 TOE/capita  
 Electricity Consumption: 2,500 KWh/capita



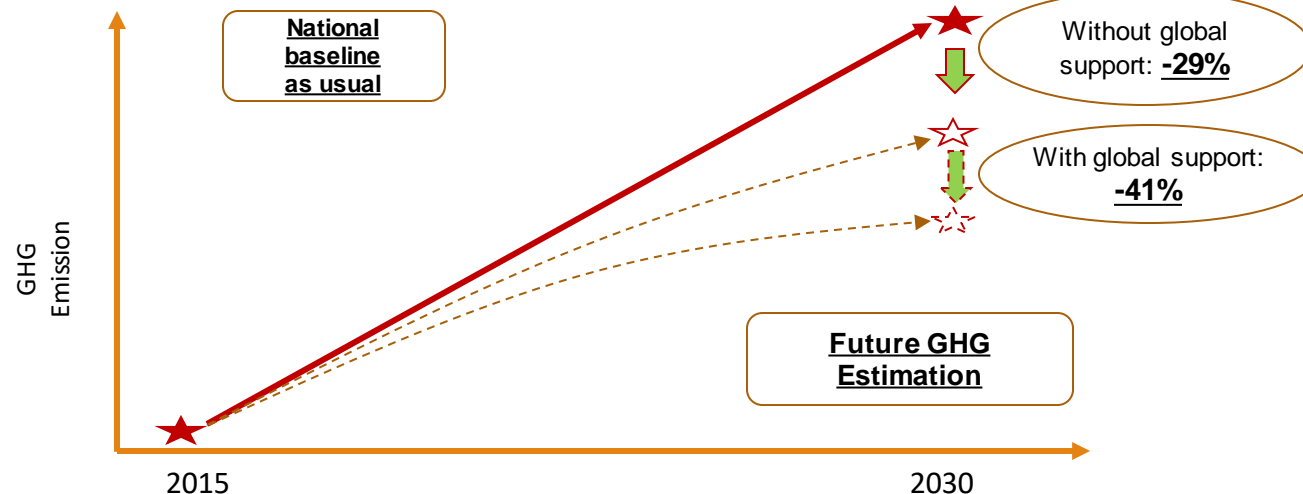
PP Capacity: 430 GW  
 Energy Consumption: 3.2 TOE/capita  
 Electricity Consumption: 7,000 KWh/capita

Source : National Energy Policy

IDN trade oil deficit possibility weakening IDN currency & **slowing economic growth**  
 → Oil supply will be reduced become 25% in 2025 (National Energy Policy)



## Indonesia CO2 Reduction Plan



No	Sector	GHG Emission Level 2010*	GHG Emission Level 2030			GHG Emission Reduction				Annual Average Growth BAU (2010-2030)	Average Growth 2000-2012*
		MTON CO <sub>2</sub> e	(MTon CO <sub>2</sub> e)			(MTon CO <sub>2</sub> e)		% of Total BaU			
			BaU	CM1	CM2	CM1	CM2	CM1	CM2		
1	Energy*	453.2	1,669	1,355	1,271	314	398	11%	14%	6.7%	4.50%
2	Waste	88	296	285	270	11	26	0.38%	1%	6.3%	4.00%
3	IPPU	36	69.6	66.85	66.35	2.75	3.25	0.10%	0.11%	3.4%	0.10%
4	Agriculture	110.5	119.66	110.39	115.86	9	4	0.32%	0.13%	0.4%	1.30%
5	Forestry**	647	714	217	64	497	650	17.2%	23%	0.5%	2.70%
TOTAL		1,334	2,869	2,034	1,787	834	1,081	29%	38%	3.9%	3.20%

\* Termasuk fugitive

\*\* Termasuk kebakaran gambut

Notes: **CM1** = Counter Measure (kondisi scenario tanpa persyaratan mitigasi-unconditional)

**CM2** = Counter Measure (kondisi scenario dengan persyaratan mitigasi-conditional)

Source: Newspaper, Ministry of domestic matter (Kementerian Dalam Negri)

GHG: Green House Gas (basically same as CO<sub>2</sub>)



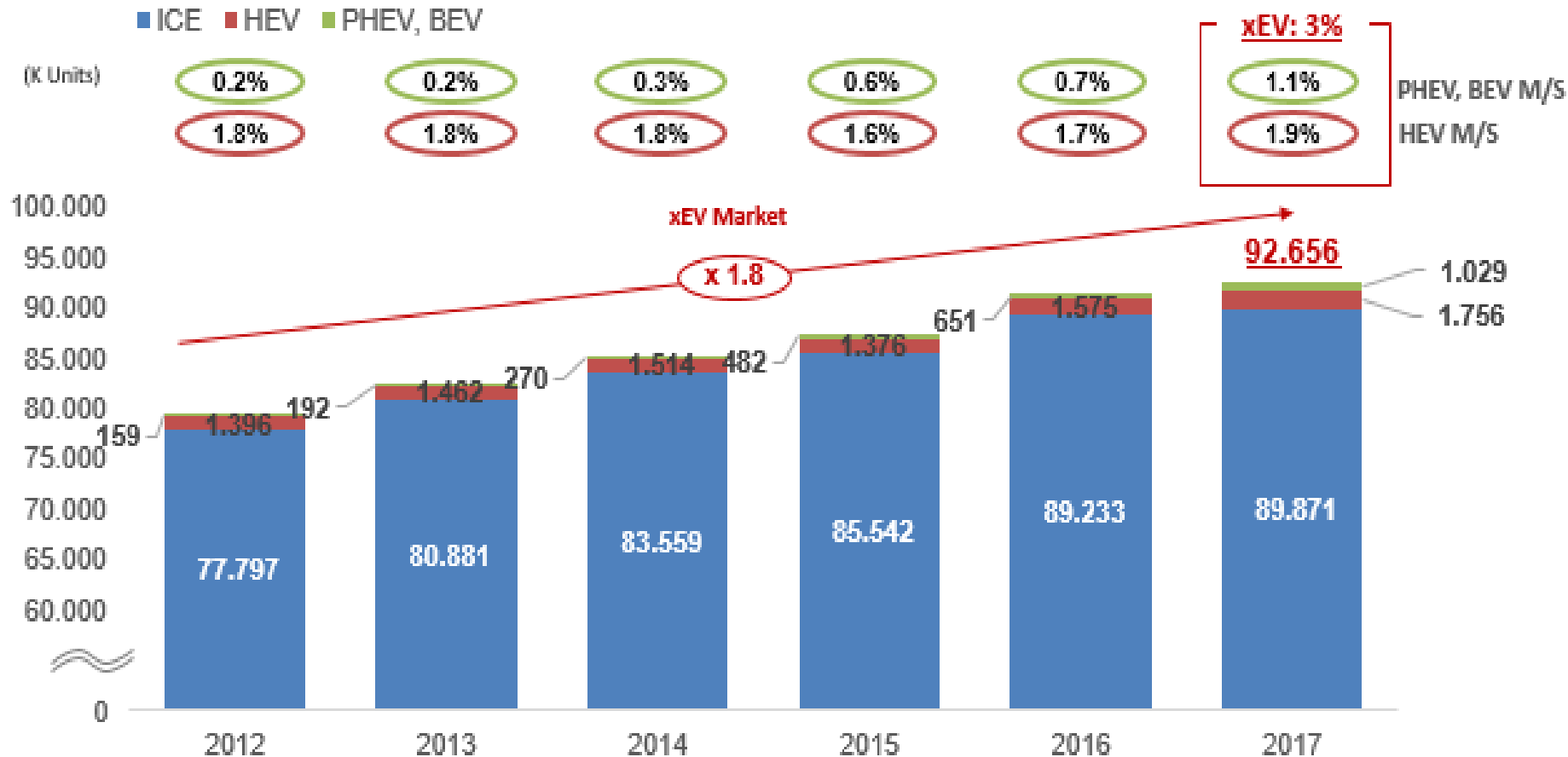
### 【Summary for Indonesia Commitment】

- Indonesia submitted the commitment at COP21 to reduce **29% CO<sub>2</sub> emission w/o international support, and reduce 41% CO<sub>2</sub> emission with international support until 2030**
- Indonesia **will increase the renewable energy usage to 23% until 2025**
- Transport Sector** is one of key sector need to reduce it's CO<sub>2</sub> emission through **measures which are suitable** with Indonesian condition

In COP21, Government committed to **reduce 29% greenhouse gas emission** compared with the baseline in 2030 and has been ratified UNFCCC Protocol in 31<sup>st</sup> October 2016

# B. Market Condition – Global Vehicle Sales

## World New Car Sales (2012 - 2017)



Source: Marklines

Note: xEV sales units are sum of HEV, PHEV, BEV sales in the following 9 countries: Japan, China, US, UK, Germany, France, Norway, Netherland, Switzerland

**PHEV&BEV m/s grew 6,5 times** in the past 5 years, which led by China market (55% from total market)

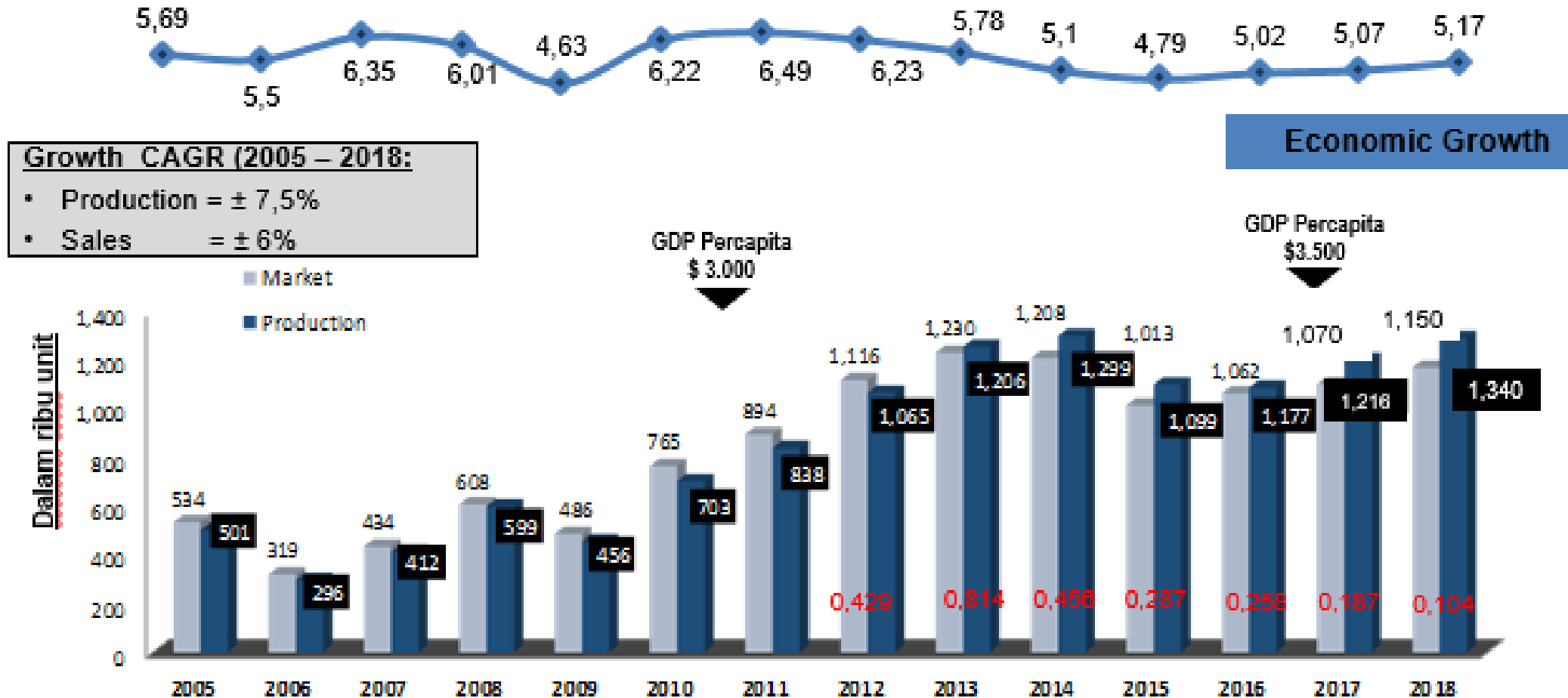
**HEV m/s grew 1,3 times** in the past 5 years, which led by Japan market

Government **Policy** and **Regulation** in each Countries as prime mover of **xEV expansion**

**xEV market** expanded consistently and recorded **1.8 times** growth in the past 5 years, which now reached **3% of world automotive market** in 2017.

## B. Market Condition – Indonesia Vehicle Sales

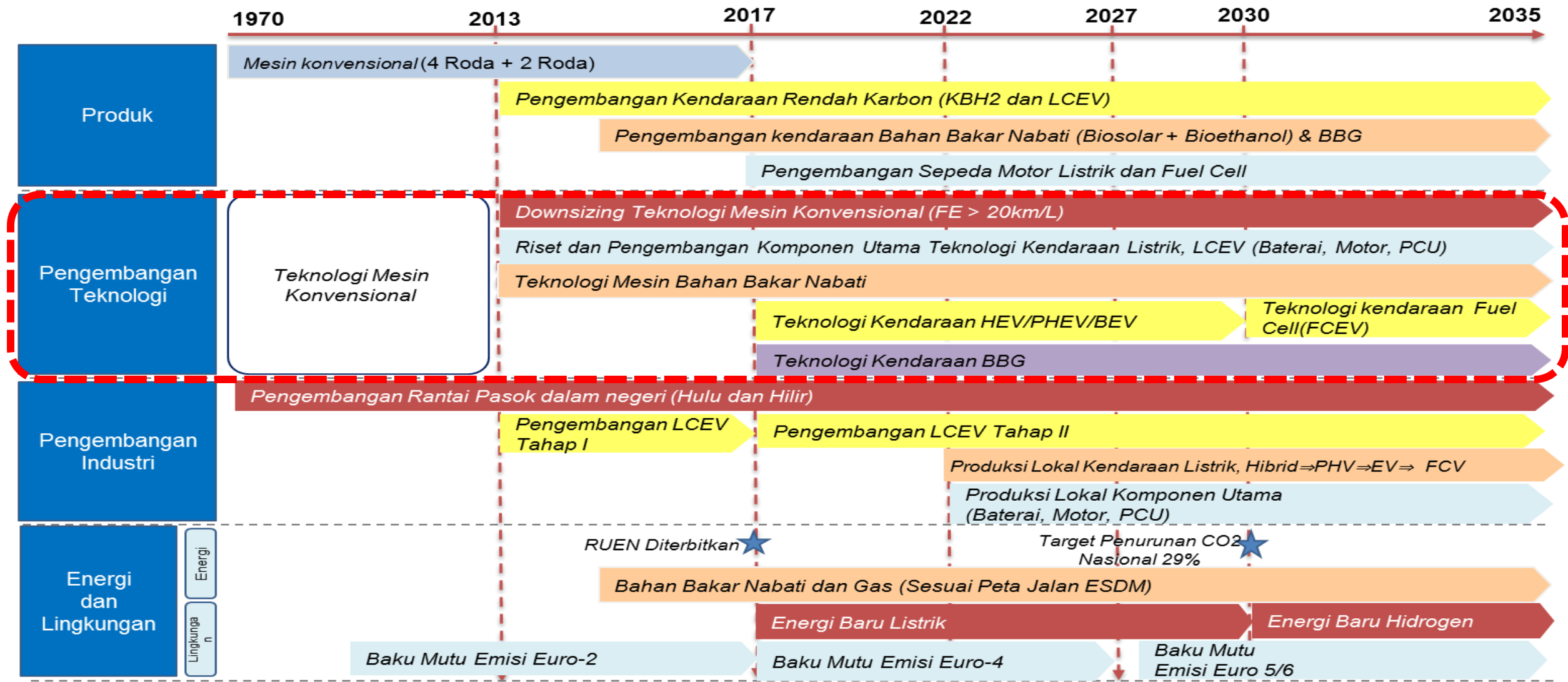
### INDONESIA AUTOMOTIVE PRODUCTION & SALES



Indonesia Sales growth average  $\pm 6\%$ , while production growth average  $\pm 7.5\%$ .

while **xEV** sales in Indonesia is still very low around  $\pm 0.02\%$  (dominated by HEV)

# C. Indonesia Auto Roadmap









Keterangan : **BBG** : Bahan Bakar Gas **HEV** : Hybrid Electric Vehicle, **PHEV** : Plug-In Hybrid Electric Vehicle, **BEV** : Battery Electric Vehicle, **FCEV** : Fuel Cell Electric Vehicle  
**LCEV** : Low Carbon Emission Vehicle **PCU** : Power Control Unit

Note :

- 1. Disusun sesuai amanat dari PP Nomor 14 Tahun 2015 Tentang RIPIN
- 2. Roadmap disusun salah satunya didasari dengan tindak lanjut komitmen COP21, Pemerintah berkomitmen untuk mengurangi 29% emisi gas rumah kaca pada tahun 2030

# D. Indonesia Auto Industry Policy

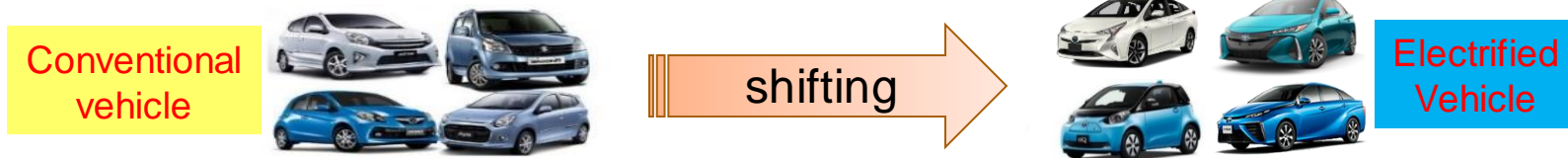
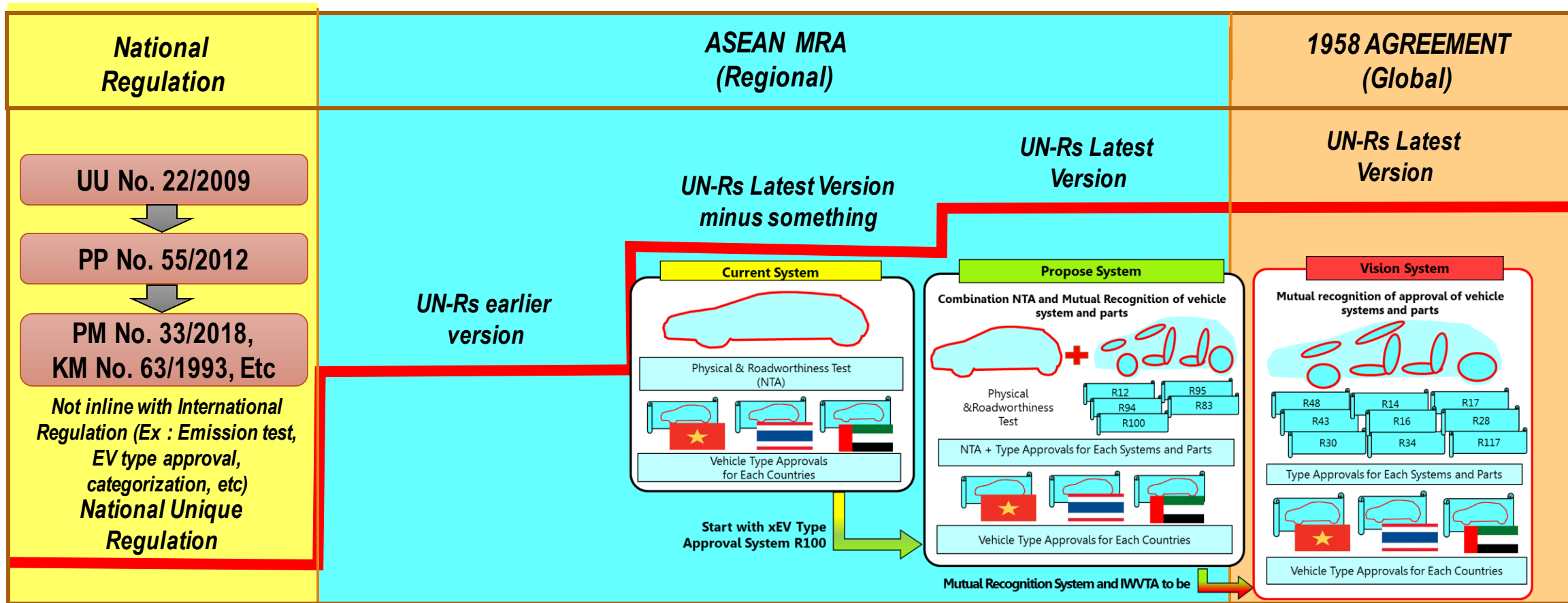
## Introduction of LCEV Program in Indonesia

	Existing	Electrified Vehicle					FLEXY ENGINE (B100/E100)
	KBH2/ LCGC	HEV	PHEV	BEV	FCEV		
							
General	<ul style="list-style-type: none"><li>Low Carbon Emission Vehicle</li></ul>	<ul style="list-style-type: none"><li>Adopt electric motor and battery for energy efficiency</li></ul>	<ul style="list-style-type: none"><li>External Charging</li></ul>	<ul style="list-style-type: none"><li>Pure battery</li></ul>	<ul style="list-style-type: none"><li>Hydrogen/FC stack</li></ul>	<ul style="list-style-type: none"><li>Biofuel 100%</li></ul>	
Energy Source	<ul style="list-style-type: none"><li>Gasoline/Diesel</li></ul>	<ul style="list-style-type: none"><li>Gasoline/Solar</li></ul>	<ul style="list-style-type: none"><li>Electricity</li><li>Gasoline</li></ul>	<ul style="list-style-type: none"><li>Electricity</li></ul>	<ul style="list-style-type: none"><li>Hydrogen</li></ul>	<ul style="list-style-type: none"><li>Gasoline</li><li>Diesel</li><li>Etanol/Biodiesel</li></ul>	
Infrastructure	<ul style="list-style-type: none"><li>Gas Station (available)</li></ul>	<ul style="list-style-type: none"><li>Gas Station (available)</li></ul>	<ul style="list-style-type: none"><li>Pump station+Charging Station (Alternative)</li></ul>	<ul style="list-style-type: none"><li>Charging Station</li></ul>	<ul style="list-style-type: none"><li>Hydrogen Charging Station</li></ul>	<ul style="list-style-type: none"><li>Blending Terminal</li></ul>	

To overcome the internal and external challenges, Indonesia Government is planning to introduce **LCEV program** in Indonesia.



# Challenge of Electrified Vehicle – Indonesia Technical Regulation towards Global Trend



To cope with Auto Industry policy as well as Technical Regulation trend both in Regional and Global, need to create **Roadmap of Technical Regulation** and its **Testing facility in Indonesia**



***Terima Kasih... 😊***

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