



**Kementerian Koordinator Bidang Kemaritiman dan Investasi
Republik Indonesia**

Indonesia Renewable Energy Investment

**Deputy for Infrastructure and Transportation Coordination,
Coordinating Ministry for Maritime and Investment Affairs**

April 2024



Energy Transition Must Be Implemented to Mitigate Climate Change, Ensure Energy Resilience, and Sustain Economic Growth of Indonesia



Climate Change

Protecting the society and environment from climate harms

e.g., global warming, air pollution, people and animal displacement, habitat destruction



Energy Resilience

Ensuring accessible and cost-effective energy sources

e.g. reducing the cost of energy imports, or minimizing disruptions in the supply of energy



Economic Growth

Leveraging energy transition to sustain economic growth

e.g. supply chain and industrial competitiveness, manage inflation, energy subsidy burden



National Commitment

Energy transition is a national commitment

Net zero commitment by 2060 or earlier



Paris Agreement - NDC



JETP agreement with IPG & GFANZ



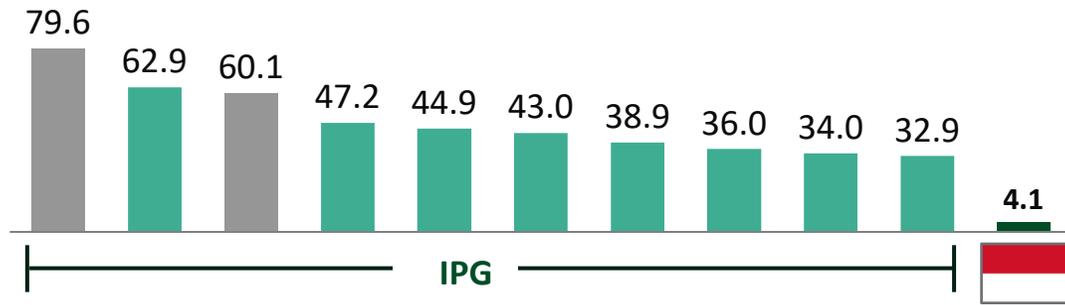
Indonesia Has Lower per Capita GDP, Electricity Generation, Coal-fired Electricity Generation, and Emissions Than Most If Not All G7 Countries

Indonesia G7 member Non-G7 member



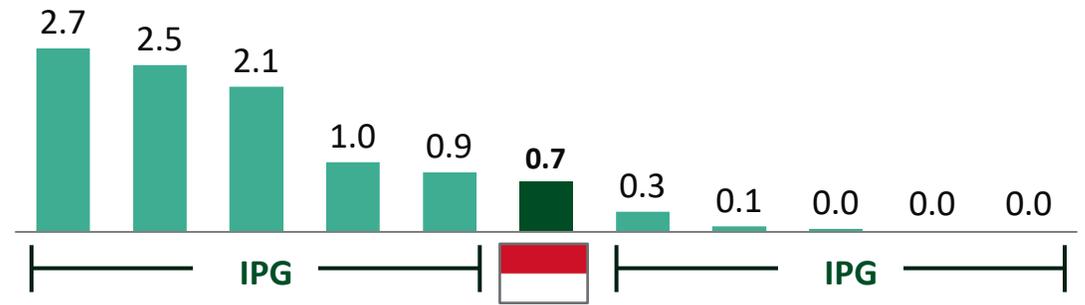
Per capita GDP

(constant 2015 '000 US\$, 2022)



Per capita coal-fired electricity generation

(MWh / person, 2022)



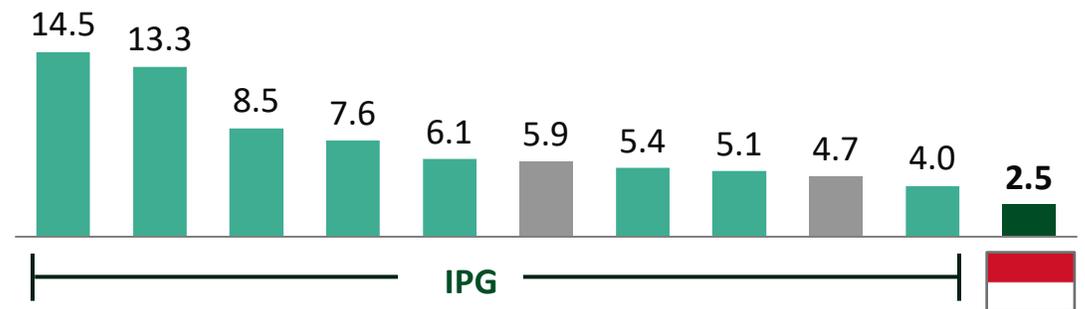
Per capita electricity generation

(MWh / person, 2022)



Per capita CO₂ emissions from energy¹

(Tonnes / person, 2022)



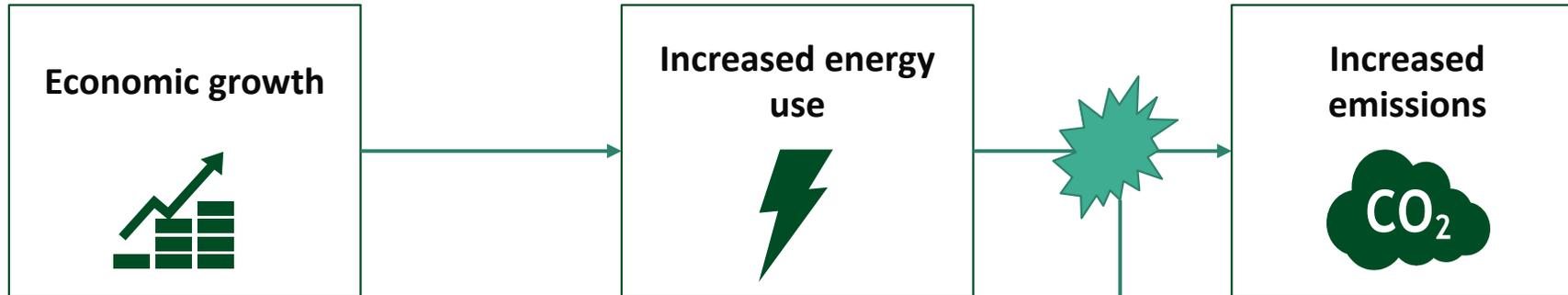
1. CO₂ emissions from energy are from consumption of oil, gas and coal for combustion related activities, and are based on Default CO₂ Emissions Factors for Combustion¹ listed by the IPCC in its Guidelines for National Greenhouse Gas Inventories (2006). This does not allow for any carbon that is sequestered, for other sources of carbon emissions, or for emissions of other GHGs. Sources: World Bank, Energy Institute 2023 Statistical Review of World Energy



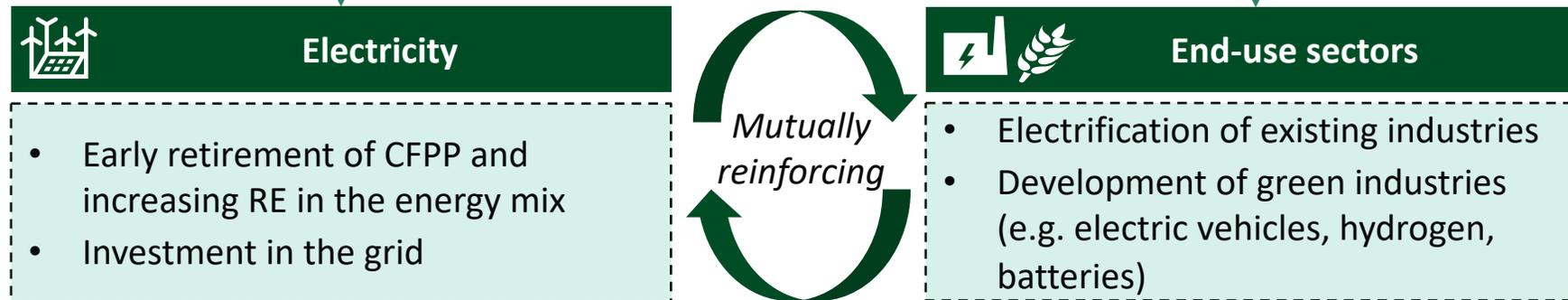
Indonesia Must Invest In Decarbonizing Both Power Generation and End-uses To Decouple The Link Between Economic Growth and Increasing Emissions

How to achieve the energy transition

Conventional growth path

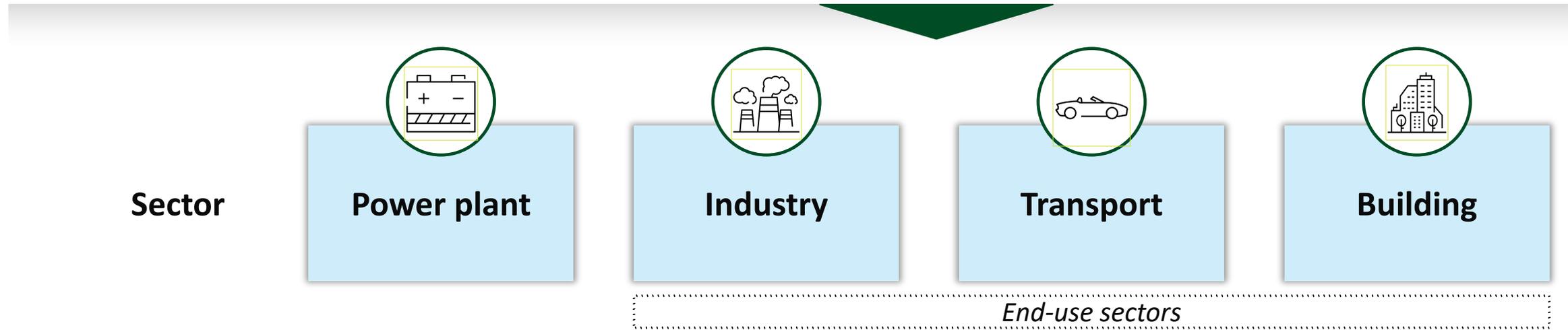
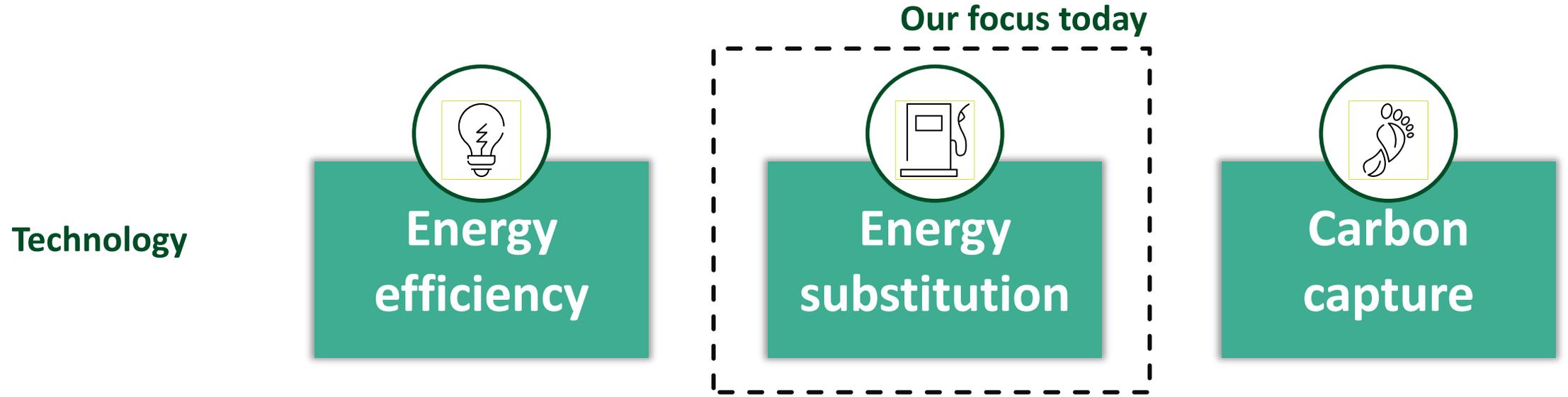


Energy transition





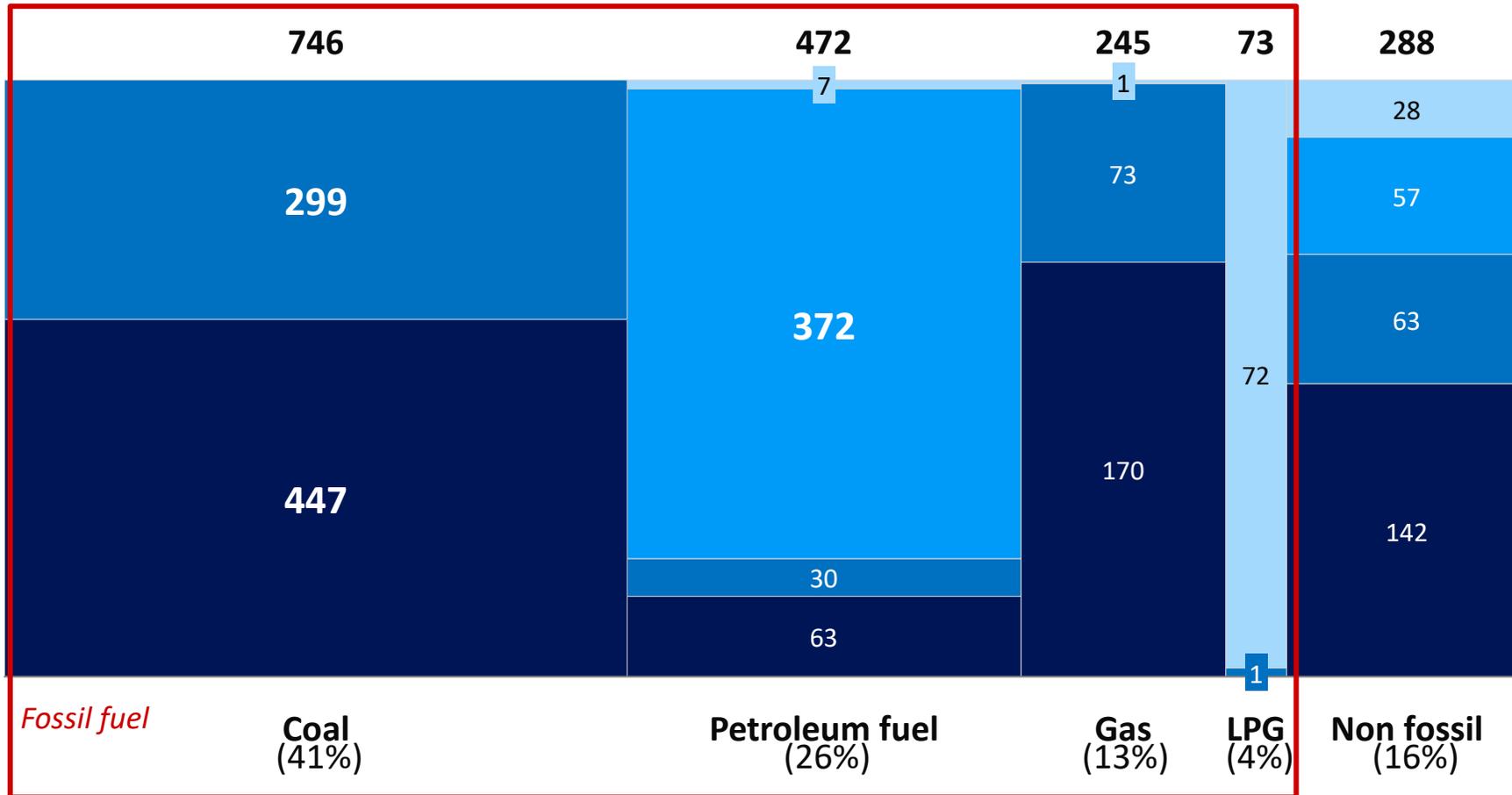
Energy Transition Typically Involves Three Technological Pillars





~75% of Fossil Energy Consumption Comes from Coal for Electricity, Petrol for Transport, and Coal for Industry

Primary energy consumption¹ per end-use sector 2022 (million BOE²)



99% of energy is consumed by three sectors

	All sector	End use ³
Building	6%	34%
Transport	23%	23%
Industry	25%	43%
Power Generation	45%	

Electricity consumption by sectors

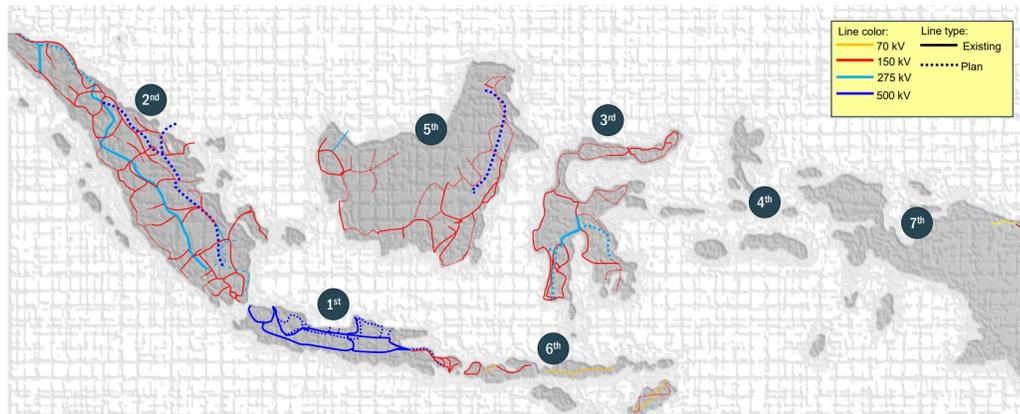


1. Chapter 5 HEESI for consumption per end-use sector; for energy consumption, electricity generation is derived from the difference between total primary energy supply (table 3.1) and total primary energy consumption of end-use sectors (Chapter 5); biogasoil is assumed to comprise 70% fossil volume and 30% non-fossil volume; 2. Barrel of Oil Equivalent; Source: HEESI ESDM 2022



To Integrate Renewable Energy Sources Effectively, Indonesia Needs to Enhance its Transmission Infrastructure

Currently renewable energy development is hindered by lack of transmission



Interconnected grid infrastructures are required to connect RE sources with demand intensive locations



Indonesia will develop **Green Supergrid** to solve the **RE bottleneck** between mismatch electricity supply and demand ...



... and develop **Smart grid** as enabler for massive RE penetration into the **interconnection power system**

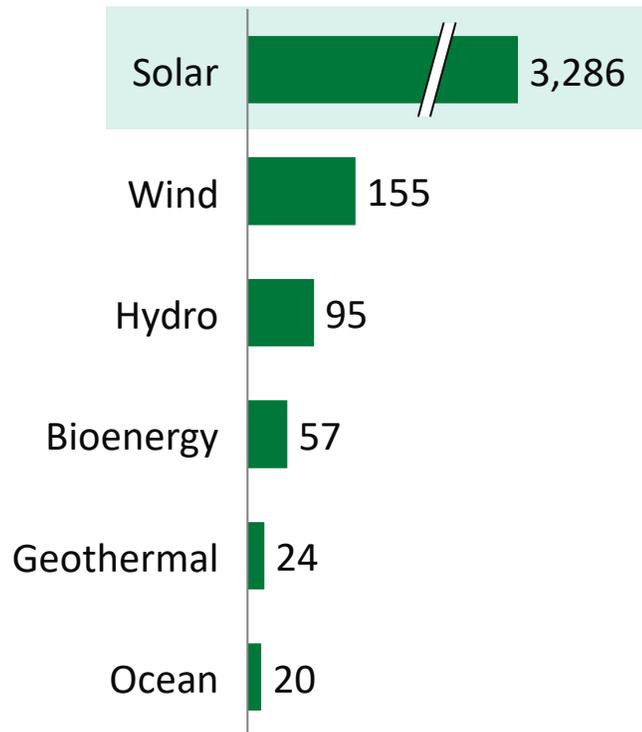
- Connectivity >17k island, with **no electrical transmission among major island**
- Inadequate **grid – not suitable for dispatchable power source**
- **RE sources and demand locations are far from each other**



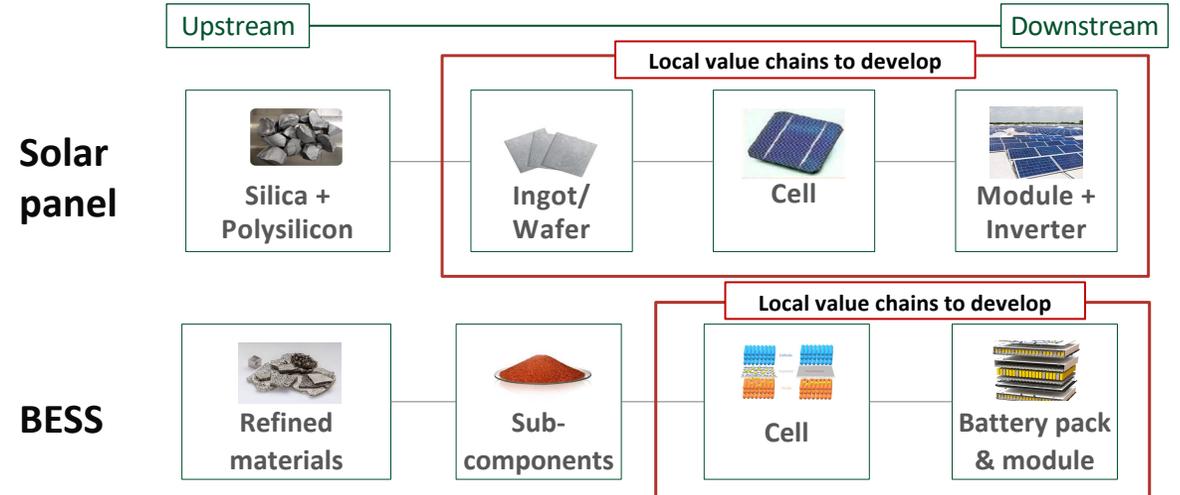
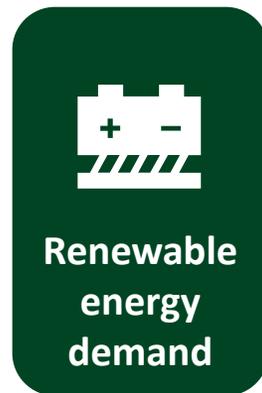
Indonesia's Solar Power Potential Relies on Adequate Renewable Supply Chain, Catering to Both Domestic Needs and Regional Demand

Huge potential of solar - 90% of total RE potential in Indonesia

RE Potential (GW)



A robust solar panel industry is needed for energy security



Demands and plans for renewable energy, especially solar, are in place



Secured renewable energy demand from Singapore (11 GW until 2035)



PLN's plans for 28 GW of variable renewable by 2040, mainly solar



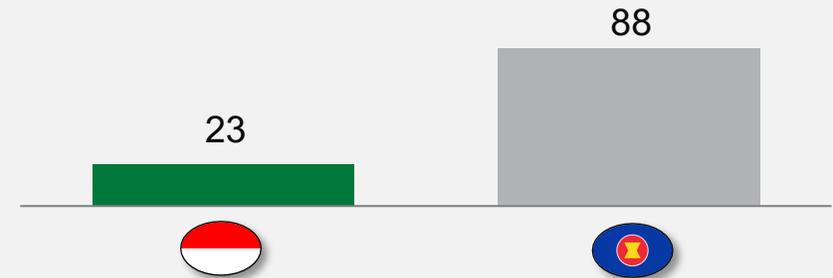
Indonesia is an Attractive Market – Indonesia Has The Largest Car Population and Car Sales Among ASEAN Countries

ASEAN population^{1,4}: 660 Mio

Indonesia population¹: 278 Mio

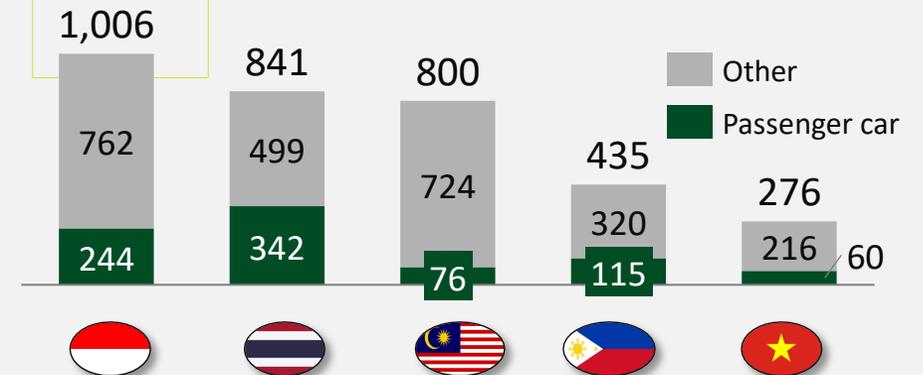


Indonesia is 25% of ASEAN car population
Total cars (Mn)²



Indonesia has largest car sales in ASEAN

Jan - Dec 2023 domestic car sales (k units)³



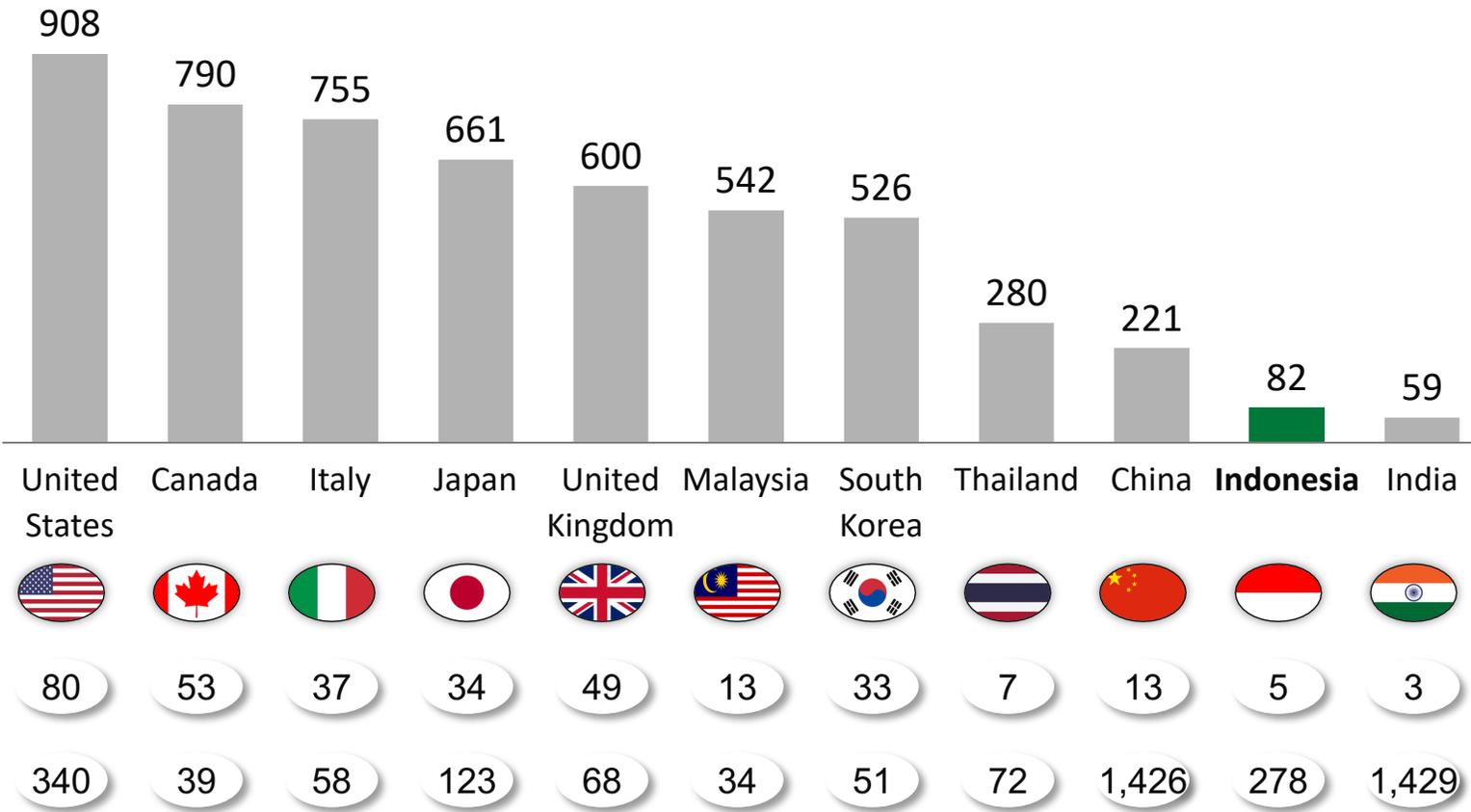
1. Population projection by BPS 2023; 2. Cars by Country 2024 – World Population Review, Latest Published Data; 3. Marklines; 4. In ASEAN, population in Right-Hand-Drive countries is estimated around 390 Mn, population in Left-Hand-Drive countries is estimated around 270 Mn
Source: BPS; Kemenkoekon, [World Population Review](#), [Marklines](#)



Indonesia's Car Ownership is Expected To Increase As The Population and The Economy Grow

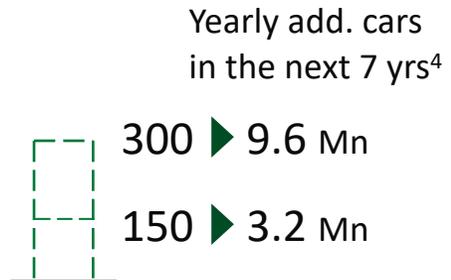
Indonesia has potential to increase the car ownership

Car ownership per 1000 people^{1,2}



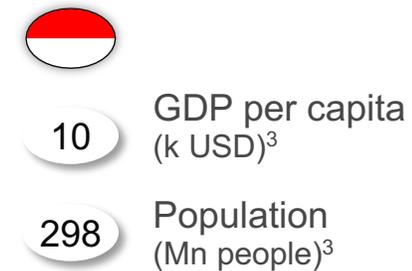
Illustration

Sales growth expected, driven by new ownership



For increase in car ownership of 25 cars per 1000 people, **yearly additional car demand will increase by ~1 Mn unit**

Indonesia 2030



1. Population projection by [BPS 2023](#); 2. Cars by Country 2024 – World Population Review; latest reported data; 3. International Monetary Fund, World Economic Outlook Database, October 2023; 4. Driven by ownership growth – on top of existing population replacement; Source: [World Population Review](#), [IMF](#)

Indonesia is Currently Dependent on Oil Import and Subsidized Fuel – Burdening Our Balance of Trade and Our State Budget



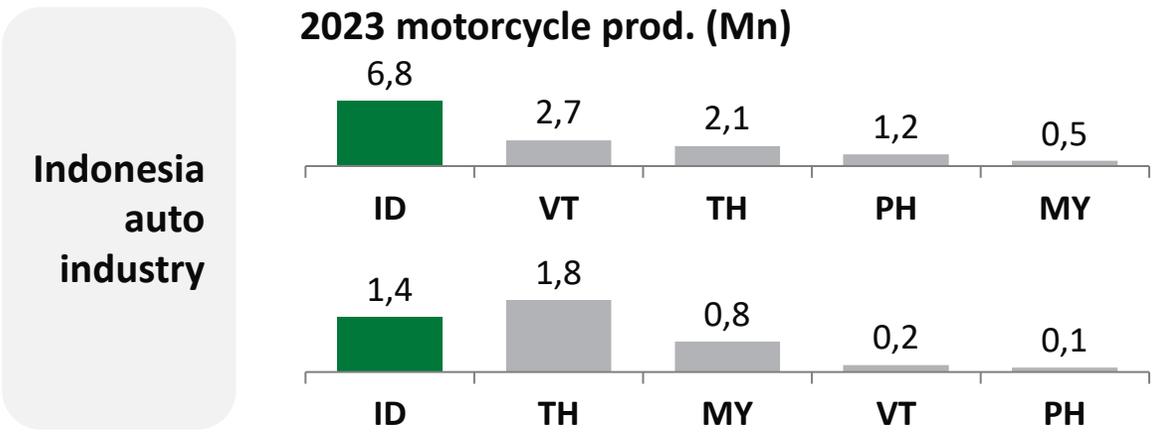
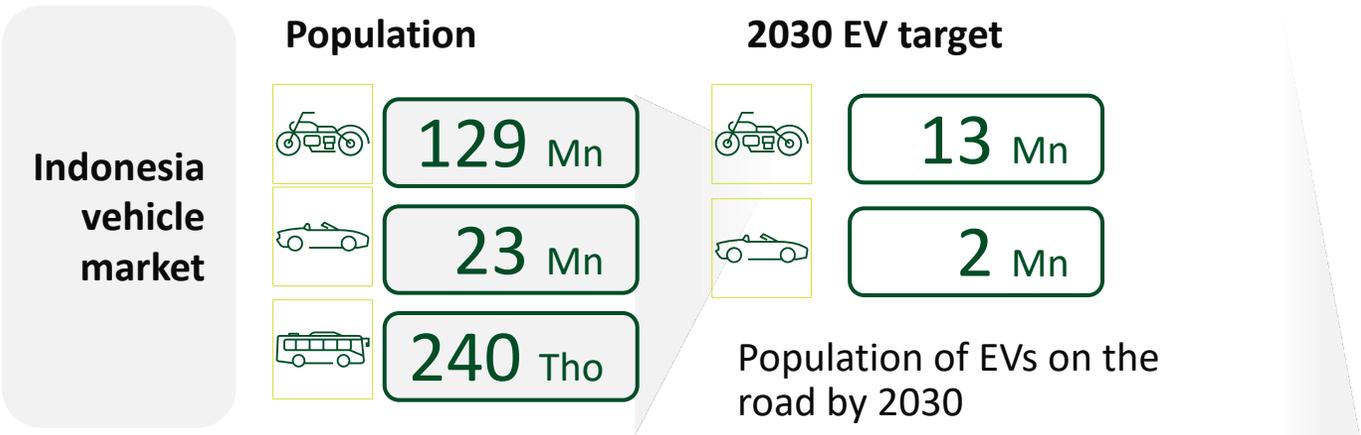
Energy sources	Primary energy users	Domestic demand 2022	Domestic production 2022	Production ratio vs demand 2022	Subsidies (total '18-'22)	
Coal	Coal	Power generation, industry	216 million tons	687 million tons	3,18	
Oil fuel	Refined oil (including FAME as gasoil blending)	Transportation	593 million barrels	276 ¹ million barrels	0,47	530 ^{2,4} IDR Tn
	LPG	Building	8,5 million tons	1,9 million tons	0,22	315 ⁵ IDR Tn
Gas	Natural gas	Power generation, industry	1.539 ³ k mmscf	2.369 k mmscf	1,54	

1. Domestic crude oil production 224 million barrels and FAME 52 million barrels; 2. Comprising subsidies, paid compensation, and unpaid compensation, covering gasoline, gasoil, dan kerosine; 3. Total consumption for natural gas is 1,361 k mmscf and LNG 178 k mmscf; 4. 530 IDR Tn = 35 USD Bn = 31 EUR Bn; 5. 315 IDR Tn = 21 USD Bn = 19 EUR Bn; 6. Currency used 1 USD = 15,000 IDR, 1 EUR = 17,000 IDR
Source: HEESI ESDM 2022; LKPP 2022



EV Will Be The Key Pillar To Decarbonize Transport Sectors, To Reduce Import Dependency, and To Reduce Subsidy Burden

Indonesia is the biggest market in ASEAN, and one of the major automotive manufacturing hub



Supported by government programs to drive adoption and investment

Incentive for EV adoption



- IDR 7 Mn (USD ~450) for new purchases
- IDR 10 Mn (USD ~640) for conversion



- VAT: 11% to 1%
- Zero luxury tax
- Excluded from odd-even traffic policy

Investment programs for industry

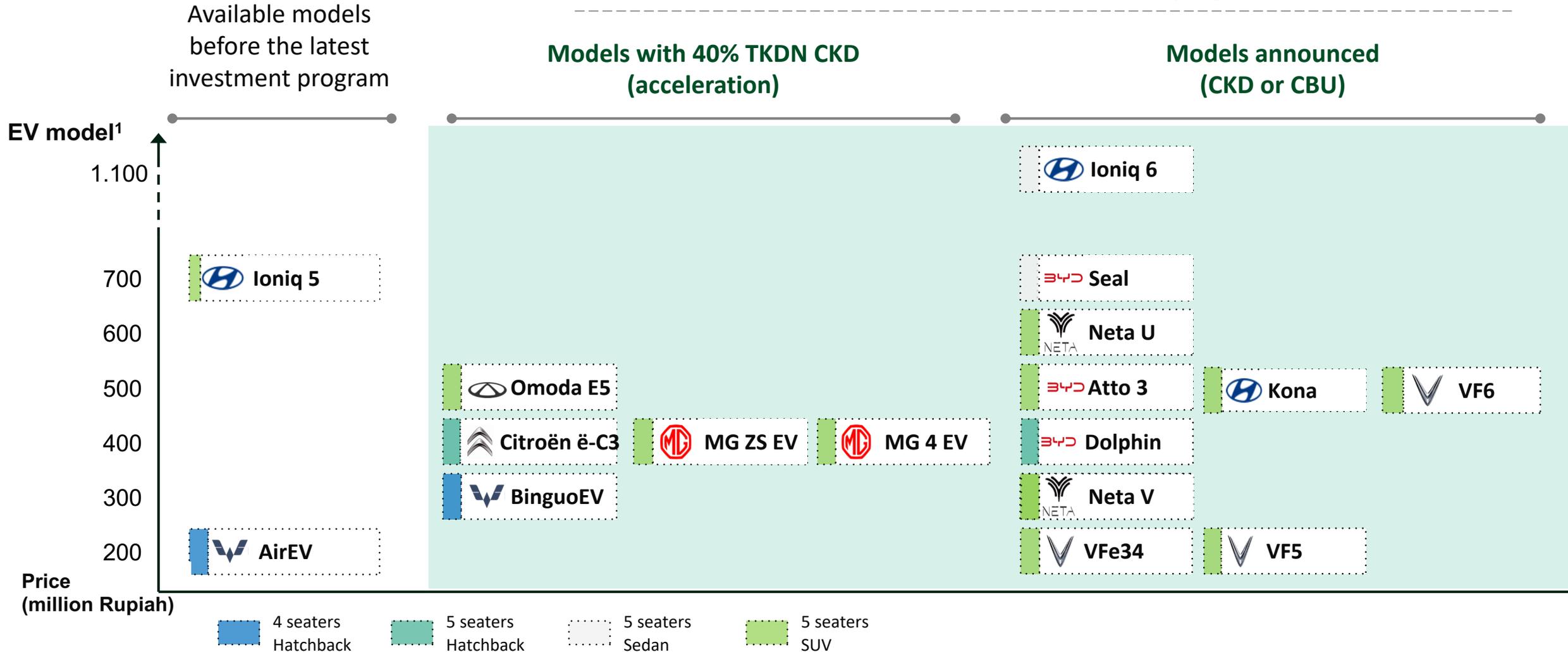
- Import & luxury tax relaxation
- Zero luxury tax
- Local content adjustment

Eligible for producers with local production commitments



Indonesian Market in 2024 Will See New EV Models at Different Price Points As The Results of EV Investment Programs

Impact of investment program:
Models announced after new investment program rolled-off

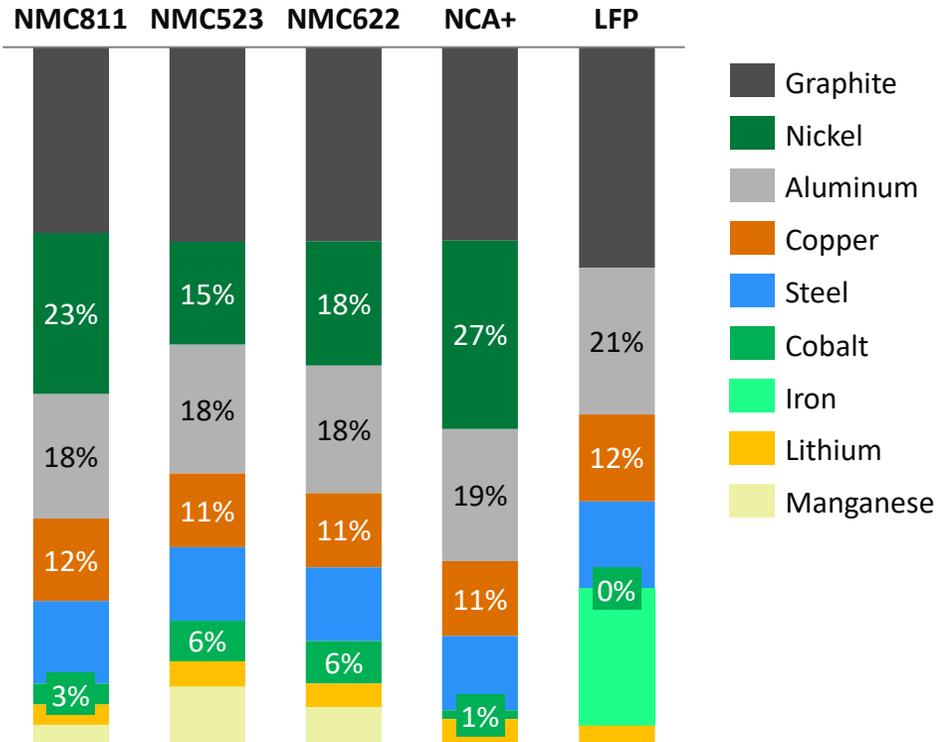


1. Available models that are produced locally in Indonesia or available through government investment programs



Indonesia is Well Positioned to Build a Strong Battery Industry for Energy Storage and EVs, Supported by Abundant Critical Minerals Reserves

Battery chemistry by minerals for 60 kwh battery



Indonesia has abundant critical minerals important for EV battery

- Ni** World's biggest nickel reserves
- Al** 6th biggest bauxite reserves
- Cu** 7th biggest copper reserves
- Co** World's 3rd biggest cobalt reserves
- Sn** World's 2nd biggest tin reserves

Indonesia is developing battery industry ecosystem with global partners



Building a total of 30 GWh capacity of battery cell



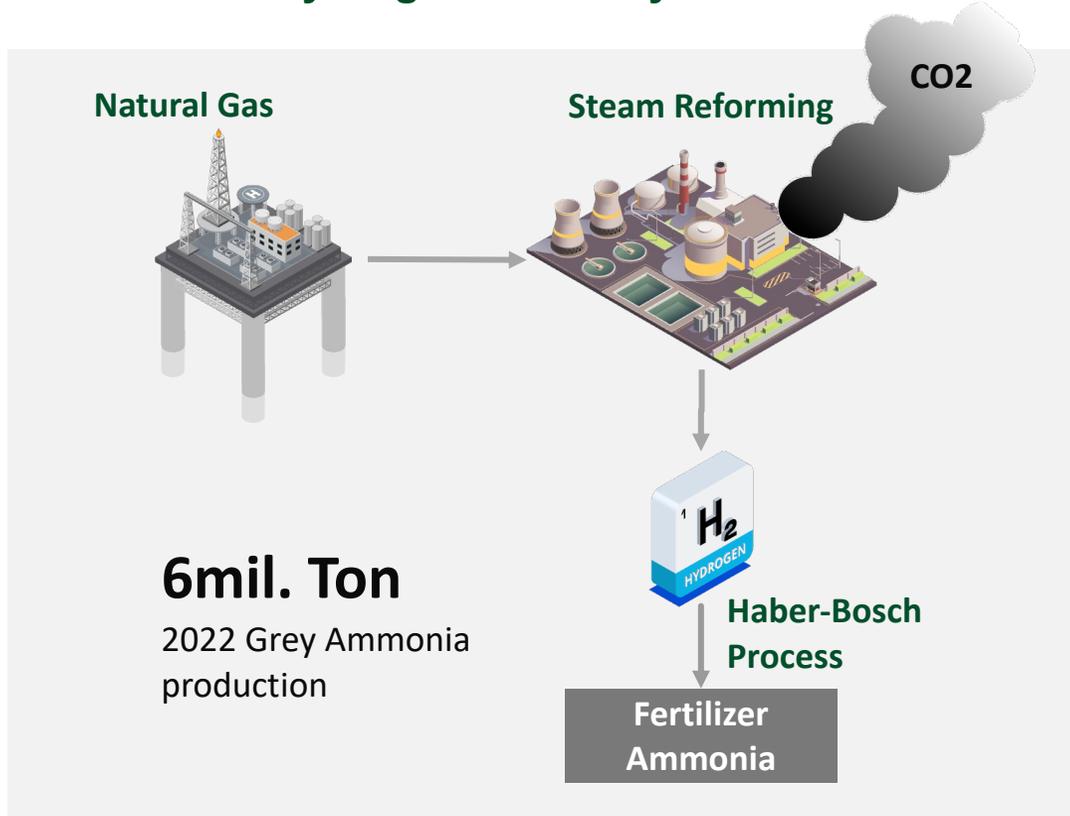
Building a total of 15 GWh capacity of battery cell

Source: [visualcapitalist](https://visualcapitalist.com); Statista



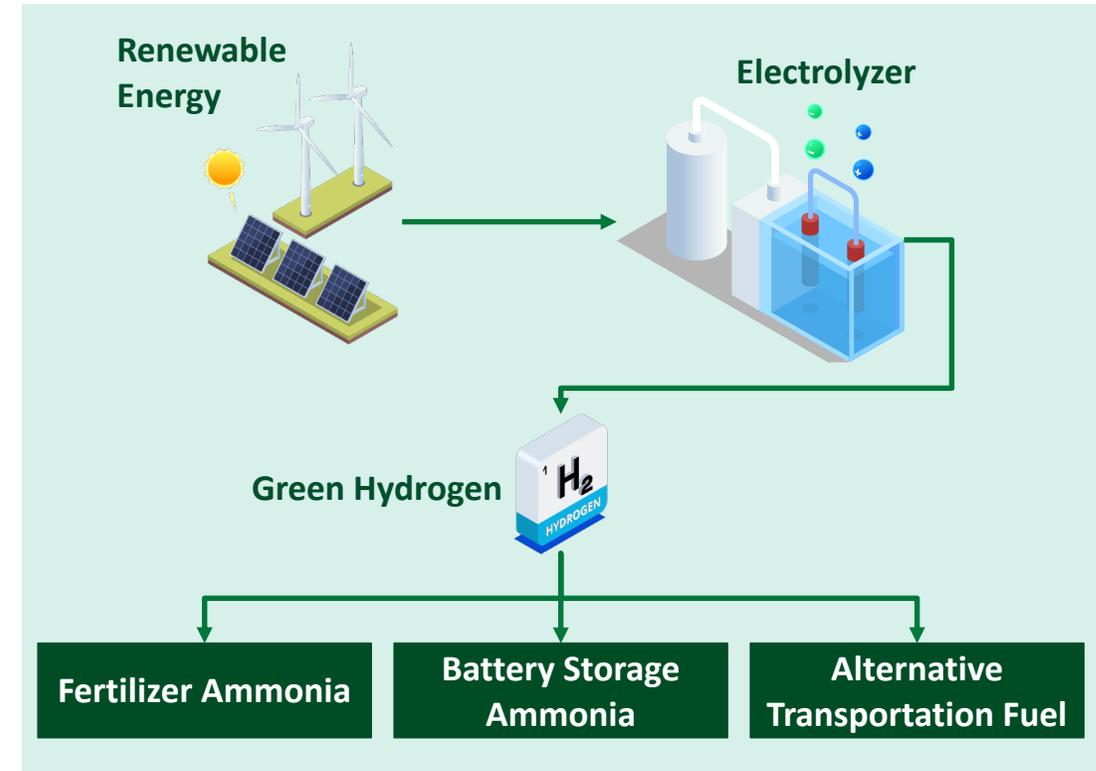
Cost-Effective Green Hydrogen Needs to be Developed to Support Indonesia's Large-Scale Agricultural Needs

Hydrogen Economy Before



Indonesia is one of the **biggest producer** of Natural Gas based **grey ammonia** which is a carbon intensive industry

Hydrogen Economy Future



More ammonia will be required for **fertilizer, battery storage and transportation fuel**, significant increase of ammonia demand will require **greener source**, i.e. green hydrogen

Technology, Capital, and Talents Are Required To Accelerate Indonesia Energy Transition



Technology and R&D

Latest technology to capture the most of the opportunity, supported by strong in-house R&D for Indonesia landscape



Capital

Capital/investment to accelerate the development of Indonesia's economy and decarbonization efforts



Talents

Talents to enable and drive the advancement of Indonesia's economy, following the strategy for Indonesia Golden 2045

Indonesia welcomes synergistic cooperation with other governments, enterprises, and institutions for a better world that will sustain in the decades to come



Thank You