TENGGARA STRATEGICS

Path to Indonesia's 8% growth: Leveraging nickel based EVs for energy security

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Founded by

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Agenda

How EVs contribute to economic growth, energy self-sufficiency and job creation

Addressing Challenges in EV Development and Adoption

Cross-Country Comparison

Policy Recommendation

President Prabowo aim to achieve 8% economic growth with energy resilience outlook

- Indonesia needs the 8 percent growth to become a high-income country by 2045.
- The initiatives to accelerate EV adoption to achieve energy security

How EVs contribute to economic growth, energy self-sufficiency and job creation

Indonesia needs to industrialize through downstream to achieve higher economic growth

- Indonesia's economic growth has been stagnant remain stagnant in 5 percent
- The manufacturing sector share in GDP decrease while metal ore mining increase

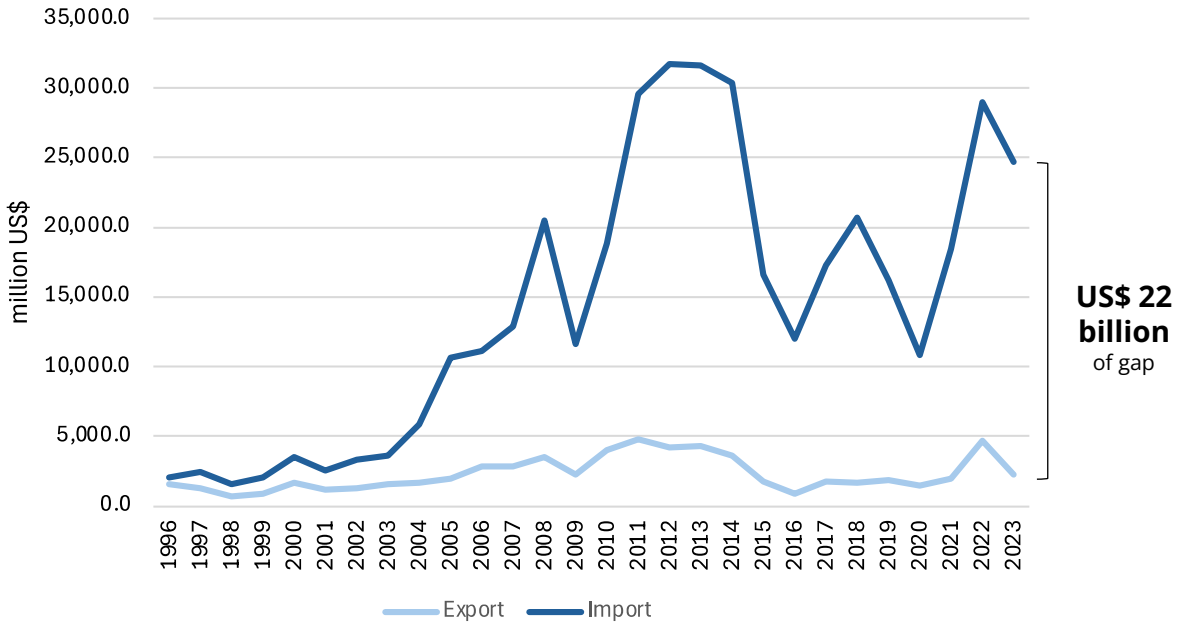
Source: Central Bureau of Statistics (2025)

EV production in Indonesia can advance nickel downstream, promote industrialization and increase economic growth

Indonesia's urge to achieve energy self-sufficiency

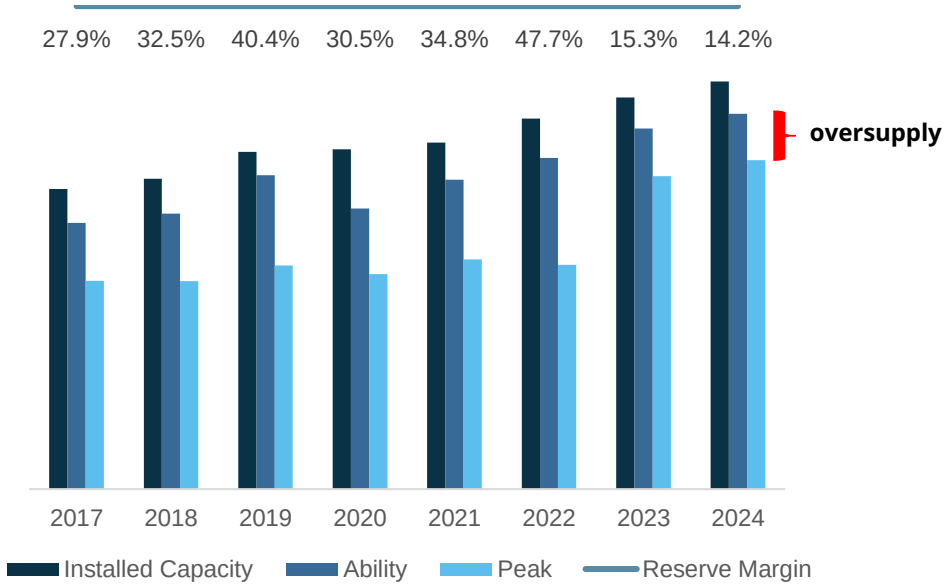
- **Over reliance on imported energy** put Indonesia at risk global uncertainty
- **Transport electrification** can be utilized to reduce the imported energy reliance

Oil export and import



Source: Central Bureau of Statistics (2024)

Electricity Supply-Demand



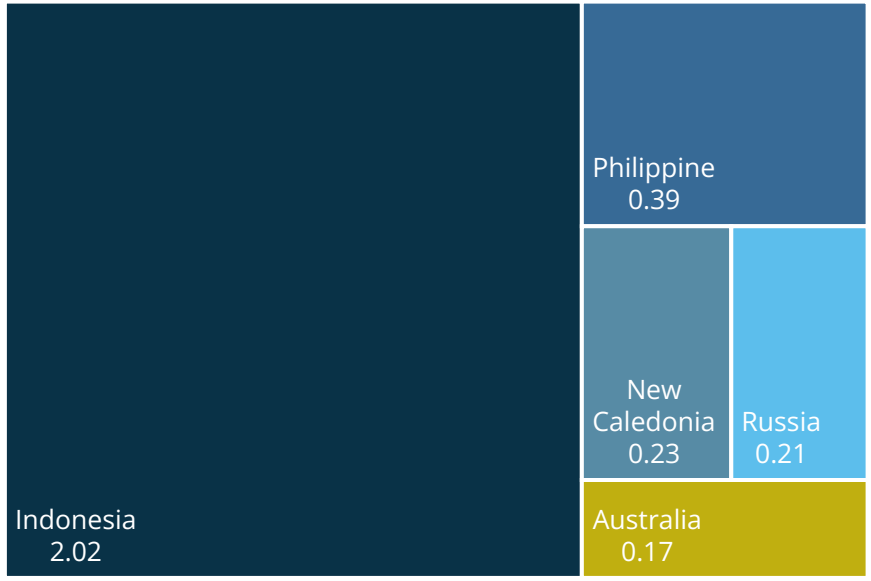
Source: PLN Statistics 2017 - 2024

The importance of Indonesia's Nickel reserves

Advantage of Nickel reserves

Indonesia is a **global leader in nickel production**, dominating the global share of nickel production (56% share)

Estimated national mine production (million metric tons)

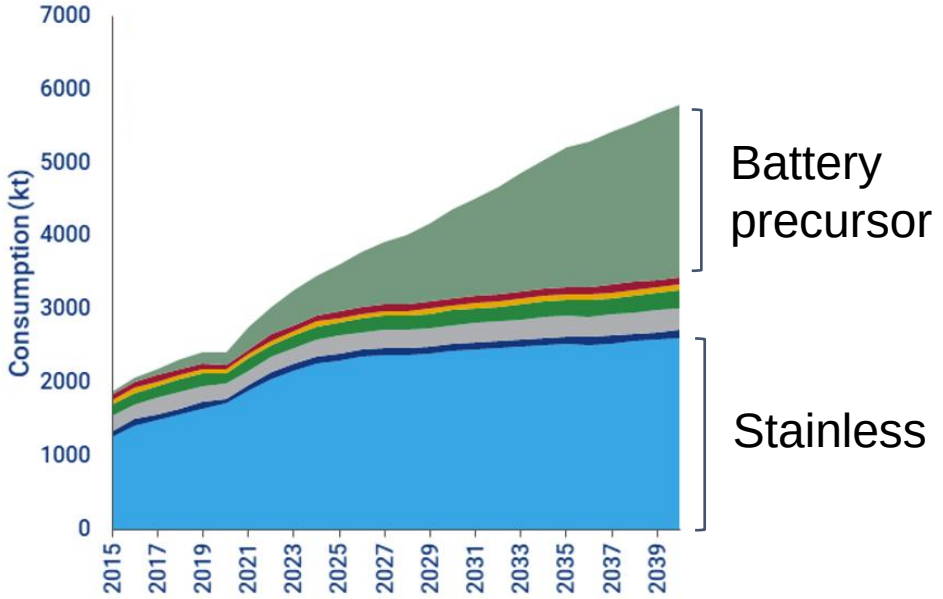


Source: S&P Global (2024)

Potential of domestic nickel utilization

Nickel consumption for battery in 2021 was only 7 percent, but is projected to increase to 41%

Nickel consumption projection



Source: Wood Mackenzie (2022)

Indonesia can advance nickel-based battery

Higher demand for advance battery

KIET Korea Institute for Industrial Economics & Trade

"Nickel-based battery is advance battery that **has higher energy density**. Although LFP demand is growing due to the cheaper price, **nickel-based battery will recover as the demand for the high performer battery increase "**

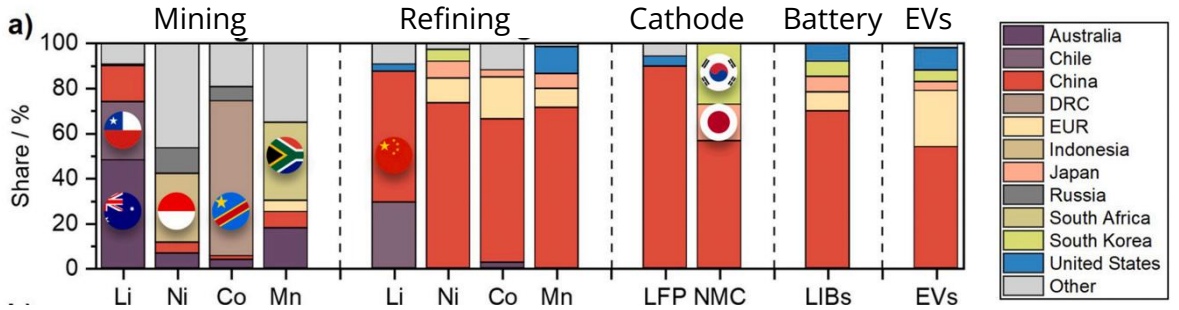
Export potential

"Making them more suitable for **export to countries with colder climates**"

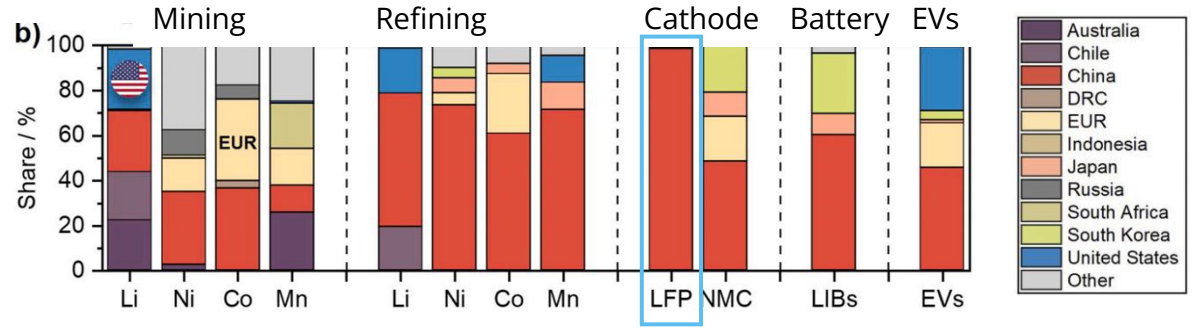
- Rachmat Kaimuddin, Deputy Coordinating Minister for Basic Infrastructure, the Coordinating Ministry for Infrastructure and Regional Development

China's dominance in LFP

Geographical distribution of EV value chain sectors



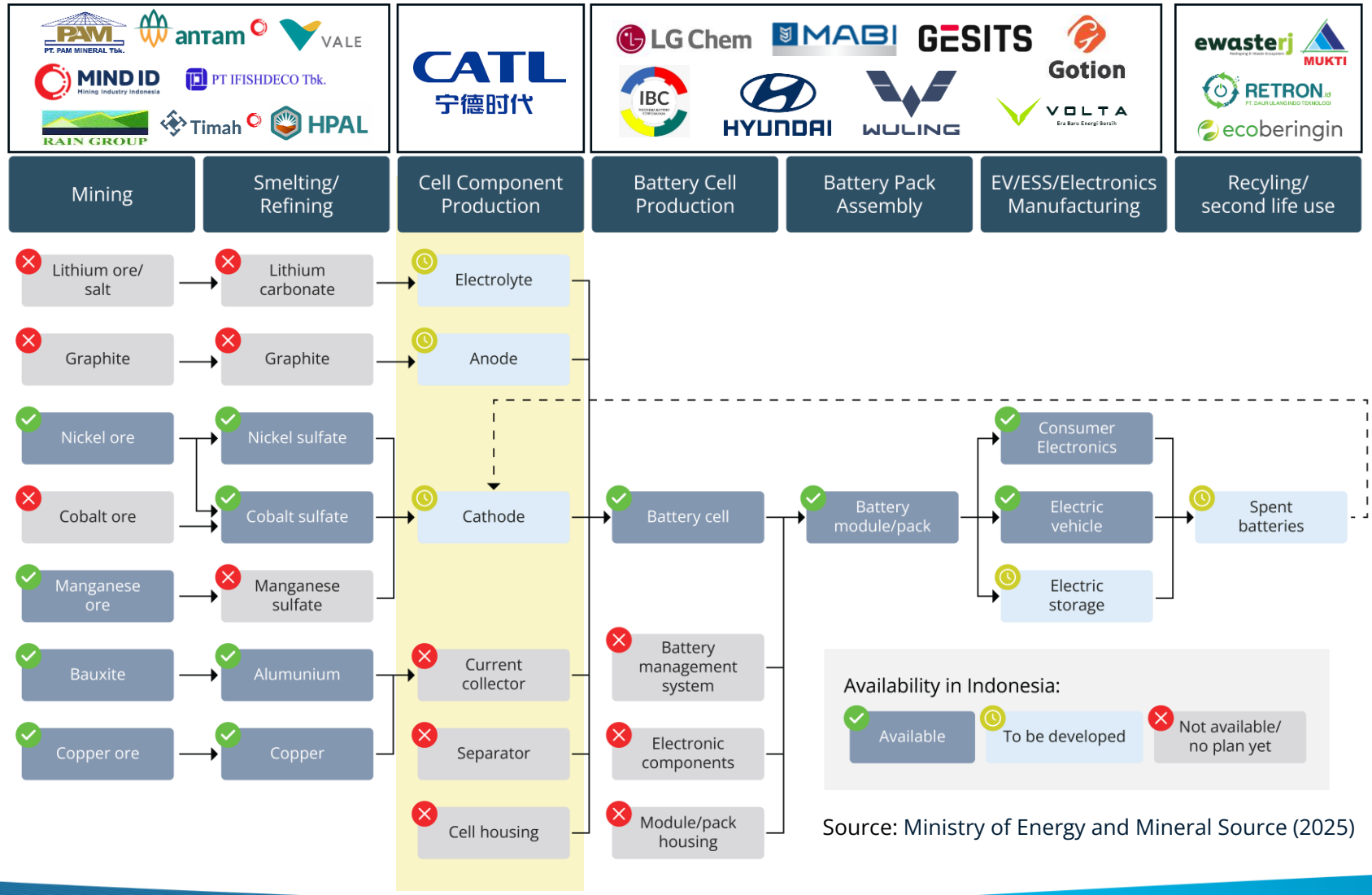
Ownership distribution of the lithium-ion battery supply chain



98.45%

Source: Greitemeier et al. (2025)

Nikel based-EV supply chain gap

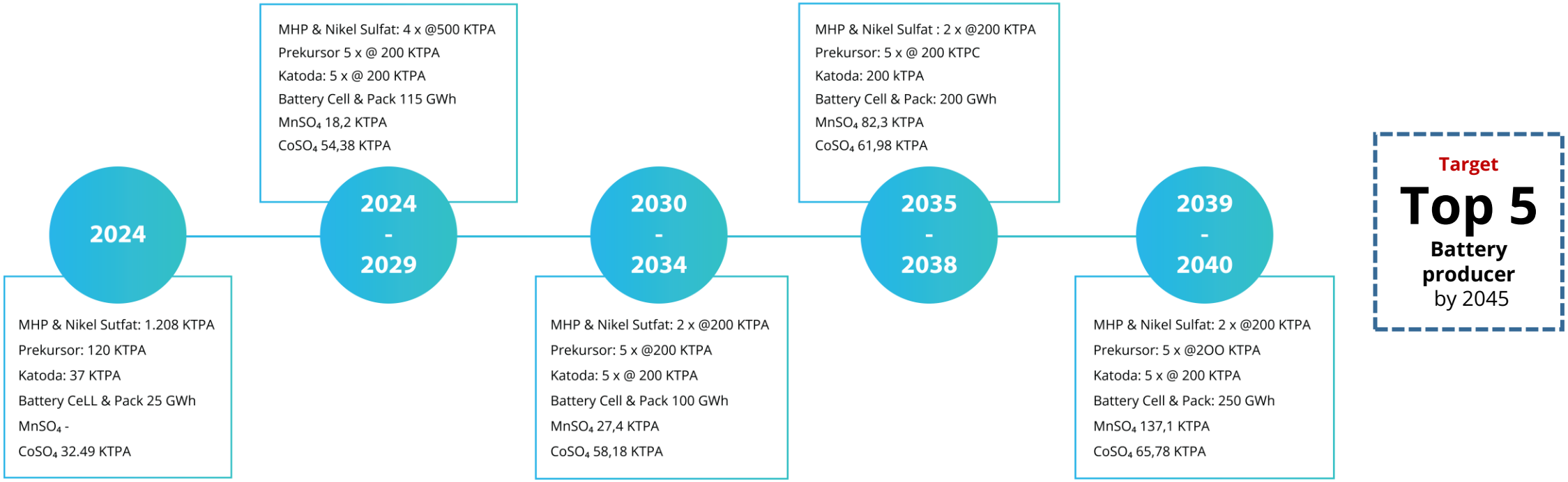


Source: Ministry of Energy and Mineral Source (2025)

Indonesia has not yet established the cell component production for nickel-based battery, while these parts hold significant share in the cost of EV battery and **potential for export diversification**

Mismatch between policy and implementation in nickel-based battery

- **There needs incentive** for the nickel-based EV battery manufacturer
- **There needs guideline and regulation to address the sustainability issue in the upstream**



Source: Ministry of Energy and Mineral Source (2025)

Nickel-based EV value chain network

Additional value added is Rp29.56 trillion (0.20%) with EV Battery and EV as the sector with the highest contributor

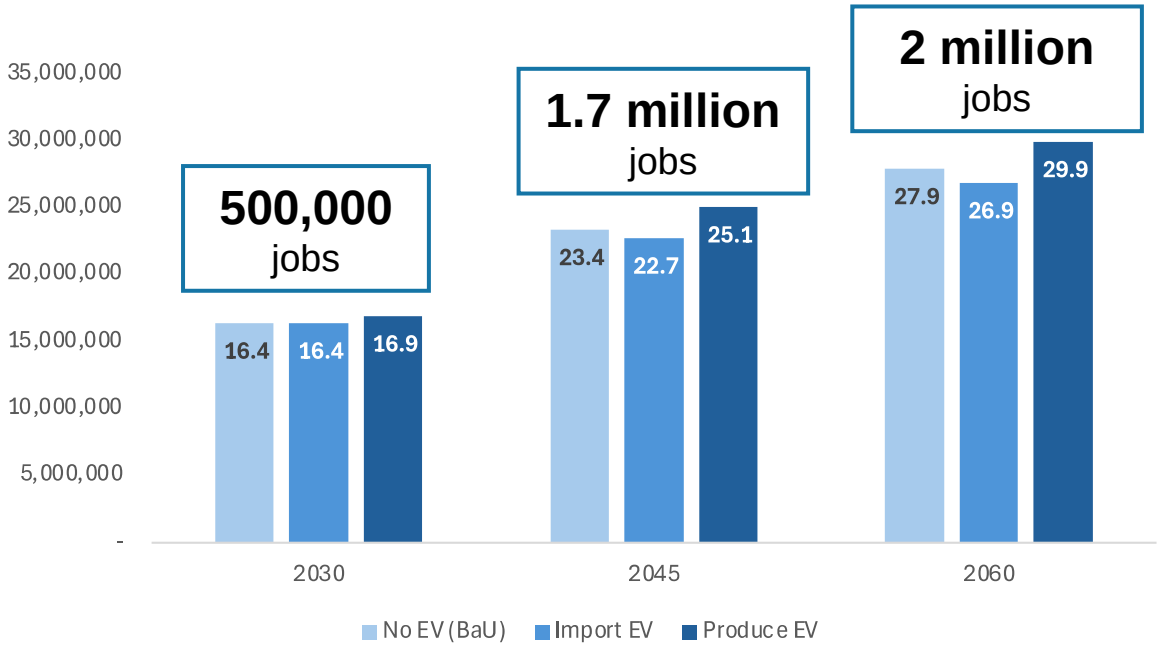
Upstream Raw Material	Midstream Parts and Components	Downstream EV Makers	Aftermarket - Services
Rp 6.29 trillion	**Rp 8.94 trillion**	**Rp 10.84 trillion**	**Rp 0.23 trillion**
 	 		

Description	Additional VA	%	Description	Additional VA	%	Description	Additional VA	%	Description	Additional VA	%
Nickel ore	2.92	9.9%	Electrical Vehicle Battery	8.29	28.0%	Electrical Vehicle	6.83	23.1%	Reparation and maintenance of car and motorcycle	0.12	0.4%
Bauxite	0.72	2.4%	Accumulator and dry batteries	0.25	0.9%	Motor vehicles except motorcycle	1.66	5.6%	Services allied to transport	0.12	0.4%
Copper	0.71	2.4%	Tires	0.11	0.4%	Motorcycle	0.01	0.0%			
Other Mining and Quarriying services	0.34	1.1%	Electrical machinery	0.08	0.3%	Retail sale for car and motorcycle	1.38	4.7%			
Nonfertilizer basic chemical	0.28	0.9%	Multipley machine	0.07	0.2%	Retail sale for non-car and motorcycle	0.96	3.2%			

Source: Author calculation using data from Central Bureau of Statistics (BPS)

*Accounting for 89% of total value added incremental

EV ecosystem industry results in additional manufacturing job



Scenario	2030	2045	2060
Import EV	(41,685)	(676,835)	(1,021,401)
Produce EV	**527,477**	1,714,327	2,021,191

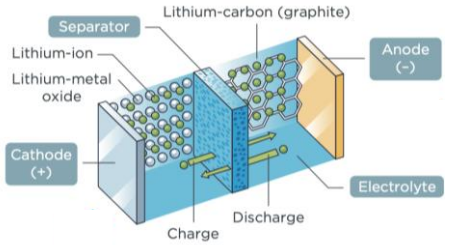
Source: ILO and Ministry of National Development Planning (2024)

Government should catch **the job creation potential in the EV ecosystem** industries through nickel downstream policy

US case of nickel-based EV battery job creation

Nickel-based EV battery generate job to America manufacturing industry about **84,000 to 125,000 jobs**

Components



Cell

Module

Pack

Recycling

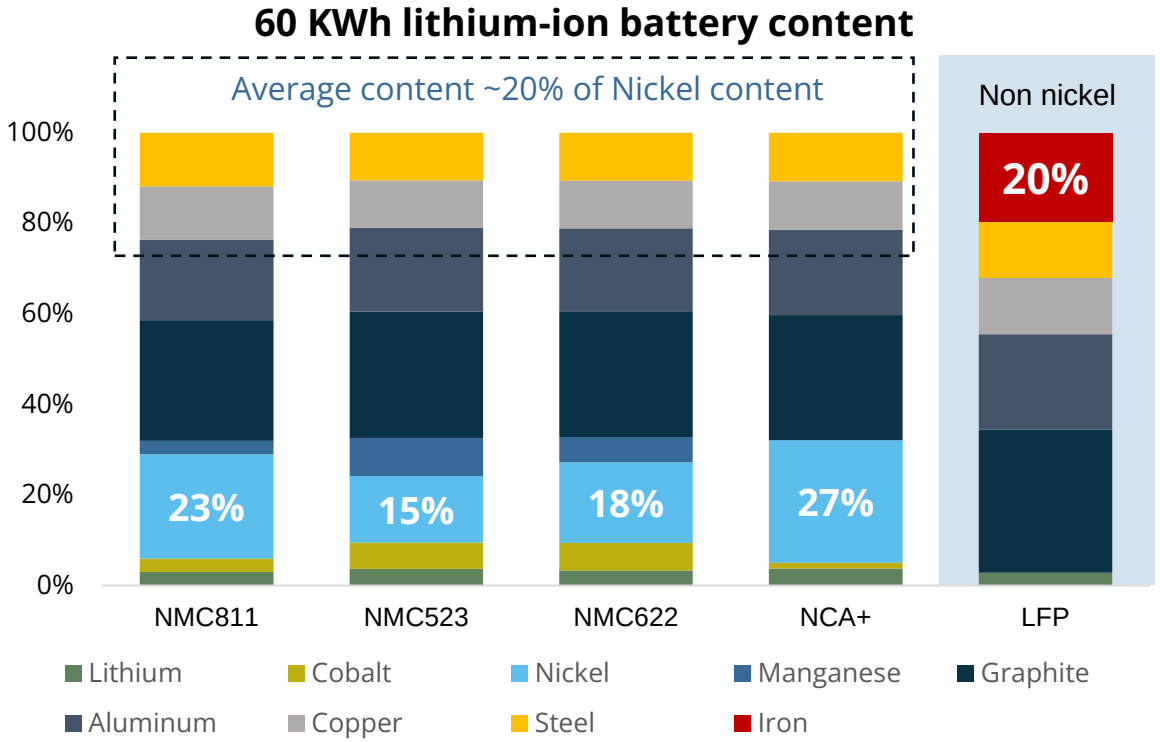
Components, Recycling	Cell, Module, Pack	Total
11,000 jobs	73,000 – 114,000 jobs	84,000 – 125,000 jobs

Jobs/GWh per production of each component							
Cathode	**Anode**	**Electrolyte**	**Separator**	**Cell**	**Module**	**Pack**	**Recycling**
15 jobs	10 jobs	4 jobs	3 jobs	22 jobs	20 jobs	50 jobs	17

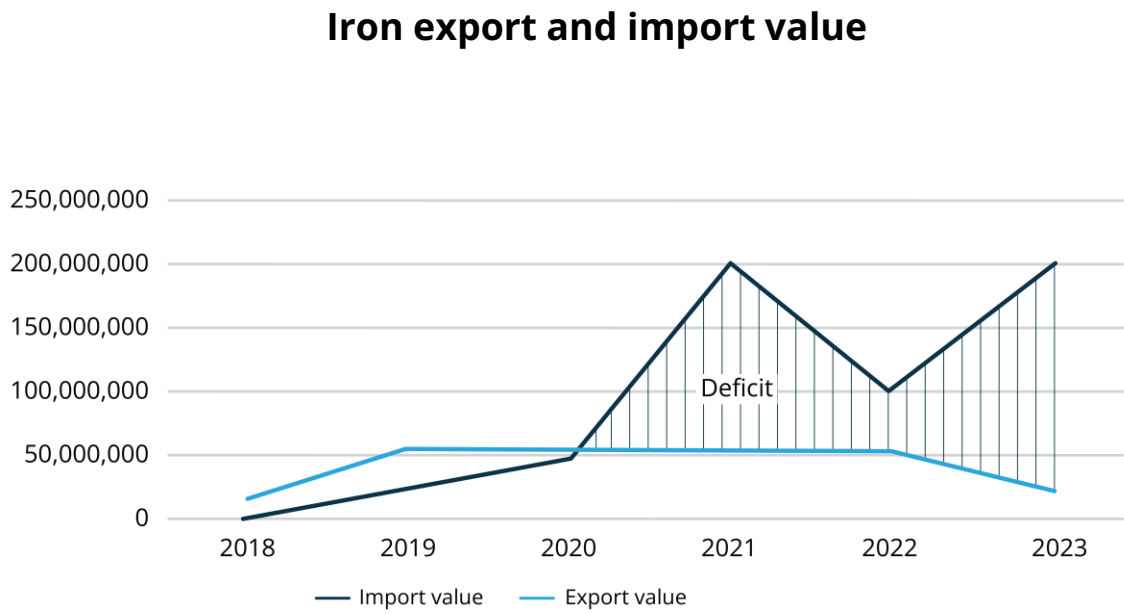
Source: International council on clean transportation (2024)

Focusing on Nickel-based batteries

- **Indonesia is the net importer of iron** while iron comprises 20% of LFP batteries.
- **The trade deficit and Indonesian exchange rate will worsen** if LFP batteries become the standard.



Source: Visual Capitalist (2022)

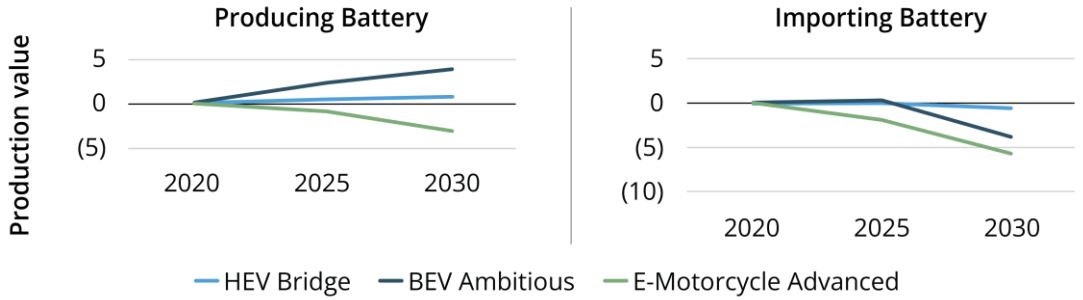


Source: World Integrated Trade Solution (2025)

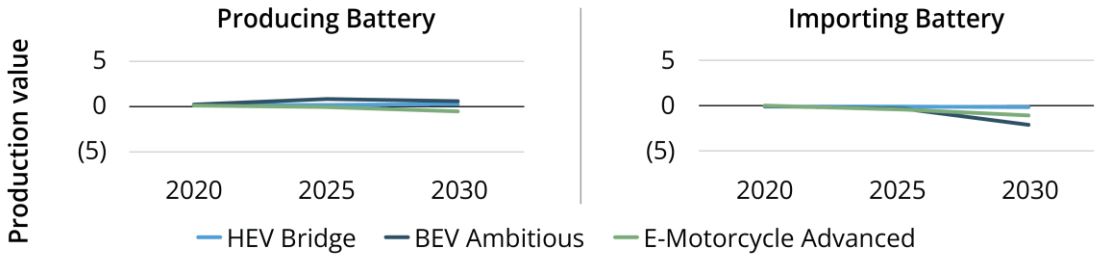
Economic impact of producing and importing battery

Indonesia has the **highest benefit of producing EV battery domestically** and the **highest loss of importing EV battery**

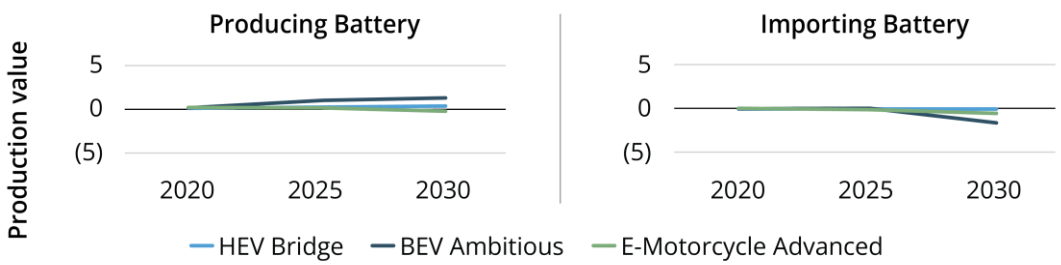
Indonesia's Ripple Effects



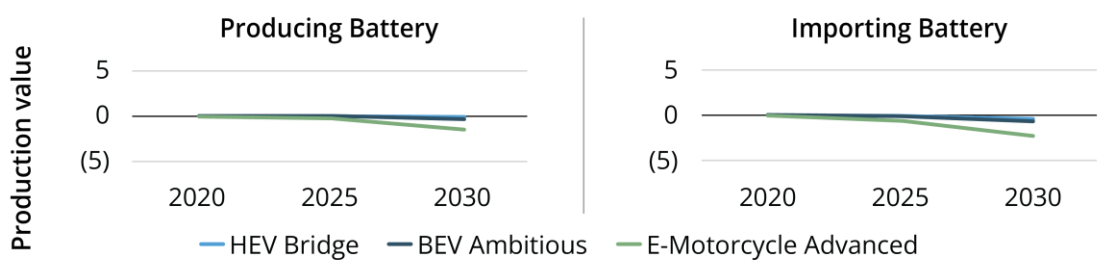
Thailand's Ripple Effects



Malaysia's Ripple Effects



Vietnam's Ripple Effects



*in billion US$

Source: ERIA (2020)

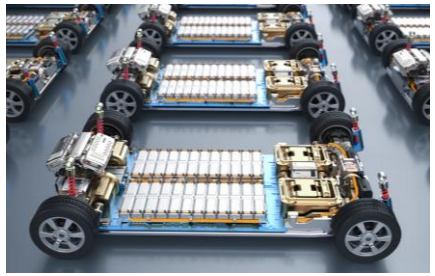
Addressing Challenges in EV Development and Adoption

Challenges in further promoting nickel-based EV adoption

Limitations of fiscal incentives

Fiscal incentive for nickel-based EV should be differentiated to leverage EV-related industries

Lack of EV technology awareness

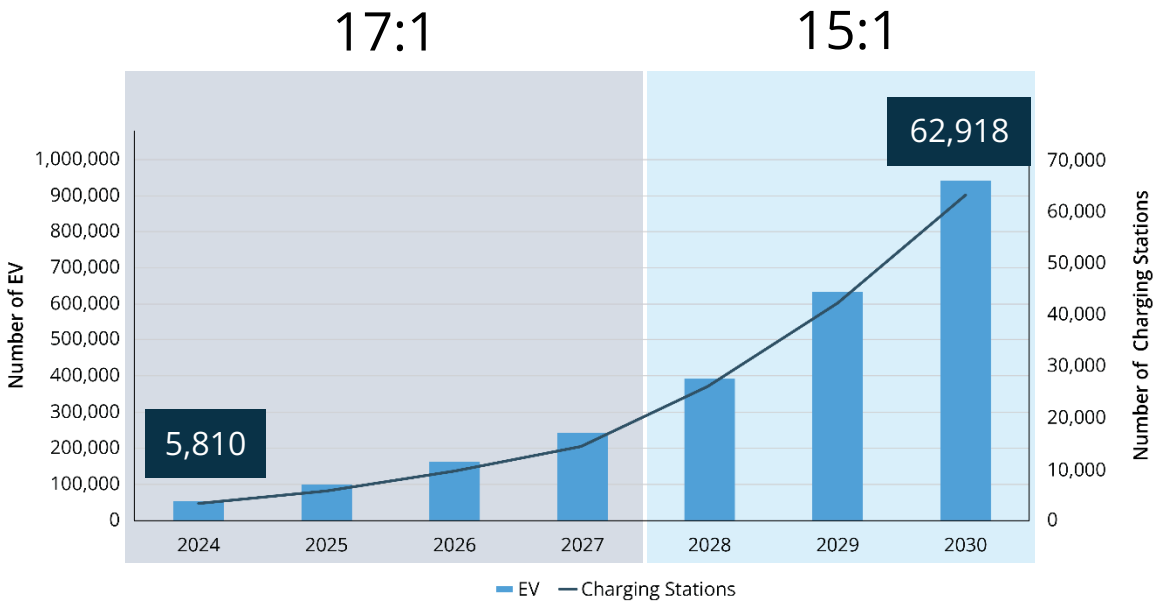


Battery lifecycle

Distance anxiety

Limited charging stations

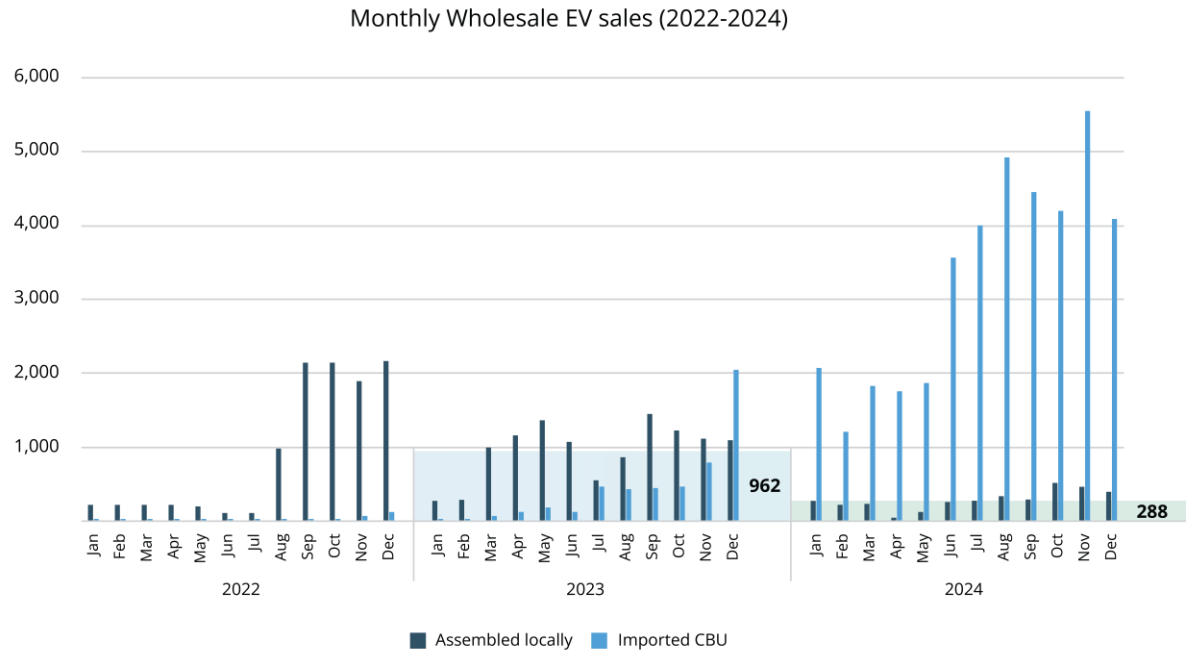
Charging station in Indonesia is currently at **3,233 charging station** with the ratio of **17:1**, which is still far behind China that reach ratio of 6:1 in 2020



Adverse impact of CBU EV to EV production

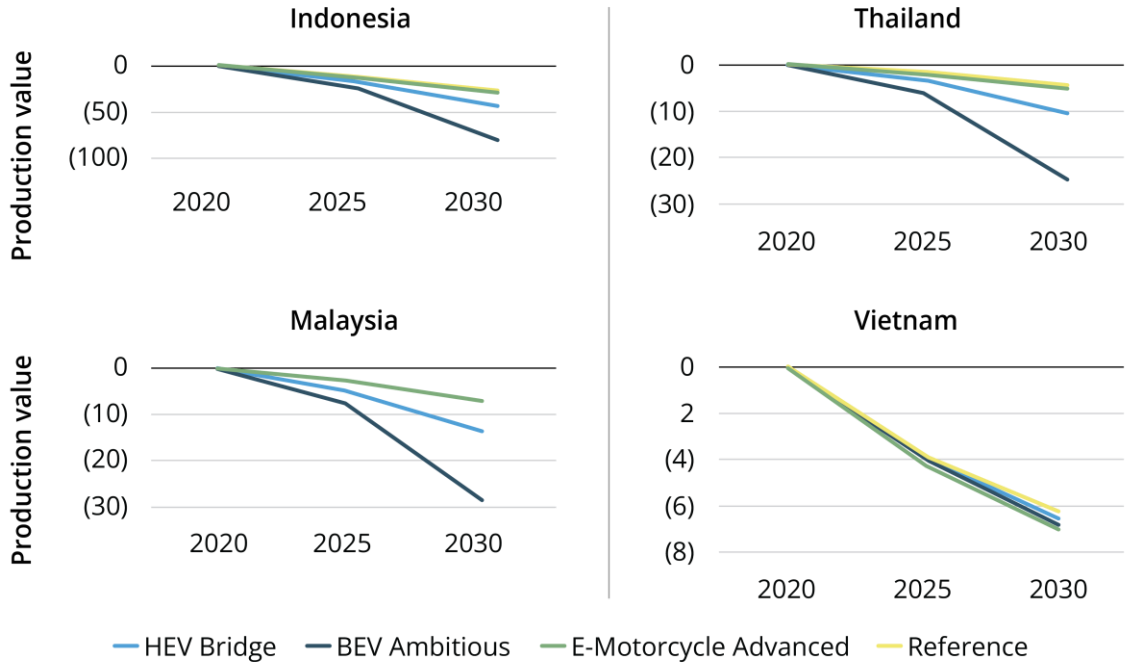
- Indonesia has exhibited a declining trend of locally manufactured EVs, and importing EV is estimated to worsen production value in the long term
- Countries such as India have been able to protect local industry through **import quotas**

Short term



Source: GAIKINDO (2025)

Long term (estimated)



*in billion US$

Source: ERIA (2020)

Policy transmission in Thailand

Price war with Chinese car manufacturer along with lower demand in Thailand cause Japanese car manufacturer to alter its facilities in Thailand

2022	2022-2023	2024
Implementation of **customs-free importation** of CBU EVs	84,000 CBU EVs were imported CBU EVs benefitted from tax incentives applied to **all EVs** Thailand domestically manufactured EVs became non-competitive	The Thai automobile market is oversaturated with cheap CBU EVs Increasing awareness for consumer to adopt EV also worsen domestic manufacturer to stay competitive Honda stop car assembly in 1 of 2 Thailand's plants Suzuki and Subaru closes its automobile production

Cross-Country Comparison

Policy comparison with other countries:

Category	Incentives	Indonesia	Malaysia	India	China	Norway	Footnote
Supply	Import tax exemption	✓[1]	✓[1]			✓	[1] Only until Dec 2025
	Income tax incentive	✓	✓[1]				[1] Malaysia: LCMB
	Manufacturing subsidy			✓[1]	✓[2]		[1] **India: PLI sheme** [2] China: Made in China 2025
	Charging infrastructure		✓[1]	✓[2]			[1] Only until 2027 [2] Only until May 2024
Demand	Price subsidy	✓		✓[1]	✓[2]	✓[2]	[1] Only until May 2024 [2] Only until 2022
	Sales/service tax incentive	✓	✓	✓	✓	✓[1]	[1] Only until 2022, replaced with conditional price subsidy
	Ownership tax incentive (road tax, PBBKB)	✓	✓	✓		✓[1]	[1] Only until 2021
	Parking incentives				✓	✓[1]	[1] Has been abolished in several places since 2017
	Bus lane				✓	✓[1]	[1] Conditional exemption
	Corporate procurement		✓[1]			✓	[1] **Malaysia: Income tax deduction**

There has not been policy yet Policy already aligns with EV adoption

Policy Recommendation

Side	Policy recommendation	Goal	Method
Demand	**Dealer incentives for selling nickel-based EV**	Fix misconception and increase public awareness	Funds from state government for dealers to rebates to EV buyers or cash bonuses for dealers
	Lower financing cost	Lower Interest rate and insurance premium fee	Providing subsidies or acting as a guarantor for EV loans
	Establish integrated urban development policy	Increase charging stations availability in apartment building	Mandate to allocate 30% of apartment parking space provided with charging stations
	Corporate procurement incentive on nickel-based EV	Increase sales and public acceptance on nickel-based EV	Income tax deduction policy
Supply	**Tax incentive for nickel supply chain industries**	Increase economic value added and export diversification	Attract investor to establish cell component production (cathode, anode, separator, electrolyte) through longer tax holiday for nickel-based battery manufacturer
	Policy and incentive for exporting nickel-based EV	Export diversification to developed countries	Incentivize export of EV and EV battery and establish ESG guideline and law enforcement on mining sector
	Impose quota system on non nickel-based EV/LFP EV	Increase economic value added and employment	Set up quota for LFP EV
	Develop human capital	Increase employment	Top up the cost of R&D centre, training facilities and import specialist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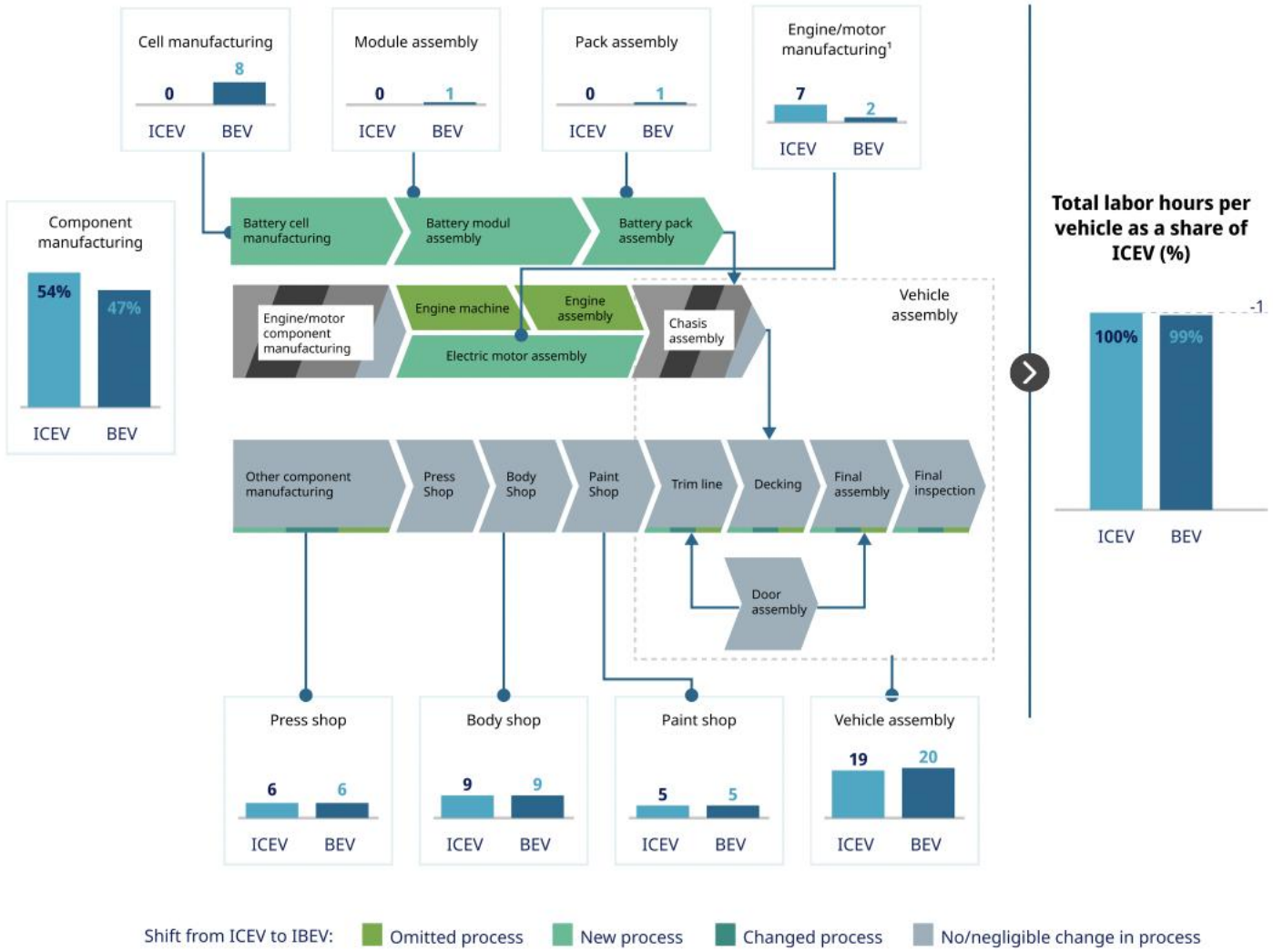
Appendix Comparison

Indonesia case of EV job creation



Source: BCG (2020)

There is no significant difference in the total labour required between EV and ICEV production, but there would be significant distribution changes from OEM and tier 1 to battery manufacturing

Negative employment impact will only occur if EV development is not accompanied by battery manufacturing.

Lesson learned from Thailand's case

Indonesia's manufacturing workforce is lacking, especially high-skilled talent, with only 6 per cent having a tertiary education, compared to Thailand's 19 per cent.

Employment impact will depend on the skills on occupation. Demand will likely grow for highly skilled engineers and technician but low-skilled production line workers may be at risk

Engineer

Increase from 10% to 20%

Technician

Increase from 20% to 50%

Operator

Decrease from 70% to 40%

Skill level	High skilled	Skilled non manual	Skilled manual	Low manual
Occupation	Quality assurance, quality management representativ¡ Engineer: design, storage and energ® Product designer	Logistics and supply chain management, Warehouse, Technician, Information technology (IT)	Supervisor, Production, Maintenance, Parts assembler, Machine operators	Labors in the production line, Quality control

Source: Osatis and Asavamirandara (2022)

US case of job creation

Type	Occupation title	Employment change, 2021–31	Percent employment change, 2021–31	Occupational openings, 2021–31 annual average	Median annual wage, 2021[1]	Typical education needed for entry
EV design and development	Total, all occupations	**8,317.4**	**5.3**	19,532.5	$45,760	
	Software developers	370.6	26.0	143.4	120,730	Bachelor's degree
	Electrical engineers	3.1	1.6	12.3	100,420	Bachelor's degree
	Electronics engineers, except computer	6.7	6.0	7.8	104,820	Bachelor's degree
	Chemical engineers	3.7	13.9	2.0	105,550	Bachelor's degree
Battery manufacturing	Electrical, electronic, and electromechanical assemblers, except coil winders, tapers, and finishers	6.0	2.2	32.8	37,460	High school diploma or equivalent
	Miscellaneous assemblers and fabricators	-96.4	-7.1	142.7	36,590	High school diploma or equivalent

Source: US Bureau of Labor Statistics (2023)

EV ecosystem players in Indonesia

Local Community

Alliance

- Alliance of Indigenous Peoples of the Archipelago (AMAN)

Mining

Company

- PT Aneka Tambang Tbk (ANTAM)
- PT Vale Indonesia Tbk
- PT Ifishdeco Tbk.
- PT Resource Alam Indonesia Tbk
- PT Timah Tbk
- PT PAM Mineral Tbk
- PT Mining Industry Indonesia (MIND ID)

Mining / Battery Manufacturer

Company

- Contemporary Amperex Technology Co. Limited (CATL) China

Motorcycle Conversion

Company

- PT Spora EV
- Braja eElectric

Battery/EV Manufacturer

Company

- LG Chem Ltd
- PT Indonesian Battery Industry (IBC)
- PT Hyundai Motor Manufacturing Indonesia (HMMI)
- PT SGMW Motor Indonesia (Wuling Motors Indonesia)
- PT Mobil Anak Bangsa (MAB)
- PT Gesits Technologies Indonesia (GTI)
- PT Volta Indonesia Semesta
- PT Gaya Abadi Perfect Tbk
- PT Gotion Green Energy Solution Indonesia

Prospective: INBC, BASF, Eramet, VW, Ford.

Community

- Industrial Association Indonesian Electric Vehicles

Charging Station / Swap-Operator

Company

- PT Swap Energy Indonesia
- State Electric Company PT (PLN)
- PT Hyundai Motor Manufacturing Indonesia (HMMI)
- PT Oyika Powered Solutions (OPS)
- PT Excelly Elektrik Indonesia (Voltron)
- PT Utomo Charge Plus
- PT Pertamina Patra Niaga

Government

- Ministry of Energy and Mineral Resources of the Republic of Indonesia
- Director of Waste Management for Hazardous and Toxic Waste and Non-Hazardous and Toxic Waste. MOEF
- Ministry of Industry
- Ministry of Finance (BKF)
- Ministry of Internal Affairs
- Ministry of Transportation
- Local Government (Jakarta, West Java and Bali)

Recycler

NGO

- Indonesian Electronic Waste Care Foundation (*E-Waste* RJ)
- PT Eco Beringin

Company

- PT. Indo Technology Recycling (Retron)
- PT Mukti Mandiri Lestari

Consumer

Company

- PT Grab Technology Indonesia
- PT Gojek Indonesia

Community

- Indonesian Electric Car Community (KOLEKSI)
- Wuling Electric Vehicel Indonesia (WEVI)
- Forum EV Indonesia

Source: Ministry of Energy and Mineral Source (2025)