

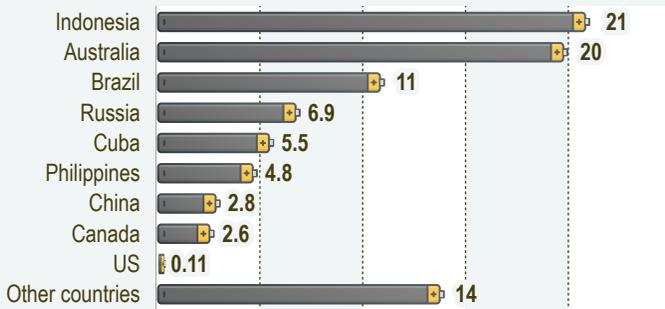
# GRASPING THE POTENTIAL OF BATTERY INDUSTRY IN INDONESIA



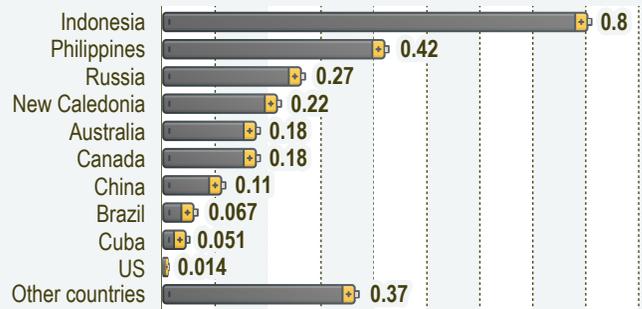
## Why Battery Industry?

Indonesia's abundant mineral resources, especially for nickel, provide a big opportunity to jump in to battery and EV industry value chain. Indonesia is one of the biggest nickel ore producers and also has the biggest nickel reserves in the world.

**Global Nickel Reserves in 2019**  
(in million metric tons)



**Global Nickel Production in 2019**  
(in million metric tons)



Battery has a significant contribution in EV cost (25% to 40%) and raw material contributes to around 60% of battery manufacturing cost. The battery materials include nickel, cobalt, aluminium, manganese and lithium. Nickel is predicted to have a significant portion as a battery component in the future.

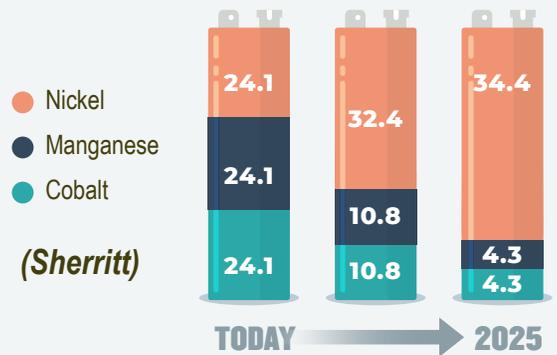
## EV Battery Components

An example of a Nickel-Rich Battery



## Outlook of EV Battery Components

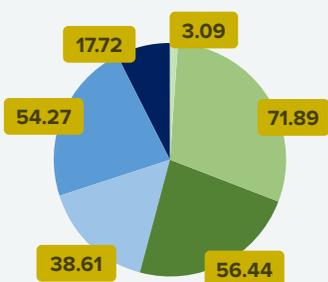
Kg Content for 50k Wh NMC Battery



## Indonesia's Mineral Resources & Reserves

The availability of many raw materials for manufacturing battery in Indonesia should be followed by a carefully planned blueprint for the downstream industry to optimize their utilization.

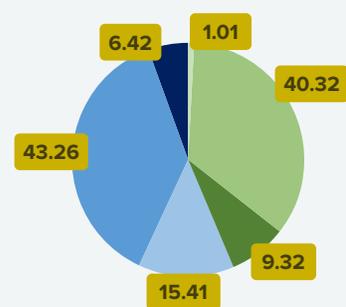
**Nickel Resources & Reserves**  
(in million metric tons)



**Cobalt Resources & Reserves**  
(in million metric tons)



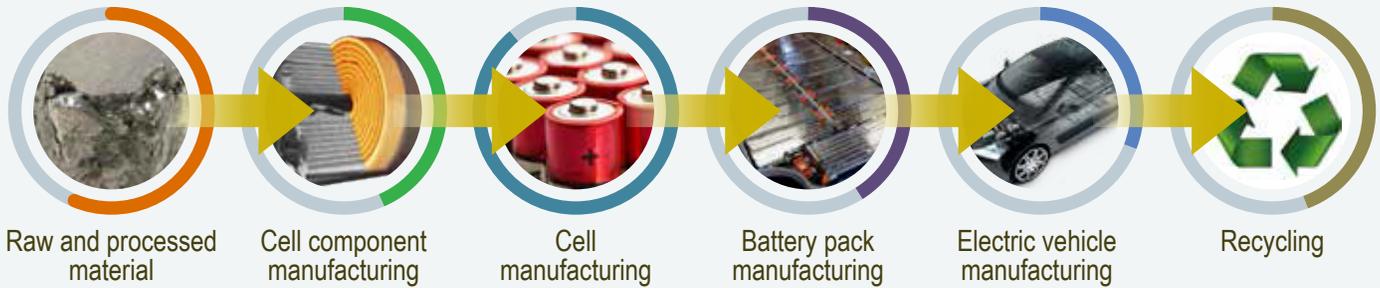
**Manganese Resources & Reserves**  
(in million metric tons)



- Hypothetical Resources
- Inferred Resources
- Indicated Resources
- Measured Reserves
- Possible Reserves
- Proven Reserves

## Battery Industry Value Chain

Blueprint is essential for developing battery industry value chain. Domestic industry should be established to capture optimum added value. Set of regulations is also needed to make domestic industry more competitive to avoid export of semi-finished goods.



## GOI's Actions



Promoting the domestic mineral processing by enacting the MEMR Regulation No. 11/2019 on Utilization of Mining Minerals and Coal.



Providing incentives to EV buyers and EV upstream industry developers to grow the EV market.



Purchasing 20% share of Vale (nickel mining company), worth IDR 5.5 trillion through a state-owned mining holding company, MIND ID.



Supporting the domestic EV industry by enacting the Presidential Regulation No. 55/2019 on The Acceleration of Battery Electric Vehicle Program for Road Transportation.



Offering tax holiday for the battery industry.



Establishing Indonesia Morowali Industrial Park (IMIP), in Central Sulawesi, as a battery manufacturer cluster. GoI is also considering developing another cluster in Patimban, West Java.

## Investments in Battery Industry

Jingmen GEM, Contemporary Amperex Technology (CATL), Tsingshan Group, IMIP and Hanwa has committed to investing USD 4 billion or around IDR 55.7 trillion in Morowali. This consortium collaborates with LG, Volkswagen, Mercedes and Tesla.

PT International Chemical Industry has committed to investing IDR 207.5 billion.

PT QMB New Energy Minerals has invested USD 700 million or IDR 10.2 trillion.

PT Pertamina Persero, PT PLN and Inalum have made a partnership to develop the EV battery industry.



## The Challenges

Lack of blueprint for mineral utilization for battery industry.

Absence of battery industry value chain.

Small domestic battery demand.

Lack of battery standardization.

Capital intensive industry.

Few capable local human resources for battery industry.

Lack of advanced smelters and technologies for producing class 1 nickel.

## Did You Know?



Globally, lithium-ion battery production for electric vehicles is concentrated in four countries: The United States (US), China, South Korea and Poland.



Recent studies indicated that geothermal brine is a great potential lithium source with nearly zero environmental impacts and marginal ground or water footprint.



Koppar Resources is planning to build Europe's first geothermal-lithium plant in the Upper Rhine Valley of Germany, called the Vulcan Lithium Project.



Some studies also highlighted the potential of coal-sourced battery material for the potassium-ion battery. Also, silicon material as an anode of the lithium-ion battery could be sourced from fly ash, a byproduct of coal-fired power plants.



Indonesia's abundant geothermal and coal potential could be explored as the raw material supply for the battery industry.

### ABBREVIATIONS:

BUMD : Regional State-Owned Enterprise  
BUMN : State-Owned Enterprise

EV : Electric Vehicle  
GoI : Government of Indonesia

Compiled from various sources by PYC research team.

