

# THE IMPORTANCE OF TRANSITION TO ELECTRIC VEHICLE

Energy Conservation Directorate

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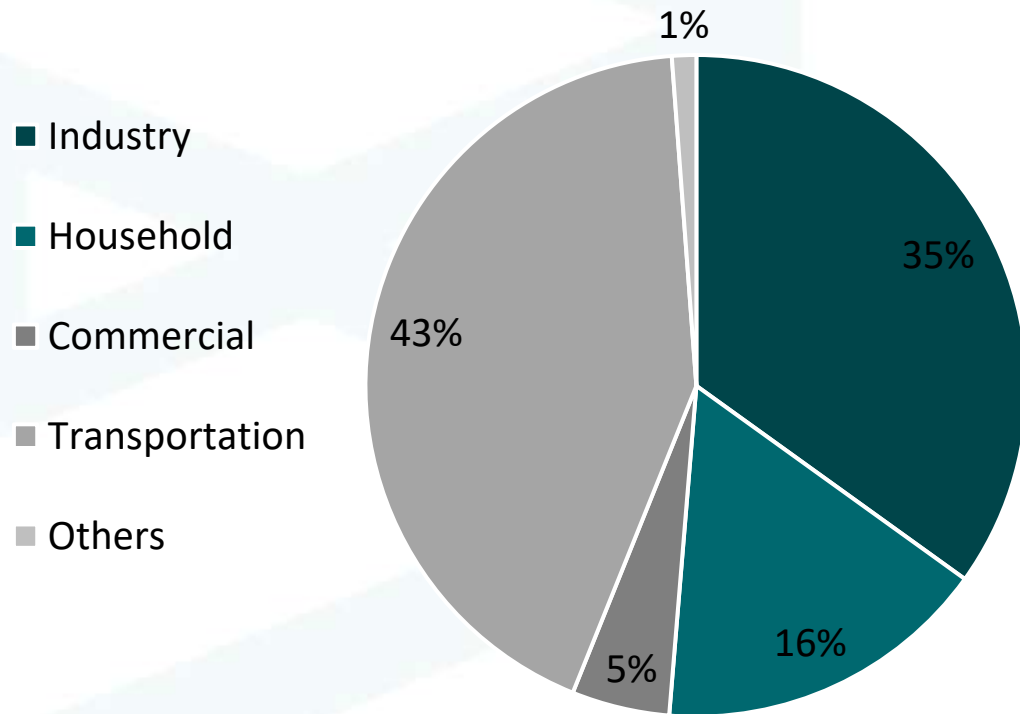


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# EV DEVELOPMENT URGENCY FOR INDONESIA



Energy mix in Indonesia (2021)

(MEMR, 2022)

Fossil fuel dominates energy source in transportation sector

- Shifting to electric vehicle could reduce fuel import.

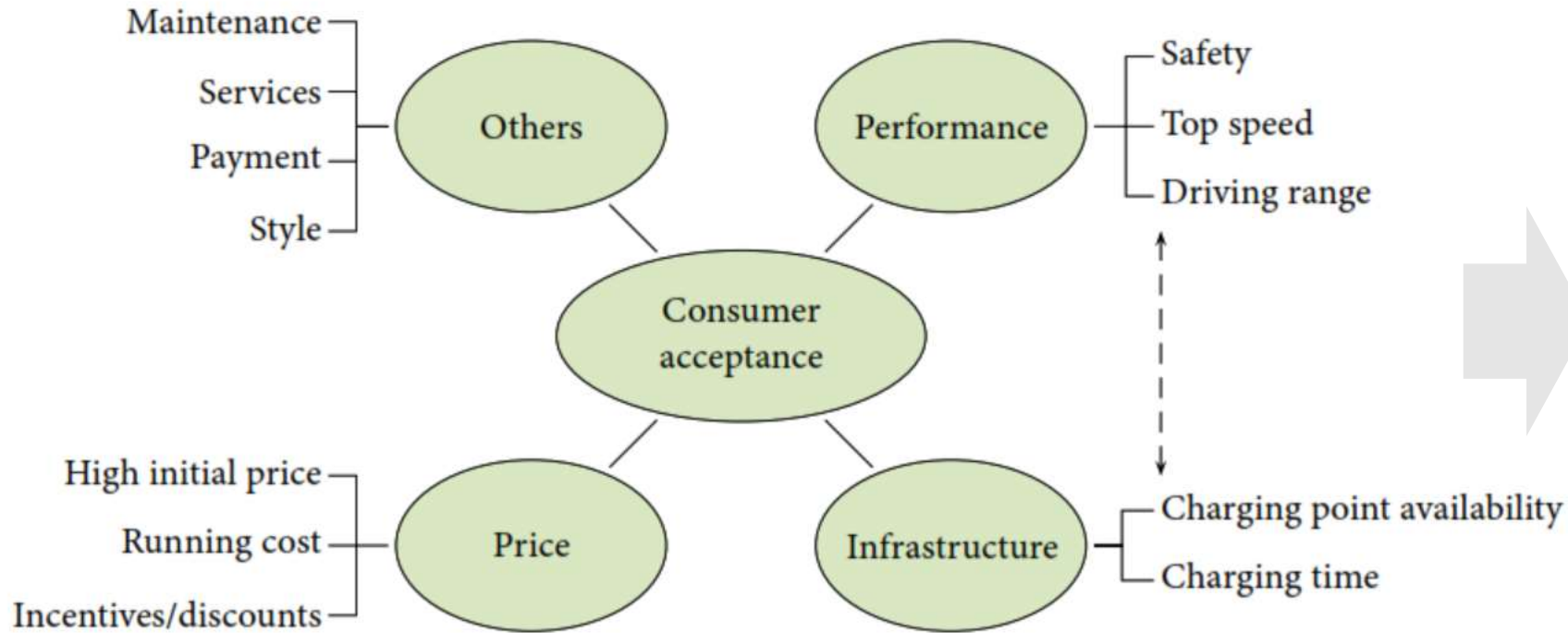
Transportation sector contribute to emission and pollutant such as pm 2.5, SOx, and NOx.

- Electric vehicles are more environmental friendly.

In addition to developed countries, several developing countries such as China and Vietnam has already developed electric vehicle.

- Indonesia need to develop electric vehicle ecosystem.

# ELECTRIC VEHICLE CHALLENGES



Public transport  
electrification as a market  
opener

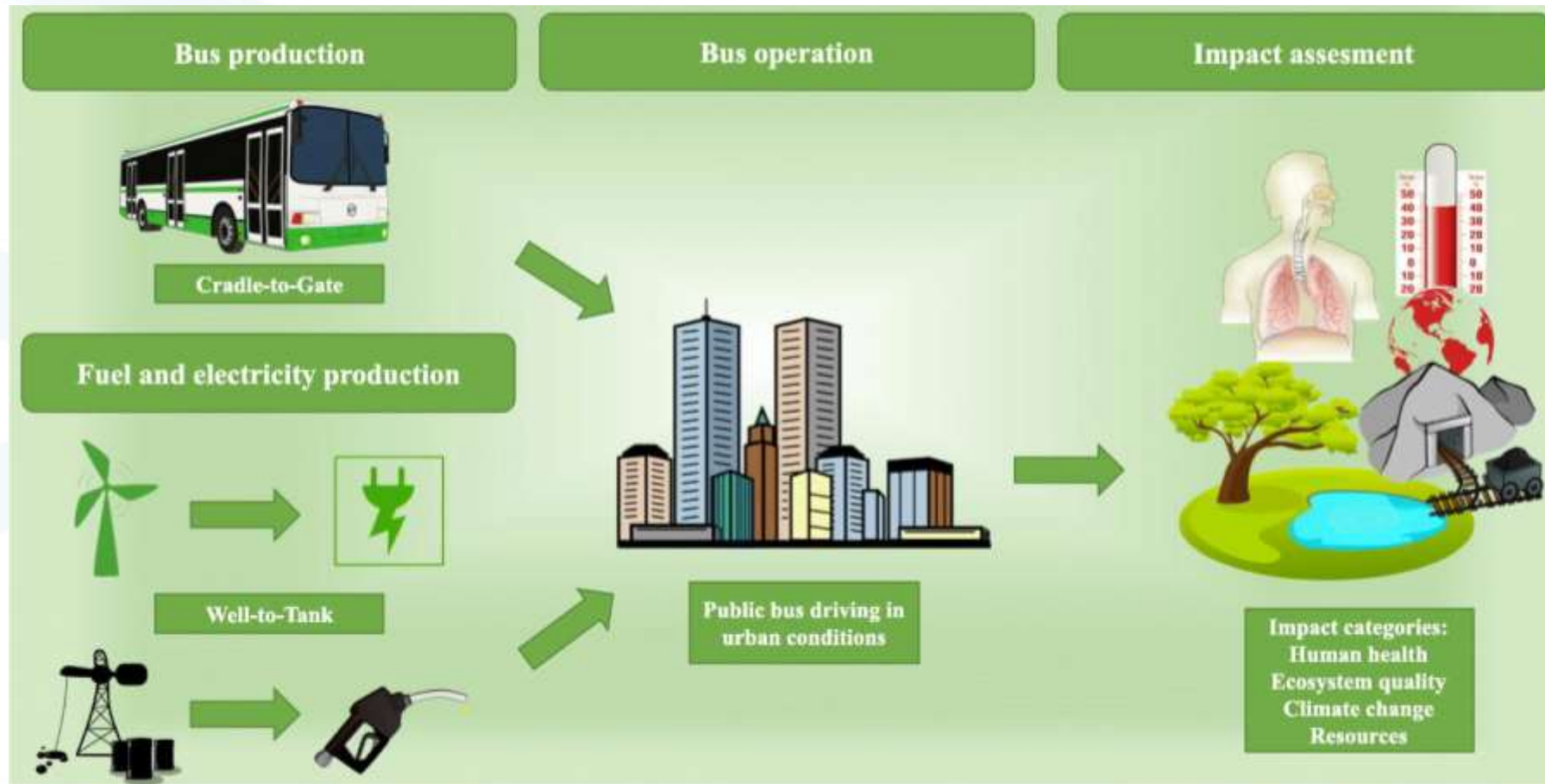
(Zulkarnain et al., 2014)

- High initial price to buy an electric vehicle still becomes one of the major inhibitors
- Driving range becomes key challenge for many consumers especially for those who need long range mobility
- With regard to technical aspects, some challenges are coming from vehicles, charging infrastructure, battery technology, and standardization

# PUBLIC TRANSPORT ELECTRIFICATION ADVANTAGES

- Public transportation electrification could open market for EV.
- Having a specific route, infrastructure such as public charger is easier to be provided.
- Public transport electrification has a positive impact to health and environment.
- Having longer driving range, public transport electrification has a more effective toward emission reduction.

# ELECTRIC BUS AND ICE COMPARISON: LIFE CYCLE ANALYSIS

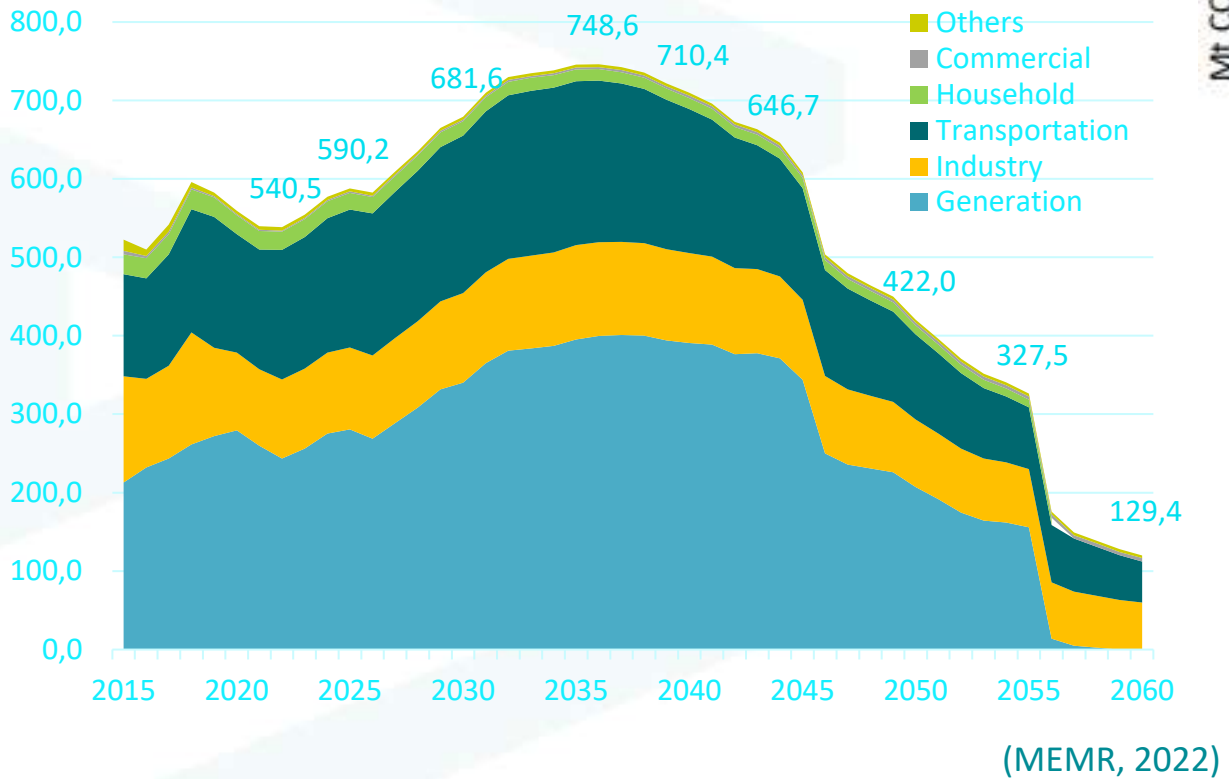


(Jakub et al., 2022)

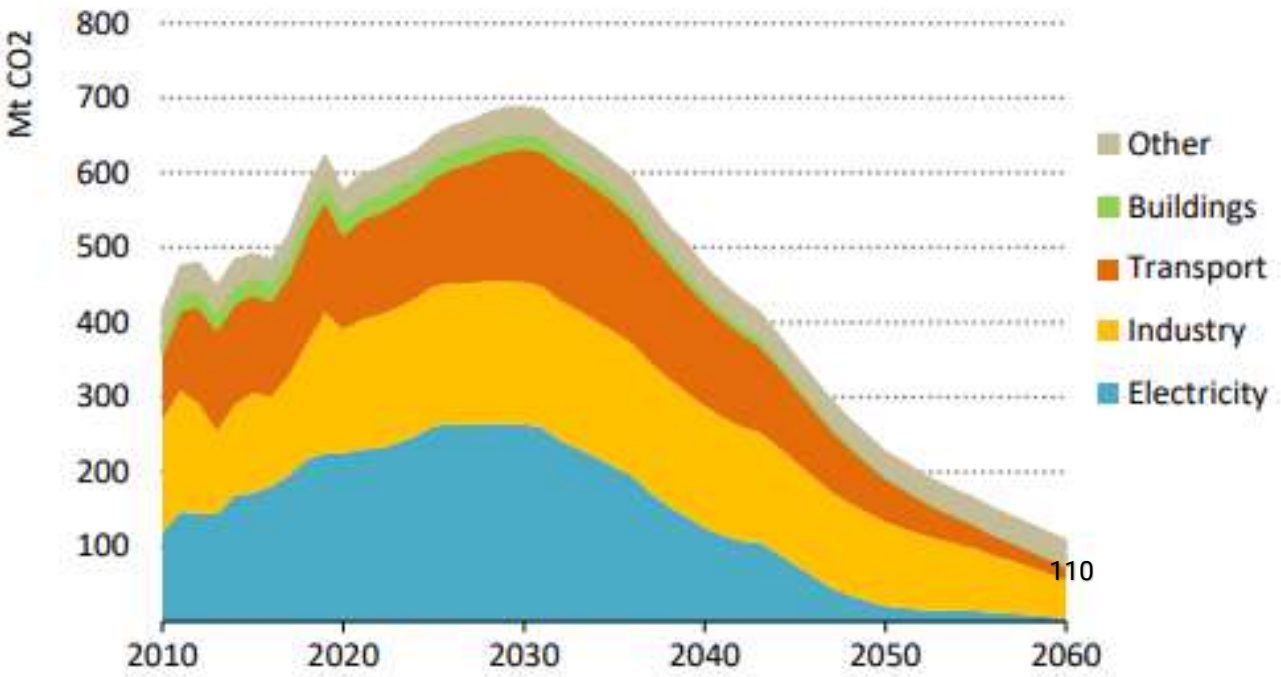
Increasing the share of electric buses in urban fleets can be highly beneficial in all four categories impact if the electricity used to power the electric buses is produced from enough low- and zero-emission energy sources.

# EMISSION PROJECTION: MEMR AND IEA

## MEMR SCENARIO (MTONCO2)



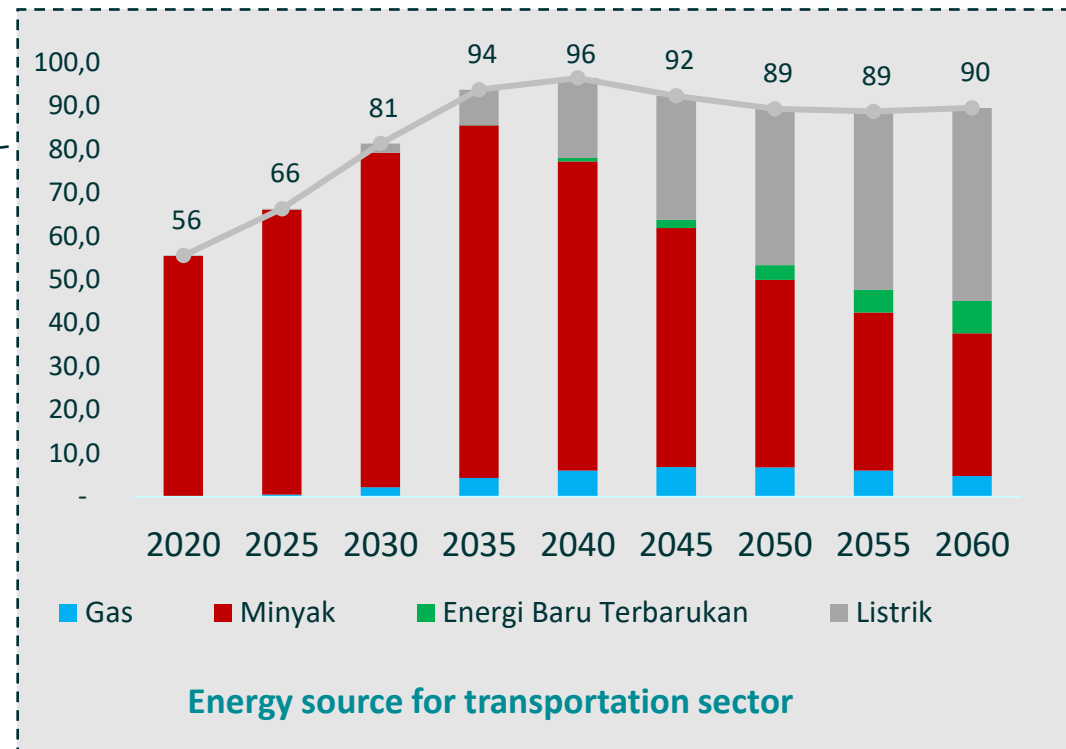
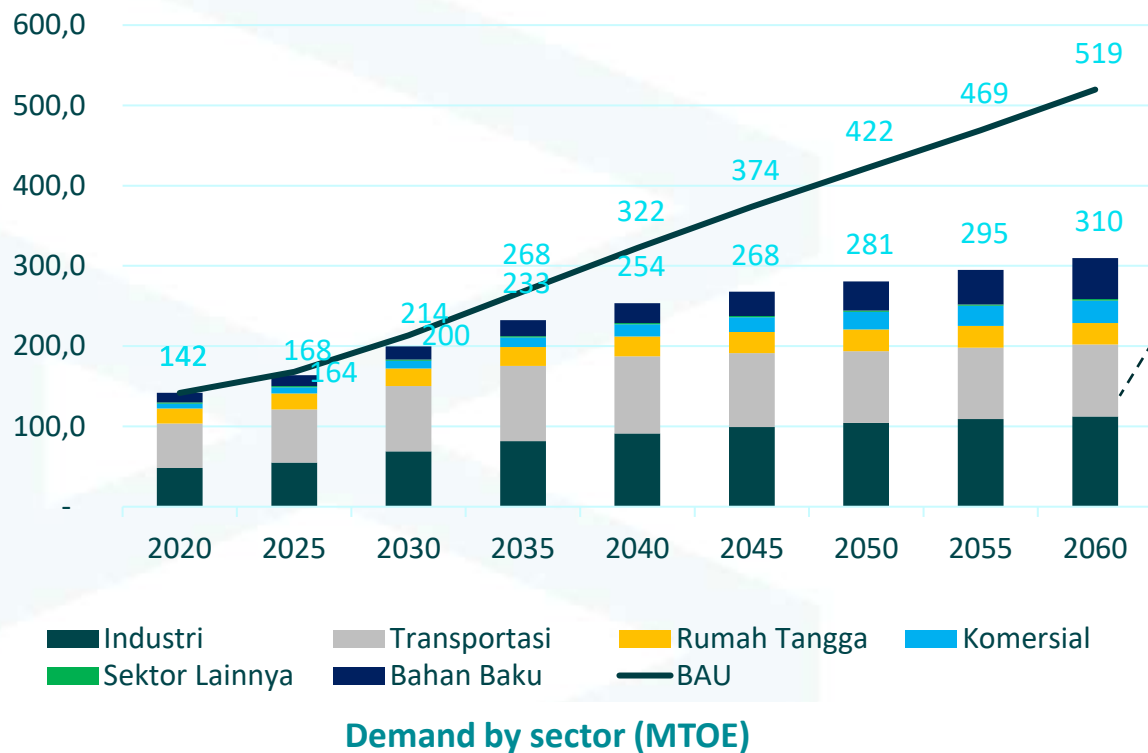
- Emission will peak by 2036 with 748 million ton CO2-e.
- By 2060, remaining emission is 129 million ton CO2-e, emitted from industry and transportation sector.



## SKENARIO INTERNATIONAL ENERGY AGENCY | MTONCO2

- (IEA, 2014)
- Emission peaking is estimated in 2030, with 700 million ton CO2-e.
  - Remaining emission is estimated around 110 million ton emission CO2-e.

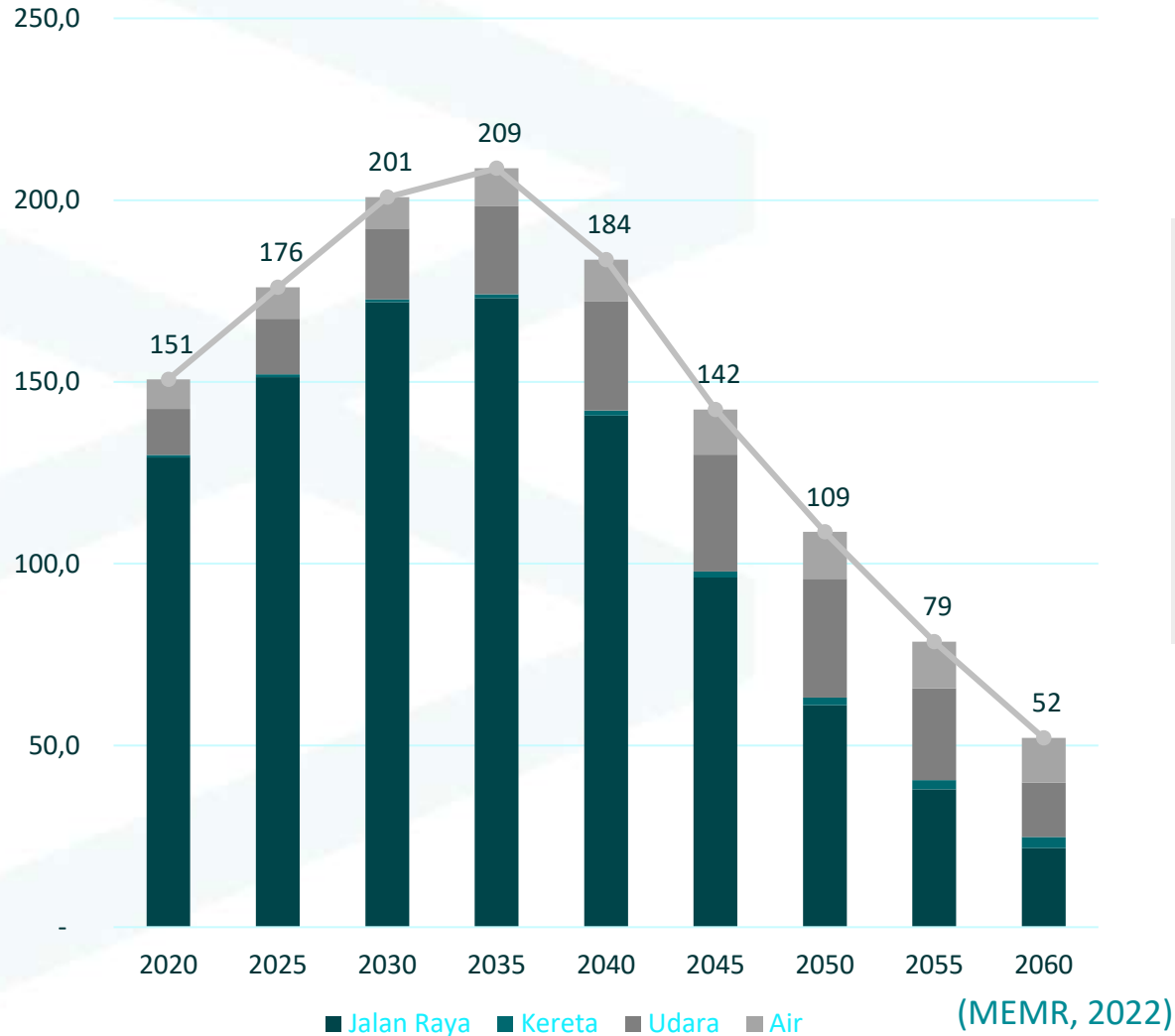
# ENERGY DEMAND PROJECTION: NZE ROADMAP



(MEMR, 2022)

- By 2060, industrial sector will consume 36% to total demand, followed by transportation (29%), commercial (9%) and household (9%).
- Total energy demand is estimated 310 MTOE (industry, household, transport, commercial) by 2060.
- By 2060, electricity share could have more than 50% share in transportation energy demand mix.

# PROJECTED EMISSION AND STRATEGY IN TRANSPORTATION SECTOR



1. Biofuel 40% (B-40) implementation;
2. Electric vehicle, 100 % electric motorcycle by 2035 and 2040 for car;
3. Hydrogen for truck;
4. Eco-fuels for aviation and shipping (ammonia, hydrogen, dan biofuel);
5. Electric/hybrid vessels for short route.



# BATTERY-BASED ELECTRIC VEHICLES (KBLBB)



DEVELOPMENT  
ROADMAP  
(2030)

Energy savings up to **29.79 MBOE**  
Total GHG emission reductions up to **7.23 Million ton CO<sub>2</sub>e**

Badan Penelitian dan Pengembangan  
Energi dan Sumber Daya Mineral

**Uji Jalan Motor Listrik**  
(Hasil Modifikasi Motor Bensin)

|                     |                       |
|---------------------|-----------------------|
| Kecapatan rata-rata | = 30km/jam            |
| Lama uji jalan      | = 115 menit           |
| Kondisi jalan       | = naik-turun-rata     |
| Beban motor         | = 1 pengendara (65kg) |
| Baterai 100%        | = 84V                 |
| Baterai Cut-off     | = 69V                 |
| Δ Battery           | = 15V                 |

**TWO-WHEELERS**  
**13 million** unit  
**67,000** SPBKLU\*

SPBKLU: General Electric Vehicle Battery Exchange Station



**FOUR-WHEELERS/More**  
**2 Million** unit  
**32,000** SPKLU\*

SPKLU: General Electric Vehicle Charging Station

**TOTAL**  
**SPKLU & SPBKLU**

As of **March 2022**, **307 units** of **SPKLU** have been built in **264 locations** and **364 units** of **SPBKLU** in **>100 locations**.



Gas Station



Office



Shopping Center



Parking Area



**ELECTRICITY RATES**

Rates:  
Bulk Electricity Rates x Q,  
where  
 $0.8 \leq Q \leq 2$   
Bulk Electricity Rates:  
Rp707/kWh

Battery rental fee:  
Refill fee + SPBKLU investment



Rates:  
Special service Electricity Rates x N, where  $N \leq 1.5$   
Special service Electricity Services: Rp1,650/kWh



(Ministry Decree of MEMR No. 28 year of 2016 regarding Electricity rates provided by PT PLN (Persero))

# SUMMARY



Shifting to electric vehicle has several benefits such as reduce fuel dependency, improve environment and health, and new growth engine.



Public transport electrification can become market opener, moreover, increasing the share of electric buses in urban fleets can be highly beneficial to health, ecosystem, resources, and climate change.



Electrification of transportation has a crucial role in achieving net zero emission target

Expediting EV penetration, government has postulated several regulations, deploying charging stations, delivering incentives, enabling ecosystem and conducting a program for EV

# Thank You

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