

WASTE-TO-ENERGY IN INDONESIA

OPPORTUNITIES AND CHALLENGES



CURRENT SITUATION

- 1 KPK^[1] found an inefficiency of almost IDR 3.6 trillion in waste-to-energy plants construction.
- 2 Take or pay purchase model would be a burden for PLN^[2] as the electricity may not meet the required quality and quantity.
- 3 A potential of additional regional income of IDR 300 billion by practicing good waste management in Jakarta (A study by an ITB Professor, Akhmad Zainal Abidin).



WHAT TO DO WITH THE WASTE?

- 1 Indonesia plans to convert its waste to energy.
- 2 Normally, combustible waste can be used as feedstocks for PLTSa^[3].
- 3 Organic wastes can be used as feedstocks for fertilizer industries and biogas plants.
- 4 Some plastic wastes can be recycled. Meanwhile, some of the others can be used to produce fuels.



HOW IS INDONESIA'S WASTE CONDITION?

- 1 Currently, Indonesia is estimated to produce >190,000 tons of waste daily ($\pm 57\%$ organic waste; $\pm 13\%$ plastic waste).
- 2 20% of plastic waste ends up in rivers and coastal waters.
- 3 Indonesia is the 2nd contributor to marine plastic debris worldwide after China.
- 4 Indonesia aims to reduce marine plastic waste by 70%, reducing waste to 30% and improving waste management to 70% by 2025.



WHAT ABOUT WASTE-TO-ENERGY?

- 1 Based on Presidential's Regulation No. 35/2018, PLN^[2] must purchase the electricity at USD 13.35 cent/kWh (capacity ≤ 20 MW) or USD 14.54 – (0.076 x contract capacity) cent/kWh (capacity >20 MW).
- 2 There will be waste-to-energy plants developed in 12 cities in Indonesia.
- 3 Investments needed for the development can reach hundreds of millions dollars, depending on the technology and capacity.

WASTE-TO-ENERGY PLANTS IN INDONESIA

PALEMBANG
Waste: 1,000 tons
Planned Capacity: 20 MW

TANGERANG
Waste: 2,000 tons
Planned Capacity: 20 MW

SOUTH TANGERANG
Waste: 800 tons
Planned Capacity: 20 MW

BEKASI
Waste: 2,200 tons
Existing Capacity: 3.5 MW
Planned Capacity: 5.5 MW

JAKARTA
Waste: 2,200 tons
Planned Capacity: 35 MW

BANDUNG
Waste: 1,820 tons
Planned Capacity: 29 MW

SURABAYA
Waste: 1,500 tons
Existing Capacity: 11 MW

MAKASSAR
Waste: 1,400 tons
Planned Capacity: 20 MW

SEMARANG
Waste: 800 tons
Planned Capacity: 20 MW

SURAKARTA
Waste: 450 tons
Planned Capacity: 10 MW

DENPASAR
Waste: 1,200 tons
Planned Capacity: 20 MW

MANADO
Waste: 1,000 tons
Planned Capacity: 20 MW

**TOTAL CAPACITY
(EXISTING & PLANNED)**
234 MW



PROS AND CONS OF WASTE-TO-ENERGY



PROS

- Provides a better waste management to reduce waste
- Generates a better air quality
- Promotes alternative energy source
- Attracts "green investors"
- Saves devisa



CONS

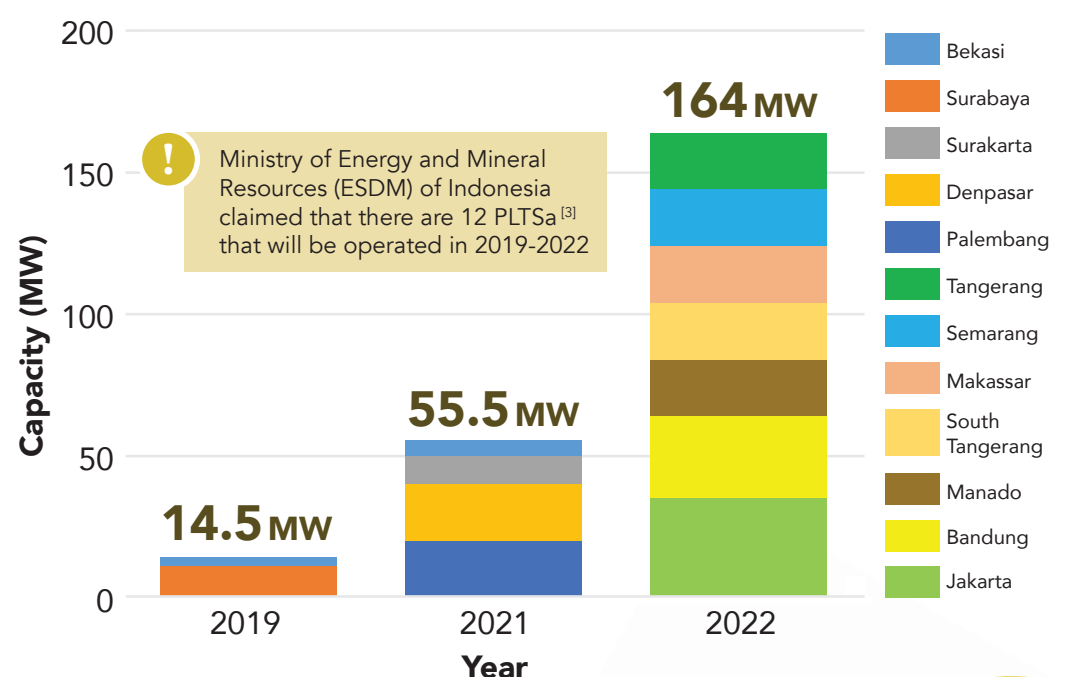
- Requires high investment cost
- Needs a sustained waste supply
- Needs a huge area
- Has relatively higher electricity production cost
- Produces residual waste (toxic & hazardous)



CHALLENGES IN IMPLEMENTATION

- 1 Requires a high investment for the implementation
- 2 Needs a sustainable supply of waste with certain characteristics
- 3 Needs a solid commitment in maintaining the facilities
- 4 Requires supporting policies to boost waste-to-energy implementation
- 5 Needs a strong coordination between local authorities, developers & other institutions

WASTE-TO-ENERGY PLANT PROJECTS IN INDONESIA 2019-2022



[1] KPK: Corruption Eradication Commission
[2] PLN: State Electricity Company
[3] PLTSa: Waste-to-Energy Plant