Potential Challenges for Proper Waste Management

July 2019

JFE Engineering Corporation

JFE

JFE Holdings, Inc.

JFE Engineering

Net Sales(million JPY)

485,815

JFE Steel

Net Sales(million JPY)

2,830,649

JFE Shoji Trade

Net Sales(million JPY)

1,125,861

Japan Marine United

(FY2018)


Waste-to-Energy


SP BOILER
Waste Heat Recovery

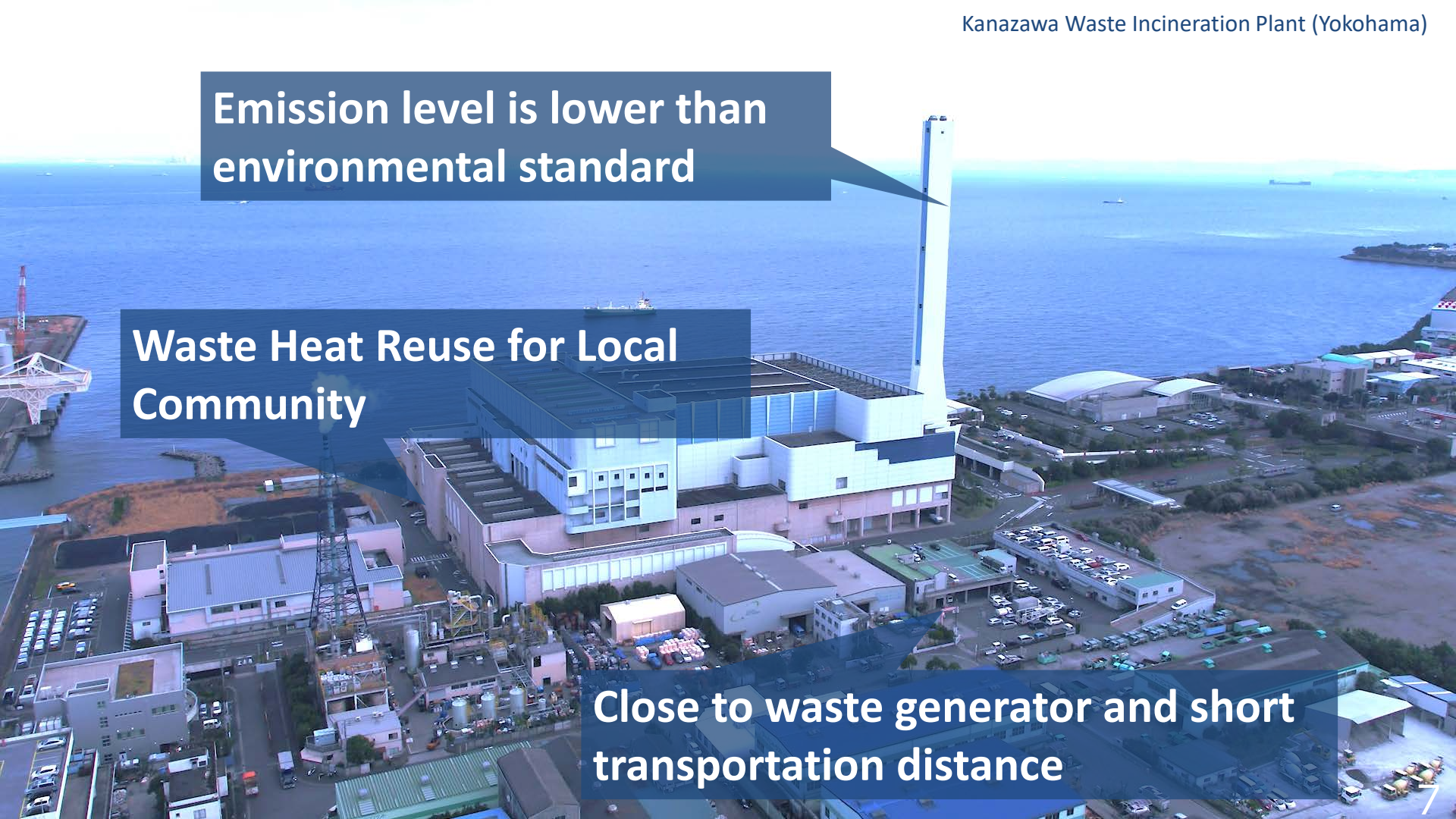

Sewage Treatment


Operation & Maintenance

Photo : Takahashi

Source : Internet

Photo : Takahashi


Emission level is lower than environmental standard
Waste Heat Reuse for Local Community
Close to waste generator and short transportation distance

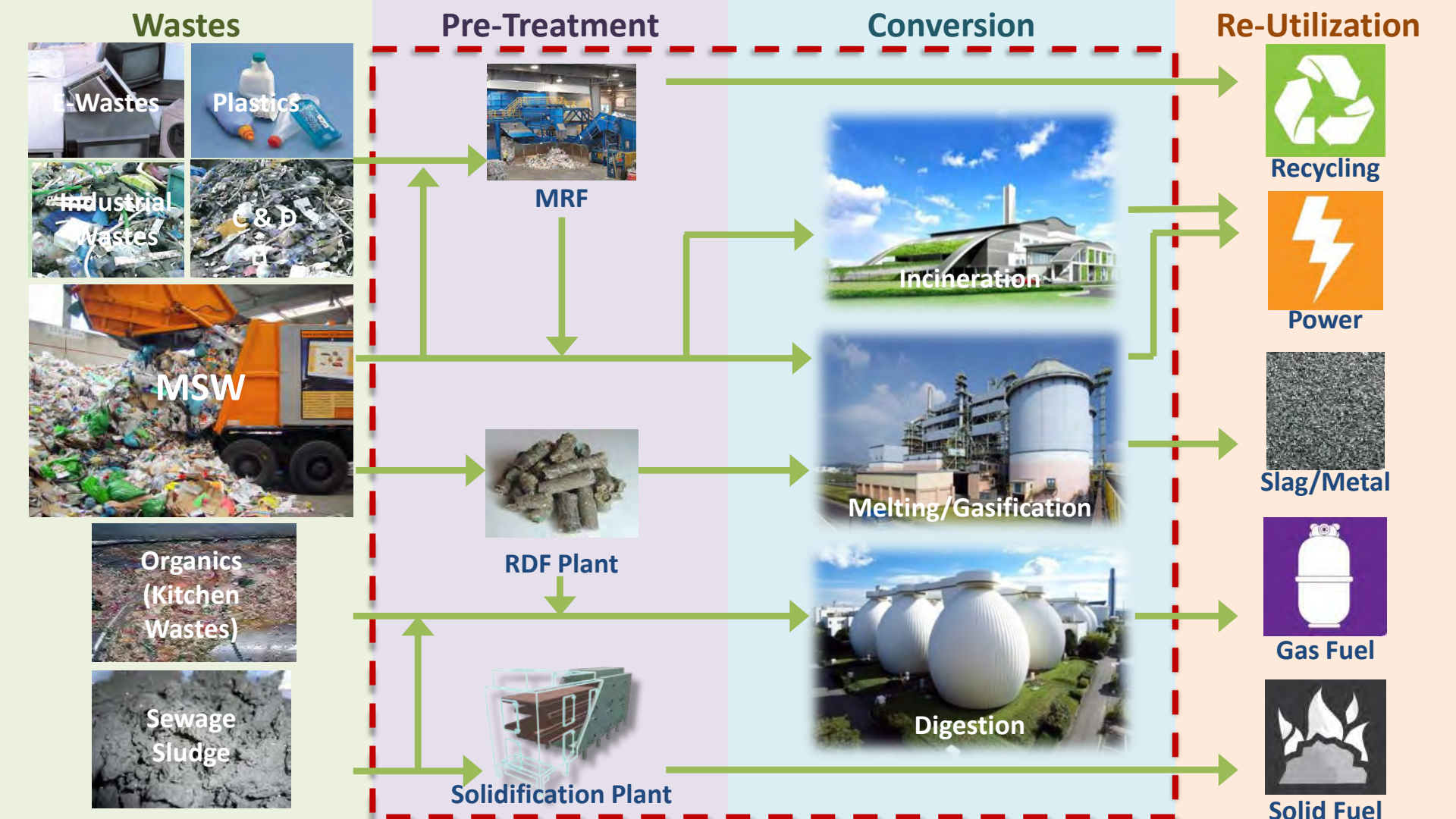

MoEJ
JCM
✓ Incinerator : 60ton/day
✓ GHG Reduction : 4,700tCO2e/y
✓ Generator : 0.7MW

Small Scale WTE As a Model Project

Larger Scale WTE

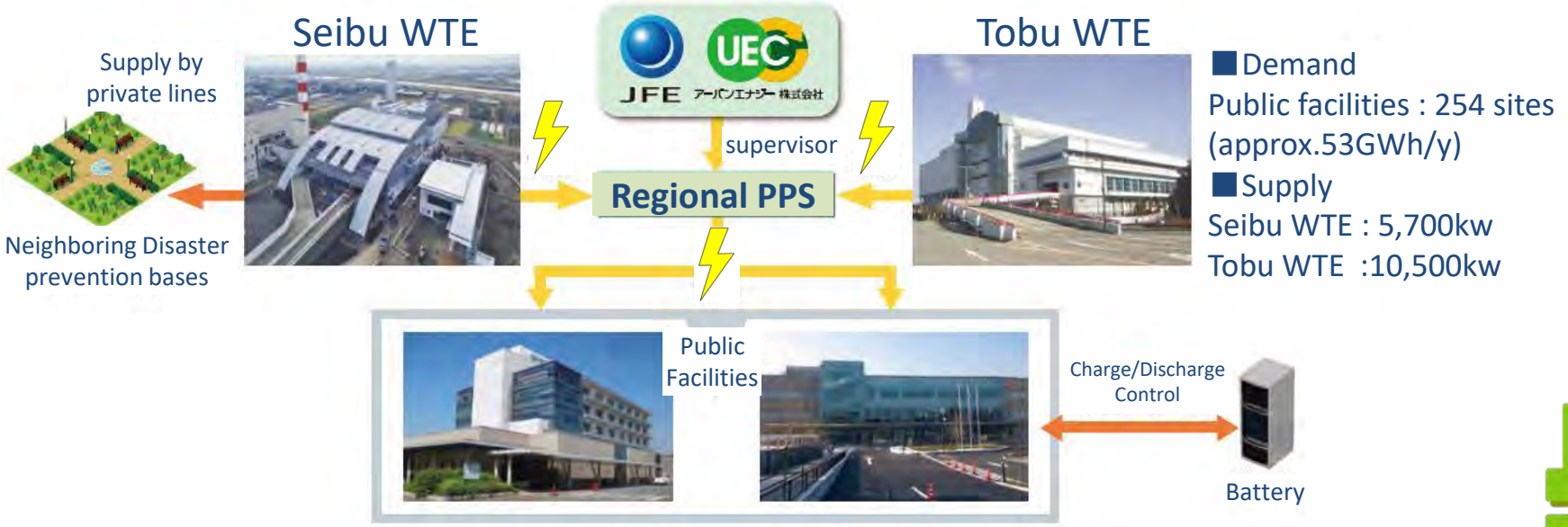
Capacity Building, Regulation Setting, Training of WTE Operation, Finance Arranging, etc.

Complete Integrated Waste Management


Wastes
Pre-Treatment
Conversion
Re-Utilization
E-Wastes
Plastics
Industrial Wastes
C & D
MSW
Organics (Kitchen Wastes)
Sewage Sludge
MRF
RDF Plant
Solidification Plant
Incineration
Melting/Gasification
Digestion
Recycling
Power
Slag/Metal
Gas Fuel
Solid Fuel

Regional PPS with Local government

< Kumamoto City >



■Demand
Public facilities : 254 sites
(approx.53GWh/y)
■Supply
Seibu WTE : 5,700kw
Tobu WTE :10,500kw

JFE's PPS sites in Japan →

Waste disposal should be prime objective of WTE plant and not Power Generation.

Planning (pre-FS) | Design (FS) | PQ / Tender | Build | Operation /Maintenance

Stop at Planning Stage

- Weak policy enforcement, public opposition, no financial source, no supporting regulations, etc.

Stop at Designing Stage

- Reject of proposal by a competent authority, opposition from existing stakeholders, lack of budget, gap between proposal and needs, etc.

Stop at PQ/Tender Stage

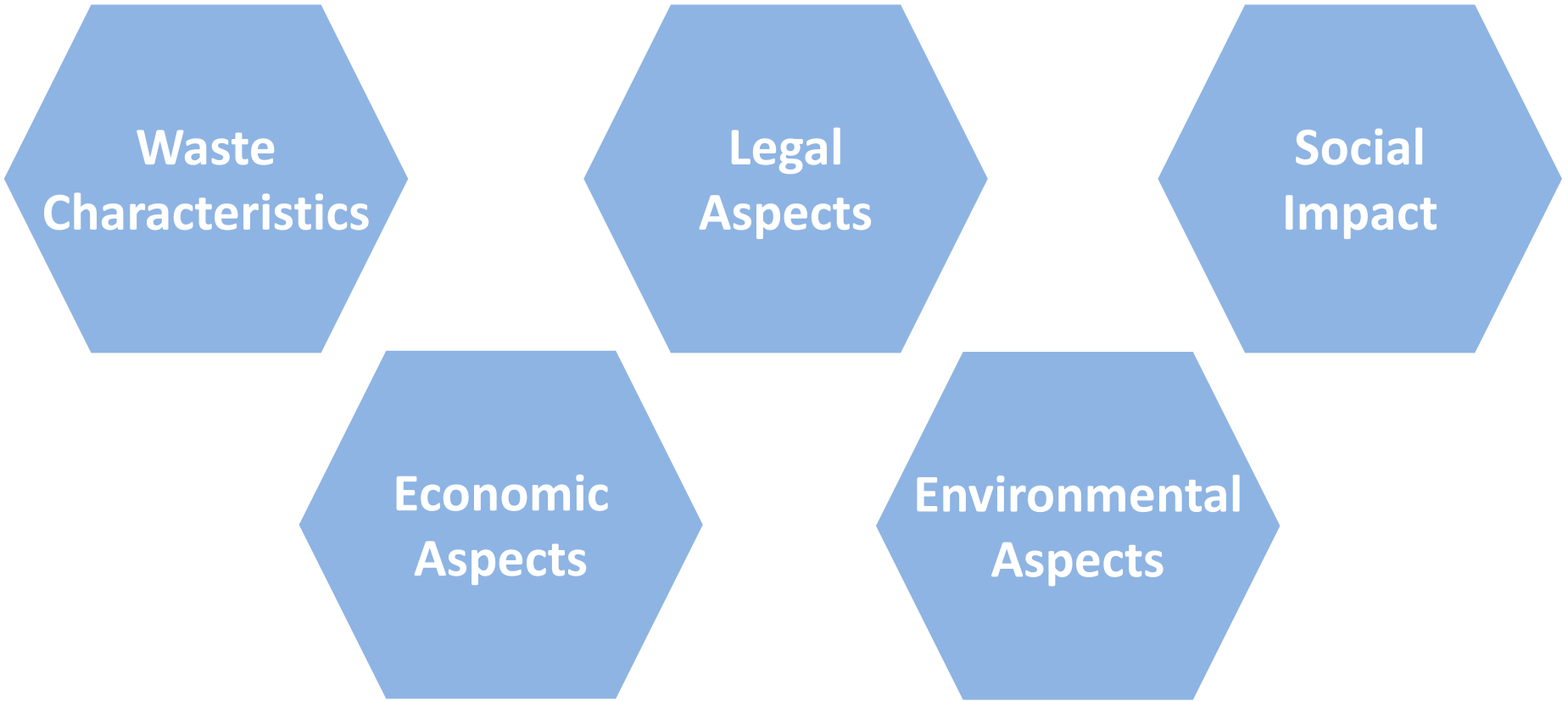
- Unsuccessful PQ/tender due to conflict of price (tipping fee, etc.), etc.

Stop at Operation Stage

- Insufficient performance of facility, critical change of waste management policy, bankruptcy of operation company, etc.

Source : Created based on “Financing issue for a development of recycling and waste treatment facility”, Nov. 3rd 2016, Shiko Hayashi, IGES

Challenges for implementation of WTEs



Source : Waste to Energy Considerations for Informed Decision-Making, UNEP-IETC, 2019

“Quality and cost based evaluation” at WTEs in Japan

Item \ Owner		Meguro (Tokyo)	Kawa saki	Osaka	Kago shima	Kasumi dai	Kikuchi	Tsuru oka	Chiba	Hama matsu
Furnace Type		Stoker	Stoker	Stoker	Stoker	Stoker	Stoker	Stoker	Gasification	Gasification
Capacity (t/d)		600	600	400	220	215	170	160	198	399
Allocated Points	Price	**25**	***1**	**40**	**40**	**60**	**40**	**40**	**40**	**50**
	Technical	**75**	**80**	**60**	**60**	**40**	**60**	**60**	**60**	**150**

***1 Total points = Technical points/Bid price × 100,000,000**

<Case Study>

Client	Hotaka administrative union (Nagano Pref.)
Capacity	120t/d
Output	3,000 kw
Scheme	DBO
O&M	20 years

Points \ Investor		A	B
Price	Bid Price	16.630 Mil Yen	16.344 Mil Yen
	Points	39.30	40.00
Technical Points		42.90	40.90
Total points		**82.20**	**80.90**

Checklist for Decision Makers

Waste data and characteristics

- ☐ *Does the waste quality and quantity meet thermal WtE requirements?*
- ☐ *Do seasonal waste variations and transboundary waste flow affect future waste projections?*
- ☐ *Is the MSW sorted at the source in the environs of the city or municipality, for both households and commerce?*
- ☐ *What percentage of the waste sent for disposal is recyclable or compostable?*
- ☐ *Are source recyclables and organics collected separately and sent to recycling and composting facilities?*

Infrastructure

- ☐ *Does systematic waste collection and transportation exist?*
- ☐ *Is a controlled landfill available for safe disposal of thermal WtE residues?*

Environmental aspects

- ☐ *Do emission standards for thermal WtE follow international standards?*
- ☐ *Are compensatory strategies available to mitigate environmental impacts?*
- ☐ *Is there installed capacity to regularly monitor emissions, including for persistent organic pollutants?*
- ☐ *What are the occupational health risks for workers and how can they be mitigated in everyday operations and in case of serious accidents?*

Economic aspects

- ☐ *Is the energy produced accessible to local users and/or available for sale in the market?*
- ☐ *Is there an available market for thermal WtE residues?*
- ☐ *Have long-term financial sources been secured?*
- ☐ *Is there access to foreign currency?*

Source : Waste to Energy Considerations for Informed Decision-Making, UNEP-IETC, 2019

Legal aspects

- ☐ *Does a comprehensive legal framework exist for all planned WtE technologies?*
- ☐ *Is there a decommission plan or decommission regulations in place for the thermal WtE plant?*

Social aspects

- ☐ *Can the working conditions of informal recyclers be improved?*
- ☐ *Are compensatory strategies available to mitigate social impacts?*
- ☐ *Are all relevant stakeholders being considered and consulted?*

Risk assessment

- ☐ *What are the flooding and tsunami risks, and what would the environmental and health impacts be if the plant was flooded?*
- ☐ *What is the hurricane or cyclone risk, and what environmental and health impacts would result if the plant was damaged by a hurricane or cyclone?*
- ☐ *What is the seismic risk, and what environmental and health impacts would result if the plant was damaged by an earthquake?*
- ☐ *What is the elevation of the site, and what environmental and health impacts would result if the site was affected by rising sea levels?*

Alternatives

- ☐ *Are there alternative WtE technologies that better suit the local conditions?*
- ☐ *Is thermal WtE, including biogenic CO2 emissions, a good option in the local context according to the life cycle assessment?*
- ☐ *Is there a way to improve rates of recycling and composting?*
- ☐ *Are there waste prevention policies in place?*

Source : Waste to Energy Considerations for Informed Decision-Making, UNEP-IETC, 2019

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Thank you

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