

RAMBØLL

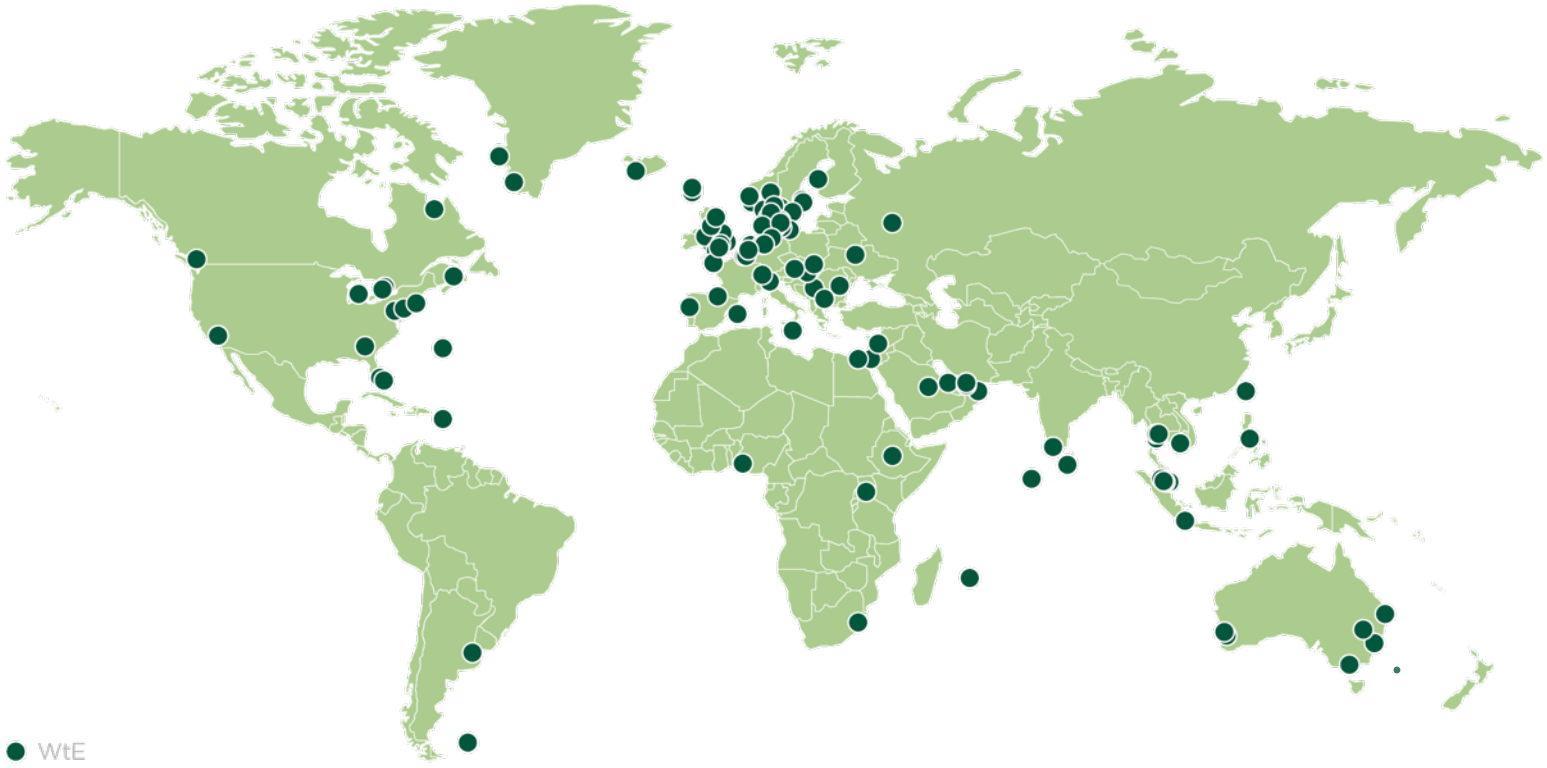
Bright ideas.
Sustainable change.

From Concept to Commissioning: Lessons Learned from International Greenfield Waste-to-Energy Projects

Bettina Kamuk, Global Market Director, Ramboll

September 29, 2026

Our global experience provides us with deep insight into the waste-to-energy market



Independent architecture, engineering, and consultancy company founded in 1945.

19,000 experts globally including 100+ in our offices in the Spain.

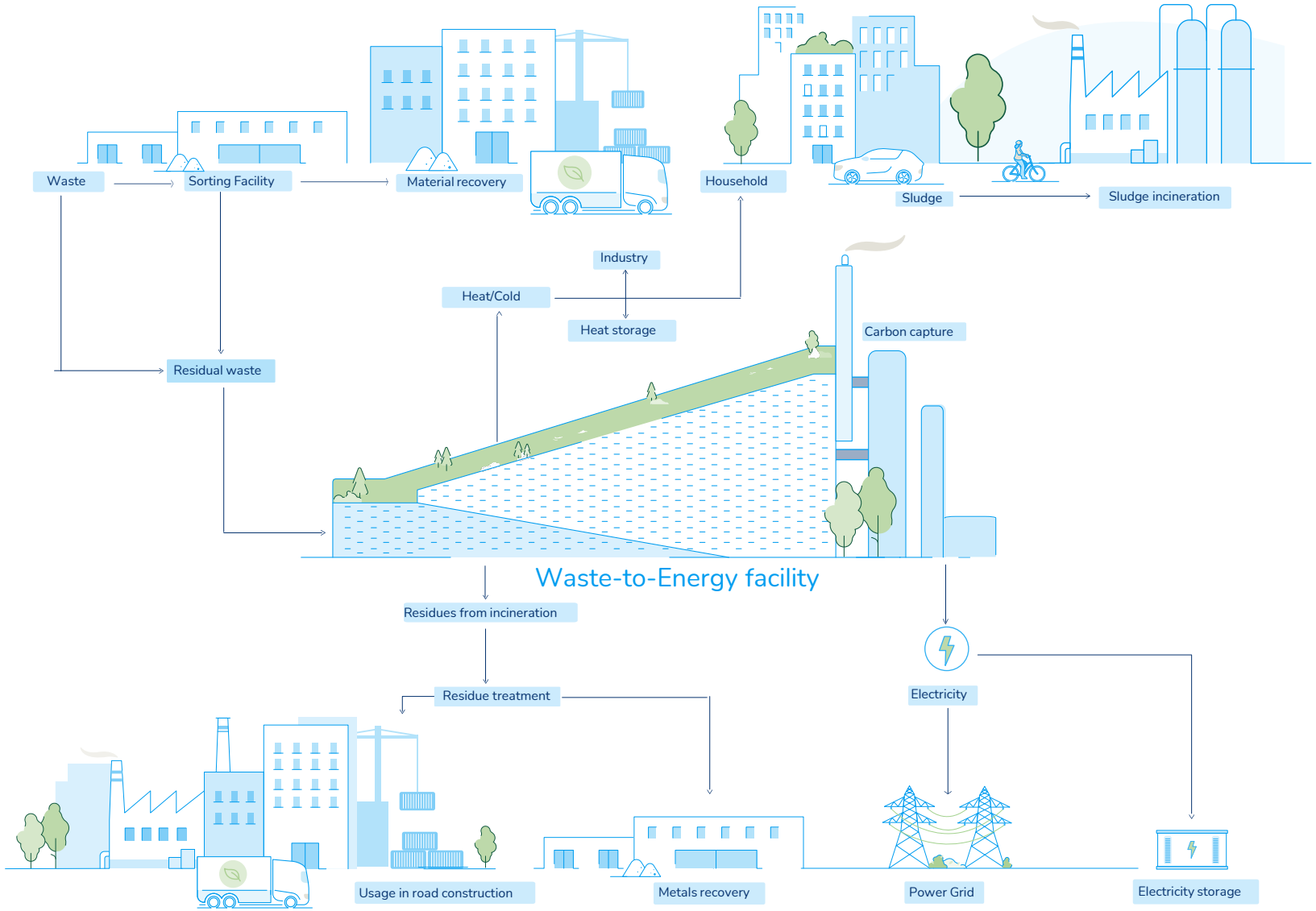
250 dedicated WtE experts and project managers,

Ramboll combines local experience with a global knowledgebase.

Creating sustainable solutions across our seven markets:

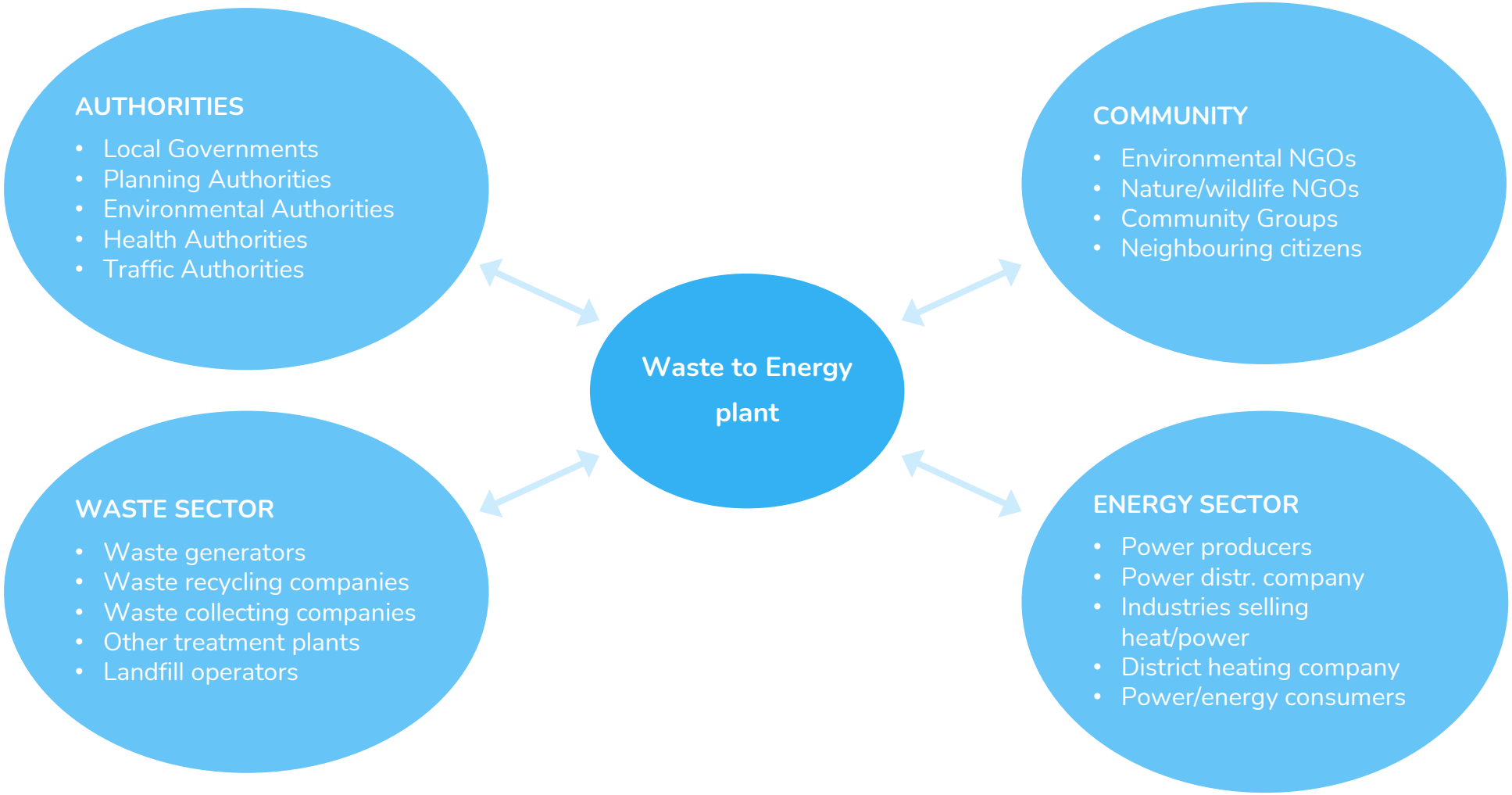
- Buildings
- Transport
- Energy
- Environment & Health
- Water
- Architecture & Landscape
- Management Consulting

Integrated waste solution



- WtE and recycling goes hand in hand.
- Safe and clean treatment of residual waste.
- Treating residual waste prevents contamination of the recyclable waste streams.
- Recovery of energy (power, heat, cooling, industrial symbiose).
- Recovery of metal and using bottom ash for construction purposes.

Remember the stakeholders – there may be many!

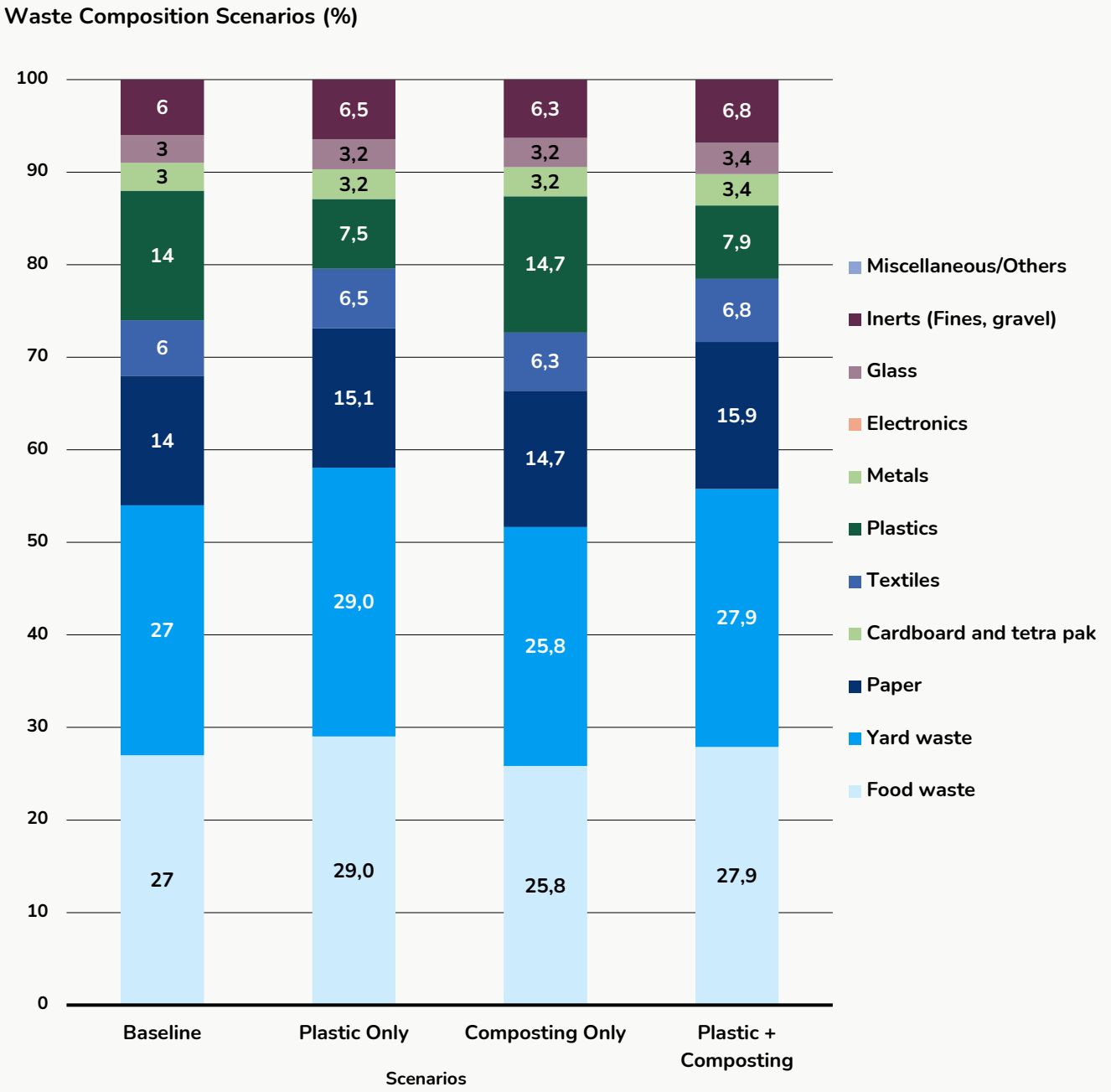


Certainty of waste is important

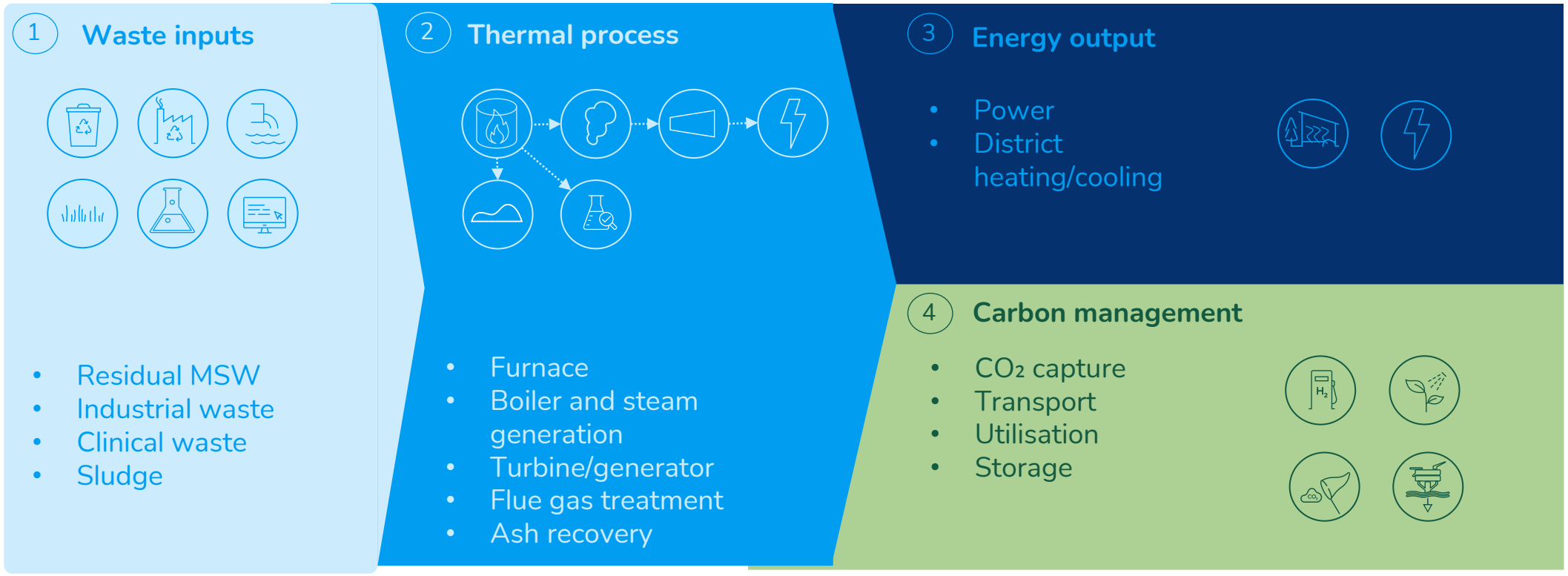
Predictability of key parameters for a WTE plant

- Certainty in waste volume, composition, and calorific value is critical
- Long-term Waste Supply Agreement is essential
- Moisture and ash content

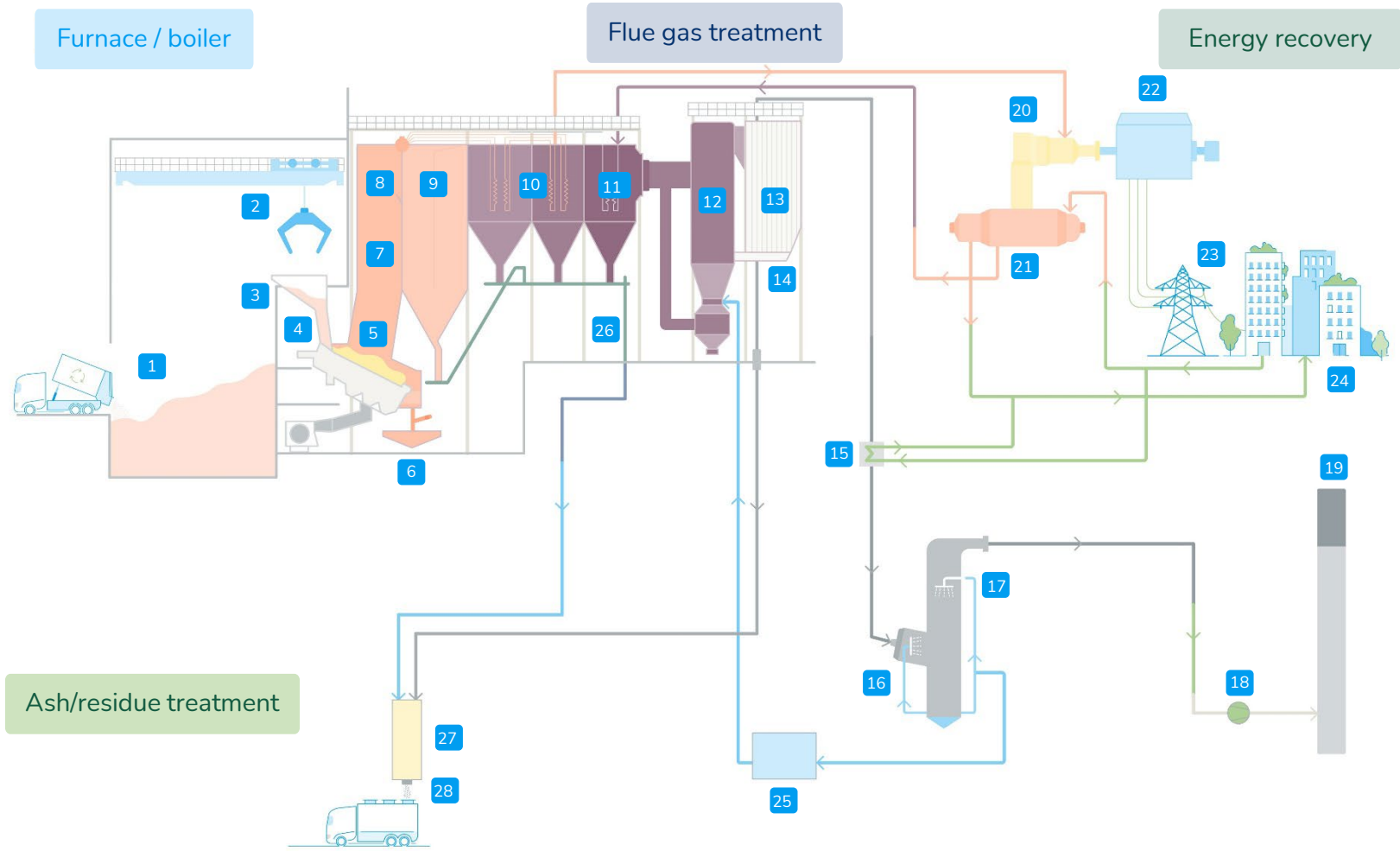
This ultimately leads to defining the size of the WTE facility.



Many technical decisions need to be taken and defines long-term plant performance



How could it look lie - example with a dry/semi-dry flue gas treatment system



Furnace/Boiler:
1. Bunker
2. Grab/Crane
3. Hopper/feed chute
4. Feeder ram (pusher)
5. Grate
6. Bottom ash
7. Furnace
8. Afterburning
9. Radiation part
10. Convection part (boiler)
11. Economiser

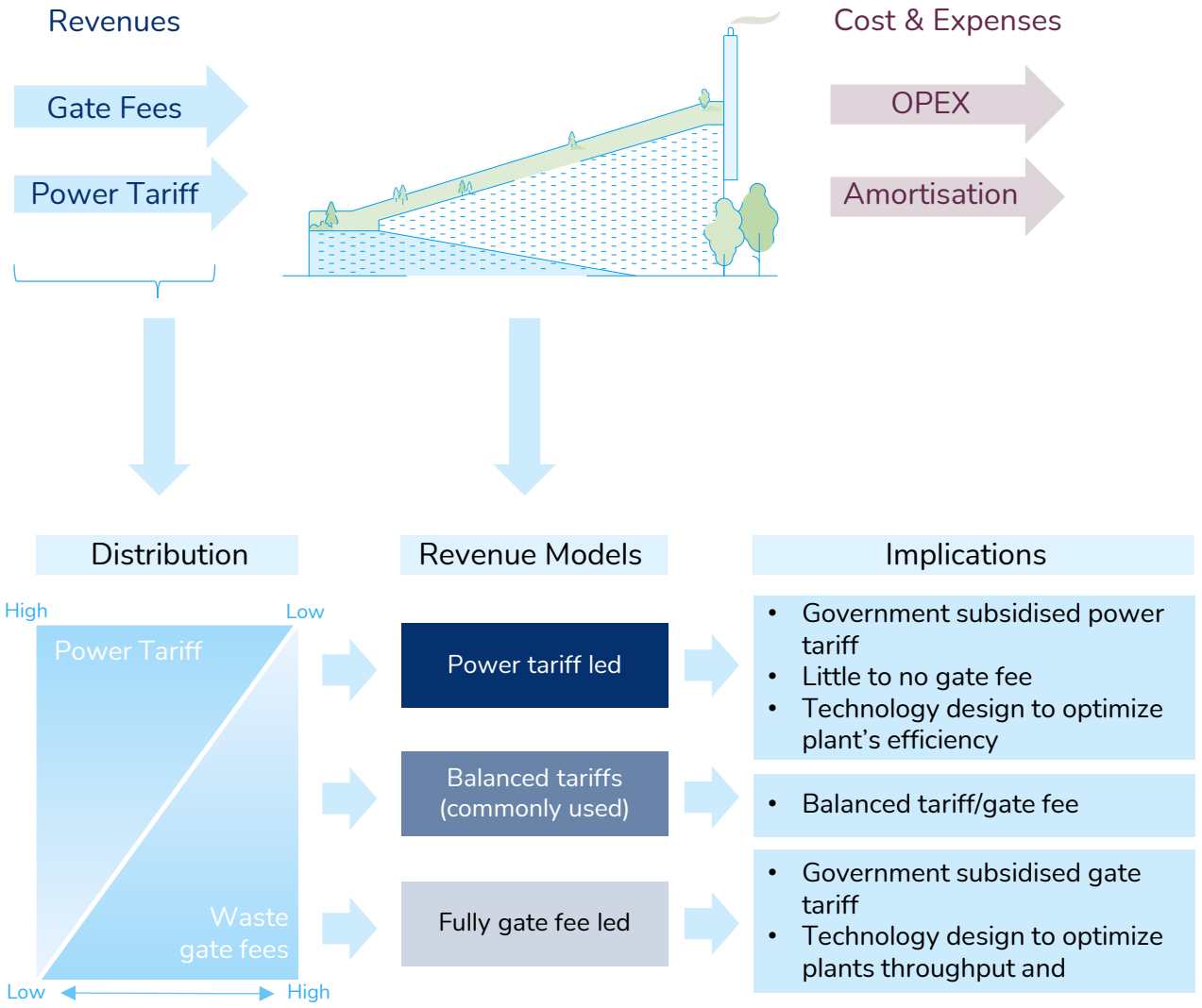
Flue gas treatment:
12. Reactor
13. Baghouse filter
14. Ash extraction
15. Heat exchanger
16. Water injection
17. Scrubber
18. ID fan
19. Stack

Energy recovery:
20. Turbine
21. Condenser.
22. Generator
23. Electrical output
24. Heat output

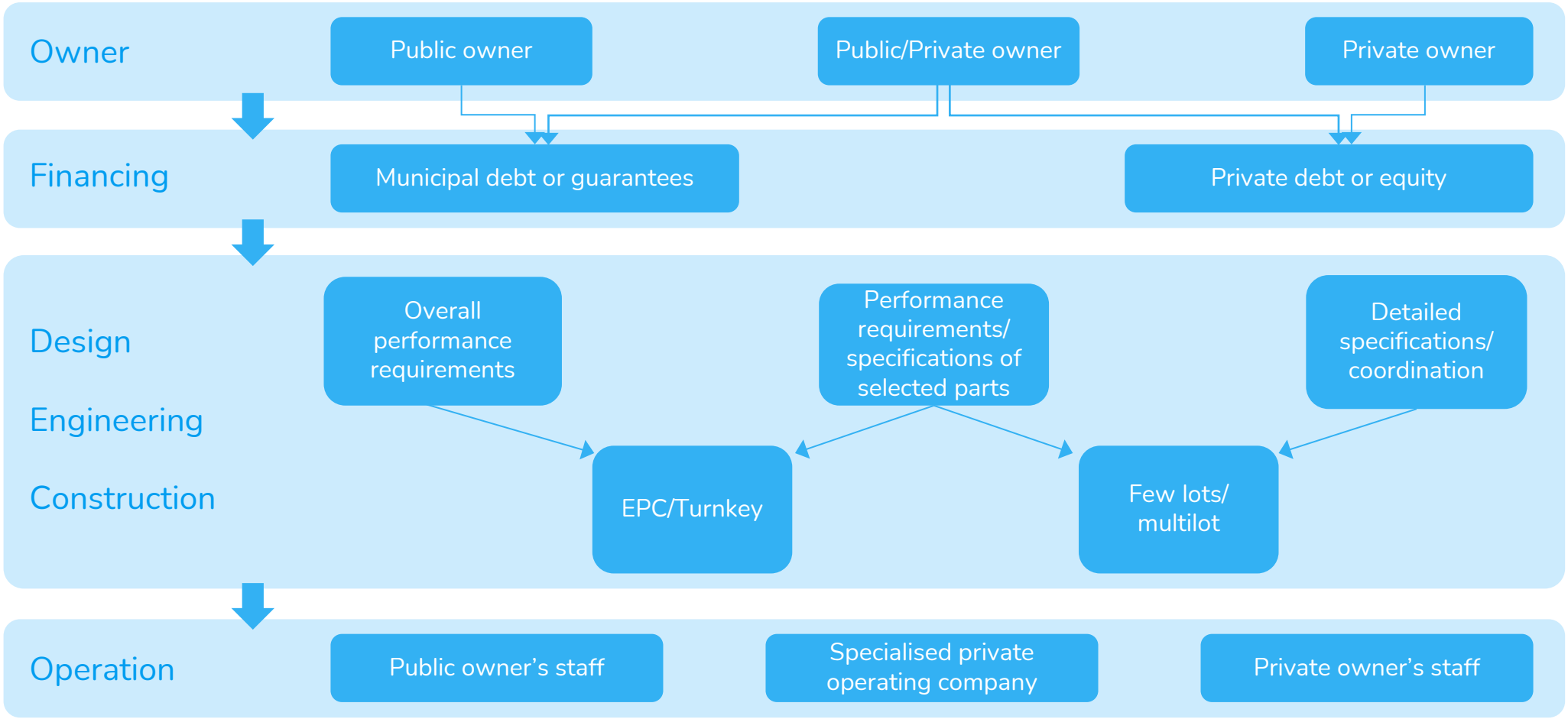
Ash/residue treatment:
25. Process water tank
26. Boiler ash
27. Silo for boiler ash and FGT residue
28. Ash/residue discharge

Revenue predictability

- Capex
- Opex
- Gate fees
- Energy off-take tariffs
- Carbon credits/taxes



Project set-up is essential



Selected Waste-to-Energy references – procurement models



Waste-to-Energy facility in Copenhagen (DK), 2009-2021

Capacity: 560,000 tpa

Ownership: Municipal

Procurement: 5 main process lots and 5 building lots

Funding: Municipal loans

Operation: Municipal company



Integrated Waste Management Facility (SG), 2014-2027

Capacity: 2,600,000 tpa

Ownership: Government

Procurement: Phase 1: EPC, Phase 2: Lot-based

Funding: Governmental funding

Operation: Governmental company



Waste-to-Energy facility in West Palm Beach, FL (US), 2008-2013

Capacity: 900,000 tpa

Ownership: Solid waste authority

Procurement: DBO (concession agreement). Operator procured the plant as an EPC

Funding: Authority bonds/loans for construction. Tipping fees pay for operation

Operation: Operator company



Waste-to-Energy facility in Perth, NSW (AUS), 2018-2026

Capacity: 460,000 tpa

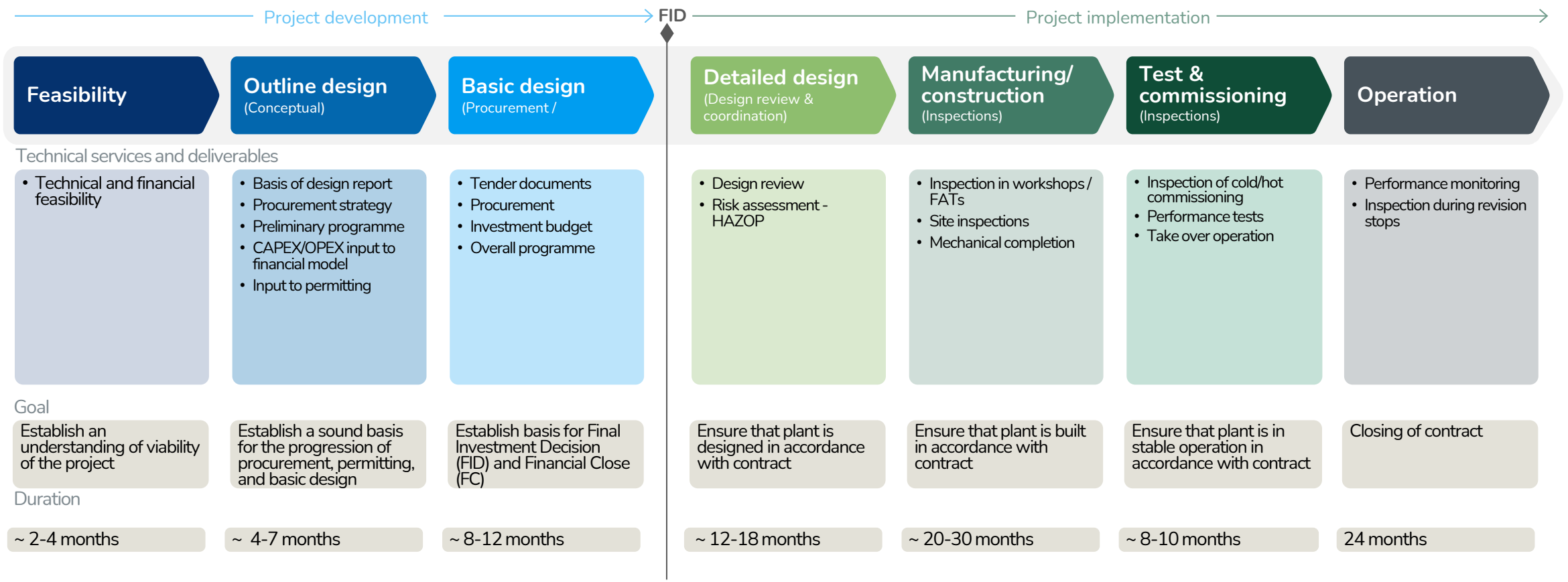
Ownership: Private

Procurement: DBOO. The project company tendered construction as EPC and operation in separate contract

Funding: Project finance/investor

Operation: The project company tendered to a private operator

Ramboll's project execution model for successful development and implementation of WtE projects



Let’s close the gap

Learn more about our Waste-to-Energy services:



Bettina Kamuk
Global Market Director
BKC@ramboll.com
+45 51618626

