DutchPowerGroup
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Waste-to-Energy Plant Specifications

Plant Models

1. Chameleon (Grate Combustion)

- *Capabilities*: Handles diverse waste streams, including municipal, agricultural and industrial waste, with a simplified and reliable operating process for increased availability.
- *Fuel Specifications:*
  - Calorific Value: 7-15 MJ/Kg
  - Humidity: 15-35%.
  - Capacity: approx. 150 tonnes/day (50,000 tonnes/year)
- *Combustion and Boiler Design*: Grate combustion with a capacity of approx. 20 MWth
- Power Generation:
  - Generator capacity: up to approx. 5 MWe.
  - Distributes power locally and to the plant
  - Produces steam for heating and industrial purposes
  - Provides potential cooling for warehouses
- *Ancillaries*: Replenishment of water plant, power supply, etc.
- *Environmental Emissions:* Complies with flue gas regulations under European and World Bank standards.

2. Phoenix (Fluidised Bed)

- *Capacities*: Designed for specific one-size-fits-all flows, optimised for sewage sludge treatment, providing comprehensive waste treatment and improved performance.
- *Fuel Specifications:*
  - Calorific value: 6-24 MJ/Kg
  - Humidity: 5-50%.
  - Capacity: 50-150 tonnes/day (16,500 to 50,000 tonnes/year)
- *Combustion and Boiler Design*: Fluidised bed with a maximum capacity of approx. 20 MWth
- *Power Generation*:
  - Generator capacity: up to 5 MWe.
  - Distribution of energy locally and to the plant
  - Steam production for heating and industrial processes
  - Cooling option available for warehouses
- *Ancillaries*: Replenishment of water plant, power supply, etc.
- *Environmental Emissions*: Complies with flue gas regulations under European and World Bank standards.

Technical Information

Area

- Construction: Requires approximately 1 hectare (the size of a football field), including space for mobility and truck access.
- Permitting Guidance: Complies with flue gas regulations in accordance with European standards and World Bank guidelines for environmental and operational safety.

Operating Days: 330 days per year

Maintenance: 30 days (1 month) per year

Facility Size: 1 hectare (similar to a football field) + 1 additional field for truck mobility and loading/unloading area

- *Container Units:* 20' and 40' standard sizes; approximately 30 containers

Maintenance and Operation

- *Operation*: 330 days per year, 24/7 operation.
- *Shifts*:
  - 1 line requires approximately 30 people
  - Ideal staffing: Operators, office staff and occasional pickers
  - Four shifts are recommended for 24/7 operation.
- *Management*:
  - Management Layer: Defines roles and responsibilities for waste management operations.
  - Record-keeping: Documentation of waste types, facilities and entities involved
  - Operational Management: Daily procedures for collection, transport, treatment and disposal of waste, ensuring compliance with regulations
  - Record Keeping: Maintains records of waste types, quantities, disposal methods, compliance, incidents and emergencies.

Turnaround Time

- Site Development and Civil Infrastructure: 6-12 months
- Facility Construction: 12-18 months

Energy Consumption and Efficiency

- Energy Consumption: A 150 tonnes/day ≈ 0.6 MWe
- Net Production: At 150 tonnes/day ≈ 4.4 MWe
- Efficiency: The efficiency rate of the technology is approximately 23%.

Finances

Cost Structure:

- Procurement: €15 million - €17 million
- Consultancy: €25,000 - €150,000
- Engineering: Basic engineering €300,000 - €550,000 (4-6 months); additional engineering (15% of total cost) could extend up to 6 months.

Environmental Impact, Odour Control & Social Considerations

Environmental Impact: EIA & Waste Framework Directive
The modular and decentralised design of our plants follows the principles of the Environmental Impact Assessment Directive (EIA - Directive 2011/92/EU, as amended by Directive 2014/52/EU). Before construction, we conduct comprehensive studies that assess how the facility will interact with its natural and urban environment. These studies consider factors such as biodiversity, air quality, water consumption and landfill reduction, aligning with the sustainability objectives of the EU Circular Economy Action Plan.

- Operating under the guidelines of the Waste Framework Directive (Directive 2008/98/EC), our plants prioritise energy recovery from waste, contributing to more sustainable management. This not only reduces the carbon footprint of

operations, but also ensures strict compliance with European environmental regulations, providing a balance between industrial development and environmental conservation.

Odour Control: IED and Air Quality Directive Compliance
We ensure that our plants comply with the Industrial Emissions Directive (IED - Directive 2010/75/EU), which requires the use of Best Available Techniques (BAT) for the reduction of gas and particulate emissions. These techniques ensure that odours from the combustion and waste storage process are minimally perceptible to nearby communities.

- In the storage bunker, we implemented active odour suppression systems that capture and redirect air to the energy recovery process, preventing the release of volatile compounds. This approach is aligned with the standards of the Air Quality Framework Directive (Directive 2008/50/EC), which sets strict limits for air pollutants, ensuring that the impact on local air quality is negligible. With a 750m radius distance from the plant stack, it ensures that the direct environment is not affected in any way in relation to the gases coming from our process.

Social Considerations: Our plants support the objectives of the European Green Deal by reducing reliance on landfills and providing clean energy for the local community. This model promotes sustainable development through job creation in the circular economy, a just transition, and strengthening local energy infrastructure.

Finally, the design and operation of our facilities ensure that each project integrates harmoniously into its surroundings, minimising potential social conflicts and maximising economic and environmental benefits for nearby communities. With these regulations as a basis, we ensure that our waste-to-energy plants not only meet the highest standards for emissions and sustainability but also contribute to the well-being of communities by creating a clean, safe and sustainable environment. This ensures the trust of our partners and the social acceptance of the project, fulfilling our company's core values.