

# Managing waste, with minimal waste

Tuas South Incineration Plant, Singapore's largest waste-to-energy plant, turns 20 this year. Such plants play a key role in ensuring waste is disposed of cleanly and efficiently, conserving the island's precious land space and generating power for homes here. **Timothy Goh** looks at what happens to your trash after it gets picked up by the garbage truck.

## 1 RECEPTION



- Waste is discharged from a fleet of waste collection vehicles into two huge refuse bunkers.
- There are about 600 such waste collection vehicles discharging waste at the plant daily.



Waste disposed of by waste collection vehicles.

## 2 REFUSE BUNKERS



- The air in the bunkers is kept below atmospheric pressure, preventing odours from escaping.
- An operator uses a large mechanical claw to mix the waste, ensuring different materials are well distributed so the trash burns at a consistent temperature. The same claw then feeds the waste into incinerators.

## 3 INCINERATION



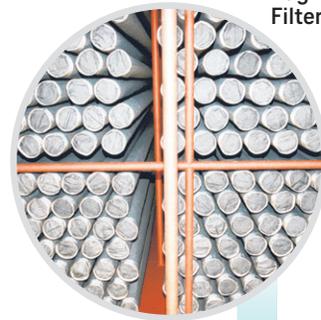
- In the incinerator, waste is burned at a temperature of about 1,000 deg C.
- Advanced combustion control systems regulate the burning to ensure that all the waste is completely burned.



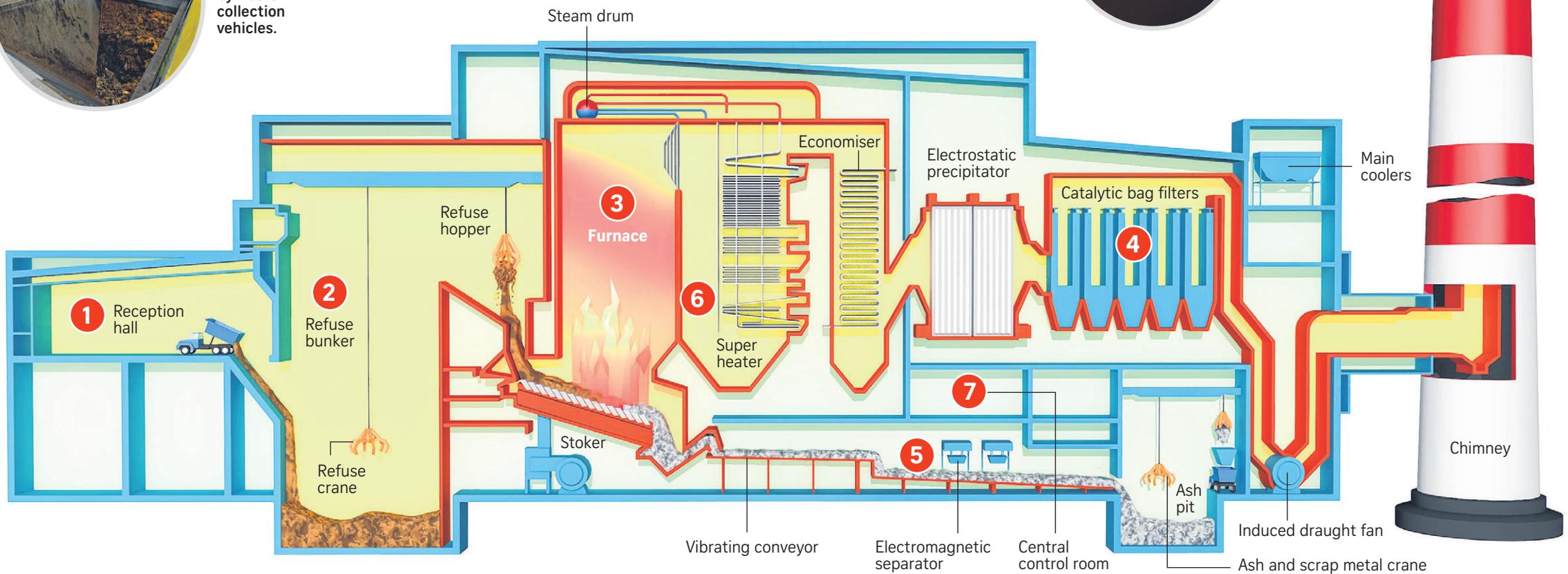
Combustion within the incinerator furnace.

## 4 FILTRATION

- Three treatment processes are used to ensure that dust, particulates, acidic gases and dioxins are removed from the gas produced by the incineration.
- The cleaned gas then passes through two 150m tall chimneys and is dispersed into the atmosphere.



Bag Filter



## 7 CONTROL ROOM

- A central control room, manned 24/7 by about 10 trained operators, monitors the processes in the plant.



## 6 POWER GENERATION

- The heat from the burning waste is used to boil water in nearby boilers, generating steam which, in turn, drives turbines in the plant's generators, producing electricity.
- About 20% of this electricity powers the plant, while the other 80% is sold.



## 5 SEGREGATION

- The ash and the metal from the burning process are sorted into separate piles using vibrating conveyors and an electromagnetic separator.
- The ash is loaded onto ash trucks to be eventually transported to Semakau Landfill, while the metal is sold as scrap.

