

Cross section diagram of the Keppel Seghers Tuas WTE Plant:

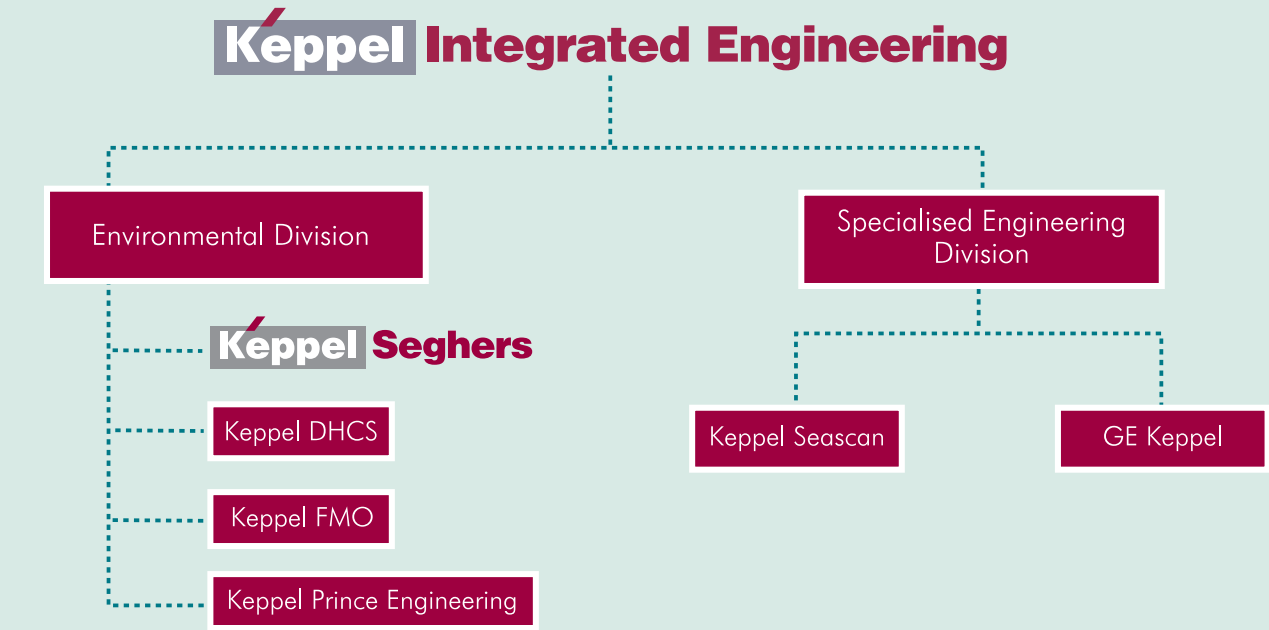


Technical Data:

PLANT DESIGN DATA		
	Keppel Seghers Tuas WTE Plant	Senoko WTE Plant
Plant capacity per day (contracted)	800 tonnes/day	2100 tonnes/day
Number of Incinerator Units	2	6
Steam Generation per Boiler	54.4 tonnes/hour	51 tonnes/hour
Live Steam Pressure	41 bar(a)	35 bar(a)
Live Steam Temperature	400°C	370°C
Condensing Pressure	0.18 bar(a)	0.2 bar(a)
Turbine Rated Capacity	22 MW*	36 MW*
Generator Voltage	11 KV	10.5 KV

MAIN PLANT EQUIPMENT		
	Keppel Seghers Tuas WTE Plant	Senoko WTE Plant
Refuse handling	3 weighbridges	3 weighbridges
	10 refuse discharge doors	27 refuse discharge doors
	2 refuse cranes	3 refuse cranes
Refuse Incineration & Steam Generation	Keppel Seghers Air-cooled Grate	Reverse Acting Grate
Flue Gas Handling	1 Reactor for flue gas treatment to each unit	1 Reactor for flue gas treatment to each unit
	1 Activated Carbon Dosing to each unit	—
	1 Baghouse Filters to each unit	1 electrostatic precipitator to each unit
	1 Concrete Chimney, 100m height	2 Concrete Chimneys, 150m height
Ash Handling	3 Vibrating conveyors	2 pusher-type ash extractors to each unit
Scrap Metal Recovery	2 Magnetic separators	2 Magnetic separators to each unit
Fly ash handling	2 Common Residue silos	3 Common Residue silos
Power Generation	1 Condensing turbine-generator	2 Condensing turbine-generators
Steam Condensation	1 Air Cooled Condensers with 6 fans	2 Air Cooled Condensers with 8 fans each
Cooling System	Closed Circuit Cooling Water system	Closed Circuit Cooling Water System

**Actual energy produced depends on the calorific value of the waste.*



Keppel Integrated Engineering

Keppel Integrated Engineering (KIE) is the environmental technology and engineering division of Keppel Corporation Limited, a leading company listed on the Singapore Exchange Securities Trading Limited.

Keppel Seghers, a member of the KIE Group, is a leading provider of comprehensive environmental solutions, including alternative energy, ranging from consultancy, design and engineering, technology and construction to operation and maintenance of facilities.

Keppel Seghers provides technology and fulfilment services for the treatment of municipal solid waste, hazardous materials and medical waste, wastewater and sludge treatment, potable water, and desalination.

To date, Keppel Seghers has executed more than 350 water and wastewater projects and more than 100 waste-to-energy projects in more than 25 countries worldwide. Keppel Seghers continues to actively pursue thermal waste treatment, water and wastewater treatment projects globally.

Keppel Seghers Engineering Singapore Pte Ltd
2 Corporation Road
#02-07 Corporation Place
Singapore 618494
Tel: (65) 6267 6800
Fax: (65) 6268 4511
Email: info@keppelseghers.com
Website: www.keppelseghers.com

**Keppel Seghers
Tuas Waste-to-Energy Plant**
96 Tuas South Avenue 3
Singapore 637366

Senoko Waste-to-Energy Plant
30 Attap Valley Road
Singapore 759907



Answering Singapore’s
Waste Management Needs

Keppel Seghers Tuas Waste-to-Energy Plant
Senoko Waste-to-Energy Plant



Creating
New Sources
of Energy

A Waste Management Solution for the Future

Across the globe, growing volumes of waste and soaring energy prices are making Waste-to-Energy (WTE) a leading solution for a cleaner future.

WTE plants not only help in landfill diversion through as much as 90% reduction in the volume of waste disposed. Using proven technology, the incinerator-boiler also captures the energy embedded in materials such as paper, leather, wood scraps and food scraps, and use that energy to generate steam and electricity.

The use of WTE plants for the generation of electricity and steam reduces dependence on fossil fuel for the same purpose. As an alternative solution to landfilling of unsorted waste, WTE plants contribute to greenhouse gas reduction by avoiding the situation of methane release from organic waste decomposition in landfills. WTE plants can also be implemented as part of a holistic waste management strategy to treat residual waste that cannot be recycled or reused.



Keppel Seghers Tuas Waste-to-Energy Plant at a Glance

Keppel Seghers Tuas Waste-to-Energy Plant is Singapore's fifth incineration plant to be built, and the first to be done so under National Environment Agency (NEA)'s Public-Private Partnership (PPP) initiative.

Keppel Seghers, the environmental engineering arm of Keppel Integrated Engineering, designed and built the plant, and has a 25-year contract to operate the plant starting from 4Q 2009. This contract was awarded by NEA under the PPP initiative, which aims to bring together resources, skills and experiences of both the public and private sectors. Keppel Seghers is currently the only private operator of incineration plants treating domestic waste in Singapore.

“First WTE plant built under the Public-Private Partnership initiative to effectively meet the needs of the public”

One of the Most Compact in the World

Built on a land space of only 1.6 hectares, Keppel Seghers Tuas WTE Plant is one of the most compact WTE plants in the world. It has the capacity to treat 800 tonnes of solid waste a day to generate 22 MW* of green energy, contributing to Singapore's energy supply with the electricity that is in excess of plant consumption.

Designed by a team of experienced engineers, the plant utilises Keppel Seghers' in-house technology in critical components such as the:

- **Air-cooled Tumbling Grates** which can withstand high temperature and abrasion, as well as ensure thorough mixing and even burning of the waste
- **Boiler** which ensures that high heat recovery is achieved from the combustion of waste
- **Flue Gas Treatment System** which effectively removes harmful and acidic gases, dust and particulates so that only clean flue gas, compliant with international standards, is emitted.

“Capacity to treat 800 tonnes/day of solid waste to generate 22 MW of green energy”

*Actual energy produced depends on the calorific value of the waste.



Waste Reception



Waste Crane



Incineration Grates



Flue Gas Treatment



“Together with Senoko WTE Plant, Keppel Seghers Tuas WTE Plant treats close to half of Singapore's total volume of waste sent for incineration”



Senoko Waste-to-Energy Plant

Apart from Keppel Seghers Tuas WTE Plant, Keppel Seghers also operates Senoko Waste-to-Energy Plant (Senoko WTE Plant), which was the third incineration plant to be built in Singapore.

Keppel Seghers provides Operation and Maintenance (O&M) services to the plant which has the contracted capacity to treat 2,100 tonnes of solid waste a day. To achieve the latest emission requirement of the plant, which was completed in 1992, Senoko WTE Plant will also be retrofitted with Keppel Seghers' flue gas treatment technology for better performance.

Keppel Seghers, the only private operator of incineration plants treating domestic waste in Singapore, is a significant contributor to the nation's waste management strategy and sustainable development. With the combined capacities of Keppel Seghers Tuas WTE Plant and Senoko WTE Plant, Keppel Seghers will treat almost half of Singapore's total volume of waste sent for incineration.