Keppel Seghers

Keppel Seghers is a leading provider of comprehensive environmental solutions, and provides consultancy, design and engineering, technology development, construction, operation and maintenance of plants and facilities, as well as investments in large-scale environmental projects.

Keppel Seghers’ advanced technology solutions address a wide spectrum of environmental issues for both solid waste and water.

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

Keppel Seghers is a wholly-owned subsidiary of the Keppel Infraestructura group, which is a division of Keppel Corporation Limited, a leading company listed on the Singapore Exchange.

Technical data

Domestic Solid Waste Management Centre (DSWMC) located near Mesaieed plus 4 transfer stations located across Qatar

Location

Domestic Solid Waste Management Centre (DSWMC) located near Mesaieed plus 4 transfer stations located across Qatar

Area

3 square kilometres; transfer stations: 4 hectares each

Capacity (Initial Stage)

2300 tonnes per day of Mixed Solid Waste (MSW)

PROCESS DESCRIPTION FOR MIXED SOLID WASTE (2300T/D)

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| Incoming Waste | • Weighbridges and data logging of incoming waste trucks  
• Initial separation: 4 Dano Drums® to separate incoming waste  
• Separation and recycling using ferrous (by magnets) and non-ferrous (by eddy current separators) metals separation; plastics (PET and HDPE) separation by NIR (Near Infra-Red) separation  
• Recycled material baling and storage prior to recycling  
• Bulky waste receiving and crushing  
• Slaughterhouse waste receiving, crushing and pumping to incinerators |
| Waste to Energy | • Incineration: Water-cooled grates and furnaces: 3 lines each with a capacity of 500 tonnes of refuse per day fed by grab cranes from storage bunker  
• Heat recovery boilers: 3 Prisms and associated steam recovery units  
• Flue gas cleaning: Rotary atomisers for injecting finely atomised lime milk; activated carbon dosing followed by bag filters on each line  
• Chimney: 80m high |
| Energy Recovery | • Steam turbine generator: Rated output of 50 MW with an estimated 30 MW exported to the national grid after meeting plant power requirements |
| Composting | • Incoming waste: organic fraction from Dano Drums®  
• Anaerobic fermentation: 5 lines of three thermophilic fermenter tanks followed by dewatering in centrifuges  
• Gas engine/generators: Gas engines utilising methane gas generated from fermenters producing 8 MW  
• Aerobic treatment: Post maturation of dewatered material from fermenters in windrows with turning equipment  
• Odour control: Foul air collection and treatment in biofilter system  
• Compost storage and bagging |
| Landfill | • Engineered landfill with composite liner system and leachate collection system to accept treated incinerator bottom ash and stabilised fly ash and street sweepings (arrive separately at the plant)  
• Over 95% of the incoming MSW entering the plant is either recycled or converted to energy |
| OTHER FACILITIES | • Permanent accommodation and facilities including Mosque for operational staff  
• Administration building  
• Canteen and prayer room for truck drivers  
• Workshops, garages and other facilities  
• Internal road network and utilities including fire and domestic water storage tanks; 66 KV substation; water, power and telecoms distribution; wastewater treatment  
• Landscaping |

Keppel Seghers Pte Ltd

Keppel Seghers Engineering (Qatar Doha Office)
Keppel Seghers, the environmental engineering arm of Keppel Infrastructure, was awarded two contracts by the Ministry of Municipal Affairs and Agriculture in Qatar (now known as Ministry of Municipality and Urban Planning) to design and build four Waste Transfer Stations and one Integrated Domestic Solid Waste Management Centre (DSWMC), and to operate and maintain the DSWMC for 20 years.

Since October 2011, Keppel Seghers has formally handed over the DSWMC to its clients and has commenced the Operations and Maintenance phase of this large Design-Build-Operate (DBO) project with excellent operational and safety record.

The 300 ha modern DSWMC facility is located near Mesaieed, and is designed to treat up to 2,300 tonnes of mixed domestic solid waste per day, serving the waste treatment needs for the whole of Qatar. The DSWMC comprises state-of-the-art waste sorting and recycling facilities, an engineered landfill, a composting plant and a 1,500 tonnes per day Waste-to-Energy (WTE) incineration plant.

Rising energy prices and increasing worldwide commitment to reduce greenhouse gas emissions and to achieve landfill diversion are driving the development of new approaches to the management of solid waste. A modern integrated waste management policy is based on harnessing waste as a resource. As the first of its kind in the Middle East, the integrated DSWMC in Qatar is a visionary infrastructure project that showcases how the latest ideas on sustainable and resource-conscious development can be put into practice. It combines the maximised recycling of used goods, water re-use, sorting and separate waste collection, and utilises a well organised and controlled waste stream which focuses on waste recovery. The integrated waste management chain can help to achieve up to 95% diversion from landfilling.

The rise of Qatar has been one of the most remarkable developments in the recent history of the Middle East. The gas-rich Gulf state entered a new era of modernisation over the last two decades and rapidly became a country with a modern and well-developed infrastructure. The DSWMC serves the waste treatment needs for the whole of Qatar, and is designed to treat up to 2,300 tonnes of mixed domestic solid waste per day.