Dunbar / East Lothian, Scotland, UK

VØLUND™ WASTE-TO-ENERGY TECHNOLOGY

PROJECT CASE HISTORY

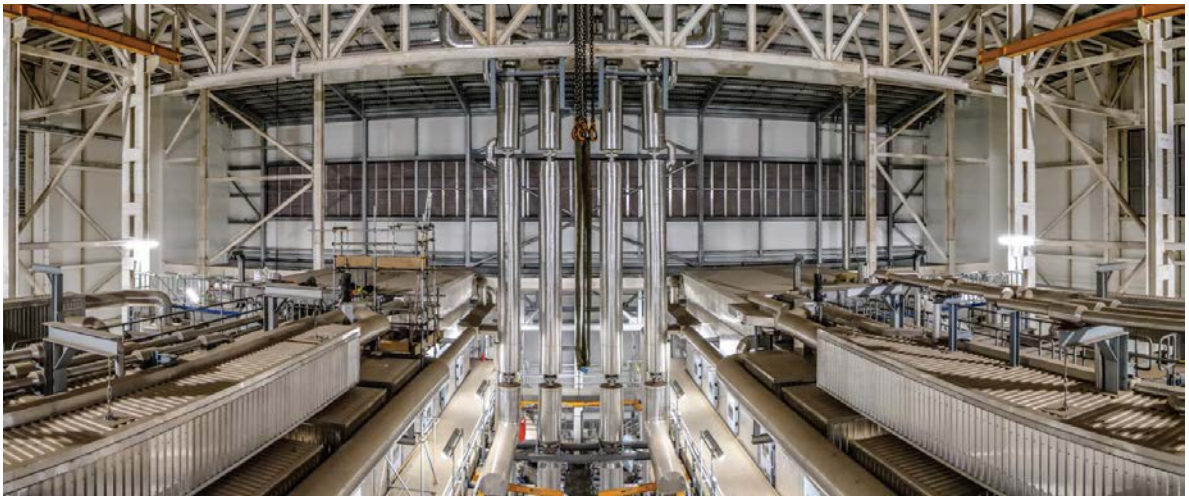
The Dunbar waste-to-energy facility, developed by Viridor, is located at the rail-linked waste treatment hub in Dunbar, East Lothian. Commissioned in 2019, the plant is integral to the Scottish government's ambitions of generating renewable energy, phasing out landfills and developing a viable circular economy.

The plant's two lines use state-of-the-art Vølund™ technology provided by Babcock & Wilcox Renewable (B&W), each burning 19.2 tonnes of waste per hour and is designed to:

- treat over 300,000 tonnes of waste per annum,
- process residual household, commercial and industrial waste, and
- continuously power 70,000 homes with 258 GWh of baseload green electricity.

Dunbar is Viridor's second plant in the UK utilizing Vølund technology. Viridor has been operating the Peterborough waste-to-energy plant in Cambridgeshire since 2015.

After commissioning, Viridor engaged us in a long-term contract to provide grate inspection and maintenance at the Dunbar facility.



continued ▶

One of two DynaGrate combustion grates being installed

The solution

We delivered all equipment from crane to stack, including the DynaGrate® combustion grate and GMAB™ flue gas treatment systems, along with SPIG™ air-cooled condensers. We worked closely with our consortium partner, Interserve Construction Limited (ICL), throughout the project.

Key reasons for choosing Vølund technology included fuel flexibility and efficiency, plant availability and performance backed by guarantees. At commissioning, initial performance tests proved excellent.

Plant design data (per line)		
Process parameters	**Values***	**Units**
Waste capacity	19.2	t/h
Heat value	10	MJ/kg
Steam output	2 x 65.3	t/h
Steam temperature	440	°C
Steam pressure	65	bar
Boiler outlet flue gas temp.	155	°C
Feed water temperature	125	°C

* *All values refer to 11% O_2 dry gas*

Primary benefits

Few fuel constraints – The DynaGrate combustion technology allows a wide range of alternative fuels to be processed such as commercial and industrial residual waste and SRF/RDF, mitigating risk if:

- the cost of sourcing fuel increases,
- the fuel supply changes,
- not compliant fuels are used, or
- a contracted fuel supplier exits the market.

Fly ash disposal costs significantly reduced – Compared to other grate technologies, the DynaGrate combustion technology produces significantly less fly ash, reducing the generation of secondary waste to landfill.

Full recovery of ferrous metal from bottom ash – It is possible to recover all ferrous metals from the bottom ash by applying simple back-end magnetic separation.

The technology

Vølund technology is based on in-house expertise and many years of experience in providing high efficiency, availability and performance.

The solution featured our DynaGrate technology. The innovative combustion grate is unique in its fuel flexibility, optimized combustion and minimal maintenance cost, all due to the mechanical design and optimized water-cooling system. The entire cooling system is well integrated and protected in the steel shaft. Also, movable grate parts are not in contact, thereby reducing grate wear, providing excellent fuel flexibility.

Energy Generation		
Parameters	**Values**	**Units**
Electricity (per year to grid)	258	GWh
Heat (max. local use)	10	MW

Babcock & Wilcox
Dybendalsvaenget 3
2630 Taastrup
Denmark
Phone: +45 76.14.34.00

www.babcock.com/renewable

B&W BABCOCK & WILCOX RENEWABLE

RENEWABLE | ENVIRONMENTAL | THERMAL

Established in 1867, Babcock & Wilcox is a global leader in renewable, environmental and thermal technologies and services for power and industrial applications.

For more information or to contact us, visit our website at www.babcock.com/volund.