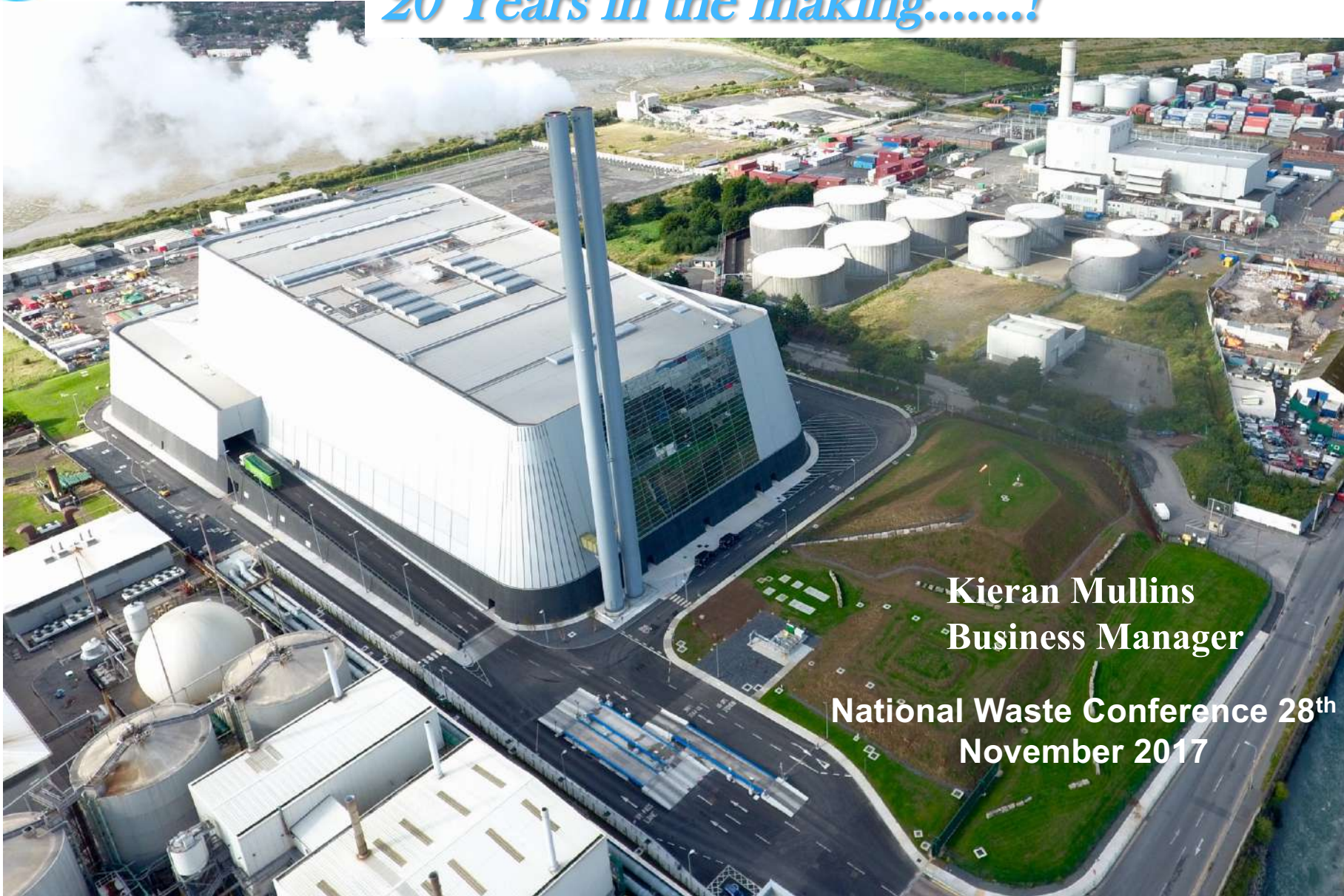


Dublin Waste to Energy Facility

20 Years in the making.....!



Kieran Mullins
Business Manager

National Waste Conference 28th
November 2017

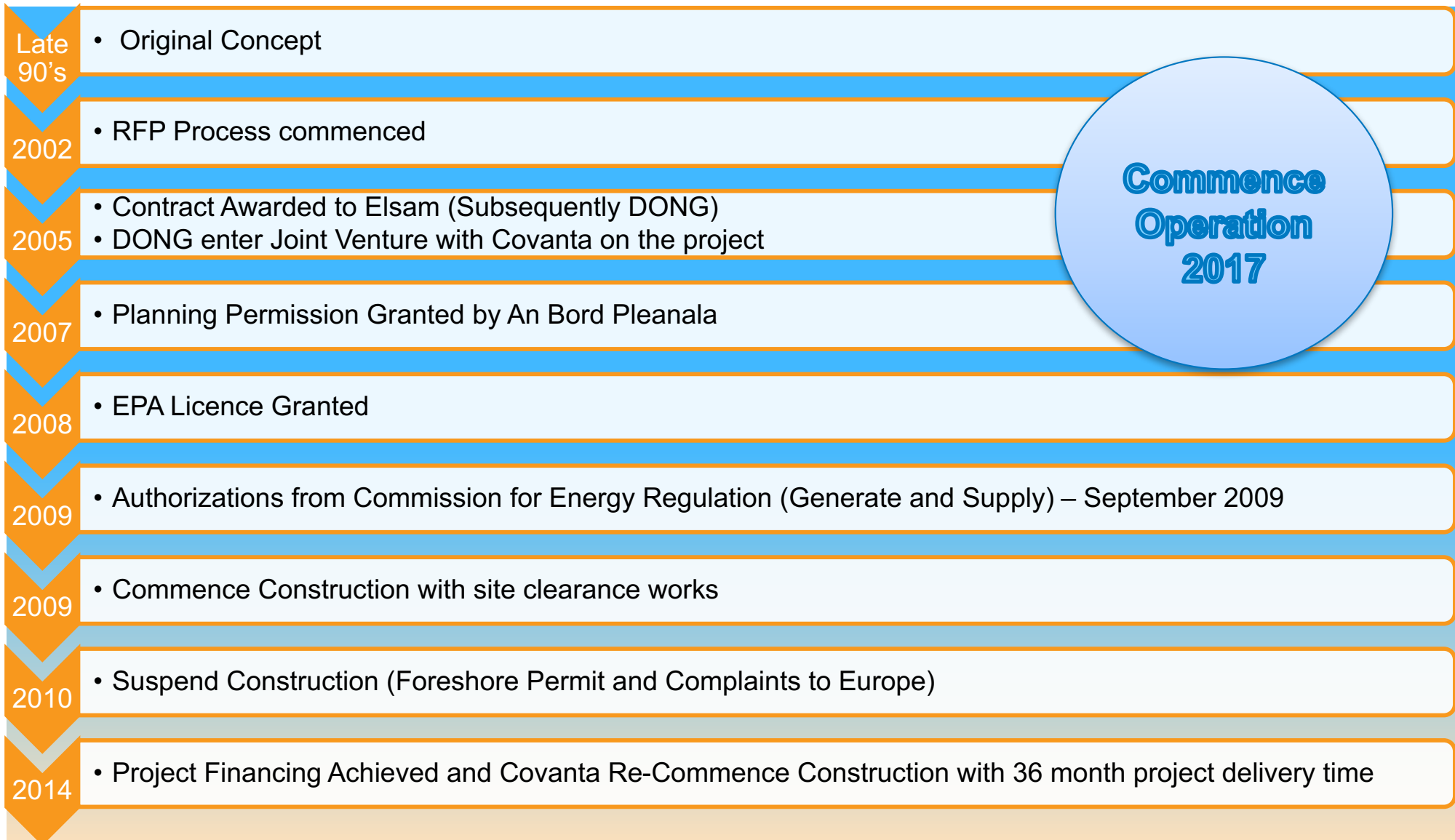
Covanta - World's Leading Waste to Energy Company

- Named as one of the Top 200 Clean Energy Companies worldwide.
- Operates 42 modern WtE facilities in North America.
- Operates 65% of US WtE volume.
- Annual WtE capacity to convert 18 million tonnes of waste into more than 10 million MWh — enough clean energy to power over 1 million homes.
- Annually recycle over 450,000 tonnes of metal - the equivalent amount of steel that would be used to build 5 Golden Gate Bridges or 5 of the new Terminal 5 in Heathrow.
- 3,500 employed.

DWtE Facility – The Need

- Consistent with Regional, National and EU Waste Management Policy
- Waste disposal capacity critically low – no new landfills, insufficient reliable secure residual waste recovery capacity in Ireland. “2 No. Section 56’s of Waste Management Act in 2016.
- In 2015 c.1 million tonnes thermally treated in Ireland / abroad.
- 2.1 million tonnes of waste exported for WtE since 2014.
- Even with recycling (predicted at 45/50% by 2020), there will remain a need to treat 1.5 – 1.6 million tonnes of residual waste annually and population growth and economic growth will fuel this further.
- Treating over 35% of residual waste in Ireland.
- 1 tonne of waste equates to 250kg of oil or 400kg coal.

The Project - Timeline



Commencement of Operation



1st Delivery



1st Feed



1st Fire

The Project - Contract

PPP between Dublin CC (Acting on behalf of 4 LA's) and Covanta

> 90% of Waste Requirements contracted from private Waste Collection Companies for 9 + years

3 year Construction

Majority of Waste from Greater Dublin Area.

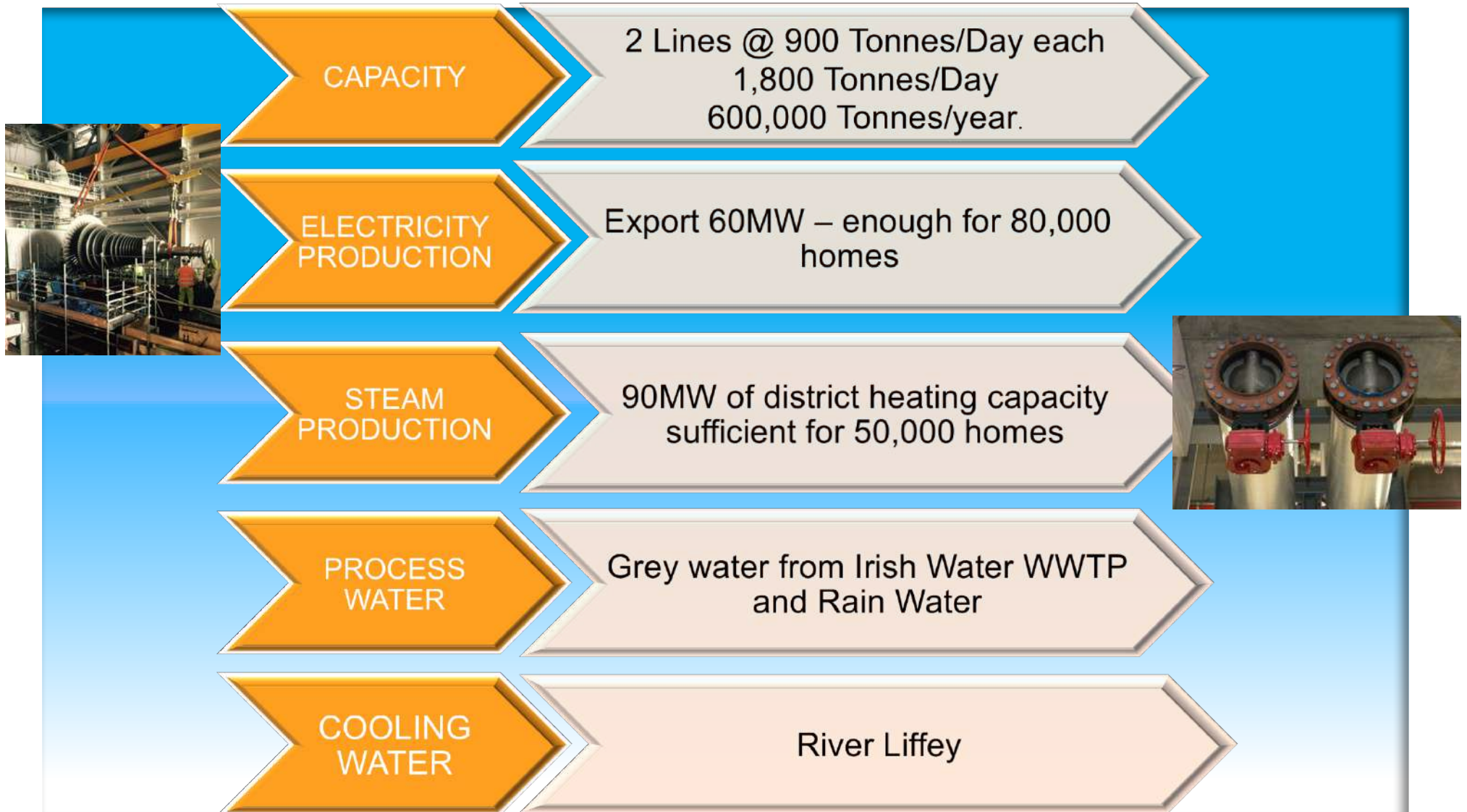
45 Years Operation

60 Full-Time Covanta Staff
30-40 Subcontractors

Main Site and Ancillaries



The Project

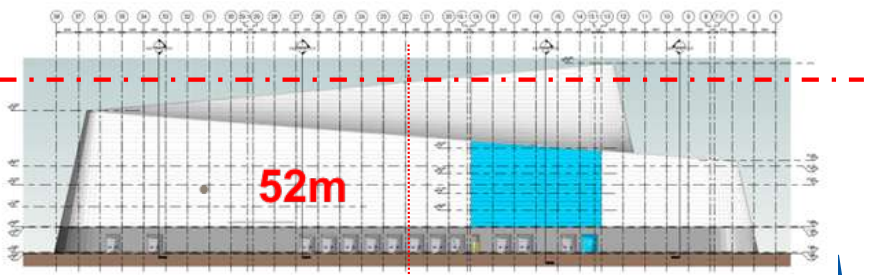
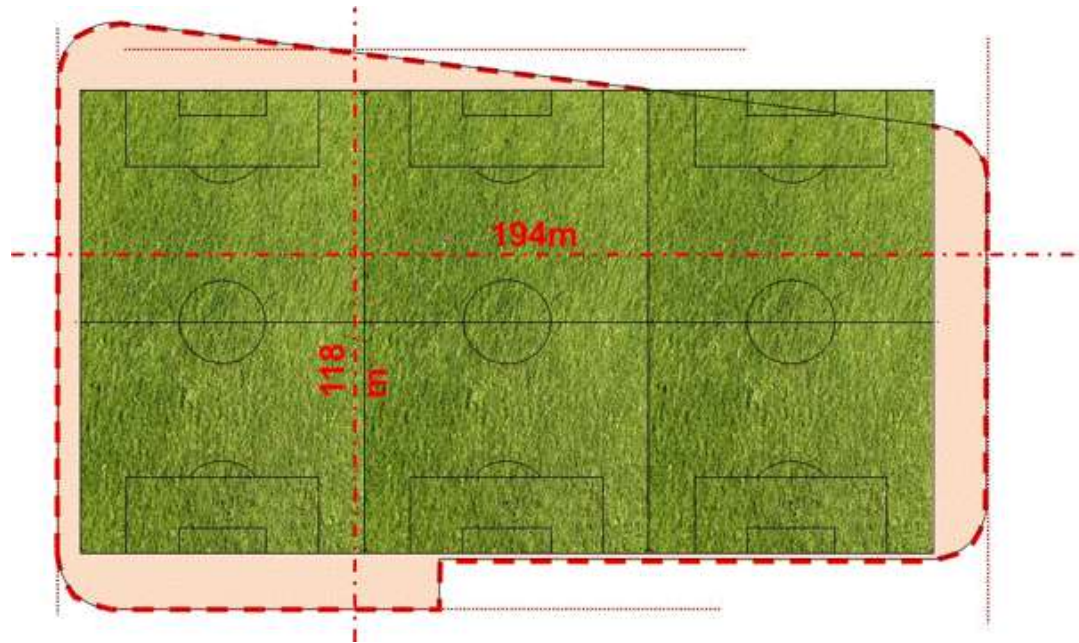


Construction Team



- Over 3.8 million man hours in the 36 month construction period.
- Equivalent to 630 full-time jobs over the period and employment peaked at 1,315.
- 75% of all labour on the project was Irish based.
- 5,500 different individuals were safety inducted onto the site.

Interesting Facts



Waste Contracts

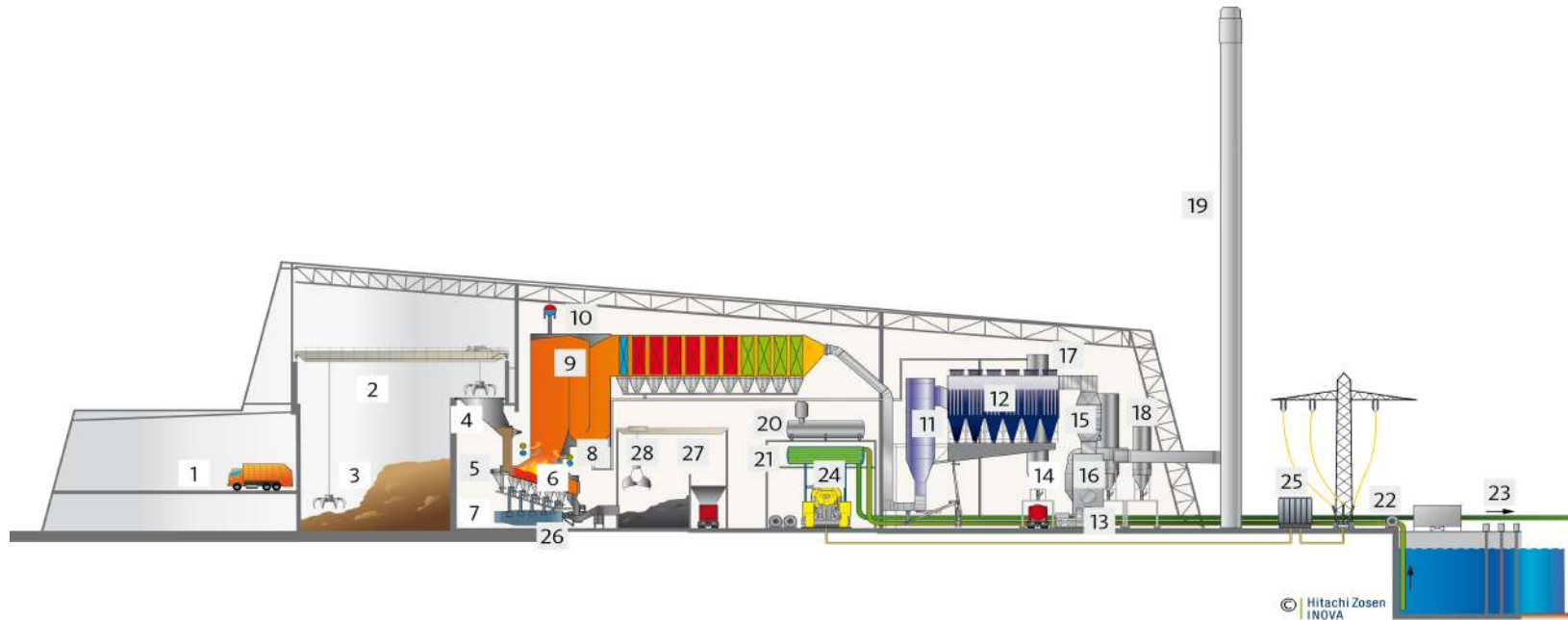
- 580,000 tonnes of 600,000 tonne capacity contracted to-date.
- Average 9 year contracts.
- Tender for capacity issued to the waste market which was oversubscribed by 250,000 tonnes.
- More than 75% of the waste will be generated from the four Dublin local authority areas.



- The Facility is only permitted to accept residual non-hazardous waste
- The list of the approved wastes are clearly set out in the DWtE EPA licence
- No hazardous waste is permitted to be accepted at the facility
- Deliveries only by pre-ordained routes

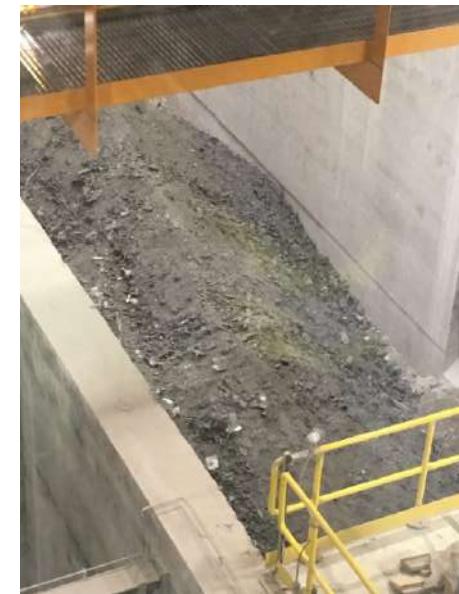
Plant Schematic

Dublin / Ireland



Waste Delivery and Storage	Combustion and Boiler	Flue Gas Treatment	Energy Recovery	Residue Handling and Treatment
1 Tipping hall	4 Feed hopper	11 SemiDry reactor	20 Feed water tank	26 Bottom ash extractor
2 Waste bunker	5 Ram feeder	12 Fabric filter	21 Water cooled condenser	27 Bottom ash bunker
3 Waste crane	6 Hitachi Zosen Inova grate	13 Induced draft fan	22 Cooling water pump	28 Bottom ash crane
	7 Primary air	14 Silencer	23 Fish screen and return system/water intake filter	
	8 Secondary air	15 Flue gas heat exchanger	24 Turbine	
	9 Four-pass boiler	16 Wet scrubber	25 Transformer	
	10 Boiler drum	17 Residue silo		
		18 Additive silos		
		19 Stack		

Plant in Operation

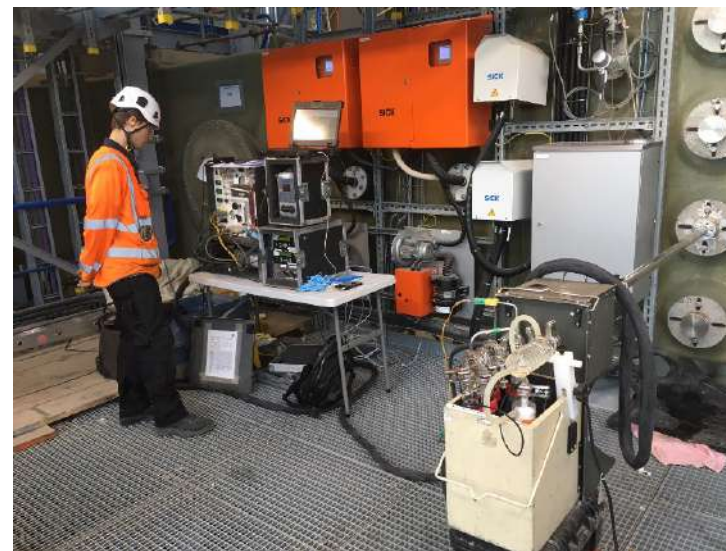


Air Pollution Control



Semi-Dry Reactor, Filter Baghouse,
Wet Scrubber

CEMS and In-stack Monitoring



September 2017 Independent Stack Test Results

Flue Gas Parameter	Units	Emission	A2-1 Line 1		A2-1 Line 2	
		Limit Value	Result	% of ELV	Result	% of ELV
Dioxins & furans (as I-TEQ)	ng/m3	0.10	0.0035	3.50%	0.0002	0.22%
Total Particulate Matter	mg/m3	30	1.350	4.50%	0.830	2.77%
Hydrogen Chloride	mg/m3	60	0.030	0.05%	0.072	0.12%
Cadmium & Thallium	mg/m3	0.05	0.0007	1.42%	0.0006	1.12%
Heavy Metals	mg/m3	0.50	0.159	31.80%	0.130	26.00%
Mercury	mg/m3	0.05	0.0003	0.60%	0.0009	1.82%
Arsenic	mg/m3	0.20	0.0007	0.33%	0.0006	0.30%
Hydrogen Fluoride	mg/m3	4	0.0036	0.09%	0.0420	1.05%
Sulphur Dioxide	mg/m3	200	0.0620	0.03%	0.0680	0.03%
Total Organic Content	mg/m3	20	2.000	10.00%	0.290	1.45%
Oxides of Nitrogen	mg/m3	400	103.2	25.80%	106.7	26.68%
Carbon Monoxide	mg/m3	100	1.82	1.82%	0.23	0.23%

Residues

- **IBA- Incinerator Bottom Ash (Non-hazardous) – includes ferrous and non-ferrous metal**
 - No processing capacity in Dublin WTE
 - Export for recovery (Netherlands/ Norway)
 - Ferrous metal – c. 9% present in IBA
 - Non-Ferrous metal – c. 4.5% w/w in IBA
 - Preferred Solution for IBA is Local (Ireland)



Residues

- **APCR – Air Pollution Control Residues (Hazardous)**
 - Export for recovery (Norway/Germany)
 - Bulk / bagged



Community Gain Fund



Initial Capital Contribution under the planning approval of €10.4 Million



Annual Contribution of €1 per tonne and index linked



Over €10.2 million in fund already



€4.8 million committed to local projects in 2016

Funded Projects.



€480,000 for redevelopment works.



€115,000 to extend and refurbish the sports hall.



€300,000 to upgrade the club's facilities



€130,000 for renovation works and purchase of van.



€225,000 to develop new sport hall.



€1.1 million to expand and refurbish the club's facilities



€55,161 to resurface the play area



€26,000 to purchase racing skiff boat

Really Guys!



Thank you

