



Cory Riverside Energy

Zero Waste Study Tour

31st August 2018



AGENDA

- Cory Riverside Energy: Who We Are
- Cory's Background
- Riverside Development
- Riverside Financing & Refinancing
- Riverside Energy Park

CORY RIVERSIDE ENERGY: WHO WE ARE

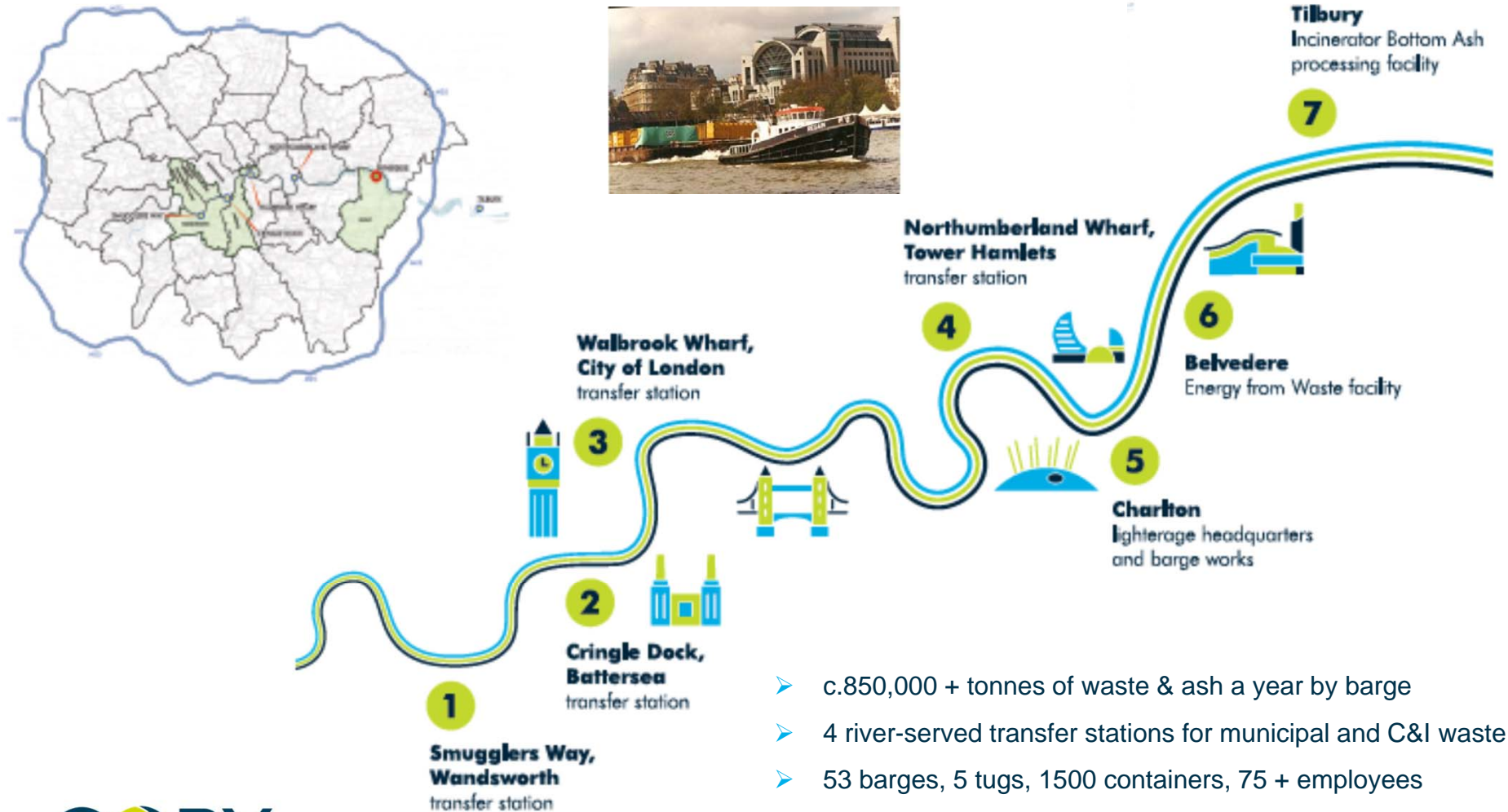
- Cory Riverside Energy is one of the leading waste management companies in London with c.300 employees across our network of sites and facilities
- Established in 1896, over 120 years of serving London
- Manage >750k tonnes of London's waste



- Work closely with local authority partners
- Unique river transport for waste management – utilising the River Thames as a Green Highway



CORY RIVERSIDE ENERGY: WHO WE ARE



- c.850,000 + tonnes of waste & ash a year by barge
- 4 river-served transfer stations for municipal and C&I waste
- 53 barges, 5 tugs, 1500 containers, 75 + employees
- Over 100,000 lorry movements saved from Central London roads each year

CORY'S BACKGROUND

- In 1896 William Cory and Son tugs and barges brought coal into London using the River Thames
- The empty barges were then filled with London's rubbish and towed back down stream where the waste was to be deposited in the marshlands of Essex and Kent
- 1918-1920 Expansion through acquisition of steamers, tugs and barges and lighterage companies
- In 1983 Cory wins tender for disposal of Greater London Council's waste (500k tonnes per year) Introduction of the containerised waste transport method to the riparian Mucking landfill site in Essex



CORY'S BACKGROUND CONTINUED

➤ 2002 Cory wins a 30 year contract worth £1.2bn with four London boroughs of Wandsworth, Kensington & Chelsea, Lambeth and Hammersmith & Fulham which make up the Western Riverside Waste Authority (WRWA) - securing the river operations

➤ Fully integrated contract including: -

Waste education programme

Provision of recycling infrastructure (Materials Recycling Facility)

Provision of modern civic amenity infrastructure

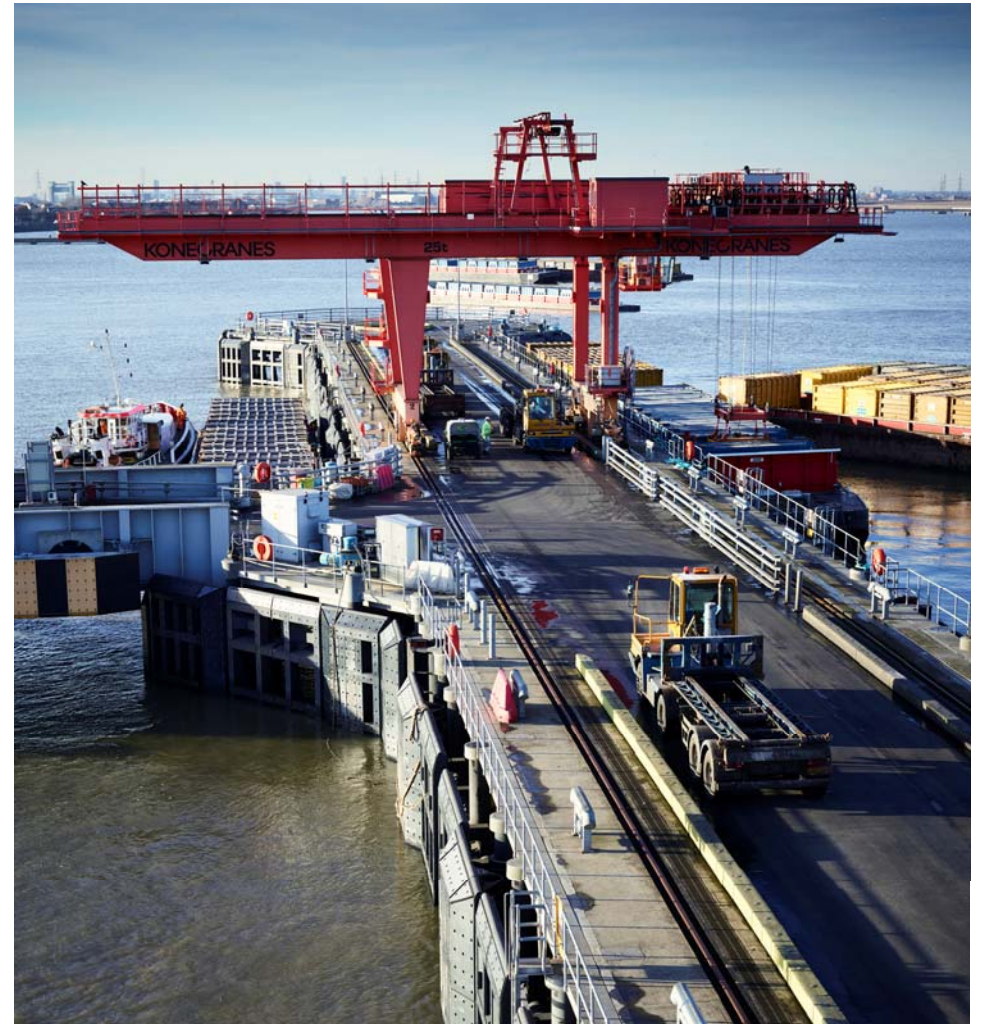
EfW at Belvedere site for residual waste



➤ Innovative approach which addressed the waste hierarchy was important for securing planning for all infrastructure

OUR VISION

- Build on CRE's existing position as the cleanest and most efficient processor of London's and the South East's residual waste: generating secure, affordable, renewable energy and manufactured construction aggregates.
- Be recognised as leaders in thought and actions to make the UK's Circular Economy a reality
- London "No Waste Wasted" by 2030: no waste to landfill or exported. All London's waste processed within London's boundaries.
- As the most prolific river operator, CRE leads modal shift of freight from road to river - a "new" business stream that reinforces and compliments our unique river heritage and low carbon route for the disposal of waste.



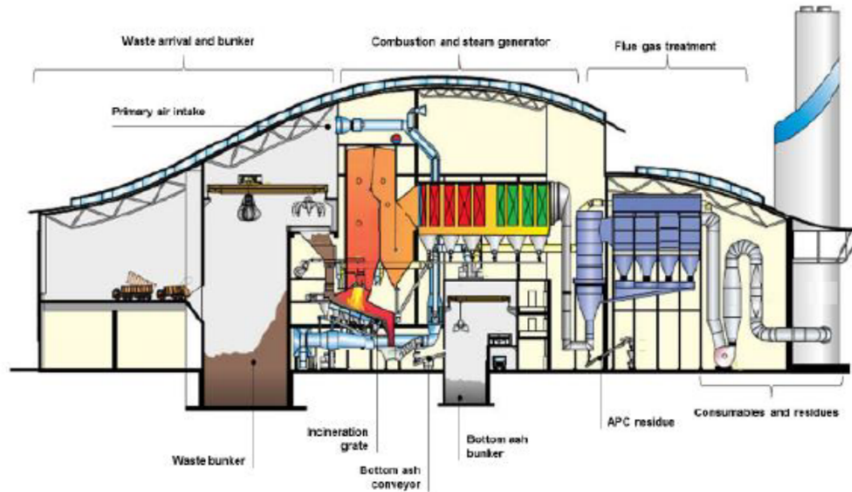
CORY RIVERSIDE ENERGY: WHO WE ARE

- Riverside EfW, **R1 rated** in operation since 2011 in Belvedere, South East London
- Processing up to **785,000 tonnes** of waste annually
- Regenerate circa. **200,000 tonnes** of useful construction materials
- Produce circa. **525,000 MWh** of baseload electricity annually (equivalent to powering 160,000 homes)
- Fleet of tugs and barges transfer circa. **1 million tonnes** of London's municipal and commercial waste and by-products annually via the carbon efficient green highway of River Thames



EXISTING RIVERSIDE RESOURCE RECOVERY EFW FACILITY

Riverside process diagram



Overview

- CRE's processes and plant equipment are based on commercially proven principles
- Grate-based combustion systems are by far the most developed for processing solid waste
- The facility has been granted 'R1' certification by the Environment Agency, in recognition of its efficiency

Key operational metrics

Takeover	• 2011
Licensed waste capacity (kt p.a.)	• Original: 670 • Current: 785
Health & Safety record (per 100,000 hrs worked)	• 0.7 LTI ¹
CV ² of waste treated	• Operating range: 7-13MJ/kg
Power output ³	• Current: 73MW gross, 66MW net • From Q1 2019: 77MW gross, 69MW net
Energy conversion efficiency ⁴	• 27.1%
Proven technology	• Three full combustion lines • Conventional moving grate • Single steam turbine • Air cooled-condenser
Thermal input	• Current: 1,962MWh/line/day • From Q1 2019: 2,005MWh/line/day
Waste throughput	• 30.7t/h per each waste stream • Three waste streams resulting in 92.1t/h of waste throughput
Asset life	• Lifecycle maintenance strategy • Perpetual
EPC contractor	• Hitachi Zosen Inova
Turbine provider	• MAN
Generator provider	• BRUSH
CMMS ⁵	• Infor EAM
Land	• Freehold ownership
People	• Headcount: 91 • Avg. experience: 6 – 7 years

ELECTRICAL OUTPUT

- Among top performing UK electricity only EfW plants (kWh/tonne basis)
- 525,000 MWh of electricity generated annually equates to:

Did you know...
A kilowatt hour gives you:

 31 hours on a laptop	 1-2 cycles in a washing machine	 80 minutes using a microwave
 9 uses of a kettle	 27 minutes ironing	 4 hours watching TV

Generation equivalent to c.2.1 billion hours (>200,000 years) of watching TV

Generation equivalent to c.4.7 billion uses of a kettle; up to c.1 billion washing machine cycles

Source: Npower

(1 MWh = 1,000 Killowatt hours)

OPERATIONAL PERFORMANCE

- By generating circa. 525,000 MWh per annum, we offset large amount of fossil fuels used for generation equivalent to 210,000 tonnes of coal or 105 million m³ of natural gas

- Operational Statistics to end July 2018 (from commencement of operations in 2011): -

- 5.1m tonnes of waste processed



Fossil Fuel
Equivalent usage

1.4 million tonnes

- 3.4m MWh of electricity exported



683 million m³
natural gas

- c. 1.0 m tonnes of Carbon diverting waste from landfill
(200kg per tonne of waste diverted)

Secondary Aggregate upcycling from process

- 1.3m tonnes of Incinerator Bottom Ash

- 134k tonnes of APC Residue



Circular
Economy

KEY NUMBERS



LESS LANDFILL

750,000

Up to 750,000 tonnes of London's waste turned into electricity and recycling product



GREEN HIGHWAY

100,000

Vehicle journeys saved using our carbon efficient fleet of tugs and barges to move waste along the Thames



LITTER TO LIGHT

160,000

Households powered with the c.525,000 MWh energy we generate



RUBBISH TO ROAD

200,000

Up to 200,000 tonnes of ash recycled as construction aggregate



BIN TO BRICK

10,000

Up to 10,000 tonnes of Air Pollution Control Residue recycled to create building blocks for use in construction



LOCAL DISPOSAL

149,000

Tonnes of carbon saved by not sending waste to landfill

RIVERSIDE DEVELOPMENT - BACKGROUND

- 1991 1st Planning application submitted and public inquiry refusal based on 1.2m tpa facility size, undeveloped access road and concerns over site
- 2003 and 2005 public inquiries held – following refreshed planning application for 670k tpa facility, redeveloped access road and consolidated environmental statement
- PPC permit granted by the Environment Agency
- Riverworks Licence received from the Port of London Authority for works connected to the provision of the deep water jetty
- Waste will be delivered to the site and ash exported by river
- June 2006 The Secretary of State for Trade and Industry granted planning consent for the facility
- Judicial Review mounted by the Mayor of London
- February 2007 review rejected
- January 2008 construction commenced on Norman Road followed by main site in July

RIVERSIDE DEVELOPMENT – ORIGINAL FUNDING

- 31 July 2008 Cory reaches financial close on Riverside
- Total project funding £570m provided by debt / equity
- Lead arrangers of the debt:



- Raising of finance took approximately 1 year, reflecting both the complexity of the project and the impact of the credit crunch on the financial markets
- Subsequent Syndication process over last 26 months (following Lehmans and financial markets collapse)
- £465.8m banking facilities as follows: -

Facility	Funding
Term Loan	£430.8m
Contingency	£25.0m
Change in Law	£10.0m
TOTAL	£465.8m

RIVERSIDE REFINANCING – DUE DILIGENCE

- Financial – Accounting – PWC
- Financial – Model Audit – PWC
- Financial – Structuring - Deloitte
- Legal – Financeability - Linklaters
- Legal – Project Structure and amendments - Ashurst
- Legal – Cory Group Structure – Slaughter & May
- Technical – Fichtner
- Market
 - Tolvik - Waste supply & gate fees
 - Baringa - Electricity Market prices
- Insurance - Willis



RIVERSIDE DEVELOPMENT – REFINANCING

- March 2017 Cory reaches financial close on Refinancing of Cory Riverside Energy
- Total refinanced debt of £520m



Facility	Funding
Term Loan	£430.8m
Contingency	£25.0m
Change in Law	£10.0m
TOTAL	£465.8m

Milestones prior to refinancing

- Successful commissioning and operational & financial track record (3.9Mt; 2.65M MWh)
- Increase in planning consent from 670k tpa to 785k tpa; ability to source waste via Tilbury; secured additional Tilbury Transfer Station Facility



RIVERSIDE ENERGY PARK & DATA CENTRE



RIVERSIDE ENERGY PARK

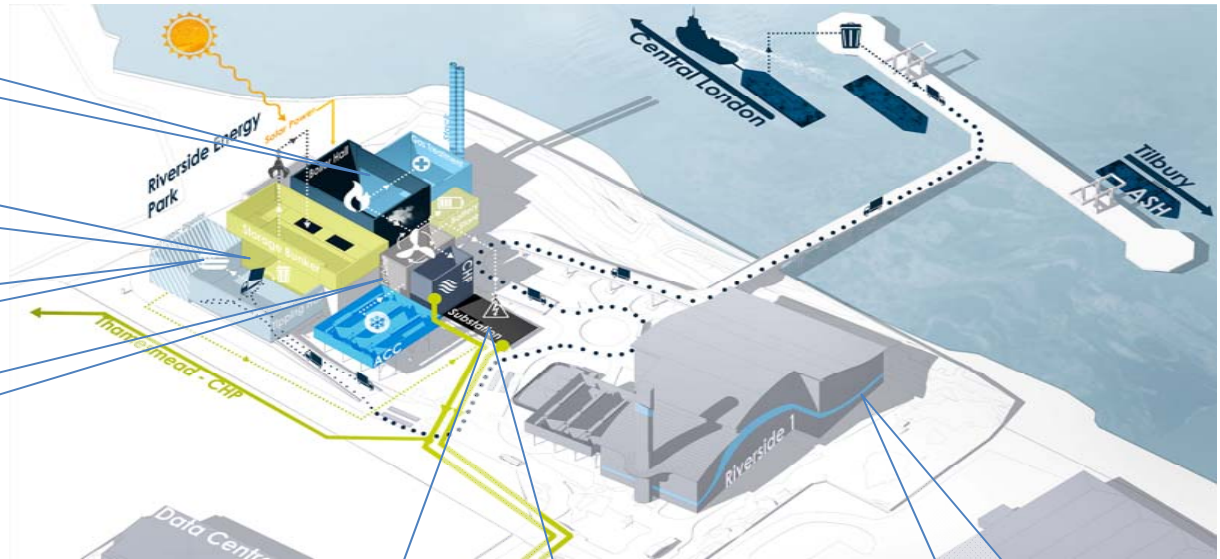
Riverside Energy Park ("REP")

EfW: c.655kt waste capacity, 68MW electricity generation capacity

Solar panels: 1MW capacity; fully utilising available space for renewable generation

Anaerobic digestion: 1MW capacity; designed to produce bio-gas

Battery storage: 20MW capacity; designed to respond to grid requirements



CHP¹: Built-in capability, option to supply up to c.30MW of heat / steam to local off takers

Existing RRR EfW facility

- **Cory's solution to London Capacity Gap**

- Nationally Significant Infrastructure Project (as >50MW per the Planning Act 2008)
- Considered through a Development Consent Order (DCO) process rather than a tradition Town & Country Planning Act process



Any
questions?

CORY
RIVERSIDE ENERGY

Andy Pike, Director
07768 583891
andy.pike@coryenergy.com
www.coryenergy.com