Energy from Waste in the UK

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www.cranfield.ac.uk

EPSRC Engineering and Physical Sciences Research Council

Innovate UK

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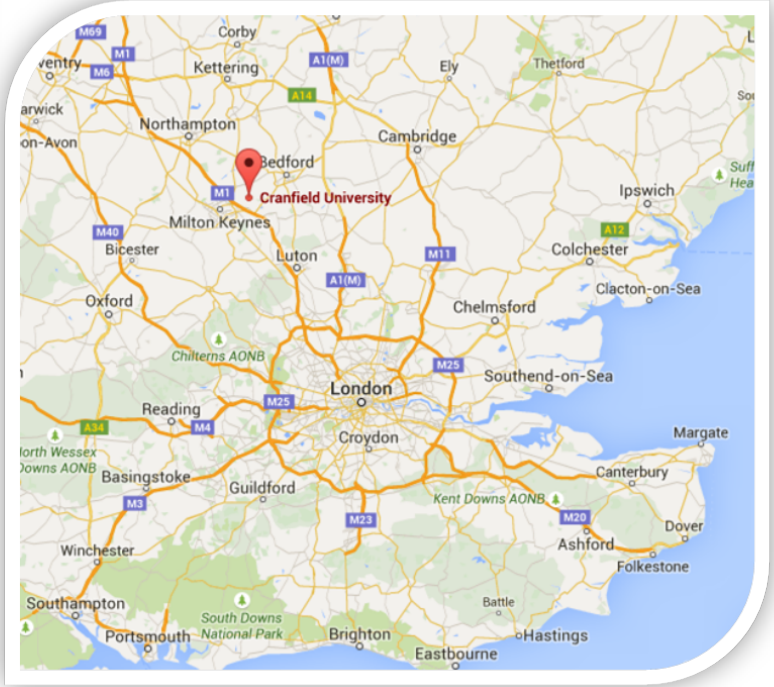
About Cranfield University



Transformational research

meeting the needs of business, government and wider society

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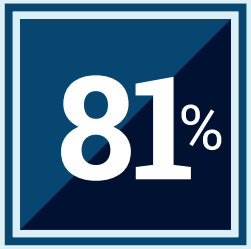
with Universities of Oxford, Imperial and Cambridge



of our research is world-leading or internationally excellent

REF 2014

UK EfW market: current status

Significant growth to date

- Current rate of thermal energy recovery = **26.5%** of total municipal waste generated (up from 11.5% in 2009)
- Over 8 million tonnes per year is sent to thermal EfW
- New facilities being developed each year
- Exporting waste (at cost) to mainland Europe for energy recovery

New facilities

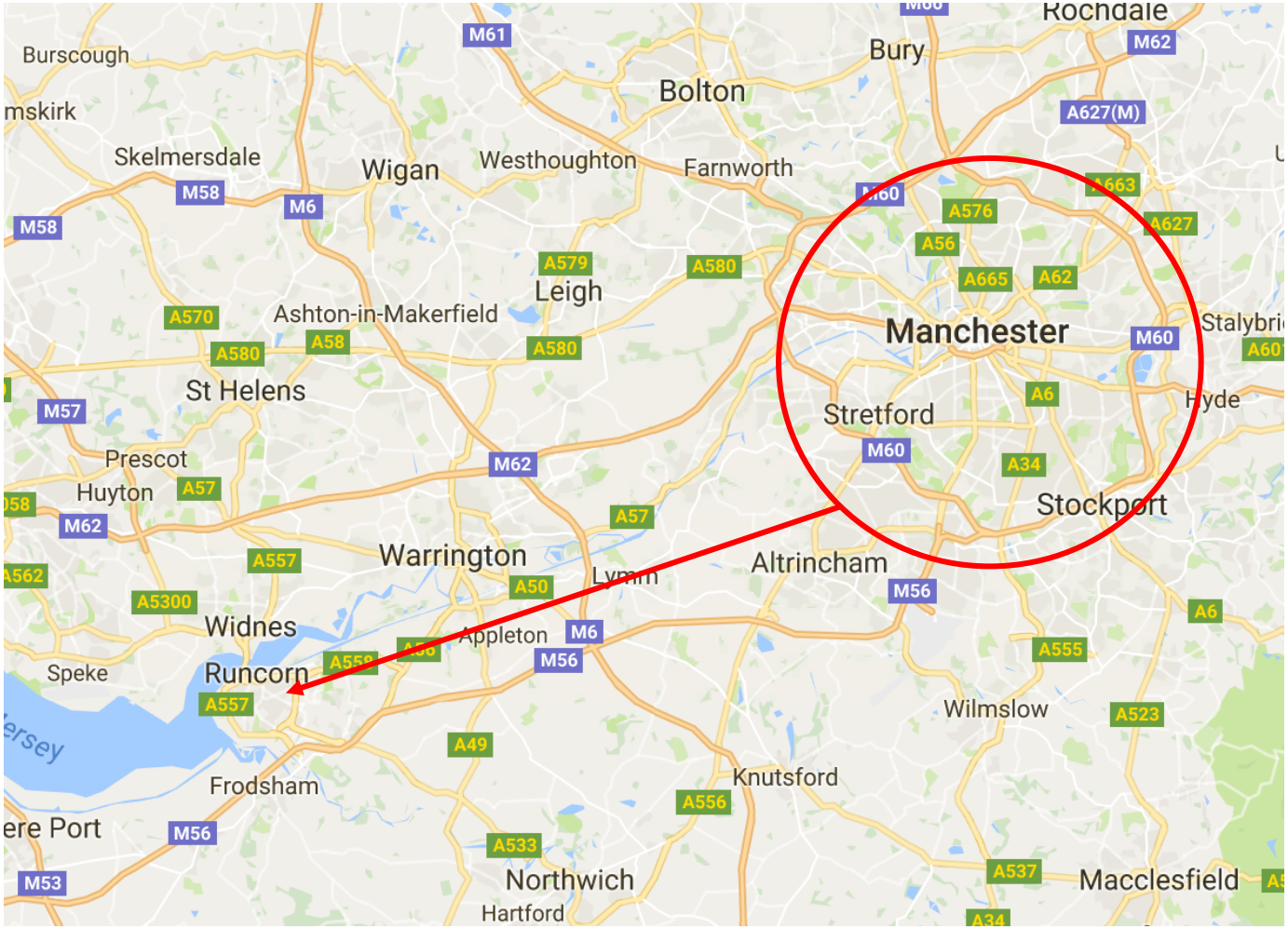
Runcorn (North-West England)

Largest EfW in UK – 850 ktpa, commissioned in 2014

Operates on RDF, not unprocessed waste

Runcorn ERF

Unique RDF supply through Greater Manchester PFI contract



New facilities

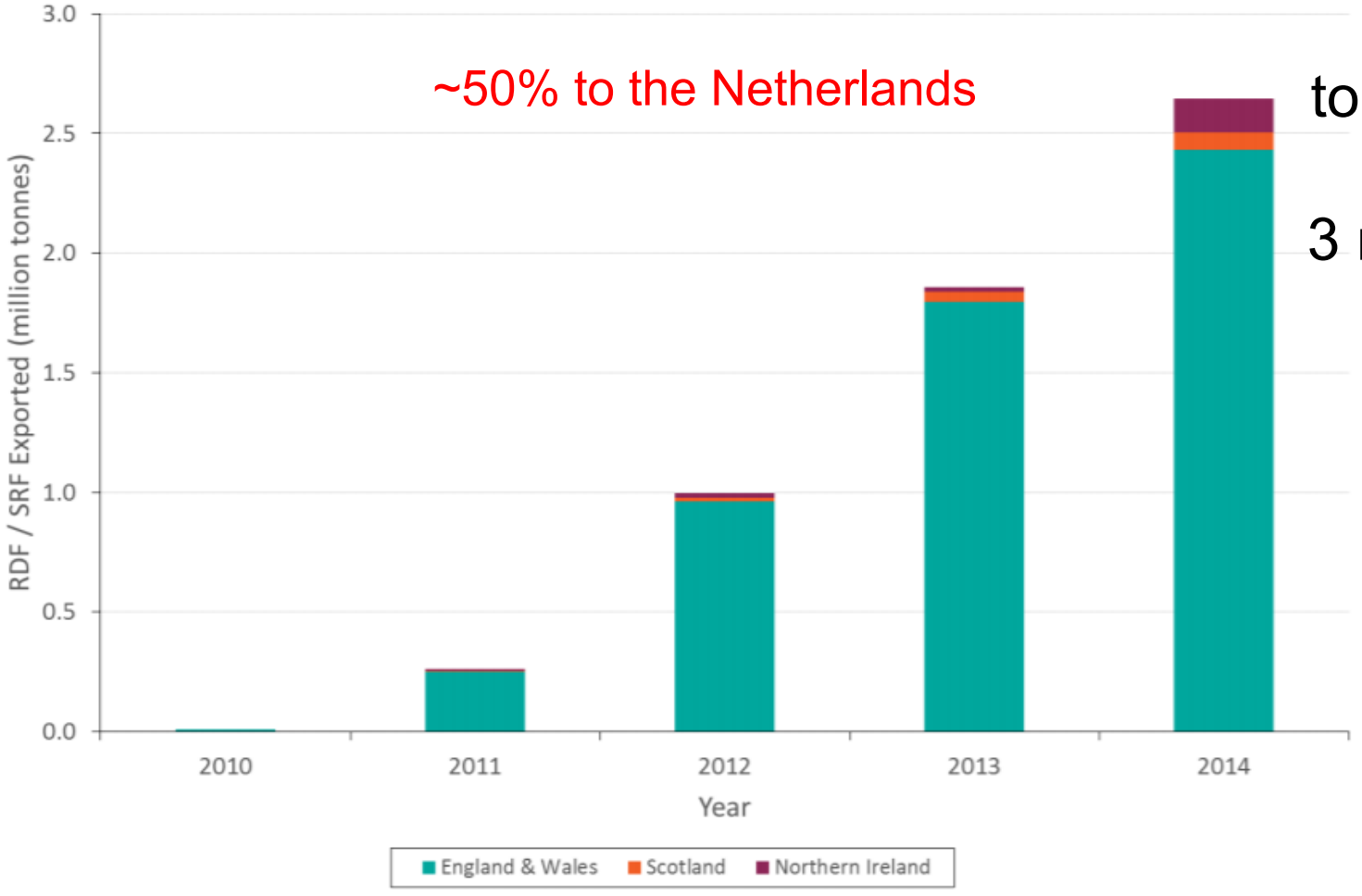
Ardley (Oxfordshire, England) – opened 2014

300 ktpa of municipal waste

Unique on-site IBA recycling plant

RDF/SRF export to EU

Growing exports (at cost!)



2.75 million tonnes in 2015.

3 million tonnes is current forecast for 2016

Source: Eunomia, RDF Export Industry Group Report

Upcoming facilities

Total 320 ktpa MBT/AD and incineration

UK's Green Investment Bank

26 SEPTEMBER 2016 by Will Date

GIB-financed Allerton EfW plant edges closer

Construction work on the long-delayed Allerton Park Waste Recovery Plant near Knaresborough is 'on track' for the facility to come on-stream in early 2018, waste firm Amey has revealed. The announcement follows a 'major milestone' in the plant's build this month (September) – with the construction of the chimney stack for the energy from waste line of the facility.

Installation of the 70m steel stack at the Allerton Park Waste Recovery Plant was completed this month

Upcoming facilities

Milton Keynes Recovery Park (AD and gasification)

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ATT development

Major company enters administration

Energos

- Providing the technology for current projects..
  - Milton Keynes Recovery Park
  - Glasgow
  - Derby
  - Knowsley

Energos calls in administrators

13 July 2016 by Luke Walsh , **Be the First to Comment**

UK: EfW plant builder currently has four projects under-development

The gasification technology being installed at the Glasgow EfW build

Energy-from-waste plant builder Energos has gone into administration, according to the firm now dealing with its financial affairs.

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Astaldi shar rises on new structure

"Cash flow issues caused by contractual disputes"

Coincided with Interserve's decision to exit the EfW market following delays in Glasgow

ATT future in the UK

Larger scale seems unlikely

- Feasibility study and pilot-scale testing funded by the ETI, involving Cranfield, came to the following conclusion:

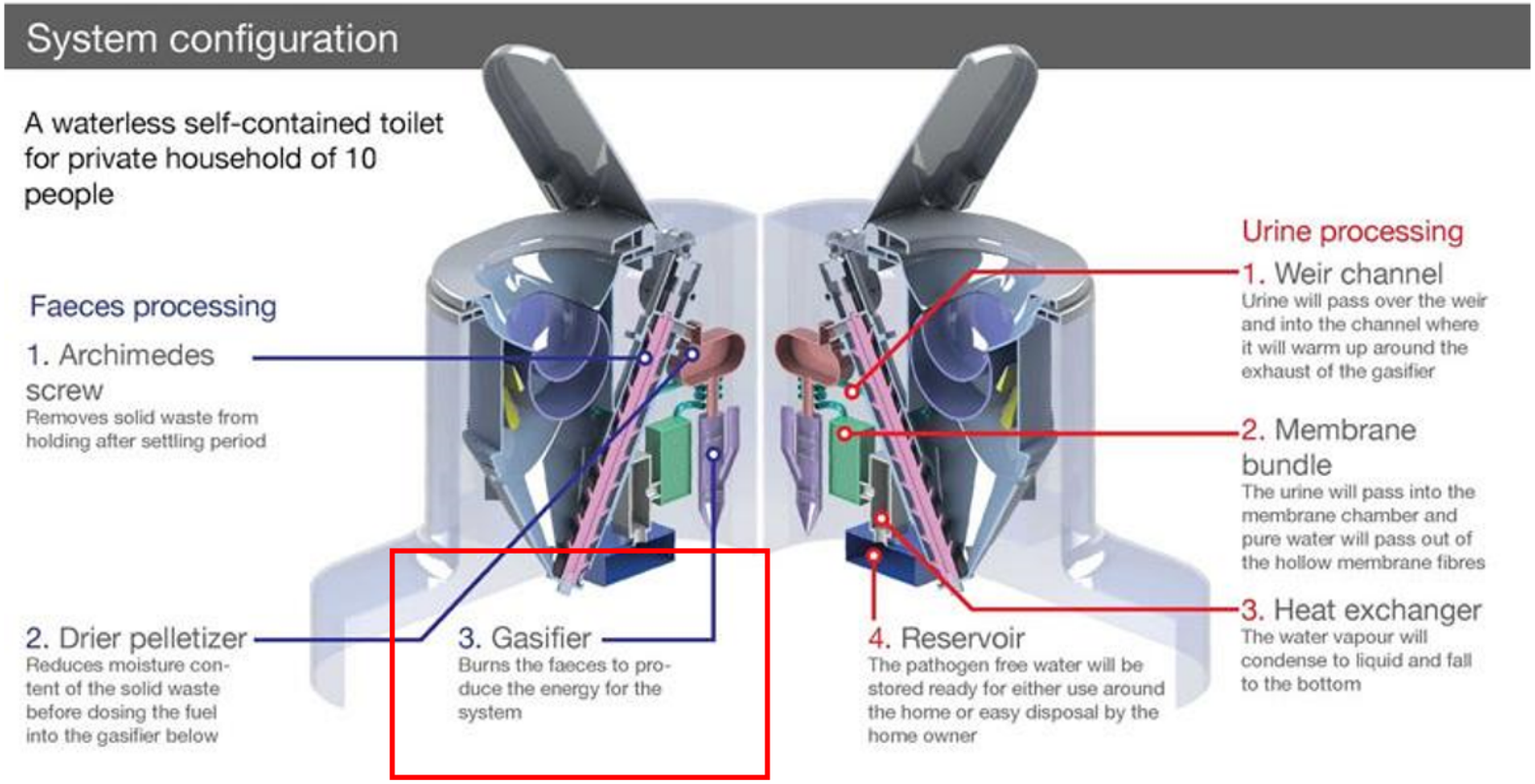
"Town-scale gasification presents a significant development opportunity"

- This translates to 5-20 MW capacity

- Future development is upcycling the syngas into valuable products, especially as the UK needs to focus on transport fuels

The Cranfield nano-membrane toilet

Proving the concept of small scale



EfW related work ongoing

- Contaminated Land for Wealth [CL4W] project
  - combines process of land phyto-remediation and production of industrially-useful chemicals and catalysts from harvested biomass
  - Recovery of metals and energy whilst also cleaning contaminated soils

- Advanced thermal conversion of waste-derived fuels to high quality outputs
  - Thermodynamic validation of a demonstration pyrolysis plant
  - Developing chemical understanding of the process

Upcycling of landfilled plastics to products through pyrolysis

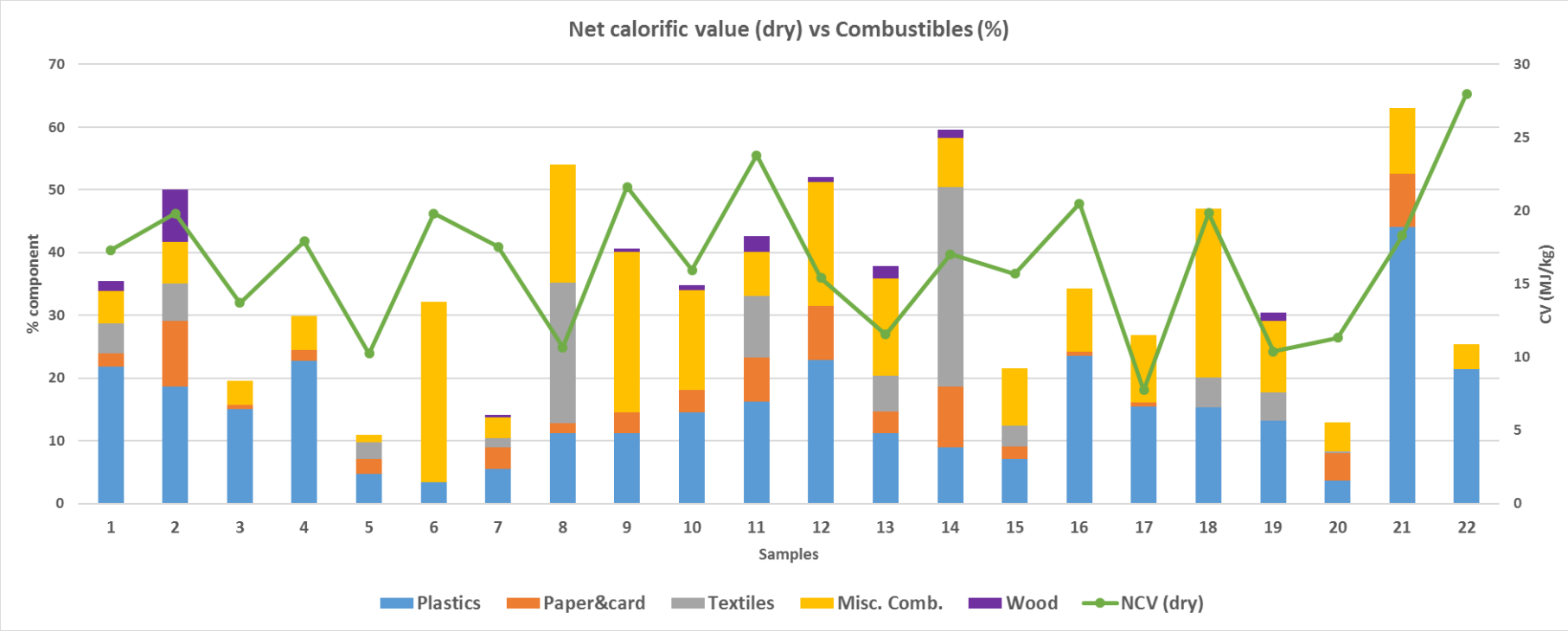
- EPSRC-funded PhD project

EPSRC Engineering and Physical Sciences Research Council

- Conversion of contaminated and degraded plastics to high-value commodities through pyrolysis

- Watch this space…..

Combustible fraction as a fuel -Landfill site in South-West England

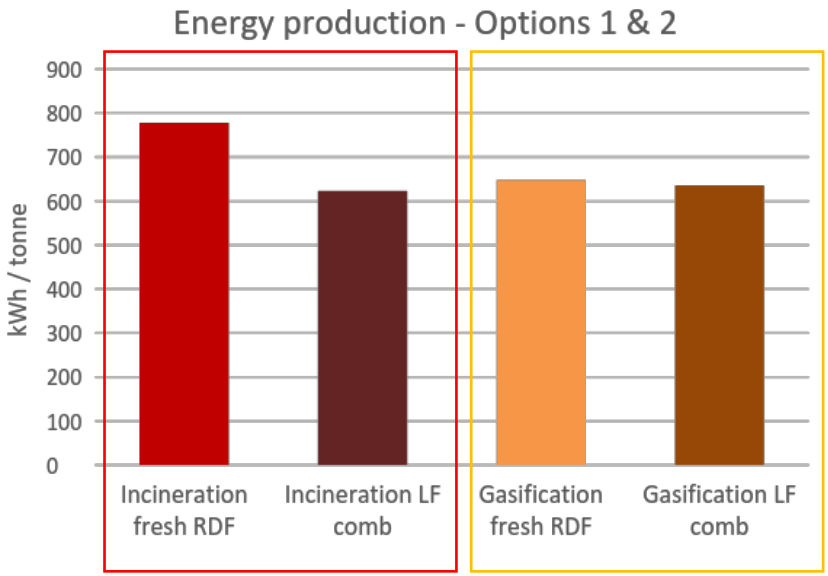


Average moisture content of combustibles: **29.3 %** (12.7-38.5)

Average Gross Calorific Value: **12.9 MJ/kg** (ar)

Average Net Calorific Value: **11.0 MJ/kg** (ar)

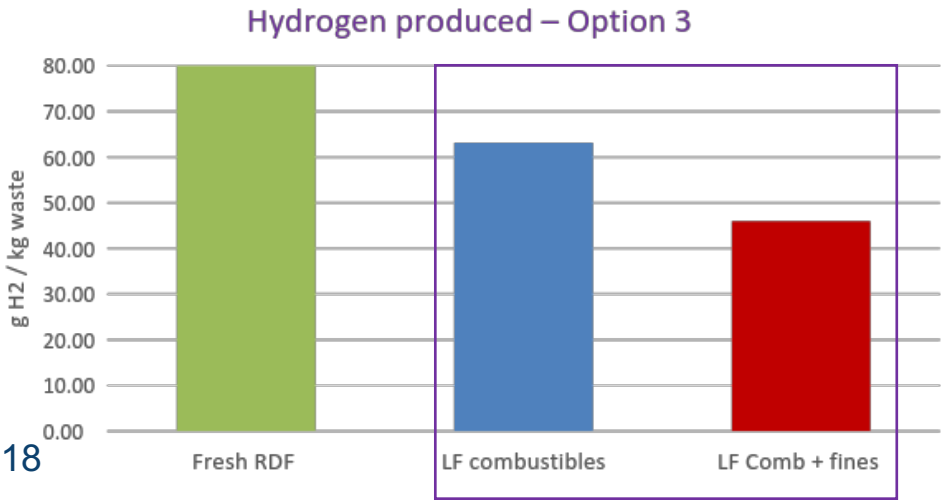
Results: Energy Production



OPTION 1 : INCINERATION – Steam turbine

OPTION 2 : GASIFICATION – Steam turbine

OPTION 3: GASIFICATION – hydrogen production



Summary

- Incineration capacity has grown significantly over the past few years
- Despite concerns of over-capacity, the RDF exports suggest otherwise
- ATT has had a few set-backs, but still has a clear place
- Notably in smaller-scale installations with potential for producing chemicals and liquid fuels, as opposed to direct energy

Thank you

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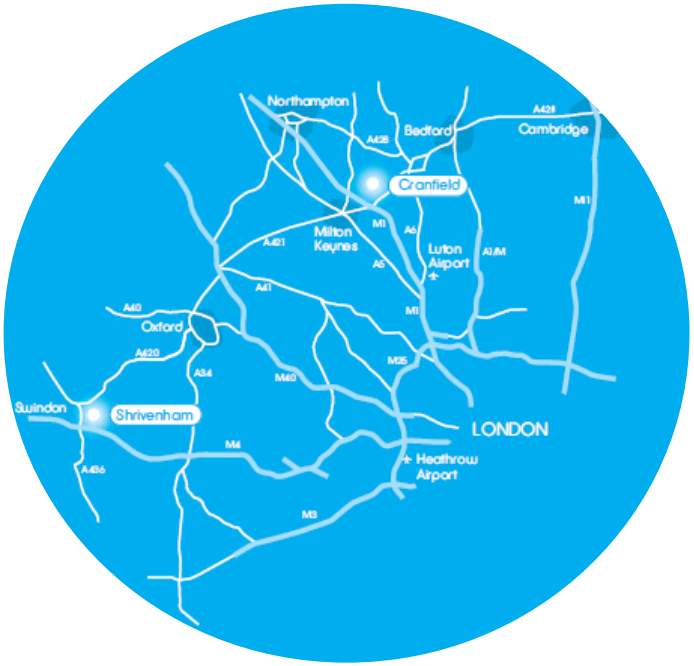

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Less than 60 minutes from London.