RDF Export: Analysis of the Legal, Economic and Environmental Rationales

The RDF Industry Group welcomes you

RDF Export: Analysis of the Legal, Economic and Environmental Rationales

RDF Industry Group

28th October 2015

Mike Brown, Managing Director
Adam Baddeley, Head of Energy

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Background to Eunomia

- **Established in 2001, now with 63 people**
  - **Offices in Bristol, London, Manchester and Brussels**
- **Experts in waste/recycling and energy**
  - **Specialise in policy, economics and environmental modelling**
- **Advisor to public sector**
  - **Local authorities across the UK**
  - **UK - DECC, Ofgem, WRAP, EA**
  - **EU - EC, EIB, JRC, EEA**
- **Advisor to the private sector**
  - **Developers, operators, lenders, private equity**
- **Secretariat to the RDF Export Industry Group**
  - **Developed the evidence–based report on behalf of the Group**

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Contents

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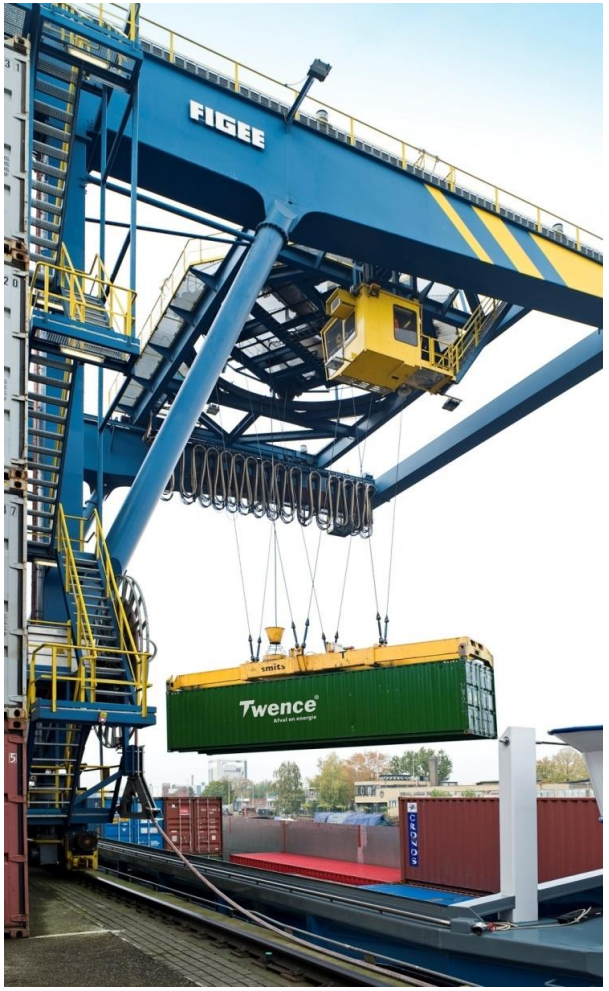
1(a) Group Background and Purpose

- **Formation prompted by Defra's response to its Call for Evidence on the RDF market**
  - **Published in December 2014**
- **Purpose of the Group to..**
  - **Explore and address issues surrounding RDF export from the UK**
  - **Develop evidenced-based information on the issues related to RDF export**
  - **Communicate its work to third parties**
- **Purpose of the Report to..**
  - **Based on the evidence, to make recommendations to improve the practice of RDF export**



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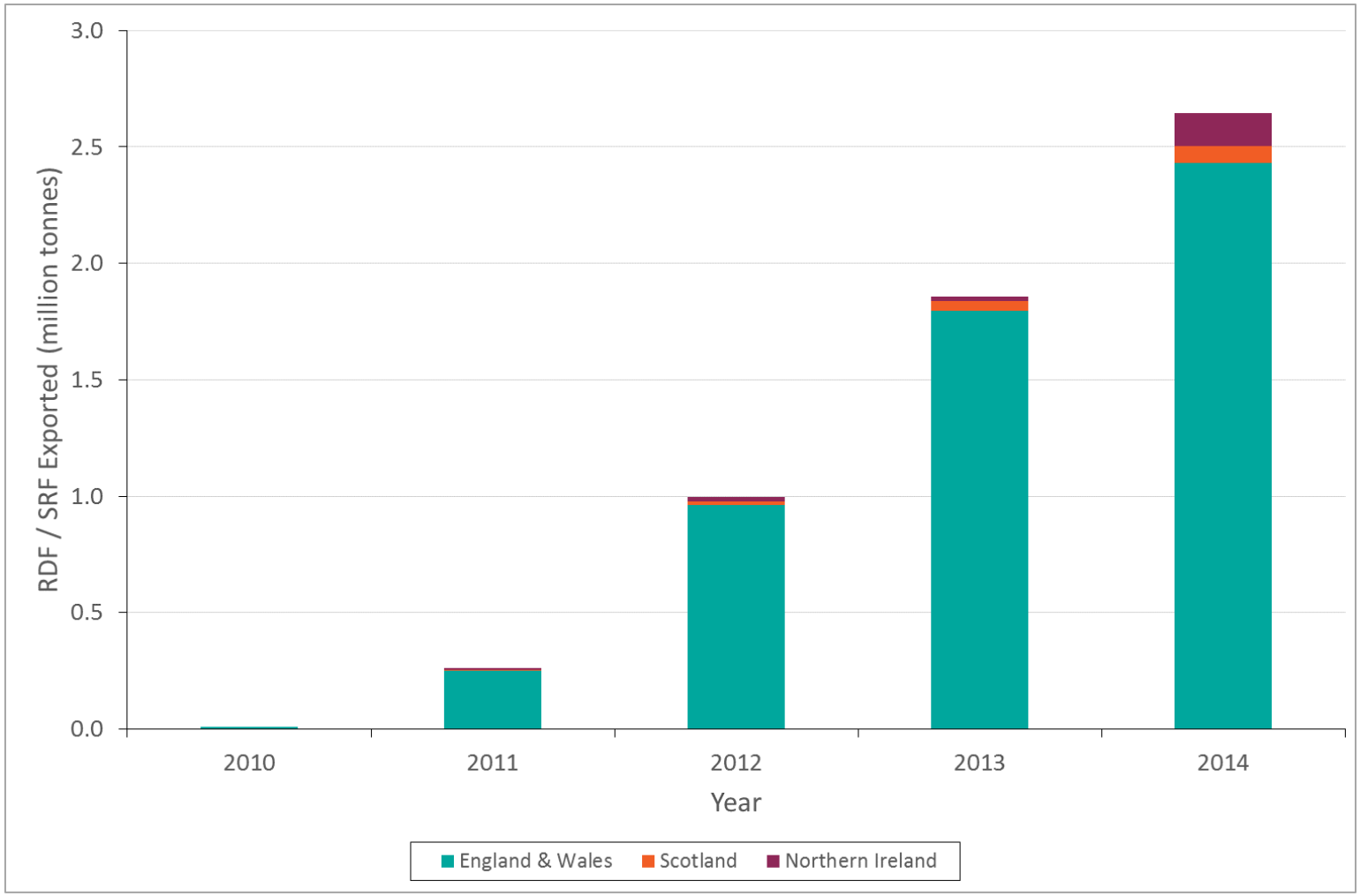
1(b) Members which provided Evidence for the Report

2. Growth in RDF Exports

2(a) RDF Exports from UK 2010-2014



Note: Calendar years

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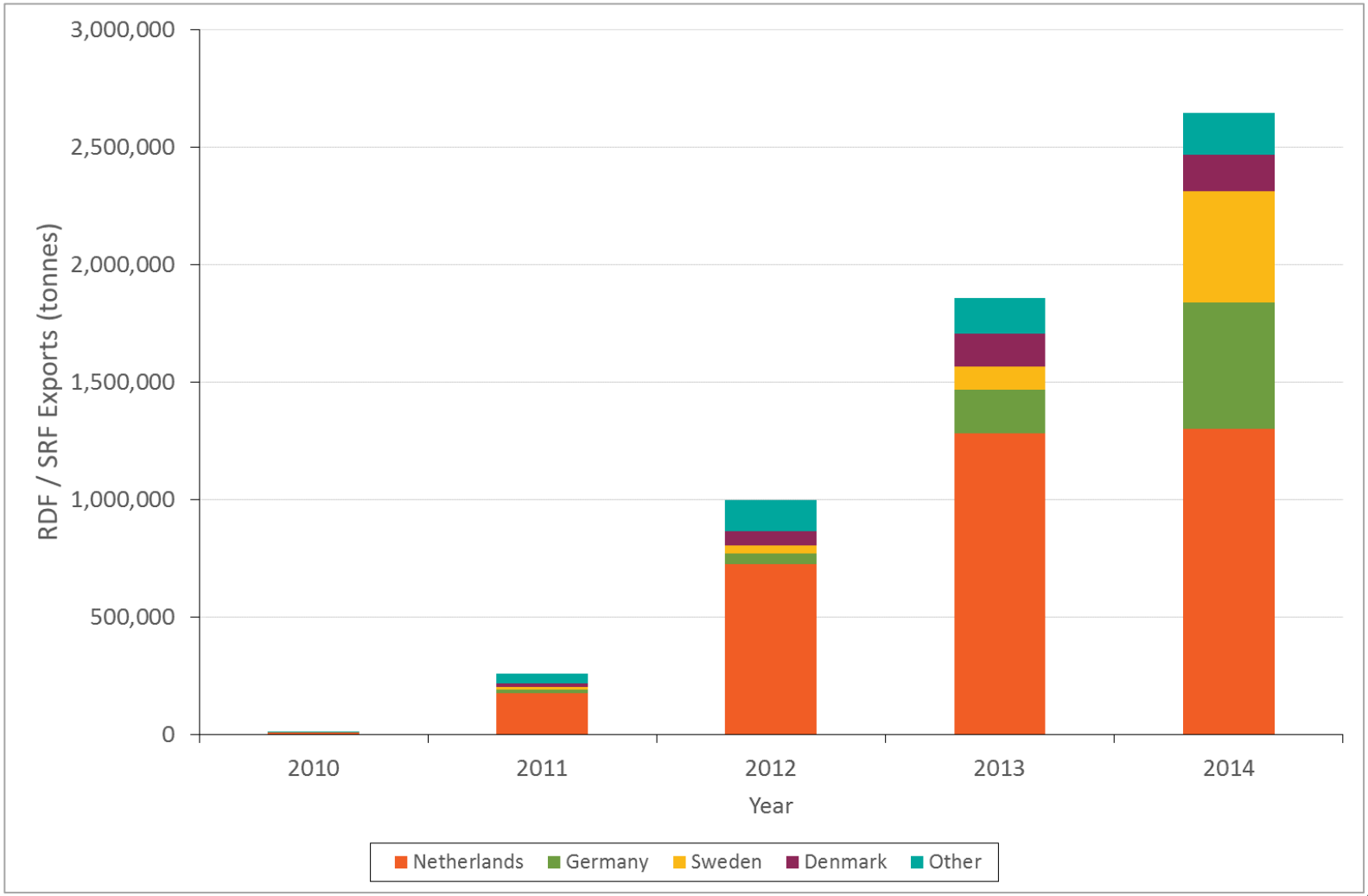
2(b) RDF Exports by Destination 2010 – 2014



Note: Calendar years

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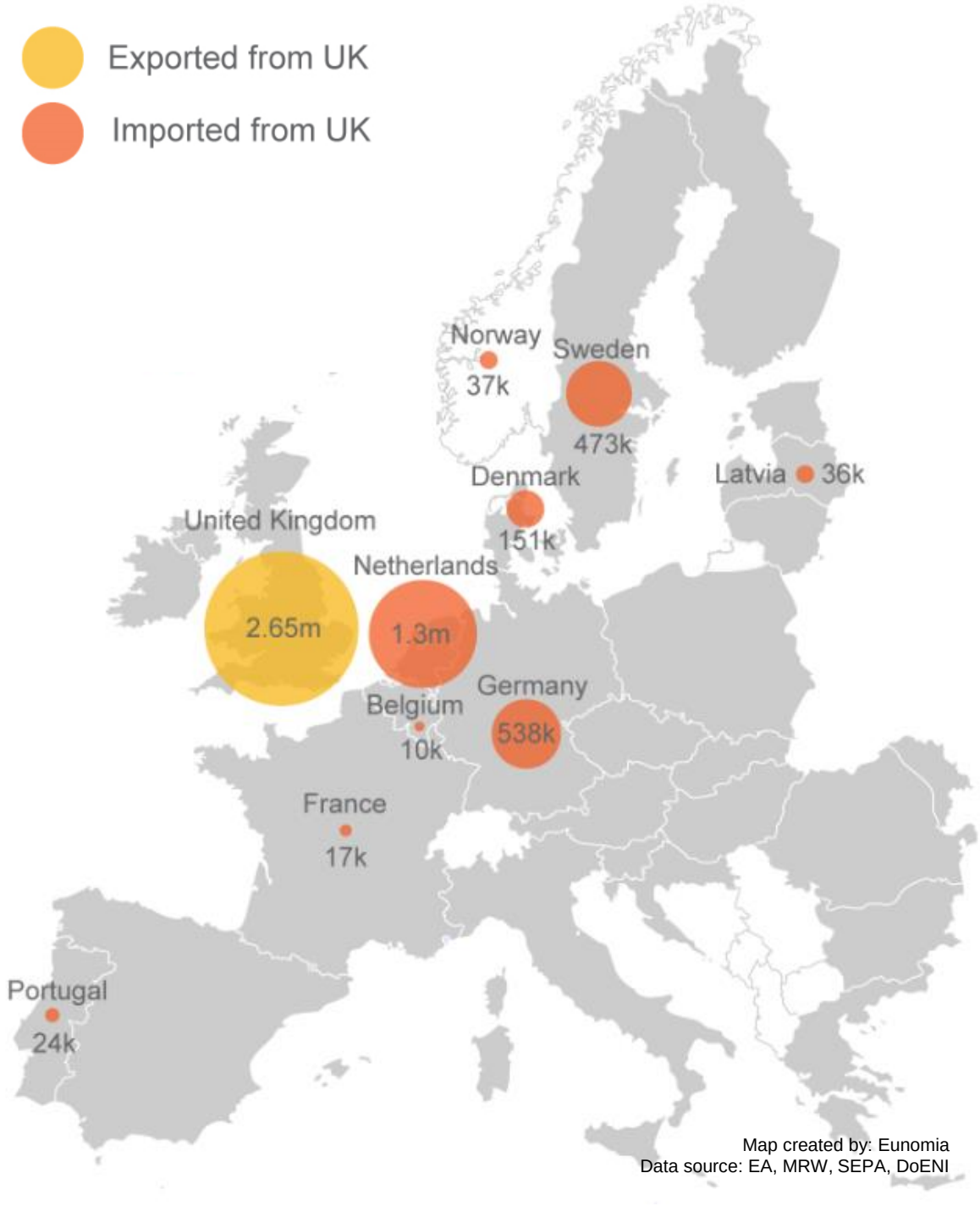
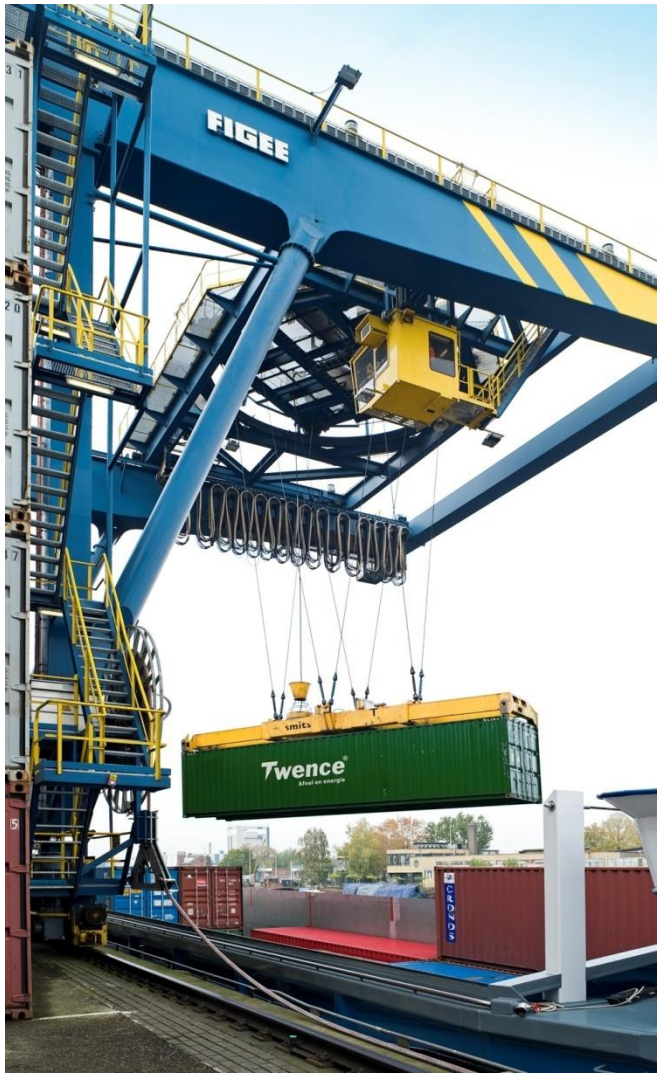


Map created by: Eunomia
Data source: EA, MRW, SEPA, DoENI



Source: Twence

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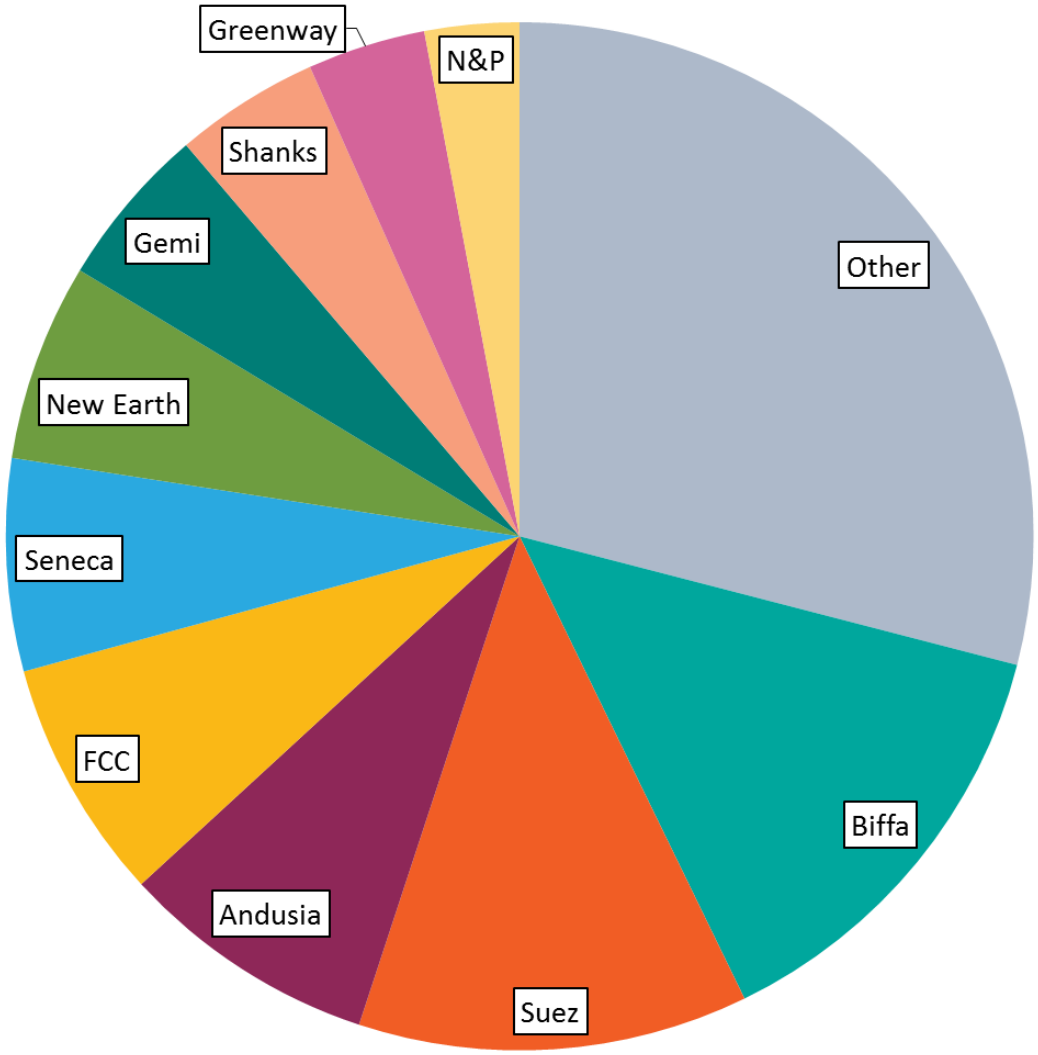
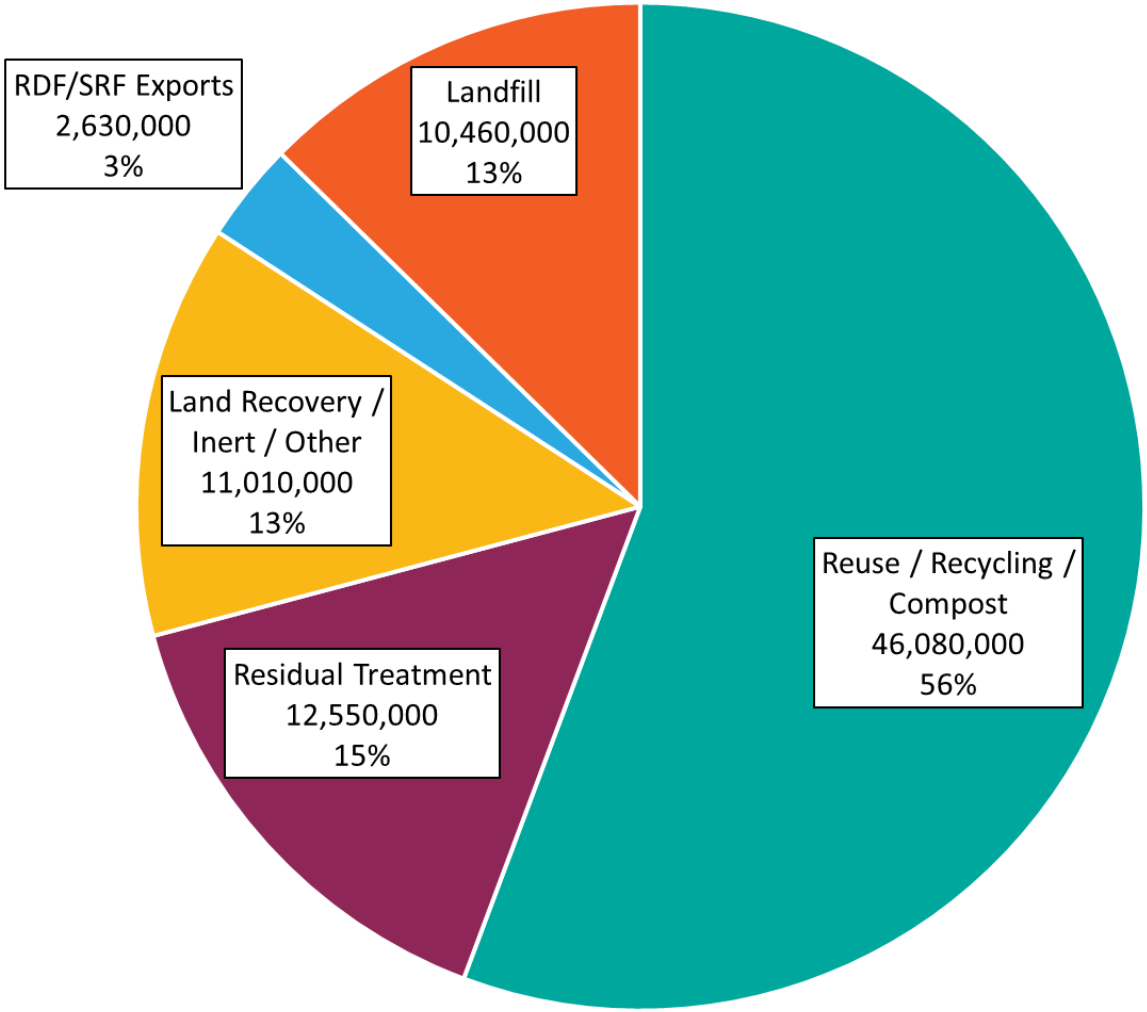
Top 10 Exporters 2014



Source: Eunomia. Data source: EA, MRW, SEPA, DoENI

Waste Treatment



Source: Eunomia

3. The Legal Context

3(a) Procedure of Prior Notification and Consent

- **Legal framework set out in Regulation (EC) No. 1013/2006 on Shipments of Waste**
  - **The 'Waste Shipment Regulations' ('WSR')**
- **Notification requires consent within 30 days by Competent Authorities of…**
  - **Dispatch, transmission (if applicable) and destination**
- **Multiple shipments may be covered by one single notification if each shipment..**
  - **Has essentially the same physical characteristics**
  - **Is shipped to the same consignee and same facility**
  - **The route of the shipment is the same**
- **In England, the EA has the discretion to...**
  - **Choose to grant a notification for 1 or 3 years**
  - **Choose to grant a notification for a longer or shorter period**

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3(b) Classification of Waste

- **Export of treated residual waste from UK permitted**
  - **EWC 19 12 10 (Combustible Waste – RDF)**
  - **EWC 19 12 12 (other wastes from MT)**
- **UK Plan for Shipment of Waste prohibits export of 'mixed municipal' waste**
  - **EWC code 20 03 01 (though Irish Republic allows it)**
- **Limited / no power for the competent authority to prescribe (pre-) treatment requirements / standard**

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3(c) Scope for Objection to Notifications

- **If the notifier / exporter complies with the procedure then waste hierarchy only basis for objection**
- **Requirement would have to apply to all waste processed at recovery facilities whether in UK or overseas**
- **EU competition provisions, free movement of goods provisions and requirement not to restrict exports all apply**
- **However, no provision in WSR to resolve disputes between competent authority and notifier / exporter**

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4. Combatting Illegal Practices

4(a) The link between RDF Export and Waste Crime

- **UK cases of abandoned, illegal stored and ignited wastes**
- **RDF export waste is.... exported**
- **Unlike most of the illegals in the UK, RDF export waste is the subject of a financial bond system**
- **However, RDF export can be a guise for illegal activity**

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4(b) EA RDF Definition Approach

- **Waste destined for RDF export?**

- **Abandoned waste?**

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4(c) Same site

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4(d) Recommended Measures to Tackle illegal Activity

- **Powers to Suspend Permits for Non-Compliance**
  - Economic as well as environmental crime
- **Powers to Issues Notices to Avoid Permit Breaches**
  - Requiring steps to be taken by operator
- **Modification of the Nature of Permits**
  - Sites storing waste should have tonnage, area and height limits

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4(d) Recommended Measures to Tackle illegal Activity (cont...)

- **Greater Focus on Non-Permitted Sites**
  - Sites outside of the permitting system
- **Powers to Physically Intervene**
  - To stop non-compliant waste build up
- **Improved Funding of the Regulator**
  - Hypothecate proceeds of crime or landfill tax receipts
- **Better Management Control of Ownership**
  - Operators financial capacity to cover their liabilities

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5. Environmental Context

5(a) Approach

- **Life-cycle Assessment (LCA) using WRATE tool**
  - **Not ‘state of the art’, but transparent to facilitate peer review**
  - **Relative not absolute performance is important**
- **Analysis of a range of environmental indicators**
  - **But focus on the ‘climate change’ (CO_2) indicator**
- **Focus on treatment of RDF**
  - **SRF outside scope of study**
- **Focus on EfW incineration and landfill only**
  - **Modelling of ACTs would be duplication for CO_2 indicator**
- **Modelling of same assumptions for incineration plant..**
  - **Efficiencies (in CHP and electricity only modes)**
  - **Recovery rates for metals from bottom ash**
  - **‘Carbon intensity' of ‘displaced’ energy generation**

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5(b) Scenarios Selected for Analysis

Recovery / Disposal Method	Energy Generation Mode	Location of Recovery/Disposal
Incineration	Electricity only	The Netherlands
Incineration	GQCHP	The Netherlands
Incineration	Electricity only	UK
Incineration	GQCHP	UK
Landfill	Electricity only	UK

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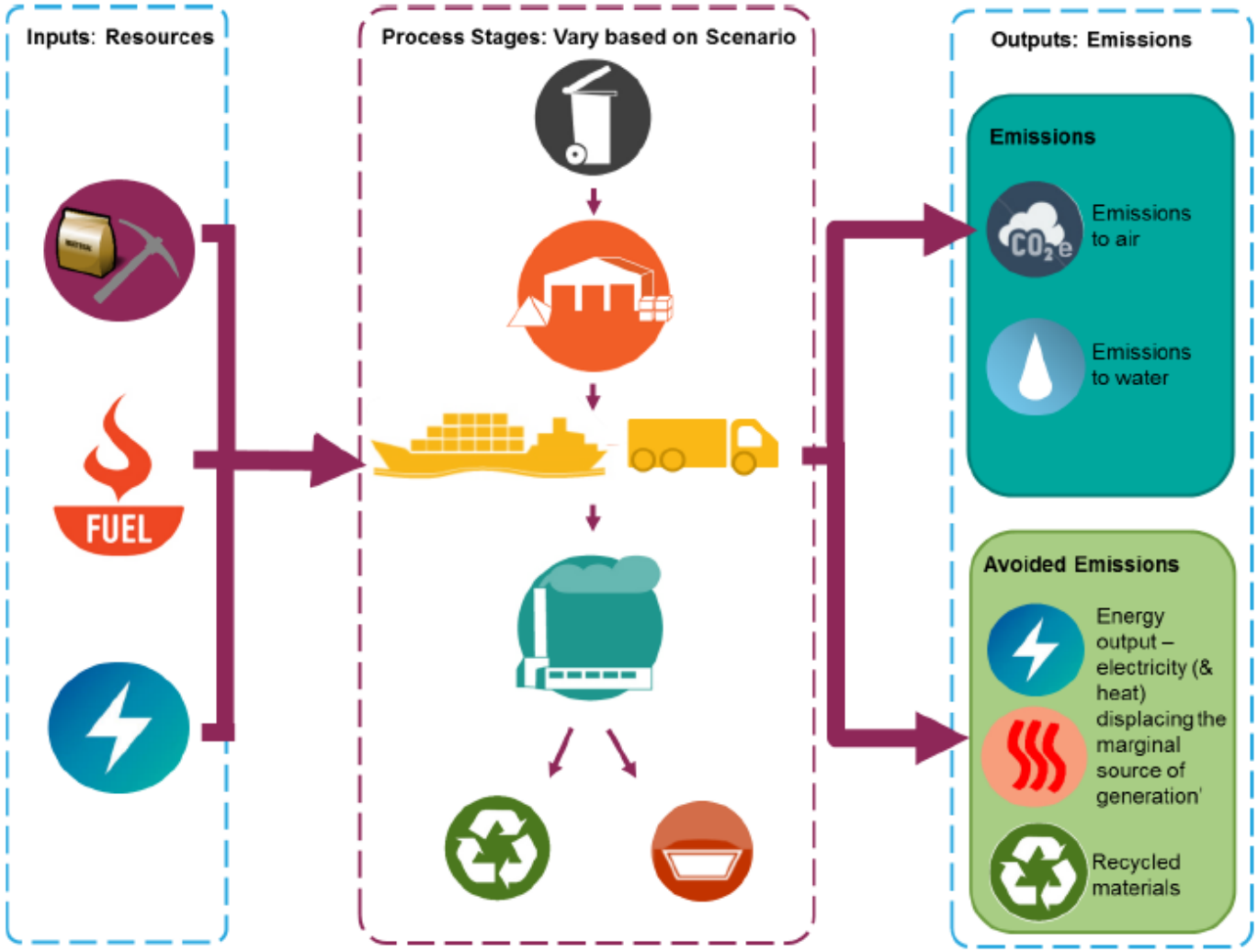
5(c) LCA System Boundaries



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5(d) Climate Change Indicator Results

Scenario	Net Climate Change Impact (kg CO_2e)
Scenario 1: Export electricity only	1,774,093
Scenario 2: Export CHP	-89,883
Scenario 3: UK electricity only	1,512,555
Scenario 4: UK CHP	-351,421
Scenario 5: Landfill	2,462,216

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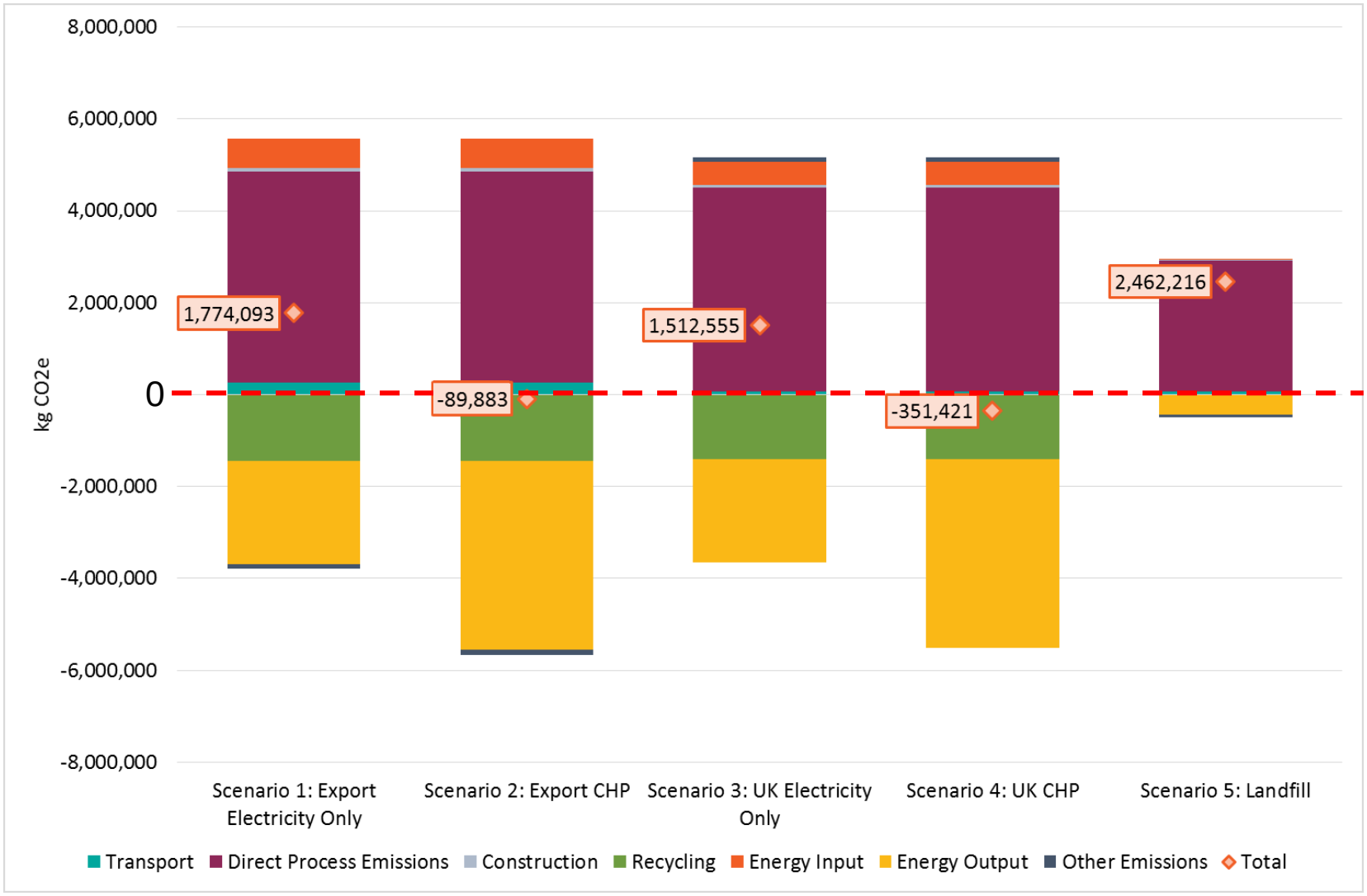
5(e) Breakdown of Climate Change Impacts



5(f) Sensitivity Analysis

- **Sensitivity of results to changes in RDF pre-treatment assumptions**
  - **Central scenario - 80% ferrous metal recovery**
  - **Sensitivity – addition of 45% non-ferrous metals and 25% rigid plastics recovery**

- **Sensitivity of results to changes in transport assumptions**
  - **Sensitivity 1 – increase shipping distance from 350 km to 2,050 km**
  - **Sensitivity 2 – ‘back-haul’ of RDF**

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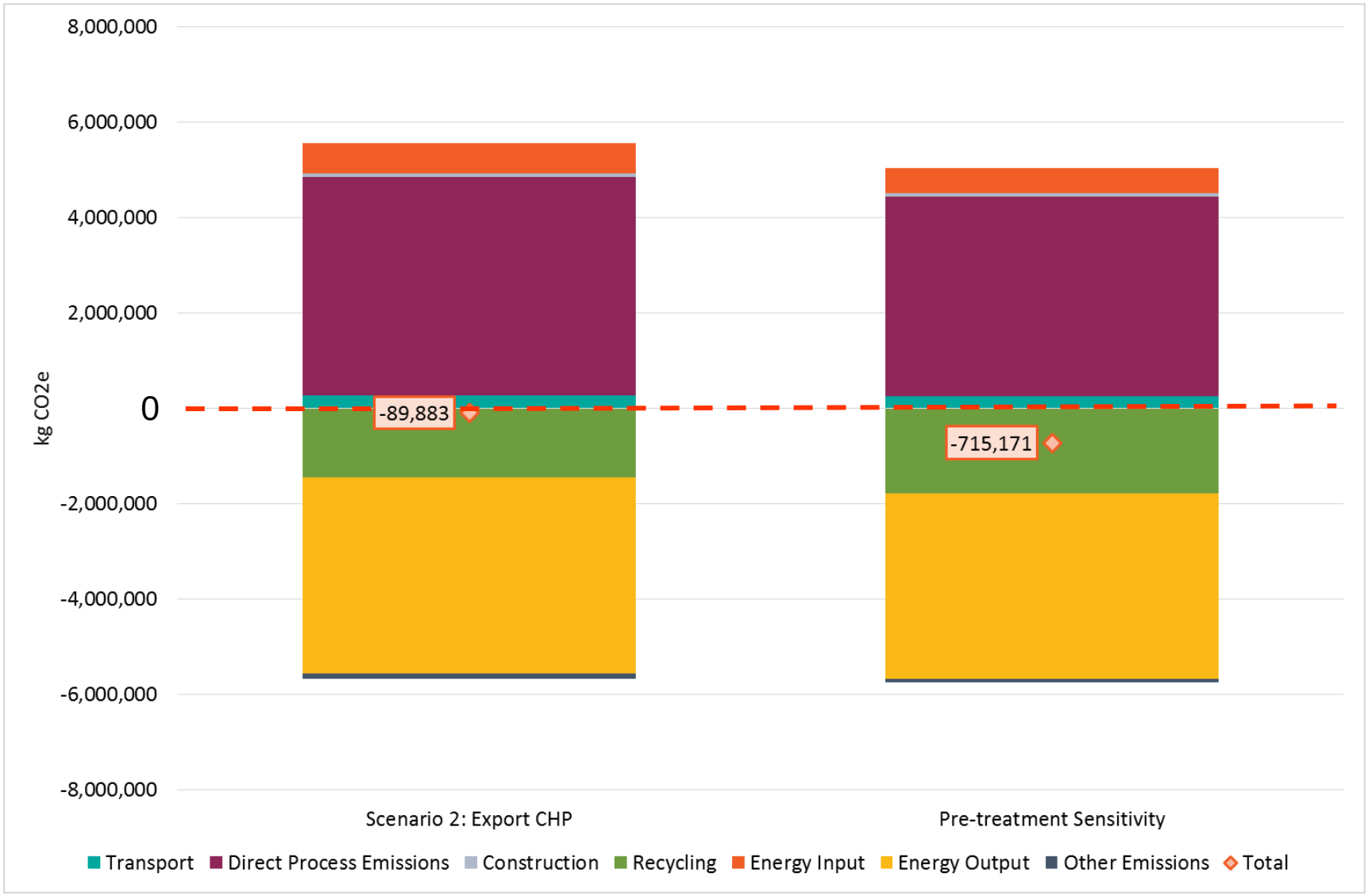
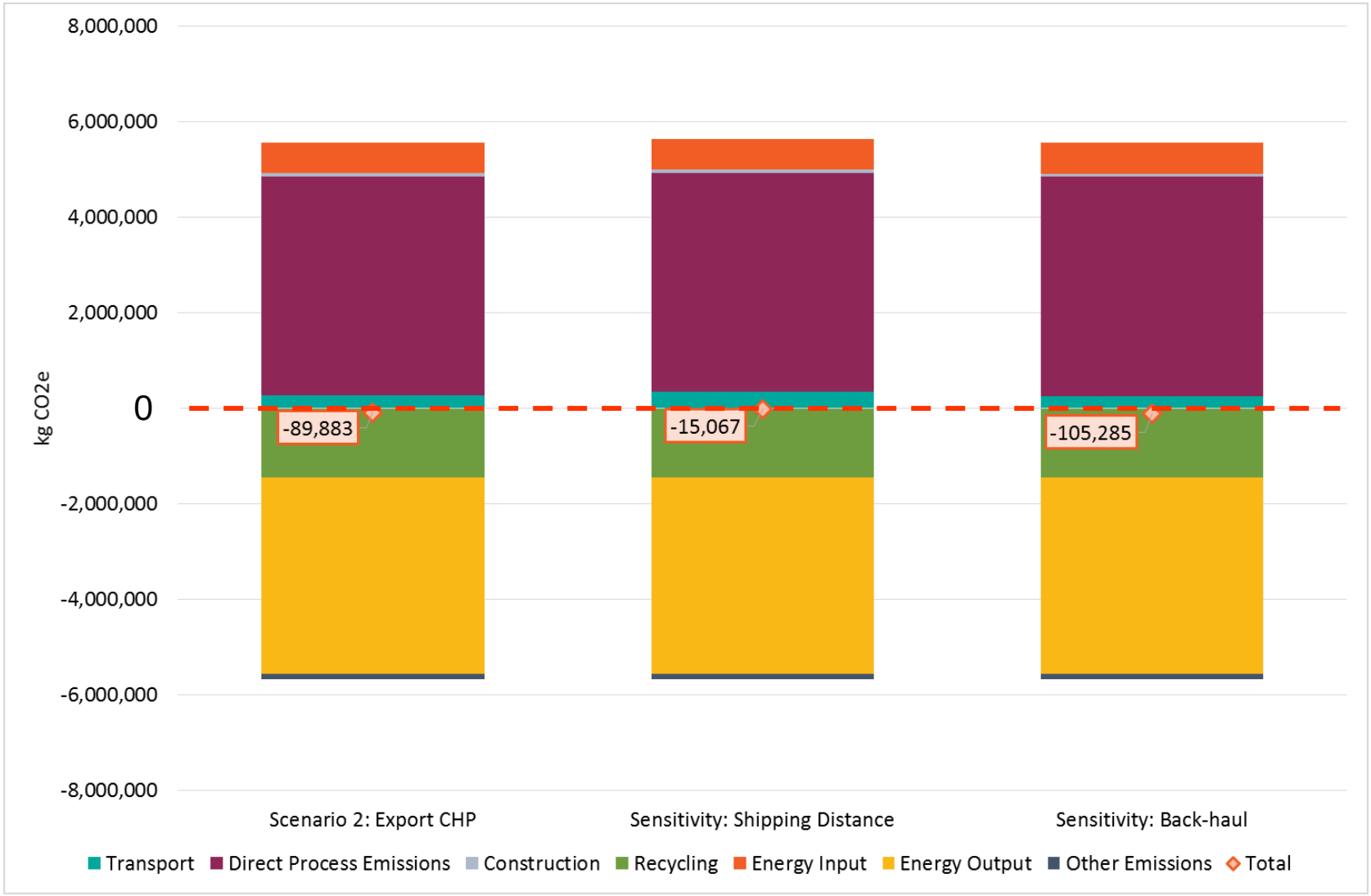
5(g) Pre-treatment Sensitivity Analysis



5(h) Transport Sensitivity Analysis



6. ‘Lost’ Energy from RDF Export

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6(a) Contribution to Total UK Elec. Generation

Key Variable	Assumption
Quantity of residual waste arising in UK suitable for EfW that was sent to landfill in 2014 (million tonnes)	14.7
RDF exported in 2014 (million tonnes)	2.6
Calorific value (CV) of residual waste	9
Average electrical efficiency of UK EfW facilities (%)	25[1]

Notes:

1. This represents an optimistic estimate of average efficiency, but is appropriate for modelling of this nature

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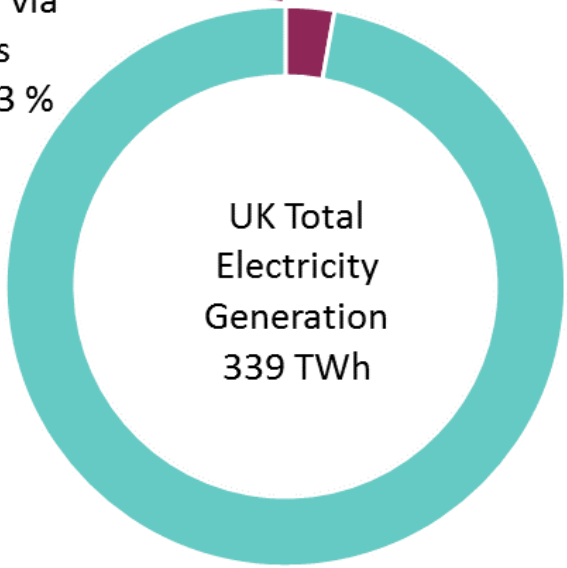
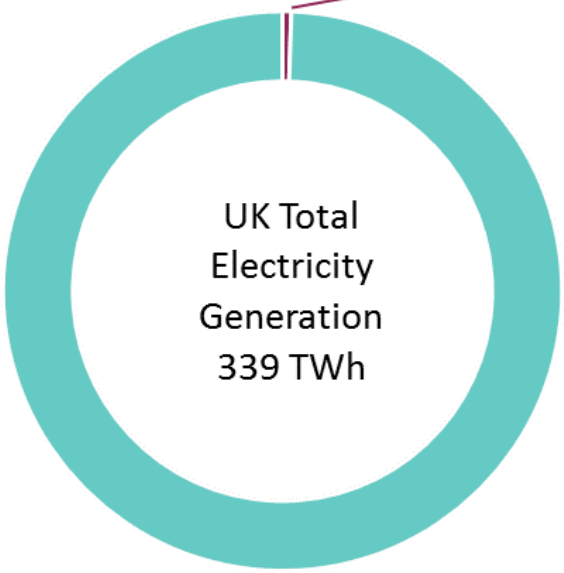
6(b) Contribution to Total UK Elec. Generation

If residual waste sent to landfill in 2014 was treated via domestic EfW this would represent 3 % of UK electricity generation





If the RDF that was exported in 2014 was treated via domestic EfW it would represent 0.5% of UK electricity generation

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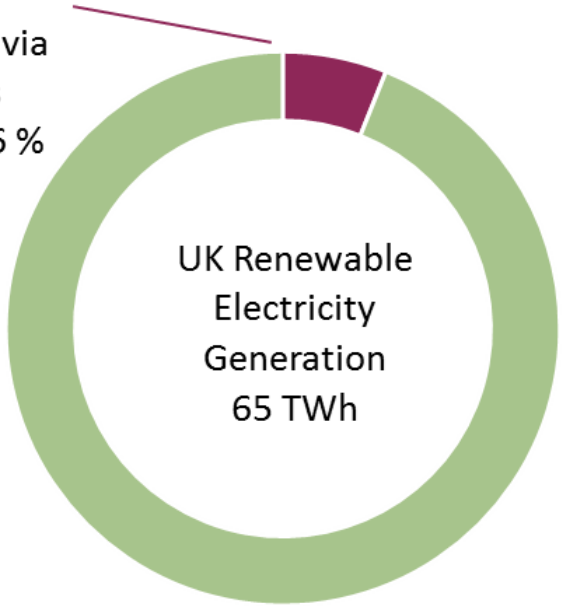
6(b) Contribution to Renewable Elec. Generation

Parameter	Value
CV of residual waste	9
Biomass fraction of residual waste (by weight)	58%
CV of biomass proportion of waste (GJ/tonne)	7
Proportion of biomass by energy content	46%

6(b) Contribution to Renewable Elec. Generation

If residual waste sent to landfill in 2014 was treated via domestic EfW this would represent 6 % of UK renewable electricity generation



If the RDF that was exported in 2014 was treated via domestic EfW it would represent 1% of UK renewable electricity generation

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7. Economic Context

(a) Costs and Benefits to Waste Producers

(b) Costs and Benefits for UK Waste Contractors

(c) Wider Costs and Benefits for UK Plc

(d) Scenario Analysis

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7(a) Current Benefits for Waste Producers?

	£ / tonne low	£/ tonne high
Landfill (including tax at 'Standard' Rate)	93	120
Domestic Incineration	65	100
Baled RDF (includes transport costs but not preparation costs)	67	90
RDF preparation costs	10	15

Source: http://www.letsrecycle.com/prices/efw-landfill-rdf-2/ (August 2015)

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7(a) Future Benefits for Waste Producers?

- **Landfill gate fees**
  - To remain relatively stable in short to medium term
- **Domestic EfW (incineration and ACTs) gate fees**
  - Nearly 5 million tpa of new capacity in next 36 months
  - EU recycling targets for 2020 (and CE target for 2030)
  - As demand for UK waste outstrips supply, competition from RDF export will hit EfW
- **RDF export gate fees**
  - Most operators can reduce gate fees as required to fill spare capacity
  - Impact on gate fees for UK RDF will depend on recycling, imports from other MS, potential closures, exchange rates
- **Evidence points to falling gate fees for UK waste producers**
  - Partly as a result of RDF export

7. Economic Context

(a) Costs and Benefits to Waste Producers
(b) Costs and Benefits for UK Waste Contractors
(c) Wider Costs and Benefits for UK Plc
(d) Scenario Analysis

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7(a) Costs and Benefits for UK Waste Contractors

- **Current loss of income to some operators**
  - **£10-35 / tonne for landfill operators**
  - **£65-100 for EfW operators***
- **But, other contractors generate revenues from the RDF production and supply chain..**
  - **Collection, bulk handling and transfer**
  - **Pre-treatment and baling**
  - **TFS administration**
  - **Bulk transfer to port**
  - **Portside handling**
- **As it is mainly landfill being displaced then current impact is limited**
  - **Albeit it can be argued that RDF export constrains development of new EfW in UK**

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7. Economic Context

(a) Costs and Benefits to Waste Producers
(b) Costs and Benefits for UK Waste Contractors
(c) Wider Costs and Benefits for UK Plc
(d) Scenario Analysis

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7(c) Wider Cost and Benefits for UK Plc

- **Balance of payments**
  - RDF export is effectively an ‘import’ of services
- **Employment**
  - RDF export reduces jobs in landfill and EfW*
  - But many other jobs created along production and supply chain
    - Greater ‘employment intensity’ in these areas
- **Lower tax revenues**
  - 2.6 Mt of RDF = £212 million in Landfill Tax (0.5% of all env. taxation receipts)
  - Partially offset by lower levels of funding required by local authorities

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7. Economic Context

(a) Costs and Benefits to Waste Producers
(b) Costs and Benefits for UK Waste Contractors
(c) Wider Costs and Benefits for UK Plc
(d) Scenario Analysis

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7(d) Qualitative Scenario Analysis

Impact		Export of RDF	Development of Domestic Incineration Plant	Landfill
Cost to producer (gate fee)		✓ ✓	✓	✗
Direct employment in UK	Construction	✗	✓ ✓	✗
	Preparation, handling, shipping	✓ ✓	✗	✗
	Operation	✗	✓	✓
Taxation receipts		✗	✗	✓

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8. Key Messages

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8. Key Messages

- **The RDF export market has grown exponentially and continues to grow**
- **To move waste up hierarchy, Govt should focus on materials capture at source**
- **There is no link between *legitimate* export and waste abandonment / ignition**
- **Environmental impacts of RDF export are largely dependent upon heat off-take**
- **Current levels of RDF export represent around 1% of UK renewable electricity generation**
- **The net economic benefits of RDF export may not be dissimilar to those from EfW incineration**

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