BILLET D'ÉTAT

II
2014

WEDNESDAY, 29th JANUARY 2014

Volume 2

PUBLIC SERVICES DEPARTMENT

IMPLEMENTATION OF THE SOLID WASTE STRATEGY - APPENDICES

Printed by Image Group, Caslon Court, Pitronnerie Road, St Peter Port, Guernsey GY1 3NE

Appendix 1

Glossary of waste terms

Term	Definition
Calorific value (CV)	The amount of heat produced by the complete combustion of a material or fuel, measured in MJ/kg.
Disposal	Disposal of waste is where the intention is to permanently store or treat the solid waste for the duration of its biological and chemical activity, such that it is rendered harmless.
Dry recycling	Dry recycling includes materials sent to processors for recycling and reuse; these materials include paper, cans, plastic, cardboard, green waste, and textiles.
Energy from Waste (EfW)	In an EfW facility, household and commercial waste is subjected to heat treatment and energy is recovered.
In-Vessel Composting (IVC)	Method in which organic material is composted aerobically in a controlled environment in a contained area.
Residual waste	Residual waste refers to the material that remains after the segregation of reusable, recyclable, or compostable materials from the waste stream, either at source or through processing at a Materials Recovery Facility (MRF). It can also be applied in a more domestic sense, referring to household rubbish not able to be recycled, re-used or composted.
Recycling rates	Recycling rates are calculated to express the percentage of waste material that is reused, recycled or recovered prior to treatment and/or disposal.
Waste Acceptance Criteria (WAC)	These are the criteria which can be set by receiving facilities to specify conditions such as how the material must be delivered to the facility, what it can or cannot contain, in the case of energy from waste facilities what calorific value the material should have. Failure to comply would result in additional costs incurred or the load being rejected.
Waste Disposal Authority (WDA)	The Department of the States designated as such. The Public Services Department is currently designated as the WDA. The WDA has various duties in relation to operation and management of the public waste management system in Guernsey.
Waste Hierarchy	The Waste Hierarchy is an internationally accepted principle. The aim is to extract maximum practical benefit from the products we buy and use. Waste prevention is top of the list, and disposal the least preferred option.

Waste minimisation	Measures and/or techniques that reduce the amount of wastes generated during any domestic, commercial and industrial process. Waste minimisation encompasses measures for the prevention, reduction and reuse of waste, the uppermost activities of the Waste Hierarchy.
Waste prevention	Measures taken before a substance, material or product has become waste that reduces: a) The quantity of waste, including through the reuse of products or the extension of the lifespan of products, b) The adverse impacts of the generated waste on the environment and human health, c) The content of harmful substances in materials and products (qualitative waste prevention).

The following abbreviations have also been used throughout the report:

DEFRA	Department for Environment, Food and Rural Affairs
IVC	In-Vessel Composter
MRF	Materials Recovery Facility
RDF	Refuse Derived Fuel

Appendix 2

Chief Minister
Policy Council
Sir Charles Frossard House
La Charroterie
St Peter Port

8 October 2013

Dear Sir

Implementation of the Solid Waste Strategy

I should be grateful if this letter can be appended to the Public Services Department's States Report in order that States members can consider the proposals in the report whilst fully understanding the legal position relating to the drafting of a Waste Disposal Plan.

As explained in section 2 of the Public Services Department's report the Environment Department has a legal duty to present to the States a Waste Disposal Plan, which plan will, if the States approves the legislative amendments to the Environmental Pollution law proposed in the report, also address waste recovery and recycling.

The Waste Disposal Plan is the statutory document which:

- Identifies the descriptions (types/categories) and quantities of waste
- The methods to be deployed for its disposal
- The estimated financial costs
- Arrangements for the recovery of costs
- Sites to be designated as "public waste disposal sites"

In preparing the Waste Disposal Plan the Environment Department receives recommendations from the Waste Disposal Authority. Once the Waste Disposal Plan has been approved by the States it is that plan that the Regulator and the Waste Disposal Authority must operate to. As such it is the Waste Disposal Plan rather than the Public Services Department's States Report that sets the future direction of waste management. The Department recognises that the Public Services Department's report constitutes the recommendations of the WDA and it is grateful to the Public Service Department for the work and effort it has put into arriving at this position.

There is a logic in this process in that it is the WDA that has the hands on experience and knowledge of the changing nature of Guernsey's waste streams. The quantities and categories of waste are monitored by the WDA and the WDA is best placed to form views on the future life expectancy of waste management plant, facilities and sites and should be monitoring international trends etc. The WDA is, therefore, best placed to make recommendations in this respect. However, the WDA is a waste disposal operator operating in competition with other

providers and, as for all waste operators, is subject to regulation by the Director. The Director is bound to regulate in accordance with the principles of the law but more specifically in accordance with the policies laid down in the Waste Disposal Plan. As such the Law provides for the Waste Disposal Plan to be independent of the WDA. This is intended to prevent the Game keeper/Poacher conflict from occurring. In essence, therefore, the WDA makes recommendations about but cannot prescribe the content of the Waste Disposal Plan.

In preparing the Waste Disposal Plan the Environment Department will of course take due regard of the recommendations of the WDA and would need good cause if it were to prepare a Waste Disposal Plan that was at odds with those recommendations. But it is natural that the Environment Department will, when considering the recommendations of the WDA, have regard to all environmental policy issues and requirements and this may include issues or policy concerns not fully addressed by the Public Services Department including but not limited to air and water pollution, waste storage and processing impacts etc. The Department must satisfy itself as to the appropriateness of the recommendations of the WDA before committing itself to including them in the Waste Disposal Plan.

The Department appreciates that this is an additional stage in the process that has the potential to delay progress. However, the Department considers that risk can be readily mitigated. The Public Services Department is recommending a Design Build and Operate contract and such contracts have a natural break at the end of the design stage. This is necessary as such contracts inevitably require various planning and or licensing permissions which cannot be granted until the design stage is complete. The procurement process to awarding a DBO contract inevitably necessitates a tender process which involves several selection stages leading to a preferred partner to take forward the design stages. As such it is most unlikely that the Public Services Department will be in a position to commence the design stage of the infrastructure before late spring 2014 and certainly will not have entered the build stage before the Summer.

The Environment Department is confident that it can return to the States with the draft Waste Disposal Plan in accordance with that timetable. As such should detailed consideration of the Public Services Department's recommendations lead to alternative proposals within the Waste Disposal Plan, these will be known to the States in good time. The Department is, therefore, confident that it can exercise its statutory duty and mandated policy functions in considering the WDA's recommendations, evaluating any other relevant information or policy issues and returning to the States with a draft Waste Disposal Plan prior to the letting of any construction element of the contracts and in all likelihood prior to letting the design element of the contracts.

Yours faithfully

A Spruce
Deputy Minister

Appendix 3

RICARDO-AEA

States of Guernsey: Implementation of Guernsey's Waste Strategy – Export of Waste

Stage 1: Market Review and Legislative Review Regarding the Export of Waste from Guernsey






Report for States of Guernsey

Ricardo-AEA/R/ED58036
Issue Number 2.2 Final
Date 07/08/2013

COWI

Customer:

States of Guernsey

Customer reference:

Agreement dated 23 November 2012

Confidentiality, copyright & reproduction:

Ricardo-AEA reference:

Ref: ED58036- Issue Number 2.2 Final

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Date:

07 August 2013

Signed:

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1 Introduction

1.1 Scope

Ricardo-AEA has been commissioned by the Public Services Department of the States of Guernsey Government ("the Department") to support the implementation of the new waste strategy and specifically the analysis of options and procurement of services in relation to the export of residual waste. This report presents a market review and feasibility study for the export of waste from Guernsey.

1.2 Background

1.2.1 Context

The Bailiwick of Guernsey is a Crown Dependency of approximately 63,000 people that is part of the British Isles but not part of the UK or a European Union Member State ("MS"). The Department is the Waste Disposal Authority under the Environmental Pollution (Guernsey) Law, 2004[1] and is responsible for implementing the Waste Disposal Plan and providing waste and recycling services and facilities.

Residual waste is currently disposed at Guernsey's only non-hazardous landfill facility at Mont Cuet, which is owned and operated by the States of Guernsey. Mont Cuet is Guernsey's only remaining suitable site for landfill disposal of any significance that sits wholly outside the water catchment area that covers around 95% of the island. The Guernsey Government recognises that continued reliance on landfill for the management of residual waste is unsustainable due to the potential environmental impacts arising and the limited remaining capacity; under current practices Mont Cuet is predicted to be full by July 2022.

1.2.2 The Revised Waste Strategy

In February 2012 the States of Deliberation passed a revised waste strategy to address the challenge of managing waste more sustainably within a relatively small island community, focussing on ensuring that as little waste as possible remains for treatment or disposal. The objectives of the strategy include endorsing and implementing the principles of the waste hierarchy and developing an environmentally, economically and socially sustainable waste strategy that is practicable and adaptable to meet Guernsey's current and future needs. The strategy is based on waste minimisation, high recycling rates and the export of genuinely residual waste. The revised waste strategy was published as the Public Services Department policy report in Billet D'État No. IV of 2012[2]; this also confirmed the rationale behind the development of the strategy by the Department.

Waste arising data from 2010 indicate annual residual waste of 42,203 tonnes comprising 14,329 tonnes household waste and 27,874 tonnes commercial and industrial (C&I) waste, including 7,237 tonnes of waste wood that is currently diverted

[1] http://www.guernseylegalresources.gg/article/94566/Environmental-Pollution-Guernsey-Law-2004
[2] http://www.gov.gg/CHttpHandler.ashx?id=5387&p=0

from landfill but for which there is uncertainty over its future management. As recycling rates improve through implementation of other aspects of the strategy, the quantity of residual waste will reduce. Based on current projections it is anticipated that approximately 28,000 tonnes per annum residual waste will require management; this is considered inefficient and uneconomic to treat conventionally on the island. The strategy recommended the export of pre-treated residual waste to Jersey or another jurisdiction in Europe, including the UK, for incineration with energy recovery.

1.2.3 Pre-treatment of Waste for Export

It is becoming more common in the UK for local authorities to export pre-treated residual waste to energy from waste (EfW) facilities in Europe. The level of pre-treatment varies from minimal treatment, such as sorting in a materials recovery facility (MRF), to producing a refuse derived fuel (RDF) or solid recovered fuel (SRF) meeting a quality specification.

Guernsey requires new facilities to achieve the objectives of the strategy, including a waste transfer station and MRF to treat commercial waste at Longue Hougue. The level of pre-treatment required was initially anticipated to be transfer and mechanical treatment, involving screening to remove inappropriate materials and crushing or shredding of bulky items, prior to baling in readiness for transport by sea. There is however flexibility in the configuration of pre-treatment processes to allow pre-treatment to be designed to meet waste acceptance criteria (WAC) in relation to the receiving facility once confirmed.

1.2.4 Export to Jersey

The States of Jersey authorities have confirmed in principle that they could offer capacity in the new EfW facility at La Collette to deal with Guernsey's residual waste. The facility is currently operating well below its 105,000 tonnes per year maximum nominal capacity at a throughput of approximately 70,000 tonnes per year. The Chief Officer of the States of Jersey Transport and Technical Services (TTS) Department set out his position at the time that the new waste strategy was developed with respect to the possible acceptance of waste, proposing a 3-year agreement (with an option to extend) to take up to 30,000 tonnes of waste meeting WAC. TTS has also indicated that ash residues in proportion to Guernsey's waste input may need to be exported.

The Jersey EfW facility is designed to accept untreated municipal solid waste (MSW) and C&I waste. As such, there is no requirement for pre-treatment, indeed input of RDF or SRF with a high calorific value (CV) may give rise to process issues and would not improve capacity as EfW facilities are sized on the basis of the energy content (CV) of the feedstock waste. Any waste shipped to Jersey would be subject to strict WAC that are commonly applied to ensure, for example, that no potentially dangerous items such as compressed gas cylinders are able to enter the plant or that feedstock waste will not give the potential to exceed emissions limits.

1.2.5 Regulation of Waste Exports

In principle it is also possible for Guernsey to obtain the necessary consents to export waste that had undergone minimal pre-treatment to facilities located other than in Jersey; whilst Jersey would be a convenient option owing to its proximity, this does mean that Guernsey would be wholly reliant on the on-going co-operation of the Jersey authorities.

The UK's ratification of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal ("the Basel Convention") was

extended to Guernsey on 27 November 2002. This required the States to adopt legislation that implements sufficient controls over waste imports and exports, as detailed in Article 4 of the Basel Convention. The States subsequently approved the Transfrontier Shipment of Waste Ordinance, 2002 ("the 2002 Ordinance") which incorporated the provisions for controlling waste in line with European standards, including prohibiting the export of waste for disposal with limited exceptions.

Council Regulation 259/93[3] transposed the provisions of the Basel Convention into European Community law. The 2002 Ordinance implements Regulation 259/93[4] (as amended) in Guernsey with certain modifications. Regulation 259/93 was replaced by the Waste Shipments Regulation[5] ("WSR") in 2006. Clause 18 (1) and (2) of the 2002 Ordinance enables amendment of the Schedule (Regulation 259/93) however it does not appear that the Schedule has been replaced by Regulation 1013/2006.

As a Crown Dependency, being a Party to the Basel Convention and outside the EU, Guernsey may use the duly reasoned request (DRR) procedure in the Regulation in respect of the shipment of waste for disposal. This exception allows shipments of waste to a MS where the competent authority has acceded to a DRR and where the shipment is subject to notification controls. The competent authority must also accept that the country of dispatch does not have and cannot reasonably acquire the technical capacity and facilities to dispose of waste in an environmentally sound manner. Given Guernsey's status there is considerable uncertainty as to whether a competent authority would accept a DRR in relation to residual MSW, furthermore, in support of the proximity principle it might not accept one where there are appropriate facilities closer to the country of dispatch, i.e. in Jersey.

Guernsey (2004) and Jersey (2009) both have bilateral agreements with the UK Environment Agency that permit the disposal of hazardous waste. The 2002 Ordinance does not take account of Jersey's more recent ability to conduct bilateral agreements under the Basel Convention that could potentially facilitate exports from Guernsey for disposal.

In the case of exports for recovery, provided the waste is being sent to a facility that uses it principally as a fuel to generate energy, as defined in the revised Waste Framework Directive (2008/98/EC) ("WFD"), the shipment is classed as export for recovery (R1) not disposal and an export can take place provided the destination country consents to the import.

The export of waste to a MS for recovery is therefore considered in the market review. A comprehensive legislative review is provided in the feasibility study (refer to Section 4.1).

1.2.6 Commercial Considerations for Exports to Jersey

Recent consideration of waste exports to Jersey has concentrated on the option of Guernsey being treated as a customer of the facility. Another option is for Guernsey to purchase a share of the facility and establish a joint managing body. This gives the

[3] Council Regulation (EEC) No 259/93 of 1 February 1993 on the supervision and control of shipments of waste within, into and out of the European Community
[4] Council Regulation (EEC) No 259/93 of 1 February 1993 on the supervision and control of shipments of waste within, into and out of the European Community
[5] Regulation (EC) No 1013/2006 of the European Parliament and of the Council of 14 June 2006 on Shipments of Waste http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:190:0001:0001:EN:PDF

potential advantage of security on both sides and a more advantageous commercial deal for Guernsey, with the disadvantage of restricting flexibility. This would require careful negotiation of detailed contractual terms and conditions to ensure that neither party was exposed to unacceptable risk or benefitted disproportionately from the arrangement.

1.3 Approach

Ricardo-AEA's approach to support the Department is based on the following structure. The tasks addressed in this report are highlighted.

- Project Initiation:
  - **Industry Day**
- **Stage 1: Feasibility Study for the Export of Waste from Guernsey**
  - **Task 1a: Market Review**
  - **Task 1b: Screening of Options**
  - **Task 1c: Initial Transport Cost Impact Assessment**
  - **Task 2a: Feasibility Study: Legislative Review**
  - Task 2b: Feasibility Study: Review of Short-listed Solutions
  - Task 3: Business Case Preparation

- Stage 2: Development of an Export Contract and Bilateral Agreement
  - Task 1: Drafting the Export Contract and Bilateral Agreement
  - Task 2: Updating the OBC and Presenting Recommendations
- Stage 3: Procurement of Transportation Services
  - Task 1: Transportation Service Specification
  - Task 2: Transportation Service Tendering
  - Task 3: Finalising the Business Case and Appointing Contractors

2 Market Review

2.1 Introduction

This market review forms the first element of the feasibility study to review potential receiving waste treatment facilities and to identify the preferred option(s) to be explored in more detail. The review is divided into the following elements:

- **Review Jersey export option:** to confirm viability including confirming that the required capacity is available, including reviewing any difference between the anticipated calorific value (CV) of Guernsey's residual waste and the CV on which the capacity of Jersey's EfW facility was specified, and confirming the R1 status of the facility.
- **Review export (shipping) routes from Guernsey:** to support the definition of the geographical boundary within which UK and European waste treatment facilities should be located.
- **Define the geographical boundary:** for UK and European waste treatment facilities based on shipping routes and overland transport restrictions considering available transport modes and assumed maximum travel distances and times.
- **Review pre-treatment requirements:** prior to considering appropriate waste treatment technologies it is necessary to define the level of pre-treatment and resulting waste characteristics.
- **Review alternative waste treatment technologies:** to determine appropriate waste treatment technologies, including considering technical and commercial risk.
- **Identify facilities for further consideration:** identify all potentially viable UK and European waste treatment facilities considering the geographical and technology restrictions defined in the preceding tasks.

The waste strategy specifically recommends incineration with energy recovery in relation to the preferred Option B:

> *"This prepares residual waste for export to an off-island energy from waste plant (e.g. Jersey)."*

Based on this statement, Ricardo-AEA proposed to the Department that the scope of the market review be restricted to conventional EfW with energy recovery (with and without combined heat and power CHP). This would exclude all other technologies including but not limited to advanced conversion technologies (ACT), including gasification, pyrolysis and variant technologies; mechanical biological treatment (MBT), including bio-drying; mechanical heat treatment (MHT), including autoclaving; and cement kilns.

This restriction is also considered appropriate to minimise commercial risk to Guernsey, as explored in further detail in Section 2.4. Notwithstanding this, the Department asked Ricardo-AEA to consider all technologies at the outset of the market review and provide a full justification before excluding any technology.

2.2 Review Jersey Export Option

2.2.1 Anticipated Export Timescales

The new EfW facility located at La Collette is fully commissioned and optimised and began full scale operation in early 2011. The La Collette facility has a nominal capacity of 105,000 tonnes per annum (tpa) but is currently operating below capacity with an annual throughput of approximately 70,000 tpa.

Ricardo-AEA has reviewed publicly available information from the States of Jersey to identify any potential restrictions in relation to export to Jersey. The Environment Scrutiny Panel of the States of Jersey published the outcomes of a review into the existing policy and future options for the disposal of incinerator ash in December 2012. The potential import of residual waste from Guernsey was considered in the review due to its impact on the quantities of ash to be managed. In relation to importing Guernsey's waste, the report issued by the Scrutiny Officer stated (emphasis added):

> *"The figure of 30,000 tonnes is seen as a practical proposition, as this would bring the plant to its full operating capacity of 105,000 tonnes per annum."*
>
> *"…processing Guernsey's waste would also generate additional quantities of ash… This would leave Jersey with the problem of how to deal with some 1,700 tonnes of extra APCr* [air pollution control residues] *and 8,000 additional tonnes of IBA* [incinerator bottom ash] *annually".*
>
> *"If the Minister for TTS* [Transport and Technical Services] *adopts the recommendations for ash disposal… a similar additional volume of 8,000 tonnes of IBAA* [IBA aggregate] *would be produced, which would require a larger market for IBAA construction materials... Permission would also need to be sought in the short to medium term for export of the additional APCr. Because of these factors it is recommended that a new ash disposal strategy is allowed time to settle in and prove itself in operation before a decision on importing Guernsey's waste is made."*

The published transcript of the public hearing with the Minister for Transport and Technical Services (TTS) in connection with the ash review[6] confirmed that:

> *"…your* [TTS'] *road map for the future management of ash* [states that] *you are going to secure funding and design and construct a maturation facility for I.B.A. by late 2015."*

In addition, the published Ministerial response to the review of the States of Jersey's Medium Term Financial Plan[7] confirmed that:

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[6] *States of Jersey Environment Scrutiny Panel Public Hearing: Ash Disposal Review*, Friday, 21st September 2012
http://www.statesassembly.gov.je/ScrutinyReviewTranscripts/2012/Transcript%20-%20Ash%20Disposal%20Review%20-%20Minister%20for%20Transport%20and%20Technical%20Services%20-%2021%20September%202012.pdf

"…the Guernsey waste disposal amount of £1.5 million is in the MTFP from 2015 onwards".

Interpreting these statements indicates Jersey may not be in a position to accept Guernsey's waste until potentially mid to late 2016. This is based on Jersey's anticipated implementation of ash management strategies in late 2015, and the anticipated timing of income, together with the need for the adopted ash management options to be proven before additional waste (and ash) can be accepted for treatment. Ricardo-AEA suggests that a reasonable timescale to judge whether the options are proven may be 6-12 months. This indicates that Guernsey would require an alternative export option until late 2016.

A pan-island meeting on the potential export of waste from Guernsey to Jersey was held on 22 February 2013. At this meeting John Rogers, TTS Chief Officer, suggested that Jersey could potentially receive Guernsey's waste in 2015, indicating that IBA processing trials had already commenced and would complete during 2015. Guernsey's Senior Project Manager Rob Roussel indicated that the completion of required infrastructure to facilitate waste export from Guernsey, including a transfer station, was now anticipated in late 2015. As such, John Rogers suggested that IBA treatment trials would be completed before infrastructure was in place and should not therefore delay Jersey's acceptance of waste from Guernsey. TTS has also indicated that the issue of whether or not Guernsey would be required to take back a proportion of processed IBA commensurate with the quantity of its waste is outstanding.

TTS has confirmed that the Environment Agency has acceded to a DRR for the export of APCr from Jersey to the UK for disposal and that this would apply to APCr resulting from the treatment of waste imported from Guernsey. Permission is therefore in place to manage APCr and this should not delay the export of waste from Guernsey. A DRR is however time limited (refer to Section 4) giving an on-going risk that Jersey will lose this position with potential repercussions on importing waste from Guernsey.

Overall, recent discussions suggest that Jersey would be able to accept Guernsey's waste as soon as Guernsey is ready to start exporting it. This assumes Jersey's IBA processing trials proceed on time and are successful and that either the Environment Agency keeps renewing its permission to export APCr to the UK for disposal or that Jersey secures a longer term recovery or on-island solution. It is also possible that Guernsey would be required to find a market for circa 8,000 tonnes IBAA if waste is exported to Jersey. Some uncertainty and risk therefore remains, but export to Jersey should at this stage be considered a viable option within the required timeframes for the purpose of the market review.

[7] *States of Jersey Review of the Medium Term Financial Plan (S.R.18/2012): Response of the Minister for Treasury and Resources*, 5th December 2012, States Greffe http://www.statesassembly.gov.je/scrutinyreports/2012/ministerial%20response%20-%20medium%20term%20financial%20plan%20-%205%20december%202012.pdf

2.3 Review Export (Shipping) Routes from Guernsey

2.3.1 Introduction

Guernsey has established commercial shipping routes, as described in paragraph 2.3.2, which provide potential routes for the export of containerised waste. In addition, other ports can potentially be accessed by dedicated shipping.

The Department met Guernsey Harbours on 27 February 2013 to discuss shipping options. Notes from this meeting are provided in Appendix 1. Discussions assumed that waste would be pre-treated and baled (refer to paragraph 2.5.3) and considered both St Peter Port Harbour and St Sampson's Harbour as potential options.

Consultation indicated the preferred export option is bulk (2,000-2,500 tonnes) shipments of uncontainerised baled waste. In the long term this would be via a berth developed to the north of Longue Hougue where the transfer station is to be located. In the short term this could be achieved using exisiting facilities at St Sampson's Harbour using modified cranes. It was also acknowledged that existing scheduled freight routes would allow RO-RO shipments of containerised waste to Jersey or Portsmouth.

2.3.2 Current Commercial Shipping Routes

Ricardo-AEA reviewed the Future Harbour Requirements Study[8] to identify port destinations that are accessible from Guernsey via established commercial routes. The report confirmed:

> *"Guernsey is part of a three port route, with Portsmouth and Jersey, for RORO vessels"*

The destinations with direct links to Guernsey and the proportions of commercial cargo being shipped between Guernsey and each port were identified as follows:

- Portsmouth: the dominant cargo export route at around 77% commercial cargo
- Jersey: 10%
- St Malo, France: 7%
- Weymouth: ≤5%
- Poole: ≤5%
- Cherbourg: 0% (currently a passenger route only)

Based on this analysis, Ricardo-AEA selected Portsmouth and St Malo for further consideration as potential containerised waste export routes from Guernsey. Note that the exclusion of the ports of Weymouth and Poole and Cherbourg from further consideration does not have a significant effect in terms of restricting potential receiving waste treatment facilities as these ports are relatively closely located to the selected ports of Portsmouth and St Malo respectively.

2.3.3 Dedicated Shipping Option

Ricardo-AEA facilitated an industry day on behalf of the Department in September 2012 and a report describing the outcomes is provided in Appendix 2. Representatives

[8] *States of Guernsey Public Services Department Future Harbour Requirements Study,* September 2010. Halcrow Group Limited. Document Reference: DRSSPP/FHRS. (Revision B, November 2010).

at the industry day confirmed that the dedicated shipping of baled materials may be a commercially viable option. This extends the export routes beyond the existing commercial shipping routes to other European Commercial Ports.

Ramboll / Babtie Fichtner 2005[9] assumed that waste shipments from Guernsey would leave from St Peter Port Harbour because St Sampson's Harbour is not equipped with RO-RO facilities or cranage of sufficient capacity to support the LO-LO (using shipping containers) option. Consideration was given in this report to the charter or scheduled shipping services and the report noted that a third option of purchasing a dedicated ship should also be explored.

2.4 Define the Geographical Boundary

Ricardo-AEA has undertaken research to define assumptions in relation to available travel modes and maximum travel distances from the available commercial ports described in paragraph 2.3.2. Both road and rail transfer of waste from the ports has been considered.

2.4.1 Rail Transfer

Portsmouth International Port was rail linked[10] in 2009 and Network Rail[11] confirms it currently has an intermodal rail terminal. This provides the opportunity to access suitable waste treatment facilities across England, Wales and Scotland.

There are also 4 intermodal rail terminals in the vicinity of Southampton Docks. The proximity of waste treatment facilities to intermodal rail terminals is also crucial in determining available facilities where rail transfer is used. Facilities that are in proximity to a Network Rail 'strategic freight site' are also assumed to be available; these sites are held by Network Rail in a land bank, set aside for future freight use.

Research based on maps published by Réseau Férre de France (RFF)[12], the organisation that owns and maintains the French national railway network, indicates that the port of St Malo is not linked into the French freight network. Ricardo-AEA contacted SITA[13] to confirm this point and SITA's Bulk Shipping Team confirmed its understanding that there is no existing rail connectivity at the port of St Malo. This also appears to be the case for the port of Cherbourg. As a result it is assumed that access to suitable waste treatment facilities in Europe can only be achieved by road transfer.

2.4.2 Road Transfer

To define a boundary within which waste treatment facilities are considered accessible by road transfer, Ricardo-AEA has assumed that road transport will be limited to approximately 500 kilometres from the overseas commercial ports described in Section 2.3. This distance assumes the maximum available travel time within 1 day (8.25 hours) and speed (60 km/h) are achieved and is therefore considered to represent an optimistic distance for 1 day. This assumption does not consider handling and

[9] *Jersey / Guernsey Feasibility Study of a Joint Channel Island EfW Solution*, Final Edition, 21 January 2005, Ramboll and Babtie Fichtner
[10] http://www.portsmouthfreight.co.uk/
[11] http://www.networkrail.co.uk/aspx/10520.aspx
[12] http://www.rff.fr/IMG/Fret-2009-v_01-10-09.pdf
[13] Personal communication Peter Marshall, Special Projects (Alternative Fuels) SITA UK, 29 November 2012

turnaround times and the port and facility which are additional to the maximum 1 day road travel time.

Ricardo-AEA suggests limiting waste to 1-day road transfer is appropriate given the nature and economic value of the material. In addition, proximity is potentially taken into account by the relevant authorities in receiving jurisdictions when determining their position on accepting the import.

2.4.3 Potential Receiving Jurisdictions

Based on the above analysis, potential receiving jurisdictions are identified in Table 1. Specific States and Regions of Germany and France respectively have been identified. This is appropriate considering the transport assumptions and because the competent authorities under WSR Article 53 are not a single national body as they are with all other MS identified in Table 1. A list of competent authorities is available from the EU website[14]. The specific circumstances for Germany and France are described further below.

With the exception of France, only England and Wales are accessible by road based on the assumptions outlined in paragraph 2.3.2. Parts of northern England are outside the 500 km assumed maximum road transport distance however the whole of England is included in the assessment of available facilities for simplicity and because there is a single competent authority.

2.4.3.1 German States (Länder)

The competent authority for import and export is represented by the government of the state in which the receiving facility is located. The five states included in Table 1 are those with a coastline or inland port and therefore potentially having port-linked facilities. No German states can be accessed by road or rail transit based on the assumptions outlined above.

2.4.3.2 French Regions

The regions included in Table 1 have been selected on the basis that they are within the maximum assumed road transit distance and/or have a coastline and therefore potentially port-linked facilities.

Travel distances exclude non-coastal southern and eastern regions from consideration. The competent authority for import and export is represented by the prefect of the department in which the receiving facility is located. The prefect represents the national government at the local level. Regions are divided into departments however for the purposes of the analysis in Table 1 the coarser split by region is considered appropriate.

[14] http://ec.europa.eu/environment/waste/shipments/pdf/list_competent_authorities.pdf

Table 1: Potential receiving jurisdictions and transport options

Country	State (Germany only) or Region (France only)	Potential transport options		
		Road (Y/N)?[1]	Rail-linked? (Y/N)[2]	Port-linked? (Y/N)
Belgium	-	N	N	Y
Denmark	-	N	N	Y
England	-	Y	Y	Y
France	Brittany	Y	N	Y
	Lower Normandy	Y	N	Y
	Upper Normandy	Y	N	Y
	Picardy	Y	N	Y
	Nord-Pas-De-Calais	Y	N	Y
	Western Loire	Y	N	Y
	Loire Valley (Centre)	Y	N	N
	Paris Region	Y	N	N
	Poitou-Charentes	Y	N	Y
	Limousin	Y	N	N
	Aquitaine	N	N	Y
Germany	Niedersachsen (DE 014)	N	N	Y
	Mecklenburg-Vorpommern (DE 049)	N	N	Y
	Schleswig-Holstein (DE 025)	N	N	Y
	Hamburg (DE 009)	N	N	Y
	Bremen (DE 007)	N	N	Y
Holland	-	N	N	Y
Republic of Ireland	-	N	N	Y
Norway	-	N	N	Y
Scotland	-	N	Y	Y
Sweden	-	N	N	Y
Wales	-	Y	Y	Y

[1] Only available from commercial ports linked to Guernsey i.e. Portsmouth and St Malo
[2] Only available from rail-linked commercial ports linked to Guernsey i.e. Portsmouth

2.4.3.3 Geographical Limitation of Dedicated Shipping

The option of dedicated shipping opens up the possibility of export across and beyond Europe to countries that are not otherwise accessible via existing commercial shipping routes and onwards transfer by road or rail.

Ricardo-AEA has applied the following assumptions in order to appropriately limit the extent to which MS and other countries are included in the assessment to that shown in Table 1:

- Only MS are considered in order to restrict export options to countries regulated under the overarching WSR.
- In addition to those countries that are accessible via existing commercial shipping routes and onwards transfer within the restrictions applied (i.e. UK and France) the representatives at the industry day (refer to Appendix 2) stated that Scandinavia, Belgium, Holland, Germany and Estonia should be considered as potential markets. All of these countries are now considered with the exception of Estonia (see below).
- CEWEP 2010[15] also reported that over-capacity was emerging in northern Europe, specifically Denmark, Holland, Germany, Sweden, Belgium, Switzerland and Austria; all are included with the exception of Switzerland and Austria based on the transport assumptions.
- Shipping distances were considered to develop appropriate restrictions on travel distances from Guernsey and therefore limit costs and emissions; Estonia is excluded on this basis, for example Tallinn is over 500 nautical miles further east of Guernsey than Copenhagen, Denmark. In northern Europe, the other Baltic States, Finland, Russia and Poland are excluded on the same basis.
- The Republic of Ireland was not mentioned at the industry day as a potential market, having only 1 EfW facility at circa 200Ktpa capacity. It is anticipated that Ireland's EfW capacity will grow considerably in the future with a proposed 600Ktpa EfW facility in Dublin however the expected commissioning in 2013 has been significantly delayed and construction is yet to start. Ireland is however included in this study.
- In Southern Europe, Spain and Portugal are excluded partly on the basis that they were not stated as being economic markets at the industry day. In addition, reports published by letsrecycle.com[16] confirm a very limited waste derived fuel (WDF) export market to Iberia. CEWEP 2010 also reported that, although there may be market opportunities in Spain and Portugal, complications exist due to 'local policies and preferences' (notably CEWEP considered France and Estonia in the same way, supporting the exclusion of Estonia).

2.4.3.4 Territorial extent

The Environment Department policy report in Billet D'État No. XIII of 2006 raised the issue that for export to Europe waste must pass through English territorial seas and as such it may be necessary to gain the agreement from the competent authority to transit

[15] *Developments on Waste to Energy across Europe*, presentation to WTERT, Columbia, 8 October 2010, Jan Manders, Deputy President CEWEP (Confederation of European Waste-to-Energy Plants).
[16] http://www.letsrecycle.com/news/latest-news/energy/test; http://www.letsrecycle.com/news/latest-news/waste-management/waste-fuel-permitted-for-export-tops-a-million-tonnes

through its territory. Defra guidance[17] on interpretation of the Transfrontier Shipment of Waste Regulations 2007[18] confirms, in summary:

> *"This instrument applies to all of the United Kingdom including the territorial sea adjacent to the United Kingdom, including the area on the landward side of the baselines submerged at mean high water springs… by Order in Council under section 1(7) of the Continental Shelf Act 1964 and the waters superjacent to the seabed… within the area designated by Order in Council under section 84(4) of the Energy Act 2004."*

This indicates that if waste undergoes transit through any territorial seas the relevant MS should be informed according to the requirements of the WSR. Competent authorities for transit are specifically identified in EU guidance, which confirms the Environment Agency is the competent authority for transit through the UK (refer to paragraph 2.4.3).

2.5 Review Pre-treatment Requirements

2.5.1 Introduction

Section 4 provides a detailed legislative review in relation to controls on the export of waste from Guernsey, which concludes that waste should be treated to derive RDF before export to a recovery process; as such, the following section focuses on the preparation of RDF in Guernsey. Preparation of RDF would not be required if the receiving facility was in Jersey but even in this situation it would be appropriate to have facilities in place to prepare RDF in the event that the Jersey facility had a period of planned or unplanned shutdown during which an alternative short term market were required.

This review of pre-treatment requirements focuses on satisfying legislative requirements in relation to waste shipments rather than ensuring compliance with site specific waste acceptance criteria (WAC) at receiving sites, although it is anticipated there will be significant crossover. Specific pre-treatment requirements in relation to meeting WAC at the short-listed sites are included in the scope of the separate feasibility study.

2.5.2 Classification of Waste Derived Fuel (WDF)

WDF includes RDF and SRF, as summarised below:

- **RDF (refuse derived fuel)** is generally used to define unspecified waste after basic processing to increase the CV of MSW or C&I waste. There is no clear legal position, guidance, standards or classification systems to define what constitutes RDF and it is understood that each potential consignment would be treated on a case-by-case basis.

[17] *Explanatory Memorandum to the Transfrontier Shipment of Waste Regulations 2007*, 2007 No. 1711, 12 June 2007, Defra
http://www.legislation.gov.uk/uksi/2007/1711/pdfs/uksiem_20071711_en.pdf

[18] In the UK WSR is supported by the Transfrontier Shipment of Waste Regulations 2007, which establishes the Environment Agency as competent authority, specify offences and provide the regulators with enforcement tools.

- **SRF (solid recovered fuel)** can be considered to represent the opposite end of the WDF spectrum. The European Committee for Standardisation (CEN) has published technical standard EN 15359:2011 *Solid recovered fuels – Specifications and classes*, establishing a classification system for SRF based on its CV and chlorine and mercury content. The standard confirms SRF is prepared from non-hazardous waste where prepared means processed, homogenised and upgraded to a quality that can be traded amongst producers and users. The standard also recognises that users will need a more detailed description of the SRF and lists parameters that are obligatory to specify and properties that are non-obligatory to specify, such as compositional information. CEN has also established methods to determine for example moisture, ash, sulphur, fluorine, bromine and trace element content in SRF. Demonstrating compliance with the standard and additional customer specifications requires a programme of sampling and measurement of the appropriate properties.

In view of the proposed new facilities and anticipated level of pre-treatment to be provided in Guernsey, (refer to paragraph 1.2.3) it is apparent that RDF will be produced, not SRF.

2.5.3 Determining Pre-treatment Requirements for RDF

The treatment of waste to RDF is likely to focus on changing one or more of the following:

- increasing the CV;
- reducing the level of priority contaminants such as chlorine and mercury;
- reducing moisture content;
- improving homogeneity/consistency;
- reducing ash content;
- achieving a target particle size distribution (PSD);
- achieving a target biomass content;
- reducing other contaminants such as total heavy metals, cadmium and thallium, sulphur, fluorine, bromine; and
- minimising the potential for self-heating through microbial decomposition

Treating waste to ensure it falls within target ranges for any of the above properties whilst also preparing the waste for recovery may be sufficient to be considered to substantially alter the properties of the waste (refer to paragraph 4.1.3.2). Potential target parameters in this context may be increasing CV (e.g. by processing to remove metals and inert fraction and/or high moisture content fractions, thereby also reducing moisture content); and achieving a maximum particle size or defined PSD (e.g. by shredding).

Industry day outcomes

One of the objectives of the industry day (refer to Appendix 2) was to clarify the potential pre-treatment requirements for RDF. These are summarised as follows:

- Minimum requirements:
  - shredding; and
  - separation of metals and inert fraction
- Recommended further pre-treatment:

- baling using plastic ties and plastic wrapping;
- screening to remove fines (various screen sizes mentioned);
- separation of other recyclable materials; and
- separation of hazardous waste and gypsum

Screening was strongly recommended for a number of reasons. The primary concern appeared to be the potential for RDF quality requirements to be defined in the future. As indicated above, there is currently no definition of RDF but the industry representatives indicated a clear expectation that this would change in the future and suggested that a potential implication would be a requirement for screening to remove fines (organic and inert), for example to meet limits for CV, moisture content and organic content.

Ricardo-AEA therefore considers that it would be prudent to include space for screening equipment in the design of the waste transfer station and MRF in the event that RDF quality is defined in the future to 'future-proof' the pre-treatment facilities by enabling screens to be installed later. Even if an RDF specification is implemented, it may be possible to avoid screening if Guernsey's waste composition indicates the proportion of fines is already low, for example due to successful kitchen and green waste separation and upstream controls on C&I waste composition. Liaison with the relevant competent authority following any change to European regulations regarding the definition of RDF would confirm requirements.

Screening would also reduce the potential for biodegradation of material in storage because readily degradable organic material is concentrated in the fine fraction. The screening of fines would therefore prevent deterioration and potential implications such as odour, although wrapping should also minimise this risk. The industry also identified that screening would guard against potential penalties from the market as EfW operators may want to limit the amount of fines, although WAC for receiving sites should define any such requirements and the need for screening to meet WAC will be discussed during negotiations with short-listed facilities.

Consistency with previous assessments

The Department has also provided a document indicating proposed requirements for waste pre-treatment[19], specifically regarding pre-treatment prior to potential export to Jersey. The document indicates baling is required. The Department has also indicated during the course of the market review[20] that baling remains an essential requirement to ensure control of nuisance impacts such as odour and litter, regardless of the end market. The document also describes a decision (reference meeting 23 March 2010) on restricting waste types that are not acceptable for transfer, specifically hazardous waste, batteries, WEEE and fragmentiser plant shredder residues. Ricardo-AEA considers these are appropriate exclusions and should be separated from waste prior to baling.

The document also refers to a quotation prepared by Ramboll (reference December 2004) and provisional summary of export costs that confirm the expectation for segregation of unsuitable materials, bulky waste shredding, wrapping (of bales) and metals separation. The proposed requirements are therefore consistent with the

[19] *Waste Transfer to Jersey: Comprehensive Review of Waste Transfer Options & Costs*, undated
[20] Personal communication, Rob Roussel, Project Manager

recommendations from the industry day, with the exception that screening is not mentioned.

Ramboll / Babtie Fichtner 2005 assessed pre-treatment requirements in the context of a potential joint Channel Island EfW facility. Establishing a joint managing body for the Jersey EfW remains a possibility (reference paragraph 1.2.6). The 2005 report assumed that a transfer station would be established in Guernsey for transfer by either:

- compaction and loading into containers for LO-LO transfer; or
- baling and sealing with plastic wrapping for RO-RO transport in bulk tipping trailers, requiring a bale splitting facility at the receiving site

Ramboll / Babtie Fichtner 2005 reported that initial costing indicated the RO-RO option would be most cost effective for the Jersey market and would offer some technical and operational advantages. The report however based the outline scheme for the transfer station on the LO-LO method, noting that the final solution would be refined later through consultation with the suppliers. The transfer station was assumed to be 55,000 sq. ft. including an area for intermediate storage of waste or containers and incorporate two 1,200m^3 tipping bays with overhead cranes and grabs. Equipment for shredding and separating metals from 'waste other than parish/domestic waste' was assumed required.

A document was prepared by the Department and Policy Council[21] in December 2010 in relation to the export of residual waste to Jersey. The document confirmed that not all waste currently landfilled is suitable for incineration, specifically referring to WEEE, batteries and fragmentiser residues due to heavy metal content, and stated that measures to minimise these materials in residual waste must be as effective as in Jersey. Other unsuitable wastes were noted as contaminated ground, plasterboard and large carcasses. The report states that export is 'highly desirable' to retain capacity at Mont Cuet as an essential disposal option for the following wastes:

- putrescible waste [not required after implementation of the revised waste strategy];
- 'special' waste that cannot be treated or exported [as mentioned above; remains appropriate];
- residual waste [ash] resulting from future waste treatment processes [not considered possible under the Basel Convention; not required]; and
- contingency in event of interruption to alternative arrangements [unlikely to be required given anticipated requirement to bale and wrap waste]

Given that only waste referred to as 'special' waste is expected to require disposal at Mont Cuet following implementation of the revised waste strategy, and as indicated in the Policy Council document this was only 1,250 tonnes in 2009, it appears that sufficient contingency may be available if required to accept screened fines from RDF pre-treatment. The Department has however indicated[22] that it proposes to cap the majority of the landfill site for other uses and if the amount of screened fines requiring disposal was significant this would require a re-evaluation of proposals for landuse at Mont Cuet.

[21] *Export of Residual Waste for Treatment in Jersey*, sixth draft, December 2010, Policy Council and Public Services Department, States of Guernsey
[22] Personal communication, Rob Roussel, Project Manager

The Policy Council document also supports the view that waste preparation should include separation of recyclable materials and those unsuitable for incineration. It also recommended shredding of bulky items from both C&I and MSW streams; Ramboll / Babtie Fichtner 2005 referred to shredding of C&I only. Baling or compaction for transport were both considered but special purpose containers were considerably more expensive than baling and transport in standard shipping containers. The advantages of baling to allow flexibility for transport options (i.e. enabling dispatch on regular cargo sailings) and temporary storage in the event of interruptions to normal transport and treatment processes were also identified. Finally the document suggested keeping both RO-RO and LO-LO options open.

Billet D'État No. IV of 2012 (the revised waste strategy) confirms that the MRF would only process C&I waste to extract recyclables, not black bag waste and gives the examples of metals, card, paper and plastics to be extracted. The revised waste strategy also confirms that residual waste will be baled before export. Billet D'État No. IV of 2012, Appendix 13 is a letter from the Chief Officer, Transport and Technical Services Department, States of Jersey. The Chief Officer confirms the EfW is designed to treat 'normal municipal and commercial waste' and the input of higher CV WDF would potentially offer process issues and would not improve capacity. The Chief Officer confirmed that the 105,000 tpa capacity is nominal based on an average CV therefore if WDF had a higher CV this would limit the tonnage throughput.

Conclusions

The industry day outcomes indicate that screening may be required to ensure confidence that treated waste can be appropriately classified as RDF. This position is supported by analysis in paragraph 4.1.3.2 of this report (refer to Table 9), which as part of a comprehensive review of export regulations indicates that screening is required to substantially alter the properties of the waste. Review of the industry day outcomes and previous assessments provided by the Department indicates that pre-treatment should comprise the processes described in Table 2. The treatment recommended is for both MBT and C&I fractions unless stated.

Table 2: Proposed RDF pre-treatment

Ref	Description	Comments
1	Removal of hazardous waste, batteries, WEEE, gypsum and other unacceptable materials as required (e.g. gas bottles, asbestos, radioactive materials, hazardous wastes, large animal carcasses, contaminated ground)	List of unacceptable wastes dependent on receiving site WAC
2	Shredding	States' documents indicate only C&I to be shredded however shredding (bag opening) may also be appropriate prior to screening MSW; shredding (and mixing) also ensures consistent RDF characteristics

3	Screening for fines removal for disposal (not currently required to prepare RDF; requirements of receiving facilities to meet WAC to be determined during negotiations)	For example trommel screen with small holes (e.g. <150 mm) to limit the proportion of rejected fine material; may not be necessary for household waste following implementation of kitchen waste collections or for C&I waste depending on sources (e.g. whether organic fines are expected to represent a significant proportion of C&I waste)
4	Metals removal (magnetic separators for ferrous and eddy current separators for non-ferrous)	Commonly after screening with removal from both oversize and undersize fractions/lines
5	Removal of inert materials	Larger inert fraction e.g. bricks, glass bottles; may not be essential for the market (no adverse effect on the process) but can 'substantially alter' the waste by helping to drive up CV in addition to fines removal
6	Removal of other recyclable materials	Not essential; most likely target material is dense plastic which has lower market risk (e.g. than paper and card from mixed waste containing ABPR) and benefits RDF quality by removing source of chlorine (PVC)
7	Baling (plastic ties) including compaction	States' requirement for nuisance control; potential requirement for chartered shipping; not required if compaction containers are used (depends on the market)
8	Wrapping (plastic)	As above

2.6 Review Alternative Waste Treatment Technologies

As outlined in Section 2.1, the waste strategy indicates that considering only EfW facilities (with and without CHP) to accept Guernsey's waste is appropriate. The following sections provide further justification for the exclusion of each grouping of technologies from further consideration.

2.6.1 Advanced Conversion Technologies (ACT)

ACT (also referred to as advanced thermal treatment) includes gasification, pyrolysis, plasma gasification and combination technologies. Gasification is not a combustion process, rather a thermal upgrading process. Gasification converts carbon into the feedstock waste into its gaseous form by reacting or partially combusting the material at high temperatures within a reactor. Plasma arc gasification is a variant of gasification where intense heat is applied by plasma torches in place of a conventional furnace. Reaction usually takes place with a controlled amount of air such that the energy content of the waste is transferred into the gas phase or syngas (synthesis gas) as chemical energy that can be further processed for conversion to chemicals or power in

a reciprocating engine. In pyrolysis, thermal degradation takes place either in the absence of oxygen or where it is so limited that gasification does not occur to any appreciable extent.

There is limited operational experience of ACT taking a waste feedstock in the UK and Europe, with the exception of gasification in Scandinavia, but there is significant operational experience in Japan. Most gasification experience is in heavy industry (petrochemicals) and most pyrolysis research knowledge relates to fuels such as coal. Operational plants are generally small compared to moveable grate (EfW) technology.

ACT generally needs more consistent feedstock than combustion and fuel may be restricted within a tight specification to ensure syngas CV is within a tight range to ensure flue gas emission limits are not exceeded. There is also significant technical risk in relation to syngas cleaning for power production using engines or turbines to protect the energy recovery equipment.

Ricardo-AEA recommends that ACT facilities are excluded from consideration in the market review for the following reasons:

- **Feedstock restriction:** ACT is more suited to accepting a consistent SRF feedstock that meets a quality specification. Waste from Guernsey will be pre-treated but is not proposed to be treated to meet a defined quality specification. The waste strategy considered but ruled out an option to produce RDF using MBT for export to EfW or a cement kiln (Option C), in part due to the cost of an on-island MBT process.
- **Capacity:** ACT facilities generally have a lower capacity than EfW. Where facilities are available in Europe there is a significant risk there will be insufficient capacity to accept Guernsey's waste. The majority of European ACT facilities are Energos[23] gasification plants located in Norway. Two Norwegian facilities have a capacity of 78Ktpa with the others all less than 40Ktpa.
- **Technical and commercial risk:** limited European experience in waste ACT with specific issues in relation to feedstock quality and gas clean-up leads to further concerns over technical and commercial risks associated with reliance on ACT.

2.6.2 Mechanical Biological Treatment (MBT)

MBT is considered in this context to include bio-drying and mechanical heat treatment (MHT) technologies. MBT and bio-drying encompasses a wide range of technologies that aim to process solid waste using a combination of mechanical separation and biological treatment. The technologies are widely used in Europe including Germany, Austria, Italy and the UK. The mechanical phase aims to capture additional valuable recyclables such as metals and plastics and generates an oversize fraction that is landfilled. The biological phase can be configured for bio-degradation (composting or anaerobic digestion) or bio-drying depending on the output market. Bio-degradation produces a stable compost-like output for disposal or recovery on land or potentially as a fuel whilst bio-drying primarily aims to produce RDF and does not significantly alter the bio-degradability of the waste.

MBT and bio-drying generate residues that require landfill disposal or further treatment, e.g. as a fuel. The facilities can be large and depending on the waste stream and

[23] http://www.energ.co.uk/index1578.aspx

location of the EfW market may not represent significant benefit over direct EfW. A suitable organic content is also required to generate sufficient heat from microbial activity; this conflicts with the preferred Option B in the waste strategy which incorporates separate collections of food waste whilst green waste would continue to be separated and composed at Mont Cuet.

MHT involves configurations of mechanical and thermal, including steam, based technologies. MHT commonly uses autoclaving (pressurized steam treatment to achieve sterilization) but can use non-pressurised heat treatment where waste is treated in a rotating kiln using externally applied heat before mechanical separation to extract recyclables. The output is a typically fine, homogeneous floc that may be suitable as RDF. Floc may be more suitable as RDF when externally applied heat is used rather than steam because its moisture content will be significantly lower.

Ricardo-AEA recommends that MBT/MHT facilities are excluded from consideration in the market review for the following reasons:

- **Residual waste organic content:** sufficient organic content is required to generate heat in bio-drying processes or to enable biological activity and mass loss in the MBT configuration. The waste strategy's preferred Option B includes separation of organic waste and, even if the decision to separate food waste was overturned, transporting residual waste with a high organic content may cause handling and odour problems in transit and processing problems on presenting already significantly (anaerobically) degraded waste to the treatment process.
- **Technical and commercial risk:** technical risk includes the presentation of waste that is potentially significantly degraded to the treatment process and associated transport issues; commercial risk includes the need to find a market for residues including CLO/bio-dried waste and the oversize fraction.
- **Cost and markets:** potentially significant landfill disposal requirements for MBT and bio-drying residues, depending on the availability of a thermal outlet, are likely to increase costs. MHT requires external heat with cost implications and autoclaving floc has relatively high moisture content which may limit thermal treatment options.

2.6.3 Cement Kilns

The Mineral Products Association (MPA) reports that waste-derived fuels (WDF) have been used world-wide for many years to partially replace fossil fuels in cement manufacture. In the UK, WDF is rigidly specified and sourced from materials including used tyres, secondary liquid fuels (e.g. recycled inks, solvents, thinners and oils), wood, packaging wastes (e.g. non-recyclable paper, cardboard and plastics), sewage sludge (pellets), residual household waste, C&I waste and meat and bone meal (MBM).

The cement industry requires high CV fuel and one of the world's leading producers of building materials, Heidelberg Cement, reported to the International Energy Agency (IEA)[24] that the UK and European cement industry uses WDF with a CV >20 MJ/kg. In addition to high CV, cement kilns accept WDF within a tight quality specification including limits for chlorine, mercury, moisture content, ash content and particle size.

[24] Task 36: Integrating Energy Recovery Into Solid Waste Management Systems

Processing of residual waste is therefore required to meet defined customer fuel specifications or publicly available specifications for SRF.

As described in Section 2.4.1 in relation to ACT feedstock, the waste strategy considered but ruled out an option to produce RDF using MBT for export to EfW or a cement kiln (Option C). This is a crucial requirement for cement kiln fuels and Ricardo-AEA therefore recommends that cement kilns are excluded from consideration in the market review.

2.7 Identify Facilities for Further Consideration

2.7.1 Critical Success Factors

The potential viability of EfW facilities to import residual waste from Guernsey is determined by a number of critical success factors that represent criteria for an initial screening process. Initial screening is intended to limit the number of facilities requiring consideration in depth to those most likely to proceed whilst ensuring a robust decision making process. The criteria applied are individually relatively simplistic, but in combination are intended to provide an indication of the potential commercial and regulatory risk associated with each facility.

- **Distance (<500km from the receiving port).** This is taken into account by defining the geographical boundary for the market review on the basis of road and rail transfer restrictions and port access (refer to Section 2.4).
- **Age (commissioned post-1995).** The first requirement is that the facility must be currently operational or is expected to be commissioned by 31 December 2013. The commissioning date provides an indication of a number of factors relevant to Guernsey, for example the availability of the market based on an assumed 25-year design life and the potential requirement for a substantial refit or decommissioning after this time. In addition, the likelihood that the facility will meet the R1 recovery criterion can be expected to decline with age. 1995 has been selected as the earliest commissioning date as this indicates at least 5 years design life remaining from service commencement (assumed 2014/15) given an assumed 25-year design life. A risk is that facilities commissioned before 1995 and which have already undergone a refit are excluded; to mitigate this risk the commissioning date is reported as that of the most recent line if capacity was added after the plant was first commissioned.
- **Available capacity (30Ktpa headroom or >150Ktpa design capacity).** Data are not readily available from the competent authorities in any EU countries to confirm available capacity. In the absence of these data Ricardo-AEA will only consider sites with >150Ktpa capacity for the purpose of initial screening. This means Guernsey waste would represent up to 20% of total capacity based on a conservative estimate of 30,000 tonnes arising.

  This approach relies on the simplistic assumption that a higher capacity gives an increased likelihood of the site being able to accept Guernsey's waste. Consistent with other assumptions, reported capacity represents that of all lines commissioned since 1995 and therefore will not always equate to full plant capacity; actual available capacity will be considered in Task 1b.
- **Recovery (R1) status.** Exports of waste to facilities that use it principally as a fuel to generate energy, as indicated by its R1 status, are classed as export for

recovery and do not require a DRR. Only considering those facilities that represent a recovery option is considered to improve the potential for gaining consent to export from the relevant authority and further provides assurance in relation to the environmental sustainability of the option. The R1 status of facilities is currently not reported either by individual countries or the Commission Ricardo-AEA received correspondence from CEWEP confirming that most of the EfW plants in Europe are R1 compliant. This criterion will therefore not be applied in the first screening but R1 status will be verified for short-listed facilities.

- **Current feedstock type (untreated residual MSW wholly or in part).** Only facilities currently accepting waste of a nature similar to Guernsey's waste will be considered.

2.7.2 Outline Methodology

Operational EfW facilities within the jurisdictions listed in Table 1 were identified from ISWA 2012[25]. Ricardo-AEA considers ISWA 2012 to represent the best available source data, being comprehensive and recently updated. ISWA 2012 provides technical and operational data for EfW facilities in Europe and the USA with a capacity over 10Ktpa that incinerate MSW and excludes facilities treating sludge, hazardous, agricultural and hospital wastes.

Although ISWA 2012 represents a comprehensive list of facilities, a significant amount of detailed facility information is missing. Ricardo-AEA has reviewed data and addressed gaps through further desk based research and expert knowledge.

Ricardo-AEA also considers that facilities that are not currently operational but are expected to be commissioned by 31 December 2013 should also be considered. Any such facilities will be available within a timescale relevant to Guernsey's requirements. Data for such facilities are not reported in ISWA 2012 or in any single reference source to the best of Ricardo-AEA's knowledge. As such Ricardo-AEA and COWI have identified such facilities and completed required information using in-house data and desk based research.

Having finalised the list of facilities within the jurisdictions listed in Table 1, facilities were assessed against the critical success factors described in section 2.7.1. The outcomes of this assessment and subsequent stages are described in Section 3.

[25] *Waste-to-Energy State-of-the-Art-Report*, Statistics 6th Edition, August 2012, ISWA – the International Solid Waste Association

3 Market Review: Outcomes

3.1 Initial Screening

The tables provided in Appendix 3 represent the outcomes of the market review and initial screening exercise (Task 1a) following the methodology described in Section 2. Tables are provided in Appendix 3 for each potential receiving jurisdiction (refer to Table 1) and facilities are coloured green[26] where they meet the critical success factors or red where they are excluded from further consideration; the reasons for inclusion or exclusion are set out and referenced in the tables. Initial screening resulted in 41 facilities that met the critical success factors, as summarised in Table 3.

Table 3: Results of initial screening

No	Ref	Country	Location	Name	Year	Capacity (tpa)
1	BE1	Belgium	Brugge	IVBO	2004	170,000
2	BE2	Belgium	Brussel	Brussel Energie	1999	515,000
3	BE3	Belgium	Doel-Beveren	Indaver/ Sleco	2001	384,800
4	BE8	Belgium	Herstal	Uvelia-Intradel	2009	336,000
5	D1	Denmark	Esbjerg	L90 Affaldsforbrænding	2003	192,000
6	D17	Denmark	Odense	Odense Kraftvarmeværk A/S	2000	256,000
7	D18	Denmark	Roskilde	KARA/NOVEREN Roskilde forbrændingsanlæg	1999	160,000
8	D27	Denmark	Aalborg	Reno-Nord I/S	2005	160,000
9	D28	Denmark	Århus	Kraftvarmeanlæg Århus Nord	2004	188,800
10	EN1	England	Billingham	Teeside EfW Plant	1998	224,000
11	EN2	England	Birmingham	Tyseley Waste Disposal Ltd	1996	350,000
12	EN6	England	Colnbrook	Lakeside Energy from Waste Ltd.	2010	410,000
13	EN10	England	East Sussex	Newhaven	2012	210,000
14	EN17	England	London, Bexley	Riverside	2011	585,000
15	EN24	England	Sheffield	Sheffield ERF	2006	225,000
16	EN25	England	Stoke on Trent	Stoke on Trent	2000	200,000
17	F7	France	Bègles	Bordeaux (Bègles)	1998	264,000
18	F18	France	Cergy Pontoise	Cergy Pontoise	1995	168,000

[26] If viewed in black and white print, green = light grey, red = dark grey

No	Ref	Country	Location	Name	Year	Capacity (tpa)
19	F30	France	Grand Quevilly	Rouen 2	2000	348,000
20	F33	France	Halluin	Halluin (Lille)	2000	348,000
21	F35	France	Issy-Les-Moulineaux	Issy-Les-Moulineaux	2007	480,924
22	F68	France	Villiers Saint Paul	Esiane (Villiers Saint-Paul)	2004	176,000
23	F78	France	Vaux-le-Penil	Melun	2003	164,640
24	F79	France	Vert le Grand	Vert le Grand	1999	235,200
25	G2	Germany	Hamburg - Rugenberger Damm	Müllverwertung Rugenberger Damm Hamburg	1999	350,000
26	G3	Germany	Hamburg - Stellinger Moor	Müllverbrennung Stellinger Moor Hamburg	1999	180,000
27	G10	Germany	Rostock	EBS-HKW Rostock	2011	210,400
28	G14	Germany	Bremen	swb Müllheizkraftwerk Bremen	2009	234,119
29	H2	Holland	Amsterdam	AEB Afval Energie Bedrijf, Amsterdam	2007	537,600
30	H4	Holland	Delfzijl	E.ON Energy from Waste, Delfzijl B.V.	2010	275,000
31	H8	Holland	Hengelo	Twence B.V. Afval en Energie, Hengelo	1997	288,000
32	H10	Holland	Moerdijk	Attero, Moerdijk	1997	424,000
33	H12	Holland	Rotterdam	AVR Afvalverwerking B.V., Rotterdam	2009	432,000
34	N8	Norway	Oslo (Klemetsrud)	Klemetsrud Energigjenvinningsanlegg	2011	160,000
35	SE7	Sweden	Göteborg	Sävenäsverket i Göteborg	2009	592,000
36	SE9	Sweden	Helsingborg	Filborna KVV1	2013	227,000
37	SE22	Sweden	Malmö	SYSAV Sydskånes Avfallsaktiebolag	2008	400,000
38	SE24	Sweden	Norrköping	Händelöverket	2010	408,000
39	SE26	Sweden	Stockholm	Högdalenverket i Stockholm	2005	544,000
40	SE27	Sweden	Stockholm	Bristaverket	1997	350,000
41	SE31	Sweden	Umeå	Dåva kraftvärmeverk	2000	160,000

3.2 Potential Additional Markets

Table 4 describes 3 further facilities that Ricardo-AEA anticipates will be commissioned and will represent additional potential markets by the end of 2013.

Table 4: Anticipated additional capacity by end 2013

No	Ref	Country	Location	Name	Year	Capacity (tpa)
42	EN27	England	Four Ashes, Staffordshire	Veolia W2R (Waste to Resource)	2013	300,000
43	EN28	England	North Hykeham, Lincolnshire	FCC Lincolnshire	2013	150,000
44	SE35	Sweden	Linköping (extension)	Lidköpings Värmeverk	2013	150,000

In addition to the 44 facilities described in Table 3 and Table 4, the Jersey La Collette EfW facility is included as a potential option. Fourty-five facilities were therefore taken forward to the subsequent screening stage, Task 1b.

3.2.1 Excluded Potential UK Markets

A significant number of new EfW facilities are proposed or consented in the UK however based on current market knowledge it was not anticipated that any of the following facilities will be fully commissioned and operational by the end of 2013:

- FCC Buckinghamshire;
- FCC Nottingham (expansion);
- Biffa Newhurst Quarry, Leicestershire;
- SSE and Wheelabrator Technologies Ferrybridge, Yorkshire;
- Cory and Wheelabrator Technologies King's Lynn, Norfolk;
- INEOS ChlorVinyls, Viridor and John Laing Runcorn (refer to Section 3.3.2);
- Covanta Energy Rookery Pit, Bedfordshire;
- Covanta Energy and Peel Environmental Inch Marsh, Cheshire;
- Covanta Energy and Airdrie North Limited Drumshangie, North Lanarkshire;
- SITA UK Great Blakenham, Suffolk;
- SITA and Sembcorp Wilton, Middlesbrough;
- SITA Cornwall;
- SITA Bristol;
- E.ON and Tata Chemicals Europe Limited, Lostock Gralam, Cheshire;
- E.ON, Wheelabrator Technologies and DS Smith, Sittingbourne, Kent;
- Viridor Dunbar, East Lothian;
- Viridor Ardley, Oxfordshire;
- Viridor Cardiff;
- Viridor Bristol;
- Urbaser Balfour Beatty Gloucestershire;
- Mercia EnviRecover Worcestershire;

- MVV Environment Plymouth, South West Devon;
- AmeyCespa North Yorkshire;
- Aecom, Skanska and FCC Bradford, West Yorkshire; and
- Veolia Leeds, West Yorkshire

Additional proposed UK facilities that are not included in the above list include a number that have been excluded as they would not meet the critical success factors described in Section 2, primarily on the basis of technology type and capacity. The above list is reported to confirm that a robust market review has been carried out and all potential sites have been appropriately considered.

3.3 Task 1b: Screening of Options

Following completion of Task 1a, further screening was undertaken with the objective to reduce the list of potential facilities from 45 to 3 for consideration in the feasibility study. The facilities listed in Table 3 and Table 4 were contacted electronically and by post using the contact details included in Appendix 4 (Jersey contact details are excluded from Appendix 4 as the initial approach was made by the Department).

Facilities were invited to express interest in the opportunity to treat Guernsey's residual waste and to provide further information in relation to capacity; regulatory and commercial issues; the nature of waste and their ability to accept it; and transport issues. The correspondence used is provided in Appendix 5. Correspondence was sent on 14 January 2013 for return by 31 January 2013 with the exception of facilities referenced F78 and F79, which were initially wrongly omitted and were contacted on 1 February 2013, and the Jersey EfW facility as the initial approach was made by the Department.

3.3.1 Multiple-installation Option

An alternative approach to contracting direct with a single EfW facility was raised by SITA UK during the screening process. A representative of SITA UK called Ricardo-AEA on 25 January 2013 to discuss whether an alternative approach would be considered; specifically that SITA UK would manage Guernsey's waste on the back of other agreements where they are moving large tonnages around Europe for a number of clients through SITA Europe, thereby enabling SITA UK to take advantage of spot market prices.

Further correspondence was received from SITA Europe on 29 January 2013, confirming that the approach was to use multiple-installations in Holland, including the SITA ReEnergy facility in Roosendaal (refer to Appendix 3, Table A2.6, Ref H11). Guernsey's Senior Project Manager Rob Roussel indicated that the Department would consider this alternative option if a response was received before the deadline. Ricardo-AEA suggests that implications in terms of the comparability to other options would need to be fully considered, as SITA UK indicated in discussions on 25 January 2013 that the inclusion of transportation within the overall arrangement would be 'cleaner'.

3.3.2 Evaluation and Initial Ranking of Responses

Seventeen responses were received (excluding Jersey) and are summarised in Table 5. Responses are referenced Expression of Interest 1-17 (EoI 1-17) and also retain the country specific reference assigned previously. Following an initial review of responses,

clarification questions were prepared by Ricardo-AEA on 5 February 2013 and issued to bidders by the Department on 6 February 2013. Clarifications primarily sought to confirm the scope of costs that had been included in the gate fee following a range of different explanations in the responses. Specifically, the clarifications asked if elements such as port handling costs; costs of waste transfer from the port to the facility; local taxes; and taxes on polluting activities were included or excluded from the gate fee to ensure the stated gate fees are compared on an equal basis.

The detailed responses, including where relevant additional information provided in response to the clarification questions, are included in Appendix 6; this includes Jersey's response. Appendix 6 is structured around an evaluation template developed by the Department and reviewed by Ricardo-AEA. Appendix 6 also includes the initial scoring based on an evaluation conducted by The Department and reviewed by Ricardo-AEA; this is not the final scoring (refer to paragraph 0).

In addition to the SITA UK option described in paragraph 3.3.1 (reference EoI11), three further responses refer to multiple-sites. Responses EoI3 and EoI12 refer to a single site in the submission details however the proposal details refer to contingency arrangement using a number of sites. Response EoI10 submitted by Indaver Ireland also refers to a single site at Doel (Beveren) in Belgium; following receipt of this submission, and the response date having elapsed the named contact telephoned Phil White of Ricardo-AEA to suggest Indaver might prefer to offer the use of the Attero facility in the Netherlands, which it partly owns. EoI10 therefore appears to potentially be a 2-site solution and clarification should be sought from Indaver if this option progresses to the feasibility assessment. Note also that the Attero facility already forms part of the solution in EoI12.

Response reference EoI1 refers the proposed INEOS ChlorVinyls site at Runcorn. This site was not contacted but was excluded as publicly available information had indicated that the facility would not be commissioned by late 2013 (refer to paragraph 0). EoI1 supporting information however states there will be a phased commissioning and phase 1 will be ready in 2013 so it is appropriate to consider this option.

Table 5: Expressions of Interest Received

No	Ref	Country	Respondent	Facility	Contact
	n/a	England	Viridor	Runcorn, Cheshire, UK	Robert Ryan, Head of Projects
	SE9	Sweden	Filborna KVV1	Helsingborg, Sweden	Jesper Baaring
	SE35	Sweden	EFO AB	Gärstadverket i Linköping	Mårten Eriksson, Waste Fuels Coordinator (broker)
	EN19	England	Veolia Environmental Services (UK) Plc	Marchwood ERF	Ben Slater, Regional Director
	EN10	England	Veolia Environmental Services (UK) Plc	Newhaven ERF	Ben Slater, Regional Director
	EN22	England	Veolia Environmental Services (UK) Plc	Portsmouth ERF	Ben Slater, Regional Director

No	Ref	Country	Respondent	Facility	Contact
	F30	France	SMEDAR	Rouen 2, France	Patricia Guilbert
	SE24	Sweden	EON – Händelöverket	Norrkoping, Sweden	Elisabeth Söderpalm
	BE2	Belgium	Brussel Energie	Brussel Energie	Vincent Jumeau, Administrator
	BE3	Belgium	Indaver Ireland – Indaver Group	Doel (Beveren) Belgium	Claire Downey, Sustainable Business Planner
	H1, H2 & H11	Holland	SITA	HVC Huisvuilcentrale, Alkmaar; AEB Afval Energie Bedrijf, Amsterdam; SITA ReEnergy, Roosendaal	Ane-Dick Steringa, International Business Development Manager
	H10	Holland	Attero	Attero Moerdijk, Holland	Richard Huijzer, Senior Account Manager International Business Development
	G14	Germany	swb Entsorgung	Mittelkalorikkraftwerk /Müllheizkraftwerk, Bremen, Germany	Christoph Heemsoth
	H4	Holland	E.ON Energy from Waste, Delfzijl B.V.	E.ON Energy from Waste, Delfzijl, Holland	Geert Jan Pastoor
	F81	France	Esiane (Villiers Saint-Paul) SITA Suez	Le Havre, France	Aurelien Toupet
	BE8	Belgium	Intradel	Uvelia-Intradel, Belgium	Jean-Marc Digneffe
	SE31	Sweden	Umea Energi	Dåva kraftvärmeverk, Umea, Sweden	Johan Soderberg

3.3.3 Initial Transport Cost Impact Assessment

Evaluation of initial responses indicated that 2 Swedish options (reference EoI3 and EoI8) were the highest ranked options. Given that the indicative preferred options were located in the most distant country from Guernsey of those considered, Ricardo-AEA recommended that indicative transport costs be taken into account. The Department accepted this, and Ricardo-AEA reviewed shipping costs, including transportation and port handling costs, through a survey of contacts including shipping brokers and providers; haulage companies; consultants and ports authorities.

As described in paragraph 3.3.2, the scoring described in Appendix 6 takes account of later clarifications, including in relation to EoI3 and EoI8, which reduced the score for both options based on confirmed preferred contract durations. As such, the baseline prior to considering indicative transport costs no longer ranked EoI3 and EoI8 as the preferred options. Appendix 7 summarises the contacts and information provided to support the transport cost analysis and the following summarises relevant comments and assumptions applied.

- Chartered shipping costs (excluding port costs) are assumed as:
  - England €5/t
  - France €5-7/t
  - Germany €15-20/t
  - Belgium €15-20/t
  - Holland €15-20/t
  - Sweden €17-23/t
- Guernsey is limited to 110 m ships[27], corresponding to 3,000t charter vessels, which might permit 2,200-2,500t loads of baled RDF;
- Port handling fees are highly variable and may vary between £3K-£10K per shipment;
- Comments in relation to shipping to Sweden included:
  - competition reduces with distance from Guernsey, so shipping may be more expensive;
  - costs in the winter may double due to ports becoming iced and specialist ships being required
- Guernsey to southern England (e.g. Portsmouth or Southampton) in trailers would cost in the order £700/26t trailer (£27/t) including harbour dues; port handling; port fees; and transport; and
- Portsmouth to Gothenburg (which may be representative of Guernsey to Sweden) in trailers would cost in the order £1,000/26t trailer (£38/t) including all costs, as above

[27] Information provided by St Helier Port Services. Subsequent information provided by Guernsey Harbours in discussion with the Department on 27 February 2013 (refer to Appendix 1), indicated that the maximum vessel length that can currently be accommodated is 85 m at St Peter Port Harbour and 79 m at St Sampson's Harbour. Notwithstanding this, Guernsey Harbours indicated that assuming 2,000 to 2,500 tonne shipments is appropriate. Furthermore, the preferred future option is to develop a new berth at the northern end of Longue Hougue which may be able to accommodate larger vessels.

Ricardo-AEA also reviewed port handling costs, which are included in the assessment in Table 6. Where bidders have provided estimated port handling and transfer costs these have been accepted as correct. Analysis is also based on documents published by port authorities or port owners, variously referred to as port tariffs, or port dues, rates and charges, and from telephone discussions where data are not publicly available.

Port costs are variable and complex to calculate from the reviewed documents. For example, documents include broad ranges of some fee items that are dependent on the characteristics of the vessels and documents variously include or exclude e.g. craneage charges which, even where provided, require assumptions in relation to equipment and time needed for unloading. A large number of assumptions support the analysis and are based on judgement but are not itemised given their number and complexity and the indicative nature of the analysis. Selected generic assumptions that are not already described above are given below.

- The majority of gate fees and available assumptions are quoted in Euros therefore the analysis is reported in Euros, with any pounds sterling data being converted at the current rate, as referenced in Table 6 footnotes. Exchange rate sensitivity is not considered necessary based on the position of UK options in the evaluation outcome.
- Guernsey port costs are excluded as considered common across all options.
- Road transport costs are based on a number of assumptions including: 26 tonne loads; €1.7/litre diesel; transport costs represent 35% haulage costs (reference e.g. Road Haulage Association; KPMG; Freight Transport Association).

Although indicative, the analysis is considered a reasonable representation of indicative transport costs to inform evaluation. Comments (reference Appendix 7) confirm the difficulty in defining accurate costs, suggesting only a tender process would give the true answer.

Table 6: Breakdown of indicative transport costs

Ref	Operator and facility name	Gate fee/t (averaged where required)[1]	Description (incl. local tax; CO_2 tax; ash management)	Bidder port/ transfer cost estimate	Option	Load (t)	Shipping costs/t		Port charges/t		Road costs/t		Total transport costs/t		Total price/t including gate fee and transport	
							Lower	Upper	Lower	Upper	Distance (one-way km)	Cost	Lower	Upper	Lower	Upper
[redacted]	[redacted]	(£67.50) €78.30	Gate fee only	N/A	Ferry to Portsmouth	26	€31.23	€66.68	Incl.	Incl.	386	Incl.	**€31.23**	**€66.68**	**€109.53**	**€144.98**
					Charter to Liverpool	2,500	€15	€20	€8.72	€20.95	25.5 (avg)	€3.27	**€26.98**	**€44.22**	**€105.28**	**€122.52**
		€47.50	Gate fee only	N/A	Charter to Helsinborg	2,500	€17	€23	€34.56	€46.94	6	€0.77	**€52.33**	**€70.71**	**€99.83**	**€118.21**
		€27.50	Gate fee only	N/A	Charter to closest port of two facilities (Norrköping/ Västerås)	2,500	€17	€23	€8.75	€8.75	22 (avg)	€2.82	**€28.57**	**€34.57**	**€56.07**	**€62.07**
		(£125) €145	Gate fee only	N/A	Charter to Southampton	2,500	€5	€5	€14.69	€14.69	0	0	**€19.69**	**€19.69**	**€164.69**	**€164.69**
		£125 €145	Gate fee only	N/A	Charter to Newhaven	2,500	€5	€5	€2.30	€4.72	1	€0.13	**€7.43**	**€9.85**	**€152.43**	**€154.85**
					Ferry to Portsmouth	26	€31.23	€66.68	Incl.	Incl.	96	€12.30	**€43.53**	**€78.98**	**€188.53**	**€223.98**
		£125 €145	Gate fee only	N/A	Charter to Portsmouth	2,500	€5	€5	€3.13	€3.24	6.8	€0.87	**€9**	**€9.11**	**€154.00**	**€154.11**
					Ferry to Portsmouth	26	€31.23	€66.68	Incl.	Incl.	6.8	€0.87	**€32.10**	**€67.55**	**€177.10**	**€212.55**
		€86.50	Gate fee only	€12-15	Charter to Rouen	2,500	€5	€7	€12	€15	0	0	**€17**	**€22**	**€103.50**	**€108.50**
		€50	Gate fee only	€10	Charter to Norrkoping	2,500	€17	€23	€10	€10	4	Incl.	**€27**	**€33**	**€77**	**€83**
		€91	Gate fee only	N/A	Charter to Brussels	2,500	€15	€20	€1.43	€5	0	0	**€16.46**	**€25.03**	**€107.46**	**€116.03**
		€60	Gate fee only	€5	Charter to Antwerp	2,500	€15	€20	€5	€5	10	€1.28	**€21.28**	**€26.28**	**€81.28**	**€86.28**
		€57	Gate fee only	€8	Charter to closest facility	2,500	€15	€20	€8	€8	23	€2.95	**€25.95**	**€30.95**	**€82.95**	**€87.95**

Ref	Operator and facility name	Gate fee/t (averaged where required)[1]	Description (incl. local tax; CO_2 tax; ash management)	Bidder port/ transfer cost estimate	Option	Load (t)	Shipping costs/t		Port charges/t		Road costs/t		Total transport costs/t		Total price/t including gate fee and transport	
							Lower	Upper	Lower	Upper	Distance (one-way km)	Cost	Lower	Upper	Lower	Upper
[redacted]		€60	All inclusive	N/A	Charter to Attero quay	2,500	€15	€20	Incl.	Incl.	0	0	**€15**	**€20**	**€75**	**€80**
		€75	All inclusive	N/A	Charter to Cologne	2,500	€15	€20	Incl.	Incl.	Incl.	Incl.	**€15**	**€20**	**€90**	**€95**
		€59.50	Gate fee only	€5.50 (only transfer)	Charter to Delfzijl	2,500	€15	€20	€2.23	€5	2.5	€0.32	**€17.55**	**€25.32**	**€77.05**	**€84.82**
		€74.50	Gate fee only	€23-38 (with transfer)	Charter to Le Havre	2,500	€5	€7	€23	€38	Incl.	Incl.	**€28**	**€45**	**€102.50**	**€119.50**
		N/A	**Excluded (insufficient capacity)**													
		€200	**Excluded (prohibitively expensive gate fee)**													
		€133.40	Gate fee only	N/A	[redacted]	10	€35.8	€67.13	€11.38	€11.38	2	€0.67	**€47.85**	**€79.18**	**€181.25**	**€212.58**

[1] Assumed £1=€0.86 / €1 = £1.16
[2] Port costs provided in SEK (Swedish Krona); assumed 1SEK=€0.1179 / €1=8.46SEK

Table 7: Evaluation outcome

Ref	Facility	Capacity score	Regulatory score	Contract duration score	Gate fee score (weighted)	Total 1[2]	Rank 1[2]	Gate fee plus transport (lower)	Total 2[3]	Rank 2[3]	Gate fee plus transport (upper)	Total 3[4]	Rank 3[4]
[redacted]													

[1] Gate fee provided is all inclusive therefore comparison is most appropriate when transport costs are included for other options.
[2] Gate fee and ranking with no consideration of transport costs (with the exception as specified in footnote 1).
[3] Gate fee and ranking with considering 'lower' transport costs (refer to Table 6).
[4] Gate fee and ranking with considering 'upper' transport costs (refer to Table 6).
[5] Excluded due to prohibitively high gate fee therefore transport costs not assessed; results assume €50 transport cost to ensure overall rank is appropriate.

3.3.4 Evaluation Outcome

The transport cost analysis reported in Table 6 considers the costs of alternative transport routes for EoI1, EoI5 and EoI6 to enable both existing commercial routes and chartered shipping to be considered. In each case the preferred option on a cost basis is indicated to be chartered shipping. Only the preferred option is considered in the evaluation in Table 7. Table 6 also presents 'lower' and 'upper' values for shipping costs and port charges due to the uncertainties described above, and overall lower and upper values.

Table 7 indicates that the preferred options to progress to the feasibility assessment are, in order of preference, EoI12, EoI10, EoI11 and EoI3. Ricardo-AEA suggests that, although the feasibility assessment was intended to consider 3 alternative options, that EoI3 be included. The reasons are set out in the following recommendations.

The analysis indicates that the inclusion of indicative transport costs has a relatively limited impact on results. One implication is that the order of the 3 highest ranked options changes, but not the options themselves, and that a clear gap appears between options 4 and 5 given the significant transport and handling costs associated with EoI15, which includes a transfer station.

Notably Jersey is ranked 16 of the 17 options. Jersey's reponse indicated a contract duration of '5 year renewable' was preferred. For consistency with the evaluation of all other options this was interpreted as 5-years contract duration and scored accordingly. Ricardo-AEA anticipates that the Jersey EfW would have 20-years design life remaining from 2014 but the response does not reflect this. Even if this criterion was allocated the maximum 20 points, the Jersey option would only rank 9 (excluding transport) or 12-14 (including transport lower and upper respectively).

3.4 Recommendations

Ricardo-AEA recommends options [redacted] progress to the feasibility assessment based on the evaluation outcome. Table 8 summarises the advantages and uncertainties of the preferred options to support this position. Including [redacted] allows the option with the lowest gate fee by some margin to be considered. Further, the evaluation scores indicate that the preferred 4 options are closely matched (within 6.5%); considering the level of assumptions and uncertainty in the analysis, the scores for the preferred 4 options could be considered sufficiently similar to justify the inclusion of all options.

Table 8 summarises a number of uncertainties in the assessment which could only be fully considered in the feasibility assessment. Once details are known it is conceivable that the order of the 4 preferred options might change, supporting the retention of [redacted]. Sensitivity analysis shows that if the maximum value in the large gate fee range indicated for [redacted] was applied in the analysis in place of the mean, the weighted score of [redacted] and [redacted] would be within 1.3 points. This supports the justification to retain [redacted].

A further potentially significant concern is the indication, however informal, that [redacted] no longer considers the site for which the response was made [redacted] to be their preferred option and that [redacted] may become the primary option, potentially in a multiple site solution that retains [redacted] This would duplicate (in part) [redacted] and would mean, assuming the 3 preferred options remain the same following any revised

scoring, that there is almost total reliance on the Dutch market for capacity. Again this suggests retaining [redacted].

Table 8: Analysis of indicative preferred options and recommendations

Ref	Option	Advantages	Uncertainties
[redacted]			

Ref	Option	Advantages	Uncertainties

4 Feasibility Study: Legislative Review

4.1 Legislative Review

4.1.1 Introduction

The following summarises legislation covering international movements of waste and the export and acceptance of waste from one jurisdiction to another. Aspects of the review have been prepared in discussion with Helen Shorey, the Crown Advocate, Drafting and Advisory Division of the Law Officers of the Crown, States of Guernsey ("the Crown Advocate"). This legislative review was initially included in the scope of the feasibility study however understanding controls on waste shipments is essential at the earliest stage to complete aspects of the market review, particularly the understanding of pre-treatment requirements.

Ricardo-AEA has considered the following documents in the preparation of this review:

- Ordinance I of 2002 The Transfrontier Shipment of Waste Ordinance, 2002 ("the 2002 Ordinance")
- Council Regulation (EEC) No 259/93 of 1 February 1993 on the supervision and control of shipments of waste within, into and out of the European Community ("Regulation 259/93")
- Regulation (EC) No 1013/2006 of the European Parliament and of the Council of 14 June 2006 on shipments of waste referred to as the Waste Shipments Regulation ("WSR")
- UK Plan for Shipments of Waste, May 2012, Defra ("the UK Plan")
- The Environment Department policy report in Billet D'État II, Wednesday, 25th January 2006 Section 7. Joint Facility with Jersey, p. 212 ("Billet D'État No. II of 2006")
- The Environment Department policy report in Billet D'État XIII, Wednesday, 26th July 2006 Section 26. Export of Waste, p. 1438 ("Billet D'État No. XIII of 2006")
- The Public Services Department policy report in Billet D'État IV, Tuesday, 21st February 2012 Section 7. Revised Waste Strategy, p. 427 ("Billet D'État No. IV of 2012")

Section 1.2.5 of this report introduces the regulation of waste exports, confirming that the UK's ratification of the Basel Convention has been extended to Guernsey and as such Guernsey is required to comply with its requirements. The 2002 Ordinance implemented Regulation 259/93 (as amended) in Guernsey with certain modifications, and established the States of Guernsey Board of Health (now the Health & Social Services Department) as Guernsey's competent authority of despatch and destination for the purposes of Regulation 259/93 (as amended) and established relevant powers, offences, and penalties.

4.1.2 Guernsey Policy Context

Billet D'État No. II of 2006 reviewed the option of export to Europe, reporting that in May 2005 the States had resolved to seek agreement over making appropriate requests to France and Germany to export municipal waste. Billet D'État No. II of 2006 identified that a strategy based on time limited export permissions had unacceptable risks in terms of the capital investment required to support the export route, where the export permissions had no guarantee of being renewed. For example, Billet D'État No. II of 2006 stated that the German and French equivalents of a duly motivated request had to be renewed annually.

Under WSR, export permissions are still time limited. WSR Article 9(4) states that a written consent to a planned shipment shall expire one calendar year after it is issued (or a later date as indicated in the notification document or an earlier date indicated by the competent authorities). In relation to pre-consented recovery facilities (refer to paragraph 4.1.6 and

Table *10*), WSR Article 14 (2) does however enable the period of consent to be extended up to 3 years in the case of general notification[28] by the competent authority of destination in agreement with the other competent authorities concerned. As such, in relation to shipments for recovery the limit is up to 3 years, not 1 year as was relevant to shipments to disposal in the context of Billet D'État No. II of 2006.

Billet D'État No. II of 2006 also stated that the procurement of on-island transfer facilities could not be approved in advance of a long-term waste management strategy and any interim export must rely on basic processing facilities.

Billet D'État No. II of 2006 reported that an advert was placed in the Official Journal of the European Community seeking expressions of interest to receive and dispose of Guernsey's waste up to the period 2010. No responses were received but the Environment Department continued to negotiate with European operators to take Guernsey's waste as a short-term waste disposal solution. To put this activity in context, the Environment Department had been directed to investigate the possibility of short term export to Europe and to report back to the States before entering into a contract; no agreement was progressed.

Billet D'État No. XIII of 2006 reported that SITA SNN was willing to import to France for landfill subject to permissions and was identified as preferred supplier. A preferred option was identified including baling, supported by shredding of larger items of C&I waste, and wrapping with container shipments.

Billet D'État No. XIII of 2006 also shows that export to the UK was explored but stated that on 16 May 2006 the Environment Agency refused a request by the States to export waste to England and Wales. The Agency stated that it was not satisfied that Guernsey's circumstances met the requirements of Article 19(3) of Regulation 259/93 (as amended), which was then in force, in that it had not been demonstrated that Guernsey cannot reasonably acquire the technical capacity and the necessary facilities in order to dispose of the waste in an environmentally sound manner. Further opinion is provided in Section 4.1.3.1 in relation to whether circumstances have changed since

[28] WSR Article 13 (general notification): *"1. The notifier may submit a general notification to cover several shipments if, in the case of each shipment: (a) the waste has essentially similar physical and chemical characteristics; and (b) the waste is shipped to the same consignee and the same facility; and (c) the route of the shipment as indicated in the notification document is the same."*

the Environment Agency's 2006 decision to refuse a DRR application, or whether the same outcome could be expected now.

Billet D'État No. XIII of 2006 also set out the views of the Policy Council and the Department on the Environment Department's recommendation for the States to approve the temporary export to France. The Policy Council considered the costs, risks and environmental disbenefits of the proposed waste export strategy outweighed the advantages of extending the life of Mont Cuet. The Department raised concerns, including the time limited nature of approvals; potential disruption or blockades in France; concern that, having refused a DMR, the UK might intervene to curtail the export; cost implications in terms of the interim export option taking a significant proportion of the budget for a potential long-term on-island solution; and the contradiction of a landfill solution with the States' environmental policy.

The Public Services Department concluded that baling and export was a 'very expensive and high risk strategy'. The States rejected the recommendation to approve such export for landfill when it considered the report on 27 July 2006.

Billet D'État No. IV of 2012 published the proposals for a revised waste strategy including export of genuinely residual waste. At this time Jersey had commissioned a new EfW facility, offering a local market and reducing or giving a better understanding of concerns reported in Billet D'État No. XIII of 2006.

As such, it appears the factors that were considered unacceptable risks in 2006 are no longer viewed as such compared to the risks and issues related to procuring on-island treatment, as determined during the intervening period. The States approved recycling targets consistent with option B, as detailed in Billet D'État No. IV of 2012, and directed the Public Services Department to pursue the option of export of residual waste. Billet D'État No. IV of 2012 focuses on the potential for export to Jersey but identifies that economies of scale, reducing treatment costs per tonne, may be realised with export to larger scale facilities and the cost of shipping is not necessarily the dominant cost. Billet D'État No. IV of 2012 also recognises that export for recovery may simplify the required permissions. This is a crucial point which is explored further later in this section.

4.1.3 Introduction to the WSR

The WSR is the overarching European Union legislation applicable to the export of waste. The WSR implements into EU law the Basel Convention and the Organisation for Economic Co-operation and Development (OECD) decision on Control of transboundary movements of waste destined for recovery operations[29].

The WSR sets three levels of control over movements of waste, specifically[30]:

- information requirements ('green list controls');
- notification procedure ('amber list controls'); and
- prohibition controls (export of hazardous waste and waste for disposal to countries to which the OECD Decision does not apply)

These controls depend on what the waste is, the destination country and whether the waste is destined for disposal or recovery. The WSR assigns classification codes to

[29] http://trade.ec.europa.eu/doclib/docs/2006/october/tradoc_130520.pdf
[30] Presentation on EU Legislation on Waste *"Workshop on EU Legislation – Waste – The EU Waste Shipment Regulation"*, 2011, European Commission.

different wastes and these are listed under a number of annexes. Exporters must determine in which annex the code that best describes the waste being moved appears, and in so doing take into account contamination or mixing of wastes that may make the material more hazardous, or prevent it being recovered in an environmentally sound manner.

Information requirements generally apply to movements of wastes in Annexes III and IIIA of WSR to EU and OECD countries for recovery and Annex IIIB to EU countries for recovery. Such movements do not generally require prior notification or consent.

Notification controls broadly apply to proposed movements of wastes in Annexes IV and IVA (no waste is listed in Annexe IVA at present). Such wastes must be pre-notified to the regulatory authorities in all countries concerned and prior written consent obtained before export. Wastes that do not have an appropriate code ('unassigned wastes') in Annex III, IIIA, IIIB, IV and IVA and are destined for recovery, such as RDF (refer to paragraph 4.1.3.2), are subject to notification controls.

Prohibition controls apply to, for example, exports of any wastes for disposal (with very limited exceptions) and exports of hazardous waste to economically developing (non-OECD) countries. Such controls also apply to mixed municipal waste classified under European Waste Catalogue (EWC) code 20 03 01. WSR Title II, Article 3(5) confirms:

> *"5. Shipments of mixed municipal waste (waste entry 20 03 01) collected from private households, including where such collection also covers waste from other producers, to recovery or disposal facilities shall… be subject to the same provisions as shipments of waste destined for disposal."*

4.1.3.1 Prohibition of Exports for Disposal (Including 20 03 01 to Recovery)

The UK Plan sets out UK Government policy in relation to shipments of waste for disposal to and from the UK. The UK Plan confirms that all shipments to and from the UK for disposal are prohibited, with a number of exceptions which are subject to the procedure of prior written notification and consent (reference WSR Articles 39 to 41).

A relevant exception is shipments of waste into the UK from a Party to the Basel Convention outside the EU (applies to Guernsey) where a UK competent authority has acceded to a DRR. In this case the country of dispatch must demonstrate that it does not have and cannot reasonably acquire the technical capacity and the necessary facilities to dispose of waste in an environmentally sound manner. This is not considered to apply to municipal waste from Guernsey; however the following is relevant.

Explanatory note Paragraph 38 of the UK Plan clarifies the criteria for assessing DRRs. Even if the country of dispatch has the resources available to reasonably acquire facilities to dispose of the waste in an environmentally sound manner, as is the case in Guernsey, the assessment should consider whether it is likely to be in a position to acquire such facilities in the short to medium term. It may be relevant that Mont Cuet landfill has limited remaining void space and further that it is unlined and may therefore be considered unsuitable to ensure that waste is disposed in an environmentally sound manner. In addition, void space is required in the long term to continue the disposal of certain hazardous wastes (e.g. asbestos and clinical waste incinerator ash) in an environmentally sound manner to avoid their export to a UK hazardous waste facility and the export of municipal waste protects this capacity.

Specifically, WSR Article 49 specifies additional obligations in relation to the protection of the environment, which although not specifically referenced in Article 41(4), might reasonably be expected to be considered in the DRR decision. Article 49 states (emphasis added):

> *"1. The producer, the notifier and other undertakings involved in a shipment of waste and/or its recovery or disposal shall take the necessary steps to ensure that any waste they ship is managed without endangering human health and in an environmentally sound manner throughout the period of shipment and during its recovery and disposal. In particular, when the shipment takes place in the Community, the requirements of Article 4 of Directive 2006/12/EC and other Community legislation on waste shall be respected."*

Directive 2006/12/EC (the Waste Framework Directive) was repealed on 12 December 2012 by Directive 2008/98/EC (the revised Waste Framework Directive). Article 13 (Protection of human health and the environment) of the revised Directive corresponds to Article 4 of the repealed Directive, and states:

> *"Member States shall take the necessary measures to ensure that waste management is carried out without endangering human health, without harming the environment and, in particular:*
>
> *(a) without risk to water, air, soil, plants or animals;*
>
> *(b) without causing a nuisance through noise or odours; and*
>
> *(c) without adversely affecting the countryside or places of special interest."*

Under the UK Plan, the UK competent authority also needs to consider whether present and predicted waste arisings are sufficient for such facilities to be economically viable. It is not clear whether this might apply to Guernsey with a predicted 28,000 tonnes of waste per year, which may fall below 20,000 tonnes per year as the revised waste strategy is implemented.

Paragraph 37 of the UK Plan however provides guidance to UK competent authorities in considering DRRs, stating all countries have the resources to acquire facilities to dispose of non-hazardous waste. The UK Plan indicates that the DRR decision should therefore take account of whether the import is destined for a specialised disposal technology, being high temperature incineration (HTI) or specialist landfill and, as this is not the case, this may be an obstacle to a DRR decision.

Guernsey may also be considered an OECD Decision country (refer to paragraph 4.1.5.2), and Paragraph 34 of UK Plan states:

> *"Given their level of economic development, it is unlikely that a DRR would be submitted by an OECD Decision country or an EFTA* [European Free Trade Association] *country or accepted by a UK competent authority."*

In addition, Paragraph 35 indicates that the presence of the Jersey facility is likely to be an obstacle to a DRR decision:

> *"…in support of the principle of proximity in the disposal of waste, waste should not be shipped to the UK for disposal from OECD Decision countries outside the EU or EFTA* [applies to Guernsey] *where there are appropriate facilities closer to the country of dispatch."*

Whilst this refers to the UK Plan, the principles of self-sufficiency and proximity are set out in the WFD and therefore apply to all MS. WSR Article 11(1)(a) confirms that grounds to object to a shipment of waste for disposal include that it would not be in accordance with the principles of proximity or self-sufficiency, in accordance with WFD.

On balance it appears unlikely that Guernsey would have a DRR request accepted and there is a precedent for a DRR being refused by the Environment Agency in 2006. Even if a DRR were accepted the option of export to landfill disposal is likely to be prohibitively expensive compared to continued short term disposal at Mont Cuet and the most cost effective solution is likely to be export to recovery. Disposal of municipal waste may become relevant in the context of the revised waste strategy if the pre-treatment of waste prior to export gives rise to reject fractions (e.g. organic fines) that require disposal (refer to Table 9). Further opinion is provided in Box 1.

Box 1: Opinion on DRR Decisions for MSW Disposal

Communication with the Environment Agency's International Waste Shipments Team on 29 January 2013 indicates that the Agency's position has not changed in relation to waste exported from Guernsey for disposal, as opposed to recovery.

Ricardo-AEA enquired into the potential for the Agency to accede to a DRR for the shipment of municipal waste from Guernsey to England or Wales for disposal where:

- the on-island solution is limited to landfill disposal at Mont Cuet, which has limited capacity and is unlined [does not have the facilities to deal with the wastes in an environmentally sound manner];
- arisings are circa 20,000 tonnes per annum or less [new facilities may not be economically viable]; and
- landfill capacity cannot be extended and any on-island thermal treatment facility would not be expected to meet the R1 recovery criterion [not in a position to acquire facilities to dispose of the waste in an environmentally sound manner in the short to medium term]

The Agency stated (refer also to paragraph 4.1.3.1) that a DRR for disposal would most likely be rejected. The Agency further stated that a DRR would not be acceded to on the basis that the remaining landfill facility needs to be reserved as contingency; the fact that landfill capacity exists at that point in time means that a DRR would not be acceded to and furthermore the States should be seeking a recovery route to divert the waste from landfill.

The Agency confirmed this as the reason that a further DRR request in 2010/11 was rejected in relation to municipal waste. The Agency considered that a DRR on that basis would not be consistent with the principles set out in WSR Article 11(1)(a); including in relation to proximity with the availability of facilities in Jersey and France.

4.1.3.2 UK Crown Dependencies and WSR

Annex B of the UK Plan confirms that for the purpose of WSR, UK Crown Dependencies are regarded as independent countries outside the EU, or 'third parties'. The UK Plan confirms that the UK has extended its ratification of the Basel Convention to the Bailiwick of Guernsey and therefore Guernsey may use the DRR procedure in respect of the shipment of waste for disposal, which Guernsey already does for hazardous waste that cannot be managed locally.

4.1.4 RDF Classification

Guernsey's residual waste as collected is appropriately classified under EWC code 20 03 01 (mixed municipal waste). The WSR lists mixed municipal waste, coded Y46 'waste collected from households that is not appropriately classified under a single entry in Annex III' (where Annex III is green list waste) under:

- Annex IV ('Amber' listed waste subject to prior notification and consent), Part 1; wastes listed in Annexes II and VIII to the Basel Convention, where:
  - Annex VIII to the Basel Convention is listed in WSR in Annex V, Part 1, List A (see below); and
  - Annex II to the Basel Convention contains entry Y46: waste collected from households unless appropriately classified under a single entry in Annex III
- Annex V, Part 3, List A; waste subject to the export prohibition in Article 36, i.e. exports to non-OECD Decision countries.

Mixed municipal waste can be treated such that it can be considered RDF. RDF (including SRF meeting a specification) is classified under EWC code 19 12 10 'combustible waste (refuse derived fuel)'. WSR lists 19 12 10 in Annex V, Part 2. If mixed municipal waste is treated but not considered RDF it may be most appropriately classified under EWC code 19 12 12 (other wastes (including mixtures of materials) from mechanical treatment of wastes other than containing dangerous substances). WSR also lists 19 12 12 in Annex V, Part 2.

In summary, WSR Annex V confirms the export prohibition in Article 36 WSR applies to waste classified under:

- Part 1, List A (hazardous waste listed in Annex VIII to the Basel Convention);
- Part 2, where designated hazardous or where not designated hazardous if the waste is contaminated to the extent that it is appropriately classified hazardous or that it prevents its recovery in an environmentally sound manner; and
- Part 3, List A (Annex II to the Basel Convention), including Y46 waste collected from households.

Therefore in relation to the EWC codes of interest for mixed municipal waste and RDF:

- 19 12 10/12 are listed in Annex V, Part 2 and are not designated hazardous therefore the export prohibition does not apply (other than if hazardous due to contamination); and
- 20 03 01 (Y46) is listed in Part 3 therefore the export prohibition applies in relation to exports to non-OECD Decision countries

As what constitutes RDF is not defined in any specification (refer to paragraph 2.5.2), it is unclear what minimum level of treatment is necessary to justify a reclassification of the waste from EWC code 20 03 01 to EWC code 19 12 10/12.

European Commission guidance ("EC 2012")[31] confirms in relation to waste that originates from households and is subsequently treated sufficiently to code it under EWC chapter 19 (e.g. RDF):

> *"By referring to Part 3, List A of Annex V of the WSR a view can be taken that waste remains Y46 unless it can be appropriately classified under a single entry in Annex III... It follows that although waste has moved from 20 03 01 to a Chapter 19 code it can remain Y46 and subject to the export prohibition to non-OECD countries in Article 36 (1)(b)… while energy can be recovered from RDF in the appropriately licensed and controlled facilities in the EU and the OECD, we are less certain of standards in non-OECD countries."*

Therefore regardless of the level of pre-treatment carried out, mixed waste, or RDF derived from it, is Amber list waste and subject to prior notification and consent whether it is destined for disposal or recovery. RDF is not however referenced in Title II, Article 3(5) WSR (refer to paragraph 4.1.3) and, if destined for recovery, is not therefore clearly required to be subject to the same provisions as shipments of waste destined for disposal.

4.1.4.1 Opinion on what Constitutes RDF

It is essential to determine with as much certainty as possible the point at which waste can be considered sufficiently treated to be classified as RDF. Tolvik 2011[32] reported that an Environment Agency position statement in relation to RDF, available in May 2011 but subsequently withdrawn, stated (emphasis added):

> *"RDF production is forecast to increase significantly… there is currently not enough suitably authorised capacity to make use of additional RDF. We have been asked to give a view on storing, importing and exporting RDF whilst the market develops additional capacity.*
>
> *We will not object to import or export of RDF as a short-term market solution when this is for legitimate recovery purposes. In addition to compliance with shipment rules and facility permits we would expect the importer/exporter to use Best Available Techniques (BAT) in transport, handling and energy recovery processes".*[33]

The withdrawn position statement does not define RDF and places responsibility on exporters to demonstrate that they are producing RDF. The position indicates a light touch regulatory position and indicates mixed waste could be subject to minimal treatment before being described as RDF (although it may be relevant that the context is 'a short-term market solution'). Tolvik 2011 also reported that the Agency referred in correspondence to the EWC definition of RDF as a benchmark, specifically that the

[31] *Assessment and guidance for the implementation of EU waste legislation in Member States: Report on the Experience gained with the Helpdesk for Questions related to the WSR*, Reference: ENV.G.4/SER/2009/0027, 10 January 2012, European Commission (page 49 question R) http://ec.europa.eu/environment/waste/shipments/pdf/report_helpdesk_forum.pdf

[32] *2011 Briefing Report: UK Waste Exports: Opportunity or Threat?*, June 2011, Tolvik Consulting Ltd

[33] The proximity principle does not apply in relation to exports for recovery therefore more proximate facilities that do not represent BAT need not be considered.

waste should have undergone some sort of mechanical or physical treatment such as shredding, sorting and compaction[34].

Recital 33 of the revised Waste Framework Directive (2008/98/EC) however suggests a clear intention that the waste should have been 'substantially altered':

> *"For the purposes of applying Regulation… 1013/2006… mixed municipal waste as referred to in Article 3(5) of that Regulation remains mixed municipal waste even when it has been subject to a waste treatment operation that has not substantially altered its properties."*

There does not appear to be a legal definition of 'substantially altered' therefore the following paragraphs describe opinion in relation to what processing might be required to 'substantially alter' the properties of mixed municipal waste.

WFD Article 3 paragraph 14 defines treatment as recovery or disposal operations, including preparation prior to recovery or disposal. Recovery operations are defined in Annex II including R1 'use principally as a fuel or other means to generate energy'. Treatment that facilitates the use of waste primarily as a fuel whilst substantially changing its characteristics is therefore required. Requirements in relation to the receiving facility are addressed below.

RDF is not legally defined and the level of treatment required to alter the description of waste from untreated or mixed waste to RDF is not defined in any specifications. The level of treatment may be best defined in terms of the specific market and the quality acceptable to the receiving facility. The level of treatment required may vary significantly; for example to generate RDF with the characteristics suitable for combustion in a cement kiln is likely to be less challenging than generating RDF for gasification. Even if the market for Guernsey is limited to conventional incineration processes, the quality requirements of individual plants are likely to vary.

The Irish Environmental Protection Agency (EPA) prepared an opinion to clarify when the properties of the waste have been substantially altered[35] ("EPA 2012"). EPA 2012 noted that UK competent authorities do not prescribe the level of treatment required but do make clear that the waste must have undergone some sort of treatment in a waste management facility, which may comprise mere physical treatment, but that this position is subject to review.

EPA 2012 interpreted WSR to mean that the point of re-classification of Y46 waste is when it is appropriately classified under a single entry in Annex III, which is not the case when the waste only undergoes rudimentary or basic treatment, for example separation of large items followed by baling. EPA 2012 interpreted EC 2012 to determine what pre-treatment is necessary to justify reclassification to 19 12 10/12; the conclusions of EPA 2012 are summarised in Table 9.

[34] Commission Decision 2000/532/EC describes wastes listed under chapter heading 19 12 as "*wastes from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified*".

[35] *EWC classification of mixed municipal waste exiting waste management facilities*, October 2012, Office of Environmental Enforcement, Environmental Protection Agency.

Table 9: Guidance on pre-treatment to 'substantially alter' properties of the waste

Ref	Description of pre-treatment process	Substantially alters the properties of the waste? (Yes/No)
1	Baling/compaction of waste only	No
2	Removal of large/bulky items followed by baling/compaction	No
3	Removal of large/bulky items followed by screening to produce oversize and fines residues combined with other processes including magnets, manual picking, blowers, wind-shifters, eddy currents etc.	Yes (residues have undergone significant treatment to substantially alter their properties)
4	Mechanical separation, blending and compressing to increase CV and produce RDF/SRF; range of possible techniques but the key being that CV is increased	Yes (needs to demonstrate increase in CV between inputs and outputs with regular sampling and testing)

EPA 2012 also sought to identify when 19 12 12 becomes 19 12 10 (RDF) in cases where SRF meeting the CEN specification is not being produced. EPA 2012 suggested that to classify waste as 19 12 10 a waste operator should be able to meet and demonstrate compliance with a customer specification through effective sampling procedures.

4.1.4.2 Recovery or Disposal

Whether MSW or WDF is considered to be exported for recovery or disposal is dependent on the classification of the receiving facility under WFD Annex II. In relation to EfW facilities, the relevant classification is R1 'use principally as a fuel or other means to generate energy'.

EfW facilities can be classified as recovery operations provided they achieve a defined threshold of energy efficiency. Consequently waste treated in the facility is then considered to have been recovered. Environment Agency guidance[36] states that EfW facilities dedicated to treating MSW must meet or exceed an energy recovery threshold to be defined as a recovery (R1) operation. The R1 formula calculates the energy efficiency of the EfW facility and expresses it as a factor. It calculates the total energy produced as a proportion of the energy of the fuel (both traditional fuels and waste) being incinerated in the plant.

The energy recovery threshold for plants which commenced operation prior to the end of 2008 is 0.6 and for plants which commenced operation thereafter is 0.65. Plants processing only SRF or RDF will be considered within the scope of the formula when at least 50% of the waste being processed is derived from MSW and the plant is technically capable of incinerating mixed MSW, including following pre-treatment e.g. to recover dry recyclables.

[36] http://www.environment-agency.gov.uk/business/regulation/129303.aspx

Commission guidance[37] confirms in relation to R1 status in the context of transboundary shipments (emphasis added):

> *"The operator of a MSWI* [MSW incineration] *plant with R1 classification has to communicate the status of his plant to his clients by means of appropriate documentation (official certificate). In case of doubts, the competent authority can be asked for confirmation by other involved authorities and potential economic partners. A valid permit is a prerequisite for transboundary movement. The procedural requirements of the Waste Shipment Regulation should apply for MSWI with R1 classification as for any other facility."*

Plants which do not achieve recovery status will be classified as disposal operations (D10 in WFD Annex 1).

4.1.5 Legislative Controls and Application to Guernsey

4.1.5.1 The 2002 Ordinance

Billet D'État No. IV of 2012, page 438, refers to Appendix 14, a letter from the Director of Environmental Health, Health & Social Services Department, which summarises Guernsey's regulatory position with regards to waste exports. The letter confirms that the 2002 Ordinance prohibits the export of waste for disposal except to MS or to EFTA members provided they are also Basel signatories. Article 3 (1) of the Schedule to the 2002 Ordinance states:

> *"All exports of waste for disposal shall be prohibited, except those to EFTA countries or MSEU which are also parties to the Basle* [sic] *Convention."*

This prohibits the export of waste to Jersey for disposal. Jersey adopted legislative controls under Article 4 of the Basel Convention through The Waste Management (Jersey) Law, 2005 and the UK extended its ratification of the Basel Convention to Jersey on 14 September 2007.

Exports from Guernsey to Jersey for disposal remain prohibited under the 2002 Ordinance, which does not yet reflect Jersey's more recent ability to conduct bilateral agreements under the Basel Convention that could potentially facilitate exports from Guernsey to disposal.

Articles 5 and 6 of the Schedule to the 2002 Ordinance sets out the controls under which the export of waste for recovery to countries to which the OECD Decision applies is permitted.

4.1.5.2 OECD Decision Country or Basel Party

WSR Article 43 permits imports of waste for recovery to the EC from countries:

- to which 1(a) the OECD Decision applies; or
- that are 1(b) Parties to the Basel Convention

[37] *Guidelines on the Interpretation of the R1 Energy Efficiency Formula for Incineration Facilities Dedicated to the Processing of Municipal Solid Waste According to Annex II of Directive 2008/98/EC on Waste*, not legally binding, June 2011, European Commission Directorate-General Environment

If Guernsey is considered a non-OECD Decision country, Article 45 and consequently Article 42 and Title II, as modified by Article 42, apply.

If Guernsey is an OECD Decision country, Article 44 and consequently Title II, as modified by Article 44, apply.

Therefore, regardless whether Article 44 or 45 applies to Guernsey, Title II (Articles 3 to 33) applies. Whether Guernsey is treated as a Basel Party or an OECD Country is relevant to the WSR requirements that apply and the detailed requirements are assessed in Box 2.

4.1.6 Reasoned Objections

WSR paragraph (14) specifies that competent authorities can raise reasoned objections to shipments of waste destined for disposal (Article 11) or waste not listed in Annex III, IIIA or IIIB and destined for recovery (Article 12). Therefore, whether the shipment is of untreated waste or RDF, it appears open to objection.

WSR Article 14 provides that the competent authorities of destination which have jurisdiction over specific recovery facilities may decide to issue pre-consents to such facilities. Pre-consented facilities for Y46 waste are shown in

Table *10* derived from OECD information[38]. This means that the authority of destination will not raise objections concerning shipments of certain types of waste to the facility, and as a consequence the time limit for objections by the authorities of dispatch and transit is shortened to 7 working days.

WSR Article 14(2) states that where a general notification to cover several shipments is given, the consent to export may be extended up to 3 years, instead of the normal 1 year, by the competent authority of destination in agreement with the other competent authorities concerned (refer also to section 4.1.2).

Box 2: RDF Exports for Recovery: OECD Decision Country or Basel Party

The States of Guernsey website states:

> "*The convention founding the OECD is extended to the island and decisions recommendations and agreements apply to the same extent as they do to the UK.*"

Advice from the Crown Advocate confirms the OECD Decision applies to Guernsey. This is based in particular on a 1990 UK Government declaration which clarified that the OECD Convention and decisions made under it (including the OECD Decision) extend to Guernsey. This position was confirmed by Defra to the Crown Advocate in correspondence dated 25 February 2013 stating that Defra considers that Guernsey and Jersey are OECD countries for the purposes of the WSR based on a Communication by the Ambassador of the United Kingdom in France to the French Minister of Foreign Affairs dated 20 July 1990 [C(90)124].

Consistent with its obligations under the OECD Convention, Guernsey enacted the 2002 Ordinance which implements the OECD Decision through implementation of Regulation 259/93 (as amended) (refer to section 1.2.5).

The Crown Advocate also indicated that in 2004 a Defra policy advisor stated that Guernsey would be treated, for the purposes of WSR, as a Basel Party and not as

[38] http://www2.oecd.org/waste/Countries.asp?q=71 Last accessed 29 January 2013.

an OECD Decision country. This indication appears to have been erroneous. The implications of Guernsey's status as an OECD Country in relation to exports for recovery are set out below.

Implications of Guernsey being an OECD Country (WSR Article 44 applies)

- Title II applies, adapted by Article 44(2) and (3) and consequently Article 42(3) (b), (c) and (d). These requirements all relate to 'administrative' requirements in relation to e.g. providing documents to HMRC and do not appear significant, namely:
  - 44(2)(a) consent required by Article 9 may be provided as tacit consent from the competent authority of despatch outside the Community (apparent simplification of requirement to provide written consent);
  - 44(2)(b) notification required by Article 4 may be submitted by the notifier (apparent simplification of requirement to provide notification through the competent authority of despatch);
  - 42(3)(b) competent authorities of destination and, where appropriate, transit shall send a stamped copy of their consent decisions to the customs office of entry into the Community (no impact on the States);
  - 42(3)(c) a copy of the movement document shall be delivered by the carrier to the customs office of entry into the Community (no impact on the States); and
  - 42(3)(d) the customs office of entry into the Community shall send a stamped copy of the movement document to the relevant competent authorities (no impact on the States)
- Article 44 additionally requires that: 44(4)(a) all consents have been received by the notifier and any conditions met; 44(4)(b) a contract is in place and in effect between notifier and consignee; 44(4)(c) a financial guarantee or equivalent insurance is in place and in effect; and 44(4)(d) 'environmentally sound management is ensured'. These requirements are considered normal and not onerous.

If Guernsey were considered a Basel Party, WSR Article 45 would apply; Article 42 would apply in full and the requirements of Title II would apply in full as adapted by Article 42(2) and (3). The adaptations to Title II made by Article 44(2) would not apply and as such the requirements of Article 9 and Article 4 would apply in full. The following explains that not being considered a Basel Party for the purposes of WSR appears to have minimal impact.

The adaptation to Article 9 appears to simplify the requirements for the country of dispatch (Guernsey) by allowing tacit consent rather than written consent in the form of a notification document. There does not appear to be any further change to Article 9, for example submission of decisions and timescales for objections relevant to the competent authorities of transit and destination. This appears therefore to have minimal impact. The adaptation to Article 4 appears to allow the notifier to submit prior written notification without going through the competent authority of dispatch. There is otherwise no change to Article 4. This may reduce bureaucracy between States Departments but again appears to have minimal impact.

If the waste being exported is not considered RDF and consequently the same controls are required as shipments to disposal, there may be implications depending

on whether Guernsey is considered an OECD Decision country (refer to paragraph 4.1.3.1). This is not however considered further as the analysis in this document sets out that the export will be based on RDF to a recovery market.

Table 10: Pre-consented Facilities Y46 Waste Collected from Households (from OECD)

Country	Competent authority	Recovery facility	To	Quantity (tpa)
Netherlands	Agentschap NL	Afval en Energie Bedrijf	8/4/2020	Not stated
		AVR Afvalverwerking B.V., locatie Duiven	18/12/2022	Not stated
		NV Afvalverbranding Zuid-Nederland	29/3/2022	Not stated
		Twence BV	23/3/2021	Not stated
Sweden	Swedish Environmental Protection Agency	Bodens Energi AB	31/12/2020	Not stated
		Sydskånes Avfallsaktiebolag (SYSAV)	31/12/2019	160,000
		Tekniska Verken i Linköping AB, Gärdstadverket	31/12/2020	100,000
		Vattenfall AB Heat Nordic Uppsala	31/12/2019	Not stated

4.1.7 Summary

- The export prohibition under WSR applies to shipments of mixed municipal waste classified under EWC 20 03 01 (Y46) whether destined for disposal or recovery.
- Exports to Jersey need not comply with WSR as both Guernsey and Jersey are outside the EU. The 2002 Ordinance prohibits the export of waste for disposal except to MS or to EFTA members provided they are also Basel signatories; this therefore prohibits the export of waste to Jersey for disposal. The 2002 Ordinance does not prohibit the export of waste for recovery, which is relevant for exports to Jersey as its EfW facility meets the R1 recovery criterion.
- Imports of waste to MS for disposal are prohibited subject to limited exceptions. The exception in relation to shipments to a MS from a Party to the Basel Convention outside the EU (applies to Guernsey) where the country of dispatch does not have and cannot reasonably acquire the technical capacity and the necessary facilities to dispose of waste in an environmentally sound manner, is considered unlikely to apply to shipments of mixed municipal waste for disposal from Guernsey.
- The export prohibition does not apply to shipments of RDF classified under EWC 19 12 10/12 following appropriate treatment to substantially alter its

properties however there is no Commission guidance in relation to what amounts to such treatment.

- Notification controls apply to unassigned wastes (e.g. RDF) that are destined for recovery, for example RDF exported to EfW facilities that are defined as a recovery (R1) operation.
- There do not appear to be any significant implications of Guernsey being treated as an OECD Decision country or a Basel Party for the purposes of WSR in relation to RDF export for recovery.
- In the case of pre-consented recovery facilities, where a general notification to cover several shipments is given, the consent to export may be extended up to 3 years instead of the normal 1 year.

Appendix 1: Outcome of Consultation with Guernsey Harbours

Guernsey Waste Strategy – Meeting Regarding Export of Waste Logistics, 27/02/13

Location: Harbour Offices

Attendees: Peter Gill – Harbour Master
Tony Pattimore – Deputy Harbour Master
Rob Roussel – Senior Project Manager, PSD

Meeting notes, Wednesday 27 February 2013, 15:30 – 16:30.

Options for the export of Guernsey's residual waste to an off-island Energy from Waste facility were discussed. Whatever the solution, waste is expected to be pre-processed and baled prior to shipment. Exports of waste from Guernsey would be controlled by the Environmental Pollution (Guernsey) Law 2004, and the Transfrontier Shipment of Waste Ordinance 2002.

Two harbour routes – St Peter Port and St Sampson's.

St Peter Port Harbour

St Peter Port Harbour's activity focuses on ferry passenger movements, import/export of freight, local and visiting recreational boating, commercial fishing, and cruise ship transfers. Ro-Ro and Lo-Lo options are available.

1. Ro-Ro (Maximum size = Commodore Goodwill)

It would only be practical to export using the Commodore Goodwill, operated by Condor Ferries – early morning loading (Depart Guernsey 04:00, Arrive Jersey 06:00). Use of the Commodore Clipper at 17:30, (a Ro-Pax ship) would soon be shown to be inappropriate.

'Round Robin' service – Guernsey → Jersey → Portsmouth → Guernsey.

Full containers would be shipped to Jersey, with empty containers coming back via Portsmouth over night. The carrier would need to have adequate containers to allow for this.

One of the benefits of this option is that it uses existing freight services. Regular shipments of waste (based on 30,000 tonnes of residual waste there would be an estimated 200 shipping movements per year (i.e. 4/week), resulting in 15 vehicle movements per shipment (assuming 10 tonnes per vehicle movement), limiting the requirement for on-island storage of waste associated with the waste processing facility.

Issues:

- Limited storage space at St Peter Port Harbour:
  - Storage prior to shipping at the Harbour is a concern – there is very limited space. The nature of the containers and how the waste is loaded into containers will affect this.

  - Export through St Peter Port will require a fleet of 'Prime Movers' (Tractor Units) and Trailers to transport waste from Longue Hougue to the terminal at the time of loading. Existing 'Prime Movers' on the Island are fully utilised with limited spare capacity – this may require the States/haulage contractor to invest in new vehicles.

- Environmental Concerns with Storage:
  - leakage from containers,
  - odours,
  - vermin

  Measures would need to be taken to eliminate these issues – baling and containerising waste may achieve this (additional cost). Seals on containers do not last – problems have been experienced with Alderney's waste coming into Guernsey.
- 'Gateway to Guernsey' issue – concern regarding shipping waste adjacent to a passenger terminal and alongside cruise ship transfers.
- Only one operator for Ro-Ro – lack of competition, likely to pay a premium for this service, which is already a higher cost per movement than Lo-Lo alternatives.
- Health & Safety Issues/Environmental Controls required for shipping.

2. Lo-Lo

More alternatives with other operators (Channel Seaways, Huelin Renouf, Sark Shipping), but the issues relating to Ro-Ro are similar. Guernsey Stevedores Limited should be consulted.

Advantage: HSPP is operational and available 24/7/365 for Lo-Lo vessels of drafts 4.5 m and 85m in length.

Cost comparison – costs for Lo-Lo are lower than costs for Ro-Ro.

St Sampson's Harbour

St Sampson's Harbour focuses on bulk shipments (solid bulk, aggregates, and fuel) and local recreational boating. North Pier has Lo-Lo facilities, although limited to 7 tonnes per lift.

Bulk shipment of baled waste is possible from the North Pier using existing facilities (cranes may require some minor modification). Bulk shipments of 2,000 – 2,500 tonnes per shipment are anticipated, resulting in approximately 10 to 12 shipments/year. Potential to store waste prior to shipment at Griffith's yard (storage of waste in Jersey is an issue, restricting options for bulk exports).

It may be possible to collect Alderney's waste on the outward journey, as long as it is pre-processed and baled appropriately.

Issues:

- Harbour restrictions – NAABSA (Not Always Afloat But Safe Aground capable) (drying out). Maximum length 79.25m, twin screw, bow thrusters. This type of bulk carrier is relatively standard, and vessel size restrictions should not pose an issue for shipments of the anticipated volume. Purchase/charter/ waste industry operator options would all be feasible. The best option is for an existing waste carrier to collect waste from Guernsey. May incur additional 'dead leg' costs due to coming to Guernsey empty,

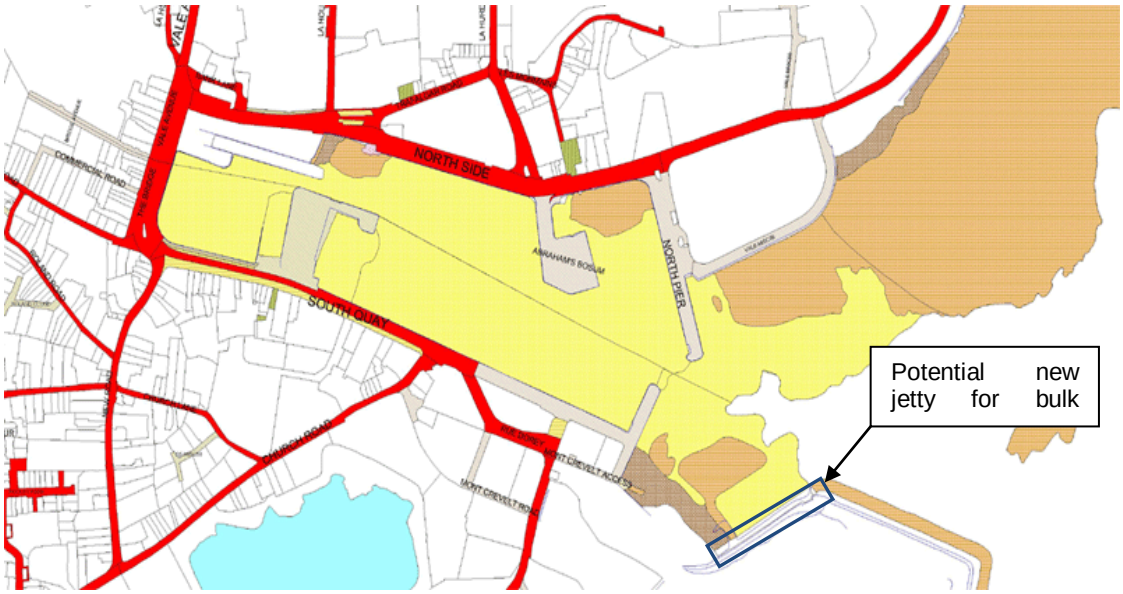
although these are accounted for in standard term charter arrangements. Costs would be included in the business case.

- Tidal restrictions – harbour dries out. Entry to the harbour is less of an issue if coming in empty. Exiting full may need to avoid neap tides. (See harbour criteria document for details).
- Shipping to Northern Europe is likely to be a 4-5 day round trip.
- Road transport issues delivering waste to the North Pier from Longue Hougue via The Bridge.

St Sampson's Harbour – alternative option

Develop new, possibly piled jetty adjacent to Longue Hougue outside the harbour (same location as used by Lagan for the importation of aggregates for the Airport project (see map below)). Suggested 20ft width extension to existing pier, fill in gap created to enable access to Longue Hougue lagoon.

Note: the moorings in the Longue Hougue Lagoon are no longer useable, and Land Reclamation activities need no longer take this into consideration.



Benefits:

- No road transportation of waste is required as the new jetty is linked directly to Longue Hougue (the transportation cost savings may offset the construction costs of the jetty over the life of the strategy – further investigation required. Construction costs of new jetty estimated at £2mil).
- Loading of baled waste using mobile plant fitted with grabs (similar plant required at Longue Hougue facility).
- Fewer restrictions on access compared with existing harbour, though this option would still dry out at 2.1m. The ability to maintain a NAABSA berth in regular use at such depth would have to be determined.
- Potential development partnership opportunity with other bulk shipping operators (e.g. Ronez).

- Dedicated jetty and plant may avoid/minimise harbour dues and crane dues.
- Conforms with the Ports Master Plan – transfer of heavy commercial activities to St Sampson's harbour in the longer term.

Summary

Existing services and facilities at St Peter Port and St Sampson's could accommodate the export of the Island's residual waste; however there are storage issues (among others) at St Peter Port which means waste would require delivery to the quay at the time of export.

Guernsey Harbours' preferred option for exporting Guernsey's waste would be through utilising a new berth at the northern end of Longue Hougue Reclamation site. In the short term, shipments could be made using existing craneage from North Side St Sampson's Harbour or from South Side using new craneage.

Rob Roussel, 27 February 2013

Appendix 2: Outcomes of Industry Day, 12 September 2012

1. Introduction

An industry day was held to seek the view of potentially interested parties in relation to the potential long term export of waste or RDF from Guernsey. In attendance were Colette Falla, Deputy Chief Officer and Rob Roussel, Senior Project Manager from the Public Services Department and Phil White, Technical Director from Ricardo-AEA.

The following table confirms the involved industry parties. This paper presents a summary of the overall findings, with recommendations in relation to the procurement approach, followed by detailed notes from each discussion.

Organisation	Name	Position
Stobart Biomass	Piers Harden	Biomass Manager
	Charlie Jones	Commercial Director
SITA UK	Peter Marshall	Special Projects (Alternative Fuels)
The Road Haulage Association	Nick Deal	Manager Logistics Development (Secretary to Waste Management Group)
Dutch Recycling	Robert Corijn	International Business Development
GemiNor	Atle Marøen	Sales & Purchasing Manager UK
FCC	Paul Dumpleton	Regional Business Manager
Ecomondis*	Ciaran Cotter	Business Development Manager
	David Walsh	International Commercial Manager

* By subsequent telephone conference and correspondence

2. Summary

- **Interest in transport only.** Three (all also being interested in transport and treatment).
- **Interest in transport and treatment.** Six (including 1 with a preference for treatment only that could use a third party to organise transport).
- **Technology.** Only EfW discussed, i.e. no suggestions for ACT, MBT or cement kilns (Ecomondis' core work is SRF to cement kilns but they confirm RDF to EfW is the right solution). One advised against fluidised bed EfW due to technical risk.
- **Contingency.** One specifically mentioned contractor provides; one placed this risk on the authority; one identified capacity at receiving plant as shared risk. Highly dependent on bidder and sites involved in solution including if sites in bidder ownership.
- **Geography.** France and Benelux is relevant if restricted to current export routes but strong indication Scandinavia should be included due to capacity growth. Individual parties had preference for (one each): UK; France and Benelux;

Holland; Holland and Scandinavia; Holland, Germany, Estonia and Scandinavia; Holland, Germany and Scandinavia (although stating latter currently not price competitive). Different countries but consensus that this is a commercial decision.

- **Pre-treatment for RDF.** Consensus minimum requirement is shredding (suggestions were <500 mm or <300 mm; <200 mm; and <150 mm) and metal and inert separation. Three raised caution over fines regarding penalties from the EfW; future RDF quality requirements ('future-proofing'); degradation from organics; and to demonstrate appropriate treatment. Individual parties also mentioned (one each): remove recyclables and hazardous; remove gypsum and hazardous.
- **Presenting the waste.** Strong consensus baled with plastic ties and wrapped e.g. gives storage time to build-up shipping load. Individual parties (one each) stated baling depends on the market or shipping company preference. Loose is possible and may depend on market, specifically need for storage.
- **Transport.** Two prefer dedicated shipping; a third stating dedicated ships vs. trucks depends on economics. Trucks or containers both mentioned, one stating containers would only be suitable when back loading is possible. Three said if baling, trucks would be used. One said depends on receiving site e.g. storage/bunker capacity.
- **Contract term.** No clear consensus. One was entirely flexible, stating term depends on security of the off-take. Others stated the longer the better for hauliers and to define a gate fee, however two stated shorter would be beneficial to Guernsey (and bidder) with the market changing to benefit sellers. Parties mentioned (one each); 3-5 years; 5-7 years, 5-10 years, 15-20 years. Important mention of a break clause if the export permission is withdrawn.
- **Information required.** Consensus for composition (envelope), CV and future tonnage. No mention of e.g. ash or moisture limits or limits on specific components e.g. chlorine.
- **GMT.** Three stated GMT required; two of these suggesting 20Ktpa. Three asked for tonnage predictability 1-year ahead; one stated they would require exclusivity.
- **CV (MJ/kg).** Two mentioned specific CV ranges, being 8-15 and 10-14. Apparent consensus that CV would need to be higher than MSW (9-10 MJ/kg) with one stating receiving sites need imported RDF to improve fuel quality.
- **Interest in MRF contract.** Three (significant waste companies) confirmed interest; two stating this might offer better value (e.g. having control of quality to negotiate lower gate fee at off-take) and referring to either 20 or 25-year contract.

3. Recommendations

Procurement Approach

Ricardo-AEA considers that the findings indicate a procurement exercise is required to identify the most preferable commercial option for Guernsey and that the market review and feasibility study may not be appropriate to achieve this. Specifically this is due to the following issues:

- significant variation in the proposed treatment contact term from 3 years to 20 years;
- clear indication that direct shipping to Holland or Scandinavia should be considered in addition to existing commercial routes thereby opening a significant geographical area;
- more interest in a combined transport and treatment contract than transport only (the mix of industry involved might reasonably be expected to give this outcome);
- interest in combining transport and treatment with the MRF contract which may offer an economic advantage; and
- key risks and dependencies associated with the specific receiving facility including storage and bunker capacity

MRF Contract

In relation to the potential Jersey export option, mixed (untreated) waste represents the preferred feedstock. Guernsey has confirmed that export to Jersey would in any case require the waste to be baled. In relation to all other markets waste would require pre-treatment to derive RDF, which is not legally defined and does not have a specification.

The industry day outcomes indicate that the following MRF pre-treatment infrastructure is appropriate where an RDF is required. Equipment identified (*) may not be required if the preferred option is Jersey. A key risk is that screening is recommended to remove undersize material; Guernsey requires sufficient landfill capacity over the duration of the waste strategy period to accept this material.

- reception hall for inspection and removal of e.g. oversize non-combustibles, gypsum, hazardous waste and other items contrary to receiving site waste acceptance criteria;
- shredder;
- belts to transfer and appropriately present waste to downstream equipment;
- trommel screen*;
- ferrous (magnet) and non-ferrous (eddy current separator) separation (in duplicate for undersize and oversize lines where trommel is installed);
- metals baler;
- RDF baler and wrapper;
- product (baled metals and RDF) capacity (external may be appropriate); and
- residue (fines) storage capacity (internal may be appropriate)*

4. Notes of Individual Discussions

Stobart Biomass **www.stobartgroup.co.uk/services/Stobart-Biomass/**

- Dealing with Government is very attractive as project is high risk/low margin
- Prefer a heavily used commercial port
- Prices likely to be around UK landfill cost or slightly less; the more waste processing the better the revenue; asked if there would potentially be any recycling revenue
- Would rather supply to UK [although statement appeared to be made before understanding that export controls are the same to any MS]; if export are open to any facilities
- UK has limited facilities now but more coming in 2-3 years

- Absolutely interested in transport and market as Stobart Biomass; interested in transport only but would advise speaking to Eddie Stobart
- Need GMT e.g. if 28Ktpa would look for GMT around 20Ktpa
- Can use trucks or containers; must be baled; preferably limited handling
- Concerned over trucks being tied up on ferry to Guernsey; would investigate bringing other material in as fleet runs full around 85% of time
- Could do bonds, financial guarantees, work with TFS permissions etc.

SITA UK www.sita.co.uk

- Flexible in relation to transport or transport/treatment contracts
- Have invested in 40-foot shipping containers
- Have done baling but don't consider best method for higher volumes; bales appropriate e.g. for Sweden (seasonal market requiring storage); loose/containers appropriate for France and Holland (continuous market)
- Baled would probably use curtain siders; wrapping is an absolute must including to Dutch facilities
- Need to store in appropriate way (odour etc.); containers probably not viable due to tonnage
- Would ensure 2 outlets; not tied to specific facilities and happy to send to identified sites or any other
- SITA UK works with SITA France and Northern Europe; has sites in France; will be processing to export to France by end 2012; access through Le Havre
- Geography [UK, France, Belgium, Netherlands] seems appropriate; SITA Northern Europe has access to wider (Benelux) markets
- Exporting to AEB (Amsterdam) and HVC Alkmaar
- With experience gained can now turn around TFS applications in around 6 weeks
- To generate RDF just shredding and inert/metal separation; if there was no extraction it is unlikely to be RDF; also don't want recyclables, including wood, or hazardous
- Shipping as RDF not mixed waste and accepted by the Competent Authorities; send process map and dialogue the issue with the CA
- Could potentially keep drier commercial waste separate for SRF; understand why would mix this with MSW due to tonnages, CAPEX, SRF monitoring requirements etc.
- Facilities want security of supply from SITA, not necessarily waste originator; want flexibility rather than specific waste to a specific site
- Not currently involved in rail but would look at it
- Contract – tend to get off-take first; term is entirely flexible; main issue security of off-take
- GMT – need agreed figure for shipping/logistics e.g. 20Ktpa with potential for 30Ktpa and a potential price benefit for the higher tonnage
- Need material analysis for final material (envelope)
- Would also be interested in MRF contract and could potentially give better value

The Road Haulage Association
www.rha.uk.net/information/specialist_groups/waste_management_group

- Contacted members but limited responses; one negative response from a member with EfW infrastructure (unnamed) who is not interested given waste procurement history

- Can think of a number of interested members for the transport element only; Guernsey could access them through RHA
- Wrapping is potentially not required for waste in trailers; shipping companies would potentially define how the waste should be carried
- No members of the RHA waste group are international hauliers
- Considered the longer the contract the better for hauliers
- Stated members would be interested in transport only or transport and treatment although also stated opinion that members with EfW facilities and own transport would not be interested; will canvass member interest over next 2 weeks (mostly those with EfW infrastructure)
- Members are nervous of engaging only for the information provided to be used as a stick [in relation to getting the best Jersey deal]; members could not understand why Guernsey wouldn't use the Jersey market

Dutch Recycling www.dutchrecycling.com

A summary of the discussion is provided below. Following this discussion, Dutch Recycling provided an email (refer to the Annex provide in Section 5) with further information including an indicative gate fee excluding transport (€ 72.50/t) for a long term 15-20 year contract. The email also summarises the advantages of the solution in terms of contingency and storage capacity, high efficiency and public ownership of the facilities.

- Joint venture between Attero and Twence (Government owned Dutch EfW operators) to trade spare capacity in 3 facilities (Hengelo, Moerdijk and Wijster) with total capacity 2.5Mtpa; also have landfills to store waste if needed
- Facing spare capacity in the Netherlands; JV to support UK/Ireland landfill diversion
- Suggested shipping to Holland e.g. 10 ships per year; there is a direct port connection to Moerdijk
- Prefer baled and wrapped as appropriate for storage and unloading ships to prevent litter
- For RDF minimum metals separation; suggest also shredding; require CV 8-15 MJ/kg
- Prefer long term contract e.g. 10-20 years; important to define gate fee
- Look for tonnage predictability forecasting 1-year ahead; is OK for tonnage to drop so long as aware
- Would prefer to simply accept the waste at the facility gate; 10-year relationship with GemiNor [trading and logistics] including involvement in West Sussex
- Would want to review the waste/preparation site as part of protecting their public image
- Would accept risks e.g. residue management and consistency with the contractor
- Baling using plastic bands are accepted and easier to handle; investigating metal bands

GemiNor http://geminor.no/

- Waste to energy trading; 700Ktpa (recycling and waste) traded mostly in Sweden, also Finland, Denmark, Germany
- Sweden has 100% overcapacity for new EfW; anticipated 1Mtpa spare capacity in Sweden by 2014; Norway already exporting to Sweden

- Deal with 15 plants in Sweden; 3 in Holland (via Dutch Recycling); 5 in Norway and 1 in each of Germany and Denmark
- In terms of countries being considered would definitely consider Scandinavia
- For Sweden bulk transport by boat is the best option [assumed refers to bales in bulk ships given following comment]; e.g. 2-2.5K tonnes baled per shipment
- GemiNor could manage shipping; numerous companies are bulk carriers with dry-load boats e.g. UK company John Scott Transport (JST)
- Could manage all haulage aspects including downstream of receiving port; stated having inland transport from port to facility is extra handling but not necessarily significantly greater cost
- Baled and wrapped is appropriate; not exclusively but for competition and cost; for tender competition baled and wrapped
- Can use containers when back loading; SITA are using containers but back hauling empty
- Has to be RDF, specifically no gypsum or hazardous and metals removed (or can be recycled at EfW)
- Swedish/Scandinavian trade doesn't require pre-treatment; <500 mm or <300 mm is perfect; urge caution over fines as may invoke penalty; CV 10-14
- CV, composition, GMT preferred for planning; plan around 1-year ahead
- Advises contract term 5-10 years; need break clause in contract in the event that export permission is withdrawn
- Prefer a combined transport and treatment contract
- Advise against use of fluidised bed technology due to technical risk
- Risks on Guernsey include for anything unsuitable in the bales; TFS permissions; buffer capacity

FCC www.wrg.co.uk

- Project Integra facilities (3 EfW facilities in Hampshire operated by Veolia) has capacity
- FCC has current (Allington, Kent) [fluidised bed] and approaching (Buckinghamshire CC rail-linked facility, 2015) capacity
- FCC is exporting significant RDF to EfW and SRF; not via Portsmouth; destinations Holland, Germany, Estonia, Scandinavia (significant growth area)
- Would not use MBT for RDF; Bletchley (Buckinghamshire) prepares fuel for EfW; specifically shredding to 150 mm and size separation (trommel screen) at +/-70 mm; >70 mm metals separation only; <70 mm fines removed, metal separation, light fraction re-combined with >70 mm in final fuel; fines removal was FCC decision, not driven by outlet
- Anticipates RDF quality restrictions within a couple of years; suggests fines removal for future-proofing
- Receiving sites may only take plastic bale bands; suggests using 'industry standard' Macpress baler for maximum compaction; contact Paul Godfrey 07808 365866
- Confirms interested in MRF-side (25-year contract)
- Confirms interested in transport and treatment only; suggests 5-7 year contract most economical; market is changing to a sellers' market due to overcapacity in Europe
- Contractor would take risks of outlets etc. in gate fee
- Would not necessarily want GMT but sign agreement for annual tonnage; would want exclusivity on total tonnage

Ecomondis www.ecomondis.com

Ricardo-AEA identified Ecomondis as potentially having a significant interest in this project but was unable to arrange a meeting during the industry day. Ecomondis responded to an invitation from Ricardo-AEA to provide information by email on 18 September 2012 and on the same day took part in a telephone conference to discuss the issues in more depth. Ecomondis is an Irish owned company that reports to be a leader in production and supply of waste derived fuels. Its parent company is Greyhound Recycling.

- Very interested in export of residual waste/RDF from Guernsey as a transport and treatment contract. Transport would be outsourced but managed by Ecomondis.
- One of the pioneers of RDF processing and export with over 10 years' experience exporting RDF across Europe. Also process RDF/SRF in Ireland and US.
- MRF contract is key interest for an integrated solution with control of RDF quality and one accountable party; potential friction over RDF quality if different MRF operator and would need RDF specification and mechanism to deal with quality issues. Can use control of RDF quality (credibility) to drive better price from EfW facility.
- Core work SRF to cement kilns across Europe. Moved into RDF to EfW e.g. Dublin City; integrated solution including collection, RDF treatment and export.
- Currently export mainly to Germany; also Holland; interest in Sweden and Scandinavia particularly due to CHP but indicate uncertainty over future capacity and currently gate fees and transport costs mean this is less attractive market. Indicates capacity quite low in France and Belgium which dictates price.
- Off-take dependent on quality and market i.e. most economical site; could use scale of Dublin contract to seek best price for combined tonnage with Guernsey.
- For transport and treatment suggest 3-5 year contract as market can change significantly in that time; better value to Guernsey and Ecomondis. Outlets will generally sign 1-3 year supply contract due to changing nature of the industry and maintain competitive advantage. This is challenge to separate MRF operator with 20-year contract without security on outlet over same period.
- Want some commitment to be credible with markets when negotiating price.
- Identified source separation, particularly organics, is important to supply suitable material for RDF production. Consider the standards of the competent authority and facility (generally higher).
- Irish market is 'ahead of the curve' in relation to RDF quality and classification RDF or mixed waste. Anticipate quality controls coming soon and not including a trommel would be short-sighted – referred to 'future-proofing'. Need to demonstrate processing to destination country.
- Dublin contract shred to <200 mm; metal removal; trommel fines; baling. Destination country doesn't want fines, specifically organics with low CV and risk RDF degradation.
- Market uses imports to improve fuel quality vs. local material so want better quality with higher CV.
- Preferred solution is baling due to tonnage to give 3-4 weeks storage to build stock to fill a ship; loose material would degrade. Plastic ties as few, older plants take metal.

- Bales in ships or trucks are options; commercial decision if not restricted. Also depends how facility can receive waste e.g. depends on storage/bunker capacity for 3,000 tonne loads by ship.
- Baling and use of vessels more cost effective than containers; can book ships as needed but Guernsey should be predictable tonnage over 1 year to pre-arrange ships.
- Would need composition; CV; biomass content; current/future waste strategy and tonnage prediction; breakdown MSW/C&I.
- Referred to shared risk in off-taker capacity.

5. Annex: Correspondence from Dutch Recycling, 17 September 2012

Thanks for providing us the opportunity to make a proposal for a energy-from-waste solution for residual waste from Guernsey, which is expected to start in 2014 with approximately 28.000 tons. As explained during the session in Novotel, Dutch Recycling is confident that we can offer Guernsey a uniquely qualifying solution:

1. **Direct access by ship**: Vessels can go from Guernsey's port directly to our plant in Moerdijk resulting in efficient logistics and cost savings compared to solutions that combine ships and trucks;
2. **Guaranteed continuity**: Dutch Recycling is always able to take your RDF, because we have many contingencies in place (3 energy-from-waste plants that operate with high uptimes for many years plus different landfills to temporarily store RDF). This will avoid you from ever getting into storage issues on your side;
3. **Highest energy efficiency**: All three energy-from-waste plants have a R1-status. Because of the direct connection to a RWE energy plant and to Shell our facilities in Moerdijk has the highest energy efficiency in the Netherlands;
4. **>98% landfill diversion**: Dutch Recycling is a master in recycling. Besides a high energy efficiency Dutch Recycling is unique in the way we reuse bottom-ashes (which counts to approximately 30% of your waste). All bottom-ashes are used in concrete or in road construction. This results in an unprecedented achievement on your targets for landfill diversion.
5. **High standards**: Dutch Recycling is owned by the Dutch government (provinces and municipalities) and is therefore has built up a reputation of living up to the highest standards in reliability, ethics and sustainability. Dutch Recycling has a broad experience in accepting RDF from both Ireland and the United Kingdom and can assist you in arranging the TFS's and fulfilling other requirements.

We can offer this unique solution for a price of € 72,50 per ton gatefee, delivered at our docks, starting in 2014, for a period of 15 to 20 years. We propose that each year the price is indexed based on a price index that we should mutually agree upon.

Dutch Recycling does not require a minimum tonnage, but we would appreciate an agreement on receiving all residual waste that is available for energy-from-waste. Furthermore we would like to agree upon a yearly delivery schedule which enables us to plan our portfolio. We prefer to receive the materials in wrapped bails with plastic strips. If Guernsey prefers other ways, we are open to discuss these ideas.

We gladly invite you to come over to visit our facilities. We could also combine this with a program in which information is exchanged with other government officials on best practices.

Please let me know if you have any questions or needs for further information.

Best regards,

drs. Robert Corijn MKM
Sales Manager Attero

Appendix 3: Facility Screening (Operational Sites)

Table A2.1: Belgium

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	MSW
BE 1	Brugge	IVBO	Pathoekeweg 41 BE-8000		2004	[4]170,000			Y	[4]Y
BE 2	Brussel	Brussel Energie	Monnoyerkaai 8 BE-1000		[5]1999	[5]515,000			Y	Y
BE 3	Doel-Beveren	Indaver	Haven 1940 Molenweg BE-9130		[6]2001	[6]384,800			Y	[4]Y
BE 4	Doel-Beveren	Sleco	Haven 1940 Molenweg BE-9130		[7]As above	-			-	-
BE 5	Eeklo	IVM	Sint-Laureinsesteenweg 29 BE-9900 Eeklo		1982	[4]100,000			-	-
BE 6	Gent	IVAGO	Proeftuinstraat 43 BE-9000		1996	104,000			-	-
BE 7	Harelbeke	IMOG	Kortrijksesteenweg 264 BE-8530 Harelbeke		1977	[4]65,000			-	-

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	MSW
BE 8	Herstal	Uvelia-Intradel	Port de HERSTAL - Pré Wigi BE-4040	INTRADEL SCRL Port de Herstal - Pré Wigi BE-4040	2009	336,000			Y	[4]Y
BE 9	Houthalen	Bionerga	Industrieterrein Centrum Zuid 2098 BE-3530 Houthalen	10% Limburg.net and 90% NUHMA	1984	-			-	-
BE 10	Knokke-Heis	Knokke-Heist	Sluisstraat 82 BE-8300		Unknown	[6]40,000			-	-
BE 11	Oostende	IVOO	Klokhofstraat 2 BE-8400 Oostende	IVOO Klokhofstraat 2 BE-8400 Oostende	1981	[4]60,000			-	-
BE 12	Pont-de-Loup	ICDI	Port de la Praye 1 BE-6250		Unknown	[8]89,537			-	-
BE 13	Roeselare	MIROM Roeselare	Oostnieuwkerksest eenwet 121 BE-8800	MIROM Roeselare	Unknown	[9]63,000			-	-
BE 14	Thumaide	Ipalle	Chemin de Ribonfasse 5 BE-7971 Thumaide	[10]Ipalle	2013	[8]264,120 [11]400,000			N	-

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	MSW
BE 15	Virginal	IBW (Unité de valoristion énergétique de Virginal)	16 rue de Tubize BE-1460		Unknown	[8]107,015			-	-
BE 16	Wilrijk (Antwerpen)	ISVAG	Boomsesteenweg 1000 BE-2610		2000	144,000			-	-

[1] Considered sequentially therefore if a filter is coloured red (failed) no further filters are considered
[2] Most recent commissioning date where there are multiple lines
[3] Calculated based on all lines commissioned since 1995 and assuming 8,000 operational hours (circa 90% availability); does not consider current nominal CV
[4] http://www.bw2e.be/nl/lid/ivbo
[5] http://www.brusselsgreentech.be/oldBGT/en/details_entreprises.php?menu_ID=3&e_ID=116
[6] *Energy from Waste State-of-the-Art-Report, Statistics 5th Edition, August 2006*, ISWA – the International Solid Waste Association
[7] Sleco is an Indaver-SITA partnership; note fluidised bed facility http://www.sleco.be/fileadmin/indaver.be/pdfs/lr_2214_Indaver-sleco-folder-doel-ENG.pdf
[8] http://www.ibw.be/data/valo/Brochure%20Virginal%20version%202.pdf
[9] http://www.lne.be/themas/duurzaam-bouwen-en-wonen/presentaties-energienetten/ervaring-in-stadsverwarming-bonte
[10] http://ibh.be/en/references/waste-to-energy-plant-ipalle
[11] http://www.vkgroup.be/en/industry/project/Waste-to-energy-plant-Thumaide

Table A2.2: Denmark

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	MSW
D1	Esbjerg	L90 Affaldsforbrænding	Måde Industrivej 35 DK-6705 Esbjerg Ø	L90 Uldjydevej 2 DK-7400 Herning	2003	192,000			Y	Y
D2	Eystur	Brennistøðin á Hagaleiti	Hagaleiti FO-520 Leirvik	IRF, Interkommunali Renovatiónsfelagsskapurin L/F Hagaleiti, FO-520 Leirvik	Unknown	[4]20,000			-	-
D3	Frederikshavn	Frederikshavns Affaldskraftvarmeværk A/S	Vensysselsvej 201 DK-9900 Frederikshavn	AVØ A/S Knivholtvej 14 DK-9900 Frederikshavn	1994	40,000			-	-
D4	Glostrup	I/S Vestforbrænding	Ejbymosevej 219 DK-2600 Glostrup	I/S Vestforbrænding Ejbymosevej 219 DK-2600 Glostrup	1970 [5]1999-05	[5]488,000 [6,7]520,000			[8]Y	[5]Y

D5	Grenaa	Grenaa Forbrænding a/s	Kalorievej 9 DK-8500 Grenaa	Grenaa Varmeværk A.m.b.a. Energivej 6 DK-8500 Grenaa	[6]1981	[4]20,000			-	-
D6	Haderslev	Haderslev Kraftvarmeværk	Dybkær 2, Marstrup DK-6100 Haderslev	DONG Energy A/S Overgade 45 DK-7000 Fredericia	1993	72,000			-	-
D7	Hammel	Hammel Fjernvarme A.m.b.a.	Irlandsvej 6 DK-8450 Hammel	Hammel Fjernvarme A.m.b.a. Irlandsvej 6 DK-8450 Hammel	2002	32,000			-	-
D8	Hjørring	Forbrændingsanlæg AVV	Mandøvej 8 DK-9800 Hjørring	AVV I/S Mandøvej 4 DK-9800 Hjørring	1998	48,000			-	-
D9	Hobro	I/S Fælles Forbrænding	Hvedemarken 13 DK-9500 Hobro	I/S Fælles Forbrænding Hvedemarken 13 DK-9500 Hobro	2001	31,200			-	-
D10	Holstebro	Måbjergværket A/S	Energivej 2 DK-7500 Holstebro	DONG Energy A/S Overgade 45 DK-7000 Fredericia	1992	-			-	-

D11	Horsens	Horsens Kraftvarmeværk A/S	Endelavevej 7 DK-8700 Horsens	DONG Energy A/S Kraftværksvej 53 DK-7000 Fredericia	1992	-			-	-
D12	Hørsholm	Nordforbrænding I/S	Savsvinget 2 DK-2970 Hørsholm	I/S Nordforbrænding Savsvinget 2 DK-2970 Hørsholm	1999	80,000			-	-
D13	Kolding	Kolding Forbrændingsanlæg	Bronzevej 6 DK-6000 Kolding	TAS I/S Bronzevej 6 DK-6000 Kolding	1993	-			-	-
D14	København	I/S Amagerforbrænding	Kraftværksvej 31 DK-2300 København S	I/S Amagerforbrænding Kraftværksvej 31 DK-2300 København S	1971	-			-	-
D15	Nykøbing F	I/S REFA	Energivej 4 DK-4800 Nykøbing F.	I/S REFA Energivej 4 DK-4800 Nykøbing F.	1999	72,000			-	-
D16	Næstved	AffaldPlus Næstved	Ved Fjorden 20 DK-4700 Næstved	AffaldPlus Ved Fjorden 20 DK-4700 Næstved	2005	136,000			-	-

D17	Odense	Odense Kraftvarmeværk A/S	Havnegade 120, Postboks 928 DK-5000 Odense C	Vattenfall A/S Støberigade 14 DK-2450 København SV	2000	256,000			Y	Y
D18	Roskilde	KARA/NOVEREN Roskilde forbrændingsanlæg	Håndværkervej 70 DK-4000 Roskilde	KARA/NOVEREN I/S Håndværkervej 70 DK-4000 Roskilde	1999	160,000 [9]350,000			Y	Y
D19	Rønne	BOFA I/S	Almegårdsvej 8 DK-3700 Rønne	Municipality of Bornholm Ullasvej 23 DK-3700 Rønne	1991	-			-	-
D20	Skagen	Skagen Forbrænding	Buttervej 66 DK-9990 Skagen	AVØ A/S Knivholtvej 14 DK-9900 Frederikshavn	1979	-			-	-
D21	Skanderborg	Renosyd I/S	Norgesvej 13 DK-8660 Skanderborg	Renosyd I/S Norgesvej 13 DK-8660 Skanderborg	1992	-			-	-
D22	Slagelse	AffadPlus Slagelse	Dalsvinget 11 DK-DK-4200 Slagelse	AffaldPlus Ved Fjorden 20 DK-DK-2700 Næstved	1990	-			-	-

D23	Svendborg	Svendborg kraftvarmeværk	Bodøvej 15 DK-5700 Svendborg	Svendborg Kraftvarme A/S Bodøvej 15 DK-5700 Svendborg	1999	48,000			-	-
D24	Sønderborg	Sønderborg Kraftvarmeværk I/S	Vestermark 16 DK-6400 Sønderborg	Sønderborg Kraftvarmeværk I/S Vestermark 16 DK-6400 Sønderborg	1996	64,000			-	-
D25	Thisted	I/S Kraftvarmeværk Thisted	Industrivej 9, Postboks 166 DK-7700 Thisted	I/S Thyra (50%) / Thisted Vandforsyning (50%) Asylgade 30 / Ringvejen 26 DK-7700 Thisted	1991	-			-	-
D26	Torshavn	Torshavn Forbrændingsanlæg	Á Hjalla, 188 Hoyvik FO-110 Torshavn	Torshavnar Kommuna Vaglið FO-100 Torshavn	Unknown	[4]20,000			-	-
D27	Aalborg	Reno-Nord I/S	Troensevej 2 DK-9220 Aalborg Øst	I/S Reno-Nord Troensevej 2 DK-9220 Aalborg Øst	2005	160,000			Y	Y

D28	Århus	Kraftvarmeanlæg Århus Nord	Ølstedvej 20 DK-8200 Århus N	AffaldVarme Århus Bautavej 1 DK-8210 Århus V	2004	188,800			Y	Y
D29	Aars	Aars Fjernvarmeværk	Dybvad Møllevej 1 DK-9600 Aars	I/S Aars Varmeværk Dybvad Møllevej 1 DK-9600 Aars	1995	40,000			-	-

[1] Considered sequentially therefore if a filter is coloured red (failed) no further filters are considered
[2] Most recent commissioning date where there are multiple lines
[3] Calculated based on all lines commissioned since 1995 and assuming 8,000 operational hours (circa 90% availability); does not consider current nominal CV
[4] http://www.seas.columbia.edu/earth/wtert/sofos/100YearsofWasteIncinerationinDenmark.pdf
[5] http://www.vestfor.com/incineration-plant
[6] COWI in-house data
[7] Excluded on basis of COWI knowledge that the facility is operating at full capacity
[8] Located in relatively close proximity to the Port of Copenhagen
[9] http://karanoveren.dk/english taking into account increased capacity with inauguration of an additional line in 2013

Table A2.3: England (and Isle of Man)

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	MSW
EN1	Billingham	Teeside EfW Plant	Haverton Hill Road Billingham TS23 1PY Teesside	SITA UK	1998	224,000	Y	[12]Y	Y	Y
EN2	Birmingham	Tyseley Waste Disposal Ltd	James Road Tyseley B11 2AB	Veolia	1996	[4]350,000	Y	N	N	Y
EN3	Bolton	Bolton Thermal Recovery Facility		Greater Manchester Waste Ltd PO Box 151, Higher Swan Lane BL3 3WW Bolton	1975	-	-	-	-	-
EN4	Brighton	East Sussex/ Brighton PFI (Veolia)			[5]Duplicate	-	-	-	-	-
EN5	Chineham	Chineham	Integra North ERF, Whitmarsh Lane Chineham RG24 8LL Basingstoke	Veolia	1997 [4]2003	192,000 [4]90,000	-	-	-	-

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	MSW
EN6	Colnbrook	Lakeside Energy from Waste Ltd.	Lakeside Rd Colnbrook Berkshire	Grundon Waste Management	[6]2010	[6]410,000	Y	N	N	Y
EN7	Coventry	Coventry & Solihull	Bar Road CV3 4AN COVENTRY		[4]1975	-	-	-	-	-
EN8	Douglas (Isle of Man)	Douglas (Isle of Man)	Richmond Hill Douglas IM4 1JH Isle of Man	SITA Isle of Man Richmond Hill, Douglas IM4 1JH Isle of Man	2006	232,000 [4]60,000	-	-	-	-
EN9	Dudley	Dudley	Lister Road DY2 8JT DUDLEY West Midlands	Dudley waste service Crown Street WV1 1QB WOLVERHAMPTON West Midlands	[4]1998	[4]90,000	-	-	-	-
EN 10	East Sussex	Newhaven	North Quay Newhaven East Sussex	Veolia	[7]2012	[7]210,000	Y	N	Y	Y
EN 11	Ellesmore Port	Ellesmore Port, Wirral	Bridges Road, Ellesmere Port, Wirral CH65 4EQ Cheshire	Veolia	Unknown	[8]100,000	-	-	-	[8]N

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	MSW
EN 12	Grimsby	Grimsby	Stallingborough on the Humber bank	Newlincs Development Ltd Fishermans Wharf/Alexandra Dock Grimsby DN311UL South Humberside	[4]2004	[4]56,000	-	-	-	-
EN 13	Huddersfield	Kirklees		SITA UK Diamond Street , Kirklees HD1 6BZ Huddersfield	1998	112,000 [4]136,000	-	-	-	-
EN 14	London	Edmonton	Angel Road N18 3AG Edmonton	London Waste Ltd Advent Way N18 3AG Edmonton	1994 [4]1975	-	-	-	-	-
EN 15	London	Belvedere (London Borough of Bexley)	South East London		1970	-	-	-	-	-
EN 16	London	SELCHP	Landmann Way Off Surrey Canal Road SE14 5RS Deptford	Veolia	[4]1994	-	-	-	-	-

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	MSW
EN 17	London, Bexley	Riverside	Norman Road Belvedere DA17 6JY Kent	Riverside Resource Recovery Cory Environmental 2 Coldbath Square EC1R 5HL London	2011	585,000	Y	[13]N	Y	Y
EN 18	Maidstone	Allington	Laverstoke Road Maidstone Kent	Kent Enviropower Ltd. White Ladies Office, Teston Road, Offham ME19 5PF Kent	[9]n/a	-	-	-	-	-
EN 19	Marchwood, Southampton	Marchwood ERF	Integra South West ERF, Oceanic Way Marchwood Industrial Park Hampshire SO40 4BD	Veolia	2003	96,000	-	-	-	-
EN 20	North Yorkshire	Seamer Carr (Yorwaste)			[10]n/a	-	-	-	-	-

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	MSW
EN 21	Nottingham	Eastcroft Energy from Waste Facility	Incinerator Road, Off Meadow Lane Nottingham NG2 3JH Nottinghamshire	WRG	1973	-	-	-	-	-
EN 22	Portsmouth	Portsmouth ERF	Integra South East ERF Quartremaine Road PO3 5QH Portsmouth	Veolia	2002	136,000	-	-	-	-
EN 23	Cheshire	Runcorn	Picow Road Farm Weston Point Runcorn		[11]2013-15	850,000	-	-	-	-
EN 24	Sheffield	Sheffield ERF	Bernard Road S4 7YX Sheffield	Veolia	[4]2006	[4]225,000	Y	Y	N	Y
EN 25	Stoke on Trent	Stoke on Trent	Campbell Road Sideway ST4 4DX Stoke-on-Trent	Handford waste service Campbell Road, Sideway ST4 4DX Stoke-on-Trent	2000	26,400 [4]200,000	Y	[15]Y	N	Y

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	MSW
EN 26	Wolverhamp-ton	Wolverhamp-ton	Crown Street WV1 1QB WOLVERHAMPTON West Midlands	Wolverhampton waste service Crown Street WV1 1QB Wolverhampton, West Midlands	2000	128,000	-	-	-	-

[1] Considered sequentially therefore if a filter is coloured red (failed) no further filters are considered
[2] Most recent commissioning date where there are multiple lines
[3] Calculated based on all lines commissioned since 1995 and assuming 8,000 operational hours (circa 90% availability); does not consider current nominal CV
[4] http://archive.defra.gov.uk/environment/waste/residual/newtech/documents/incineration.pdf
[5] Brighton & Hove City Council jointly procured the Newhaven facility (refer to EN10)
[6] http://www.grundon.com/how/energyFromWaste.htm
[7] http://www.veoliaenvironmentalservices.co.uk/southdowns/Facilities/Energy-Recovery-Facility/
[8] http://www.veoliaenvironmentalservices.co.uk/Documents/Publications/Main/Commercial,%20Industrial%20and%20Municipal%20Services/ves_hti.pdf
[9] Fluidised bed combustion plant – excluded
[10] Gasification plant – excluded
[11] Completion assumed too late for Guernsey requirements http://www.waste-management-world.com/articles/print/volume-12/issue-6/features/passing-planning-perils-in-greater-manchester.html
[12] Teesport, Tees Riverside Intermodal Park and Cleveland (Wilton) intermodal rail terminals closely located
[13] Barking and Dagenham intermodal rail terminals closely located but on the opposite bank of the River Thames therefore assumed not a viable route
[14] Sheffield (Tinsley) intermodal rail terminal closely located
[15] Stoke-On-Trent strategic freight site closely located

Table A2.4: France

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	MSW
F1	Sainte Gemmes sur Loire	Angers	Quartier de la Roseraie- 36, rue d'Arbrissel FR-49130	Communauté d'agglomération Angers Loire Métropole 83 rue du Mail - BP 80529 FR-49105 Angers Cedex 02	1977	-	-		-	-
F2	Paris	Ivry	43, rue Bruneseau FR-75013	SYCTOM de l'agglomération Parisienne 35 Boulevard de Sébastopol FR-75001 Paris	1969	-	-		-	-
F3	Amilly	Montargis	215 rue de Paucourt FR-45200	SMIRTOM Parc de Chaumont FR-45700 Pannes	1969	22,000	-		-	-

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	MSW
F4	Argenteuil	Argenteuil	2 rue du Chemin Vert FR-95100	Syndicat Azur à Argenteuil 2 rue du Chemin Vert FR-95100 Argenteuil	1998	72,000	-		-	-
F5	Arrabloy	Gien	Les Gatines FR-45500	SIDEME Les Gatines FR-45500 Arrabloy	1999	80,000	-		-	-
F6	Bayonne	Bayonne	CIVD des Bacheforès Chemin de Loustaounou FR-64100	Syndicat Mixte Biltagarbi 7 rue Candelé FR-64990 Saint Pierre d'Irube	1990	28,000	-		-	-
F7	Bègles	Bordeaux (Bègles)	rue Louis Blériot FR-33323	ASTRIA rue Louis Blériot FR-33323 Bègles	1998	264,000	n/a		[4]Y	n/d
F8	Benesse-Maremne	Benesse Maremne	FR-40230	SITCOM DE LA COTE SUD DES LANDES 62 Chemin du Bayonnais FR-40230 Benesse-Maremne	1985	-	-		-	-

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	MSW
F9	Béthune	Labeuvrière	FR-62411	Communauté d'agglomération de l'Artois Hôtel Communautaire 100 avenue de Londres - bp 548 FR-62411 Béthune Cedex	1996	84,000	-		-	-
F10	Blois	Blois 2	161 avenue de Chateaudun FR-41000	Val Eco - Syndicat Intercommunal de Traitement des Déchets du Blésois 1 rue Honoré de Balzac FR-41000 Blois	2000	88,000	-		-	-
F11	Bourgoin Jallieu	Bourgoin Jallieu	3 rue du Pont Rouge - BP 594 FR-38314	SITOM Nord Isère 3 rue du Pont Rouge - BP 594 FR-38314 Bourgoin Jallieu Cedex	1995	48,000	-		-	-

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	MSW
F12	Brest	Brest	179 Boulevard de l'Europe FR-29200	Communauté Urbaine de Brest (CUB) Hôtel de CUB 24 rue Coat Ar Gueven - BP 9224 FR-29222 Brest Cedex 2	1988	-	-		-	-
F13	Briec de l'Odet	Briec (Quimper)	ZI Luminoc'h FR-29510	SIDEPAQ Mairie 44 Place Saint Corentin - BP 17059 FR-29107 Quimper cedex	1996	64,000	-		-	-
F14	Carhaix	Carhaix	Site de Kervoazou FR-29270	Syndicat Intercantonnal de repurgation du centre ouest bretagne (SIRCOB) 21 Route de Gourin FR-29270 Carhaix	1994	-	-		-	-

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	MSW
F15	Carrières sous Poissy	Carrières sous Poissy	RD 190 Les Bouveries FR-78955	SIDRU Azalys - RD 190 Les Bouveries FR-78955 Carrières sous Poissy	1998	120,000	-		-	-
F16	Carrières sur Seine	Carrières sur Seine	2 rue de l'Union FR-78420	SITRU TRAITEMENT RESIDUS URB BOUCLE DE LA SEINE 2 rue de l'Union FR-78420 Carrières sur Seine	1987	80,000	-		-	-
F17	Cenon	UIOM de Cenon	rue Jean Cocteau FR-33150	SO.CO.GEST 40 rue de Belfort FR-33000 BORDEAUX	1983	128,000	-		-	-

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	MSW
F18	Cergy Pontoise	Cergy Pontoise	Parc d'activités les Bétunes 2 - ave. du Fief - BP 9111 - St Ouen L'Aumône FR-95073	(SAN) SYNDICAT AGGLO NOUVELLE DE CERGY PONTOISE Parc d'activités les Bétunes 2 ave. du Fief - BP 9111 St Ouen L'Aumône FR-95073 Cergy Pontoise cedex	1995	168,000	Y		N	[5]Y
F19	Chateaudun	Chateaudun	FR-28200	SICTOM DE LA REGION DE CHATEAUDUN Route de Sancheville FR-28200 Chateaudun	1976	-	-		-	-
F20	Colombelles	Caen (Colombelles)	9 rue Francis de Pressencé FR-14460	SYDEVAC Hôtel de Ville Esplanade Jean Marie Louvel FR-14000 Caen	1972	124,800	-		-	-

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	MSW
F21	Concarneau	Concarneau	Le Poteau Vert - Rue Neuve FR-29900	SICOM DE LA REGION SUD EST DU FINISTERE Stang Argant - BP 111 FR-29181 Concarneau Cedex	1989	62,400	-		-	-
F22	Confort Meilars	Confort-Meilars (Douarnenez)	Menez Gourret FR-29790	SITOM Ouest de Cornouaille 75 rue Ar Veret - BP 225 FR-29172 Douarnenez cedex	1973	24,000	-		-	-
F23	Coueron	Nantes (Ouest)	La Cité Navale FR-44220	Agglomération Nantaise ARC EN CIEL - La Cité Navale FR-44220 Coueron	1994	112,000	-		-	-
F24	Créteil	Créteil	10 rue de Malfourches FR-94000	CIE de Créteil 10 rue de Malfourches FR-94000 Créteil	2000	120,000	-		-	-

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	MSW
F25	Dieppe	Dieppe	FR-76203	COMMUNE DE DIEPPE Mairie-Parc Jehan Ango - BP 226 FR-76203 Dieppe cedex	1971	-	-		-	-
F26	Dijon	Dijon	rue alexander fleming FR-21075	Communauté de l'Agglomération Dijonnaise (COMADI - Grand Dijon) 40 avenue du Drapeau - BP 17510 FR-21075 Dijon	1974	145,600	-		-	-
F27	Douchy les Mines	Douchy	7 route de Lourches FR-59282	Syndicat intercommunal élimination des ordures ménagères (SIAVED) 5 route de Lourches FR-59282 Douchy Les Mines	1977	88,000	-		-	-

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	MSW
F28	Dunkerque	Rochefort	Chemin Rural n° 12 FR-17620	Communauté Urbaine de Dunkerque Pertuis de la Marine - BP 5530 FR-59386 Dunkerque cedex 1	1977 Closed 1998	-	-		-	-
F29	Echillais	Martiniquaise de Valorisation	ZAC Rivière Roche FR-97200	CACEM - Communauté d'agglomération du centre de la Martinique Immeuble Cardinal Chateauboeuf Est - BP 407 FR-97204 Fort de France - Martinique	1990	-	-		-	-
F30	Grand Quevilly	Rouen 2	Boulevard de Stalingrad FR-76120	SMEDAR 149 boulevard de l'Yser FR-76000 Rouen	2000	348,000	Y		Y	[5]Y

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	MSW
F31	Guerville	Mantes (Valene)	Route Départementale 113 FR-78390	VALENE Route Départementale 113 FR-78390 Guerville	1997	77,600	-		-	-
F32	Guichainville	Evreux Sud	V.C.6 - Lieu Dit Saint Laurent FR-27930	SETOM Sud de l'Eure V.C.6 - Lieu Dit Saint Laurent FR-27930 Guichainville	2003	89,600	-		-	-
F33	Halluin	Halluin (Lille)	Rocade de la Valée de la Lys - RD 191 - BP 302 FR-59433	Communauté Urbaine de Lille Métropole 1 rue du Ballon - BP 749 FR-59034 Lille cedex	2000	348,000	Y		N	n/d
F34	Henin-Beaumont	Hénin-Beaumont	chemin de la buisse FR-62253	Communauté d'agglomération d'Hénin-Carvin 242 boulevard Schweitzer FR-62 110 hénin-beaumont	1974	-	-		-	-

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	MSW
F35	Issy-Les-Moulineaux	Issy-Les-Moulineaux	167 Quai de Stalingrad FR-92130	SYCTOM de l'agglomération Parisienne 35 Boulevard de Sébastopol FR-75001 Paris	1965 [6]2007	601,000 [6,7]480,924	Y		-	[6]Y
F36	La Couronne	Angoulême	Route de Saint Michel, Le Mas FR-16400	Communauté d'agglomération du Grand Angoulême 25 Boulevard Besson Bey FR-16008 Angoulême	1986	-	-		-	-
F37	La Rochelle	La Rochelle	Rue du Chef de Baie FR-17041	Communauté de l'agglomération de la Rochelle 6 rue Saint Michel - BP 1287 FR-17086 La Rochelle	1988	-	-		-	-

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	MSW
F38	La Séguinière	Cholet	Lieu Dit l'établère - BP 5 FR-49280	SAS INCINERATION BOUYER LEROUX Lieu Dit l'établère - BP 5 FR-49280 La Séguinière	1983 Closed 2005	-	-		-	-
F39	La Veuve	Aureade (La Veuve)	Avenue des Crayères - ZI de la Veuve FR-51520	Syndicat Départemental Traitement des déchets ménagers (SYVALOM) 13 rue Carnot FR-51000 Châlons en Champagne	2006	100,000	-		-	-
F40	Lasse	Lasse Sivert	RD 139 - Route de Mouliherne à Clefs FR-49490	SAVED SALAMANDRE RD 139 - Route de Mouliherne à Clefs FR-49490 Lasse	2004	100,000	-		-	-

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	MSW
F41	Le Mans	Le Mans	206 rue de l'Angevinière FR-72024	SEC 206 rue de l'Angevinière FR-72024 Le Mans Cedex	2002	76,800	-		-	-
F42	Lens	Noyelles sous Lens	FR-62302	Communauté d'agglomération de Lens-Liévin 21 rue Marcel Sembat - BP 65 FR-62302 Lens	1973	-	-		-	-
F43	Lescar	Pau	rue d'Arsonval - ZI Induspal FR-64320	Communauté d'Agglomération de Pau Pyrénées bassin Est - 2 bis Place Royale - BP 547 FR-64000 Pau	1997	48,000	-		-	-
F44	Limoges	Limoges	Centrale Energie Déchets - Avenue de Faugeras FR-87280	STVL Centrale Energie Déchets Avenue de Faugeras FR-87280 Limoges	1992	-	-		-	-

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	MSW
F45	Livet	Bourg d'Oisans	FR-38220	SITOM de l'Oisans Place de L'Eglise - BP 50 FR-38220 Le Bourg d'Oisans	1998	20,000	-		-	-
F46	Mainvilliers	Chartres 2 (Orisane)	La Mare Corbonne FR-28300	Communauté d'agglomération de Chartres Métropole 3 rue Charles Brune - BP 90085 FR-28112 Lucé	1999	120,000	-		-	-
F47	Massy	Massy	FR-91743	CURMA UIOM Zone Industrielle de Bonde Route de Bonde FR-91743 Massy Cedex	1986	-	-		-	-

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	MSW
F48	Maubeuge	Maubeuge	ZI des Terres du Pont Rouge FR-59600	Syndicat MIxte de l'Arrondissement d'Avesnes (SMIAA) 32 Boulevard de l'Europe - BP 81251 FR-59607 Maubeuge Cedex	2002	44,000	-		-	-
F49	Mère	Vernou-en-Sologne	FR-41500	SIEOM - Syndicat Intercommunal Elimination des Ordures Ménagères du Groupement de Mère - Hôtel de Ville FR-41500 Mère	[8]1987	-	-		-	-
F50	Messanges	Messanges	FR-40660	SITCOM DE LA COTE SUD DES LANDES 62 Chemin du Bayonnais FR-40230 Messanges	[9]1976	[9]24,000	-		-	-

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	MSW
F51	Montauban	Montauban	786 avenue Gasseras FR-82000	SIRTOMAD Rue de l'Hôtel de Ville - BP 764 FR-82013 Montauban Cedex	1986	-	-		-	-
F52	Montereau Fault Yonne	Montereau	ZI - 22 rue des Grandes Haies FR-77130	SIRMOTOM Hôtel de l'Intercommunalité 4 rue Edouard Branly FR-77130 Montereau Fault Yonne	1973	-	-		-	-
F53	Monthyon	Monthyon (Somoval)	La Croix Gillet FR-77122	SMITOM DU NORD SEINE ET MARNE MONTHYON Chemin de la Croix Gillet FR-77122 Monthyon	1998	33,600	-		-	-

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	MSW
F54	Mourenx	Mourenx	FR-64150	Communauté des Communes de Lacq Rond Point des Chênes - BP 73 FR-64150 Mourenx	[8]1990	-	-		-	-
F55	Nantes	Nantes (Est)	350 rue de l'Etier FR-44326	VALORENA 350 rue de l'Etier - BP 62633 FR-44326 Nantes cedex 3	1987	-	-		-	-
F56	Ouarville	Rambouillet (Ouarville)	Chemin Saint Mathurin FR-28150	SITREVA Valoryele - Chemin Saint Mathurin FR-28150 Ouarville	2000	128,000	-		-	-

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	MSW
F57	Pessac	Agen	Monbusc FR-47520 Le Passage	SOGAD Envoi Courrier: Novergie 28 avenue Léonard de Vinci Parc Technologique FR-47520 Le Passage	1991	-	-		-	-
F58	Pithiviers	Pithiviers	FR-45300	SITOM DE L'ARRONDISSEMENT DE PITHIVIERS Route Bouzonville en Beauce FR-45300 Pithiviers	1985	-	-		-	-
F59	Planguenoual	Lamballe (Planguenoual)	Les landes lambert FR-22400	SMICTOM DE PENTHIEVRE-MENE 50 rue d'Armor - BP 90456 FR-22404 Lamballe cedex	1993	-	-		-	-

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	MSW
F60	Plouharnel	Plouharnel	Kernévé FR-56720	Syndicat Mixte D'AURAY-BELZ-QUIBERON (SIVOM) 31 Avenue de l'Océan - BP 6 FR-56720 Plouharnel	1971	-	-		-	-
F61	Pluzunet	Pluzunet Lannion	Site de Quelven FR-22140	SMITRED OUEST ARMOR Valorys Site Quelven Convenant Le Grand FR-22140 Pluzunet	1997	56,000	-		-	-
F62	Poitiers	Poitiers	Route Edouard Branly - Saint Eloi FR-86000	Communauté d'agglomération de Poitiers Hôtel de Ville 15 Place du Maréchal Leclerc - BP 569 FR-86021 Poitiers Cedex	1984	-	-		-	-

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	MSW
F63	Pontivy	Pontivy	Rue Vicat, Zone Industrielle Le Sourn FR-56300	Communauté de communes du pays de Pontivy (SITTOM-MI) 31 rue Jean Moulin - BP 96 FR-56303 Pontivy cedex	1990	-	-		-	-
F64	Pontmain	Pontmain	Route de Fougères FR-53220	Conseil Général de la Mayenne Datae Sender - Hôtel du Département 39 rue Mazagran - BP 1429 FR-53014 Laval Cedex	2003	32,000	-		-	-
F65	Pontx-les-Forges	Born 2 (Pontenx)	Lieu dit Larrouza, Chemin Départemental 49 FR-40200	SIVOM des CANTONS du pays de Born Place du Général de Gaulle FR-40161 Parentis-en-Born Cedex	1997	42,400	-		-	-

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	MSW
F66	Rennes	Rennes	Avenue Charles Tillon FR-35000	SOBREC Avenue Charles Tillon FR-35000 Rennes	1996	64,000	-		-	-
F67	Rungis	Rungis	1 rue du Four - Secteur Marée - BP 10328 FR-94569	SIEVD 15 rue des Hautes Bornes FR-94310 Orly	1985	-	-		-	-
F68	Saint Ouen	Saint Ouen	22 rue Ardoin FR-93400	SYCTOM de l'agglomération Parisienne 35 boulevard de Sébastopol FR-75001 Paris	1990	-	-		-	-
F69	Saint Saulve	Valenciennes	Zone Industrielle - 4 rue du Galibot FR-59880	SIVDMHV ECOVALOR Zone Industrielle - 4 rue du Galibot FR-59880 Saint Saulve	1977	-	-		-	-

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	MSW
F70	Saint-Jean-De Folleville	Saint Jean de Folleville (Le Havre)	FR-76170	SEVEDE Oréade - ZAC de Port Jéröme II BP 60048 FR-76170 Saint-Jean-De-Folleville	1975	-	-		-	-
F71	Saran	Saran (Orléans)	651 rue de la Motte Pétrée FR-45770	Communauté d'agglomération Orléans Val de Loire 33 rue Hatton FR-45000 Orléans	1995	112,000	-		-	-
F72	Sarcelles	Sarcelles (Saren)	1 rue de Tissonvilliers FR-95200	SAREN 1 rue de Tissonvilliers FR-95200 Sarcelles	1978	-	-		-	-
F73	St Pierre d'Oléron	St Pierre d'Oléron	FR-17310	Communauté de communes de l'Ile d'Oléron 59 route des Allées - BP 85 FR-17310 St Pierre d'Oléron	1979	-	-		-	-

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	MSW
F74	St Thibault des Vignes	Lagny	3 rue Grand Pommeraye - ZA la Courtillière FR-77400	SIETREM DE LAGNY SUR MARNE 3 rue Grand Pommeraye ZA la Courtillière FR-77400 St Thibault des Vignes	1995	100,800	-		-	-
F75	Surgères	Paille	FR-17700	SMICTOM de Surgères (Syndicat Mixte Collecte et Traitement Ordures Ménagères) 41 bis rue Bernard Palissy FR-17700 Surgères	1981	-	-		-	-
F76	Taden	Dinan 2	Lieu Dit Les Landes Basses - Route de Ploubalay FR-22100	IDEX FASSA Environnement Lieu Dit Les Landes Basses Route de Ploubalay FR-22100 Taden	1998	112,000	-		-	-

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	MSW
F77	Thiverval-Grignon	Thiverval-Grignon	Chemin latéral n° 18 FR-78850	SIDOMPE SI DESTRUCTION OM DE PLAISIR ET ENVIRONS Place du Village FR-78910 Behoust	1993	-	-		-	-
F78	Vaux-le-Penil	Melun	Route de Nangis - ZAC du Tertre de Chérisy FR-770000	SMITOM Centre Ouest Seine et Marnais Route de Nangis ZAC du Tertre de Chérisy FR-77000 Vaux-le-Penil	2003	164,640	Y		N	Y
F79	Vert le Grand	Vert le Grand	Ecosite FR-91810	SEMARDEL PSE - CITD Ecosite de Vert Le Grand Chemin Butte - BP 2 FR-91810 Vert le Grand	1999	235,200	Y		N	Y

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	MSW
F80	Villejust	Villejust 1 & 2	Route Départementale 118 FR-91140	SIOM de la Vallée de Chevreuse CD 118 FR-91140 Villejust	1984	-	-		-	-
F81	Villiers Saint Paul	Esiane (Villiers Saint-Paul)	avenue Frédéric et Irène Joiliot Curie FR-60870	Esiane avenue Frédéric et Irène Joiliot Curie FR-60870 Villiers Saint Paul	2004	176,000	Y		N	[10]Y
F82	Vitré	Vitré	ZI de la Haie Robert FR-35500	SMICTOM DU SUD-EST DE L'ILLE ET VILAINE 1 Place Notre Dame FR-35500 Vitré	1998	33,600	-		-	-

[1] Considered sequentially therefore if a filter is coloured red (failed) no further filters are considered
[2] Most recent commissioning date where there are multiple lines
[3] Calculated based on all lines commissioned since 1995 and assuming 8,000 operational hours (circa 90% availability); does not consider current nominal CV
[4] http://www.bordeaux-port.fr/fr/plans-d%E2%80%99acc%C3%A8s
[5] *Energy from Waste State-of-the-Art-Report, Statistics 5th Edition, August 2006*, ISWA – the International Solid Waste Association
[6] http://www.hz-inova.com/cms/images/stories/pictures/Combustion.pdf
[7] Capacity based on 2 lines x 732tpd at assumed 90% availability

[8] www.ieabioenergytask36.org/Publications/2007-2009/Chapter_1_Final.pdf
[9] http://www.seas.columbia.edu/earth/wtert/sofos/benhamou_thesis.pdf
[10] http://wteplants.com/plant/esiane

Table A2.5: Germany

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	[4]MSW
G1	Hamburg - Borsigstraße	Müllverwertung Borsigstraße Hamburg	Borsigstraße 6 DE-22113 Hamburg	Müllverwertung Borsigstraße GmbH Borsigstraße 6 DE-22113 Hamburg	[4]1994	[5]130,000			-	-
G2	Hamburg - Rugenberger Damm	Müllverwertung Rugenberger Damm Hamburg	Rugenberger Damm 1 DE-21129 Hamburg	MVR Müllverwertung Rugenberger Damm GmbH & Co KG Rugenberger Damm 1 DE-21129 Hamburg	1994 [6]1999	[6]350,000			Y	Y

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	[4]MSW
G3	Hamburg - Stellinger Moor	Müllverbrennung Stellinger Moor Hamburg	Schnackenburg allee 100 DE-22525 Hamburg	Stadtreinigung Hamburg Schnackenburgallee 100 DE-22525 Hamburg	1999 [7]1973	[6]180,000			Y	Y
G4	Kiel Schleswig-Holstein	Müllheizkraftwerk Kiel	Theodor-Heuss-Ring 30 DE-24114 Kiel	Landeshaupt-stadt Kiel / REMONDIS GmbH & Co. KG Holstenstraße 106-108 / Am Kiel-Kanal 36 DE 24114 Kiel	1996	[8]140,000			-	-
G5	BKB Hannover Niedersachen	E.ON Energy from Waste Hannover GmbH	Moorwaldweg 310 DE-30659 Hannover		2005	[9]280,000			N	-
G6	Emlichheim Niedersachen	EVI Abfallverwertung B.V. & Co. KG	Vosmatenweg 6 DE-49824 Laar	EVI Abfallverwert-ung B.V. & Co. KG Vosmatenweg 6 DE-49824 Laar	2008	[10]360,000			N	-

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	[4]MSW
G7	Hameln Niedersachen	Enertec Hameln GmbH	Heinrich-Schoormann Weg 1 DE-31789 Hameln	Interargem GmbH Schelpmilser Weg 30 DE-33609 Bielefeld	2009	[11]300,000			N	-
G8	Helmstedt Niedersachen	E.ON Energy from Waste Helmstedt GmbH	An der B 244 (zwischen Helmstedt und Schöningen) DE-38350 Helmstedt	E.ON Energy from Waste Helmstedt GmbH An der B 244 DE-38350 Helmstedt	2005	540,000			N	-
G9	Ludwigslust Mecklenburg - Vorpommern	Thermische Abfallverwertungs anlage (TAV) Ludwigslu	Am Alten Flugplatz DE-19288 Ludwigslust	ANDRON GmbH & Co. KG Feldafinger Str. 5 DE-82343 Pöcking	2005	[12]50,000			-	-
G10	Rostock Mecklenburg - Vorpommern	EBS-HKW Rostock	Ost-West Straße 25 DE-18147	Vattenfall Europe New Energy GmbH Ecopower	2011	210,400			Y	n/d

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	[4]MSW
G11	Salzbergen Niedersachen	SRS EcoTherm GmbH Salzbergen	Neuenkirchener Str. 8 DE-48499 Salzbergen	SRS EcoTherm GmbH Salzbergen Neuenkirchener Str. 8 DE-48499 Salzbergen	2004	[13]120,000			-	-
G12	Stapelfeld Niedersachen	E.ON Energy from Waste Stapelfeld GmbH	Ahrensburger Weg 4 DE-22145 Stapelfeld	E.ON Energy from Waste Stapelfeld GmbH Ahrensburger Weg 4	[14]1979	[6]120,000			-	-
G13	Tornesch Schleswig-Holstein	Müllheizkraftwerk Tornesch-Ahrenlohe	Hasenkamp 15 DE-25436 Tornesch-Ahrenlohe	GAB Gesellschaft für Abfallwirtschaft und -behandlung Bundesstr. 301 DE-25495 Kummerfeld	[15]1987	-			-	-

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	[4]MSW
G14	Bremen	Müllheizkraftwerk Bremen	Otavistraße 7 - 9 DE-28237 Bremen	Mittelkalorik-Kraftwerk Bremen Theodor-Heuss-Allee 20 DE-28215 Bremen	2009	234,119			Y	Y
G15	Bremen	Mittelkalorik-Kraftwerk Bremen	Oken 2 DE-28215 Bremen	Müllheizkraftwerk Bremen Theodor-Heuss Allee 20 DE-28215 Bremen	1976	-			-	-
G16	Bremerhaven	Müll-Heiz-Kraftwerk Bremerhaven	Zur Hexenbrücke 16 DE-27570 Bremerhaven	Bremerhavener Entsorgungsgesellschaft mbH Zur Hexenbrücke 16 DE-27570 Bremerhaven	1977	-			-	-

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	[4]MSW
G17	Neustadt	Müllheizkraftwerk Neustadt/Holstein	Industrieweg 9 - 11 DE-23730 Neustadt	ZVO Entsorgung GmbH P.O. Box 1353 DE-23663 Holstein/Neustadt Timmendorfer Strand	[15]1984	58,600			-	-

[1] Considered sequentially therefore if a filter is coloured red (failed) no further filters are considered
[2] Most recent commissioning date where there are multiple lines
[3] Calculated based on all lines commissioned since 1995 and assuming 8,000 operational hours (circa 90% availability); does not consider current nominal CV
[4] http://powerplants.vattenfall.com/node/272
[5] http://www.iswa.org/uploads/tx_iswaknowledgebase/Gruemmert.pdf
[6] http://www.lacitysan.org/solid_resources/strategic_programs/alternative_tech/PDF/ThermalRecyclingFacility.pdf
[7] http://www.atlas.d-waste.com/index.php?view=master_table_format&id=17&master_id=10
[8] http://www.mvkiel.de/energie/Daten/index.html
[9] http://www.industcards.com/wte-germany-hh-ni.htm
[10] http://www.metrovancouver.org/services/solidwaste/planning/Feedback/PublicInputJune23-29.pdf
[11] http://www.eon-energyfromwaste.com/Leistungen/149.aspx
[12] http://www.itad.de/itad/mitglieder/karte/index.html?detID=69
[13] http://www.rwe.com/web/cms/en/76990/rwe-power-ag/locations/more/salzbergen-thermal-waste-treatment-plant-tas/
[14] http://www.eon-energyfromwaste.com/SnetWebControls/Forms/PDF/EEW_Stapelfeld.pdf
[15] *Energy from Waste State-of-the-Art-Report, Statistics 5th Edition, August 2006*, ISWA – the International Solid Waste Association

Table A2.6: Holland

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	[4]MSW
H1	Alkmaar	HVC Huisvuilcentrale, Alkmaar	Jadestraat 1 NL-1812 RD Alkmaar	HVC Group PO Box 9199 NL-1800 GD Alkmaar	2005	664,000			N	-
H2	Amsterdam	AEB Afval Energie Bedrijf, Amsterdam	Australiehavenweg 21 NL-1045 HG Amsterdam	City of Amsterdam Amstel 1 NL-1011 PN Amsterdam	2007	537,600			Y	Y
H3	Beuningen	ARN B.V., Nijmegen	Nieuwe Pieckelaan 1 NL-6503 GM Nijmegen	ARN B.V. PO Box 7006 NL-6503 GM Nijmegen	1995	168,000			N	-
H4	Delfzijl	E.ON Energy from Waste, Delfzijl B.V.	Oosterhorn 38 NL-9936 HD Farmsum	E.ON Energy from Waste AG Schöninger Strasse 2-3 DE-38350 Helmstedt	2010	[4]275,000			Y	Y
H5	Dordrecht	HVC Huisvuilcentrale, Dordrecht	Baanhoekweg 40 NL-3313 LA Dordrecht	HVC Group PO Box 9199 NL-1800 GD Alkmaar	1990	-			-	-

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	[4]MSW
H6	Dordrecht	Zavin, Dordrecht	Baanhoekweg 46 NL-3313 LA Dordrecht	Zavin C.V. Baanhoekweg 46 NL-3313 LA Dordrecht	1991	-			-	-
H7	Duiven	AVR Afvalverwerking B.V., Duiven	Rivierweg 20 NL-6921 PZ Duiven	Van Gansewinkel PO Box 8785 NL-5605 LT Eindhoven	1975	-			-	-
H8	Hengelo	Twence B.V. Afval en Energie, Hengelo	Boelderschoekweg 51 NL-7554 RT Hengelo	Twence B.V. Afval en Energie PO Box 870 NL-7550 AW Hengelo	1997	288,000			Y	Y
H9	Midden-Drenthe	Attero, Wijster	Vamweg 7 NL-9418 TM Wijster	Attero PO Box 4114 NL-6080 AC Haelen	1996	576,000			N	-
H10	Moerdijk	Attero, Moerdijk	Middenweg 34 NL-4782 PM Moerdijk	Attero PO Box 4114 NL-6080 AC Haelen	1997	424,000			Y	Y
H11	Roosendaal	SITA ReEnergy, Roosendaal	Potendreef 2 NL-4703 RK Roosendaal	SITA	1976 [5]2011	[5]291,000			N	-

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	[4]MSW
H12	Rotterdam	AVR Afvalverwerking B.V., Rotterdam	Brielselaan 175 NL-3081 AC Rotterdam	Van Gansewinkel PO Box 8785 NL-5605 LT Eindhoven	2009	432,000			Y	Y
H13	Rozenburg	AVR Afvalverwerking B.V., Rozenburg	Prof. Gerbandyweg 10 NL-3197 KK Rozenburg	Van Gansewinkel PO Box 8785 NL-5605 LT Eindhoven	1994	-			-	-

[1] Considered sequentially therefore if a filter is coloured red (failed) no further filters are considered
[2] Most recent commissioning date where there are multiple lines
[3] Calculated based on all lines commissioned since 1995 and assuming 8,000 operational hours (circa 90% availability); does not consider current nominal CV
[4] http://www.eon-energyfromwaste.com/en/Leistungen/588.aspx
[5] http://www.hz-inova.com/cms/en/news-downloads/press-releases/item/238-sitas-reenergy-one-of-the-most-modern-waste-to-energy-plants-in-europe-opens-in-roosendaal

Table A2.7: Republic of Ireland

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	[4]MSW
ROI1	Carranstown	Meath Waste-to-Energy Plant	Carranstown, Duleek, Co. Meath Drogheda Duleek	Indaver Ireland 4th Fl, Block 1 West Pier Business Campus Dun Laoghaire, Dublin	2011	216,000			N	-

[1] Considered sequentially therefore if a filter is coloured red (failed) no further filters are considered
[2] Most recent commissioning date where there are multiple lines
[3] Calculated based on all lines commissioned since 1995 and assuming 8,000 operational hours (circa 90% availability); does not consider current nominal CV

Table A2.8: Norway

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	[4]MSW
N1	Averøy	Nordmøre Energigjenvinning KS	Kristvika NO-6530 Averøy	Energos AS, Nordmøre Interkommunale renovasjonsselskap	[4]n/a	-			-	-
N2	Bergen	BIR Avfallsenergi, Bergen	Fanavegen 219 NO-5239 Rådal	BIR AS Post box 6004, Postterminalen NO-5892 Bergen	2010	117,600			-	-
N3	Frederikstad	FREVAR KF	Postboks 1430 NO-1632 Gml. Frederikstad	FREVAR KF post box 1430 NO-1602 Fredrikstad	1984	-			-	-
N4	Fredrikstad	Hafslund Miljøenergi AS - HME BEF	Habornveien 61 NO-1630 Gamle Fredrikstad		[5]2008	[5]80,000			-	-
N5	Hamar	Eidsiva Bioenergi	Engomsvingen 41 NO-2323 Ingeberg	Eidsiva Bioenergi AS Pb4100 NO-2307 Hamar	2011	80,000			-	-

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	[4]MSW
N6	Lenvik	Senja Avfallselskap IKS	Botnhågen NO-9300 Finnsnes	Senja avfallsselskap IKS Botnhågen NO-9300 Finnsnes	2006	15,360	X	X	-	-
N7	Oslo (Haraldrud)	Haraldrud Energigjenvinningsanlegg	Brobekkveien 87 NO-0583 Oslo	Oslo Kommune Energigjenvinningsetaten Post box 54, Mortensrud NO-1215 Oslo	1967	100,000	X	X	-	-
N8	Oslo (Klemetsrud)	Klemetsrud Energigjenvinningsanlegg	Klemetsrudveien 1 NO-1278 Oslo	Oslo Kommune Energigjenvinningsetaten Post box 54, Mortensrud NO-1215 Oslo	2011	160,000	X	X	Y	Y
N9	Rakkestad	Returkraft AS	Setesdalsveien 205 NO-4618 Kristiansand S		[6]2005	[6]10,000	X	X	-	-

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	[4]MSW
N10	Sandnes	Forus Energigjenvinning KS	Forusbeen 202 NO-4313 Sandnes	Forus Energigjenvinning KS Forusbeen 202 NO-4313 Sandnes	[4]n/a	-			-	-
N11	Sarpsborg	Østfold Energi A/S	Oskar Petersens vei 10 NO-1701 Sarpsborg	Østfold Energi A/S Post Box 17 NO-1701 Sarpsborg	[4]n/a	-			-	-
N12	Sarpsborg	Hafslund Miljøenergi AS - HME BWtE	Hjalmar Wessels vei 10 NO-1721 Sarpsborg		[4]n/a	-			-	-
N13	Spjelkavik	Tafjord Kraftvarme A/S	Serviceboks 1 NO-6025 Ålesund	Tafjord Kraftvarme A/S Serviceboks 1 NO-6025 Ålesund	Unknown	'34,658			-	-

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	[4]MSW
N14	Trondheim	Heimdal varmesentral	Østre Rosten 82 NO-7075 Tiller	Statkraft Varme AS Sluppenveien 6 NO-7005 Trondheim	2007	120,000			-	-
N15	Ål	Hallingdal Renovasjon	Kleivi NO-3570 Ål	Hallingdal renovasjon IKS Kleivi NO-3570 Ål	1984	-			-	-

[1] Considered sequentially therefore if a filter is coloured red (failed) no further filters are considered
[2] Most recent commissioning date where there are multiple lines
[3] Calculated based on all lines commissioned since 1995 and assuming 8,000 operational hours (circa 90% availability); does not consider current nominal CV
[4] Gasification plant – excluded
[5] http://www.hafslund.no/english/facts/artikler/les_artikkel.asp?artikkelid=2144
[6] http://www.weiss-as.dk/files/files/CASE%20STUDY%20-%20waste%20to%20energy%204MW.pdf
[7] *Energy from Waste State-of-the-Art-Report, Statistics 5th Edition, August 2006*, ISWA – the International Solid Waste Association

Table A2.9: Scotland

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	[4]MSW
SC1	Shetland Islands	Lerwick Energy Recovery Plant	Greenhead ZE1 0NT Lerwick	Shetland Islands Town Hall Lerwick ZE1 0NT	[4]2000	26,400	-	-	-	-
SC2	Dumfries	Dumfries and Galloway		Scotgen	[5]Duplicate	-	-	-	-	-
SC3	Dumfries	Dargavel Stores (gasifier)	Lockerbie Road Dumfries	Ascot Environment	[6]n/a	-	-	-	-	-
SC4	Dundee	Dundee		Dundee Energy Recycling Ltd Forties Rd DD4 0NS Dundee	[4]2000	[4]128,000	-	-	-	-

[1] Considered sequentially therefore if a filter is coloured red (failed) no further filters are considered
[2] Most recent commissioning date where there are multiple lines
[3] Calculated based on all lines commissioned since 1995 and assuming 8,000 operational hours (circa 90% availability); does not consider current nominal CV
[4] *Energy from Waste State-of-the-Art-Report, Statistics 5th Edition, August 2006*, ISWA – the International Solid Waste Association
[5] The only Dumfries facility is Dargavel Stores http://www.sepa.org.uk/waste/waste_regulation/energy_from_waste/efw_sites_in_scotland.aspx
[6] Gasification plant – excluded

Table A2.10: Sweden

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	[4]MSW
SE1	Avesta	Källhagsverket i Avesta	Värmevärden AB, Industrigatan 40 SE-77435 Avesta	Värmevärden AB Industrigatan 40 SE-77435 Avesta	2002	72,000			-	-
SE2	Boden	Värmeverket i Boden	Degerbergsvägen 2 SE-96140 Boden	Bodens Energi AB Slipvägen 7 SE-96140 Boden	1997	64,000			-	-
SE3	Bollnäs	Säverstaverket i Bollnäs	Bollnäs kommun Värmeverket SE-82180 Bollnäs	Bollnäs Kommun SE-82180 Bollnäs	1983	-			-	-
SE4	Borlänge	Bäckelundsverket	Ritargatan 1 SE-78178 Borlänge	AB Borlänge Energi Box 834 SE-78178 Borlänge	2009	88,000			-	-
SE5	Eda	Åmotfors energi AB	Pappersvägen SE-67040 Åmotfors	Åmotfors Energi Pappersvägen SE-67040 Åmotfors	2010	73,600			-	-

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	[4]MSW
SE6	Eksjö	Eksjö Energi AB	Eksjö Energi AB SE-57580 Eksjö		Unknown	40,000			-	-
SE7	Göteborg	Sävenäsverket i Göteborg	Renova Box 156 SE-40122 Göteborg		[5]2009	592,000			Y	Y
SE8	Halmstad	Kristinehedsverket i Halmstad	Halmstads Energi & Miljö AB, Box 31 SE-30008 Halmstad	Halmstad kommun	2003	120,000			-	-
SE9	Helsingborg	Filborna KVV1	Hjortshögsvägen 7 SE-25189 Helsingborg	Öresundskraft Kraft & Värme AB P O Box 642 SE-25106 Helsingborg	2013	180,000 [6]227,000			Y	[6]Y
SE10	Hässleholm	Beleverket i Hässelholm	Hässleholm Miljö AB, Tippvägen 7 SE-28141 Hässelholm	Hässleholm Fjärrvärme AB Tippvägen 7 SE-28141 Hässelholm	2003	40,000			-	-

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	[4]MSW
SE11	Jönköping	Jönköping Energi	Jönköping Energi AB, Kraftvärmeverket Torsvik, Box 5150 SE-55005 Jönköping	Jönköping Energi AB Jönköping Energi AB, Box 5150 SE-55005 Jönköping	2006	160,000			N	-
SE12	Karlskoga	Karlskoga Kraftvärmeverk	Karlskoga Kraftvärmeverk AB, Box 155 SE-69123 Karlskoga	50 Box 155 SE-69123 Karlskoga	1986	-			-	-
SE13	Karlstad	Avfallsvärmeverket på Heden	Hedenverket SE-65184 Karlstad	Karlstads Energi AB SE-65184 Karlstad	1986	-			-	-
SE14	Kil	Kils Energi AB	Kils Energi AB, Box 88 SE-66523 Kil		[7]2004	Unknown			N	-
SE15	Kiruna	Kiruna Värmeverk	Värmeverksvägen 12 SE-98185 Kiruna	Tekniska Verken i Kiruna AB SE-98185 Kiruna	2001	80,000			-	-
SE16	Kumla	SAKAB	SAKAB AB SE-69285 Kumla	E.on	2003	100,000			-	-

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	[4]MSW
SE17	Köping	Norsaverket	Norsavägen 13 SE-73198 Köping	Vafab Miljö AB SE-72187 Västerås	Unknown	[8]c.25,000	X	X	-	-
SE18	Landskrona	Hetvattencentralen i Landskrona	Landskrona kommun Tekniska verken SE-26180 Landskrona		Unknown	[8]c.20,000	X	X	-	-
SE19	Lidköping	Lidköpings Värmeverk	Lidköpings Värmeverk AB Sjöhagsvägen 8 SE-53188 Lidköping		1985	-	X	X	-	-
SE20	Linköping	Gärstadverket i Linköping	Tekniska Verken i Linköping AB, Box 1500 SE-58115 Linköping		1983	-	X	X	-	-
SE21	Ljungby	Ljungsjöverket i Ljungby	Ljungsjöverket Märta Ljungbergsvägen 61 SE-34135 Ljungby	Ljungby Energi AB BOX 262 SE-34135 Ljungby	Unknown	[9]60,000	X	X	-	-

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	[4]MSW
SE22	Malmö	SYSAV Sydskånes Avfallsaktiebolag	Box 503 44 SE-20313 Malmö	Sysav Box 50344 SE-20313 Malmö	2008	400,000			Y	Y
SE23	Mora	Utmeland Avfallsanläggning	Mora Fjärrvärme, EON Värme SE-79223 Mora	E.ON Värme Sverige AB SE-20313 Malmö	1981	-			-	-
SE24	Norrköping	Händelöverket	EON Värme SE-60171 Norrköping	E.ON Värme Sverige AB Energigatan 5 SE-60171 Norrköping	2010	408,000			Y	Y
SE25	Nybro				[6]2013	[6]55,000			-	-
SE26	Stockholm	Högdalenverket i Stockholm	AB Fortum Värme / Stockholms stad Kvicksundsvägen 16 SE-12459 Bandhagen	AB Fortum Värme samägt med Stockholms stad SE-11577 Stockholm	2005	544,000			Y	Y
SE27	Stockholm	Bristaverket	Fortum Värme		[10]1997	[10]350,000			Y	[6]Y
SE28	Sundsvall	Korstaverket i Sundsvall	Sundsvall Energi, Box 823 SE-85123 Sundsvall		1984	-			-	-

Ref	Location	Name	Address	Owner	[1]Filters					
					[2]Year of operation	[3]Capacity (tpa)	Road (Y/N)	Rail (Y/N)	Port (Y/N)	[4]MSW
SE29	Södertälje	Igelstaverket	Söderenergi, Nynäsvägen 43 SE-15207 Södertälje	Söderenergi AB Box 7074 SE-15207 Södertälje	Unknown	Unknown			Y	N
SE30	Uddevalla	Lillesjöverket	Uddevalla Energi AB, Strömberget SE-45181 Uddevalla	Uddevalla Energi AB Strömberget SE-45181 Uddevalla	2009	88,000			-	-
SE31	Umeå	Dåva kraftvärmeverk	Dåva Energiväg 1, SE-90105 Umeå	Umeå Energi AB Box 224 SE-90105 Umeå	[11]2000	[11]160,000			Y	Y
SE32	Uppsala	Vattenfall Värme Uppsala AB	SE-75382 Uppsala	Vattenfall Värme AB	1982	-			-	-
SE33	Västervik	Stegeholmsverket i Västervik	Västerviks Miljö & Energi AB, Värmeverksgatan 5 SE-59350 Västervik	Västerviks Miljö & Energi AB Box 25 SE-59321 Västervik	1985	-			-	-
SE34	Västerås	Mälarenergi			[12]Mid-2014	480,000			Y	Y

[1] Considered sequentially therefore if a filter is coloured red (failed) no further filters are considered
[2] Most recent commissioning date where there are multiple lines

[3] Calculated based on all lines commissioned since 1995 and assuming 8,000 operational hours (circa 90% availability); does not consider current nominal CV
[4] http://www.avfallsverige.se/fileadmin/uploads/Statistikfiler/SWM2010.pdf
[5] Includes capacity of line 2 (1994) which appears to have been part of the same capacity increase as line 5 (1995)
[6] COWI in-house data
[7] http://www.noxor.se/img/Ash-handling-Roxon.pdf
[8] http://www.seas.columbia.edu/earth/wtert/sofos/DIOXINS_in_SWEDEN.pdf
[9] http://www.opet-chp.net/download/wp3/d3bcase3ljungby.pdf
[10] http://www.fortum.com/en/energy-production/combined-heat-and-power/sweden/Documents/Download%20Brista%20CHP%20power%20plant%20brochure.pdf
[11] *Energy from Waste State-of-the-Art-Report, Statistics 5th Edition, August 2006*, ISWA – the International Solid Waste Association
[12] http://www.malarenergi.se/PageFiles/7417/F%C3%B6rnyelsprojektet_folder_A6_maj2012_ENGELSKA.pdf

Table A2.11: Wales

None

Appendix 4: Contact Details (Task 1b Screening)

No	Ref	Country	Location	Name	Email address 1	Email address 2	Contact Name	Postal Address
1	BE1	Belgium	Brugge	IVBO	Pieter.vijncke@ivbo.be	info@ivbo.be	Pieter Vijncke	IVBO Pathoekeweg 41 BE-8000 Brugge Belgium
2	BE2	Belgium	Brussel	Brussel Energie	Georges.dumbruch@bruxelles-energie.be	Norbert.deloose@brussel-energie.be	Georges Dumbruch	Brussel Energie Monnoyerkaai 8 BE-1000 Belgium
3	BE3	Belgium	Doel-Beveren	Indaver/ Sleco	nic.maes@indaver.be		Nic Maes	Indaver Molenweg, Haven 1940 BE-9130 DOEL (BEVEREN) Belgium
4	BE8	Belgium	Herstal	Uvelia-Intradel	jean-marc.digneffe@intradel.be	info@intradel.be	Jean-Marc Digneffe	INTRADEL SCRL Port de Herstal - Pré Wigi BE-4040 Belgium
5	D1	Denmark	Esbjerg	L90 Affaldsforbrænding	l90@l90.dk		Jan Fletcher Hansen	L90 Affaldsforbrænding Måde Industrivej 35 DK-6705 Esbjerg Ø Denmark

No	Ref	Country	Location	Name	Email address 1	Email address 2	Contact Name	Postal Address
6	D17	Denmark	Odense	Odense Kraftvarmeværk A/S	peter.graversen@vattenfall.com	pia.hansen@vattenfall.com vattenfall.danmark@vattenfall.com	Peter C. Graversen	Odense Kraftvarmeværk A/S Havnegade 120 Postboks 928 DK-5000 Odense C Denmark
7	D18	Denmark	Roskilde	KARA/NOVEREN Roskidle forbrændingsanlæg	info@karanoveren.dk		Berit Nielsen	KARA/NOVEREN Roskidle Forbrændingsanlæg Håndværkervej 70 DK-4000 Roskilde Denmark
8	D27	Denmark	Aalborg	Reno-Nord I/S	hsk@reno-nord.dk	renonord@renonord.dk	Henrik Skovhaug	Reno-Nord I/S Troensevej 2 DK-9220 Aalborg Øst Denmark
9	D28	Denmark	Århus	Kraftvarmeanlæg Århus Nord	affaldvarme@aarhus.dk		Kenneth Egeskov	Kraftvarmeanlæg Århus Nord Ølstedvej 20 DK-8200 Århus N Denmark
10	EN1	England	Billingham	Teeside EfW Plant	graham.ingleson@sita.co.uk		Graham Ingleson	SITA UK Teeside EfW Haverton Hill Road Billingham Teesside TS23 1PY

No	Ref	Country	Location	Name	Email address 1	Email address 2	Contact Name	Postal Address
11	EN2	England	Birmingham	Tyseley Waste Disposal Ltd	Mark.heesom@veolia.uk		Mark Heesom	Veolia Environmental Services Tyseley ERF James Road Tyseley Birmingham B11 2BA
12	EN6	England	Colnbrook	Lakeside Energy from Waste Ltd.	DCooke@viridor.co.uk	marketing@grundon.com	Dan Cooke	Lakeside Energy from Waste Ltd Lakeside Rd Colnbrook Berkshire SL3 0FE
13	EN10	England	East Sussex	Newhaven	Rob.Allen@veolia.co.uk		Rob Allen	Veolia Environmental Services Newhaven ERF North Quay Road Newhaven East Sussex BN9 OAB

No	Ref	Country	Location	Name	Email address 1	Email address 2	Contact Name	Postal Address
14	EN17	England	London, Bexley	Riverside	Apike@coryenvironmental.co.uk	info@coryenvironmental.co.uk	Andy Pike	Cory Environmental Riverside Resource Recovery Facility Norman Road Belvedere Kent DA17 6JY
15	EN24	England	Sheffield	Sheffield ERF	Nigel.williams@veolia.co.uk	Sheffieldenquiries@veolia.co.uk	Nigel Williams	Veolia Environmental Services Sheffield ERF Lumley Street Sheffield S4 7ZJ
16	EN25	England	Stoke-on-Trent	Stoke-on-Trent	Andrew.Jackson@cnim.com		Andrew Jackson	MES Environmental Ltd Campbell Road Sideway Stoke-on-Trent ST4 4DX
17	F7	France	Bègles	Bordeaux (Bègles)	thierry.lamotte@novergie.fr		M. Thierry LAMOTTE	ASTRIA Rue Louis Blériot FR-33323 Bègles Gironde France

No	Ref	Country	Location	Name	Email address 1	Email address 2	Contact Name	Postal Address
18	F18	France	Cergy Pontoise	Cergy Pontoise	stéphane.piercourt@veolia-proprete.fr [email undeliverable and/or incorrect contact]	info@veolia-proprete.fr	Stéphane PIERCOURT	CGECP AUROR'ENVIRONNEMENT (SAN) SYNDICAT AGGLO NOUVELLE DE CERGY PONTOISE Parc d'Activités les Béthunes 2 Avenue du Fief - BP 9111 FR-95073 St Ouen L'Aumône Cergy Pontoise cedex France
19	F30	France	Grand Quevilly	Rouen 2	bruno.gautier@smedar.fr		M. Bruno GAUTIER	SMEDAR Rouen 2 Boulevard de Stalingrad FR-76120 France
20	F33	France	Halluin	Halluin (Lille)	jlmusilli@cudl-lille.fr [email undeliverable and/or incorrect contact]	info@veolia-proprete.fr	M. Jean-Luc MUSILLI	Communauté Urbaine de Lille Métropole Rocade de la Valée de la Lys RD 191 - BP 302 FR-59433 France

No	Ref	Country	Location	Name	Email address 1	Email address 2	Contact Name	Postal Address
21	F35	France	Issy-Les-Moulineaux	Issy-Les-Moulineaux	lecat@syctom-paris.fr [email undeliverable and/or incorrect contact]	communication.idf@sita.fr	Mme. LECAT	SYCTOM de l'agglomération Parisienne 167 Quai de Stalingrad FR-92130 France
22	F78	France	Vaux-le-Penil	Melun	kschott@lombric.com [email undeliverable]	smitom@lombric.com	M. DIDION	SMITOM Centre Ouest Seine et Marnais Route de Nangis ZAC du Tertre de Chérisy FR-77000 Vaux-le-Penil France
23	F79	France	Vert le Grand	Vert le Grand	cfranchino.pse@wanadoo.fr	mrajade@semardel.fr	M. FRANCHINO	SEMARDEL PSE - CITD Ecosite de Vert Le Grand Chemin Butte - BP 2 FR-91810 Vert le Grand France
24	F81	France	Villiers Saint Paul	Esiane (Villiers Saint-Paul)	christophe.guerin@novergie.fr [email undeliverable and/or incorrect contact]	communication.idf@sita.fr	Jean-Christophe Guerin	SITA Suez Novergie Esiane Avenue Frédéric et Irène Joiliot Curie FR-60870 Villiers Saint Paul France

No	Ref	Country	Location	Name	Email address 1	Email address 2	Contact Name	Postal Address
25	G2	Germany	Hamburg - Rugenberger Damm	Müllverwertung Rugenberger Damm Hamburg	mvr@mvr-hh.de		Dr.-Ing. Martin Mineur	MVR Müllverwertung Rugenberger Damm GmbH & Co KG Rugenberger Damm 1 DE-21129 Hamburg Germany
26	G3	Germany	Hamburg - Stellinger Moor	Müllverbrennung Stellinger Moor Hamburg	mva@srhh.de		Dr. Anke Boisch	Müllverbrennung Stellinger Moor Hamburg Stadtreinigung Hamburg Schnackenburgallee 100 DE-22525 Hamburg Germany
27	G10	Germany	Rostock	EBS-HKW Rostock	carolin.kurzawa@vattenfall.de	silvia.feldhusen@vattenfall.de	Hr. Michael Henning	Vattenfall Europe New Energy Ecopower GmbH EBS-HKW Rostock Ost-West Straße 25 DE-18147 Germany
28	G14	Germany	Bremen	Müllheizkraftwerk Bremen	matthias.hesse@swb-gruppe.de	christian.walter@swb-gruppe.de	Matthias Hesse	swb Entsorgung GmbH & Co. KG Müllheizkraftwerk Bremen Otavistraße 7 - 9 DE-28237 Bremen Germany

No	Ref	Country	Location	Name	Email address 1	Email address 2	Contact Name	Postal Address
29	H2	Holland	Amsterdam	AEB Afval Energie Bedrijf, Amsterdam	info@afvalenergiebedrijf.nl	info@aebamsterdam.nl	N. Wakidjan	AEB Afval Energie Bedrijf Australiehavenweg 21 NL-1045 HG Amsterdam Netherlands
30	H4	Holland	Delfzijl	E.ON Energy from Waste, Delfzijl B.V.	horst.bieber@eon-energi.com [email undeliverable and/or incorrect contact]	marleen.houwing@eon.com	Horst Bieber	E.ON Energy from Waste Delfzijl B.V. Oosterhorn 38 NL-9936 HD Farmsum Netherlands
31	H8	Holland	Hengelo	Twence B.V. Afval en Energie, Hengelo	info@twence.nl	robert.corijn@attero.nl	H. Schrooten	Twence B.V. Afval en Energie Boelderschoekweg 51 NL-7554 RT Hengelo Netherlands
32	H10	Holland	Moerdijk	Attero, Moerdijk	azn@nvAZN.nl [email undeliverable and/or incorrect contact]	richard.huijzer@attero.nl robert.corijn@attero.nl	R.F. van Vugt / Richard Huijzer	Attero Middenweg 34 NL-4782 PM Moerdijk Netherlands
33	H12	Holland	Rotterdam	AVR Afvalverwerking B.V., Rotterdam	info@vangansewinkel.nl	florens.slob@vangansewinkel.com	R. Arends	AVR Afvalverwerking B.V. Brielselaan 175 NL-3081 AC Rotterdam Netherlands

No	Ref	Country	Location	Name	Email address 1	Email address 2	Contact Name	Postal Address
34	N8	Norway	Oslo (Klemetsrud)	Klemetsrud Energigjenvinningsanlegg	Johnny.stuen@ege.oslo.kommune.no	postmottak@ege.oslo.kommune.no	Johnny Stuen	Oslo Kommune Energigjenvinningsetaten Klemetsrud Energigjenvinningsanlegg Klemetsrudveien 1 NO-1278 Oslo Norway
35	SE7	Sweden	Göteborg	Sävenäsverket i Göteborg	christer.lundgren@renova.se		Christer Lundgren	Sävenäsverket i Göteborg Renova Box 156 SE-40122 Göteborg Sweden
36	SE9	Sweden	Helsingborg	Filborna KVV1	jesper.baaring@oresundskraft.se		Jesper Baaring	Öresundskraft Kraft & Värme AB Filborna KVV1 Hjortshögsvägen 7 SE-25189 Helsingborg Sweden
37	SE22	Sweden	Malmö	SYSAV Sydskånes Avfallsaktiebolag	lars.jacobsson@sysav.se	kundtjanst@sysav.se	Lars Jacobsson	SYSAV Sydskånes Avfallsaktiebolag Box 503 44 SE-20313 Malmö Sweden

No	Ref	Country	Location	Name	Email address 1	Email address 2	Contact Name	Postal Address
38	SE24	Sweden	Norrköping	Händelöverket	samuel.nilsson@eon.se		Samuel Nilsson	EON Värme Sverige AB Händelöverket SE-60171 Norrköping Sweden
39	SE26	Sweden	Stockholm	Högdalenverket i Stockholm	goran.eidensten@fortum.com		Göran Eidensten	AB Fortum Värme / Stockholms stad Högdalenverket Kvicksundsvägen 16 SE-12459 Bandhagen Sweden
40	SE27	Sweden	Stockholm	Bristaverket	goran.eidensten@fortum.com		Göran Eidensten	AB Fortum Värme Lidingövägen 115 SE-115 77 Stockholm Sweden
41	SE31	Sweden	Umeå	Dåva kraftvärmeverk	ulf.kullh@umeaenergi.se		Ulf Kullh	Umeå Energi AB Dåva kraftvärmeverk Dåva Energiväg 1, SE-90105 Umeå Sweden

No	Ref	Country	Location	Name	Email address 1	Email address 2	Contact Name	Postal Address
42	EN27	England	Four Ashes, Staffordshire	Veolia W2R (Waste to Resource)	Donald.macphail@veolia.co.uk		Donald Macphail	Veolia Environmental Services Vanguard Way Battlefield Enterprise Park Shrewsbury SY1 3TG
43	EN28	England	North Hykeham, Lincolnshire	FCC Lincolnshire	mark.james@fccenvironment.co.uk	info@fccenvironment.co.uk	Mark James	FCC Environment Lincoln EfW Plant Off Whisby Road North Hykeham Lincoln LN6 3QW
44	SE35	Sweden	Linköping (extension)	Gärstadverket i Linköping	henrik.lindstahl@tekniskaverken.se		Henrik Lindståhl	Gärstadverket Tekniska Verken i Linköping AB Box 1500 SE-58115 Linköping Sweden

Appendix 5: Correspondence Inviting Expressions of Interest

Our Ref: RR2761

14 January 2013

{EfW address – see contact list}

Dear {contact name}

COMMERCIAL OPPORTUNITY: TREATMENT OF RESIDUAL WASTE FROM THE STATES OF GUERNSEY

The States of Guernsey ("the States") are pursuing the option of export of residual waste as part of the Island's waste strategy. The Public Services Department of the States is seeking to identify suitable energy from waste (EfW) facilities to treat approximately 25,000 tonnes per year of pre-treated residual municipal solid waste (MSW) and commercial waste of a similar composition. In accordance with the waste strategy implementation programme, the States would aim to begin exporting waste during 2015.

I am contacting you as the representative of a facility that has been identified by a screening exercise as potentially suitable. If you are not the most appropriate contact point it would be appreciated if you could please forward this correspondence directly within your organisation.

The States now seeks to short-list facilities for detailed discussions in relation to this opportunity. This letter forms the basis of the short-listing exercise.

This letter contains:

- an introduction to our objectives and our published waste strategy;
- outline information on the nature of residual waste to be exported; and
- a short questionnaire in relation to the specific facility at which you have been contacted to gauge your interest and suitability

What you need to do

I hope this opportunity is of interest. If not, please accept my apologies and confirm your position in a short email to the contact email address provided below.

If you are interested, please review the information in Annex 1 and provide responses to the questions in Annex 2 by 12.00 CET (11.00 GMT) on 31 January 2013. Completed questionnaires should be emailed to Amy de Carteret, Waste Strategy & Policy Adviser at amy.decarteret@gov.gg. I regret that if you do not respond by the deadline I must assume that you are not interested in this opportunity. You will receive a hard copy of this letter but you will not receive a further reminder.

You must respond to all questions to remain in the selection process. A completed Annex 2 table is a suitable form of response. Limited supporting information can be provided in addition if required but should not exceed 5 sides of A4, or equivalent, in total.

In order to ensure that we carry out a fair procurement exercise with all potential candidates we would ask that you do not enter into correspondence with us unless it is in relation to a clarification related to this letter or the questionnaire. We will of course provide you with the outcome of the short-listing process but reserve the right to control the form and content of any feedback given. The States also reserves the right to withdraw from this Expression of Interest and subsequent tender process (through the Channel Island e-tender portal) at any time prior to concluding a contract without payment of any compensation to any candidate. This procurement is not subject to the EU procurement rules which are applicable to public sector bodies within the EU as the States of Guernsey is not an EU Member.

The information collected at this stage will enable the States to short-list facilities for more detailed consideration in relation to this opportunity. Short-listed operators will be contacted in due course and invited to register on the Channel Islands e-tender portal, which is utilised by the States for formal tenders. Full details will be provided to the relevant facilities.

How the States will treat your commercial information

Information provided in response to Annex 2 will be treated as confidential. The States, or its representatives, Ricardo-AEA (www.ricardo-aea.com), will only use such information in relation to this selection process. The States will take all reasonable steps to safeguard and protect the information from any theft, loss, unauthorised access, unauthorised use or disclosure and accord it at least the same degree of confidential and proprietary treatment as it gives its own confidential and proprietary information. The information will not be disclosed or made available to third-parties except in relation to any decisions the States takes in relation to this procurement or for the States to seek professional advice. Any professional advisers will be subject to a duty to keep confidential material provided to them confidential. Please note that the States does not currently have a Freedom of Information Law.

I very much look forward to receiving your response.

Yours sincerely

Colette Falla
Deputy Chief Officer

Annex 1: Background Information

The following information, and that available at the link provided, forms the extent of information that will be provided at this stage. Please do not attempt to enter into correspondence with the States or its' representatives unless this is in relation to a point of clarification.

1. The Bailiwick of Guernsey is a Crown Dependency that is part of the British Isles but not part of the UK or EU. The UK's ratification of the Basel Convention has been extended to Guernsey however, and the OECD Decision has also been extended to Guernsey.

2. Guernsey currently disposes of residual waste at a single landfill site that is owned and operated by the States. Capacity is limited and the States recognises that this practice cannot continue.

3. The revised waste strategy (www.gov.gg/wastestrategy), approved by the States in February 2012, includes challenging recycling targets to minimise residual waste. The export of genuinely residual waste is an integral part of the long term waste strategy.

4. The States applies its own mandatory procurement rules and is committed to obtaining value for money. The States chose not to opt into EU law on procurement and is not therefore required to use any procedures contained in this. You can however consider this letter to represent a call for expressions of interest.

5. A new 105,000 tonne per year EfW facility is in operation on the neighbouring island of Jersey, which is also a Crown Dependency of the British Isles. This may represent one option, but the States is also committed to considering other potential markets.

6. The States seeks to export circa 25,000 tonnes per year residual MSW and similar commercial waste. This estimate will be affected by the implementation of other elements of the waste strategy. The calorific value is estimated at circa 11-12.5 MJ/kg. Industry on Guernsey is limited and future waste growth is not likely to be significant.

7. At this stage we anticipate waste will have been handled and treated in the following way before export (note that waste pre-treatment requirements will be agreed with the importing facility):

    a. Separation of dry recyclables, food waste and kitchen waste at the point of collection.

    b. Pre-treatment of MSW and commercial waste at an on-island MRF, including:

i. Removal of unacceptable wastes dependent on receiving site waste acceptance criteria (WAC) (e.g. hazardous waste, batteries, WEEE, gypsum, gas bottles, asbestos, radioactive materials, large animal carcasses, contaminated ground).
ii. Shredding (or bag splitting in relation to MSW) for size reduction and inherent mixing.
iii. Removal of ferrous and non-ferrous metals and potentially additional marketable recyclable materials.
iv. Removal of large inert items.
v. Potentially screening of fines depending on WAC and any future tightening of legislation in relation to the definition of RDF.
vi. Baling and wrapping.

8. The transportation of waste from the States to the receiving facility may be subject to a separate procurement process.

Annex 2: Questionnaire

Question		Category	Response
1. Capacity			
1a	Does your facility have a nominal spare capacity of at least 25,000 tonnes per year?	Pass/fail	Yes/No
1b	Please estimate how many years this capacity could be made available to the States?	Ranking	
2. Regulatory			
2a	Does your facility currently meet the R1 recovery criterion?	Pass/fail	Yes/No
2b	If you answered 'yes' to 2a do you foresee any reason for this R1 status to change in the short to medium term?	Ranking	Yes/No
2c	If you answered 'yes' to 2b please expand.	Information	
3. Commercial			
3a	Please indicate a gate fee (€ or £ excluding taxes and transportation to your facility). A narrow fee range is acceptable. This should include elements such as ash management and provision of contingency. Please briefly outline any supporting information if required.	Ranking	
3b	What contract duration(s) are you interested in? Or state 'no preference'.	Ranking	
3c	Would you require a guaranteed tonnage over any contract period? If so, please expand.	Information	
3d	Do you currently import waste from other European jurisdictions?	Information	Yes/No
4. Nature of waste			
4a	Please indicate if you anticipate being able to accept the type of waste described in Annex 1?	Pass/fail	Yes/No
4b	Can you accept waste that is baled or loose or either?	Information	Baled/ Loose/ Either
5. Transport			
Context: Current commercial shipping routes for scheduled services from Guernsey are principally to Portsmouth, England and St. Malo, France. Onwards transfer takes place by road or rail (Portsmouth only). Dedicated shipping represents an alternative transport option. The following questions have been included to enable the States to consider the potential viability of dedicated shipping although we recognise this may not be relevant for all sites.			
5a	Is your facility co-located with a port that could accept the waste on dedicated shipping? Co-located is considered to mean access from the port to the EfW without using public roads.	Information	Yes/No/ Not relevant
5b	If you answered 'no' to 5a but consider that your facility is conveniently located to a suitable port please confirm the distance (km) and established method(s) of transfer to your facility.	Information	

Appendix 6: EoI Responses and Initial Scoring

Ref	Question summary	Criteria and scoring basis	Response/score					
			EoI1	EoI2	EoI3	EoI4	EoI5	EoI6
0	Company details							
0.1	Organ-isation	Information	Viridor	Filborna KVV1	EFO AB	Veolia Environmental Services (UK) Plc	Veolia Environmental Services (UK) Plc	Veolia Environmental Services (UK) Plc
0.2	EfW Facility		Runcorn, Cheshire, UK	Helsingborg, Sweden	Gärstadverket i Linköping	Marchwood ERF	Newhaven ERF	Portsmouth ERF
0.3	Contact name		Robert Ryan	Jesper Baaring	Mårten Eriksson	Ben Slater	Ben Slater	Ben Slater
0.4	Position		Head of Projects		Waste Fuels Coordinator (broker)	Regional Director	Regional Director	Regional Director
0.5	Address		Viridor Waste Management Limited, Peninsula House, Rydon Lane, Exeter EX2 7HR		EFO AB Kungsgatan 50 S-111 35 Stockholm	Marchwood ERF, Southampton, Hampshire SO40 4BD	Newhaven ERF, East Sussex, BN9 0AB	Portsmouth ERF, Portsmouth PO3 5QH
0.6	Telephone		(+)44 7795 654415		(+)46-8- 24 90 58	0203 5673043	0203 5673043	0203 5673043
0.7	Fax							
0.8	E-mail		RRyan@viridor.co.uk	Jesper.Baaring@oresundskraft.se	marten.eriksson@efo.se	Ben.Slater@veolia.co.uk	Ben.Slater@veolia.co.uk	Ben.Slater@veolia.co.uk
0.9	Website		http://www.viridor.co.uk/			http://www.veoliaenvironmentalservices.co.uk	http://www.veoliaenvironmentalservices.co.uk	http://www.veoliaenvironmentalservices.co.uk

1	**Capacity**													
1a	Spare capacity	Pass/fail	**Y**		**Y**		**Y**		**Y**		**Y**		**Y**	
1b	Period of capacity	Ranking >10 years=20 0-10 years=0-10	**20**	30 years	**5**	2 - 5 year depending on contract	**20**	25 - 30 years	**20**	10 - could be longer if Veolia's Hampshire client was agreeable to a commitment beyond the natural termination date of our Contract with them	**20**	20 - could be longer if Veolia's East Sussex client was agreeable to a commitment beyond the natural termination date of our Contract with them	**20**	Up to 2025 (although this could be longer if Veolia's Hampshire client was agreeable to a commitment beyond the natural termination date of our Contract with them)
2	**Regulatory**													
2a	R1 status	Pass/fail	**Y**	Designed to achieve R1 efficiency of 0.76	**Y**		**Y**		**Y**		**Y**		**Y**	
2b	Possible change of R1 status in the short to medium term	Ranking No=20 Yes=0-10	**20**		**20**		**20**		**20**		**20**		**20**	
2c	Further information	Information												

3	**Commercial**													
3a	Indicative gate fee	Ranking Proportion-al to range where: lowest fee=40 highest fee=0	**28.25**	£65-£70 per tonne	**35.36**	Between 45-50 EURO depending on quality and lasting of contract	**40.00**	25-35 EURO per tonne	**12.81**	£125 per tonne	**12.81**	£125 per tonne	**12.81**	£125 per tonne
-	**Gate fee clarif-cation**	**Evaluation score not adjusted**	No clarifications raised		No response		25-35 EURO includes all CHP costs (local taxes; ash management; CO_2 taxes etc.) Excludes transfer from port; variable depending on facility used with average 22 kms of the options cited.		We tried to pull a transport price together to be included in the gate price, but unfortunately it is not possible without a clear understanding of how the material would be delivered to the dockside. As far as we are aware no local taxes or taxes on polluting activities etc. would currently be levied at all three facilities. We would suggest that the matter of how any future costs arising due to the introduction of new local taxes or through legislative changes could be most appropriately covered would be through detailed discussions at the next stage of this procurement process.				

3b	Contract duration(s)	Ranking 20 years+ =20 1-10 years=1-10	**20**	5-10 years, or longer up to 30 years.	**5**	2 - 5 year	**10**	>1 **Clarification:** Depends on what kind of price adjustment agreement can be discussed. On a fixed price basis, without even a consumption index clause, max 3 years. If the price can be adjusted according to a known and independent index or with some market price correlation, then a duration of 5-10 years is possible. Or possibly 5+3+2 years or any equal solution.	**9**	No preference although the maximum would be 9 years (but please also see the response to question 1b above)	**18**	No preference but up to 18 years (but please also see the response to question 1b above)	**10**	10 - No preference although the maximum would be 10 years (but please also see the response to question 1b above)
3c	Guaranteed tonnage	Information	**Y**	15-20ktpa over any contract period	**Y**	If contract signed, we need a guaranteed minimum amount per year	**Y**	Without knowing if you have intentions of splitting up the tonnages of 25 000 tonnes per year, to several outlets. Our expectations would be to receive deliveries within the range of what has been contractually agreed upon.	**Y**	Veolia would require a minimum annual tonnage over the contract period through a "put or pay" arrangement.	**Y**	Veolia would require a minimum annual tonnage over the contract period through a "put or pay" arrangement.	**Y**	Veolia would require a minimum annual tonnage over the contract period through a "put or pay" arrangement

3d	Current imports of waste from Europe	Information	**N**		**N**	About to start up it	**Y**		**N**		**N**		**N**	
4	**Nature of Waste**													
4a	Ability to accept Guernsey waste	Pass/fail	**Y**		**Y**		**Y**		**Y**		**Y**		**Y**	
4b	Ability to accept waste that is baled or loose or either	Information	**Either**			Can only accept baled and wrapped in plastic	**Either**		**Either**		**Either**		**Either**	
5	**Transport**													
5a	Vicinity to port that could accept the waste on chartered shipping	Information	**N**	But feasible	**N**		**Y**		**Y**		**N**		**N**	

5b	Distance and method/s of transfer	Information	14.5 miles to 18 miles from the Port of Liverpool by road depending on the route taken. Our EfW accepts waste by road (bulk and curtain side) or train (bulked in rail containers). There are two docks in Runcorn, the Port of Weston and Runcorn Dock (adjacent to our site) which are both suited to further development. Runcorn EfW is designed to and will accept the delivery of waste / RDF by rail. This provides further flexibility to the States of Guernsey in its choice of transport route.	Port located about 6 kilometers from site and need to be done by truck	Since EFO AB represents several Power Plants we have the possibility to offer capacity at more than one facility. Regarding Tekniska verken i inköping AB the transport would require the use of public roads to the EFW. Their EFW is located about 44 km from the port. But for Mälarenergi in Västerås (another of EFO's owners with spare capacity), their EFW is co-located with a port (therefore the answer 'yes' in 5a).	The Marchwood Energy Recovery Facility is located adjacent to Southampton Water, which is an established route/port for both passenger and freight shipping. Adjoining the Facility is Veolia's Marine Services operations which can receive containerised waste directly off-loaded from shipping or via its seagoing barge.	The Newhaven Energy Recovery Facility is located adjacent to the River Ouse to the north of Newhaven Harbour. The Facility has its own railhead and is able to receive containerised waste by rail e.g. from Portsmouth via the Ferry Port and Portsmouth freight rail link, or potentially direct delivery via road from the Harbour itself – a distance of less than 1.0km.	The Portsmouth Energy Recovery Facility is located approximately 6.8km from the Port and the established methods of transfer to the facility include articulated vehicles.
		Score (/100)	**88.25**	**65.36**	**90.00**	**61.81**	**70.81**	**62.81**

Ref	Question summary	Criteria and scoring basis	Response/score					
			EoI7	EoI8	EoI9	EoI10	EoI11	EoI12
0	**Company details**							
0.1	Organ-isation	Information	SMEDAR	EON - Händelöverket	Brussel Energie	Indaver Ireland - Indaver Group	SITA	Attero
0.2	EfW Facility		Rouen 2, France	Norrkoping, Sweden	Brussel Energie	Doel (Beveren) Belgium	Three Dutch Facilities operated by	Attero Moerdijk, Holland
0.3	Contact name		Patricia Guilbert	Elisabeth Söderpalm	Vincent Jumeau	Claire Downey	Ane-Dick Steringa	Richard Huijzer
0.4	Position			Fuel Buyer	Administrator	Sustainable Business Planner	International Business Development Manager	Senior Account Manager International Business Development
0.5	Address			E.ON Värme Sverige AB Energigatan 5 SE-601 71 Norrköping	Brussel-Energie, Monnoyerkaai 8, BE-1000, Belgium	Indaver Ireland ltd. 4th Floor, Block 1 West Pier Business Campus, Old Dunleary Road, Dun Laoghaire l Co. Dublin		
0.6	Telephone		02 35 62 60 60	(+)46 70 276 36 43	02-778.08.14	(+)353 1 6972845	(+)31(0)6 52013758	(+)31 6 15 88 42 92
0.7	Fax		02 35 62 64 64	(+)46 11 12 72 08	02-778.09.43	(+)353 1 2807865		
0.8	E-mail		patricia.guilbert@valenseine.fr	Elisabeth.Soderpalm@eon.se		claire.downey@indaver.ie	ane-dick.steringa@sita.nl	Richard.Huijzer@attero.nl
0.9	Website		www.valenseine.com	www.eon.se			www.sita.be & www.sita.nl	www.attero.nl

Ref	Question summary	Criteria and scoring basis	Response/score											
			EoI7		EoI8		EoI9		EoI10		EoI11		EoI12	
1	**Capacity**													
1a	Spare capacity	Pass/fail	**Y**		**Y**		**Y**		**Y**		**Y**		**Y**	Attero operates 2 waste-to-energy plants with a joint waste-to-energy capacity of 1.8m tonnes, with spare capacity of at least 25,000tpa
1b	Period of capacity	Ranking >10 years=20 0-10 years=0-10	**20**	From 5 - 15 years	**20**	>10y	**5**	Minimum of 4 years	**20**	…capacity from 2015 onwards as required.	**20**	At least 15 - 20 years	**20**	Depending on the preference by the States for a period between 5 and 25 years.

2	Regulatory													
2a	R1 status	Pass/fail	**Y**		**Y**		**Y**		**Y**		**Y**	All of the described facilities. (SITA ReEnergy, HVC and AEB).	**Y**	Both our waste-to-energy plants meet the R1 criterion
2b	Possible change of R1 status in the short to medium term	Ranking No=20 Yes=0-10	**20**		**20**		**20**		**20**		**20**		**20**	Attero is looking into possibilities to further improve the energy-efficiency of its plant in Wijster. The plant of Attero Moerdijk currently has the highest energy efficiency of all waste-to-energy plants in the Netherlands.
2c	Further information	Information												

3	Commercial													
3a	Indicative gate fee	Ranking Proportional to range where: lowest fee=40 highest fee=0	**25.25**	Amount per tonne: €81.00* Tax on Pollutant Activities: €4.00 Local tax: €1.50 VAT: 7% *2013 price: Tax system under the 2013 Finances Law "Arrival into pit" cost Not included: unloading and transfer from the ship (in case of sea shipment) as well as packing type (containers, bales, bulk). Estimate fee per tonne to be confirmed: from €12 to €15. SOCIÉTÉ	**32.46**	Estimated gate fee for the year 2015: Ca 55-65 € CIF Norrköping, Incoterms 2010 Ca 45-55 € DDP E.ON Händelö, Incoterms 2010	**20.84**	85€/ton + 6€ tax/ton = 91€/ton without VAT (21%)	**31.30**	€60 - €70 / tonne	**31.30**	50-80 €/t Depending on material quality and contract duration	**32.46**	We offer a gatefee of €60 with an annual indexation based on either the CPI or RPI. Our price includes elements such as ash management and provision of contingency by the three waste-to energy plants.

-	**Gate fee clarifi-cation**	**Evaluation score not adjusted**	No clarifications raised		55-65 € when E.ON responsible for cost of unloading the vessel and transfer to the E.ON facility at Händelö. 45-55 € when customer takes responsibility and cost for all activities until unloading at the bunker at Händelö. Includes ash management.		Breakdown gate fee: 85€/t treatment (incineration) 6€/t environmental tax 19.11 €/t VAT (21%) Total 110.11 €/T The cost of transfer from the port to our facility is not included. We are not aware of other taxes that should apply to your kind of waste.		Includes cost of transfer from the destination port to the facility and the current level of local taxes, taxes on polluting activities etc. Should these taxes be modified, or should any other tax regime come into effect, the gate fee would be adjusted accordingly. The pricing can be broken down as follows: Transfer from destination port to facility €5/t; local taxes €7/t; gate fee €48-€58/t. Within the timeframe given these individual costs may vary but the all-in price will remain within the range €60-70/t.		The proposed gate fee ranges include the costs of transfer from the destination of the port to our facility. The transfer costs are estimated at 8 EURO/t. For 2013 there are no additional taxes or environmental surcharges from our Government. We also have NO sight of changes regarding additional Taxes/costs from our Government.		No response	
3b	Contract duration(s)	Ranking 20 years+ =20 1-10 years=1-10	**15**	5 - 10 - 15 years	**5**	Long Term Agreement; >3y **Clarification:** An indicative level of contract duration could be 3-5 years.	**20**	No preference	**20**	No preference	**20**	Preferable long term, short term also possible	**20**	A preference for a contract of 5 to 25 years, with a preference for a long period.

3c	Guaranteed tonnage	Information	**N**		**Y**	Agreed volume according to delivery plan	**N**		**N**		**Y**	For the planning of the operation	**N**	We do expect that once a contract has been signed all available RDF from the MRF-plant will be delivered. We do not mind if this tonnage drops when recycling activities in Guernsey increase.
3d	Current imports of waste from Europe	Information	**N**		**Y**		**N**		**Y**		**Y**	From the UK into the Netherlands, from The Netherlands into Germany and from Austria into Germany	**Y**	From the United Kingdom, Ireland, Germany, Belgium and Italy.
4	**Nature of Waste**													
4a	Ability to accept Guernsey waste	Pass/fail	**Y**		**Y**		**Y**		**Y**		**Y**		**Y**	
4b	Ability to accept waste that is baled or loose or either	Information	**Either**		**Baled**		**Loose**		**Either**		**Either**		**Baled**	Material needs to be baled and wrapped. Loose material is not accepted.

5	Transport													
5a	Vicinity to port that could accept the waste on chartered shipping	Information	Y	Docks on river side (Seine) next to the EfW unit. Without using public roads.	N		N		N		N	However all three have harbor solutions nearby.	Y	Attero Moerdijk's facility has its own quay (owned by Attero) that currently accepts ships from the United Kingdom and Ireland that carry approximately 2.500 tons per ship load.
5b	Distance and method(s) of transfer	Information			Approx 4 km, transfer of bales by truck from Norrköping port to E.ON Händelö		200 meters		The facility is located within the Antwerp port area, circa 10km from a suitable berth. The bales would be unloaded from the ship via cranes and transported in tipping trailers or curtainsider trailers to the outlet. Indaver also have access to efw capacity at a number of facilities across Europe, most of which are co-locted at ports. Can offer conbined transport solution.		We have multi incinerator solutions in NL with a R1 status. These facilities are within 3-23 km from the port. During 2012, SITA imported >240t RDF from UK into The Netherlands.		
		Score (/100)		**80.25**		**77.46**		**65.84**		**91.30**		**91.30**		**92.46**

Ref	Question summary	Criteria and scoring basis	Response/score					
			EoI13	EoI14	EoI15	EoI16	EoI17	EoI18
0	Company details							
0.1	Organ-isation	Information	swb Entsorgung	E.ON Energy from Waste, Delfzijl B.V.	Esiane (Villiers Saint-Paul) SITA Suez	Intradel	Umea Energi	States of Jersey Transport & Technical Services (TTS)
0.2	EfW Facility		Mittelkalorik kraftwerk/Müllheiz kraftwerk, Bremen, Germany	E.ON Energy from Waste, Delfzijl, Holland	Le Havre, France	Uvelia-Intradel, Belgium	Dåva kraftvärmeverk, Umea, Sweden	La Collette, Jersey
0.3	Contact name		Christoph Heemsoth	Geert Jan Pastoor	Aurelien Toupet	Jean-Marc Digneffe	Johan Soderberg	John Rogers
0.4	Position							Chief Officer TTS
0.5	Address		swb Entsorgung GmbH & Co. KG Theodor-Heuss-Allee 20 28215 Bremen	E.ON Energy from Waste, Delfzijl B.V., Oosterhorn 38, 9936 HD Farmsum, Niederlande		INTRADEL SCRL, Port de Herstal - Pre Wigi, BE -4040, Belgium	Umea Energi AB, Dava Kratvarmeverk, Dava Energivag 1, SE -90105, Umea, Sweden	Transport & Technical Services PO Box 412 South Hill, St Helier Jersey JE4 8UY
0.6	Telephone		(+)49 421 359-6629	(+)31(0)615066490				01534 448200
0.7	Fax		(+)49 421 359-152098					01534 445529
0.8	E-mail		christoph.heemsoth@swb-gruppe.de	gjpastor@pastoorconsult.nl	Aurelien.TOUPET@sita.fr	Jean-Marc.Digneffe@intradel.be	Johan.Soderberg@umeaenergi.se	J.Rogers@gov.je
0.9	Website		http://www.swb-gruppe.de	www.eon-energyfromwaste.com				

1	**Capacity**													
1a	Spare capacity	Pass/fail	**Y**		**Y**		**Y**		**N**	Waste flow has reached treatment capacities. Not possible to accept our waste	**Y**	Capacity 160,000tpa	**Y**	25,000t at 11 MJ/kg 20,000t at 12.5 MJ/kg
1b	Period of capacity	Ranking >10 years=20 0-10 years=0-10	**10**	5 to 10	**10**	5 to 10	**20**		**0**		**20**	More than 5 years	**20**	10+ years
2	**Regulatory**		Yes				Yes					Yes		
2a	R1 status	Pass/fail	**Y**	>0.72	**Y**	R1 efficiency was 1.00 in 2012	**Y**	0.63	**N/A**		**Y**	R1: 1.3 - top in Europe	**Y**	
2b	Possible change of R1 status in the short to medium term	Ranking No=20 Yes=0-10	**20**		**20**		**20**		**0**		**20**		**20**	
2c	Further information	Information												

3	**Commercial**													
3a	Indicative gate fee	Ranking Proportional to range where: lowest fee=40 highest fee=0	**28.99**	70 - 80€/t	**31.30**	€ 65,--	**22.03**	Between 90 and 120 € per tonne	**0.00**		**0.00**	App 200 € per tonne	**15.49**	£100 to £130

-	**Gate fee clarifi-cation**	**Evaluation score not adjusted**	Price would include transport from port to facility and any local taxes that should arise from the activities. The port facility is on our premises, we don't use public roads and all transport is done by our personnel. As stated before the price also included unloading, storing, recovering the material and onward treatment of any residues. It would include transfer, since it is "intra facility" and of course all relevant taxes, fees, etc. involved with the activities. It would for example not include VAT, since this is not applicable in this case, but would include port tax, energy tax, and so on.	The cost for transport to the plant is €5.50 per ton and is included in our gatefeeprice of €65/t. All other local taxes cost and taxes are included as well. The cost for deloading the ship is not included but is very dependent on the way of packaging the waste and loading the ship. For example roundbales, sqaurebales, if the bales are slinged, the density of the bales and many other questions we have at this stage.	The gate fee includes cost of transfer from destination port to our facility, local taxes and taxes on polluting activities. Unloading 10-15 €/t Transport from port to displaying and storage facility VAL'ESTUAIRE; quality control and extraction of undersirable items; administrative formalities (responsibility of producer ends at that point): 8-15 €/t Transport from VAL'ESTUAIRE to treatment facility OREADE: 5-8 €/t Treatment cost 63-78 €/t Taxes on polluting activities 4 €/t TOTAL 90-120 €/t Keep in mind the costings and thus the final price could vary depending on the timing, the duration and the guarantee of a potential supply into our facilities.	No clarifications raised	No clarifications raised	No clarifications raised

3b	Contract duration(s)	Ranking 20 years+ =20 ; 1-10 years=1-10	**10**	Long term 5 to 10 years	**10**	5 to 10 years	**20**	No preference	**0**		**5**	After trial shipping, 2 - 5 years	**5**	5 year renewable
3c	Guaranteed tonnage	Information	**Y**		**N**		**Y**	A slippery average over 24 months of 20,000t/year			**Y**	What's agreed in the contract	**Y**	Yes – Minimum 15000t
3d	Current imports of waste from Europe	Information	**Y**		**Y**	Import from Germany, Italy (150,000t from Naples), UK & Ireland	**Y**				**Y**		**N**	
4	**Nature of Waste**													
4a	Ability to accept Guernsey waste	Pass/fail	**Y**	Calorific Value needs to be 11 - 14 MJ/kg	**Y**		**Y**				**Y**		**Y**	Subject to States approval and waste law
4b	Ability to accept waste that is baled or loose or either	Information	**Baled**	Particle size <30cm	**Baled**		**Either**				**Either**		**Either**	However gate fee may vary
5	**Transport**													
5a	Vicinity to port that could accept the waste on chartered shipping	Information	**Y**		**N**		**Y**				**N/A**	Have their own site at the port	**Y**	Yes – Lift on lift off No – Roll on roll off
5b	Distance and method(s) of transfer	Information			Yes, 2.5 km, transport by lorries						15km from the port. They are currently transporting fuel daily from the port.		Road transport 2 km Roll on Roll off	
		Score (/100)	**68.99**		**71.3**		**82.03**		**0**		**45**		**60.49**	

Appendix 7: Transport Cost Assumptions

Company and nature of business	Contact details	Summary of discussion and assumptions
DSV Vehicle operator	Patrick Thompson 01489 563180	• DSV will only transport from Guernsey to the UK because of problems in the past with the customs paperwork etc. The paperwork has to be for loading and unloading in the UK e.g. shipments cannot go to Sweden via UK. • DSV ship 13.6m curtain trailers, no overhead loaders, they have a waste carriers licence • DSV would pick it up from MBT on Guernsey (having dropped off the empty trailer), ship to UK then transport to the facility. The trailers belong to DSV, so they would not allow the trailers to be picked up by others. • DSV currently works with Guernsey Recycling and a metal & waste tyre company. • 25ktpa would be 20 trailers per week. • DSV say there is not a company operating in Guernsey that can wholly provide this service and it would have to be shared out; the biggest companies in Guernsey are DSV, Ferryspeed and Paul Davies. Ferryspeed and DSV would never work with Paul Davies, stating they do not comply with H&S. Ferryspeed is committed to food shipments, as such during the summer months do not have capacity. Currently DSV do not have capacity, but for a committed long term contract they would drop other contracts to accommodate it. • To give an idea of costs: – Guernsey-Portsmouth all inclusive (i.e. harbour dues; port handling; port fees; transport) £700 per 26t trailer +VAT. – Guernsey-Runcorn (dock at Portsmouth and drive to Runcorn) £950 per 26t trailer +VAT. • Due to customs issues, DSV suggested we probably will not find anyone who will transport beyond the UK unless we charter our own vessel.

Company and nature of business	Contact details	Summary of discussion and assumptions
St Helier's Port Services (SHPS) Broker	Lorraine Jay 07581 068328 lorraine@sthelierportservices.com	• Guernsey is limited to 110 m ship length so each shipment could carry 2,500-5,000 tonnes. • SHPS offer charter and freight brokering to get the best deals. • Provided indicative costs for the operation of the ships based on returning to the port of departure, including fuel and crew and excluding port costs. Costs are based on a number of discussions with Charterers. SHPS can provide accurate costs when we can give more detail: – England 5 euros per tonne – France 5-7 euros per tonne – Sweden 20 euros per tonne – Germany 15 euros per tonne – Belgium 15 euros per tonne – Holland 15 euros per tonne • SHPS would need to know exactly what ports would be used to get discharge costs, which vary greatly. SHPS noted that the Charterers kept advising them that costs were indicative rates only and they would not be held to them.

Company and nature of business	Contact details	Summary of discussion and assumptions
Cobelfret Vehicle operator	Robin Beecham 01708 865522 Robin.beecham@cldn.com	• Do not operate out of Guernsey but could provide a service (be it slightly more expensive) from Portsmouth/Southampton to mainland Europe if we ship waste the UK. Valuable comments provided regardless. • Already ship RDF from the UK to Netherlands in 13.56m trailers using RORO unaccompanied service. • Suggest between Guernsey and South of England shipping would be expensive. • Their service is a package; they will pick up the trailer from a specified location, transport to dock, load onto vessel and put trailer onto truck in destination country and transport to facility (articulated vehicle with side access). Each trailer can weigh up to 26t (as per road rules), which can hold 26 pallets of RDF. Each shipment can hold 150 trailers. • To give an idea of costs (based on facilities being within close proximity to port otherwise cost goes up in line with fuel costs etc.): – Portsmouth-Rotterdam for the package circa £350 per 26t trailer (including driving and all costs at both sides). – Portsmouth-Gothenburg for the package circa £1,000 per 26t trailer. • Around England, Netherlands and France area costs are low due to competition; as you go further up towards Sweden it gets very expensive as there is less competition.
COWI Consultants	Carsten Schneider (+45) 56 40 00 00 CASC@cowi.dk Jens Bjørn Jakobsen +45 56 40 00 00 jbj@cowi.dk	• Have previously investigated shipping waste from Nuuk, Greenland to Aalborg, Denmark. The distance is a little further than from Guernsey and there was a requirement that the waste was baled and shipped in containers. The price corresponded to £55/t. • The price will very much depend on the possibility for the ship to take return shipments; this price was based on return freight. • Contacted a waste dealer who is organising shipping of waste from UK to Sweden. It should be more or less the same costs from UK as from Guernsey. The price will depend on compaction factors, conditions for loading, harbour taxes, ship load (tonnage) etc. but is in the region of 17-23€/t.

Company and nature of business	Contact details	Summary of discussion and assumptions
John Scott Transport Charter	Neil Wallace 01292 262 050 Neil.wallace@jstservices.co.uk	• Specialise in RDF. Wanted to know if round or square bales and weight. Ricardo-AEA confirmed assumption that road transport would require square bales and shipping round bales; each around 1t weight. • Responded with a price – which was incorrect – as they wrongly assumed Guernsey had their own ships. Several telephone conversations and emails chasing but have not yet provided a response.
Huelin Renouf Containers	Michael LeFeuvre 01534 825611 Michael.LeFeuvre@huelin-renouf.com	• Daily freight services between Southampton and Guernsey, but can arrange with approved haulers at other ports to ship further afield. • Containers are 20ft standard (but can accommodate 40ft at Guernsey), LOLO. • Variable costs at each port. • Committed to providing Guernsey-Southampton and Guernsey-Jersey costs; have chased but have not yet provided a response.
Condor Transport operator	Len LePage 01481 728620 len.lepage@condorferries.co.uk	• Guernsey to Portsmouth by conventional ferry. Indicative costs but will not be held to these. Charges refer to vehicle length in metres: – £88/m (including driver and costs). – Fuel surcharge currently £4.88/m (changes regularly). – Guernsey Port facility charge £8.90/t. • Guernsey to Jersey on Commodore Goodwill. Indicative standard costs given although states that, given the volume of cargo and the appetite of Condor to be involved, a significant discount could apply. Charges again refer to vehicle length in metres: – £29.40/m (>6.5m vehicles; on-way inter-island crossing; vehicles provided by PSD or contractors). – Fuel surcharge currently £2.75/m (changes regularly). – Guernsey Port facility charge £8.90/t. – Jersey Port facility charge £8.41/t.

Company and nature of business	Contact details	Summary of discussion and assumptions
GemiNor Broker	Atle Maroen 0047 979 49 185 atle.maroen@geminor.no	• In relation to the suggestion that Sweden may be comparatively more expensive compared to the Netherlands for shipping, stated that at this time Sweden and the Netherlands should be quite similar when it comes to total price as shipment might be more expensive as it is a 24-36 hour longer journey with additional fuel costs etc. Gate fees might be lower in Sweden right now and this will even out the difference in shipment price. • There is not a €/mile/tonne matrix that can be used as shipments are dependent, amongst other things, on: – Availability of vessels for bulk transport between the different ports/countries. – Availability of backloads i.e. is a vessel 'free' in a specific port and needs to go to another specific port. – Certain ports have certain regulations that can limit the number of vessels available, usually draft, length of vessel, etc. For instance do some of the ports in river areas have a low draft of 4,0-4,5 meters which limits the number of vessels and the loads they can carry • The rates will change all the time as this is a very dynamic market where you typically don't get rates for more than one year at the time. To get an instant picture you can call any ship broker in London that knows something about chartering in dry loads. • For the Guernsey Authorities it is only a good tendering process that will give you the true answer. Guernsey is attractive I guess for all vessels in these regions going to any port from Belgium to Finland/Norway.

Company and nature of business	Contact details	Summary of discussion and assumptions
Clarksons Shipping broker	Mark Collins 01482 586 760	• Guernsey is restricted to 110 m therefore could probably accommodate a 3,000t vessel which would hold about 2,200-2,300t baled RDF. • Sweden is difficult to cost as it gets iced up and this would double any rate if travelling during the winter as you would need specialist ships. • Port fees vary e.g. Port of Liverpool £10,000 due to Peel owning it and taking a lot of money; somewhere e.g. in the Wash, would cost £3-4K. • In terms of providing some kind of cost; Guernsey to the Netherlands, carrying 2,200t RDF you can look at 40-45K Euro (plus port and handling fees) so you're looking at 18-20 Euros/t for Netherlands. • Unable to comment per tonne/mile as it's just too difficult and would need to know individual ports. There are too many variables. Happy to answer questions in the future and provide a service if required.

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Appendix 4

Legal considerations relating to export of waste

As set out in paragraph 17.1 of this report, the export of waste from one jurisdiction to another is regulated by international conventions and legislation and national legislation. Guernsey is bound by some of these or is indirectly affected because any territory of destination is so bound. Specific domestic provisions apply in Jersey but that legislation also implements the Basel Convention and the OECD Decision. There are a number of inter-related international conventions and European Union (EU) legislation, the most relevant of which are:

- The Basel Convention on the control of transboundary movement of (certain) waste and its disposal,
- The OECD Decision concerning the transfrontier movement of wastes destined for recovery operations,
- The EU Regulation on shipments of waste ("the Waste Shipment Regulation") which implements the Basel Convention and the OECD Decision in the EU, and
- The EU Waste Framework Directive to which the Waste Shipment Regulation cross-refers.

Outline of international conventions/legislation

The UK's ratification of the Basel Convention has been extended to the Bailiwick of Guernsey so Guernsey must comply with the obligations on parties to the Convention. The OECD Decision also applies to the Bailiwick.

In broad terms the principal aims of the Basel Convention are to restrict transboundary movements of hazardous and certain other wastes, including waste collected from households, except where in accordance with environmentally sound management and to put in place a regulatory system for permissible transboundary movements. It was principally put in place to deal with the problem of toxic shipments being sent for disposal to the developing world.

The OECD Decision was put in place to provide a framework for OECD member countries to control transboundary movements of recoverable (e.g. recyclable, reclaimable etc.) wastes in an environmentally sound and economically efficient manner.

The provisions of the Basel Convention and the OECD Decision have now largely been harmonised and are both implemented in the EU by the Waste Shipment Regulation referred to above.

Four of the five shortlisted export options in this States Report are located in EU member states so that the provisions of the EU Waste Shipment Regulation will regulate the import of waste shipments from Guernsey into those countries. For Jersey the

import is regulated by the Waste Management (Jersey) Law 2005, which also implements the Basel Convention and the OECD Decision in Jersey, but is different in certain important regards from the EU Waste Shipment Regulation.

The export of shipments from Guernsey will be regulated by the Transfrontier Shipment of Waste Ordinance, 2002 which, unlike the Jersey legislation, implements EU Waste Shipment legislation and, therefore, in turn implements the Basel Convention and the OECD Decision in Guernsey.

Legal risks of export option

Waste shipment regulation

The main legal risks arising from the Waste Shipment Regulation broadly arise from the lack of clarity under that Regulation as to the treatment that mixed municipal waste (this includes black bag waste as collected from Guernsey households) has to undergo to be regarded as waste for recovery. This is important as the regulation has less strict controls on shipments of waste for recovery than on shipments of waste for disposal. Waste shipments treated as shipments for disposal are potentially subject to a higher possibility of objections from the relevant authorities in the destination countries.

The Waste Shipment Regulation specifies that shipments of mixed municipal waste to recovery facilities shall be subject to the [stricter] disposal provisions. However, waste which is treated sufficiently so that it may be classified as refuse derived fuel (RDF) can be treated as waste for recovery if sent to an energy from waste plant meeting the R1 energy efficiency. Shipments of such waste occur fairly often in practice within the EU including from countries with their own domestic incineration facilities. There is no EU guidance as to what amounts to combustible waste or RDF although the recitals to the Waste Framework Directive indicate that the treatment should at least be such as will substantially alter its properties: "..mixed municipal waste....remains mixed municipal waste even when it has been subject to a waste treatment operation that has **not** substantially altered its properties".

National legislation

There is scope under the EU Waste Shipment Regulation for competent authorities of destination to object to shipments on the basis that it is inconsistent with certain provisions of national law including that on environmental protection. However, similar shipments for recovery take place within the EU, with the UK Environment Agency reporting that almost 900,000 tonnes of waste was exported from the UK to European EfW facilities in 2012[1]. When the preferred tenderer is selected it will be necessary to seek appropriate advice to ensure compliance with any relevant national legislation of the country of destination.

[1] Environment Agency presentation to the Chartered Institute of Wastes Management 'Regulatory Developments in the Export of Refuse Derived Fuel', February 2013

Jersey legislation

Initial discussions have taken place with Jersey relating to the legal barriers to export to Jersey under the Waste Management (Jersey) Law, 2005. Jersey officials have indicated that under that Law all shipments for incineration (including to an R1 efficient plant), are treated as imports for disposal and, therefore, subject to strict controls. It appears from discussions with Jersey officials that there is a significant risk of shipments from Guernsey being objected to under relevant provisions of the Jersey Law as currently drafted.

Requirements on Guernsey under the Basel Convention

Guernsey has already implemented the controls on waste shipments required under the Basel Convention in the Transfrontier Shipment of Waste Ordinance, 2002. As stated above, the Basel Convention seeks to restrict transboundary movements of hazardous and certain other wastes, including waste collected from households, except where in accordance with environmentally sound management. Consistent with this there are related obligations on parties including to ensure the availability of adequate disposal (this is defined here to include both disposal and recovery) facilities for the environmentally sound management of such waste, to ensure that the transboundary movement of such wastes is reduced to the minimum consistent with such environmentally sound and efficient management of such waste and to take appropriate measures to ensure that transboundary movements of such waste is only allowed in certain specified circumstances.

There is obviously some potential for tension between the obligations on Guernsey under the Basel Convention, including that of reducing transboundary movement of wastes to a minimum, and the environmentally sound and efficient management of waste in a small jurisdiction where it may not be practicable to provide an energy from waste plant of the energy efficiency possible at a larger plant in a bigger jurisdiction.

Liaison with competent authorities in countries of destination and UK authorities

In order to reduce the above risks and the general risk of reliance on external policy and political decisions and competent authority approval of shipments, the Public Services Department is proposing to have early contact with competent authorities of destination, once a preferred tenderer is selected, and to inform DEFRA of the proposed export policy to identify any concerns arising from the relevant international and EU requirements.

Appendix 5

Summary of key assumptions relating to Section 14 (Costs)

- Annual tonnage to be exported: 28,000 tonnes.
- Shipments per annum: approximately monthly.
- Contract length with Energy from Waste (EfW) plant operator: 10 years.
- Calorific Value (CV) of waste to be exported: 11.5MJ/kg to 12.5MJ/kg. The CV of waste currently is estimated at 11.5MJ/kg, however this will increase with the removal of food waste.
- One of the five potential tenderers approached is unable to accept 28,000 tonnes at the CV stated above.
- Capital recovery: 20 years.
- Loading of ship in Guernsey will be performed by contract staff.
- Potential tenderers quote transportation costs from Guernsey to the EfW plant as well as the EfW gate fee.
- Disposal costs of bottom and fly ash produced at the EfW plant from Guernsey's waste included in quoted prices.
- Euro exchange rate used: €1.16/£1.00.
- Rental costs for storage area adjacent to North Quay based on indication from States Property Service in Treasury and Resources.
- Costs of moving waste bales from Longue Hougue to North Quay storage area based on indication from the States Central Procurement team in Treasury and Resources.
- Size of ship based on a current local ship utilising the Harbour rounded up to 2,000 tonnes.
- Number of local households: 26,000.
- Waste split between domestic and commercial: 45% : 55% respectively.
- St Sampson's Harbour charges based on Guernsey Harbours 2013 Charges Booklet.

(NB The Treasury and Resources Department is, in accordance with its mandate, limiting its comments to the resource implications and any associated risks to the delivery of the Public Services Department's proposals.

The Department supports the introduction of the Solid Waste Trading Account which will, in a clear and transparent manner, enable solid waste disposal to be separately accounted for and reported. It will also provide a firm basis for setting fees and charges which fully recover all costs incurred. This change in accounting arrangements will affect General Revenue from 2016 and the implications of this will be considered by the Treasury and Resources Department and addressed in forthcoming Budget Reports.

It is noted that there remain areas that are lacking in clarity and there are a large number of significant risks and unknowns that could impact on the timing and cost of the full implementation of the Solid Waste Strategy. These include the outcome of negotiations for contracts for the processing and export of residual waste, the actual capital cost of the necessary infrastructure and its financing mechanism, the issuing of a waste management licence and any effects of implementing the Waste Disposal Plan, when completed by the Environment Department.

The report contains proposals to delegate authority to the Treasury and Resources Department for approval of the capital expenditure to procure the necessary infrastructure and release funding (from the Solid Waste Trading Account) to operate the various new facilities and services. In relation to this, my Board will be working with the Public Services Department to put in place a process to ensure that best practice is followed through the preparation of the overarching solid waste strategy programme, followed by comprehensive business cases for the individual elements. I confirm it is intended that, as for all major capital projects, the Gateway Review process will be followed. The Public Services Department will, inter alia, need to demonstrate that its recommendations are clearly aligned to strategic objectives, represent the best value for money and have all risks clearly identified, analysed and managed.

The Treasury and Resources Department will need to be satisfied that the costs (both in respect of the capital and revenue expenditure) are broadly in line with those detailed in this Report and also that the business cases put forward by the Public Services Department recommend the most appropriate way forward. If this is found not to be the case, I advise that my Department will not exercise its delegated authority and this will necessitate the Public Services Department submitting further States Report(s) for the Assembly's consideration.)

(NB The Policy Council acknowledges the considerable amount of work the Public Services Department has undertaken in building upon the 2012 States Report. It notes that the Department has chosen to go further than the previous States Resolution to report back with costings, however it acknowledges that the position reached enables the States to consider the full costs of a revised solid waste strategy and will provide the Department with the direction required to advance its implementation without further delay.

The Policy Council notes that the Department has taken a pragmatic approach, which has the support in principle of the Environment Department, to push ahead with proposals in the current absence of an agreed Waste Disposal Plan (WDP). The Policy Council is mindful that the Environment Department has a legal duty to present to the States a Waste Disposal Plan, which will, if the States approves the legislative amendments to the Environmental Pollution law proposed in the report, also address waste recovery and recycling. It is acknowledged that it is the Waste Disposal Plan rather than the Public Services Department's States Report that sets the future direction of waste management and the Policy Council appreciates the opinion of the Environment Department that there is a logic in this process bearing in mind it is the Public Services Department that has the hands on experience and knowledge of the changing nature of Guernsey's waste streams.

Given its mandate to be the interface with the Parishes, the Policy Council should technically submit a separate report dealing with the changes to parochial waste legislation. However, it is supportive of PSD's approach to deal with this as part of a single report which will enable States Members to discuss all aspects of the proposals relating to export, policy and legislation at the same time. The Douzaines have been met with since the September Douzaine Liaison Group meeting during October to consult further on the Legislative matters concerning them.

The Policy Council acknowledges that a change to the Island's waste disposal strategy was certainly not going to be a low-cost transformation, shifting from what is more or less the cheapest form of waste disposal (land fill) to a highly sophisticated model that takes seriously Guernsey's social and environmental responsibilities. The Policy Council is therefore in support of the concept of the funding mechanisms but awaits further details within a subsequent States Report of the exact mechanism for calculating charges, as explained within section 22.27 of this report.

Ten of the eleven Members of Policy Council therefore support all the proposals contained within the States Report, including the revisions to the current Parochial Collection of Refuse Law, 2001 (under which the Policy Council is responsible for Parish functions).)

The States are asked to decide:-

I.- Whether, after consideration of the Report dated 9th December, 2013, of the Public Services Department, they are of the opinion:-

1. To rescind Resolution 3 of Article VII of Billet d'État No. IV of 2012.

2. To establish, with effect from 1 January 2014, a "Solid Waste Trading Account" and for the financial arrangements in relation to solid waste to be managed therefrom, including that currently within Public Services Department's Revenue Budget.

3. To authorise the Treasury and Resources Department to approve expenditure from the "Solid Waste Trading Account" necessary to progress development and implementation of the solid waste strategy; funding of waste minimisation; and recycling initiatives, including kerbside collections, until such time as a new charging regime is in place, whichever is the sooner.

Export of Waste

4. To direct the Public Services Department to tender for the construction, or construction and operation, of the Transfer Station as part of the infrastructure necessary for the new waste strategy and, following that tender, to recommend a tenderer for the same to the Treasury and Resources Department.

5. To direct the Public Services Department to tender for the transportation and export of residual waste to an off-island energy from waste facility and, following that tender, to recommend a tenderer for the same to the Treasury and Resources Department.

6. To authorise the Treasury and Resources Department to approve the Public Services Department's recommended tenderers outlined in proposition 4 and proposition 5 above, on receipt of a suitable business case and to release the relevant funds for capital costs and for operational costs of the same upon such approval, with the capital costs being funded by way of a loan either from the States General Investment Pool or the external market.

Other Infrastructure

7. To direct the Public Services Department to tender for the construction, or construction and operation, of the following:

    - Materials Recovery Facility
    - In-Vessel Composter
    - Civic Amenity Site
    - Repair and Reuse Centre
    - Kerbside collection vehicles (if required)

and, on receipt of such tenders, to recommend preferred bidders to the Treasury and Resources Department.

8. To authorise the Treasury and Resources Department to approve the Public Services Department's recommended tenderers for propositions 4 and 7 above on receipt of suitable business cases; and to release the relevant funds for capital costs up to a total sum not to exceed £29.5 million (including capital costs related to export of waste) with the capital costs being funded by way of a loan either from the States General Investment Pool or the external market; and at the same time to approve operational costs associated with those same facilities.

Legislation and Policy

9. That certain current controls on licensing of private waste disposal sites, under the Environmental Pollution legislation, be extended to other private facilities which may compete with the Island's key waste infrastructure (as set out in particular in paragraphs 27.1 to 27.4 and 37.1).

10. That the Waste Disposal Authority's current duty to make reasonable provision for the disposal of household and commercial waste be amended to cover the making of arrangements for recovery or disposal of such waste and consequently to widen the current powers of the Waste Disposal Authority to impose waste acceptance criteria at public waste disposal sites to all States provided, funded or arranged recovery or disposal facilities (as set out in paragraphs 37.2 to 37.3).

11. That the Douzaines retain their current waste collection functions but that the parochial collection of refuse legislation be amended to:

    (a) require the Douzaines to:

        (i) make such arrangements as may be necessary to collect the separate waste streams as required by the Waste Disposal Authority;
        (ii) transfer such waste to the waste management facilities as required by the Waste Disposal Authority and not just for final disposal;
        (iii) provide the above collection and transfer service for small businesses opting into the parish collection service, and
        (iv) take into account the Waste Disposal Plan in carrying out their functions in relation to parochial collection of waste,

        as set out in paragraphs 30.2 to 30.6, 32.5 to 32.6, 37.5 and 37.11;

    (b) confer on the Douzaines a power to delegate their functions under the Parochial Collection of Refuse Legislation to the Waste Disposal Authority as set out in paragraphs 30.7 to 30.9 and 37.25 and

(c) remove the Douzaines' current power to impose limitations on the quantity of refuse collected under the Parochial Collection of Refuse Legislation as set out in paragraph 37.26.

12. To introduce a new charging system for waste management services provided to householders (as set out in particular in 31.9 to 31.11 and 37.7 to 37.10).

13. To amend the Waste Disposal Authority's current gate fee charging powers to include all States' provided, funded or arranged recovery or disposal facilities (as set out in particular in paragraphs 31.16 to 31.21, 32.1 to 32.3 and 37.6).

14. That statutory duties be imposed on occupiers of households and small business premises using parish collection services in relation to the presentation of household waste and other parochially collected waste put out for collection (as set out in particular in paragraphs 33.1 to 33.7 and 37.12).

15. That a civil fixed penalty scheme be introduced to enforce the statutory requirements outlined in proposition 14 (as set out in paragraphs 37.13 to 37.24).

16. That amendments be made consequential to the above policy proposals to the Environmental Pollution (Guernsey) Law, 2004 and legislation made under it, the Parochial Collection of Refuse (Guernsey) Law, 2001 and other legislation relating to waste and legislation making references to the same.

17. To direct the Public Services Department and the Commerce and Employment Department to work with the commercial sector to develop and implement voluntary initiatives to prevent or minimise waste both generated by businesses directly and indirectly and through the products and services businesses provide.

18. To direct all States Departments and Committees, and Councils (however named) to implement, as far as practicable, such waste prevention and minimisation initiatives as are needed to contribute to the achievement of the States' approved recycling targets.

19. To direct all States Departments and Committees and Councils (however named) that own or manage land hired out or otherwise used for public events to include, where practicable, in terms and conditions of such hire or use, a requirement for organisers to provide recycling facilities.

20. To direct all States Departments and Committees and Councils (however named) that own or manage land hired out or otherwise used for public events to include, in terms and conditions of such hire or use, a requirement that, where relevant, only recyclable or reusable tableware and takeaway food and drink containers be used, such conditions to be phased in as soon as practicable but in any event no later than 31 December 2018.

21. To direct the preparation of legislation as may be necessary to give effect to their above decisions.