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BILLET D'ÉTAT

WEDNESDAY, 29th JULY, 2009

PUBLIC SERVICES DEPARTMENT –
RESIDUAL WASTE TREATMENT –
SELECTION OF PREFERRED BIDDER

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B I L L E T D'É T A T

TO THE MEMBERS OF THE STATES OF

THE ISLAND OF GUERNSEY

I have the honour to inform you that a Meeting of the States of Deliberation will be held at **THE ROYAL COURT HOUSE, on WEDNESDAY,** the **29th JULY, 2009,** at 9.30am, to consider the item contained in this Billet d'État which has been submitted for debate.

G. R. ROWLAND
Bailiff and Presiding Officer

The Royal Court House
Guernsey
26 June 2009

PUBLIC SERVICES DEPARTMENT

RESIDUAL WASTE TREATMENT – SELECTION OF PREFERRED BIDDER

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

29th May 2009

Dear Sir

1.0 Executive Summary

1.1 In January 2007 the States considered a report submitted by the Environment Department concerning waste management in Guernsey. (Billet d'État I, 2007 refers.) As a result, the Public Services Department was charged with procuring a long-term residual waste management system capable of dealing with Guernsey's residual waste for a 25-year period.

1.2 This report briefly outlines the procedures that have been followed that have resulted in the Public Services Department being in a position to make a firm recommendation of a preferred bidder to supply a residual waste treatment facility for Guernsey.

1.3 The report gives a brief outline of all the bids that were received and explains in detail why the preferred bidder has been selected.

1.4 Finally, the Public Services Department seeks States' approval to proceed with the appointment of the preferred bidder.

1.5 Given the subject matter of the report, it uses terminology that may be unfamiliar to some readers and so a glossary has been included as Appendix One.

2.0 Introduction

2.1 It has been acknowledged for some time that Guernsey's current method of waste disposal – i.e. landfill – cannot continue in the long term. The Island's only remaining landfill site at Mont Cuet has a limited life span and, based on a 5-year rolling average of tipping rates, is predicted to be road level within 3 years and full at approximately 18 metres above road level by February 2019.

2.2 Consequently, the Environment Department, whose responsibility it then was, made recommendations concerning the future of waste management in Guernsey, which were presented to the States in January 2007.

2.3 After consideration of the Environment Department's report (Billet d'Etat I, 2007) the States resolved as follows:

> *"To agree to seek competitive tenders for the design, build and operation of either*
>
> *(a) a Mass Burn Energy from Waste Facility, or*
>
> *(b) a Mechanical Biological Treatment plant coupled to an Energy from Waste facility, which facility may be a Mass Burn or Advanced Thermal Treatment plant;*
>
> *such facilities, whether through procurement of successive modules or not, to have the capacity to deal with the waste arisings to be endorsed, but that tenders for any, or any combination of, MHT[1], MBT[2] and ATT[3] should also be considered."*

2.4 The States further resolved:

> *"To direct the Public Services Department to appoint engineering and legal consultants to assist with the preparation and issue of tender packs, the assessment of tenders and post tender negotiation."*

2.5 After consideration of a further report of the Environment Department (Billet d'Etat XXIV November 2007) the States also resolved that the waste arisings to be managed would be 45,000 tonnes per year in 2012 rising to 70,000 tonnes per year in 2037, and also adopted a target of 50% recycling by 2010.

2.6 As explained in its previous report on residual waste management (Billet d'Etat XI, 2008 refers), the Public Services Department appointed Rambøll Danmark A/S /AEA Energy and Environment/PH McCarthy & Partners to act as its technical consultants.

2.7 In January 2008 a notice inviting Expressions of Interest was placed in the Official Journal of the European Union (OJEU), the magazine of the Chartered Institute of Wastes Management (CIWM) and the Guernsey Press. In addition, the Department's consultants wrote to all the organisations that had been identified as part of the Environment Department's "global search" in 2006, as well as to other companies that had expressed an interest in being considered for

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1 Mechanical Heat Treatment
2 Mechanical Biological Treatment
3 Advanced Thermal Treatment

the contract. This gave a total of 62 approaches in addition to the advertisements.

2.8 Interested parties were given until 15 March 2008 to make their submissions, and, as reported to the States in July 2008, the Department was pleased to receive over 30 submissions covering a wide range of solutions.

2.9 The Expressions of Interest were duly evaluated against criteria agreed by the Public Services Department, which included evidence of the company's financial stability, track record and robustness of their proposed technology.

2.10 The results of this evaluation were reported to the States in July 2008, when the States agreed that a shortlist of 8 companies should be invited to tender. The eight companies were as follows:

- Suez Environnement (SA)
- CNIM
- Waste Recycling Group Ltd (WRG)
- Cyclerval UK Ltd
- ENER-G Group
- Biffa Waste Services
- Earth Tech Engineering Ltd
- Bedminster International + Land Securities Trillium

2.11 The States also noted the criteria against which the tenders would be evaluated. These criteria are set out in the Tender Evaluation Model, which is attached to this report as Appendix Two. Further detail of the Tender Evaluation Model is discussed later in this report.

3.0 The Process

3.1 On 22 August 2008 the Department issued an Invitation to Tender to each of the companies listed above. The Invitation to Tender essentially comprised:

a) Detailed instruction to the Tenderers as to how to prepare the Tenders;

b) The Tender Evaluation Model, against which the Tenderers were expected to optimise their proposals;

c) The draft Contract; and

d) Background information, which was for the Tenderers only – i.e. non-warranted information.

3.2 Originally, the tender return date was 20 November 2008. However, at the request of two of the bidders this was put back until 19 December 2008 and, subsequently, following an approach from one bidder, to 16 January 2009.

3.3 During the time allowed for the preparation of submissions, a number of those invited to tender elected to drop out of the process for a variety of reasons as summarised below in Table 1.

Table 1 – Invitation to Tender not accepted

Company	**Reason for Withdrawal**
ENER-G Group	Decided to join forces with another Guernsey bidder. (WRG)
Biffa Waste Services	Too busy with UK bids.
Earthtech Engineering Ltd	Main partner had withdrawn. Busy with UK bids.
CNIM	Busy with UK bids. Believed there was too much political uncertainty surrounding the required solution.
Bedminster International + Land Securities Trillium	Main interest was financing rather than operation.

3.4 Once the above bidders had withdrawn, three companies remained, namely: Suez Environnement; WRG; and Cyclerval UK Ltd. All of these companies submitted a bid within the revised time scale outlined above. Although the two extensions resulted in a longer Tender period than is usual for projects of this nature, the Department believed, on balance, that it was preferable to incur a short delay and maximise the chances of receiving three tenders, rather than run the risk of one removing itself from the process as a result of being unable to submit a bid within the required time scale.

4.0 Bids Received

4.1 The Department knows there is much interest in the different bids received but it is necessary to balance the desire for transparency of decision making with the need to respect commercial confidentiality. It has therefore set out below in Table 2 a brief summary of each bid, outlining the technical proposals and the costs associated with each of them. For the avoidance of doubt, all costs quoted are net of any revenues received from electricity generation.

4.2 The cost of operating each facility ("opex") comprises an annual availability fee plus an operating fee. The availability fee is a payment made to the operator to cover the cost of ensuring that the facility is available to receive waste. It relates directly to the fixed costs of operating the facility, such as staffing and maintenance costs.

4.3 In addition, the States will pay to the Contractor an operating fee, which is a price per tonne directly related to the amount of waste received at the facility. This fee relates to variable costs, such as the costs of chemicals, etc. used in processing the waste, which are used in variable amounts related to waste volumes.

4.4 The 25-year Design, Build and Operate (DB25O) Contract includes provision for annual inflationary increases and 5-yearly reviews of the operating and availability fee payable to the Contractor.

4.5 Each bidder has put forward proposals that are divided into 2 phases. These phases are summarised separately but the capital costs ("capex") quoted in table 2 encompass both phase 1 and phase 2 of each proposal, as the whole package is what each tenderer was expected to deliver. It should however be noted that certain Phase 2 costs are estimates as it is not possible to say at this stage exactly what they will be if the time comes for Phase 2 to be implemented.

Table 2 – Summary of Bids Received

Bidder	**Technology – Phase 1**	**Technology – Phase 2**	**Capital Cost (£)* (Phases 1 & 2)**	**Operating Costs per annum at 2009 rates (£)***	**25-year Capex + Opex (£)* (Phases 1 & 2)**
Suez Environnement	MRF/Recycling Facility to deal with 45,000 – 57,000 tonnes per annum, including EfW plant to deal with 37,000 – 41,500 tonnes per annum plus ash recycling plant.	As Phase 1 plus Refuse Derived Fuel (RDF) Burner EfW to deal with additional 13,000 tonnes per annum.	95.8m	1.8m Plus £11.44 per tonne	135.9m
WRG	MRF/Recycling Facility to deal with 45,000 – 55,000 tonnes per annum, including gasification EfW 40,000 tonnes per annum.	As Phase 1 plus gasification EfW to deal with additional 37,500 tonnes per annum.	135.8m	4.0m Plus £18.70 per tonne	230.3m

Cyclerval UK Ltd	MRF/Recycling Facility to deal with 45,000 – 70,000 tonnes per annum, including EfW plant for 45,000 – 56,000 tonnes per annum.	As Phase 1 plus additional recycling of 14,000 tonnes per annum.	58.8m	2.6m Plus £41.14 per tonne	149.8m

*at £1= €1.119 = NOK10.33

4.6 It can be seen that each proposed solution includes a front-end recycling facility in addition to thermal treatment and energy recovery. This combination of materials recovery and energy recovery reflects the approach most commonly adopted in the UK, with EfW the favoured technology for dealing with the residual component.

4.7 Each bid has been presented as a two-phase approach, with Phase 2 being triggered at roughly the same stage in respect of each one. In the event that Phase 2 does not prove necessary, Table 3 shows the costs that would apply.

Table 3 – Costs of Phase 1 only over a 25-year period

Bidder	**Technology – Phase 1**	**Capital Cost (£)***	**Operating Cost per Annum at 2009 rates (£)***	**25-year Capex + Opex (£)***
Suez Environnement	MRF/Recycling Facility to deal with 45,000 – 70,000 tonnes per annum, including EfW plant to deal with 37,000 – 41,500 tonnes per annum plus ash recycling plant.	79.8m	1.8m Plus £11.44 per tonne	115.1m
WRG	MRF/Recycling Facility to deal with 45,000 – 70,000 tonnes per annum, including gasification EfW 45,000 tonnes per annum.	95.1m	4.0m Plus £18.70 per tonne	195.2m
Cyclerval UK Ltd	MRF/Recycling Facility to deal with 45,000 – 70,000 tonnes per annum, including EfW plant for 45,000 – 56,000 tonnes per annum.	58.8m	2.6m Plus £41.14 per tonne	144.7m

*at £1= €1.119 = NOK10.33

4.8 It should be noted that in order to ascertain the comparative costs of each solution, it is necessary to consider not only the capital cost of building the facility but also the net costs of running each one over a 25-year period. This simple comparison does not take into account the costs associated with financing the project, which will, however, be taken into consideration when determining the gate fees that will apply, as explained later in this report. In addition, no allowance has been made for inflation, which means that all prices are at 2009 rates.

4.9 Looking at capital costs in isolation, the Cyclerval bid seems attractive but the capital plus operating costs of phases 1 and 2 total £149.8m, compared to £135.9m for the Suez bid.

5.0 Tender Evaluation

5.1 In accordance with the decision of the States in July 2008, each bid was evaluated against the criteria set out in the Tender Evaluation Model.

5.2 Tender Evaluation comprised two elements. Stage one was a pass/fail evaluation, which considered, in summary, the following matters:

i. Compliance of the Tender with the Instructions to Tenderers;

ii. Completeness of the Financial, Technical and Management Proposals in accordance with the Instructions to Tenderers;

iii. Legal compliance;

iv. The requirement of the Tenderers to identify the bidding entity in accordance with the Instructions to the Financial Proposal;

v. Provision of evidence of previously completed similar projects based on the specific solution proposed;

vi. Satisfactory confirmation of the Tenderer's organisation; and

vii. Compliance with Appendix One of the Contract (the Employer's Requirements).

5.3 After receiving the initial bids, the Project Team, which comprised officers and consultants, sent clarification questions to all bidders. On receipt of the clarification requested, further meetings were held with the companies that were considered able to submit a compliant bid – i.e. to satisfy the requirements needed to move from Stage One to Stage Two of the evaluation process.

5.4 On initial evaluation it emerged that none of the tenderers had submitted a fully compliant bid in respect of criterion iii above, legal compliance, which meant that, strictly speaking, all should have been marked as a "fail" and not taken to stage two of the evaluation process.

5.5 However, this was not considered a sensible approach as it would have resulted in there being no tenders. Consequently the Department took a pragmatic view and agreed that all three tenders should be evaluated against Stage 2 of the Evaluation Model on the basis that at least two of the tenders had the potential to result in an acceptable bid, albeit that they would be unlikely to deliver the type of Design Build Operate (DBO) Contract that was originally sought.

5.6 There was some expectation of achieving a contract where the entire operating risk was borne by the Contractor, which means that in the unlikely event of a serious and prolonged plant breakdown the financial consequences of such would have to be met by the Contractor rather than Employer (i.e. the States). This is more akin to the type of risk profile that can be achieved with a Private Finance Initiative (PFI) contract (albeit without the finance element).

5.7 In any contract the Employer carries some risk and a PFI type risk profile as outlined above is an ideal position; however, all of the bidders tried to move away from such a position. Suez was closest to compliance.

5.8 The baseline position is that Suez is limiting its liability to 2 years' operating fee unless the cost can be passed to the Construction Contractor(s) or insurance. It is noted that the aborted 2004 waste project was a Design and Build contract and the offer from Suez is more advantageous than a pure Design and Build contract offer. However the risks of this altered expectation need to be considered, addressed and managed, which is achievable and is in hand.

5.9 Whilst it is perhaps disappointing that original expectations cannot be met, the market has been thoroughly tested and it is not unreasonable to draw the conclusion that the ideal solution sought – i.e. that the Contractor takes on 100% of the operating risk - will not be delivered.

5.10 In the second stage, each Tenderer's Technical, Financial and Management Proposals were separately evaluated and given scores.

5.11 As set out in the Tender Evaluation Model, the three main evaluation criteria were weighted as follows:

- Financial Proposal 55%
- Technical Proposal 35%
- Management Proposal 10%

5.12 Table 4 summarises the main factors considered under each Proposal. Full details are given in the Tender Evaluation Model.

Table 4 – Tender Evaluation Summary

Financial	• Pricing of works and services • Financial strength of bidder • Insurances and guarantees
Technical	• Robustness, simplicity and reliability, efficiency and quality • Construction, operation and maintenance phases • Environmental performance
Management	• Organisation at each phase • Communications strategy • Health and Safety and Quality Management • Staff, recruitment and training

6.0 The Recommended Bidder

6.1 Following careful and objective evaluation of the bids, the scores[4] were as follows:

Suez Environnement	100
Cyclerval	62.5
WRG	20.8

6.2 It can be seen that Suez Environnement emerged as the bidder with the highest score by a considerable margin. Suez consistently scored higher in all areas than any other bidder, reflecting the quality of the submission. The Department is aware that States Members will have a keen interest in the Tender Evaluation document. However, it must be appreciated that the full document contains a great deal of commercially confidential information. Consequently, having taken appropriate advice, the Department has decided that it would not be appropriate to publish the entire document. It has, however, included the environmental analysis of each bid as Appendix Three.

[4] Scores – the bidder who is most compliant or suitable in each of the criteria is awarded the maximum of 100

6.3 In view of the above scores a Letter of Intent has been issued, indicating that Suez Environnement is the Preferred Bidder, subject to the confirmation of the States of Deliberation. The Letter of Intent will be substantially in the form of the letter attached as Appendix Four.

7.0 Details of the Preferred Bid

Technical Summary

7.1 As can be seen in Table 2, the Suez bid comprises an industrial and commercial waste Mechanical Treatment Recycling Unit (MTRU) plus a thermal EfW unit. The MTRU will enable the Island to achieve high levels of material recycling, anticipated to be in the order of 10-40% per annum during Phase 1. It must be noted that these figures refer only to **commercial** waste and should not be confused with household waste. The proposals do not include any recycling facilities for household waste.

7.2 A combination of mechanical and manual sorting in the MTRU will ensure that, as far as possible, all recyclable material is identified and removed. If other recycling routes should be introduced in the future (e.g. wood) it will be possible to recover additional recyclable materials with relative ease.

7.3 In addition to the MTRU, the facility includes a thermal EfW unit, which will produce electricity sufficient to meet 5% of Guernsey's electrical energy needs, and treat mainly household waste. In addition to household waste (and, in due course, sewage sludge) all non-reusable Industrial and Commercial waste will, after screening in the MTRU, be sent to the EfW line for conversion into energy. Appendix Five shows these processes in a simple diagrammatic form.

7.4 There are a number of benefits associated with the plant's ability to convert otherwise useless residual waste into energy. In the first place, income realised from the sale of that energy – estimated to be in the region of 17,000 Megawatt hours per annum, or enough to power at least 2,000 homes – has helped to offset the cost to the users of building the facility. This income will be taken into account when determining the gate fee to be charged by the States for waste taken in for processing, which means that the more electricity that can be sold, the lower the price paid by those delivering such waste.

7.5 Furthermore, the facility to generate electricity in this way will reduce the need to import the heavy oil required to operate Guernsey Electricity's Power Station, thereby reducing Guernsey's carbon footprint.

7.6 The proposed furnace comprises a stepped grate and a central steam flow combustion chamber. It has the advantage of being able to handle a wide range of calorific values and waste throughputs. Furthermore, the technology is well proven and reliable, with several plants of similar capacity in operation already. This is a key factor for Guernsey because it cannot easily send its waste elsewhere for processing if the plant should suffer a catastrophic failure, resulting in long-term unavailability.

7.7 The plant includes a bottom- ash grading and sorting process. Ferrous and non-ferrous metals will be recovered from the bottom ash for recycling, after which the ash will be graded by size for re-use in the construction industry, following a weathering process which will be carried out within the plant. Bottom ash represents 18% by weight of the incoming waste.

7.8 Residues from the Air Pollution Control System, representing 3% of incoming waste, will be collected in $2m^3$ bags for disposal to a hazardous waste site or recovery process. Suez has confirmed an available export route to a hazardous waste treatment facility in France.

7.9 Unusually for a Contract of this nature, Suez has confirmed prices that it is prepared to pay to the States for recyclables removed from the waste stream. It is prepared to guarantee these prices for 20 years, which is a great benefit to the States and one not offered by any other bidder. The reason for this is likely to be that Suez runs many waste and recycling facilities across the UK and Europe and therefore has a ready market for such commodities. This is an advantage of contracting with a large company that is responsible for many waste operations.

7.10 The 2 treatment lines (MTRU and EfW) are designed to produce a holistic solution to managing the Island's residual waste. They are each dependent on the other and combine to provide a solution capable of enabling more than 95% of the material sent to the plant to be recovered.

7.11 In the event that it proves necessary to activate phase 2 of the treatment unit, a third recovery unit will be installed to deal exclusively with Industrial and Commercial waste. Once phase 2 is operational, the industrial waste sorting unit will operate for increased periods and a grate boiler will be installed, which will allow energy recovery from the sorting screenings. A second steam turbine will also be put in place to increase the generation of electricity redistributed to the Guernsey public grid.

Architecture

7.12 The location of the proposed plant in an exposed area clearly visible from land and sea means that it is imperative that it is sympathetically designed in order not to result in an unacceptable visual impact. The Department firmly believes that the proposed design is of the highest standard and will not result in any adverse visual impact. Computer generated images of the facility are attached as Appendix Six and are on display in the lobby of the Royal Court building.

7.13 In summary, the building has been designed to mirror the profile of Vale Castle, which means that, when viewed from the sea, it will blend sympathetically with the existing landscape. There are no harsh angles and the visual impact of the chimney has been minimised by ensuring that it emerges from the highest point of the building.

7.14 Careful consideration has also been given to screening and landscaping works on the landward side of the building, including the planting of tall trees on the approach road and low rise plants closer to the building.

7.15 The building has a green roof – the Kalzip® Nature Roof – which is an advanced green roofing system that comprises plants being laid on an aluminium roof. This has visual and environmental benefits and would be a first in Guernsey.

The Company

7.16 Suez Environnement is a large, established international company that has successfully won contracts for managing waste and water in countries around the world, which are managed through its wholly-owned subsidiaries SITA (waste management) and Degremont (water and waste water). It has considerable experience in waste management and has access to excellent resources and a high level of experience, meaning that it is well placed to offer a first rate service to Guernsey in terms of the operation of the facility.

7.17 For the purposes of the Guernsey bid, other partners have been included in order to ensure the best possible offering. The supplier of the MTRU is Vauche, which has many reference plants in Europe. The EfW process plant will be designed and built by Vinci, a company with 50 reference plants in operation in Europe.

7.18 For the design phase, the expertise of French waste management site architects, Architectes Associés pour l'Environnement (AA'E) has been combined with the Guernsey knowledge and joint venture experience of local architects Falla Associates International. AA'E has a great deal of experience of building waste plants, often in areas where the location presents a challenge. For example, in 2006 an incinerator designed by AA'E was completed in the mountainous region of Andorra, an area of great natural beauty, which is also relatively inaccessible and presents the challenge of designing a building which could blend into the scenery on the side of a mountain.

7.19 With regard to the construction phase, Norwest Holst, a UK civil engineering company owned by Vinci, with specific knowledge and experience of the construction of EfW units, has entered into partnership with J W Rihoy and Sons Ltd, Building Contractors, who will of course bring their considerable knowledge and experience of significant local construction projects.

7.20 For the operational phase, Suez has created a team of locally-based partners with knowledge of specific aspects of local waste management and recycling. Such partners include Ronez, Island Waste, Guernsey Recycling and Alderney Shipping.

Waste Arisings

7.21 The figure for waste arisings used in the tender documents was a starting point of 45,000 tonnes in year 1 (2012), rising to 70,000 tonnes over the 25-year operating period of the plant. These figures were agreed by the States in November 2007 (Billet d'Etat XXIV, 2007 refers) and the Public Services Department was therefore directed to use these amounts as a basis for the tender.

7.22 The figures assume a growth rate of about 1.8% per annum. It is accepted that this is a projection made on the strength of the best information available at the time and that any changes to one or more of the factors taken into account in calculating both the figures and the growth rate will bring about a different result.

7.23 For those who have cast doubt on the wisdom of using the figures approved by the States in 2007, it is hoped that the modular nature of the proposed solution will provide some comfort. Suez' approach is to start in year 1 with a plant capable of dealing with 45,000 tonnes of residual waste, rising to 54,000 tonnes. The EfW component has a maximum capacity of 41,500 tonnes per annum.

7.24 In 2008, approximately 37,000 tonnes of material was landfilled at Mont Cuet. To this must be added other waste streams, such as wood, that are currently being disposed of in ways that will not be lawful after the introduction of the Environmental Pollution (Guernsey) Law, 2004, which is anticipated prior to the commencement of plant operations in 2012. Therefore the starting capacity of the plant is considered to be correctly sized.

7.25 Once operations commence, it will be possible to determine the actual annual changes in waste arisings and plan accordingly. This means that Phase 2 will not be put in place until the need for it has been confirmed and, should increased tonnages never become a reality, Phase 2 need not be triggered. Alternatively, its implementation can be brought forward or moved back in accordance with actual trends observed in waste arisings figures.

7.26 This has the added advantage that the initial capital investment costs are limited to those necessary to implement Phase 1, with further capital investment only being required when (or if) it becomes necessary to implement Phase 2.

7.27 In addition, it provides a good incentive for Islanders to continue to recycle because phase 1 is limited only by the capacity of the EfW component. The MTRU can cope with far greater tonnages, meaning that as long as sufficient material can be recycled – both household and Industrial and Commercial waste – the less likely it is that phase 2 will be needed and associated costs will be incurred.

8.0 Costs

8.1 For the avoidance of doubt, all costs quoted in this section, with the exception of those in paragraph 8.10, are at 2009 rates with no allowance for inflation.

8.2 The capital cost of building phase 1 of the Suez proposal is approximately £80m. To this must be added the annual availability fee and operating fee, as outlined in section 4.0 above.

8.3 In year 1, the fixed fee would be £1.8m, whilst the operating fee would be £11.44 per tonne. Assuming a starting tonnage of 45,000 tonnes, that equates to £515,000, giving a total cost of £2.2m in year 1.

8.4 The capital cost of phase 2 is anticipated to be approximately £16m.

8.5 The costs of building the plant, totalling around £80m, will be paid in stages as the project progresses over a period of 41 months. This comprises an 11-month period of design, site preparation, etc, followed by a 30-month construction period. Milestone payments will be made as follows:

Year 1	£ 8.0m
Year 2	£21.6m
Year 3	£34.4m
Year 4	£16.0m
Total	**£ 80m**

8.6 In addition, it would be prudent to allow a contingency sum of 15% of the civil engineering costs. Such sum would be £5.4m.

8.7 Throughout the construction and testing period the Department will need to employ consultants to provide advice and oversee the works. The exact costs of such consultancy services are not yet known but it is estimated that they will cost in the region of £2m.

8.8 Further budgetary provision needs to be made for miscellaneous expenditure such as travel costs, room hire, etc. It is suggested that an appropriate sum would be £0.1m.

8.9 In addition, given the length of the project, it would be advisable to include a 2.5% allowance for inflation (see paragraph 8.10).

8.10 The total project costs are therefore as follows:

Item	**Cost (£m)**
Design and construction	80.0
Contingency	5.4
Consultancy	2.0
Miscellaneous	0.1
Allowance for inflation	6.0
Total	**93.5**

8.11 The current best estimates for stages of the payments (inclusive of those set out in paragraph 8.5 above) are:

Year 1	£ 9.6m
Year 2	£24.3m
Year 3	£39.0m
Year 4	£20.3m
Year 5	£ 0.3m
Total	**£93.5m**

8.12 It should be noted that a proportion of the contract price has been quoted in Euros, (55% for phase 1) which brings with it risks to the States in terms of exchange rate fluctuations (see table in paragraph 9.6). Advice will be sought from the Treasury and Resources Department as to how best to manage those risks.

9.0 Financing

9.1 It is proposed that the cost of procuring the facility should be met through an internal loan from the Treasury and Resources Department. The capital sum will be repaid with interest over the 25-year operating period, with repayments being funded by the gate fees.

9.2 As stated above, the gate fees will be set by the States to cover operating costs plus capital repayment and interest charges less any income from the sale of energy or other by-products of the process. In order that the facility operates on a commercial basis the Department may seek to generate a 5% surplus to cover unforeseen expenditure.

9.3 Current forecasts indicate that the breakeven gate fee would be in the region of £175 per tonne (p.t.) at 2009 rates. By comparison the charge at Mont Cuet for "contaminated" waste (i.e. waste containing recyclable materials) is currently £189.90 per tonne. The proposed new plant will offer facilities that far exceed those at Mont Cuet, plus significant environmental improvements and it is not unreasonable for these to be reflected in the charges.

9.4 The Department currently undertakes several activities such as bulk refuse collection, civic amenity site and other recycling initiatives. These costs are currently absorbed by the Department and therefore the general taxpayer. If the States decide to adopt a "user pays" principle in the future, it may be that these costs will also be reflected in the future gate price.

9.5 It is to be noted that the breakeven gate fee is based on three main assumptions namely; the interest rate (4.7%), the currency exchange rate (calculated at £1 = €1.119 = NOK 10.33) and the tonnage processed (45,000).

9.6 Inevitably there will be fluctuations and variations in all these areas. For ease the following is a rough guide of the impact that a 10% variation would have on the breakeven gate fee:-

	Tonnage/Rate	Potential gate fee
	50000	£160
Tonnage	**45000**	**£175**
	40000	£200
	4.2%	£168
Interest Rate	**4.7%**	**£175**
	5.2%	£183
	€ 1.01	£183
Exchange Rate £1 :€	**€ 1.12**	**£175**
	€ 1.23	£168

10.0 General Revenue Implications

10.1 At present the charges levied at Mont Cuet more than cover the costs of operating the landfill site. Surplus monies are then applied to reduce the annual cash limit of the Public Services Department.

10.2 The long term plan is that the costs of procuring and operating the waste plant should be covered by the amount charged per tonne. If this is followed through it will mean that once built and operational there will be no surplus available to spend on other general revenue services such as highway maintenance and sewer repairs. In this respect the surplus, and the funding of recycling initiatives currently sourced from the surcharge at Mont Cuet, amounts to approximately £1.7m per annum. It will therefore be necessary for the States to direct the Treasury and Resources Department to take this into account when recommending Departmental cash allocations from 2012 onwards.

11.0 Planning and Environmental Considerations

11.1 In July 2002 the Urban Area Plan (Review No.1) (UAP) was approved by the States. This included specific policies for the consideration of waste facilities and an Outline Planning Brief (OPB) was produced specifically in respect of the Longue Hougue site, which had been identified following a comprehensive selection process as the appropriate location for the focus of the Island's waste management activities.

11.2 The OPB, which was project-specific, stated that Longue Hougue could be used for the siting of an integrated waste management facility, comprising:

- Waste to Energy Plant
- Materials Recovery Facility
- Civic Amenity Site
- Metals recycling
- Continuing incineration of animal carcasses

The OPB was written at a time when the States of Guernsey's agreed technology for long-term waste management facility would be Energy from Waste. In fact, it was written with reference to the specific project that was ongoing at the time and included drawings of the plant that had been proposed. With it being so specific, there was concern that the UAP policies and the OPB may not offer a suitably wide enough policy gateway for the planning system to consider alternative technologies.

11.3 The States Resolution of 1 February 2007 directed the Public Services Department to seek tenders for the design, build and operation of a wider range of technologies than was envisaged in 2002. Consequently, there was a possibility that the chosen technology might not have been able to be considered against the criteria set out within the UAP and in the OPB and therefore could not be granted planning permission.

11.4 In order to ensure that such an occurrence did not materialise and to ensure that the most recent requirements of the States could be met in November 2008 the Environment Department brought forward proposals to amend the Urban Area Plan (UAP) in order to provide an appropriate land use policy framework for determining waste-related planning applications at Longue Hougue.

11.5 The purpose of the amendment was to ensure that, in principle, the full range of technologies identified by the States in 2007 could be considered at Longue Hougue, rather than technology selection being constrained by the parameters of the 2002 OPB.

11.6 A Planning Inquiry was held in February 2009 and in May 2009 the States approved the recommendations of the Environment Department and the Planning Inspector that the amendment should be adopted without further revision.

11.7 Consequently, a policy gateway now exists to allow a broad range of technologies to be considered at Longue Hougue, now or in the future. Specific proposals will, of course, require the approval of the Environment Department and will also need to meet the requirements of the Director of Environmental Health and Pollution Regulation, (the Director).

11.8 It was a requirement of the tender process that each bidder's proposals should meet certain minimum architectural standards. Members of the Environment Department's Planning staff were consulted and have confirmed that from the evidence supplied at that time, the scheme submitted by Suez shows evidence of it being able to meet these standards. However, a planning application will need to be submitted and considered in detail and it will be for the Environment Department Board to determine the acceptability of the proposals. Detailed design work is ongoing and formal planning approval will be sought in due course.

11.9 Planning approval will not, however, be granted unless the plant meets the licensing requirements of the Director. Discussions have taken place with the Director, who has confirmed that the proposed technology is capable of meeting the licensing requirements. Again, a formal application for an operating licence will be considered in due course and no permissions will be granted until the Director is satisfied that all relevant regulatory criteria will be met.

12.0 Conclusion

12.1 In seeking tenders for a residual waste management system, the Department had a number of criteria that it aspired to fulfil, which may be summarised as follows:

- Proven technology offering a robust and sustainable solution at a value for money price;
- Maximum recycling;
- Sympathetic architectural design;
- Minimal environmental impact;
- Minimisation of final residues; and
- Construction and operating risks carried fully by the Contractor over the full life of the plant.

12.2 As explained in section 5 of this report, it has not proved possible to achieve the final point on the above list to the extent that the Department had hoped. Nevertheless, the Department considers that the current offer represents the best that will be obtained in this respect in the current market. Whilst this does mean that the States will be obliged to take on a greater degree of risk than initially envisaged, the Department is in the process of putting together a package of measures to mitigate and manage such risks. Consequently it does not consider this aspect should be allowed to prevent the progress of the project.

12.3 With regard to the other factors set out above, the Department believes that the Suez bid "ticks all the boxes" and represents a good solution to Guernsey's waste management problem.

13.0 Recommendations

13.1 The Public Services Department recommends the States to:

1. Agree to the appointment of Suez Environnement as the Preferred Bidder for the design build and operation of a residual waste treatment facility as detailed in this report;

2. Authorise the Treasury and Resources Department to advance to the Public Services Department a loan to the maximum sum of £93.5m to be drawn down according to the schedule and for the purposes outlined in this report.

3. Direct the Public Services Department to set a gate price from time to time that covers the full capital and operating cost of the facility.

4. Direct the Treasury and Resources Department to take into account the revenue implications associated with the proposals set out in this report when recommending to the States Cash Limits for the Public Services Department for 2012 and subsequent years.

Yours faithfully

B M Flouquet
Minister

Appendix One

GLOSSARY OF TERMS

Advanced Thermal Treatment (ATT)	In general, ATT technologies can be split into two categories, pyrolysis and gasification. These technologies are not new; for example, in the case of pyrolysis the conversion of wood to charcoal in the absence of air has been used for hundreds of years. Similarly, an example of gasification would be the formation of producer gas which is the gasification of coal, coke and wood in the presence of air and steam. The word 'advanced' indicates that ATT is claimed to be superior to conventional EfW technology in respect of a higher electrical efficiency and/or a more stable bottom ash. However ATT plants do require a very clean fuel which means that the waste to be supplied to an ATT plant would require significant pre-treatment and therefore an ATT plant could not serve as a stand-alone solution. Pre-treated municipal solid waste is introduced into a pyrolysis/gasification chamber from which is derived bottom ash and metals and the organic material in the waste is converted into syngas which is cleaned and used for heat and power generation.
Energy from Waste (EfW)	In an EfW facility, household and commercial waste is incinerated and energy is recovered. A typical EfW facility consists of a waste reception and feeding system, a furnace, a boiler, an energy recovery system, flue gas treatment system and a stack. The outputs from an EfW facility are electricity, bottom ash, metals for recycling and air pollution control residues. EfW plants are commonplace and are being built throughout the world.
Materials Recovery Facility (MRF)	A Materials Recovery Facility is a plant that receives, separates and prepares recyclable materials that are then sent to processors for recycling. Generally, there are two types - clean and dirty MRF's. A clean MRF accepts recyclable co-mingled materials that have been separated at source. A dirty MRF

	accepts a mixed solid waste stream and then separates out designated recyclable materials through a combination of manual and mechanical sorting.
Mechanical Biological Treatment (MBT)	MBT technologies combine mechanical and biological processes within one system. Typically MBT facilities will involve a mechanical sorting process similar to a Materials Recovery Facility where metals are recovered and the remaining material is split into two fractions, one with high calorific value to be used as fuel and the other with high easily degradable biological content to be bio-stabilised. There are a number of potential outputs from an MBT depending on the configuration of the plant. They are the recyclable fractions together with Refuse Derived Fuel (RDF), bio-gas and Compost-Like Output (CLO). In Guernsey's situation RDF would most likely be disposed of by means of thermal treatment. With regard to CLO, the disposal method would depend on the characteristics of the CLO.
Mechanical Heat Treatment (MHT)	MHT facilities are in many ways similar to MBT but the main difference is that MHT includes heat treatment and excludes the biological treatment step. The inclusion of the heat treatment stage is designed to produce a clean waste stream for sorting due to the reduction of bacteria. The output from an MHT plant will be metal and sanitised waste split into a biodegradable fraction and a high calorific fraction for thermal treatment.
Municipal Solid Waste (MSW)	Solid Waste produced by households and commercial undertakings.
Refuse Derived Fuel (RDF)	A fuel produced by shredding municipal solid waste (MSW). Noncombustible materials such as glass and metals are generally removed prior to making RDF. The residual material is sold as-is or compressed into pellets, bricks, or logs. RDF processing facilities are typically located near a source of MSW, while the RDF combustion facility can be located elsewhere.

Appendix 2

1. Tender Evaluation Model

The Tender evaluation will be a two-stage process.

The first stage is a pass/fail evaluation of the Tenders.

The Tenders will be evaluated against pre-defined criteria and for compliance with the applicable requirements of Appendix 1 [Employer's Requirements] of the Contract as further set out in Section 5.2.1.2 of that document.

Tenders, which pass the first stage evaluation, will then be evaluated in the second stage of the evaluation against a pre-defined scoring model as further set out in Section 5.2 of that document.

Prior to rejecting a Tenderer, whose Tender fails the first stage evaluation, the States may at their sole discretion seek clarification from the Tenderer before confirming rejection of the Tender.

The second stage evaluation is a scoring evaluation in which the Tenderers' Technical, Financial and Management Proposals are separately evaluated in the sense that each Proposal will be given a score.

Scores will not be made available to Tenderers.

The States are not bound to award the Contract to the highest scoring Tenderer or any other Tenderer, as the States may decide.

1.1 Stage 1 - Pass/Fail Evaluation

The Tenders will be pass/fail tested against the following criteria:

1. Compliance of the Tender in accordance with Volume 2, Instructions to Tenderers, Section 1.1.

2. Completeness of the Financial, Technical and Management Proposals in accordance with the Instruction to Tenderers.

3. Legal compliance

4. The requirement of the Tenderers to identify the Tendering Entity in accordance with Instructions to Financial Proposal including

    - Identification of the party that, for the purpose of the Contract, will be the Contractor; and

- Provision of all requested information as required by the Instruction to Tenderers for that identified party, specifically provision of evidence of satisfactory financial strength of the Tendering Entity together with its ultimate parent company (if applicable)

5. The requirement of Tenderers to provide evidence of previously successfully completed similar projects based on the specific solution proposed in accordance with the Instructions to Technical Proposal.

6. Satisfactory confirmation of the Tenderer's organisation as further set out in the Instructions to Tenderers, and in the Instructions for Management Proposal.

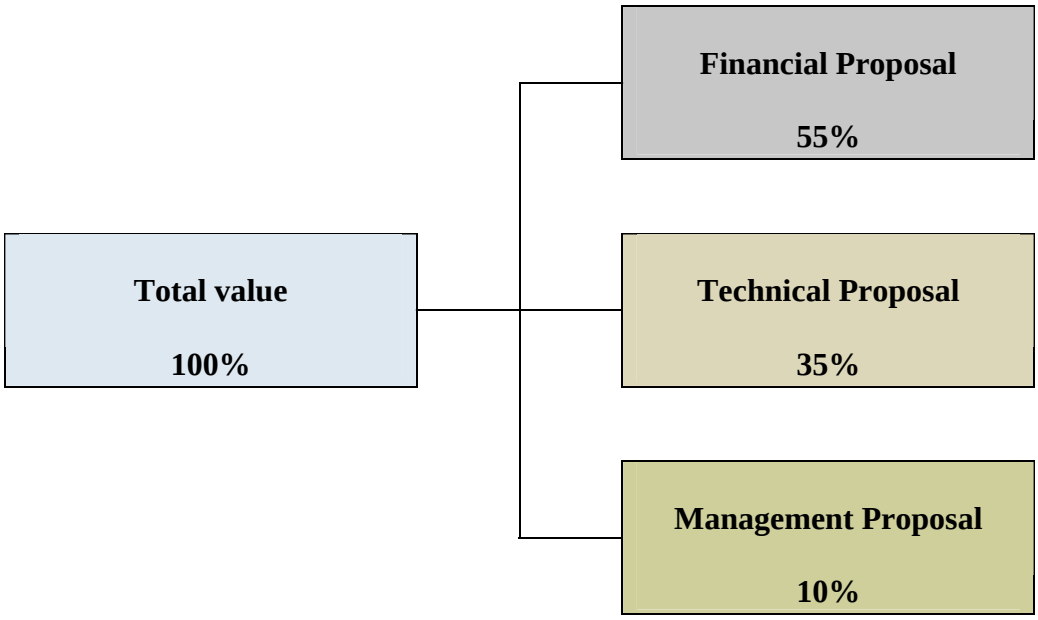
7. Compliance with applicable requirements of Appendix 1 [Employer's Requirements] of the Contract.

Tenders passing all of the above criteria will be deemed compliant and will qualify for the second stage scoring evaluation as set out in Section 5.2 of that Volume 2.

1.2 Stage 2 - Scoring Evaluation

1.2.1 Proposal scoring evaluation

Tenders, which pass the first stage evaluation, will subsequently be further evaluated in accordance with the score model described below.



The figure above represents the weighting of the three main evaluation criteria. The breakdown of these three main criteria into sub-criteria and the weighting of these sub-criteria are shown on the following pages.

1.2.1.1. Scoring Evaluation of the Financial Proposal

The Financial Proposal will have the following annexes:

1. The Form of Tender
2. Pricing Schedule for the Works
3. Pricing Schedule for the Services, including financial model
4. Documentation demonstrating financial strength of the Tendering Entity
5. Insurance statement
6. Performance Security Statement

The evaluation of the Financial Proposals shall be made in accordance with the table below.

Item	Method of Evaluation
Net Present Value	The net present value (NPV) will be calculated as the sum of the capital costs and the calculated NPV for operating the Plant in its Plant Lifetime. A real rate of interest of 5% shall be used. <u>Capital cost</u> 1) The Contract Price as presented in the Pricing Schedule for the Works taking into account the suggested Milestone Payment Profile. <u>The calculated NPV for operating the Plant</u> 1) Annual Fixed Fee as presented in the Pricing Schedule for the Services 2) Operating Fee calculated on the basis of 45,000 tonnes of Waste increasing to 70,000 tonnes of Waste delivered to the Plant over a 25-year period. 3) Projected costs of procurement of electricity and income from energy export, if applicable. If the Plant exports energy in the form of electricity then this value will be calculated on the basis that power export shall sold at a rate of 5.5p/kWh Annual standing charges shall be calculated as 9.15p/kWh parasitic load requirement plus a charge of £8.89 per kW for each kW of maximum load per month.

Item	Method of Evaluation
	4) The States' costs of disposal of Final Residues 5) Value of Land 75£/m^2 per annum for land take required in excess of 3.5 hectares for the entire Plant, measured by the perimeter of the site required.

55 points will be given to the Tender with the lowest calculated lifetime NPV.

A lifetime NPV of 1.75 times that of the lowest calculated lifetime NPV will be given 0 points.

In between these NPV values, a linear relationship shall be used to calculate the score for the Financial Proposal

1.1.1.2 Scoring Evaluation of the Technical Proposal

The Technical Proposal will have the following annexes:

1. Proposed Solution, General Description

2. Deviations from Appendix 1 [Employer's Requirements] of the contract

3. Detailed Solution; M&E Elements

4. Detailed Solution; Civil Works Elements

5. Detailed Solution; Services – operation and maintenance

6. WRATE information

The evaluation of the Technical Proposals shall be made in accordance with the table below.

Item	Method of Evaluation
Compliance with Appendix 1 [Employer's Requirements]	A general view of the degree of compliance with the applicable requirements of Appendix 1 [*Employer's Requirements*] of the contract will be taken. The evaluation panel will evaluate proposed deviations. Robustness, reliability, simplicity, efficiency and quality shall be of key importance in this evaluation.

Item	Method of Evaluation
M&E Elements	Technical diagrams, arrangement drawings and specifications shall be reviewed against the key performance criteria as set out in the Employer's Requirements.
Civil Works Element	Arrangement drawings, specifications and architectural solution shall be reviewed against the Employer's Requirements.
Operation and Maintenance Procedures	The Tenderers proposed strategies for operating the Plant shall be reviewed against the intentions set out in the Employer's Requirements. This will include a careful review of the suggested contents of the Operational Plan, the Annual Maintenance Plan, the O&M Manuals, the O&M System and the reporting.
Programme	This will include a careful review of the suggested Works Programme cf. Annex 1 of the Technical Proposal The review will also consider the Tenderer's Design Submission Programme, cf. Annex 1 of the Technical Proposal.
WRATE assessment	The States have decided to implement the application of DEFRA's WRATE modelling tool to enable an objective method of assessing different technical solutions against each other.

A score will be given for each annex in the Technical Proposal and scores for each annex will be weighted according to its importance. On that basis, a total score will be given for each Technical Proposal.

The Technical Proposal with the highest total score will be given 35 points.

A Technical Proposal with a total score of 65 % of the highest total score will be given 0 points. Linear interpolation shall be used to calculate the score for the Technical Proposal.

1.2.1.3 Scoring Evaluation of the Management Proposal

The Management Proposal will have the following annexes:

1. Details of Tenderer

2. The Tenderer's Structure

3. Management of Public Relations

4. Management of Health, Safety and Welfare

5. Management of Quality Assurance

6. Staff, Recruitment and Training

7. Facility Management

Item	Method of Evaluation
Tenderer	Management Proposal will have described the Contractor's organisation and structure during the different defined periods of the Contract. The management strength of the Tenderer will be evaluated.
Public Relations	The Tenderer's strategy for Public Relations will be carefully reviewed. The strength of the Public Relations strategy will be evaluated.
Health, Safety and Welfare	The Tenderer's strategy for health, safety and welfare will be carefully reviewed. The strength of the health, safety and welfare strategy will be evaluated.
Quality Assurance	The Management Proposal shall set out how a quality assurance system in accordance with Clause [11] of the Contract will be implemented in relation to designing, constructing, testing, commissioning and operating the Plant. High standards will be expected but also the Tenderers practical approach to quality assurance will be reviewed. The Employer will wish to see quality assurance documentation regularly and the Management Proposal will be reviewed with this in mind.
Staff, Recruitment and Training	The Plant shall be built in a small island community. The Plant shall depend on continuous availability of suitably qualified and trained Key Personnel and operating staff. The suggested policy submitted with the Management Proposal to support this concern will be evaluated.

A score will be given for each memo in the Management Proposal and scores for each memo will be weighted according to its importance. On that basis, a total score will be given for each Management Proposal.

The Management Proposal with the highest total score will be given 10 points.

A Management Proposal with a total score of 65 % of the highest total score will be given 0 points. Linear interpolation shall be used to calculate the score for the Management Proposal.

Appendix 3

States of Guernsey

Guernsey RWTF

WRATE Evaluation

May 2009

RAMBØLL

States of Guernsey

Guernsey RWTF

WRATE Evaluation

May 2009

Ref	7459500
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Date	2009-05-01
Prepared by	JTK
Checked by	THC
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Table of contents

1. Introduction to WRATE

WRATE is software tool for conduction Life Cycle Assessment (LCA) for different waste management options. WRATE (Waste and Resources Assessment Tool for the Environment) allows waste managers to compare current, planned and hypothetical waste management scenarios, including all activities from collection to final disposal. The results help to identify the more environmentally preferable waste management options, and will function as a decision support tool prior to decisions for new facilities.

WRATE calculates all burdens from both directly from waste management and handling, and from capital burdens (from construction and production of buildings, machines etc.) and from energy and materials that are used in the process or energy and materials that is replaced due to the waste management system.

WRATE includes generic data for a range of activities:

- 32 types of containers
- 25 forms of transport
- 12 types of intermediate facilities (e.g. transfer station)
- 24 different recycling processes
- 43 Treatment & Recovery processes (including eight composting systems, four anaerobic digestors and 15 mechanical-biological treatment (MBT) systems, seven incineration technologies as well as autoclaving, pyrolysis and two gasifiers)

The above processes and the data included may not in all cases represent the actual technologies, why it is necessary to develop user defined technologies, that exactly represent the relevant technology options.

2. Scenarios

2.1 General

Ramboll has made two sets of scenarios; a set of scenarios for year 1 and a set of scenarios for year 25 for each of the three tenders. In both sets of scenarios, all three proposed technical solutions from the tenders will be included as well as a reference landfill scenario for comparison. It should be noted that the landfill scenario assumes a landfill that collects and utilise the landfill gas for electricity production, as this is a generic calculation of the WRATE model, i.e. WRATE analysis of this landfill will be more generous than if the landfill at Mont Cuet were to be modelled.

Waste collection and any burdens associated with collection material and collection transport is not included in the evaluation. This relies on the assumption, that the burdens from collection will be equal in all the scenarios.

All recycling processes in the scenarios are assumed to be of the same technology. Ramboll has not changed in the allocation parameters for any of these recycling activities. The same is valid for landfilling of residues.

2.1.1 Waste Input

The waste input has not been defined in the tender documents, thus the proposals have different preconditions regarding to the waste input and the waste composition. Ramboll has therefore defined a waste composition which partly is based on the waste composition that SUEZ Environment has defined in their proposal, partly based on default waste composition in WRATE. It is important that the scenarios have the same waste composition input as otherwise they would not be easily comparable.

Waste composition	Household waste	Industrial and commercial waste	Total Ton yr.1
Paper + card	17.00%	11.20%	6036
Plastic film	12.10%	5.00%	3574
Dens plastics	1.40%	11.00%	2946
Textiles	3.50%	9.00%	2869
hygiene products	8.30%	0.00%	1618
Wood	0.90%	30.00%	7465
Combustibles	2.60%	3.00%	1236
Non-combustibles	1.20%	8.20%	2226
Glass	4.30%	1.75%	1264
Organics	37.00%	4.55%	8321
Ferrous metals	1.00%	9.30%	2455
Non-ferrous	3.00%	2.00%	1071
Fines	5.40%	3.00%	1782
WEEE	1.00%	1.00%	438
Haz. waste	1.30%	1.00%	497
Total	**19,500 ton**	**24,300 ton**	**43,800**

Table 1. Waste composition year 1 excluding 1200 ton of sewage sludge.

The waste input for both year 1 and year 25 is specified in Appendix I.

2.1.2 Electricity Mix

WRATE needs that the electricity mix is defined in order for the model to calculate any burdens and savings due to electricity production. As electricity production is of significant size the type of electricity offset is very important.

Currently Guernsey imports most of its electricity from France while some electricity is produced on the island. Electricity production in Guernsey is based on diesel oil while electricity produced in France mainly is based on nuclear power (app. 77% in year 2002).

Identifying the marginal electricity offset is very often related to some uncertainties. The offsetting technologies is in the short term reliant mainly on fuel prices and in the longer term reliant on national energy strategies that define which energy sources that should be promoted and which should be phased out.

Due to this, it is very difficult to define exactly which energy source that is replaced due to electricity production at the energy to waste facility on Guernsey. For simplicity reasons, Rambøll has defined that the marginal electricity is based on 50 % diesel oil and 50 % nuclear power in all 25 years of operation. Rambøll assumes that the electricity efficiency at the diesel based power plant will increase from 27.5 % to 33 % in year 25.

2.1.3 Recyclables Output

As waste input is not assumed to be the same in the three proposed technical solutions also the waste output and waste to recycling is not directly comparable. Thus, Rambøll has estimated amounts of waste to recycling according to the proposals technical descriptions and the total amounts assumed to be recycled in the proposals. It is assumed that the front-end recycling of metals are the same in all three proposals.

WRG has not specified which material fractions and amount that are recovered for recycling. Thus, Ramboll has assumed the following values.

YEAR 1	**Cyclerval**		**SUEZ**		**WRG**	
	Year 1	**Year 25**	**Year 1**	**Year 25**	**Year 1**	**Year 25**
inert, rubbles and concrete	2000	2846	1993	3000	2200	3000
Paper	700	2587	673	1499	0	1200
cardboard	0	1811	670	1499	0	1200
plastic containers	0	388	1291	2500	500	900
plastic films	0	0	587	1500	500	900
Glass	0	1035	0	0	1000	1000
Wood	0	2199	1129	0	1650	2501
WEEE	0	1552	237	0	340	525
Ferrous	1129	401	1129	2463	1129	2463
Non-ferrous	237	129	237	517	237	517
Ferrous in BA	801	1000	831	1040	0	0
Non-ferrous from BA	0	0	107	130	0	0
Front-end recycling	**4066**	**12948**	**6580**	**12978**	**6566**	**11180**
Front-end recycling %	*9 %*	*19 %*	*15 %*	*19 %*	*15 %*	*16 %*
Back-end recycling	**801**	**1000**	**938**	**1008**	**0**	**0**

Table 2. Waste composition year 1 and year 25 excluding 1200 ton of sewage sludge.

2.1.4 Energy Production

A very important aspect in waste treatment and the related environmental impacts is the degree of energy recovery. All three tenders suggest recovery of electricity and no heat. The amount of electricity generated is dependant on the amount of waste that is fed into a waste to energy facility and the energy efficiency of the plant. In the table below the gross electricity production for the three proposed technical solutions are shown.

	Electricity recovery	Cyclerval Scenario 2	SUEZ	WRG
YEAR 1	**Gross production**	87 mill. MJ	83 mill. MJ	79 mill. MJ
	Net sale	71 mill. MJ	60 mill. MJ	73 mill. MJ
YEAR 25	**Gross production**	108 mill. MJ	112 mill. MJ	123 mill. MJ
	Net sale	89 mill. MJ	80 mill. MJ	115 mill. MJ

Table 3. Gross and net electricity production for the three tenders for year 1 and year 25

2.2 Cyclerval

The proposed technical solution from Cyclerval includes two scenarios. Scenario 1 has no recycling in year 1 and Scenario 2 has 10 % recycling in year 1. Rambøll has chosen scenario 2, as it is important that recycling is initiated from the beginning. This is important because Cyclerval hopes to recycle 14,000 ton in year 25, and to obtain this, recycling activities has to be initiated from the beginning.

However, Cyclerval has not defined the exact amount of recyclables. Thus, it is assumed that the amounts of ferrous and non-ferrous metals that are recovered are equal to the recovery rate for these fractions of SUEZ. Also it is assumed that a significant fraction of the 4500 ton of recyclable material recovered is inert material that is used for construction purposes. The remaining part of the 4500 ton is assumed to be paper.

Cyclerval has not defined the energy consumption for the material recovery facility (MRF) thus a generic value has been used in the interim evaluation. Only wastes from commercial and industrial sources are fed to the MRF while waste from households and sewage sludge is fed directly to the WTE facility.

The energy consumption for the WTE includes:

Diesel fuel	6982 kg
Fuel oil	39,984 kg
Electricity	15,000,000 MJ

The gross electricity production constitutes 3.02 MW. It is estimated that the plant should operate for 8000 hrs in year 1. That gives an electricity production of app. **87,000,000 MJ** (= 24,200 MWh).

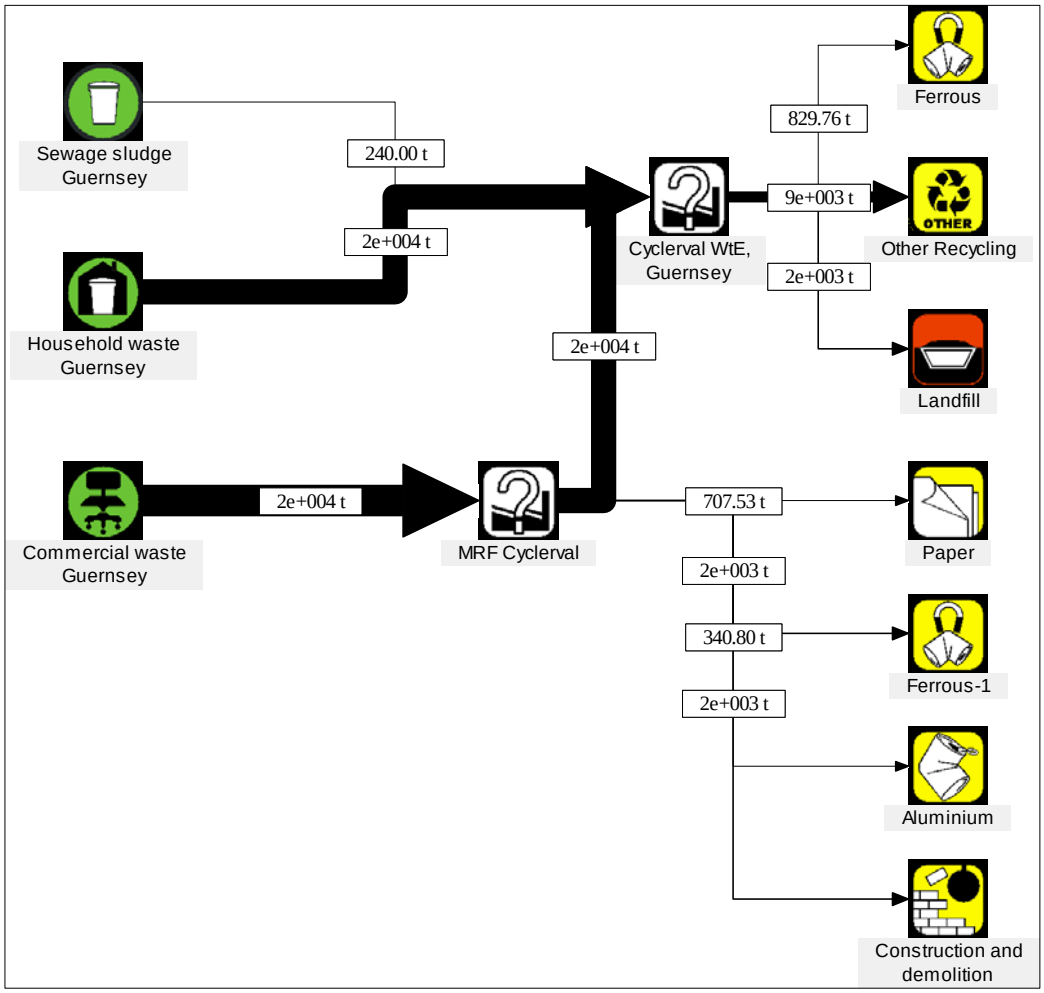


Figure 1. Schematic flow diagram for Cyclerval year 1.

2.3 SUEZ Environnement

The proposed technical solution from SUEZ Environnement includes a comprehensive recovery of waste to recycling. The amounts for recycling in the proposal are for some fractions higher than seems reasonable compared to the waste composition, that Ramboll has defined. Therefore, the amounts to recycling of inter, rubble and concrete are reduced compared to the proposal, and the relation between plastic film and plastic bottles (high density plastic) is changed. The overall amount of plastic is however nearly as defined in the proposal.

Only wastes from commercial and industrial sources are fed to the MRF while waste from households and sewage sludge is fed directly to the WTE facility.

The energy consumption for the MRF and for WTE includes:

Diesel fuel	21,840 kg	MRF
Electricity	900,000 MJ	MRF
Fuel oil	5,376 kg	WTE
Electricity	19,440,000 MJ	WTE

The gross electricity production constitutes **83,500,000 MJ** (= 23,200 MWh).

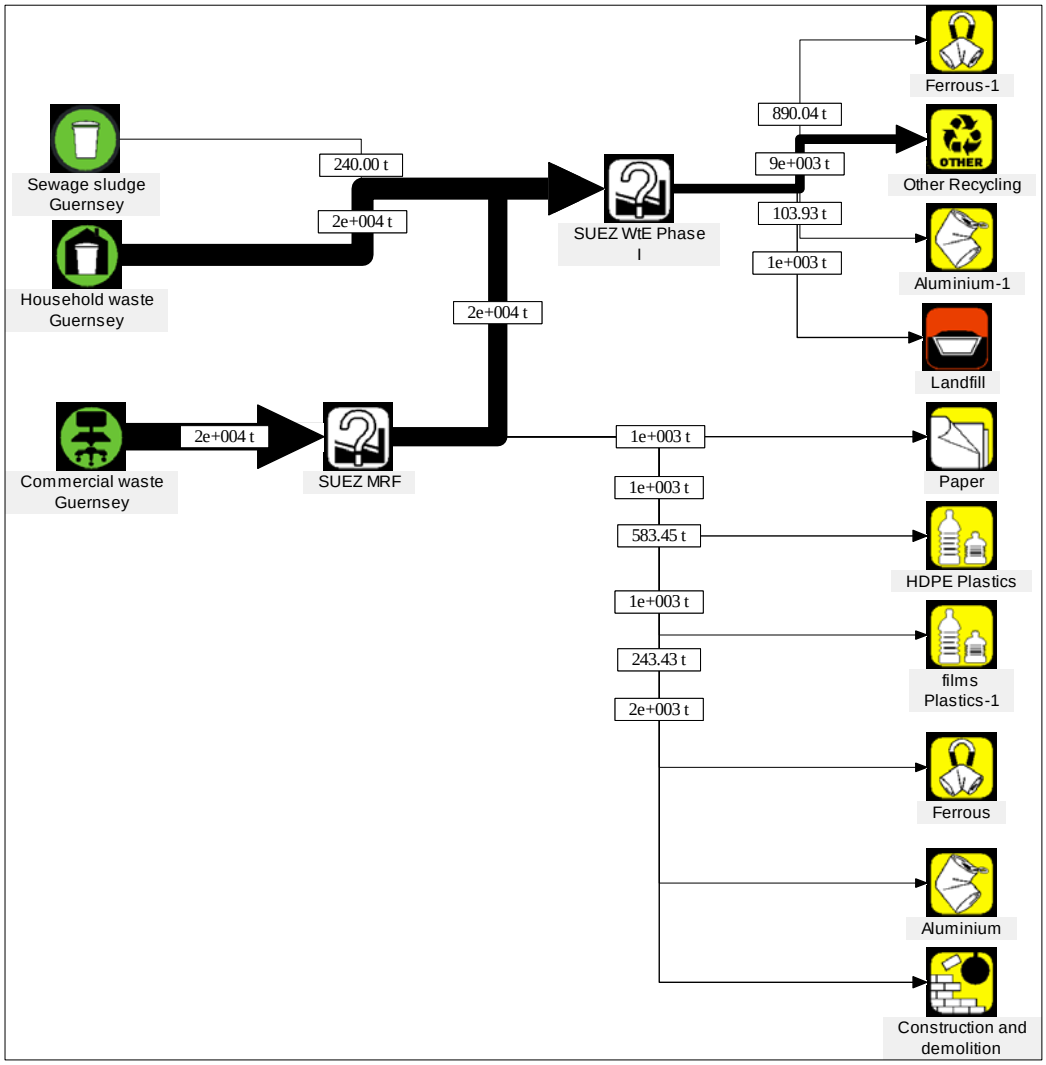


Figure 2. Schematic flow diagram for SUEZ year 1.

2.4 Waste Recycling Group

The proposed technical solution from Waste Recycling Group (WRG) includes two scenarios; a scenario with respectively 10 % and 6 % front end material recovery. This evaluation is based on their second scenario with 16 % material recovery. A MRF separates app. 7200 ton in year 1 and app. 11000 ton in year 25. However, the amounts of each waste fraction recovered are not given in the specification from WRG; thus Ramboll has estimated the material fractions and quantities that are assumed to be recycled.

The remaining 37,800 ton in year 1 and 59,000 ton in year 25 is treated in the Energos gasification plant. In the WRATE model, the treatment is based on a conventional incinerator, as the gasification plant in WRATE can only receive RDF and not unsorted waste from households or sewage sludge.

The energy consumption for the MRF and for WTE are shown in the following table. No electricity consumption is defined for the MRF plant from the tender. Unlike the Cyclerval and SUEZ proposals WRG suggest to feed all waste from both households and commercial sources to the MRF. However; this does not lead to an increased amount of recovered material compared to waste plants offered by Cyclerval and SUEZ.

Energy consumption Year 1		
Diesel fuel	1176 kg	MRF
Fuel oil	89,000 kg	WTE
Electricity	5,770,000 MJ	WTE

The gross electricity production is informed to be 3.1 MW in year 1 and is equivalent to a gross electricity efficiency of app. 18 % given a lower heating value of 11.68 GJ/ton (which WRG has assumed in their tender). This leads to an overall electricity production of **79,060,000 MJ** (=21,960 MWh) in year 1.

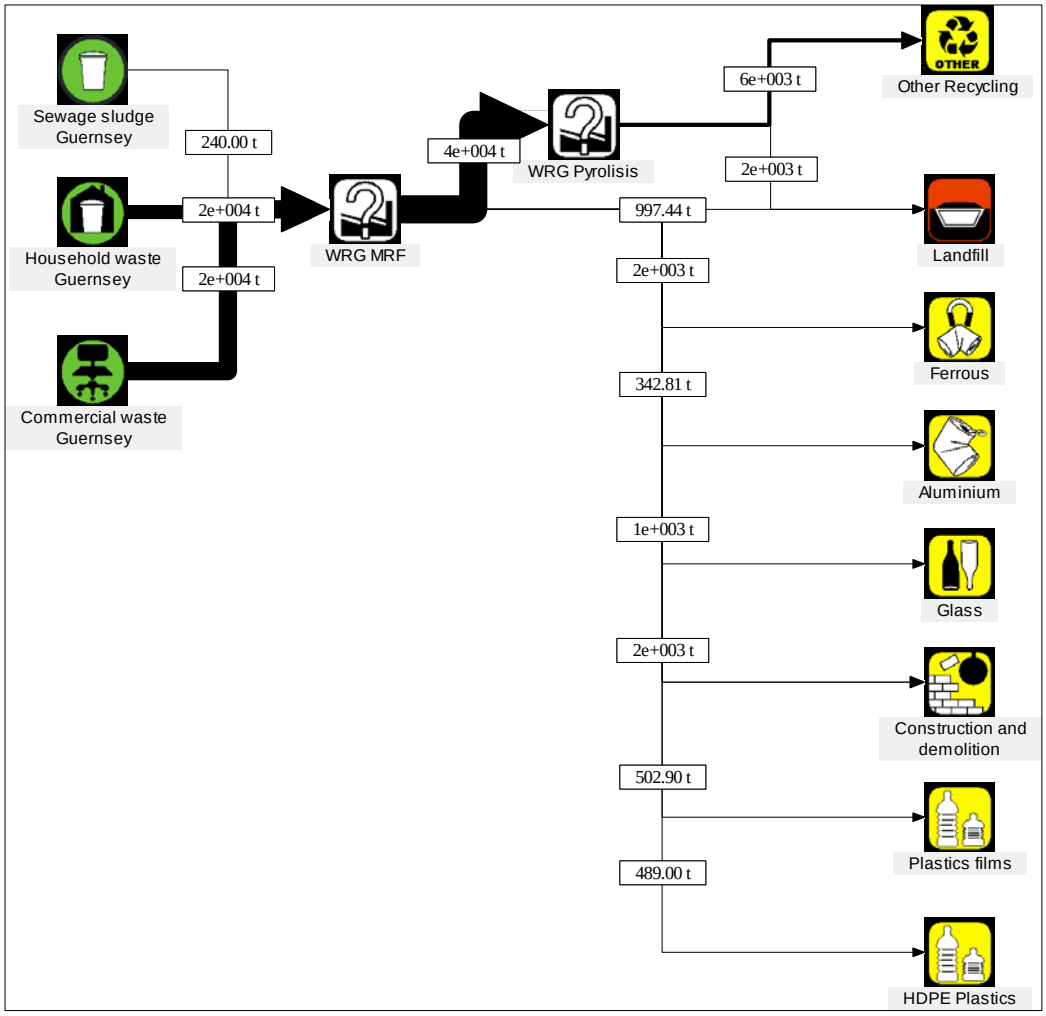


Figure 3. Schematic diagram for waste flows for WRG in year 1.

3. Results

The life cycle impact assessment (LCIA) results from WRATE are provided in the default impact assessment method and are given in normalised results. The normalisation helps gain a better understanding of the relative magnitude between different environmental impacts as the results relate to the average impact from one person.

The results are given for six environmental impact categories which can be both of local or global range:

- Abiotic resource depletion (ex. use of non-renewable fuels and metals)
- Global warming (ex. by emission of CO2 and methane (CH4)
- Human toxicity (ex. by emissions of heavy metals to air)
- Fresh water ecotoxicity (ex. by emissions of metals to fresh water environments)
- Acidification (ex. by emission of SO2)
- Eutrophication (ex. by emission of phosphorous and nitrogen to aquatic environments)

The results in the following are normalised but not weighted. Thus, the results will in general not indicate any assessment of which environmental impacts that are more significant or important.

The results will be described for year 1 and for year 25 respectively in the following.

3.1 Year 1 - Overall Life Cycle Impact Assessment (LCIA) Results

Error! Reference source not found. shows the overall results for the three scenarios and for landfilling as a reference scenario. The results are normalised and given in person equivalents, which is a measure of the load from an average person. Negative values represent an offset or an environmental burden that is avoided. Positive values represent an actual environmental burden.

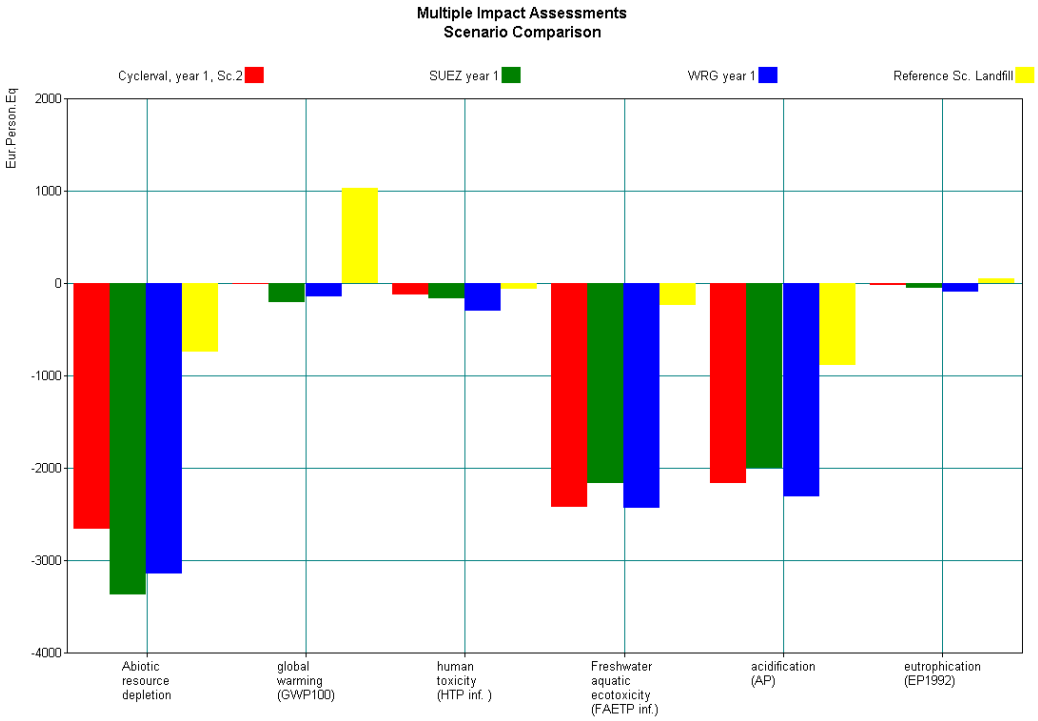


Figure 4. Multiple normalised LCIA results for year 1

The figure shows that all scenarios involve a replacement of abiotic resources. This is due to recycling and to electricity production. SUEZ has the highest degree of replacement of resources which is due to the high degree of recycling. SUEZ also scores best regarding to global warming which also mainly is due to recycling and energy recovery.

Cyclerval and WRG scores similar in many environmental categories, but WRG has a minor advantage compared to Cyclerval for abiotic resource consumption and global warming which is due to the higher electricity production from the WRG facility.

Cyclerval and WRG performs better compared to SUEZ with respect to acidification due to higher degrees of electricity production where diesel based electricity is avoided.

WRG offers the best option regarding human toxicity potential. This is due to very low emission factors in the WRATE annex for heavy metals such as cadmium and mercury. However, this environmental impact is associated with a large degree of uncertainties.

Figure 5 and Figure 6 shows more detailed results for global warming potential. Figure 5 shows the contribution from each main category. Here it is shown that recycling in all cases lead to an avoided emission whereas sorting and treatment leads to an actual burden.

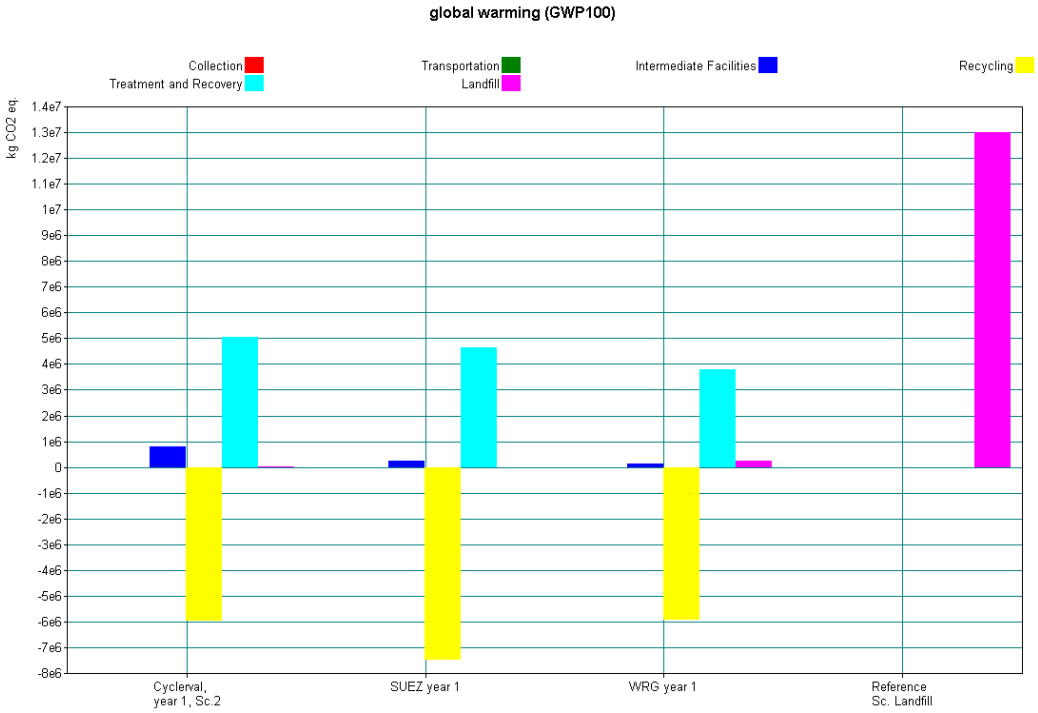


Figure 5. Global warming potential for each main category, results for **year 1**

Figure 6 shows that the direct burdens of global warming gasses are higher than the avoided burdens from electricity production. This is partly due to the assumption, that half of the produced electricity replaces nuclear power which has a very low CO_2 contribution.

The figure shows that capital burdens related to construction, maintenance and de-commissioning is insignificant. However, the direct burdens, energy balance and the material recycling is of significant importance.

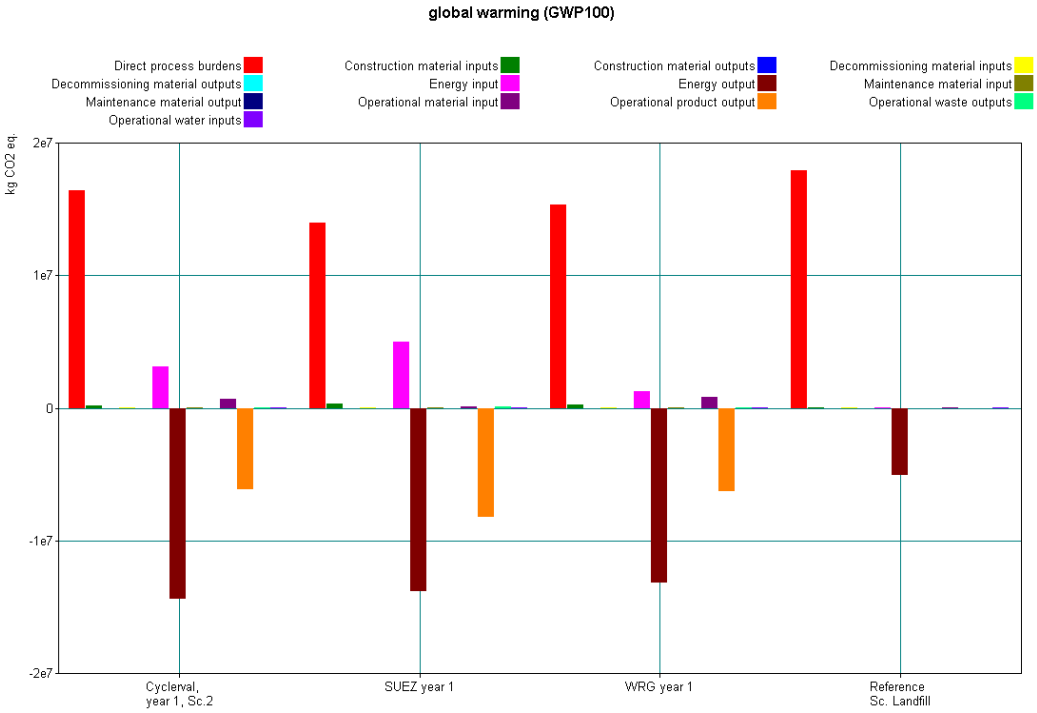


Figure 6. Global warming potential specified for each process, **year 1**

3.2 Year 25 - Overall Life Cycle Impact Assessment (LCIA) Results

In the following results for the WRATE calculations for year 25 is presented. For all solutions more waste is treated and more waste is recycled compared to year 1.

Figure 7 shows the multiple LCIA results for year 25. Again the technical solution offered by SUEZ performs best with regards to the use of abiotic resources and to global warming due to high energy recovery and high recycling rates. Especially recycling of aluminium and plastics contribute to avoided environmental burdens.

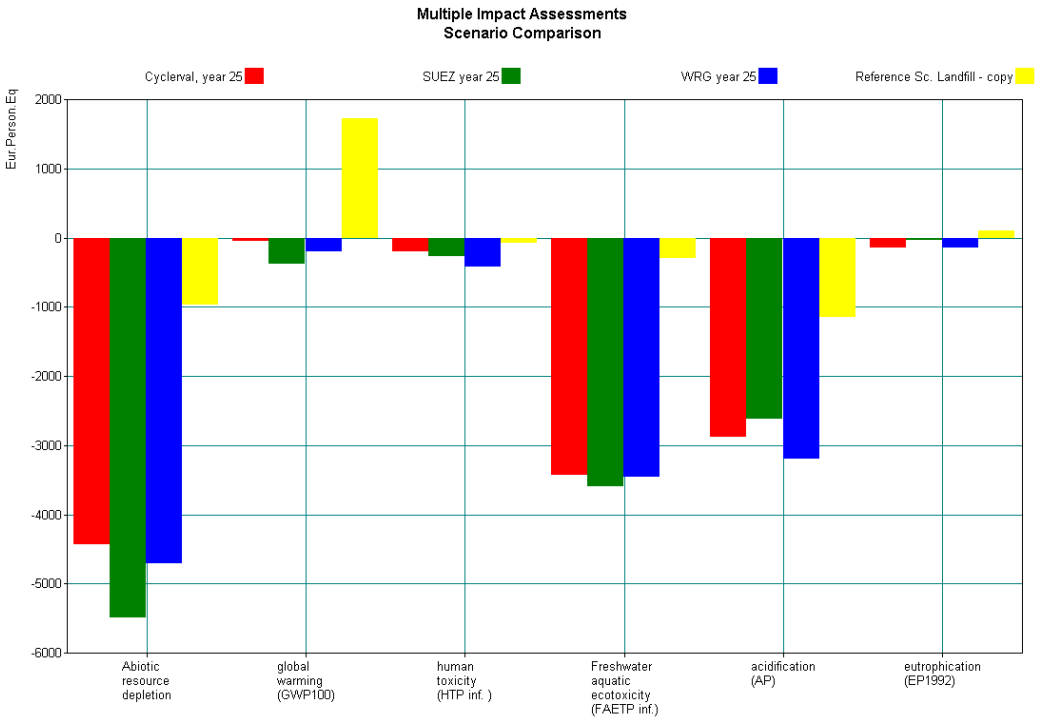


Figure 7. Multiple LCIA results for **year 25**

Figure 8 and Figure 9 shows more detailed results for global warming potential. The figures show that recycling is the main activity that reduces the emission of global warming gasses.

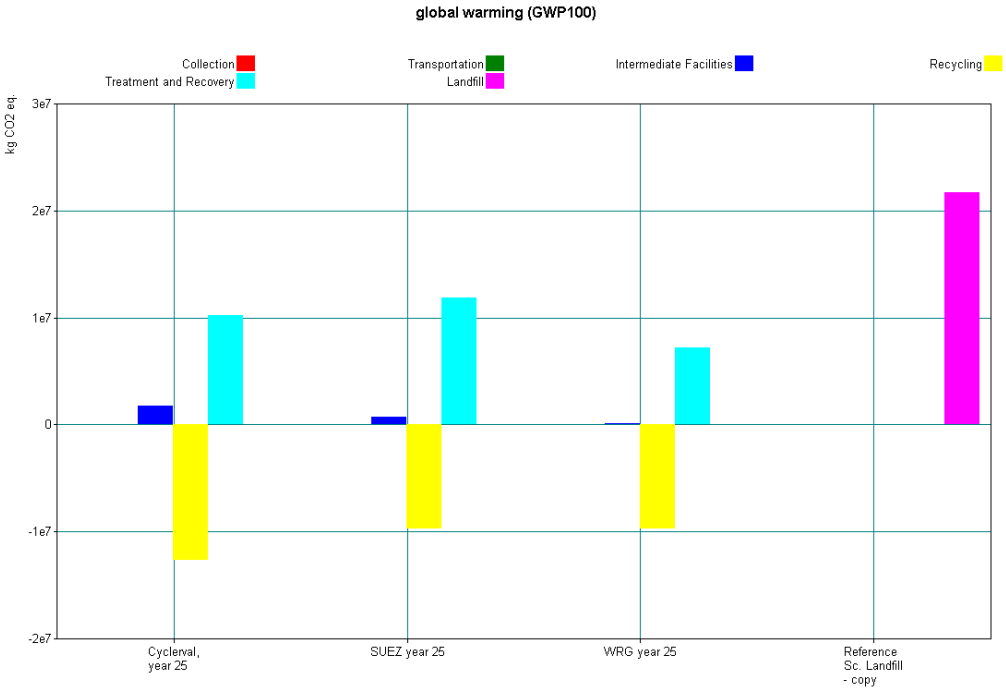


Figure 8. Global warming potential for each main category, results for **year 25**

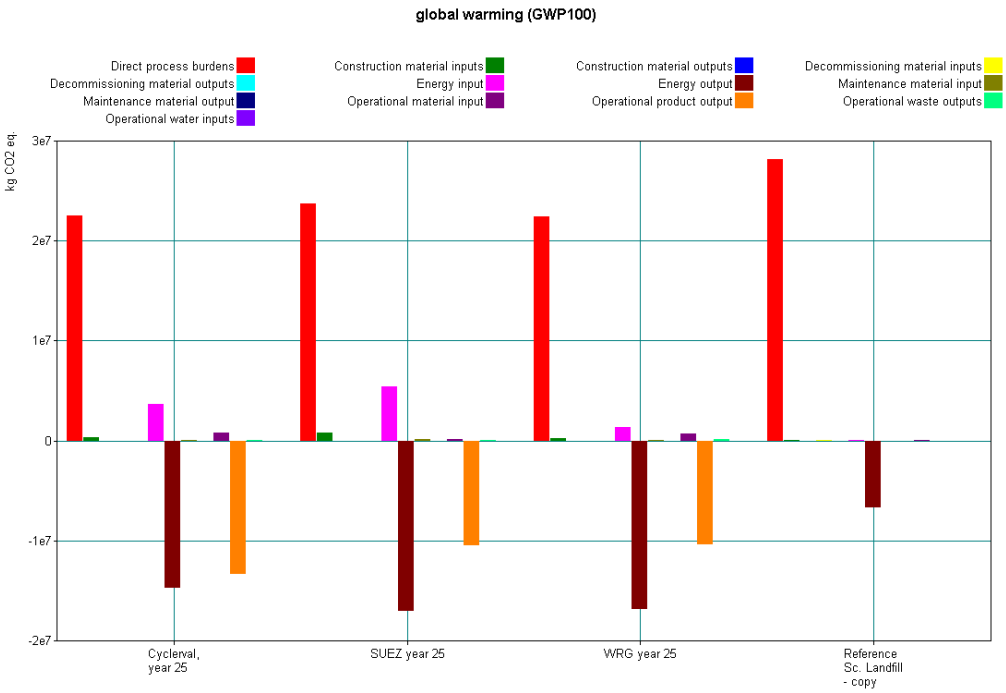


Figure 9. Global warming potential specified for each process, **year 25**

3.3 Sensitivity Analysis

3.3.1 Sensitivity on Electricity Mix

The following two figures show the results with electricity mix based only on diesel and only on nuclear power respectively. Cyclerval performs equally well or slightly better than SUEZ in the case where diesel oil is assumed to be the marginal electricity mix, as Cyclerval has higher electricity production than both SUEZ and than WRG. WRG perform close to SUEZ and Cyclerval in the case of using diesel oil as a marginal source also as a consequence of a higher degree of electricity production than SUEZ.

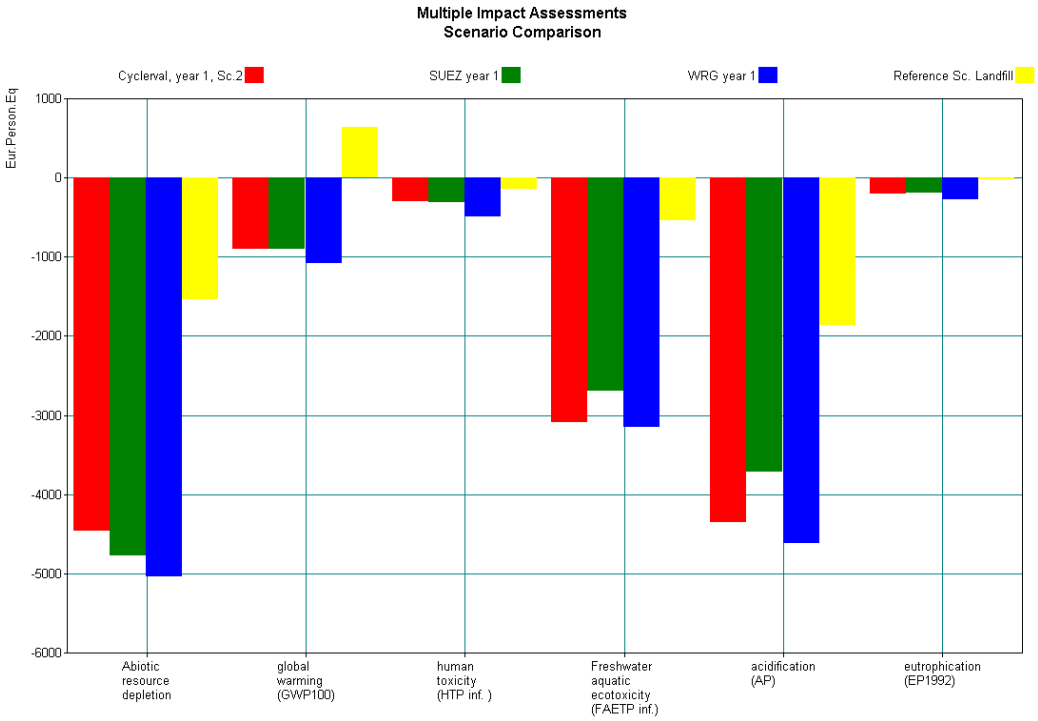


Figure 10. Multiple LCIA results for **year 1** with 100% diesel oil for electricity production

When nuclear power is assumed to be the marginal energy source SUEZ performs significantly better than the two other options for nearly all environmental impact categories. For year 25 the results are more unambiguous and shows that the technology offered by SUEZ is the most environmentally advantageous (refer to figure 13).

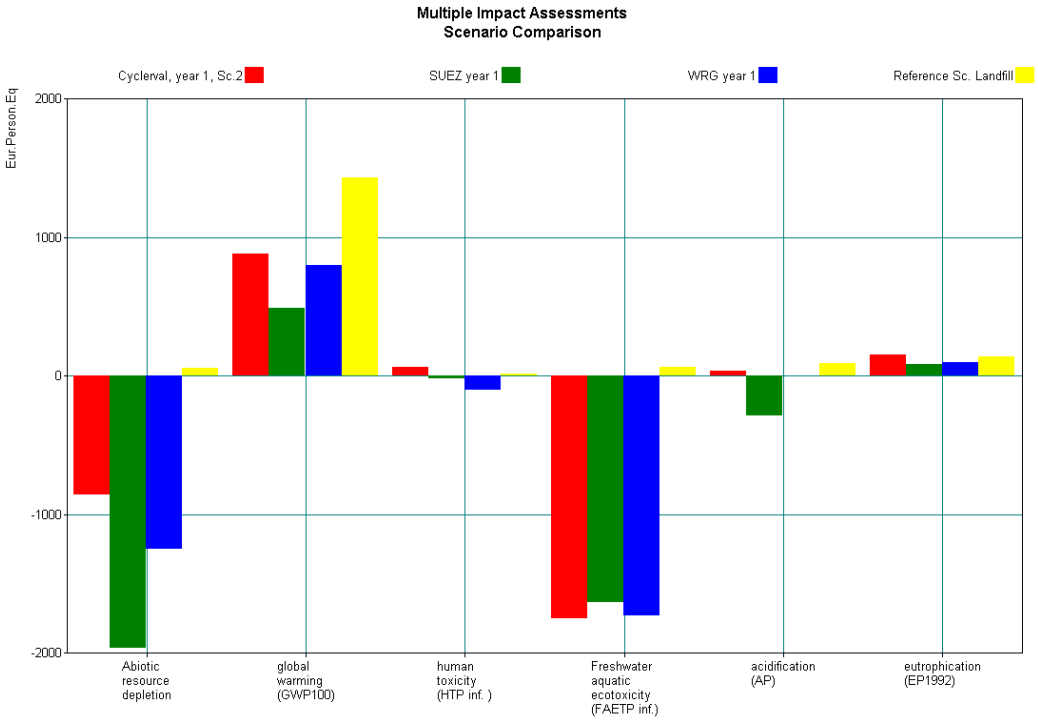


Figure 11. Multiple LCIA results for **year 1** with 100% nuclear sources for electricity production

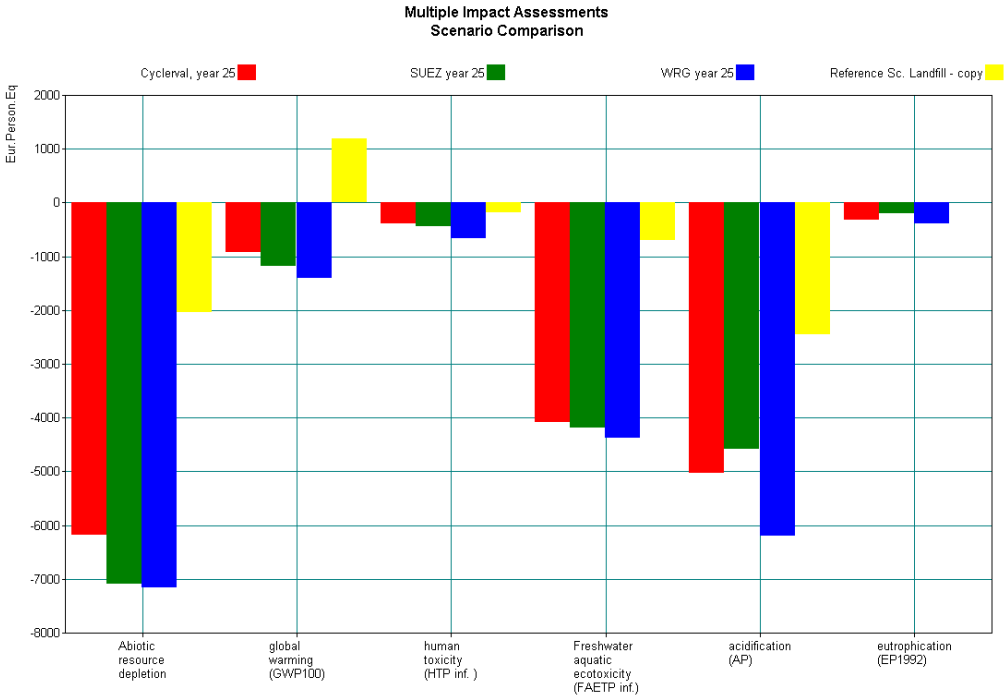


Figure 12. LCIA results for electricity based on 100 % diesel fuel – **Year 25**

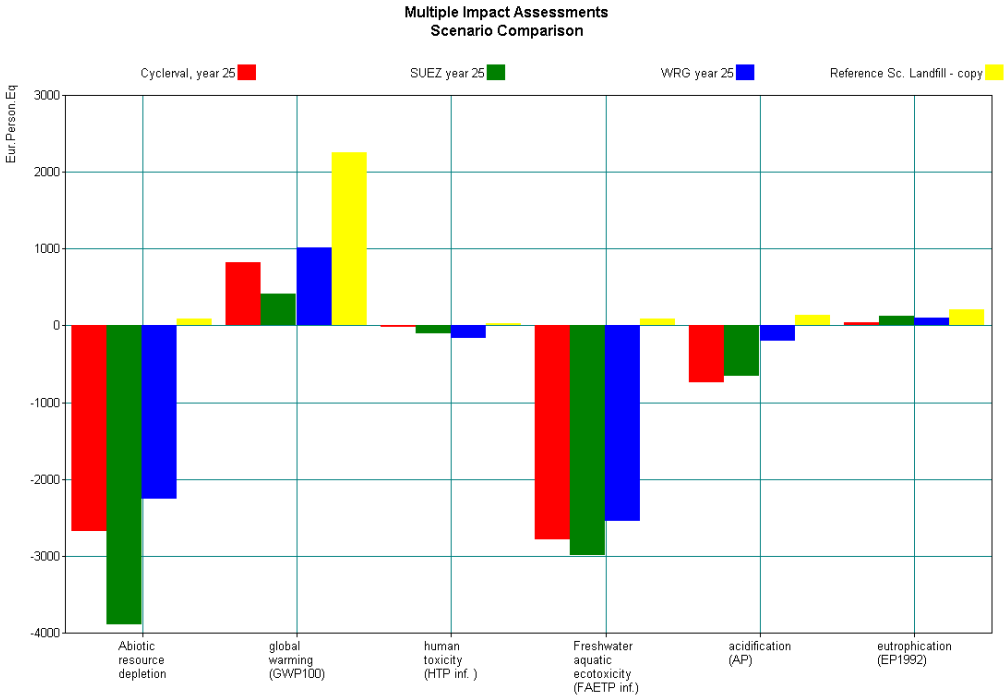


Figure 13. LCIA results for electricity based on 100 % nuclear power – **year 25**

3.3.2 Electricity Production

Another very important aspect is the electricity production that the waste treatment plant is expected to deliver. The plant offered by WRG is expected to deliver a net electricity production of app. 32,000 MWh in year 25. This net energy sale is remarkably higher than the proposed technical solutions offered by SUEZ and Cyclerval (see table 3) partly because of a very low energy consumption and partly because of a high energy recovery rate. Therefore it may be reasonable to assume, that energy demand for front end recovery and RDF production is higher than assumed, and that the energy production is reduced. This scenario reduces the net electricity sale from 32,000 MWh/yr to 25,000 MWh/yr.

The results show that the proposed technical solution offered by WRG performs significantly worse and does not perform better with regards to human toxicity and acidification compared to the two alternatives. Assuming this scenario represents a more realistic energy balance, the system offered by SUEZ performs overall significantly better than WRG.

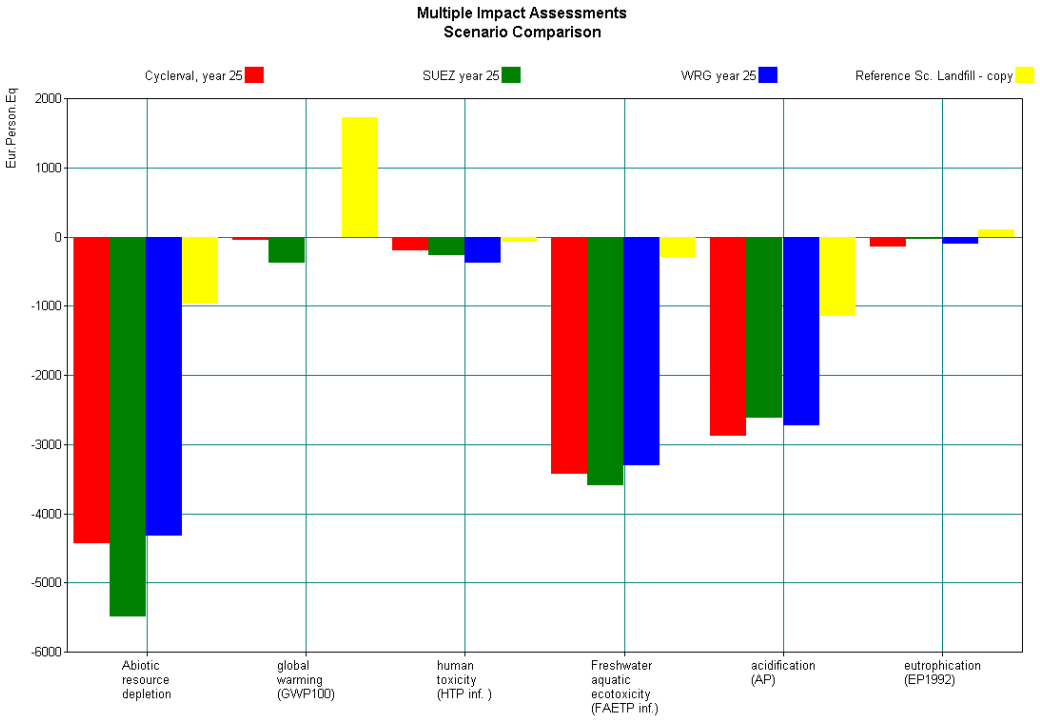


Figure 14. LCIA results for reduced electricity production from SUEZ – year 25

3.3.3 Front End Recycling

Recycling is the most important activity category with a net offset for all environmental impacts. Especially recycling of aluminium and plastics contribute to avoided environmental impacts.

As SUEZ has the highest degree of recycling the SUEZ scenarios performs best. Considering that the technical solution offered by SUEZ are able to only retrieve half the expected recyclables, ie. app. 6500 ton/yr, from the material recovery facility, the overall environmental performance decreases. Figure 15 shows the results from decreased front end recycling in the scenario for the technical solution from SUEZ.

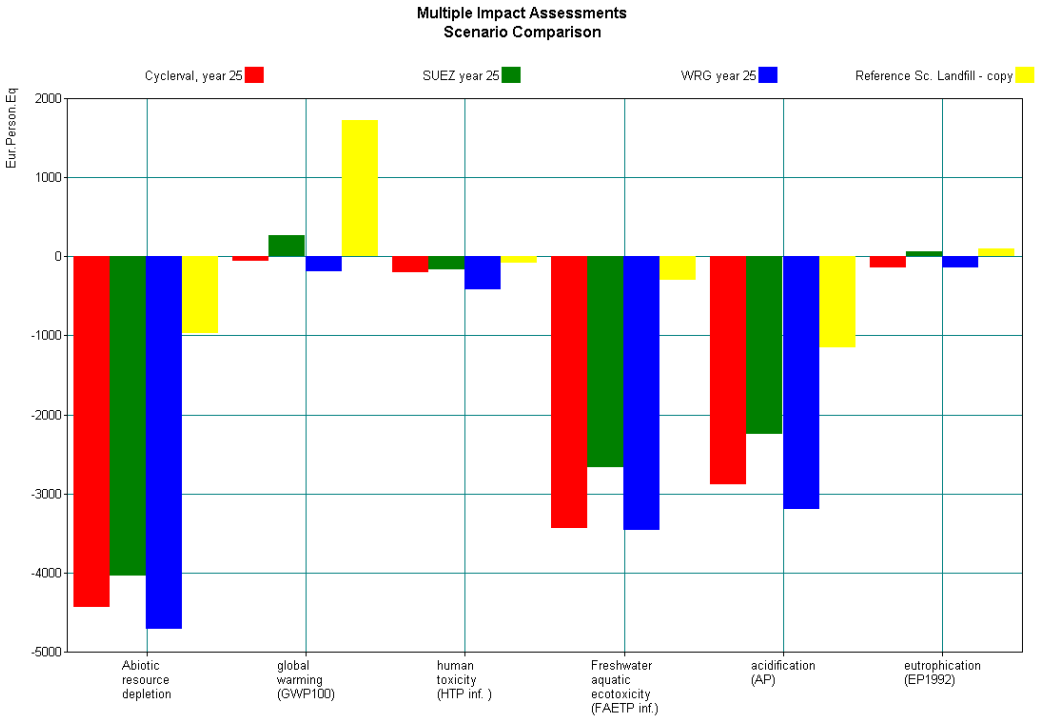


Figure 15. LCIA results for reduced front end recycling at SUEZ – year 25

This indicates that it is essential for the SUEZ plant that the MRF recovers the expected amounts of waste, and especially that plastics and aluminium recovered in fairly high amounts as these waste fractions contribute to significant avoided environmental burdens by being recycled. The increase energy offset from WtE does not in the case of aluminium and plastics outweigh the offset from recycling.

4. Conclusion

All three waste management options proposed by the tenders will perform significantly better than the existing waste management system (landfill) and also significantly better than a new landfill with recovery of landfill gas.

The results indicate that the proposed technical solutions from SUEZ and from WRG perform equally well and better than the solution from Cyclerval with respect to most environmental categories.

The proposed technical solution from SUEZ performs well due to high material recycling while the technical solution from WRG performs well due to a very high net energy recovery. Especially recovery of non-ferrous metals and plastic is a significant contribution to avoided use of abiotic resources and emission of global warming gasses.

The results regarding human toxicity and aquatic toxicity shows no significant differences for the three scenarios and are very often related to a high degree of uncertainties, as the vulnerability of local ecological system is very important for the actual environmental impact. WRG performs slightly better due to very low emission factors for heavy metals according to the information given in the WRATE annex.

The results for acidification, which mainly is caused by the emission of sulphur dioxide (SO_2) indicate that the best options offered by WRG. This is due to the fact that this system produces more electricity and consume less than the alternative solutions. A large emission of SO_2 is hereby avoided from electricity offset based on diesel fuel.

The results for eutrophication is insignificant compared to the other environmental impacts.

Table 4 below shows the overall environmental results given in normalised values. The total value is an average value for the 6 environmental impacts without any weighing of each of the environmental impacts. The total value indicates that the waste treatment plants offered by SUEZ and WRG perform slightly better than Cyclerval according to the WRATE modelling.

Normalised results [Eur.Person.Eq]	Year 1			Year 25		
	Cyclerval	SUEZ	WRG	Cyclerval	SUEZ	WRG
Abiotic resource depletion	-2659	-3369	-3142	-4431	-5495	-4709
Global warming (GWP100)	-6.35	-206	-141	-51	-381	-195
Human toxicity	-119	-162	-296	-202	-269	-416
Freshwater aquatic ecotoxicity	-2424	-2164	-2437	-3434	-3590	-3457
Acidification	-2161	-2004	-2307	-2881	-2618	-3199
Eutrophication	-25.5	-55	-91.5	-138	-34.6	-142
Total (average)	**-1232**	**-1327**	**-1402**	**-1856**	**-2065**	**-2020**

Overall average [Eur.Person.Eq]	Cyclerval	SUEZ	WRG
	-1544	**-1696**	**-1711**
Points	90.3	99.1	100.0

Table 4. Normalised results for year 1 and year 25
Eur.Person.Eq: European person equivalent, normalised reference

Figure 16 below shows the development in the avoided emissions of greenhouse gasses. The figure shows that the proposed technical solution by SUEZ performs considerably better than both WRG and Cyclerval and especially after the installation of the second phase of the SUEZ treatment plant. The sudden decrease in avoided CO2 emissions in year 2027 is due to implementation of Phase II where a large amount of recovered material are redirected from recycling to energy recovery.

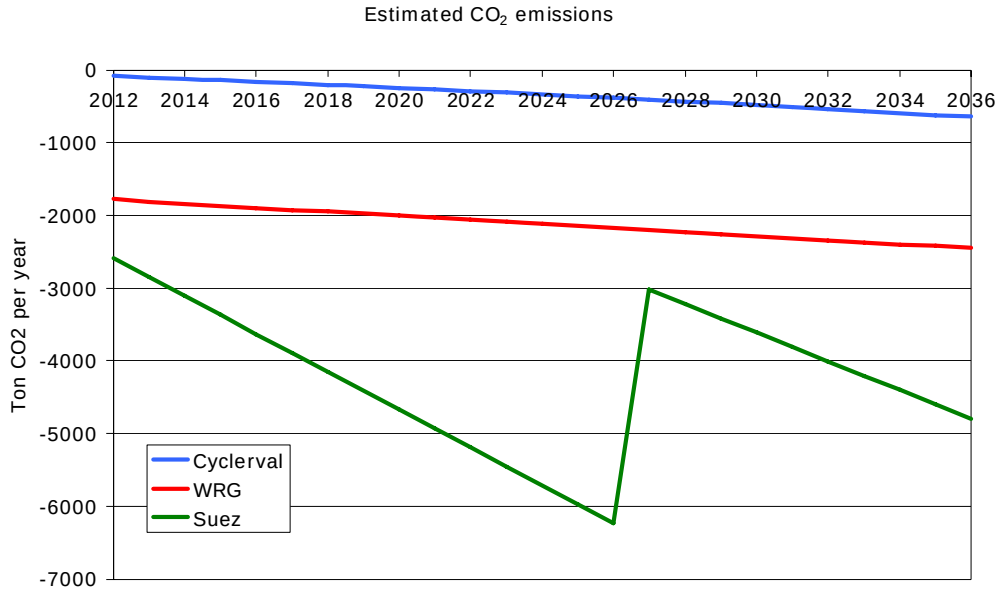


Figure 16. Estimated CO2-emissions in the 25 year operation period

The overall differences in performance are relatively minor also considering the uncertainties in the data provided. On the significant issue of greenhouse gas emission, SUEZ is clearly the better option, however overall WRG are comparable with Cylcerval only slightly behind.

Based on this the overall score for each of the proposed solutions on the environmental performance as modelled by WRATE are seen below.

Overall score (out of 10)	**Cyclerval**	**SUEZ**	**WRG**
	9 pts.	**10 pts.**	**10 pts.**

Table 5. Overall score for WRATE annex

Appendices

Appendix I. Assumed waste composition in year 1 and in year 25

	Distribution	Year 1 ton	Year 25 Ton
Household waste total	**100,00%**	**19,500**	**30,635**
Paper + card	17,00%	3,315	5,208
Plastic film	12,10%	2,360	3,707
Dense plastics	1,40%	273	429
Textiles	3,50%	683	1,072
Hygiene products	8,30%	1,619	2,543
Wood	0,90%	176	276
Combustibles	2,60%	507	797
Non-combustibles	1,20%	234	368
Glass	4,30%	839	1,317
Organics	37,00%	7,215	11,335
Ferrous metals	1,00%	195	306
Non-ferrous	3,00%	585	919
Fines	5,40%	1,053	1,654
WEEE	1,00%	195	306
Haz. waste	1,30%	254	398

	Distribution	Year 1	Year 25
I&C waste total	**100,00%**	**24,300**	**38,176**
Paper	4,70%	1,142	1,794
Cardboard	6,50%	1,580	2,481
Plastic film	5,00%	1,215	1,909
Dense plastics	11,00%	2,673	4,199
Textiles	9,00%	2,187	3,436
Hygiene products	0,00%	0	0
Wood	30,00%	7,290	11,453
Combustibles	3,00%	729	1,145
Non-combustibles	8,20%	1,993	3,130
Glass	1,75%	425	668
Organics	4,55%	1,106	1,737
Ferrous metals	9,30%	2,260	3,550
Non-ferrous	2,00%	486	764
Fines	3,00%	729	1,145
WEEE	1,00%	243	382
Haz. waste	1,00%	243	382

	Year 1	Year 25
Total HH. waste and I&C waste	**43,800**	**68,810**
Paper + card	6,037	9,484
Plastic film	3,575	5,616

Dense plastics	2,946	4,628
Textiles	2,870	4,508
Hygiene products	1,619	2,543
Wood	7,466	11,728
Combustibles	1,236	1,942
Non-combustibles	2,227	3,498
Glass	1,264	1,985
Organics	8,321	13,072
Ferrous metals	2,455	3,857
Non-ferrous	1,071	1,683
Fines	1,782	2,800
WEEE	438	688
Haz. waste	497	780
Sludge	1,200	1,200
Total incl. sludge	**45,000**	**70,010**

Appendix II. Detalied results for year 1

Cyclerval:

Impact Assessment [Eur.Person.Eq]	Total	MRF Cyclerval	Aluminium	Construction and demolition	Ferrous-BA	Ferrous	Paper	Other Recycling	Cyclerval WtE, Guernsey	Landfill
Abiotic resource depletion	-2659	109	-532	-3.01	-133	-265	-37.5	39.5	-1839	2.9
global warming (GWP100)	-6.35	65	-281	-1.46	-65.6	-130	-11.2	16.3	402	0.442
human toxicity (HTP inf.)	-119	27	-87.4	-0.124	-5.5	-10.9	-0.31	4.15	-60.1	13.9
Freshwater aquatic ecotoxicity (FAETP inf.)	-2424	128	-1458	-4.2	-172	-341	41.8	21.7	-700	59.6
acidification (AP)	-2161	108	-245	-1.14	-54.9	-109	-20.4	30.9	-1870	0.656
eutrophication (EP1992)	-25.5	18.5	-43.6	-0.248	-13.5	-26.8	-2.62	5.35	34.9	2.49

SUEZ:

Impact Assessment [Eur.Person.Eq]	Total	SUEZ MRF	Aluminium	Aluminium-BA	Construction and demolition	Ferrous	Ferrous-BA	Paper	films Plastics	HDPE Plastics	Other Recycling	SUEZ WtE Phase I	Landfill
Abiotic resource depletion	-3369	36	-380	-162	-3.01	-182	-143	-72.1	-206	-845	37.1	-1450	2
global warming (GWP100)	-206	19.1	-201	-85.7	-1.46	-89.3	-70.4	-21.6	-24.6	-116	15.3	369	0.305

human toxicity (HTP inf.)	-162	8.8	-62.5	-26.7	-0.124	-7.48	-5.9	-0.596	-3.01	-13.4	3.89	-64.2	9.55
Freshwater aquatic ecotoxicity (FAETP inf.)	-2164	40.1	-1041	-445	-4.2	-234	-184	80.4	-0.278	17.1	20.3	-454	41.1
acidification (AP)	-2004	29.9	-175	-74.6	-1.14	-74.8	-58.9	-39.2	-18.1	-225	29	-1397	0.452
eutrophication (EP1992)	-55	5.88	-31.1	-13.3	-0.248	-18.3	-14.5	-5.04	-3.26	-33.5	5.03	51.5	1.72

WRG:

Impact Assessment [Eur.Person.Eq]	Total	WRG MRF	Aluminium	Construction and demolition	Ferrous	Glass	Plastics films	HDPE Plastics	Other Recycling	WRG Pyrolisis	Landfill
Abiotic resource depletion	-3142	14.1	-536	-2.44	-268	-7.38	-177	-322	27	-1860	-9.87
global warming (GWP100)	-141	10.2	-283	-1.26	-132	-2.04	-21.2	-44.1	11.1	302	18.3
human toxicity (HTP inf.)	-296	6.2	-88	-0.102	-11.1	-0.376	-2.6	-5.12	2.84	-205	6.86
Freshwater aquatic ecotoxicity (FAETP inf.)	-2437	47.2	-1467	-4.3	-345	-1.96	-0.24	6.51	14.8	-714	27.3
acidification (AP)	-2307	8.13	-246	-0.919	-110	-3.64	-15.6	-85.6	21.1	-1860	-14.1
eutrophication (EP1992)	-91.5	3.24	-43.8	-0.146	-27.1	-0.678	-2.81	-12.8	3.66	-13.8	2.72

Appendix III. Detalied results for year 25

Cyclerval

Impact Assessment [Eur.Person.Eq]	Total	MRF Cyclerval year 2036	Aluminium	Constr. and demolition	Ferrous-BA	Ferrous	Paper	Wood	Glass	HDPE Plastics	Compost Use	Other Recycling	Composting	Cyclerval WtE, Guernsey Yr 25	Landfill
Abiotic resource depletion	-4431	304	-956	-4.74	-113	-458	-292	0.817	-7.47	-984	-3.52	33.8	10.3	-1964	2.67
global warming	-51	141	-504	-2.3	-55.7	-225	-87.5	0.153	-2.01	-140	-5.65	13.7	5.93	810	0.407
human toxicity	-202	54	-157	-0.195	-4.67	-18.9	-2.41	0.0925	-0.366	-16.8	18.9	3.55	1.51	-92.7	12.8
Freshwater aquatic ecotoxicity	-3434	249	-2617	-6.62	-146	-589	325	0.413	-1.95	14.5	-0.743	18.9	7.45	-743	54.9
acidification	-2881	256	-439	-1.8	-46.7	-189	-158	0.0571	-3.48	-274	-2.4	25.3	16.2	-2064	0.603
eutrophication	-138	37.9	-78.2	-0.391	-11.4	-46.3	-20.4	-0.137	-0.685	-39.8	7.89	4.67	3.77	2.32	2.3

SUEZ

Impact Assessment [Eur.Person.Eq]	Total	SUEZ MRF Yr.25	Aluminium	Aluminium-BA	Construction and demolition	Ferrous	Ferrous-BA	Paper	films Plastics	HDPE Plastics	Other Recycling	SUEZ Phase II	SUEZ WtE Phase I, Yr.25	Landfill
Abiotic resource depletion	-4062	119	-418	-245	-4.74	-200	-328	-79.6	-271	-844	29.9	-616	-1207	2.59

global warming	221	55.7	-221	-129	-2.3	-98.5	-162	-23.9	-32.6	-120	12.1	493	448	0.395
human toxicity	-165	20.2	-68.7	-40.3	-0.195	-8.25	-13.5	-0.658	-4.01	-14.4	3.13	-27.9	-22.6	12.4
Freshwater aquatic ecotoxicity	-2677	91.8	-1145	-671	-6.62	-258	-423	88.7	-0.547	12.4	16.7	-93.2	-343	53.2
acidification	-2375	106	-192	-113	-1.8	-82.5	-135	-43.2	-24.4	-235	22.3	-620	-1057	0.585
eutrophication	8.5	14.5	-34.2	-20.1	-0.391	-20.2	-33.2	-5.56	-4.32	-34.1	4.13	54.4	85.3	2.23

WRG

Impact Assessment [Eur.Person.Eq]	Total	WRG MRF Phase I+II	Aluminium	Construction and demolition	Ferrous	Paper	Glass	Plastics film	HDPE Plastics	Other Recycling	WRG Pyrolisis phase I+II	Landfill
Abiotic resource depletion	-4709	9.99	-813	-3.3	-410	-126	-6.98	-317	-620	59.1	-2487	4.72
global warming	-195	9.24	-429	-1.71	-202	-37.6	-1.87	-38.2	-87.8	23.9	570	0.668
human toxicity	-416	3.88	-134	-0.138	-16.9	-1.04	-0.342	-4.69	-10.6	6.2	-274	15.7
Freshwater aquatic ecotoxicity	-3457	31	-2227	-5.82	-528	140	-1.82	-0.641	9.11	33.1	-970	63.5
acidification	-3199	8.04	-374	-1.24	-169	-68.2	-3.25	-28.5	-173	44.2	-2436	1.04
eutrophication	-142	3.41	-66.6	-0.197	-41.4	-8.77	-0.639	-5.06	-25	8.16	-7	1.58

Appendix Four

[Suez Environnement
& address

Dear Sirs,

Guernsey Residual Waste Project (the "Project)

Further to the submission of your bid and the clarifications and revisions set out in the various documents listed in Paragraph 1 of this letter ("Tender Submission") and subject to the further terms of this letter of intent ("LOI"), we are pleased to inform you that we will be seeking to recommend to the States of Deliberation that you be appointed as Preferred Bidder in respect of this Project.

Your signature to this LOI indicates your acceptance of its terms. Unless defined in this LOI capitalised words have the same meaning as in the Contract.

Tender Submission

1. Your Tender Submission comprises your bid submitted to the States of Guernsey ("SoG") on the 16th January 2009 and as further clarified and revised by:

    a. The record of clarifications and revisions produced by our technical consultants, Ramboll, version [ ] and dated [ ], attached to this LOI as Annex 1.

    b. So many of the terms of the contract DBO25 set out in the Invitation to Tender issued to you on 20th August 2008 ("Contract") that have been agreed to date and the remaining outstanding contractual issues as documented in the negotiation table issued by SoG, version 4 dated 24 April 2009, and the Suez letter to the States dated 28 April 2009. The latter two documents are attached to this LOI as Annex 2, and together with the other documents referred to in this paragraph 1 are called the "the PB Contract Terms".

    c. The revised financial model submitted by you to SoG on the 17th April 2009, version 19.

Preferred Bidder Appointment

2. Your formal appointment by SoG as Preferred Bidder is conditional upon approval by the States of Deliberation that you be appointed as Preferred Bidder.

3. For the avoidance of doubt, subject to Paragraphs 0 to 0, SoG in its absolute discretion reserves the right to give to you written notice of, withdrawal of your Preferred Bidder status and/or SoG's decision to withdraw from the procurement process without payment of any compensation or incurring any liability to you.

Status of Tender Submission

4. Your Tender Submission constitutes a standing offer to contract ("Tender Offer") with SoG up until 11 January 2010 upon the PB Contract Terms subject to agreement being reached on all outstanding issues and final wording and subject to the price inflation provisions set out in Paragraph 0.

5. SoG's acceptance of that offer will occur when it formally signs the contract at contract close unless it notifies you otherwise in writing in unequivocal terms indicating its intention under this Paragraph of the LOI.

Price for Tender Offer

6. The price ("Price") for your Tender Offer is:

   a. to design, construct, complete, test and commission the Plant and remedy defects in accordance with the PB Contract Terms:

      GPB £: £35,894,723 (thirty five million, eight hundred and ninety four thousand, seven hundred and twenty three pounds sterling)

      and,

      Euros €: €48,313,645 (forty eight million, three hundred and thirteen thousand, six hundred and forty five euros).

   b. to operate and maintain the Plant for the Services Period at the following Annual Fixed Fee and Operating Fee:

      Annual Fixed Fee (GBP per year): £1,763,827 (one million, seven hundred and sixty three thousand, eight hundred and twenty seven pounds sterling)

      and,

Operating Fee (GBP per tonne): £11.44(eleven pounds sterling forty four pence).

Price Inflation

7. The Price for your Tender Offer is subject to the following agreed adjustments from 1 May 2009 until 11 January 2010 ("Price Inflator Terms") or contract close whichever is the later:

   a. the Price shall be inflated by the balance of indices referred to in ITT Amendment No 1 (reference Volume 2, para 1.1.3)

   b. The States will bear the exchange rate risk on the Euros value stated in Paragraph 0 from 16th January 2009.

Design Costs

8. SoG will make a payment to you upon signature by both parties to this LOI of 0.5% of the capital cost for the Plant on the basis of a Euro to Sterling exchange rate of 1.1, namely £399,081, three hundred and ninety nine thousand and eighty one pounds sterling, towards the costs of :

   a. preparing a planning application (including environmental impact statement),

   b. undertaking Detailed Design for the Plant. Detailed Design means [*to be defined]*

   c. progressing the Environmental Licence, and

   d. using all reasonable endeavours to progress the negotiation table referred to in Paragraph 0 prior to the debate regarding your preferred bidder appointment by the States of Deliberation.

9. SoG will make a further payment of 0.5% of the capital cost for the Plant towards the said costs, the capital cost being notionally adjusted at that point in time by the Price Inflator Terms, when you achieve a planning permission for the Project and provided in SoG's opinion (acting reasonably) sufficient progress has been made upon the matters referred to above in Paragraph 0b to d.

10. The sums paid by SoG under Paragraphs 0 and 0 ("Design Costs") shall be subject to the following conditions:

    a. you must progress the matters referred to in Paragraph 0a to d with the care and skill expected of a contractor proficient in a Project of this kind and promptly, diligently and efficiently

b. you must provide Reviewable Design Data to the States for its comment and take reasonable account of such comments. Reviewable Design Data means [*to be defined*]

c. no further payment shall be paid or owed by SoG to you or any other party prior to contract close whether on a quantum meruit basis or otherwise, whether for those matters listed in Paragraph 0 or for any other purpose

d. you must maintain detailed records of time spent and money expended and submit regular invoices to SoG for work undertaken in relation to the Design Costs. Expenses may only be charged if they are reasonable in nature and amount.

e. the Design Cost percentage of 1% of the capital cost will be deducted from the capital cost element of the Price upon contract close following adjustment to the capital cost by the Price Inflator Terms.

f. in the event your status as Preferred Bidder (PB) is withdrawn the balance of Design Costs which have not been incurred or earned by you prior to that date shall be repayable to SoG as a debt due to SoG seven business days after SoG notifies you of in writing of the withdrawal of your PB status.

Communications

11. The payments made under this LOI are conditional upon Suez seeking consent and approval from the States to any public statements made in relation to the Project.

Jurisdiction

12. This LOI shall be subject to the laws of Guernsey and the exclusive jurisdiction of the Guernsey courts.

Signed by
THE STATES OF GUERNSEY
acting by

…….. Authorised Signatory

Signed by
[SUEZ ENVIRONNEMENT]
acting by

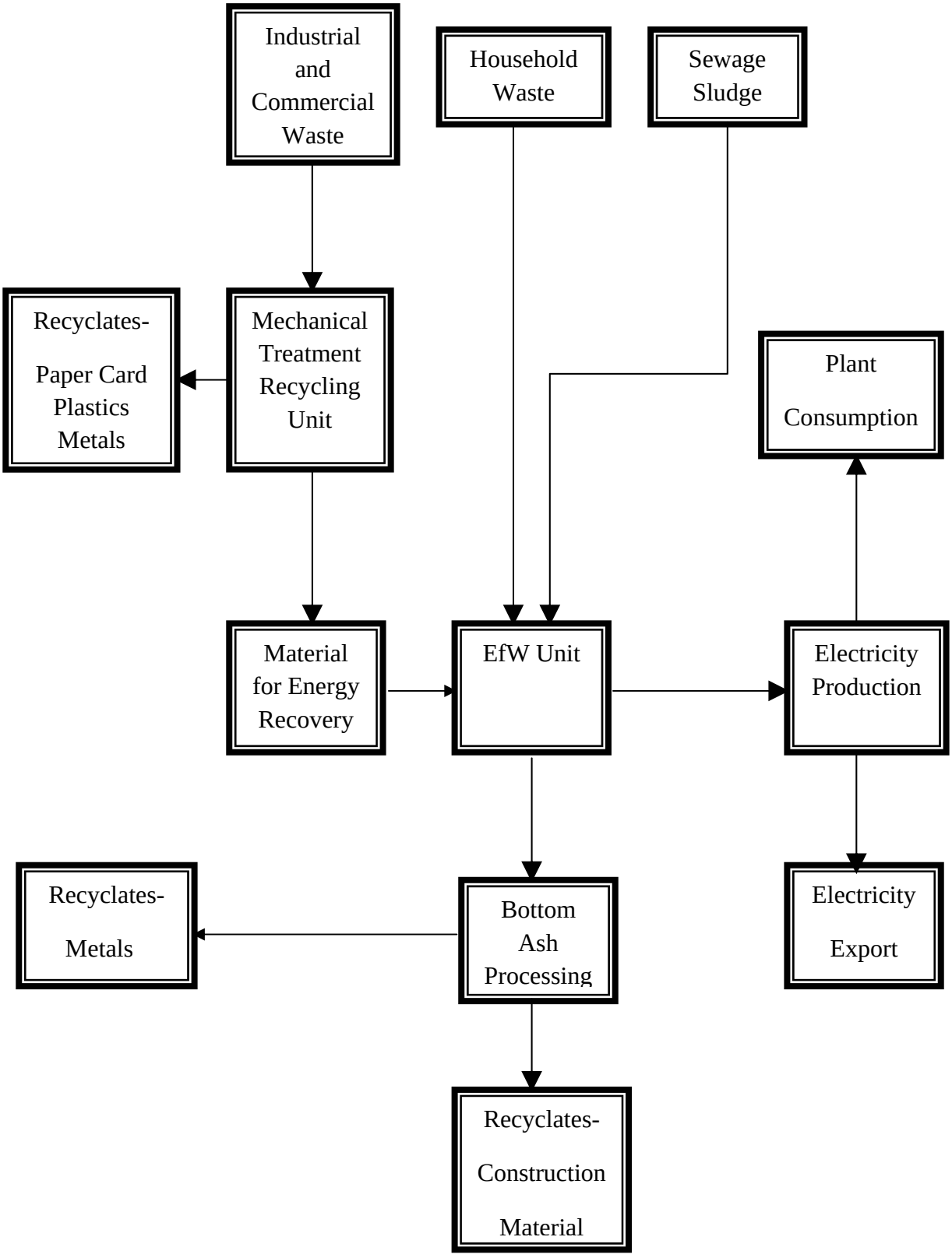
…….. Authorised Signatory

DATED

……..**2009**

Appendix 5

Waste Treatment Process in Diagrammatic Form



Appendix 6

(NB The Policy Council is acutely aware of the need for the island to implement a long-term solution to disposing of its solid waste, without further delay. The Public Services Department's proposals are compliant with existing States resolutions on solid waste disposal, and provide a robust solution using proven technology. The Policy Council supports the proposals and recommends the States to approve them.)

(NB The Treasury and Resources Department supports the proposals.)

The States are asked to decide:-

Whether, after consideration of the Report dated 29th May, 2009, of the Public Services Department, they are of the opinion:-

1. To agree to the appointment of Suez Environnement as the Preferred Bidder for the design build and operation of a residual waste treatment facility as detailed in that Report.

2. To authorise the Treasury and Resources Department to advance to the Public Services Department a loan to the maximum sum of £93.5m to be drawn down according to the schedule and for the purposes outlined in that Report.

3. To direct the Public Services Department to set a gate price from time to time that covers the full capital and operating cost of the facility.

4. To direct the Treasury and Resources Department to take into account the revenue implications associated with the proposals set out in that report when recommending to the States Cash Limits for the Public Services Department for 2012 and subsequent years.

IN THE STATES OF THE ISLAND OF GUERNSEY ON THE 30th DAY OF JULY, 2009

The States resolved as follows concerning Billet d'État No XX dated 26th June 2009

PUBLIC SERVICES DEPARTMENT

RESIDUAL WASTE TREATMENT – SELECTION OF PREFERRED BIDDER

After consideration of the Report dated 29th May, 2009, of the Public Services Department:-

1. To agree to the appointment of Suez Environne ment as the Preferred Bidder for the design build and operation of a residual waste treatment facility as detailed in that Report.

2. To authorise the Treasury and Resources Department to advance to the Public Services Department a loan to the maximum sum of £93.5m to be drawn down according to the schedule and for the purposes outlined in that Report.

3. To direct the Public Services Department to set a gate price from time to time that covers the full capital and operating cost of the facility.

4. To direct the Treasury and Resources Department to take into account the revenue implications associated with the proposals set out in that report when recommending to the States Cash Limits for the Public Services Department for 2012 and subsequent years.

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HER MAJESTY'S GREFFIER