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Value Assessment Report

Feasibility study for an Advanced Integrated Solid Waste Management System for Rustenburg Local Municipality (RLM)



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TABLE OF CONTENTS

0	Introduction	7
Part 1	Determination of the Type of Value-for-Money Assessment.....	8
Part 2	External Reference Model.....	9
2.1	Type of External Option.....	9
2.2	Proposed Project Structure and Sources of Funding	9
2.3	Identification of Revenues	11
2.3.1	Regular User Fees.....	11
2.3.2	Other User Fees	18
2.3.3	Gate Fees	20
2.3.4	Governmental Grants.....	22
2.3.5	Revenues from Selling of Refuse Derived Fuel	25
2.3.6	Revenues from Selling of Recyclables	28
2.3.7	Revenues from Greenhouse Gas Emissions Reductions.....	30
2.3.8	Indirect Revenues through Landfill Costs Savings	32
2.3.9	Summary of the Revenues	33
2.4	Development of the Core Components of the Payment Mechanism.....	34
2.5	Setting and Costing of BEE Targets.....	35
2.6	Explanation of the Assumptions and Indicators	37
2.7	Calculation and Consolidation of All Costs.....	41
2.7.1	Direct Costs	41
2.7.2	Indirect Costs.....	48
2.8	Construction of the External Reference Model.....	48
2.9	Construction of the Risk-Adjusted External Reference Model.....	52
2.9.1	Identification of Risks	52
2.9.2	Risk-adjusted Costs	60
2.9.3	Project Financing	63
Part 3	Qualitative Considerations	75
Part 4	Sensitivity Analysis	76

Part 5	Affordability	79
5.1	Municipal Budget Available for the Project.....	79
Part 6	Initial Value-for-Money Test	83
6.1	Assessment of the BEE Value for Money.....	84
Part 7	Verify Information and Sign Off	86
7.1	Verification of the Information Used in the Feasibility Study	86
7.1.1	Data Reliability.....	86
7.1.2	Enhancing Value-for-Money	87
7.1.3	Assumptions	87
7.1.4	Methodology for Valuing Costs	87
7.1.5	Audit Trail of Documentation.....	87
7.2	Checklist for Legal Compliance.....	87
7.3	Sign Off the Feasibility Study	89
Part 8	Procurement Choice	89

LIST OF TABLES

Table 1	Current and proposed waste management tariffs for regular services.....	12
Table 2	Estimated total revenues from the households in the RLM city.....	14
Table 3	Estimated total revenues from the businesses in the RLM city	15
Table 4	Estimated total revenues from the institutions in the RLM city.....	16
Table 5	Total expected revenues from waste management fees.....	17
Table 6	Current and proposed waste management tariffs for services on as-needed basis	19
Table 7	Proposed tariff schedule for the Waterval Landfill	21
Table 8	Estimated revenues from gate fees.....	22
Table 9	Equitable share available for waste management services in RLM	23
Table 10	Operating transfers and grant receipts from the budget schedule 2016-2019	24
Table 11	Coal prices for the domestic market and amount of coal used by user category in 2015.....	26

Table 12	Potential revenues from selling of RDF	28
Table 13	Estimated prices of recyclable materials	29
Table 14	Potential revenues from selling of recyclables	30
Table 15	Potential revenues from greenhouse gas emission reductions	32
Table 16	Summary of the potential revenues [R/a]	33
Table 17	B-BBEE Scorecard	37
Table 18	Headline inflation forecasts	38
Table 19	Machinery costs of the mechanical treatment (MT) (2015 prices).....	43
Table 20	Total costs of civil works of the mechanical treatment (2015 prices)	43
Table 21	Costs of mobile equipment for mechanical treatment (2015 prices)	44
Table 22	Costs of mobile equipment for biological treatment (2015 prices).....	44
Table 23	Rates for the calculation of annual maintenance costs	45
Table 24	Required staff and salaries considered	46
Table 25	Unit prices of consumables	46
Table 26	Estimated amount of consumables	47
Table 27	Initial investment and replacement costs [ZAR]	49
Table 28	Operating costs over the planning horizon [ZAR].....	51
Table 29	Risk distribution within the Poznan MBT PPP Agreement	53
Table 30	Risk matrix of the project	55
Table 31	Estimated risk costs of the private party	60
Table 32	Risk-adjusted investment costs over the planning horizon [ZAR]	61
Table 33	Risk-adjusted operating costs over the planning horizon [ZAR].....	62
Table 34	Expenditures over the planning horizon [ZAR]	63
Table 35	Scenario 1: Financing structure of the investments.....	64
Table 36	Scenario 1: Loan costs over the planning horizon [ZAR]	65
Table 37	Scenario 1: Dividends to be paid to the equity investors.....	66
Table 38	Scenario 1: Cash flow before debt service and dividends payments	67
Table 39	Scenario 1: Cash flow after financing and net profit of the SPV [ZAR].....	69
Table 40	Scenario 2: Financing structure of the investments.....	70
Table 41	Scenario 2: Loan costs over the planning horizon [ZAR]	71
Table 42	Scenario 2: Cash flow before debt service and dividends payments	72
Table 43	Scenario 2: Cash flow after financing and net profit of the SPV [ZAR].....	74

Table 44	Key parameters and better, default and poorer values (tpa = tonnes/annum).....	76
Table 45	Consolidated overview of 2016/2017 MTREF	79
Table 46	Revenue and expenditure of Waste Management Unit of RLM	80
Table 47	Comparison of the calculated unitary fee payments with the budget [ZAR]	81
Table 48	Compliance Checklist	88

TABLE OF FIGURES

Figure 1	Proposed project and contract structure.....	10
Figure 2	Average monthly fees levied in the first quarter of FY2014/2015.....	13
Figure 3	RBCT Coal index 2004 – 2015 (USD/ton).....	25
Figure 4	Consumer price inflation: Targeted inflation	38
Figure 5	Development of the government bond yield.....	39
Figure 6	Euro to Rand exchange rate development.....	41
Figure 7	Risk-Price-Function in a PPP	52
Figure 8	Scenario 1: Changes in the sensitivity parameters with better and poorer values.....	76
Figure 9	Scenario 2: Changes in the sensitivity parameters with better and poorer values.....	77
Figure 10	AIC for worst and best case for the Scenarios 1 and 2	78

ABBREVIATIONS

AAP	Anglo American Platinum
AD	Anaerobic digestion
AIC	Average incremental cost
AISWMS	Advanced Integrated Solid Waste Management System
B-BBEE	Broad-Based Black Economic Empowerment
CBD	City Business Development or Central Business District
CDM	Clean Development Mechanism
CER	Certified Emission Reductions
DBSA	Development Bank of South Africa
DDP	Delivered Duty Paid
DEA	South African Department of Environmental Affairs
DEDECT	Department of Economic Development, Environment, Conservation and Tourism
DFI	Development Finance Institution
DM	dry mass
DNA	Designated National Authority
DoE	Department of Energy
DUC	Discounted Unit Cost
EPC	Engineering, Procurement, and Construction
EPWP	Expanded Public Works Programme
EUR	Euro
FS	Feasibility study
FY	Financial year
GHG	Greenhouse gas
GIS	Geographical information system
GS	Gold Standard
HH	household
IDP	Integrated Development Plan
IIPSA	Infrastructure Investment Programme for South Africa
IU	INFRASTRUKTUR & UMWELT
IWMP	Integrated Waste Management Plan
KfW	KfW Entwicklungsbank (German Development Bank)
LGES	Local Government Equitable Share
MBT	Mechanical biological treatment
MIG	Municipal Infrastructure Grant
MPPP	Municipal Public Private Partnership
MT	Mechanical treatment
MRF	Material recovery facility
MSW	Municipal solid waste
MTREF	Medium Term Revenue and Expenditure Framework
NWMS	National Waste Management Strategy
O&M	Operation and maintenance
PPP	Public Private Partnership
PWR	Platinum Waste Resources
RBCT	Richards Bay Coal Terminal
RDF	Refuse derived fuel

REDISA	Recycling and Economic Development Initiative of South Africa
RFP	Request for Proposal
RLM	Rustenburg Local Municipality
SARS	South Africa Revenue Service).
SLA	Service Level Agreement
SMMEs	Small, Medium and Micro Enterprises
SPV	Special purpose vehicle
TA	Technical assistance
TOC	Total Organic Carbon
Tpa	tonnes per annum
UAWEC	Urban Agricultural and Waste Education Centre
USD	US Dollar
VCS	Verified Carbon Standard
VfM	Value-for-money
WDC	Waste drop-off centre
ZAR	South African Rand

0 Introduction

As part of South African-German co-operation, Rustenburg Local Municipality (RLM) and KfW Entwicklungsbank (KfW) agreed to explore the feasibility of implementing an Advanced Integrated Solid Waste Management System (AISWMS) for RLM. The main aims of the AISWMS are:

- Adoption of the South African National Waste Policies with regard to utilization of waste as a resource (recyclables, energy recovery) by applying innovative waste treatment technologies
- Increasing the quality and efficiency of waste management services in RLM

A KfW Entwicklungsbank-funded Feasibility Study Report for an AISWMS for RLM dated August 2009 developed and evaluated different waste treatment options from fairly simple technologies up to very sophisticated state-of-the-art technologies. As a result of this assessment a waste treatment facility, focussing on the production of refuse derived fuel (RDF) with a state of the art mechanical biological waste treatment was identified as the most favourable technology solution for RLM.

Recent developments in the energy market and the worsening financial situation of RLM, has necessitated a revision of the waste treatment concept. Specifically, the biological treatment as a component for the production of refuse derived fuel, is currently not seen as a feasible inclusion (mainly due to financial constraints). In order to reduce the investment and operating costs, the concept has been revised during the process of preparing this Municipal Public Private Partnership (MPPP) Feasibility Study. The revised concept, which is the basis for this value assessment, includes the following treatment components:

- Mechanical treatment for reclamation of recyclables and production of RDF, and
- Biological treatment (composting) of separately collected green waste

This report focuses on the value-for-money assessment to demonstrate whether the external option offers optimum value for money by substantial transfer of risks and within the affordability limits of the municipality.

Part 1 Determination of the Type of Value-for-Money Assessment

A value-for-money (VfM) assessment is necessary to determine

- If the envisaged project is affordable to the municipality
- If the risks are appropriately transferred from the municipality to the private party, and
- If the project provides value for money, for the municipality as well as for the private party.

For the determination of the type of VfM assessment to be carried out, i.e., a full value assessment or a simplified value assessment, the nature of the project and the capacity of the municipality have been considered.

It is clear that the undertaking of the output to be assessed is not a realistic public-sector option. The RLM is unlikely to ever implement such a waste treatment facility as a waste support activity and there is no current model composed of all the relevant components in South Africa to serve as a benchmark. The costs of the mechanical treatment part, which is similar to existing Material Recovery Facilities (MRFs) in South Africa could be compared in the VfM assessment; however, this would not be sufficient to give an overall assessment.

On this basis, a Simplified Value-for-Money Assessment has been carried out. The requirement to proceed with a simplified VfM assessment was also confirmed in the earlier phases of the feasibility study, after engagement and consultation with the project adviser from the National Treasury, assigned to the project, Mr Themba Mdletshe.

Part 2 External Reference Model

2.1 Type of External Option

It has been recommended to implement the Mechanical Biological Treatment (MBT) facility through a Public Private Partnership (PPP) over 20 years. A special purpose vehicle (SPV) will be set up for the construction, operation and maintenance of the MBT facility. The SPV will hand the MBT facility back to the municipality when the contract period expires.

This external option will mobilise private funding and capacities for the delivery of a municipal activity that would have a significant impact on the lifespan of an important asset, i.e. the Waterval landfill. This option is likely to be quicker to implement due to the fact that the private sector is assumed to already have the human resource capacity required to deliver on the projects.

The final form of the PPP will be determined depending on the funding mechanism applied and the levels of equity taken up by various partners.

2.2 Proposed Project Structure and Sources of Funding

The proposed project and contract structure is illustrated in Figure 1.

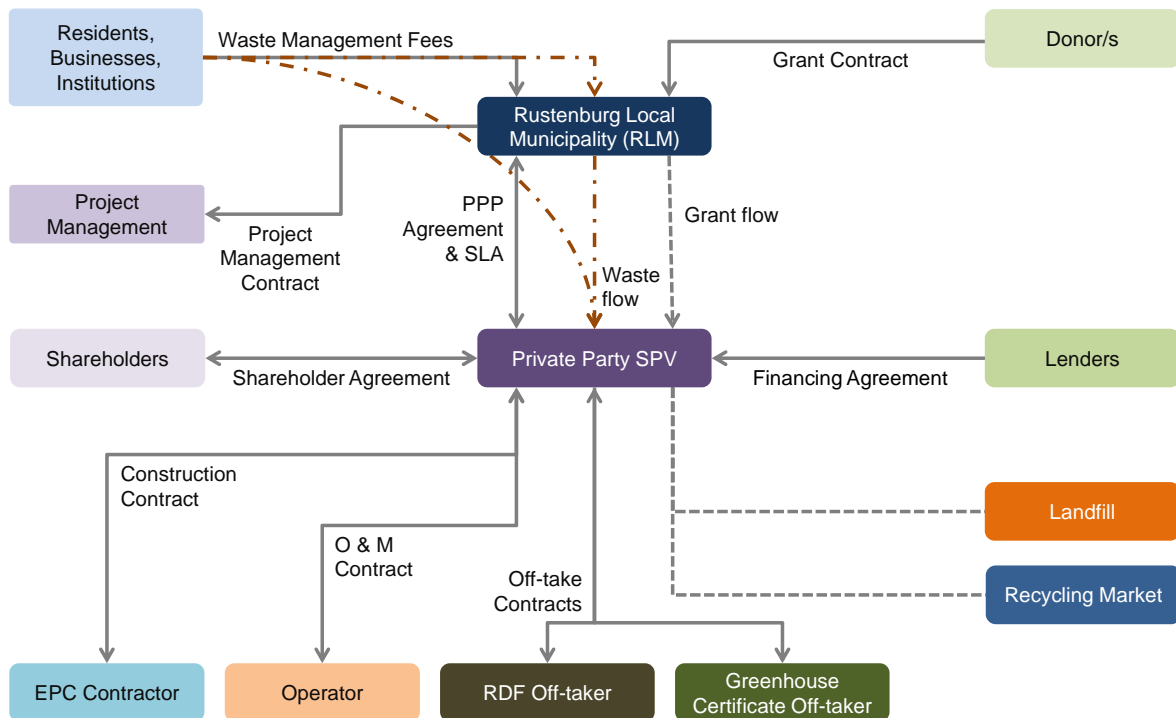


Figure 1 Proposed project and contract structure

For the funding of the project, two options have been considered:

1. The SPV will fund the MBT project through a combination of debt and equity in an 80:20 ratio
2. The initial investment costs will be financed by non-refundable grants (from the government and/or other national/international donors)

In the first option, the private party will enter into a financing agreement with a lender to finance 80% of the investment costs throughout the project lifetime. The rest will be financed by equity investors or other possible project partners.

In the second option, grant funding will be applied for by RLM and/or by the private party for the financing of the initial investments. The follow-up investment shall be financed through loans. For grant funding, various possibilities will be considered, e.g. solely governmental grants or jointly developed grant programmes, like the Infrastructure Investment Programme for South Africa (IIPSA) with funding by the Development Bank of South Africa (DBSA) and some European Union Development Finance Institutions (DFIs).

2.3 Identification of Revenues

The following revenues will be available to finance the project activities:

- Regular user fees collected from households and businesses for waste management services,
- Fees collected for other waste management services; like the skip container rental service,
- Gate fees at the Waterval landfill where the MBT facility will be located,
- Governmental grants to cover operating costs; e.g. local government equitable share (LGES)
- Revenues from selling of refuse derived fuel produced by the MBT facility,
- Revenues from selling of recyclables and compost
- Revenues from selling of greenhouse gas certificates.

The first two revenue streams are from existing sources and the current project aims to improve the collection of these fees as well.

In addition to the revenue streams above, indirect revenues will be generated through the saving of the landfill operational and future development costs.

2.3.1 Regular User Fees

The current and proposed waste management tariffs for households, businesses and institutions are presented in Table 1.

Table 1 Current and proposed waste management tariffs for regular services

	Tariff Code	Unit	Approved Tariff 2015/16	Proposed Tariff 2016/17	Increase (%)	2017/2018	2018/2019
1. DOMESTIC							
STD CONTAINER 1 X WEEK RES 1	AA	R/month	107.48	113.93	6	120.54	127.53
STD CONTAINER 1 X WEEK RES 2-4	BA	R/month	107.48	113.93	6	120.54	127.53
RESIDENTIAL VACANT	NEW	R/month	0.00	118.23	0	125.09	132.34
BAG COLLECTION (4 BAGS each 85L)	NEW	R/month	107.48	113.93	6	120.54	127.53
MONTHLY RENTAL PER 240LITER BIN	NEW	R/month	16.41	17.39	6	18.40	19.47
2. INDUSTRIAL							
INDUSTRIAL	DA	R/month	119.93	129.52	8	137.04	144.99
INDUSTRIAL VACANT	DA	R/month	0.00	143.92	0	152.26	161.09
3. COMMERCIAL							
240L BULK CONTAINER 1 X WEEK	CF	R/month	370.00	399.60	8	422.78	447.30
240L BULK CONTAINER (ADDITIONAL)	CG	R/month	315.00	340.20	8	359.93	380.81
770L BULK CONTAINER 1 X WEEK	NEW	R/month	1,100.00	1,188.01	8	1,256.91	1,329.81
770L BULK CONTAINER (ADDITIONAL)	NEW	R/month	930.00	1,004.40	8	1,062.66	1,124.29
1100L BULK CONTAINER 1 X WEEK	NEW	R/month	1,580.00	1,706.41	8	1,805.38	1,910.09
1100L BULK CONTAINER (ADDITIONAL)	NEW	R/month	1,340.00	1,447.21	8	1,531.14	1,619.95
1.5 m ³ BULK CONTAINER 1 X WEEK	CB	R/month	1,800.00	1,944.01	8	2,056.76	2,176.05
1.5 m ³ BULK CONTAINER 1 X WEEK (ADDITIONAL)	CC	R/month	1,540.00	1,663.21	8	1,759.67	1,861.73
4.0 m ³ BULK CONTAINER 1 X WEEK	NEW	R/month	4,100.00	4,428.02	8	4,684.85	4,956.57
4.0 m ³ BULK CONTAINER 1 X WEEK (ADDITIONAL)	NEW	R/month	3,460.00	3,736.82	8	3,953.55	4,182.86
6.0 m ³ BULK CONTAINER 1 X WEEK	CD	R/month	6,075.24	6,561.29	8	6,941.84	7,344.47
6.0 m ³ BULK CONTAINER 1 X WEEK (ADDITIONAL)	CE	R/month	5,150.00	5,562.03	8	5,884.62	6,225.93
COMMERCIAL VACANT	CA	R/month	0.00	444.00	0	469.75	497.00
4. INSTITUTIONAL							
MUNICIPAL	EA	R/month	101.49	109.61	8	115.97	122.69
GOVERNMENT	FA	R/month	101.49	109.61	8	115.97	122.69
CHURCH	GA	R/month	101.49	109.61	8	115.97	122.69
EDUCATIONAL	JA	R/month	101.49	109.61	8	115.97	122.69

These tariffs include the overheads, costs of provision of containers (additional for households), collection of waste, transport to the disposal facility, and disposal costs. Up until now, the tariffs were estimated roughly without consideration of actual costs incurred for the provision of the respective services. With the start of operations at the Waterval landfill and the recording of waste received for disposal across the weighbridge at the landfill entrance, an accurate performance analysis and thus calculation of specific unit costs will be possible. After that the tariffs may be adjusted stepwise towards full cost recovery.

For the financial year 2015/16, the Waste Unit proposed adjusting the tariffs upwards for businesses and institutions by a significant percentage. Furthermore, the tariff schedule was restructured to take into account all services and goods that are offered by the Unit..

In addition to increasing the tariffs, the RLM is in process of improving billing and fee collection. Concurrent with updating the database of customers, particularly in conjunction with the distribution of the waste bins to households, is the increase in fee collection rate by improvement of billing data, like tariff codes, addresses, number of containers provided, etc.

The average monthly fees levied in the first quarter of the financial year 2014/15 were 2.9 percentage points (after inflation by 6%) higher than the average monthly fees levied during the first quarter of the previous financial year. The total average monthly fees levied in the first quarter of 2014/15 were about R8.4 million (including irregular rental services). Figure 2 shows the distribution of this total amount according to the main tariff categories.

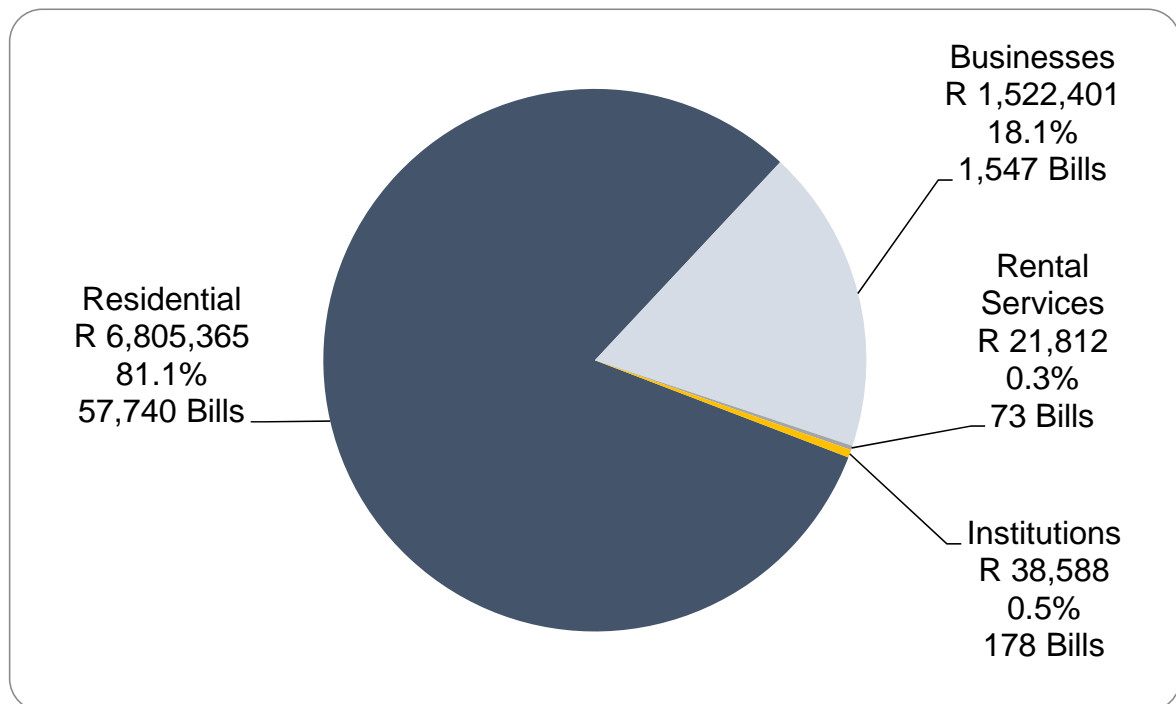


Figure 2 Average monthly fees levied in the first quarter of FY2014/2015

The main revenue source from fees is the households who contribute 81% of the total operating revenues. The businesses, industrial and commercial facilities contribute only 18%. However, with the reorganisation of the tariff schedule, an increase in the revenues from businesses and institutions is expected in the coming financial years¹.

The budget amount of revenues from user fees for the 2014/2015 financial year was R91.2 million. At the end of the financial year (i.e., June 2015), about R93.6 million had been billed and R85 million collected. This equals to a fee collection rate of 91%. The maximum fee collection rate for the households is assumed to be 98% and will be achieved in 2024 (Table 2).

¹ As at June 2016, the detailed data on the collected revenues during the 2015/2016 financial year (2015/2016) was not available.

The above mentioned revenues are used to cover all expenditures of the Waste Unit. As mentioned above, at the moment, there is no clear calculation of specific costs for different services and this will be done once the weighbridge at the Waterval landfill is in operation. According to a rough estimation, about 18% of the proposed tariff for 2015/16 (R233 HH/a) is dedicated to the disposal costs. This is equivalent to a fee of R219 per ton of waste and will cover the operating costs of the new Waterval Landfill. On reflection, if the inhabitants of the RLM are currently willing and able to pay this fee for the current service, without the existence of a sanitary disposal facility, then they may be persuaded to pay increased fees for improved waste disposal. In order to cover the future disposal costs, the fees as well as the share of the disposal fee in the total fee shall be increased. For households, this means an increase of 14% in FY 2016/17 and 16% in FY 2017/18. The share of the disposal fee shall increase from 18% to 24% and 30% respectively. Table 2 presents the number of households served and billed, and potential and collectable revenues from the households over the planning horizon.

Table 2 Estimated total revenues from the households in the RLM city

Year	Number of served HH in RLM	Number of billed HH in RLM City	Proposed tariff 2017/18	Potential Revenues from HH	Collection Rate HH tariffs	Collectable Revenues from HH
	#	#	R/HH/month	R/a	%	R/a
2017	113,172	59,616	120.5	86,226,198	91%	78,465,840
2018	118,978	60,213	127.8	92,315,055	92%	84,929,851
2019	124,952	60,816	135.4	98,833,912	93%	91,915,538
2020	131,089	61,425	143.6	105,813,033	94%	99,464,251
2021	137,384	62,040	152.2	113,284,803	95%	107,620,563
2022	143,831	62,661	161.3	121,283,871	96%	116,432,516
2023	150,424	63,288	171.0	129,847,313	97%	125,951,893
2024	157,155	63,921	181.2	139,014,794	98%	136,234,498
2025	164,016	64,561	192.1	148,831,059	98%	145,854,438
2026	170,998	65,207	203.6	159,339,485	98%	156,152,696
2027	178,090	65,860	215.9	170,591,262	98%	167,179,437
2028	185,283	66,519	228.8	182,636,103	98%	178,983,381
2029	192,557	67,185	242.5	195,532,569	98%	191,621,918
2030	199,301	67,857	257.1	209,337,632	98%	205,150,879
2031	206,052	68,536	272.5	224,118,275	98%	219,635,909
2032	212,795	69,222	288.9	239,943,243	98%	235,144,378
2033	219,515	69,915	306.2	256,886,102	98%	251,748,380
2034	226,196	70,615	324.6	275,025,571	98%	269,525,060
2035	232,823	71,322	344.0	294,445,886	98%	288,556,968
2036	239,380	72,036	364.7	315,237,179	98%	308,932,435

Comparing the specific tariff per unit of service provided (e.g. container volume), the businesses pay more than the residential customers. Thus a cross subsidisation of the

waste management services from businesses to residential customers is realised. Under consideration of local economic development, this tariff structure will be retained in future.

There is no precise information about the quantity of waste collected by RLM from businesses. For the estimation of the revenues from businesses, an average fee of R1,500 per business and month is estimated for the first year of operation. As envisaged by the municipality, the increased rate in the business tariff is assumed to be inflation (see 2.6) plus 2%, namely 8% per annum. Table 3 gives the estimated revenues from businesses.

Table 3 Estimated total revenues from the businesses in the RLM city

Year	Average Number of Businesses	Average fee for Businesses	Potential Revenues from Businesses	Collection Rate Businesses Tariffs	Collectable Revenues from Businesses
	#	R/bus/m	R/a	%	R/a
2017	1,594	1,500	28,692,000	93%	26,683,560
2018	1,610	1,620	31,298,400	94%	29,420,496
2019	1,627	1,750	34,159,190	95%	32,451,231
2020	1,644	1,890	37,277,398	96%	35,786,302
2021	1,661	2,041	40,675,899	97%	39,455,622
2022	1,678	2,204	44,379,585	98%	43,491,994
2023	1,695	2,380	48,415,536	99%	47,931,380
2024	1,712	2,571	52,813,209	99%	52,285,077
2025	1,730	2,776	57,637,967	99%	57,061,587
2026	1,748	2,999	62,896,682	99%	62,267,715
2027	1,766	3,238	68,627,908	99%	67,941,629
2028	1,784	3,497	74,873,591	99%	74,124,856
2029	1,802	3,777	81,679,366	99%	80,862,572
2030	1,821	4,079	89,143,826	99%	88,252,388
2031	1,840	4,406	97,279,853	99%	96,307,054
2032	1,859	4,758	106,147,123	99%	105,085,652
2033	1,878	5,139	115,810,565	99%	114,652,459
2034	1,897	5,550	126,340,816	99%	125,077,408
2035	1,916	5,994	137,814,720	99%	136,436,573
2036	1,936	6,474	150,393,551	99%	148,889,615

The low amount of fees for institutions has been increased recently. However, they will still get a rebate which is assumed to be 20% compared to business fees. The estimated revenues from the institutions are given in Table 4.

Table 4 Estimated total revenues from the institutions in the RLM city

Year	Average Number of Institutions	Average Tariff for Institutions	Potential Revenues from Institutions	Collection Rate Institution Tariffs	Collectable Revenues from Institutions
2017	184	1,200	2,649,600	95%	2,517,120
2018	186	1,296	2,892,672	96%	2,776,965
2019	188	1,400	3,157,678	97%	3,062,948
2020	190	1,512	3,446,572	98%	3,377,641
2021	192	1,633	3,761,480	99%	3,723,865
2022	194	1,763	4,104,715	99%	4,063,668
2023	196	1,904	4,478,794	99%	4,434,006
2024	198	2,057	4,886,456	99%	4,837,591
2025	200	2,221	5,330,679	99%	5,277,372
2026	202	2,399	5,814,705	99%	5,756,558
2027	205	2,591	6,373,147	99%	6,309,415
2028	208	2,798	6,983,725	99%	6,913,888
2029	211	3,022	7,651,208	99%	7,574,696
2030	214	3,264	8,380,792	99%	8,296,985
2031	217	3,525	9,178,143	99%	9,086,361
2032	220	3,807	10,049,432	99%	9,948,937
2033	223	4,111	11,001,387	99%	10,891,373
2034	226	4,440	12,041,339	99%	11,920,925
2035	229	4,795	13,177,274	99%	13,045,501
2036	232	5,179	14,417,894	99%	14,273,715

According to the Medium Term Revenue and Expenditure Framework (MTREF) of the RLM for the financial years 2016 to 2019, the refuse bills will amount to R114m, R123m, and R132m during the next three years (2017-2019). Accordingly, the estimated amounts of collectable refuse fees are 94%, 95% and 96% of the billed amount of refuse fees. The total estimated revenues of the RLM through refuse fees are given in Table 5.

As already mentioned, the fees presented below are allocated to cover all costs of the waste management services delivered by the municipality. Since the level of operations required at the new Waterval landfill are higher,, the fees have been increased and thus the share of the fees used to cover the disposal costs have increased as well.

Table 5 Total expected revenues from waste management fees

Year	Collectable Revenues from HH	Collectable Revenues from Businesses	Collectable Revenues from Institutions	Total Collectable Revenues
	R/a	R/a	R/a	R/a
2017	78,465,840	26,683,560	2,517,120	107,666,520
2018	84,929,851	29,420,496	2,776,965	117,127,312
2019	91,915,538	32,451,231	3,062,948	127,429,717
2020	99,464,251	35,786,302	3,377,641	138,628,193
2021	107,620,563	39,455,622	3,723,865	150,800,050
2022	116,432,516	43,491,994	4,063,668	163,988,178
2023	125,951,893	47,931,380	4,434,006	178,317,280
2024	136,234,498	52,285,077	4,837,591	193,357,166
2025	145,854,438	57,061,587	5,277,372	208,193,398
2026	156,152,696	62,267,715	5,756,558	224,176,968
2027	167,179,437	67,941,629	6,309,415	241,430,480
2028	178,983,381	74,124,856	6,913,888	260,022,125
2029	191,621,918	80,862,572	7,574,696	280,059,186
2030	205,150,879	88,252,388	8,296,985	301,700,252
2031	219,635,909	96,307,054	9,086,361	325,029,325
2032	235,144,378	105,085,652	9,948,937	350,178,967
2033	251,748,380	114,652,459	10,891,373	377,292,213
2034	269,525,060	125,077,408	11,920,925	406,523,394
2035	288,556,968	136,436,573	13,045,501	438,039,043
2036	308,932,435	148,889,615	14,273,715	472,095,765

Because the revenue for solid waste management services is not ring-fenced, a part of this revenue stream is currently used to subsidise other services of the RLM. As per the budgets for the financial years 2016/17 and 2017/18, the costs of service by the Waste Unit services, other than disposal, comprise 67% (64% in 2017/18) of the revenues, while the disposal costs are only 3% of the revenues. Thus, 30% of the revenues are used for other purposes. It is expected that in the future, with ring fencing, all waste management revenues will be used for waste management services. In this respect, the RLM shall consider this within the framework of budgeting and begin to prepare the replacement of this financing by other sources.

For the assessment of value-for-money, it is assumed that the maximum share of revenues to be allocated to disposal services will be 30% of the revenues.

2.3.2 Other User Fees

In addition to regular waste collection and disposal services, the RLM Waste Unit offers services on an as-needed basis. The categories of services and respective tariffs are presented in Table 6.

Table 6 Current and proposed waste management tariffs for services on as-needed basis

	<i>Tariff Code</i>	<i>Unit</i>	<i>Approved Tariff 2015/16</i>	<i>Proposed Tariff 2016/17</i>	<i>Increase (%)</i>	<i>2017/2018</i>	<i>2018/2019</i>
5. RENTAL SERVICES							
240L BIN RENTAL (Including disposal costs)	<i>CJ</i>	<i>R/week</i>	192.00	203.52	6	215.32	227.81
770L CONTAINER RENTAL (Including disposal costs)	<i>NEW</i>	<i>R/week</i>	385.00	408.10	6	431.77	456.81
1100L CONTAINER RENTAL (Including disposal costs)	<i>NEW</i>	<i>R/week</i>	440.00	466.40	6	493.45	522.07
1.5 m ³ CONTAINER RENTAL	<i>CN</i>	<i>R/week</i>	525.00	556.50	6	588.78	622.93
4 m ³ SKIP CONTAINER RENTAL (First Removal)	<i>CK</i>	<i>R/week</i>	1,060.00	1,123.60	6	1,188.77	1,257.72
4 m ³ SKIP CONTAINER RENTAL (Additional Removal)	<i>NEW</i>	<i>R/week</i>	900.00	954.00	6	1,009.33	1,067.87
6 m ³ SKIP CONTAINER RENTAL (First Removal)	<i>CL</i>	<i>R/week</i>	1,530.00	1,621.80	6	1,715.87	1,815.39
6 m ³ SKIP CONTAINER RENTAL (Additional Removal)	<i>NEW</i>	<i>R/week</i>	1,300.00	1,378.00	6	1,457.93	1,542.49
9 m ³ SKIP CONTAINER RENTAL (First Removal)	<i>NEW</i>	<i>R/week</i>	2,250.00	2,385.00	6	2,523.33	2,669.69
9 m ³ SKIP CONTAINER RENTAL (Additional Removal)	<i>NEW</i>	<i>R/week</i>	1,912.50	2,027.25	6	2,144.83	2,269.23
36 m ³ RORO CONTAINER RENTAL (First Removal)	<i>NEW</i>	<i>R/week</i>	5,400.00	5,724.01	6	6,056.00	6,407.25
36 m ³ RORO CONTAINER RENTAL (Additional Removal)	<i>NEW</i>	<i>R/week</i>	4,590.00	4,865.41	6	5,147.60	5,446.16
6. OTHER SERVICES							
RENTAL OF WASTE MANAGEMENT HALL	<i>NEW</i>	<i>R/day</i>	841.91	892.43	6	944.19	998.95
RENTAL OF PA (SOUND) SYSTEM	<i>NEW</i>	<i>R/day</i>	688.35	729.65	6	771.97	816.75
WASTE REMOVAL INFORMAL SETTLEMENT PER SHACK	<i>NEW</i>	<i>R/shack</i>	15.89	16.84	6	17.82	18.85
WASTE TRANSPORTER PERMIT VEHICLES UNDER FOUR TON PER ANNUM	<i>NEW</i>	<i>R/vehicle</i>	105.90	112.25	6	118.76	125.65
WASTE TRANSPORTER PERMIT VEHICLES ABOVE FOUR TON PER ANNUM	<i>NEW</i>	<i>R/vehicle</i>	211.80	224.51	6	237.53	251.31
ILLEGAL DUMPING REMOVAL ON EMPTY STANDS 1000 SQUARE METERS	<i>NEW</i>	<i>R/stand</i>	8,556.72	9,070.13	6	9,596.20	10,152.78
ILLEGAL DUMPING REMOVAL ON EMPTY STANDS ABOVE 1001 SQUARE METERS AND ABOVE	<i>NEW</i>	<i>R/stand</i>	10,590.01	11,225.42	6	11,876.50	12,565.33
SPECIAL WASTE REMOVAL	<i>KA</i>	<i>R/t</i>	885.16	938.27	6	992.69	1,050.27
CARCASS REMOVAL	<i>KD</i>	<i>R/carcass</i>	244.60	259.28	6	274.31	290.22
CONDEMNED FOODSTUFF	<i>NEW</i>	<i>R/t</i>	835.05	885.15	6	936.49	990.81
STREET SWEEPER OR COLLECTION WORKER	<i>NEW</i>	<i>R/h</i>	115.00	121.90	6	128.97	136.45
DRIVER	<i>NEW</i>	<i>R/h</i>	170.00	180.20	6	190.65	201.71
240 LITER BIN ONCE OFF PURCHASE	<i>???</i>	<i>R</i>	540.09	572.50	6	605.70	640.83
770 LITER BIN ONCE OFF PURCHASE	<i>???</i>	<i>R</i>	5,083.20	5,388.20	6	5,700.71	6,031.35
1100 LITER BIN ONCE OFF PURCHASE	<i>???</i>	<i>R</i>	5,295.00	5,612.71	6	5,938.24	6,282.66

As presented in Figure 2, the share of revenues for the FY 2014/2015, from these services, was very small with only 0.3% or R21,812 per month; although there is potential for higher revenues. In parallel with improvements in the billing system by the RLM and the Waste Unit, there is a proposal to significantly increase tariffs in subsequent financial years. Furthermore, the users of container rental services should be billed the disposal costs in addition to these tariffs according to the type and quantity of waste and respective gate fee at the Waterval Landfill. Thus it is expected that the revenues from rental services will be about R750,000 in FY 2016/17 and R1.1 million in FY 2017/18. These fees will cover the collection and transport costs as well as the disposal costs. For the calculation of revenues, it is assumed that the disposal related revenues are included in the gate fees as presented in 2.3.3

The Integrated Waste Management By-Law of the RLM includes a four-page Fine Schedule with a list of offences referenced to specific sections and the fine that will apply to each, as well as for continued transgressions. Although this fine catalogue is a possible source of additional revenues, the monitoring and collection of these fines will require considerable manpower and capacity building. Therefore, at this stage no revenues for the Waste Unit or for the envisaged MBT facility are considered from this source. On the other side, the possibility of illegal dumping due to lack of law enforcement and environmental awareness might reduce the quantity of waste delivered to the facility and thus reduce the gate fees. Therefore, an intensive awareness raising campaign accompanied by strengthening of the enforcement capacity shall be implemented before the project start.

2.3.3 Gate Fees

Currently there is no gate fee for the disposal of waste at the Townlands landfill. In order to recover the costs for waste disposal, in the future a gate fee will be introduced at the Waterval landfill so that particularly, industrial facilities directly delivering their waste, shall cover the costs of disposal of their waste. Table 7 shows the approved disposal charges at the Waterval Landfill for 2015/16 and proposed tariffs until 2018/19.

Table 7 Proposed tariff schedule for the Waterval Landfill

	<i>Tariff Code</i>	<i>Unit</i>	<i>Approved Tariff 2015/16</i>	<i>Proposed Tariff 2016/17</i>	<i>Increase (%)</i>	<i>2017/2018</i>	<i>2018/2019</i>
8. DISPOSAL CHARGES AT THE WATERVAL LANDFILL							
Non Municipal Resident	<i>NEW</i>	<i>R/t</i>	315.00	333.90	6	353.27	373.76
General waste (household waste and similar commercial, industrial and institutional wastes)	<i>NEW</i>	<i>R/t</i>	75.00	250.00	233	300.00	350.00
Private deliveries of any kind of uncontaminated (non-hazardous) waste (passenger car, pick-up, bakkie / trailer up to 1,000 kg payload) - once a week	<i>NEW</i>	<i>R/t</i>	0.00	0.00	0	0.00	0.00
Garden waste (free from impurities)	<i>NEW</i>	<i>R/t</i>	0.00	0.00	0	0.00	0.00
Construction and demolition waste (uncontaminated soil and rubble up to a length of 80 cm from edge to edge)	<i>NEW</i>	<i>R/t</i>	5.00	5.30	6	5.61	5.93
Rubble (stone, concrete or asphalt) with a length of larger than 80 cm from edge to edge	<i>NEW</i>	<i>R/t</i>	10.00	10.60	6	11.21	11.87
Mixed construction and demolition waste (including glass, packagings, gypsum, wood, plastics, metals, etc.)	<i>NEW</i>	<i>R/t</i>	100.00	106.00	6	112.15	118.65
Special waste (Includes solid, liquid, sludge waste or waste requiring special handling, e.g. condemned foodstuff, animal carcasses, de-listed sanitary waste, rags and grit from sewerage works, incinerator ash, sludge etc. all special wastes will require prior approval and laboratory testing)	<i>NEW</i>	<i>R/t</i>	200.00	212.00	6	224.30	237.31
Mixed industrial and commercial waste	<i>NEW</i>	<i>R/t</i>	150.00	159.00	6	168.22	177.98
Mixed recyclable wastes (impurities less than 5%)	<i>NEW</i>	<i>R/t</i>	0.00	0.00	0	0.00	0.00
Waste tyres up to a diameter of 0.8 m (normal passenger vehicle tyre) - without wheel rim	<i>NEW</i>	<i>R/tyre</i>	5.00	5.30	6	5.61	5.93
Waste tyres up to a diameter of 0.8 m (normal passenger vehicle tyre) - with wheel rim	<i>NEW</i>	<i>R/tyre</i>	7.50	7.95	6	8.41	8.90
Waste tyres with a diameter of larger than 0.8 m - without wheel rim	<i>NEW</i>	<i>R/tyre</i>	15.00	15.90	6	16.82	17.80
Waste tyres with a diameter of larger than 0.8 m - with wheel rim	<i>NEW</i>	<i>R/tyre</i>	22.50	23.85	6	25.23	26.70
Tyres cut or shredded	<i>NEW</i>	<i>R/t</i>	100.00	106.00	6	112.15	118.65
E-waste (if more than 50kg) (Electrical and electronical waste)	<i>NEW</i>	<i>R/t</i>	50.00	53.00	6	56.07	59.33
Bulky waste (Furniture, sofas, beds, mattresses, shelves, carpets, bicycles, and other bulky household items)	<i>NEW</i>	<i>R/t</i>	50.00	53.00	6	56.07	59.33
Hazardous Household Waste (If more than 10kg)	<i>NEW</i>	<i>R/kg</i>	10.00	10.60	6	11.21	11.87

With the implementation of the MBT facility, the gate fees will be adjusted accordingly. For the estimation of the future revenues from the gate fees, an average gate fee of 160 ZAR/t for the first year of operation is assumed. In the fifth year of operation, a full cost covering tariff for all waste types shall be introduced. After that, an average increase of the tariffs at the rate of inflation is assumed. Table 8 presents the total amount of waste to be delivered directly (by others than waste unit) to the facility (assumed to be 30% of the total deliveries) and subject to a gate fee and the development of the average fee as well as annual revenues from these fees.

Table 8 Estimated revenues from gate fees

Year	Direct delivered waste quantity	Average Gate Fee	Gate Fee Revenues
	t/a	R/t	R/a
2017	24,681	160	3,948,970
2018	25,788	250	6,447,100
2019	26,920	350	9,421,997
2020	28,075	400	11,229,802
2021	29,250	480	14,040,171
2022	30,446	509	15,490,875
2023	31,659	539	17,074,749
2024	32,889	572	18,802,115
2025	34,132	606	20,683,751
2026	35,387	642	22,731,017
2027	36,611	681	24,927,998
2028	37,840	722	27,310,616
2029	39,069	765	29,890,001
2030	40,148	811	32,557,745
2031	41,211	860	35,425,423
2032	42,258	911	38,504,414
2033	43,284	966	41,806,068
2034	44,288	1,024	45,342,260
2035	45,267	1,085	49,124,850
2036	46,218	1,150	53,166,292

2.3.4 Governmental Grants

The main operating grant from the central government for the Waste Unit of the RLM is the Local Government Equitable Share (LGES). In the budget of the current financial year of 2016/17, the amount of the LGES is R72.9 million making up for about 39% of the total revenues.

The budgeted equitable share for the FY2017/18 is about 13% higher than the budgeted equitable share of the FY2016/17, while it remains unchanged in the FY2018/19. It is assumed that in future, equitable share will also be available and increase at the inflation rate per year. Table 9 gives the estimated amount of equitable share over the planning horizon.

Table 9 Equitable share available for waste management services in RLM

Year	Equitable Share
	R/a
2017	82,541,760
2018	82,541,760
2019	87,494,266
2020	92,743,922
2021	98,308,557
2022	104,207,070
2023	110,459,494
2024	117,087,064
2025	124,112,288
2026	131,559,025
2027	139,452,567
2028	147,819,721
2029	156,688,904
2030	166,090,238
2031	176,055,653
2032	186,618,992
2033	197,816,131
2034	209,685,099
2035	222,266,205
2036	235,602,177

Even if this value of governmental grants is assumed to be given to the RLM, it should be the target of the Waste Unit to reduce the coverage of costs through governmental grants. Similar to the revenues from households and businesses, the maximum amount of equitable share to be allocated to disposal services is assumed to be 30%.

Other governmental grants and subsidies which are available for the entire RLM are presented in the following extract from the Final Budget Schedule for 2016 – 2019² (Table 10).

² Stand: 02 June 2016

Table 10 Operating transfers and grant receipts from the budget schedule 2016-2019

Description	2012/13	2013/14	2014/15	Current Year 2015/16			2016/17 Medium Term Revenue & Expenditure Framework		
	Audited Outcome	Audited Outcome	Audited Outcome	Original Budget	Adjusted Budget	Full Year Forecast	Budget Year 2016/17	Budget Year +1 2017/18	Budget Year +2 2018/19
RECEIPTS:									
Operating Transfers and Grants									
National Government:	252,882	353,918	388,062	541,492	538,542	538,542	583,300	631,999	673,555
Local Government Equitable Share	239,749	285,427	333,249	399,145	399,145	399,145	451,980	521,872	585,878
Finance Management	1,500	1,550	1,600	1,600	1,600	1,600	1,625	1,700	1,700
Municipal Systems Improvement	800	890	934	930	530	530	-	-	-
Water Services Operating Subsidy	3,564	300	5,000	7,000	7,000	7,000	-	-	-
2010 FIFA World Cup Operating	-	-	-	-	-	-	-	-	-
Energy Efficiency and Demand Management	-	-	-	-	-	-	-	-	5,000
NDPG	-	-	-	-	-	-	400	600	1,300
FIFA	-	-	-	-	-	-	-	-	-
EPWP	7,269	-	4,611	3,384	3,384	3,384	4,219	-	-
PTIS	-	-	27,664	124,406	116,856	116,856	72,578	67,341	64,146
PMU	-	65,751	5,004	5,028	5,028	5,028	5,997	6,486	6,856
MIG	-	-	10,000	-	5,000	5,000	46,500	34,000	8,675
Other transfers/grants [insert description]									
Provincial Government:	39	1,830	2,162	670	841	841	468	617	515
Sport and Recreation	-	670	947	670	841	841	468	617	515
Skills Levy	-	-	1,050	-	-	-	-	-	-
LG-SETA	39	1,160	165	-	-	-	-	-	-
Other transfers/grants [insert description]									
District Municipality:	-	-	-	-	-	-	-	-	-
[insert description]									
Other grant providers:	-	-	-	4	4	4	-	-	-
[insert description]				4	4	4			
Total Operating Transfers and Grants	252,921	355,748	390,224	542,166	539,388	539,388	583,768	632,616	674,070

2.3.5 Revenues from Selling of Refuse Derived Fuel

The MBT facility will produce refuse derived fuel (RDF) which can be utilised at cement plants or similar facilities as secondary fuel.

The handling of the utilisation of RDF at cement plants differs from location to location around the world. In some cases, the RDF is accepted by cement plants, free of charge, while some cement plants pay a certain amount per ton of RDF to the RDF producers. This depends on the price of substituted fuels, availability of primary fuels, and the additional costs for the cement manufacturer to utilise the RDF.

During the first months of 2016, the coal prices (export) jumped from 675 R/t in October 2015 to 820 R/t (54 USD/t) in March 2016. However, looking at the development of the coal price in South Africa, this figure is still lower than the average price (Figure 3).

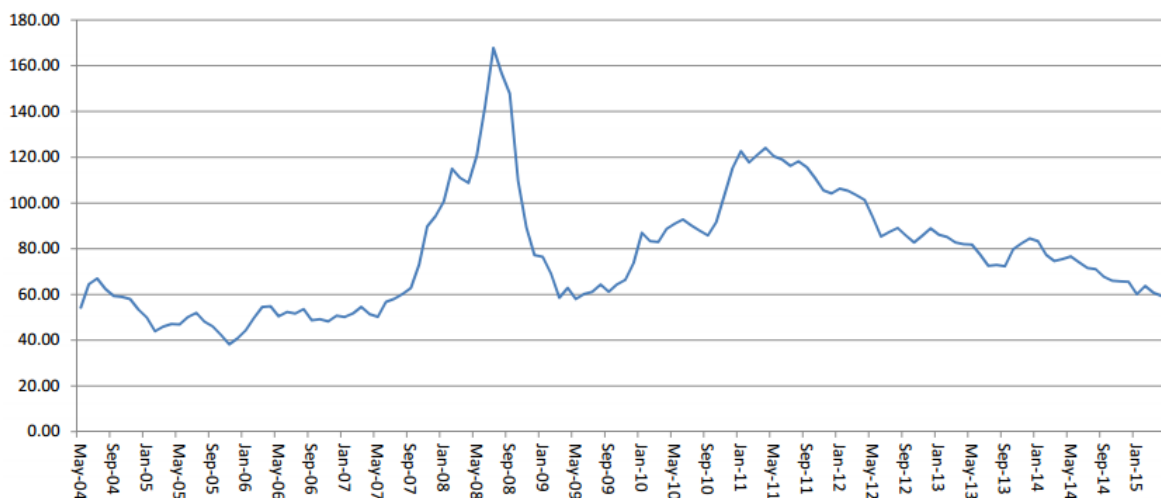


Figure 3 RBCT Coal index 2004 – 2015 (USD/ton)³

The prices in the domestic market vary depending on the end consumers. For instance, the cement industry paid about 456 R/t on average in 2015 (Table 11).

³ RBCT: Richards Bay Coal Terminal Source: <http://www.fossilfuel.co.za/conferences/2015/JCMV-X/Session-2/01Xavier-Prevost.pdf> (accessed 23.07.2016)

Table 11 Coal prices for the domestic market and amount of coal used by user category in 2015⁴

User	Mass [Mt]	Price [R/t]
Electricity	117.30	258
Synfuels	39.60	297
Merchants and Domestic	10.10	381
Industries	5.20	502
Steel	3.20	588
Chemical	2.20	237
Metallurgical	1.70	969
Cement	1.00	456
Brick and Tile	0.20	143
Agriculture	0.02	734
Transport	0.01	777
Mines	0.01	742
Total	180.80	294

For the calculation of the revenues from selling of RDF, any transport costs from the MBT facility to the cement plant should be considered as well. However, the exact location of the cement facility buying this RDF is not known at the moment. Furthermore, some of the interested parties have cement storage depots close to the new Waterval Landfill site where the MBT facility will be situated. Therefore, trucks that transport cement from the cement kilns to the depot can transport the RDF (back) to the cement kilns on a return trip. If it is assumed that the RDF will be transported independently over an average distance of 150 km, the additional costs would be 240 R/t.

According to expert opinions, the coal price will recover in 2016. If it is assumed that the MBT plant will be put into operation earliest in 2017, the potential saving and thus revenues might be higher than presented in the Table 12.

In addition to the financial benefits for the cement manufacturers, the utilisation of RDF can contribute to them reaching their sustainability targets as well as the targets set by national environmental legislation and regulations. For instance PPC aims to source 10% of its energy requirements from renewable or alternative energy sources by 2017⁵.

⁴ Source: Presentation of Xavier Prevost at the annual Mozambique Coal Conference, <http://www.slideshare.net/informaoz/xavier-prevost-xmp-consulting>

⁵ Source: <http://www.ppc.co.za/sustainability/environment/>

Another manufacturer Lafarge has more ambitious targets; the company aims to use 50% non-fossil fuels in their cement plants by 2020, 30% of which should be biomass⁶.

Both companies have embarked on some initiatives to utilise alternative fuels at their plants. PPC has an agreement with the Recycling and Economic Development Initiative of South Africa (Redisa) to use waste tyres at its De Hoek Cement Plant in Piketberg. Lafarge has entered into a joint venture project with the waste management company Interwaste to implement an alternative fuels blending platform in Kaalfontein, Johannesburg. According to information provided by Interwaste: “the blending platform will accept various suitable (liquid) waste streams from industrial generators on an ongoing basis, screen their quality and process them to produce a consistent waste-derived-fuel product which will be transported to the Lafarge cement production facility in Lichtenburg for co-processing”⁷. This facility was put into operation in the first half of 2014.

These developments, the earlier discussions with three cement companies in South Africa (AfriSam (Pty) Ltd., Lafarge, and Pretoria Portland Cement (PPC)) and filled questionnaires by them (see Annex 1) demonstrate the interest shown by cement manufacturers to use alternative fuels despite the low prices of fossil fuels. If the cement industry is directly involved in the future operation of the MBT, the potential savings as presented above could be considered as revenue. If the cement manufacturers are involved in the project as off-takers, they will not forward the full amount of savings to the MBT facility, since they will include an additional risk factor in the RDF price. With the recovery of the fuel prices in coming years, the willingness to pay for refuse derived fuel will certainly be higher. However, to be on the safe side, a revenue of 200 R/t is considered for the calculations in this report. The development of the selling price and revenues from marketing of RDF are presented in Table 12.

⁶ Source: <http://www.lafarge.co.za/SustainableReport.pdf>

⁷ <http://www.platinumwasteresources.co.za/lafarge.html> (accessed 23.07.2016)

Table 12 Potential revenues from selling of RDF

Year	Total RDF quantity	RDF Price	RDF Revenues
	t/a	R/t	R/a
2017	5,426	200	1,085,167
2018	5,640	212	1,195,773
2019	5,859	225	1,316,587
2020	6,081	238	1,448,415
2021	6,305	252	1,592,102
2022	6,533	268	1,748,546
2023	6,763	284	1,918,691
2024	6,995	301	2,103,542
2025	7,228	319	2,304,144
2026	7,463	338	2,521,591
2027	7,678	358	2,750,111
2028	7,893	380	2,996,686
2029	8,106	402	3,262,304
2030	8,292	427	3,537,085
2031	8,473	452	3,831,210
2032	8,649	479	4,145,691
2033	8,821	508	4,481,527
2034	8,987	539	4,839,762
2035	9,146	571	5,221,429
2036	9,300	605	5,627,615

2.3.6 Revenues from Selling of Recyclables

The good quality materials which bring in more revenues as secondary raw materials than as RDF will be sorted out at the MBT facility and directed to the recycling market.

Taking the average prices in 2014 and average price increase of 2% during the last two years into consideration, the selling prices of recyclable materials for 2017 are estimated in Table 13.

Table 13 Estimated prices of recyclable materials

Material Type	Selling Price in 2017 [R/t]
White Paper	1,379
Magazines/newspapers	441
Cardboard	662
Other papers	551
Plastic bags/foils	1,434
PET	2,206
HDPE	2,206
PP	1,103
PS	1,103
Other plastics	1,103
Aluminium cans	3,860
Tinplate cans	1,323
Other metals	1,103
Glass	496

Considering these prices and an average price increase rate at the inflation rate of 6% per annum, the revenues from the marketing of recyclables over the project period are estimated in Table 14.

Table 14 Potential revenues from selling of recyclables

Year	Total Recyclables	Total Revenues
	t/a	R/a
2017	13,918	16,228,105
2018	14,493	17,916,321
2019	15,080	19,763,298
2020	15,676	21,781,800
2021	16,282	23,985,296
2022	16,897	26,388,101
2023	17,518	29,005,298
2024	18,146	31,852,968
2025	18,779	34,947,857
2026	19,417	38,307,560
2027	20,016	41,867,739
2028	20,615	45,716,999
2029	21,211	49,871,787
2030	21,731	54,169,499
2031	22,241	58,777,599
2032	22,741	63,712,920
2033	23,227	68,992,158
2034	23,700	74,632,767
2035	24,158	80,652,092
2036	24,600	87,068,345

The annual revenues will be about R18 million in 2018. Of course, these revenues depend on the market prices and the quality of the materials, thus they may vary considerably from time to time.

2.3.7 Revenues from Greenhouse Gas Emissions Reductions

All three outputs of the envisaged MBT facility; recyclables, RDF, and compost, will reduce the greenhouse gas emissions.

With the utilisation of RDF as secondary fuel, approximately 1.2 to 1.8 tCO₂e can be reduced. Considering an average reduction of 1.5 tCO₂e per ton of RDF used in a cement kiln, the total amount of reduced CO₂ emissions would be then approx. 225,000 tCO₂e over the 20 years of the operation period.

The recycling of different materials would result in avoided CO₂-emissions of between 0,4 t (plastics) and 11 t (aluminium) per ton of recycled material. The total avoided emissions through recycling would amount to 500,000 tCO₂e over the planning horizon.

The contribution of composting will be rather marginal with 8 kg CO₂-emissions avoided per ton of input. The total emissions reduction will be approx. 3,000 tCO₂e over 20 years.

Since there are no binding targets for South Africa based on the Kyoto Protocol, South Africa has no capping of domestic industries emissions or any formal emission trading, and there is no regulatory or voluntary cap-and-trade market. However, South Africa has committed to reduce greenhouse gas emissions below business as usual by 34% by 2020 and 42% by 2025. In this respect, the National Treasury published the Draft Carbon Tax Bill for public comment in November 2015. According to the Draft Bill, the rate of carbon tax will be R120 per tonne carbon dioxide equivalent of the greenhouse gas (GHG) emissions of a taxpayer. However, in consideration of the various revenue recycling measures proposed by the treasury, the effective rate of the tax might be much lower than this.

In June 2016, a set of draft carbon offset regulations were released for public comment. Firms may reduce their carbon tax liability by using offset credits of up to a maximum of 5% or 10% of their total GHG emissions. The South African carbon offset scheme will rely primarily on existing international carbon offset standards namely, the Clean Development Mechanism (CDM), Verified Carbon Standard (VCS) and the Gold Standard (GS). Alternatively, a project might be accepted as an “approved project” if it complies with another standard approved by the Minister of Energy or a delegated authority. The Designated National Authority (DNA), within the Department of Energy (DoE) will be responsible for administering the carbon offset scheme.

Before starting payments of carbon tax, regulations and guidelines on the reporting and monitoring of GHG emissions must first be finalised. The first provisional tax payment is scheduled for June 2017. However, because of the complexity of the proposed carbon tax design, which would require collaboration and coordination between National Treasury, the DEA, the South African Revenue Service, and the Department of Energy, it is expected that the implementation of the tax might be further delayed .

If implemented, on the one hand, the off taker of the RDF may be willing to pay more to increase the share of renewable energy usage at their facilities; on the other hand, the emission reductions due to recycling activities could be sold as offset credits. It is assumed that the additional payment for RDF and the price of offset credit would be the same and 50% of the price set in the Draft Carbon Tax Bill (due to revenue recycling

mechanisms and costs of registration, monitoring, reporting, and verification). As proposed by treasury, the tax rate will increase by 10% until 2021. For the time thereafter, an increase in rate of 6% is assumed. Under these considerations, the possible revenues are presented in Table 15.

Table 15 Potential revenues from greenhouse gas emission reductions

Year	Reduction through RDF utilisation	Reduction through recycling	Total CO2 reduction	Price of per tonne of reduction	Potential revenues
	tCO2e/a	tCO2e/a	tCO2e/a	R/tCO2e	R/a
2017	8,139	18,062	26,201	60	1,572,033
2018	8,461	18,779	27,239	66	1,797,797
2019	8,788	19,508	28,296	73	2,054,316
2020	9,121	20,249	29,370	80	2,345,496
2021	9,458	21,001	30,459	88	2,675,688
2022	9,800	21,761	31,561	93	2,938,844
2023	10,145	22,530	32,674	99	3,225,064
2024	10,492	23,305	33,797	105	3,536,041
2025	10,842	24,085	34,927	111	3,873,535
2026	11,194	24,868	36,062	118	4,239,389
2027	11,517	25,591	37,108	125	4,624,090
2028	11,840	26,311	38,151	132	5,039,226
2029	12,159	27,026	39,185	140	5,486,468
2030	12,437	27,648	40,085	148	5,949,201
2031	12,709	28,256	40,965	157	6,444,557
2032	12,974	28,849	41,823	167	6,974,247
2033	13,231	29,425	42,656	177	7,539,959
2034	13,480	29,982	43,462	187	8,143,458
2035	13,720	30,520	44,240	199	8,786,493
2036	13,950	31,036	44,986	211	9,470,897

As the implementation of the carbon tax and the modalities of the offset scheme are uncertain at the moment, the potential revenues have not been considered in the following value for money assessment.

2.3.8 Indirect Revenues through Landfill Costs Savings

By assessing the financial feasibility of the proposed MBT project, the project should be compared to the baseline, namely disposal of waste without any treatment.

Once the MBT is implemented, the waste quantity to be disposed will be reduced by ca. 25%. Over 20 years, about 690,000 tonnes of material will be diverted from landfill. The annual costs of landfill will be reduced and the lifetime of the landfill will be prolonged. Due to composting of green waste, the leachate and landfill gas will be reduced.

The present value of total savings over the planning horizon will be about R83 million.

2.3.9 Summary of the Revenues

Table 16 gives a summary of the revenues which will be used to finance the ongoing costs of the Waste Unit. As mentioned in the previous chapters, the revenues from waste management fees and the equitable share are used to cover the costs of other waste management services as well. It is assumed that a maximum of 30% of these available amounts will be allocated to treatment and disposal services.

Table 16 Summary of the potential revenues [R/a]

Year	Administrative Revenues			Operational Revenues		Total Potential Revenues
	Waste management fees	Gate Fees	Equitable Share	RDF Revenues	Recyclable Revenues	
2017	107,666,520	3,948,970	82,541,760	1,085,167	16,646,821	211,889,238
2018	117,127,312	6,447,100	82,541,760	1,195,773	18,376,413	225,688,357
2019	127,429,717	9,421,997	87,494,266	1,316,587	20,268,318	245,930,885
2020	138,628,193	11,229,802	92,743,922	1,448,415	22,335,550	266,385,883
2021	150,800,050	14,040,171	98,308,557	1,592,102	24,591,835	289,332,714
2022	163,988,178	15,490,875	104,207,070	1,748,546	27,051,756	312,486,425
2023	178,317,280	17,074,749	110,459,494	1,918,691	29,730,680	337,500,895
2024	193,357,166	18,802,115	117,087,064	2,103,542	32,644,982	363,994,870
2025	208,193,398	20,683,751	124,112,288	2,304,144	35,811,712	391,105,293
2026	224,176,968	22,731,017	131,559,025	2,521,591	39,248,776	420,237,377
2027	241,430,480	24,927,998	139,452,567	2,750,111	42,892,159	451,453,314
2028	260,022,125	27,310,616	147,819,721	2,996,686	46,830,803	484,979,950
2029	280,059,186	29,890,001	156,688,904	3,262,304	51,081,492	520,981,888
2030	301,700,252	32,557,745	166,090,238	3,537,085	55,481,981	559,367,302
2031	325,029,325	35,425,423	176,055,653	3,831,210	60,200,085	600,541,696
2032	350,178,967	38,504,414	186,618,992	4,145,691	65,253,008	644,701,072
2033	377,292,213	41,806,068	197,816,131	4,481,527	70,657,808	692,053,747
2034	406,523,394	45,342,260	209,685,099	4,839,762	76,432,319	742,822,833
2035	438,039,043	49,124,850	222,266,205	5,221,429	82,594,255	797,245,782
2036	472,095,765	53,166,292	235,602,177	5,627,615	89,162,218	855,654,068

The Waste Unit in particular and the RLM in general continuously improve the billing and fee collection. External consultants have been assigned to update the database of customers including reconciliation of customers of different departments, updating of the addresses, and improving the billing system. For instance, at the Waterval Landfill, a private financial manager will be responsible for the billing of customers. Furthermore, the waste tariffs have been updated with the support of international/national consultants and approved by the city council.

Generally, the RLM makes considerable efforts to improve the revenue generation through consumer fees.

2.4 Development of the Core Components of the Payment Mechanism

The full payment mechanism will be developed during the preparation of the Request for Proposal (RFP) in line with Module 5 of the Municipal Service Delivery and PPP Guidelines prepared by National Treasury's PPP Unit.⁸, wherein, the core components of the payment mechanism are described.

The development of the payment mechanism must incorporate the following principles:

- Only the services received will be paid for.
- Payment will be made according to the performance; deductions, bonuses and penalties may be applied depending on assessment of the performance
- The revenue collection and tariff-setting assumptions as well as the revenues generated by the MBT facility will be considered

Referring to the first principle, the unit as a base for the payments will be per ton of waste delivered to the MBT facility.

As the operator will make available certain manpower and equipment for the operation of the facility considering the waste amount given by the RLM, the RLM shall guarantee

- either the delivery of a minimum amount of waste
- or payment of the fixed costs (for financing and operating) of the operator.

As the task to determine the exact fixed costs of the operator is quite onerous being extremely time consuming, requiring consideration of many variables and with accuracy

⁸ <https://www.gtac.gov.za/Publications/Municipal%20Service%20Delivery%20and%20PPP%20Guidelines%20new.pdf>
24.07.2016

limited to the time of the determination, it is recommended that the first option be selected. The prerequisite for proceeding with this option is the availability of the weighbridge data from the Waterval Landfill for a certain period, e.g. one year. In the event of under-performance of the RLM, a contract penalty should be paid to the private operator. The amount of this penalty might be equal to the rough estimation of the fixed costs of the operator.

The economic and environmental benefits of the MBT facility will only be possible to a full extent, if all delivered waste is treated in accordance with the technical specifications given by the RLM. The output specifications will describe the share of products to be produced from every ton of waste delivered. In this respect, the operator shall assure the production of a certain amount of RDF/recyclables/compost and a maximum amount of residual waste to be disposed. The operator shall be responsible for the marketing of the products. Thus, with poor performance, the operator will penalise himself, since less or poor quality products will generate less revenues. On the other hand, poor treatment will also result in more waste quantities to be disposed of. Consequently, the lifetime of the landfill will be shortened. In this case, the RLM might make deductions from the payments in order to compensate for the reduced lifespan of the landfill. In contrast to poor performance, good performance will be rewarded by higher revenues from more and better quality RDF and more recyclables.

The calculation of the payments to be made by the RLM to the operator of the facility will consider all revenues and costs of the facility plus a reasonable profit for the operator. The revenues include the gate fees and SWM fees collected from households and businesses, revenues from marketing of RDF and recyclables as well as governmental subsidies. The costs consist of operating and maintenance costs of the facility. Of course, all costs of the operator shall be borne by the RLM; however, the determination of the profit and distribution of the risks will consider the revenue situation of the RLM as well.

2.5 Setting and Costing of BEE Targets

Rustenburg Local Municipality fully endorses and supports the Government's Broad-Based Black Economic Empowerment Programme and it is strongly of the opinion that all South African business enterprises have an equal obligation to redress the imbalances of the past. Furthermore, it is National Treasury's intention that BEE is integral to all phases of the regulated PPP project cycle, and that BEE is made contractually binding.

Rustenburg Local Municipality would therefore prefer to do business with enterprises who share these same values and who are prepared to contribute to meaningful BEE initiatives

as part of their tendered responses. All procurement transactions will be evaluated accordingly.

1. BEE Score in relation to overall bid evaluation
 - 1.1. As prescribed in terms of the Preferential Procurement Policy Framework Act (PPPFA), Act 5 of 2000 and its Regulations, Respondents are to note the following for PPP procurement:
 - 1.1.1. Proposals will be evaluated on technical elements and price which will be allocated 90% and BEE component which will be allocated 10%.
 - 1.1.2. BEE in the PPP bid will be evaluated against a Balanced Scorecard designed for the project, and bidders must achieve a minimum threshold of 50% of the total BEE points.
 - 1.2. If a PPP bid fails to pass this BEE threshold, the bid should not be evaluated further.
 - 1.3. In the RFP, Rustenburg Local Municipality will accordingly allocate a maximum of 10 [ten] points in accordance with the 90/10 preference point system prescribed in the Preferential Procurement Policy Framework Act (PPPFA), Act 5 of 2000 and its Regulations to the Respondent's final score based on the PPP BEE balanced scorecard rating.

In July 2015, the South African Government published Draft Preferential Procurement Regulations, which states that the 90/10 preference point system shall be used for the acquisition of goods, works and/or services with a Rand value above R50 million. Therefore, even if and when the new regulation come into force, there will be no change regarding the preference point system.

The targets set for black economic empowerment and socio-economic objectives have already been described in the Due Diligence report of the Feasibility Study. Table 17 summarises these targets.

Table 17 B-BBEE Scorecard

A	Private Party Equity		20%
A1	Black Equity	40%	5%
A2	Active Equity	51% of A1	5%
A3	Cost of Black Equity	Value for Money	5%
A4	Timing of project cash flows to Black Shareholders	Early and ongoing	5%
B	Private Party Management and Employment Equity		15%
B1	Black Management Control	40%	4%
B2	Black Women in Management Control	10% of B1	4%
B3	Employment Equity Plan	Compliance with the law	3%
B4	Skills Development Plan	1% of payroll	4%
C	Subcontracting		50%
C1	Capital Expenditure Cash Flow to Black People and/or Black Enterprises	40%	7%
C2	Operating Expenditure Cash Flow to Black People and/or Black Enterprises	40%	8%
C3	Black Management Control	30%	7%
C4	Black Women in Management Control	20% of C3	7%
C5	Employment Equity Plans of Subcontractors	Compliance with the law	7%
C6	Skills Development Plans of Subcontractors	1% of Subcontractors payroll	7%
C7	Procurement to Black Enterprise SMME's	40%	7%
D	Local Socio-Economic Impact	Sustainable and effective plan	15%
TOTAL			100%

The project aims to facilitate the establishment of Small, Medium and Micro Enterprises (SMME's), with the intention to enhance local job creation, skills development and increase economic participation of Black Owned enterprises in the regional integrated management of waste.. The project will therefore include Enterprise and Supplier Development commitments at 2% of the direct operating costs of the facility, and such investment to facilitate the establishment and incubation of these Black Owned SMME's.

2.6 Explanation of the Assumptions and Indicators

Inflation Rate

As from 2009, the inflation target is a range of 3 to 6 per cent for the year-on-year increase in the headline CPI (for all urban areas) on a continuous basis. This range and actual inflation rates achieved are presented in Figure 4.

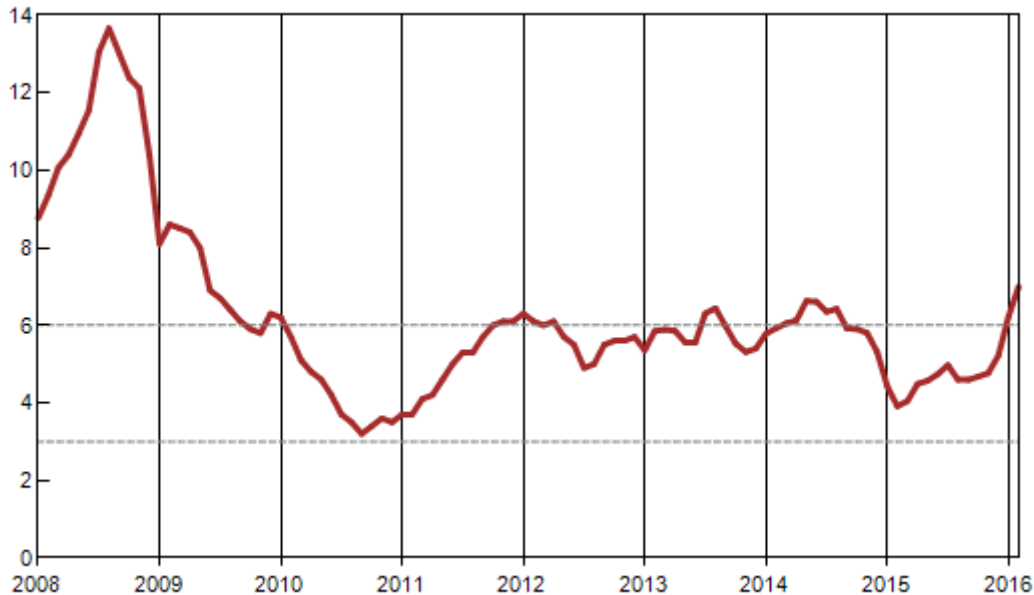


Figure 4 Consumer price inflation: Targeted inflation⁹

The achieved inflation rates during the last five years were mostly at the upper end of the selected range and thus on average about 6%. On 9th March 2015, the National Treasury issued MFMA Circular 75 which provided guidance to all municipalities and municipal entities for compiling their budgets. According to this circular, the headline inflation forecasts are as following (Table 18).

Table 18 Headline inflation forecasts

Fiscal Year	2015/2016 Current	2016/2017 Forecast	2017/2018 Forecast	2018/2019 Forecast
Headline CPI Inflation	5.6%	4.8%	5.9%	5.6%

As the current inflation rate is 7% as of March 2016, the inflation rates to be achieved in near future might be higher than given rates in the circular. Therefore, and for the simplification of the calculation, a flat inflation rate of 6% is considered throughout the planning horizon.

⁹ <http://www.resbank.co.za/MonetaryPolicy/DecisionMaking/Pages/TargetsResult.aspx> (accessed 28.07.2016)
 CPIX for metropolitan and other urban areas until the end of 2008; CPI for all urban areas thereafter. Originally sourced from Statistics South Africa

Discount Rate

Since the National Treasury does not prescribe a discount rate, the government bond yield might be considered as the discount rate for practical proposes. Figure 5 presents the development of the government bond yield during the last 10 years and the trend lines (red line: considering the last 10 years, and green line: considering the last 60 years).

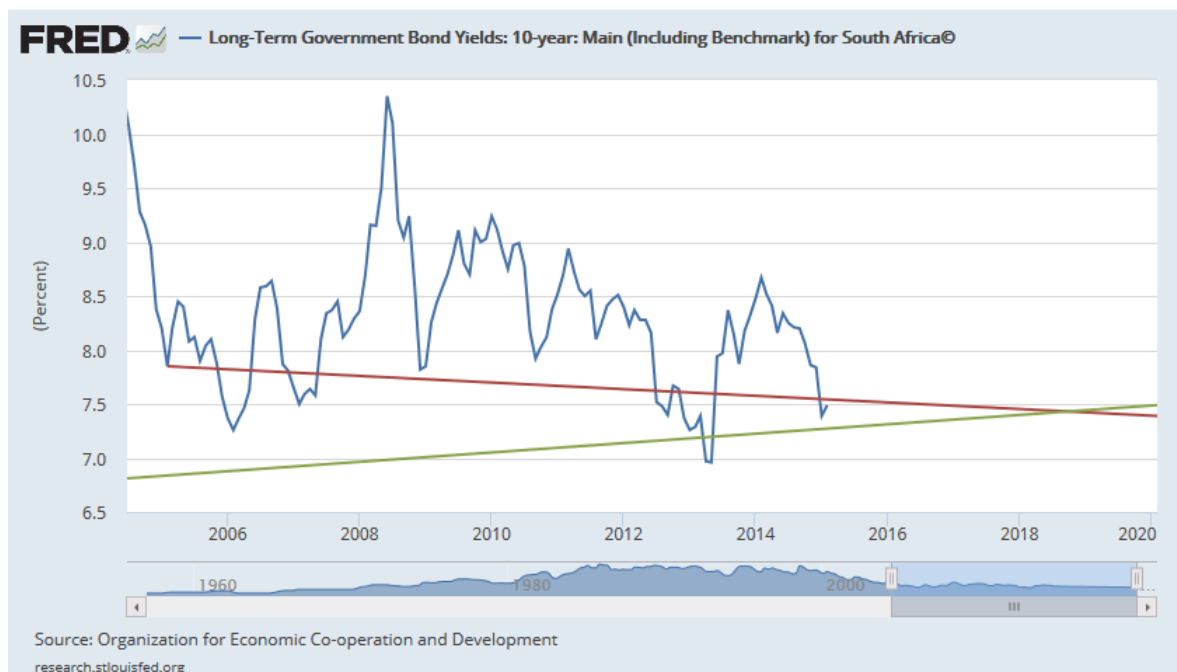


Figure 5 Development of the government bond yield¹⁰

In February 2015, the Government of South Africa issued the Bond R2035 with a yield rate of 8.875%. Considering that the maturation period of this bond (final maturity date 28 February 2035) is similar to the planning horizon of the MBT facility, the rounded up yield rate of this bond with 9% plus 1% risk premium is considered as a nominal discount rate for the project financial calculations.

Lending Rate

Between 2005 and 2015, the prime rate varied between 8.5% and 15.5%. The current prime rate of the South African Reserve Bank is 10.5%¹¹. Considering the risks of the

¹⁰ OECD, "Main Economic Indicators - complete database", Main Economic Indicators (database), <http://dx.doi.org/10.1787/data-00052-en> (28.07.2016)

¹¹ Source: <https://www.resbank.co.za/Research/Rates/Pages/CurrentMarketRates.aspx>, 12.05.2016

project, it is assumed that the debt financing by the private party can be done with the rounded up prime rate plus 2%, namely at 13%.

Depreciation

The costs are calculated applying a cash flow model. Thus, non-cash items like depreciation are not considered. The initial and replacement investment costs are considered before or in the year of each investment. For the replacement of equipment and assets, depreciation periods, which are accepted internationally and nationally, and consider the local working conditions, have been considered. Thus, it is assumed that 20% of the immobile machinery shall be replaced after 15 years of operation, while for mobile equipment a depreciation period of 10 years has been considered. For other machinery and civil works, a depreciation period of 25 years is assumed.

Residual Values

Considering the depreciation period of each asset, the residual values have been reflected in the cost calculation by applying linear depreciation.

Taxes

The private party will be liable for any taxation applicable to its income according to the valid laws and regulations of the country

According to Section 37B of the Income Tax Act, in case of a new and unused environmental treatment and recycling asset owned or acquired by the taxpayer, a deduction of 40% of the costs to the taxpayer to acquire the asset in the year of assessment that it is brought into use for the first time by that taxpayer, and of 20% in each succeeding year of assessment shall be allowed.

Exchange Rate

Figure 6 presents the Euro to Rand exchange rate development from January 1999 to July 2016. During this period, the minimum, average and maximum exchange rates were 6.07, 10.13 and 18.28 ZAR/EUR respectively.



Figure 6 Euro to Rand exchange rate development¹²

The exchange rate has been trending higher since early 2015 because of changing domestic policy and global market conditions. The current rate as of 8 July 2016 is 16.24 ZAR/EUR. However, the analysts¹³ expect a recovery against the EUR during the coming years. Thus it is expected that the exchange rate will fall to 14.20 by September 2016 and close the year with 13.85. For 2017, it is expected to trade at 13.30 ZAR/EUR.

Despite this optimistic forecast and to be on the safe side, a constant exchange rate of 16.00 ZAR/EUR (average rate of the last year) over the planning horizon is considered for the calculations in this report.

2.7 Calculation and Consolidation of All Costs

2.7.1 Direct Costs

The direct costs of the project are those that are allocated to the particular works and services required to implement the envisaged project. Since no similar project has been

¹² Source: European Central Bank

¹³ Ebury Partners UK Ltd, in <https://www.poundsterlinglive.com>

implemented in South Africa yet, some of the costs are based on best estimates with adjusted prices from Europe or elsewhere with similar framework conditions. For the costs of the services and works, e.g. construction works, available in South Africa, local costs are considered. In addition to this realistic approach to estimating the costs, the risk assessment includes contingencies for unforeseen expenditures.

2.7.1.1 Capital Costs

The capital costs include the following items:

- Costs of machinery on the base of “Delivered Duty Paid – DDP” prices¹⁴
- Costs of civil works
- Costs of electrical installations
- Costs of installation, training, and all other labour
- Costs of mobile equipment on the base of “Delivered Duty Paid – DDP” prices
- Costs of design
- EPC (engineering, procurement and construction) contractor fee
- Cost of capital

The costs of machinery for the mechanical treatment are listed in Table 19.

¹⁴ The seller bears all the costs and risks involved in bringing the goods to the place of destination and has an obligation to clear the goods not only for export but also for import, to pay any duty for both export and import and to carry out all customs formalities.

Table 19 Machinery costs of the mechanical treatment (MT) (2015 prices)

Machinery	Unit costs		Quantity	Total
	EUR	ZAR		ZAR
Feed hopper with bag opener	90,000	1,440,000	2	2,880,000
Waste screen (100mm)	200,000	3,200,000	2	6,400,000
Ferrous separator < 100 mm	65,000	1,040,000	1	1,040,000
Ferrous separator > 100 mm	50,000	800,000	2	1,600,000
Non-ferrous separator	100,000	1,600,000	2	3,200,000
RDF Shredder (< 100 mm)	250,000	4,000,000	1	4,000,000
Wind-sifter	200,000	3,200,000	1	3,200,000
Baling machine (paper, cardboard)	350,000	5,600,000	1	5,600,000
Baling machine (metal cans)	20,000	320,000	1	320,000
Conveyors 1.5 m width	3,500	56,000	117	6,536,828
Conveyors 1.0 m width	2,500	40,000	177	7,074,555
Sorting conveyor 1.2 m width	3,000	48,000	113	5,446,137
Air condition sorting cabin	20,000	320,000	4	1,280,000
Hall air extraction system with dedusting	4.0	64	68,000	4,352,000
Chutes and frames, installation	12.5%			6,616,190
Electrical works	12.5%			6,616,190
Sub-total Machines				66,161,899
Engineering	10.0%			6,616,190
EPC contractor fee	8.0%			5,292,952
Sub-total Engineering & Contracting				11,909,142
Total Machinery Costs				78,071,041

The total costs of civil works are given in Table 20.

Table 20 Total costs of civil works of the mechanical treatment (2015 prices)

Civil Works	Unit	Unit costs	Quantity	Total
		ZAR		ZAR
Delivery hall	m ³	4,000	1,152	4,608,000
Treatment halls	m ³	4,000	2,620	10,480,000
Push walls reception and storages	m ³	3,500	139.5	488,250
Sorting cabins	m ²	3,500	270	945,000
Roads / outdoor storage	m ²	500	7,528	3,764,000
Interface connections (electricity, transformer station, water sewer, telephone/data etc.)	lump sum	2,400,000	1	2,400,000
Workshops, offices, staff rooms	m ²	21,000	800	16,800,000
Fencing, lightning etc.	lump sum	3,500,000	1	3,500,000
Subtotal Civil Works				42,985,250
Engineering		10%		4,298,525
EPC contractor fee		10%		4,298,525
Subtotal Engineering & Contracting				8,597,050
Total Costs of Civil Works				51,582,300

The procurement of the mobile equipment for the mechanical treatment activities will cost about R10.5 million as presented in Table 21.

Table 21 Costs of mobile equipment for mechanical treatment (2015 prices)

Mobile Equipment	Unit costs		Quantity	Total ZAR
	EUR	ZAR		
Grab crane	120,000	1,920,000	1	1,920,000
Front-end loader, large	120,000	1,920,000	1	1,920,000
Front-end loader, small	90,000	1,440,000	2	2,880,000
Hook-lift truck	90,000	1,440,000	1	1,440,000
Hook-lift containers	5,000	80,000	12	960,000
Telescope handler	60,000	960,000	1	960,000
Mobile platform (for maintenance works)	30,000	480,000	1	480,000
Total Costs of Mobile Equipment				10,560,000

The biological treatment of the green waste will take place at the landfill site and therefore only mobile equipment will be necessary. The required costs to purchase this mobile equipment are given in Table 22.

Table 22 Costs of mobile equipment for biological treatment (2015 prices)

Mobile Equipment	Unit costs		Quantity	Total ZAR
	EUR	ZAR		
Pre-crusher	250,000	4,000,000	1	4,000,000
Compost screen	170,000	2,720,000	1	2,720,000
Collection bays containers	5,000	80,000	5	400,000
Front-end loader, large	120,000	1,920,000	1	1,920,000
Farmer truck	70	1,120,000	1	1,120,000
Compost turner	45,000	720,000	1	720,000
Total Costs of Mobile Equipment				10,880,000

The total initial costs of investment will be R151 million at 2015 prices.

Parts of the MBT facility and the mobile equipment shall be replaced after 12 and 10 years of operation. The VAT is calculated separately on top of all capital costs. Furthermore, the external reference model includes contingencies at a rate of 10% of the total investment costs. The capital costs over the planning horizon are presented in Chapter 2.8.

2.7.1.2 Maintenance Costs

The direct maintenance costs include the costs over the entire planning horizon of maintaining the MBT facility in the condition required to deliver the specified outputs

including raw materials, tools and equipment, wear and spare parts, and labour associated with maintenance.

Since there is no actual data in South Africa as a basis for future maintenance costs estimation, the maintenance costs have been estimated on the basis of maintenance expenditures of similar facilities in Europe with similar framework conditions. The rates in Table 23 are considered for the cost calculations.

Table 23 Rates for the calculation of annual maintenance costs

Machinery	6%	of investment costs
Civil works	2%	of investment costs
Mobile equipment	10%	of investment costs

On average the maintenance costs will make up about 12% of the total operating costs and increase from R7.8 million in 2017 to R23.7 million in 2036. The details are given in Chapter 2.8.

In contrast to current maintenance practices of the municipality, the future maintenance works foresee an advanced proactive maintenance with high reliability. Since the operator’s revenues will depend on the quality and quantity of the outputs, the operator will have a vested interest in high availability of the facility. Therefore, it is expected that the operator will implement a correspondingly efficient maintenance system.

2.7.1.3 Operating Costs

Except for the maintenance costs, the operating costs include all costs for the daily operation of the facility; namely labour costs, costs of consumables, leasing costs, and taxes to be paid by the operator.

For the calculation of the labour costs, the required staff and associated salaries are considered (Table 24). The staff numbers in brackets are required for the biological treatment process. With the increase of the waste input, the number of staff, particularly the number of sorters, will increase over the years. It is assumed that the annual increase rate of salaries will be equal to the assumed inflation rate.

Table 24 Required staff and salaries considered

	Required staff		Salary (2015) [ZAR/a]
	2017	2036	
Facility Manager	1	1	315,000
Personal Manager	1	1	240,000
Bookkeeper	1	1	150,000
Technical Manager	1	1	290,000
Office clerk	2(+1)	2(+1)	120,000
Supervisor	4(+1)	4(+1)	180,000
Mechanic / Electrician	4(+1)	4(+1)	150,000
Operator	3(+2)	3(+2)	100,000
Frontend loader operator	4	7	110,000
Hook-lift driver	2	3	85,000
General worker	5(+2)	8(+3)	75,000
Sorter	88	156	75,000

The unit prices for consumables are assumed as in Table 25.

Table 25 Unit prices of consumables

Year	Electricity Price	Fuel Price	Hydraulic Oil Price	Lubricants Price	Water Price
	R/kWh	R/l	R/l	R/kg	R/m ³
2015	0.90	11.22	30.00	25.00	10.00
2017	1.01	12.61	33.71	28.09	11.24
2036	3.06	38.14	101.99	84.99	34.00

The amount of consumables over the planning horizon has been estimated as presented in Table 26.

Table 26 Estimated amount of consumables

Year	Electricity for MT	Fuel	Hydraulic Oil	Lubricants	Water	Total Costs
	kWh/a	l/a	l/a	kg/a	m ³ /a	ZAR/a
2017	2,056,755	55,092	770	289	14,910	2,975,995
2018	2,149,033	57,449	803	301	15,392	3,292,286
2019	2,243,333	59,849	838	314	15,940	3,639,586
2020	2,339,542	62,289	873	327	16,490	4,019,673
2021	2,437,530	64,765	908	341	17,042	4,435,167
2022	2,537,158	67,274	944	354	17,656	4,889,794
2023	2,638,275	69,811	981	368	18,207	5,384,678
2024	2,740,732	72,372	1,017	382	18,757	5,923,849
2025	2,844,352	74,953	1,055	396	19,305	6,510,585
2026	2,948,948	77,549	1,092	410	19,850	7,148,339
2027	3,050,912	80,086	1,129	423	20,451	7,834,165
2028	3,153,319	82,624	1,166	437	21,015	8,576,672
2029	3,255,791	85,155	1,202	451	21,542	9,379,166
2030	3,345,639	87,424	1,235	463	22,057	10,212,120
2031	3,434,266	89,658	1,267	475	22,500	11,105,604
2032	3,521,466	91,850	1,298	487	23,028	12,067,054
2033	3,607,003	93,996	1,329	498	23,513	13,096,853
2034	3,690,663	96,090	1,359	510	23,924	14,197,579
2035	3,772,217	98,125	1,389	521	24,416	15,377,563
2036	3,851,465	100,098	1,417	531	24,801	16,634,814

The total costs of consumables will increase from R3 million in 2017 to R16.6 million in 2036 (considering inflation). The development over the years is given in Chapter 2.8.

Further running costs will occur for the disposal of residues from the mechanical and biological treatment. Considering a unit cost of R210 per tonne of waste disposal (in 2017), the disposal costs will increase from R13.5 million to R77.8 million in 2036.

Provisions are made also for miscellaneous costs, like taxes and fees (1% of investment costs), safety equipment (R3,000 per staff member per year), office expenses (R20,000 per month), leasing of passenger cars (R16,000 for two cars), and also the leasing fee to the Anglo Mines (R150,000 per annum). The miscellaneous costs will be then R2.3 million in 2017 and R6.6 million in 2036.

The total direct operating costs will amount to R39.4 million in 2017 and R183.1 million in 2036.

2.7.1.4 BEE Costs

The direct BEE costs will be spent to achieve the project's BEE objectives as identified in Chapter 2.5. Accordingly, for this project, the 90/10 preference point system will be applied to calculate the points in price during the tender evaluation.

Taking the B-BBEE scorecard of the project, costs have been considered for the skills development plan (1% of the total payroll) and for the development of local enterprise and suppliers (2% of the direct operating costs per annum). All other costs to achieve the B-BBEE targets are assumed to be negligible compared to other costs of the project.

The estimated BEE costs are R0.9 million in 2017 and R4.2 million in 2036.

2.7.2 Indirect Costs

As indirect costs, the costs of the municipality to manage the project with internal and external resources and costs for bookkeeping are considered.

For the Waterval landfill, the RLM will appoint a financial advisor and a technical advisor. It is assumed that these advisors will also be responsible for the MBT facility once the facility is constructed and operational.

These administration costs are assumed to be 5% of the direct operating costs, which means R1.9 million in 2017 and R9.1 million 2036.

The readiness of the MBT facility for start of operation shall be confirmed by an independent third party. The costs of this service have been considered within the indirect costs as well.

2.8 Construction of the External Reference Model

On the base of assumptions described and costs estimated above the external reference model has been prepared as a discounted cash-flow model.

Table 27 presents the initial investment costs and the replacement costs including the residual values of the investments at the end of the operation period.

Table 27 Initial investment and replacement costs [ZAR]

Performance		Initial Investment Costs				Replacement Costs		Total	VAT	Total incl. VAT	
Year	Waste Quantity	Machinery	Civil Works	Mobile Equipment	Engineering & Contracting	Machinery	Mobile Equipment				
0	2016	0	R 70,131,613	R 45,564,365	R 22,726,400	R 21,736,563	R 0	R 0	R 160,158,941	R 22,422,251.75	R 182,581,193
1	2017	96,227 t	R 0	R 0	R 0	R 0	R 0	R 0	R 0	R 0	R 0
2	2018	100,430 t	R 0	R 0	R 0	R 0	R 0	R 0	R 0	R 0	R 0
3	2019	104,716 t	R 0	R 0	R 0	R 0	R 0	R 0	R 0	R 0	R 0
4	2020	109,080 t	R 0	R 0	R 0	R 0	R 0	R 0	R 0	R 0	R 0
5	2021	113,516 t	R 0	R 0	R 0	R 0	R 0	R 0	R 0	R 0	R 0
6	2022	118,017 t	R 0	R 0	R 0	R 0	R 0	R 0	R 0	R 0	R 0
7	2023	122,577 t	R 0	R 0	R 0	R 0	R 0	R 0	R 0	R 0	R 0
8	2024	127,187 t	R 0	R 0	R 0	R 0	R 0	R 0	R 0	R 0	R 0
9	2025	131,841 t	R 0	R 0	R 0	R 0	R 0	R 0	R 0	R 0	R 0
10	2026	136,528 t	R 0	R 0	R 0	R 0	R 0	R 38,395,775	R 38,395,775	R 5,375,408	R 43,771,183
11	2027	141,104 t	R 0	R 0	R 0	R 0	R 0	R 0	R 0	R 0	R 0
12	2028	145,691 t	R 0	R 0	R 0	R 0	R 22,632,226	R 0	R 22,632,226	R 3,168,512	R 25,800,737
13	2029	150,271 t	R 0	R 0	R 0	R 0	R 0	R 0	R 0	R 0	R 0
14	2030	154,337 t	R 0	R 0	R 0	R 0	R 0	R 0	R 0	R 0	R 0
15	2031	158,343 t	R 0	R 0	R 0	R 0	R 0	R 0	R 0	R 0	R 0
16	2032	162,279 t	R 0	R 0	R 0	R 0	R 0	R 0	R 0	R 0	R 0
17	2033	166,136 t	R 0	R 0	R 0	R 0	R 0	R 0	R 0	R 0	R 0
18	2034	169,903 t	R 0	R 0	R 0	R 0	R 0	R 0	R 0	R 0	R 0
19	2035	173,569 t	R 0	R 0	R 0	R 0	R 0	R 0	R 0	R 0	R 0
20	2036	177,127 t	R 0	R 0	R 0	R 0	R 0	R 0	R 0	R 0	R 0
Residual values			-R 39,577,202	-R 30,979,791	R 0	R 0	-R 12,745,556	R 0	-R 83,302,549	-R 11,662,357	-R 94,964,906
Total		2,758,878 t	R 30,554,411	R 14,584,574	R 22,726,400	R 21,736,563	R 9,886,669	R 38,395,775	R 137,884,392	R 19,303,815	R 157,188,207

Net Present Value	966,319 t
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NPV	R 151,496,344	R 174,682,062
Unit Cost	157 R/t	181 R/t

The total investment costs (incl. VAT) to implement the facility will be about R182 million. The net present value of the total investment will be R174 million (considering the residual values). The specific investment costs are **R181** per tonne of input to the MBT facility.

The operating costs of the facility including the indirect costs of the RLM are presented in the next table. The net present value of all operating costs will be R623 million over 20 years of operation. The specific costs per tonne of waste input will be **R645**.

Thus the total specific costs of the MT facility will be **R826** per tonne of waste input at 6% inflation rate and 10% discount rate.

Table 28 Operating costs over the planning horizon [ZAR]

Performance		Operating Expenditures							
Year	Waste Quantity	Staff Costs	Consumables	Maintenance Costs	Disposal costs	Miscellaneous costs	RLM Administration Costs	Total	
0	2016	0						R 0	
1	2017	96,227 t	R 12,629,264	R 2,975,995	R 7,835,334	R 13,507,671	R 3,399,833	R 1,971,657	R 42,319,753
2	2018	100,430 t	R 13,565,672	R 3,292,286	R 8,305,454	R 14,975,291	R 3,607,629	R 2,137,778	R 45,884,110
3	2019	104,716 t	R 14,758,356	R 3,639,586	R 8,803,781	R 16,586,065	R 3,841,337	R 2,327,527	R 49,956,651
4	2020	109,080 t	R 16,045,325	R 4,019,673	R 9,332,008	R 18,351,961	R 4,090,379	R 2,533,279	R 54,372,625
5	2021	113,516 t	R 17,433,600	R 4,435,167	R 9,891,928	R 20,285,645	R 4,355,797	R 2,756,265	R 59,158,401
6	2022	118,017 t	R 19,208,877	R 4,889,794	R 10,485,444	R 22,400,626	R 4,653,549	R 3,012,069	R 64,650,358
7	2023	122,577 t	R 20,959,102	R 5,384,678	R 11,114,570	R 24,711,183	R 4,962,441	R 3,280,509	R 70,412,483
8	2024	127,187 t	R 22,723,492	R 5,923,849	R 11,781,445	R 27,232,592	R 5,284,660	R 3,564,647	R 76,510,685
9	2025	131,841 t	R 24,624,156	R 6,510,585	R 12,488,331	R 29,980,818	R 5,628,162	R 3,871,853	R 83,103,905
10	2026	136,528 t	R 26,671,095	R 7,148,339	R 13,237,631	R 32,972,697	R 5,994,354	R 4,203,794	R 90,227,910
11	2027	141,104 t	R 29,196,971	R 7,834,165	R 14,031,889	R 36,197,187	R 6,400,167	R 4,576,883	R 98,237,262
12	2028	145,691 t	R 31,823,290	R 8,576,672	R 14,873,802	R 39,697,096	R 6,826,335	R 4,974,459	R 106,771,654
13	2029	150,271 t	R 34,410,958	R 9,379,166	R 15,766,230	R 43,489,178	R 7,269,921	R 5,390,752	R 115,706,206
14	2030	154,337 t	R 37,194,583	R 10,212,120	R 16,712,204	R 47,413,493	R 7,738,305	R 5,828,371	R 125,099,077
15	2031	158,343 t	R 39,807,311	R 11,105,604	R 17,714,937	R 51,635,126	R 8,218,838	R 6,278,615	R 134,760,430
16	2032	162,279 t	R 43,205,539	R 12,067,054	R 18,777,833	R 56,171,221	R 8,757,916	R 6,791,544	R 145,771,107
17	2033	166,136 t	R 46,654,173	R 13,096,853	R 19,904,503	R 61,038,904	R 9,321,920	R 7,330,873	R 157,347,226
18	2034	169,903 t	R 49,907,264	R 14,197,579	R 21,098,773	R 66,256,096	R 9,901,756	R 7,885,411	R 169,246,879
19	2035	173,569 t	R 54,216,625	R 15,377,563	R 22,364,699	R 71,840,716	R 10,552,908	R 8,520,115	R 182,872,627
20	2036	177,127 t	R 57,979,557	R 16,634,814	R 23,706,581	R 77,811,578	R 11,209,429	R 9,155,008	R 196,496,968
Residual values									
Total		2,758,878 t	R 613,015,209	R 166,701,542	R 288,227,376	R 772,555,144	R 132,015,637		R 2,068,906,317

Net Present Value	966,319 t
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Net Present Value	R 623,383,338
Unit Cost	645 R/t

2.9 Construction of the Risk-Adjusted External Reference Model

2.9.1 Identification of Risks

For the identification of project related risks, similar projects, particularly in Europe, have been considered. Accordingly, following the main risk categories have been identified:

- Design and construction risks
- Operation and maintenance risks
- Demand risk
- Risk of service delivery

The external reference model foresees the transfer of some of the risk to the private party. The distribution of the risks shall be done in such a way that the risks and benefits are balanced between all parties. Figure 7 presents a balanced risk-price-ratio within a PPP project.

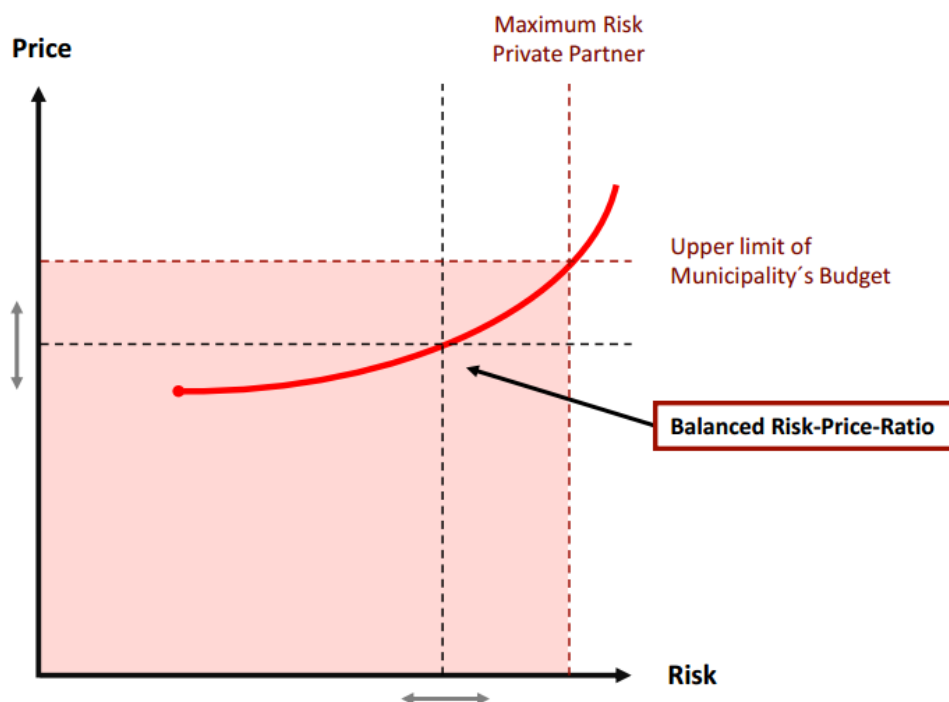


Figure 7 Risk-Price-Function in a PPP¹⁵

¹⁵ Source: EEW Energy from Waste, <https://www.b2match.eu/>

Accordingly the risk-benefit-ratio is to be defined within the area limited with the maximum risk the private party is ready to take on, on the one side and the upper limit of RLM's budget to pay the services on the other side.

In waste management projects, usually risks are transferred to the private sector for

- Design
- Construction
- Operation & Maintenance
- Delivery of a service

Against these risks, the municipality shall secure the waste deliveries to the envisaged MBT facility on a long-term basis. Table 29 shows the distribution of the risks between the City of Poznan (Poland) and the Special Purpose Vehicle (SPV) of the Poznan MBT PPP Project.

Table 29 Risk distribution within the Poznan MBT PPP Agreement¹⁶

Risk	City	SPV
Update of EIA Report and building permit application		✓
Design documentation		✓
Construction delay and cost overruns		✓
Waste volume and calorific value risk	✓	
Waste throughput, heat and power output performance		✓
Heat, power and green certificates prices	✓	
Assumptions on recyclable metals and bottom ashes		✓
O&M costs overruns		✓
Financing (senior debt, subordinated debt, equity)		✓
EU Grant availability (<i>cap</i>)	✓	✓
Exchange rate (EUR/PLN) variation between BAFO submission and start of construction	✓	
Interest rate variation between BAFO submission and hedging transaction entered at start of construction	✓	
Change in Law (<i>cap</i>)	✓	✓
Force Majeure & Fait du Prince	✓	

In this project, the SPV is paid by the City of Poznan solely under the terms of the PPP Agreement. The products, heat, power and green certificates are marketed directly by the City of Poznan and therefore, the risk for their prices is taken by the City. Otherwise, the

¹⁶ Source: EEW Energy from Waste, <http://www.aik-invest.hr/>

main risk of the municipality is to ensure the volume and calorific value of the waste to be delivered to the facility.

The risks of availability of grants and changes in law are shared by both partners.

In addition to design and construction related risks, the private party will be responsible for the capacity of the facility and the performance and output quality. Table 30 present the risk matrix for the project. The risk ownership scored with 0: fully transferred risk to 5: retained risk. The weighting is done between 1: low risk, 2: medium risk, and 3: high risk.

Table 30 Risk matrix of the project

Risk identification	Risk Ownership		Issues/ Impact	Mitigation Measures	Weighting		Score	
	RLM	Private Party			RLM	Private Party		
Planning Risks								
Setup of a SPV	5	0	No proposals received	Run a pre-qualification process as part of the procurement process to include a shortlist of tenderers who must either commit to tendering if they are shortlisted or after the shortlist has been finalised, confirm that they will submit a tender. Amendment to technical option currently being prepared which may make the project more attractive to a wider range of service providers.	1	5	0	
Onerous BEE requirements	5	0	Despite the MBT project not being responsible for the loss of access to a landfill site by the reclaimers, through the closure of the Townlands landfill and the opening of the Waterval Landfill Site, there is still a loss of some income by reclaimers and some secondary projects may need to be packaged and included as part of the requirements of the private party during procurement. This may place an additional burden on a potential private party which they may not be keen on taking on.	Engagement with BEE Specialist to assist in the development of sub-projects that may prove easily implementable and attractive to the PPP partner. Further engagement with National Treasury on this matter Development of sub-projects proposals.	1	5	0	
Planning risks	4	1	Proposed technology unlikely to be implemented. The data basis for the preliminary studies is not reliable	Consultant to revisit technical approach and designs and rework Feasibility Study Reports Consultant to apply sensitivity analysis to figures to try to compensate for lack of accurate data.	2	8	2	
Time schedule	2	3	Delay in operation start, additional usage of landfill space, loss of usable waste fractions	Continuous rescheduling, realistic time planning	3	6	9	
Change of political landscape in one or more Councils resulting in rejection of current solution.	5	0	Delay or re-evaluation of preferred solution.	Engage at the highest level of the municipality to ensure and maintain buy-in. – Municipal manager committed as a SteerCom member. Ensure continuous engagement	1	5	0	

Risk identification	Risk Ownership		Issues/ Impact	Mitigation Measures	Weighting		Score	
	RLM	Private Party			RLM	Private Party		
Planning Risks								
Institutional risks	5	0	Insufficient staff qualification for tendering of SWM services supervision of private sector performance	Training and guidance by technical assistance The RLM shall keep the Project Officer responsible for developing the project beyond signature date into the implementation.	1	5	0	
Supply of guarantees	0	5	Proven technology to produce the required outputs	Preparation of detailed design plans and detailed specifications for tendering	2	0	10	
Contractual delays	3	2	One of the parties withdraws from procurement e.g. a pre-qualified bidder	Ensure that figures and data used in the modelling are accurate and sensitivity analysis carried out considering alternative scenarios Shortlisted bidders will be requested to lodge a bid bond with the municipality as a guarantee that they will not withdraw before the process is concluded.	3	9	6	
Legal risks	2	3	Ownership of assets (Anglo might terminate the leasing contract for the Watervall landfill site, then RLM could not provide the site to the PPP partners) A party is subject to legal proceeding after (pre-)qualification	Currently there is a long-term contract with Anglo, however, because of changed interests or non-payment of leasing fee by RLM, Anglo might terminate the contract. RLM must regularly pay the fees and confirm the availability of the site before starting the procurement The Consultant shall be careful by the selection of parties and thoroughly assess their former litigation and arbitration proceedings and related risks.	3	6	9	
Regulatory risks	5	0	Amendment to the waste licence delayed Rezoning might be required Delay or even halt in implementation	Consultant assesses the nature and extent of the variations and engage with NWREAD to determine if any amendment is required	1	5	0	
Access to funding	0	5	Councils fail to adequately resource project	The RLM to ensure adequate budgetary provision for the project. Grant funding options to co-fund the project are being explored and Consultant will assist RLM with IIPSA application	3	0	15	

Risk identification	Risk Ownership		Issues/ Impact	Mitigation Measures	Weighting		Score	
	RLM	Private Party			RLM	Private Party		
Planning Risks								
Financing risks	1	4	No substantial increase of fee collection efficiency	Technical assistance to improve the billing system, enforcement measures, awareness creation measures, utilisation of alternative financing measures	3	3	3	12
Construction Risks								
Cost overrun	0	5	Project is financially unviable, changes in inflation, exchange rates, or interest rates	Proper contract design with provisions against changing prices, selection of proven technologies	3	0	0	15
Time overrun	1	4	Delay in operation start, additional usage of landfill space, loss of usable waste fractions	Project duration defined in the contract, penalties for delay, appropriate project management	3	3	3	12
Sponsor risks	0	5	Financiers pulling out	Reverse penalties in the contract, measures to keep project financially viable	2	0	0	10
Design risk	0	5	Construction not possible/costly with the provided design	Contract with experienced contractors, proven technology	2	0	0	10
Labour issues	0	5	Strike, accidents, etc. related to the labour of the contractors (no labour of RLM will be affected)	Risk transfer to contractor in the contract, project management and monitoring applying valid labour practises	2	0	0	10
Insolvency risk	0	5	Private party not able to deliver services anymore	Proper contracting, performance guarantees	1	0	0	5
Operation Risks								
Supply risk	5	0	The waste cannot be supplied in agreed quantity and quality	Verification before contracting, conservative amount and composition in the contract, RLM to secure waste amounts from other sources (for this purpose, RLM will start discussions with the neighbouring municipalities)	2	10	10	0
Design capacity and availability	0	5	The facility cannot handle the delivered waste because of low capacity or long time not available	Performance monitoring, flexible design, contract monitoring, penalties	2	0	0	10

Risk identification	Risk Ownership		Issues/ Impact	Mitigation Measures	Weighting		Score	
	RLM	Private Party			RLM	Private Party		
Operation Risks								
Output is not according to specifications	0	5	The quality and quantity of the products are lower than required, loss of revenues	Contract /performance monitoring, penalties	2	0	10	
Single elements of the facility fail	0	5	Not specified to work under the given conditions, improper maintenance	Flexible facility design, backup solutions, proper maintenance, insurances	1	0	5	
Demand risk	0	5	There is no off-taker of products	Long-term contract for RDF, better analysis of recycling market	1	0	5	
Operating costs overrun	0	5	The operating costs are over the planned budget, financial viability is threaten	Appropriate financial management and monitoring, measures to increase performance	2	0	10	
Payment risks	3	2	RLM not able to pay	To secure the funds for the payment, the Waste Unit (incl. its revenues) will be ring-fenced (currently 30% of the revenue being used in other areas) Improvement of the billing and fee collection, adjustment of tariffs on the base of real costs, guarantee to private party to pay, penalties, introduction of a gate fee at the Waterval Landfill	3	9	6	
Labour issues	0	5	Strike, accidents, etc.	Risk transfer to contractor in the contract, project management and monitoring applying valid labour praxises	2	0	10	
Revenue risks	0	5	Specific prices for outputs are lower than estimated	Long term agreement for RDF, better analysis and continous monitoring of recycling market, possibility to store outputs for the time of low prices	3	0	15	

Risk identification	Risk Ownership		Issues/ Impact	Mitigation Measures	Weighting		Score	
	RLM	Private Party			RLM	Private Party		
Operation Risks								
Contractual risks	3	2	Inconsistencies in the contract which become visible during the operation e.g. due to changing framework conditions	Experienced consultant, cross check of contract clauses, periodical review	2	6	4	
Changes in law	3	2	Legal requirements for the quality of the outputs might change during the operation period (e.g. higher emissions standards, even ban on utilisation of RDF, or in the contrast lower emissions/quality standards so that the supply of RDF is higher than the demand: lower revenues)	The contract shall allow flexible changes in the payment to adapt to the changing legal requirements Periodically review of the contract shall allow adjusting the contract before new regulations entered into force (in the transition phase)	1	3	2	
Political interference	4	1	Other objectives than the project are set by the politicians	Long term contract with clauses against political changes	1	4	1	
Termination by the private party	0	5	Termination of the contract for reason not listed in the contract	Experienced consultant, proven contract template with special conditions covering all cases of termination, penalties	1	0	5	
Termination by RLM	5	0	Termination of the contract for reason not listed in the contract	Experienced consultant, proven contract template with special conditions covering all cases of termination	1	5	0	
Force majeure	1	4	Occuring of unforeseen events	Proven force majeure clauses in the contract	2	2	8	
Total						99	216	
Share						31%	69%	

The shares of the risk score at the bottom of the table clearly show a substantial transfer of the risk to the private party with the envisaged project implementation structure.

2.9.2 Risk-adjusted Costs

The private party will be able to mitigate the risks better through managerial expertise, output oriented operation, optimized design and marketing of products, and better asset management. However, in order to cover the losses resulting from the risks mentioned above, the private party might consider higher prices for services offered. These risk costs are estimated for key categories in Table 31.

Table 31 Estimated risk costs of the private party

Risk category	Risk costs (additional costs)
Costs of risks related to design and construction	10% of the estimated design, construction, and procurement costs
Costs for sub-contractors to be contracted during the operation (e.g. in case of failure of own staff or work overload)	2.5% of the estimated total operating costs
Insurance costs for; buildings, stocks, machinery, comprehensive general liability, environmental liability, etc.	1.0% of the estimated total operating costs
Operational contingencies against O&M costs overruns	5.0% of the estimated total operating costs
Increased required return on equity	10% of the estimated profit for the private party
Increased cost of debt	0.5% of the outstanding amount of the loan

Particularly, at the beginning, the degree of uncertainties for the private party will be high since there is very limited experience with similar facilities in South Africa. It can be expected that the private operator might make a better estimate of risks after a couple of years of operation.

The main risk of the RLM which can be costed is the risk to meet the demand. As described in Chapter 2.4, the RLM might pay penalties, if the quantity and quality of the delivered waste is lower than agreed in the contract. In order to prevent paying penalties, the RLM might ask neighbouring municipalities to deliver their waste to the facility in RLM. In this case, the RLM might compensate the additional transport and disposal costs of these municipalities. Of course, this option is significant if the additional costs are less

than the penalties to be paid by the RLM. The respective assessment shall be made on a case by case basis. For the calculation purposes, it is assumed that the RLM shall pay the total amount of estimated fixed operating costs on an annual basis. This will not change the total costs to the municipality, but the specific costs per ton of treated and disposed waste.

In Table 32 the costs of the risk-adjusted external reference model are presented.

Table 32 Risk-adjusted investment costs over the planning horizon [ZAR]

Performance		Waste Quantity	Total	VAT	Total incl. VAT	Contingencies	Total incl. Contingencies
Year							
0	2016	0	R 160,158,941	R 22,422,251.75	R 182,581,193	R 18,258,119.29	R 200,839,312
1	2017	96,227 t	R 0	R 0	R 0	R 0	R 0
2	2018	100,430 t	R 0	R 0	R 0	R 0	R 0
3	2019	104,716 t	R 0	R 0	R 0	R 0	R 0
4	2020	109,080 t	R 0	R 0	R 0	R 0	R 0
5	2021	113,516 t	R 0	R 0	R 0	R 0	R 0
6	2022	118,017 t	R 0	R 0	R 0	R 0	R 0
7	2023	122,577 t	R 0	R 0	R 0	R 0	R 0
8	2024	127,187 t	R 0	R 0	R 0	R 0	R 0
9	2025	131,841 t	R 0	R 0	R 0	R 0	R 0
10	2026	136,528 t	R 38,395,775	R 5,375,408	R 43,771,183	R 4,377,118	R 48,148,301
11	2027	141,104 t	R 0	R 0	R 0	R 0	R 0
12	2028	145,691 t	R 22,632,226	R 3,168,512	R 25,800,737	R 2,580,074	R 28,380,811
13	2029	150,271 t	R 0	R 0	R 0	R 0	R 0
14	2030	154,337 t	R 0	R 0	R 0	R 0	R 0
15	2031	158,343 t	R 0	R 0	R 0	R 0	R 0
16	2032	162,279 t	R 0	R 0	R 0	R 0	R 0
17	2033	166,136 t	R 0	R 0	R 0	R 0	R 0
18	2034	169,903 t	R 0	R 0	R 0	R 0	R 0
19	2035	173,569 t	R 0	R 0	R 0	R 0	R 0
20	2036	177,127 t	R 0	R 0	R 0	R 0	R 0
Residual values			-R 83,302,549	-R 11,662,357	-R 94,964,906	-R 9,496,491	-R 104,461,397
Total		2,758,878 t	R 137,884,392	R 19,303,815	R 157,188,207	R 15,718,821	R 172,907,027
Net Present Value		966,319 t	R 151,496,344		R 174,682,062		R 193,561,861
			157 R/t		181 R/t		200 R/t

With the consideration of the risk costs, the specific investment costs will increase from R181 to R200 per tonne of waste treated.

Table 33 presents the risk-adjusted operating costs over the planning horizon. The net present value of all operating costs will be R683 million over 20 years of operation. The specific costs per tonne of waste input will be R707. Thus the total specific costs of the MT facility will be R922 per tonne of waste input at 6% inflation rate and 10% discount rate.

Table 33 Risk-adjusted operating costs over the planning horizon [ZAR]

Performance		Operating Expenditures								
Year	Waste Quantity	Staff Costs	Consumables	Maintenance Costs	Disposal costs	Miscellaneous costs	Risk Costs	RLM Administration Costs	Total	
0	2016	0							R 0	
1	2017	96,227 t	R 12,629,264	R 2,975,995	R 7,835,334	R 13,507,671	R 3,399,833	R 4,551,514	R 1,971,657	R 46,871,267
2	2018	100,430 t	R 13,565,672	R 3,292,286	R 8,305,454	R 14,975,291	R 3,607,629	R 4,826,876	R 2,137,778	R 50,710,986
3	2019	104,716 t	R 14,758,356	R 3,639,586	R 8,803,781	R 16,586,065	R 3,841,337	R 5,147,129	R 2,327,527	R 55,103,781
4	2020	109,080 t	R 16,045,325	R 4,019,673	R 9,332,008	R 18,351,961	R 4,090,379	R 5,497,791	R 2,533,279	R 59,870,416
5	2021	113,516 t	R 17,433,600	R 4,435,167	R 9,891,928	R 20,285,645	R 4,355,797	R 5,881,195	R 2,756,265	R 65,039,596
6	2022	118,017 t	R 19,208,877	R 4,889,794	R 10,485,444	R 22,400,626	R 4,653,549	R 6,326,955	R 3,012,069	R 70,977,313
7	2023	122,577 t	R 20,959,102	R 5,384,678	R 11,114,570	R 24,711,183	R 4,962,441	R 6,796,723	R 3,280,509	R 77,209,206
8	2024	127,187 t	R 22,723,492	R 5,923,849	R 11,781,445	R 27,232,592	R 5,284,660	R 7,296,317	R 3,564,647	R 83,807,003
9	2025	131,841 t	R 24,624,156	R 6,510,585	R 12,488,331	R 29,980,818	R 5,628,162	R 7,839,741	R 3,871,853	R 90,943,646
10	2026	136,528 t	R 26,671,095	R 7,148,339	R 13,237,631	R 32,972,697	R 5,994,354	R 8,430,160	R 4,203,794	R 98,658,070
11	2027	141,104 t	R 29,196,971	R 7,834,165	R 14,031,889	R 36,197,187	R 6,400,167	R 9,291,835	R 4,576,883	R 107,529,097
12	2028	145,691 t	R 31,823,290	R 8,576,672	R 14,873,802	R 39,697,096	R 6,826,335	R 9,987,654	R 4,974,459	R 116,759,308
13	2029	150,271 t	R 34,410,958	R 9,379,166	R 15,766,230	R 43,489,178	R 7,269,921	R 10,832,842	R 5,390,752	R 126,539,048
14	2030	154,337 t	R 37,194,583	R 10,212,120	R 16,712,204	R 47,413,493	R 7,738,305	R 11,590,516	R 5,828,371	R 136,689,592
15	2031	158,343 t	R 39,807,311	R 11,105,604	R 17,714,937	R 51,635,126	R 8,218,838	R 12,372,178	R 6,278,615	R 147,132,608
16	2032	162,279 t	R 43,205,539	R 12,067,054	R 18,777,833	R 56,171,221	R 8,757,916	R 13,272,943	R 6,791,544	R 159,044,050
17	2033	166,136 t	R 46,654,173	R 13,096,853	R 19,904,503	R 61,038,904	R 9,321,920	R 14,223,865	R 7,330,873	R 171,571,091
18	2034	169,903 t	R 49,907,264	R 14,197,579	R 21,098,773	R 66,256,096	R 9,901,756	R 15,203,687	R 7,885,411	R 184,450,565
19	2035	173,569 t	R 54,216,625	R 15,377,563	R 22,364,699	R 71,840,716	R 10,552,908	R 16,335,822	R 8,520,115	R 199,208,448
20	2036	177,127 t	R 57,979,557	R 16,634,814	R 23,706,581	R 77,811,578	R 11,209,429	R 17,468,317	R 9,155,008	R 213,965,285
Residual values										
Total		2,758,878 t	R 613,015,209	R 166,701,542	R 288,227,376	R 772,555,144	R 132,015,637			R 2,262,080,377

Net Present Value	966,319 t
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Net Present Value	R 683,142,032
Unit Cost	707 R/t

2.9.3 Project Financing

For the funding of the project, two scenarios have been considered:

1. Scenario 1: The SPV will fund the MBT project through a combination of debt and equity in an 80:20 ratio
2. Scenario 2: The initial investment costs will be financed by non-refundable grants (from the government and/or other national/international donors)

In both scenarios, the RLM will pay a unitary fee to the SPV for all services delivered. For the calculation of the unitary fee, the administration costs of the RLM are not considered. Thus the total costs will be as in Table 34.

Table 34 Expenditures over the planning horizon [ZAR]

Year	Waste Quantity	Total investment costs	Total operating costs	Total expenditures
	t/a	ZAR	ZAR	ZAR
2016	0	200,839,312	0	200,839,312
2017	96,227	0	44,899,610	44,899,610
2018	100,430	0	48,573,208	48,573,208
2019	104,716	0	52,776,254	52,776,254
2020	109,080	0	57,337,137	57,337,137
2021	113,516	0	62,283,331	62,283,331
2022	118,017	0	67,965,244	67,965,244
2023	122,577	0	73,928,697	73,928,697
2024	127,187	0	80,242,355	80,242,355
2025	131,841	0	87,071,793	87,071,793
2026	136,528	48,148,301	94,454,276	142,602,577
2027	141,104	0	102,952,214	102,952,214
2028	145,691	28,380,811	111,784,849	140,165,660
2029	150,271	0	121,148,296	121,148,296
2030	154,337	0	130,861,222	130,861,222
2031	158,343	0	140,853,993	140,853,993
2032	162,279	0	152,252,505	152,252,505
2033	166,136	0	164,240,218	164,240,218
2034	169,903	0	176,565,154	176,565,154
2035	173,569	0	190,688,333	190,688,333
2036	177,127	-104,461,397	204,810,276	100,348,879
Total	2,758,878	172,907,027	2,165,688,967	2,338,595,995
NPV	966,319	193,561,861	654,098,311	847,660,171
DUC		200	677	877

The total present value of all investments and operational expenditures is then R847 million. This amount includes the residual value of the investments after the end of the operation period as well.

2.9.3.1 Scenario 1: Private Financing

As already mentioned, in scenario 1 the project will be funded through a combination of debt and equity in a 80:20 ratio as presented in Table 35.

Table 35 Scenario 1: Financing structure of the investments

	Total	Main Loan	Equity Financing
		80%	20%
2016	200,839,312	161,073,128	40,167,862
2017	0	0	0
2018	0	0	0
2019	0	0	0
2020	0	0	0
2021	0	0	0
2022	0	0	0
2023	0	0	0
2024	0	0	0
2025	0	0	0
2026	48,148,301	38,614,938	9,629,660
2027	0	0	0
2028	28,380,811	22,761,410	5,676,162
2029	0	0	0
2030	0	0	0
2031	0	0	0
2032	0	0	0
2033	0	0	0
2034	0	0	0
2035	0	0	0
2036	0	0	0
Total	277,368,425	222,449,476	55,473,685
NPV	207,677,789	166,557,587	41,535,558

Before determining the amount of unitary fee, the loan costs must be added to the total expenditures above. These are given in Table 36.

Table 36 Scenario 1: Loan costs over the planning horizon [ZAR]

Year	Repayment	End of year	Interest @13.00%	Commitment Fee @0.25%	Debt Service Payment
2016	0	161,073,128	0	401,679	401,679
2017	8,053,656	153,019,472	20,939,507	0	28,993,163
2018	8,053,656	144,965,816	19,892,531	0	27,946,188
2019	8,053,656	136,912,159	18,845,556	0	26,899,212
2020	8,053,656	128,858,503	17,798,581	0	25,852,237
2021	8,053,656	120,804,846	16,751,605	0	24,805,262
2022	8,053,656	112,751,190	15,704,630	0	23,758,286
2023	8,053,656	104,697,533	14,657,655	0	22,711,311
2024	8,053,656	96,643,877	13,610,679	0	21,664,336
2025	8,053,656	88,590,221	12,563,704	0	20,617,360
2026	8,053,656	119,151,502	11,516,729	96,297	19,666,682
2027	11,915,150	107,236,352	15,489,695	0	27,404,845
2028	11,915,150	118,082,612	13,940,726	56,762	25,912,638
2029	14,760,326	103,322,285	15,350,740	0	30,111,066
2030	14,760,326	88,561,959	13,431,897	0	28,192,224
2031	14,760,326	73,801,632	11,513,055	0	26,273,381
2032	14,760,326	59,041,306	9,594,212	0	24,354,539
2033	14,760,326	44,280,979	7,675,370	0	22,435,696
2034	14,760,326	29,520,653	5,756,527	0	20,516,854
2035	14,760,326	14,760,326	3,837,685	0	18,598,011
2036	14,760,326	0	1,918,842	0	16,679,169
Total	222,449,476		260,789,926	554,737	483,794,139
NPV	75,045,107		118,966,223	415,356	194,426,686

The loans to finance the follow-up investments will be repaid within the operation lifetime of the facility.

The dividends will be paid out with the residual earnings on a yearly basis. Also under the considerations of the targets set for B-BBEE, it is assumed that 16.5% of the equity investment will be paid to the shareholders annually as dividends. Dividends are subject to the dividends tax in the amount of 15%, thus the SPV will withhold 15% of the dividends to be paid to SARS (South Africa Revenue Service). Consequently the net profit of the shareholders will be about 15% (Table 37).

Table 37 Scenario 1: Dividends to be paid to the equity investors

Year	Dividends	Dividends Tax	Net Dividends
2017	6,627,697	994,155	5,633,543
2018	6,627,697	994,155	5,633,543
2019	6,627,697	994,155	5,633,543
2020	6,627,697	994,155	5,633,543
2021	6,627,697	994,155	5,633,543
2022	6,627,697	994,155	5,633,543
2023	6,627,697	994,155	5,633,543
2024	6,627,697	994,155	5,633,543
2025	6,627,697	994,155	5,633,543
2026	6,627,697	994,155	5,633,543
2027	8,216,591	1,232,489	6,984,103
2028	8,216,591	1,232,489	6,984,103
2029	9,153,158	1,372,974	7,780,184
2030	9,153,158	1,372,974	7,780,184
2031	9,153,158	1,372,974	7,780,184
2032	9,153,158	1,372,974	7,780,184
2033	9,153,158	1,372,974	7,780,184
2034	9,153,158	1,372,974	7,780,184
2035	9,153,158	1,372,974	7,780,184
2036	9,153,158	1,372,974	7,780,184
Total	155,935,420	23,390,313	132,545,107
NPV	56,164,956	8,424,743	47,740,212

The after tax profit of the SPV is assumed to be 20% of the total expenditures before debt service and dividends payments. On this basis, the unitary fee has been determined. After five years of constant rate, the unitary fee will be increased by 6% annually (assumed average inflation rate over the planning horizon). The development of the unitary fee and the cash flow over the planning horizon are presented in Table 38. The column “cash-in” includes the unitary fee paid by RLM, the revenues from the marketing of outputs, and the loans/equity financing of the investments.

Table 38 Scenario 1: Cash flow before debt service and dividends payments

Year	Waste Quantity	Unitary Fee	Cash-in				Cash-out	Balance
			Revenues from Unitary Fee	Revenues from sales	Investment Financing	Total Cash-in		
	t/a	R/t	R/a	R/a	R/a	R/a	R/a	R/a
2016	0		0	0	200,839,312	200,839,312	200,839,312	0
2017	96,227	660	63,510,091	17,731,988	0	81,242,079	44,899,610	36,342,469
2018	100,430	660	66,283,548	19,572,186	0	85,855,733	48,573,208	37,282,525
2019	104,716	660	69,112,238	21,584,905	0	90,697,143	52,776,254	37,920,889
2020	109,080	660	71,992,573	23,783,965	0	95,776,539	57,337,137	38,439,402
2021	113,516	660	74,920,355	26,183,937	0	101,104,291	62,283,331	38,820,960
2022	118,017	700	82,564,746	28,800,302	0	111,365,048	67,965,244	43,399,804
2023	122,577	742	90,899,824	31,649,371	0	122,549,195	73,928,697	48,620,498
2024	127,187	786	99,978,059	34,748,525	0	134,726,583	80,242,355	54,484,228
2025	131,841	833	109,854,118	38,115,856	0	147,969,974	87,071,793	60,898,182
2026	136,528	883	120,585,510	41,770,367	48,148,301	210,504,178	142,602,577	67,901,601
2027	141,104	936	132,104,913	45,642,269	0	177,747,182	102,952,214	74,794,968
2028	145,691	992	144,582,872	49,827,489	28,380,811	222,791,171	140,165,660	82,625,511
2029	150,271	1,052	158,076,227	54,343,796	0	212,420,023	121,148,296	91,271,727
2030	154,337	1,115	172,094,393	59,019,066	0	231,113,460	130,861,222	100,252,238
2031	158,343	1,182	187,154,852	64,031,296	0	251,186,148	140,853,993	110,332,154
2032	162,279	1,253	203,316,231	69,398,699	0	272,714,930	152,252,505	120,462,425
2033	166,136	1,328	220,636,865	75,139,335	0	295,776,200	164,240,218	131,535,981
2034	169,903	1,408	239,177,792	81,272,081	0	320,449,873	176,565,154	143,884,719
2035	173,569	1,492	258,999,818	87,815,685	0	346,815,503	190,688,333	156,127,169
2036	177,127	1,582	280,166,804	94,789,833	0	374,956,638	100,348,879	274,607,758
Total	2,758,878		2,846,011,827	965,220,951	277,368,425	4,088,601,202	2,338,595,995	1,750,005,207
NPV	966,319		851,178,815	285,012,408	207,677,789	1,343,869,012	847,660,171	496,208,840

The unitary fee will increase from R660 to R1,582 per tonne of waste delivered to the facility. Taking the residual value of the facility at the end and the revenues from marketing of the outputs into consideration, the present value of all payments of the RLM to the SPV will be R837 million. The average incremental cost to RLM will be R866 per tonne of waste.

The net present value of the cash flow will be R462 million at the end of the operation period. Under consideration of the equity payments, the debt service cover ratio is 1.98.

The cash flow after financing is presented in Table 39. Since the dividends are to be taxed only once (with the dividends tax), the taxable income is calculated after deduction of the dividends. The present value of the total profit of the SPV after-tax will be R166 million after 20 years of operation. With the R47 million dividends paid to the shareholders, the facility will make a net profit of R214 million.

It is assumed that the facility will be transferred to the RLM after the end of the operation period. Therefore, the residual value of the facility is not considered by calculating the profit and dividends.

Table 39 Scenario 1: Cash flow after financing and net profit of the SPV [ZAR]

Year	Cash-in	Cash-out	Balance	Dividends	Taxable income	Income tax	Net Profit
2016	201,240,991	201,240,991	0	0	0	0	0
2017	81,242,079	73,892,773	7,349,306	6,627,697	721,608	202,050	519,558
2018	85,855,733	76,519,396	9,336,337	6,627,697	2,708,640	758,419	1,950,221
2019	90,697,143	79,675,467	11,021,676	6,627,697	4,393,979	1,230,314	3,163,665
2020	95,776,539	83,189,374	12,587,165	6,627,697	5,959,468	1,668,651	4,290,817
2021	101,104,291	87,088,593	14,015,698	6,627,697	7,388,001	2,068,640	5,319,360
2022	111,365,048	91,723,531	19,641,518	6,627,697	13,013,820	3,643,870	9,369,951
2023	122,549,195	96,640,009	25,909,186	6,627,697	19,281,489	5,398,817	13,882,672
2024	134,726,583	101,906,691	32,819,892	6,627,697	26,192,195	7,333,815	18,858,380
2025	147,969,974	107,689,153	40,280,821	6,627,697	33,653,124	9,422,875	24,230,249
2026	210,600,474	162,269,259	48,331,216	6,627,697	41,703,518	11,676,985	30,026,533
2027	177,747,182	130,357,060	47,390,122	8,216,591	39,173,531	10,968,589	28,204,942
2028	222,847,933	166,078,298	56,769,635	8,216,591	48,553,044	13,594,852	34,958,192
2029	212,420,023	151,259,362	61,160,661	9,153,158	52,007,503	14,562,101	37,445,402
2030	231,113,460	159,053,445	72,060,014	9,153,158	62,906,856	17,613,920	45,292,936
2031	251,186,148	167,127,374	84,058,773	9,153,158	74,905,615	20,973,572	53,932,043
2032	272,714,930	176,607,044	96,107,886	9,153,158	86,954,728	24,347,324	62,607,404
2033	295,776,200	186,675,915	109,100,285	9,153,158	99,947,127	27,985,196	71,961,932
2034	320,449,873	197,082,008	123,367,865	9,153,158	114,214,707	31,980,118	82,234,589
2035	346,815,503	209,286,345	137,529,158	9,153,158	128,376,000	35,945,280	92,430,720
2036	374,956,638	221,489,445	153,467,192	9,153,158	144,314,034	40,407,930	103,906,105
Total	4,089,155,939	2,926,851,531	1,162,304,408	155,935,420	1,006,368,988	281,783,317	724,585,672
NPV	1,344,284,367	1,056,202,786	288,081,582	56,164,956	231,916,626	64,936,655	166,979,971

2.9.3.2 Scenario 2: Grant Financing

As the unitary fee in the first scenario is much higher than the expected affordability level of the RLM, a second scenario with consideration of a grant funding for the initial investments has been developed. The grant shall be in the form of a non-refundable direct grant from the South African Government and/or national/international donors.

The follow-up investments after 10 and 12 years of operation start shall be financed by the private party with loans under the same conditions as described in the Scenario 1. The financing structure is given in Table 40 with loan costs over the planning horizon presented in Table 41.

Table 40 Scenario 2: Financing structure of the investments

	Total	Loan Financing by Private Party	Grant Financing
2016	200,839,312	0	200,839,312
2017	0	0	0
2018	0	0	0
2019	0	0	0
2020	0	0	0
2021	0	0	0
2022	0	0	0
2023	0	0	0
2024	0	0	0
2025	0	0	0
2026	48,148,301	48,148,301	0
2027	0	0	0
2028	28,380,811	28,380,811	0
2029	0	0	0
2030	0	0	0
2031	0	0	0
2032	0	0	0
2033	0	0	0
2034	0	0	0
2035	0	0	0
2036	0	0	0
Total	277,368,425	76,720,435	200,839,312
NPV	207,677,789	25,159,337	182,581,193

Table 41 Scenario 2: Loan costs over the planning horizon [ZAR]

Year	Repayment	End of year	Interest @13.00%	Commitment Fee @0.25%	Debt Service Payment
2016	0	0	0	0	0
2017	0	0	0	0	0
2018	0	0	0	0	0
2019	0	0	0	0	0
2020	0	0	0	0	0
2021	0	0	0	0	0
2022	0	0	0	0	0
2023	0	0	0	0	0
2024	0	0	0	0	0
2025	0	0	0	0	0
2026	0	48,268,672	0	120,371	120,371
2027	4,826,867	43,441,805	6,274,927	0	11,101,795
2028	4,826,867	67,066,701	5,647,435	70,952	10,545,254
2029	8,383,338	58,683,363	8,718,671	0	17,102,009
2030	8,383,338	50,300,026	7,628,837	0	16,012,175
2031	8,383,338	41,916,688	6,539,003	0	14,922,341
2032	8,383,338	33,533,350	5,449,169	0	13,832,507
2033	8,383,338	25,150,013	4,359,336	0	12,742,673
2034	8,383,338	16,766,675	3,269,502	0	11,652,839
2035	8,383,338	8,383,338	2,179,668	0	10,563,005
2036	8,383,338	0	1,089,834	0	9,473,171
Total	76,720,435	393,510,630	51,156,382	191,323	128,068,140
NPV	15,891,251		12,048,512	62,741	28,002,505

The after tax profit of the SPV is assumed to be 20% of the total expenditures before debt service (without initial investments). On this basis, the unitary fee has been determined. Since the expenditures at the beginning will be low due to missing debt service payments, the start amount of the unitary fee is only R370 per tonne of waste. The unitary fee will be increased by 6% annually (assumed average inflation rate over the planning horizon). The development of the unitary fee and the cash flow over the planning horizon are presented in Table 42. The column “cash-in” includes the unitary fee paid by RLM, the revenues from the marketing of outputs, and the loans/grant financing of the investments.

Table 42 Scenario 2: Cash flow before debt service and dividends payments

Year	Waste Quantity	Unitary Fee	Cash-in				Cash-out	Balance
			Revenues from Unitary Fee	Revenues from sales	Investment Financing	Total Cash-in		
	t/a	R/t	R/a	R/a	R/a	R/a	R/a	R/a
2016	0		0	0	200,839,312	200,839,312	200,839,312	0
2017	96,227	370	35,604,142	17,731,988	0	53,336,130	44,899,610	8,436,520
2018	100,430	392	39,388,496	19,572,186	0	58,960,682	48,573,208	10,387,473
2019	104,716	416	43,533,589	21,584,905	0	65,118,494	52,776,254	12,342,240
2020	109,080	441	48,068,778	23,783,965	0	71,852,743	57,337,137	14,515,607
2021	113,516	467	53,025,048	26,183,937	0	79,208,985	62,283,331	16,925,654
2022	118,017	495	58,435,383	28,800,302	0	87,235,686	67,965,244	19,270,442
2023	122,577	525	64,334,553	31,649,371	0	95,983,925	73,928,697	22,055,227
2024	127,187	556	70,759,694	34,748,525	0	105,508,219	80,242,355	25,265,864
2025	131,841	590	77,749,498	38,115,856	0	115,865,354	87,071,793	28,793,561
2026	136,528	625	85,344,664	41,770,367	48,148,301	175,263,332	142,602,577	32,660,755
2027	141,104	663	93,497,547	45,642,269	0	139,139,817	102,952,214	36,187,602
2028	145,691	702	102,328,851	49,827,489	28,380,811	180,537,150	140,165,660	40,371,490
2029	150,271	745	111,878,803	54,343,796	0	166,222,599	121,148,296	45,074,303
2030	154,337	789	121,800,192	59,019,066	0	180,819,258	130,861,222	49,958,036
2031	158,343	837	132,459,265	64,031,296	0	196,490,560	140,853,993	55,636,567
2032	162,279	887	143,897,517	69,398,699	0	213,296,216	152,252,505	61,043,711
2033	166,136	940	156,156,234	75,139,335	0	231,295,569	164,240,218	67,055,351
2034	169,903	996	169,278,617	81,272,081	0	250,550,698	176,565,154	73,985,544
2035	173,569	1,056	183,307,700	87,815,685	0	271,123,385	190,688,333	80,435,051
2036	177,127	1,119	198,288,682	94,789,833	0	293,078,515	100,348,879	192,729,636
Total	2,758,878		1,989,137,253	965,220,951	277,368,425	3,231,726,629	2,338,595,995	893,130,634
NPV	966,319		583,581,639	285,012,408	207,677,789	1,076,271,836	847,660,171	228,611,665

Taking the residual value of the facility at the end and the revenues from marketing of the outputs into consideration, the present value of the total payments of the RLM to the SPV will be R569 million. The average incremental cost to RLM will be R589 per tonne of waste which means a 32% reduction compared to the Average Incremental Cost (AIC) of Scenario 1. The net present value of the net cash flow will be R228 million at the end of the operation period. In this scenario, the costs of the risks “increased required return on equity” and increased cost of debt” are not considered since the investments to be made by the private party are marginal.

The present value of the total profit of the SPV after-tax will be R134 million after 20 years of operation (Table 43). Compared to the net profit of the first scenario, this is about 37% less.

Table 43 Scenario 2: Cash flow after financing and net profit of the SPV [ZAR]

Year	Cash-in	Cash-out	Balance (Taxable Income)	Income tax	Net Profit
2016	200,839,312	200,839,312	0	0	0
2017	53,336,130	44,899,610	8,436,520	2,362,226	6,074,294
2018	58,960,682	48,573,208	10,387,473	2,908,493	7,478,981
2019	65,118,494	52,776,254	12,342,240	3,455,827	8,886,413
2020	71,852,743	57,337,137	14,515,607	4,064,370	10,451,237
2021	79,208,985	62,283,331	16,925,654	4,739,183	12,186,471
2022	87,235,686	67,965,244	19,270,442	5,395,724	13,874,718
2023	95,983,925	73,928,697	22,055,227	6,175,464	15,879,764
2024	105,508,219	80,242,355	25,265,864	7,074,442	18,191,422
2025	115,865,354	87,071,793	28,793,561	8,062,197	20,731,364
2026	175,383,703	142,722,948	32,660,755	9,145,011	23,515,744
2027	139,139,817	114,054,009	25,085,808	7,024,026	18,061,781
2028	180,608,102	150,710,914	29,897,188	8,371,213	21,525,976
2029	166,222,599	138,250,304	27,972,295	7,832,242	20,140,052
2030	180,819,258	146,873,397	33,945,861	9,504,841	24,441,020
2031	196,490,560	155,776,334	40,714,226	11,399,983	29,314,243
2032	213,296,216	166,085,012	47,211,204	13,219,137	33,992,067
2033	231,295,569	176,982,892	54,312,678	15,207,550	39,105,128
2034	250,550,698	188,217,993	62,332,705	17,453,157	44,879,547
2035	271,123,385	201,251,339	69,872,046	19,564,173	50,307,873
2036	293,078,515	214,283,448	78,795,067	22,062,619	56,732,448
Total	3,231,917,952	2,571,125,532	660,792,420	185,021,878	475,770,542
NPV	893,753,385	707,197,412	186,555,973	52,235,672	134,320,301

Part 3 Qualitative Considerations

Creation of additional employment opportunities as a result of new economic development is of high importance for the RLM and is given highest priority. In this respect, the existing staff complement of the RLM will not be affected by the new facility. On the contrary, the new facility will create new jobs, during the construction as well as during the operational phases.

As shown in the service delivery option analysis, the implementation of the project through a PPP is the most suitable option. Thus, a significant amount of private funding will be mobilised to deliver a municipality activity. The major risks will be transferred to the private party. The project will assist to accomplish strategic national, provincial and municipal solid waste targets. It will contribute to the development of solid waste cost centres and the ring-fencing of the function within the municipality.

With the implementation of the project, the lifespan of the Waterval landfill will be prolonged considerably. It is expected that within the value chain of the recycling business additional economic activity will be stimulated, for example, for processing of recovered materials. For this purpose a buffer zone around the Waterval landfill has been defined.

In order to protect resources and reduce greenhouse gas emissions there is a global move for the development of renewable energy sources. In South Africa, as well, there is pressure to consider alternative energy sources. Energy from waste, which currently is scarcely exploited, could be one important source. In this regard, the industrial use of RDF offers benefits both in terms of greenhouse gases and coal mining related impacts.

Other than in Europe, in South Africa currently, there is very limited use of refuse derived fuel. Good quality RDF has a heating value similar to lignite coal. Furthermore, the energetic utilization of RDF has clearly a better CO₂ balance than the incineration of fossil fuels. The use of RDF in the cement industry is one of the most attractive options. Compared to the use of RDF in other furnaces, very high temperatures in rotary kilns for cement production offer clear advantages with regard to emission control. Product specific wastes have limited application because the fuel ashes are incorporated into the clinker. The cement industry has a very high energy demand and there are several cement kilns in close proximity to Rustenburg. In some European countries alternative fuels already make up more than 50 % of the overall fuel consumption in the cement industry.

Part 4 Sensitivity Analysis

The key parameters and their low, default and high values considered for the sensitivity analysis are listed in Table 44. The better and poorer values are estimated on the base of historical lows and highs and probability of occurrence considering similar projects.

Table 44 Key parameters and better, default and poorer values (tpa = tonnes/annum)

Parameter	Better Value	Default Value	Poorer Value
Inflation rate	5%	6%	8%
Discount rate	7%	10%	12%
Construction costs	-5%	Per calculation	15%
Operating costs	-5%	Per calculation	10%
Waste quantities	10%	82,000 tpa in the first year	-20%
Prices for outputs (recyclables and RDF)	5%	Average price Recyclables and RDF	-15%

The changes in the waste composition, another key parameter, are accounted for by the last parameter in the table; if the delivered waste includes different amounts of recyclables or combustible materials, the revenues will differ accordingly.

In the first instance (Scenario 1), the low and high value of each parameter are compared with the default value used in the report. The resulting average incremental costs are presented in Figure 8.

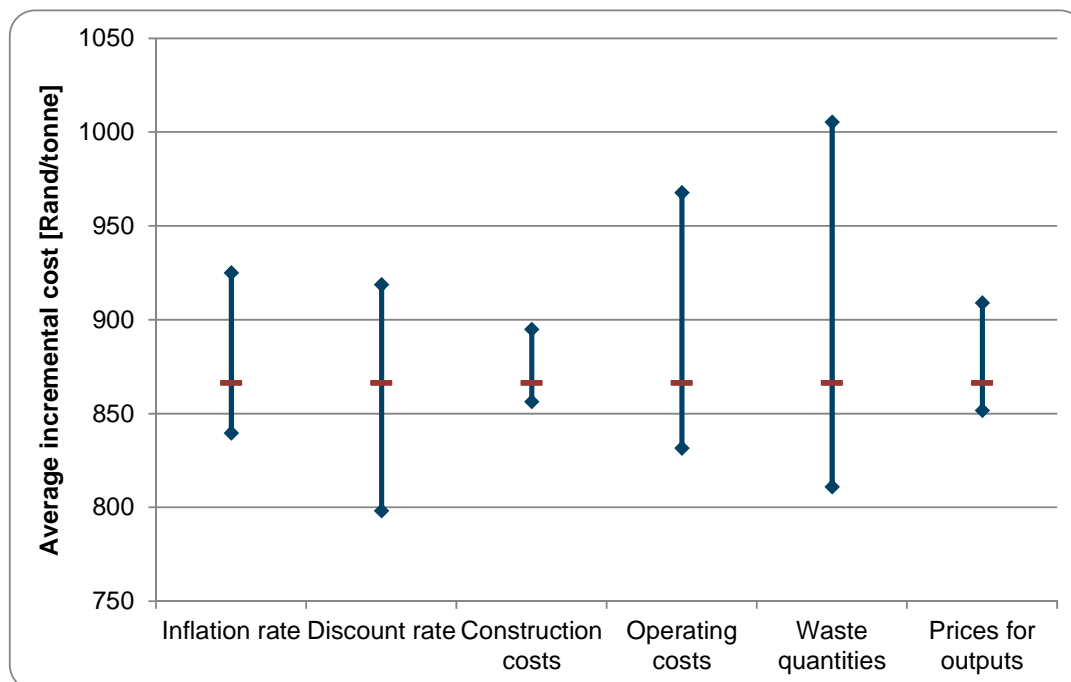


Figure 8 Scenario 1: Changes in the sensitivity parameters with better and poorer values

The most important parameter is the “waste quantity” followed by “operating costs”. A decrease of 20% in waste quantities would mean an increase of 16% in the AIC, although the total present value of the payments to the SPV would remain almost unchanged.

In Scenario 2, the parameter “construction costs” has almost no effect on the AIC and present value of total payments, since the initial investments should be financed by non-refundable grants. Apart from that, the average specific costs are very sensible to the changes in the operating costs and waste quantities as presented in Figure 9. An increase of 10% in the operating costs would cause an increase of 17% in the AIC and present value of payments. 20% less waste deliveries would make a difference of 15% increase to the average incremental cost.

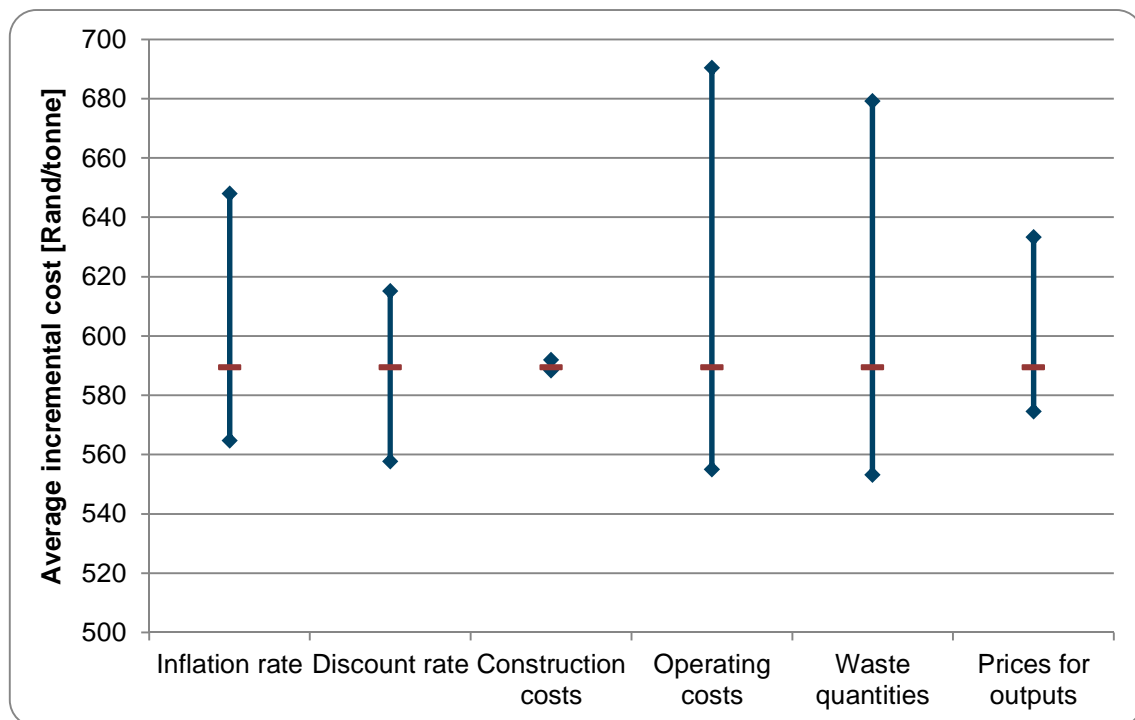


Figure 9 Scenario 2: Changes in the sensitivity parameters with better and poorer values

The parameters inflation rate, discount rate, waste quantities, and prices for outputs are considered together in a worst and best case since changes in these parameters at the same time are most likely. Figure 10 shows the results of this assessment for both scenarios.

In a worst case, the AIC in Scenario 1 and Scenario 2 might increase to R1,172 and R817 per tonne respectively. This means an increase of 35% and 39% compared to the results

with default values. The best case scenario resulted with R709 and R483 per tonne. In both financing scenarios, the decrease would be 18%.

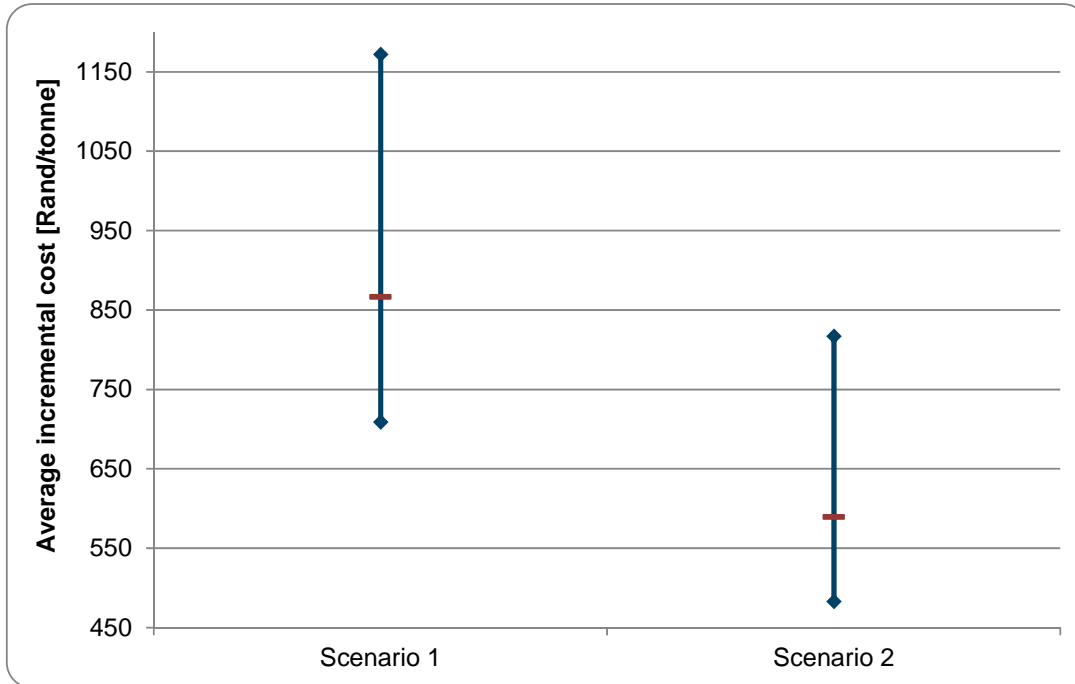


Figure 10 AIC for worst and best case for the Scenarios 1 and 2

Part 5 Affordability

5.1 Municipal Budget Available for the Project

The Rustenburg Local Municipality faced financial challenges during the last years because of several reasons¹⁷;

- High unemployment rate of 21% of population in productive age group
- High dependency on the mining sector, strikes and job cuts negatively impacts the municipality's economy
- Dependency of the municipality on grant funding and external financing to fund its capital infrastructure
- Supply of water at high costs during the drought and consequently reduction in revenues for water
- High salary costs that does not translate in economic efficiency of the unit and municipality
- Limited scope for diversifying local economy that leads to limited room for improving revenue enhancement
- Gross monthly increase in consumer debtors due to non-payment for services.

Accordingly, the financial situation of the RLM is not good at the moment. The consolidated overview of the 2016/2017 MTREF is given in Table 45.

Table 45 Consolidated overview of 2016/2017 MTREF¹⁸

Description	2015/2016	2016/17 Medium Term Revenue & Expenditure Framework		
		Adjusted Budget	Budget Year 2016/17	Budget Year 2017/18
R thousand				
Total Revenue (excl. capital transfers and contributions)	3,682,471	4,033,495	4,448,892	4,787,131
Total Expenditure	3,522,473	3,868,286	4,257,066	4,554,333
Surplus/(Deficit)	159,998	165,208	191,826	232,798
Total Capital Expenditure Standard	1,042,393	486,873	575,952	547,394

¹⁷ As listed in the 2016/2017 MTREF explanation by the Directorate: Budget and Treasury Office of the RLM

¹⁸ Directorate: Budget and Treasury Office of RLM

As can be seen, the capital expenditures have been cut by more than half. In the MTREF it is also stated that no budget will be allocated for externally funded projects and capital projects unless it is included in the Integrated Development Plan (IDP). For the waste infrastructure, no capital budget is foreseen in the MTREF.

In contrast to the other services, the waste management division has generated a surplus (except for the financial year 2014/15) during the last years. As presented in Table 46, a surplus is expected in the coming years as well. The continuous generation of surplus is secured with the introduction of the waste management tariff policy that outlines the cost to be mapped against the tariff required to reflect the true costs of rendering the service.

Table 46 Revenue and expenditure of Waste Management Unit of RLM

Standard Classification Description		Revenues Waste	Expenditures Waste	Surplus/ (Deficit)
2012/13	Audited Outcome	117,952,275	75,706,677	42,245,598
2013/14	Audited Outcome	219,863,089	186,733,364	33,129,725
2014/15	Audited Outcome	140,161,884	166,189,167	-26,027,283
Current Year 2015/16	Original Budget	164,022,262	110,139,516	53,882,746
	Adjusted Budget	170,142,262	120,939,516	49,202,746
	Full Year Forecast	170,142,262	120,939,516	49,202,746
2016/17 Medium Term Revenue & Expenditure Framework	Budget Year 2016/17	186,905,525	131,645,860	55,259,665
	Budget Year +1 2017/18	205,078,145	137,555,854	67,522,291
	Budget Year +2 2018/19	214,308,222	180,863,334	33,444,887

The surplus generated by the waste management services makes up about one third of the municipality's total surplus, although the waste management revenues are only 4.6% of the total revenues of the RLM. In this respect, if ring fenced, a considerable amount of revenues would be available for the MBT facility.

The operational revenues, generated by the marketing of recyclables, compost and RDF, have been already considered for the calculation of the unitary fee, as the marketing will be the responsibility of the SPV. The revenues given above are used to cover the costs of disposal as well as other waste management services like waste collection and street

cleaning. For this reason, it was already stated that the revenue budget allocated to waste disposal shall be a maximum of 30% of the budget.

Furthermore, the low quality part of the waste delivered to the facility will be sent directly to the landfill without being treated at the MBT facility. The available administrative revenues as given in Chapter 2.3.9 will be used to cover the disposal costs of these materials as well. The present value of these disposal costs will be R105 million over 20 years of operation. Also the administration costs of the RLM (see Table 28) to manage the project shall be deducted from the available budget.

In Table 47, the payments to the SPV in the two previously described scenarios are compared to the available net municipal budget.

Table 47 Comparison of the calculated unitary fee payments with the budget [ZAR]

Year	Total Net Potential Administrative Revenues	Payment to the SPV in Scenario 1		Payment to the SPV in Scenario 2	
2017	186,072,672	63,510,091	34%	35,604,142	19%
2018	197,259,479	66,283,548	34%	39,388,496	20%
2019	214,637,683	69,112,238	32%	43,533,589	20%
2020	231,965,604	71,992,573	31%	48,068,778	21%
2021	251,501,988	74,920,355	30%	53,025,048	21%
2022	270,925,666	82,564,746	30%	58,435,383	22%
2023	291,888,944	90,899,824	31%	64,334,553	22%
2024	313,984,293	99,978,059	32%	70,759,694	23%
2025	336,317,075	109,854,118	33%	77,749,498	23%
2026	360,265,362	120,585,510	33%	85,344,664	24%
2027	385,962,714	132,104,913	34%	93,497,547	24%
2028	413,528,732	144,582,872	35%	102,328,851	25%
2029	443,109,408	158,076,227	36%	111,878,803	25%
2030	474,817,465	172,094,393	36%	121,800,192	26%
2031	508,847,196	187,154,852	37%	132,459,265	26%
2032	545,319,144	203,316,231	37%	143,897,517	26%
2033	584,452,541	220,636,865	38%	156,156,234	27%
2034	626,455,110	239,177,792	38%	169,278,617	27%
2035	671,472,736	258,999,818	39%	183,307,700	27%
2036	719,888,865	280,166,804	39%	198,288,682	28%
Total	8,028,672,678	2,846,011,827	35%	1,989,137,253	25%
PV	2,495,256,993	851,178,815	34%	583,581,639	23%

Considering the present values of the payments and the revenues, 34% and 23% of the revenues will be used to make the payments to the SPV in Scenario 1 (Section 2.9.3.1) and Scenario 2 (Section 2.9.3.2) respectively. Since particularly towards the end of the project lifetime, the share of revenues used for the MBT facility will considerably exceed the limit of 30%, Scenario 1 with the private financing of the envisaged facility will not be affordable to the municipality.

The average incremental value of the total available revenues (max. 30% of total net revenues) is R775 per tonne of waste. The sensitivity analysis showed that the AIC in Scenario 1 will not drop below this figure by individually adjusting parameters. On the contrary, in Scenario 2, the lower impacts on the sensitivity parameters, suggest that the calculated costs have lower uncertainty.

Under the pre-requisite that the Waste Unit will be ring-fenced and the waste management revenues will be used only to cover the costs of waste management services, the RLM will be able to afford the payment of the unitary fee in Scenario 2 (grant financing of initial investment).

Part 6 Initial Value-for-Money Test

After finalising the construction of the risk-adjusted external reference model and the analysis of the sensitivity and assessment of the affordability, the model has been checked regarding output specifications, consideration of all related costs including for BEE, risks, and all assumptions used in the model.

The value for money of the envisaged project has been assessed by applying the discounted cash flow model. On the base of a certain profit rate for the private party, the unitary fee to be paid by RLM per tonne of delivered waste to the MBT facility has been identified.

The present value (PV) of the costs to the RLM in two different scenarios, S1: private financing, S2: grant financing of initial investments, has been calculated and compared to each other.

This assessment has shown that a mix of a loan and equity financing would cost the municipality 47% more than the costs of the second scenario with grant financing of initial investments. Furthermore, the payments exceed the available budget by 30% of the total potential administrative revenues. Thus the affordability for the first scenario could not be demonstrated.

The second scenario with grant financing of the initial investments would be affordable to the RLM under the following conditions:

- RLM Waste Unit is ring-fenced and all revenues are used for waste management purposes
- RLM continues to improve the fee collection and billing
- RLM continues to increase the fees and introduce the gate fees at the new landfill and MBT facility
- RLM makes use of the great potential to improve efficiencies in the waste collection and street cleaning services and thus reduce these costs
- If the costs of other services cannot be reduced through performance improvement measures, the governmental grants, LGES or others, are available in future
- RLM ensures that the waste quantity actually delivered to the facility is equal or higher than the assumed waste quantity in this report.

If realised, the value for money for RLM would be:

- About 25% of the waste will be diverted from landfilling, this means approx. 690,000 tonnes of waste will be converted to RDF, secondary raw materials and compost over 20 years
- The utilisation of RDF at cement plants will reduce the consumption of fossil fuels, the recyclable materials segregated from the municipal waste will save natural resources, and the compost made from garden waste will replace the use of fertiliser in agriculture
- The present value of total savings due to diversion will be R83 million
- The present residual value of the facility will be R14 million at the end of the contracting period
- On average 162 jobs will be created during the operation period. A number of temporary jobs will be created during the construction of the facility
- About 723,000 tCO₂e will be avoided, the potential revenues of which are not considered in the cost calculation because of uncertainties in the carbon market. This is about R28 million at the present value
- In addition to creating jobs, the PPP model will facilitate the achievement of B-BBEE targets
- Besides direct jobs, indirect jobs related to recycling activities will be created around the facility and in Rustenburg
- The major part of the risks will be transferred to the private party

The service delivery option analysis showed clearly that the project cannot be realised by the municipality and the realisation through a PPP has several advantages. The test of the initial value-for-money as discussed above shows the realisation of the project will have clear benefits for the Rustenburg Local Municipality. However, further assessment regarding the feasibility and value for money need to be done once the grant funding has been secured and offers from the interested private parties have been received.

6.1 Assessment of the BEE Value for Money

The BEE assessment shall be included in the procurement process as described in Chapter 2.5. At the same time, BEE should be an integral part of the PPP contract so that the SPV may fulfil all requirements of BEE for the authorisation of the licenses and permissions to be required to implement and operate the envisaged MBT facility.

This Project is designed, and proactively seeks, to produce positive local socio-economic impact in any way that is appropriate to the project and its location. Commitment to local development will result in poverty alleviation, thereby contributing to development

objectives. This development must be sustainable in order to have a long-term and meaningful impact.

During the construction and operation phase new skills will be brought to South Africa and new job opportunities will be created. Employment will be created within the Rustenburg District and Historically Disadvantage Individuals will benefit from these opportunities.

The project will facilitate the establishment of SMME's, with the intention to enhance local job creation, skills development and increase economic participation of Black Owned enterprises in the regional integrated management of waste.

Part 7 Verify Information and Sign Off

7.1 Verification of the Information Used in the Feasibility Study

7.1.1 Data Reliability

The conclusions of this value assessment report are highly dependent on the quality and accuracy of the information they are based on. The Consultant has determined the base data with particular care. Since no similar project has been implemented in South Africa yet, some of the costs are based on best estimates with adjusted prices from Europe or elsewhere with similar framework conditions. For the costs of the services and works, e.g. construction works, available in South Africa, most recent local costs have been considered. With several cross checks, the validity of the data used in the model has been confirmed:

- For the design of the MBT facility, two waste parameters are of highest importance: waste quality and quantity. To determine these parameters, the Consultant carried out two waste analysis campaigns. During these campaigns, a representative amount of waste samples from different part of RLM was analysed and all deliveries to the Townland landfill were recorded. For the estimation of the waste quantities, the historical data from RLM and future developments in the municipality and region were considered as well.
- Since there are still uncertainties with the quantities of waste to be delivered to the MBT facility, a security factor was assumed to exclude deliveries from uncertain sources.
- With the operational start of the new Waterval Landfill, more reliable data will be available. The Consultant has prepared a waste information system for the RLM Waste Unit to be implemented at the outset of these operations; however, the start of operations at the Waterval landfill has been delayed several times.
- The information on budget, actual expenditures and revenues, and the tariffs were obtained from the head of the Waste Unit at RLM.
- The finalisation of the BEE specifications and the assessment will be done during the procurement process.
- Sensitivity analyses for different key parameters have been conducted.
- The results have been checked internally applying four-eyes principle.

On the base of this, the Consultant considers all assumptions and other data used in the model realistic and appropriate.

7.1.2 Enhancing Value-for-Money

The assessment made in the previous chapters has clearly shown that the implementation of the project through a PPP will enhance the value-for-money for the municipality. This will be possible through directing valuable materials to the recycling market, production of secondary fuel (RDF), diversion of waste from landfill, enhancing local job creation and skills development, and fulfilling BEE requirements.

7.1.3 Assumptions

For the determination of the assumptions, the historical development of the key parameters as well as the expected future developments and the typical values in similar projects have been considered.

7.1.4 Methodology for Valuing Costs

The output specifications have been fully considered in the development of the model and all related costs have been included; investment, follow-up investment and replacement costs, costs for labour and management staff, for consumables, and maintenance and repair. By applying a “zero-based” costing methodology, the operating costs of the SPV were estimated. The future cash flows were discounted to their present values by applying a discount rate appropriate to the project.

The risks have been identified on the basis of data from similar projects, the Consultant’s experience and local framework conditions, and costed appropriately.

7.1.5 Audit Trail of Documentation

The internal control system of the Consultant allowed for versioning and archiving of all gathered and generated documents during the entire MPPP feasibility process. Also in the next phases of the project, the Consultant together with the RLM Waste Unit will keep an audit trail of all documentation.

7.2 Checklist for Legal Compliance

For the legal compliance of the project, the requirements in Table 48 have to be fulfilled.

Table 48 Compliance Checklist

<p>Statutory Requirements</p> <ul style="list-style-type: none"> ➤ Registration of project with National Treasury PPP Unit (already done) ➤ Treasury Views and Recommendations (TVR) I, from PPP Unit for Feasibility Study as per s120(6) of MFMA ➤ Provincial Treasury & COGTA and other relevant departments' views and recommendations ito s120(6) ➤ Council approval of s120(6) Feasibility Study ➤ TVR IIA and IIB from PPP Unit ito PPP Regulations iro tender process to get private partner ➤ TVR111 from PPP Unit and MFMA Unit ito s33 of the MFMA iro PPP contract ➤ Provincial Treasury & COGTA and other relevant departments' views and recommendations ito s33 ➤ Council approval ito s33 of PPP Contract ➤ The Executive Mayor, as the accounting officer in terms of the MFMA, authorized to sign the PPP Agreement <p>The Minister of Energy acting with the concurrence of the Minister of Finance will need to sign off on any guarantees or indemnities (typically found in PPP Agreements).</p>
<p>Contractual Requirements</p> <p>A comprehensive PPP Agreement will need to be concluded with the Private Party that details, inter alia:</p> <ul style="list-style-type: none"> ➤ Service level specifications signed off by the relevant municipality; ➤ Consequences of failure to meet service levels, and any incentives for exceeding service levels; ➤ The payment mechanism and how and when penalties will be applied; and ➤ Risk transfer to the private party, taking into consideration key value for money drivers such as skills availability, operational efficiency, funding capacity, experience developing a MBT facility, etc.
<p>Consultation - Community</p> <ul style="list-style-type: none"> ➤ Needs to be consulted / asked for comments in accordance with s21 of the MSA. ➤ Should receive all reports to comment on ito s120(6) of MFMA ➤ Receive PPP contract to comment on ito s33 of the MFMA

Consultation - Organised Labour

- Needs to be consulted if any current staff affected – not any known
- Invited as IAP to comment on report ito s120(6) of MFMA
- Invited as IAP to comment on PPP Contract ito s33 of the MFMA

7.3 Sign Off the Feasibility Study

The letter of the advisers to confirm that all inputs into the feasibility study are accurate and verifiable is attached as Annex 1 to the Feasibility Study.

Part 8 Procurement Choice

The Value-for-Money Assessment has clearly shown that the external reference model will be affordable and enhance the value-for-money under the following conditions:

- The Waste Unit must be ring-fenced
- The initial investment costs must be covered by non-refundable grants

Under these conditions, the Consultant recommends the procurement of the MBT facility through a PPP.

Annex 1: Filled Questionnaires for Utilization of RDF

General Information	
Name of Company:	Lafarge South Africa
City:	Johannesburg
Address:	Building 3, Country Club Estate, 21 Woodlands Drive, Woodmead 2144 Private Bag X26 Gallo Manor ZA - 2052 JOHANNESBURG
Contact Person:	Rantsadi Moatshe
<i>Telephone:</i>	+27832273827
<i>E-Mail:</i>	Rantsadi.moatshe@lafarge-za.lafarge.com
Date:	September 9th 2011
Interest in Utilization of RDF	
<i>Would your company be interested in the utilization of the RDF produced in the foreseen Rustenburg waste treatment facility</i>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<i>If so, would you be interested in a long term agreement for RDF utilization</i>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<i>Is there a permit for co-processing of RDF at this site</i>	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<i>Up to what amount of RDF per year would / could you accept in your facility (for different years if capacity changes are expected)</i>	We are in the process to obtain the waste permit. Public EIA process is ending this month. Current expectation is to receive permit by the end of this year. Volumes that could be received will depend greatly of actual %CI. It could vary from 30 kT/Yr up to 40 kT/Yr or even higher if % CI is managed properly.

Participation in the Operation of the Waste Treatment Plant

<p><i>Would your company be interested to participate in operation of the MBT</i></p> <p><i>If yes, what kind of engagement would you prefer (please describe)</i></p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Lafarge has a lot of experience in using RDF in many plants over the world and has an organisation fully structured to transfer the know-how.</p> <p>Lafarge is also already involved in several preparation plants of RDF and is willing to participate to the engineering and operation of preparation plants to optimize and control the quality to his best needs.</p> <p>Therefore, Lafarge would be ready to propose a kind of EPCOM (Engineer, Procure, Construct, Operate and Maintain) contract with Rustenburg, however with a financing coming from the Municipality. We would like to be involved in the design in order to optimize both the investment and the quality of RDF (Granulometry, % contaminants, %Cl, CV).</p> <p>We are fully at your disposal and RLM disposal to discuss it further both regarding the technical aspects and the financial organization.</p>
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Financial Aspects

If your company is interested in long term utilization of the produced RDF what are your financial expectations:

<i>We are expecting financial compensation for taking the RDF</i>	<input type="checkbox"/> Yes <input type="checkbox"/> No
<i>Probably, we could take the RDF without additional payment</i>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<i>Probably, we could pay for the RDF, if certain quality criteria are fulfilled</i>	<input type="checkbox"/> Yes <input type="checkbox"/> No
<i>Probably, we would not pay for the RDF, but we could provide free transportation from Rustenburg to our facility</i>	<input type="checkbox"/> Yes <input type="checkbox"/> No

General Information	
Name of Company:	AfriSam South Africa (Pty) Ltd
City:	Johannesburg
Address:	P. O. Box 6367, Weltevreden Park, 1715
Contact Person:	Ed Volek
Telephone:	083 4567045
E-Mail:	edward.volek@za.afrisam.com
Date:	14 September 2011
Interest in Utilization of RDF	
<i>Would your company be interested in the utilization of the RDF produced in the foreseen Rustenburg waste treatment facility</i>	X Yes <input type="checkbox"/> No
<i>If so, would you be interested in a long term agreement for RDF utilization</i>	X Yes <input type="checkbox"/> No
<i>Is there a permit for co-processing of RDF at this site</i>	X Yes <input type="checkbox"/> No
<i>Up to what amount of RDF per year would / could you accept in your facility (for different years if capacity changes are expected)</i>	61 300tpa

Participation in the Operation of the Waste Treatment Plant	
<i>Would your company be interested to participate in operation of the MBT</i>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<i>If yes, what kind of engagement would you prefer (please describe)</i>	

Financial Aspects	
<i>If your company is interested in long term utilization of the produced RDF what are your financial expectations:</i>	
<i>We are expecting financial compensation for taking the RDF</i>	<input type="checkbox"/> Yes <input type="checkbox"/> No
<i>Probably, we could take the RDF without additional payment</i>	<input type="checkbox"/> Yes <input type="checkbox"/> No
<i>Probably, we could pay for the RDF, if certain quality criteria are fulfilled</i>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<i>Probably, we would not pay for the RDF, but we could provide free transportation from Rustenburg to our facility</i>	<input type="checkbox"/> Yes <input type="checkbox"/> No

General Information	
Name of Company:	Pretoria Portland Cement Company Limited
City:	Johannesburg
Address:	PO Box 787416 Sandton 2146
Contact Person:	Egmont Ottermann
Telephone:	+27 11 386 9114
E-Mail:	egmont.ottermann@ppc.co.za
Date:	2011-09-15
Interest in Utilization of RDF	
<i>Would your company be interested in the utilization of the RDF produced in the foreseen Rustenburg waste treatment facility</i>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<i>If so, would you be interested in a long term agreement for RDF utilization</i>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<i>Is there a permit for co-processing of RDF at this site</i>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	<p>PPC Hercules has an authorisation from the Limpopo Government. Waste and Air permits will have to be amended upon implementation</p> <p>PPC Dwaalboom has an authorisation from the Limpopo Government. Waste and Air permits will have to be amended upon implementation.</p> <p>PPC Slurry is in the process of obtaining an authorisation</p>

<p><i>Up to what amount of RDF per year would / could you accept in your facility (for different years if capacity changes are expected)</i></p>	<p>Dwaalboom up to 75% of Calciner Fuel (90 000 tons), if no other alternative fuels are added. A more realistic calculation would be a third of that, taking other alternative fuels into account.</p> <p>Slurry If the RDF is filament based, and 30 mm, the capacity would be 15 000 tons per year</p> <p>Hercules If the RDF is filament based, and 30 mm, the capacity would be 8 0000 tons per year</p> <p>All the above capacities are dependant on the usage of other alternative fuels at that time and the usage of industry benchmark numbers</p>
<p>Participation in the Operation of the Waste Treatment Plant</p>	
<p><i>Would your company be interested to participate in operation of the MBT</i></p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>
<p><i>If yes, what kind of engagement would you prefer (please describe)</i></p>	<p>We would engage in a partnership with a large waste management company to operate the entire waste management chain in Rustenburg</p>
<p>Financial Aspects</p>	
<p><i>If your company is interested in long term utilization of the produced RDF what are your financial expectations:</i></p>	
<p><i>We are expecting financial compensation for taking the RDF</i></p>	<p><input checked="" type="checkbox"/> Yes</p>
<p><i>Probably, we could take the RDF without additional payment</i></p>	<p>The best we could offer would be to receive the material for free, under <input type="checkbox"/> No</p>
<p><i>Probably, we could pay for the RDF, if certain quality criteria are fulfilled</i></p>	<p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p>
<p><i>Probably, we would not pay for the RDF, but we could provide free transportation from Rustenburg to our facility</i></p>	<p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p>