

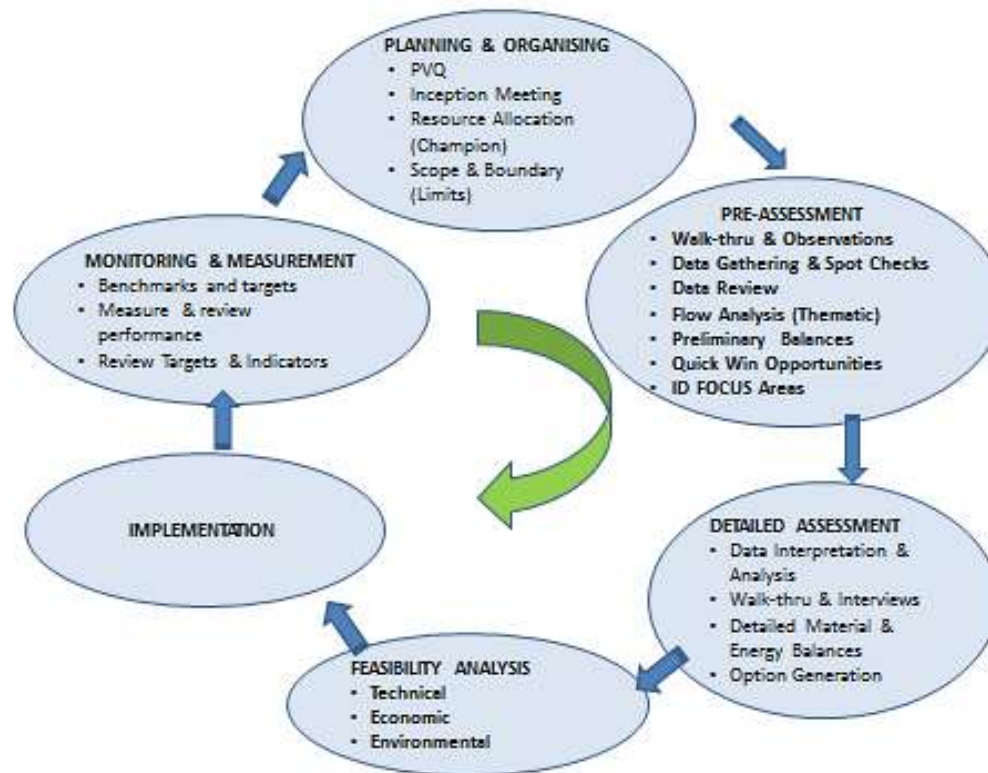


THE RECP ASSESSMENT

Brent Goliath



Resource Efficiency Cleaner Production (RECP) Assessment Methodology



Planning & Organising - PVQ Information



Please provide a production timetable for your main manufacturing areas/departments:

Planning	7am - 5:30pm
Preparation	7am - 5:30pm
Weaving	24hours per day throughout the year
Dye House	24hours per day throughout the year
Cutting	7am – 5:pm
Sewing	7am – 5:pm
Packing	7am – 5:pm
Despatch	7am – 5:pm

Year:	kWh	kWh Cost in Rand	kVA (Maximum Demand)	kVA Cost in Rand	Total cost
Jan 2014	450 240	0.5435	1200.00	161.82	438 880.44
Feb 2014	473 700	0.5435	1392.00	161.82	482 709.39
Mar 2014	463 440	0.54355	1392.00	161.82	477 133.08
Apr 2014	480 200	0.5435	1178.00	161.82	440 419.02
May 2014	303 960	0.5435	1008.00	161.82	328 316.82
Jun 2014	307 197.7	0.5435	791.118	161.82	296 087.86
Jul 2014	904 14.315 248 639.385	0.5435 0.5850	839.838	174.17	340 868.8
Aug 2014	404 202.00	0.5850	1041.588	174.17	417 871.55
Sep 2014	398 894.89	0.5850	994.776	174.17	408 613.53
Oct 2014	384 822.809	0.5850	978.516	174.17	395 549.36
Nov 2014	411 816.900	0.5850	1138.755	174.17	439 249.85
Dec 2015	446 746.500	0.6499	1179.834	193.50	518 638.43

2013 - 2014	Water, m ³	Cost, R
January 2014	701.00	8 810.00
February 2014	750.00	9 425.92
March 2014	944.00	11 862.86
April 2014	646.00	8 124.88
May 2014	842.22	10 579.64
June 2014	634.36	6 819.67
July 2014	339.14	4 567.54
August 2014	741.00	10 056.87
September 2014	731.24	9 924.42
October 2014	832.0	11 866.36
November 2014	1030.0	13 961.26
December 2014	1015.0	13 768.61
January 2015	848.4	11 496.09
TOTAL	9 253.3	122 434.32

2013 - 2014	Production tons
January 2014	2 385
February 2014	2 342
March 2014	3 167
April 2014	2 526
May 2014	2 691
June 2014	3 420
July 2014	2 617
August 2014	2 202
September 2014	2 173
October 2014	2 096
November 2014	2 256
December 2014	1 704
January 2015	1 438
TOTAL	28 632 tons





4.3. Compressed Air (barg)

For each air compressor please state:

Manufacturer:	Atlas Copco	Quincy	Quincy
Model & Year		QSI-370i	QSI-370
Type (screw, recip):	Screw	Screw	Screw
Drive motor size:	45kW	55kW	55kW
Typical loading:	Stand-by	47%	100%
Annual running hours:	24/6days	24/6days	24/6days
Air delivery pressure:	750kPa- 88 °C	800kPa-120 °C	115kPa-88 °C

8. SOLID WASTE

Major types and sources of solid waste

Description	Source	Annual volume	Disposal route
Cardboard	Supply	Wasteman collects 3times a month	Landfill
Plastic	Supply		Recycle
Hard paper	Supply		Solid landfill
Poly bag	Supply		

9. ENVIRONMENTAL POLICY

Has the company formulated and communicated an environmental policy? (aims, vision, guidelines)	<input checked="" type="checkbox"/> yes, implemented → <input type="checkbox"/> not in writing <input type="checkbox"/> no
Does the company have an environmental officer?	<input type="checkbox"/> yes → <input checked="" type="checkbox"/> not officially <input type="checkbox"/> no
Have environmental audits already been conducted?	<input checked="" type="checkbox"/> yes → <input type="checkbox"/> no

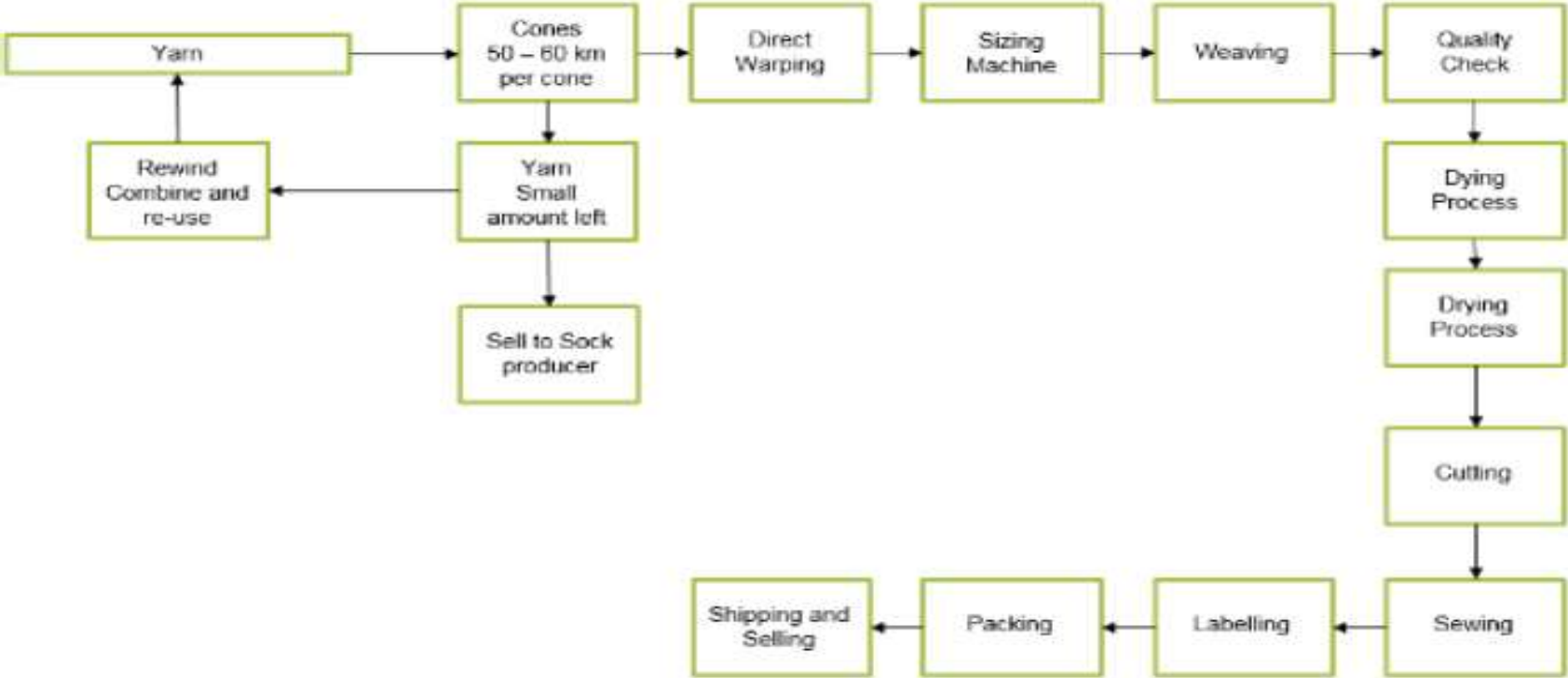
Pre-Assessment - Potential Savings Opportunities



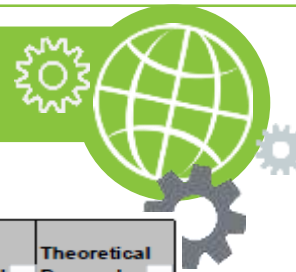
	Good 😊	Average 😐	Not Good ☹️
Waste Water		√	
Solid Waste	√		
Air Quality	√		
Noise	√		
Energy		√	
Environmental Policy		√	

- Cooling water pump:
 - 5 – 10% reduction in overall speed of motor.
 - 5 – 20% reduction in motor power consumption.
- HVAC Fans:
 - 25 – 35% reduction in power draw at low fan flow compared to damper control.
- Air leaks:
 - Compressed air used for cleaning and hand drying.
 - Reduce load/unload pressure.
 - Evaluate VSD for compressors and remove load/unload cycle.
 - Recover heat of compression.
 - Change compressor type.

Pre-Assessment – Process Flow Diagram



Detailed Assessment - Energy Balance

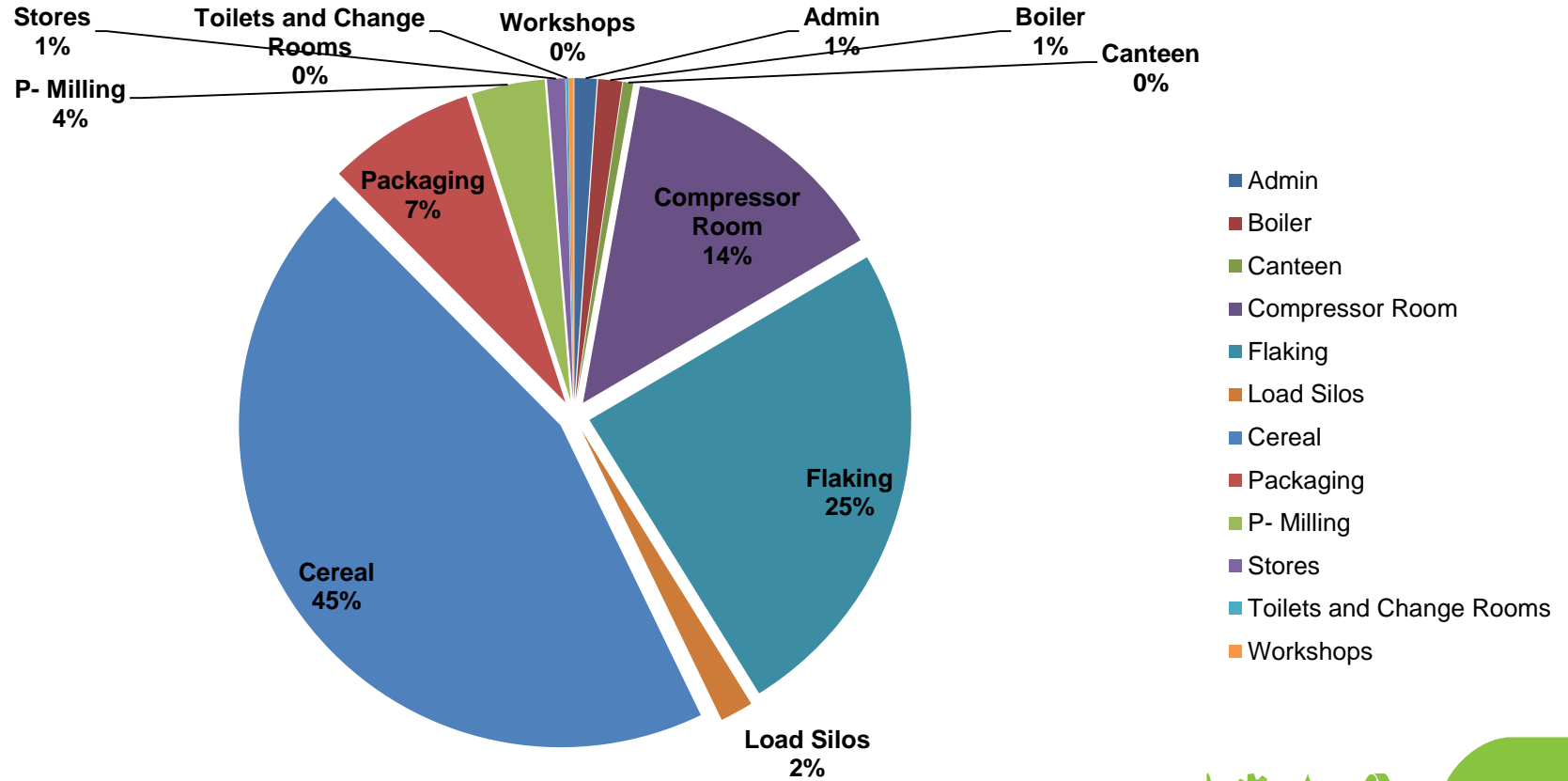


Area	Process	Machine	Power (kW)	Quantity	Utilisation Ratio	Working hours per week	Weeks	Electricity (kWh)	Max demand	Theoretical Demand
Admin-Factory	HVAC	Airconditioners	2.00	25	0.35	16	4.33	1,213	50.0	17.5
Admin-Factory	HVAC	Airconditioners	3.00	1	0.35	16	4.33	73	3.0	1.1
Admin-Factory	Lighting	CFL 14W	0.014	6	1	36	4.33	13	0.1	0.1
Admin-Factory	Heating	Coffee Machine	2.00	1	0.35	43	4.33	130	2.0	0.7
Admin-Factory	Equipment	Computers	0.30	24	0.35	36	4.33	393	7.2	2.5
Admin-Factory	Equipment	Flat Screen TV	0.50	1	0.35	4	4.33	3	0.5	0.2
Admin-Factory	Lighting	Fluorescent -T8 58W 2 Lamp	0.116	34	1	36	4.33	615	3.9	3.9
Admin-Factory	Lighting	Fluorescent -T8 58W 3 Lamp	0.174	2	1	36	4.33	54	0.3	0.3
Admin-Factory	Heating	Geyser	2.00	1	0.35	168	4.33	510	2.0	0.7
Admin-Factory	Lighting	LED Downlighters	0.008	16	1	20	4.33	11	0.1	0.1
Admin-Factory	Heating	Microwave	0.75	4	0.35	4	4.33	18	3.0	1.1
Admin-Factory	Equipment	Multifunction Copier	1.50	1	0.35	36	4.33	82	1.5	0.5
Admin-Factory	Equipment	Printers	0.50	4	0.35	5	4.33	15	2.0	0.7
Admin-Outbuildings	HVAC	Airconditioners	3.00	1	0.35	168	4.33	764	3.0	1.1
Admin-Outbuildings	HVAC	Airconditioners	2.00	18	0.35	16	4.33	874	36.0	12.6
Admin-Outbuildings	Lighting	CFL 14W	0.014	1	1	36	4.33	2	0.0	0.0
Admin-Outbuildings	Lighting	CFL Spot 18W	0.018	4	1	36	4.33	11	0.1	0.1
Admin-Outbuildings	Equipment	Computers	0.40	17	0.35	36	4.33	371	6.8	2.4
Admin-Outbuildings	Equipment	Flat Screen TV	0.50	1	0.35	4	4.33	3	0.5	0.2
Admin-Outbuildings	Lighting	Fluorescent -T8 58W 2 Lamp	0.116	37	1	36	4.33	670	4.3	4.3
Admin-Outbuildings	Lighting	Fluorescent -T8 58W 3 Lamp	0.174	2	1	36	4.33	54	0.3	0.3
Admin-Outbuildings	Cooling	Fridge	0.30	1	0.35	168	4.33	76	0.3	0.1
Admin-Outbuildings	Heating	Hydroboil	1.50	1	0.35	90	4.33	205	1.5	0.5
Admin-Outbuildings	Lighting	LED Downlighters	0.008	6	1	20	4.33	4	0.0	0.0
Admin-Outbuildings	Heating	Microwave	0.75	4	0.35	4	4.33	18	3.0	1.1
Admin-Outbuildings	Equipment	Multifunction Copier	1.50	2	0.35	36	4.33	164	3.0	1.1
Admin-Outbuildings	Equipment	Printers	0.50	2	0.35	5	4.33	8	1.0	0.4
Admin-Outbuildings	Heating	Solar Water Heater	2.00	1	0.35	0	4.33	0	2.0	0.7
Admin-Outbuildings	Cooling	Water Cooler	0.10	1	0.35	90	4.33	14	0.1	0.0
C-Bay	Motors	DCE Dalamatic	5.50	1	0.35	43	4.33	359	5.5	1.9
C-Bay	Motors	Mixing Drum Motor	7.50	2	0.35	43	4.33	978	15.0	5.3
C-Bay	Motors	Polar Mohar Motor	9.35	2	0.35	43	4.33	1,220	18.7	6.5
C-Bay	Motors	Regrind Granulator 1	32.00	1	0.35	43	4.33	2,087	32.0	11.2



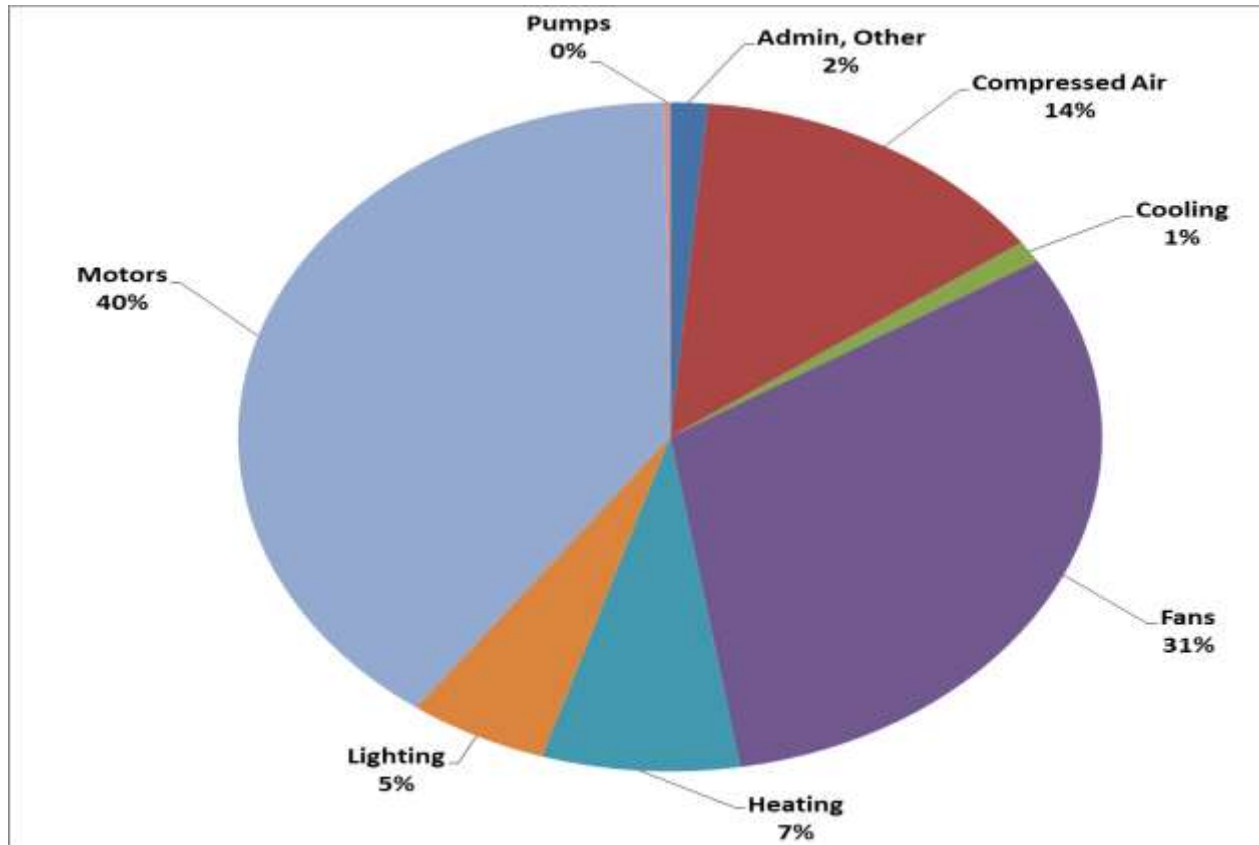


Electrical Consumption By Department/Area

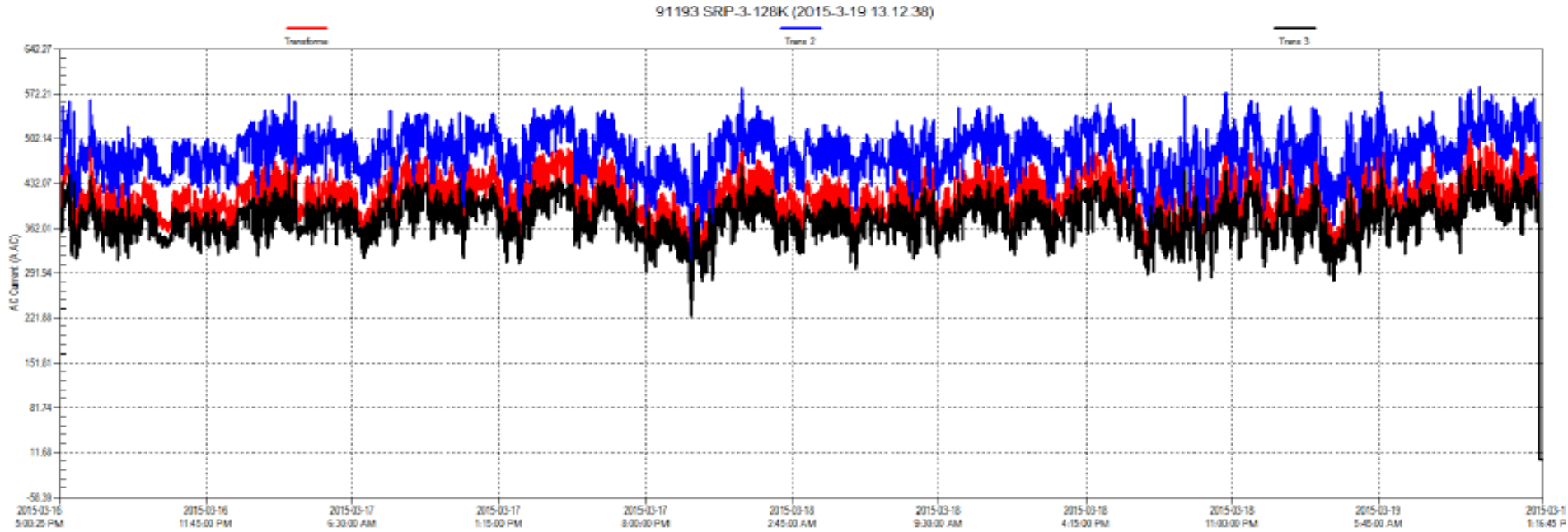




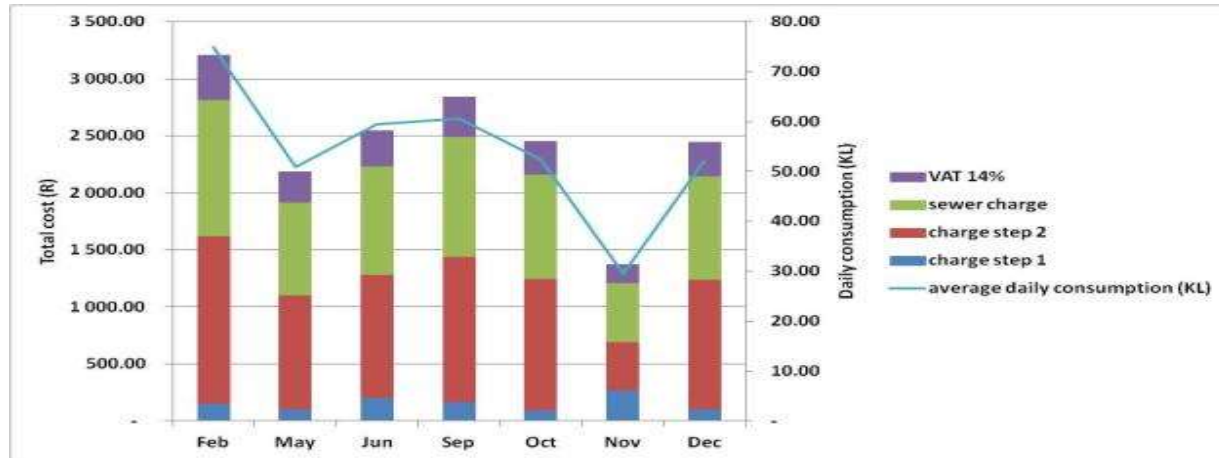
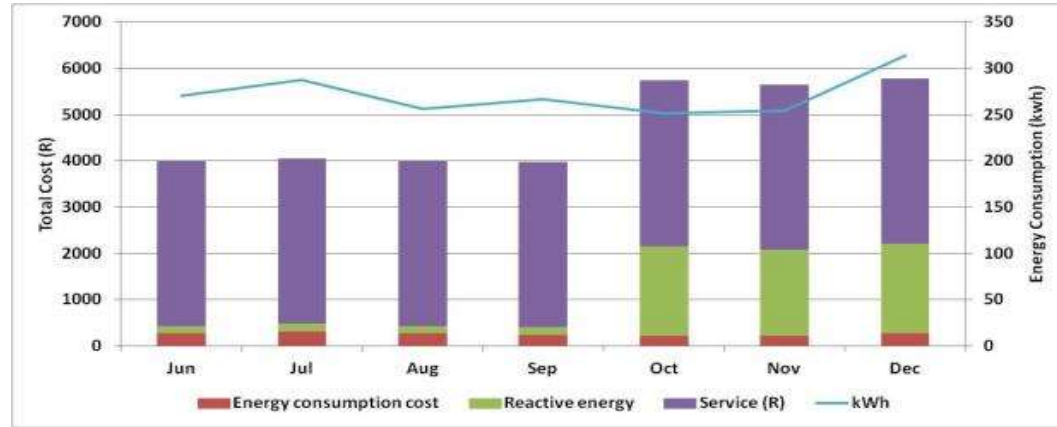
Electricity Balance By Process

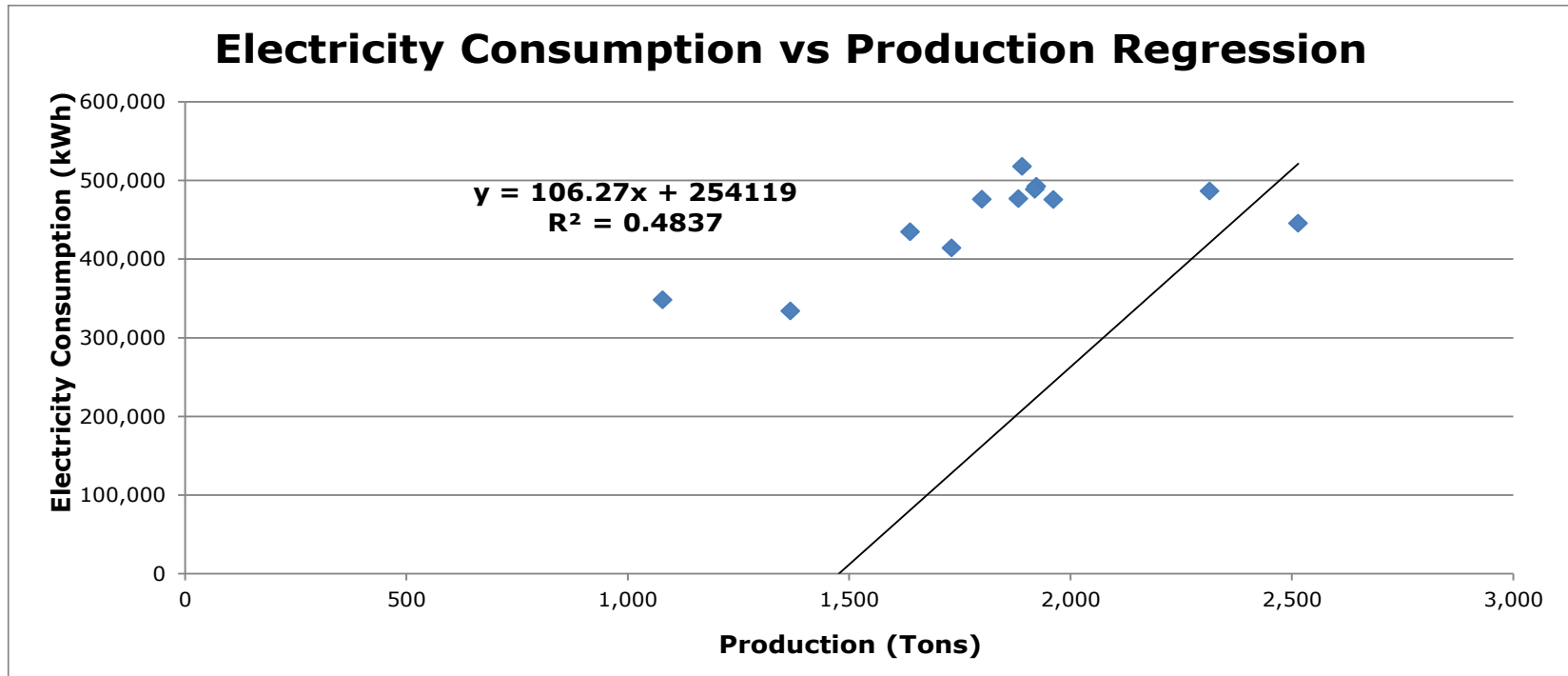


Detailed Assessment – Transformer Graph

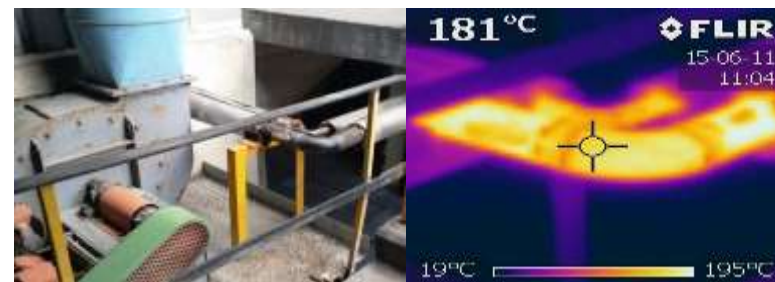
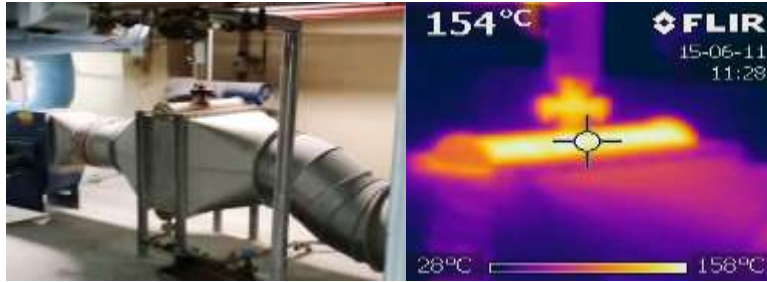


Detailed Assessment - Graphical Representation of Analysed Data





Detailed Assessment - Evidence of Findings



Uninsulated lines (m)		Loss W / m	Total loss kW	Steam tonne / annum	Cost / annum	Insulation Cost / m	Total Cost
25mm line (1")	60	650.0	39.0	442.6	R 91,776	R 1,200	R 72,000
50mm line (2")	7	650.0	4.6	51.6	R 10,707	R 1,600	R 11,200
75mm line (3")		1,000.0	0.0	0.0	R 0	R 2,000	R 0
100mm line (4")	2	1,500.0	3.0	34.0	R 7,060	R 3,000	R 6,000
Subtotal			46.6	528.3	R 109,543		R 89,200
Uninsulated items (Valves / flanges)		Loss W / m	Total loss kW	Steam tonne / annum	Cost / annum	Insulation Cost / m	Total Cost
25mm line (1")	55	650.0	17.9	202.9	R 42,064	R 2,000	R 110,000
50mm line (2")	26	650.0	8.5	95.9	R 19,885	R 3,000	R 78,000
75mm line (3")	12	1,000.0	6.0	68.1	R 14,119	R 4,000	R 48,000
100mm line (4")		1,500.0	0.0	0.0	R 0	R 5,000	R 0
Subtotal			32.3	366.9	R 76,069		R 236,000
Total			78.9	895.2	R 185,612		R 325,200



Detailed Assessment – Reducing Waste to Landfill



Figure 35. Contents of general waste skip.



Figure 36. Bale with product residual as well as product on the floor.



hazardous skip with oil stained cloth and safety equipment.

Detailed Assessment – Recommended Savings – The Basic Reporting Requirements



No	Optimisation Opportunity	Annual Estimated Savings			Implementation Cost (R)	Payback Period (years)
		Energy (kWh)	Cost (R)	CO ₂ Emissions (tons)		
Electrical Savings Recommendations						
1	Upgrade high bay lights	111 500	111 900	109.3	306 300	2.7
2	Recovery and reuse of heat from wrapping machines	76 990	77 280	75.5	20 700	0.27
3a	Additional compressed air storage	88 880	89 200	87.1	126 000	1.4
3b	Speed control on existing compressor	214 300	215 100	210	193 420	0.9
3c	New variable speed compressor	214 300	215 100	210	353 000	1.64
4	Improved effluent treatment	114 100	270 600 (energy & treatment chemicals)	112	310 000	1.1

- Recommended savings should include a short description or context of the RECP opportunity
- Should include basic operating parameters of the equipment or department etc.
- A picture, graph or diagram to provide evidence and more context
- A very brief calculation to confirm the kL, tons, kWh and Rand savings
- Key Information that is linked to the Savings Opportunity Table are:-
 - RECP Opportunity Description
 - Annualised kWh Savings
 - Annualised Rand Savings
 - CO₂ Emissions Reduction
 - Annualised kL Water Savings
 - Annualised Rand Savings for Water
 - Annualised Ton Waste Saved
 - Annualised Rand Saved for Waste
 - etc



Detailed Assessment – Action Plan for Implementation



Energy conservation opportunity	Order of Priority	Funding Approach	Procedure and Possible Time
ECO5: Energy Management System (Ranked 1 because implementation of all other savings opportunities should be done at the same time as an energy management system is introduced).	1	Funding for project management may possibly be obtained by consultants from the NCP-C-SA.	<p>Appoint a suitable and experienced consultant and then work with the consultant.</p> <p>Energy management systems take several months, and possibly as long as a year to implement fully.</p>
ECO6: Motor Management System (ranked 1 because it should be part of an energy management system)	1		The same consultant who facilitates introduction of an energy management system should work with the relevant people in MacNeil Plastics to draft and implement a motor management policy. Since it is only part of an energy management system, it could be done in less than a month.
ECO1: Lighting upgrade (ranked second because there are several reputable lighting contractors in the Cape Town area who could do the job, and the technological risk is low)	2	<p>Funding for equipment may be applied for under the applicable DTI (Department of Trade and Industry) scheme.</p> <p>Funding for project management may possibly be obtained by consultants from the NCP-C-SA.</p>	<ul style="list-style-type: none"> • Contact reputable, locally based lighting contractors for proposals, with savings and cost (these should include lighting controls) • Chose the most favourable one and give them the work. • Monitor installation and commissioning. <p>Once approval for the capital expenditure (Capex) has been obtained it should be possible to complete the work in a few months or less.</p>





THANK YOU

Brent Goliath

