

Resource Efficiency and Cleaner Production Project in South Africa

Case Study – ESO Interventions

Company name	MPACT Corrugated Cardboard
Sector	Agro-processing
Year joined RECP Project	2013
Year of interventions	2014
Contact person	Zaheed Yacoob
Systems of intervention	Steam , Compressed Air, Lighting

1. BACKGROUND

1.1 Previous Work

Mpact participated in the NCPC-SA internship program 2013/2014 and hosted an intern by the name of Fundile Ngcobo. The intern conducted an In-Plant Assessment which focused on Resource Efficient and Cleaner Production opportunities for savings.

1.2 Company profile

Mpact Limited, formerly Mondi Packaging South Africa, is one of the largest paper and plastic packaging businesses in southern Africa, with 31 operating sites, 24 of which are manufacturing operations, based in South Africa, Namibia, Mozambique and Zimbabwe.

Mpact is listed on the JSE and has the leading market position in southern Africa in corrugated packaging, recycled-based carton board and containerboard, recovered paper collection, polyethylene terephthalate (PET) preforms, styrene trays and plastic jumbo bins.

Plant profile

The corrugated division manufactures and sells a comprehensive range of printed and unprinted converted corrugated products, including board, which we use to manufacture corrugated packaging, corrugated boxes, die-cut cases, folded glued cases, trays and point-of-sale displays.

The corrugated packaging division has nine corrugated box plants, each with corrugator and converting facilities, producing corrugated board and boxes. Eight plants are located in South Africa in Gauteng (Springs and Brakpan), KwaZulu-Natal (Durban – Pinetown), Western Cape (Epping and Kuils River), Eastern Cape (East London and Port Elizabeth) and Mpumalanga (Nelspruit) and one plant is located in Namibia. We also own two corrugated sheet plants in Mozambique and Namibia respectively, and have an interest in several corrugated sheet plants throughout South Africa.

Corrugated customers include producers of agricultural, fast moving consumer goods (FMCG) and other durable and non-durable goods that use packaging primarily for the protection of products in transit and for point-of-sale display.

1.3 Nature of challenges

The company is a large user of electrical and steam energy. With the costs of fuel increasing significantly over the past 10 years, Mpact has placed concerted effort to reduce the consumption to reduce costs.

2. OVERVIEW OF IMPLEMENTATION

2.1 Steps taken and Interventions

Mpact corrugated have implemented the following changes:

1. Steam leaks have been repaired and actively managed
2. Air leaks are now logged into the Supervisory Control And Data Acquisition (SCADA) system
3. Daylight switches installed on outside lights, compressor house lights and paper stall lights.
4. Energy saving awareness – switch off lights campaign.
5. Clear sheeting replacement – in progress.

3. KEY ACHIEVEMENTS

Key findings table -

Implementation Period	2014-2015
Total Number of project	3 Projects Partially Implemented
Monetary savings in ZAR	R 58 647
Energy savings in KWh	108 561
Total investment made ZAR	R 16 000
Payback time period in years	~0.27 year
GHG Emission Reduction (ton CO2) ¹	72.6

¹ SA Grid kWh to CO2 Conversion Factor set at 0.957 as per the 'Journal of Energy in South Africa' – Vol 22 No 4; November 2011.

4. HIGHLIGHTS OF ESO INTERVENTIONS

The following table highlights the Implemented Projects

System	Energy Carrier (i.e. electricity, LPG,etc.)	Intervention	Period of Implementation	Investment ZAR	Savings ZAR	Payback Yrs	Energy saving (kWh)	GHG Emission Reduction (Ton CO2/year)
Steam	HFO	Steam Leak	2014-2015	-	20 024	Immediate	37 037	2.6
Compressed Air	Electricity	Air leaks	2014-2015	-	31 229	Immediate	57 821	57
Lighting	Electricity	Daylight Switch	2014-2015	16 000	7 400	0.06	13 703	13

Total Savings from Identified Projects= R58 647.pa.

4.2 Details of implemented interventions

Steam Leaks

- MPact has noted that there was significant savings to be made with implementing a formalized steam leak management system.
- This intervention enabled the maintenance team to report, control and repair leaks in a systematic manner

Compressed Air Leaks

- Similarly to the steam leaks, a formalized system had been prepared to assist the maintenance team in detecting compressed air leaks and repairing the leaks.
- The system recorded leak reports from the production staff, as well as highlights the status of repair. Usually leaks are fixed during the periodic maintenance scheduling
- It is unlikely to have had 100% reduction in compressed air leaks. Most companies target a 10% leeway of system capacity when finding and repairing compressed air leaks. Due to the incorporation of the compressed air leaks on the SCADA system, the leaks are actively managed and controlled.

Daylight Switching

- It was found that the MPact management had taken full benefit of this intervention and installed daylight sensors on all the external lighting.

Clear Sheeting

- MPact is currently in the process of repairing and installing clear sheeting on the production roof. Although the payback period had deemed the projected to be financially unfeasible, the implementation of clear sheeting was due to safety motives. The company will benefit from the savings from the reduced lighting requirement.

5. PROCESS CHALLENGES

Lighting / Clear Sheeting

Financial constraints and the lack of specialized resources (cherry pickers, specially trained personnel, etc.) had inhibited the facilities progress in implementing the lighting saving opportunities. The facility however has developed a replacement policy that would gradually phase out older less efficient technology with more energy efficient lighting.

Steam Leaks

MPact plans to replace all current steam lines/valves by end of March 2016. It was not feasible to insulate the current lines/valves and then re-insulate the new lines/valves. MPact opted to insulate the lines/vales after the installation as this would save costs associated with installations, labour, etc.

6. FUTURE PLANS

MPact has developed momentum in generating energy efficiency projects. Project teams have been developed to roll out new projects. MPact plans to make use of specialised resources (Cherry Picker) during shut down periods to avoid any unnecessary production stoppages.

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Steam	HFO	Steam Leak	2014-2015	-	200 240	Immediate	370 370	26
Steam	HFO	Steam Valves	2014-2015	TBD	29 400		54 444	3.8
Steam	HFO	Pipe Insulation	2014-2015	TBD	11 552		21 392	1.5
Compressed Air	Electricity	Air leaks	2014-2015	-	312 236	Immediate	578 214	572
Lighting	Electricity	Daylight Switch	2014-2015	16 000	7 400	0.06	13 703	13
Lighting	Electricity	Efficient Lights	2014-2015	112 700	31 104	3.6	57 600	57
Lighting	Electricity	Switch-off Lights	2014-2015	-	3 103	Immediate	5 746	5.6
Lighting/Building Services	Electricity	Clear sheets	2014-2015	430 000	21 600	19	40 000	39
Process	Electricity	Interlocking	2014-2015	TBD	11 520	Immediate	21 330	21

7. BENEFITS & LESSONS LEARNED

- The ECO process greatly facilitated the calculation of the savings possible by introducing efficiency measures.
- Regression analyses was utilised to try and quantify the savings but a correlation between energy consumption and production was not found. Actual savings were estimated through calculating from first principles.
- There should be a constant follow up with the companies after the In-Plant Assessment is carried out in order to identify that implementations are actually being made.
- It is important to stress the benefit of RECP techniques so that the company does not perceive the report as unnecessary/ irrelevant.
- The company had taken the initiative to determine the feasibility of some the suggested ECO's. The process dynamics had deemed the ECO's to be unfeasible, due to this, some of the projects would not be implemented.