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## **RECP Experiences at Matadouro Municipal**

The efficient and environmentally sound use of materials, energy and water - coupled with the minimization of waste and emissions - makes good business sense. Resource Efficient and Cleaner Production (RECP) is a way to achieve this in a holistic and systematic manner. RECP covers the application of preventive management strategies that increase the productive use of natural resources, minimize generation of waste and emissions, and foster safe and responsible production. Benefits are eminent in many enterprises in the world, regardless of sector, location or size, as demonstrated by the experiences of Matadouro Municipal in Mozambique.

### **Achievements of Matadouro Municipal**

Resource Efficient and Cleaner Production (RECP) implementation at Matadouro Municipal led to annual savings of around USD 18,700, by investing USD 72,500 and improved product quality.

While the initial intention of the company was to address the problem of effluents, the RECP programme enabled the company also to improve their energy productivity.

Matadouro Municipal has demonstrated that taking care of materials, energy, water and waste makes good business sense. RECP covers the application of preventive management strategies that increase the productive use of natural resources, minimize generation of waste, and foster safe and responsible production. Benefits are eminent in many enterprises, regardless of sector, location or size.

The RECP In Plant Assessment at Matadouro Municipal de Maputo it was conducted by Mozambique National Cleaner Production Center (MNCPC) team.

### **Overview**

The Matadouro Municipal de Maputo is a company dedicated to slaughtering, processing, distribution and sales of cattle and goats meat . The company was established in 1936 and in earlier times, it worked as a public company, but nowadays it is private-owned company, and being part of the "Commercial Soeiro, Lda." Group with currently 79 employees.

There are slaughtered on average 50 heads cow per day, equivalent to about 7250 kg /day of proceed meat, with a maximum capacity of 120 head / day.

In current year, it has expanded the new production line with modernized technologies including new electronic features, new process facilities, logistics and other technical equipment as well as some good practices measures implementation suggested by the MNCP team during the RECP in plant assessments.

The new production line in testing it has processing capacity of about 75 cattle's / hour. Other parts of the company are still under rehabilitation. The company also foresees in the future, to install a new production line of goats and sheep's slaughtering.

## Benefits

The RECP programme was mainly focused on improving production process, but special attention was so given to water issues, material use and process.

The benefit gained by installation of the new production line, was the increase on operational safety of the unit by having the work area better organized as possible.

Improve the health and hygiene conditions. Increase efficiency and competitiveness reducing the risk of occupational accidents. Improvement of health conditions and worker safety, improvement of the company's image to the consumers, suppliers, public authorities, market and local community, improved relationship with environmental authorities and civil society.



Figure 1 – Production Line

The benefit gained by installation of water flow regulators in the water hoses is reduction of about 50% of water consumption and wastewater volume.

Reduction in amount of effluent generated, with consequent reduction of the Environmental impact. The economic benefit are calculated at around USD 5.500 /year.



Figure 2 – Hoses with water flow reducers

The benefit gained by Installation of cooling chambers is to preserve meat, avoid contamination of meat and fulfil the requirements of inspection from the Ministry of Health and Agriculture on food safety and hygiene to ensure public health protection.



Figure 3 – Cooling chamber

Table 1: Results at a Matadouro Municipal

Indicator	Unit	Baseline (B) (Before RECP intervention)	Year 2014 A (After RECP implementation)	Change (C) C=100*(A-B)/B [%]	Difference Between A and B
<b>Resource use</b>					
Energy Use	[MJ/yr]	104.022,00	189.234,00	81,92	85.212,00
Materials Use	[ton/yr]	0,16	0,32	100,00	0,16
Water Use	[m3/yr]	2.012,43	770,39	-61,72	-1.242,04
<b>Pollution</b>					
Carbon dioxide	[ton CO <sub>2</sub> -eq/yr]	0,03	0,05	81,92	0,02
Waste-Water	[m3/yr]	0,00	0,00	0,00	0,00
Waste	[ton/yr]	0,00	0,00	0,00	0,00
<b>Product Output</b>					
Product Output: P	[ton/yr]	1.374.297,00	1.125.887,00	-18,08	-248.410,00

**Note:** The *absolute indicators* provide a measurement of how much resource use/pollution output has changed in absolute terms e.g. units of energy used or tons of waste generated. A negative percentage indicates a decrease and a

positive percentage indicates an increase. The *relative indicators* provide a measurement of changes in resource use/pollution in relation to production output. *Resource productivity* provides a measurement of how much product output can be produced per unit of resource use, from a sustainability perspective, productivity should increase. *Pollution intensity* provides a measurement of how much pollution is generated per unit of production output, from a sustainability perspective, intensity should decrease.

## RECP Profile

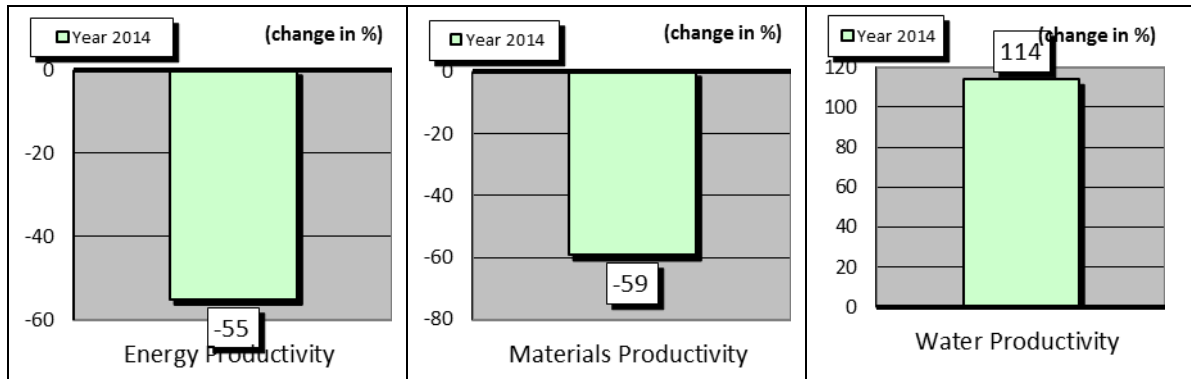


Figure 4 – Resource productivity

The company has already made changes in its operations. The following changes have been made in the new production line. This has led to decrease of resource productivity (Energy and material) during a transition phase.

However this issue will be addressed through further implementation of RECP measures for improvements. Concerning to the water productivity, the company just provides some measurements to decrease this consumption, it means there was efficiency on water usage.

## Pollution Intensity

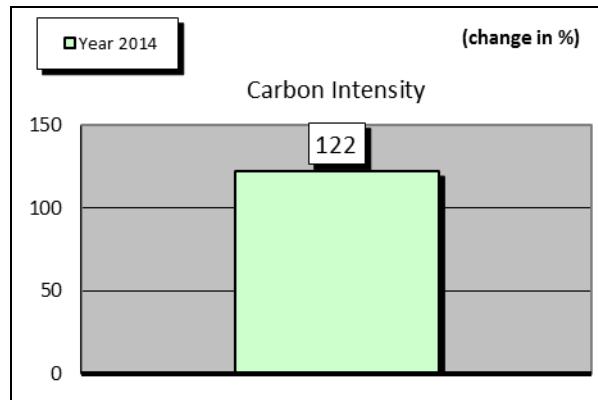


Figure 5 – Pollution Intensity



The changes made by the company during this year in its production line has also, led to increase of pollution intensity during the transition phase. However this issue will be addressed through further implementation of RECP measures. For energy use, there was increase of CO<sub>2</sub> emission in 122% that means a less efficiency on energy use.

## Resource Efficient and Cleaner Production (RECP)

**Resource Efficient and Cleaner Production (RECP)** entails the continuous application of preventive environmental strategies to processes, products and services to increase efficiency and reduce risks to humans and the environment.

RECP addresses three sustainability dimensions individually and synergistically:

- *Production efficiency*

- > Through improved productive use of natural resources by enterprises

- *Environmental management*

- > Through minimization of the impact on nature by enterprises

- *Human development*

- > Through reduction of risks to people and communities from enterprises and supporting their development



## Success Areas

The results were achieved through the implementation of the following measures:

- Installation of new production line;
- Installation of cooling chambers;
- Installation of water flow regulators hoses;
- Controlled water flow in process tank;
- Reduction of water percentage in initial washing and in the rinse process;
- Improved the overall production processes with the purpose of reducing losses.

Table 2: Option Implemented

Principal Options Implemented	Benefits			
	Economic		Resource Use	Pollution generated
	Investment [USD]	Cost Saving [USD/yr]	Reductions in energy use, water use and/or materials use (per annum)	Reductions in waste water, air emissions and/or waste generation (per annum)
Installation of new production line	50,000	12,000	Energy consumption reduced by 55 % and Materials Productivity reduced by 59%	122 % of CO <sub>2</sub>
Installation of cooling chambers	20,000	5,500	Energy consumption reduced by 55 %	Reduction of 17% of CO <sub>2</sub> emission
Installation of water flow regulators hoses .	2,500	1,200	Overall water consumption reduced by 50 %	Reduction of waste water by 50%

## Approach taken

The Matadouro Municipal management was concerned on effluents and solid waste management from their production processes in the slaughterhouse. For this purpose the Mozambique National Cleaner Production Center (MNCPC) was invited to conduct the RECP assessment jointly with the company CP team established and several no and low cost measures were identified, and successfully implemented, the high cost measure not yet implemented is related to installation of biogas plant, that will allow the reduction of electricity consumption for water heating, elimination or reduction of fossil fuels use.

The reduction on the amount of effluent generated, with consequent reduction of the Environmental impact. Recovery of energy from the production processes waste to produce fuel. Reduction of the organic load of effluent generated, with consequent environmental impact reduction.

The economic benefit calculated is approximately USD 12.600 /year. The estimated investment to install the Biogas Plant is around USD 48.700.

## Business case

Although the programme was mainly focused on change of the production line, a direct positive consequence was also improvement of the overall production process, which has increased the value of the final products. RECP not only allows companies to achieve savings from decreased resource use, but also decreases pollution to the environment, which benefits the surrounding community.

## Testimony Box

### National Cleaner Production Centre (NCPC)

The Mozambique National Cleaner Production (NCPCs) was official established 2001, and operates as the executive arm of FEMA - Business Forum for the Environment, Under the policy advice component is the focal point of Ministry of Land, Environment and Rural Development (MITADER) and with the support and expertise from UNIDO and UNEPs RECP net.

The centre offers service in the areas of Resource efficiency and Cleaner Production, Waste Management, Energy Efficiency and Renewable Energy, and Sustainable Management.

#### Summary of MNCPC achievements 2010-1014

- **18** Awareness Raising Seminars and Training were carried out for the national experts, managers and company technicians, public officials and the municipalities of Maputo and Matola representatives.
- **33** National experts trained on UNIDO methodology RECP toolkit;
- **65** Hotel Managers, companies technicians, government officials and Municipalities of Maputo and Matola representatives have attended the Awareness Raising Workshops on Resources Efficiency Use and Cleaner Production and **146** Hotel and company technicians trained on RECP;
- Wide Seminars for dissemination of RECP concepts delivered for **165** students and teachers of Instituto Industrial de Maputo (IIM) and Escola Superior de Hotelaria e Turismo de Inhambane (ESHTI) that is Eduardo Mondlane University Branch;
- Awarding Ceremony Workshop and Presentation of Results of the First Round of RECP assessments conducted and Awards of 7 hotels by good performance and commitment on environmental conservation and resource efficiency use in 3 of November 11 at VIP hotel Maputo jointly organized by UNIDO, MICOA, MITUR and MNCPC.

Total of **21** companies being (16 hotels and 5 supply chain industries of food products to the tourism sector) were subjected to the RECP assessments and their respective RECP reports document the results have been delivered with financial savings options, including investments, environmental and technical benefits.

### Contact Details

Centro Nacional de Produção Mais limpa (CNPML)  
Address: Road Kibiriti Diwane (Ex. Francisco Barreto), 322  
Maputo Mozambique  
Phone Number: +258 2148 5768. PO.Box 4595  
Email: mncpc@tvcabo.co.mz

**English Abstract** (where applicable)





# RECP Experiences



N/A

## ABOUT RECP EXPERIENCES

Through the joint Resource Efficient and Cleaner Production (RECP) Programme, the United Nations Industrial Development Organization (UNIDO) and the United Nations Environment Programme (UNEP) cooperate to improve the resource productivity and environmental performance of businesses and other organizations in developing and transition countries. The Programme is implemented in partnership with the Global Network for Resource Efficient and Cleaner Production (RECPnet). This series of enterprise success stories documents the resource productivity, environmental and other benefits achieved by enterprises in developing and transition countries through the implementation of RECP methods and practices.

These successes were achieved with the assistance of the National Cleaner Production Centres, which are part of RECPnet established with support of the UNIDO and UNEP. The success stories employ the indicator set described in *Enterprise Level Indicators for Resource Productivity and Pollution Intensity*, UNIDO/UNEP, 2010. The primer with accompanying calculator tool and further case studies are available at [www.recpnet.org](http://www.recpnet.org), as well as on [www.unido.org/cp](http://www.unido.org/cp) and [www.unep.fr/scp/cp](http://www.unep.fr/scp/cp).