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RECP Experiences at Hotel 2001

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, regardless of sector, location or size, as demonstrated by the experiences of Hotel 2001, located at Maputo in Mozambique.

Achievements of Hotel 2001

The implementation of Resources Efficiency and Cleaner Production (RECP) will contribute to continuous improvement of Hotel 2001 performance indicators, where we expect a reduction of 5,135 kWh per year on electricity consumption, reduction of approximately 15% on water consumption and recovery of about 72% of recycle material.

The Hotel 2001, has demonstrated that taking care of the environmental impact of the Hotel's activities, make it more competitive, ensuring that guests can spend more their time at Hotel 2001 in proper hygienic conditions, and showing alternatives to the hotel management that highlights options, to minimize the environmental impact that might arise from the effluents generated in the hotel area.

Overview

The hotel is three stars and has 58 rooms, restaurant, pastry, room service, tourist information, business services and two waiting rooms. The suppliers of consumables at the hotel are mostly from the region - purchases are made in the domestic market and in local grocery stores, including also meat products and vegetables are provided by local businesses.

It was defined as priority and opportunity by the company as follows:

- Improve electric boilers water heating system in the guest rooms, improve energy use in public places.
- Reduce water consumption in public bathrooms.
- Improve waste the segregation system and its management.

Benefits

The RECP programme was mainly focused on improving electric water heating system in the guest rooms, improving energy use in public places, reduce water consumption in public bathrooms and improving waste the management by putting in place the the waste segregation system with coded containers. .

The benefit gained by improving the water heating electric boilers system in the guest rooms consisted in improvement of energy efficiency.

Before

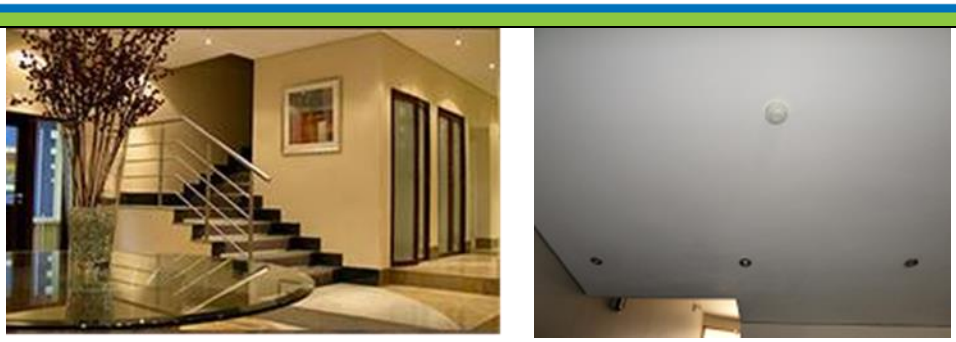
After

Figure 1 – Two news heaters water installed

The financial savings from improvement of the energy use in public places consisted in reduction of energy consumption of around 108 KWh of electricity per day, which represents annual savings of 39,420 KWh/year equivalents to USD 3,500 /year, Reduction of CO_2 emission and reduced costs of electricity bills . No investment is required. Although the economic and environmental benefits may seem small, the implementation of this opportunity is important to introduce the habit of energy savings and good housekeeping to the employees.

Before

After



Before After

Figure 2 – Lights turned in waiting room and corridors during the day

The turn of the lights whenever are not required the hotel employees were also made aware on this substantial potential of energy savings, and were trained and asked to be careful, do not to leave lights on while they can work with natural lighting.

Before After

Figure 3 – Lights turned when not required

The environmental benefit from implementing it is reflected in the reduction of CO_2 needed to produce the electricity for lighting and therefore in reduction of the electricity bills cost of the Hotel 2001. No investment is required.

The benefits gained by installation of flow sensors in the taps with of the public toilets are equivalent to saving of about 40m^3/year. With estimated investment for year 2015 of around USD 600.

The expected benefit by putting in place coded containers for different types of waste consist to increase the lifetime of the landfill and costs saving on waste collection. The company has not yet implemented this recommendation. The estimated investment is USD 750. The Hotel can save USD 1,231 /years, associated waste collection costs, and recover about 72% of recyclable materials (paper, glass, pet, plastic and aluminium) and other valuable objects.

Actually, in all corridors were left cartons boxes to collect plastic pet bottles. The workers were trained for separated collection of the plastic bottles used in rooms by guests. The collected

bottles are intended for social benefit of the employees by its sale to the recycling companies and get some revenues.

Figure 4 – Plastic bottle selected

The environmental benefit from implementation this opportunity is increase of the landfill lifetime of and cost savings on waste collection. No investment is required.

Table 1: Results at a Hotel 2001

Indicator	**Unit**	**Year 2013 Baseline (B) (Before RECP intervention)**	**Year 2014 A (After RECP implementation)**	**Change (C) C=100*(A-B)/B** [%]	**Difference Between A and B**
Resource use					
Energy Use	[MJ/yr]	1.180.191,56	1.670.148,36	41,52	489.956,80
Materials Use	[ton/yr]	0,00	0,00	0,00	0,00
Water Use	[m3/yr]	8.969,00	6.872,00	-23,38	-2.097,00
Pollution					
Carbon dioxide	[ton CO_2-eq/yr]	0,33	0,46	41,52	0,14
Waste-Water	[m3/yr]	0,00	0,00	0,00	0,00
Waste	[ton/yr]	3,00	3,00	0,00	0,00
Product Output					
Product Output: P	[ton/yr]	858,00	886,00	3,26	28,00

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

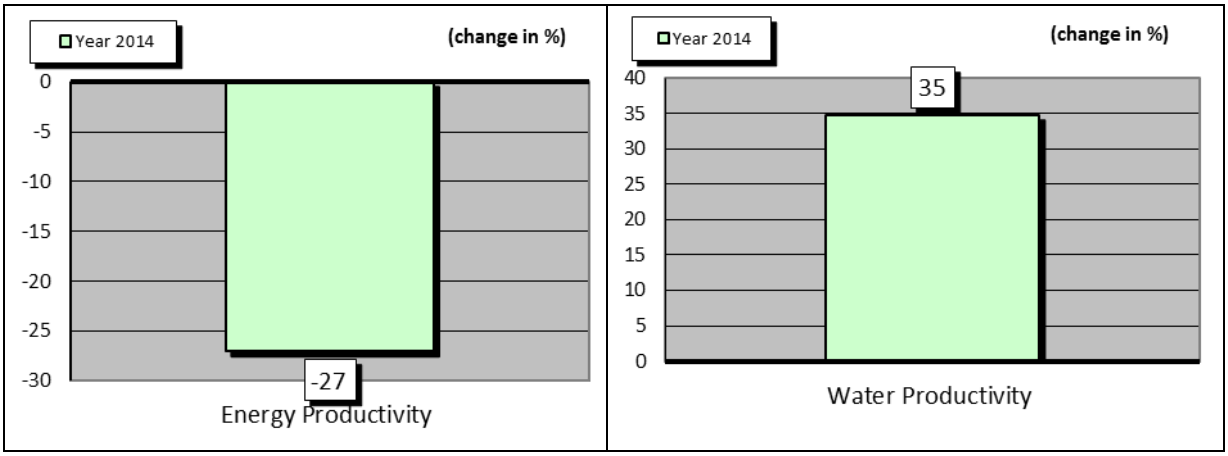


Figure 5 – Resource productivity energy and water

The graphic above shows the that the energy productivity decreased and concerning water productivity increased.
The company has focused on improving environmental performance in regard to water heating in the the guest rooms, this has required additional resource inputs for new electric boiler installation. This issue will be addressed through further implementation of RECP measures.

The equipment failure occurred during on 2013. This has unfortunately cancelled out the progress made in improving resource productivity in regard to replacement of water heating system.

However, the problem will be solved, the company has conducted feasibility study for installation of solar thermal water heating system.

Pollution Intensity CO2 emissions and Waste Generation

For energy use, there was increase of CO2 emission in 37% that means inefficiency on energy usage, concerning waste generation there was reduction in 3%.

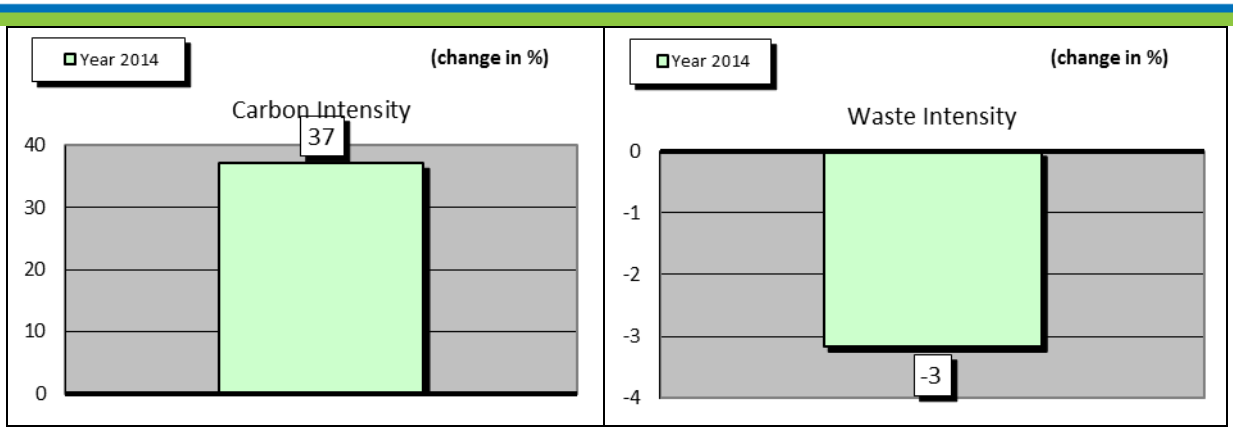


Figure 6 – Pollution intensity CO2 emission and Waste Generation

The company has made changes in its operations during this year. The implemented changes has in procedures during the transition phase, led to increased pollution intensity. However, this issue will be addressed through further implementation of RECP measures.

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:

- Improve energy use in public places;
- Improve the electric boilers water heating system in the guest rooms;
- Improve the waste segregation system;
- Implementation of good housekeeping practices;
- Feasibility study for installation of solar thermal water heating system;

- Installation lamps with motion and presence sensors detector in hallways;
- Turn of the lights whenever not required;
- Installation of led lamps in the guest rooms;
- Turn of the public Ac when are not required;
- Installation of water flow sensors taps;
- Repair of water pipe leaks ;
- Installation of coded containers for different types of waste streams.

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)**
Improve energy use in public places	No investment is required.	3,500	The environmental benefit consists of not consume about 108 KWh of electricity per day	Reduction of CO_2 emission and reduced costs of the electricity bills
Replace two electric water heaters for the guest rooms	4,800	1,500	Energy consumption reduced by 31,25 %	Reduction in 20% of CO_2 emission
Install taps with water flow sensors in public toilets	600	150	Overall water consumption reduced by 25 %	Reduction about 15% on water consumption in public toilets.

Approach taken

The Hotel 2001 managers of were concerned on about resource efficiency and environment conservation in their complex . For this purpose the Mozambique National Cleaner Production Center (MNCPC) was invited to conduct in plant RECP assessment jointly with the Hotel CP team set up and severally no and low cost investment option were identified during the assessment and successful implemented the high cost investment options were to put in place waste segregation system by installing coded containers to recover different types of waste streams taken to the landfill and Install solar thermal water heating system for hot water provision in the guest rooms..

The environmental benefit from implementation of waste segregation system is increase of the landfill lifetime and cost savings the on waste collection.
The Solar thermal water heating system will reduce the electricity consumption for water heating, with consequent reduction of the Environmental impacts.

The financial savings from implementation waste segregation systems for different types containers are around USD 1,231 /years associated with waste collection cost, and recovering of 72% of recyclable materials taken to the landfill namely: (paper, glass, pet, plastic and aluminium) and other valuable objects. With estimated investment of around USD 750.
The economic benefit from implementation of the solar thermal water heating system is equivalent to financial savings of USD 3,860/year with estimated investment is of around USD 10,750.

Business case

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 Centres (MNCPC) was officially established in 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 of 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.

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English Abstract (where applicable)

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 (RECP*net*). 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 RECP*net* 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, as well as on www.unido.org/cp and www.unep.fr/scp/cp.