



TOGETHER
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OCCASION

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RECP Experiences in the Project Lake Victoria Environmental Management Programme (LVEMP II), United Millers Limited Bakery Division (UML-Bakery)

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 United Millers Limited Bakery Division (UML-Bakery)

Achievements at a Glance

United Millers Bakery (UML-Bakery) is one the leading Bakeries in Kenya. The company is located along Nkrumah Road in Kisumu Kenya, its core business being Pan Bread and Confectionary Baking and distribution. This includes; Premium 400gm White and Brown Bread, premium 400gm Sandwich Bread, Premium 600gm White and Brown Bread, Premium 800gm White and Brown bread, Sweet Scones and Soft Rolls and Buns. The Company was established in 1990 and has an approximate production capacity of 200,000 pieces (400g) of loaves per day, with a work force of about 220 employees.

Resource Efficient Cleaner Production has enabled us monitor our processes very closely, enabling us to assess ourselves and establish suitable mitigation measure in order to reduce overall Water and Energy use while at the same time minimizing Waste generation. Since our operations involve whole some use of water, the only areas where wastewater is generated is housekeeping and wash room maintenance. Wastewater from wash rooms are connected to the septic tanks and at the moment, we are in the process of establishing the amount thereof.

 <p>Use of florescent tubes for lighting- Before CP</p>	 <p>Use of Transparent sheeting- After CP</p>	 <p>Bread crumbs recycling</p>
 <p>Use of wind powered cyclones instead of electric fans</p>	 <p>Bread crumbs for fish meal production</p>	 <p><i>dry cleaning of the floor to save on water use</i></p>

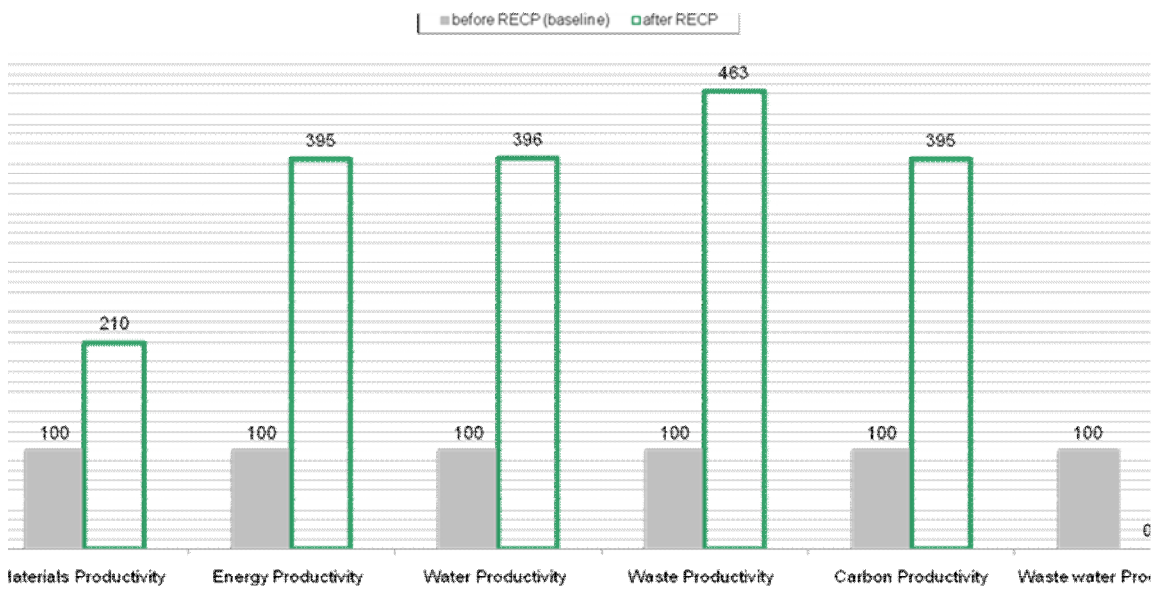
Overview

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Benefits

Implementation of RECP technology has helped the company in efficient resources utilization, environmental conservation through solid wastes and wastewater minimization including reduced Air emissions. The overall production output has steadily increased as the cost of production decreases. In 2012 the company obtained a National Cleaner production award in best water reduction and has consequently gained market competitiveness and created some job opportunities for the local communities. UML- Bakery has realized an approximate annual saving of USD 80,099.05. This was attributed to overall water use reduction, energy use reduction and reduced wastages of raw materials, including packaging materials during manufacturing processes.

Resource use indicator



RESULTS AT A GLANCE

Thematic Areas	Benefits				
	Economics			Resource Use	Environment
Principal Options Implemented	Investment [\$/Year]	Cost saving	Pay Back Period(Yrs.)		
<p><u>Option 1: Water Management</u></p> <ul style="list-style-type: none"> ▪ Repair and replacement of broken Water taps and water Cisterns. ▪ Repair and Modification of Toilet water cisterns. ▪ Metering and Sub-metering water usage ▪ Harvesting and of Rain Water. ▪ Switching from running water hose cleaning to fixed quantity cleaning ▪ Awareness through trainings and use of signage's. 	<p><u>Investment</u> [\$].</p> <ul style="list-style-type: none"> ▪ Total Investment <p>=Ksh.11,313.33 =\$ 131.55</p>	<p><u>Cost Saving</u></p> <ul style="list-style-type: none"> ▪ Total water savings /yr. <p>=910.66 M³ =Ksh.273,200 =\$3,176.74</p>	<p>3 Weeks</p>	<ul style="list-style-type: none"> ○ Reduction in water use Per/yr. <p>=910.66 M³</p>	<ul style="list-style-type: none"> ○ Reduct ion of waste water/ Yr.
<p><u>Option 2: Material Management</u></p> <ul style="list-style-type: none"> ▪ Preventive maintenance of machines and Equipment and effective process control of production processes to minimize product damage. ▪ Good store keeping. ▪ Automation of Bakers flour transfer. ▪ Quality recycling of intermediate and finished products and selling of bye 	<p><u>Investment</u></p> <ul style="list-style-type: none"> ▪ Total Investment. <p>= Ksh.975,599.48 =\$11,344.18</p>	<p><u>Cost Saving</u></p> <ul style="list-style-type: none"> ▪ Total savings /yr. <p>=Ksh.1,512,000 = \$17,581.4</p>	<p>8 Months</p>	<ul style="list-style-type: none"> ▪ Reductions in materials use Per/Yr. <p>=15.83 tons</p> <ul style="list-style-type: none"> ▪ Improved raw material quality 	<ul style="list-style-type: none"> ○ Minimiz ed environ mental pollutio n through solid wastes generati on

products					
<p>Option 3: Energy Management</p> <ul style="list-style-type: none"> Sensitization of staff by affixing 'switch off the lights' stickers. Metering and daily monitoring of Electricity usage. Installation of Isolators, Relays and control timers. Monitoring of daily electricity usages & taking corrective measures where necessary. De-lamping and use of transparent iron sheets Replacement of old generation Bulbs with energy saving florescent tubes. Replacement of large capacity exhaust motors with low capacity exhaust motors. Installation of wind driven cyclones Introduction of variable speed drives (VSDs) compressor and air conditioners at the Bakery. steam pipe lagging 	<p>Investment</p> <ul style="list-style-type: none"> Total Investment <p>= Ksh. 7,206,038.04 = \$ 83,791.14</p>	<p>Cost Saving</p> <ul style="list-style-type: none"> Total Energy savings /yr. <p>=194,313k Wh = Ksh. 3,303,321 = \$38,410.71</p>	<p>2 Months</p>	<ul style="list-style-type: none"> Reduction in energy use/Yr. <p>= 194,313kWh.</p>	<ul style="list-style-type: none"> Reduction in Air emissions/Yr. <p>= 48.58 tons</p>

<p>Option 4: Solid Waste Management</p> <ul style="list-style-type: none"> Preventive maintenance of machines and process control of production processes to minimize raw material spillage and product damage. Training and Sensitization of all machine operators, packers/loaders and Cleaners. Construction of solid waste handling unit/Point and dust bins. Identification and segregation of different types of waste & subsequent routine disposal. Introduction of Oracle technology (has reduced paper work by 30%). 	<p>Investment</p> <ul style="list-style-type: none"> Total Investment <p>= Ksh. 912,200.00 = \$.10,606.98</p>	<p>Cost Saving</p> <ul style="list-style-type: none"> Total Solid Waste savings /yr. <p>= Ksh.1,800,000 = \$.20,930.2</p>	<p>6 Months.</p>	<ul style="list-style-type: none"> Reduction in packaging material damages and product spillages. 	<ul style="list-style-type: none"> Reduction in environmental contamination through solid wastes.
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RECP Profile

Indicator	Unit	(2010)Baseline (Before CP intervention) (B)	(2011)Follow up (After implementation of 'all' feasible CP options) (A)	Improvement (I) (I=100*(B-A)/B [%])	2012 Follow up (After implementation of 'all' feasible CP options) (A2)	Improvement (II) (II=100*(B-A2)/B [%])	2013 Follow up (After implementation of 'all' feasible CP options) (A3)	Improvement (III) (III=100*(B-A3)/B [%])	Difference between A3 and B (B-A3)
Resources use									
Energy Use: E	[KWh /yr]	2,405,860.70	2,340,985.50	2.69%	2,221,049.00	7.68%	2,072,369.00	13.86%	333,491.7 kWh
Material Use: M	[t/yr]	11,247.48	20,606.34	-0.01%	15,902.12	-41.38%	14,258.97	-26.77%	-3011.49 tons

Water Use: W	[M ³ yr]	11,696.00	11,351.20	2.95%	10,673.31	8.74%	10,330.91	11.67 %	1,365.09 M ³
Environmental Impact									
Air Emissions: A	[ton CO ₂ /yr]	601.71	585.33	2.72%	555.40	7.70%	518.46	13.84 %	83.25 tons
Waste: W	[t/yr]	128.85	134.11	-4.08%	119.03	7.61%	85.92	33.32 %	42.93 tons
Production Output									
Production: P	[ton/yr]	23,887.27	91,702.28	-2.84%	24,085	-8.28	20,811.00	-12.88 %	3076.27 tons

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

Embracing Resource Efficient Cleaner Production has helped the company in cost saving through implementation of the following CP options; Energy use management, Water use management, Wastewater management, Solid Waste Management and Raw Material use.

Water use reduction has been achieved by monitoring water consumption and wastewater generation through metering and sub-metering at usage points, establishing effective preventive maintenance program to prevent leakages, practicing Good Housekeeping and harvesting of rain Water. About 7.8% water reduction has been realized every year since 2010.

Energy use reduction has been achieved by metering of electricity and Diesel usage, retiring over-sized motors; introduction of variable speed drives (VSDs) compressors and air conditioners, installation of Isolators, Relays and control timers, installation of wind driven cyclones, de-lamping and use of transparent iron sheets, steam pipe lagging and use of signage's to ensure employees switch off light whenever not in use/idling. This has reduced energy use by 8.1% every year. Raw materials wastages through spillages has been minimized through Good store keeping, automation of Bakers flour transfer from the Mill to the Bakery, and training of Machine operators on efficient monitoring of material usage and reconciling in every shift.

Approach taken

Cleaner production (CP) was adopted in UML-Bakery in 2011. This was after an initial training and an In-plant assessment by Kenya National Cleaner Production Centre (KNPCPC) on Resource Efficient and Cleaner Production (RECP). After the audit, the company conducted an awareness training attended by representatives from all CP units. A self-assessment was then conducted to identify potential CP projects by UML-Baker CP members. One identified, 4 CP teams (Water, Energy and Materials team) were formed and mandated to spearhead RECP implementation process. Implementation began by 'no and low cost investment options before embarking on real time investments options. In order to sustain RECP, UML-Bakery teams have worked closely with the rest of the production staff and ensured continuous monitoring and regular awareness training. Top management support and commitment has equally been very essential in RECP implementation without which no achievements would have been realized to date. RECP provides an opportunity for better resource use and environmental conservation hence sustainable growth.

Business case

RECP has impacted positively on the company by increasing the overall production output while ensuring high quality products that meet customer demand. The image of the company has greatly improved thereby increasing demand for our products. With an increased product demand our market base has expanded nationally and regionally for example in Tanzania and S. Sudan. Currently over 20 UML staffs are directly involved in cleaner production activities and the rest have been trained to enhance general awareness.

Testimony Box
Kenya National Cleaner Production Centre (KNPCPC)
The Kenya National Cleaner Production Centre (KNPCPC) is a Trust under the Ministry of Industrialization and Enterprise Development. It was established in July 2000 as part of the global UNEP/UNIDO National Cleaner Production Centre program under the UNDP-Government of Kenya Country Co-operation Framework of 1999-2002. Currently, it is being transformed into a semi-autonomous government agency. The Centre is a nodal Government agency in building capacity and providing advisory services in Resource Efficient and Cleaner Production (RECP) so as to increase the productivity of enterprises by reducing wastage of resources (water, energy and raw material) and their associated negative environmental impacts. The Centre offers consultancy and training on environmental impact assessment, environmental audit, energy management training and audit, Clean Development Mechanism and climate change (CDM), amongst others. These programmes are implemented in service and manufacturing enterprises including hotels, hospitals, households, municipalities, water services and sewerage companies, supermarkets among others.
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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 (RECPnet). This series of



RECP Experiences



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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.recenet.org, as well as on www.unido.org/cp and www.unep.fr/scp/cp.