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RECP Experiences at Distillery “Agustín Rodríguez Mena”

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 DISTILLERY “AGUSTÍN RODRÍGUEZ MENA”, CUBA.

Achievements at a Glance

Distillery “Agustín Rodríguez Mena” saved around USD 126,244.00 with the implementation of RECP options. In terms of environmental performance in the industry the resource productivity was increased and the pollution intensity was reduced. The best relative indicators were got in year 2010. The percentage of changes was 51 % energy productivity, 6 % materials productivity, 51 % water productivity, -34 % carbon intensity, -70 % waste-water intensity and -62 % waste intensity.

The positive change in energy productivity was, mainly, due to the insulation of equipments and the distribution steam pipes; the installation of an automatic control system for the steam generation and distillation processes and the appropriated use of compressed air. The reduction of the fuel oil and electricity consumption led to the decrease of carbon emissions. The result of material productivity was achieved implementing a management waste procedure. Water productivity is bound up with waste-water intensity. The waste-water generated in the distillation process was characterized and reused in the same process as dilution water and re-reused too to feed the steam generator diminishing the water and also the steam consumption.



Figure 1. Insulated distillation columns



Figure 2. Insulation the steam distribution line

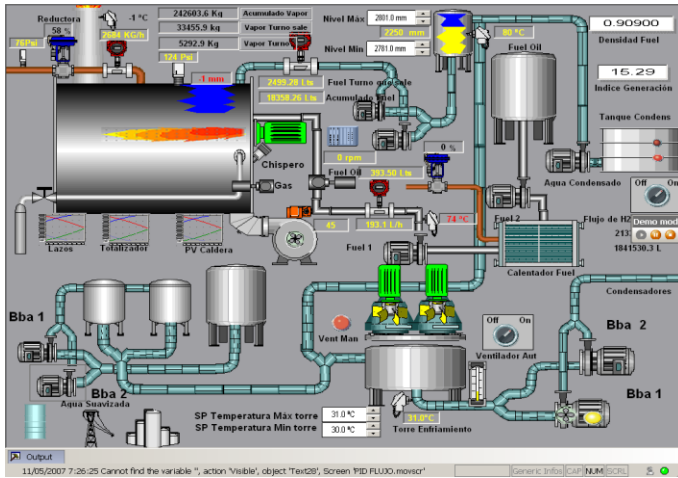


Figure 3. Control system of steam production process

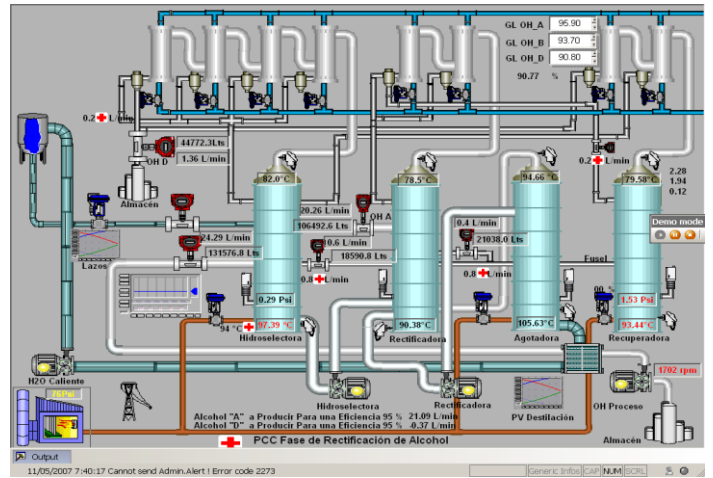


Figure 4. Control system of the distillation process



Figure 5. Control system of steam production process



Figure 6. Technical discussion with the company's manager

Overview

The Distillery “Agustín Rodríguez Mena” located in Villa Clara province, Cuba, is a business unit of the Central Rum Company belongs to the joint venture, Cuba Ron S.A. and it produces a high quality alcohol “A” used as raw material to the elaboration of liquor base for rums with the trade marks Havana Club and Cubay. The unit has 12 workers and annually makes an average of 50,000 hL of alcohol “A”. Its strength resides, mainly, in the experience of their employees, their high sense of responsibility with the environment, and the applications of the concept of continuous improvement.

This Distillery is an industry with tradition in the solution of environmental problems that has taken them to obtain several recognitions from the provincial government. They adopt the RECP focus with the intention of reducing the generation of wastewater, to save water and energy resources, looking for to upgrade their environmental acting and competitiveness.

Benefits

The RECP assessment embraced the processes of alcohol refining, production and supply of steam and compressed air and also

the production of soft water by means of ionic exchange with resins of sodium cycle. It was focused on the input and output streams of selected processes.

The industry reached progress in the environmental acting on each one of the evaluated years compared to the baseline. The Table 1, show the changes in per cent get by the distillery in the years 2006, 2007 y 2010 after implementation RECP.

Table 1. Results at a glance.

Absolute Indicator	Change (%) 2006	Change (%) 2007	Change (%) 2010	Relative Indicator	Change (%) 2006	Change (%) 2007	Change (%) 2010
Resource Use				Resource Productivity			
Energy Use	-26	-37	-26	Energy Productivity	41	51	51
Materials Use	3	-7	5	Materials Productivity	2	2	6
Water Use	-4	-8	-26	Water Productivity	8	2	51
Pollution Generated				Pollution Intensity			
Air Emissions (global warming, CO ₂ eq.)	-26	-37	-26	Carbon Intensity	-29	-33	-34
Waste Water	-28	-32	-67	Waste-water Intensity	-31	-29	-70
Waste	-46	-60	-58	Waste Intensity	-48	-58	-62
Product Output	4	-5	11				

Absolute Indicators measure basic data in a given time frame (one year). The absolute production indicator covers the product output created by the industry.

Relative Indicators are a measurement of absolute consumption or emission figures relative to reference data. In terms of environmental performance, productivity and intensity ratios are central relative indicators. A negative percentage indicates a decrease and a positive percentage indicates an increase. *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

Changes in the three resource-productivity indicators and the three pollution-intensity indicators are collectively presented in an RECP profile (Figure 7).

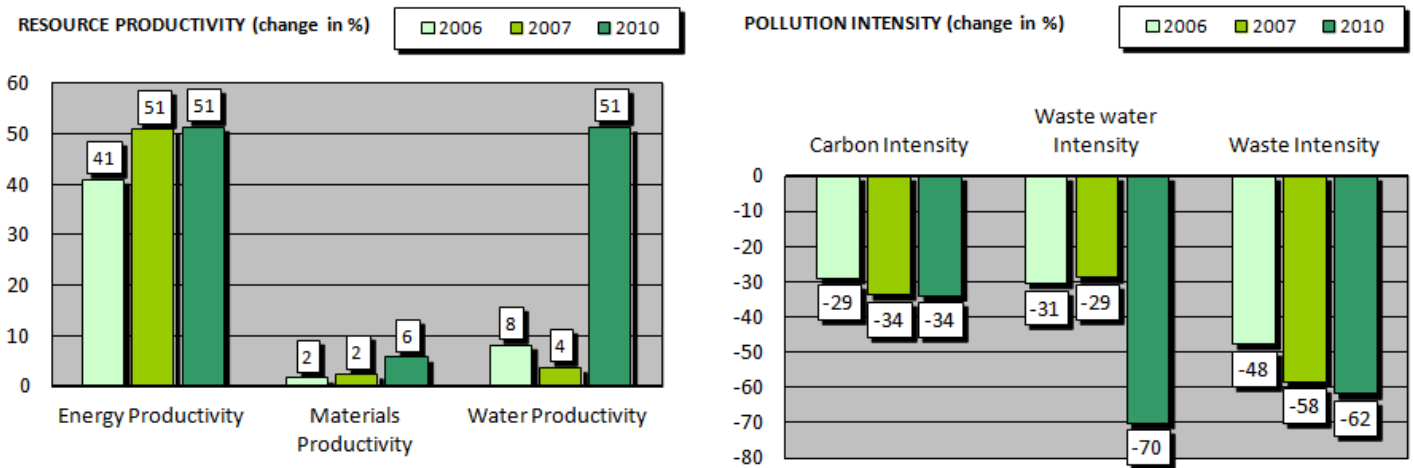


Figure 7. RECP profile for the years 2006, 2007 and 2010.

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

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)
Insulation of the steam distribution line to reduce the energy losses.	2,560	1768	Energy: 409,058 MJ Fuel: 12.6 tons	Carbon emission: 31.8 tons CO ₂ eq.
Change the agitation system of the brine solution tank, installing two pipes in cross shape with small orifices in the bottom of the tank reducing the air consumption and improving the homogenization of the brine solution	477	8064	Energy: 322,560 MJ	Carbon emission: 77.32 tons CO ₂ eq.
Change of air entrance valve used into the brine solution tank, by a globe valve allowing the appropriate control of the air flow.	12			
Regular monitoring to the preventive maintenance of the compressor	Nil			
Insulation of the heat exchanger and pipes of the alcohol distillation process.	870	961	Energy: 222,472 MJ Fuel: 6.9 tons	Carbon emission: 17.3 tons CO ₂ eq.
Installation an automatic control system in the steam generation and distillation processes.	6700	9100	Energy: 1,280,772 MJ Fuel: 39.5 tons Water: 1238 m ³ Crude alcohol: 542 m ³	Carbon emission: 99.6 tons CO ₂ eq.
To reuse the liquid wastes of the distillation columns as feed to the boiler and as dilution water feed to distillation process.	200	6,465	Energy: 4,542,273 MJ Water: 12,403 m ³	Carbon emission: 353 tons CO ₂ eq. Waste-water: 12,403 m ³
Reparation and modernization of the distillation columns.	167,307	35,919	Crude alcohol: 275 m ³ Better quality of product Energy: n.a Water: n.a	Carbon emission: n.a.
Elaboration and implementation a waste management procedure.	-	7,478 CUP	-	Waste: 72 kg

Approach taken

A complete RECP assessment was conducted by the Focal Point-III A (FP-III A), belonging to the National Cleaner Production Network (NCPN) of Cuba, using the cleaner production methodology proposed by UNEP that consists of five stages: (1) Planning and organization, (2) pre-assessment, (3) assessment, (4) feasibility analysis and (5) implementation and continuation. A group of employees were trained in CP and they worked together with the FP-III A team in the identification and implementation of improvement opportunities. The distillery after the application of RECP has strengthened collaboration with nearby community. They carry out activities there where give to know their advances in the environmental protection acting; they distribute bulletins with information on good practices to preserve the natural resources to help to elevate the environmental responsibility of the neighbors of the industry.

Business case

The results reached contributed so that the company obtained the recognition of the Cuban Ministry of Food Industry and this experience served as starting point to begin the introduction of RECP in the remaining three industries of Cuba Ron S.A.

Testimony Box
National Cleaner Production Centre (NCPC)
The NCPN of Cuba was established in May 2001, in the framework of the CP Program developed by UNIDO with support of the Austrian Government for 6 years. It operates currently with three Focal Points hosted by the Institute for Research of Sugar Cane Derivates (ICIDCA), the Institute for Research on Food Industry (IIIA) and the Research Institute of Tropical Fruits (IIFT). The NCPN is being coordinated by the representative of UNIDO Focal Point in Cuba. The Network's mission is setting in motion, coordinating and supporting national efforts in applying the RECP concept in the industrial and service sectors, in order to improve their economic and environmental performance, contributing to a higher industrial productivity and competitiveness, while decreasing the emission of pollutants. The NCPN performance is highly recognized in the country, especially by the industry sector and the environmental authorities. Since its creation, the NCPN has developed many activities in the most important sectors in Cuba, contributing to increase the efficiency, productivity and environmental performance.
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English Abstract (where applicable)
N/A



RECP Experiences



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