

## RECP Experiences at DUKAT Zagreb

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 DUKAT d.d., Zagreb, Croatia.

### Achievements at a Glance

The Resource Efficient and Cleaner Production (RECP) project in DUKAT included the Dairy Industry Plant. RECP implementation in the DUKAT led to annual savings of EUR 328,008 by investing EUR 31,051 and payback time of 1 month.

RECP project in DUKAT resulted in reduction of waste water amount by 286,000 m<sup>3</sup>/year (27%) and waste water pollutant load (COD) by 25%, savings of fresh (drinking) water by 280,000 m<sup>3</sup>/year, washing liquids by 183 t/year (12%), steam by 904 t/year (2%) and heat energy of 500,000 kWh/year.



### Overview

DUKAT is the biggest producer of milk and dairy products in Croatia. In DUKAT factory in Zagreb, approximately 166,000 liters of milk are processed per year, obtaining the following main products: fresh and UHT milk, fermented products, cream, spreads, desserts and juices.

In the factory, fresh drinking water was used for washing vehicles, production lines and machinery, heat exchange in technological processes and sanitary requirements. Wastewater obtained from cleaning the machinery, containing both washing liquids and raw material remains, was drained into the sewer without previous treatment. In addition to this, losses of hot water, condensate and "soft-demi" water were detected and attributed to technical reasons and inadequate habits of employees.

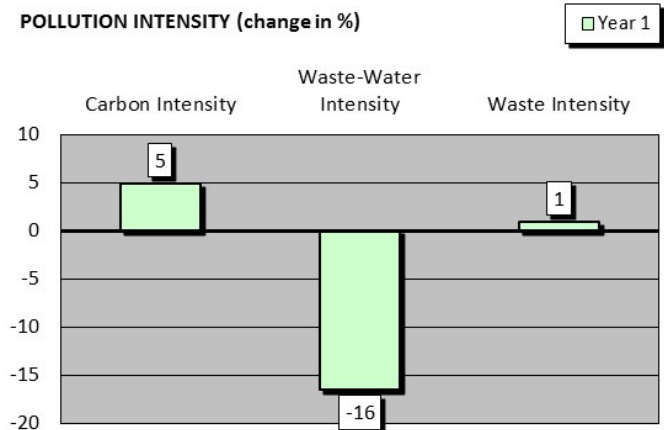
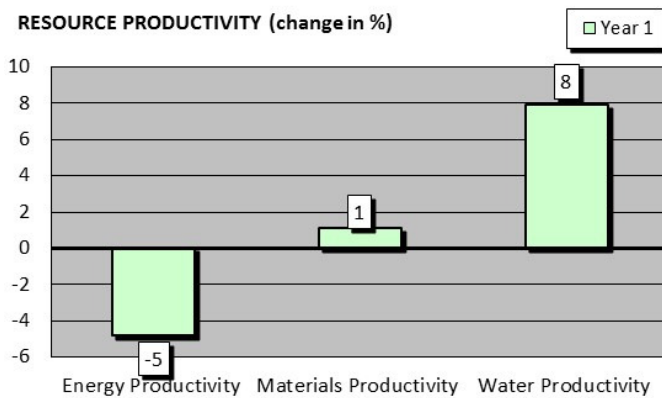
### Benefits

The factory implemented the following measures to achieve its pollution prevention and water and energy saving objectives:

- Carried out employee education concerning water consumption reduction and optimal concentrations of washing liquids
- Used hoses with a smaller diameter (12 mm) for washing the process lines and machinery
- Used hot condensate as an additional energy source for warm water preparation
- Applied warm water circulation and replaced the steam with warm water in the mixer.

Absolute Indicator	Change (%) Year 1	Relative Indicator	Change (%) Year 1
<b>Resource Use</b>		<b>Resource Productivity</b>	
Energy Use	-8,15	Energy Productivity	-5
Materials Use	-13,57	Materials Productivity	1
Water Use	-19,00	Water Productivity	8
<b>Pollution Generated</b>		<b>Pollution Intensity</b>	
Air emissions (global warming, CO <sub>2</sub> equivalent)	-8,26	Carbon Intensity	5
Waste-water	- 27,00	Waste-water Intensity	-16
Waste	-11,70	Waste Intensity	1
<b>Production Output</b>	-12,59		

## RECP Profile



## 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:

Principal Options Implemented	Benefits			
	Economic		Resource Use	Pollution generated
	Investment [EUR]	Cost Saving [EUR/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)
Employee education concerning water consumption reduction and optimal concentrations of washing liquids	31,051	328,008	-	-
Using hoses with a smaller diameter (12 mm) for washing the process lines and machinery			Reducing water consumption of 280,000 m <sup>3</sup>	Reducing waste water of 286,000 m <sup>3</sup>
Using hot condensate as an additional energy source for warm water preparation			heat energy of 500,000 kWh	-
Applied warm water circulation and replaced the steam with warm water in the mixer			saving of steam 904 t	-

## Approach taken

RECP is a great cost-saving tool that has enabled the company to reduce CO<sub>2</sub> emission and savings in utility raw materials. The implemented measures lead to reduction of waste water amount by 27% and waste water pollutant load (COD) by 25%, savings of fresh (drinking) water by 19%, washing liquids by 12%, steam by 2% and heat energy of 500,000 kWh/year.

## Business case

In the case of DUKAT resource efficient and cleaner production methodology was used, but adopted to the conditions and needs of the plant. The company continues to work on RECP activities, especially related to water savings.



# RECP Experiences



<b>Testimony Box</b>
<b>National Cleaner Production Centre (NCPC)</b>
Croatian Cleaner Production Centre (CRO CPC) was founded as non-governmental, non-profit institution in year 2000.  It is a member of the Global Network for Resource Efficient and Cleaner Production (RECP net).  <b>Centre's core business</b> lies in providing consulting services and trainings related to environmental protection, with a focus on: <ul style="list-style-type: none"><li>• Training and implementation of cleaner production in industrial companies and service sector</li><li>• Implementation of Environmental Management System and HACCP</li><li>• Best Available Technology Assessment (BAT; BREF)</li><li>• Implementation of Corporate Social Responsibility (CSR) and monitoring of achievements by utilising UNIDO REAP software tool</li><li>• Consultancy services for the industry (Environmental Impact Assessments, Environmental permits)</li></ul> For the work and achievements in the field of environmental protection the Croatian Cleaner Production was awarded with the National Environmental Award in 2004.
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<b>English Abstract</b> (where applicable)

## 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.recenet.org](http://www.recenet.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).