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UNEP

Regional Activity Centre for Cleaner Production

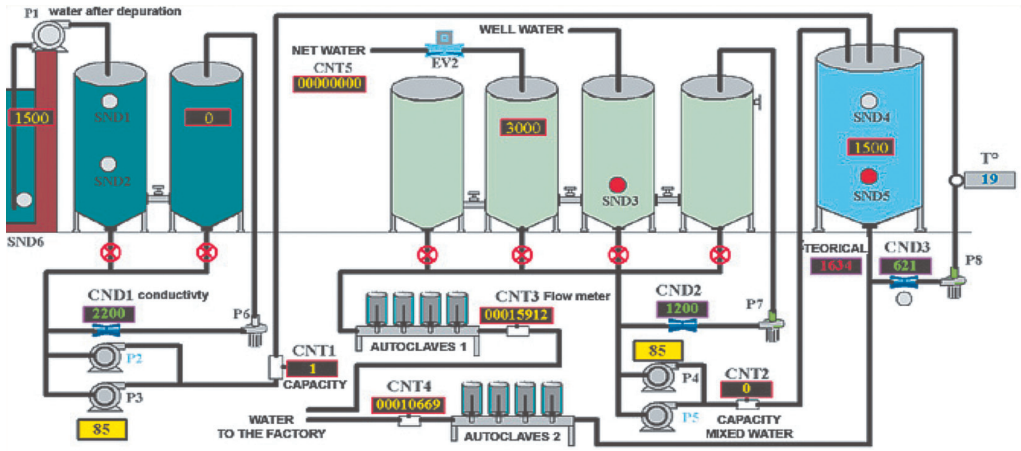
MINISTERIO DE MEDIO AMBIENTE

Generalitat de Catalunya
Government of Catalonia
Department of the Environment and Housing

No. 86 Pollution prevention case studies

Reduction of water consumption

Company	Leonardo 1502 Ceramica, Casalfiumanese (Bolonia, Italy).
Industrial sector	Production of ceramic tiles.
Environmental considerations	Leonardo 1502 Ceramica uses a high quantity of water. After the production process the water is sent to the water treatment system. Part of water goes back in the production process and part of it is discharged into the sewage system. During the summer there are problems with the low availability of water, hence recycling as much water as possible is very important.
Background	Leonardo 1502 Ceramica uses approximately 100,000 m^3/year of water and produces more than 20,000 m^3/year of wastewater.
Summary of actions	1. Improvement of the water treatment plant with the installation of seven new bathtubs, with the aim of improving the homogenisation of the cleaned water. 2. Updating of remote management with new software. The homogenisation of water is necessary as the incoming load of pollutants in the water coming from the production process is highly variable, and without the homogenisation of the water it cannot be recycled into the production process. The most important parameter to control is conductivity (with an excessinve conductivity there may be problems during wet grinding of raw materials). After laboratory controls it was defined that the maximum conductivity is 2,000 µS/cm. With this new system the water can be mixed after depuration (with high level of conductivity), net water and well water (with a low level of conductivity) to obtain a "mixed water" with a max conductivity of 2000 µS/cm.
Outline of the process	In the production chart it is possible to see the seven bathtubs, pumps and flow meters:

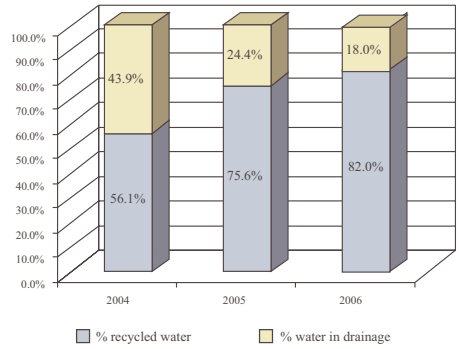


Balances

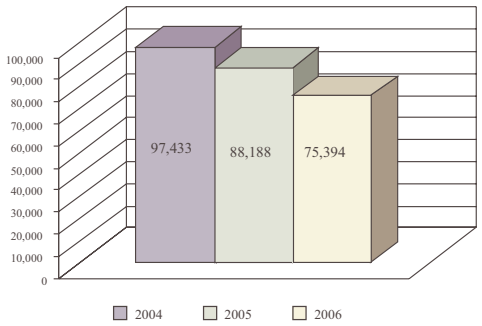
The new system was installed in November 2004

Year	Water consumption (m^3/year)	Water in drainage	Recycled water	Water	% recycled water	% water in drainage
2004	97,433	20,269	25,951	46,220	56.1%	43.9%
2005	88,188	9,946	30,826	40,772	75.6%	24.4%
2006	75,394	6,593	30,035	36,628	82.0%	18.0%

% water in drainage and % recycled water



Water consumption (m^3/year)



Economic balance	2004	2005	2006
Wastewater in drainage (m^3/year)	20,269	9,946	6,593
Water saving (m^3/year)	—	10,323	13,676
Wastewater drainage cost (€/m^3)	€ 0.60	€ 0.60	€ 0.60
Water cost (€/m^3)	€ 1.15	€ 1.15	€ 1.15
Total drainage cost	€ 12,119	€ 5,947	€ 3,942
Total drainage cost saving with new system		€ 6,172	€ 8,177
Water cost saving	—	€ 11,871	€ 15,727
Investment	€ 65,000		
Tax benefits		€ 3,250	€ 3,250
Total benefits (in €)		€ 21,293	€ 27,154
Rate	3.50%		
Return of investment (in year)	2.8		

Conclusions

With a relatively simple system we have obtained a saving of water and a reduction in quantity of wastewater. It is important to underline that a low level of wastewater means a lower level of pollution discharge.

NOTE: This case study seeks only to illustrate a pollution prevention example and should not be taken as a general recommendation.

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