Mediterraneum
Clean
Propre
Limpio

UNEP
MAP
GRECO INITIATIVE
GREEN COMPETITIVENESS
Regional Activity Centre
for Cleaner Production
GOBIERNO DE ESPAÑA
MINISTERIO DE MEDIO AMBIENTE Y MEDIO RURAL Y MARINO
Generalitat de Catalunya
Government of Catalonia
Ministry of Territory
and Sustainability

No. 143 Pollution Prevention Case Studies

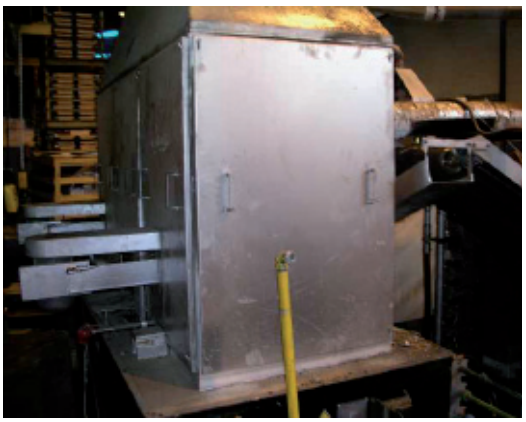
LPG-powered Grid-casting Machine in a Battery Manufacturing Facility

Company	Chloride Egypt (Information provided by Eng. Ahmed Kamal & Eng. Adel Taha from the Environmental Compliance Office and Sustainable Development, ECO-SD)
Industrial sector	Manufacture of batteries and accumulators ISIC Rev. 4 no. 2720 (International Standard Industrial Classification of All Economic Activities)
Environmental considerations	The manufacture of batteries implies the use of several products that can be hazardous to workers and the environment, such as heavy metals, acids and other chemical products. The main factory gas emissions are acid vapours, lead or lead-oxide emissions, and CO_2 emissions from fuel combustion. In addition, the generation of potentially toxic solid waste includes: lead and lead alloy scrap, lead oxide dust, and packaging materials. For this reason, it is important to implement clean production measures to reduce and control the exposure limits both for workers and the surrounding environment.
Background	Chloride Egypt is an Egyptian joint-stock company established in 1982 and is a leading company in manufacturing several types and models of batteries, such as car batteries, solar batteries, industrial batteries—both acidic and alkaline, standby batteries and UPS.
Summary of actions	The process of grid casting starts by melting the lead ingot in open melting pots via electrical heaters and could lead to health hazards due to exposure to lead emissions. There is also a significant loss in energy, as the melting pots are completely opened. Prior to the development of this project, the grid-casting machine used electricity as its power source. The measures carried out consisted in: - Exchanging the electrically powered grid-casting machine for another one using liquid petroleum gas (LPG) as fuel. This change would control lead emissions, as the melting pots are always completely closed, thus improving the conditions of the working environment. In addition, the LPG has been found to have cheaper operating costs.

Photo

OLD PROCESS

NEW PROCESS



Balances

INVESTMENT	
LPG-powered grid-casting machine	€81,435.99[1]

SAVINGS	
Reduction in CO_2 emissions	113.6379 t/year
Reduction in SO_2 emissions	6.8806 t/year
Reduction in heavy metal emissions	0.0023 t/year
Total savings (monetary)	€19,105.16/year[2]

RETURN ON INVESTMENT	
The return-on-investment period is calculated as	**5.5 years**

[1] Feb. 2011 exchange rate. Original amount: EGP648,625

[2] Feb. 2011 exchange rate. Original amount: EGP152,170

Conclusions

In this case, investment in new equipment with an alternative power source (although a fossil fuel) has lead to a reduction in CO_2 emissions due to improved performance. In addition, it has allowed the company to reduce the emissions of other pollutants such as SO_2 and heavy metals.

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

Regional Activity Centre for Cleaner Production
Dr. Roux, 80
08017 Barcelona (Spain)
Tel. (+34) 93 553 87 90
Fax. (+34) 93 553 87 95
e-mail: cleanpro@cprac.org
http://www.cprac.org