

Donor country Italy				
Project/programme title Biomass substitution of fossil fuels in cement kiln of Italcementi Group plant in Thailand				
Purpose Reduce the use of fossil fuels in cement kiln by substitution with Rice husk which is carbon dioxide neutral.				
Recipient country Thailand	Sector Cement industry	Total funding 700,000 Euros	Years in operation 4 years	
Description <p>The Thailand economy is heavily based on agriculture and rice cultivation is a major practice both for local consumption and exportation. Rice husk constitutes more than 20% of the milling process output which has historically been considered waste and dumped in open fields with subsequent emission of methane from their anaerobic decomposition.</p> <p>This project implements the use of rice husk as alternative and renewable fuel, substituting highly carbon intensive coal and lignite used in the cement kiln of the Pukrang plant. The year 2006 marked the start of the gradual substitution process which attained 10% total fossil fuel substitution in 2008.</p> <p>At first a series of tests in the laboratories of the Group's Technical Centre (CTG), in Bergamo- Italy, were carried out to evaluate the properties of the rice husk thus establishing its suitability as fuel in kilns. Then an industry standard storage transport and feeding system for biomass was designed and installed.</p> <p>Leveraging the Group's technology in processing alternative fuels, a new very efficient way to increase the rice husk substitution of fossil fuel was developed and implemented by the Group engineers at the end of 2007. Currently local engineers have fully acquired the new technology and handle the whole process independently.</p>				
Indicate factors that led to project's success <ul style="list-style-type: none"> - Country specific conditions: Rice husk is locally sourced contrary to coal and lignite which is imported into the country from Indonesia involving availability and shipping constraints. The widespread rice cultivation and the high number of rice mills in the region made it possible to create a reliable supply network which is fundamental for success in the substitution process. - External technical assistance: Technical barriers of the burning of rice husk in cement kilns usually include reduced cement production and out of schedule maintenances often requiring a stop of the entire production process. Acquired experience in the similar practice at the Group's plants enabled implementation with limited adverse effects. - Environmental aspect: Many environmental concerns related to the use of fossil fuels advocates a switch to biomass especially in a fast growing economy like that of Thailand. The quality of emissions was in compliance with existing environmental standards. Furthermore, the more than 300.000 tCO₂ emission reductions achieved by the switching process in the space of 4 years constitute a valid contribution to the fight against climate change in a country considered to be highly exposed to the impacts of climate change 				
Technology transferred <ul style="list-style-type: none"> - Biomass feeding and burning technology from Group engineers - Technical assistance and training of local engineers 				
Impact on greenhouse gas emissions/sinks				
Operation year	Rice husk LHV as received (MJ/ton)	Rice husk energy substitution (TJ)	Fossil fuel emission factor (tCO₂/TJ)	Emission reduction (tCO₂)
2006	13,000	187.17 (1.5%)	98.9	18,511
2007	12,000	553.25 (4.2%)	97.40	53,886
2008	12,000	1,398.71 (10%)	96.20	134,556
2009 (to September)	13,000	1,154.29 (10.6%)	96.30	111,158
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