

ENGRO CHEMICAL PAKISTAN LIMITED

Environmental Footprint of a Fertilizer Plant & Its Reduction Techniques

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Engro's Introduction – A Brief History

1965: Esso Pakistan Fertilizer Co. Ltd.

1991: Exxon divests its equity; company renamed Engro Chemical Pakistan Ltd after an employee led buyout



Our Track Record: 1968 to date

EXXON:

- Original capacity debottlenecked from 173 KT to 268 KT

ENGRO:

- Relocating used ammonia/urea plants from USA/UK respectively. Capacity increased to 950KT
- Set up two JV companies :
 - Engro Vopak Terminal Ltd- 1997
 - Engro Asahi Polymer & Chemicals Ltd - 1999
- Launched three new businesses :
 - NPK fertilizer – 2001
 - Process Control & Automation – 2002
 - Foods -2005

Certifications:

- ISO-9001 (2001) ISO-14001(2003)
- SA-8000 (2005) OHSAS-18001 (2005)
- ISO-17025 (2006)



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Environmental Policy

- Continuously improve environmental performance to achieve sustainable development
- Practice transparent public reporting of environmental performance



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Environment Management Approach

- Compliance of National Environment Quality Standards
- Environmental foot print quantification
- Benchmarking with similar operations



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Environment Management Approach

- Minimize ammonia emission
- Pursue energy conservation
- Pursue water conservation
- Responsible disposal of hazardous waste
- Reduction in noise in working areas
- Green area development on Site
- Eliminate the use of CFC gases

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Environmental Footprint Development & Use

"You can only improve upon what you see or measure..." Dr Edward Deming

- Quantify environmental impact activities:
 - Air emission quality & quantity
 - Effluent quality & quantity
 - Hazardous & non hazardous waste generation
 - Natural resources consumption
 - Noise
 - Carcinogens in use

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Environmental Footprint Development & Use

- Benchmarking against the best practices
- Identification of improvement opportunities
- Set long term environmental performance targets
- Public reporting of environmental performance



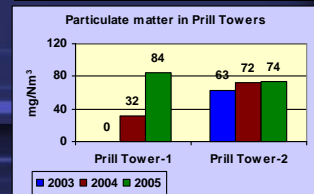
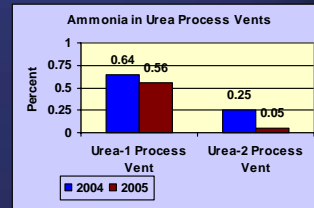
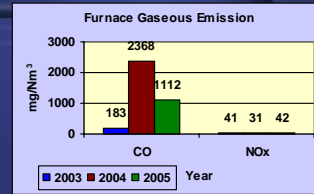
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Engro's Environmental Footprint

- Developed annually since 2004
- Reported in Sustainability Report
- Focuses on three key impact areas:

Air Emissions

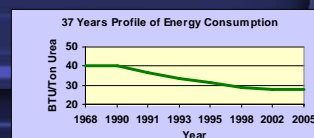
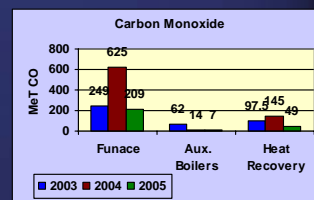
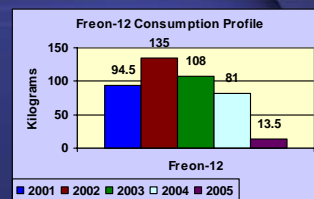
- Focus on ambient air quality & global environment
- Sources are; furnace, boilers, gas turbines, prill towers, process vents & powered vehicles
- CO emissions from furnace reduced by application of high emissivity coating
- Ammonia recovery & procedures improved to reduce venting
- Height of vents increased
- Vibro-Priller technology usage reduced dust emissions from prill towers even at higher through put



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Global Environment

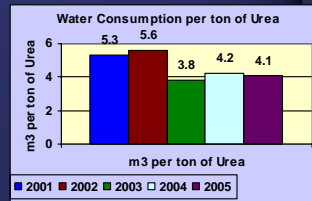
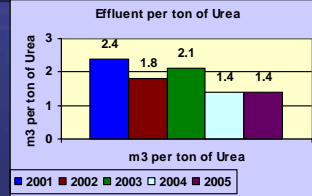
- CFC Reduction
 - Elimination of CFC usage
- Reduction in Green House Gases
 - Over the last 15 years, energy consumption reduced by 31.6%, per ton of urea produced



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Effluent Discharge - Natural Resource Conservation

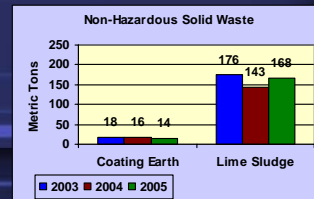
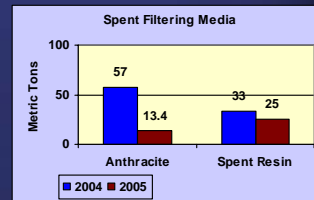
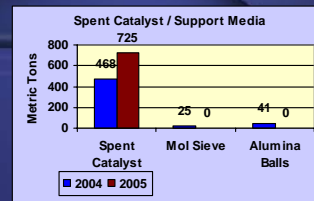
- Focus is on source elimination
- Hydrolyser / Stripper & collection network in place to treat ammonia laden effluent
- Since 2004, 30 % reduction in ammonia concentration in effluents going to canal & 50 % to evaporation ponds
- Water usage 522 m³/hour, generating about 70-90 m³/hour of wastewater, of which about ½ is recycled for agricultural use
- Domestic effluents is treated and used for horticultural usage. Fresh water saving of about 45 m³/hour



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Waste Management

- Spent catalyst is stored in specially designed storage area on Site
- Used lubrication oil, insulation & anthracite disposed off through recycling companies
- Lime sludge is disposed in a land fill



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Noise and Carcinogen Removal

Noise

- Vents with silencers ensure that the boundary limit noise level of 45 dBA is met even during shut down or start up
- Focus area is to reduce noise level at the plant

Carcinogens Removal

- Chromate replaced with a phosphatic treatment in cooling towers
- Hydrazine replaced with Eliminox as an oxygen scavenger in boiler feed-water
- Eliminated the use of asbestos gasket by switching to non-asbestos gasket

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Land

- Tree plantation in and around our plant site and housing colony, over 1,200 trees planted in 2005
- Most of our unutilized land has been converted into lawns
- World Wildlife Fund (WWF) survey found our site home to 49 species of birds - over 20,000 migratory birds visit our ponds in their annual journey through the Indus Flyway



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Engro – A Socially Responsible Corporate Citizen

"BEHTER ZINDAGI – ENGRO SE" : IS OUR MOTTO, WHICH MEANS; A BETTER LIFE FOR ALL WHO COME INTO CONTACT WITH ENGRO.

Education

- 23 schools; benefiting 4000 students
- Teacher training center; trained 2600 teachers

Health care facilities

- Free snake bite treatment
- Oncology, Dialysis, Eye care, thalassaemia, mother & child care centres
- Telemedicine
- 150,000 patients benefited

Sports

- Stadium in Daharki & tournament sponsorship

Environment

- Indus Blind Dolphin Conservation
- Environmental awareness seminars
- Infrastructural schemes of drainage



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Future Environmental Plan & Challenges

Salient environmental targets for 2006 are:

- Finalize proposal to convert energy source of street lights & water heater to solar power
- Reduce Green House Gases emissions through energy conservation projects
- Environmentally friendly disposal of spent catalyst
- Finalize a Clean Developing Mechanism Project
- Finalize waste water recovery Study



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