



ENGRO CHEMICAL PAKISTAN LIMITED

# Concept of 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

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



# Environmental Policy

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



# Environment Management Approach

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



# 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

# 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

# Environmental Footprint Development & Use

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

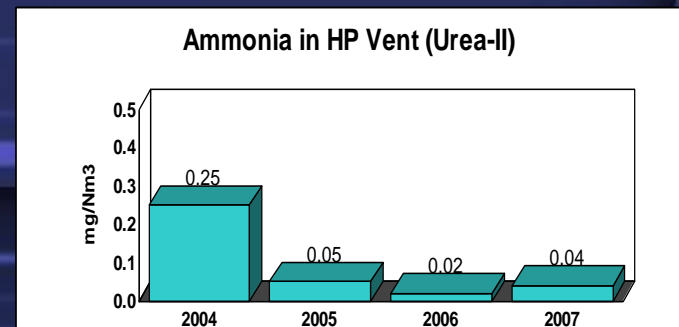
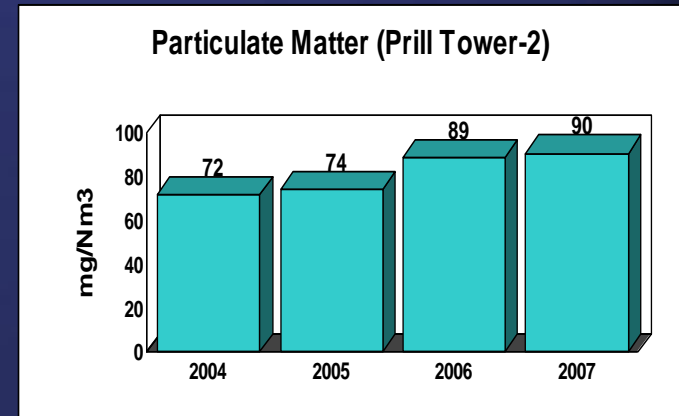
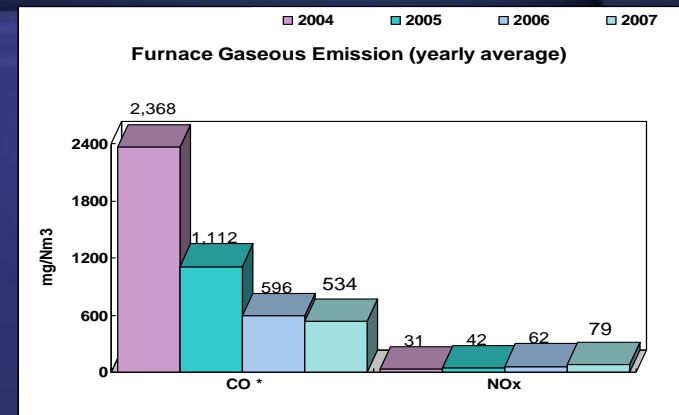


# Engro's Environmental Footprint

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

## Air Emissions

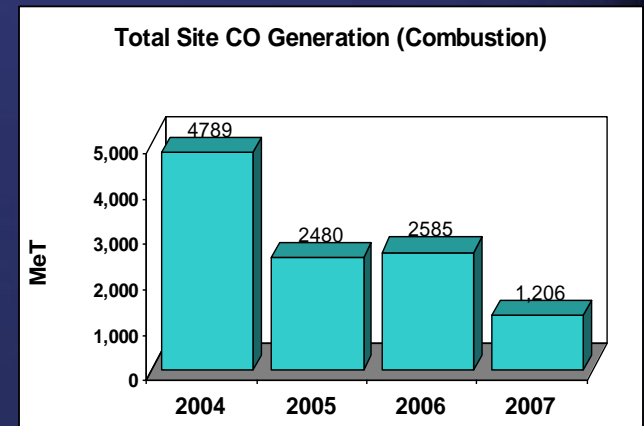
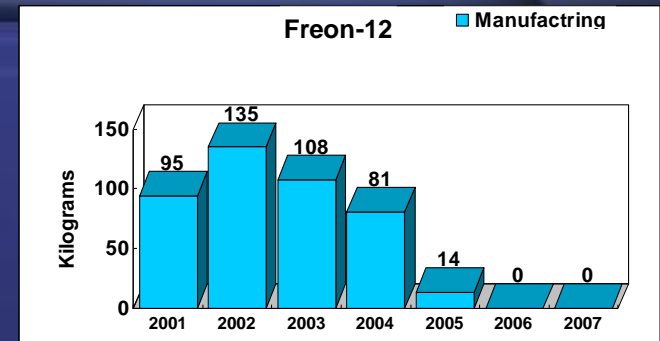
- Focus on ambient air quality & global environment
- Sources are; furnace, boilers, gas turbines, prill towers, process vents & powered vehicles
- CO emissions from furnace reduced by application of high emissivity coating
- Ammonia recovery & procedures improved to reduce venting
- Height of vents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





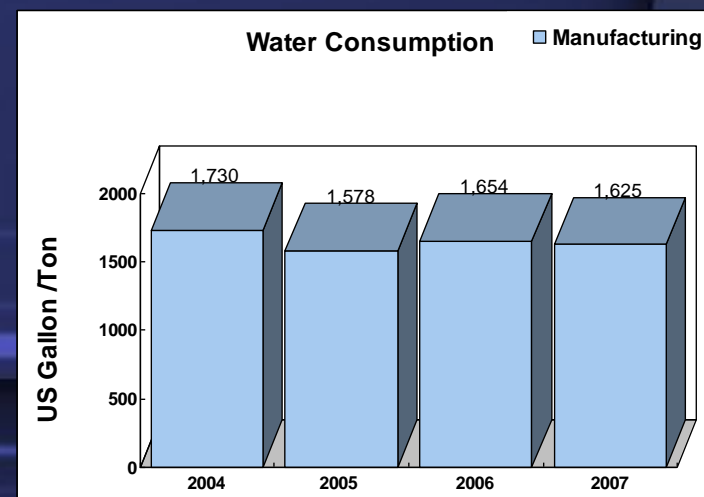
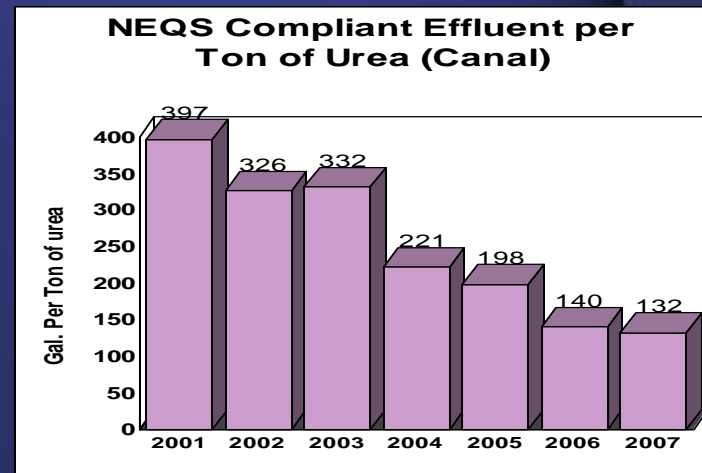
# Global Environment

- 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



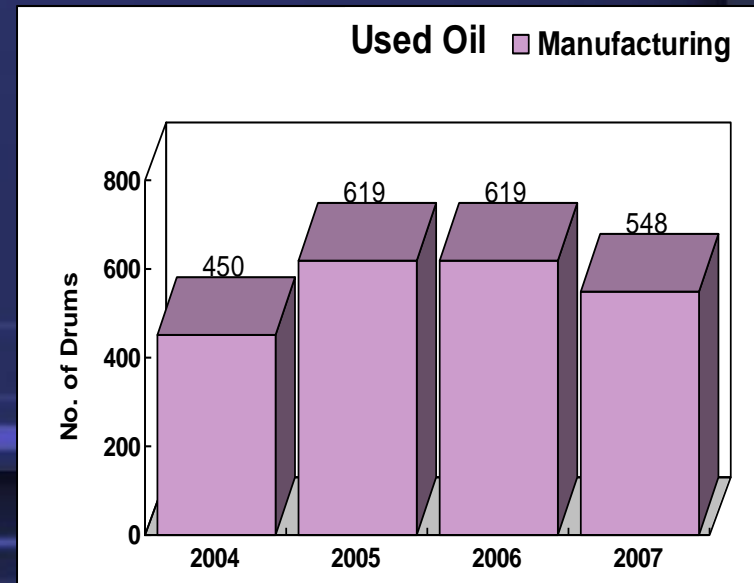
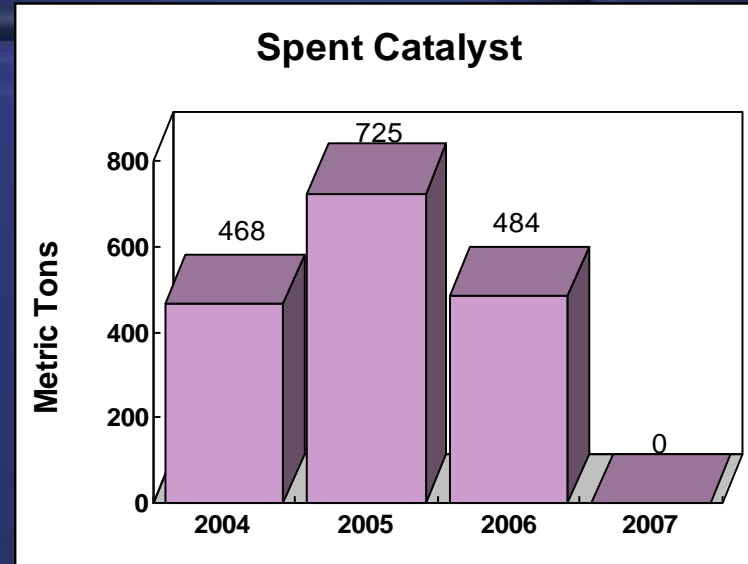
# Effluent Discharge - Natural Resource Conservation

- 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 m<sup>3</sup>/hour, generating about 70-90 m<sup>3</sup>/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 m<sup>3</sup>/hour



# Waste Management

- Spent catalyst has been disposed off for recycling & reuse
- Used lubrication oil, insulation & anthracite disposed off through recycling companies
- Lime sludge is disposed in a land fill



# 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

# Land

- Tree plantation in and around our plant site and housing colony, over 2,000 trees planted in 2007
- 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



# Future Environmental Plan & Challenges

Salient environmental targets for 2008 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 solid waste
- Finalize a Clean Developing Mechanism Project
- Finalize waste water recovery Study

