



*Towards a Greener Tomorrow*  
**environment report**  
**2008**



Engro Polymer & Chemicals Ltd.



This report presents an overview of the environmental performance of Engro Polymers & Chemicals Ltd. and the progress made in its environment-friendly initiatives in the year 2007-2008.

We wish to acknowledge and thank all team members for providing input and guidance for developing the 4th Environment report of the Company.

This report is also available on our website:  
[www.engropolymer.com](http://www.engropolymer.com)



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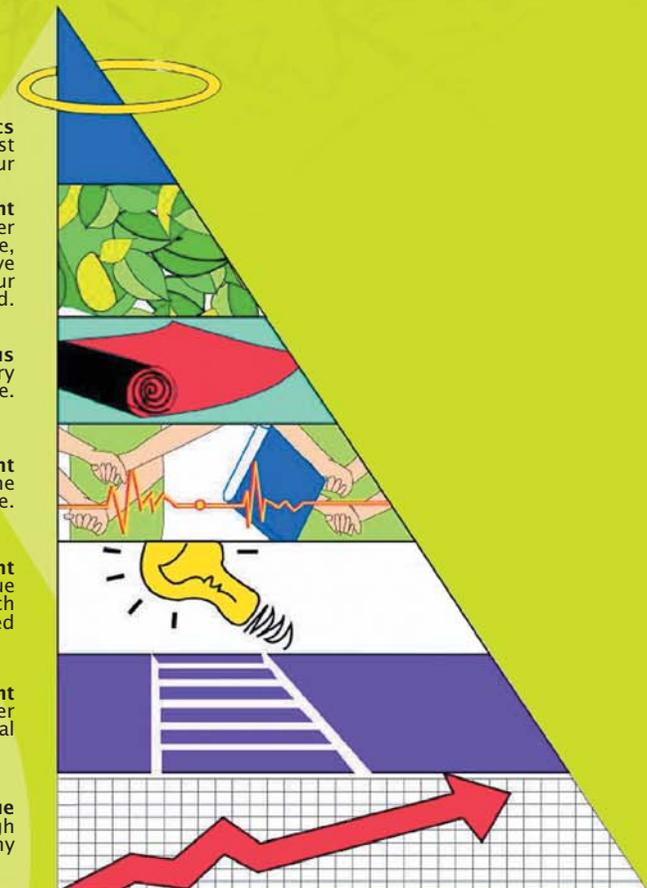
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# mission statement

Our mission is to create value for our customers by offering quality product at competitive prices, on-time deliveries, business development and technical support to achieve growth while maintaining safety, environment and ethical standards as well as enhancing value for our stakeholders.

## core values

- ethics**  
We are committed to the highest standards of ethical behaviour
- safety, health & environment**  
We will operate, manage and utilize resources in a manner that ensures health and safety of our assets, people, neighbors, and customers. We believe in playing a positive role in environment conservation and will ensure our operations remain environmentally sound.
- customer focus**  
We believe in keeping customer needs as our primary focus as they define the reason for our existence.
- community involvement**  
We shall endeavor to improve the quality of life in the communities in which we live and operate.
- continuous improvement**  
Continuous improvement is a way of life for us. We value breakthrough ideas and encourage an environment in which innovative ideas are generated, nurtured and developed
- individual growth & development**  
We shall endeavor to assist, encourage, and empower individuals to achieve their maximum potential
- enhancement of shareholders' value**  
We shall endeavour to enhance shareholders value through long-term profitable growth of our company



# president's message

## president's message



It is a great pleasure for me to present our Environment report 2008. This has been a record year for our Company in terms of performance in all the disciplines, starting from Safety and Environment to Productivity and Business growth. The safe and smooth startup of our new PVC unit and its associated utilities plant, without any NEQS violations, is a commendable achievement in itself.

This is a critical time in the history of EPCL. We are at an advanced stage of a 250M-US\$ project. A 60MW power plant, an EDC/VCM plant and a Chlor-alkali plant will be started by mid 2009. Substantial investments have been made to make processes environment friendlier. Accident free construction and startup of the remaining units will be a challenging job. Our team has accepted challenges like these in the past and I have full confidence that they will be able to do so once again. Higher standards of performance need higher level of dedication from employees at all levels and each one of our employees is committed to continuous improvements.

Our business has direct impact on the health and safety of our employees, customers, community and other stakeholders. While ensuring the highest standards of Safety, Health and Environment at the plant, we have endeavored to go beyond our stated duties by working with communities in different areas of social responsibilities to reduce our environmental footprints.

As part of our Company's "Corporate Social Responsibility" is to help the community in our neighboring areas, various contributions have been made in the field of health, education, IT and relief work during crisis. In the past one year, the Company has been involved in the provision of a clean drinking water supply - 500 gallons per hour of purified water to be exact - to nearby communities. We support a local Government school near our Port Qasim site; provide infrastructure and other supplies needed by conducting an environmental awareness program and free medical tests for schoolchildren and by donating funds and blood to different welfare organizations.

We give extreme importance to the preservation of biodiversity around the operating site; one example is the step taken towards protecting mangroves and after four years, we have conserved 100,000 mangroves at a coastal site spread over an area of almost 24 acres. In the future, we are considering a major biodiversity initiative to neutralize our carbon emission by planting trees. It is an uncompromising commitment of the Company to act proactively and positively as a benefactor of the society of which it is a part. And we are determined to carry on the tradition.

*Asif Qadir*  
Asif Qadir

## executive summary



EPCL is the sole manufacturer of PVC in Pakistan and has been producing and marketing PVC resin since late 1990's, which is used in manufacturing a wide range of plastic Products.

We, at EPCL are serious about taking initiatives to protect the environment and believe in conserving environment while ensuring that all our operations and activities remain environment friendly. Since our business can have impact on the health and safety of our employees, customers and neighboring community,

# Executive Summary

hence, we are fully committed to ensuring the highest standards of Safety, Health & Environment.

Contributing to the economic growth of Pakistan, the Company has embarked on an expansion and backward integration project worth 240 million US dollars. This is the single biggest investment of its kind in the petrochemical sector in Pakistan, which envisages setting up several petrochemical units at our Port Qasim Site. After the completion of the project, Chlorine and Ethylene will be used in the EDC/VCM plant to produce EDC and subsequently VCM. As part of our ongoing focus on environment, we have ensured that the potential environmental impacts of this project are fully assessed and mitigated. This project envisages state of the art environmental initiatives like waste effluent handling, solid & liquid waste disposal, incinerator revamping, DCS conservation, CFC replacement and Hydrogen firing. These environmental initiatives have cost Engro Polymers around 4.4 million US dollars to implement.

The Company has a comprehensive Environmental Management System (EMS), certified and regularly audited for ISO-14001:2004. Environment and Safety will always continue to play a key role in arriving at their business decisions.

# management committee

Engro Management Committee headed by the Company's President promotes Environment, Health and Safety activities in the Company. Management Committee takes a basic stance on Environment, Health and Safety and manages the Company's Environmental, Health and Safety in line with the Company's environmental policies approved by its Board of Directors. The committee is strict in complying with the applicable laws and requirements of the government and other stakeholders. The committee believes in continuous improvement in effectiveness of health, environment and safety management systems.



**Asif Qadir**  
President



**Syed Ahsenuddin**  
Vice President & Site Executive



**Yoshio Shigo**  
Vice President Technology & Supply Chain



**Arshaduddin Ahmed**  
General Manager F & A



**Nayyer Iqbal Raza**  
Technical Manager



**Zia Naeem Siddiqi**  
Project Manager



**Khalid Mukhtar**  
Admin Manager



**Syed Ashar Hussain**  
Marketing Manager



**M. Imran Farookhi**  
Human Resource Manager



**Saleem Lalani**  
Corporate Audit Manager

# introduction

# introduction



Engro Polymer & Chemicals Limited is involved in the manufacturing, marketing and distribution of PVC and its allied products. The Company was established in 1997, and went into commercial production in December 1999. EPCL, with the installation of EDC / VCM & Chlor-Alkali plants, is also expanding its existing PVC production capacity from 100,000 tons to 150,000 tons per annum. The manufacturing operations will also be back-integrated to produce the raw materials and Caustic soda by mid of 2009. This includes setting up of an Ethylene Dichloride and Vinyl Chloride Monomer (EDC-VCM) plant along with a Chlor-Alkali plant adjacent to the existing PVC plant. **The estimated cost of expansion and back-integration is approximately \$240 million**, which is being financed through a combination of debt and equity. The PVC expansion has been completed in **4Q 08**, while the EDC - VCM and Chlor-Alkali plants are scheduled for completion in **1Q 09** and **2Q09** respectively.

- Engro Chemical Pakistan Ltd
- Mitsubishi Corporation
- International Finance Corporation
- EPCL Employees' Trust
- Others



# introduction

To facilitate the increase in production, expansion in the existing utilities of the plant will also be undertaken. These new facilities will be installed adjacent to the existing EPCL PVC plant in the Eastern Zone of Port Qasim Industrial Area. This is about 50 km away from the centre of the city. This location is a part of the Indus Delta system having long and narrow creeks, mangrove forests and mud flats. The area has no freshwater body and groundwater resources.

The Company markets its product under the brand name of SABZ. The name was selected in view of this Company's core value of 'Environment' and SABZ has five different grades which are based on K-values.

The PVC domestic market continues to grow at a steady pace. Its Pipe sector remains a dominant user of PVC resin constituting more than 50% of the total resin consumption. Growth in construction industry and schemes for supply of water and removal of sewerage is expected to result in an increase in PVC consumption in Pakistan.

EPCL is the sole producer of PVC resin and has been playing a pivotal role in ensuring the sustainability of PVC's domestic industry. The role of EPCL is to support the existing local industry by providing them quality products and quality technical services. Besides supporting the existing customer base, EPCL also indulges in developing newer products and markets. As a part of market development, EPCL is considering setting up a complete business line for the construction industry through promoting PVC based doors and windows.

The quality of EPCL products meets international standards. The Company maintains a robust product complaint tracking system which is backed by strong follow-up. A close liaison with customers is pursued to achieve the highest level of satisfaction of our customers. Market Development and Technical Support departments of EPCL are playing a vital role not only in supporting PVC customers to resolve their processing issues but also by introducing environment friendly products in the market.

EPCL continues its focus on increasing and sustaining its values through growth and innovation. All national and international standards for Environment, Health and Safety are closely monitored while meeting increments in production targets. New ventures for sustainable development and corporate social responsibility are also being explored by the Company.



**AU 67 S** Film, Sheet, artificial leather, wire coating, hoses

**AU 72** Film, Sheet, artificial leather, wire coating, hoses

**AU 67 R** Pipe, Sheet, Window Profiles

**AU 60** Film, sheet, bottle, Window Profiles

**AU 58** Film, Sheet, Bottles, Window Profiles

# accreditations

# accreditations

## ACCREDITATIONS (ISO 9000 and 14000)

### EMS - ISO 14001 Certification

In line with Engro Polymer and Chemicals Ltd. management's philosophy to maintain a clean environment, EPCL remains committed to energy conservation and environment friendly business practices in 2007 as well.

After ISO 14001 certification in 2001 through United Registrar of Systems Ltd. (URS), accredited by United Kingdom Accreditation Services (UKAS), there has been a continuous focus on Safety, Health & Environmental Policies. As a result, during 2007 and 2008 Surveillance Audit, no non-conformity was reported.

This system has helped us in managing our activities in an environmentally friendly manner. This is a useful way to display our commitment to Environment to our stake holders and reduce environmental risks. Awareness of these risks has increased among employees with the follow up of ISO 14000 systems.

### QMS – ISO 9001:2000 Certification

EPCL commenced its operations in 1999. Within the first year, EPCL obtained its ISO 9001:2000 certifications. This meant enhanced customer satisfaction through documented systems and procedures, setting high standards and meeting challenging objectives through training of personnel.

Each year EPCL arranges annual third party customer satisfaction surveys. This provides an unbiased customer feedback on their perception of EPCL's product and related services. Additionally,



the performance is matched against EPCL's previous performance and against the best in class industrial practices.

2008 Surveillance Audit was of major significance as EPCL's non-manufacturing areas were included in ISO 9001:2000 net. Also, no NCR was reported during this audit.



# accreditations

## INVESTOR IN PEOPLE CERTIFICATION

EPCL believes that improving an individual's performance will ultimately result in improving the organization's performance. **Investors in People** is an international standard of best Human Resource Practices. It is a framework for performance improvement, a business / organization development tool and a benchmark of good practice in people management. About 40,000 country's organizations around the globe conform to the Standard. **Investors in People** is based on four principles i.e. Commitment, Planning, Action and Evaluation. These are supported by 12 indicators, or criteria, against which organizations are 'measured' through independent, external assessment.

EPCL manufacturing division acquired IIP certification in 2005 which has expanded its Company operation in 2008. We are the first in Pakistan to be recognised by IIP. In practice it means shared aims and vision, clear roles and responsibilities, business planning, improved communications, Management development, Effective induction, Focused training and development and Improved performance. Since acquiring this certification, EPCL has practiced Human Resource development especially Training as per the guidelines of this Standard. Due to the utmost importance of employees' motivation and training, non-manufacturing areas of EPCL acquired IIP certification in October 2008.



# credibility

In today's world, investors / shareholders require more than just a return on investment and expect a company to conduct its business responsibly by giving sufficient thought to the impact it has on the community and the environment in which it operates. And since all chemical processes have either direct or indirect impact on environment, Transparent Environment Reporting is now an important part of corporate governance. It ensures that stakeholders, financial institutions and the public at large have access to standardized, comparable, consistent and verifiable environmental information similar to corporate financial reporting. This Report allows us to address issues in an open, credible and transparent manner.

The publication and distribution of this Environmental Report will provide our stakeholders with the opportunity to comment on our progress and this will be a sincere commitment on our part to show our openness and transparency. To top it all, this will also allow our stakeholders to measure our progress through a set of performance indicators. This, we believe, will further allow us to align our business practices with the reasonable expectations of our stakeholders.

Engro Polymer & Chemicals Ltd. published its first Environment Report in 2005. The effort continued when the Company published its second and third Environmental Report in 2006, 2007 and this report is the fourth in the series of our Environmental Reports. Our efforts for sustainable development and transparency reporting have been acknowledged in general by all concerned and especially by different forums working for appreciating and promoting environment-friendly initiatives in the country.



EPCL Environmental Report 2007 has also won the Best Environmental Reporting Award in the Local Unlisted category of companies in ACCA-WWF Pakistan Environmental Reporting Award 2007, which were held earlier in 2008.

Engro Polymer & Chemicals Ltd. has also won Annual Environmental Excellence Award – 2008 from the National Forum for Environment and Health (NFEH).



# EPCL environment management system

EPCL has established procedures, which it maintains for identifying the environmental aspects of its activities and products, in order to determine those which have or can have significant impacts on the environment.

The procedure to identify the significant environmental impacts includes normal operating conditions, shut down and start up conditions and potential emergency situations. This procedure considers, where relevant: Discharge to air, Discharge to water, Land Contamination, Waste for Landfill, Waste for incineration, Waste for reuse / recycle and Emergency.



EPCL maintains records of all environmental impacts and considers significant impacts in setting its environmental objectives. Legal requirements and significant environmental aspects are considered in establishing and reviewing objectives. Designation of responsibility for achieving objectives and targets and means and time frame by which they are to be achieved is included in program. EPCL has also established and maintained procedures for including environmental management in new developments and projects. This includes consideration of planning, design, production, marketing and disposal stages where appropriate and practical.

These targets and objectives are stewarded through Environmental Steering Committee (ESC), which also reviews the environmental management system to ensure its continuing suitability, adequacy and effectiveness.

EPCL has established and maintains a program and procedure for conducting periodic environmental management system audits, in order to determine whether the environmental management system conforms to plan arrangements for environmental management and to provide information on the results of audits to management.

The audit program is based on the environmental importance of any activity concerned and the results of previous audits. Internal audit are by trained company employees whereas United Register Services (URS) conducts external audits.

## EPCL environment and industrial hygiene policy

# environment policy

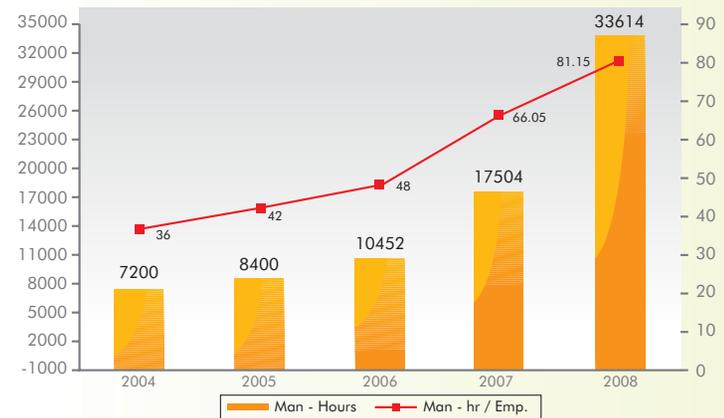
EPCL has established comprehensive indicators for monitoring “Environment performance”. The monthly performance is measured by monitoring parameters like Effluent quality and quantity, emissions quantity, natural resource consumption which includes the consumption of raw water and fuel gas utilized against the cooperate plan, solid waste management and paper consumption.

- Top management provides continuous support.
- Gives highest priority to Safety, Environment and industrial Hygiene ahead of production, sales and profits in arriving at business decisions.
- Maintains and operates in a manner that protects the environment and the surrounding communities and complies with all laws in this regard and meets the National Environmental Quality Standards (NEQS).
- Safety, Environment and Industrial Hygiene is a major responsibility of every employee and is considered as such in Personnel performance appraisals.
- Provides the necessary tools and equipment to perform work safely, consistent with the Environment and Safety objectives. Employees keep tools and equipment fit for use at all times, in safe operating conditions.
- Provides Training to enable employees to recognize and handle unsafe or environmentally harmful situations.
- Maintains and updates Safety, Environment and Industrial Hygiene rules and procedures. The employees are responsible for carrying out their work in a safe and efficient manner within the framework of these guidelines.
- Maintains good standard of housekeeping.
- Encourages contractors to abide by its Safety, Environment and Industrial Hygiene standards and regulations whilst performing tasks for the Company.
- Encourages off-the-job Safety, Environment and Health awareness amongst its employees and their families.
- Tests the effectiveness of its Safety, Environment and Industrial Hygiene programs from time to time to ensure adequacy, compliance and continuous improvement in standards.

# training and development

EPCL believes in imparting continuous training for the development of employees to maintain sustainable efforts in safe operation, environment protection and provide the necessary knowledge and skills to execute job functions in a manner consistent with environment friendly standards. EPCL has devoted training department to conduct orientation sessions for new employees, which cover Safety, Environment Protection Program, Environment Management System and other administrative functions.

EPCL believes that positive people deliver positive results and this starts with a supportive working environment. Environment is one of the major constituents of training covered annually; topics like ISO 14001 compliance, Environment Management system procedures, NEQS requirement & procedures to NEQS compliance, Hazard Communication Program (HAZCOM), Hazardous Waste Operation & Emergency Response (HAZWOPPER) are some major areas covered under the environment annually. Training Need analysis survey of all employees is carried out on an annual basis. TNA related EPP & EMS procedures are part of the whole exercise. About 593 in-house training sessions and 30 out-source training sessions were held at EPCL in 2008. This year, special emphasis was given to training with new technologies due to upcoming operating units.



## community awareness and emergency preparedness

# community awareness

To attain strict quality standards of health, safety and environment from the start since its first ever commercial production back in 1999, EPCL has demonstrated its un-tiring commitment to protecting community, employees, contractors and preventing damage to equipment from any hazardous conditions.

An emergency squad comprising of EPCL employees and contractor employees is in place to safe guard the life, property and environment in case of any emergency situation. Emergency control centre led by Plant Manager remains standby to guide and inform the squad leader of any unforeseen conditions. To address public affairs, a spokesperson has been nominated to address the media, family and neighboring plant concerns.

Weekly and quarterly drills are conducted for the squad with different scenarios. Emergency conditions are formed at plant; observers are spread out to analyze the personnel following their designated roles. At the end of each drill, a critique meeting is conducted covering the weak areas for improvement. Recommendations of each critique are recorded and tracked for improvement.

For more effectiveness in the emergency response, yearly training and skill certification of squad is imperative. The objective of skill certification is to ensure that the incumbent possesses and maintains necessary skills and knowledge to handle various types of emergencies at the site.

With continuous expansion and integration of new sites, the emergency response is expanded with a revised emergency plan each time to cover the respective site. Every time the plan is revised, trainings are carried out.

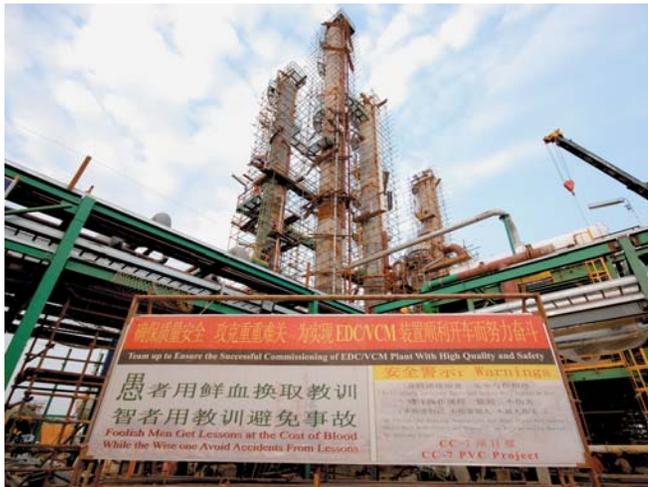
Due to mega expansion at EPCL, enormous construction activities of different nature are conducted. More than 1600 workers are involved in these activities comprising of Chinese and local contractors. Practiced procedures are followed to minimize the hazards and implement safe work practices.



# community awareness

EPCL recently purchased a fire truck to overcome any fires at their new complex. This hi-tech fire truck is equipped with new techniques to handle fires of any class. Huge capacity of water, foam and dry chemical powder are provided with the tender; all systems are ready to cater for any type of fire related emergency.

In line with the emergency plan of EPCL, construction contractors have set up emergency response teams ready to overcome incidents like fires and medical emergencies. These teams are led by their SIC's and a contractor's qualified physician respectively.



For emergency preparedness, the contractor also carries out monthly drills. Brief refresher trainings, safety talks and orientations are provided for contractor awareness regarding the hazards of operational plant and construction activities. Weekly safety trainings are conducted to impart emergency response training.

Due to continuous efforts of EPCL's personal and contractor employees as well as its own commitment towards implementing safe work practices and maintaining safe working conditions, the Company has achieved 4.0 million man-hours with out lost work injury at base plant and 4.5 million man hours without lost work injury at expansion project site with an accumulative average TRIR of 0.4v

## global carbon balance and GHG emissions

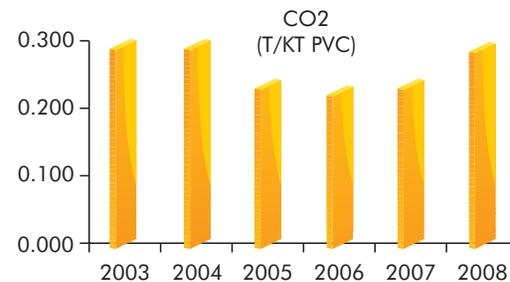
# global carbon emissions

Sun-rays comprises of radiations of various wavelengths. When ultra violet radiations strike the earth surface, 30 % energy is reflected back and 70 % is absorbed by the earth. It is crucial to maintain this balance at all time because excessive or limited energy exposure may result in harmful effects like global warming or spread of different skin diseases. Carbon dioxide strongly absorbs infrared and does not allow as much of it to escape into space. Therefore, there is an urgent need to keep a strong focus on maintaining the concentration of carbon dioxide gas in the atmosphere.

It has been seen that the major source of carbon dioxide production is power generation, usually electricity, and combustion of Natural gas that causes release of GHG gas CO<sub>2</sub>. Conventionally, reduction of CO<sub>2</sub> is achieved by reduction of fuel consumption per ton of product. An effective way of reducing this Green House Effect is through Greening.

Environment has always been a prime objective and the most focused aspect in EPCL and therefore EPCL believes in keeping the environment clean from emissions. Continuous monitoring of the plant emissions have been carried out by Process Engineering department. The Company has set up its own controlling limits (MCL - Manufacturing Control Limits), which are set well below NEQS.

The CO<sub>2</sub> emission data for the past few years is as follows:



CO<sub>2</sub> emissions per ton of product have increased a little bit due to decrease in our production this year.

There are two ways of reducing carbon dioxide emissions. The conventional way is to reduce fuel consumption. EPCL is continually assessing opportunities in its processes for optimizing fuel consumption and is working on the same lines for its upcoming project. A design of Power plant is selected so that around 25% of total electricity can be produced without any additional fuel consumption. To meet the power requirement of the expansion project, a new Power Plant of 60MW shall be setup where around 45 MW will be generated from gas turbines. Flue gases from these turbines will be used in heat recovery steam generators to produce high-pressure steam. The steam produced is again used to drive a steam turbine of 15 MW.

# carbon emissions

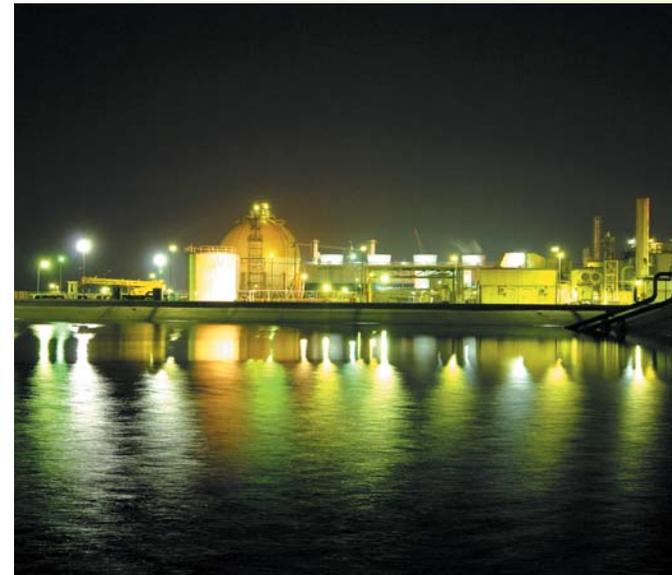
One possible option for mitigating the impacts of Green House Gases is to reduce it through increasing forest cover because it acts as the most effective Carbon storage device and sequesters excessive amount of carbon from the atmosphere.

EPCL has worked this year to explore the opportunity of forest gradation in Pakistan to partially offset CO<sub>2</sub> emissions through a long-term forestation program throughout the country by grading reserved forestland having species with maximum sequestration capacity of carbon. Studies have proved globally that forests act as storehouses of carbon, playing a critical role in influencing Earth's climate and helping retard global warming by storing and sequestering carbon. Carbon sequestration is the process through which agricultural and forestry practices remove carbon dioxide (CO<sub>2</sub>) from the atmosphere. Sequestration activities can help prevent global climate change by enhancing carbon storage in trees and soils, preserving existing tree and soil carbon, and by reducing emissions of CO<sub>2</sub>, methane and nitrous oxide. Just as our lungs absorb carbon dioxide from the blood and infuse it with oxygen, green plants absorb carbon dioxide and release oxygen into the atmosphere in return. Which is why forests are often referred to as the "Earth's lungs".

EPCL has been engaged in Mangrove forest rehabilitation and conservation along the coastal belt in front and the plant site is spreading and strengthening carbon neutrality efforts. This

contribution may be small but at least, it is adding value in the reduction of overall carbon dioxide emission by EPCL.

This year, EPCL has also increased greenery and plantation with the expansion of its manufacturing site.



# conservation of natural resources

# natural resources

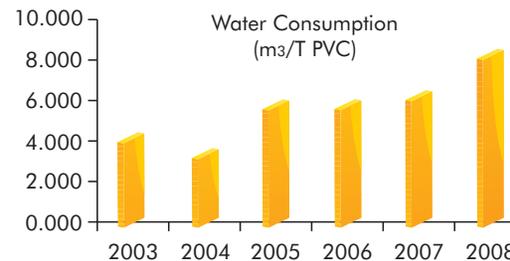
The best way to conserve natural resources is to optimize their consumption. EPCL uses natural gas and water as vital utilities for its operations. EPCL is using Natural gas for production of electrical power and steam necessary for its Operations. It also consumes water to facilitate PVC manufacturing. EPCL endeavors to further reduce its energy and water consumption by optimizing its consumption, resources of supply and efficiency of its processes. Being more efficient means using fewer resources. EPCL is constantly working to further reduce the impact made by its installations, on the atmosphere and natural resources.

## WATER CONSUMPTION

Fresh water is the most valuable resource not only for humans but also for all kinds of life; therefore, it should be utilized in a sustainable manner. EPCL utilizes fresh water for cooling and production purpose.

EPCL started pre-commissioning of PVC back-integration project in October 2008. During the pre-commissioning and commissioning of EPCL's upcoming units (i.e. PVC-II unit, EDC/VCM unit & Power Plant unit), water was consumed in flushing and construction activities. During the same period, there was no production of PVC from the upcoming 50 KTA PVC plant; therefore, the water consumption was higher per tons of PVC produced.

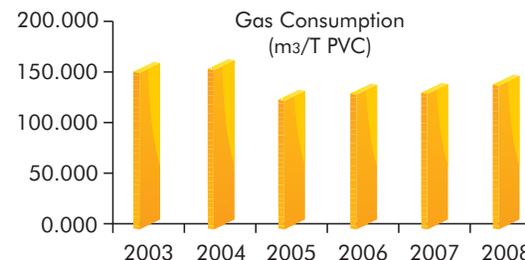
To utilize water in optimum limits, EPCL process engineering department monitors water consumption on a daily basis. Shown below is the consumption of water for the year 2008 including expansion activities.



## NATURAL GAS CONSUMPTION

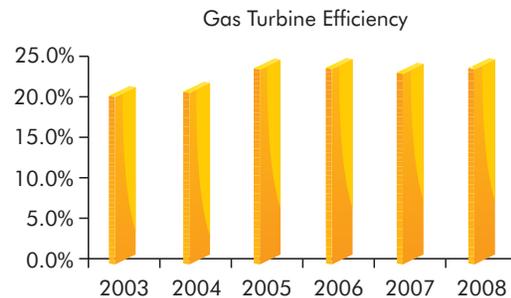
EPCL utilizes natural gas as a source of power generation. A 5.2 MW gas turbine fulfills the power requirement of 100 KTA PVC plant. While maintaining an excellent efficiency of Gas Turbine in the year 2008, its natural gas consumption has been kept at reduced value. Below are GTG efficiency comparisons for the year 2008 with previous years.

For the coming year, EPCL will be operating 2 x 22.5 MW high efficiency gas turbines from HITACHI.



# natural resources

EPCL is practicing energy conservation as a part of its Operations. These practices are good for business of course, but they also help to protect and conserve our valuable natural resources. One common practice of energy conservation being carried out at EPCL is "cogeneration", which means that excess energy from normal operations in the form of heat, is used to create additional Steam. This increases efficiency, and can lead to energy conservation because waste heat from gas turbine is used for making steam using waste heat boiler.



## EMISSIONS TO AIR

Nature has its ability to assimilate pollutants. But this ability is not unlimited. Therefore, as a responsible corporate organization, EPCL has its commitment to follow national environment quality standards. EPCL continuously monitors its emissions and not just keep them within NEQ's limits but also try to reduce them year by year.

There are six criteria for air pollutants categorized by EPA viz. Sox, NOx, CO, PM, Ozone and Lead. Our processes are free from direct emission of ozone and lead. Oxides of sulfur, which are a major threat to the environment, are also not present normally in the EPCL emissions.

At EPCL, there are two sources of Nox. These are the Gas turbine and package boiler. SOx, NOx, CO and PM result from the combustion process in gas turbine generator and auxiliary boiler. These are well within control.

At EPCL, our vision is to keep all kinds of emissions to as minimum as possible. We recognize the fact that nature's assimilative capability is not unlimited. Therefore, we have a proactive control of these emissions far ahead of NEQS limits.



# natural resources

## GASEOUS EMISSIONS

Gases like CO<sub>2</sub>, CO, SO<sub>x</sub> (Oxides of sulfur), NO<sub>x</sub> (Oxides of Nitrogen) are the combustion products of natural gas at EPCL. Total emissions in T/KT of PVC are higher in 2008, the reason being a greater consumption of natural gas to generate more power. This was again to facilitate pre-commissioning, commissioning & construction activities.

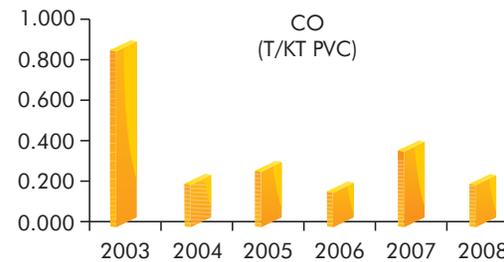
## CARBON MONOXIDE (CO)

CO can cause harmful health effects by reducing oxygen delivery to the body's organs (like the heart and brain) and tissues. It has cardiovascular effects. Its long-term exposure can damage the central nervous system.

At EPCL, combustion processes are regularly monitored and corrective measures are taken to minimize hazardous emissions. That is why we are operating much below the allowed NEQS limits.

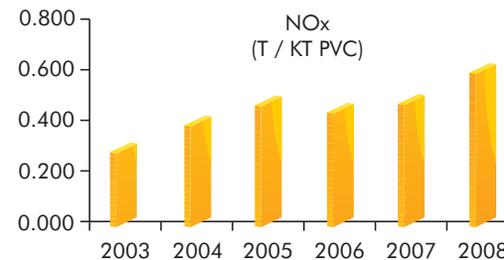
As reflected by the chart, CO emissions have been a little bit higher per ton of the product this year. This is mainly due to two reasons:

CO (Carbon Monoxide) is the result of incomplete combustion of fuel. By maintaining higher efficiency of gas turbine, EPCL succeeded in reducing CO emissions in the year 2008 even with a higher number of power generation.



## NO<sub>x</sub> EMISSIONS

NO<sub>x</sub> causes a wide variety of health and environmental impacts. These are visibility impairment, climatic change, ground level ozone, acid rain and water quality deterioration.

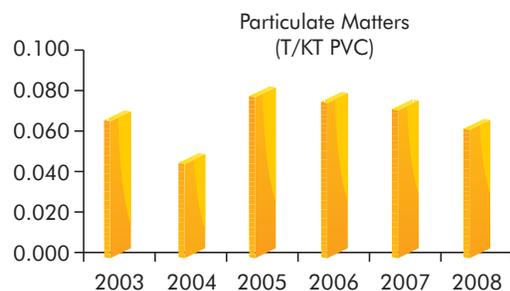


## PARTICULATE MATTER

Particle pollution (also called particulate matter or PM) is the term for a mixture of solid particles and liquid droplets found in the air. Some particles, such as dust, dirt, soot, or smoke, are large or dark enough to be seen with the naked eye. Others are so small, they can only be detected using an electron

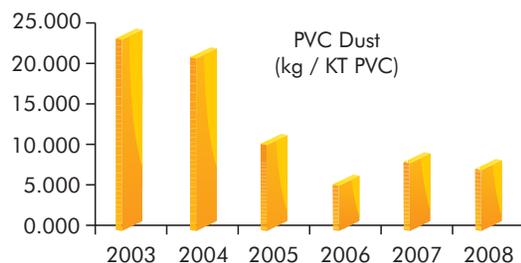


microscope. PM is dangerous for the respiratory system and their presence in air reduces visibility.



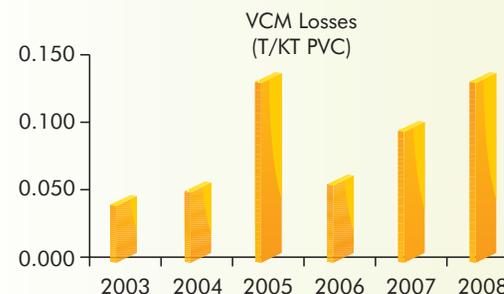
### PVC DUST

In addition to the above mentioned air pollutants, we take care of two other emissions. These are PVC dust and VCM. PVC dust results in the product drying and screening stage. However, a state of the art scrubber system arrests maximum dust from the off gases to keep them from emitting.



### VCM

Vinyl Chloride Monomer is the major raw material for PVC production. Giving due consideration to its health effects, it is handled in a strictly monitored closed loop, i.e. from storage of monomer to recovery from product; VCM is not allowed to emit directly into the atmosphere. This also eliminates wastage of costly raw material.



### WASTE WATER TREATMENT

Wastewater treatment system at EPCL is a state of the art effluent treatment system. By using the aerobic degradation technique, all the incoming effluent from process and Utilities is treated in order to meet Chemical Oxygen Demand, Biological Oxygen Demand, Suspended Solids, pH and other parameters under the National Environment Quality Standard Limits. Treated effluent at discharge is measured in terms of various parameters in order to check its quality in compliance with the NEQS standards and to ensure that the equipment operates at optimum efficiencies and erosion levels.

# natural resources

VCM, though not an NEQS parameter, is still monitored and controlled as per international standards. Negligible amount of VCM is discarded into the Effluent as only 0.54 kg of VCM is recorded in the effluent this year. We have had our VCM audit this year and the auditor found the VCM balance satisfactory. Also, in other parameters like COD & SS, 2007 numbers are well below the target numbers showing commitment towards maintaining the fine performance of the system keeping the Environment healthy.

We have had an unfortunate NEQS violation last year because of High COD in Rigid grade production. This was a single violation recorded in the last 50 months. We had an objective since then to improve our system in such a way that there would be no repetition of such problems. We have taken certain measures in terms of Efficiency improvement of the system and have controlled operational parameters well under their prescribed range in 2007. During the annual turn around 2007, repair and maintenance of wastewater treatment unit has been a major activity. More than 300 tones of bacterial sludge were temporarily transferred from the reactor into a facility designed for this purpose. The reactor was properly cleaned and repaired for the first time in ten years of its operation. Equalization basin was also cleaned this year.

This maintenance activity reduced SS, TDS and COD in effluent. However, BOD has been higher. This followed because the bacterial reactor took time in achieving its steady state. We aim to maintain and further improve WW quality by next year.

Aquatic life has been observed to be healthy in the effluent drain channels and treated effluent water pits, which is proof of fine quality water discharge into the Eco system. Fish, Frogs & Tadpoles are using these drain channels as their habitat.

As demonstrated by the existing project, Industrial wastewater treated to meet the NEQS can be used for the plantation of mangroves. Mangrove plantation in additional areas will be carried out after the expansion of the plant. New wastewater treatment will be set up as a part of PVC expansion & back integration project to treat the increasing level of effluent & discharges. After a major overhaul of the WWTU this year, wastewater quality has been very good overall.

EPCL monitors its wastewater quality parameters on a daily basis. Parameters like temperature and PH are monitored continuously on 24 hr basis, as online monitoring is available on temperature and PH. Higher or lower values of certain parameters in wastewater set by EPA can affect marine life, therefore they need to be monitored on a continuous basis so that they do not exceed the specified limits.

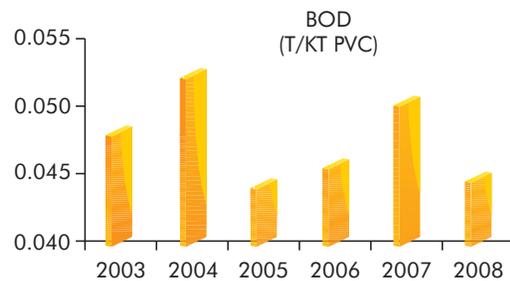
There has been no NEQs excursion in the year 2008.

## **BIOLOGICAL OXYGEN DEMAND**

BOD is the amount of oxygen required by microorganisms to degrade organic waste. As effluent from wastewater treatment unit is fed to seawater, care should be taken before disposing it off. Avg BOD during the year 2008 remained within limits of national environment quality standards. Better operation of

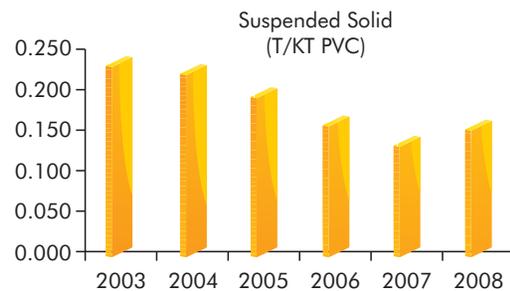


wastewater treatment plant, implementation of preventive maintenance programs and daily monitoring led to these results.



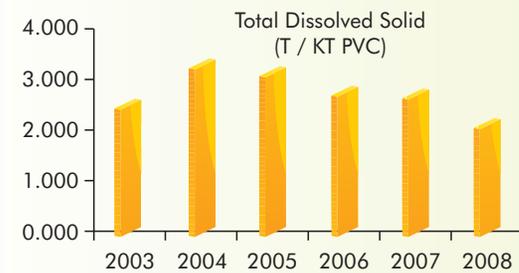
### SUSPENDED SOLIDS

Continuing the decreasing trend in suspended solids, EPCL has maintained and reduced the load of suspended solids in its effluent throughout the year.



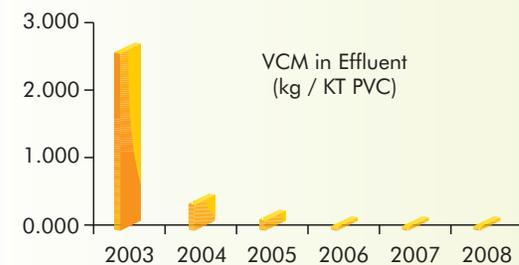
### TOTAL DISSOLVED SOLIDS

Total dissolved solids have been reduced from previous years, due to a better control over wastewater system.



### VCM IN EFFLUENT

VCM, being carcinogenic, needs to be reduced to minimum in effluent. EPCL monitors VCM in effluent on a daily basis. The trends shown below provide successful engineering & administration controls over wastewater treatment systems as well as on the process plant.

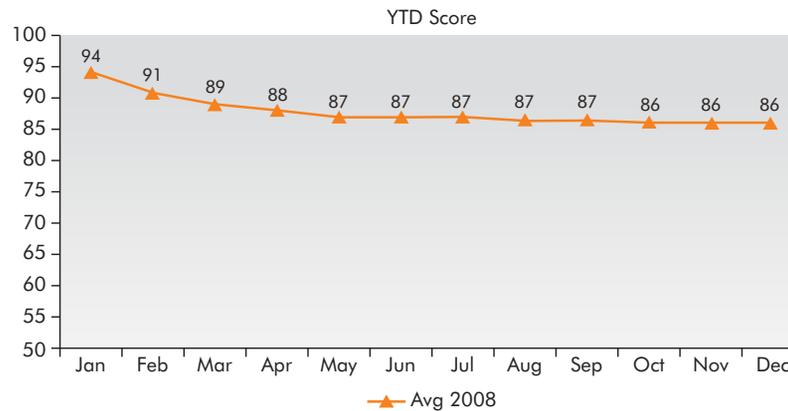


# reducing our environmental footprint

# reducing our environmental footprint

EPCL has established a very strong program to maintain and monitor the Environmental Management System. The Environment Steering Committee is one of the designated forums assigned with the responsibility of monitoring and maintaining the Environmental footprints by reviewing the Environmental Performance on a quarterly basis.

The ESC is chaired by EPCL Plant manager along with a cross functional team with the designated responsibility of reviewing contents of environmental manual, suggesting modifications, reviewing regulatory developments, progress against targets and assisting in setting new or revised targets, findings from environmental audits and management reviews and progress tracking of any corrective action and supporting the training and motivation of employees to conduct their activities, consistent with the EPCL environmental policy.



EPCL's environmental footprints are based on the performance of effluent quality, quantity, emissions profile, waste generation, CFC venting, natural resource consumption (paper, water and electricity), VCM venting and losses, NEQS excursion or any major or minor Environmental incident.

EPCL has established a very comprehensive procedure for identifying Environmental aspect of operation and activities under normal, abnormal, emergency conditions and also by focusing on the impacts of its activities, if discharged, to air, water, land, waste generation and recycling. Every year, there is a special session conducted for setting of next years objectives, and targets are usually derived from the aspect impact study.

# environmental footprint



EPCL believes that in upcoming years, after all the project commissioning, there will be no NEQS excursion, no moderate and major VCM release, no NCR related to environment and it will have no environmental incident.

This year ESC had special focus on the replacement of all CFC refrigerants which includes fridges, AC's, split airs, and coolers by CFC free refrigerants. Also strengthening controls on reducing HCFC leakages and wastewater treatment to avoid MCL excursion and introducing Biocide treatment for sewage water.

Environment plan 2009 will specifically focus on the implementation of Management Control limits (MCL) for emissions, effluent and solid waste, which are called internal control limits with ranges well below NEQS for a project by June 2009.

From last year onwards, EPCL has also decided to celebrate, on a continuous basis, a dedicated Day as "Environment Day" and "Earth Day" to recognize our environmental achievements and performance by involving the employees, children and communities. It also encourages monthly reporting to SEPA and transparency reporting to ACCA-WWF.

This year, EPCL has done a lot in establishing and maintaining Environmental systems and procedures for expansion projects, which included appropriate and practical consideration of planning, design, production, marketing, disposal phases and was thoroughly reviewed by higher management.



# environment initiative 2008

# environment initiative 2008

## ENVIRONMENT AWARENESS CAMPAIGN

Acknowledging the need for environmental protection, EPCL conducts environment awareness campaigns with the employees and its neighboring community aimed at preserving and restoring the environment. The campaign includes different awareness sessions related to Environment, strengthening EMS and practices, awareness of applicable standards and laws, which includes lectures, dialogue, and group discussions. Information is shared among the employees regarding many environmental topics, with an emphasis on:

- Global warming & climate change
- Waste management and recycling
- The importance of protecting forests
- Encouragement to plant trees
- Measures to decrease pollution
- The importance of protecting drinking water

There are a number of initiatives taken by EPCL especially in the last few years, to reiterate its commitment for the preservation of environment and minimize any environmental impact on the neighboring communities.

These initiatives include but are not limited to:

## ENVIRONMENT DAY YEAR 2008

World Environment Day is celebrated each year on June 5 to stimulate worldwide awareness about the environment and enhance political attention and action. Unlike many other International events, World Environment Day is a people's event

with colorful activities. EPCL believes in engaging employees and communities in such programs as this initiative is to make people realize and understand the importance of Environment and Natural resources.

This years Environment day's agenda was to make EPCL families, specially mothers and school children aware about the importance of environmental issues and empower people to contribute however little they can to become active agents of sustainable development.

The World Environment Day slogan selected for 2008 is 'CO2 - Kick the Habit' and focuses on how we can create a more carbon neutral world economy. Based on the concept, the day was designed by arranging the following activities for employees,





their families and community. Children were shown documentaries on Mangrove forests and their importance to tell them about the benefits of these forests for the people and the planet. A documentary on Green turtles was also shown to educate children about the danger faced by this specie and the urgent need to protect it.

EPCL has always shown its dedication towards mangrove protection, so this year employees children and community school students got an opportunity to visit a nearby mangrove forest and plant mangroves in fresh water and wet clay. Activities like painting competitions based on the theme "Creative family corner", had been arranged where children supported by their mothers, were asked to draw "How their environment looks".

The whole event was given good coverage by the media. A special advertisement for Financial Daily's "World Environment Day" supplement was also developed, mainly focusing on the initiatives taken to minimize the impact of EPCL's future expansion on the environment.



This was the first ever event organized at such magnitude at Port Qasim Authority Karachi Pakistan, which proved to be more than a success in terms of community involvement and increasing their environmental awareness.



# environment initiative 2008



## EARTH DAY CELEBRATIONS AT MAZAR-E-QUAID

Every year, Earth Day is celebrated the world over on 22nd April to revitalize the promise of mankind to save the planet Earth from all types of hazards in order to sustain life.

To celebrate the event this year, Sindh EPA (Environmental Protection Agency) organized a full day program at Mazar-e-Quaid Karachi and invited various industries to support SEPA. EPCL, being an environment friendly company, joined hands with SEPA with an objective to raise awareness amongst the general public and school kids and encourage their participation for the protection and conservation of natural resources.

The event started with the gathering of people from all walks of life including kids from various schools along with their teachers and parents. The Chief Guest, Ms. Shazia Mari (Information Minister, Sindh) addressed the crowd of more than 2000 people and emphasized the importance of realizing impact of our daily activities on the environment. The Chief Guest especially thanked the support shown by EPCL as one of the few industries that sponsored the event.

The speeches were followed by a walk along Mazar-e-Quaid. The participants were given garbage bags to collect the garbage on their way. EPCL HSE employees participated in the walk while carrying banners to convey EPCL's commitment to save environment.





The participants of the walk were given refreshments from EPCL. The banners were placed at various locations in the event to convey EPCL's commitment for the environment to the general public.

After the walk, school kids presented various items and delivered speeches to highlight the importance of Earth Day.

In the end, prize distribution ceremony was held along with SEPA's acknowledgment of efforts made by the sponsors especially EPCL, who made the event a success on such a short notice.

### ENVIRONMENT TALK

The Environment talk is a forum, which provides a platform to the employees of EPCL to discuss, share and suggest ways to protect their operating environment. Different literature and information handouts were circulated and employees committed to 'Kick One Habit' related to their areas and life, which is causing a modest but significant impact to Environment and contributing to Environmental conservation.

### RESEARCH PROJECT "TO OFFSET FUTURE CO<sub>2</sub> EMISSIONS"

The future EPCL expansion and back integration project, on one hand, will be a unique example, which will be one of its kind in Pakistan, but this petrochemical complex, on the other hand, will have CO<sub>2</sub> emissions. EPCL believes that there should be no Environmental footprints because of the expansion projects

started up by the mid of 2nd quarter 2009 and to achieve this, the management of EPCL decided to conduct this feasibility study.

As EPCL thinks green and has a vision of a company headed towards "Low Carbon economy", thus this projects concept will support EPCL to partially offset CO<sub>2</sub> emissions through a long term forestation program throughout Pakistan by grading reserved



# environment initiative 2008

forest land having species with maximum sequestration capacity of Carbon which is stored in its biomass(wood), soil and tree cover. After comprehensive research on different types of forests, their soil type and biomass calculation, selection of Subtropical thorn forest in Sindh, the Subtropical evergreen forest in Punjab and the most effective of them all: the coniferous forest in N.W.F.P, was presented. It was also found that, globally for the choice of carbon offset projects, coniferous forests have been preferred because of their long term sequestration capacity and woody biomass.

For a preliminary study and support works, WWF was engaged in the designing of the project but later on, the forest department and Ministry of environment became involved for carrying out a feasibility study of different reserved forests in Pakistan which



include: Mirpurmathailo Sindh, Nara forest area Khairpur district Sindh, Changamanga forest Punjab, Peerowal forest Punjab, Okara forest areas Punjab, Dupher forest (Madibahauddin) Punjab, Khushab forest areas Punjab, KT bundar communal land (mangrove forest) Singh AJK forest area AJK, Khariyan rain forest, Jehlum range land forest Punjab, Galis forest which includes Nathia gali and thandiani forest areas.

During the research, another opportunity of CDM (clean developing mechanism) project has also been explored which, if adapted, will provide benefits to create carbon credits within the Kyoto framework and act as financial incentive to enhance the social and sustainable development component of forestry activities, as CDM is a market base mechanism driven by demands for credits. The potential of forestry CDM is even more important in the face of climate change related events such as droughts, heat waves and floods and will support EPCL to balance and certify the emission reduction, sequestered by different species. The type of credits that can be taken from the project can be temporary and long-term credits i.e. for a time span of up to 60 years. The CDM project will claim to contribute in sustainable development and exchange of better practices for forestry and environmental management practices.

Till date, the project has led EPCL to build good relationships with stakeholders like WWF Pakistan, IUCN Pakistan, Ministry of Environment, provincial forest Department, CDM Cell Ministry of Environment and Pakistan forest institute Peshawar. EPCL has also engaged World Bank Bio Carbon fund, IFC, JICA, UNDP and UNIDO, for a preliminary discussion of the idea for trading carbon out of the forestry project credits.



### **MANGROVE REHABILITATION PROGRAM**

The Mangrove trees planted over the coast line would serve as the natural habitat for fish like Mud-Skipper, Prawns and birds like Kingfisher, Log Horn, Curlews, Waders, Humming Birds and Seagull etc. The plan is to develop a Mangrove plantation in front of our plant shoreline. This plantation will serve as a breeding nursery for fish and prawns which will attract birds.

Mangroves plantation commenced along the shore lines of Arabian Sea, just across the road to the plant site. To date, 100,000 mangroves over 24 acre land saplings have been planted and now some of the mangrove plants have grown well beyond an average mans height.

EPCL has an on-site wastewater treatment plant that treats streams from various process units. The effluent from the wastewater treatment unit is routed through the channel to the receiving water body. There are fish and frogs in the effluent channel indicating that the quality of effluent is such that the sea life can survive in it.

### **WASTE MANAGEMENT AND RECYCLING**

EPCL is operating the waste management program based on 3R's (Reduce, Reuse & Recycle). Solid waste that is generated from the process (e.g. empty drums, paper, iron etc), is recycled 100% to the local recyclers, in an effort to reduce environmental footprint. Approximately 80 tonnes of non-hazardous solid waste is recycled in this manner every year.



### **EXPANSION PROJECT INITIATIVES AND PLANS**

For the expansion project, there is a large quantity of water consumed for flushing and hydro jetting of the equipment. EPCL took the initiative and analyzed the quality of effluent from the hydro jetting activity. After testing and verification, the wastewater was recycled to sprinkle around the project site to minimize dust emissions.

Till date, EPCL had made an environmental investment of 4.426 M US \$ which includes the wastewater treatment unit, evaporation pond to handle chlorides, incinerator and treatment units for EDC/VCM plant. Furthermore, to mitigate the project impacts and hazards, frequent PHAs, Hazops, FMEA and QRA were conducted, costing around 0.46M US\$ in the year 2008.

### **HYDRO CARBON INCINERATORS**

The under construction EDC/VCM plant of the expansion project is equipped with incinerators to decompose chlorinated hydrocarbons into carbon dioxide and hydrochloric acid vapors. (HCl) will then be absorbed in water through absorption column producing (HCl) liquid and acid free gas will be discharged to the atmosphere. EPCL plans to neutralize the concentrated (HCl) stream in-house, using a neutralizing agent or sell it for other uses. In future, steps will be taken to convert the concentrated (HCl) stream into a sellable commodity.

# environment initiative 2008

Waste Water Flow (m <sup>3</sup> /h)	No. of E-Ponds	Total Ponds Area (acres)	Holding Volume (000'm <sup>3</sup> )	Evaporation Area to WW Flow Ratio acre/(m <sup>3</sup> /h)	Summer Evaporation Rate (kg/h-m <sup>2</sup> )	Winter Evaporation Rate (kg/h-m <sup>2</sup> )
23.5	2 (Lined)	15.6	205.6	0.6	Equation=0.6	Equation=0.4 Pan Test=0.4 30 yr Data=0.4 5 yr Data=0.5

## EVAPORATION POND TO CONTROL CHLORIDES ON-SITE TREATED EFFLUENT

In order to comply with National Environment Quality Standards (NEQS), EPCL has invested in constructing an on-site Evaporation pond that will take the high chloride water steam from the process units where the effluent will evaporate instead of being discharged to the sewer. This not only endorses EPCL's commitment for Biodiversity but also ensures that the nearby sea remains clear of any water pollution.

## WASTE WATER TREATMENT UNIT II

The Basic design of Wastewater Treatment unit II is based on the biological treatment. The local environmental protection and drainage standard in Pakistan analyzes from the view of source and quality of influent. The unit handles effluent from the EDC/VCM, PVCII and chlorine plants, which contain organics and salt in high concentration. An effective and economic method for removal of organic pollutant is biological technology; the Bio-contact oxidation process was used for our project. Under the function of metabolism by microbe living on bio-film, wastewater will be purified and organic pollutant will be removed. Another way is providing oxygen for microbe. Under the condition

of rich oxygen, wastewater will be purified via fully contacting with bio-film, which adheres to the surface of packing. The process has some advantage such as easy operation, resistance to impact load, long sludge age, less quantity of excess activated sludge.

The treatment unit has four parts

- High concentration wastewater treatment
- Treatment of mixing and settling both for High and Low concentration wastewater
- Sludge Treatment
- Chemical system which consists of various chemicals used for dozing in wastewater treatment



# corporate social responsibility

Corporate Social Responsibility is an uncompromising commitment on the part of the company, to proactively and positively act to be a benefactor of the society of which it is a citizen. The very first demand is to run our business in a manner that is fair to all the Stakeholders:

Our employees,  
The community surrounding our place of business,  
The marine life,  
The forests,  
Society as the whole,  
Future generations in terms of environment protection,  
Our shareholders,  
And last but not the least, the consumers of your products and services.

Today, giving back to the community is no more a choice, and social investments are the need of the Day. We need to recognize our responsibility and take proactive actions not only to meet the requirements but surpass their aspirations, to improve their lives and take them to a Better World.

EPCL strongly believes in involving the surrounding Community of PQ areas which includes the areas around the water line from KG canal, Ghaggar phattak / Razzakabad / Port Qasim areas.

Engro Polymer and Chemicals Ltd. is involved in social work and finds ways and means to help the communities especially

in and around the Port Qasim area where our plant is located. This year two schools were identified for infrastructure improvement; these schools are located at ghaghar phattak including Haji Ghanji Khan School located at ghaghar phattak, & Primary School Haji Ibrahim Goath near Ghaghar Phattak; both the schools consist of almost 300 students.

This year EPCL's focus was supporting infrastructure of both the schools, with work like white wash of the school, Water connection from the gate of school to the toilets, Repair of a class room roof, Replacement of door and furniture provision, Stationary for school children.

## ENVIRONMENT DAY CELEBRATION WITH COMMUNITY CHILDREN

In line with its corporate cause, Engro Polymer & Chemicals, organized Environmental day under which the school children



# corporate social responsibility

spent an entire day at Plant, being entertained with speeches, drawings, reading story books; the school children planted mangroves trees on the sea shore. Field educational trips were also arranged. A smile was seen on face of every child, they also ensured the members, that they will put their best efforts towards their education.



## SCHOLARSHIP PROGRAM FOR PQA EMPLOYEES AND CHILDREN

As a part of the EPCL scholarship program, scholarships were given to the children of PQA's deserving employees. EPCL has also taken a step to enhance career growth and development opportunities for polymer engineering graduates by offering scholarships to students of Plastic Technology Center. Every major

industry is a consumer of polymers and hence the career opportunities of these graduate engineers are surprisingly diverse. The purpose of this scholarship is to provide financial assistance to polymer engineering students and an opportunity to intern at EPCL to teach them about environment and exposure.

## SUPPORTING BLOOD DONATION CAMPS

Every year employees take part in facilitating "Blood donation camps" at port Qasim, where employees and their families voluntarily donate blood to Fatimid Foundation. This year, EPCL has received a token award from "Fatimid Foundation" for being a responsible organization that cares for humanity.



# sustainable development

# sustainable development

## **WATER CONSERVATION IN AGRICULTURAL SECTOR**

Our economy depends heavily on the output of the Agricultural sector, which constitutes 20-25% of GDP, gives input to a large portion of the manufacturing sector, and provides direct employment to more than 40% of labor force. For a water stressed country faced with the prospect of further deterioration, the shortage of irrigation water is arguably the single largest threat to this sector. EPCL, by virtue of being the sole PVC resin manufacturer in the country, was already engaged with the downstream industry, including PVC pipe manufacturers, for its capacity building as well as promoting water conservation technologies in the agri sector of Pakistan's economy since 2001. Apart from improving the existing irrigation system, we also need to introduce efficient water-usage technologies for the agriculture sector, which, by some estimates, consumes as much as 96% of our fresh water resources. PVC pipes constitute an important component of high-efficiency-irrigation-systems (HEIS) and therefore, became a natural business line extension for pipe manufacturers. Initially, the model was tested with one manufacturer and later, two more manufacturers were included, who helped develop a complete supply chain for the rest of the components to enable them to provide solutions on a turnkey basis.

## **WATER CONSERVATION TECHNOLOGIES**

HEIS is an irrigation methodology, which optimizes the use of water by allowing it to drip slowly in the root zone of a plant through a network of pipes, valves, and emitting devices. It typically considers crop's water requirement, soil/water condition,

climate, and farm size etc at the design stage, and involves designing and installation of a demand-based system in farms to provide the right quantity of water to each plant and increasing water productivity by avoiding seepage and evaporation losses. HEIS offers a large range of benefits at the farm level, bringing in efficiencies in virtually all farm inputs, including fertilizer application, the most important being water efficiency. Flood irrigation - the traditional method in use in Pakistan - normally achieves 30% efficiency whereas HEIS efficiency can go up to 95%. A uniform and consistent water supply results in a stress free crop /orchard, higher yield of uniform size and better grades, improving farmers' economics. For Pakistani orchards, payback period of a typical HEIS system, having a life of 15-20 years, ranges from 1-3 years.



# sustainable development

PVC Geomembrane offers an affordable and easy to install solution with a seepage proof lining arrangement for the storage and delivery mechanism of water at 1/3rd the cost of concrete reservoir and a longer life. It can be used in lining canals, watercourses, and reservoirs. PVC pipes, used in tube well casing, conveyance and distribution and micro irrigation systems have advantages like low cost, non-corrosive nature, durability and ease in installation. Developing the indigenous capacity became our priority as Pakistan has an adequate capacity to produce PVC pipes; but not lateral lines and emitting devices. We tapped international sources, short-listed a few suppliers based on their quality and prices; arranged visits and seminars for some of their representatives to familiarize them with the emerging market for their business lines. As a result, they now have regular supplies in the local market and we continuously act as an enabling body for maintaining a vital link in this supply chain.

Developing the indigenous technical knowledge base was the logical next step in the supply side and a core team of design and installation expertise was developed to kick-start the project, in the absence of specialized courses in design and implementation of HEIS in Pakistan. Today, EPCL has training facilities in Karachi, Quetta, and Peshawar for capacity building of various stakeholders, (government officials, industry professionals and students), helping supply companies maintain a knowledgeable workforce and increasing installation capacities. Using books of certificate courses in system design, installation, and quality audit from Irrigation Association - USA and exploring partnerships with agriculture universities and other institutions

to start a formal skill certificate program is part of this process. In order to build further indigenous capacity at a cost effective rate, we have emitting devices like bubblers of various sizes, drippers, and micro sprinkler, developed locally through engaging mold manufacturers. Setting up demonstration sites at strategic locations for regular field activities cater to the demand side where farmers, opinion leaders, and associated professionals can witness demonstrations of water conservation systems. EPCL has conducted approximately 120 farmers' gathering and established 35 demonstration sites all across the country, in the past 6 years.



# sustainable development

EPCL's regional teams are actively engaged with a number of NGOs, which are working for water conservation, livelihood improvement and agricultural capacity building. These NGOs have penetration at community level and with funding from social investment organizations like PPAF, USAID, and CRS, they have been instrumental in the introduction of technology in their geographies. We are in regular contact with locally based leading financial institutions, to assist in developing financial products, and ultimately help farmers get loans for financing the installations. In parallel, advocacy with government institutions has been a regular feature, from supporting the launch of Government of Pakistan's largest ever HEIS project at all stages – from conception to recent roll-out, to interactions with other government institutions that have resulted in successful roll-out of projects like Governor Balochistan's HEIS program etc. Such activities have increased the reach of supply companies to areas where operational challenges were immense. Today, through EPCL's active support, 3 companies, covering almost the entire national geography, offer micro irrigation solutions on a turnkey basis. Moreover, 3 installers for PVC Geomembrane lining have been developed and EPCL is in the process of supporting other supply companies and developing programs for them.

Challenges for HEIS range from a shortage of skilled manpower, and access to customers, to financial viability of supply companies in the backdrop of rising import costs and adaptation of systems to local infrastructure. Agriculture universities and skill development institutions need to start offering certification courses for the industry to develop an adequate local knowledge base and local

manufacturing of components must be promoted to bring the overall cost of systems down and increase the appeal of HEIS for an average Pakistani farmer.



## ENVIRONMENTAL PERFORMANCE FEED BACK FORM

To Advisor Safety, Environment and Training Department, EPCL

We welcome your valuable feedback on our Environmental Performance Report 2007 (the report), which will help us make improvements in the coming year. Please complete this form and send it to us. You may also send any comments by email.

- 1. What is your opinion on the report?**
  - Meets expectation
  - Generally informative
  - Not impressive
- 2. How did you find the presentation of the report?**
  - Presented professionally and with good readability
  - Well structured and balanced in text and figures
  - Too verbal and woolly
- 3. Which chapter(s) of the report would you like to have more information on? (You may mark more than one box)**
  - EPCL Vision and Strategy
  - Environment Organization and Governance
  - Stakeholder Engagement
  - Training and Development
  - EPCL efforts towards sustainable development
  - Environmental Impacts of Internal Operations
  - EPCL efforts towards CSR
  - Progress on Year 2007 Targets
  - Targets for 2008
- 4. Which topic(s) are you most interested in? (You may select more than one box)**
  - Air
  - Environmental Assessment & Planning
  - Conservation
  - Noise
  - Waste
  - Water
  - Environmental Compliance
  - Community Awareness
  - Corporate Social Responsibility
- 5. How can we improve the report, if applicable?**
  - Length about right
  - More statistical presentations
  - Focused more on topical issues

**6. Other comments and suggestions, if any:**


Name of sender

Contact number



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