

# CHEMICALS AND WASTE MANAGEMENT

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Indian Chemical Industry faces problems which are mainly the legacies of the erstwhile “Licence Regime” such as low economics of scale and internal cost disabilities due to heavy taxes, higher logistics costs and power problems. Indian Industry will have to consolidate and upgrade the scale of its operations in manufacturing, logistics, marketing and R&D to compete effectively. Like the overseas strategies, firms are pursuing to develop global scale operations, provide low cost manufacturing with highly skilled resources of knowledge of intensive chemistry and engineering.

Development of the industry clusters have the potential of driving down the cost by 30-40%. Number of States in India are already working on it. Maharashtra and Gujarat have already developed the cluster industries whereas the States like Tamilnadu are already working on it with facilities like heating, cooling, maintenance, common effluent treatment plant, common waste storage and safe disposal, import-export administration, preliminary marketing administration, quality control and laboratory services etc. are being outsourced from the common facilities set-up to render the service in the cluster industry.

The sustainable development in chemical industry is a global phenomena. This will only increase with public and NGO measures becoming more strident which are adding to cumbersome work and increase in the costs. The only solution is the industry to be pro-active and have direct engagement with the public at large to enlighten them the benefit that chemistry and chemical engineering has heaped on humankind. Unfortunately it is not being conveyed to the masses. The industry keeps on communicating within itself and not to the main stakeholders, which is the public at large. This has given a field day for all kinds of misinformation, disinformation and motivated campaigns by the interested sections of NGOs and others. The industry has to be moved in great deal faster on the following initiatives:

1. Use of recycled and renewable feed stocks and renewable energy.
2. Increasing atom efficiency

3. Reducing energy consumption,
4. Reducing mass intensity,
5. Reuse, remanufacture and recycling (zero effluent discharge approach).

India has almost 16% of the worlds' population. However, our land and water resources are disproportionate to the population percentage. We have only 2% of the worlds' geographic area, out of it only 56% is cropped and 41% is irrigated. Worst is that we have only 4% of the worlds' water.

In order to feed India's enormous population, agriculture assumes maximum importance. Agriculture is the key driver of Indian economy. It is the largest private but unorganised sector in India. Every 7 out of 10 Indians are directly or indirectly engaged in agriculture.

An ever increasing demand for energy and power for driving the wheel of industrial production and agriculture twinned with quantitative constraints on the use of non-renewable resources has placed the sector at cross roads. On the one hand the growth of NGOs crusading for the "Cause of environment" has influenced formulation of the entirely new sets of laws and regulatory programmes in India, on the other hand environmental "activism and intervention of our judiciary" has made some of the most difficult and impossible regulatory measures "possible and implementable". These two drivers have pushed the polluters and regulators in a newer context in which pollution treatment has become unavoidable. Consequently the options of waste minimisation, recycling and recovery have been emerging as the preferred interventions.

India is the first country, which has amended the National Constitution to address the threat of up gradation of environment and natural resources. Fundamental duty of every citizen is to protect and improve the natural environment including forests, lakes, rivers and wild life to have compassion for living creatures.

Urbanisation, which is proceeding at an accelerated speed around the world, has posed several problems before the urban residents. Inadequate water supply and poor

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water quality have been provoking serious contemporary concern for many municipalities, industries, agriculture and the environment. Communities are frustrated for potable water as well as processed waters. It has not been possible for communities living in the slums to get even 10 liter of water per person per day. On the one hand there is an escalating demand for water for domestic, agriculture as well as industrial purpose, on the other hand the available water is getting deteriorated as a result of disposal of domestic and industrial effluents.

In spite of unprecedented laws there has been steady deterioration of environmental sub-system. For example, a large volume of waste water continues to be discharged into the natural watercourses leading to the pollution of our costal zones and drinking water reservoirs. The existing regulations appears to be inadequate while looking at the pollution caused by our communities and industry. On account of disposal of partially treated and mostly untreated effluents into the rivers, lakes and run-off from urban and agricultural areas are the two main reasons responsible for deterioration of our drinking water resources. In addition, excessive withdrawal of water for agriculture and municipal utilities as well as use of rivers and lakes for religious and social practices and the water used for dilution of wastes is responsible for shortage of water.

The installations of effluent treatment plants are enforced by the Statutory authorities for the industrial units to carry out the treatment of effluent before discharge. The treatment of effluent is prescribed depending upon the quality of the effluent may be either and all of the biological treatment, chemical treatment, crystallisation electro dialysis, air oxidation, floatation, ion exchange membrane separation, chemical precipitation and solidification etc. The concept of zero effluent discharge is the one of the major issues need to be looked into.

## CASE STUDY

In our own pesticides manufacturing unit, M/s Hindustan Insecticides Limited (A Government of India Enterprise), the total consumption of water was 3000 meter cube per day all together for process and utility purposes. After carrying out the water budget in the organisation, suitable measures were taken to reduce the water consumption and the following steps were considered:

- (i) Recycling of treated effluent for process i.e. product washing
- (ii) Collection of condensate for recycling to the boilers
- (iii) Treated effluent to use for coal ash quenching
- (iv) Treated effluent for use in absorbers.
- (v) Treated effluent for primary jacket cooling.

After implementation there could be reduction of 30% of the water consumption and the water consumption was reduced to 2100 Meter cube per day.

The industries may be accepting the zero discharges concept but the cost of thermal oxidation, thermal evaporation does not keep the unit financially viable. In view of above the concept of recycling/reuse shall work better in the cluster industry. The effluent is proposed to be collected by the common effluent treatment plants and recycled back to the industrial units after treatment.

With the above experience on hand which has given encouraging results in terms of resource conservation and cost reduction it can be suggested that implementation of water conservation may be carried out by a team comprising of statutory authorities, local bodies, industry representatives and NGOs. The unit should be insisted upon to work towards the zero effluent discharge. In order to implement the same, financial assistance may be supplemented by the State/International bodies for procurement and installation of equipments. All out efforts are required to be made to develop the industry in cluster

and install the common facilities in order to reduce the cost of production and conserve the natural resources.