



Waste treatment

Treatment of the solid, liquid and gaseous waste streams generated by industries in every country are a significant global challenge. These streams may be: waste solids, like sludge, residues and sediments contaminated with heavy metals like lead and arsenic; wastewater, including process water, contaminated stormwater and effluent many of which contain organic contaminants like hydrocarbons and polycyclic aromatic hydrocarbons; or gaseous waste, such as fugitive emissions and un-scrubbed flue gases composed of sulphur dioxide, selenium or mercury. For example, the largest industrial solid waste stream is alumina refinery residue (ARR), which accumulates in holding dams at a rate of more than 120 million tonnes per year; with about two billion tonnes currently in stockpile and a further two billion tonnes projected in the next three years ARR is a growing international problem.

National statistics of industrial waste tell the story: China's total solid industrial waste is more than 640 billion tonnes per year and industrial wastewater at 1.9 trillion litres per year. India's hazardous industrial solid waste is 6.2 million tonnes per year, with less hazardous but equally problematic fly ash from power plants, which can be contaminated with lead, mercury and arsenic, at about 100 million tonnes per year. Industrialised countries too face growing management and treatment problem, with Japan generating 190 million tonnes of industrial sludge per year and generating 24 billion litres of industrial wastewater per year.

CIID provides comprehensive, expert and up-to-date analysis, support and service to deliver the most effective solutions for the treatment of solid, liquid and gaseous industrial waste. We deal with the key factors contributing to the problems and opportunities in this sector, including:

- The fast pace of industrialisation
- Increasingly high volumes of industrial solid, liquid and gaseous waste
- Increasingly higher percentages of hazardous and toxic waste streams
- The rapidly growing global demand for raw materials, such as alumina, copper and lead
- Declining appetite by regulators in industrialised countries for industrial waste being disposed to landfill
- Potential for recycling solid and liquid industrial waste streams for commercial or agricultural use
- Potential for increased toxic leachate into water table and water supply
- Emission of noxious and unpleasant gases, including climate change gases
- As populations encroach on industrial sites, challenges associated with the incompatibility of residential and industrial activities, including problems of noise and obnoxious odour generation

Methodology

CIID will commence with an interactive discussion with the ministries and agencies responsible for solid, liquid and gaseous waste management, following which we will develop a comprehensive programme to introduce international standards of best practice in this sector, including waste analysis, waste treatment, and knowledge transfer in the following topics:

- Technologies and technical solutions
- Recycling
- Waste to energy
- Extracting valuable materials and components from waste
- Improving occupational health and safety standards
- Industrial education in recycling and minimising waste
- Optimising or reducing use of hazardous and non-hazardous landfills
- Engineering management training and adoption of international best practice and standards

Training Topics

CIIDs management training will include a range of topics related to the treatment of industrial waste, including:

- Removing heavy metals from industrial wastewater and the sequestration of heavy metals in waste solids and sludge, including arsenic (As), cadmium (Cd), copper (Cu), lead (Pb), mercury (Hg), and nickel (Ni)
- Removing and sequestering chromium (Cr) from tannery wastewater, sludges and solids
- Removing phosphate from industrial wastewater and reducing sludge volumes
- Removing CCA from runoff, wastewater and leachate ponds at timber preservation plants and immobilising CCA in waste solids, sludges and contaminated soil
- Removing objectionable odour from industrial wastewater and processes
- Destroying organic pollutants, such as volatile organic compounds (VOCs) and polycyclic aromatic hydrocarbons (PAHs), from industrial solid waste

Integrated implementation programme

CIID will create a comprehensive implementation programme, in consultation with the senior management of the relevant ministries and agencies. The aim of this programme will be to introduce and maintain international standards of best practice and create a sustainable programme for industrial waste identification, analysis, treatment, disposal or discharge and recycling where possible, including the development of physical resources, improved capability of management and workforce, and development of a rigorous regulatory environment.

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