

Environmental and Sustainable Best Practices of Sterlite Copper, Thoothukudi

Sterlite Copper's operations include a copper smelter which employs Glencore's ISASMELT smelting technology, globally considered to be an environmentally advanced method.

Some of the features of the Glencore Xtrata technology is as follows:

- Safest technology in the Copper smelting industry
- Capable of handling different grades of raw materials and variable feed rates
- Effective collection of gases
- Lowest energy specification
- Minimal water cooling

Besides the adoption of the best-in-class technology, the following are a few of Sterlite Copper's best practices with respect to environment.

Air Pollution Control Measures:

- Provision of Flue Gas Desulphurization System (FGDS) for handling secondary emissions by two stage scrubber for SO₂ removal.
- Provision of Bag house for convertor operations to control dust emissions.
- Raw material handling through closed conveyor (Pipe conveyor) system to avoid dust emission.
- Pavement of roads inside the plant to control dust emissions.
- Tail Gas Scrubber (TGS) for the Sulphuric Acid Plant (SAP) to achieve emission levels of less than 1 kg of SO₂ per tonne of Sulphuric acid produced.
- Provision of Dry Dust Collection System (DDS) in Phosphoric Acid Plant (PAP) to control the dust emissions from the rock loading and unloading operations.
- Pipe conveyor for the transfer of gypsum from the phosphoric acid plant to Gypsum storage pond to avoid spillage.
- As a substitution to manual cleaning of roads, a road cleaning machine has been deployed to clean the roads with water sprinkling mechanism which reduces manual labor involvement in dust handling.

Air Quality Monitoring:

- Online analyzer in all process stacks and connected to Care Air Centre - TNPCB & CPCB.
- CAAQM-Continuous Ambient Air Quality Monitoring Station.
- Operating 6 Ambient Air Quality Monitoring Stations in and around the plant premises to measure SO₂, NO_x, Fluoride, PM₁₀ & PM_{2.5} throughout the year.
- Operating 7 Continuous Ambient Air Quality Monitoring (CAAQM) Station to measure SO₂, NO_x, PM₁₀ & PM_{2.5} throughout the year and values displayed at the plant main entrance.
- All stack emission parameters are interlocked with process trips.
- Monitoring ambient air quality through Continuous Ambient Air Quality Monitoring (CAAQM) stations in and around the plant as well as through Fence Line Monitoring (FLM) system.
- Sterlite Copper SO₂ stack emission norms are the most stringent in the world. It is also a Zero Liquid Effluent Discharge Copper Smelter since inception.

Water Quality Management:

- Sterlite copper, Tuticorin is the one of the world's lowest water consumption unit operating with ZLD in the World.
- "Zero Liquid Discharge" since the inception of the copper plant.

- Air Cooled condensers for the reduced water consumption in Sulphuric Acid Plant (SAP) and Power Plant.
- R.O. plant facility for Utility & Effluent Treatment Plant treated water to ensure Zero Liquid Discharge (ZLD).
- Sewage treatment plant (STP) for the treatment of sewage generated inside the plant and treated water is utilized for greenbelt development.
- Rainwater catchment ponds with capacity of 1,00,000 m³ to collect rain water through drain network.
- Water supplied by SIPCOT for industrial purpose is from the extreme end of the downstream, which otherwise enters the sea.
- Out of 18911 m³/day allotment by SIPCOT, Sterlite Copper is using only utilizing 20% of the water.
- In total water demand for 13500 m³/day, 30% is sourced from SIPCOT, 45% is from Desalinated Water and 25% is from internal recycled RO water.
- Monitoring wells around Hazardous and Solid waste storage to monitor the ground water quality.

Solid Waste Management:

- Reduced hazardous waste by installation of FGDS and Bag House.
- Hazardous waste is disposed to authorized CPCB recyclers as per hazardous waste rules.
- Dedicated onsite secured landfill for the disposal of hazardous waste.
- Disposal of copper slag for the sustainable applications like cement, concrete, road and embankment construction.
- Maintaining 1.5 times disposal rate for copper slag and Gypsum to maintain low stock inside factory premises.
- Gypsum is sold to cement manufacturing companies, fertilizer companies and brick manufacturing companies for the promotion of Sustainable building material.

Greenbelt Development:

- Developed and maintaining 43 ha. of greenbelt incorporating native species to help promote biodiversity.
- Professional horticulture agency engaged for greenery development & maintenance.
- Developed greenery outside plant areas in Thoothukudi such as Collectorate, Govt. Hospital, etc.
- Spending approx. INR. 100 lakhs per annum for greenery development & maintenance activities.
- Distributed tree saplings to nearby villages as an environmental awareness initiative on regular basis as part of Sterlite Copper's greenbelt project - Pasumai Thoothukudi project.

Energy Conservation measures:

- Waste Heat Recovery Boiler at ISA smelt furnace to generate 11.2 MW power from the waste heat.
- Waste Heat Recovery Boiler at DG sets exhaust gas to generate 10 MT/hr of steam from the waste heat.
- Waste Heat Recovery Boiler at Sulphuric Acid conversion beds to generate 8 MT/hr of steam from the waste heat.
- Steam heating system in oxygen plants in the adsorber vessels to conserve 1 MW of power.

Clean Development Mechanism:

- First Copper smelter to register a Clean Development Mechanism (CDM) project in the year 2008, on Waste Heat Recovery Boiler for the utilization of waste heat from the smelter. Has the potential to reduce 40,000 tons eq. of CO₂ per year.
- Adherence to International Financial Corporation (IFC) guidelines practices in Sustainability.

Accolades for Excellence in Sustainable Development:

- The Copper Smelter Plant has attained Global standards, receiving key recognitions in the field of Water Management, Energy Management, Quality Management, Environment Management, Safety & Health Management, etc. for its best practices in these areas, including:
 - Golden Peacock Business Excellence Award, Occupational Health and Safety Award and Environment Award.
 - Platinum Certificate of Merit – Frost & Sullivan 14th Edition of “India Manufacturing Excellence Award (IMEA).
 - First Copper Smelter in the World to be Accredited With Five Star Rating by British Safety Council, in 2002 for Safety & Health System and also a recipient of the “Sword of Honour” prestigious safety award.
 - UNESCO Water Digest Award.
 - CII-EHS Five Star Excellence Award.