

INITIATIVES AND INNOVATIONS BY ESSAR STEEL INDIA LTD.

SUSTAINABLE BUSINESS LEADERSHIP FORUM
ANNUAL SUMMIT 2013

PRESENTED BY: PRANAB MONDAL

ESSAR STEEL APPROACH

As a global steel maker, we are aware of our responsibility, and our potential, in reducing the overall environment impact of our activities. As an organization, we have always set ourselves a high benchmark in environment management and waste reduction.

We are committed to the following:

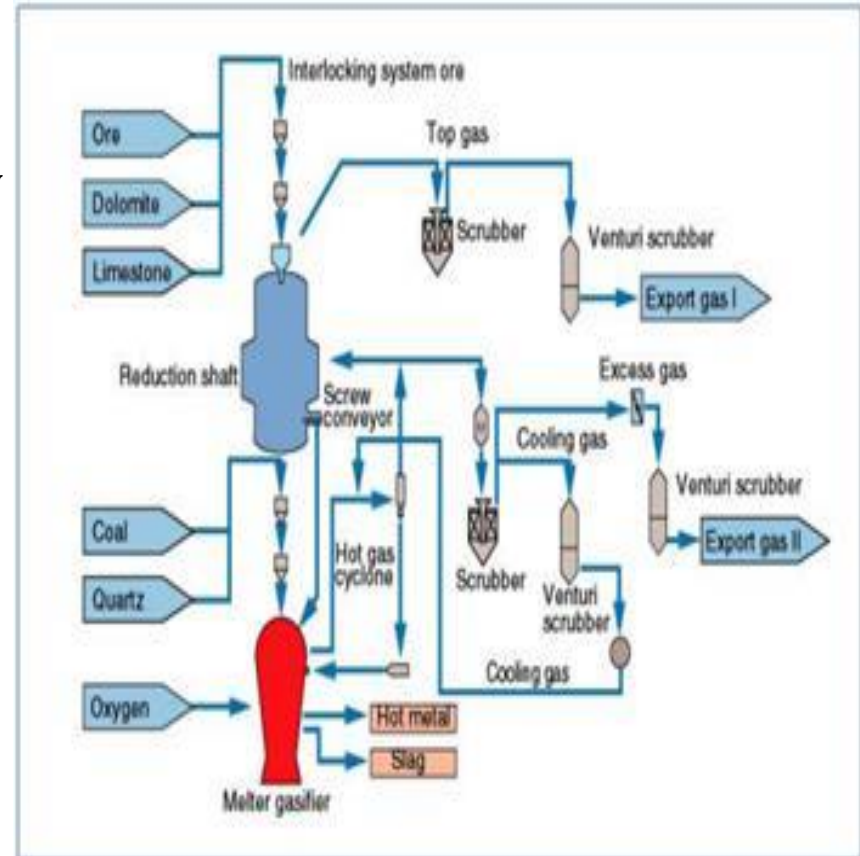
- Minimize pollution and continually improve the performance to reduce environmental foot print.
- Optimise resource consumption by planning and carrying out operations using proven resource conservation methods
- Identification of opportunities such as clean technologies, energy efficiency, water efficiency with an approach that enables long term sustainability
- Increasing awareness of the environmental issues – global and business-specific

Commitment to Environment is driven from the top at Essar Steel and is demonstrated through the top management's involvement in reviewing environmental performance and conformance to international standards in Environment. Dedicated team exists at site for management of Environment.. In addition to the environment function, Essar Steel has established a water management and energy management cells. Our commitment to Environmental issues is communicated through the Environment policy at Group/ site level.

Implementation of Environmental friendly technologies at Essar steel

Challenges Faced by Essar Steel

- High cost of NG and its unavailability due to distribution to priority sector.
- Requirement of coke and iron bearing material in pellet form.
- Installation of Sinter Plant and Coke Oven is must for conventional Blast furnace
- Scarcity of land



To overcome above challenges, Essar has implemented 1.7 MTPA Corex Furnaces.

COREX® Smelting Reduction technology –Benefits

- ESSAR Steel is the second integrated steel complex in India having Corex technology for iron making.
 - Corex is Environment friendly technology as listed by Central Pollution Control Board (CPCB).
 - Corex technology does not require Sinter Plant & Coke oven, thereof its pollution is less as compare to Blast Furnace, Sinter plant & Coke oven.
 - The process offers benefits in terms of its environment-friendly nature, harnessing revert materials including poor quality coals and having lower Carbon foot-print.
 - Use of weakly coking coal and non-coking coal, thereby utilizing available resources and minimizing dependence of metallurgical industries on the prime coal.
 - Making available by-product gas containing high calorific value (~ 1850 Kcal/Nm³) from which cheap and pollution-free power can be produced in the country like ours which is power starved.
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COREX® Smelting Reduction technology –Benefits

- The by-product gas can even replace NG as feedstock to various industries – fertilizer, steel etc.
 - Excellent qualities of hot metal and also easy correction of hot metal & slag analysis possible within 3-4 hours.
 - Easy shut down and restart of the plant within one hour, greater flexibility.
 - Potential to use even Indian coals after washing and enriching their Fixed Carbon.
 - Environment-friendly i.e. very low emission of Carbon dioxide, NO_x, Sox, Phenols, Sulphides.
 - Low Carbon-footprint and possibility of generating CDM revenue.
 - Process flexibility allows usage of revert materials – mill scale, coal briquettes, various iron-bearing fines, nut-coke, plastic wastes (trails made abroad). This Improves Solid waste Utilization index of Steel Plant.
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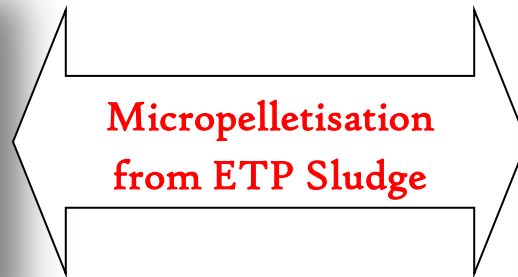
Environmental friendly process in comparison with traditional BF iron making.

Parameter	Corex	Blast furnace
CO ₂ Emission (Kg/ THM)	1420	1900
NO _x Emission (Kg/THM)	53	1410
SO _x Emission	-	10% More than COREX route
Phenols (gms/ THM)	0.04	100
Sulphides (gms/ THM)	0.01	180
Ammonia (gms/ THM)	60	900

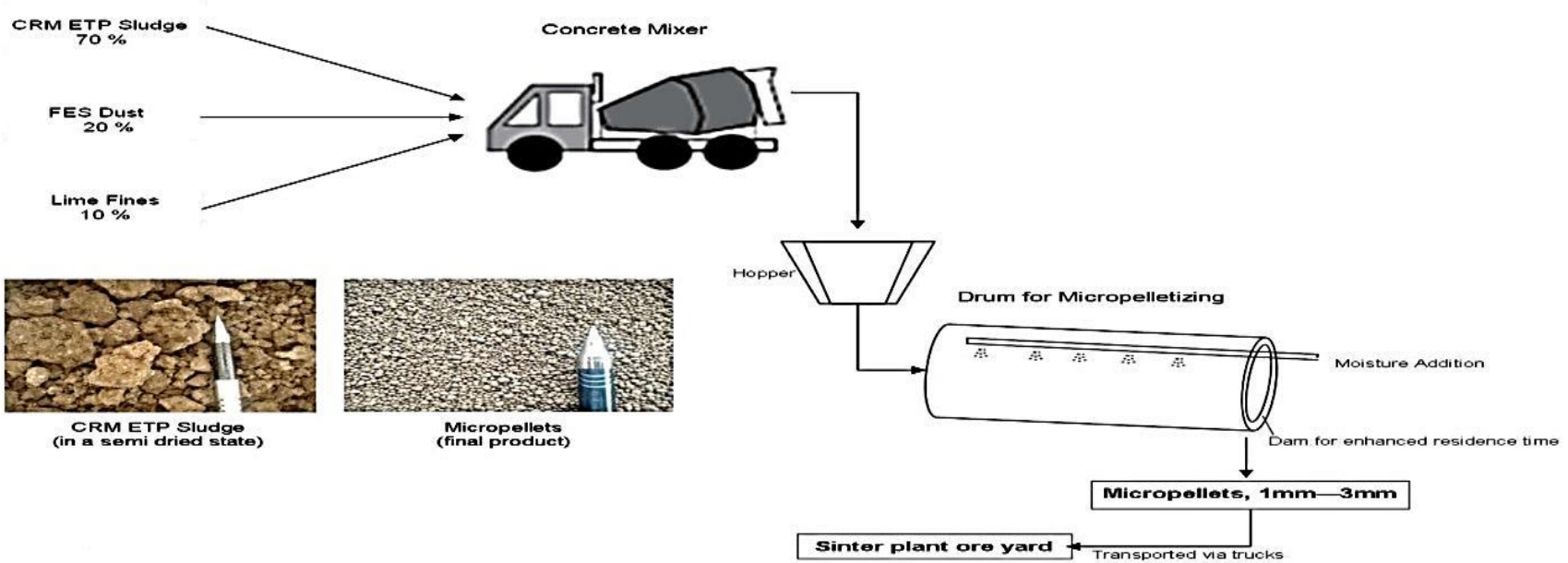
MICRO PELLETTISATION OF ETP SLUDGE

ETP Sludge is being generated during Cold Rolling Mill Plant, Plate mill, CSP mill & HSM operations. It is declared as hazardous waste as per HW Rules, 2003. It is being collected in Tractor- Trolley then transfer to Sludge Storage Shed for drying. From there it is being disposed off to common TSDF site of GEPIL at village Gabhane, Sachin, Dist Surat. Recently as a part of Recycle/Reuse Essar has developed a technology to produce Micro-pellets from ETP sludge & it is being reused in Sinter plant as an iron bearing material.

Last four years ETP Sludge disposal is showing decreasing trend i.e. respectively for the year 09-10, 10-11, 11-12, 12- 13 are 547MT, 637MT, 187MT & NIL. And for the year 12-13, Total 15925 MT micro pellets produced from CRM ETP, Plate Mill, CRM, CSP sludge and Filter Cake and consumed by Sinter Plant And not a single ton of sludge sent to secured landfill site.



Benefits



- Monetary Savings Due to This Project**

Elimination of Dumping Cost - 4.8 Lakhs/Month

Iron Recovery - 10.06 Lakhs/Month

Total Savings - 14.86 Lakhs/Month

Operation Cost - 3.5 Lakhs/Month

Net Savings - 11.36 Lakhs/Month

Annual Savings - 136.32 Lakhs

Eco-restoration by Mangrove Plantation- A Social Forestry Project

- Being near to coastal region, issues are seen in developing Green Belt (GB). With heed to the concerns towards GB development, we consulted regional forest department personnel to enquire about the practices which can be brought into system to support the coastal eco-system. Consequent to consulting various experts, Essar came up with the plot of Mangrove plantation. Hence, in concern to create the eco- system, we are in progress to carry out 1000 Ha Mangrove plantations within 10 years, in consultation with M/s Gujarat Ecology Commission (GEC) and the local community.



Benefits achieved

Uniqueness of the project

- It is one of its kind which gives benefit to Environment as well as Society. Plantation of Mangrove is a unique process that apart from its genuine benefits of creating a marine eco- system (breeding place for all aquatic creatures), massive plantation, providing work to backward community to name a few, provides an advantage of CO₂ sequestration as well.

Environmental benefits (tangible & intangible) achieved

- Mangroves provide nursery habitat and support a range of wildlife species.
 - Mangroves maintain coastal water quality by abiotic and biotic retention, removal, and cycling of Nutrients, pollutants, and particulate matter from land-based sources, filtering these materials from water before they reach seaward coral reef and sea grass habitats.
 - Mangroves help in carbon sequestration as well.
 - It prevents the coastal land erosion.
 - As mangrove plantation is beneficial towards CO₂ sequestration, by the end of complete plantation, we shall be able to put a benchmark towards Carbon Neutral industry.
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First Steel Plant to verify GHG data by DNV for the year 2011-12 as ISO 14064 Standard



GHG Data
Verification by DNV
for the year 2011-12
& 2012 – 13.

RAIN WATER CONSERVATION

❖ Status of Essar Steel

YEAR [FY]	RAIN WATER CONSERVED M ³
2009 - 10	79780
2010 - 11	218303
2011 - 12	219089
2012 - 13	50852

❖ Rain water collection system installed at Central Ground (Dia 147m x 1.5 m depth) , Nand Niketan Township.



