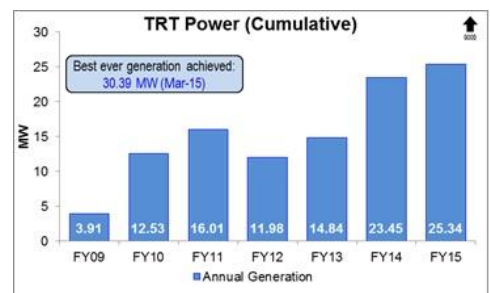
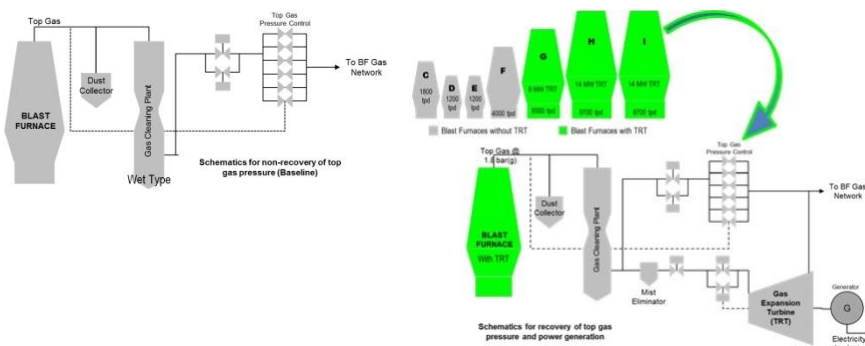




Tata Steel Ltd

Clean power generation through utilization of waste pressure energy of Blast Furnace (BF) top gas

CASE STUDY



Baseline: BF top gas was directly passed through Gas Cleaning Plant for dust removal and supplied to by-product gas network.

Existing: BF top gas after cleaning and mist removal is passed through TRT (wet and two stage variable type expansion turbines) and generated power from turbine is synchronized with power distribution system. BF gas is fed to as usual by-product gas network.

Over the period of time, TRTs operation has streamlined and increased experience over technology has resulted in increased generation.

Summary

Tata Steel has a vision to be a global benchmark for value creation. To benchmark energy consumption or CO2 emission, the Company has taken many initiatives to improve operating performance that can be categorized as in-house improvement and adoption of best available technologies. One of such technologies is TRT.

During hot metal production in BF, huge gas is evolved of pressure around 1.8 to 2 bar(g) which is drawn from top of the furnace and after cleaning used as gaseous fuel to utilize its chemical energy. To convert the pressure energy to electrical power which would otherwise left unused, TRT is commissioned.

Objective of Intervention

1. To recover waste pressure energy from BF top gas and generation of electric power using Top Gas Pressure Recovery Turbine (TRT).
2. To reduce dependence on grid power for smooth operation and improve CO2 emission intensity/ energy consumption of BF operation



Type of Intervention and Location

Adoption of Clean Technology at Steel Works Jamshedpur

Description of Intervention

Till date company has 3 TRTs successfully running at G, H & I BFs with a installed capacity of 36 MW and 150-180 Crores capital investment. TRT at HBF was commissioned in 2008 with 14 MW turbine capacity followed by GBF in 2009 with 8 MW and then at IBF in 2012 with 14 MW.

Without TRT the BF top gas was directly passed through Gas Cleaning Plant for dust removal and supplied to by-product gas network for further distribution to different units for utilization of its chemical energy as gaseous fuel. Pressure energy of such a high pressure of huge volume top gas remain un utilized thus potential wastage of 36-50 MW of equivalent electrical energy.

Intangible or Tangible Benefit

The impact of this technology is tabulated below;

Parameter	UoM	FY09	FY10	FY11	FY12	FY13	FY14	FY15
Contribution in total consumption of Works	%	1.52%	4.39%	5.89%	4.30%	3.93%	5.63%	6.03%
TRT generation rate	kWh/thm	5	15	19	14	15	21	22
CO2 Abated	ktCO2	32	103	132	99	122	193	209
	tCO2/thm	0.005	0.014	0.018	0.013	0.014	0.020	0.021

At works level, CO2 abatement from TRT power contributes to 0.02 tCO2/tcs. 40-45 crores per annum is the monetary saving considering present power generation and O&M cost. Conservation of non-renewable fuel sources (coal) and reduction in air born pollutants PM, SOx and NOx in ambient air are the intangible benefits. Payback period for the project is around 4-5 years.

About Tata Steel Ltd

Established in 1907 as Asia's first integrated private sector steel company, Tata Steel is the flagship of Tata Group of companies. Tata Steel Group (TSG) is among the top global steel companies with an annual crude steel capacity of nearly 30 million tonnes per annum (MTPA). TSG comprises of mainly Tata Steel India (TSI), Tata Steel Europe, Natsteel Holdings and Tata Steel Thailand. Tata Steel Group is among the top global steel companies. It is the world's second-most geographically diversified steel producer, with operations in 26 countries and a commercial presence in over 50 countries. The Tata Steel Group, with a turnover of INR 1.395 Trillion in 2014-15, has over 80,000 employees across five continents and is a Fortune 500 company. The Group's vision is to be the world's steel industry benchmark in 'Value Creation' and 'Corporate Citizenship' through the excellence of its people, its innovative approach and overall conduct. Underpinning this vision is a performance culture committed to aspiration targets, safety and social responsibility, continuous improvement, openness and transparency. TSI is one of the largest steel producers in India. It also operates Ferro Alloys & Mineral, Tubes, Wires, Bearings, Agrico tools and fabrication shop.



TSI with overall revenue of INR 417.85 Billion in 2014-15 has operational Steel Works, Mines & Collieries at various locations under Steel Business. The reporting scope of Climate Change disclosure is the integrated steel works at Jamshedpur. In 2008, Tata Steel India became the first integrated steel plant in the world, outside Japan, to be awarded the Deming Application Prize 2008 for excellence in Total Quality Management. In 2012, Tata Steel became the first integrated steel company in the world, outside Japan, to win the Deming Grand Prize 2012 instituted by the Japanese Union of Scientists and Engineers.