



ORIGINAL RESEARCH PAPER

Economics

ENVIRONMENTAL REPORTING AND SUSTAINABLE DEVELOPMENT GOALS (SDGs) : A CASE STUDY FROM NTPC LTD

KEY WORDS: Energy, Sustainable Development Goals And NTPC

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ABSTRACT

Energy and environment are closely interlinked. Every form of energy is either derived or captured from the environment and is eventually returned to the planet as by-product or as harmful emissions or waste. NTPC, one of the world's largest electricity producers and an environmentally responsible company recognizes its dependence on environment and is committed towards its conservation. NTPC establishes its green environmental policy initiatives by linking sustainable development goals for climate action plans. The study shows that NTPC has been focusing on improving fuel efficiency and cutting emissions over the years towards environment and changing business landscape. The study highlights the important environmental initiatives taken by NTPC towards Fly ash utilisation and production of Green Hydrogen products.

INTRODUCTION :

NTPC is India's largest energy conglomerate with roots planted way back in 1975 to accelerate power development in India. Since then it has established itself as the dominant power major with presence in the entire value chain of the power generation business. From fossil fuels it has forayed into generating electricity via hydro, nuclear and renewable energy sources. This foray will play a major role in lowering its carbon footprint by reducing green house gas emissions. To strengthen its core business, the corporation has diversified into the fields of consultancy, power trading, training of power professionals, rural electrification, ash utilization and coal mining as well. NTPC became a Maharatna company in May 2010. As of January 2020, there are 10 Maharatnas CPSEs in India. NTPC is ranked No. 2 Independent Power Producer (IPP) in Platts Top 250 Global Energy Company rankings. NTPC has been operating its plants at high efficiency levels. As on 31.03.2023 the company has 17% of the total national capacity and, it contributes 25% of total power generation of India due to its focus on high efficiency. In October 2004, NTPC launched its Initial Public Offering (IPO) consisting of 5.25% as fresh issue and 5.25% as offer for sale by the Government of India. NTPC thus became a listed company in November 2004 with the Government holding 89.5% of the equity share capital. In February 2010, the Shareholding of Government of India was reduced from 89.5% to 84.5% through a further public offer. Government of India has further divested 9.5% shares through OFS route in February 2013. With this, GOI's holding in NTPC has reduced from 84.5% to 75%. The rest is held by Institutional Investors, banks and Public. Presently, GOI holding in NTPC is 51.10%. NTPC is not only the foremost power generator; it is also among the great places to work. The company is guided by the "People before Plant Load Factor" mantra which is the template for all its human resource related policies. In 2019, NTPC is recognized as "Laureate" for consistently ranking among "Top 50 Best Companies to Work for in India" for last 11 years in the Great Place to Work and Economic Times survey. Besides, NTPC was also recognized as the best among PSUs and in Manufacturing.

Fly Ash Utilization At NTPC Ltd

FlyAsh produced at Coal based Thermal Power Plant, is a resource material for Cement industry and building products manufacturing units. It is also being used as one of construction material in Road and Fly over embankment construction and thus helping to save earth and degradation of good agricultural land. Sustainable Fly Ash utilization is one of the thrust areas of its activities at all NTPCs Coal based Power Plants. To give momentum for FlyAsh utilization, separate Ash Utilization Group was set up in 1991. Now, at all Coal based stations are having dedicated group responsible for Ash utilization activities and the group strives to achieve 100% Ash utilization on sustainable basis.

Supply Of FlyAsh To Cement Industry:

To make dry FlyAsh available to users, suitable dry Fly Ash extraction and storage silos have been installed at all Coal based Thermal PowerPlants (TPPs) of NTPC. Further, to facilitate bulk transportation of FlyAsh through Railway wagons, which is presently cheapest option for bulk transportation, Rail loading facilities have been developed at Kahalgau, Ramagundam, Rihand, Mouda, Simhadri and Korba TPS. Such system is also under installation at Sipat, Vindhyachal, Talcher-Kaniha, Solapur, Kudgi, Meja, Khargone, Lara, Darlipalli and Gadarwara TPS. Bulk transportation of FlyAsh through Railway: To start bulk transportation of FlyAsh in closed and environment friendly manner through Railway wagons, NTPC has signed an agreement with Indian Railway under SFTO (Special Freight Train Operator) scheme and purchased three BTAP wagon rakes. Now, FlyAsh supply in BTAP rakes has been started from Rihand to CementPlant located in Maihar region. FlyAsh is also being brought to demand centre like NTPC-Dadri through BTAP wagon rakes from Rihand for supply to Cement industry. NTPC Kahalgau and Ramagundam are supplying FlyAsh through Railway wagon rakes on regular basis to Cement industries located in North East States and Gulbarga region respectively. NTPC Mouda has dispatched FlyAsh in BCFC/ BCCW wagon rakes to Cement Plant located in Gulbarga Region. Recently, FlyAsh transportation has been started in bags from Vindhyachal and Barauni TPPs also. NTPC Rihand, Mouda and Simhadri TPPs have also dispatched FlyAsh in BOXN wagons on trial basis to Cement Plants and efforts are being made to start supply from these stations on regular basis.

Use Of FlyAsh Bricks:

To promote use of FlyAsh bricks in building construction, NTPC has set up FlyAsh brick manufacturing Plants at its Coal based Thermal PowerPlants and FlyAsh bricks are being manufactured on regular basis. These bricks are being utilized in Plant as well as township construction activities exclusively. On an average total about 60 million FlyAsh bricks are being manufactured annually by NTPCs own FlyAsh brick Plants. As per the MoEF&CC directives, NTPC stations are keeping at least 20% of total FlyAsh produced in reserve for issue to FlyAsh brick/ blocks/ tiles manufacturers and issuing FlyAsh free of cost to them. About 9% of total FlyAsh produced in NTPCs stations, is being utilized by FlyAsh bricks/ blocks and tiles manufacturing units annually.

Use Of Ash In Reclamation Of Mine Voids:

Reclamation of Mine voids using Ash is one of the area where large quantity of Ash can be utilized on sustainable basis and reclaimed area can be developed into green land through afforestation. Reclamation of Mine void filling at NTPC Talcher -Thermal Power station has been carried out since 2005 onwards after getting due clearances from Odisha State

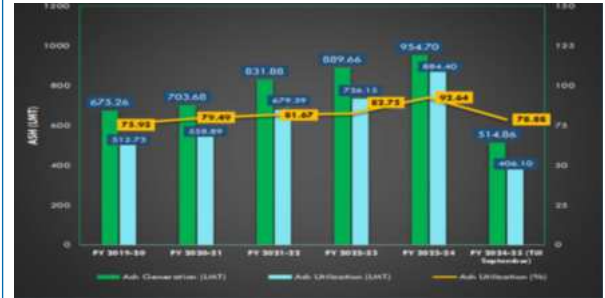
Pollution Control Board and subsequently from Expert Committee of MoEF & CC. Station has also carried out environmental studies as directed by Expert Committee of MoEF &CC and based on the results of all studies, Committee as well as National Green Tribunal has expressed that reclamation of Mine voids can be one of the permissible avenue for sustainable utilization of Ash. NTPC is also doing Mine void filling with Ash from its Korba TPP to Manikpur Mine voids on regular basis. Further, Bottom Ash is being utilized in stowing of Surakachar underground Mine in Korba area. This activity is helping Mine company to extract more Coal from underground Mine. At Ramagundam, Bottom Ash is being issued to Singareni Collieries Company Limited for stowing of Srirampur underground Mine. NTPC Talcher-Kaniha has also been allocated Jaganath Mine voids and necessary infrastructure & pipeline laying is being carried to start Mine Ash filling in the voids. NTPC Vindhyachal has been allocated Gorbi Mine voids for Ash filling. Environmental studies and development of infrastructure are being carried out for taking up Ash filling in this Mine void.

New Initiatives For Fly Ash Utilization

NTPC has successfully developed FlyAsh based Geo-Polymer Road construction technique and Roads were constructed at Ramagundam, Rihand, Kahlagoan, Farakka TPS for its demonstration. These Road stretches are performing well. Now, Township and CSR Road will be constructed at NTPC stations through this FlyAsh based technology for large scale promotion and confidence building. To promote use of FlyAsh in Agriculture, NTPC in association with Indian Institute of Soil Science (IISS), Bhopal has taken up long term project titled "Use of FlyAsh in Agriculture for Sustainable Crop Production and Environment Protection". The results of this study will help to remove doubts amongst agriculturist for safe and beneficial use of FlyAsh in this sector. NTPC stations are organizing awareness program on FlyAsh utilization as well as interactive meets with FlyAsh users/ customers on regular basis for increasing FlyAsh utilization.

Ash Utilization Progress At NTPC

The last five years Ash utilization status at NTPC are as under:



Environmental Reporting And SDGs Goals Linkage:

S. no	Area of Material Topics	Key Action	SDG Linkage
1	Energy management	- Stress on efficient utilization of resources and use of technological advancements for improving energy efficiency - Dedicated groups created to improve the Energy Efficiency Management - Energy Efficiency Management System (EEMS)consisting of periodic assessments, field tests, performance gap analysis, deviations analysis and updation of action plans at all stations	 
2	Climate change	- Enhanced geographical and technological diversification, inherently reduces our risks to any location-specific natural catastrophe - Power plants and associated infrastructure are designed to withstand cyclones, heatwaves and increase in ambient temperatures - Decommissioning of old thermal plants and a revised target of 60 GW of RE capacity by 2032 - Our current Non-Fossil based energy capacity is ~10% .And with further massive RE addition, we anticipate reducing our specific CO2 emissions substantially over the next few years.	   

Green Hydrogen And Chemicals At NTPC Ltd

NTPC has been exploring the use of hydrogen as a substitute for fossil fuel. This is to achieve energy security and decarbonization of the energy sector. To achieve these objectives a number of pilot projects have been launched. These cover concentrated use like power generation to distributed use like mobility and house holdc ooking purpose. Below are some of the key Initiatives:

i) NTPC has setup up India's first Green Hydrogen Blending facility to blend green hydrogen in Piped Natural Gas (PNG)network at Kawas, Gujarat. It was commissioned in Jan'23and is currently operating with 8% v/v of green hydrogen blending, which is the highest so far achieved in India.

ii) Green Hydrogen Mobility project of production capacity80 kg/day is under execution at Leh, Ladakh. The Project involves 5 number of FCEVs for intra city travel in Leh. This is being powered by a 1.7 MW co-located solar plant. This project is located at an elevation of 3500 m above MSL, a first of its kind globally. The trial run of one bus has already been successfully demonstrated.

iii) Green Hydrogen fuelling station is being setup at Greater Noida, U.P. with a capacity of 260 kg/day and 5 number of CEVs for intra city travel in DelhiNCR.

iv) A Solar-hydrogen storage system is planned to provide round-the-clock RE power supply (RE-RTC) at an elevation of 4500 m above MSL.

v) A green hydrogen hub spreading over 1200 acres is being developed in the state of Andhra Pradesh focusing on production of green chemicals like methanol, ammonia and setting up allied manufacturing facilities.

vi) Techno-economic feasibility study for deployment of green hydrogen-based locomotive for operation within NTPC is under process.



3	Water & effluents management	- Optimisation of water consumption through advanced technologies and process re-engineering - Implementation of “Water Policy” and “Rainwater Harvesting Policy” - Implementation of “Zero Liquid Discharge (ZLD)” at all stations, including ensuring good quality freshwater availability in and around plant locations through community investments and capacity building - Installation of Air-Cooled Condensers having potential to save 60% of water - Cycles of Concentration (CoC) is being increased at all stations for reducing freshwater intake	
4	Air emissions	- Installation of FGD/DSI system for SO_x control completed for 23 units while execution work in 119 units is in process - Combustion modifications for De-NO_x 49/50 units completed, whereas execution work for rest one unit is in process - Retrofitting of ESP done for 40/50 units at 13+GW capacity to curb particulate emissions at all stations, whereas retrofitting for the remaining capacity is ongoing. - Continuous Emission Monitoring System (CEMS) of all stacks - Ambient air quality monitoring through an online Ambient Air Quality Monitoring System (AAQMS)	
5	Waste management	- Waste (Hazardous & Non-hazardous) generated are properly handled and disposed with approved agencies - Specific guidelines and systems instituted for handling domestic waste and bio-medical waste - The scrap and recyclable waste are managed through auction on the MSTC e-platform - Other solid waste is managed according to our Waste Management Policy & applicable govt. regulations	
6	Biodiversity and natural resource management	- Implementation of dedicated Biodiversity Policy 39+ Million saplings have been planted - Currently implementing 16 Wildlife and habitat restoration projects. - Integration of biodiversity considerations into business decision-making processes.	

CONCLUSION:

The study articulated the United Nations' Sustainable Development Goals (SDG) intent and NTPC commitment towards climate change mitigation in our business activities. Reduction of emission intensity, increase of portfolio and capacity of renewable, addition of carbon sinks through tree plantation are some of the notable initiatives undertaken by NTPC. The company has developed policies on environment and water to bring more focus and guidance to our units in reducing ecological footprint. NTPC is constantly innovating and re-engineering processes to ensure environmental impact is minimal. A very significant step taken by NTPC is indigenous development of advanced ultra-supercritical technology (AUSC), which will increase the efficiency by 10% over current conversion efficiency of 42% from super-critical technologies. NTPC has taken many proactive steps through its R&D wing NETRA (NTPC Energy Technology Research Alliance) in exploring alternative areas of ash utilisation such as development of coarse / fine aggregates and geo polymer based concrete roads from bottom and fly ash.

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