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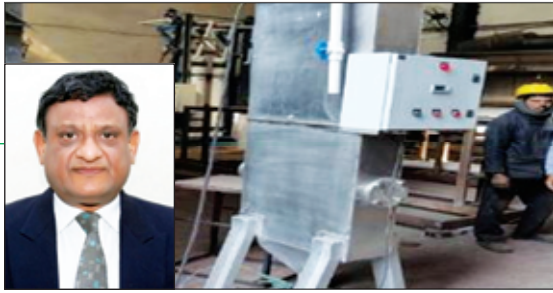
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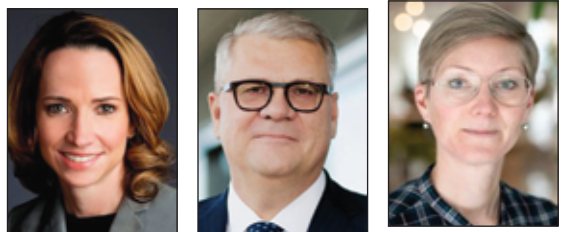
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Demonstration and Technology transfer of odour-control technology in Indian paper industry: UNIDO's Innovative approach



Dr. Rakesh Kumar Jain*

India is the fastest growing pulp and paper market producing more than 22 million tons of paper, paper boards and newsprint against an installed capacity of around 27 million tonnes per annum, using recycled waste paper (RCF), agro-residues and wood, including small quantities of imported wood pulp, as raw materials.

Though the demand for paper is growing considerably, however the Indian paper industry faced with various challenges such as availability of good quality raw materials, high cost of basic inputs, traditional technology, limited resource efficiency, poor internal water handling, and environment.

To address these challenges, UNIDO, through its project 'Firm-level demonstration of technologies and productivity enhancement for the pulp and paper industry' funded by the Department for Promotion of Industry and Internal Trade (DPIIT), Ministry of Commerce and Industry, Government of India has been supporting the Indian pulp and paper industry by facilitating exposure to, and adoption of, global best practices and best available technologies.

The project aims to enhance the productivity and competitiveness of the Indian pulp and paper industry. This is achieved through demonstration of process

improvement interventions as well as the applicability of the identified innovative technologies. The application of Chlorine dioxide (ClO_2), a broad-spectrum and ecologically compatible biocide, has been identified as one of the potential innovative option for odour control in RCF based paper mills.

RCF based paper mills which contributes to more than 73% of the total country's paper production majorly producing packaging grades of paper and paper boards. These mills in an attempt to reduce its fresh water consumption have closed up the back water system and adopted approach towards zero liquid discharge. This result in build-up of microbial growth, (the anaerobes and aerobes) causing odour due to the formation of volatile fatty acids and other odour causing substances which has significant impact on the product quality, productivity and overall process efficiency of the paper mill. Conventional prevalent treatment options that include biocides have found to have limited efficacy in controlling the root cause of the issue.

Though the application of ClO_2 is known as an disinfectant for the potable water, cooling towers and also rarely applied in some paper mills in developed countries, its usage for treating process water in the RCF based segment of

Indian paper mills is an unexplored area. Under the ongoing paper project, trials were to conducted using a specialized ClO_2 generation system. This includes optimisation of the ClO_2 doses in respect of treatment time, appropriate point of ClO_2 dosing and analysis of the microbial counts (anaerobes and aerobes) and VFA which are the indicative parameters for assessment of the efficacy and odour intensity in the process water and paper. The trials were done in cooperation with specialized technology suppliers as well as national technical institutes for testing and validation.

The mill scale trials conducted over a period of more than six months in a recycled fibre-based paper mill showcased that the application of ClO_2 treatment contributed to significant reduction in microbial growth (the anaerobes and aerobes) resulting in control of the odour (unpleasant smell) in the process water and in the final product. The successful demonstration of odour control technology has been widely disseminated through technical workshops in 4 major paper clusters, Chennai, (South), Muzaffarnagar (North), Vapi (West) and Kolkata (East) and more than 400 participants across country attended the workshops.

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Dissemination workshops for odour control, audit tool and PEMs, Muzaffarnagar (30 June 2022) and Vapi (19 August 2022).



CLO₂ treatment system for odour control in operation in RCF based paper mill.

Following the successful demonstration of the odour control technology solution, several other technology providers and paper mills have expressed interest in delivering and adopting this solution respectively, on the basis of which subsequent trials have been initiated in various other paper mills across country and results of the trials have been promising which resulted in control of foul odour besides additional benefit of slime control thereby, less slime breaks in paper machine, improved machine run ability and enhanced productivity.

The technology demonstrations described have the potential to make Indian paper mills more competitive not only from the point of view of achieving their sustainability and environmental management requirements (vis--a-vis water consumption and effluent discharge), but also by reducing input costs, achieving higher product quality and consistency in production. This is expected to facilitate technology uptake and firm-level innovation, with high potential for productivity enhancement and replication among other players in the sector leading to increased productivity and competitiveness.

Acknowledgement

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