Application of Cleaner technologies – case study

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***Abstract*—Cleaner technology is a preventive, company specific environmental production initiative. It is intended to minimize waste and emission and maximize product output. For the present research study an automobile parts manufacturing industry in Bangalore is chosen as study area". The present study carried out on three major areas such as Environmental Management System practices (EMS), organic waste management (food waste) and application of statistical tools to automated effluent treatment plant. The food waste generated in Ban-P canteen area has been effectively utilized for converting organic waste into Biogas by designing 25M^3 plants for 250 kg of food waste. The designed plant estimation gives out saving of 16 cylinders of 19 kg weight which accounts for 2.48,650 rupees and 250 tones of CO_2e /annum will be reduced. The study on Environmental Management System practices in Bosch has been carried out with respect to Environmental Objectives, employee training, aspect/ impact registration, internal audit and etc. The standard statistical tools have been applied to AETP in-order to predict the effluent parameters such as BOD,COD,TDS,TSS etc., correlation analysis between all the effluent parameters has been studied, finally comparison between effluent parameters and standards has been assessed using one t test.**

Keywords: cleanertechnologies, Internalaudit, organic waste

I.INTRODUCTION

Cleaner production is a concept that goes beyond simple pollution control. It involves active research and development into new structures, systems, processes, materials and products that are more resource and energy efficient, whilst engaging and empowering people. Such approaches have become necessary for businesses, institutions, governments, and civil society to ensure ecologically, socially, and economically sustainable, consumption production and service strategies. These involve educational, training, management, and technical assistance programs, which are needed to accelerate the adoption of cleaner production and sustainability by industries, governments and universities[1].This concept came into existence during the preparation of the Rio Summit as a programme of UNEP (United Nations Environmental Programme) and UNIDO (United Nations Industrial Development Organization) under the leadership of Jacqueline Aloes de Larder, the former Assistant Executive Director of UNEP. The programme aims to reduce impact of industry on the surrounding environment. It is built on ideas used by 3M in its 3P program (pollution prevention pays). It has attracted more international support than all other comparable programmers. The program idea is described to help developing countries in leapfrogging from high pollution to less pollution, using existing technologies. "Starting from the simple idea to produce with less waste, Cleaner Production was developed into a concept to increase the resource recovery, resource efficiency of production in general"[1].Cleaner production developed in order to preventive, company-specific environmental protection initiative. Its main goal is to minimize waste and emissions and maximize product output. By analyzing the flow of material, resource and energy in a company, one can try to identify available options to minimize waste and emissions out of the industrial processes through source reduction techniques. Improvements of organization and technology, helps to reduce or suggest better options in use of raw materials and energy, and to avoid generation of waste, wastewater, and air pollution, and also waste heat and obnoxious noise [1].

II.STUDY AREA

The objectives were chosen based on background of green technology by adopting practices of cleaner production, continual improvement through EMS, prediction of feasibility of AETP through computational model/statistical tools.Complete study of Environmental management system practices including procedure for internal audit, ISO 14001 certification, aspect/impact identification and registration.The study of area of food waste generation, composition of food waste and estimation of quantity of food waste/day.Design of Anaerobic fixed dome type digester for the estimated quantity of food waste.Cost Benefit analysis,Carbon credits,To develop a computational prediction model for all the 9 parameters of

treated effluent of AETP using statistical tool.Study of correlation analysis of each parameters of treated effluent.Comparison model for effluent parameter with pollution control board standards.

III.MATERIALS AND METHODS

The following clauses from ISO 14001 are briefly discussed on how it is being implementedMethodology to identify aspects related to activities, products or services within the scope of EMS.Evaluate and record document aspects and identification of significant aspects.Implementation.The range coordinators/members of the Cross Functional Team are responsible to carry out study of aspects and impacts in their range and maintain a register. The methodology adopted consists of a particular product, process or services, the processes outsourced and activities contracted within the premises .Identification of impacts for relevant activities based on input, generation and output for each relevant activity in Aspect Impact Register .Evaluation of impacts according to Tool 1 for Evaluating Impacts.Significant impacts are those impacts –satisfying at least 1 criteria for significance (Legality, Emergency, Interested party concern or saving potential) or having score >8.Prioritization of significant aspect carried out ,based on criteria for prioritization. Based on this it is classified as Top, High, Medium or Low.MR maintains a consolidated list of department wise significant and non significant aspects. This is updated as and when the aspect impact register is updated. But CFT maintains an Aspect Impact Register in his/ her range.

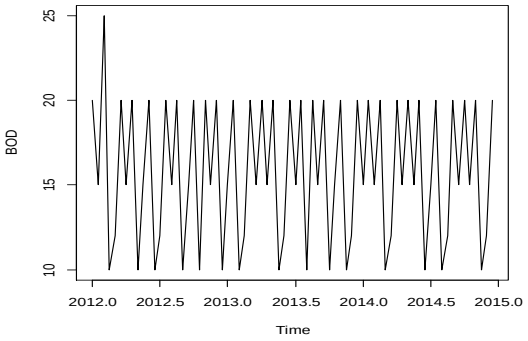

Fig.1 Time series Analysis for Oxygen Demand (BOD)

IV CONCLUSIONS

For the generated 250kg/day of food waste at BanP canteen area, 25M^3 Biogas plant has been designed which yields on an average of 16 cylinder of 19kg weight Biogas which accounts for 2,48,650 rupees saving/Annum.Designed 25M^3 Biogas plant contributes towards reduction of 272.4144 tones of CO_2e /Annum.The digestate (sludge) obtained from the Biogas plant process, can be used as Organic fertilizer to plants maintained in and around area.The Statistical tool such as Prediction model using "R" software is used to predict the future outcome of effluent parameters such as pH, BOD, COD, TDS, COLOR, TSS, Oil & Grease.The trend of past 3 years Treated Effluent parameters has obtained as well as future values is obtained which helps to take management decisions.One T-Test is done to analyze the variation between treated effluent parameter values against the set standards and it is found to be within the limits.Correlation analysis between each treated effluent parameters showed that there is a negligible correlation between BOD & TDS, COD & Color, TSS & Oil-Grease.

V.REFERENCES

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