CO-GENERATION – ECONOMY BOOSTER FOR SUGAR FACTORIES

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ABSTRACT

Most of the Indian Sugar Mills are being operated with the highly inefficient power plant & equipments like low pressure & temperature Boilers of 21/32/45 Kg./Cm2 with back pressure turbines and the very inefficient turbines for Mill Drives and Fibrizer/Shredder drive. Due to the inefficient operation for all above equipments and the demand for higher sugarcane prices, these factories are passing through a very tough time and many factories are unable to make payments to the farmers and in turn not getting sufficient cane.

Co-generation is the need of the hour for such factories to boost up the economy and efficiency of the plant and the paying capacities of the sugar factory to pay to sugarcane

CO-GENERATION TARIFF – REGULATORY APPROACH

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BACKGROUND

In simple terms, co-generation is the process of using a single fuel to produce more than one form of energy in sequence. Co-generation of steam and electricity can significantly increase the overall efficiencies of fuel utilization in process industries. A minimum condition for co-generation is the
simultaneous requirement of heat and electricity in a favourable ratio, which is well fulfilled in the sugar industry.

The sugar industry across the world has traditionally used bagasse-based cogeneration for achieving self-sufficiency in steam and electricity as well as economy in operations. In India, almost all sugar mills have been practicing some form of co-generation. This is true even for mills that were set up 70–80 years ago. Technologies are now available for high-temperature/highpressure steam generation using bagasse as a fuel. These technologies make it possible for sugar mills to operate at higher levels of energy efficiency and generate more electricity than what they require. For example, when steam generation temperature/pressure is increased from 400 ºC/32 bar to 485 ºC/66 bar, more than 80 kWh (kilowatt-hour) of additional electricity can be generated from each ton of cane crushed. Revenues from sale of surplus electricity can go a long way in improving the viability of sugar mills.

The importance of co-generation has already been recognized by our policy makers and maximization of non-conventional energy including co-generation has been highlighted as a national priority.

PROBLEM FACED AND IMPROVEMENTS MADE IN COGEN PLANT AT HAIDERGARH CHINI MILLS

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ABSTRACT

Energy is one of the major inputs for economic development of the country. In India energy supply and demand gap is increasing day by day. Power saving and power export to the grid is the only way for successful operations of the factory and to make financially viable and economically profitable. In our Cogen Plant, we keep implementing innovating systems to over come the problems to optimize the O&M of power plant.

CO-GENERATION IN SUGAR INDUSTRIES & ITS OPERATIONAL ASPECTS

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ABSTRACT

Since beginning Co-generation in sugar mills has been in existence starting with the simultaneous generation of heat & electricity (CHP). Co-generation, now, from sugar mills is, exporting the surplus power to grid after meeting captive consumption requirements.

The concept of present day Co-generation has developed confidence in the industry and gained momentum after its successful implementation. Considering the competitiveness and volatile market situation, profitability of sugar mill revolves around the export of maximum possible surplus power to the grid. As power generation from bagasse based Co-generation is renewable and eco-friendly, Central and State Governments encourages its installation by providing subsidies and better tariff. State Policies encouraged developers to invest on Co-generation in sugar complexes in efficient manner to reduce operational cost and to earn additional revenues. This paper deals in brief description of Co-generation and its technical and operational aspects and the conclusion.

ADVANCED INSPECTION TOOLS FOR HIGH PRESSURE CO-GENERATION BOILERS

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INTRODUCTION

Sugar Industry has been witnessing significant advancement in boilers used for co-generation. This advancement is primarily in the Pressure and Temperature ratings of Steam along with Steam Generation capacity for more output with reduced bagasse consumption. While every effort has been taken by Boiler makers in design, selection of material, Valve ratings and advanced Instrumentation and controls to ensure safety and reliability of boilers, maintenance, an area whose ordinates fall in User's territory have a lot to attain to meet these advancements. General trends show that typical plant operation & maintenance involves manipulation of the plant equipment as per laid down guidelines of Boiler makers or self generated instructions, with the objective of achieving desired level of output. However Operating philosophy is always based on the assumption that equipment is in efficient and fit condition. To keep equipment in efficient and fit condition, maintenance is essential at any available opportunity. Maintenance virtually is a re-active response of scheduled inspection, past history of equipment/parts etc. Hence it is critical to have the knowledge of various damage mechanisms that components may undergo along with know-how of latest testing tools available for carrying out inspection.

A CASE STUDY OF SUGAR CO-GENERATION

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The energy has become the most important single factor influencing human activities, ranging from physical comforts (room heating, cooling, transport etc), food supplies (agricultural activities, food processing etc) to every type of economic achievement. Hence energy is a major input for economic development of any country.

In sugar industry, co-generation is one of the main renewable energy technology, as it uses non-conventional or renewable energy sources which are in-exhaustible & without release of harmful pollutants. It is a simultaneous generation of electrical and thermal energy.

Benefits of high efficiency co-generation systems in sugar mills :

- Power generation using bagasse is environmentally cleaner as bagasse produces very little fly ash and no sulphur.
- The net contribution to the greenhouse effect from a bagasse based cogenerating plant is zero, since the carbon dioxide absorbed by the sugarcane grown, is more than what is emitted by the co-generation plant.
- A bagasse-based installation has a much lower gestation period as compared to the conventional power plant.

- A bagasse-burning unit requires a smaller capital investment and lower recurring costs compared to fossil fuel based power plants.
- Such a unit uses a totally renewable source of energy, which does not involve mining, extraction and long distance transportation of fossil fuels.
- The rural location of sugar mills enables co-generated power to be directly fed to the local sub-station, consequently minimizing transmission and distribution losses and the provision of long feeder lines.
- The adoption of co-generation systems results in the benefit of quick returns on capital investment.
- Even among the renewable energy projects, sugar is perhaps the only sector, which has the available infrastructure.

BAGASSE DRYER – AN ENERGY SAVER

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Bagasse drying is an efficient way of increasing the calorific value of bagasse which results in energy saving. Flash draft dryers are well proven for bagasse drying as compared to other types of dryers available.

POWER EXCHANGE INDIA LIMITED

Presentation by Jignesh Mirani