

POWER GENERATION POTENTIAL FROM DISTILLERY WASTE

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ABSTRACT

The aim of this study was to evaluate potential of Spent Wash as an alternative source of electricity generation through the burning of Spent wash (Slop) in special type Boiler i.e. known as Slop Fired Boiler. The Spent wash produced from a process of producing ethanol, but with environmental problems of its application. This study was conducted on the basis of theoretical data to calculate the potential of generation of electricity and energy. Our purpose is to use Spent Wash for electric power generation. The paper presents a case study of a distillery with a production of 200KLday⁻¹ ethanol. The use of Spent Wash (Slop) as a source of energy has great potential energy for Indian Distilleries.

Keywords: *Spent Wash, Distilleries, Renewable Energy.*

1. Introduction

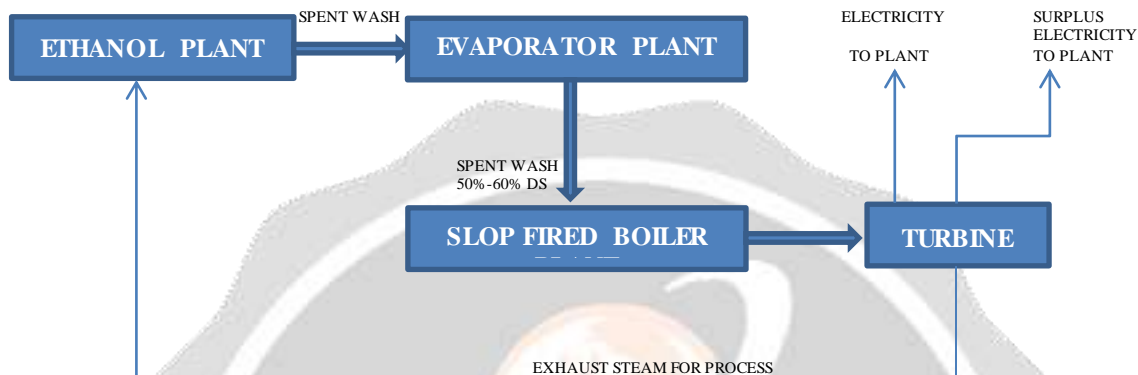
India being a developing nation, sustainable development is more important. Energy is a basic requirement for economic development. Every sector of Indian economy – agriculture, industry, transport, commercial and domestic – needs inputs of energy. Energy is an important factor for any developing country. Ever increasing consumption of fossil fuels and rapid depletion of known reserves are matters of serious concern in the country. This growing consumption of energy has also resulted in the country becoming increasingly dependent on fossil fuels such as coal and oil and gas. Rising prices of oil and gas and potential shortages in future lead to concerns about the security of energy supply needed to sustain our economic growth.

Spent wash is the waste of the Distillery. In Spent wash the percentage of Alcohol should be nil. The disposal of spent wash has always been a headache for the Distillery industry.

Spent wash in Distillery comes out as a waste after distillation process. Before this technology spent wash was the waste product and the disposal of spent wash was a headache to the plant because it creates too much Soil, Water pollution. But now a days with the help of Evaporator plant, spent wash will be treated as to utilized as supplementary fuel in Boiler to generate steam. The spent wash comes out from the distillery have about 15% Total Solid. In evaporator Plant Spent wash will be treated and increase its Total Solid percentage up to 50% to 60% because this much amount solid particles is efficiently burn in Boiler. After Evaporator Plant, Spent wash becomes Slop and collect it in Slop Tank.

Now Slop will be burn in Boiler through sparser and produce steam. Some difficulties comes to operate the Boiler on Slop because it has choking properties and support fuel will be used to burn with Slop to avoid chock and increase the steam generation rate.

2. Methodology



General Description of the concept of concentration by evaporation

This paper is an exploratory literature research and a case study, based on published data in literature. Data regarding the production of ethanol were obtained from the India Glycols Limited, Gorakhpur. The paper presents the process of Spent Wash production, demonstrating feasibility aspects of the project.

This paper work done on survey and collect the data from M/s India Glycols Limited, Gorakhpur. M/s India Glycols Limited set up 200 KL per day distillery where during operation of Distillery, at rate of 110 m³/hr spent wash produced. Average generation of spent wash is around 8-12 liters / liter of alcohol produced, depending on continuous or batch process and quality of molasses used etc. The spent wash comes out from the distillery have about 15% Total Solid.

Spent wash have 15% total solid which cannot be easily burn in Boiler. M/s India Glycols Limited set up 110 m³/hr capacity Evaporator plant. In which they feed 110 m³/hr spent wash and after process 30 to 40 m³/hr Slop comes out. In evaporator Plant Spent wash will be treated and increase its Total Solid percentage up to 50% to 60% because this much amount solid particles is efficiently burn in Boiler. After Evaporator Plant, Spent wash becomes Slop and collect it in Slop Tank.

3. Case Study

The case study done in India Glycols Limited, Gorakhpur Evaporator plant whose installed capacity is 110 m³/ hr feed of Spent wash per hour and produced 30 m³/hr Concentrated spent wash with 65% solid. Factory have captive power plant and a special type Boiler setup for burning of this distillery waste to avoid pollution because The disposal of spent wash has always been a headache for the Distillery industry. The aim of this case study to find out profit from Evaporator Plant in terms of Energy and money.

Cost of Rice husk = 151.2 x Rs. 2500/Ton (Rate of 1 MT Rice Husk = Rs. 2500)
 = **Rs. 3, 78,000 per year**

Saving Rs. 3, 78,000 per year by using Slop (Concentrated Spent Wash) in place of Rice Husk.

4. Conclusion

For this study, was used a potential of producing 10 liters of spent wash per liter of ethanol, and spent wash potential to generate energy by used as a fuel in Slop fired boiler. We estimated the cost for producing Concentrated spent wash with 65% concentration which is much lower than the Rice Husk or Coal cost with good calorific value. By use the Slop in Boiler as a fuel we can save approx. Rs. 4 Lac in terms of Rice husk or we can say that we save that much quantity of Rice Husk and also dispose the Slop by burn it in Boiler which is much more beneficial for Environment.

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