

## **Non-conventional Energy: Biomass to Distillery, Sustainable Source**

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**Abstract:** *In our pursuit of material progress and happiness we are placing immense pressure on this planet. Growing population, increasing consumption, use of fossil fuels to supply electricity, use of minerals to manufacture electronics is resulting in degrading land and natural ecosystems. Some scientists have coined the term and believe that we are living in the Anthropocene era. Business sustainability which refers to managing the triple bottom line i.e. profits, people, and planet are an imperative by organizations which need to manage their financial, social, and environmental risks, obligations and opportunities. In this context, this case study attempts to highlight the endeavours of Octaga Green Power & Sugar Co. Ltd in its goal towards achieving business success in a sustainable way through using renewable energy, coupled with cutting edge technologies with a green carbon and water footprint.*

**Keywords:** *Green Distillery Industry, Business Sustainability, Renewable Energy*

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### **I. Octaga Green Power & Sugar Co Ltd**

Octaga Green Power & Sugar Co Ltd is engaged in distillery products manufacturing with its bottling plant in Village Karnoor, Tal. Kagal, Dist. Kolhapur, Maharashtra with an annual capacity of three lakh cases of vodka/whiskey/ brandy/ rum and has a state of the art distillery with the rated capacity of 40,000 liters per day. In 2007, the company board unanimously decided to go in for a Zero Pollution effluents treatment plant with five effect evaporator system along with spray drier, in spite of an immediate increase in the capital cost to the company as compared with the before bio-methanation method. In the long run this would stand to be beneficial to both the company and the environment.

The company would enjoy the benefit of Clean Development Mechanism (CDM) revenue through which some cost of the company would be compensated. The avoidance of coal usage for the cogeneration plant would result in reduced greenhouse gas emission and would be eligible under the Carbon Credit scheme of the Kyoto Protocol. The benefit of this to the surrounding environment is huge as burning coal results in air pollution (smog, soot, acid rain, global warming, and toxic air emissions), generates waste (ash, sludge, toxic chemicals, and waste heat), fuel supply (mining, transporting, and storing coal levels mountains and pollutes the land, water, and air), and water use (Coal plants need billions of gallons of cooling water and harm wildlife). Coal pollutes when it is mined, transported to the power plant, stored, and burned. All this had been avoided as the project would avoid coal usage for the cogeneration plant. Thus, a dried spent wash and bagasse based cogeneration plant was approved in spite of the escalation in costs over a coal based system. This formed the base for the registration of the project with the United Nations Framework Convention on Climate Change (UNFCCC) board.

### **Validation Report by TUV Nord on Incineration of Spent Wash to Operate 1MW Captive Cogeneration Project**

The report concluded that the project was in line with all criteria and all relevant UNFCCC requirements for CDM. The monitoring plan was transparent and adequate. The calculation of the project emission reductions was carried out in a transparent and conservative manner, so that the calculated emission reductions of 34,051 t CO<sub>2</sub>e are most likely to be achieved within the (1st renewable) crediting period. Since the project reduced anthropogenic Green House Gas (GHG) emission (CO<sub>2</sub>) to atmosphere by replacing coal based cogeneration unit, the project activity would reduce 340,510 tCO<sub>2</sub>e for the fixed 10 years of crediting period.

The project does not fall under the purview of the Environment Impact Assessment (EIA) notification of the Ministry of Environment and Forest, Government of India as per EIA notification dated 27.1.94 and its subsequent amendments. As biomass waste will be used for energy production with an efficient combustion and emission control no negative environmental impacts will arise as a result of the project activity.

The stakeholders for the project activity were identified at the outset by a team of Octaga Green Power & Sugar Co Ltd staff and the stakeholders were duly informed of the consultation meeting via advertisement in the local newspaper, personal communication and notices. In addition public notices were also issued for the local stakeholder consultation meeting. Participants representing various groups attended the meeting in June 2009 at

the site, Kagal, District - Kolhapur, Maharashtra. Local communities, NGOs, Employees, Contractors, and Consultants/ advisors were involved in the stakeholder consultation meeting. All positive comments were received and thus the meeting was assessed to be adequate.

#### **United Nations Global Compact (UNGC) goals: The world's largest corporate sustainability initiative**

The company is a pioneer in the industry by setting international standards of corporate, social and environmental responsibility in business practices since inception. The company supports and upholds United Nations Global Compact (UNGC) goals. As a member of the Global Compact, the company believes that its business policies and practices incorporate and are constantly evolving to reflect its commitment to the tenets of human rights, labour standards, and environment and corruption standards.

#### **Employment Generation**

The socio economic status of the population is an indicator of development of a region. Any industrial project has a bearing on the living conditions and economic status of the population living in that particular region. Setting up Octaga Green Power & Sugar Co Ltd has generated employment to 250 – 300 persons when the factory is running and 100 persons in the off- season period.

#### **Socio Economic Development**

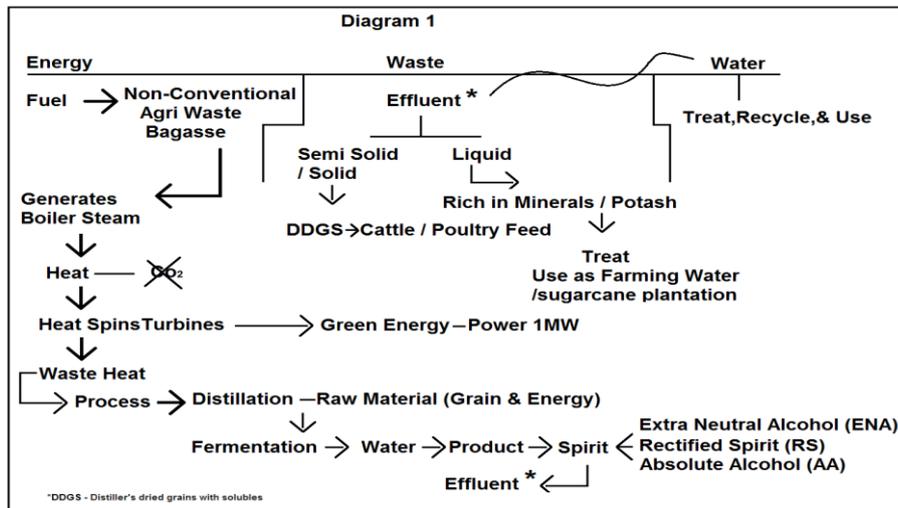
The organization supports the Local Gram Panchayat by sponsoring Rs. Two lakhs every year to build Community Welfare projects and encourage local events such as wrestling matches. Apart from this monetary assistance to the Local Gram Panchayat Farming Water generated from the process is given free of charge to the farmers around the distillery.

#### **Effective Utilization Of Water**

Wastage of water is a major cause of its shortage. Agriculture is water driven practice and reuse of waste water can augment water requirements to some extent. Distillery waste water or spent wash is an enriched source of nutrients and irrigation water for crop production. Studies done on some distilleries have shown that such waste water used continuously is unsuitable but 2-3 pre-sown irrigation and rest with fresh water can be recommended. This pattern of irrigation can utilize the manurial value of effluent and reduce the environmental hazard to a considerable extent. It provides a plausible solution for on-land disposal of the effluents as they have the potential to improve macro and micro nutrients status. This helps save cost of fertilizers. An increasing population and food demand with resultant increase in water withdrawal for agricultural and industrial purposes is causing water shortages. Thus, meeting the demand of water for satisfying a growing population and safe disposal of waste water generated from distilleries is achieved.

#### **Effective Utilization of Distiller's Dried Grain with Soluble (DDGS)**

DDGS is sold in semi-solid form, as cattle / poultry feed, which fetches additional income to the project and results in zero discharge of process effluents. The plant produces Extra Neutral Alcohol (ENA) for India manufactured foreign liquor (IMFL), Rectified Spirits (RS) for Indian country liquor and Absolute Alcohol (AA) which is 99.99% pure ethanol for power generation, government mandated petrol blending, industrial use, and Bottle Potable Alcohol. It has been designed to scale up from the current 40 Kilo Litres Per Day (KLPD) capacity and 1MW Captive Cogeneration Power Plant to up to 200 KLPD capacity and 16 MWCogeneration Power Plant (See Diagram 1).



**Horticultural Green Belt**

The planting of a Horticultural green belt of approximately 30 acres is currently underway where Sugarcane, Soya bean, Groundnut and Mango are being planted.

**General Management and Housekeeping**

The project employs indigenous technology that is environmentally safe and sound. A total area of 1.5 lakh square feet are used for office, staff quarters and guest house facilities.

**Collapse of the Global Carbon Trading System**

Under the Clean Development Mechanism (CDM), developers of projects to cut carbon emissions in developing countries receive a UN-issued carbon credit for every tonne of carbon dioxide the project avoids. This applied to a wide range of activities, from building new windfarms and solar panels, and distributing more efficient cook stoves and lights, to the installation of technology on factories to prevent the release of certain industrial gases. The system was set up under the 1997 Kyoto protocol. Such carbon credits could be bought by governments which were bound by the Kyoto protocol to cut their emissions. But the US refused to ratify the Kyoto protocol. Large emerging economies such as China, Mexico and India carried no emissions cutting obligations under the treaty. Europe was the only market for sale of such credits. Europe had its own cap-and-trade emissions scheme, under which heavy industries were awarded a quota of carbon they were permitted to emit, which they could top up by buying the UN credits. Unfortunately, recession and the Eurozone crisis resulted in a decline in industrial activity and destroyed this market as few European Union (EU) countries now needed to top up their carbon quotas. All this resulted in a collapse in the price of carbon credits. The first commitment period of the Kyoto Protocol ended in 2012. Ratification of the Doha Amendment, relating to the second commitment period upto the year 2020, of the Kyoto Protocol is important. The UNFCCC Secretariat is encouraging governments to speed up their ratification of the Doha Amendment to the Kyoto Protocol by the end of the year 2015.

After the crash in the prices of carbon credits many buyers of carbon credits, comprising mainly energy traders, financial institutions and European energy utilities were trying to find ways and means of exiting from forward contracts in India and China, according to P Ram Babu, CEO General Carbon Advisory Services. Companies which had invested in clean and green energy technologies and had hoped to recover some of the costs through the benefits of the Clean Development Mechanism revenue now could not be compensated through encashment of their carbon credits.

**II. Conclusion**

Due to the crash in the prices of Carbon Credits, the company was unable to enjoy the benefits of the Clean Development Mechanism (CDM) revenue. The escalation in costs to the company of setting up the cogeneration plant based on the use of dried spent wash and bagasse instead of coal could not be compensated.

The products obtained from the distillery industry support several other industries like solvent for paints, sterilizing and antiseptic agents for medicines and hospitals, cosmetics and perfumeries and flavour enhancement for food. The distillery industry is unique because it uses several waste products and the products of this industry are used in several other industries. This industry uses fermentation which is a biological process in which microorganisms produce different types of alcohol products. Effluents of such industries can result in serious pollution if released into the environment without treatment. The Central Pollution Control Board (CPCB) has prescribed and implemented zero discharge norms from distillery effluent for the distillery industry with effect from 1-1-2006. This was prescribed under charter on Corporate Responsibility for Environmental Protection (CREP) Programme of the Government of India introduced by the CPCB. The distillery industry needs to find solutions to the industrial, economic, and environmental issues facing it.

Managing environmental risks helps companies in improving their reputation and their brand. Investment in resource efficiency helps companies strengthen their competitive advantage. Studies have shown that improvements in resource efficiency in energy and water have led to significant cost savings and lower environmental impact. <sup>x</sup>Octaga Green Power & Sugar Co Ltd has taken proactive steps in this direction.

### REFERENCES

- [1]. The Clean Development Mechanism (CDM) is one of the Flexible Mechanisms defined in the Kyoto Protocol (IPCC, 2007) that provides for emissions reduction projects which generate Certified Emission Reduction units which may be traded in emissions trading schemes.
- [2]. <sup>1</sup>Use of Distillery Effluent in Agriculture: Assessment of Irrigation Quality and Nutrient Supplying Potential, S. R. Panda, D. K. Sharma, P. C. Moharana, D. K. Gupta *Environment & Ecology* 31 (3A) : 1453—1458, July—September 2013 Website: [environmentandecology.com](http://environmentandecology.com) ISSN 0970-0420
- [3]. United Nations Framework Convention on Climate Change, [http://unfccc.int/kyoto\\_protocol/items/2830.php](http://unfccc.int/kyoto_protocol/items/2830.php)
- [4]. United Nations Framework Convention on Climate Change, [http://unfccc.int/kyoto\\_protocol/doha\\_amendment/items/7362.php](http://unfccc.int/kyoto_protocol/doha_amendment/items/7362.php)
- [5]. “Carbon credit prices crash, companies hit”, Namrata Singh, TNN | Feb 18, 2012, 03.48AM IST, The Times of India
- [6]. <sup>11</sup>Chemical Study on Distillery Effluent to Assess Pollution Load, AtulThakkar, *International Journal on Emerging Technologies* 4(2): 121-123(2013)
- [7]. All India Distillers’ Association accessed online July 28, 2015
- [8]. IFC International Finance Corporation, World Bank Group, The Business Case for Sustainability
- [9]. The author would like to thank Mr. Basab B. Paul, Managing Director, Octaga Green Power & Sugar Company Ltd. for allowing the case study on the company, organizing the factory visit and generously giving his time during the course of the case study being written.