COST MANAGEMENT IN THE MODERN ERA: REDEFINING BUSINESS STRATEGIES FOR SUSTAINABLE GROWTH AND OPERATIONAL EFFICIENCY

Sustainability Linked Cost Management – Case study of a Sugar Refinery in Andhra Pradesh

Abstract

The Article describes the growth story of a leading Sugar refinery in Andhra Pradesh as to how it has reduced its fuel cost, which is one of the major cost components of its conversion cost. It was done through cost management and operational efficiency by re-defining its business strategy over the recent years. This refinery was able to run the operations by adopting improved operational efficiencies and cost management over time.

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Strategic Cost Management is necessary for any business to achieve sustainable competitive advantage by aligning costs with long-term goals, optimizing resource allocation, enhancing customer value and improving profitability. It moves beyond short-term cost reduction to incorporate strategic decision-making, value chain analysis, and continuous improvement to navigate a dynamic business environment and secure long-term success.

Refined Sugar exports from India are restricted by the Government of India's [GoI] policies from time to time in order to maintain a stable sugar pricing in India. GoI is allowing export of Refined sugar from India based on sugarcane crop, monsoon impact and refined sugar stocks in the country.

The story is of a Company having its sugar refinery located in Andhra Pradesh. The Company imports Raw Sugar from Brazil, converts the same to Refined Sugar and exports to various countries in Africa, UAE and other neighboring South Asian Countries.

Raw Sugar is moist coarsely crystalline mass with sucrose content of about 95-98%. The solid cores of raw sugar crystals are further covered with a layer of syrup. These covering substances make raw sugar moist and tacky giving it a typical yellowish brown colour and malty, burnt flavor.

Raw sugar is used in the manufacture Refined sugar and so its quality becomes a critical factor for the cost performance of a refinery.

Major costs involved in converting the Raw Sugar into Refined sugar include Process Loss, Steam Cost, Chemicals, Packing, Logistics and other admin costs. From a broader perspective, process loss reduction mainly depends on the quality of the Raw Sugar, which is not in the hands of the refinery,

whereas the steam cost, which contributes to around 30% to 35% of the total conversion cost of the refinery, is within the control parameters of the refinery. In order to reduce the cost of fuel, which in turn reduces the overall cost of conversion, the Management had taken several strategic initiatives to reduce the cost. The key initiatives taken by the Management to reduce the fuel cost included the introduction of Biofuels as a part supplement for the existing fossil fuel as well as the introduction of Double Effect Falling Film Evaporator to reduce the steam consumption etc., These initiatives helped the Company to reduce its cost for sustainable growth and progressively improved the operational efficiencies.

Methodology Adopted by the company in the Cost Reduction:

Two Methods followed by the company for total cost reduction process. In method -1, it started using the alternatives to the fossil fuels (Paddy Husk & Saw Dust). Once they felt, the methodology followed has reached the optimum results, then the used the second method of new investment on the new machinery, which will reduce the steam consumption, which will reduce the use of fossil fuels. These two methods were deployed in a phased manner. Details as below.

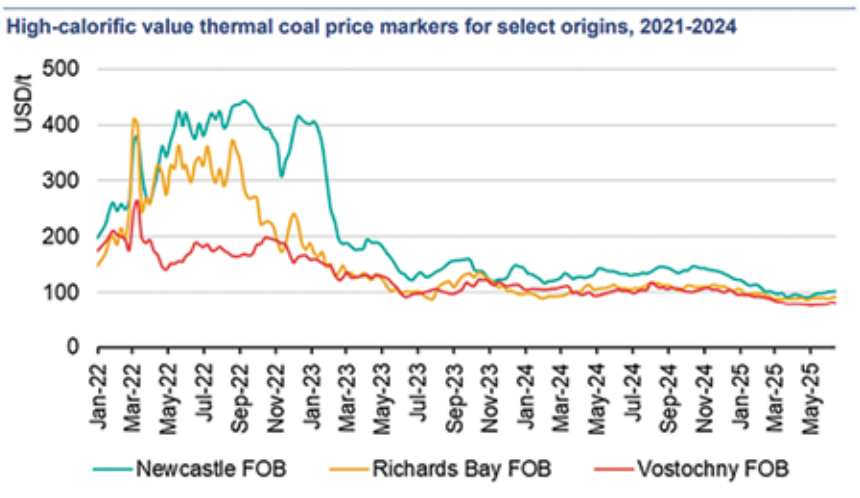
The sustainable cost reduction has taken place in the recent years in two phases. Phase 1, in which the Company has introduced the Bio Fuels as an alternative to the fossil fuel and in Phase 2, investment in new equipment for the reduction of its steam consumption, which in turn directly reduces the overall fossil fuel consumption requirement. Various steps taken in these two phases are described below.

Phase I: Introduction of Biofuels as alternative to Fossil Fuels

Throughout 2022, coal prices saw a significant increase. This was largely due to greater fuel and electricity demand as countries slowly exited more stringent coronavirus restrictions, as well as fallout of the Russia-Ukraine war. As many European countries moved to curtail gas imports from Russia, coal became the alternative to fill the power supply gap, more than doubling the annual average price index between 2021 and 2022.

Although China makes up by far the largest share of worldwide coal production, it is among those countries consuming the majority of its extracted raw materials domestically. In terms of exports, Indonesia, the world's third-largest coal producer, trades more coal than any other country, followed by Australia and Russia. Meanwhile, Japan, China, and India are among the leading coal importers, as these countries rely heavily on coal for electricity and heat generation.

Following is the trend of prices of High Calorific value thermal coal of select origins



Note: FOB = free on board.

During the year 2022, in order to reduce the fuel cost, Management had done extensive study and brainstorming to optimize on the fuel cost. As a result, they introduced Husk, a byproduct generated from the milling of Paddy. The results of the introduction of the paddy husk were very encouraging in terms of cost as well as operational performance. Due to its seasonal availability and use of the same in other industries as fuel for their boilers, continuous availability of the paddy husk in sufficient quantities became critical.

As a result, the refinery started looking at other biofuels, which could be available throughout the year as an alternate fuel. In this process, they identified Saw Dust (particles generated from wood cutting process at local sawmills) as another fuel mix to coal along with Paddy Husk. This biofuel has given good result in reduction of the fuel cost. Even though the results of using Saw Dust were encouraging, the availability of suitable volumes for the operational requirements was not sufficient. Since the dust generation at sawmills is of lesser volumes, the process was further fine-tuned with installation of new equipment at sawmills, which would generate the required size dust, from the waste wood chips while cutting the wood. This additional equipment for generating the saw dust from the waste wood chips, helped in generation of the required quantity of saw dust for boiler operation. As a result, the Refinery was able to use a mix of biofuels (Saw Dust from waste wood) along with Coal for the Boiler.

in order to optimize the cost, the Refinery started using a mix of Paddy Husk and Saw dust as fuel for the boiler, with reduction of the Coal quantity in the boiler. With this change, the management was able to utilise up to 20% of their fuel requirements by using low cost and sustainable products i.e., Paddy Husk and Saw Dust. This process helped in reducing their fossil fuel consumption cost, without making any major functional changes to the Boiler. **Usage of Saw Dust as a fuel source in boiler is a first of its kind in the region**.

In this journey of Cost Management, sustainable fuels usage for continuous operational efficiency was moved another step forward with the Double effect falling film evaporator in Phase II in Financial Year 25 [FY25].

Phase II: Introduction of Double Effect Falling Film Evaporator

In second phase, the Company Management had invested in technology for reduction in steam consumption for refining the sugar. They commissioned a project in FY25 with external agency support viz., Double Effect Falling Film Evaporator, aimed at reduction in steam consumption.

A double effect falling film evaporator uses the vapor from the first evaporator to heat the second, increasing evaporation efficiency. It consists of two or more falling film evaporators connected in series. The liquid to be concentrated is fed into the first evaporator, where it flows down the inside of tubes as a thin film, partially vaporizing. The vapor from the first evaporator then becomes the heating medium for the second evaporator.

The process of improvement in the existing system of decolorization of liquor by using single effect rising film plate evaporator to double effect falling file evaporation is intended to reduce the steam consumption. By this process, the Company was able to achieve steam consumption reduction of 10% from the existing consumption levels; average coal consumption reduced by ~ 12%. Efforts of the Company Management seeking continuous improvement in cost reduction through operational excellence coupled with the objective of sustainable growth had helped the organization in significant reduction of its conversion cost of refining the Raw Sugar into Refined Sugar with special focus on the fuel cost. This helped the organization in maintaining its premier position in the international market as one of the key low cost refining supplier of refined sugar. MA

Conclusion:

The operational excellence by reducing the cost with sustainable business strategies for Growth and Operational Efficiency - Through Cost Management seems to be 'a journey and not a destination' for this Organization.

Reference:

1. *International Energy Agency - Coal Mid-year update 2025*