



**POTENTIAL FOR HIGH EFFICIENCY COGENERATION
IN THE SUGAR INDUSTRY**

**USING A CASE STUDY OF THREE SUGAR FACTORIES
IN KARNATAKA**

1993

Summary

Although India has been the world's largest sugar producer (with 13.4 million tonnes in 1992-92), cogeneration of electricity using high-pressure boilers had not been a common practice.

A study was therefore made of the benefits and costs of high-pressure cogeneration, using data from three sugar factories in Karnataka.

1. The study examined three sugar factories in Karnataka, namely Sri Chamundeswari Sugars Ltd., Malaprabha Co-operative Sugar Factory Ltd., and Ugar Sugar Works Ltd. The study assessed their respective cogeneration capacity at 21, 26, and 39 MW, with generation surplus of 68, 86, and 128 GWh/year.
2. As the Karnataka Electricity Board (KEB) allows wheeling and banking, it is possible for a generator to sell power directly to a buyer, at a mutually-negotiated price, using the KEB's transmission and distribution system.
3. The estimated life-cycle cost of energy and power from cogeneration would be Rs 0.69/kWh and Rs 23,000/kW, in contrast to the corresponding estimated costs of Rs 1.68/kWh and Rs 70,000/kW, through centralised thermal units. As per the financial assessment, the debt-service coverage ratio would be 1.85 – 1.87, and the IRR would be 25.5 – 25.74%.
4. The transmission of power through the existing grid appears to be the weak link, as most of the existing sugar factories are linked to the 11 kV lines that also service rural loads and are associated with system instability. Parallel 33/66 kV lines would be preferable.
5. The cooling water requirement could also be a problem, particularly during summer. However, the power/electricity shortfall is also the highest during these months, forcing higher prices that could enable expenditure for water. Further study is recommended.
6. The design adopted in this study does not take into account the availability of sugarcane trash for use as fuel. The sugar companies expressed reservation regarding the use of trash for this purpose as it is currently being used as manure, and there would also be collection difficulties. However, if the net working days were increased by 25%, i.e. from 200 to 250 working days per year, a corresponding increase of electricity generation would be feasible.

The results were presented to Ministers and officials of the state government, officials of national development financial institutions, and senior officials of sugar factories. IEI conducted a conference in Bangalore on the 2nd and 3rd of June 1993, during which discussions took place.