

# Management discussion and analysis

Divisional analysis

## 1. Sugar division

Turnover, 2004-05: Rs. 8.13 bn

Turnover growth: 68 per cent

Turnover growth CAGR (5 years): 16 per cent

Turnover as a proportion of the company, 2004-05: 78 per cent

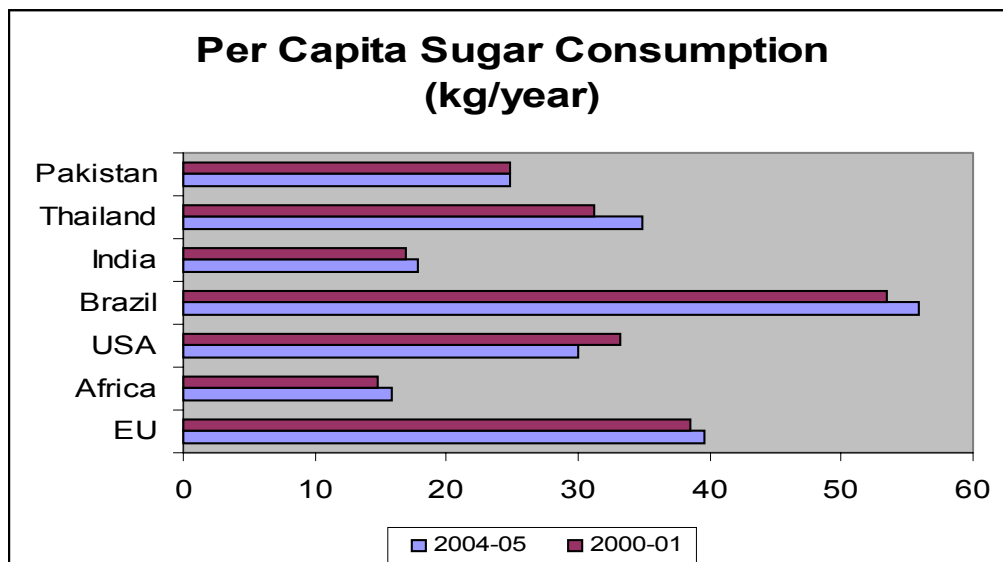
Plants: Khatauli and Deoband in West UP, Ramkola in East UP

### Overview

The company's installed capacity of 25,250 tcd across the three units is among the largest in India. The company's Khatauli unit is credited with having crushed the largest quantity of sugar across any unit in India in the 2004-05 sugar season.

### Rationale for presence

Even though India is the largest consumer of sugar and its per capita consumption is still below the levels achieved by peer countries (see graph). With a projected increase in per capita incomes and an improvement in lifestyle quality across India's middle and lower economic classes, we expect that sugar consumption will increase significantly primarily on account of two factors: the crossover from the consumption of gur and khandsari to sugar and an increase in direct and indirect consumption by all sections of the Indian society.



Data source: International Sugar Report 2004-05

### ***Triveni's value proposition***

Sugarcane is the only significant raw material for the domestic sugar industry. Consequently, any interruption in sowing or harvesting of sugarcane can lead to a detrimental impact on the sugar industry at large and to our company.

As a forward-looking organization, Triveni is actively engaged in mitigating foreseeable risk factors. In relation to fostering the availability of sugarcane in its 'command area', Triveni protects farmer interests in a number of ways – ensuring consistent and equitable cane purchase from farmers, providing access to advanced farming best-practices, arranging timely remuneration and taking a leadership position in community development activity. In turn, these initiatives encourage farmers to allocate a significant acreage towards the cultivation of sugarcane, making the arrangement mutually rewarding. The quality of the company's output has helped it graduate to the status of a major brand in India's retail and wholesale markets, thereby enabling it to enjoy a premium and a distinctive recall in a relatively unbranded marketplace.

### ***Triveni's strengths***

- Advanced technological assets and capital equipment, represented by world-class continuous vacuum pans at the B (sugar boiling) and C (sugar boiling) stages, resulting in boiling consistency, uniform crystal size, reduced molasses purity, decline in steam consumption and enhanced product quality. The technology and intellectual property for this equipment was jointly developed with Sugar Research International, the premier Australian organization.
- Positive recall in a competitive marketplace, translating into a premium and quicker off-take.
- The location of the sugar manufacturing plants in the fertile Doab region (between the Ganga and Yamuna rivers), resulting in superior sugarcane quality and exceptionally high yields.
- Canal water availability over a large part of the region, representing one of the highest penetrations of man-made water interventions in India, reducing the company's dependence on monsoon vagaries.
- Established culture of cane cultivation in the region.
- Largest cane crushing capability across any one unit in India (18.66 million quintals in the 2004-05 sugar season at Khatauli); a quicker crush enables the farmer to grow wheat on fallow land and earn an attractive supplementary income.
- Excellent cane procurement logistics, critical for any large sugar unit, demonstrated in the systematic pooling of cane from no less than 220 purchase centers in the Khatauli command area without any shortage or inventory pile-up.
- Dependable relations with more than 160,000 farmers across the Khatauli, Deoband and Ramkola command areas, resulting in a reliable and increasing supply of sugarcane.
- Strong in house technical and project management capability, resulting in the commissioning of the Deoband co-generation project in the fastest implementation time lines; expansion of the Khatauli capacity from 11750 tcd to 16000 tcd.
- Vast project execution experience in setting up sugar plants and carrying out expansions in view of our earlier experience in sugar plant machinery and through our subsidiary, Triveni SRI Limited.

## **Industry analysis**

**World sugar:** The forecast of the world sugar balance (October 2004 to September 2005) indicates that production will be 2 mn tonnes lower than consumption: world sugar output<sup>1</sup> (October 2004 to September 2005) has been estimated at 146.1 mn tonnes (raw value) as against 143.7 mn tonnes in the previous year while consumption is estimated 2.1 per cent higher at 148 mn tonnes (raw value) with increased demand coming out of Asia and Far East.

Interestingly, leading trade house ED&F Man sees this global (2004-05, Oct-Sept) deficit widening to 4 mn tonnes; its production estimate for 2004-05 is unchanged from its 2003-04 benchmark of 143 mn, while consumption, driven by Asia, is forecast to increase from 144 mn to 147 mn.

In fact, the principal factor behind the price rise over the past 18 months was the conviction that global demand growth could outstrip production in 2004-05, depleting stocks, as well as the belief that high oil prices may induce Brazil and other countries to divert more cane towards the production of ethanol, reducing cane supplies directed towards sugar manufacture.

Looking into the short-term, two developments are likely to tip the Asian balance: India's sugar consumption has been growing at an average annual rate of around 3 per cent over the last ten years; besides, global sucrose demand, discounting the role of artificial sweeteners, is expected to grow by around one mn tonnes a year. China too is likely to become a major importer after 2007, given the limited availability of its resources to expand sugar production.

**WTO:** Sugar and dairy products are probably the most protected agricultural sectors. As a result, the impact of product-specific negotiations in the WTO Doha Round (as agreed in the July 2004 framework) on sugar was more significant than in the last WTO Round of multilateral trade negotiations.

The critical factors: the base period chosen for the duty reduction commitments, the length of the implementation period for making the reductions and whether sugar would be included in a WTO list of sensitive products, which would allow it to escape a part of the WTO trade reform process.

More recently, the World Trade Organization's highest court issued a final ruling on April 28, 2005, ordering the European Union to stop dumping subsidized sugar illegally on the global markets or face trade sanctions. The decision by the WTO's Appellate Body in Geneva gives the EU up to 15 months to strictly comply with this directive. It is important to note that the export of white sugar, especially from European Union, is heavily subsidised at prices less than 25 per cent of the prices prevailing in the European domestic markets. But for such exports, the international prices of the white sugar would be higher and would in turn have a favorable impact on India's domestic prices.

In 2004, a panel of WTO experts estimated that the EU exported about four million metric tonnes of sugar in 2000-01 (period under investigation) or about three times more than what the rules

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<sup>1</sup> Source: F O Licht, World Sugar Balance (2005)

permitted. As a result, any reform in this area will give Indian exports a significant boost and have a positive impact on global prices.

India also suffers from a small quota in the Lome and ACP conventions, which gives members a preferential price in the lucrative EU and US markets. Any increase in these quotas could help domestic manufacturers in the short term.

**Ethanol**<sup>2</sup>: At the 13th annual International Sugar Organisation seminar in 2004, Chairman Francisco Varua (also President of the Philippines Sugar Millers Association) pronounced that ethanol could become the sugar cane industry's principal product by the end of the first decade of the new millennium. Not only are fuel ethanol programmes spreading across the globe, but more players are becoming aware of the need for cross-order trade to help the product become more competitive against gasoline.

Since Brazil will need to raise ethanol production by 14 bn litres<sup>3</sup>(25 mn tonnes sugar equivalent) just to meet its growing domestic demand – this represents 175 mn tonnes of cane, 2.5 mn hectare of extra land and an addition 85 to 90 mills – FO Licht does not expect large Brazilian sugarcane crops to upset the world sugar balance, especially as ethanol is expect to become dearer over the foreseeable future.

### ***Domestic industry scenario and outlook***

**Industry structure**: The sugar industry in India is highly fragmented, with 566 sugar units spread over 16 states. The total capital employed by the sugar industry is Rs.500 bn, the annual turnover Rs.250 bn, annual sugarcane payments Rs.180 bn, direct employment for 500,000 and the involvement of 45 mn farmer/families in cane growth.

The average size of each unit is approximately 3300 tcd, substantially below the new international economic size of 7500 tcd<sup>3</sup>. Nearly 35 per cent of all Indian mills are in the private sector, 6 per cent in the public sector and 59 per cent in the co-operative sector. Despite the large recent profits shown by the Indian sugar industry, 112 mills – old and inefficient - remained closed during the year.

In a raw material-dependant industry, profitability is influenced by the following factors:

- Cane availability: Within the 'reserved area' of any factory, the yield and size of the area under sugarcane are critical success drivers.
- Economic size: Without a minimum economic size of 5,000 tcd (generally 10,000 tcd in Western Uttar Pradesh), it is becoming increasingly difficult for a sugar unit to command pricing power.

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<sup>2</sup> Source: F O Licht (Sweetner Report)

<sup>3</sup> Source: Triveni research and ISO

- Technology: The ability to minimize sugar processing losses depends on process technology.
- Demand-pull: The ability to draw a higher percentage of sugarcane from the 'reserved area' reduces the diversion to other sweeteners.
- Sucrose content: This is directly influenced by soil quality and cane development programmes initiated by progressive manufacturers; a higher sugar content in sugarcane leads to the manufacture of more sugar, while payment is still based on weight.
- Operating efficiency: The ability to bring cane in quickly from the fields and continuously operate a sugar unit minimises post-harvest sucrose evaporation.

### **Cane area and production**

Year <sup>4</sup>	Area under sugarcane (million hectares)	Yield (tonnes per hectare)	Sugarcane production (million tonnes)	Sugar production (million tonnes)
1930-31	1.2	30.9	36.4	0.1
1940-41	1.6	32.1	52.0	1.1
1950-51	1.7	40.5	69.2	1.1
1960-61	2.4	45.0	110.5	3.0
1970-71	2.6	48.3	126.4	3.7
1980-81	2.7	57.8	154.3	5.1
1990-91	3.7	65.4	241.1	12.0
1999-00	4.2	70.8	299.2	18.2
2001-02	4.4	68.2	298.4	18.5
2002-03	4.3	64.6	281.6	20.1
2003-04	3.9	63.8	221.2	13.9
2004-05	3.7	62.9	201.9	13.0 (estimated)

In the 2004-05 sugar season, a lower planting of sugarcane and poor yields resulted in a fall in sugar production in India. With rising sugarcane prices and prompt payment to farmers, this trend is expected to reverse over the next few years.

**Sugar pricing:** A turnaround in free sale sugar realizations commenced in February 2004, with subsequent increases in May 2004 and January 2005 (Indian Sugar Mills Association data). Triveni's realisations were higher than the all-India average due to a combination of regional, quality, colour and crystal size factors.

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<sup>4</sup> Source: National Federation of Co-operative Sugar Factories and Energy Lines (2005)

### Ex-factory prices of free sale realizations<sup>5</sup>

(Rs./MT/sugar)	2002-03	2003-04	2004-05
October	11600	11290	14710
November	11140	12030	14650
December	10810	11770	15360
January	10710	11660	16630
February	10660	12930	16500
March	10540	12770	16640
April	10650	13420	
May	10580	13990	
June	10810	14220	
July	11810	14060	
August	12590	14650	
September	12340	14720	
<b>Average</b>	<b>11190</b>	<b>13210</b>	

On average, domestic sugar prices strengthened in 2004-05 and demand-supply forecasts indicate that they could remain firm over the coming three years. The graph below shows the variation of sugar prices over the past 10 years, including the rise in prices since mid-2003.

**India's sugar import policy:** The upturn in India's sugar cycle is a direct result of the forward-looking policies of the Minister of Food, Government of India. There have been instances in the past when a sugar shortage in India was followed by a reduction in customs tariff, allowing an enormous quantity of white sugar to flood the market and trigger a steep fall in sugar prices. GOI permitted only the import of raw sugar by sugar factories - not traders - with an export obligation under the Advance License Scheme, one of a number of policies to ensure long-term price stability, given the temporary imbalance between production and consumption.

In 2004-05, government policies ensured that sugar prices remained at reasonable levels, which improved industry viability and resulted in record, timely and even retrospective payments to sugarcane growers, a win-win proposition. This encouraged nationwide sugarcane planting and will translate into higher output, notwithstanding a lower than average monsoon.

**Levy sugar prices:** Under the provision of sub-section (c) of section 3 of the Essential Commodities Act, 1955, the ex-factory prices of levy sugar are determined each year by the Ministry of Food and Civil Supplies, Government of India. The current ratio of free to levy sugar is 90:10 i.e. 10 per cent of sugar produced is to be sold at prices fixed by Government for different levy price zones in the country. Every month, a fixed quantity is released to each factory in respect of specified buyers nominated by the Central Government. In U.P., there are three levy price zones: while the Khatauli and Deoband factories figure in the Western U.P. price zone, Ramkola figures in the Eastern U.P. price zone. The levy price for West U.P. was Rs. 1275.92 per quintal and Rs. 1383.41 per quintal for East U.P.

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<sup>5</sup> ISMA

**Statutory minimum sugarcane price (SMP):** This price is determined by the Central Government on the basis of Clause 3 of the Sugarcane (Control) Order, 1966 with respect to each sugar season. The Government fixes the price considering the recommendations by the Commission for Agricultural Costs and Prices. The SMP for 2004-05 season was fixed at Rs. 74.5 per quintal corresponding to a base recovery of 8.5 per cent. The previous season's average recovery for each sugar unit was used to determine what SMP payment needed to be made by each factory, calculated on the basis of Rs. 0.88 per quintal for every 0.1 per cent increase in recovery over 8.5 per cent. The SMP for Khatauli, Deoband and Ramkola units were fixed at Rs. 89.46 per quintal, Rs. 92.10 per quintal and Rs. 87.70 per quintal respectively.

For the purpose of extra sugarcane payment to growers above the SMP, a formula of sharing sugar realizations with the growers has been prescribed under Sugarcane Control Order, 1966. After the 'L' factor (representing the cost of production) based on the SMP is announced by the Government (which invariably comes some two or three years later), the cost based on the L factor is subtracted from the actual realization of sugar; 50 per cent of this extra amount is shared with growers. In reality, factories in U.P. invariably pay much more than what is warranted by this formula as State Advised sugarcane Prices (SAP) announced by the U.P. government are higher than the SMP by more than the 50 per cent sharing payable.

**State advised price:** A majority judgement of the Supreme Court dated 5 May 2004 held that the State Government in U.P., in exercise of its regulatory power as contained in the U.P. Sugarcane (Regulation of Supply & Purchase) Act 1953, could fix the price of sugarcane. A review petition filed by ISMA, highlighting the inconsistencies with an earlier unanimous decision of a five-judge bench of the Supreme Court of 1956 in Ch. Tikaramji's case, and other specific constitutional points, was turned down. The U.P. Government announced an SAP higher than that paid by the industry in 1996-97, 2002-03 and 2003-04. On a demand made by the Sugarcane Societies and the U.P. Government, Triveni made all these payments for its three sugar units under protest, making it one of a handful of such factories in U.P. to have done so.

**U.P. government sugar policy:** To encourage investment in the sugar industry, the U.P. Government announced Sugar Industry Incentive Policy 2004 during the year under review. It spelt out the following:

- The sugar industry as the most important industry in the state and sugarcane as its principal cash crop, supporting the livelihoods of 3.2 mn farmer families and a labour force of 160,000 directly or indirectly in the state.
- The industry's position as a driver of social and economic growth in the locations of its presence.
- The identification of various ancillary or downstream industries like sugar machinery, distilleries, electricity co-generation, ethanol and bio-fertilizer as being linked with the industry.
- The contribution of almost Rs. 4 bn to the Indian and state exchequer via excise and purchase tax.
- The reservation of almost 2.3 mn hectares for U.P. sugar mills, accounting for 124 mn tonnes of sugarcane (almost 42 per cent of the national production).

- The use of only 41.04 per cent of the sugarcane produced in the state by the sugar industry, the rest going to gur, khandsari, seed, juice, cattle feed and chewing.
- The need to produce 7.5 mn tonnes of sugar by 2010-11 through enhanced cane drawl to fulfill the country's increased appetite for the commodity.
- The planned special incentive policy for the entry of private mills into sugar manufacture due to a funds constraint among the government and co-operative sectors.
- An estimated capital requirement of Rs. 20 billion to fund the new plants for which a special incentive package may be required.

For being eligible for the incentives, the government announced the following guidelines:

- Minimum one-time capital investment of Rs. 3.5 bn or phased (from 2004-05 to 2006-07) capital investment of Rs. 5 bn; to commence commercial production by 31 March 2007.
- Eligibility covers setting up new sugar units, expansion of the sugar capacity and related projects (ethanol/alcohol from molasses as well as co-generation from bagasse).
- Provision of monetary benefits in the form of capital subsidy and various incentives on the cane purchase and sugar and molasses sale.
- The government announced that these incentives would be provided only after the company or the unit cleared all its sugarcane dues to farmers. For an investment of over Rs. 3.5 bn, the incentive would be applicable for five years; for an investment over Rs. 5 bn, the incentive would be applicable for 10 years with a provision that proceeds from the overall incentive did not exceed the capital investment. Triveni intends to take advantage of this scheme.

***Operational performance in the 2004-05 sugar season:*** Your company's Khatauli, Deoband and Ramkola units crushed 18.66 mn tonnes, 13.8 mn tonnes and 3.4 mn tonnes of sugarcane respectively during the 2004-05 sugar season. The sugarcane crushed at the Khatauli sugar unit was the highest in the country. Recovery was 10.06 per cent at Khatauli, 10.19 per cent at Deoband and 9.86 per cent at Ramkola. The company also imported 0.185 mn tonnes of raw sugar, which was converted into white sugar during the 2004-05 sugar season.

The company produced 1,96,000 tonnes in Khatauli (including processed raw sugar), 1,52,000 tonnes in Deoband (including processed raw sugar) and 33,600 tonnes in Ramkola, a cumulative 3,81,600 tonnes in 2004-05 (3,64,400 tonnes in 2003-04). As a result, your company emerged as one of the largest sugar producers in India and expects to preserve this position following the increased production from its ongoing expansion programmes.

The company's Khatauli unit procured cane from over 220 out centres during the latter part of the season, a record across any sugar unit in India. Dispersed prudently over a 59,000 hectare command area, Khatauli's sugarcane marketing staff refined the logistical system of cane harvest and transportation in the shortest time (empirical studies suggest that if whole stock sugarcane is not crushed within 16-24 hours following harvest, the sucrose in the cane is converted into non-sugars with a consequent drop in sugar recovery). This efficiency will stand the company in good

stead when the company expands its capacity to 16,000 tcd in the 2005-6 season. Besides, engineering stoppages were within the estimated budget and there was an attractive improvement in steam consumption, thereby increasing the allocation of bagasse for the Deoband co-generation plant.

### **Forward-looking statement**

**Global consumption forecast:** Global sugar consumption is expected to increase by an average 1.5 per cent over the next 10 years. While the outlook does not account for any significant demand shocks - the only country that will reduce its consumption is the US - analysts have argued that China could increase its per capita consumption levels dramatically during this period.

<b>World sugar consumption projection (1000 tonnes, raw value) <sup>6</sup></b>			
	<b>2005</b>	<b>2010</b>	<b>2015</b>
EU	18080	18612	19117
Russia	6860	7942	8866
Europe	32122	33976	35685
Africa	13842	15989	18114
U.S.A.	8959	8969	8949
N & C America	19221	20462	21760
Brazil	10395	11379	12383
South America	18161	18669	20254
China	12500	14143	16553
India	19250	22470	25188
Asia/Pacific	63204	71516	80187
TOTAL	149549	160709	176163

**Global corporate strategy:** In the opinion of leading international sugar expert F.O. Licht, regulatory, technological and organizational issues will drive the growth of sugar companies. Since sugar is an agricultural commodity, the last factor is expected to influence profits the most. In this connection, it would be reasonable to assume that regulatory differences between various production locations may decline. As a result, companies that have profited from 'regulation rents' (guaranteed income within a protected business environment) will need to change their strategy to protect their longer-term survival.

The last of these determinants limits the expansionary drive of sugar companies to national and/or supra-national entities (EU) where an identical set of rules guarantees a high degree of planning security. The regulatory environment under which sugar companies operate is often challenging, requiring skill, experience and political clout.

From an international perspective, the industry structure of the sugar sector is surprisingly mature and yet fragmented; technology is advanced but innovations restricted to 'normal technological progress'; markets saturated but driven by economic or population growth. As a result, technological economies of scale are important in determining the size of an individual plant.

<sup>6</sup> Source: FO Licht, 2005

From an organizational perspective, companies can succeed through prudent cost reduction by centralizing functions (cost accounting and data processing) or optimizing competencies (bargaining contracts with suppliers and customers etc.).

**Domestic sugar balance:** Your company has been fairly accurate in its sugar production forecasts (with reference to data given in the annual reports of the last two years) usually made in May, well before the monsoons. Looking ahead, your company has made a five-year nationwide production, consumption and inventory forecast.

**Comparison between Triveni estimates and actual sugar production (mn tonnes)**

Details	2002-03	2003-04	2004-05	2005-06
Company estimate	19.5	13.6	13.0	17.5 <sup>7</sup>
Actual production	20.1	13.6	13.0 <sup>8</sup>	-

**Production, consumption and stock – past, present and future (mn tonnes)**

Details	2003-04	2004-05	2005-06	2006-07
Opening Stock	11.60	7.80	4.50	4.30
Production	13.60	12.90	17.50 <sup>8</sup>	21.00 <sup>9</sup>
Imports/ raw sugar processed	0.50	2.00	1.50 <sup>10</sup>	-
Total available	25.70	22.70	23.50	25.30
Internal consumption	17.70	18.20	18.80	19.40
Exports	0.20		0.40 <sup>12</sup>	1.60 <sup>11</sup>
Closing stock	7.80	4.50	4.30	4.30
Closing stock per cent (of domestic consumption and exports)	43.6	24.7	22.4	20.5
Sugar price trends	↑	↑ ↑	↑ ↑	↑

The key determinant of average sugar prices over a year is the stock ratio (stock in the country compared to consumption), which is also the basis on which the International Sugar Organization, Sugar Journal F.O.Licht and global sugar trading houses draw out their estimates. Some factors used by your company in arriving at the estimated stock levels comprise the following:

- Even as industry estimates have opening stocks as on October 1, 2004 that vary from 6.9 mn tonnes to 7.5 mn tonnes, the Government is using a figure of between 8.2 mn and 8.5 mn tonnes. If we take the Government figure, then internal consumption in 2003-04 will be even lower than 17.7 mn tonnes, which does not seem sustainable as the industry and

<sup>7</sup> This figure is also the latest Government of India estimate

<sup>8</sup> Source: ISMA and Ministry of Food, Government of India (April 2005)

<sup>9</sup> ISMA discussions / press reports

<sup>10</sup> Source: Financial Express (April 2005)

<sup>11</sup> White sugar export obligation under Advance License Scheme (ALS)

Government have agreed on the consumption figure of 16.80 mn tonnes in 2001-02 as their base.

- With low sugar prices in 2002-03 and 2003-04 as well as the impact of rising population and prosperity, it would be reasonable to assume that sugar consumption increased by around 0.6 mn tonnes per year during the period. According to the Government estimates, the consumption of sugar is estimated to grow by CAGR of 3%. In the current sugar season up to March 31 2005, 1.4 mn tonnes of raw sugar had been imported. Taking into account the existing contracts for raw sugar imports and future contracts, we forecast that a further 0.6 mn tonnes of raw sugar will arrive in the country before September 30, 2005.
- While it is difficult to accurately predict sugar production before the onset of the monsoons, as in the past, we have collected data on the existing area under sugarcane in different parts of the country, and after making a prediction on sugarcane drawal rates based on expected competition from alternate sweeteners, arrived at the subsequent year's production. Sugar production for 2006-07 has taken into account new crushing capacities, which will come on stream and the closure of some unviable ones.
- By the end of the 2005-06 season, around 4.0 mn tonnes of raw sugar will have been imported (as per Government policy, tolled white sugar will need to be exported within 24/36 months from the date of imports). It will only be possible for these export commitments to be completed by 2007-08.
- With closing stock as a proportion of consumption under 25 per cent upto September 2007, we expect sugar prices to keep pace with inflation and the inevitable rise in sugarcane cost during the next three years, enabling current margins to be preserved.
- We have not factored an increase in disposable incomes, which, if it transpires, will strengthen Indian average consumption for 2004-05 (17.82kg / year<sup>12</sup>) towards the European (39.34kg / year) and North American (37.24 kg / year) averages.

**Company's expansion plans:** Your company intends to complete the following projects which will enable the company to avail benefits / incentives under the UP Government sugar policy:

- The commissioning of three new sugar plants . Each plant to have 5000 to 7000 tcd capacities (expandable to 10,000-12,000 tcd at minimal cost). The commissioning of one of the plants (Sabitgarh) at one of the best sites in India today, with 75 per cent of the cultivable area being canal irrigated with almost no low lying sugarcane areas. In preparation, over 5000 hectares of high recovery sugarcane have been planted.
- The modernisation and expansion of the Khatauli sugar unit from 11750 tcd to 16,000 tcd, which will make it the largest single standalone sugar unit in India.

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<sup>12</sup> Source: FO Licht

- The commissioning of a 23 MW co-generation plant at Khatauli by September 2005 to supplement the 22 MW cogeneration plant at Deoband.

Following the establishment of these three units and the expansions at the existing units, your company's cane crushing capacity will significantly rise from existing 25,250 tcd.

The benefits of this scale equate to a better coverage of overheads and the generation of adequate bagasse to ensure the fullest utilization (over 270 days) of your company's two cogeneration units and tax-free profits from the two cogeneration units for ten years.

Going ahead, your company also intends to commission a large distillery to fully consume the large throughput of molasses with the objective to manufacture ethanol in line with the government policy.

It is our opinion that there will be an inevitable consolidation over the next few years in the sugar industry, with unviable plants in the co-operative, state government and private sectors closing down. This will present attractive acquisition opportunities and your company expects to avail of them especially if they lie in our targeted geographies.

### **Co-generation**

Bagasse-based cogeneration power is a renewable, environment friendly driver of sustainable development. The Government of India has issued the national electricity policy which calls for promotion of cogeneration and generation from renewable sources of energy. It also calls for progressively increasing the share of electricity from non conventional sources as prescribed by state electricity regulatory commissions.

The potential of bagasse-based cogeneration in India is estimated at around 3500 MW of which over 750 MW has already been installed. Uttar Pradesh, a power-deficit state, is experiencing an average power shortage of approximately 12 per cent and a peak shortage of about 20 per cent. The potential of exportable power from the state's sugar mills is estimated at 1000 MW, of which approximately 150 MW has been installed.

Your company commissioned a 22 MW ultra-modern and energy efficient, bagasse-based cogeneration power plant at Deoband on December 5, 2004. This plant, completed in one of the fastest implementation timelines in India, utilises a high pressure (87 Ata) and temperature (515 degree C), 120 TPH boiler and a matching 22 MW double extraction condensing turbo-generator with supporting auxiliaries. The highly efficient turbine as per global benchmarks was sourced from Skoda, Czeck Republic. Superior technology and project management as a result of the company's insight into turbine manufacture and function resulted in very high availability of plant since commissioning.

This Rs. 760 mn cogeneration plant is fully automated, using a sophisticated DCS. For maximising energy efficiency, a large number of variable frequency drives have been added. The boiler is fitted with electro-static precipitators, which allows the plant to minimize emissions far below the norms prescribed by the state pollution control board.

The electricity produced by the cogeneration power plant was sold to the Uttar Pradesh Power Corporation, with which your company has a power purchase agreement for 10 years. The applicable price is at Rs.2.81 per unit.

Your company also embarked on the commissioning of a similar 23 MW cogeneration power plant at Khatauli. This cogeneration plant will also incorporate a Skoda turbine and equally sophisticated equipment, similar to the plant in Deoband, but will additionally utilize a continuous electro de-ionization polishing step in its boiler feed water system (installed through the Water Business Group of Triveni) with the objective to rationalise bulk acid and alkali handling and improve water quality. This will be the first installation of this world-class technology in the power segment in India; the installation itself will be one of the largest in the world.

The cogeneration of power across these two projects is expected to represent a stable and predictable proportion of the company's bottom line over the coming years.

### ***How we manage risks in our sugar division***

**Raw material risk:** The business of this division depends entirely on the availability of cane, any decline in which could jeopardize the existing and proposed investments.

**De-risking:** Your company's Khatauli and Deoband plants are situated in one of the most fertile stretches of Gangetic India, ensuring a high yield. Cane growing is a tradition in this geography. Your company incentivises the sustained planting of cane and supply to the company through a number of initiatives, such as, accelerated cane payments, providing seeds and other services to the farmer, imparting best farm practices for enhancing the yield and assisting the growers to keep the crop healthy and disease free. It intends to move to cash-and-carry system to incentivise a greater cane planting in Sabitgarh.

**Cyclical risk:** Your company has no control on its sugar realizations, which are influenced by a number of factors.

**De-risking:** Your company has enhanced capacity at existing units, is adding more greenfield units and is investing in technology to rationalize operational costs. Your company has – and is making – made synergic diversifications through cogeneration projects, which will enhance the stable and predictable component in its profit mix. Your company also plans to commission a distillery to make a better downstream utilization of molasses for the manufacture of ethanol. With a view to enhance its realisations, the company branded its sugar 'Shagun', receiving an encouraging market response. Though its market is currently small, it is expected to grow steadily in view of the consumers' preference for food hygiene. The mix of these factors and a diversified business portfolio will enable the company to minimise the cyclical influence of the sugar industry.

### ***Technology and our sugar business***

- Continuous Vacuum Pan: Developed by Triveni SRI Limited, a wholly owned subsidiary, in association with Sugar Research International (SRI) of Mackay, Australia, the CVC was installed in the Deoband sugar factory for usage on 'C' massecuite, the first time an SRI pan was installed for 'C' massecuite in a sulphitation plant.

- SRI is one of the sugar machinery technology authorities in the world; our subsidiary, Triveni SRI Ltd., has an exclusive license in India from SRI International for many of their products. Owing to technical improvements made on the CVP, Triveni and SRI are now eligible to jointly own the intellectual property for this new improved vacuum pan. Your company has in the past presented these details in a paper jointly presented with SRI at a convention of the International Society for Sugar Sugarcane Technology.
- Syrup Clarifier System: Installed at the Deoband and Khatauli sugar plants to improve the quality of sugar, this licensed product from SRI has been sold to EID Parry in Tamil Nadu, where it is working efficiently.
- Short Retention Clarifier: To be installed in 2005-6 at the Khatauli unit and at the new plant, the clarification of juice is achieved in only 30 minutes while in a normal clarifier juice is retained for approximately 150 minutes. This prevents the inversion of sugar and improved sugar recovery and quality.

**Mill-tandem:** Designed and manufactured by the company (captive technology), installed in your company's sugar plants. The mill-tandem has proved to be one of the most efficient in India: reflected in the reduction in bagasse losses and increase in reduced mills extraction (RME); RME for the unit is 96 while that of the industry is around 95; bagasse loss in the unit is 1.6 compared to 1.9 for the rest of the industry; strong design features ensure negligible downtime. Triveni has set up over 65 sugar plants and supplied over 300 cane mills to sugar factories in India and overseas.

Divisional analysis

## 2. Turbine Business Group

*Turnover, 2004-05: Rs. 1.75 bn*

*Turnover growth: 33 per cent*

*Turnover growth CAGR (5 Years): 20 per cent*

*Turnover as proportion of company, 2004-05: 17 per cent*

*Plant: Bangalore*

### **Overview**

Triveni continues to enjoy a leading position in India's steam-based industrial power generation and rotating machinery segments. The Turbine Business Group has the capability to offer comprehensive solutions for steam-based power generation ranging from 0.5 MW to 50 MW.

### **Rationale for presence**

- India's power demand is expected to increase to 200,000 MW by 2012 against an installed capacity of approximately 110,000 MW.
- The Electricity Act 2003 and National Electricity Policy encourage captive, IPPs and cogeneration power plants, a segment catered to by the company. This has already resulted in a large number of small, distributed power plants being installed.