

The Potential Earnings of “The Sugar Cane Industry” from Diversification

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Change, Challenges and Opportunities

- Friday May 18, 1923 a meeting of the Private Sector Leaders was held in an attempt to avoid Canadian “Tariff reduction on Raw and Refined Sugar”
- In 1951 the EEC/ACP international sugar agreement was signed
- In 1975 the present EU/ACP Sugar Protocol was signed only because Britain joined the EU.
- Since 1990 the indicators were out that change was coming by 2006. Although there was nothing specific, prices were expected to fall by at least fifteen percent. The real shock come in June 2005 when leaks from sources within the EU indicated that a 39% cut in price over a period 2006 – 2010 was under serious consideration.

Reconfigured “Sugar Cane Industry”

- **Raw sugar for the overseas market**
- **Raw sugar for the domestic market**
- **Refined sugar for the domestic and export markets**
- **Molasses for the local rum industry**
- **Molasses for fuel ethanol for the transportation sector and for export**
- **Cogeneration for the sale of electricity to the energy sector.**

EU Impact on Revenue

Final Settlement (all in €per tonne) on 126,000 tonnes per year

Year	2005/06	2006/07	2007/08	2008/09	2009/10
Reference price	523.7	496.8	496.8	434.1	335.0
Redn vs. 05/06/tonne	-	26.9	26.9	89.6	188.7
Reduction vs. 05/06 %	-	5.1	5.1	17.1	36.0
Earning loss vs.05/06 (€million)	-	3.389	3.389	11.290	23.776

Cumulative Loss by end 09/10 - €41.844M

Thereafter - €23.776M per year on 126,000 tonnes.

Sugar Production

- The amount required to satisfy all our markets
- Future production levels will be determined by developments predominantly in the EU and the possibly improved earnings for this sugar converted to value **added products**
- The challenge for the industry and the opportunity it must grasp is to ensure its future viability

Industry Forecast

Revenue /Cost & Price/ T. Sugar (US\$) - 2005/06 to 2009/10

Cumulative EU price cut	N/A	36%
Year	2005/06	2009/10
Estimated Production 96°	146,757	182,702
Markets	Price/tonne	Price/tonne
1) EU	660.26	408.70
2) SPS	615.25	-
3) US	512.15	520.00
4) Exp. Sales average	649.72	418.38
5) Local sales	525.89	526.00
6) Grand average	648.52	444.71

Industry Forecast

Revenue /Cost & Price/ T. Sugar (US\$) - 2005/06 to 2009/10

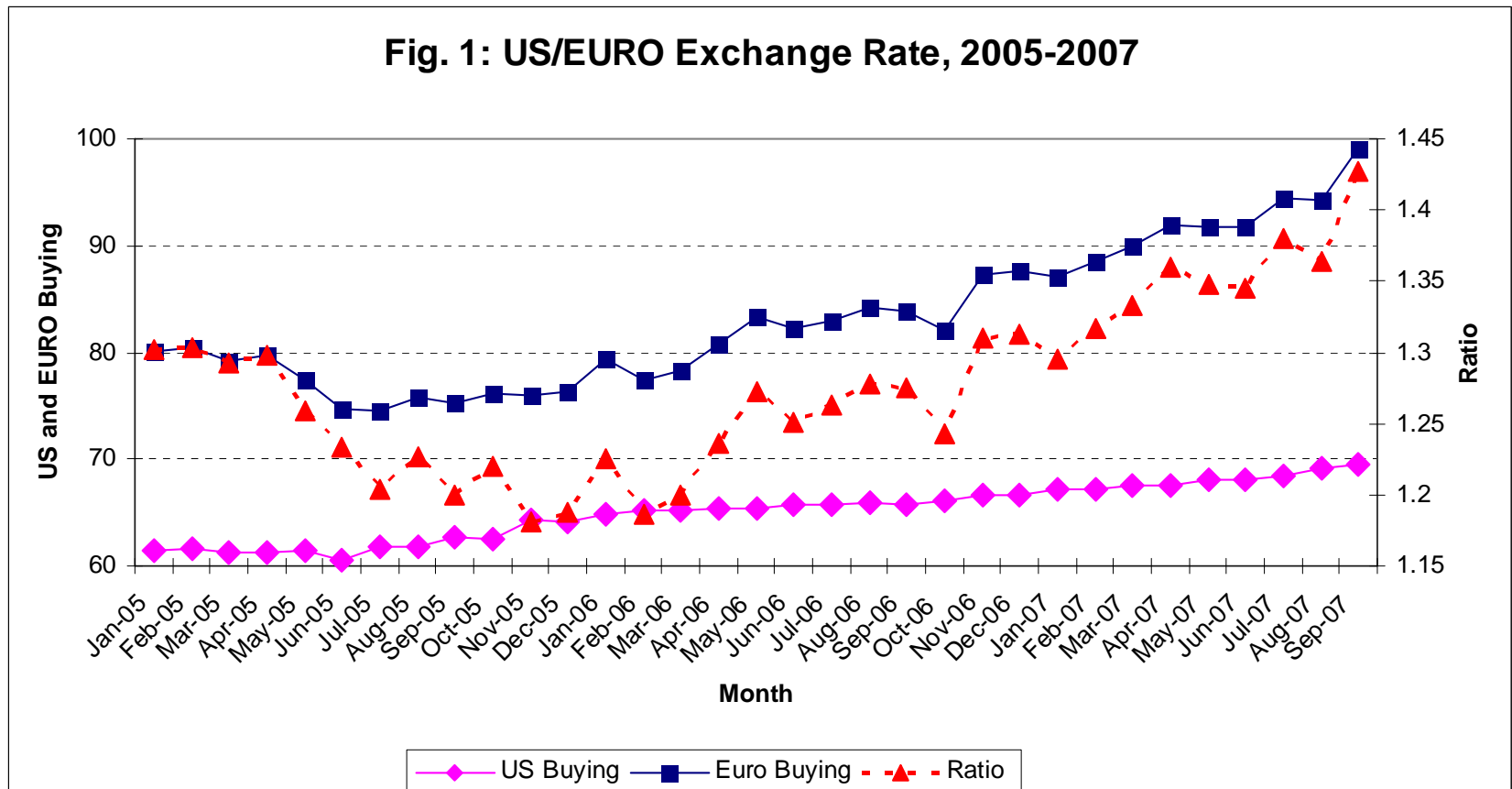
Cumulative EU price cut	N/A	36%
7) Cents per lb	29.42	20.48 ¢/lb
8) Less cost	131.55	128.73
Cents per lb	5.96	5.84
9) Net payment @ 96°	513.97	322.74
10) Cumulative reduction/tonne	-	(37.21%)
11) Net/lb. sugar US¢ average	23.31	14.64
12) Price/lb. sugar US¢ average	15.65	9.07
13) Price/lb. sugar US¢ average	7.66	5.57

This table shows the devastating impact on earnings with the revenue per pound of sugar to the industry at 14.64 cents compared to 23.31 in 2005/06.

Reference year	2005/06	2006/07	2007/08	2008/09	2009/10	2009/10
Price Cut		5%	5%	17.1%	36%	36%
Reference Price (CIF) per tonne €	482.70	458.50	458.50	393.10	294.00	294.00
US/€conversion	1.2429	1.3481	1.3000	1.3000	1.3000	1.3000
JA/US conversion	65.52	67.97	70.75	73.50	76.25	103.00
JA price/tonne	39308.60	42012.00	42170.00	37560.70	29142.80	3936670
Diff. in price Ja.\$	-	2704.00	2863.00	(1747.9)	(10165.8)	
Loss on 126,000 tonnes \$M	-	-	-	220.235	1,280.89	

Comparative buying rate Jamaican dollar vs. US and Euro

Fig. 1: US/EURO Exchange Rate, 2005-2007



Projected Sugar Revenue 2009/10

Scenario 1 (Full Potential)

Market	Quantity	Price/tonne US\$	Price/lb US¢
E.U. (45.32%)	126,000	382.00	17.94
Local	60,000	595.00	27.00
U.S.	12,000	484.88	22.00
Raws to Refinery	80,000	551.00	25.00
Total/Avg.	278,000	483.00	21.97

Projected Sugar Revenue 2009/10

Scenario 2 (Excluding EU Market)

Market	Amount	Price/Tonne US\$	Price/lb(US cents)
Local	60,000	595.00	27.00
U.S	12,000	484.88	22.00
Raws to Refinery	80,000	551.00	25.00
Total /Avg.	152,000	538.68	24.44

EtOH Alternative

- EtOH can replace MTBE as a octane enhancer
- Current consumption is 12.6M gals/year
- Cost US\$2.6/gal or US\$32.76M/ year
- EtOH estimated 2009/10 @ 85¢/litre or US\$3.21 per gal
- The estimated need is 70M litres

Refined Sugar Production Best Case

The operation of a refinery will depend on:

- the price of feed stock - \$25.00 US¢
- the cost of operation - \$5.00 US¢
- the value of end product to ensure profitability.

It is estimated that having recovered cost, there would be a margin of $(32.9\text{¢/lb} - 30.0\text{¢ costs}) = 2.9$ cents per pound.

Total earnings on 80,000 tonnes would be US\$5.113 M per year.

Molasses for Rum Production

- The demand by the distilleries for 112,000 tonnes of molasses.
- This equates to approximately 60,000 tonnes of fermentable sugars.
- This amount of “Total Sugars” can be produced with a change in our method of processing from the conventional three boiling to a two boiling system. In the latter, only one **very high (value added)** quality **“Easy Sugar”** and very high (**value added**) molasses for the rum sector would be produced.

Molasses for Rum Production

An Estimated Case Study shows:

	96° Sugar Yield	Molasses		Molasses Purity	Frem. Sugar
		Gal./tc	% Cane		
Regular Sugar Production Final molasses to distillery	10%	5.3	3.25%	33.00	55%
Reduced Sugar Production A. Mols. To distillery	6.5%	12.0	7.35%	70.00	86%
Reduced Sugar Production B. Mols to distillery	9.1%	7.5	4.59%	55.00	69%

Molasses for Rum Production

Sugar vs. Molasses Production (3.5M tonnes cane)

Scenario Boiling scheme	1 ABC	2 A&B	3 A only
Sugar Production Percent Cane	10.00% Regular	9.0% Reduced	6.5% Reduced
Tonnes Sugar (estimate)	350,000	315,000	227,500
Molasses Production	Regular 3.5%	Increase 4.50%	Increase 7.0%
Tonnes Molasses (estimated)	122,500	157,500	245,000
Tonnes Fermentable sugar (estimated) in mols.	67,375	108,675	210,000
Less Tonnes Fermentable for Rum industry	60,000	60,000	60,000
Tonnes Fermentable available for Ethanol	7,375	48,675	150,700
Ethanol Production (M.litre) (Estimated)	1,860	17,700	51,147

Ethanol Production Replacing EU Sugar-Revenue

Value per tonne (sugar vs. Ethanol @ 3.21/gal.)

Year	2006/07 / 2007/08	2008/09	2009/10
EU price reduction	5.1%	17.1%	36%
EU price per tonne	496.28	434.10	335.00
EQ. US	601.13	525.26	408.70
Cost of shipping	41.69	41.69	41.69
Net available	559.44	483.57	367.01
EtOH @ 620litre/tonne Sugar @ 85 cents US/litre US\$	527.00	527.00	527.00

Ethanol production - Cost and Return per Tonne Cane

The future price of 85¢/litre	or	US\$3.21 per US gal.
Processing cost to cane syrup (@10% sugar)		= (\$6.66) (est.cost of sugar @ 5.0c/lb)
Process cost (70L/tonne cane @ \$44.180/kl ethanol Mukherji		= (\$3.09) } (J.P & Assoc.)
Equipment cost (10yr pay back) @ \$20.075/kl ethanol		= (\$1.41) } “
Sub-Total cost (hydrated)	(70L)	= (\$11.16) per tc
Return on investment @ 20%	“	= (\$2.23)
Gross cost ex-factory (hydrated)	“	= (\$13.39) per tc
Dehydration cost	(70L)	= (\$1.30)
Gross cost ex- factory		= (\$14.69)
Gross revenue/tonne cane @ 85¢/litre	“	= \$59.50 sold locally
Net / tonne cane available	“	= \$44.81

Price of Molasses

Process cost (270L/tonne mols.) @ \$44.180/kl ethanol	= (\$11.93)	} (J.P Mukherji & Assc.)
Equipment cost (10year pay back @ \$20.075/kl ethanol)	= (\$5.420)	
Dehydration @ (270/L)	= (\$14.00)	“
Return on investment @ 20%	= (\$6.27)	
Gross total cost	= (\$37.62)	
Gross revenue/tonne @ 85¢/L	= \$229.50	
Net revenue available	= \$191.88	
Price for mols. est. (current)	= \$87.50	
Value added EtOH est. @ US \$3.2 gal.	= \$104.38	

The net revenue of fermentable in one tonne of molasses becomes = \$191.88

Fermentable percent molasses = 55%

Therefore price per tonne of fermentable (191.88) = \$348.87

55.00x100

Co-generation - Electricity production for sale

The significant advantages for co-generation are:

- **Eliminating all costs associated with imported oil**
- **Eliminating all costs associated with the boilers operation making this station redundant**
- **Eliminating all costs associated with the power house making this station redundant**
- **Providing all energy requirement to the factory increasing operating time**
- **Improving factory efficiency and cost of production**
- **A positive impact on the environment in improve air quality.**

Co-generation - Electricity production for sale

Two pre-feasibility studies have been done in recent times in Jamaica. These are:

	SIDEC:	Gibson Energy
Date	22/05/02	Revised 15/01/04
K.w.h/T Cane (net sale)	122.0	68.34
Price/k.w.h to JPS Co.	6.2 US¢	6.2 US¢
Gross rev/T. Cane	US\$5.56	4.24

Integrated Industry (2009/10)

Producing 3.5M tonne cane

	2005/06	All market remains plus Etoh	Without refined sugar	Without EU market
Scenario	Actual	1	2	3
Tonne cane	1.727	3.5M	3.5M	3.5M
E.U.	132,065.00	126,000	126,000	-
Local	6,057.00	60,000	60,000	60,000
U.S.	5,007.00	12,000	12,000	12,000
Raws to Refinery	-	80,000	-	80,000
Total	143,129	278,000	198,000	152,000
Gross/tonne	654.20	478.82	449.65	539.72
Tonne fermentable (Rum)	39,080	60,000	60,000	60,000
Tonnes Fermentable to EtOH	-	99,500	179,500	225,500

Integrated Industry (2009/10)

Producing 3.5M tonne cane

	2005/06	All market remains plus Etoh	Without refined sugar	Without EU market
Price/t fermentable US\$	160.10	348.87	348.87	348.87
Ind. Gross value M\$	99,892	188,756	172,585	181,640
Gross/tonne cane US\$	57.83	53.93	49.31	51.90
US/Ja. Rate	67.70	76.25	76.25	76.25
JA\$/tonne cane	3,915.00	4,112.00	3,760.00	3,957.00
Value Added/tonne for cogeneration Ja.\$	-	424.00	424.00	424.00

Viability of EtOH Industry

EtOH Industry			
Tonnes Fermentable to EtOH	99,500	179,500	225,500
Yield/ tonne (litres)	490	490	490
Volume EtOH M.Litres	48,845	88,120	110,700
Cost per tonne fermentable	349.00	349.00	349.00
Cost of fermentable (US\$M)	34.726	62.645	78.700
Cost of processing (US\$M)	4.689	8.460	10.627
Gross Cost	39.415	71.105	89.327
Revenue EtOH @ 85¢ per litre (US\$M)	42.471	74.902	94.095
Margin (US\$M)	3.056	3.797	4.768

SUMMARY

- **The Jamaican sugar industry is in crisis**
- The industry peaked in 1965
- The rationalization of the past was done to enhance the profitability of the others with sustained production of 250,000 to 300,000 tonnes at high productivity
- The entire industry needs urgent attention
- Sugar production starts in the field
- Factories must be geared to recover every possible grain of sugar in cane at lower costs
- Proper planning and decision must be made now
- **Jamaica cannot afford not to get it correct this time**