TULLY SUGAR LIMITED

Increased Bagasse Storage and Proposed New Bagasse In-Loading Conveyor

Estimated Cost / Income Report to
Chief Electrical Engineer from Project Engineer

Document Revision History		
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F		
G		
H		
I		

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TABLE OF CONTENTS

1 SUMMARY

Tully Sugar Limited (TSL) have considered several projects aimed at increasing factory ability to export power, since the commencement of the MRET scheme. These projects ranged from increasing the No.3 Boiler steam pressure to 45 Bar and installation of a 45 Bar 25 MW condensing steam turbine generator to the installation of a 17.25 Bar 15 MW condensing steam turbine generator to operate on existing steam pressures.

All projects were proven to have insufficient return on investments and excessive payback periods.

The project of “Increasing Bagasse Storage and New Bagasse In-Loading Conveyor” was first raised in 2005 with budget estimates being provided by Maunsell Consulting Engineers mid 2006. As well, due to poor return on investment and excessive payback period, this project was shelved.

However, Tully Sugar Limited (TSL) is continuing over time to increase bagasse storage area. In 2007, bagasse storage was limited to 13,000 tonnes. TSL have since relocated a road to create room for further storage and have completed earthworks to boost capacity to 16,500 tonnes. This has cost approximately $410,000.00 to date. A further $100,000.00 of earth works is proposed to increase storage capacity to 22,000 tonnes in the near future. TSL is carrying out this work regardless of return on investment. However, section 3 of this report demonstrates an attractive payback period for increased bagasse storage only.

As well as increasing bagasse storage capacity, the works described in the above paragraph has been conducted to reduce and preferably cease all carting of bagasse off site for disposal. Not only is this potential fuel source wasted and operations costs further escalated, the disposal site is company owned farmland. The more bagasse dumped, the less productive the land is remaining on the farm for growing sugar cane.

The payback period calculated in this report is based on the generation of electricity in the non-crush period, as 10MW (maximum export) is exported continuously during the crushing period, regardless of the new conveyor being installed. Note, these non-crush operations are disruptive to TSL’s usual maintenance period and also represent challenges and changes to normal operating resources and requirements.

More information is available in Appendix A of this report regarding above mentioned projects, TSL’s past and current capacity to export power and reasoning for TSL’s operational practices and constraints.

2 ESTIMATION OF COSTS / INCOME TO PROVIDE PAYBACK PERIOD FOR NEW IN-LOADING CONVEYOR AND INCREASED BAGASSE STORAGE

The calculations in the following several pages are for electricity generation in the non-crush period, which will most likely be in the "peak" period of January / February. This report is based on figures for operation in 2009.

The design requirements for Bagasse In-loading Conveyor remain unchanged in June 2008.

Due to escalation of materials and labour in recent and current economical climates, the cost to build the required bagasse in-loading conveyor has increased substantially.

Current prediction would be at least a 20% increase on the 2006 build estimate. The resulting 2008 estimated cost is $5,052,907. A more accurate figure can be obtained from Maunsell Consulting Engineers; however, this work would be at further cost to TSL for the consultant to update their original figures from 2006.

Calculations to obtain an estimated return on investment are as follows:

Cost of Conveyor:	**$5,052,907**
Cost of Increased Bagasse Storage:	**$ 510,000**

Total	**$5,562,907**

Assumptions => 2.14 tonne of steam (52% moisture) from 1.00 tonne of bagasse (1725kPa Boiler)
10.7 tonne steam per MW (Back Pressure Turbines)
Available bagasse storage 22,000 tonnes
$100.00 per MWHr (Export during PEAK)
$45.00 per MWHr (Export during NON PEAK)
$41.50 per REC (2009 – TSL / Ergon Energy Power Purchase Agreement)
Conveyed bagasse rate will be a maximum of 100 tonne per hour (tph)

The following is the information and calculations required for totalling the income to be received by TSL for exporting electricity during non-crush period.

Now, 100 tonne per hour (tph) bagasse burnt in boiler results in 214 tph steam.

214 tph steam divided by 10.7 results in 20MW available power, however, the whole factory will not be operating during this non-crush period of electricity export.

Given that the TSL connection to the Queensland Electricity Grid is restricted to 10MW for export, and the power required for operating the factory in the non-crush period is nominally 2.5MW.

Therefore, a maximum of 12.5MW is required to be generated by TSL plant, which requires 134 tph of steam.

As 2.14 tph steam is produced from 1.00 tone of bagasse, then a conveyor in-loading rate of 134 / 2.14 = 63 tph of bagasse is required.

Mentioned above is available bagasse storage space of 22,000 tonnes. Keeping in mind the factory requires 5,000 tonne of this bagasse for start-up operations in the following year; therefore surplus bagasse is 17,000 tonnes.

However, best practise for exporting power is to maximise income, which requires maximum export during PEAK demand periods. Therefore, the estimated operating period for maximum export will be between 7am and 9pm each weekday, and no export on weekends. OFF PEAK is generally considered between 9pm and 7am each weekday. TSL will still generate power, as is best scenario for TSL plant; however, will reduce export to approximately 5MW to conserve bagasse stocks for combustion in PEAK period.

The reasoning for TSL reducing export to 5MW during OFF PEAK periods is due to the minimum steam tonnage required to run the TSL No.2 Boiler on automatic control. This steam rate is 80 tph, which equates to 7.5MW electricity generation, of which 2.5MW is required for factory operation leaving 5MW for exporting. To run the boiler at a minimum of 80 tph steam generation, a bagasse inloading rate of 80 / 2.14 = 38 tph of bagasse.

Now, taking in to consideration the bagasse stocks required during start-up and run-down of the boiler, this will be approximately 570 tonnes where no electricity will be exported. Therefore, the cost of operations is based on 17,000 tonnes of bagasse and the income from exporting electricity is based on 16,430 tonnes of bagasse.

Given the approximated times of operation during PEAK and OFF PEAK as shown above, and calculating for 5MW export during OFF PEAK; this equates to a total of 1,262 tonnes bagasse being combusted per day (24 hour period).

The calculations to obtain 1,262 tonnes of bagasse consumption per 24 hours is as follows:

During PEAK period, 63 tph of bagasse is consumed for 14 hours resulting in 882 tonnes of bagasse.

During OFF PEAK period, 38 tph is consumed for 10 hours resulting in 380 tonnes of bagasse.

Therefore, in a 24 hour period, 882 tonnes + 380 tonnes = 1,262 tonnes of bagasse.

Income for exported electricity is based on a total operation period of 16,430 tonnes of bagasse divided by 1,262 tonnes per day of bagasse = 13 days (24 hours in a day).

The income for electricity exported in 13 days is **$211,250**.

Above income is calculated as (10MW x 5 days x 14 hours x $100 per MWHr) + (5MW x 5 days x 10 hours x $45 per MWHr) = $81,250 for one week (weekdays only). As 13 days is equivalent to 2.6 weeks, then 2.6 x $81,250 = $211,250.

RECs will not be paid during Jan/Feb, as TSL generators have not reached the baseline for REC payments. However, as the baseline will be reached earlier during the crushing due to non-crush export operations earlier in year, then the additional RECs can be calculated as an income for this non-crush exporting period.

The income for RECs during 13 days of operation will be **$134,878**.

Above income is calculated as (12.5MW x 5 days x 14 Hrs x $41.50 per REC) + (7.5MW x 5 days x 10 hrs x $41.50 per REC) = $51,876 for one week (weekdays only). As 13 days is equivalent to 2.6 weeks, then 2.6 x $51,876 = $134,878.

Therefore, the total gross export income for 13 days of the non-crush exporting period is $211,250 + $134,878 = **$346,128**.

As a conveyor will be in-loading the bagasse, instead of trucks and loaders, this represents a saving to TSL. The cost of bagasse transportation from bagasse pads to the boilers is costed at $2.90 per tonne of bagasse (including on-costs for operators). Therefore, 22,000 tonnes bagasse multiplied by $2.90 equates to $63,800 that can be considered income for the operation. However, the conveyor loading costs must be considered, which consist of usually one loader, but can be 2 x loaders + 1 truck depending on distance to be travelled to conveyor boot-end. The machinery to be used is similar to the machinery required for bagasse transport from boilers to pads. This cost is at $1.21 per tonne of bagasse. For 22,000 tonnes, this cost is $26,620. Therefore, the saving to TSL, which can be considered income is $63,800 - $26,620 = **$37,180**.

Due to increased bagasse storage earthworks in 2008, there is minimal requirement for bagasse to be carted off site and dumped. This represents a saving to TSL.

The forecasted tonnes of bagasse, which would have been dumped, had TSL not increased storage area for bagasse is based on a seven-year average of bagasse quantities dumped since 2001. These quantities of dumped bagasse for years 2001 to 2008 can be seen at bottom of first page of Appendix A of this report. The average is 14,635 tonnes of bagasse dumped. However, TSL have only increased bagasse storage capacity by 9,000 tonnes. Therefore, only the 9,000 tonnes can be claimed as a saving to the operation, which equates to **$76,140** for TSL, as bagasse cartage costs for dumping are $8.46 per tonne in 2008. TSL do not plan to dump bagasse this year nor in the future. Every effort will be made to incinerate the 14,635 tonnes – 9,000 tonnes = 5,635 tonnes of bagasse. This action will represent an inefficient usage of energy, however due to TSL's limited export connection to Queensland Electricity Grid (maximum 10MW) and increased costs of operation when dumping bagasse ($8.46 per tonne), there is nothing else left to do but incinerate this excess bagasse.

As well, bagasse dumping since the 2005 crushing season has caused the loss of productive land on the mill owned cane farm. This loss has continued through the farm cycle of 3 years and equates to $142,800 lost income. This loss will no longer continue to affect TSL after the 2008 crushing season. The farm will return to full production in the 2009 season. Thus, this is a saving to TSL's operations, due to the increasing of bagasse storage works. This savings represents an annual figure of $142,800 / 3 years = **$47,600**.

Therefore, the power generation gross income and operations savings represent a total income of $346,128 + $37,180 + $76,140 + $47,600 = **$507,048** for TSL in Jan/Feb 2009.

The following is the information and calculations required for totalling the <u>cost of operations</u> for TSL to export electricity during non-crush period.

Increasing power generation and having the capacity to store more bagasse on site raises the cost of operations above that, which is considered normal operating costs occurring during the crushing period.

Operations Costs for electricity exporting period are based on following:

- 17,000 tonnes of bagasse
- Operating period is 13 days (Mon – Fri, no weekends) plus 3 x 5 hours = 15 hours due to start-up and run-down of boiler on three occasions due to third week of operation. This amounts to 13 x 24 + 15 = 327 hours.
- 24-hour operation from 7am Monday to 9pm Friday.
- Mill operators will be 2 x Boiler crew (Watertender & Assistant Watertender) and Effet Operator on continuous shift roster.
- Electrician and fitter based on callout (minimum 4 hours). Allowance for electrician called out each two days and fitter once a week.
- Bagasse cartage from pads to bagasse bin is costed at $2.90 per tonne.

Operations costs for entire non-crush export period (327 hours) are as follows:

- Mill Operator's costs are $45,264 (including on-costs),
- Tradesmen's costs are $2,030 (including on-costs),
- Bagasse cartage is $49,300 (including on-costs).

Therefore, the operations costs total is **$96,593.**

As an extension to the operations costs above, is the indirect addition of costs resulting from other works required to make electricity export achievable in non-crush period.

These indirect costs are:

- Additional cartage of bagasse from boilers to bagasse pads during 2008 crushing season (rate $1.21 per tonne bagasse), due to newly increased bagasse storage area. This additional cost is calculated from 22,000 tonnes minus 13,000 tonnes and multiplied by $1.21 to give additional cartage cost of **$10,890**. Note the 13,000 tonnes is the storage capacity for TSL before increasing bagasse storage area.
- Increase in purchase of bagasse tarps and joining strips. This cost is a combination of 45 extra tarps required, plus additional labour required to cover, uncover and roll up tarps (+ on costs), resulting in $60,818. Note, a large percentage of this cost is for the purchase of the tarps ($52,380, 45 tarps) and can only be considered as an up-front cost, which will be treated

as part of the original investment and will be added to the costs for installing conveyor and increasing bagasse storage area. However, tarps are replaced on average every four years, due to wear and tear, which represents an increase in the ongoing costs to the business. This cost can be represented as $52,380 / 4 years + ($60,818 - $52,380) = **$21,533** per annum.

- Increase in bagasse pad maintenance per annum. Pad maintenance in 2007 was $22,969 for 13,000 tonne. Therefore, pad maintenance for an additional 9,000 tonne (22,000 – 13,000) will be (22,000 / 13,000 X $22,969) - $22,969 = **$15,902**.

Total Cost of operations in payback period for installation costs of in-loading conveyor and increased bagasse storage is $96,593 + $10,890 + $21,533 + $15,902 = **$144,918**.

Therefore, the **Net Income** per year will be $507,048 - $144,918 =

$362,130.

Before finalising the payback period, as the total income and total operating costs are known, there is a one-off cost, which needs to be taken into account. This is:

- The cost of purchasing extra tarps as a result of more bagasse to cover, due to the increased bagasse storage area, which is **$52,380**.

Therefore, the investment in bagasse in-loading conveyor and increased bagasse storage is calculated as conveyor installation **$5,052,907** plus increase in bagasse storage **$510,000** plus purchase of new tarps **$52,380**. This calculation equates to **$5,615,287**.

Therefore, the payback period for new in-loading conveyor and increased bagasse storage is estimated at $5,615,287 / $362,130

= 15.5 years

This payback period is based only on conveyor being used for returning excess bagasse.

As stated earlier, all figures are calculated for 2008/2009 operations. For the payback period extending past 2008/2009, the income and operations costs have been assumed to rise in value simultaneously.

3 ESTIMATION OF COSTS / INCOME TO EXPORT ELECTRICITY DURING NON-CRUSH PERIOD FOR 24 HOUR OPERATION ON WEEKDAYS ONLY AND UTILISING EXISTING INFRASTRUCTURE

This section of report is calculated without the addition of the proposed bagasse in-loading conveyor, instead calculated with utilisation of existing infrastructure. Without the conveyor, bagasse in loading is nominally 38 tph, which is the continuous capacity of the existing in-loading conveyor. Note the power generation is limited to 7.5MW due to bagasse in-loading constraint. As 2.5MW is required for the non-crush period's factory operations, then 5MW remains for exporting.

The calculations in following several pages are for electricity generation in the non-crush period, which will most likely be in the "peak" period of January / February. This report is based on figures for operation in 2009. Generation of electricity will be with existing infrastructure.

Assumptions => Bagasse Moisture 52%

2.14 tonne steam from 1.00 tonne bagasse (1725kPa Boiler), due to 52% moisture

10.7 tonne steam per MW (Back Pressure Turbines)

Available bagasse for electricity export is 10,000 tonnes

$100.00 per MWHr (Export during PEAK)

$45.00 per MWHr (Export during NON PEAK)

$41.50 per REC (2009 – TSL / Ergon Energy Power Purchase Agreement)

In-loading bagasse rate will be nominally 38 tonne per hour (tph)

Nominal export of electricity to be 5MW during PEAK demand

The following is the information and calculations required for totalling the income to be received by TSL for exporting electricity during the non-crush period with existing infrastructure.

The 2008 Steam Trials demonstrated the existing bagasse in-loading system could sustain an electricity export load of 5MW.

Best practise for exporting power is to maximise income, which requires maximum export during PEAK demand periods. Therefore, the estimated operating period for maximum export will be between 7am and 9pm each weekday, and no export on weekends. OFF PEAK is generally considered between 9pm and 7am each weekday. TSL will still generate power; however, will reduce export to conserve bagasse stocks for combustion in PEAK period.

As well, taking in to consideration the bagasse stocks required during start-up and run-down of the boiler, this will be approximately 400 tonnes where no electricity will be exported. Therefore, the cost of operations is based on 10,000 tonnes of bagasse and the income from exporting electricity is based on 9,600 tonnes of bagasse.

No.2 Boiler is the boiler of choice for this exercise. At 38 tph in-load of bagasse, the boiler will supply 81 tph steam and 7.5MW, of which 5MW is available for export. Note, the bagasse in-loading rate may exceed 38tph and provide opportunity to raise export, however there will be times when bagasse in-

loading will barely sustain the rate required for 5MW export. Hence, 5MW is export to commit for PEAK period.

Reducing load on boiler to conserve bagasse stocks during NON PEAK is an issue. Automatic control of boiler requires between 70 and 90 tph steam production. Selecting 80 tph as steam production, then electricity generation will be 7.5MW, of which 5MW is available for export. However, the practical application demonstrates this is not the case. 70tph steam allows for 4MW export, however, 3MW is a more conservative value for this application.

Working on the bagasse in-loading rate of 38tph, the rate at which bagasse is combusted will be 912 tonnes per 24 hours. Therefore, when operating on weekdays only, the export period will be for 10 days (2 weeks).

Income for exported electricity is based on a total operation period of 9,600 / 912 = 10 days (24 hours).

The income for electricity exported in 10 days is **$83,500**.

Above result is due to calculation of 2 weeks x {(5 days x 14 hours x 5MW x $100 per MWHr) + (5 days x 10 hours x 3MW x $45 per MWHr)} = $83,500.

RECs will not be paid during Jan/Feb, as TSL generators have not reached the baseline for REC payments. However, as the baseline will be reached earlier during the crushing due to non-traditional non-crush export operations earlier in year, then the additional RECs can be calculated as an income for this non-crush exporting period.

The income for RECs during 10 days of operation will be **$66,400**.

Above result is due to calculation of (10 days x 14 hours x 7.5MW x $41.50 per REC) + (10 days x 10 hours x 5.5MW x $41.50 per REC) = $66,400.

Therefore, the total gross export income for 10 days of non-crush exporting period is $83,500 + $66,400 = **$149,900**.

Due to increased bagasse storage earthworks in 2008, there is minimal requirement for bagasse to be carted off site and dumped. This represents a saving to TSL.

The forecasted tonnes of bagasse, which would have been dumped, had TSL not increased storage area for bagasse is based on a seven-year average of bagasse quantities dumped since 2001. These quantities of dumped bagasse for years 2001 to 2008 can be seen at bottom of first page of Appendix A of this report. The average is 14,635 tonnes of bagasse dumped. However, TSL have only increased bagasse storage capacity by 16,500 – 13,000 = 3,500 tonnes. Therefore, only the 3,500 tonnes can be claimed as a saving to the operation, which equates to **$29,610** for TSL, as bagasse cartage costs for dumping are $8.46 per tonne in 2008. TSL do not plan to dump bagasse this year nor in the future. Every effort will be made to incinerate the 14,635 tonnes – 3,500 tonnes = 11,135 tonnes of bagasse. This action will represent an inefficient usage of energy, however due to TSL's limited export connection to Queensland Electricity Grid (maximum 10MW) and increased costs of operation when dumping bagasse ($8.46 per tonne), there is nothing else left to do but incinerate this excess bagasse. Note the storage capacity at end of 2007 crushing season was for 13,000 tonnes bagasse.

As well, bagasse dumping since the 2005 crushing season has caused the loss of productive land on mill owned cane farm. This loss has continued through the farm cycle of 3 years and equates to $142,800 lost income. This loss will no longer continue to affect TSL after the 2008 crushing season. The farm will return to full production in the 2009 season. Thus, this is a saving to TSL's operations, due to the increasing of bagasse storage works. This savings represents an annual figure of $142,800 / 3 years = **$47,600**.

Therefore, the power generation gross income and operations savings represent a total income of $149,900 + $29,610 + $47,600 = **$227,110** for TSL in Jan/Feb 2009.

The following is the information and calculations required for totalling the cost of operations for TSL to export electricity during the non-crush period.

Increasing power generation and having the capacity to store more bagasse on site raises the cost of operations above that, which is considered normal operating costs occurring during the crushing period.

Operations Costs for electricity exporting period are based on following:

- 10,000 tonnes of bagasse
- Operating period of 250 hours (Mon – Fri, no weekends), which is 10 days operating + start-up and run-down of boiler x 2.
- 24-hour operation from 7am Monday to 9pm Friday.
- Mill operators will be 2 x Boiler crew (Watertender & Assistant Watertender) and Effet Operator on continuous shift roster.
- Electrician and fitter based on callout (minimum 4 hours). Allowance for electrician called out each two days and fitter once a week.
- Bagasse cartage from pads to bagasse bin is costed at $2.90 per tonne.

Operations costs for entire non-crush export period (250 hours) are as follows:

- Mill Operator's costs are $34,605 (including on-costs),
- Tradesmen's costs are $1,496 (including on-costs),
- Bagasse cartage is $29,000 (including on-costs).

Therefore, the operations costs total is **$65,101.**

As an extension to the operations costs above, is the indirect addition of costs resulting from other works required to make electricity export achievable in non-crush period.

These indirect costs are:

- Additional cartage of bagasse from boilers to bagasse pads during 2008 crushing season (rate $1.21 per tonne bagasse), due to newly increased bagasse storage area. This additional cost is calculated from 16,500 tonnes minus 13,000 tonnes and multiplied by $1.21 to give

additional cartage cost of **$4,235**. Note the storage capacity at end of 2007 crushing season was for 13,000 tonnes bagasse.

- Increase in purchase of bagasse tarps and joining strips. This cost is a combination of 18 extra tarps required, plus additional labour required to cover, uncover and roll up tarps (+ on costs), resulting in $24,327. Note, a large percentage of this cost is for the purchase of the tarps ($20,952 - 18 tarps) and can only be considered as an up-front cost, which will be treated as part of the original investment and will be added to the costs for increasing bagasse storage area. However, tarps are replaced every four years, due to wear and tear, which represents an increase in the ongoing costs to the business. This cost can be represented as $20,952 / 4 years + ($24,327 - $20,952) = **$8,613** per annum.
- Increase in bagasse pad maintenance per annum. Pad maintenance in 2007 was $22,969 for 13,000 tonne. Therefore, pad maintenance for an additional 3,500 tonne (16,500 – 13,000) will be (16,500 / 13,000 X $22,969) - $22,969 = **$6,184**.

Total Cost of operations is $65,101 + $4,235 + $8,613 + $6,184 = **$84,133**.

Therefore, the **Net Income** will be $227,110 - $84,133 =

$142,977

As a result of the capital works undertaken in 2007/2008 for the increase of bagasse storage, a payback period can be calculated.

Before finalising the payback period, as the total income and total operating costs are known, there is a one-off cost, which needs to be taken into account. This is:

- The cost of purchasing extra tarps as a result of more bagasse to cover, due to the increased bagasse storage area, which is **$20,952**.

Therefore, the investment in increased bagasse storage is calculated as increase in bagasse storage **$410,000** plus purchase of new tarps **$20,952**. This calculation equates to **$430,952**.

Therefore, the payback period is estimated at $430,952 / $142,977 = 3 years

As stated earlier, all figures are calculated for 2008/2009 operations. For the payback period extending past 2008/2009, the income and operations costs have been assumed to rise in value simultaneously.

4 CONCLUSION

Due to the 15.5 years return on investment, it is possible the proposed new bagasse in-loading conveyor project will be considered again. However, materials costs and labour rates are rising faster than the income TSL receives for Mega Watt Hours and RECs. For the conveyor project to be considered accurately, the original Maunsell designed conveyor needs to be re-costed along with any additional changes at a further cost to TSL.

Tully Sugar Limited have been steadily increasing land size for stockpiling of bagasse. This work is proposed to continue in the near future providing a total available storage area for an estimated 22,000 tonnes of bagasse. Current capacity is 16,500 tonnes.

As can be seen from section 3 of this report, increased bagasse storage works has been quite cost effective with a current payback period of 3 years.

5 APPENDIX A

The following information was sent June 2007 as part of the Assessment & Reporting Schedule for Energy Efficiency Opportunities to the Energy and Environment Division within the Department of Industry, Tourism & Resources, Canberra.

Attachment B – Increased Bagasse Storage and New In-Loading Station.

Tully Sugar Limited operates its sugar mill (one mill only) during the cane-crushing season, which runs continuously from approximately June through to December each year. Generation output is usually 10 MW continuously from June to early December. The size of the available cane crop determines the length of the cane crushing season and hence the length of time that we export power. Interruptions to this export regime are usually due to prolonged wet weather and / or the amount of bagasse in storage.

We have five generators in total and export approximately half of what is generated to Ergon Energy Queensland, with the remainder utilised for factory operations.

The generators' basic ratings are as follows :-

- No.1 Turbo Generator, 10.0 MW, 11 kV
- No.2 Turbo Generator, 2.25 MW, 3.3 kV
- No.3 Turbo Generator, 2.25 MW, 3.3 kV
- No.4 Turbo Generator, 5.30 MW, 3.3 kV (connected to 11 kV bus via step up TX)
- No.5 Diesel Generator, 1.60 MW, 3.3 kV (emergency backup generator)

Total generation capacity is therefore 21.4 MW as per our Queensland Government Generation Authority No. G03/96.

Under normal operations, the four Turbo Generators are all running in synchronism with the distribution system. The Diesel Generator is started only when the boiler station has problems.

Total generation, export amount and the amount of bagasse disposed of for the last ten years are listed below.

Year	Total Generation	Total Export	Bagasse Dumped
1997	24820 MWH	4886 MWH	
1998	41958 MWH	23518 MWH	
1999	41172 MWH	21623 MWH	
2000	50182 MWH	26355 MWH	
2001	43853 MWH	24841 MWH	4400 Tonnes
2002	66013 MWH	34923 MWH	14382 Tonnes
2003	61215 MWH	32383 MWH	11769 Tonnes
2004	60589 MWH	33391 MWH	25778 Tonnes
2005	66743 MWH	35327 MWH	38571 Tonnes
2006	49808 MWH	26008 MWH	2580 Tonnes
2007	51032 MWH	26148 MWH	4966 Tonnes

Prior to 1997, Tully Sugar Mill did not export any electricity to the Distribution network.

The new No.1 Turbo Generator was commissioned in the latter part of the 1997 crush, enabling power export to commence. The crop sizes were similar for years 1998 – 2001.

Further expansion of the available cane lands, (hence crop size) occurred, with the result being an increase in the amount generated as well as exported.

The years 2002 – 2005 are now indicative of our generation and export abilities, however 2006 was a low year as a result of crop damage by Cyclone Larry, and 2007 is going to be similar, due to a prolonged wet season at the beginning of 2007 and the lingering effects of the Cyclone damage.

We have in place with Ergon Energy Queensland, a power purchase agreement, which is in place until 2014.

The dedicated Ergon feeder to the mill is rated for 10 MW and we export continuously to this level. We therefore cannot increase the rate of our export, without the major capital expense of duplicating the Interconnector.

Regardless of the above, our boilers are operating above their maximum continuous rating, (MCR) because we vent steam to assist in managing our excess bagasse stocks.

Our four turbo generators are running near full load, (with power factors in the 0.95 range). We do not have the generator or Interconnector capacity to increase our export rate any further.

The only opportunity to increase our export amount is to generate outside of the crushing period or when the mill is stopped due to wet weather.

Under current operating conditions, there is no advantage in becoming electrically energy efficient as this would have a negative effect on our total amount generated which would have the follow on effects of reducing our earnings from the sale of Renewable Energy Certificates, (REC's) as well as increasing the amount of excess bagasse that we have to dispose of each year.

Under current operating conditions, to become steam energy efficient, will only result in more excess bagasse to dispose of, and hence increase our cost due to the fuel and labour involved in dumping bagasse.

In summarising our generation capabilities, we operate our boilers above MCR, our generators run at near full load, we incinerate bagasse by passing HP steam to the LP side and vent excess LP steam to atmosphere and we still have the problem of excess bagasse to dispose of.

Several projects to increase our ability to export power have been considered since the commencement of the MRET scheme. These projects ranged from increasing the No.3 Boiler steam pressure to 45 Bar and installation of a 45 Bar 25 MW condensing steam

turbine generator to the installation of a 17.25 Bar 15 MW condensing steam turbine generator to operate on our existing steam pressures.

All projects were proven to have insufficient return on investments and excessive payback periods.

The project of “Increasing Bagasse Storage and New In-Loading Station” was first raised in 2005 with budget estimates being provided by Maunsell Consulting Engineers mid 2006.

At that stage, due to the collapse of the price of an REC and predominately low energy cost in Queensland (coal is king), the project was shelved, again due to the poor return on investment and excessive payback periods.

However, due to the possible emerging carbon-trading scheme’s, Tully Sugar Limited has decided that we will review costing and possible revenue that may be realised from increasing the length of time that we generate electricity for, thereby increasing our total export to Ergon Energy.