Milestone D 7.3: Attachment F

Provide evidence of energy efficiency (relationship between monitored irrigation/crop data and energy consumption)

This analysis considers direct cost and savings related to efficiency gains from the pumping drive unit and the input value of solar generation. A crop evaluation over the past two seasons is also provided

Re Milestone 4.1 information - Data to end December 2018 is based on the winter, spring and early summer period of 2018 (Season 2018/2019 for harvest June to December 2019). The crop estimate is a yield potential based on the current progress of the crop and crop demand, growth estimates and economic analysis are therefore specific to the current 6 month period.

Re Milestone 5.1 information - Data to end June 2018 is based on whole of season estimate (Season 2018/2019 for harvest June to December 2018) and crop demand and growth estimates are therefore a 12 month period – irrigation data is for the full season July 2019 to June 2019 – irrigation effectiveness over the second half of the period was severely impacted by almost unprecedented drought conditions and yield potential was severely affected

Re Milestone 6.1 information - Data to end December 2019 is based on the winter, spring and early summer period of 2019 (Season 2019/2020 for harvest June to December 2020). The crop estimate is a yield potential based on the current progress of the crop and crop demand, growth estimates and economic analysis are therefore specific to the current 6 month period. Serious drought issues have been factored in and the potential of relief rainfall not occurring until late summer is considered. A return from peanut production is also considered.

Re Milestone 7.1 information - Data to 10th May 2020 is based on whole of season estimate (Season 2019/2020 for harvest June to December 2020) and crop demand and growth estimates are therefore a 12 month period. – irrigation data is for the full season July 2019 to May 2020 – 20 ha of sugarcane was replaced with peanut crop in order to boost farm annual cash flow. This peanut crop has delivered a successful outcome with the potential to return the equivalent $ value of approximately 3000 tonne of sugarcane at current sugar prices. Wet weather occurred from late January to early March curtailing the need for irrigation. A downside was storm damage to two strings of the solar array which meant that a return to irrigation was at 80% capacity. These matters have now been repaired. The option to run at reduced capacity provided opportunity to test the reliability of the original design – the reduction in solar capacity seen the grid component rise above the project average of 8.3kW/h prior to the change to14.2 kW/h with the solar system operating on 80% capacity.

Period July 2018 – May 2020	Date	Farm average Growth cm	Estimated tc/ha/100cm height at harvest	Estimated tc/ha progressive	Area irrigated ha 2019 crop	Estimated t/farm	Season crop water demand (mm)	Applied irrigation (mm)	Irrigation as % of crop water demand
Milestone 4.1- progressive crop estimate for 2019 harvest	**31 Dec 18**	**100**	**45**	**45**	**55**	**2475**	**Est 383**	**90**	**23.56**
Milestone 5.1 – final crop estimate for 2019 harvest	**30 June 19**	**140**	**35**	**49**	**55**	**2695**	**Actual with drought 651**	**290**	**44.54**
Milestone 6.1 – progressive crop estimate for 2020 harvest	**31 Dec**	**75**	**23**	**30**	**39 cane** **16 peanut**	**1170** **80**	**350** **125**	**160** **125**	**45.7** **100**
Milestone 7.1 – final crop estimate for 2020 harvest	**10 May**	**160**	**45**	**45**	**35 cane** **20 peanut**	**1575** **100**	**513** **250**	**210** **250**	**41.0** **100**

December - May 2020 irrigation cost and savings per tonne cane and peanuts

	Date of last reading	Total irrigation hours	Total motor kWh	Mains kWh	Average Mains kW/h	Solar kWh saving	Average solar kWh/hr	VFD kWh saving	Average VFD kWh/hr	Ergon Tariff $/kWh	Total cost Mains	Cost per tonne cane (tc) + peanuts
New pumping system mains input	**10 May 2020**	**488**	**14520**	**7155**	**14.66**					**0.24432**	**$3547.52**	**$2.11**
New pumping system solar input		**488**				**7365**	**15.09**					
New pumping system VFD input		**488**						**4504**	**9.22**			
Old pumping system pre replacement cost		**488**	**19024**	**19024**						**0.24432**	**$4647.94**	**$2.77**