#### IT CERTIII

# Sustainability Report

### BSBSUS401

Jason Gravestock 11/10/2016

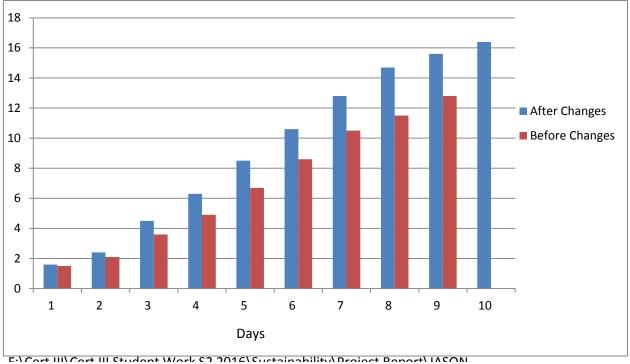
### Results

For our sustainability unit, we measured and recorded various aspects of power usage at certain times of the day. A computer bank was using 12.8 KWH. At 20.54 cents per KWH, it was costing 262.91 cents to run per hour. In order to reduce power consumption we decided to implement a few ideas, mainly turning off monitors when not in use.

By implementing the changes, we expected to see the power consumption drop by a decent but not necessarily significant amount. Without the monitors running for an hour or so a day, the power consumption would theoretically decrease; however, this did not happen.

		Com	puter B	ank B -	D23				Upper I	loor V	/ater Fo	unta	in - E	Bloc	k			Comp	uter E	Bank C	- D23		
			BEFORE CHANGES							BEFORE CHANGES								BEFORE		CHANGES			
Day	Date	Time	Volts	Amp	Watts	kwh	Power Factor	Day	Date	Time	Volts	Amp	Watts	kwh	Power Factor	Day	Date	Time	Volts	Amp	Watts	kwh	Power Factor
Tuesday	30/08/2016	9:00	247	1.12	187		64	Tuesda	30/08/2016	9:00	245	1.76	215	0	50	Tuesday	30/08/2016	9:00	246	1.46	243	0.2	58
Wednesday	31/08/2016	9:00	250	1.1	192.7	2.1	64	Wedne	31/08/2016	9:00	248	1.94	236	0.3	50	Wedneso	31/08/2016	9:00	249	1.48	244.3	2.3	58
Thursday	1/09/2016	9:00	245	1.3	179.5	3.6	66	Thursd	1/09/2016	9:00	245	1.3	179.5	0.5	66	Thursday	1/09/2016	9:00	245	1.3	179.5	4.6	66
Friday	2/09/2016	9:00	250	1.5	187	4.9	66	Friday	2/09/2016	9:00	250	1.5	187	0.7	66	Friday	2/09/2016	9:00	250	1.5	187	6.3	66
Monday	5/09/2016	9:00	248	1.07	175.2	6.69	66	Monda	5/09/2016	9:00	247	1.86	236	1	50	Monday	5/09/2016	9:00	247	1.44	238	9.9	64
Tuesday	6/09/2016	9:00	248	1.13	186	8.6	68	Tuesda	6/09/2016	9:00	248	1.83	234.3	1.1	79	Tuesday	6/09/2016	9:00	246	1.74	246.5	12.1	65
Wednesday	7/09/2016	9:00	248	1.15	190	10.5	66	Wedne	7/09/2016	9:00	248	1.92	249	1.5	56	Wedneso	7/09/2016	9:00	247	1.47	238.4	14.7	66
Thursday	8/09/2016	9:00	245	1.11	186	11.5	66	Thursd	8/09/2016	9:00	245	1.11	186	1.7	66	Thursday	8/09/2016	9:00	245	1.11	186	16.4	67
Friday	9/09/2016	9:00	250	1.2	190	12.8	66	Friday	9/09/2016	9:00	250	1.2	190	1.9	66	Friday	9/09/2016	9:00	250	1.2	190	17.4	58
		AVERAGE	247.89	1.19	185.93	7.59	65.78			AVERAGE	247.33	1.60	212.53	0.97	61.00			AVERAGE	247.22	1.41	216.97	9.32	63.11
		Com	puter B	ank B -	D23				Upper I	loor V	/ater Fo	unta	in - E	Bloc	k			Comp	uter E	Bank C	- D23		
		Com	puter B		D23				Upper I	loor V	/ater Fo		in - C	Bloc	k			Comp		Bank C	- D23		
Day	Date		AFTER C		D23 Watts	kwh	Power Factor	Day	Upper I	loor V	AFTER CH		in - [	Bloc	Power Factor	Day	Date	Comp			- D23	kwh	Power Factor
Day Monday	Date 17/10/2016		AFTER C	HANGES		kwh	Power Factor	Day Monda			AFTER CHA	ANGES					Date 17/10/2016		AFTER	CHANGES		kwh 0	Power Factor
-		Time	AFTER C	HANGES Amp	Watts	kwh 1.6			Date	Time	AFTER CHI Volts 251	ANGES			Power Factor	Monday		Time	AFTER Volts	Amp 0.77	Watts	kwh 0 2.2	63
Monday	17/10/2016	Time 9:00	AFTER C Volts 247	HANGES Amp 0.77	Watts 127.7	1.6	64	Monda	Date 17/10/2016 18/10/2016	Time 9:00	AFTER CHI Volts 251 252	ANGES		kwh 0	Power Factor	Monday Tuesday	17/10/2016	Time 9:00	AFTER I	Amp 0.77 0.84	Watts 122.7	0	63 68
Monday Tuesday	17/10/2016 18/10/2016	Time 9:00 9:00	AFTER C Volts 247 248	HANGES Amp 0.77 0.84	Watts 127.7 118.7	1.6 2.4	64 67	Monda Tuesda	Date / 17/10/2016 / 18/10/2016 sc 19/10/2016	Time 9:00 9:00	AFTER CH/ Volts 251 252 247	ANGES		kwh 0	Power Factor 100 100	Monday Tuesday Wednesd	17/10/2016 18/10/2016	Time 9:00 9:00	Volts 251 249	Amp 0.77 0.84	Watts 122.7 147.7	2.2	63 68 63
Monday Tuesday Wednesday	17/10/2016 18/10/2016 19/10/2016	9:00 9:00 9:00	AFTER C Volts 247 248 248	Amp 0.77 0.84 0.57	Watts 127.7 118.7 188.5	1.6 2.4 4.5	64 67 66	Monda Tuesda Wedne	Date / 17/10/2016 / 18/10/2016 sc 19/10/2016	9:00 9:00 9:00	AFTER CH Volts  251  252  247  250	ANGES		0.1 0.2	Power Factor 100 100 100 100	Monday Tuesday Wedneso Thursday	17/10/2016 18/10/2016 19/10/2016	9:00 9:00 9:00	AFTER   Volts   251 245 245	0.77 0.84 0.57 0.65	Watts 122.7 147.7 85.9	2.2 4.7	63 68 63 65
Monday Tuesday Wednesday Thursday	17/10/2016 18/10/2016 19/10/2016 20/10/2016	9:00 9:00 9:00 9:00	AFTER C Volts 247 248 248 247	0.77 0.84 0.57 0.65	Watts 127.7 118.7 188.5 122.7	1.6 2.4 4.5 6.3	64 67 66 64	Monda Tuesda Wedne Thursd	Date 17/10/2016 18/10/2016 19/10/2016 19/20/2016	9:00 9:00 9:00 9:00	AFTER CHI Volts 251 252 247 250 249	ANGES		0.1 0.2 0.4	Power Factor 100 100 100 100	Monday Tuesday Wednesd Thursday Friday	17/10/2016 18/10/2016 19/10/2016 20/10/2016	9:00 9:00 9:00 9:00	AFTER   Volts   251 245 245 247	0.77 0.84 0.57 0.65	Watts 122.7 147.7 85.9 122.7	0 2.2 4.7 6.4	63 68 63 65 64
Monday Tuesday Wednesday Thursday Friday	17/10/2016 18/10/2016 19/10/2016 20/10/2016 21/10/2016	9:00 9:00 9:00 9:00 9:00	AFTER C Volts 247 248 248 247 245	0.77 0.84 0.57 0.65 0.73	Watts 127.7 118.7 188.5 122.7 147.7	1.6 2.4 4.5 6.3 8.5	64 67 66 64 66	Monda Tuesda Wedne Thursd Friday	Date / 17/10/2016 / 18/10/2016 0 19/10/2016 0 20/10/2016 21/10/2016 / 24/10/2016	9:00 9:00 9:00 9:00 9:00	AFTER CHI Volts 251 252 247 250 249	ANGES		0.1 0.2 0.4 0.6	Power Factor 100 100 100 100 100	Monday Tuesday Wednesd Thursday Friday Monday	17/10/2016 18/10/2016 19/10/2016 20/10/2016 21/10/2016	9:00 9:00 9:00 9:00 9:00	251 245 245 247 247 248	0.77 0.84 0.65 0.73	Watts 122.7 147.7 85.9 122.7 147.7	0 2.2 4.7 6.4 8.7	63 68 63 65 64 62
Monday Tuesday Wednesday Thursday Friday Monday	17/10/2016 18/10/2016 19/10/2016 20/10/2016 21/10/2016 24/10/2016	9:00 9:00 9:00 9:00 9:00 9:00	AFTER C Volts 247 248 248 247 245 251	0.77 0.84 0.57 0.65 0.73	Watts 127.7 118.7 188.5 122.7 147.7 118.7	1.6 2.4 4.5 6.3 8.5 10.6	64 67 66 64 66 69	Monda Tuesda Wedne Thursd Friday Monda	Date / 17/10/2016 / 18/10/2016 50 19/10/2016 50 20/10/2016 21/10/2016 / 24/10/2016 / 25/10/2016	9:00 9:00 9:00 9:00 9:00 9:00	AFTER CH. Volts  251  252  247  250  249  251  249	ANGES		0.1 0.2 0.4 0.6	Power Factor 100 100 100 100 100 100	Monday Tuesday Wednesd Thursday Friday Monday Tuesday	17/10/2016 18/10/2016 19/10/2016 20/10/2016 21/10/2016 24/10/2016	9:00 9:00 9:00 9:00 9:00 9:00	AFTER 0 Volts 251 245 245 247 248 251	Amp 0.77 0.84 0.57 0.65 0.73 0.76	Watts 122.7 147.7 85.9 122.7 147.7 118.7	0 2.2 4.7 6.4 8.7 11	63 68 63 65 64 62
Monday Tuesday Wednesday Thursday Friday Monday Tuesday	17/10/2016 18/10/2016 19/10/2016 20/10/2016 21/10/2016 24/10/2016 25/10/2016	9:00 9:00 9:00 9:00 9:00 9:00 9:00	AFTER C Volts 247 248 248 247 245 251	HANGES Amp 0.77 0.84 0.57 0.65 0.73 0.76 0.86	Watts 127.7 118.7 188.5 122.7 147.7 118.7	1.6 2.4 4.5 6.3 8.5 10.6 12.8	64 67 66 64 66 69	Monda Tuesda Wedne Thursd Friday Monda Tuesda	Date / 17/10/2016 / 18/10/2016 0 19/10/2016 0 20/10/2016 21/10/2016 / 25/10/2016 0 25/10/2016 0 25/10/2016	9:00 9:00 9:00 9:00 9:00 9:00	AFTER CH. Volts  251  252  247  250  249  251  249	ANGES		0.1 0.2 0.4 0.6 0.8 1	Power Factor 100 100 100 100 100 100 100 100	Monday Tuesday Wednesd Thursday Friday Monday Tuesday Wednesd	17/10/2016 18/10/2016 19/10/2016 20/10/2016 21/10/2016 24/10/2016 25/10/2016	9:00 9:00 9:00 9:00 9:00 9:00 9:00	251 245 245 245 247 248 251 251	Amp 0.77 0.84 0.57 0.65 0.73 0.76	Watts 122.7 147.7 85.9 122.7 147.7 118.7 133.6	0 2.2 4.7 6.4 8.7 11 13.5	63 68 63 65 64 62 66 65
Monday Tuesday Wednesday Thursday Friday Monday Tuesday Wednesday	17/10/2016 18/10/2016 19/10/2016 20/10/2016 21/10/2016 24/10/2016 25/10/2016 26/10/2016	9:00 9:00 9:00 9:00 9:00 9:00 9:00 9:00	AFTER C Volts 247 248 248 249 247 245 251 250 248	HANGES Amp  0.77 0.84 0.57 0.65 0.73 0.76 0.86 0.92	Watts 127.7 118.7 188.5 122.7 147.7 118.7 127.7 180.4	1.6 2.4 4.5 6.3 8.5 10.6 12.8	64 67 66 64 66 69 66	Monda Tuesda Wedne Thursd Friday Monda Tuesda Wedne	Date / 17/10/2016 / 18/10/2016 50 19/10/2016 50 20/10/2016 21/10/2016 / 24/10/2016 / 25/10/2016 50 26/10/2016	9:00 9:00 9:00 9:00 9:00 9:00 9:00	AFTER CH Volts  251  252  247  250  249  251  249  249  248	ANGES		0.1 0.2 0.4 0.6	Power Factor 100 100 100 100 100 100 100 100	Monday Tuesday Wedneso Thursday Friday Monday Tuesday Wedneso Thursday	17/10/2016 18/10/2016 19/10/2016 20/10/2016 21/10/2016 24/10/2016 25/10/2016 26/10/2016	9:00 9:00 9:00 9:00 9:00 9:00 9:00 9:00	AFTER   Volts   251   245   246   248   251   250   248   251   250   248	0.77 0.84 0.57 0.65 0.73 0.76 0.86 0.92	Watts 122.7 147.7 85.9 122.7 147.7 118.7 133.6	0 2.2 4.7 6.4 8.7 11 13.5 15.8	63 68 63 65 64 62 66 65

Unfortunately, it seemed that the power consumption went up slightly in a large portion of the areas. However, the reason for this is almost certainly not because of the changes we made, but rather unrelated events that coincidently occurred during the time that we were recording. Things that may have affected the results include; use of more computers than usual, leaving devise on in order to get readings, using computers to charge phones, leaving James' computer on in memory of him, etc.



- Graph of the KWH readings of Computer Bank 2 before and after changes

Based on the recordings, if the changes were to be implemented, the campus would have to pay 336.86 cents per hour for the single computer bank recorded. Multiplied by all the computer banks on campus and how many hours they are each in use, the costs would rise by a decent amount. 73.95 cents per bank, per hour to be exact.

## Suggestions

If the TAFE campus was to look into other ways to increase sustainability, a few suggestions I can think of would be;

Install more water tanks

- The TAFE already has a few water tanks installed that definitely help with sustainability, but by increasing the amount we can switch to 100% sustainable water for all of the campus' needs.

Turn off unused computers

There are many rooms in the TAFE campus that are unused on some days, shutting down any
electrical devices unless they're being used would cut down on electricity.

Use more natural lighting

- We could allow more natural lighting into the classrooms rather than having the lights on all day.

Use natural cooling

- We could let more natural air into the rooms instead of using air-conditioning, which would save money and electricity.

Install solar panels + batteries

- Solar panels perhaps couldn't run the entire campus, but to use them in low-energy rooms could help.

#### Conclusion

The changes we implemented did not work in reducing electricity consumed, however, it is quite possible that the reason they failed are for reasons other than the changes themselves. In order to get conclusive results, longer tests would have to be conducted.

Sustainability Websites:

http://www.sustainabilitywa.com.au/

https://www.der.wa.gov.au/your-environment/sustainability

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