IT CERTIII

Sustainability Report

BSBSUS401

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Implement and monitor environmentally sustainable work practices

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.

Computer Bank B - D23

BEFORE CHANGES

Day	Date	Time	Volts	Amp	Watts	kwh	Power Factor
Tuesday	30/08/2016	9:00	247	1.12	187		64
Wednesday	31/08/2016	9:00	250	1.1	192.7	2.1	64
Thursday	1/09/2016	9:00	245	1.3	179.5	3.6	66
Friday	2/09/2016	9:00	250	1.5	187	4.9	66
Monday	5/09/2016	9:00	248	1.07	175.2	6.69	66
Tuesday	6/09/2016	9:00	248	1.13	186	8.6	68
Wednesday	7/09/2016	9:00	248	1.15	190	10.5	66
Thursday	8/09/2016	9:00	245	1.11	186	11.5	66
Friday	9/09/2016	9:00	250	1.2	190	12.8	66
		AVERAGE	247.89	1.19	185.93	7.59	65.78

Upper Floor Water Fountain - D Block

BEFORE CHANGES

Day	Date	Time	Volts	Amp	Watts	kwh	Power Factor
Tuesday	30/08/2016	9:00	245	1.76	215	0	50
Wednesday	31/08/2016	9:00	248	1.94	236	0.3	50
Thursday	1/09/2016	9:00	245	1.3	179.5	0.5	66
Friday	2/09/2016	9:00	250	1.5	187	0.7	66
Monday	5/09/2016	9:00	247	1.86	236	1	50
Tuesday	6/09/2016	9:00	248	1.83	234.3	1.1	79
Wednesday	7/09/2016	9:00	248	1.92	249	1.5	56
Thursday	8/09/2016	9:00	245	1.11	186	1.7	66
Friday	9/09/2016	9:00	250	1.2	190	1.9	66
		AVERAGE	247.33	1.60	212.53	0.97	61.00

Computer Bank C - D23

BEFORE CHANGES

Day	Date	Time	Volts	Amp	Watts	kwh	Power Factor
Tuesday	30/08/2016	9:00	246	1.46	243	0.2	58
Wednesday	31/08/2016	9:00	249	1.48	244.3	2.3	58
Thursday	1/09/2016	9:00	245	1.3	179.5	4.6	66
Friday	2/09/2016	9:00	250	1.5	187	6.3	66
Monday	5/09/2016	9:00	247	1.44	238	9.9	64
Tuesday	6/09/2016	9:00	246	1.74	246.5	12.1	65
Wednesday	7/09/2016	9:00	247	1.47	238.4	14.7	66
Thursday	8/09/2016	9:00	245	1.11	186	16.4	67
Friday	9/09/2016	9:00	250	1.2	190	17.4	58
		AVERAGE	247.22	1.41	216.97	9.32	63.11

Computer Bank B - D23

AFTER CHANGES

Day	Date	Time	Volts	Amp	Watts	kwh	Power Factor
Monday	17/10/2016	9:00	247	0.77	127.7	1.6	64
Tuesday	18/10/2016	9:00	248	0.84	118.7	2.4	67
Wednesday	19/10/2016	9:00	248	0.57	188.5	4.5	66
Thursday	20/10/2016	9:00	247	0.65	122.7	6.3	64
Friday	21/10/2016	9:00	245	0.73	147.7	8.5	66
Monday	24/10/2016	9:00	251	0.76	118.7	10.6	69
Tuesday	25/10/2016	9:00	250	0.86	127.7	12.8	66
Wednesday	26/10/2016	9:00	248	0.92	180.4	14.7	69
Thursday	27/10/2016	9:00	247	0.89	118.7	15.6	68
Friday	28/10/2016	9:00	248	0.78	133.6	16.4	67
		AVERAGE	247.90	0.78	138.44	9.34	66.60

Upper Floor Water Fountain - D Block

AFTER CHANGES

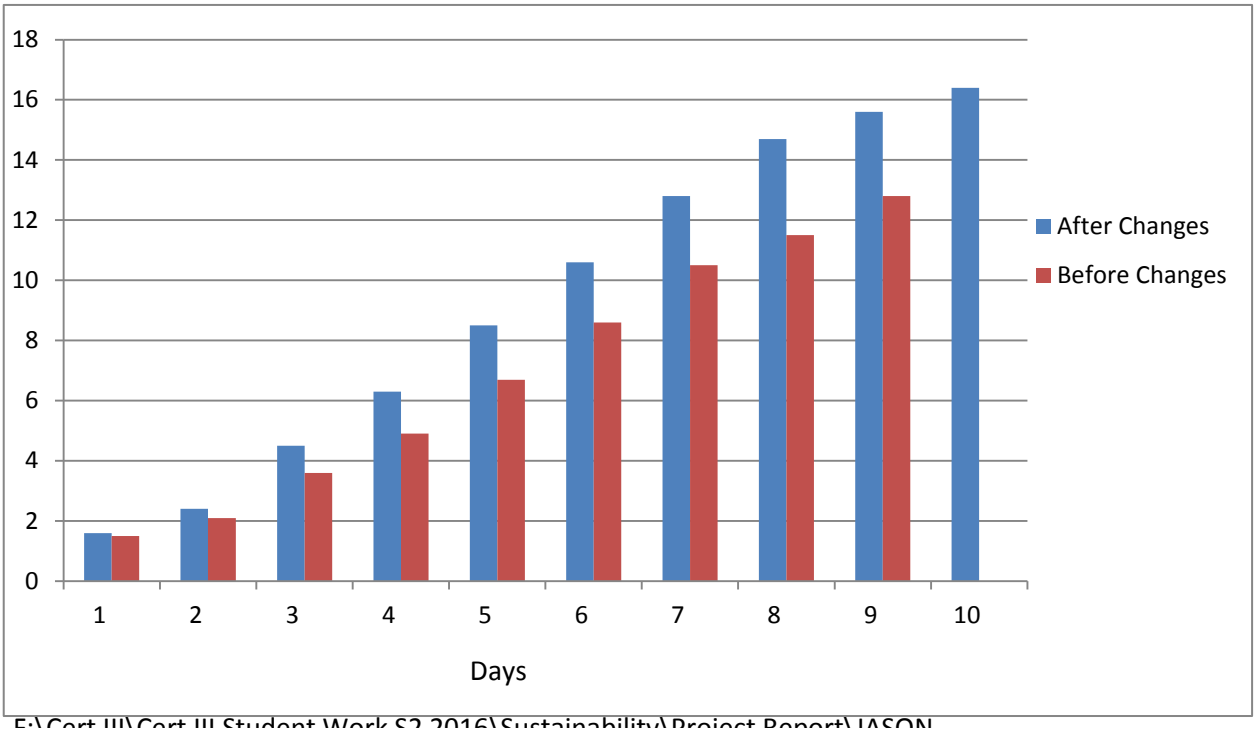
Day	Date	Time	Volts	Amp	Watts	kwh	Power Factor
Monday	17/10/2016	9:00	251	0	0	0	100
Tuesday	18/10/2016	9:00	252	0	0	0.1	100
Wednesday	19/10/2016	9:00	247	0	0	0.2	100
Thursday	20/10/2016	9:00	250	0	0	0.4	100
Friday	21/10/2016	9:00	249	0	0	0.6	100
Monday	24/10/2016	9:00	251	0	0	0.8	100
Tuesday	25/10/2016	9:00	249	0	0	1	100
Wednesday	26/10/2016	9:00	248	0	0	1.1	100
Thursday	27/10/2016	9:00	249	0	0	1.2	100
Friday	28/10/2016	9:00	250	0	0	1.3	100
		AVERAGE	249.60	0.00	0.00	0.67	100.00

Computer Bank C - D23

AFTER CHANGES

Day	Date	Time	Volts	Amp	Watts	kwh	Power Factor
Monday	17/10/2016	9:00	251	0.77	122.7	0	63
Tuesday	18/10/2016	9:00	249	0.84	147.7	2.2	68
Wednesday	19/10/2016	9:00	249	0.57	85.9	4.7	63
Thursday	20/10/2016	9:00	247	0.65	122.7	6.4	65
Friday	21/10/2016	9:00	248	0.73	147.7	8.7	64
Monday	24/10/2016	9:00	251	0.76	118.7	11	62
Tuesday	25/10/2016	9:00	250	0.86	133.6	13.5	66
Wednesday	26/10/2016	9:00	248	0.92	127.7	15.8	65
Thursday	27/10/2016	9:00	247	0.89	118.7	17.5	63
Friday	28/10/2016	9:00	248	0.78	133.6	19.6	61
		AVERAGE	248.80	0.78	125.90	9.94	64.00

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