



CASE STUDY



Electric energy-saving device for Domino's Pizza Singapore

Objective

• To achieve electrical energy saving minimum -8%

Problem Statement

• Energy saving is a persistent strategy to enhance competitiveness and environmental conservation.

Method

Smart Optimizer ECOD is an electric power saving device which

- · Control the voltage and current in the optimum range
- Filtering harmonic and increase power factor
- Improve quality of electrical power supply in overall.

• Increasing lifespan of Electrical equipment at stores by reducing current of the load /reducing KVAR and KW demand/

Working Principle

• Electronic controller regulates the direction of the current in coil of each transformer (one per phase)

to regulate and balance the network parameter to sustain within it highest performance whilst minimize power loss in the network.

TEST CONCLUSION

1. From 25 of April at store Domino's Pizza Killiney Road 71 Singapore have been installed device Smart-Optimizer **ECOD** for achieve reducing of electricity consumption

2. From 25 of May at store Domino's Pizza Tajong Katong Road Singapore have been installed device Smart-Optimizer **ECOD** for achieve reducing of electricity consumption

3. From 26 of May at store Domino's Pizza Tampines Ave 4 Singapore have been installed device Smart-Optimizer **ECOD** for achieve reducing of electricity consumption

After comparison bills of months with using and without **ECOD**, we can determine differences (reducing) of electricity consumption on close to 10%. Also, we can determine a reducing KVAR(reactive power) and KW (Demand).

Test Result

					Tampine	s						
	March	April	May	Average	June	July	August	September	October	Average	Difference	%
BILL	2636.77	2585.84	2763.57	2662.06	2361.49	2411.8	2362.26	2407.11	2262.35	2361.00		
Bill per												
day	85.06	86.19	89.15	86.80	78.72	77.80	76.20	80.24	72.98	77.19	-9.61	-11.07
KWH												
per day	477.40	483.96	500.54	487.30	441.60	436.83	427.86	450.52	409.76	433.31	-53.99	-11.08
KVAR	8972.63	8842.26	8830.25	8881.71	6891.98	7046.83	6922.53	7112.19	6863.37	6967.38	-1914.33	-21.55
KW-Max	33.44	31.96	34.16	33.19	30.88	31.62	30.34	31.04	32.18	31.21	-1.97	-5.95
					Tajong K	atong						
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D.U. I.	Narch	April		Average	June	JUIY	August	September		Average	Difference	%
BILL	3111.38	2846.23	3030.43	2996.01	2661.74	2821.19	2746.20	2538.51	2655.55	2684.6:		
Bill per	100 27	0/ 97	07.76	07.67	00 71	01.01	99 50	84.63	95.64	97.7	.0.05	10.19
	100.57	54.07	57.70	57.07	00.72	51.01	00.55	04.02	05.00	07.77	-5.55	-10.10
per dav	563.54	532.70	548.88	548.37	498.17	510.98	497.39	475.10	480.97	492.52	-55.85	-10.18
KVAR	3412.05	3371.51	3623.67	3469.08	1621.45	1599.20	1354.98	1441.42	1492.47	1501.90	-1967.17	-56.71
KW-Max	38.24	37.93	38.78	38.32	37.52	37.26	36.82	35.80	38.27	37.13	-1.18	-3.09
					Killiney 7	/1						
	February	March	April	Average	May	June	July	August	September	Average	Difference	%
BILL	2533.65	2980.55	2725.5	2746.57	2806.37	2399.72	2785.2	2906.53	2548.57	2689.28		
Bill per												
day	90.49	96.15	97.34	94.66	90.53	79.99	89.85	93.76	84.95	87.82	-6.84	-7.23
KWH												
per day	508.07	539.84	546.54	531.48	508.29	449.16	504.46	476.93	450.47	477.86	-53.62	-10.09
KVAR	10561.00	12041.00	11104.29	11235.43	8936.00	8160.09	9089.72	7684.92	7990.32	8372.21	-2863.22	-25.48
KW-Max	36.94	39.10	39.20	38.41	39.33	35.63	36.88	37.11	36.08	37.01	-1.41	-3.66

Test Result

Keppel Electric

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Name:	DOMINO'S PIZZA SINGAPORE PTE LTD				
Account No:	CU00003532				
MSSL No:	9301090040				
Contract End Date	: 31/05/20				
Premise Address:	802 TAMPINES AVE 4 #01-23 Singapore 520802				

Consumption period 01/10/2010 - 31/10/2010				
01/10/2019 - 31/10/2019				
Summary charges				
	Total Charges Before Tax:		SGD	2,114.35
	7% Goods and Services Tax	r	SGD	148.00
	Total		SGD	2,262.35
Energy Usage Charges				
HSFO - Fixed, All day	12,702.57 KWh	0.16260000 \$/KWh	SGD	2,065.44
		Sub total:	SGD	2,065.44
MSS Recurring Charges				
Market Development and Systems Charge (Futures)	12,702.57 KWh	0.00200000 \$/KWh	SGD	25.41
		Sub total:	SGD	25.41
Other Charges				
Carbon Tax	12,702.57 KWh	0.00185000 \$/KWh	SGD	23.50
		Sub total:	SGD	23.50





Maximum Demand : 32.18 kW - occurred during the interval of : 20 10 2019 11:00:00 pm Total KVam : 0,883.37 KVamh. Al rates are displayed to eight decimal places, "Non Taxabé "The total motion change will be capped at \$12.50 per month.

Keppel Electric

Name:	DOMINO'S PIZZA SINGAPORE PTE LTD
Account No:	CU00003532
MSSL No:	9301090156
Contract End Date	31/05/20
Premise Address:	301 TG KATONG RD Singapore 437084

Consumption period: 01/10/2019 - 31/10/201	19			
Summary charges				
	Total Charges Before Tax:		SGD	2,481.80
÷	7% Goods and Services Tax	*	SGD	173.73
	Total		SGD	2,655.53
Energy Usage Charges				
HSFO - Fixed, All day	14,910.20 KWh	0.16260000 \$/KWh	SGD	2,424.40
		Sub total:	SGD	2,424.40
MSS Recurring Charges				
Market Development and Systems Charge (Futur	res) 14,910.20 KWh	0.00200000 \$/KWh	SGD	29.82
		Sub totak	SGD	29.82
Other Charges				
Carbon Tax	14,910.20 KWb	0.00185000 \$/KWh	SGO	27.68
		Sub totak	SGD	27.58
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Maximum Demand : 38.27 kW - occurred during the interval of : 05.10.2019 12:30:00 pm Total KVam : 1,482.47 KVam, A rates are singulayed to eight decimal places. Hin Taxoubie "The total meter charge will be capped at \$12.50 per month.

Investment analysis

- Total consumption per month average 14,000.00 kW/h
- Average bill per month 2,800.00 SGD
- Required investment per store 4,490.00 SGD
- Minimum saving 8% = 224.00 SGD (per month)
- Payback period of investment around 16 months because real energy saving effect is close 10%
- Warranty period of (120) months from the date of sale
- Price include audit, shipping and installation

Reference Letter



Explanation what is KWH, KVAR, KW Demand

- **1** KWH A kilowatt hour (kWh) is a measure of how much energy you're using.
- 2 KW Reflects the rate of electricity usage. Peak demand.
- **3** KVAR A Reactive power. Domino's Pizza don't pay for reactive power but higher KVAR caused higher losses and higher KVAR mean higher current of load as a results affected on lifespan of electrical equipment because heating are calculated according to the Joule –Lenz law* the power of heating generated by an electrical current I: W = R*I2, where the conductor resistance is R = (1/g) * (L/A). The electric current value could be calculated I = V / R









