

SATEC Energy Management system Saved US\$ 33,500



The Israeli kibbutz is a collective community, traditionally based on agriculture. The first kibbutz was established in 1909. Today, farming has been partly supplanted by other economic branches, including industrial plants and high-tech enterprises. The kibbutz began as a utopian community, a combination of socialism and Zionism. In recent decades, some kibbutzim have been privatized and the communal lifestyle has undergone various changes.

A food factory within a kibbutz in the center of Israel receives its utility service from the Israel

Electric Corporation (IEC) at 22kV. The kibbutz itself is supplied by the factory's MV substation and the consumption is divided equally between the factory and the kibbutz.

The main utility incoming is monitored using SATEC PM175 Power Quality Analyzer, while each main section of the MV is monitored by SATEC PM130EH PLUS. All the devices are connected over the Internet to SATEC's online energy management service ExpertPower™ (www.expertpowerplus.com).

THE PROBLEM

Each month the chief engineer compares the utility bills with the SATEC system data. Since the installation of the system, the two bills were similar, with around 0.5% difference, which is explained by the measurement device accuracy class. However, in the bi-monthly bill for June and July, the utility bill was higher by 13.5% than the bill issued by ExpertPower. Moreover, the bill includes the second half of June and the first half of July. The June period was accurate (0.08% difference between SATEC and the utility bills) while the July period had 20% difference.

Billing Comparison - ExpertPower

Customer _____
 Site _____
 Location _____
 Device _____
 Dates 16/06/2015 - 15/07/2015

Description	Energy Measurements						Billing			Utility			Difference				
	Usage Code	Season	Tariff	Previous Previous Date	Previous Reading	Present Present Date	Present Reading	Usage (kWh/kW)	Cost per kWh (Agorot)	Total Cost (NIS)	Usage (kWh/kW)	Cost per kWh (Agorot)	Total Cost (NIS)	Usage (kWh/kW)	Total Cost, NIS	Pricing NIS (Agorot)	Total NIS (NIS)
TOU Energy	077	Summer	Peak	01/07/2015	27,493,822	15/07/2015	27,788,896	295,074	99.93	294,867.45	354,560	99.93	354,311.81	59,486	294,867.45	354,311.81	59,444.36
TOU Energy	078	Summer	High	01/07/2015	12,634,587	15/07/2015	12,904,676	270,089	39.97	107,954.57	323,280	39.97	129,215.02	53,191	107,954.57	129,215.02	21,260.45
TOU Energy	079	Summer	Low	01/07/2015	40,022,464	15/07/2015	40,614,385	591,921	26.39	156,207.95	784,320	26.39	206,982.05	192,399	156,207.95	206,982.05	50,774.10
TOU Energy	777	Fall/Spring	Peak	16/06/2015	26,960,247	01/07/2015	27,493,822	533,575	41.41	220,953.41	531,440	41.41	220,069.30	-2,135	220,953.41	220,069.30	-884.11
TOU Energy	778	Fall/Spring	High	16/06/2015	12,471,853	01/07/2015	12,634,587	162,734	32.59	53,035.01	162,240	32.59	52,874.02	-494	53,035.01	52,874.02	-160.99
TOU Energy	779	Fall/Spring	Low	16/06/2015	39,620,166	01/07/2015	40,022,464	402,298	25.56	102,827.37	396,800	25.56	101,422.08	-5,498	102,827.37	101,422.08	-1,405.29
Subtotal				16/06/2015		15/07/2015		2,255,691		935,845.76	2,552,640		1,064,874.27	296,949			129,028.51
kW Max DMD		General	General	16/06/2015		15/07/2015		5,089									
PF		General	General	16/06/2015		15/07/2015		0.95									
PF (Penalty) Fee				16/06/2015		15/07/2015			0.00%	0.00		0.00%	0.00	0			0.00
VAT				16/06/2015		15/07/2015			18.00%	168,452.24		18.00%	191,677.37	0			23,225.13
Total Charge				16/06/2015		15/07/2015				1,104,298.00			1,256,551.64	0			152,253.64

THE SOLUTION

Since all the loads are monitored and the time is synchronized using SATEC ETC2002, it is possible to perform an accurate energy balance for each period of time. The energy balance of this bill's period of the main incoming and the 7 loads was equal (less than 0.15% difference), proving that SATEC system measurements are accurate.

The chief engineer claimed a refund from the utility. The utility checked all SATEC data, energy balance and the bill comparison history. After validating the information, they approved the readings of the SATEC PM175 installed on the main service. Then they investigated the difference and found that there was a mistake in their calculation, due to the change of TOU season that occurring at the beginning of July. The factory received a refund of approximately US\$ 33,500, which not only returned the investment on the entire system immediately, but also provided over US\$ 20,000 additional saving. Moreover, if this mistake had gone undetected, the error could have continued on the following months, making the actual saving much higher.

CONCLUSION

The Return on Investment (ROI) showed in this case study is immediate. As utility bills are generally accurate, the detection of utility mistakes is only one of the many advantages of using SATEC energy management system. A recent study performed by ACEEE (American Council for an Energy-Efficient Economy) evaluates that the average saving from on-line device level energy management is 12% while saving can be as high as 30%.

Advantages of Online Energy Management Systems

- Track utility bills
- Track sources of energy leaks
- Improve energy efficiency and drive energy saving initiatives
- Monitoring power quality, e.g. harmonics and voltage drops
- Check status of power factor and peak demand to prevent utility surcharges

