

Electrical Monitoring System for Energy Efficiency audit

Many industrial plants do not have comprehensive electrical & energy consumption information due to various reasons and constraints. Amongst these are

- Manpower
- Lack of metering facilities

For the better organized plants, the charginan takes selected electrical parameters records manually based on the production shift. The data collected are often not complete and cannot be processed into meaningful data for management purposes.

However, with the increasing market competition which resulted in lower profit margin, there is much pressure to lower production cost and increase productivity. One such area is energy consumption / demand charges.

For industrial E2 tariff the maximum demand charges is RM21.70 for each kW. For example a plant's average power demand is 2000kW for each half hour period over the month, the demand charges shall be $2000 \times 21.70 = \text{RM } 43,400$. However if there is one specific 30 minute time period where the client has inadvertently started several equipment of high power consumption at the same period and causing the maximum demand to rise to 2200kW, the demand charges for the month would amount to RM 47,740. (Increase of RM4,340)

The energy charges is a separate component and is based on the actual peak and off peak energy consumed for the month multiplied by the peak and off peak energy unit cost respectively. Hence if the client institute an energy saving program, there must be a measureable benchmark such as kWh / production unit. As production rate varies over the different shift and days of the month, the management can use these information to chart out the effectiveness of their energy efficiency program.

Another common problem that the industry may encounter is the Power Factor Penalty problem. This occurs when the Capacitor banks in the Main Switchboards has deteriorated or failed and is unable to generate the reactive power (Vars) to maintain the power factor above 0.85. Below this threshold, the power factor penalty is levied on the client whereby the quantum is proportional to the power factor shortfall and the energy bill for the particular month.

As such, it is important for industrial consumers to start monitoring their energy efficiency and their production output. With these data, the clients is able to formulate strategy to reduce energy / maximum demand cost through proper scheduling and equipment upgrade and consequently improving productivity.

Given that the client is interested to determine the energy consumption and power demand, what are their options?

The conventional way is to purchase and install a computerised monitoring system with electronic power meters to provide dynamic graphic, trending and reporting.

Vy Engineering has developed a solution on Electrical Monitoring Services as described in the next page.

Vy-OMS™ Electrical Monitoring System

Vy Engineering (Vy) offers a solution whereby the client can

- Opt 1. outright purchase the Computerised Vy-OMS Electrical Monitoring System and the Electronic Power Meters.
- Opt 2. purchase the Base equipment & services and subscribe to the Computerised Vy-OMS Electrical Monitoring System. At the end of the subscription period, the Vy-OMS Electrical Monitoring System is handed over to the client for one Ringgit.

Base Equipment

The client shall purchase the base equipment consisting of Power Meters and the engineering services. The base equipment packages include the supply & installation of the meters to replace the ammeter on the existing panel.

Subscription

For option 2, the client shall sign a subscription agreement for the Computerised Vy-OMS Electrical Monitoring System for a fixed time period, typically two to three years. Vy shall install the Computerised Vy-OMS Electrical Monitoring System. for the enduser to monitor and log the electrical parameters of the facility.

During this subscription period, the client shall pay the subscription charges on 3 months advance basis until the end of the subscription period. Vy shall provide half yearly on site services to check and ensure that the Computerised Vy-OMS Electrical Monitoring System is in working order in addition to telephone support. If there is any computer hardware failure, Vy shall replace the necessary components or the computer to restore the Vy-OMS Electrical Monitoring System operation.

Upon the end of the subscription period and upon settlement of all subscription payments, Vy shall transfer the ownership of the computer and the rights to use the Vy-OMS software to the enduser for RM1. The client may continue to use the system at this site. The Vy-OMS software remains a copyright property of Vy Process Engineering Sdn Bhd.

Electrical Monitoring Report

These data are recorded every 30 minutes interval for an entire month and the enduser can process the data into various report format for management purposes.

Item	Electrical Parameter	Record interval	Report format
1	Average/Max/Min Voltage ($V_{I_{avr}}$)	30 minutes	Trends/Histogram
2	Average/Max/Min Current (I_{avr})	30 minutes	Trends/Histogram
3	Average Power kW	30 minutes	Trends/Histogram
4	Active Energy kWh	30 minutes	Tabulation
5	Reactive Energy kVarh	30 minutes	Tabulation
6	Average Power Factor	30 minutes	Tabulation/Histogram

Average values are computed over 30 minutes period.

Max values are the highest value that is read within the 30 minutes period.

Min values are the lowest value that is read within the 30 minutes period.

Budget estimates

A.	Base equipment	Rate
1	Engineering and mobilization lump sum cost. (Note #1)	RM 3,000
2	Supply & Installation of each Electronic Power Meter to replace the ammeter on the existing panel. (Note #2)	RM 2,000 each
B.	Subscription charges over subscription period	
1	Subscription charges is dependent on the subscription period, system and services requirement.	To quote

Note

1 : Applicable for Klang Valley & Shah Alam areas only.

2 : The existing panel must have metering CTs and 3 phase indication lights with isolating fuses. Client shall arrange a short shutdown for meter installation.

3 : Do contact us for further discussion if you have a specification requirement for the Electronic Power Meters or already have existing Power Meters units with communication port.

Do contact us for a system demonstration in our showroom.

If you require a quote, please fax or email in the electrical single line diagrams with the required Electrical Metering points, locations of meters & workstation monitor and other pertinent details.