



“Facility Metering & Usage Analysis”

Utility metering perspective

Facilities Management Council
Construction Institute
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Outline

Facility Metering & Usage Analysis

- Main Power Metering
- Sub Metering
- Monitor & Control Energy
- Who do you call?



Main Power Metering

Facility Metering & Usage Analysis

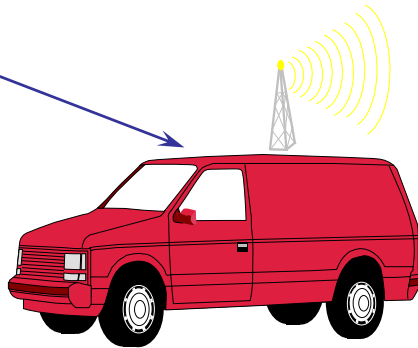
- Main power metering
 - AMR communications with the meter(s)
 - Single or Totalized metering
 - Primary or secondary metering
 - How kW or kVA demand is measured for CL&P rates
 - How does demand impact your CL&P rate
 - Time-of-Day rates

AMR "Radio kWh's"

Radio readings reflect actual kWh or ccf reading

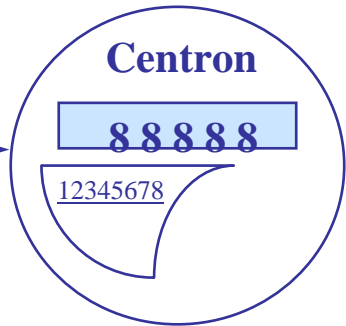
■ ERT Residential AMR

On-Cycle and
Off-Cycle Reads



Energy
ERT = **XXXXXX**
kWh's

Electric &/or Gas
ERT read in same
Route



Normal Display
• Reading are current use

AMR "Radio Demand"

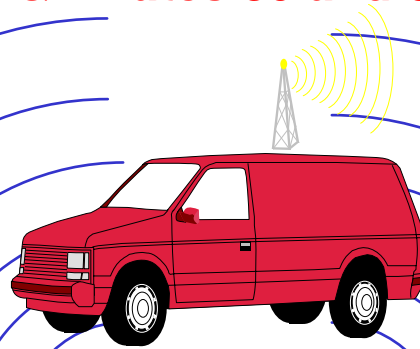
Radio Readings as of the last Self Read date

- Radio C&I AMR up to 350kW

- CL&P Rates 30 and 35

ERT 1 = kWh's
Energy
XXXXX

ERT 2 = kW's
Demand
XXX.XXX



Centron or Sentinel
Meter

Sentinel

88888

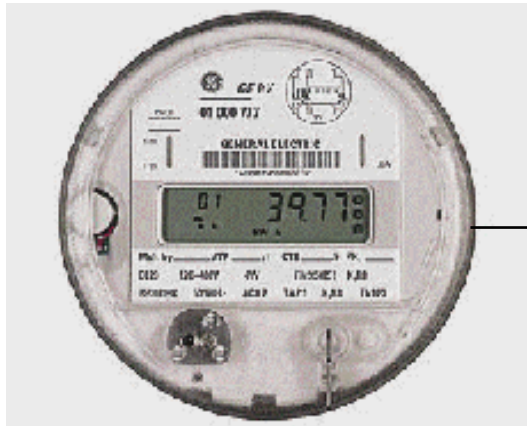
12345678

- Normal Display
 - Reading are current use
- Alternate Display
 - Previous Self Reads
 - Readings match ERT's

AMR "Telephone"

Telephone Readings daily (Outbound or Inbound)

- **Telephone C&I AMR - 350kW and greater**
- **CL&P Rates 55, 56, 57 & 58**



Utility meter

Dedicated or Shared
Phone line



Utility AMR
Reading System

Either:

- Makes calls to meter
- Receives calls from meter



Main Power Metering

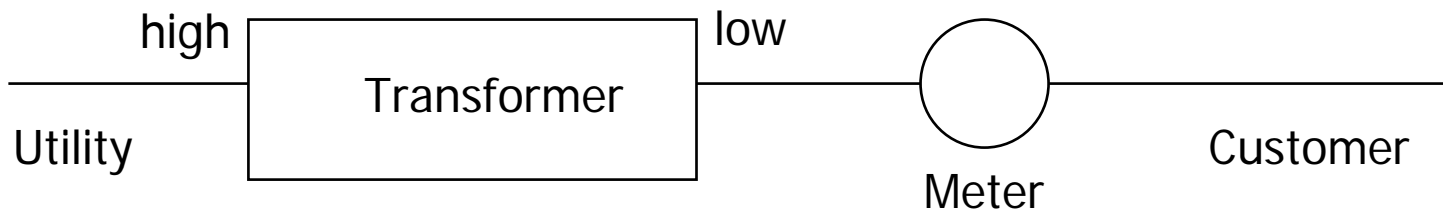
Single or Totalized Metering

- Single or Totalized metering
 - CL&P provides a single point of service for all rates in accordance with terms & conditions
 - <http://www.cl-p.com/online/residential/aboutbill/genratesinfo.asp>
 - However, CL&P may decide two or more meters are necessary for the single point of service
 - In that case the two or more meters are totalized into one bill

Main Power Metering

Primary or Secondary Metering

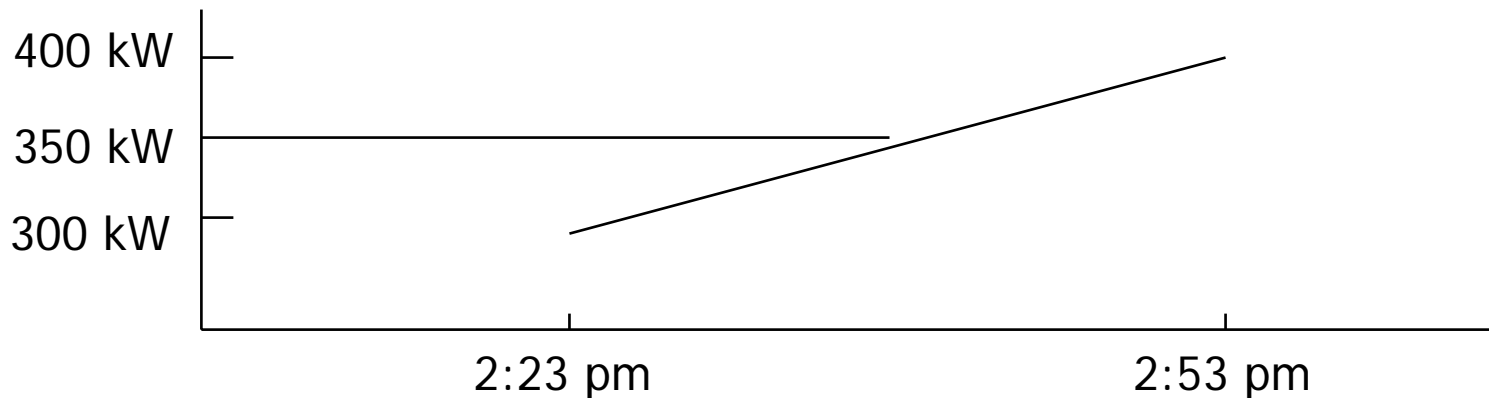
- Primary or secondary metering
 - All CL&P rates are based on secondary metering
 - Meter on the secondary (low voltage) side of the utility transformer
 - If meter is on the primary (high side) the C&I rates provide a primary metering discount to account for the 2% transformer loss



Main Power Metering

kW and kVA Demand

- How kW or kVA demand is measured for CL&P rates
 - Highest average 30-minute kW or kVA demand recorded during the billing month
 - Therefore, if the highest 30-minute period the load grew evenly from 300 to 400 kW the average would be 350 kW

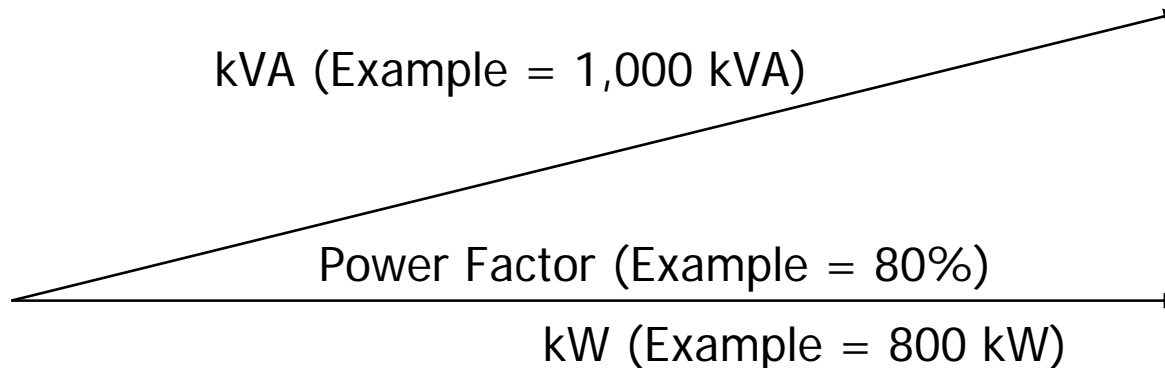


Main Power Metering

kW vs. kVA Demand

■ kW vs. kVA demand

- As of 6/1/04; kVA demand for rate 57 customers
- Scheduled for other TOD rates as follows:
 - 6/1/05 for Rate 58 (1 MW or greater Commercial)
 - 6/1/06 for Rate 55 (350 kW to 1MW for Industrial)
 - 6/1/07 for Rate 56 (350 kW to 1MW for Commercial)





Main Power Metering

Time-of-Day Rates

- Time-of-Day rates
 - Mandatory for CL&P Rates:
 - 55, 56, 57 and 58
 - On-Peak = Weekdays 7:00 am to 11:00 pm EST
 - Off-Peak = All other hours




Sub Metering

Facility Metering & Usage Analysis

- Sub panel or distribution metering
 - For charge back to end users allowed by DPUC
 - For monitoring segments or your business
 - Can not charge per kWh like a utility but can fold into rent or allocate costs within a single business
 - Available Metering Options
 - Not recommending but just listing some possibilities
 - EMon
 - <http://www.emon.com/>
 - National Metering
 - <http://www.national-meter.com/>

Sub Metering

E-Mon Sub-metering <http://www.emon.com/>



The image shows a website navigation menu for E-Mon Submetering & Energy Monitoring. The background is a dark, abstract design with streaks of light in red, orange, and blue. At the top left, the E-Mon logo is displayed in a stylized, metallic font with a red sphere to its right, followed by "L.P." and "A Hunt Power Company" below it. The main heading "Submetering & Energy Monitoring" is positioned in the upper right. Below this, several navigation links are listed: "PRODUCTS & SERVICES", "CORPORATE", "NEWS", "REPS / DISTRIBUTORS", "CONTACT US", and "CAREER OPPORTUNITIES". A "SAVINGS CALCULATOR" link is accompanied by a small calculator icon. On the left side, there is an image of a submeter unit with the text "PRODUCT OF THE YEAR" below it. At the bottom right, the GSA logo is visible.

E-MON® L.P.
A Hunt Power Company

Submetering & Energy Monitoring

PRODUCTS & SERVICES

CORPORATE

NEWS

REPS / DISTRIBUTORS

CONTACT US

CAREER OPPORTUNITIES

SAVINGS CALCULATOR

GSA

PRODUCT OF THE YEAR

Sub Metering

National Metering <http://www.national-meter.com/>



NMI **WATT WATCHER**

- Meters & Monitoring
- Communications
- Transducers
- Digital Instrumentation
- Current Transformers
- Portable Monitors
- Software
- OEM Section
- Corporate Information
- New Information
- Contact Information
- Locate A Rep



NATIONAL METER INDUSTRIES

The Next Generation Of Power Monitoring



Monitor & Control Energy

Facility Metering & Usage Analysis

- Tracking or controlling demand and usage
 - CL&P's MData web access to meter data
 - Load pulse outputs from the utility meter to feed load control equipment
 - Tips and Tricks



Customer Choice Options

Optional “**Gold Services**” - Enhanced Meters

- NU’s Optional “*Gold Services*”
 - Load Pulse Output
 - Interfaces with Customer EMS System
 - Phone AMR
 - Choice of Billing Date
 - Different facilities billed in the same billing schedule
 - Helps compare energy use at each facility
 - Allows remote access to meter for Customer/Supplier
 - Read-Only password
 - Access to historical loads



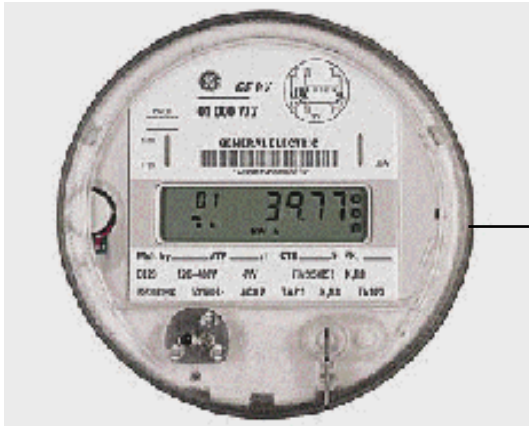
Gold Services

Optional "Gold Services" - Enhanced Meters (Cont.)

- NU's Optional "Gold Services"
 - Regulated Fees Filed and Approved:
 - Incremental cost paid by requesting Customer/Supplier
 - Options:
 - Load Pulse Output
 - Phone AMR - TOD/Recording Remote access metering
 - Combination of Load Pulse and Phone AMR

Load Pulse Output

- 2 wire (or 3 wire) switched output from Utility meter
 - Each switch change represents X kWh's per switch change



Utility meter



Facility EMS
or

Demand controller





Customer Choice Options

Optional "Platinum Services" Meter Data Services

- NU's Optional "Platinum Services"
 - Near Time Internet Data Services
 - NU's - MDATA Online Data Services
 - In Production Today
 - Data updated daily to include previous days interval data.
 - Therefore, data is only 24 hours old.

Platinum Services

Optional "Platinum Services" - Meter Data Services
(Cont.)

- NU's Optional "Platinum Services"
 - Regulated Fee Filed and Approved:
 - Incremental cost paid by requesting Customer/Supplier
 - Connecticut - DPUC in 2000
 - Massachusetts - DTE in 2001
 - Options:
 - MData on-line - "Online Internet Data"
 - Special Request Interval data reports

Internet Application

Near Time Internet Meter Data



- NU's - MData Online Data Services
 - Near Time data up to midnight the previous day
 - Peak day Demand
 - Daily Peaks and/or Totals
 - 24-Hour Profile
 - Detail 15 minute resolution profile
 - Statistics
 - Access with ID/password using any standard web browser

Who uses MDATA Online?

Used by Facility/Finance Managers and Power Buyers

- Customers shopping for suppliers
 - u Compare usage to standard load curves
 - u Get better information for smarter shopping
 - u Some suppliers are now asking for this data
- Managing load
 - u Gain a better understanding of energy usage
 - u Adjust how energy is used
 - u Improve efficiency to lower costs
- CL&P Demo
 - <http://www.cl-p.com/online/business/meter/platinum/indexplatinum.asp>
 - ID = nudemo; PW = nudemo

LOG IN WITH YOUR OWN ID



**Connecticut
Light & Power**



Daily Online Load Analysis
METER DATA SERVICES

Please log in

User Name:

Password:

OK



Bookmarks Location:

Instant Message WebMail Contact

VIEW kW, kVA, kVAR, PF



Peak Day Demand

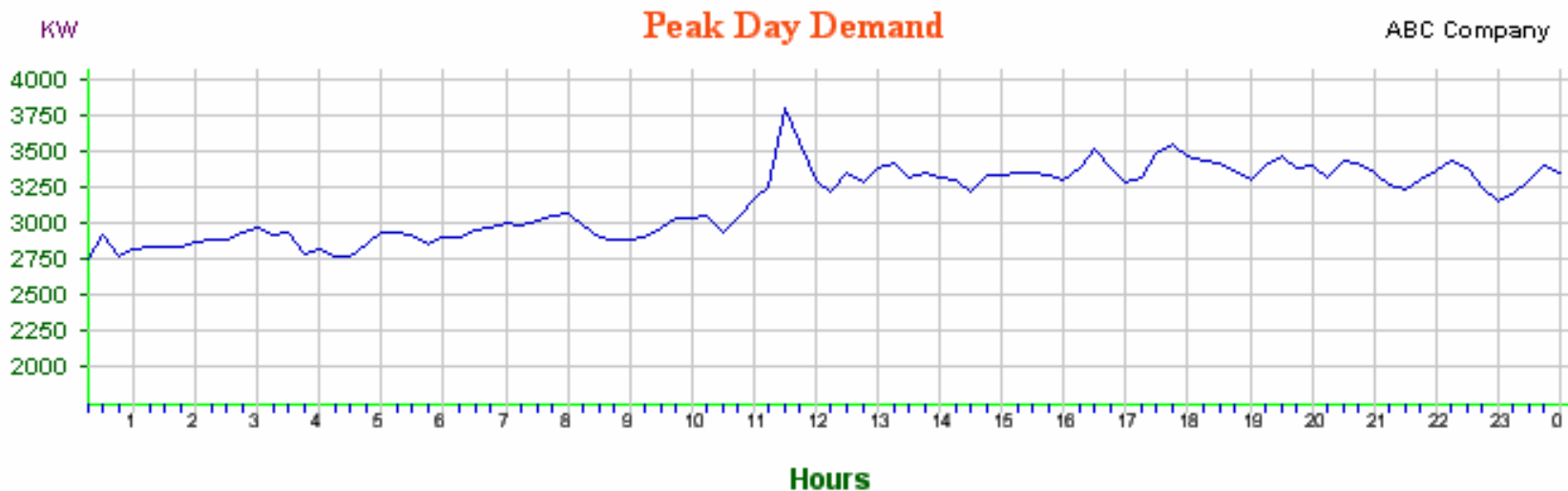


Data from Sun Nov 29 1998 to Tue Dec 29 1998

Total Usage: 1,880,425.0 KWH
 Max Demand: 3,740.0 KW
 Occurred on: Wed Dec 2 1998 11:30
 Load Factor: 67.569%

Data for Wed Dec 2 1998

Total Usage: 74,781.0 KWH
 Max Demand: 3,740.0 KW
 Occurred at: 11:30
 Load Factor: 83.31%



3,292 KW on Wed Dec 2 1998 15:00 (datapoint 59)



Bookmarks Location: http://starweb.star

Instant Message WebMail Contact

ZOOM IN...

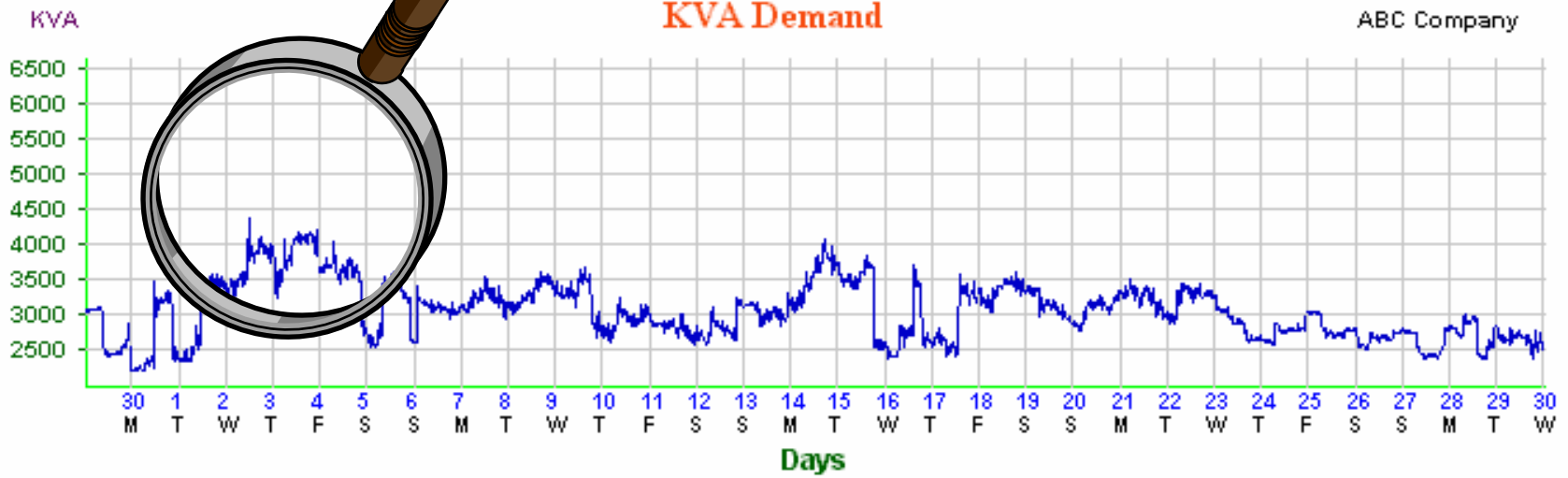
Navigation toolbar with icons for home, back, forward, zoom in, zoom out, and a dropdown menu showing 'KVA / Power Factor'.



Power Factor



KVA Demand



ABC Company

3,838.1 KVA on Wed Dec 2 1998 12:30 (datapoint 337)





Bookmarks Location: http://starweb.star

Instant Message WebMail Contact

...AND ANALYZE

Navigation icons: Home, Refresh, List, Bar Chart, Line Chart, Left Arrow, Right Arrow, Zoom In, Zoom Out, KVA / Power Factor



Power Factor



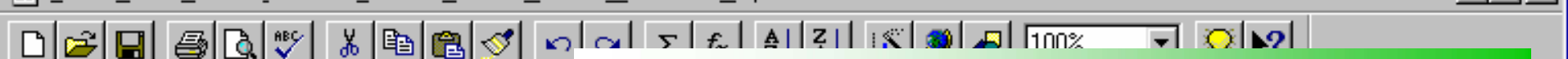
KVA Demand



ABC Company

4,310.9 KVA on Wed Dec 2 1998 11:30 (datapoint 18)

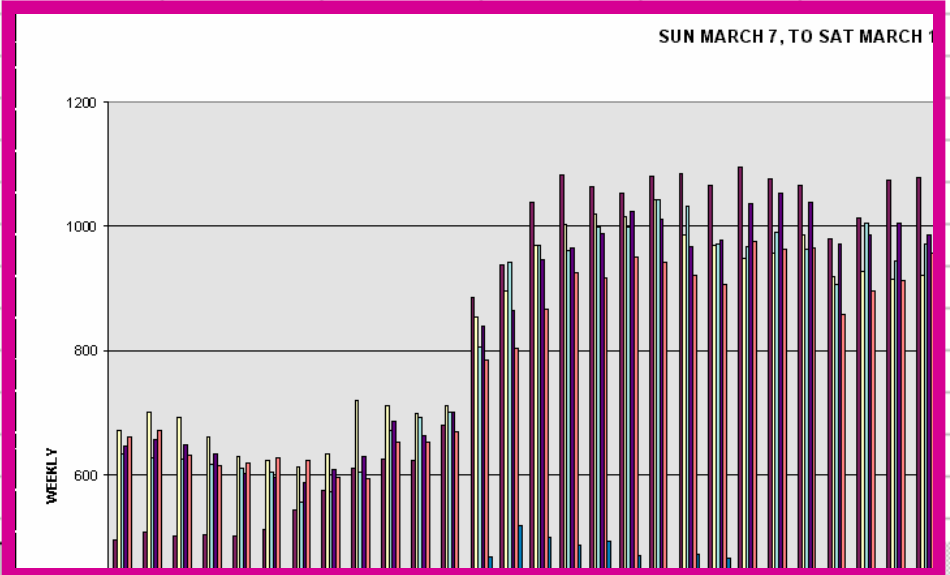




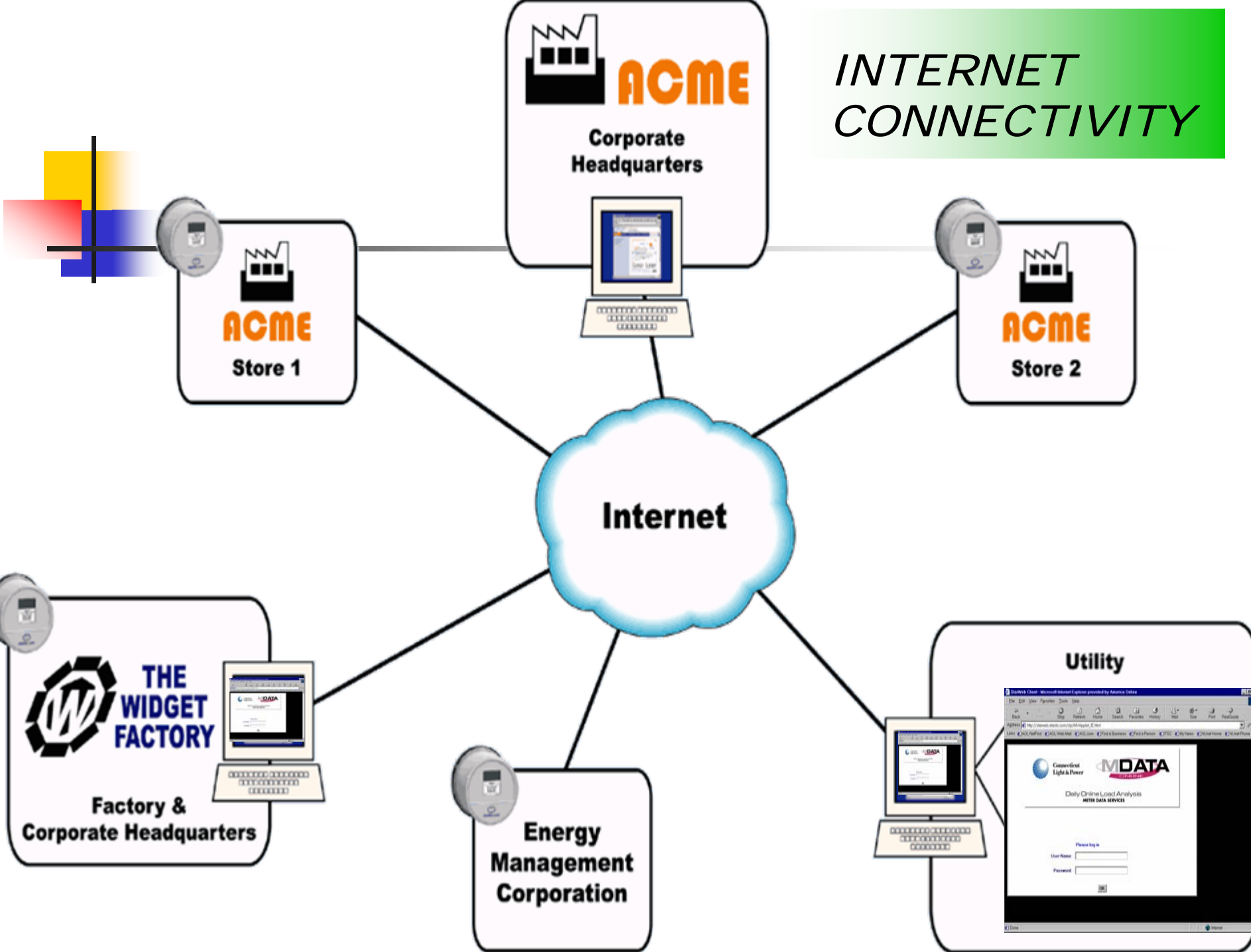
Arial 10 B I U

DOWNLOAD DATA

	A	B	C	D	E	F	G	H	I	J	K
1	METERID	DATE	TIME	INTERVAL	KWH						
2	ABC COM	12/2/98	7:00	15	740						
3	ABC COM	12/2/98	7:15	15	735						
4	ABC COM	12/2/98	7:30	15	743						
5	ABC COM	12/2/98	7:45	15	751						
6	ABC COM	12/2/98	8:00	15	757						
7	ABC COM	12/2/98	8:15	15	738						
8	ABC COM	12/2/98	8:30	15	716						
9	ABC COM	12/2/98	8:45	15	713						
10	ABC COM	12/2/98	9:00	15	714						
11	ABC COM	12/2/98	9:15	15	717						
12	ABC COM	12/2/98	9:30	15	734						
13	ABC COM	12/2/98	9:45	15	748						
14	ABC COM	12/2/98	10:00	15	750						
15	ABC COM	12/2/98	10:15	15	751						
16	ABC COM	12/2/98	10:30	15	726						
17	ABC COM	12/2/98	10:45	15	749						
18	ABC COM	12/2/98	11:00	15	783						
19	ABC COM	12/2/98	11:15	15	801						
20	ABC COM	12/2/98	11:30	15	935						
21	ABC COM	12/2/98	11:45	15	879						
22	ABC COM	12/2/98	12:00	15	812						
23	ABC COM	12/2/98	12:15	15	793						
24	ABC COM	12/2/98	12:30	15	826						



INTERNET CONNECTIVITY





Who do you call?

Facility Metering & Usage Analysis

- Where can we get help with metering or billing issues at CL&P?
 - Account Executives (C&I 350 kW and up)
 - You should know who this is. I'll help you if you don't.
 - Business Solution Center (C&I up to 350 kW)
 - <http://www.cl-p.com/online/business/solutions/indexsolutions.asp>
 - Consultants are available to assist you. Contact us by [e-mail \(BusinessSolutions@nu.com\)](mailto:BusinessSolutions@nu.com) or call toll-free at 1-888-783-6617, Monday through Friday from 8:00 a.m. to 4:30 p.m.
 - Meter Engineering
 - <http://www.cl-p.com/online/business/meter/indexmeter.asp>
 - Contact Dave Scott directly (860.665.2933) or
 - [e-mail \(MeteringServices@nu.com\)](mailto:MeteringServices@nu.com)