



U.S. Department of Energy
**Energy Efficiency
and Renewable Energy**

Bringing you a prosperous future where energy
is clean, abundant, reliable, and affordable

Federal Energy Management Program



Long Beach, California • August 14-17, 2005

**The Solutions
Network**

Using Meter Data

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Principal REM

Navy Region Southwest

Metering - An Energy Manager's Most Powerful Tool



Jon Duke

August 16, 2005

Why Meter?

“Building Level Meters Can Help”

- Jim Heller

- “...Save Money, Manage Energy Use
- Bill Tenants for Usage
- Raise Awareness of Costs/Consumption
- Benchmark Against Similar Buildings
- Identify Nighttime and Base Loads
- Identify ECO & Peak Shaving Opportunities
- M&V”



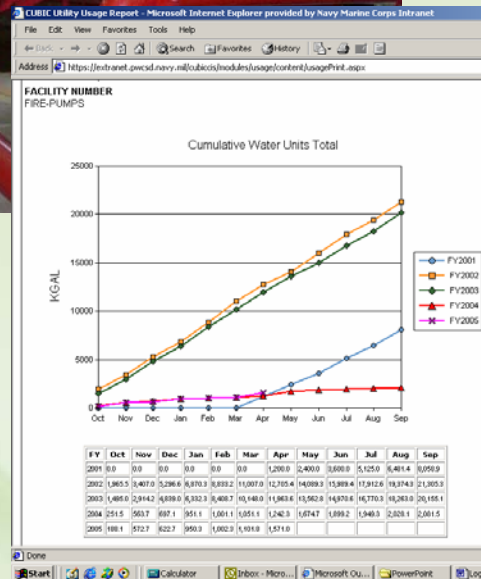
Save Money...



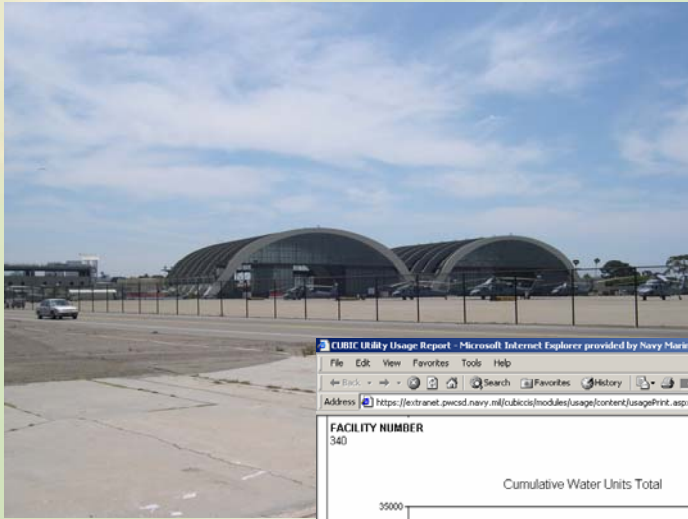
Hangar Deluge Pumps, NAS North Island, 2004

Base billed 20 MGY water & sewer for deluge pump testing. REMs investigated water ECO, found sewer charges invalid, water bill too high for process.

- Saved \$107,000/year sewer
- Saved \$110,000/year water
- Immediate savings
- No cost, no project, no risk
- Savings continuing



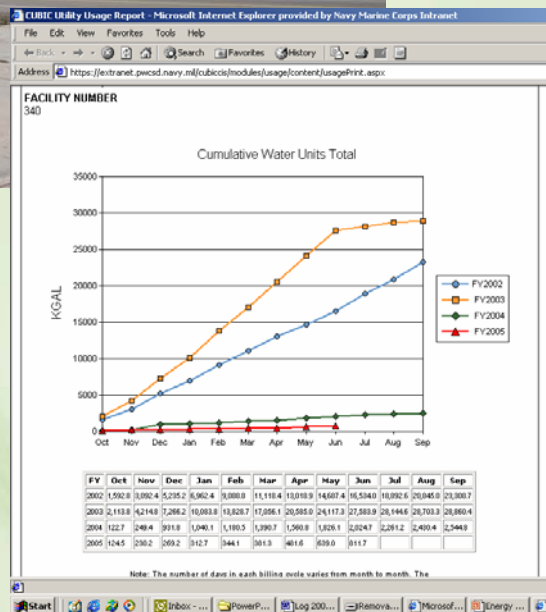
...Manage Energy Use



Hangar 340, NAS North Island, 2003:

Meter data indicated excessive water & sewer use. REMs followed up to eliminate waste. Key points:

- Saved 35 MGY water & sewer immediately
- Saved \$393K/year
- No cost, no project, no risk
- Savings continuing
- Using meter data to monitor



Bill Tenants...

The image shows two overlapping Excel spreadsheets. The top spreadsheet, titled 'Vending_Machine_surveys 3-16-04', contains a table with columns for Machine Number, Location, Size of Machine, Date Meter Installed, Date Meter Removed, Total Hours Read, kWh per Hour, kWh per 24 hours, Monthly kWh, Monthly Estimated Cost, and Per Year kWh. The bottom spreadsheet, titled 'Vending Machine Energy Costs - NRSW Bases - FY05', contains a table with columns for Machine Type, Location, Configuration, kWh per Hour, kWh per 24 hours, kWh per Month, kWh per Year, and Estimated Costs for Coronado and San Clemente Is.

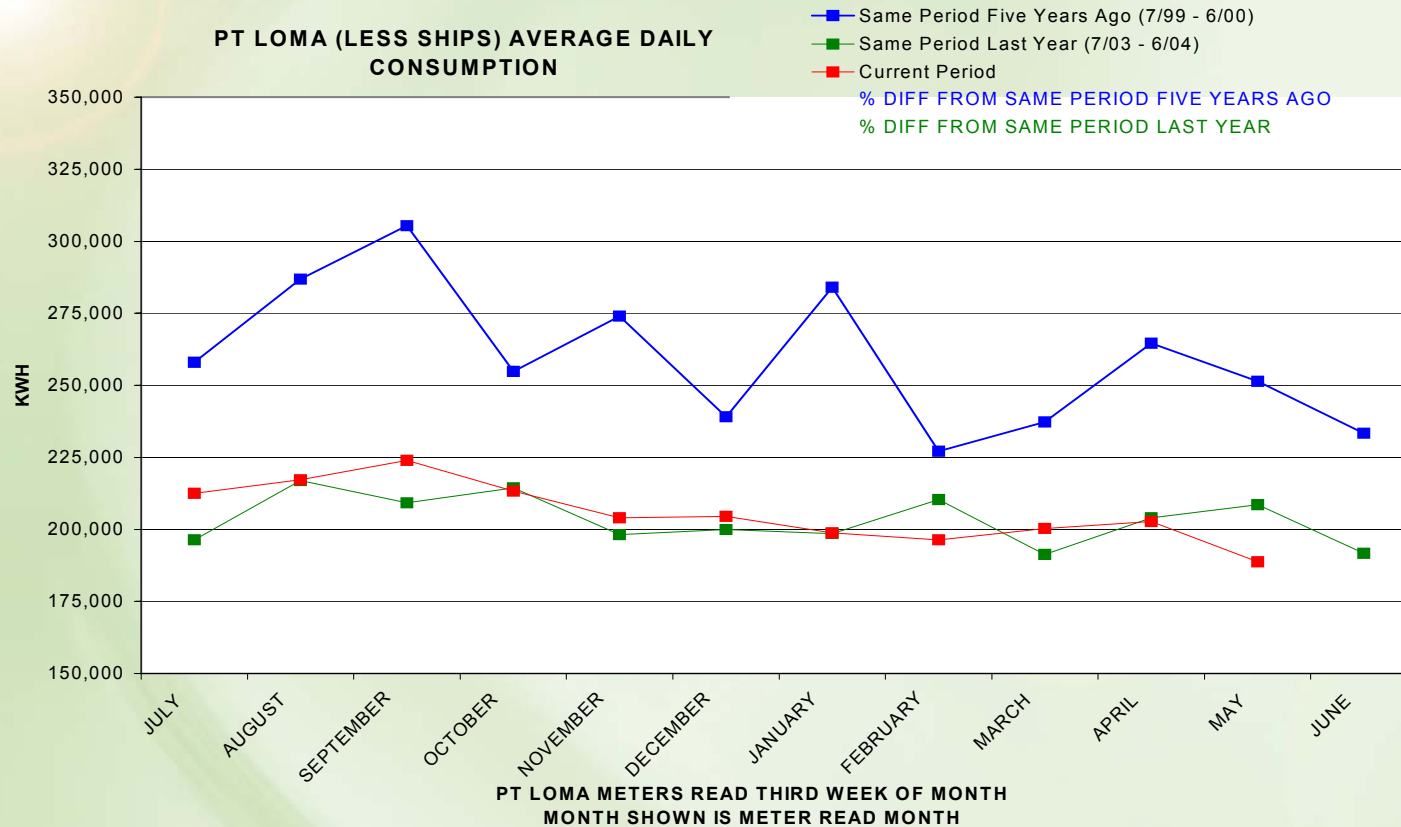
Use meter data to

- Properly bill tenants
- Ensure your base is being billed properly
- Make everyone accountable
- Provide financial incentives to save



Raise Awareness...

Provide energy management metrics to key decision makers



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Raise Awareness...

“Push” the right cost & consumption data out to the right people

The screenshot shows a web browser window displaying the CUBIC PushBill application. The application is titled "CUBIC PushBill - Microsoft Internet Explorer provided by Navy Marine Corps Intranet". The main content area shows a table of energy usage and costs for various facilities. The table is organized into sections for different facility numbers, each with a "Total for Facility Number" header and a "Graph Units | Graph Cost" link. The table columns include Fiscal Year, Current Month Usage, Current Month Units, Current Month Avg Daily Usage, Year-to-Date Usage, Year-to-Date Avg Daily Usage, Current Month Cost, and Year-to-Date Cost.

Total for Facility Number: Facility Number: 11							
Fiscal Year	Current Month Usage	Current Month Units	Current Month Avg Daily Usage	Year-to-Date Usage	Year-to-Date Avg Daily Usage	Current Month Cost	Year-to-Date Cost
2005	254.4	MWH 9.1		2,885.8	10.6	\$38,518	\$419,095
2004	338.9	MWH 12.1		3,711.2	13.6	\$49,578	\$509,360

Total for Facility Number: Facility Number: 12							
Fiscal Year	Current Month Usage	Current Month Units	Current Month Avg Daily Usage	Year-to-Date Usage	Year-to-Date Avg Daily Usage	Current Month Cost	Year-to-Date Cost
2005	16.2	MWH 0.6		283.4	1.0	\$2,457	\$40,644
2004	9.8	MWH 0.4		362.3	1.3	\$1,433	\$48,564

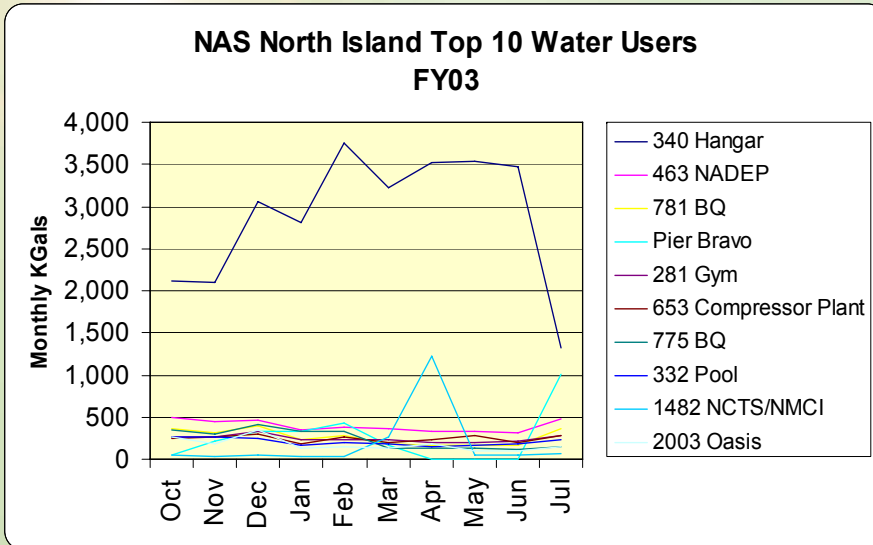
Total for Facility Number: Facility Number: 12-A							
Fiscal Year	Current Month Usage	Current Month Units	Current Month Avg Daily Usage	Year-to-Date Usage	Year-to-Date Avg Daily Usage	Current Month Cost	Year-to-Date Cost



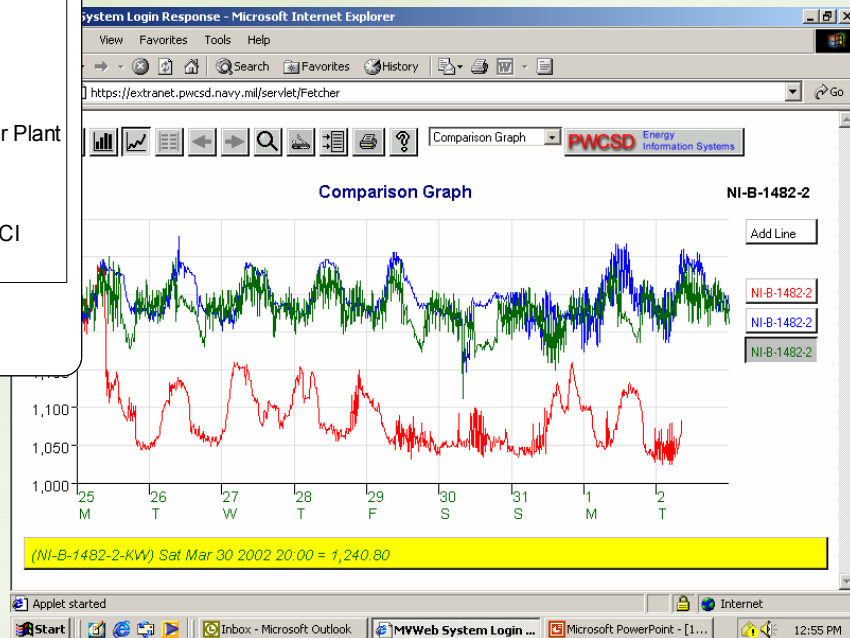
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Benchmark...



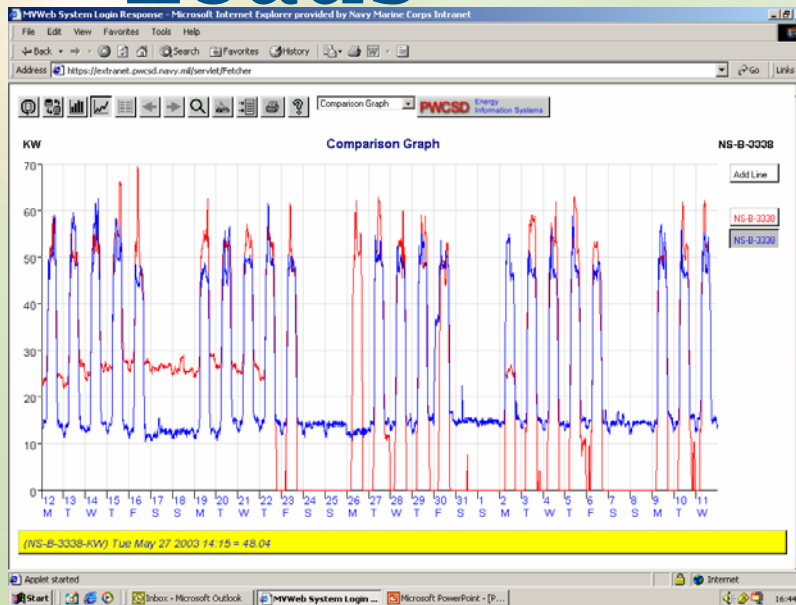
Top consumers, like facilities, etc., against each other



Same facility relative to previous periods



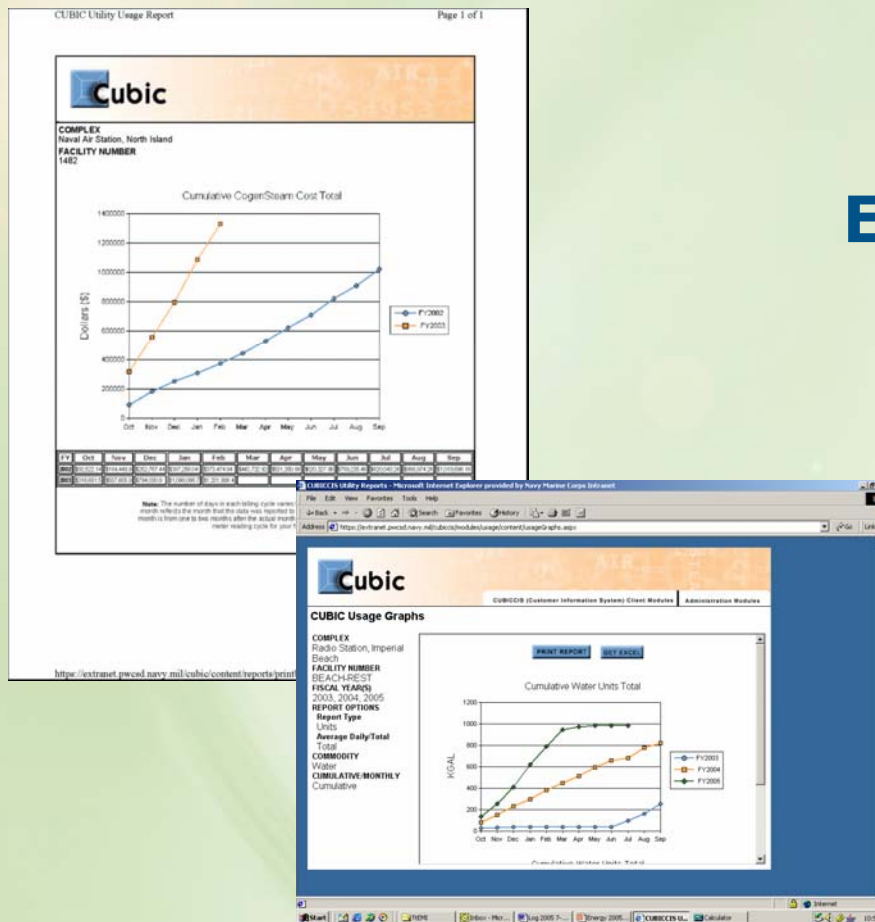
Identify Nighttime & Base Loads



Example: Bldg 3338, NAVBASE San Diego

- Used to go to zero demand overnight
- Building Monitor changed, demand went up
- REM identified trend, educated new Monitor, overnight demand went back to zero

Identify ECOs...

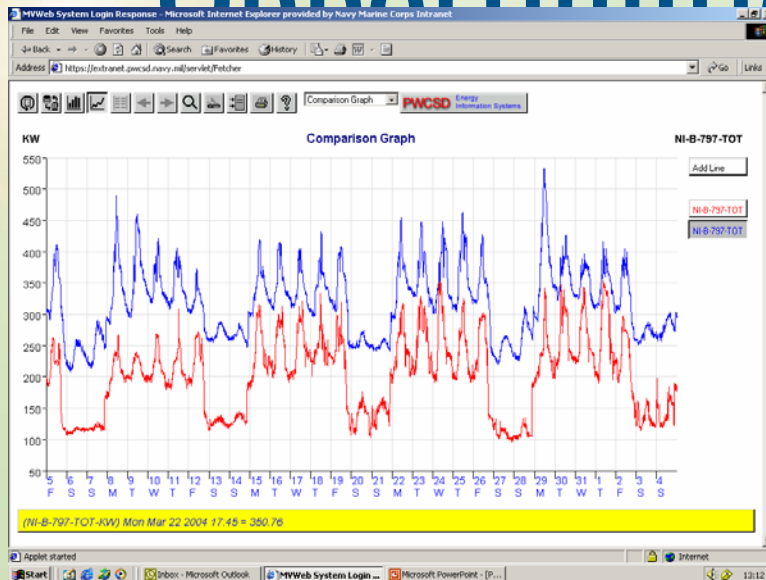


ECOs can be great or small...

- Saving big money in complex data center
- Saving thousands by securing water leak



Identify Peak-Shaving Opportunities



Typical load curve for aircraft simulator facility

- High peak demands
- Weekday base loads higher than weekends
- Good demand reduction vs last year
- Room for improvement

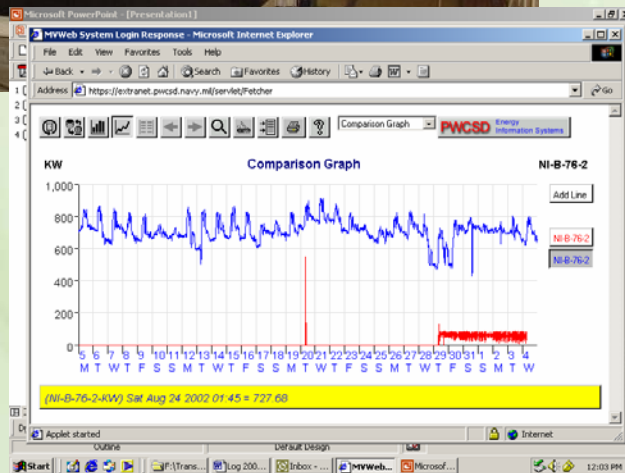


M&V



CVN Compressor Controls Improvements, NAS North Island, ESPC Project, 2003

- MVWeb load curve data illustrates demand reduction achieved
- Metering provides M&V data in support of \$300,000 utility incentive
- Metering helps PWC ensure continued efficient O&M

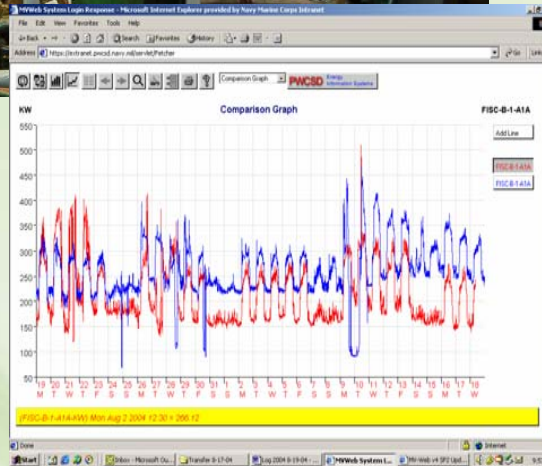


M&V



Turbocor Chiller Compressor Retrofit, Bldg 1, NAVBASE San Diego, 2004

- MVWeb load curve data documents up to 100 kW demand reduction
- Metering provides M&V data in support of \$85,000 utility incentive
- Metering helps document energy & cost savings of this Techval project





2005
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