

ION Enterprise & ION EEM Overview

Sean Farragher
Solutions Sales Engineering
Services & Projects



PowerLogic ION Enterprise



Helps engineering and management personnel meet operational goals:

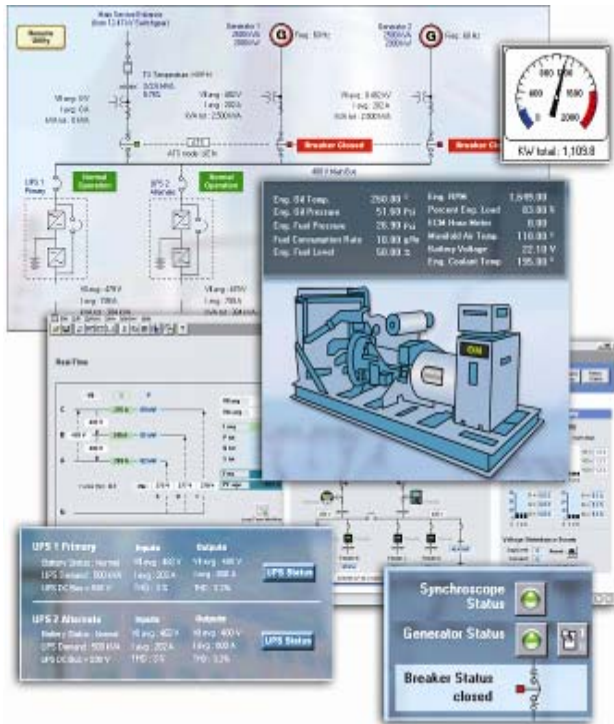
- Improve efficiency and cut energy-related costs
- Assure reliability and reduce downtime
- Optimise equipment utilisation and reduce the cost of operations

Data acquisition and integration



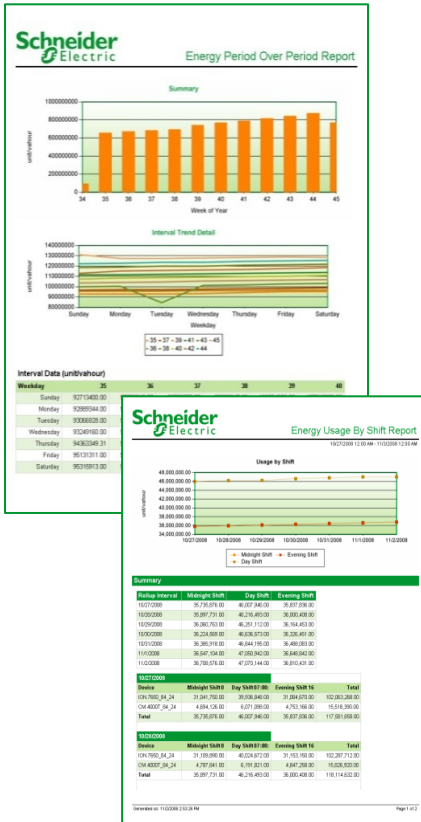
- Combined metering: electricity, gas, steam, air, water
- Monitor your distribution system, including:
 - PowerLogic meters
 - Circuit breakers
 - Protective relays
- Interface with third-party meters, transducers, PLCs, RTUs, power distribution or mitigation equipment:
 - Quickly add/configure Modbus RTU/TCP communications using templates
 - Connect transducers or other devices to the digital/analog inputs of PowerLogic meters.
- Integrate with other systems:
 - Energy management, SCADA, BAC, DCS, ERP
 - Use ODBC, XML, OPC, email, FTP, CSV, PQDIF, web services

Real-time monitoring



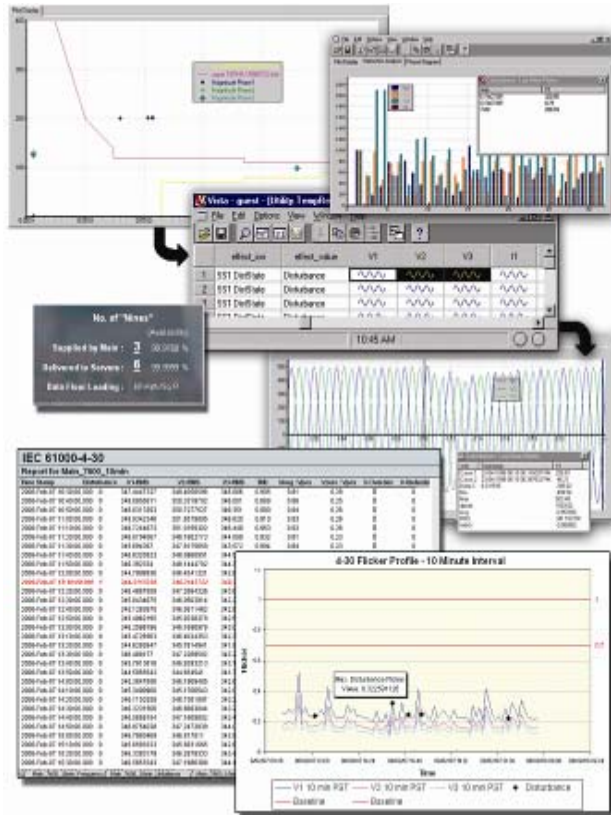
- View key distribution points
- Access from any workstation:
 - Real-time power and energy
 - Historical trends and data logs
 - Alarm conditions
 - Select pre-configured diagrams or easily create customised views
- Point-and-click navigation to reveal deeper layers of detail

Reporting



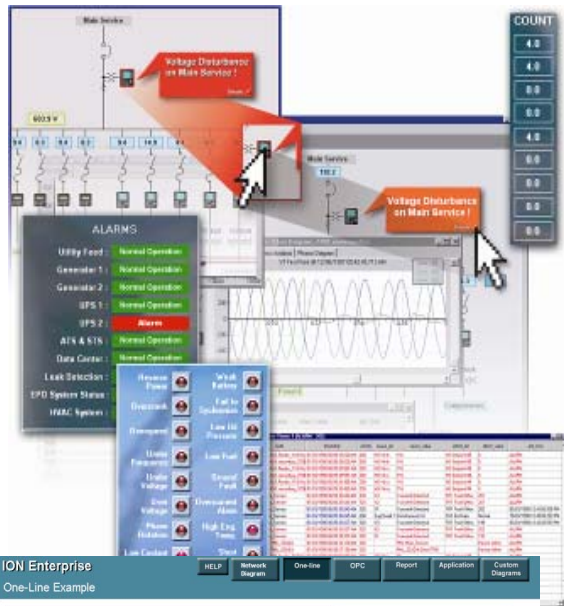
- Generate manually, scheduled or event-driven
- Distribute automatically as email, web, PDF, XML, and HTML
- Standard reports:
 - Aggregate energy and demand
 - Aggregate load profiles
 - Aggregated views of Energy usage by shift
 - IEC 61000-4-30 and EN50160 power quality compliance
 - Power Quality analysis
 - Multi-device energy usage
 - Tabular and Trend Views for any measurement
 - Alarm history
 - System Configuration Report

Power quality analysis

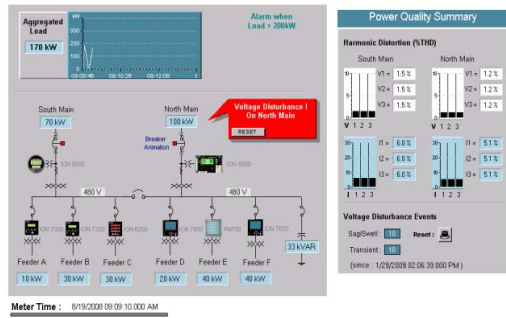


- Continuous, wide-area monitoring, data capture and reporting
- IEC 61000-4-30 and EN50160 compliance reports – view indices as numeric charts or graphic profiles
- Harmonic histograms, THD, K-factor, crest factor, phasors, symmetrical components
- Waveforms – long durations, overlays to correlate phase-to-phase
- Plot sags, swells, transients on industry-standard tolerance curves (ITIC/CBEMA, SEMI)
- Click on a time-stamped event to see more detail

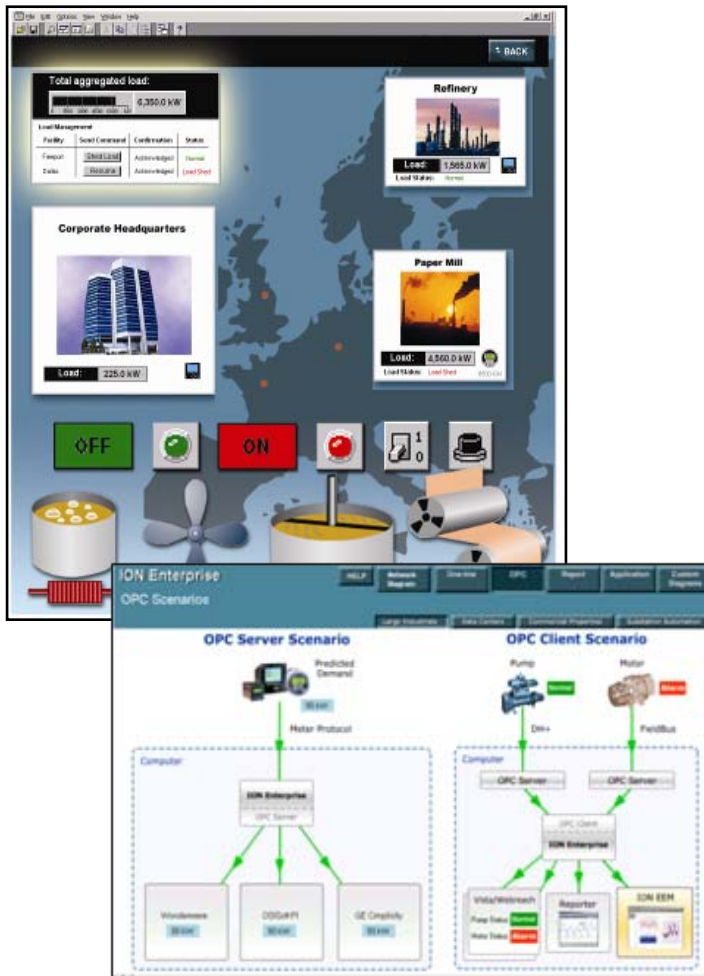
Alarms and events



- Receive alerts to outages or impending problems
- Trigger on PQ events, thresholds or equipment conditions
- Trigger on complex/summary conditions
- Alarms from meters are immediately pushed to the system level
- Automatically:
 - Send out customised notifications to workstations, email, cell phone, PDA
 - Upload all associated event data
 - Generate a report
 - Log complete information (coincident conditions, waveforms, timestamps)



Manual and automated control



- Supervisory equipment control
- Perform manual control via on-screen trigger buttons
- Automated control:
 - Gathers data from multiple devices
 - Incorporates process variables
 - If predefined thresholds are exceeded, initiates coordinated control actions over multiple loads or other equipment

PowerLogic ION EEM



Enterprise Energy Management (EEM)

- EEM provides:

- Identification, justification, & prioritization of energy savings projects
- Auditing
 - Performance reporting: Actual vs Baseline vs Target
 - Evidence of success: Return on Investment (ROI)
- Early detection of poor performance
 - Energy modeling
- Support for energy budgeting & forecasting
- A tool for achieving and maintaining a rating (ex: Energy Star, LEED)
- A tool for supporting the financial valuation of assets

PowerLogic ION EEM: Applications

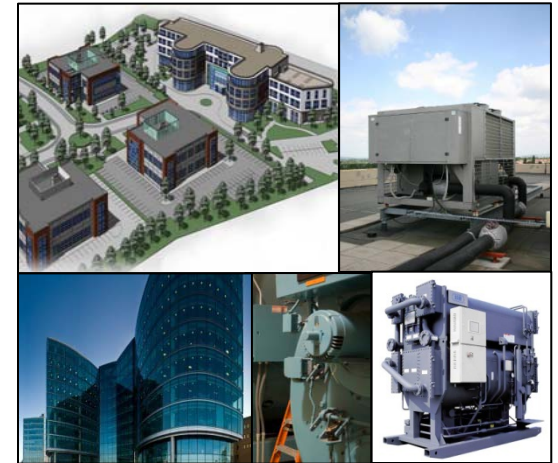
- PowerLogic EEM supports:



Energy Conservation



Environmental Management



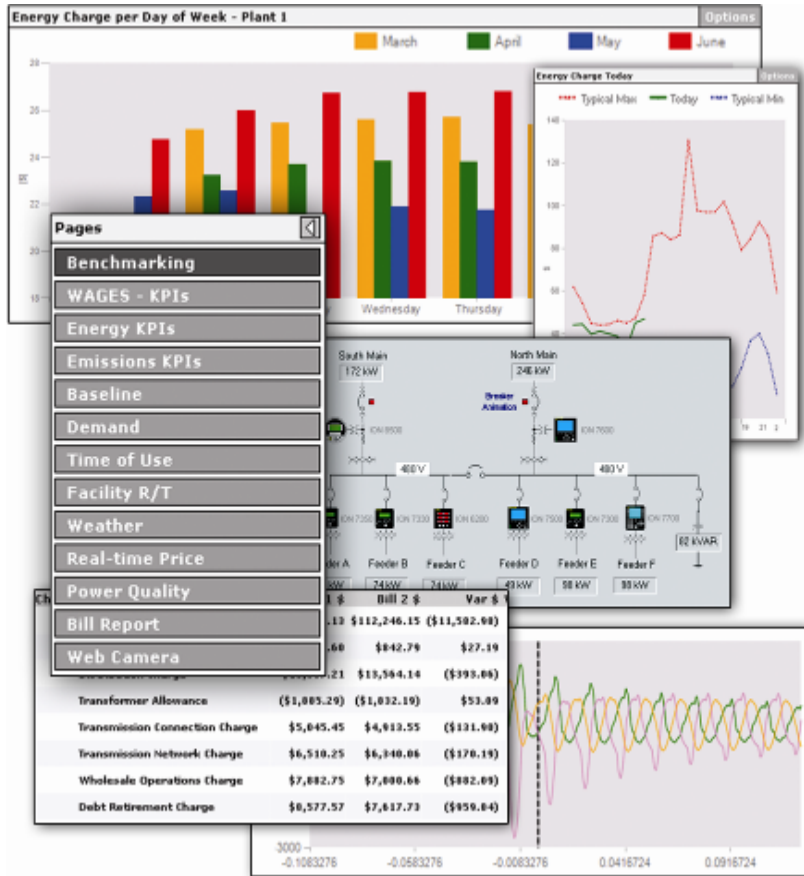
Operational Excellence

PowerLogic ION EEM: Energy Conservation



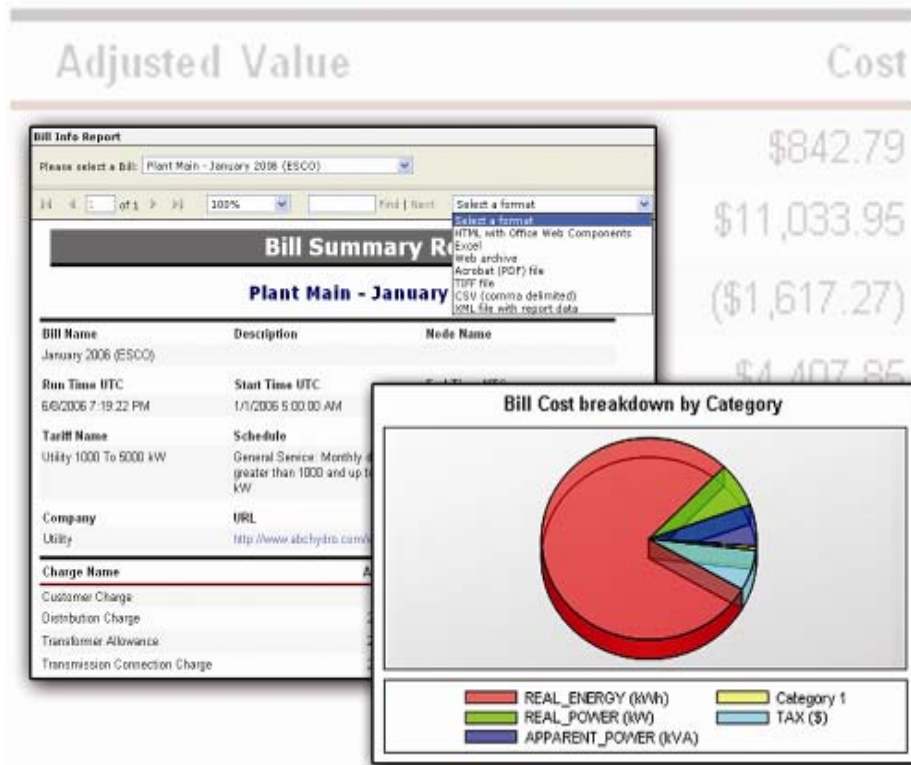
- Drive energy awareness and behavior
- Allocate energy usage and/or costs to Cost Centers/Customers
- Audit Utility bills
- Optimize energy procurement
- Identify, prioritize, justify, & audit energy savings projects
- Normalize, compare, and track energy usage, intensity, and costs
- Model, baseline, compare, and track equipment/process/plant/generation efficiency
- Forecast energy usage and costs
- Track actual usage vs budget vs target

Web Portal



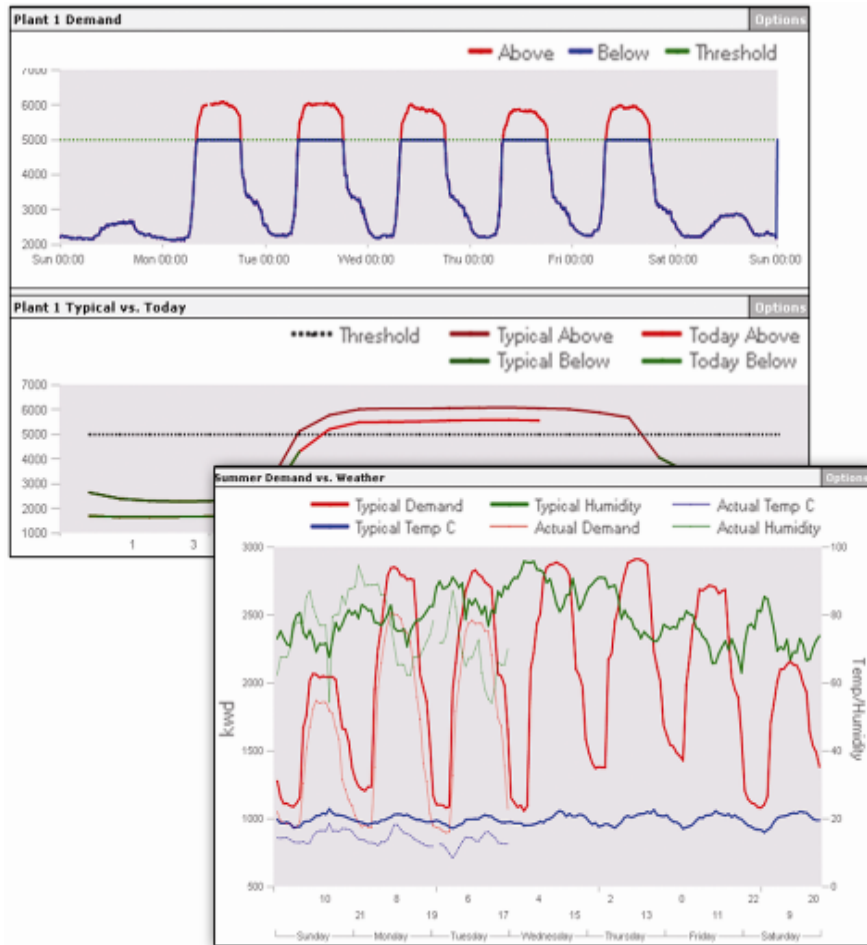
- User/group security managed access
- Browser-based access, personalised dashboards
- Variety of data formats, integration of external web content
- “Drill-down” analysis
- Real-time content from PowerLogic ION Enterprise™ or PowerLogic System Manager™ software, or third-party systems

Reporting Engine



- Rich reporting features with graphics
- Generate billing, energy or power quality reports
- Zoom, search and export
- E-mail or HTML delivery, scheduled
- Custom report development from Schneider Electric services group

Trend Analysis



- Easy-to-use visualisation tools
- Applies business intelligence concepts to energy analysis
- Aggregates data from different sources
- Hierarchical views: cost centres, business units, buildings, etc.
- Reveals complex relationships between the influences on energy efficiency and cost
- Displays historical or predicted trends in different time dimensions
- Colour coding and overlays
- Reduces time series data to statistical rollups of information.

Cost Allocation module

Cost Centers - By Commodity			
Monday, January 01, 2007 to Saturday, March 31, 2007			
Chilled Water			
Description	Consumption		Cost
	Actual	Adjusted	
Building 2	21,056,691.09	21,056,691.09	\$179,425.04
Building 3	1,558,323.97	1,558,323.97	
Facility	39,811,117.43	39,811,117.43	
Finance Dept.	12,634,024.65	12,634,024.65	
HR Dept.	9,093,609.98	9,093,609.98	
Packaging Dept.	697,645.79	697,645.79	
Plant	8,204,182.37	8,204,182.37	
Plant Process Line 1	5,742,871.64	5,742,871.64	
Plant Process Line 2	2,461,310.71	2,461,310.71	
R&D Dept.	892,678.18	892,678.18	

Cost Centers - By Source			
Monday, January 01, 2007 to Saturday, March 31, 2007			
Building 2			
Commodity	Consumption		Cost
	Actual	Adjusted	
Chilled Water	21,056,691.09	21,056,691.09	\$179,425.04
City Water	888,078.80	888,078.80	\$7,408.80
Electricity	1,066,299.73	1,066,299.73	\$598,272.34
Gas	.00	.00	\$9.00

City Water			
Description	Consumption		Cost
	Actual	Adjusted	
Building 2	888,075.60	888,075.60	\$13,189.50
Building 3	8,466,744.40	8,466,744.40	\$72,843.73
Facility	9,364,065.05	9,364,065.05	\$693,081.67
Finance Dept.	932,845.36	932,845.36	
HR Dept.	213,138.14	213,138.14	
Packaging Dept.	3,808,884.88	3,808,884.88	
Plant	19,245.05	19,245.05	
Plant Process Line 1	7,171.84	7,171.84	
Plant Process Line 2	3,073.52	3,073.52	
R&D Dept.	4,698,199.42	4,698,199.42	

Building 3			
Commodity	Consumption		Cost
	Actual	Adjusted	
Chilled Water	1,558,323.97	1,558,323.97	\$13,189.50
City Water	8,466,744.40	8,466,744.40	\$72,843.73
Electricity	1,239,899.40	1,239,899.40	\$693,081.67
Gas	.00	.00	\$9.00

Facility			
Commodity	Consumption		Cost
	Actual	Adjusted	
Chilled Water	39,811,117.43	39,811,117.43	\$262,449.18
City Water	9,364,065.05	9,364,065.05	\$80,435.46
Electricity	9,842,391.47	9,842,391.47	\$3,138,829.83
Gas	159,915,629.28	159,915,629.28	\$1,097,100.00

Campus Cost Allocation Summary				
Monday, January 01, 2007 to Wednesday, January 31, 2007				
Electricity				
Cost Center	Description	Consumption		Cost
		Actual	Adjusted	
R2416	Administration	414,720.8000	474,064.4175	\$38,880.32
FA743	College of Engineering	2,383,320.8000	2,581,385.7322	\$165,683.28
8W849	College of Nursing	5,149,216.8000	5,248,255.9410	\$388,881.28
PC247	Medical Center	3,867,880.8000	4,482,345.3813	\$375,686.84

Steam				
Cost Center	Description	Consumption		Cost
		Actual	Adjusted	
R2416	Administration	107,150.8000	218,653.5725	\$13,614.54

Individual Charge Breakdown					
Cost Center	Utility	Description	Consumption		Cost
			Actual	Adjusted	
8W849	Electricity	College of Nursing	5,149,216.8000	5,248,255.9410	\$388,881.28
8W849	Steam	College of Nursing	2,824,704.8000	2,222,913.6320	\$140,710.88
Total					\$498,711.36

- Accurately allocates energy costs by cost centre, department, production line or user-defined time periods, based on actual energy usage
- Breaks out charges for each utility type
- Simplifies the cost allocation process and ensures total utility costs are allocated
- Adjusts for system losses and cases where the sum of sub-meters does not equal main meter
- Makes cost allocation results available for trending, etc.
- Distributes reports via e-mail or web

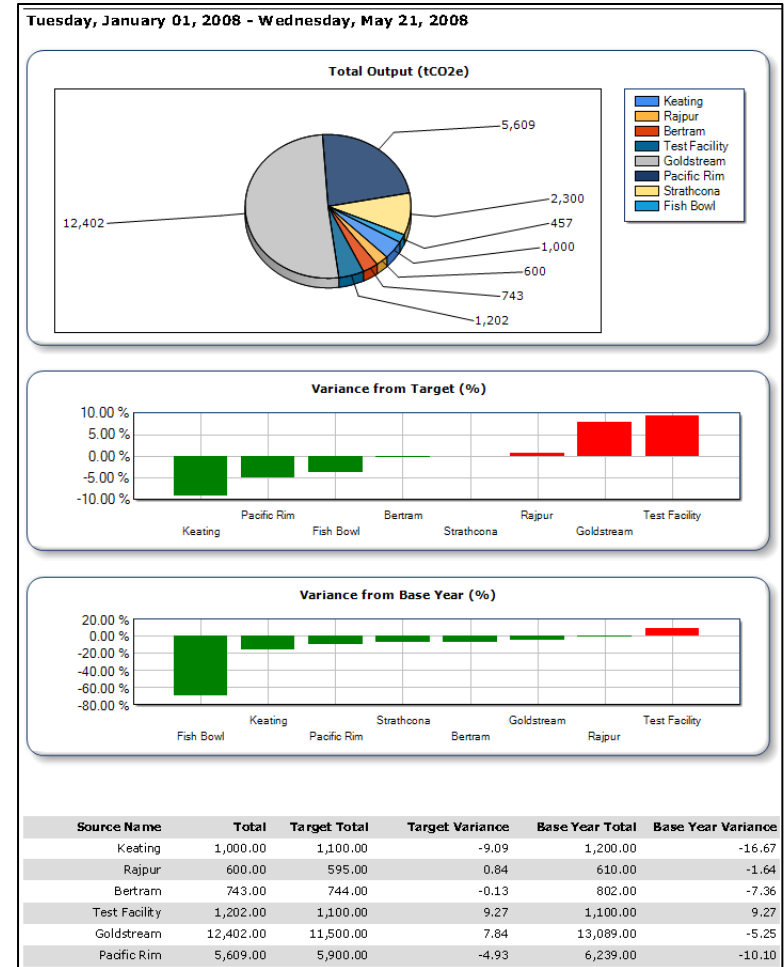
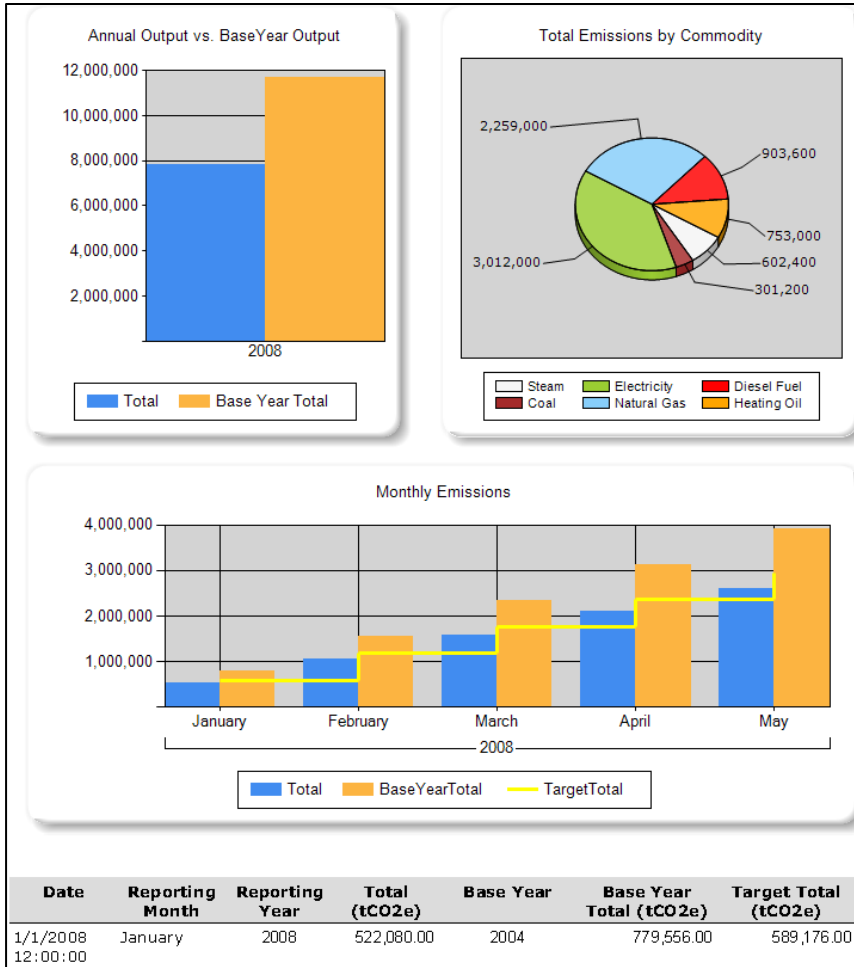
PowerLogic ION EEM: Environmental Management



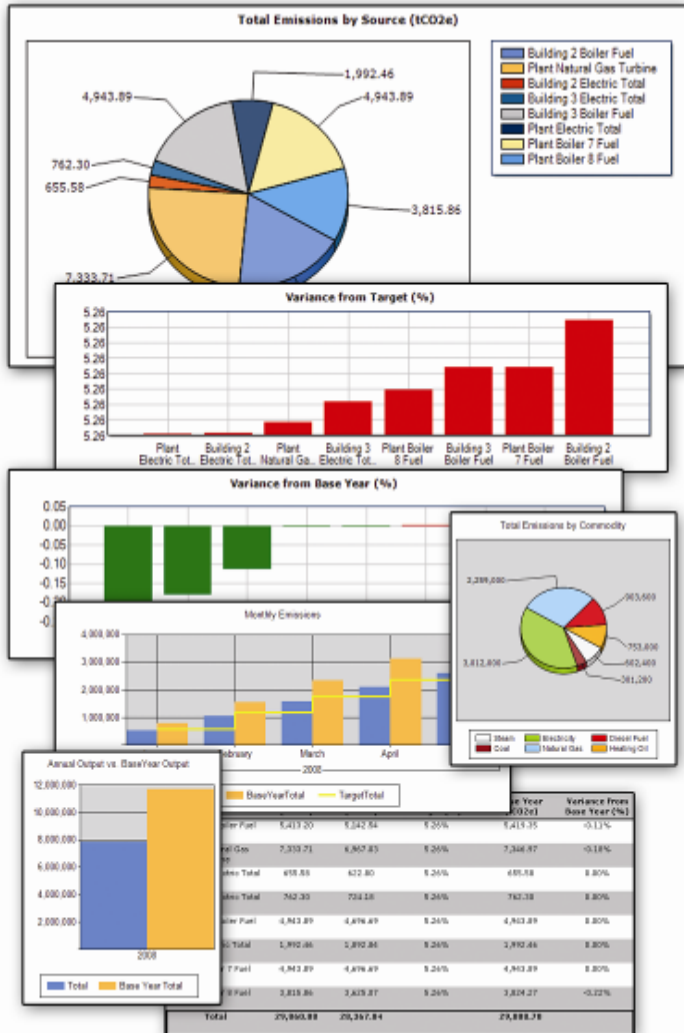
- Environmental reporting
 - Greenhouse gases
 - Airborne pollutants
 - General waste
 - Process waste (ex: landfill, organic, recycling)

- Regulation compliance reporting
 - Boilers
 - Onsite generators
 - Industrial processes

Emissions Reporting



Emissions Reporting



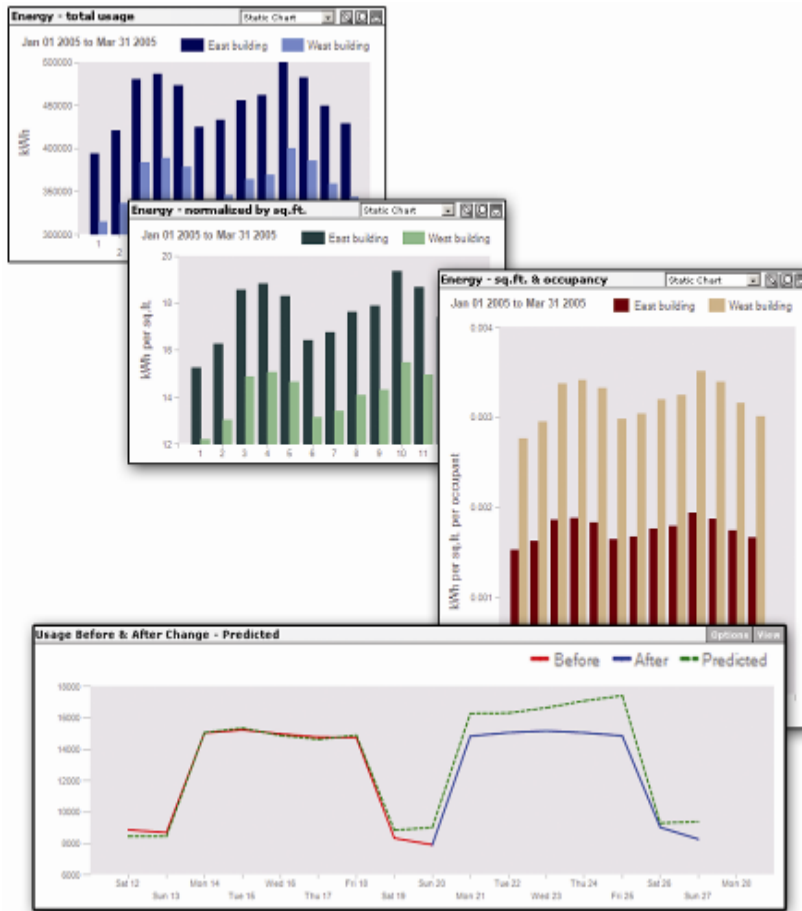
- Converts energy data into GHG emissions by applying CO₂-equivalent (CO₂e) factors
- Accurately reports on emissions from:
 - Direct sources: boilers, furnaces, vehicles, chemical production, etc.
 - Indirect sources: purchased electricity or steam
- Aggregates data from all business units
- Tracks success of reduction projects:
 - compares monthly CO₂e to targets, base year
 - breaks down CO₂e by commodity (fuel type)
- Compares different business units, regions, buildings, departments, etc.

PowerLogic ION EEM: Operational Excellence



- Identify, analyze, resolve, and track power quality issues that affect process/equipment reliability
- Identify, track, and minimize electrical losses
 - Current harmonics
 - Distribution
 - Power factor
- Capacity planning
- Equipment & infrastructure troubleshooting, preventative maintenance, & optimization
- Determine optimal run schedules for HVAC and generation equipment

Energy Modelling Module



- Models energy performance based on all relevant drivers
- Increases accuracy of:
 - benchmarking and comparison of facilities or processes
 - validation of savings against a baseline
 - forecasting of energy needs
- Regression and correlation*
- Normalises energy by weather, square footage, production volume, etc.
- Integrates relevant external data, e.g. equipment efficiency ratings, age, total/leasable space, occupancy, etc.
- Gauges dependencies and outcomes

* based on *ASHRAE Guideline 14, Measurement of*

Bill Analysis module

Bill 1 \$	Bill 2 \$	Var \$	Var \$ (%)
\$11,136.60	\$5,121.65	(\$6,014.95)	-54.01 %

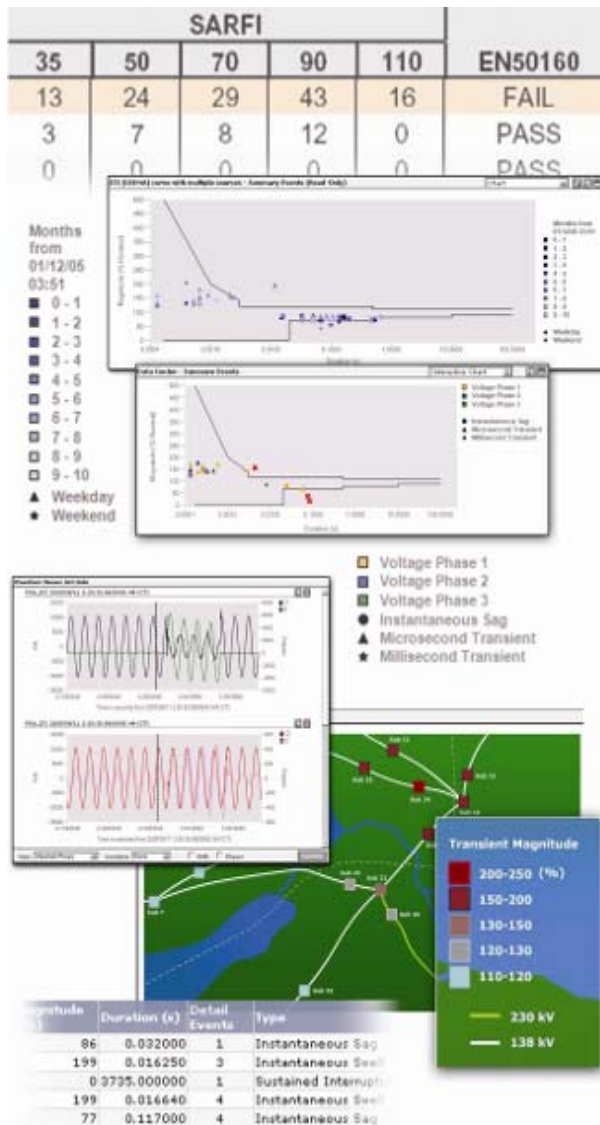
Charge	Bill 1 \$	Bill 2 \$	Var \$	Var \$ (%)	Bill 1 Units	Bill 2 Units	Var Units	Var Units (%)
Total	\$11,136.60	\$5,121.65	(\$6,014.95)	-54.01 %				
Basic Charge	\$4.15	\$4.15	\$0.00	0.00 %				
<input type="checkbox"/> Energy Charge								
0 to 14800 kWh	\$498.76	\$498.76	\$0.00	0.00 %	1.00 kWh	1.00 kWh	0.00 kWh	0.00 %
Over 14800 kWh	\$7,514.92	\$2,179.89	(\$5,334.93)	-70.93 %	246,862.75 kWh	76,291.59 kWh	-164,561.25 kWh	-66.90 %
<input type="checkbox"/> Demand Charge								
0 to 25 kW	\$0.00	\$0.00	\$0.00	0.00 %	164.82 kW	164.79 kW	-0.03 kW	-0.02 %
25 to 150 kW	\$381.80	\$0.00	(\$381.80)	-100.00 %	1.00 kW	0.00 kW	-1.00 kW	-100.00 %
Over 150 kW	\$1,309.84	\$1,309.84	\$0.00	0.00 %				
PST	\$128.47	\$128.47	\$0.00	0.00 %				
SST	\$888.24	\$888.24	\$0.00	0.00 %				

Charge	Cost	Based On
Total	\$7,309.84	
Basic Charge	\$4.15	
<input type="checkbox"/> Energy Charge		
0 to 14800 kWh	\$498.76	1.00 kWh
Over 14800 kWh	\$6,449.53	142,613.00 kWh
<input type="checkbox"/> Demand Charge		
0 to 25 kW	\$0.00	164.82 kW
25 to 150 kW	\$381.80	1.00 kW

Bill Details:	
Title:	May Bill
Status:	✔ This bill ran successfully.
Total Charge:	\$7,309.84
Description:	
Cost Center:	HQ.Main_Billing
DateTime Range (UTC):	2006-05-01 07:00 - 2006-06-01 07:00
Tariff:	Hydro 1200
Run DateTime (UTC):	8/26/2006 12:26:03 AM
Owner:	Administrator Account
Type:	Rate Engine Bill

- Inputs data for all commodity types (electricity, gas, water, etc.), combines with utility tariffs, generates business-relevant financial values
- Built-in rate engine with RateWizard™ accurately models and matches complex utility rate structures
- Validates utility bills
- Compares charges between or within organisations
- Runs 'what-if' scenarios to compare cost impacts of different tariffs
- Shares cost data with ERP or other applications

Power Quality module



- System-wide power quality and reliability analysis helps isolate problems
- Reports on international standards compliance (e.g. SARFI, EN50160, IEEE 1159)
- Trends performance over time
- Plots events against tolerance curves (ITI, CBEMA, SEMI-F47)
- Geographically maps events indicating age or severity
- Reduces data by visually categorising, classifying and correlating events with root causes
- Graphic waveform analysis with zooming, stacking and RMS overlays