emacx SYSTEMS
an energy technology company

Emacx Systems, Inc.

an energy technology company

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Emacx Systems, Inc. is an Energy Technology Company that provides sophisticated, turn key Intelligent Peak Load Control and Information Systems Solutions.

- We assist companies in reducing energy costs without interruption of operation or production

- Some of our Customers include: Macy's, Starwood Properties, Credit Suisse, Simon Properties, MSKCC, Mount Sinai Hospitals and others

- We are approved with utilities and authorities like: PSE&G, CL&P, LIPA, Con Edison, Sempra, Southern California Edison and NYSERDA

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- **We reduced** the peak load in the electrical grid more than 7 MW annually
- **We saved** our customers over 5,000,000 kWh per annum, resulting in a carbon footprint reduction of over 5,100,000 pounds
- **We saved** our customers more then $ 2.3 million by installing intelligent demand limiting systems
- **We ensured** our customers an average pay back of less then 1.8 years

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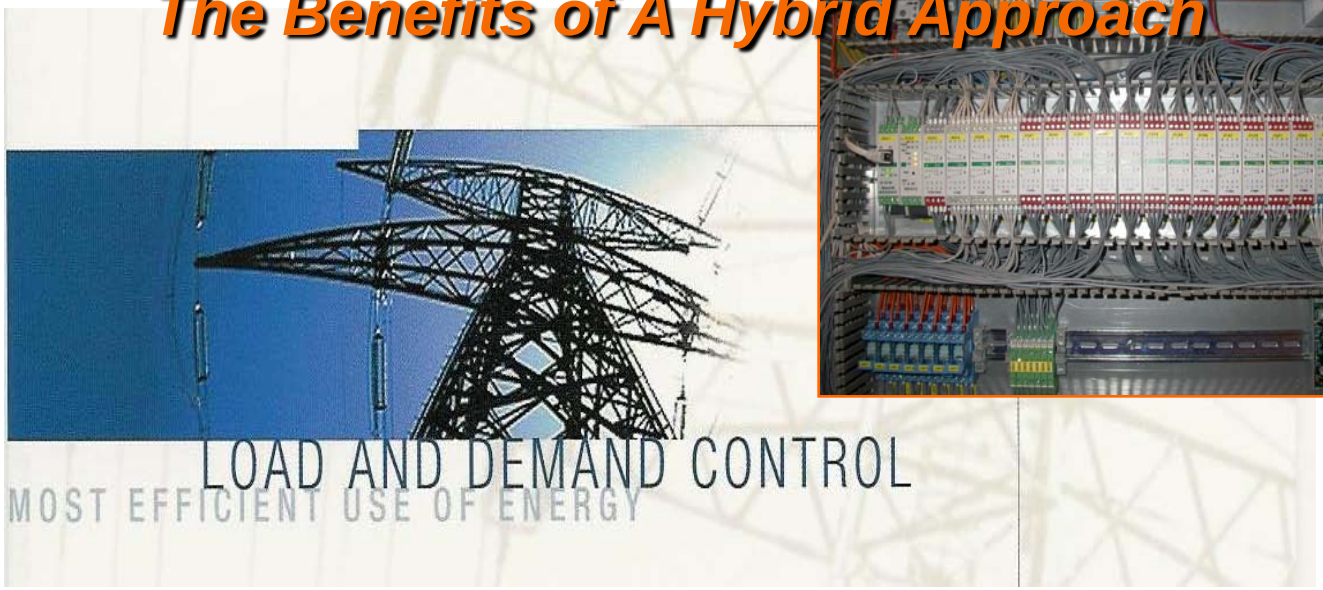
The Power of Demand Response and Demand Control

The Benefits of A Hybrid Approach



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Energy Management DC/DR Spectrum

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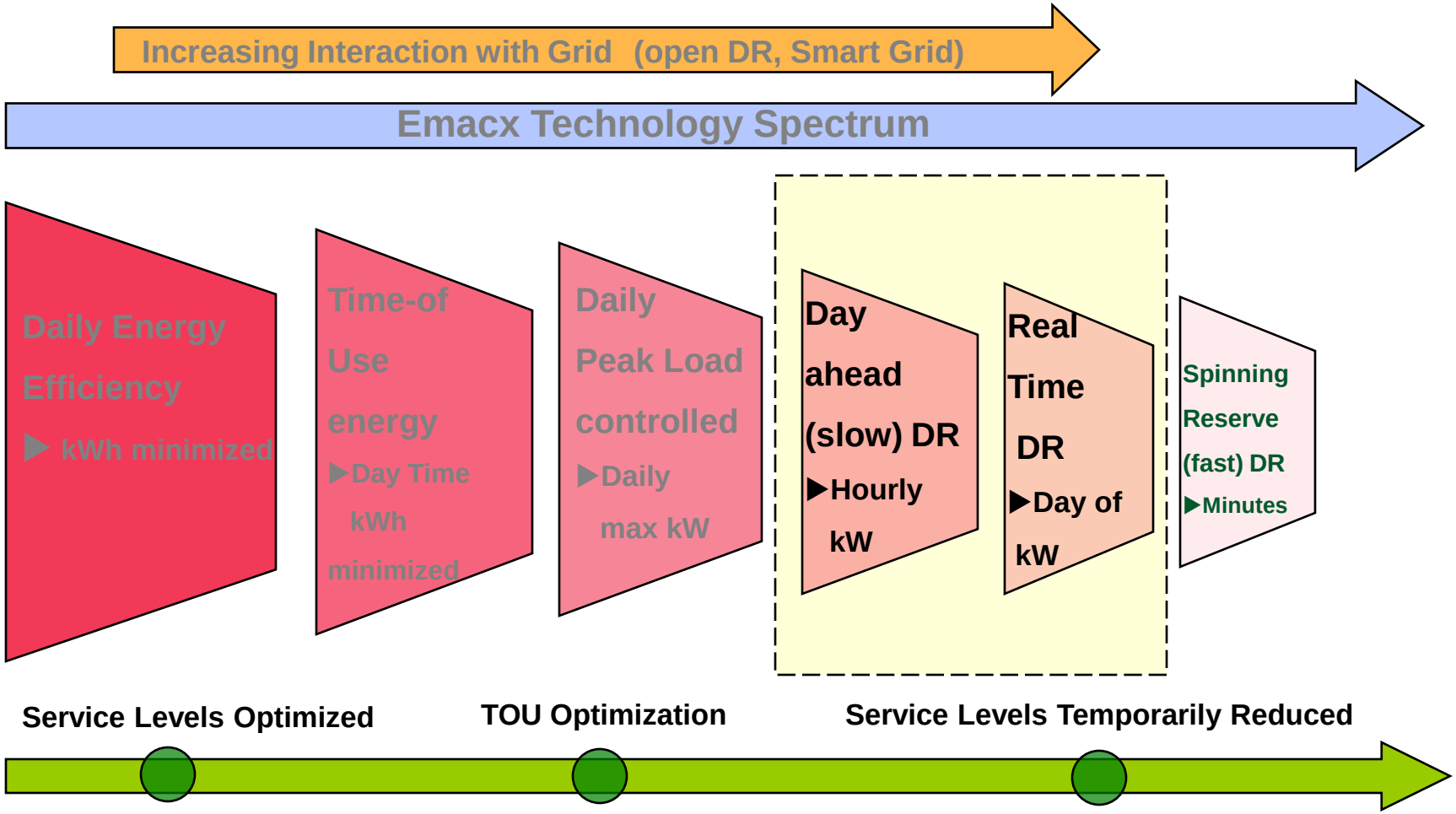

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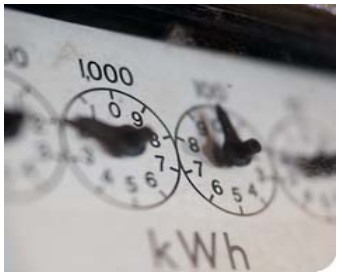
DR vs. DC

Demand Response

Is participating in voluntary efforts to reduce kW when generation capacity is at its limits.



Demand Control

Is the art of Intelligent Peak Load Control to avoid expensive daily demand peaks without jeopardizing operations.

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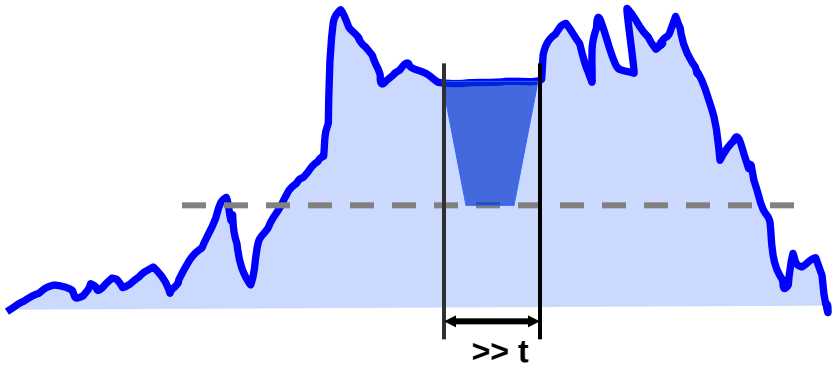
Characteristics DR vs. DC

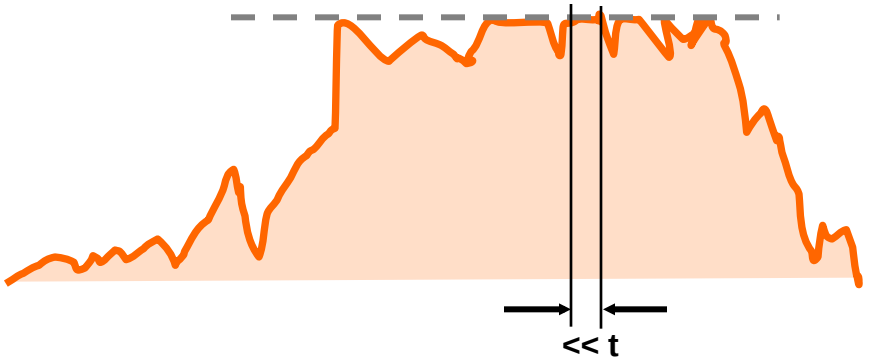
Characteristics of DR

- Longer Curtailment Time
- Lower Base Line
- >> kW Load Reduction



Characteristics of DC

- Shorter Curtailment Time
- Higher Base Line
- << kW Load Reduction



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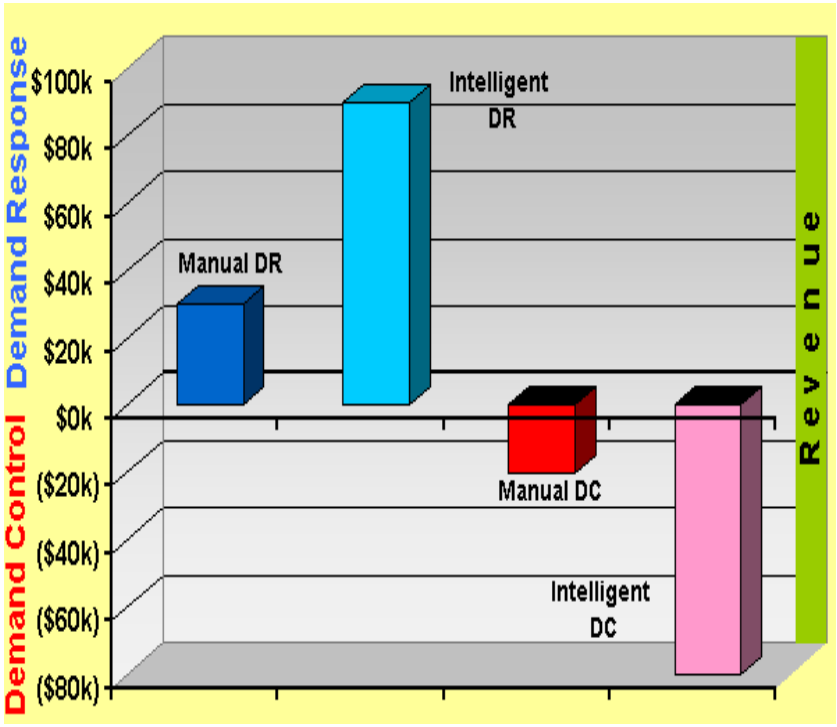
Manual DR vs. Intelligent DR

Manual Demand Response	Intelligent Demand Response
Events Require Trained Manpower	Fully Automated with Embedded Microprocessor Controller
Risk of Human Errors	Load Automatically Curtailed
Limited Load Shedding Strategy	Most Loads can be considered for DR
Limited Event Analysis Reports	Load Graph and Event Reports Automatically Generated for Validation & Verification
Separate Event Meter Necessary	Integrated Event Meter Connected to Utility Meter
Risk of Delayed DR Event Start and/or Finish	Automatic DR Event Initiation and Completion
Limited Feedback During an DR Event	Real Time Energy Data and Instantaneous Power Monitoring
No Additional Features	Intelligent DR System provides Additional Functionality and Sophisticated Software Package
Manpower Must be Available Onsite	Network Enabled Access over LAN and WAN



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Selection Criteria for an
Intelligent DR / DC System

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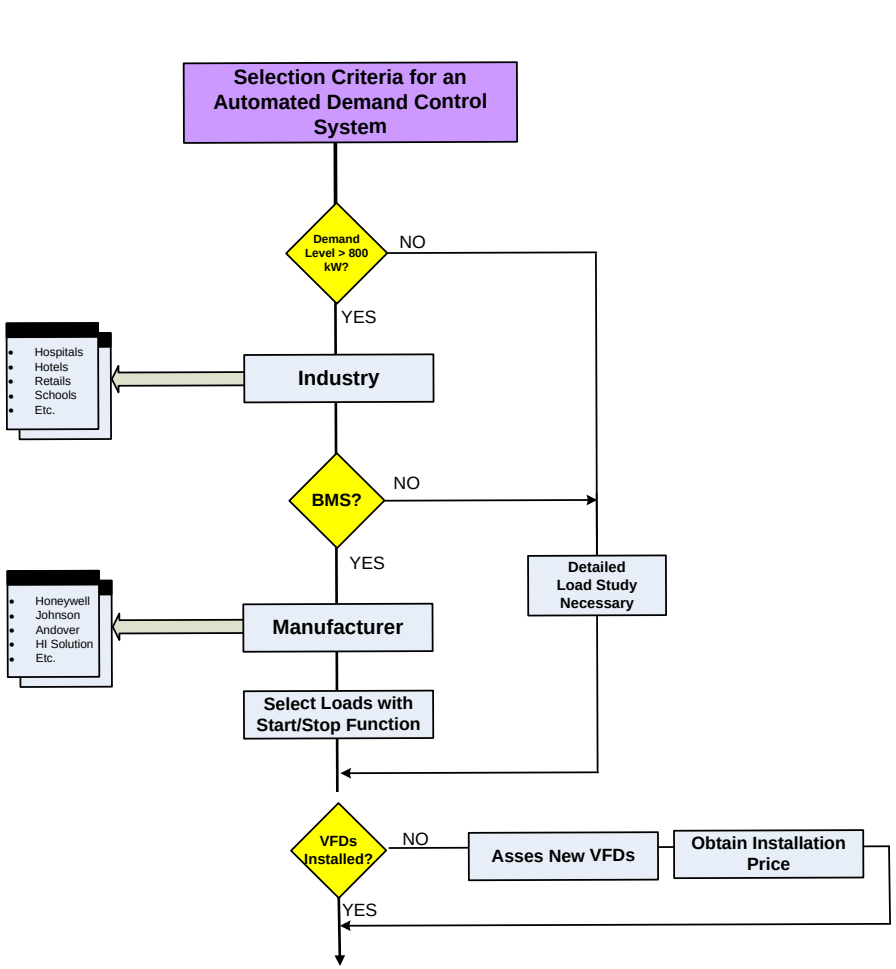

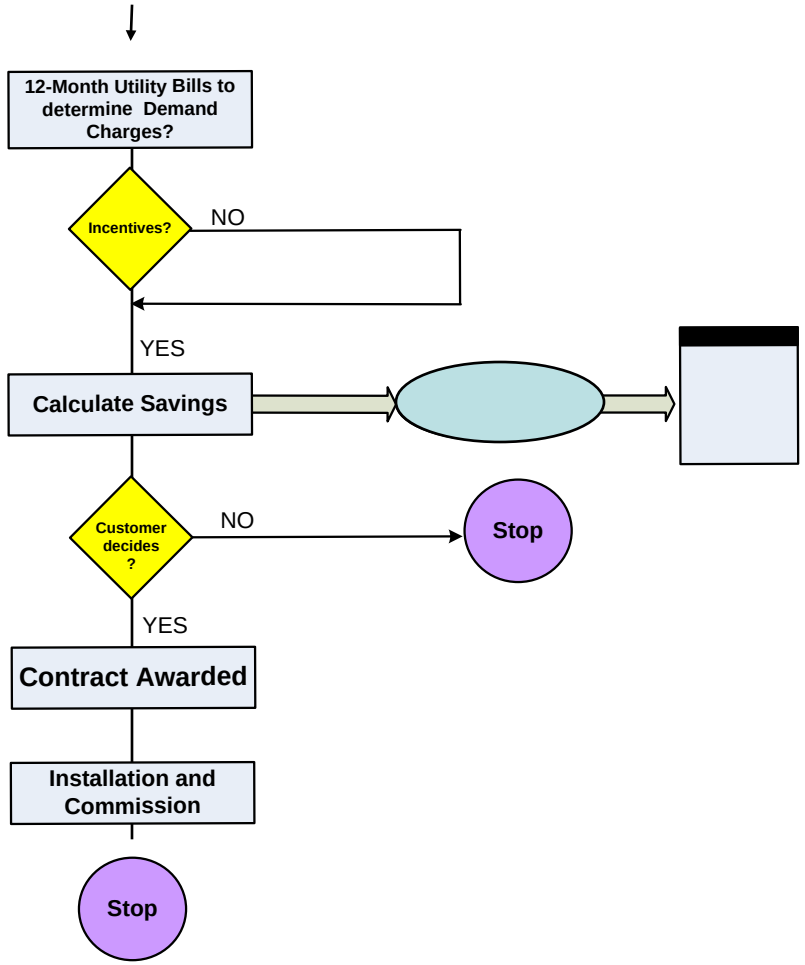

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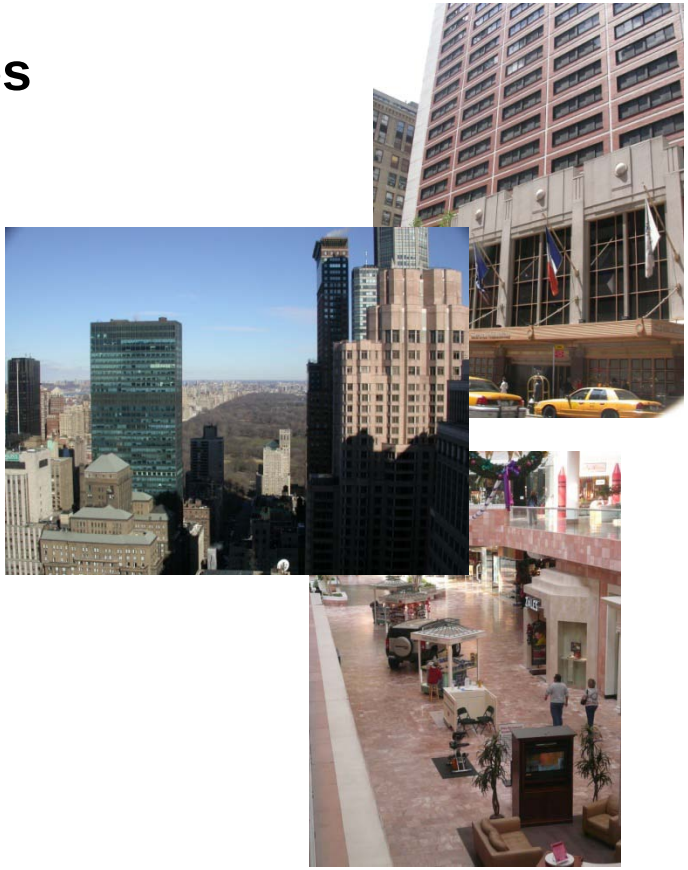
Typical Industries

- Hospitals and Healthcare Facilities
- Hotels and Restaurants
- Universities
- Schools and Public Facilities
- Heavy and Light Duty Industrial
- Pharmaceuticals
- Warehouses
- Manufacturing Plants
- Department Stores
- Corporate Headquarters
- Office Buildings



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The Process of

Intelligent Peak Load Control Measures

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Measure

Data Collection

- LAN
- BacNet
- ModBus
- LON works
- BMS

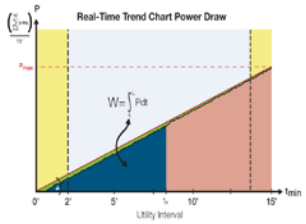
70% of Cost

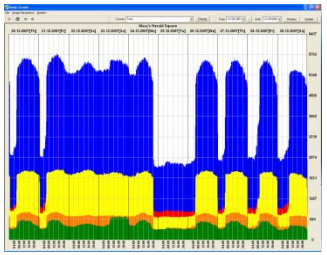
Energy / Demand Savings

30% of Cost

Optimization

Analysis





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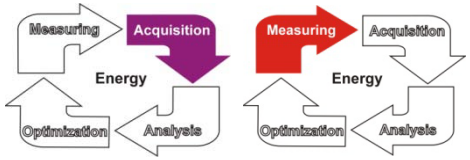

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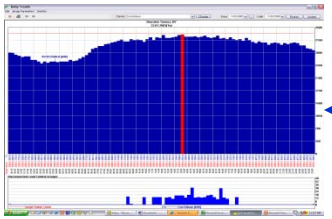
Optimization



Analysis

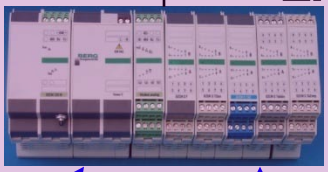
Aktuelle Auswertung 01.09.2003 - 01.10.2003	Vormonat 01.08.2003 - 01.09.2003	Abweichung +/-(%)
96,00 kW	96,00 kW	0,00 %
20.09.2003 12:15	16.08.2003 10:15	n. v.
7.776,00 €	7.776,00 €	0,00 %
20.995,00 kWh	23.843,00 kWh	-11,94 %
2.319,45 €	2.632,73 €	-11,90 %
13.262,00 kWh	11.120,00 kWh	19,26 %
805,72 €	677,20 €	18,98 %
34.257,00 kWh	34.963,00 kWh	-2,02 %
34.257,00 €	34.963,00 €	-2,02 %
6,85 €	6,99 €	-2,03 %
45.151,32 €	46.041,94 €	-1,93 %

DB

Jobs

WAN,
LAN

Acquisition

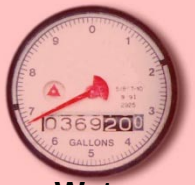


BMS

Measuring

Steam

Power



Water

Gas

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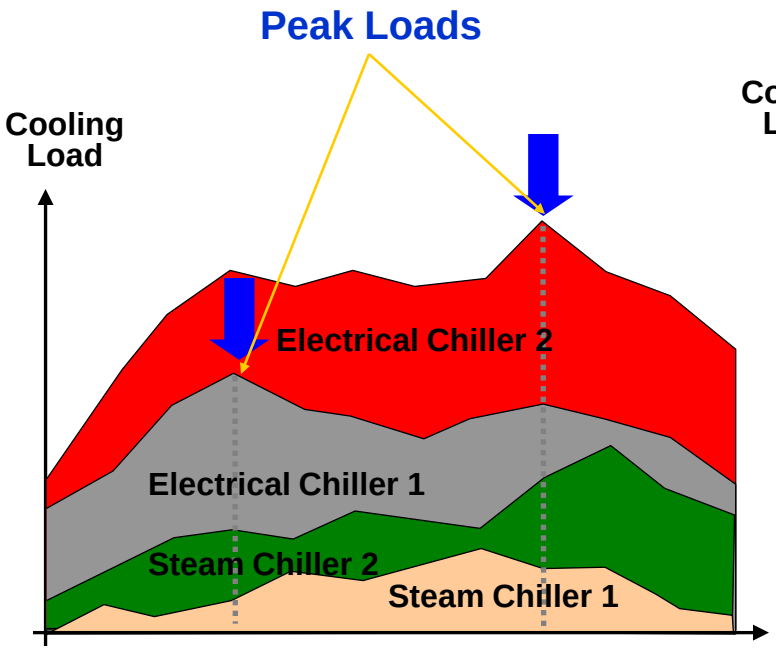
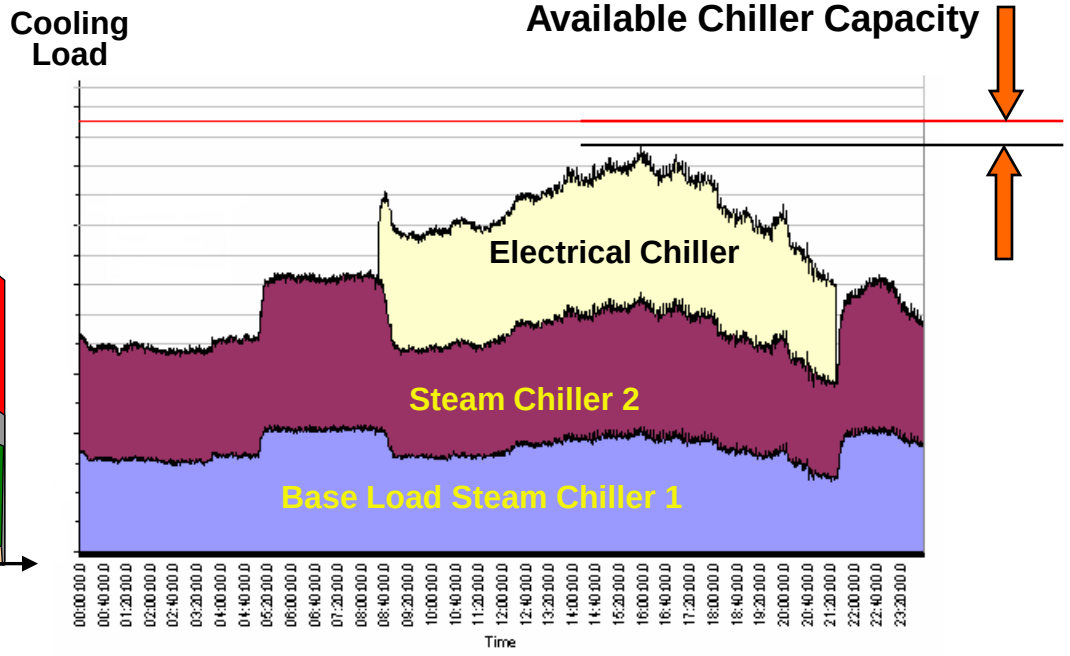
Chiller Load Graphs

Load Profile Analysis





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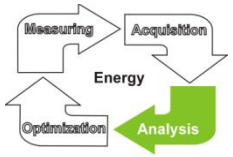

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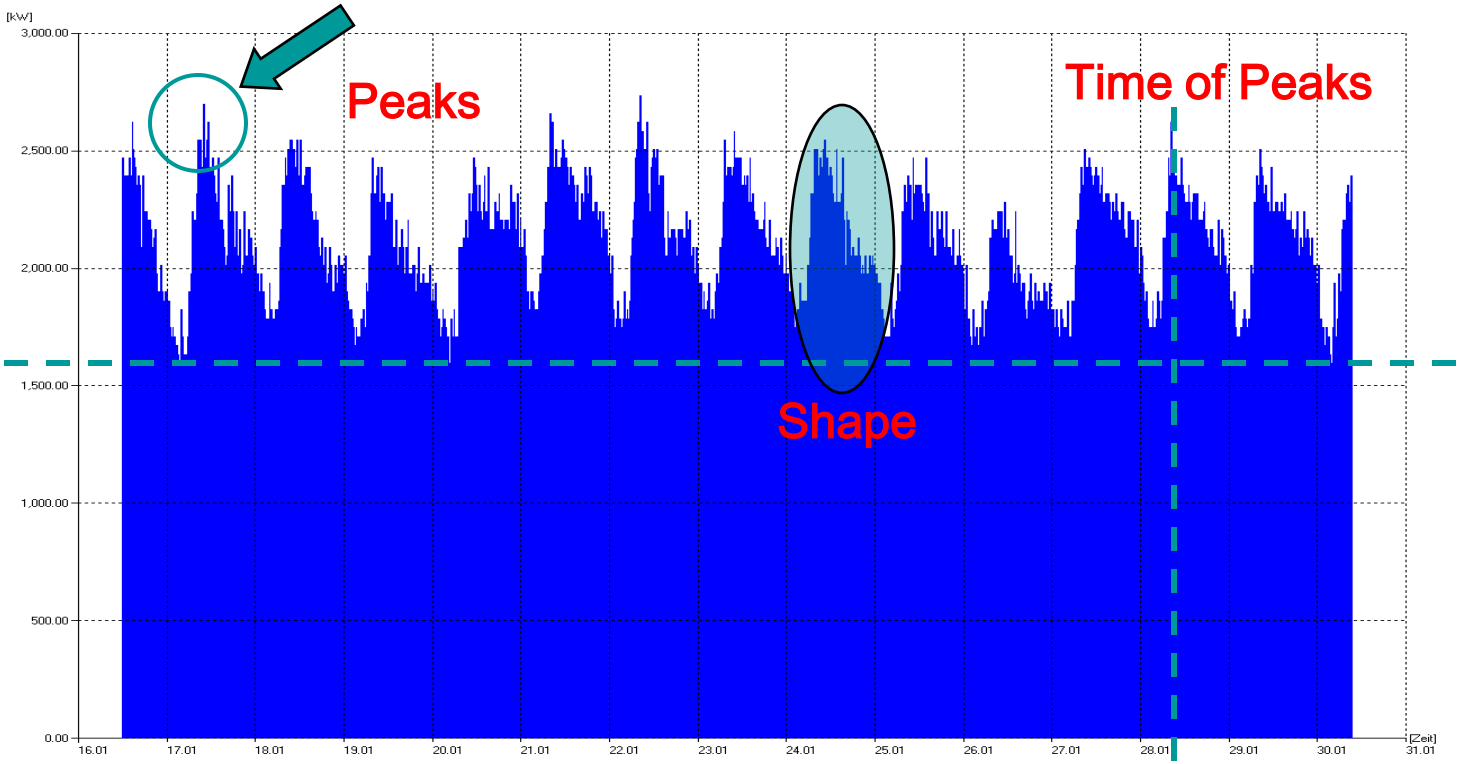
Load Profile Analysis

Typical Electrical Load Profile



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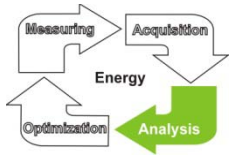

Electrical Load Audit

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Electrical Loads Name	Power Consumption	Power Consumption	Efficiency Factor	Demand Control Factor DCF (1	Curtailment Reduction Factor	Motor Loading	Coincidence Factor	Demand Savings Su -Month	KWh Savings Su-Month	Demand Savings Sh-Month	kWh Savings Sh-Month	Demand Savings Wi-Month	KWh Savings Wi-Month	On VFD	On BMS	Comments	Points of control	Phase	RLA	Volts	Tonnage	Electr.	Thermal
	Electrical Data																	HVAC Calculations				kW calc with electr. Param.	kW calc with thermal Param.
VFD Control Pumps								59		55		59											
in Hz								52		50		51		New VFD	New on BMS								
VFD Control FANs and Cooling Towers								58		50		42											
in Hz								45		40		35											
Hours per Period									80		56		40										
	kW	HP	1.00	%		%	%	kW	kWh	kW	kWh	kW	kWh					[1]	Amps	Volts	t	kW	kW
Chiller Plant																							
CW Pump 1	39.47	50.00	0.95												x								
CW Pump 2																							
CW Pump 3																							
SCHW Pu																							
SCHW Pu																							
City Water																							
City Water																							
Carrier Ch																					500.0	300.00	
Carrier Ch																					500.0	300.00	
Carrier Ch																					500.0	300.00	
Cooling To																							
Cooling To																							
AHUs																							
AHU 1 - Atrium 1	48.65	60.00	0.92	100%	22%	80%	75%	10.86	865	7.30	407	4.37	174	x	x		1						
AHU 2 - Atrium 2	48.65	60.00	0.92	100%	22%	80%	75%	10.86	865	7.30	407	4.37	174	x	x		1						
AHU 3 - Conference Center	12.16	15.00	0.92	100%											x								
AHU 4 - Atrium 3	60.82	75.00	0.92	100%	22%	80%	75%	13.57	1,081	9.12	509	5.46	218	x	x		1						
AHU 5 - Atrium 4	60.82	75.00	0.92	100%	22%	80%	75%	13.57	1,081	9.12	509	5.46	218	x	x		1						
AHU 6 - Cafeteria	24.33	30.00	0.92	100%	22%	80%	75%	5.43	432	3.65	203	2.19	87	x	x		1						
AHU 7 - Atrium 5	48.65	60.00	0.92	100%	22%	80%	75%	10.86	865	7.30	407	4.37	174	x	x		1						
AHU 8 - Atrium 6	48.65	60.00	0.92	100%	22%	80%	75%	10.86	865	7.30	407	4.37	174	x	x		1						
AHU 9 - 15th Floor	48.65	60.00	0.92	100%	22%	80%	75%	10.86	865	7.30	407	4.37	174	x	x		1						
AHU 9A - Board Room		5.00	0.92	100%	22%	80%				1.82	102	1.09	44	x	x		1						
AHU 10	48.65	6	00	0.92	100%	22%	80%			7.30	407	4.37	174	x	x		1						
AHU 26 - Atrium 26		6	00	0.92	100%	22%	80%			7.30	407	4.37	174	x	x		1						
Total										116	6,481	45	1,784	17	22		16						

1,837 kW

187.64 10.2%

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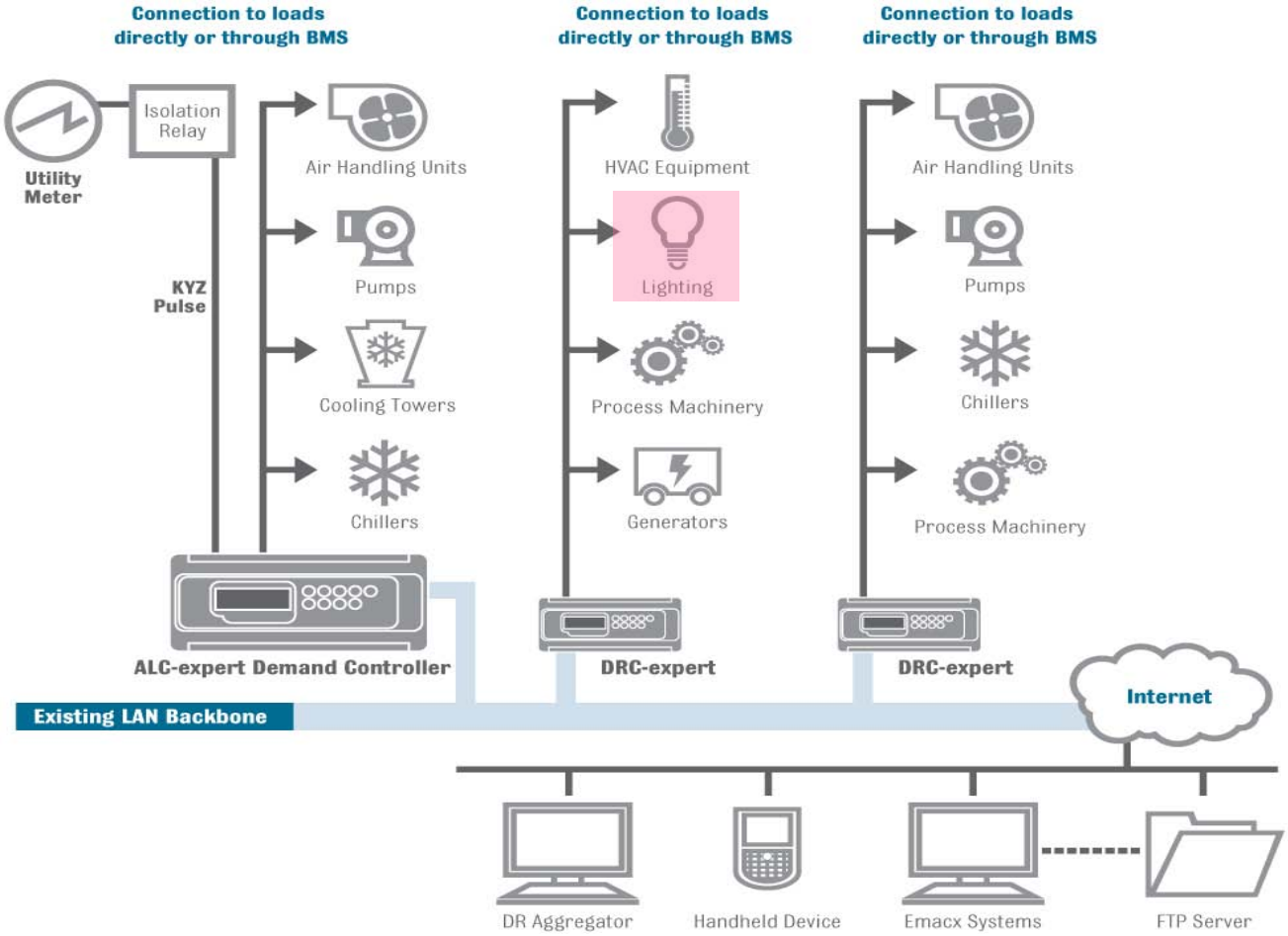
System Architecture DR / DC

- Air Handlers Units
- Pumps
- Chillers
- Lighting
- Ventilation Systems
- Non-Critical Process Equipment
- Compressors
- Electrical Industrial Equipment
- Electrical Water Heaters
- Electrical Heating Systems



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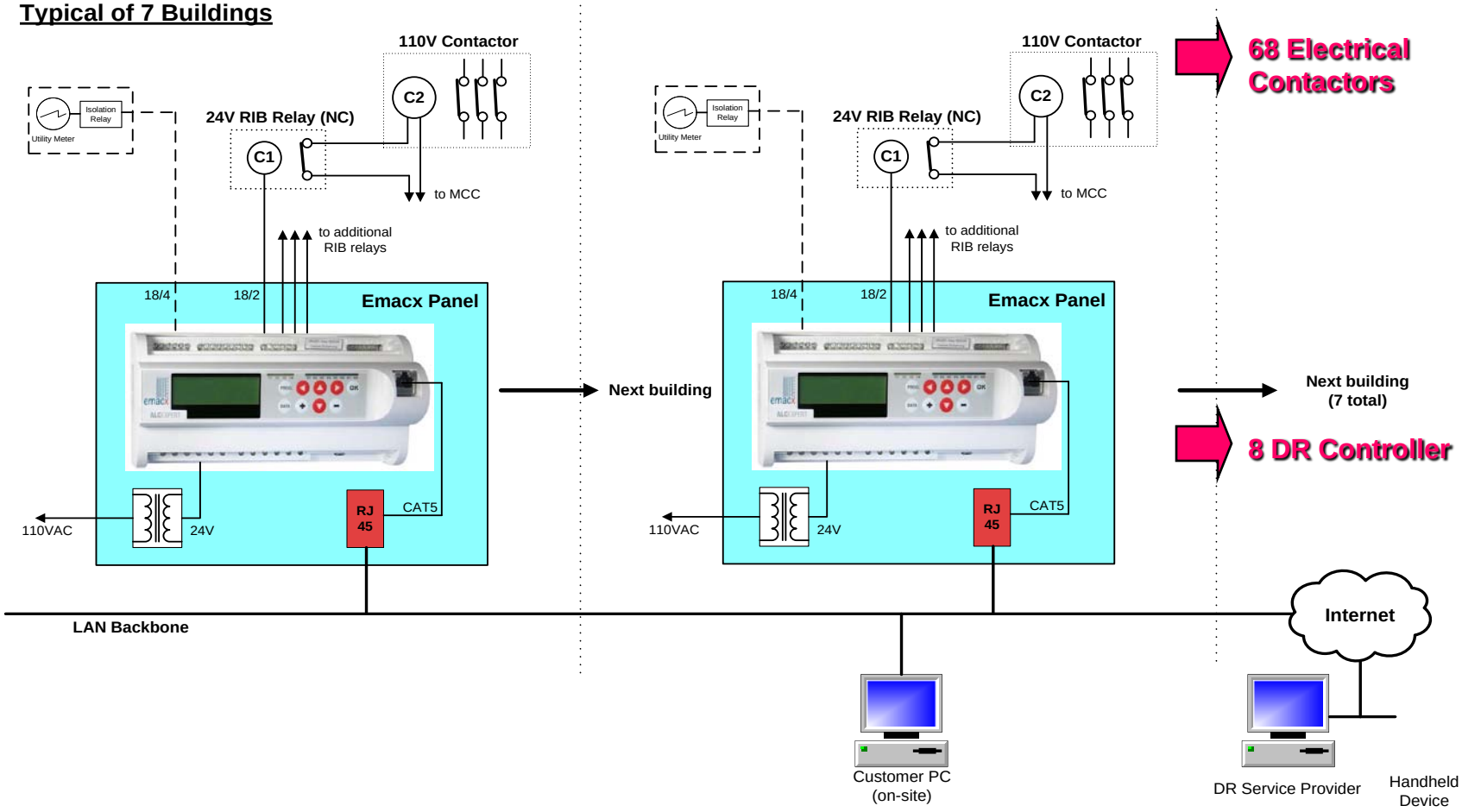
System Architecture DRC



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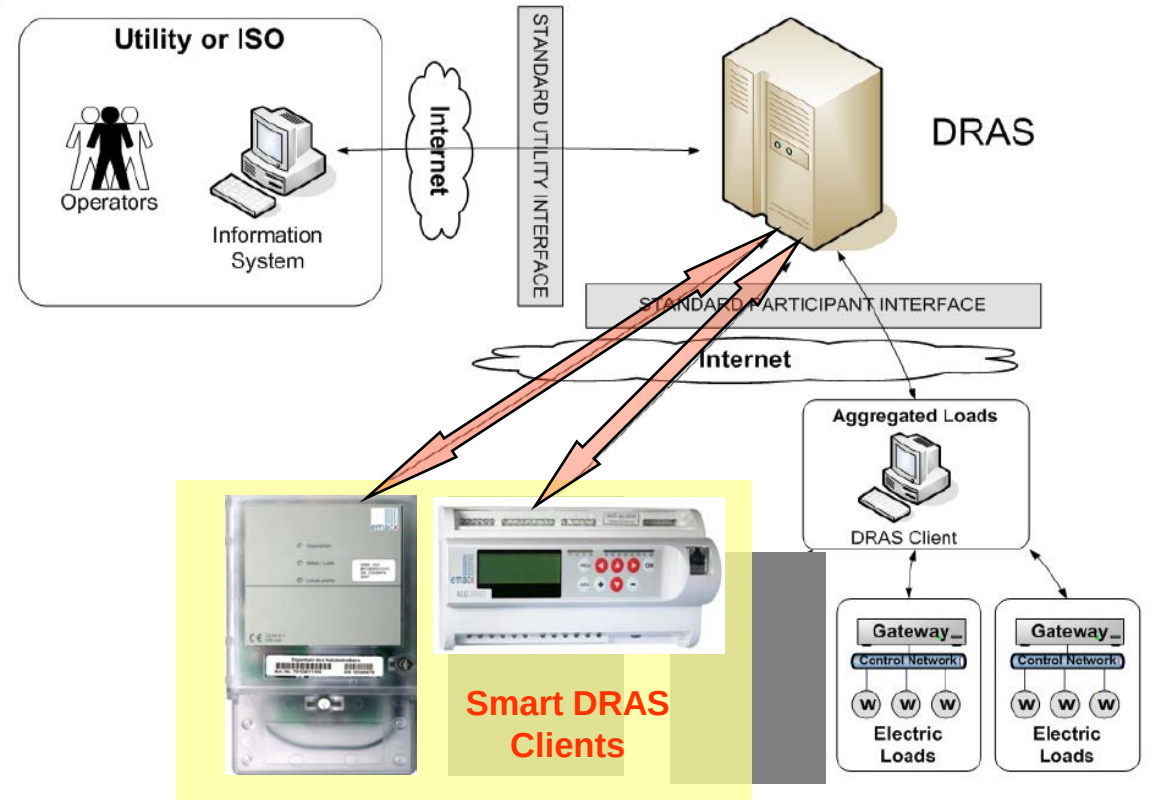
AutoDR >> The Future



ADVANTAGES

- Event Constraints
- Highly Cost Effective
- Event Reporting
- Fully Automated
- Generic Bidding Process
- Real Time Pricing
- Real Time Energy Data
- High Level of Intelligence

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AutoDR Controller

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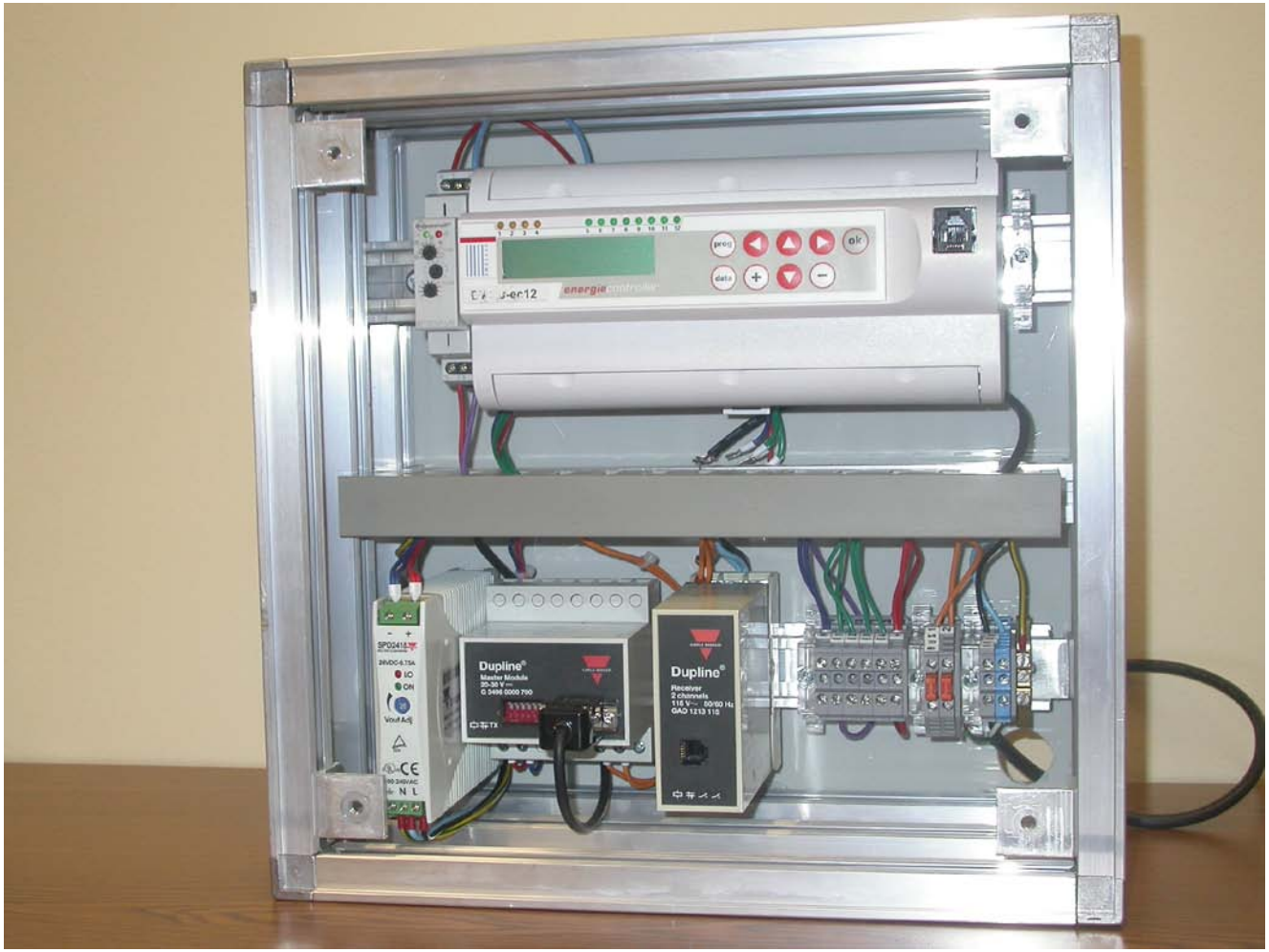

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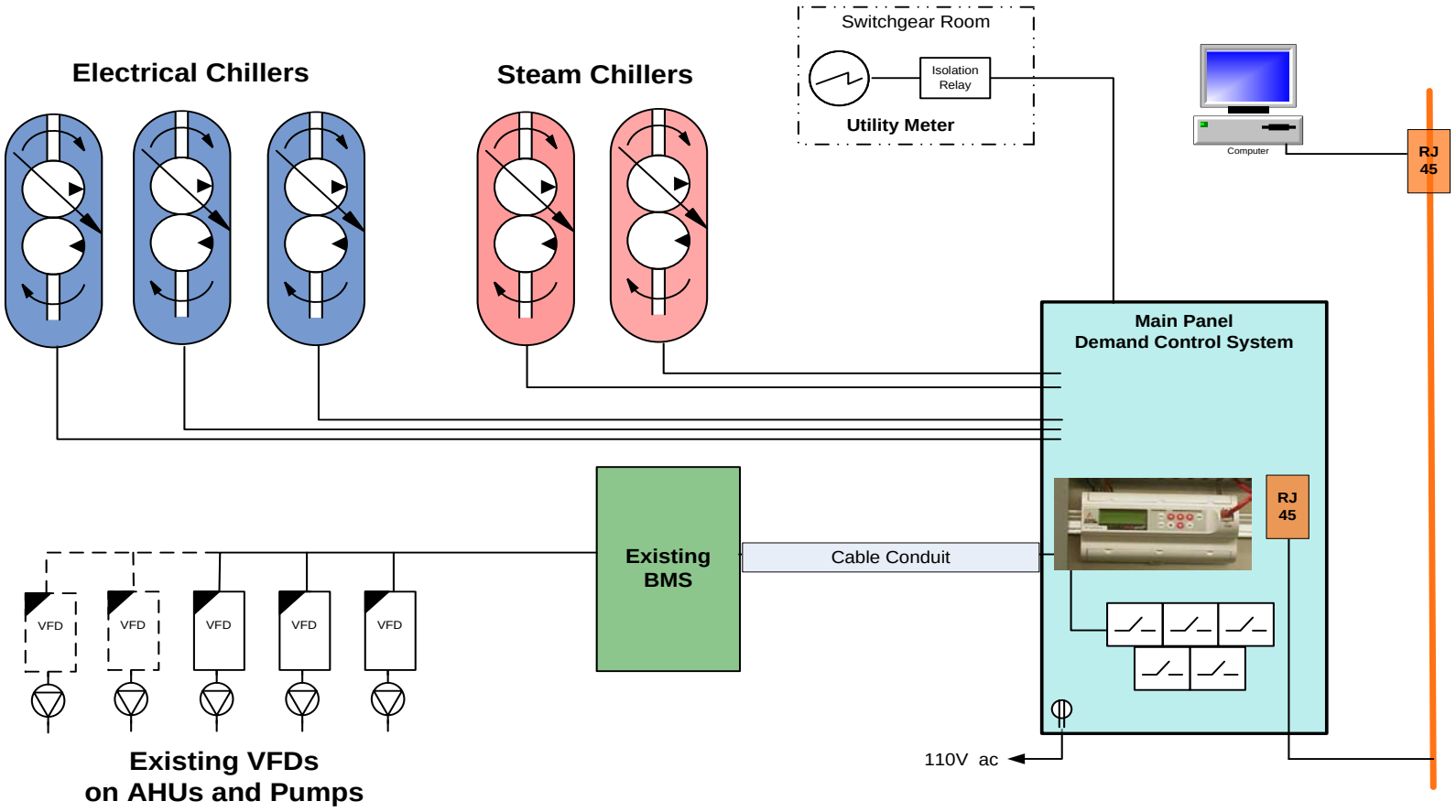
System Architecture DC



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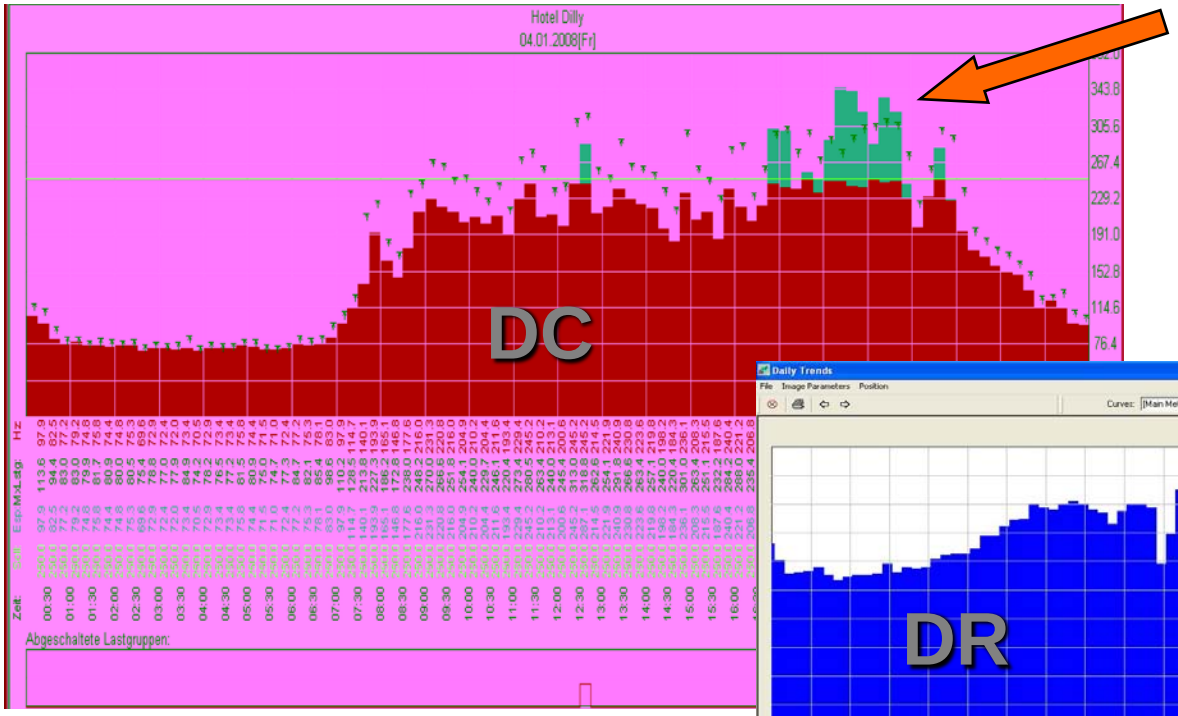
Curtailed Load Profiles

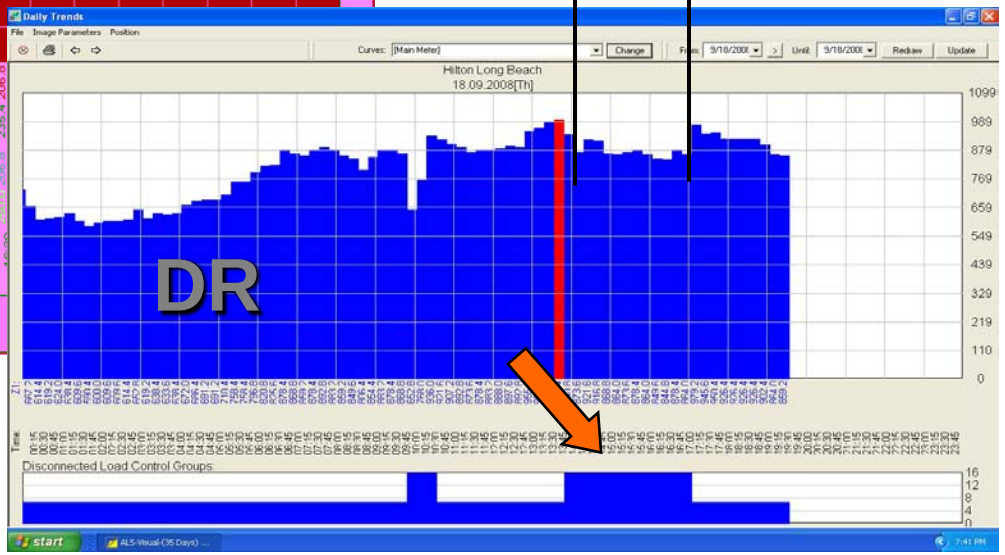
After System Installation



Load without Curtailment

DR-Event

>> t



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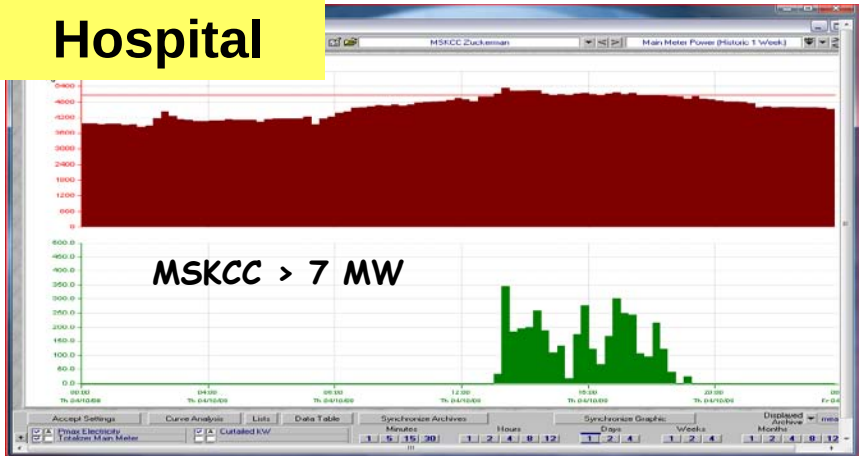
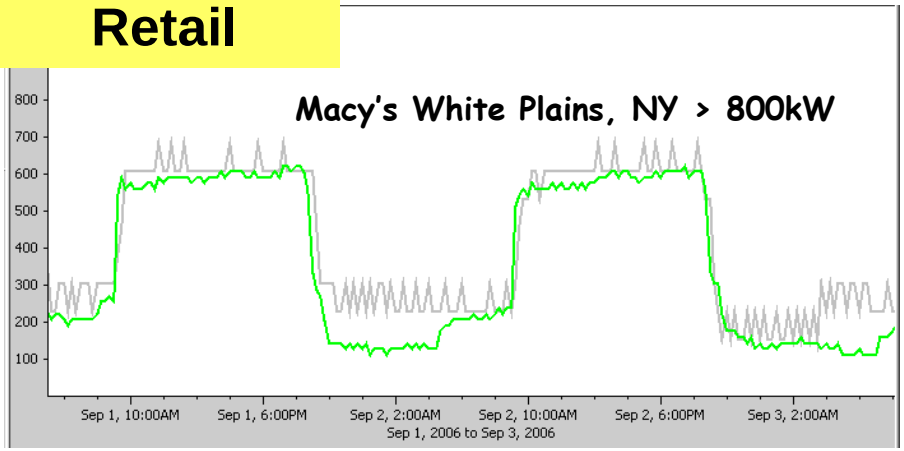
Load Profile Comparisons

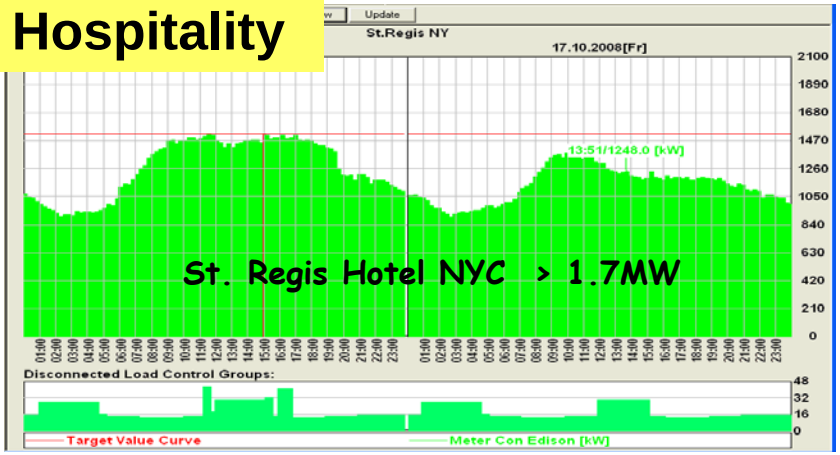
Hospital



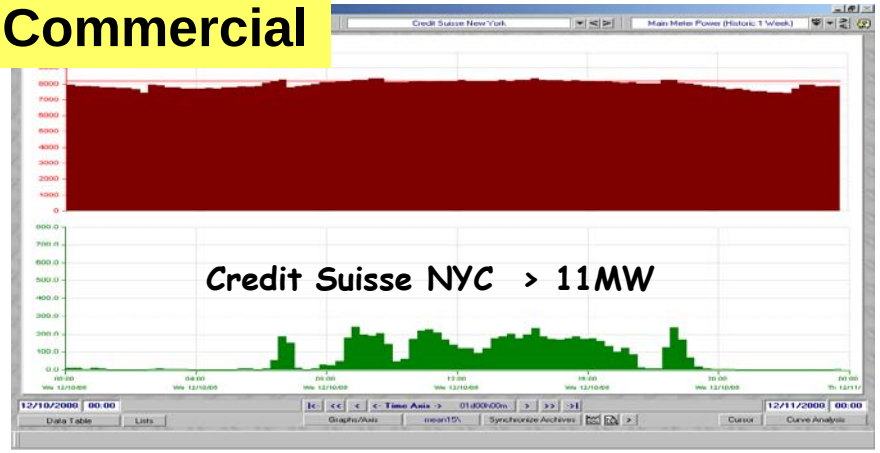
Retail



Hospitality



Commercial



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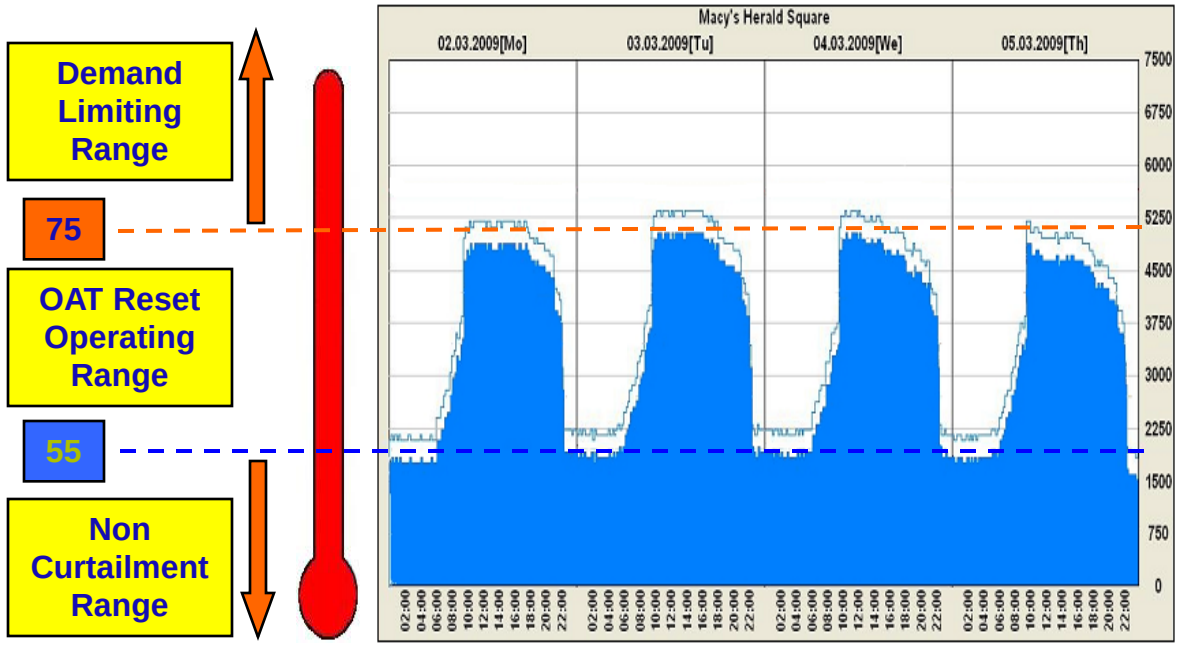
Outside Air Temperature Control Load Profile

- Supplemental curtailment based on temperature.
- More load curtailed on cooler days and less on hotter days.
- Constant demand reduction through rotating priorities.
- Overall savings improved in conjunction with existing demand control strategy.



Sample Savings Calculation – Based on average 40kW demand reduction:

40 kW x 8,760 hr/year x 75% = 262,800 kWh savings per year

262,800 kWh x $0.15/kWh = $39,420 additional yearly savings from demand reduction

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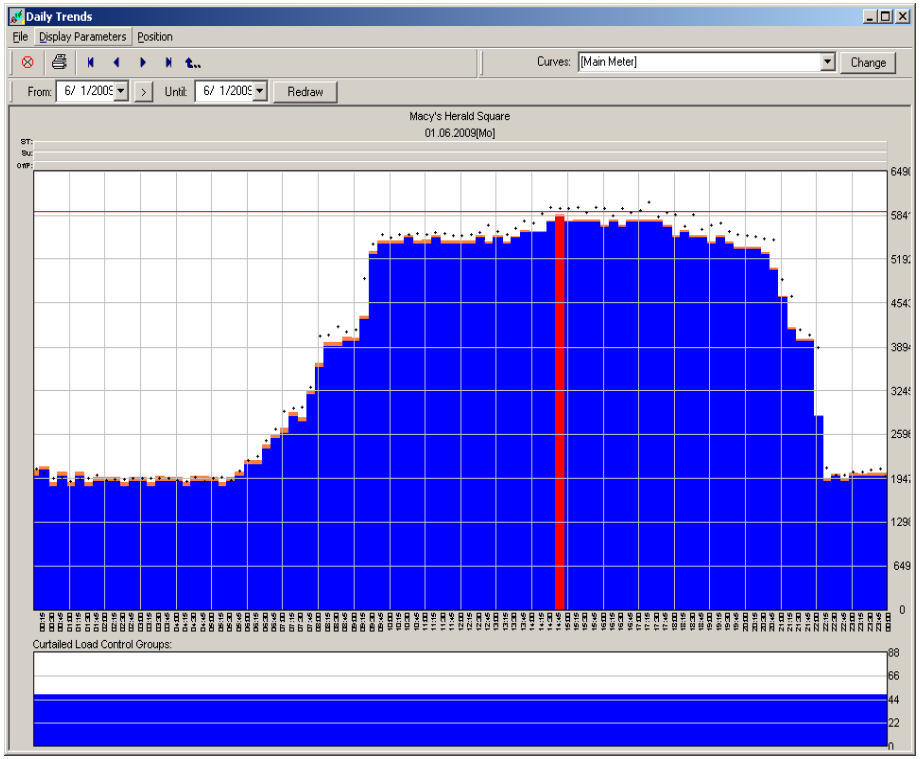
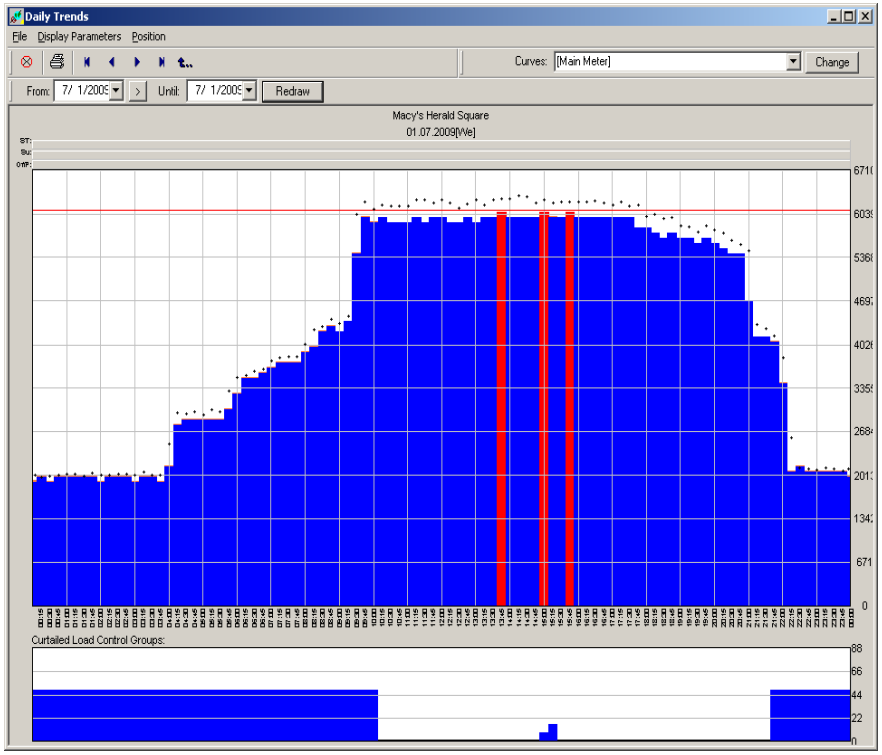
Outside Air Temperature Control actual Load Profiles





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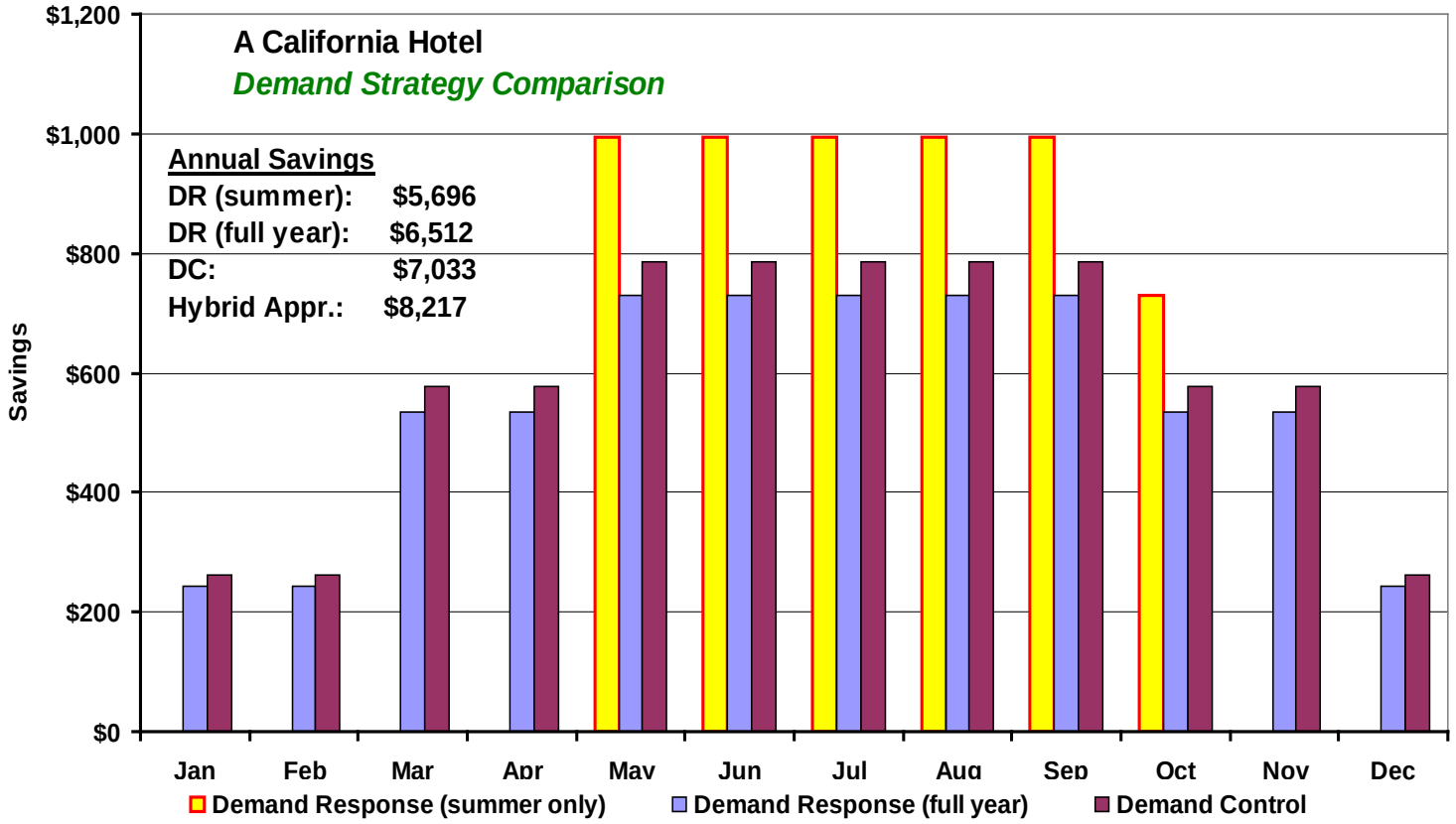
The Benefits of a Hybrid Approach…*a Hotel*



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The Benefits of a Hybrid Approach…*a Hospital*

NYC Hospital's actual savings using an Emacx IPLC System		Jan-Dec	kW-Peak Base Line going forward for DR	Highest Peak
Demand Savings with IPLC	417 kW	$ 34,650		6,720 kW
Demand Response Revenue		$ 44,446	6,540 kW	
Total		**$ 79,096**		
Difference DR Base Line vs. Highest Peak IPLC	180 kW			
Deduction due to New DR Base Line $60 /kW for DR ($60 x 180kW)		$ 10,800		
With **NO Demand Control System** savings going forward **Total**		$ 44,446		
Utilizing **Hybrid Approach** savings going forward **Total**		$ 68,296		
Advantage due to Hybrid Approach		**$ 23,850**	**54%**	

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Measuring Acquisition Energy Optimization Analysis

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Bottom Line

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