Metering Technology Show & Tell

GovEnergy (Energy 2007)
New Orleans, Louisiana
August 6th, 2007

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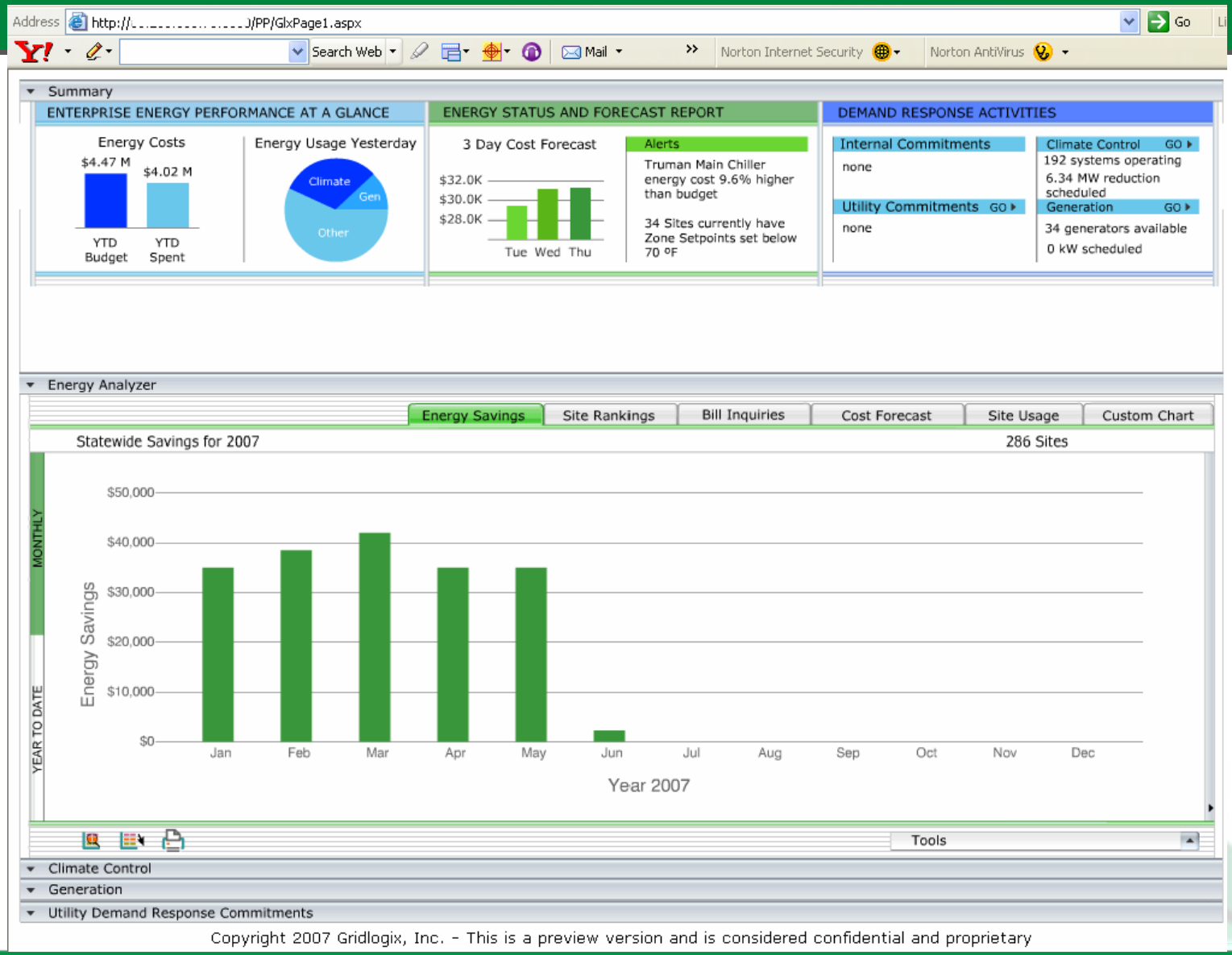
Automated Enterprise Management



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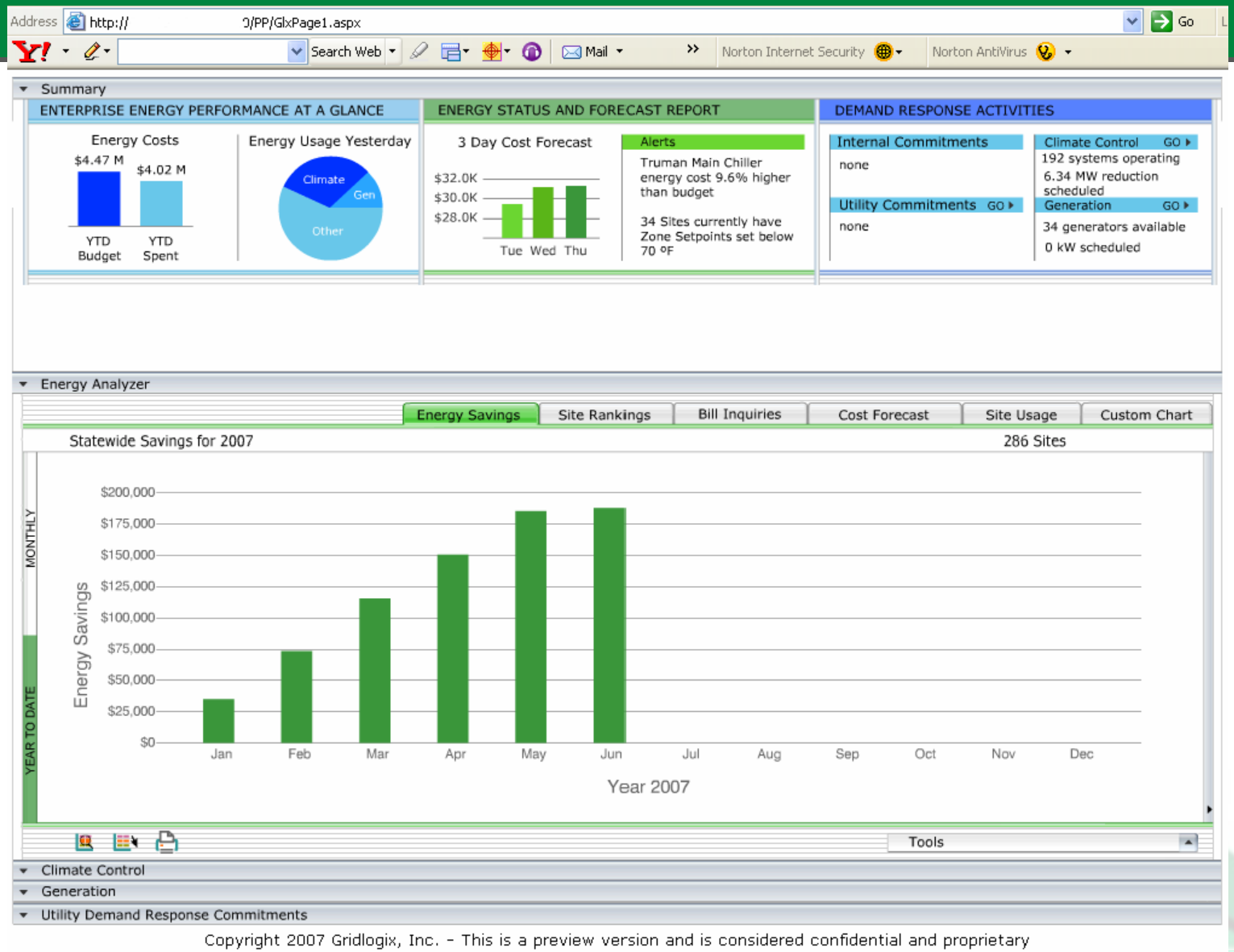
Automated Enterprise Management



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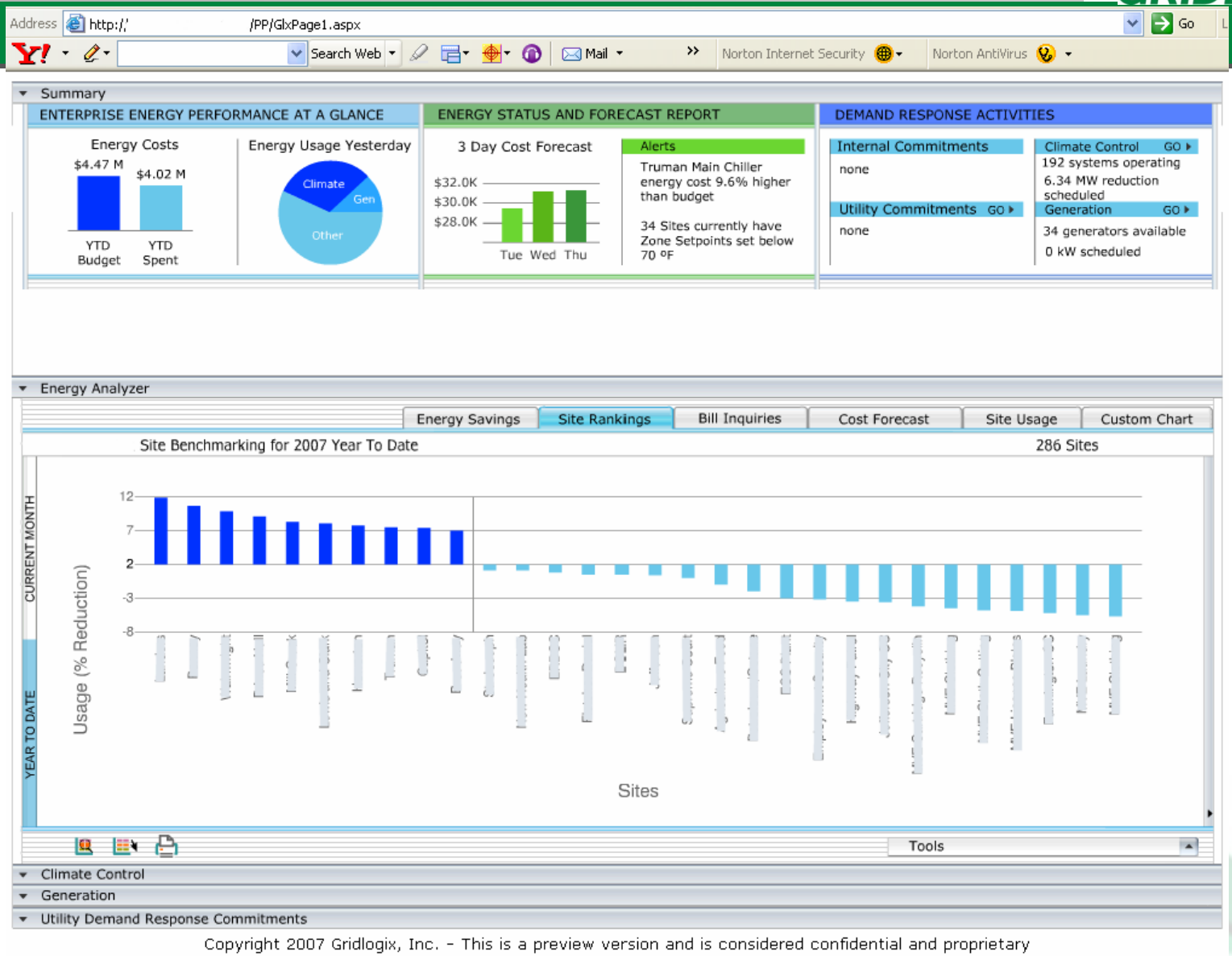

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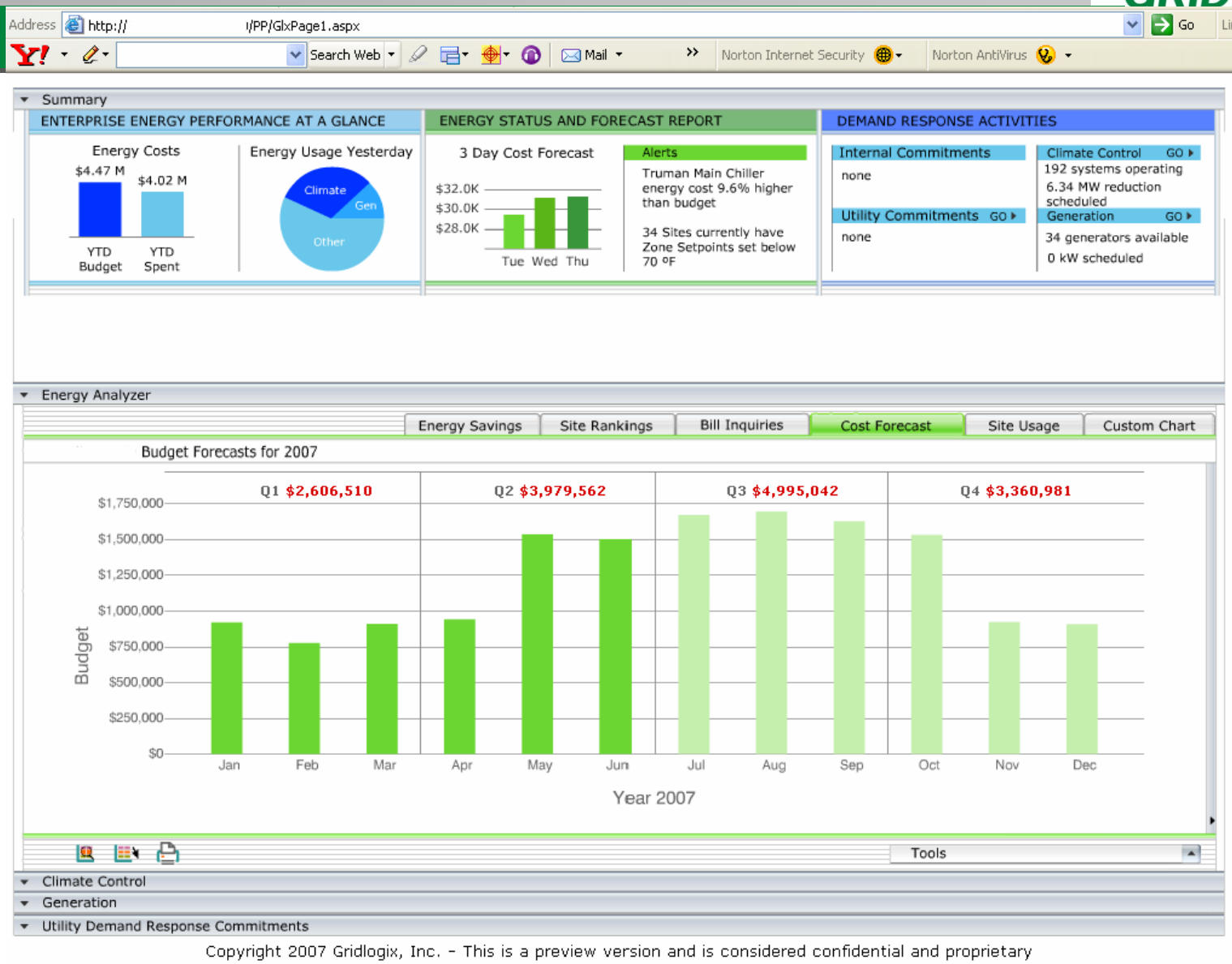
Automated Enterprise Management



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Automated Enterprise Management

Address http:// /PP/GlxPage1.aspx

Search Web | Mail | Norton Internet Security | Norton AntiVirus

Summary

ENTERPRISE ENERGY PERFORMANCE AT A GLANCE

Energy Costs
$4.47 M
$4.02 M

Energy Usage Yesterday
Climate

ENERGY STATUS AND FORECAST REPORT

3 Day Cost Forecast
$30.0K

Alerts
3-day costs forecast are 2.5% higher than budget

DEMAND RESPONSE ACTIVITIES

Internal Commitments
none

Climate Control GO
192 systems operating
6.34 MW reduction

Energy Analyzer

Climate Control

Scheduled HVAC Operation

This HVAC set Item has been scheduled.

Set Zone Temp: 74ºF from 10AM to 10PM
76ºF from 10PM to 10AM

On: Tuesday - Thursday
July 15 - July 17, 2007

Scheduled by [redacted].gov

Economics

Total Load Selected

Number of Sites: 192

Total Climate Controllable Load: 6.7 MWs

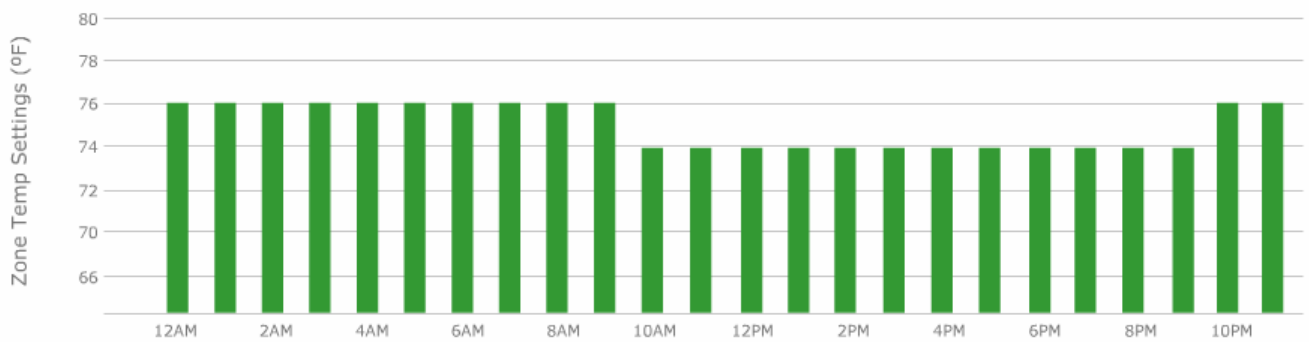
Impact Versus Baseline HVAC Settings:

Usage Reduction: 11,460 kWhs/day

Cost Savings: $2,005/day

Zone Temp Settings for July 15, 2007 — 192 Sites

Sites | GRAPH



Generation

Utility Demand Response Commitments

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Automated Enterprise Management

Address http:// /PP/GlxPage1.aspx

Summary

ENTERPRISE ENERGY PERFORMANCE AT A GLANCE

Energy Costs
$4.47 M
$4.02 M

Energy Usage Yesterday
Climate

ENERGY STATUS AND FORECAST REPORT

3 Day Cost Forecast
$30.0K

Alerts
3-day costs forecast are 2.5% higher than budget

DEMAND RESPONSE ACTIVITIES

Internal Commitments
Backup Generation
12PM to 10PM TODAY

Climate Control GO
192 systems operating
6.34 MW reduction

Energy Analyzer

Climate Control

Generation

Scheduled Generation Operation

Backup Generation has been scheduled.

Operate Generators: at 100% from 12PM to 10PM

On: Today, Monday July 14, 2007

Scheduled by [redacted].gov

Economics

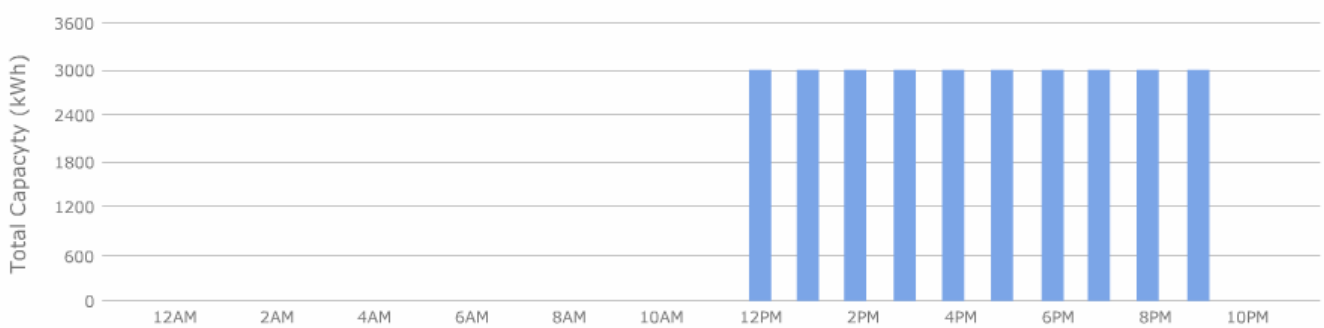
Total Generation Selected

Number of Systems:	48 Sites
Total Generating Capacity:	3,072 kWhs

Economics:

Cost of Generation (Gas/O&M):	$534.89
Avoided Utility Costs:	$4,502.28
Load Curtailment Reduction Program Credits:	$6,144.10
NET BENEFIT (Loss):	$10,640.38

Scheduled backup Power Generation - July 14, 2007 48 Sites



Sites

GRAPH

SCHEDULE THIS OPERATION

Utility Demand Response Commitments

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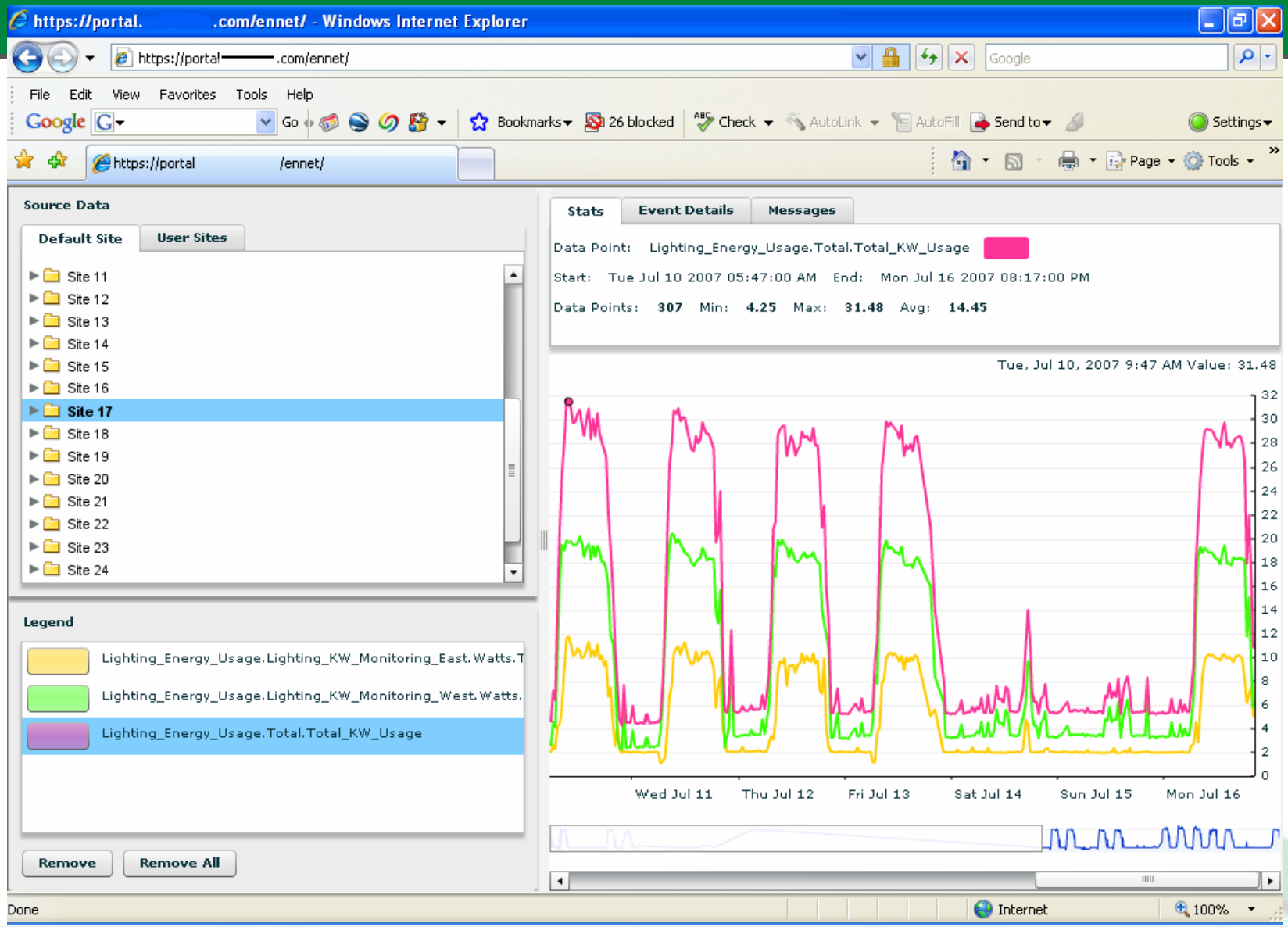
Building Automation System Data



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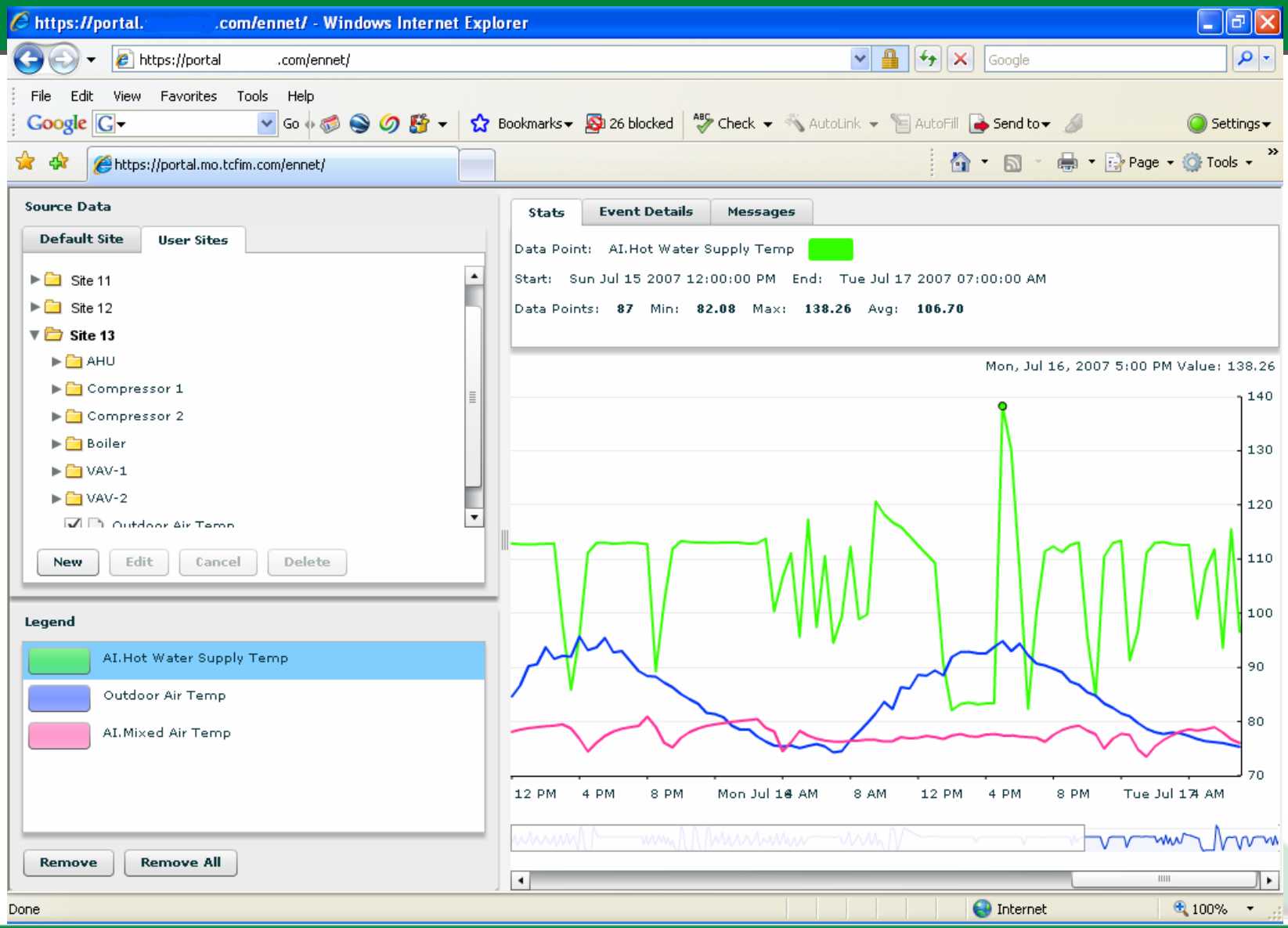
Building Automation System Data



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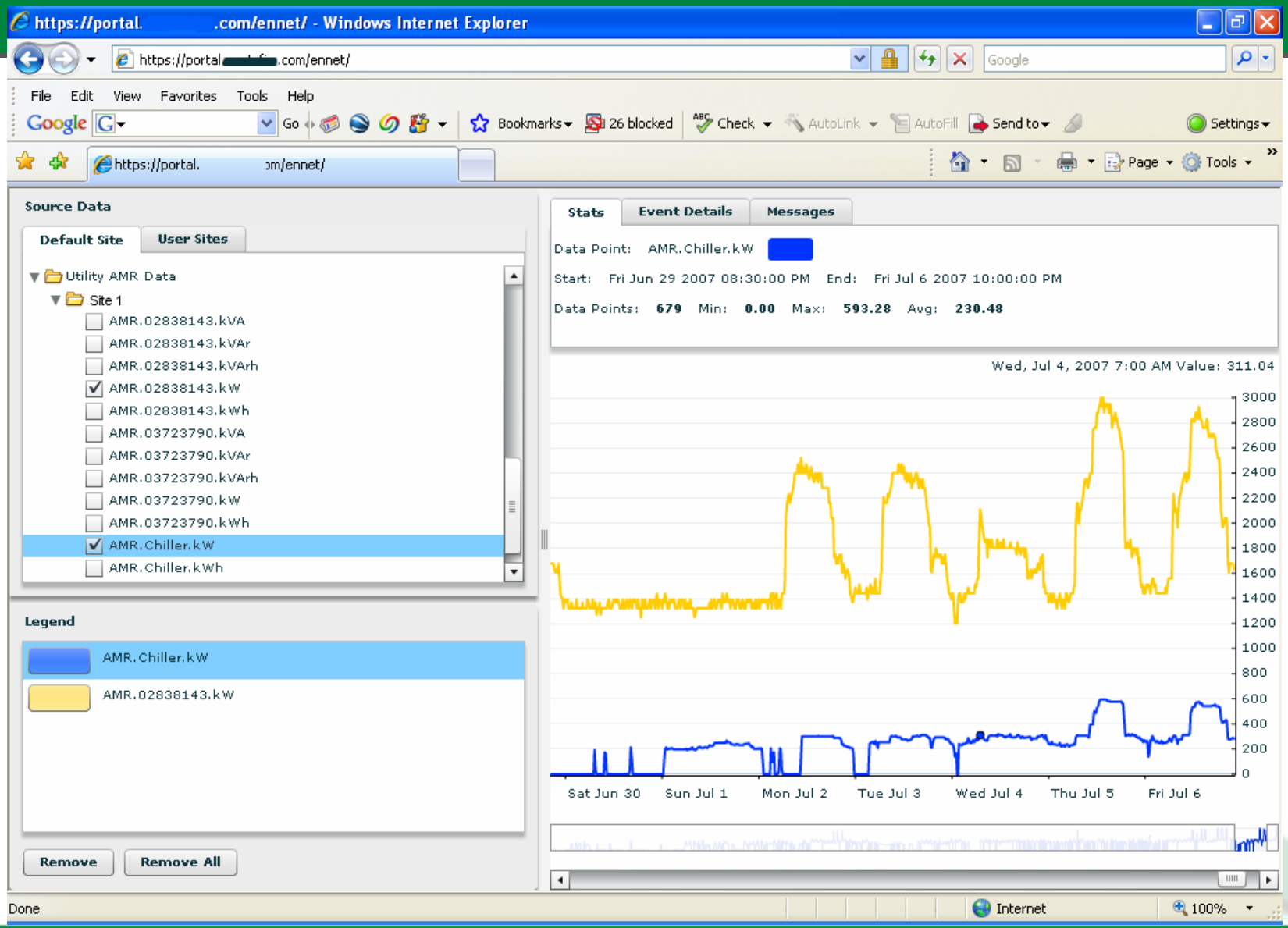
Utility AMR Data



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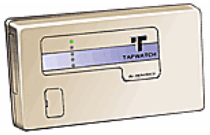
Wireless Pulse Meter Reading

http://www.inovonics.com/WorkArea/showcontent.aspx?id=1546&LangType=1033

Utility KWH Pulse



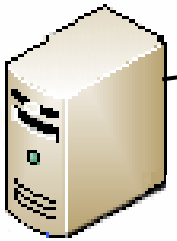
EN5000-T - High-Power Repeater

with Battery Backup and Transformer

Sub KWH Pulse

ES1501 - EchoStream Pulse Meter Transmitter

EnNET PC: EchoStream Protocol



RS-232C Cable

EN6040 - Network Coordinator

Gas Pulse

Battery Powered Transmitters

5-6 Years Battery Life

Water Pulse

Data Constraint:

Minimum 1 hour data resolution.

15 minute KWD not available for electric.

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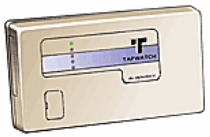
Wireless Environmental Sensors

http://www.inovonics.com/category.aspx?id=1822

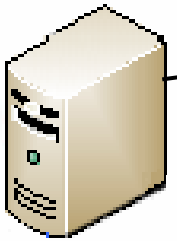
ES1702 – Dual Analog Transmitter



EN5000-T - High-Power Repeater
with Battery Backup and Transformer

ES1723 – Dual Temperature Transmitter

EnNET PC: EchoStream Protocol



RS-232C
Cable

EN6040 - Network Coordinator

ES1722 – External Temperature/Humidity Transmitter

Battery Powered Transmitters
6-7 Years Battery Life

Environmental Monitoring

- Air temperature
- Relative humidity
- Indoor air quality
- Differential pressure
- Flow

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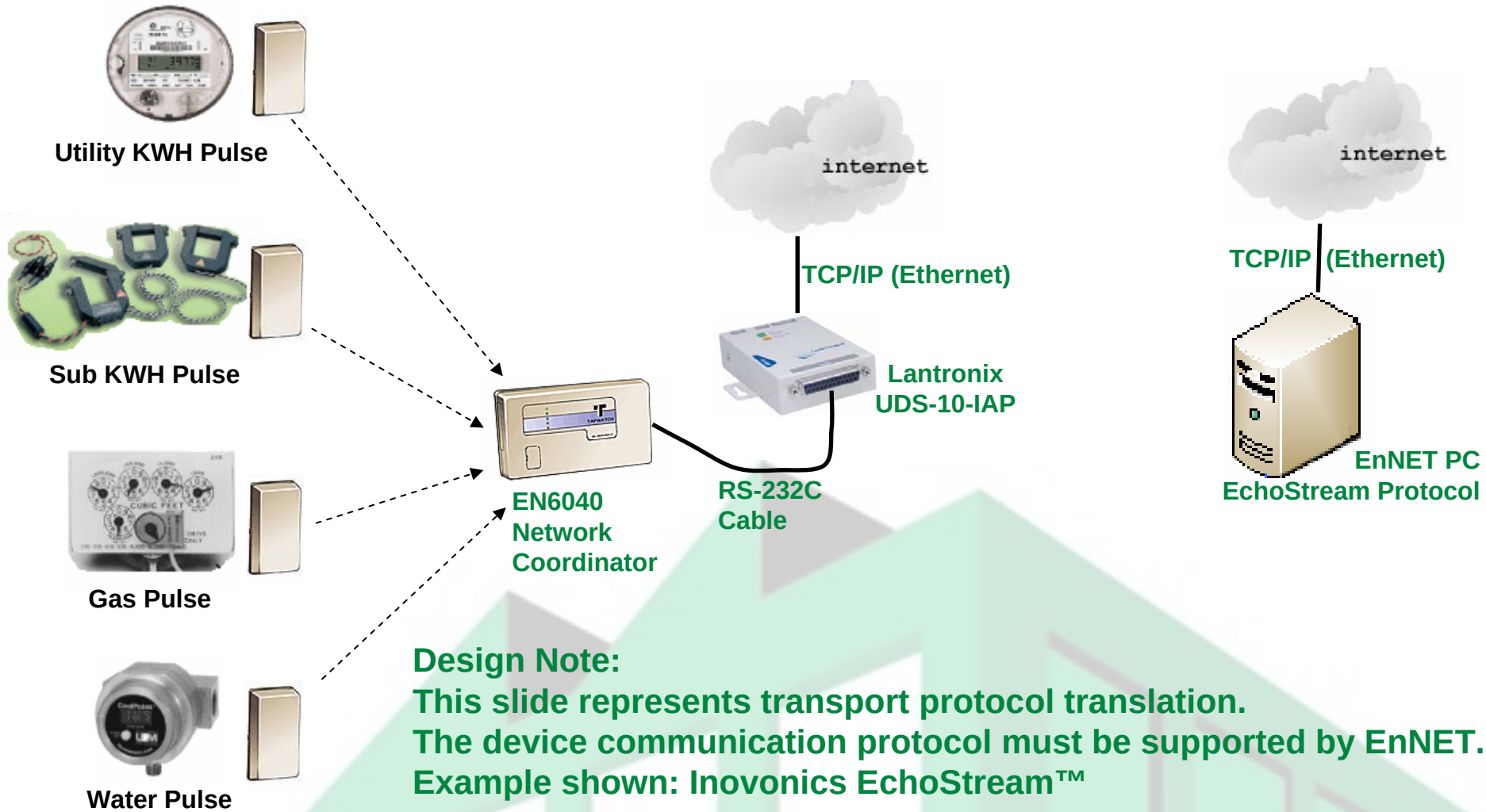
Extended Enterprise: Serial to WAN

http://www.lantronix.com/device-networking/external-device-servers/uds10-iap.html



Design Note:
This slide represents transport protocol translation.
The device communication protocol must be supported by EnNET.
Example shown: Inovonics EchoStream™

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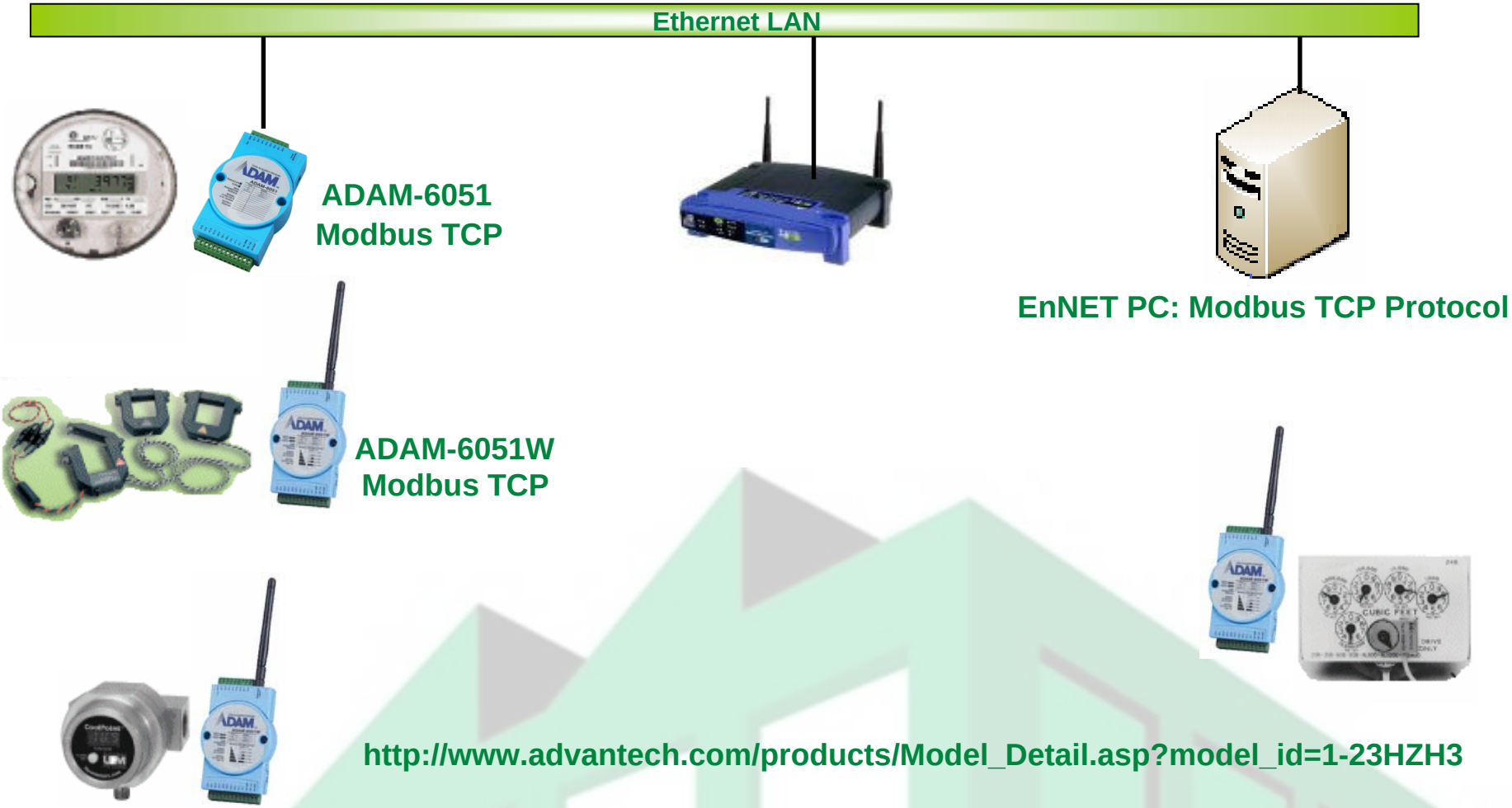
Wireless (WiFi) Pulse Meter Reading



http://www.advantech.com/products/Model_Detail.asp?model_id=1-23HZH3

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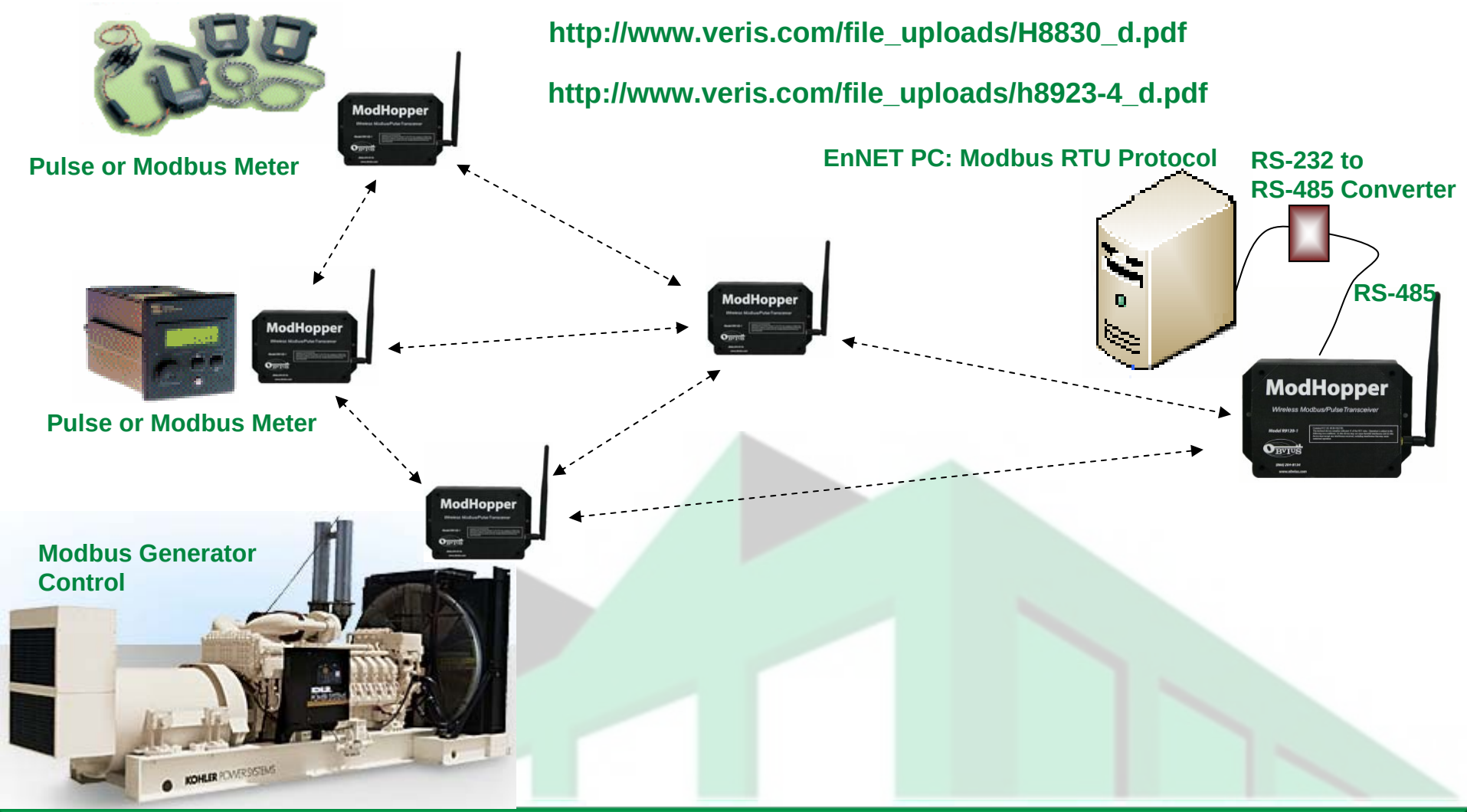
Wireless Modbus: Obvius ModHopper®

http://www.obvius.com/documentation/Obvius/R9120Manual.pdf

http://www.veris.com/file_uploads/H8830_d.pdf

http://www.veris.com/file_uploads/h8923-4_d.pdf



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Trendpoint Multi-circuit Metering

http://www.trendpoint.com/EnerSure.html

- Up to 4 input boards per unit
- 21 metered circuits per board
- Up to 84 metered circuits

WiFi Option

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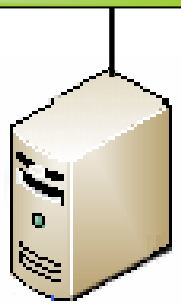
BACnet/IP Automation

Ethernet LAN



EnNET PC: BACnet/IP Protocol

Monitor and Control Products available from multiple vendors.

Example Product:
Cimetrics B6070 4 Pulse Meters to BACnet/IP

http://www.cimetrics.com/products/proddetail.php?prod=B6070&cat=7

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Proliphix IP Thermostat

Building 1

Ethernet LAN

SEM Ethernet Bridge

Proliphix Thermostat

http://www.proliphix.com/NT-Pro.aspx

EnNET PC:
Proliphix Protocol
Via
EnNET-WSConnect Driver

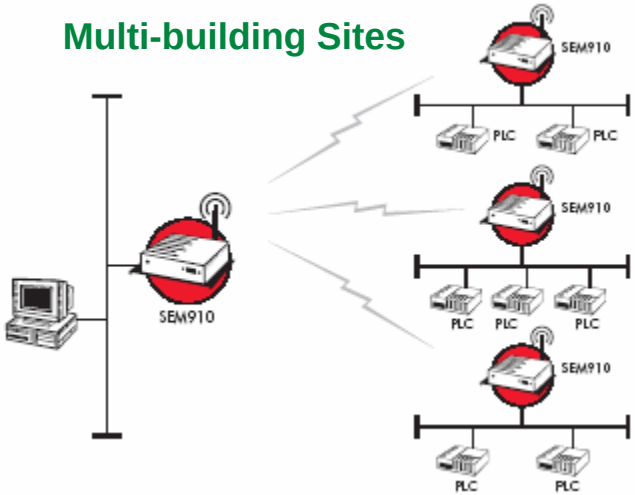
Spread Spectrum 900 MHz

Building 2…n

http://www.cirronet.com/900-ethernet.htm

Ethernet LAN

Multi-building Sites



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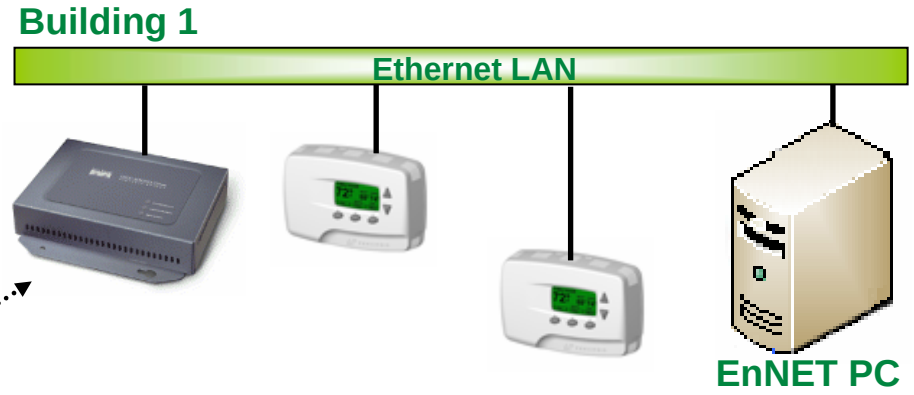
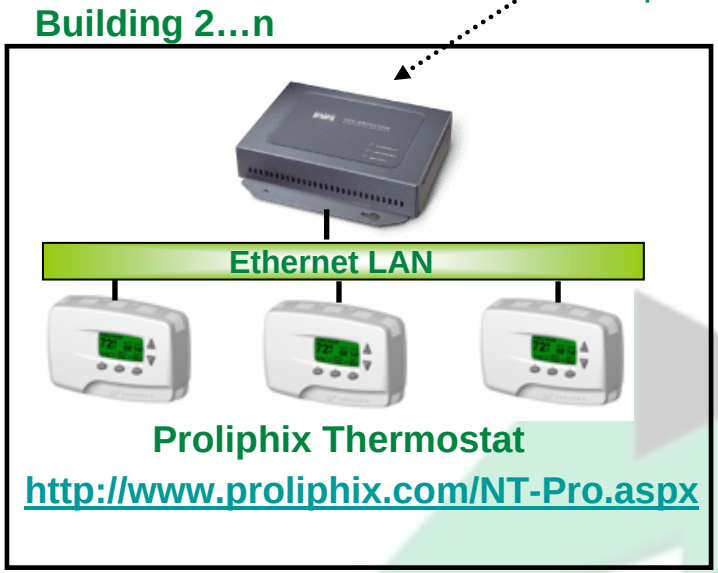
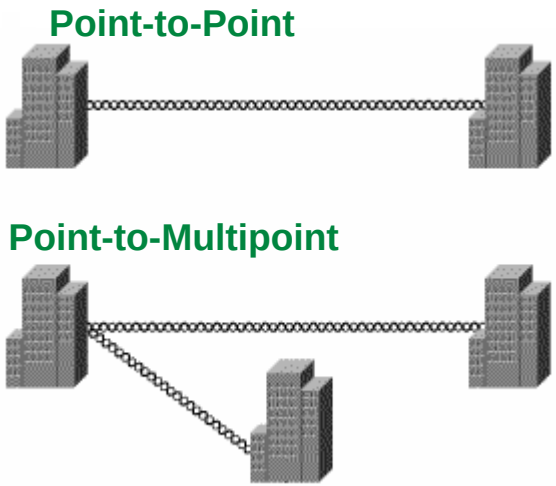
Cisco Aironet 350 Wireless Bridge



http://www.cisco.com/warp/public/cc/pd/witc/ao350ap/prodlit/a350m_ds.pdf



Multi-building Sites



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Ethernet to WiFi

http://www.lantronix.com/device-networking/external-device-servers/wispan.html

Design Note:
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The device communication protocol must be supported by EnNET.
Examples shown: BACnet/IP and Proliphix

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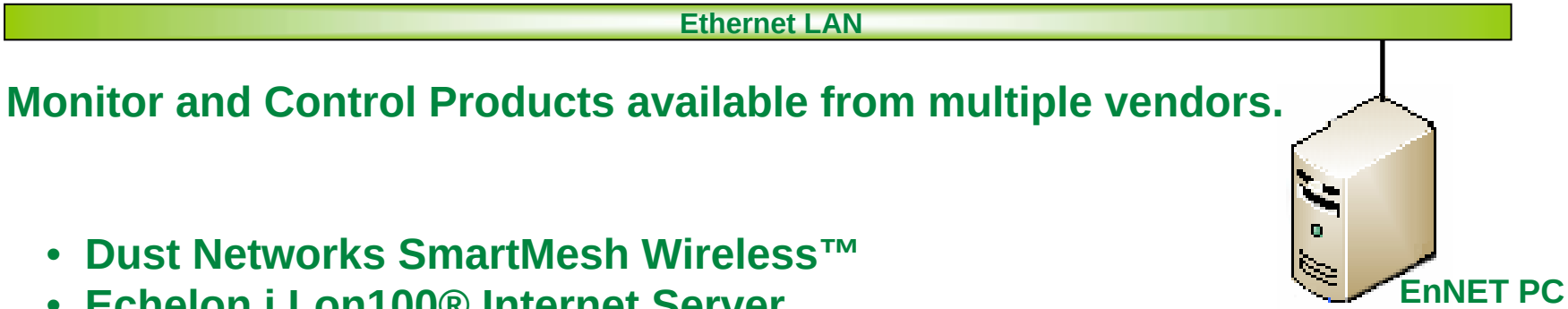
Other Protocols Supported



Monitor and Control Products available from multiple vendors.

- Dust Networks SmartMesh Wireless™
- Echelon i.Lon100® Internet Server
- Inovonics Frequency Agile™ and Echostream™ Wireless Products
- Insteon® Automation Products
- OPC DA 2.0 Servers
- SNMP Enabled Devices
- Tridium Niagara™ (Jace R2 controllers and all drivers)
- Ubiwave Wireless Mesh (ZigBee Mesh)
- Most 3rd Party W3C Compliant Web Service Interfaces

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Thank You!

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