



# NESEA

Co-Presented By

Timothy Lynch, PEPCO and Chris Allen, Inovonics



# TIM LYNCH --- EXPERIENCE

NOTES:

- ① *30 years in the Energy Management Business*
- ① *President of PEPCO Controls*
- ① *Installations in over 1,100 Building in NYC*
- ① *Over 25,000 Wireless devices in use in NYC*
- ① *Type clients we service*
  - ① *Multifamily Residential*
  - ① *Commercial*
  - ① *Industrial*
  - ① *Schools*



# CHRIS ALLEN --- EXPERIENCE

NOTES:

***26 years in the Security Communications  
and Wireless Energy Management Business***

***Regional Sales Manager Inovonics Wireless  
Corporation***

***10 Million Wireless Sensors Deployed***



## SHORT BRIEF HISTORY OF WIRELESS



1. Power Line Carrier
2. Zigbee More devices equal a lower response
3. EnOcean Cheaper but range issues
4. 802.11 Wired access points and security issues
5. Spread Spectrum 902-928 MHz



# WIRELESS INDUSTRY MAJOR PLAYERS





# WIRELESS END DEVICES

- ⊙ WIRELESS INPUTS / SOLAR POWER
  - ⊙ TEMPERATURE / HUMIDITY
  - ⊙ **ELECTRIC METER**
  - ⊙ WATER METER
  - ⊙ MOTION SENSORS
  - ⊙ LIGHT LEVEL SENSORS
  - ⊙ DOOR / WINDOW
- ⊙ WIRELESS OUTPUTS
  - ⊙ CONTROL VALVES
    - ⊙ Zone Valves
  - ⊙ LIGHT SWITCHES
  - ⊙ PLUG IN LAMP SWITCHES



# BATTERYLESS-WIRELESS SENSORS

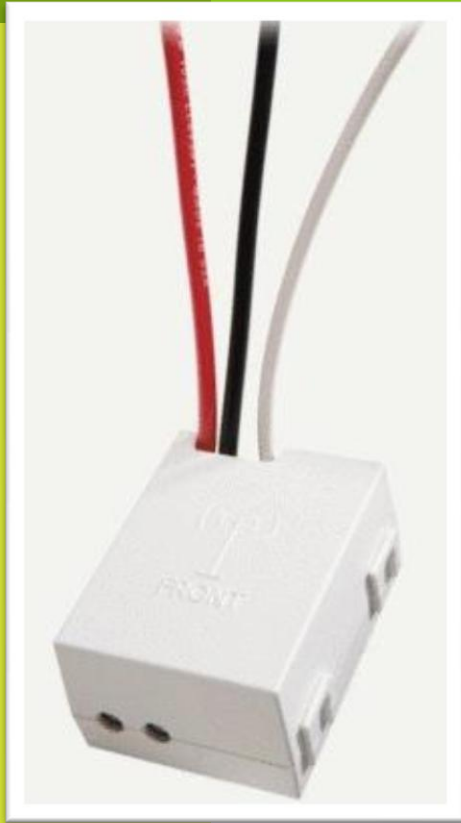


# BATTERYLESS-WIRELESS SWITCHES





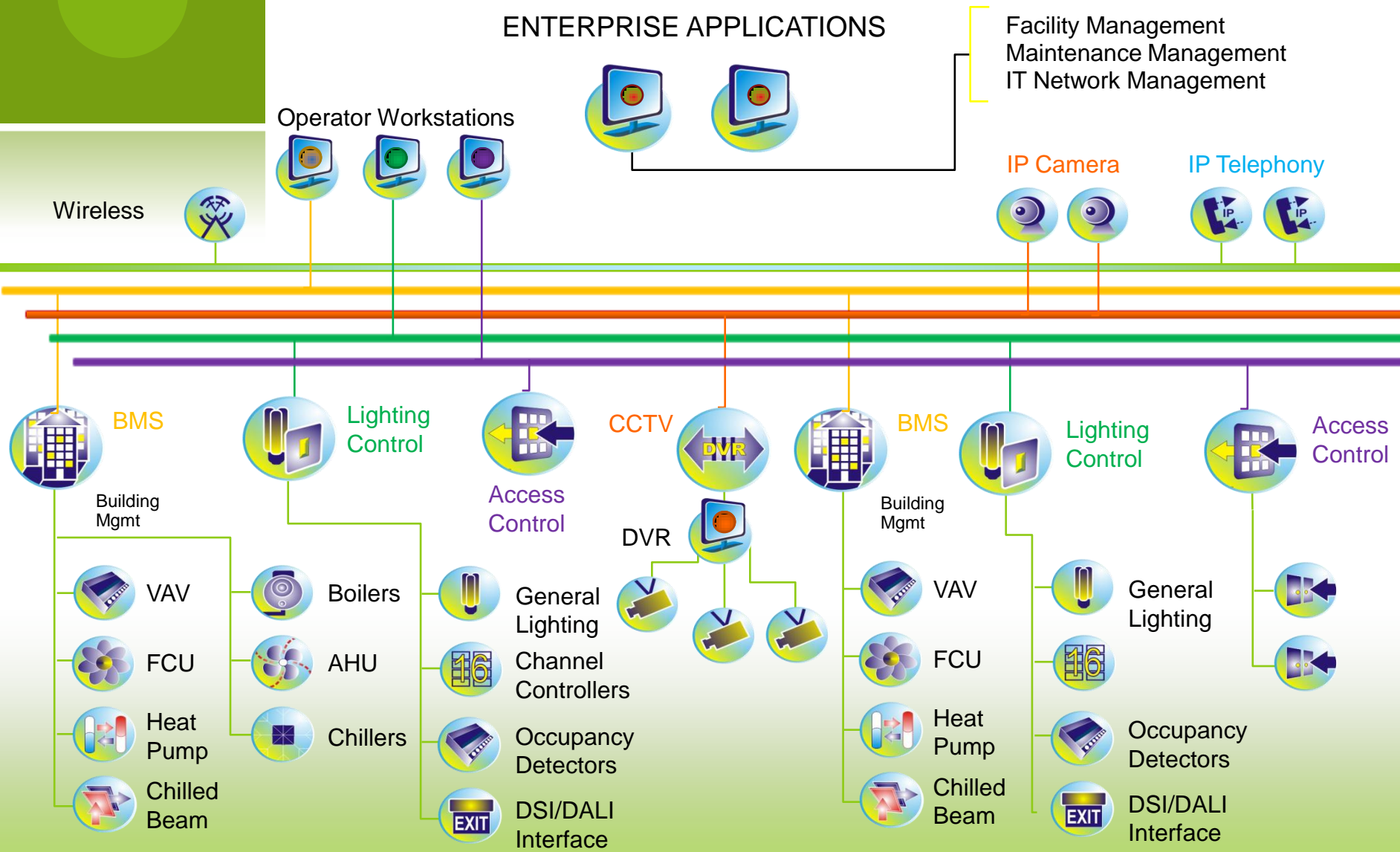
# BATTERYLESS-WIRELESS RELAYS



# BATTERYLESS-WIRELESS METER AND ACTUATORS



# BEFORE CONVERGENCE WIRED



# CONVERGED WIRELESS SOLUTION

## ENTERPRISE APPLICATIONS

Middleware Server  
Translation of  
disparate protocols to  
Common format

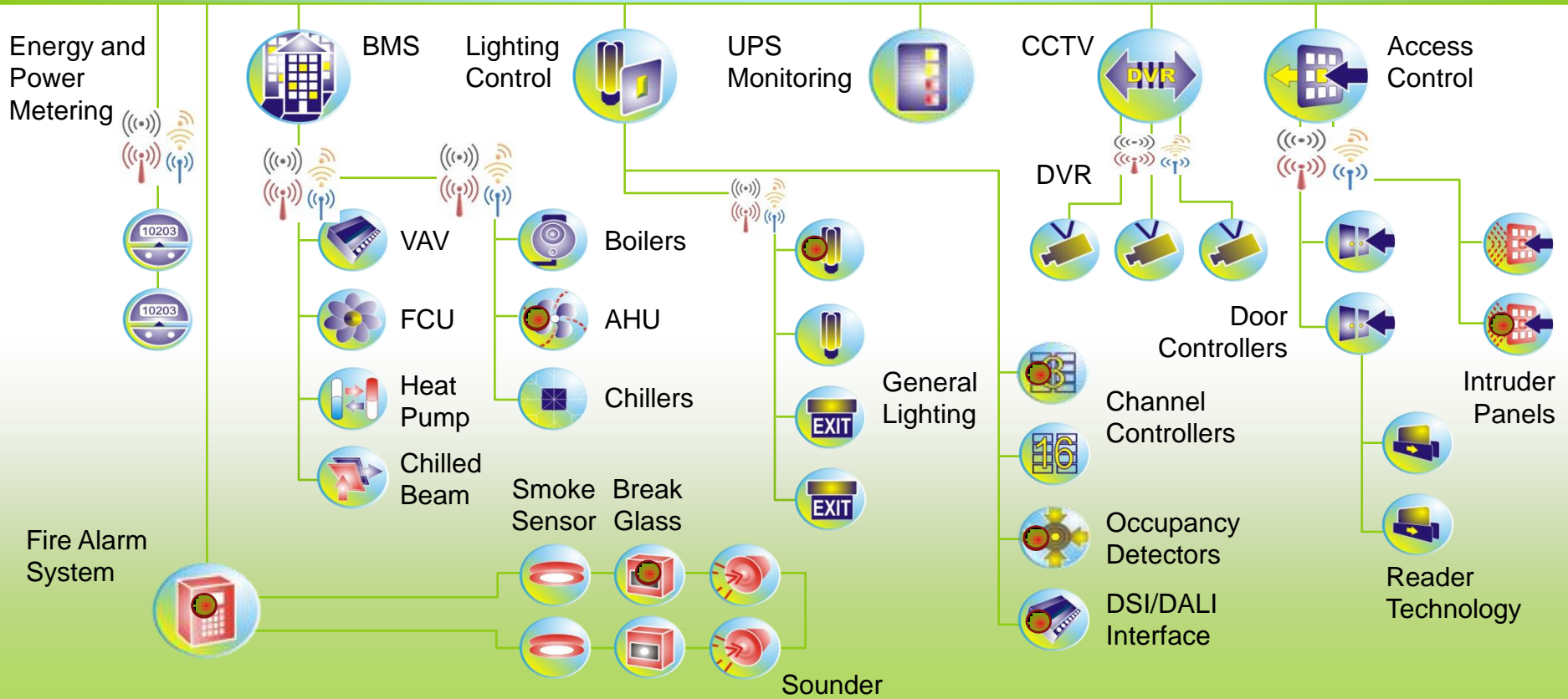
Energy Management  
Building Management  
Facility Management  
Security Management  
Maintenance Management  
IT Network Management

Wireless

TelePresence

IP Camera

IP Telephony





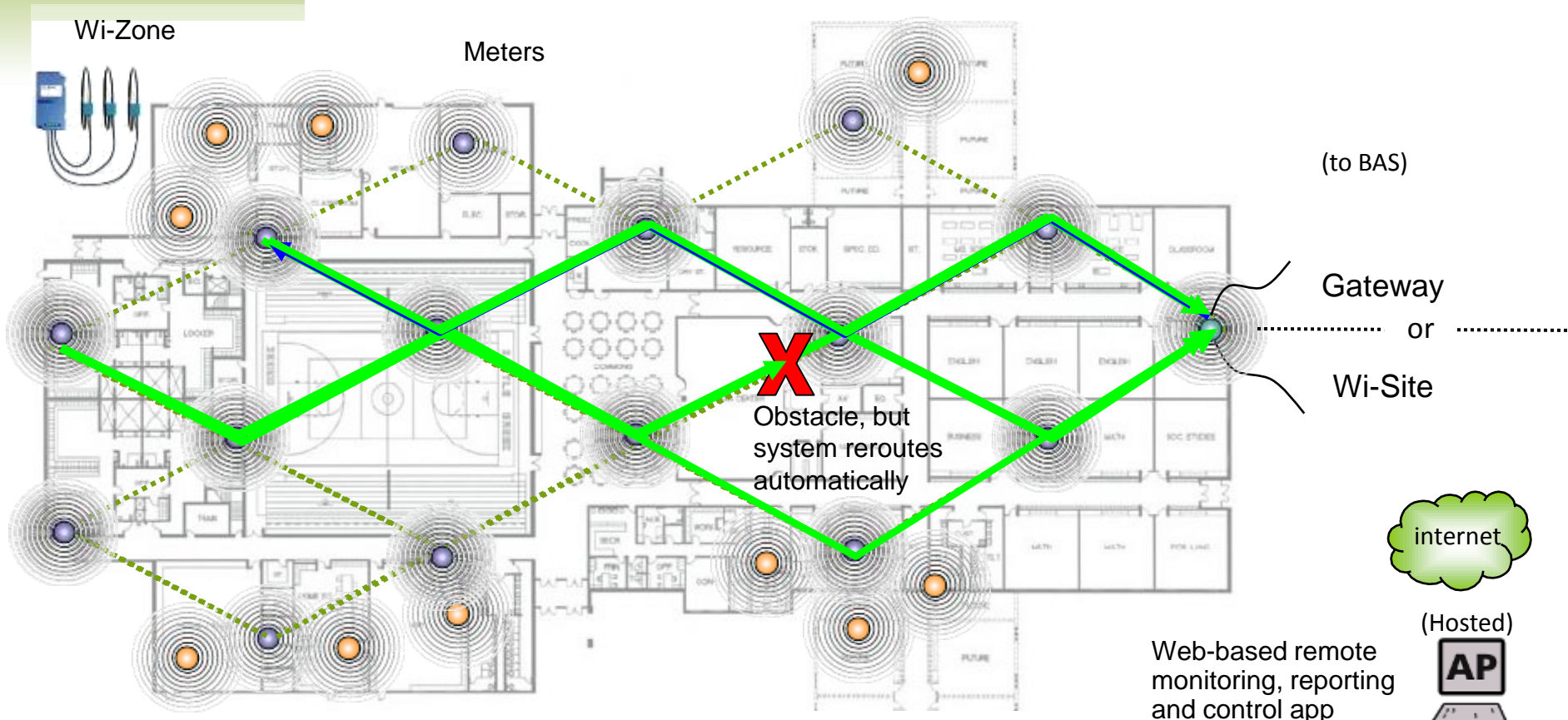
- Temperature and Humidity Monitoring
- Indoor/Outdoor



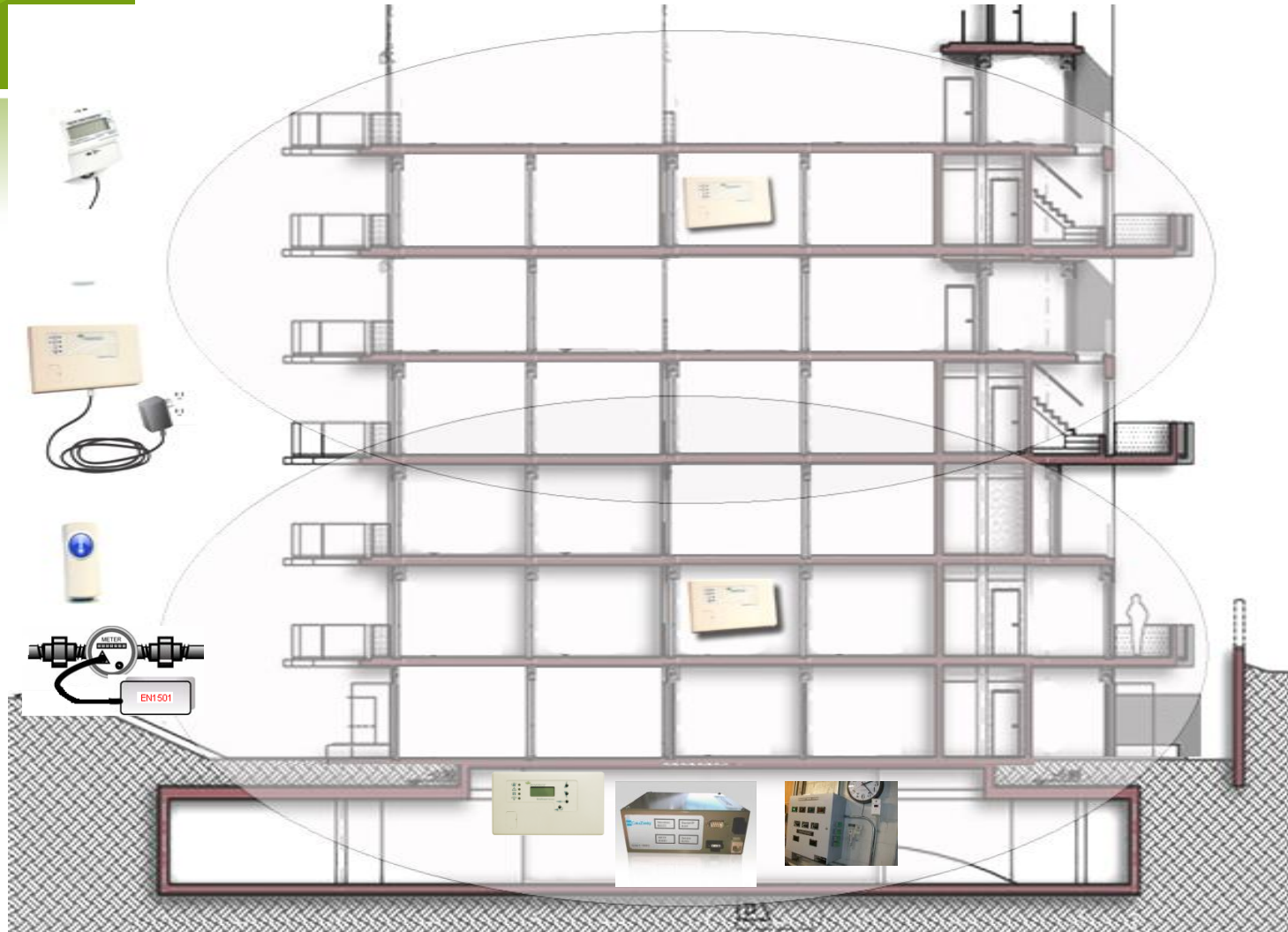
- Routes around obstacles
- Extends range of network
- Displays zone temperature
- Optional local control



- Interface between system and web
- Monitors data links, devices, network status
- Provides remote monitoring, trending, reporting, and control

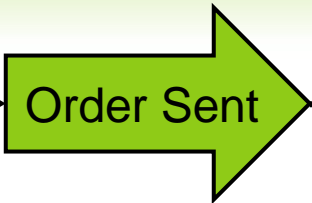


# RISER DIAGRAM

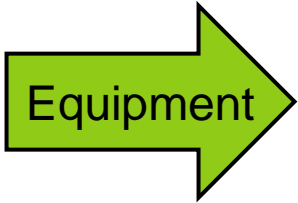
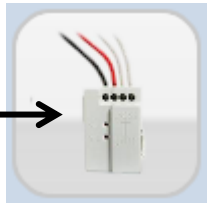
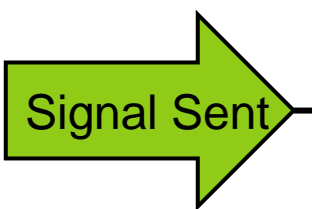
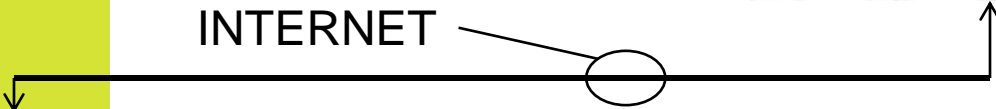


# A PICTURE IS WORTH A 1,000 WORDS

## DEMAND RESPONSE



INTERNET

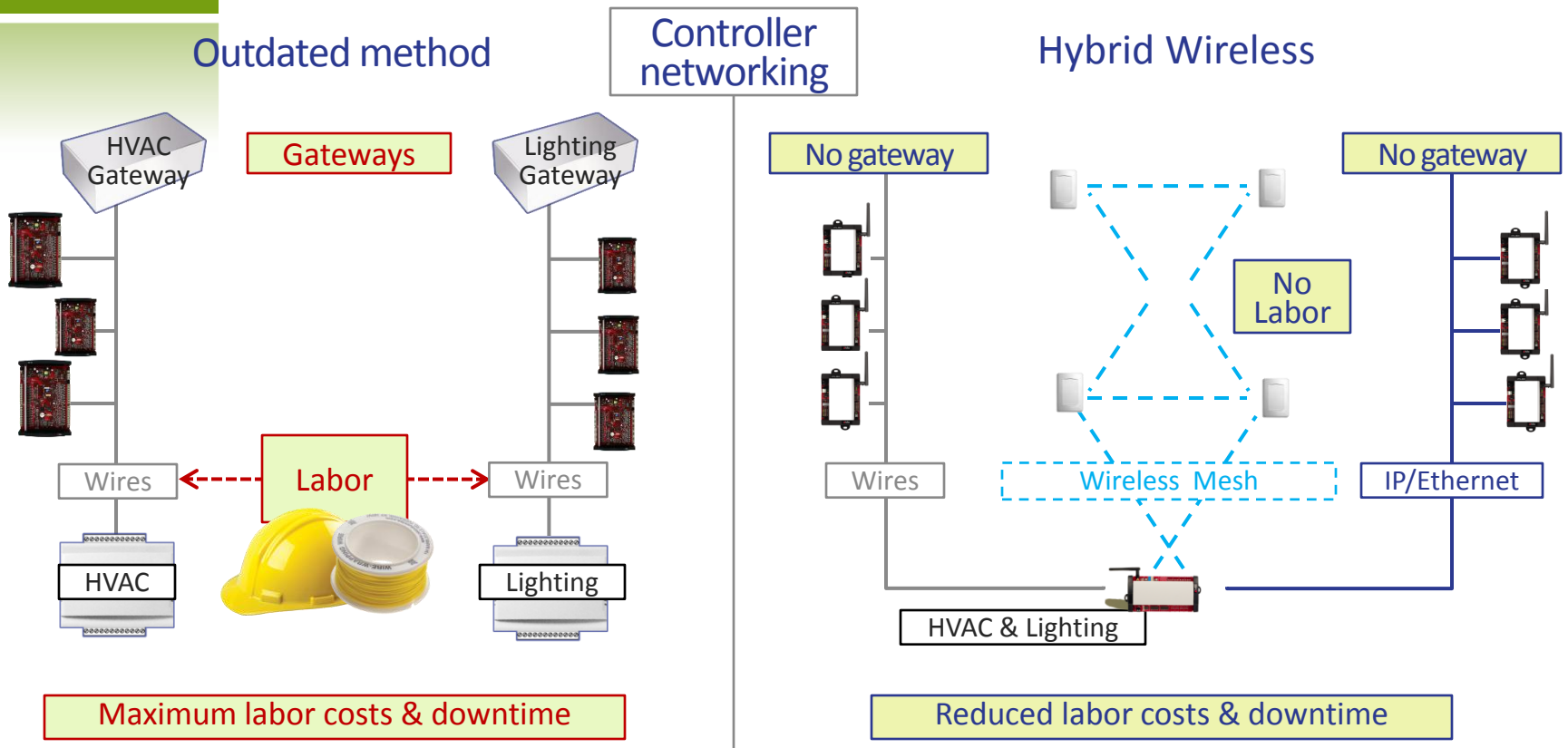


Wireless Outlet Relay



**PEPCO**  
PECONIC ENERGY PRODUCTS COMPANY

# Wireless cuts downtime & invasiveness



Bottom line: Less wires = Less labor = Less downtime



# Wireless ups scalability, cuts point limits

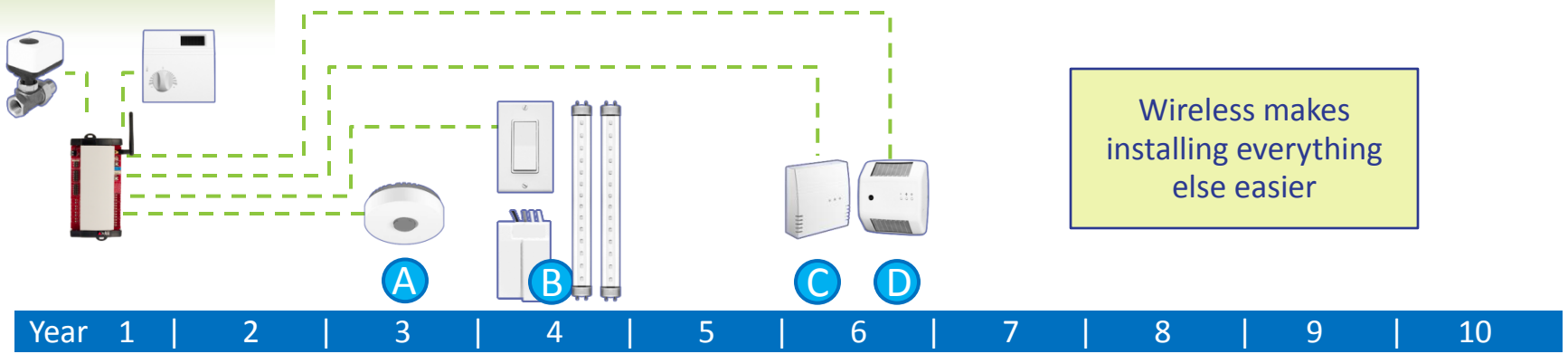
Starting with HVAC control

Adding **A** occupancy sensors

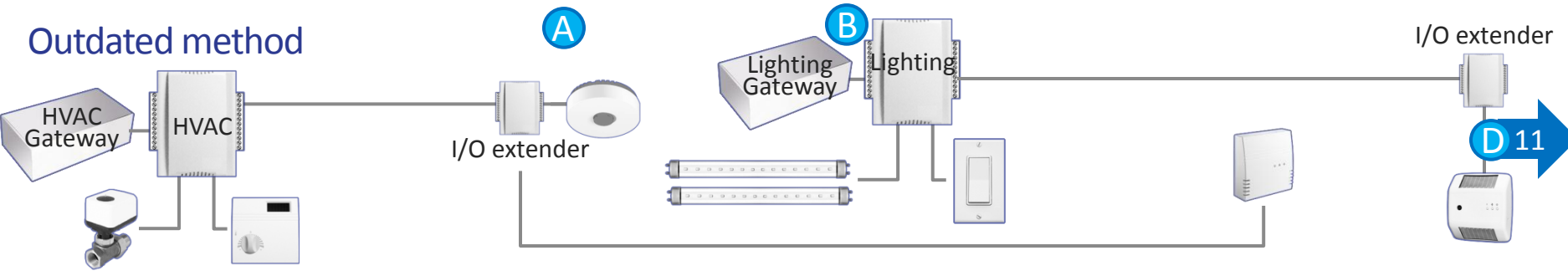
**B** light control

**C** CO2 sensors

**D** light sensors



Outdated method



Bottom line = Wireless = Shorter payback = More efficiency upgrades

# Annex: Embedded web interface

Web browser



Smartphone 



Bottom line: Flexible local and remote access

## Building Management like you've never seen before:

Power Diagnostics

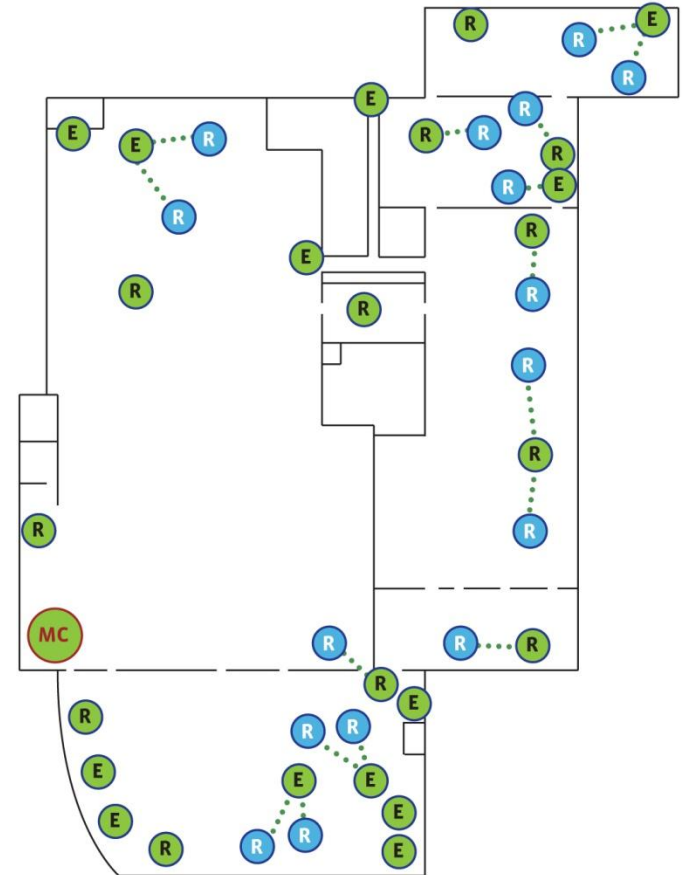
Reports



# New Construction: The Claremont

\$ 35,000 in savings  
on labor and materials

40% less time on the job



● Controller

● EnOcean

# Car Dealership: Van Buren Auto

\$ 35,000 in savings  
on labor and materials



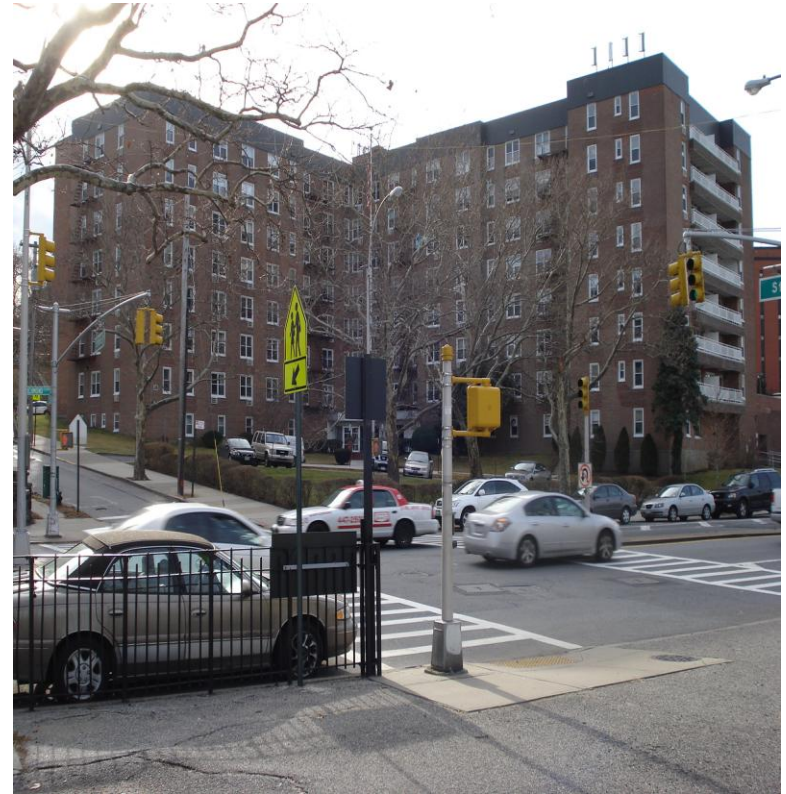
22% less time on the job

Controls from Smart Phone



# Multi-Family Residential

- \$60,000 savings in Materials and Labor
- Completed Sub Metering of 60 Units in less 1 week
- Tenants see usage from Web including History
- Utility Rebate
- Integrated with Access Control
- Open doors from SMART PHONE



# CON-ED MARKET PARTNER SINCE 2010



WE SECURE CON-ED or NYSERDA REBATES TO PAY FOR UP TO 75% OF THE SYSTEMS WE DESIGN

RETURN ON INVESTMENT  
TYPICALLY 2 YEARS OR LESS

OVER \$3,000,000 IN UTILITY  
REBATES



PEPCO is presented with First Place Trophy for most gas saved 2012



The Green Team will help you  
go green and save green



# SCHUYLER ENGINEERING, P.C.

183 NORTHWELLWOOD AVENUE • SUITE 6 • LINDENHURST, NEW YORK 11757 • TEL. (631) 956-3096 • FAX (631) 956-3091

January 14, 2010

Mr. Michael McMahon, General Manager  
Morningside Heights Housing Corporation  
80 LaSalle Street  
New York, NY 10027

Re: **Morningside Heights Housing Corporation**  
**Bldg 70 Pilot Project and Control System Evaluation**

Dear Mr. McMahon:

As per your request, Schuyler has reviewed the available data for the pilot project in Building 70 and a cost proposal to expand the work to the additional buildings. The pilot project included the installation of new steam-riser control valves and the integration of a new Building Management System (BMS) for monitoring and controlling building temperatures. The project appears to be a success in terms of both reducing tenant complaints and saving energy. Testing has indicated energy savings resulting in approximately a 29% reduction in steam used for heating. It is Schuyler recommendation that MHHC consider implementing this modernization to the other buildings onsite. Schuyler has found that the cost estimate provided by Pepco for \$ to install the same system on the other buildings is fair and reasonable.

The original steam heating consisted of a basic system using a single modulating control valve that supplied steam to all 13 steam risers at the same time. Each riser leads from the building's steam main in the basement up to the apartment radiators, where an individual riser serves a set of apartments above each other and those apartments separated by a common wall. In general, similar complaints were made by tenants served by common risers.

The pilot project resulted in the ability to individually control the steam supplied to each of the risers. The modulating valve opens or closes in response to the average apartment temperature served by that riser. This riser-valving concept was partially installed years ago at Morningside, but the installation was never completed. An early version of a BMS was also partially installed at Morningside. The original BMS was fabricated by a company called Liberty. The Liberty control system is no longer available, and the company no longer supports the older BMS system.

In conjunction with the new modulating steam valves, a new BMS fabricated by Delta Control Systems was installed to replace the Liberty system. The BMS monitors and controls building system components. The Delta control system accomplishes all the same functions as the original system, but it can also be programmed to do more than just heating control. The Delta system can be expanded to monitor energy usage and control lighting, fans, and even sprinklers.

To quantify the savings and evaluate the effectiveness of the pilot project condensate meters were installed in the basement of Building 70 and Building 501 for comparison. The physical arrangement, occupancy, and construction these two buildings are very similar and adequate for direct comparison. The condensate meters were used to determine steam used by the building for heating. Steam usage was measured from October 29<sup>th</sup>, 2009 to the present. On any particular day the steam used by Building 501 is about 29% higher than Building 70. In total, Morningside has used about 927,000 lbs less steam to heat Building 70 than to heat Building 501 during November and December. In addition to lower steam consumption, the average condensate-return temperatures from Building 70 have been observed to be about 15°F lower than Building 501, which indicated increased energy efficiency in Building 70.

**29% SAVINGS**

MR. MICHAEL MCMAHON  
JANUARY 14, 2010  
PAGE 2

In summary, the pilot project has resulted in more comfort to tenants as evidenced by a reduction in complaints, and fewer maintenance calls. The project has also resulted in approximately a 29% reduction in steam use for heating. Morningside could potentially save about 29% of it's total fuel costs used for heating once all the buildings on site have this system installed. Based on the 2009 operational season the savings would be about \$435,000.

In addition to the performance analysis of the system Schuyler was also reviewed the cost proposal from Pepco to install the system in the rest of the buildings onsite. Pepco has provided a cost proposal for each building, for a total of . Excluded from this proposal is the work necessary to install the new steam control valve, although the costs of the valves are included in the proposal. Based on previous projects and consultations with other BMS suppliers Pepco's cost of approximately \$ 00 per point monitored or controlled is reasonable for work performed in New York City using trade wage rates.

The cost to install the valves has been excluded from Pepco's cost proposal. Schuyler is currently finalizing the documents so that Morningside can competitively bid this portion of the project. It is estimated that this work would cost about \$57,000 per building, for a total of \$285,000.

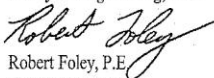
It is estimated that duplicating the pilot project to the remaining 5 buildings would cost about \$

Included in Pepco's proposal is the option to provide and install wireless temperature transmitter. The existing building temperature sensors are part of the older INTECH21 system. The temperature transmitters do not provide an accurate representation of the space temperature due to the location of some of these devices. This option would permit the installation of new temperature devices in locations that produce faulty readings. The price addition for this option is \$89,160.

The total budget would be revised to \$ including the wireless temperature sensor option.

If you have any questions concerning this information, please call me directly.

Sincerely,  
Schuyler Engineering, P.C.

  
Robert Foley, P.E.  
Project Engineer



# THE CENTURY

25 Central Park West, NY



## **MODEL: ENERGUARD™**

**THE CENTURY** The sister of the Majestic apartment building several blocks to the north on Central Park West, the Century is one of the masterpieces of developer Irwin S. Chanin, who also built the great 56-story Chanin Building on East 42nd Street and many famous theaters around Times Square such as the Roxy, the Biltmore and the Majestic.

The building heating plant was converted from city steam to a central boiler plant in 1997. The plant consists of (3) 500 HP Federal Boilers and is Dual Fuel. The ENERGUARD™ was installed in May 2009 and controls the automatic Start Stop, Lead Lag and Fuel/Air Modulation of the boilers. Six (6) Zone Valves regulate the heat through out different parts of the building. The ENERGUARD™ controls the valve modulation to each zone using feedback from wireless temperature sensors placed inside tenant apartments. The Resident Manager sets the zone temperature from a PC and monitors the temperature through out the day and night via a web browser. A weather station on the roof of the building tracks wind speed, wind direction, RH% and Outdoor Air Temperature. On high windy cold days the Resident Manger increases space temperature settings in the zone most impacted by severe weather conditions. This has reduced tenant complaints and reduced fuel consumption.

Further expansion of the system includes Card Access and Lighting Control.

Visit: <http://75.127.209.156/Deltaweb/login.asp>

User Name: 25cpw

Password: DEMO



*The CENTURY*

### **HIGHLIGHTS:**

- Fuel Savings 20%
- Control (6) 8" Steam Valves
- Control MEPCO Vari-Vac System
- Import Apartment Temperatures
- Control (3) 500 HP Boilers
- Domestic Hot Water Monitored
- Weather Station installed on Roof
- Web Based Color Graphics
- Password Protected
- Alarms\Exception Reports
- P.C. Color Graphics
- Historical Trending
- XY Trend Plot Of All Variables

Engineer: J. K. Blum

Contact: Call PEPCO for contact info



# HOFSTRA UNIVERSITY

Hempstead, N.Y. 11550



## CASE STUDY

**HOFSTRA UNIVERSITY** was founded in 1935 and is located in Long Island, New York, about 25 miles east of Manhattan, offers excellent undergraduate and graduate programs on a beautiful suburban campus.

**GRADUATE RESIDENCE** In fall of 2009 PECONIC was awarded a contract to install a DELTA Control system in the new Graduate Residence Dormitory. This building is a new building built on the North Campus and is occupied 24/7 for most of the year. The building houses both faculty and students.

Low Pressure Steam is supplied to the building from the Central Power Plant. Control of the Steam Station consisting of 1/3, 2/3 Steam Valves, two Steam to Hot Water Heat-Exchange Units and Two Heating Distribution Pumps configured with Variable Speed Drives and Differential Pressure Sensor. Individual rooms are configured with PTAC units equipped with 2 way hot water valves. As system water pressure builds from the closing of the two way valves the Variable Speed Drives throttle down to maintain a constant system pressure.

Common areas and hallways are heated and cooled from AHU's and RTU's that are equipped with Hot Water Heating Coils and Two Stages of Cooling. DELTA DAC-T305's with individual LCD Displays are used to control the space temperatures and with proper password allows the maintenance staff to view and adjust set points locally. Entrance lobby's, and stairwells are equipped with Hot Water Fan Coil Units that are active only when the Outdoor Air Temperature fall below 55 degs. Freeze stats are installed in the AHU's and RTU's that shut down the systems to prevent freeze ups.

The project required systems integration using MODBUS to connect (2) AAOON Roof Top Units furnished with factory controls to the DELTA system for monitoring and control.

The building is connected to the campus LAN and is monitored and controlled using ORCAweb. PECONIC is under a multiple year service contract to maintain and upgrade the system with new factory releases of software.

Further expansion of the system is underway and includes Card Access, Lighting Control and software upgrades to ORCAweb 3.33, which includes the ENERGY DASHBOARD.



© HOFSTRA UNIVERSITY

## HOFSTRA UNIVERSITY

### SYSTEM FEATURES:

- ORCAweb and ORCAview (Graphical User Interface)
- Password Protected
- Alarms and Exception Reports
- P.C. Color Graphics
- Historical Trending
- XY Trend Plot Of All Variables

MEP Engineer: Cosentini Associates

Contact: Tom Mascalle  
516-463-6058



# MORNINGSIDE HEIGHTS HOUSING CORPORATION

80 LaSalle Street  
New York City, N.Y.



## CASE STUDY

### **MORNINSIDE HEIGHTS HOUSING**

**CORPORATION** ("Morningside Gardens") is a residential cooperative apartment complex with more than 980 units and is located on the upper west side of Manhattan. Opened in 1954, the eight acre, beautifully landscaped campus borders on Broadway and Amsterdam Avenue and comprises six high-rise buildings, twenty-four floors each. The buildings are heated by a central plant consisting of (4) 500hp boilers that supplies 5 lbs steam pressure to each building. Steam flow to each building is regulated by a single MEPCO Vari-Vac Steam valve.

PEPCO furnished and installed the ENERGUARD in building 70 as a pilot project to demonstrate to the board that overheating could be controlled and the upgrade could be paid for thru fuel saving in under 3 years. Before the ENERGUARD was installed the studio line apartment temperatures averaged 85 degrees to get the 2 bedroom line to be a comfortable 72 degrees. To achieve even heat distribution the ENERGUARD controls the modulation of (13) new 4" riser steam valves. The system went on-line in March 2009 and the fuel savings as of January, 2010 are averaging 40% to 60% daily. The savings are measured by comparing metered condensate return gallons from building 70 vs the 501 building. The buildings are identical. As the space temperature in the studio lines reach set point the steam valve modulates to the closed position to restrict steam flow and reducing usage. Heat distribution is even through-out each line in the building.

In July 2010 the Board approved a budget of \$1,100,000 to expand the ENERGUARD System in the remaining buildings. PEPCO furnished and installed 57 new 4" Steam valves, and over 400 monitoring and control points.

Further expansion of the system includes Card Access and Lighting Control.

#### DELTA PRODUCTS:

21 DELTA DSC-1616E  
12 DELTA DAC-1212E  
3 DAC-T305  
18 DAC-633  
6 DSM-WRL  
2 ASM  
ORCAweb  
60 Wireless Temperature Sensors



**Morningside Heights Housing Corp.**  
**New York, NY**

#### HIGHLIGHTS:

- \* Fuel Savings 40% to 60% Daily
- \* Control (13) 4" Steam Valves
- \* Control MEPCO Vari-Vac System
- \* DELTA to INTECH 21 via MODBUS
- \* 31 Condensate lines monitored
- \* Domestic Hot Water Monitored
- \* Weather Station installed on Roof
- \* Web Based Color Graphics
- \* Password Protected
- \* Alarms/Exception Reports
- \* P.C. Color Graphics
- \* Historical Trending
- \* XY Trend Plot Of All Variables

Visit <http://207.237.14.3/Deltaweb/login.asp>

User Name: DEMO  
Password: DEMO

**Engineer:** Schuyler Engineering, P.C.  
**Contact:** Call PEPCO for contact info





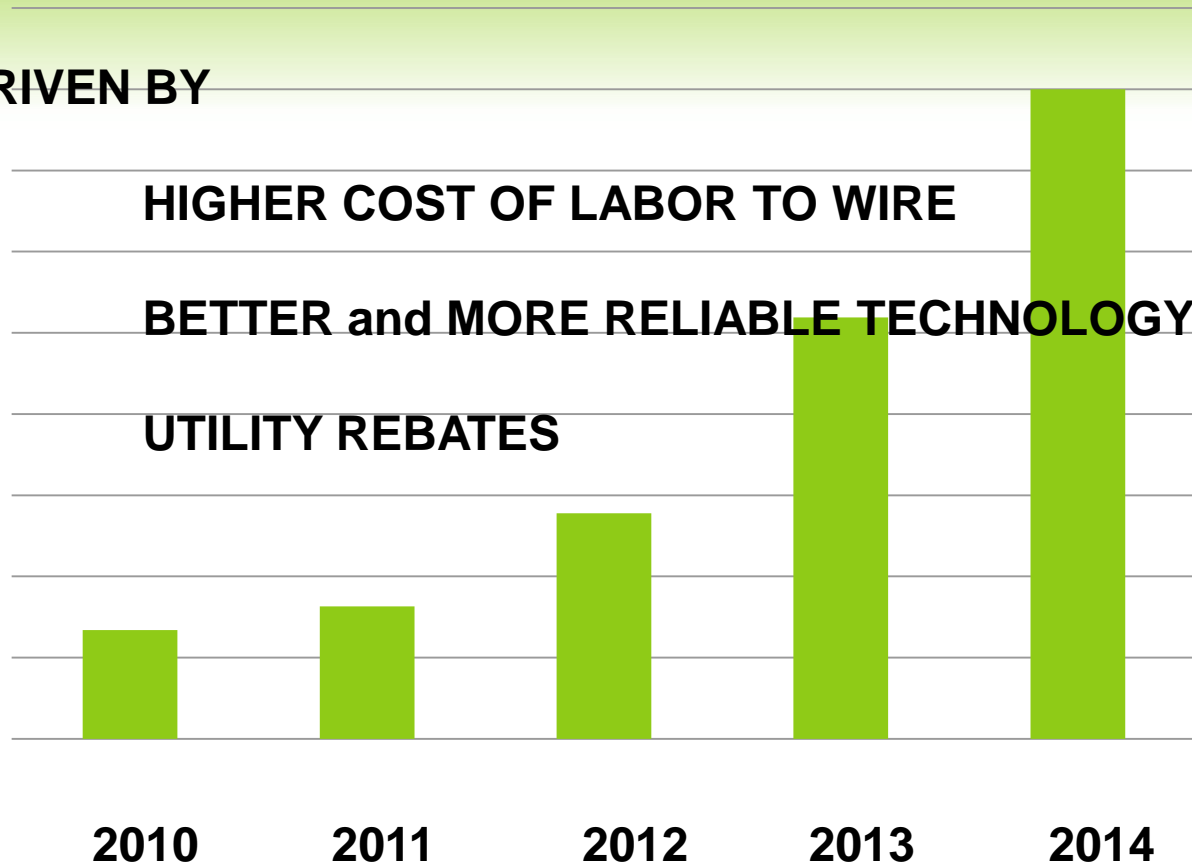
THANK YOU

**DRIVEN BY**

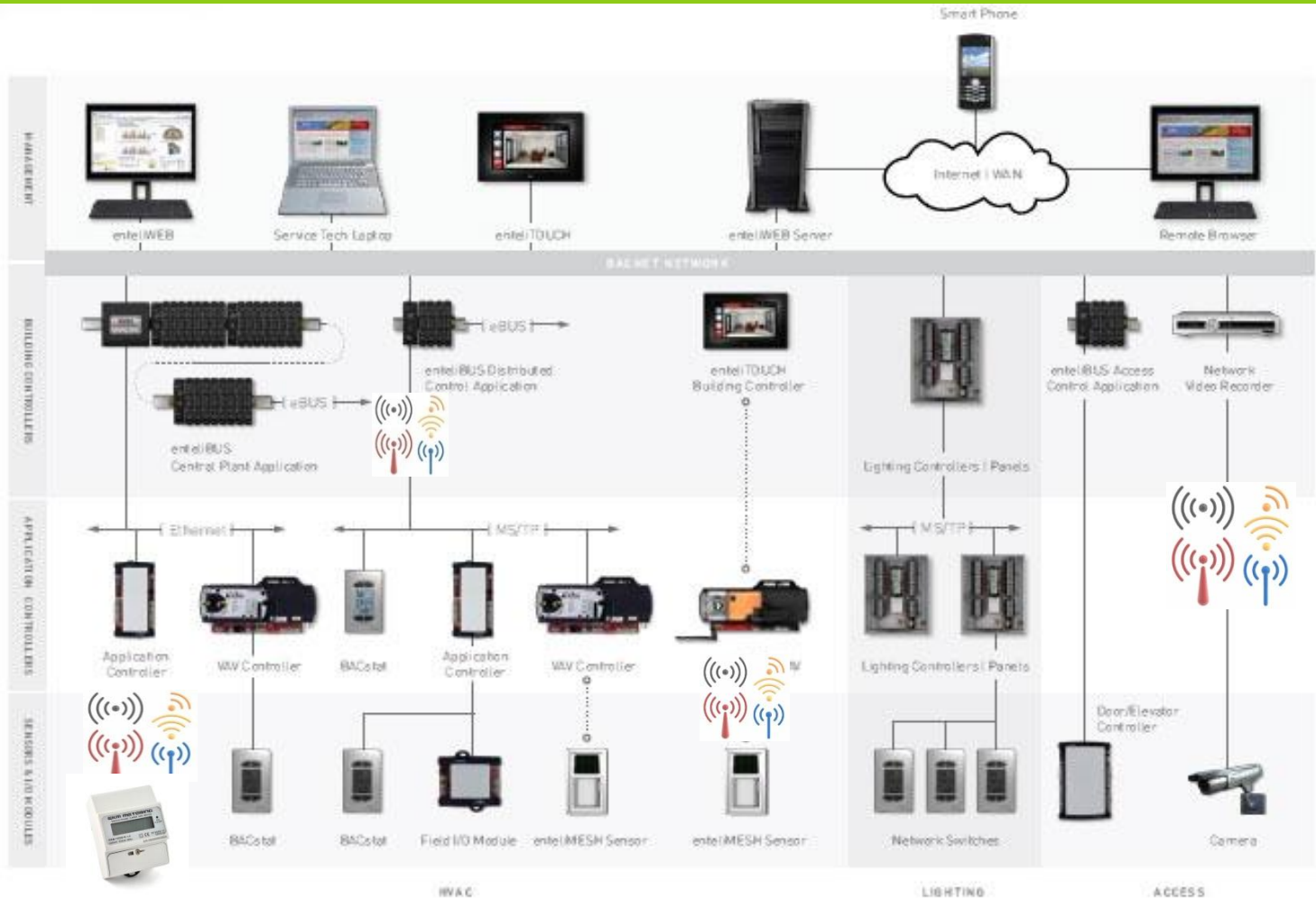
**HIGHER COST OF LABOR TO WIRE**

**BETTER and MORE RELIABLE TECHNOLOGY**

**UTILITY REBATES**



# BMS WIRELESS SYSTEM ARCHITECTURE



# CONTROLS..... FOR TODAY'S MARKET.

NOTES:

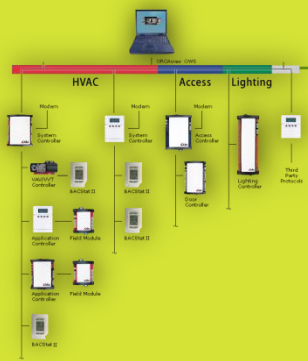


Central Management and Control Center

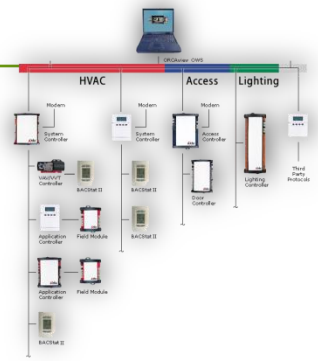


Internet

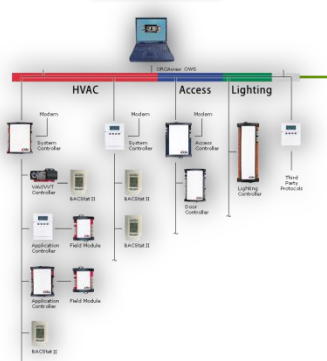
Facility 1



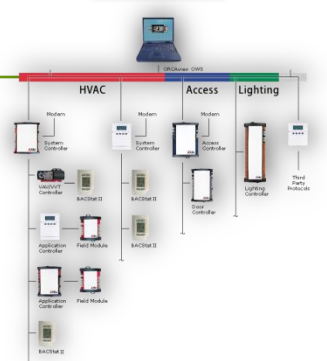
Facility 4



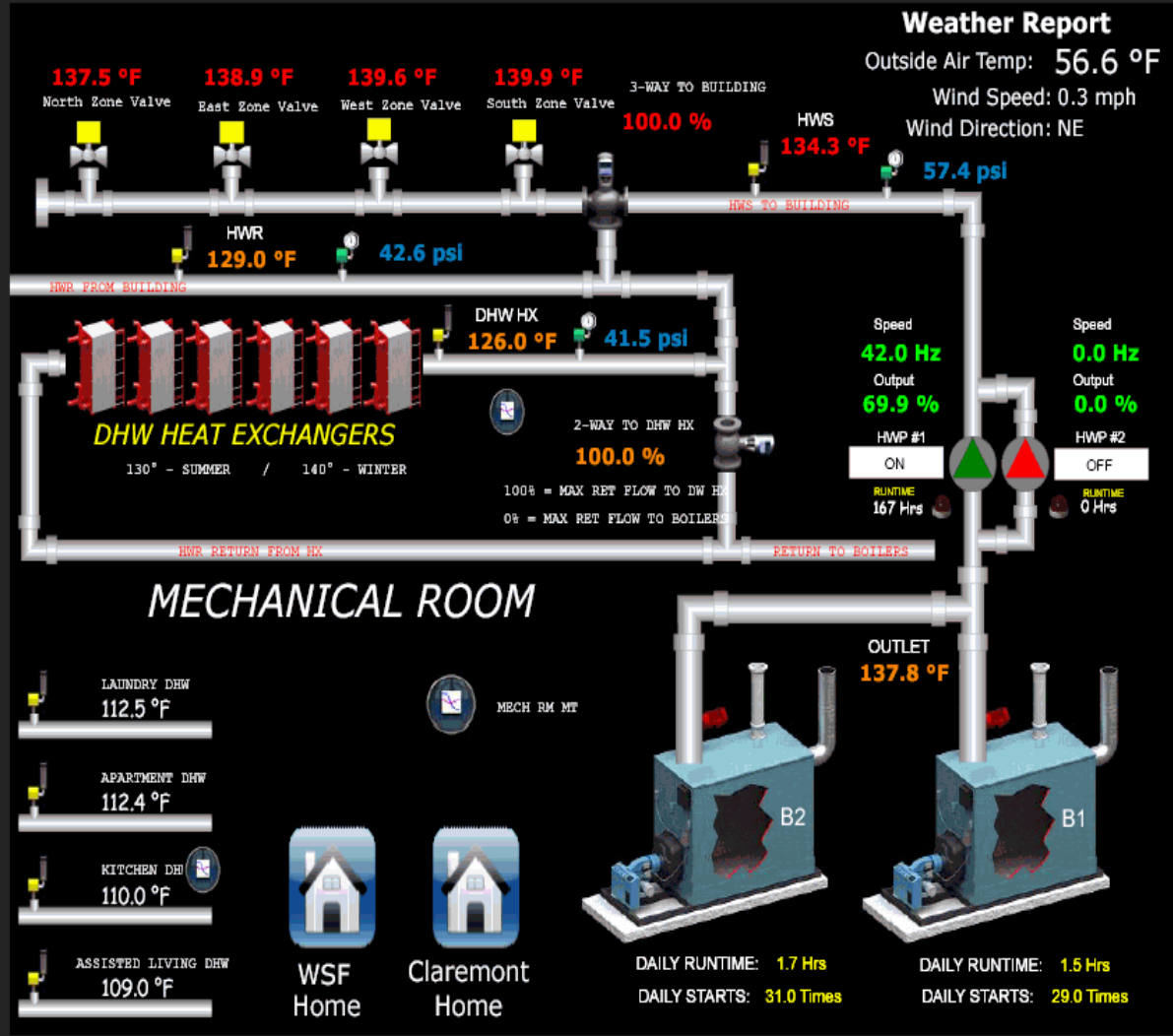
Facility 2



Facility 3



- KL\_FIRSTFLOORHEAT
- KLFLOOR2
- KLFLOOR3
- KLFLOOR4
- KLFLOOR5
- KLFLOOR6
- KLFLOOR7
- KLMAIN
- KowallBoilerFlow
- KowallHouse\_24 Hour Setpoint
- KowallHouse\_Building Main
- KowallHouse\_ErgomaxFlow
- LGRiserE3
- PANAM255west14thmain
- RedOak\_24 Hour Setpoints
- RedOak\_Building MainI
- RedOak\_BuildingSetup
- RedOak\_DHWControl
- ValleyLodge\_24 Hour Setpoint
- ValleyLodge\_Building Main
- W84thStreet\_24 Hour Setpoint
- W84thStreet\_Building Main
- W84thStreet\_OATResetScale
- W84thStreet\_RTUControl
- W87thStreet\_OATResetScale
- W87thStreet\_RTUControl
- Westbourne\_24 Hour Setpoints
- Westbourne\_Building Main
- WSF DHW MATT
- WSF IAT MATT
- WSF\_MainMenu
- Alarms
- Reports
- Administration
- Delta Controls Inc.
- Contact Administrator
- Preference
- Help



# CUSTOM GRAPHICS



Last Update: May 1, 2012 06:11:30



## 2 CASE STUDIES

NOTES:

Cutting Edge vs Bleeding Edge



- MORNINGSIDЕ HEIGHTS HOUSING
- THE CLAREMONT



# EXISTING PROJECTS

