International District Energy Association

IDEA's 28th Annual Campus Energy Conference

CampusEnergy2015

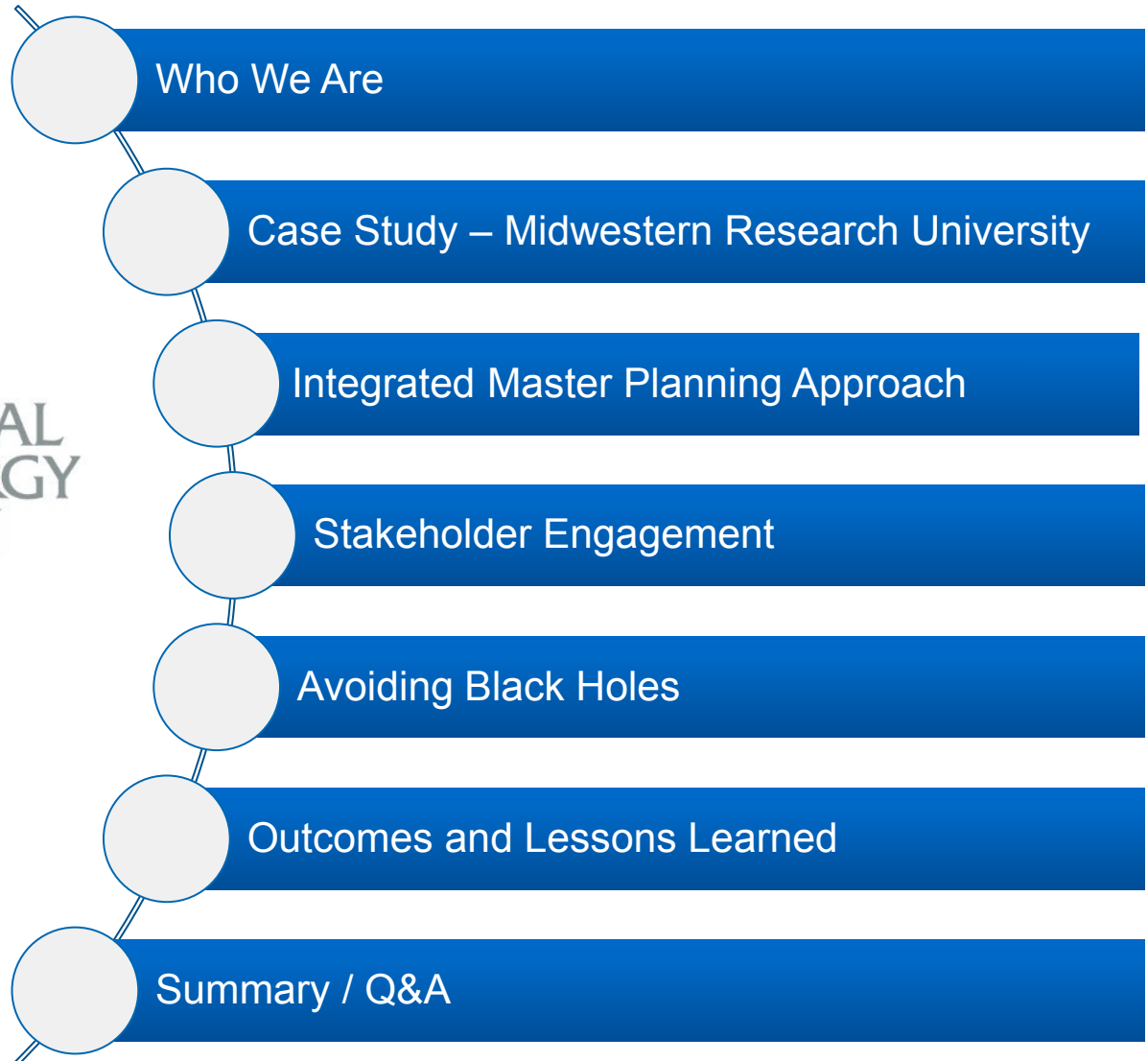Clean Energy for the Next Generation | February 10-13, 2015 | Denver, Colorado

MicroGrid Power Study Migrates to Integrated Multi-Campus Design of Facility Controls

10 February 2015

Agenda

INTERNATIONAL DISTRICT ENERGY ASSOCIATION

- Who We Are
- Case Study – Midwestern Research University
- Integrated Master Planning Approach
- Stakeholder Engagement
- Avoiding Black Holes
- Outcomes and Lessons Learned
- Summary / Q&A

We are Integrated

Technology is Changing What is Possible for Buildings and Campuses, Utilizing Controls Master Planning to Explore and Achieve the Possibilities

Market Vertical Focus			
Workplace	High Performance Buildings	Mission Critical Facilities	Health, Science, & Education

Specialized Service Focus:
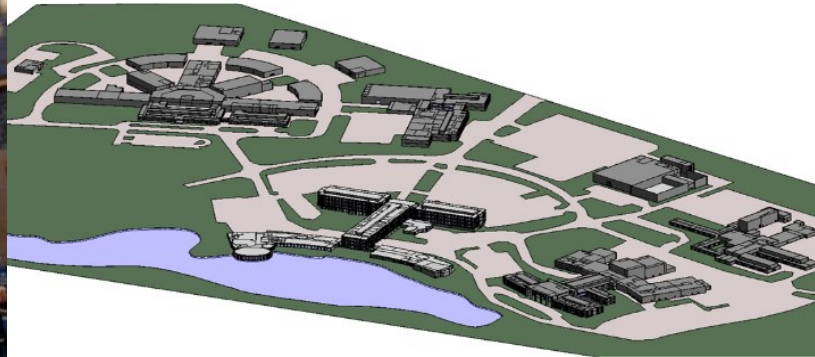- Consulting
- Engineering
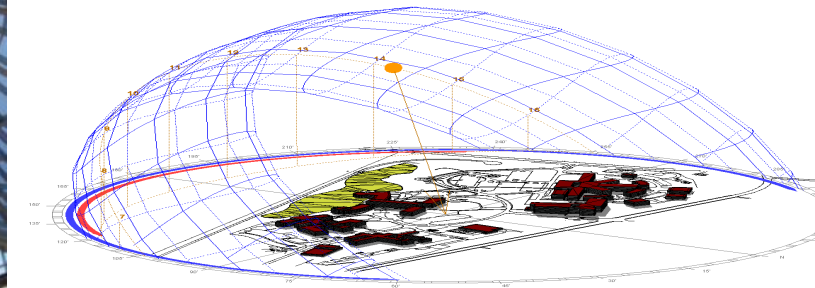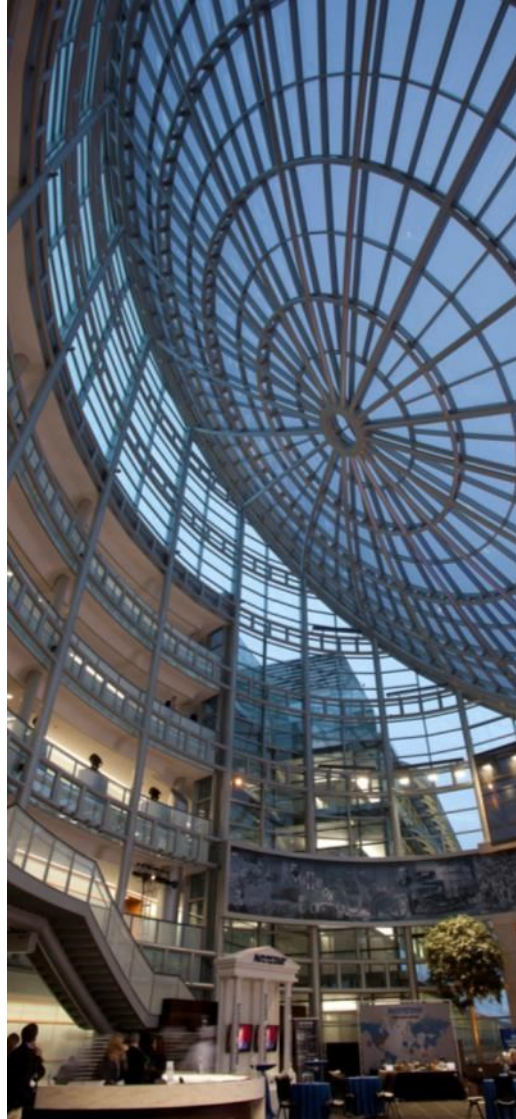- Technology
- Energy+Eco
- Commissioning

For over 47 years our corporate mission has remained unchanged:
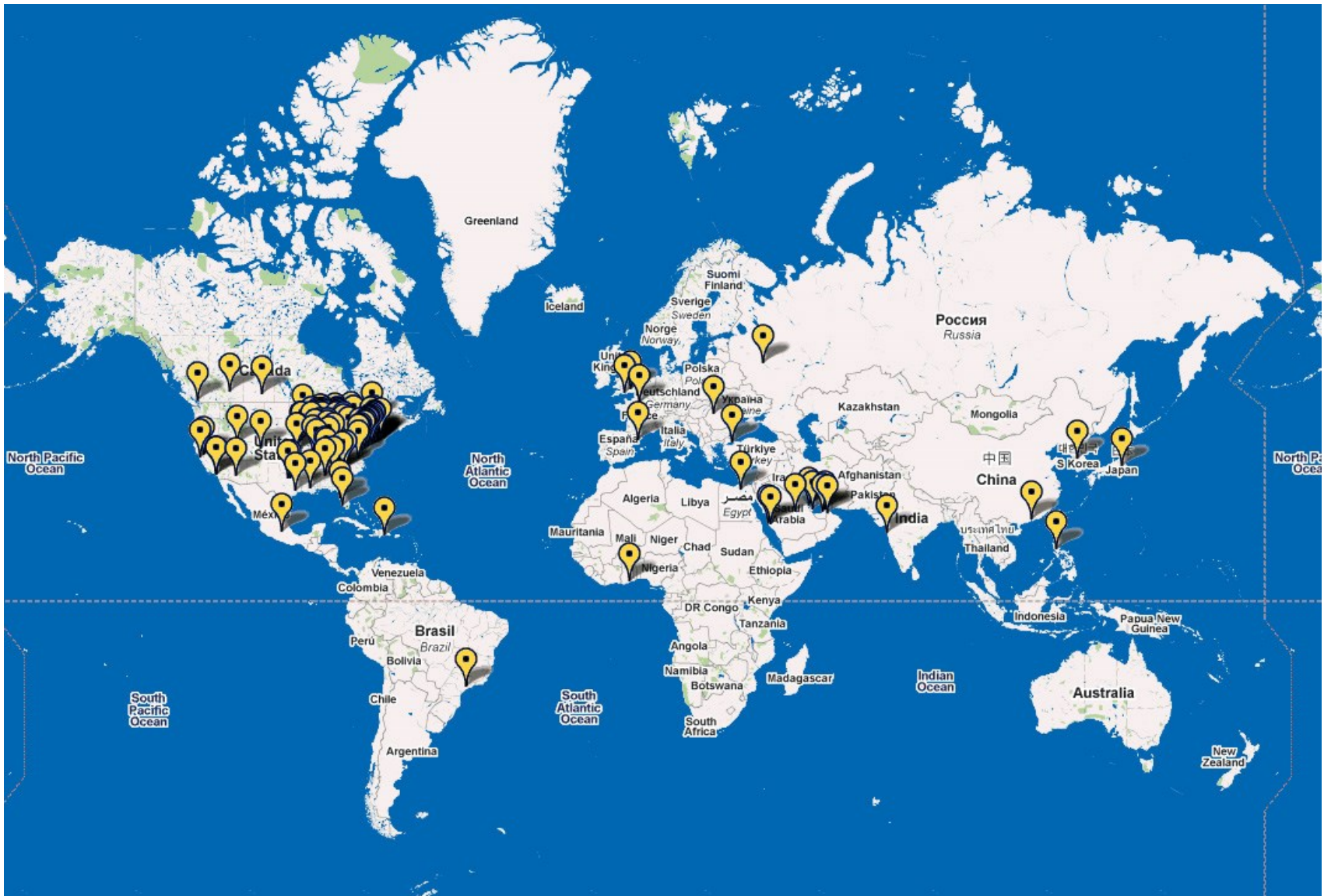
Improve Society Through the Built Environment.

We are High Performance

We are Innovators

We are Global

Case Study Overview

- Large Midwestern Research University

- Engagement Timeline
  - Initial Engagement = Electrical Safety Remediation Project
    - Arc Flash and Short Circuit
    - Power Condition Study
    - Assessment of Electrical and Mechanical Infrastructure
  - Expanded into Power Grid Monitoring & Control Assessment and subsequent Design

- General Requests/Requirements:
  - Aged Electrical Power Monitoring System at, or near, end of useful life – upgrade or replace
  - Improve quality of visibility
  - Extend monitoring and control functionality
  - Remote access and control capabilities
  - Improve data storage/retention, reporting capabilities
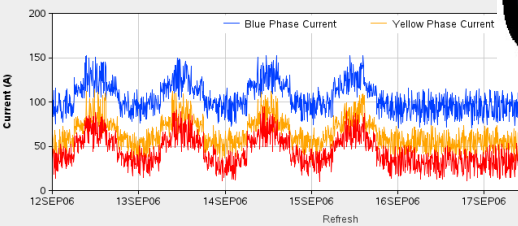 - Improve graphical representations and data displays

Identifying the Pieces
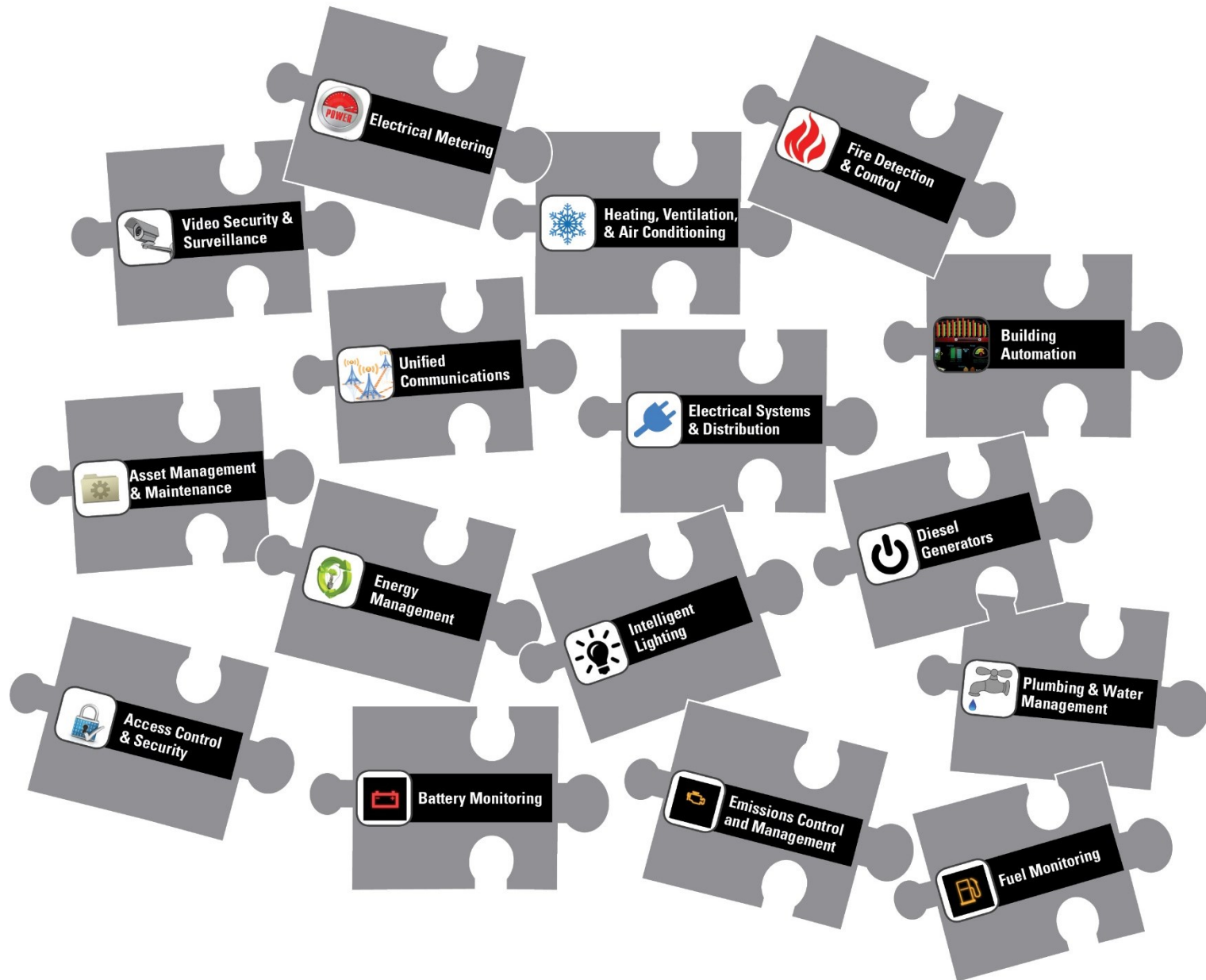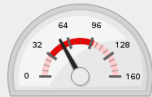
Finding the Information
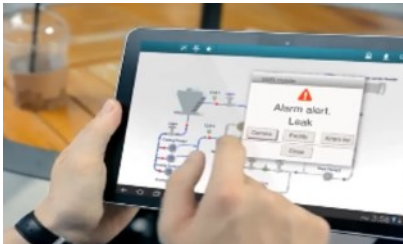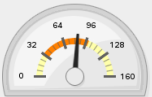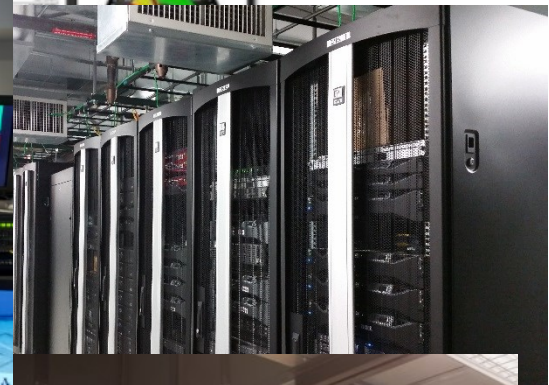
Integrated Master Planning Approach

Engage Our Clients

Extend conversations throughout the lifecycle of the built environment to help clients maintain their edge.

- Engage ALL Stakeholders

- Understand Business Drivers and Initiatives

- Prioritize Project Goals and Initiatives

- Gain Consensus on Project Goals

  - Just as important – gain agreement on what will NOT be included

- Define the Expected Functionality and Occupant Experience

- Identify the Systems Required to Deliver the Functionality and Experience

Integrated Master Planning Approach

ESD

Understand Client Drivers

Speak their language and listen (discover the needs behind their requests).

- Clearly communicate the project requirements to prospective providers

- Specify systems and related sub-components that deliver the experiences to meet the defined project goals and initiatives

- *Fit for Purpose:* Clearly state required functionality

- *Fit for Future:* Ensure system scalability and for future expansion – both in capacity and functionality

- Address network security, remote access capabilities

Integrated Master Planning Approach

Deliver

Challenge the norm to create an environment that encourages innovation and communication.

- Counsel Client during provider selection process

- Understand Business Drivers and Initiatives

- Prioritize Project Goals and Initiatives

- Ensure the completed product/system fully

  – Just as important – gain agreement on what will NOT be included

Stakeholder Engagement

Financial
- Reduce costs
- Enable more granular data
- Enable comparative/ competitive analysis across campus(es)

Sustainability
- Utility Consumption Reduction
- Water Conservation

Social PR
- Prestige/Recognition
- Increased Awareness
- Public and Employee Engagement

Operational
- Increased Operational Efficiencies
- Improved Functionality
- Increased Productivity

People
- Security
- Life Safety

Stakeholder Engagement

- Interactive, collaborative meetings with ALL stakeholders

Integrated Intelligent Building System Scoring/Rating

System Category	Building System	Priority (1 -10)	Notes
Mechanical	Chiller System	10	BAS Interface; Heat Recovery (BACnet MSTP)
	Boiler System	10	BAS Interface (Modbus TCP preferred)
	Fuel System Monitoring	10	
	Chemical Treatment	10	
	Glycol Fill	2	Discrete inputs to BAS
	Air Handling Units	10	Field applied controls by BAS Contractor
	Building Automation	10	
	Mechanical Shades	5	4th floor for sure; need to identify control options PARKING LOT
	VFDs	10	Utility
	Process Cooling	10	
	Stairway Pressurization	1	Initiated from FA; monitored by BAS
Electrical	Interior Lighting	10	Native to IB Network
	Exterior Lighting	10	Part of primary lighting control system
	Emergency Generator	10	Through A/V
	UPS	10	
	Switchgear	10	
	ATS	10	
	Battery Monitoring	10	
Security/Life Safety	Fire Alarm	3	Maybe Parking Lot
	Video Surveillance	5	Need input/direction on policy from Enterprise and Security
	Access Control	5	Need input/direction on policy from Enterprise and Security
	Emergency Intercoms	1	Typically through Security system;
Plumbing	Hot Water Heaters	8	Point of use; no data integration; need consumption data
	Irrigation	8	Potential connection to openAPI; domestic backup usage?
	Thermostatic Mixing Valves	1	
	Sewage Ejectors/Sumps	1	Discrete inputs to BAS
	Intelligent Fixtures	1	
Miscellaneous	Parking Systems	1	Tenant parking separate
	Weather Stations	1	Included in BAS
	Metering	10	Steam, CHW, HW, DHW, Gas, Electric, City Water
	Elevators/Escalators	10	Need power consumption data
Displays	Digital Signage	6	Push Life Safety info
	Kiosks	6	Public and Employee Engagement
	Dashboards	10	
	Wayfinding	1	
Communications	Public Wi-Fi	8	If not delivered otherwise; GuestNet is part of IT implementation
	Distributed Antenna	8	IT responsibility; enterprise wi-fi-need scope clarification
Enterprise Applications	Analytics	10	
	Fault Detection/Diagnostics	10	
	Optimization	10	
	Asset Management/RFID	1	
	CMMS	10	

Stakeholder Engagement
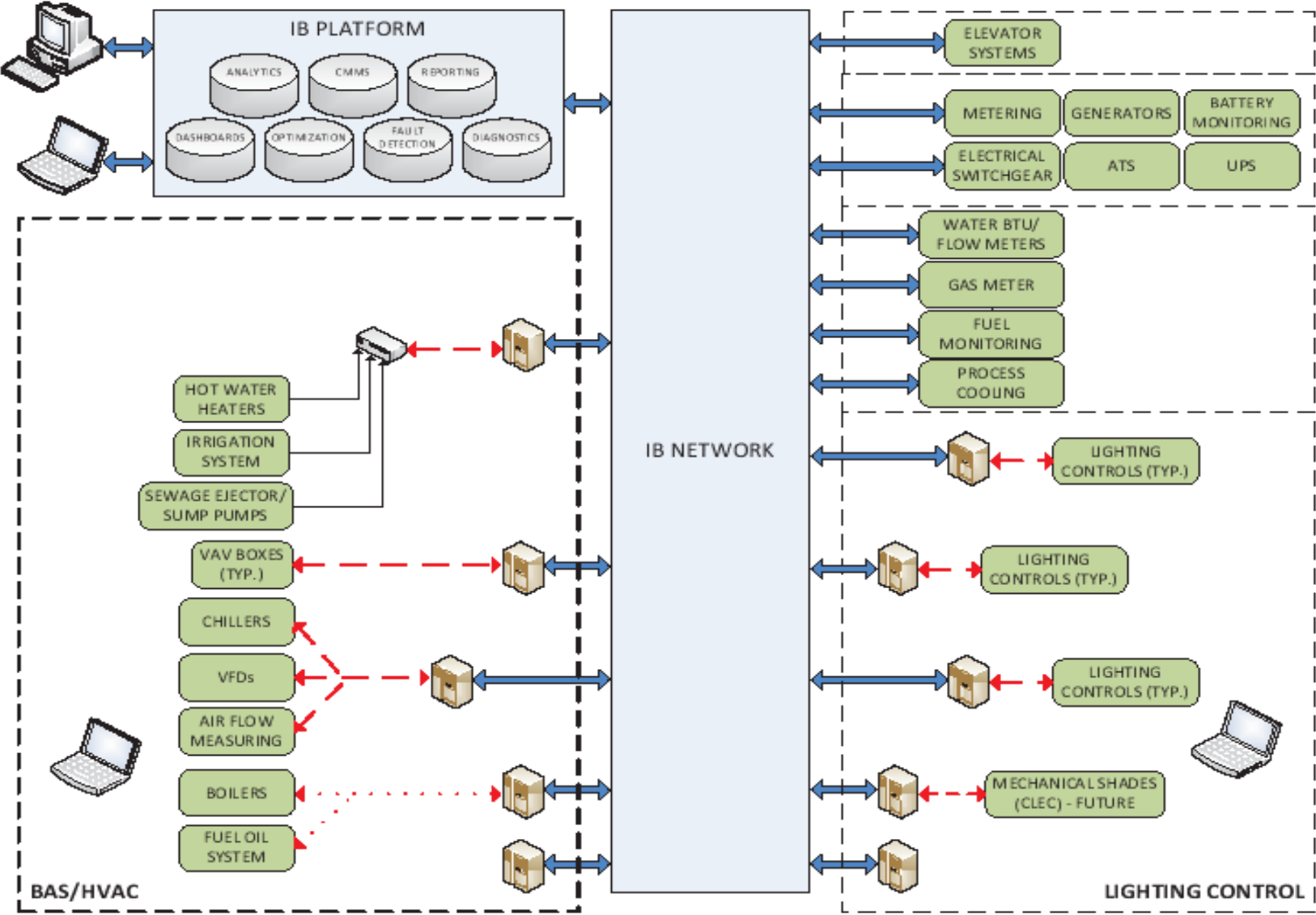
Lessons Learned

- Address and Resolve Network Security Concerns

- Limitations of Existing Equipment

- Build in Flexibility and Scalability; Avoid Stranded Data, Capacity, Functionality

- Develop Criteria and Process to Enable Selection of "Best-Fit" Provider

Outcomes

Insert Final Puzzle
Graphic Here