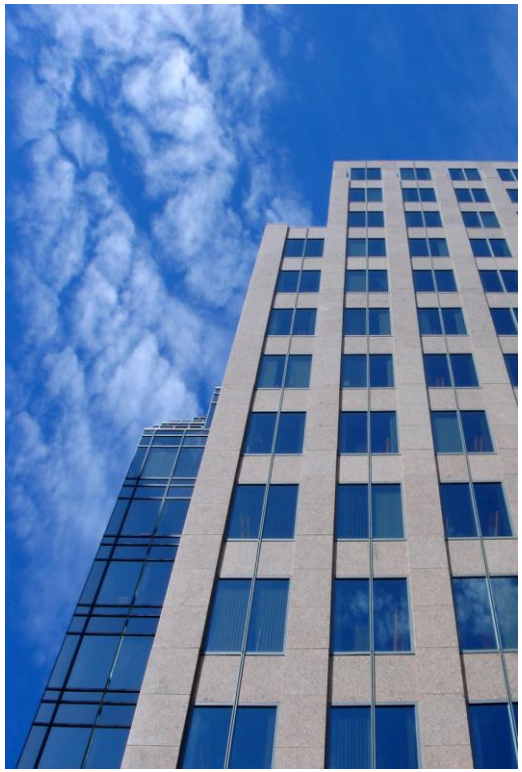

Infrastructure Master Planning: Building From the Inside Out

Efficiency Vermont BBD BETTER BUILDINGS BY DESIGN

Conference theme: NET ZERO by 2030

Annual Conference

Wednesday, February 5, 2013

10:20 - 11:50am

Presented By:

SourceOne A Veolia Energy Company and VEOLIA ENERGY

Introductions

Jack Griffin, CIA, PMP
Vice President and General Manager
SourceOne, A Veolia Energy Company

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Business Development Manager
Veolia Energy North America

Presentation Overview

- Introduction
- Issues
- What is Infrastructure Master Planning?
- Who benefits from Master Planning?
- Planning Process
- Benefits
- Case Studies
- Workshop Session
- Conclusion/ Q&A

Issues

- Lack of comprehensive Master Planning results in many negative effects, including:
  - Inefficient operation:
    - Financially
    - Environmentally
  - Obstructive to growth
  - Unreliable
  - Construction delays
  - Spiraling construction costs
  - Poor coordination

What is Infrastructure Master Planning?

- Infrastructure Master Planning is a tool for owners, developers, and facility managers to actively manage their assets as efficiently as possible.
- It is a process and management technique aimed at minimizing long term costs that affect profitability and sustainability

Who Benefits From Master Planning?

- Individual facilities
- Organizations
- Communities
- Cities
- States
- International Collaborations

Planning Process

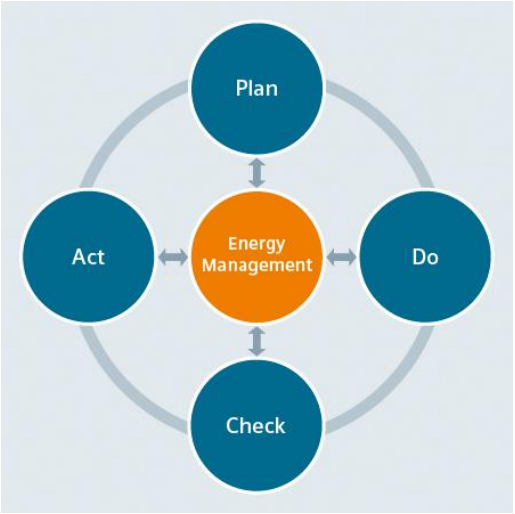
- Infrastructure master Planning is a dynamic process to optimize business support services.
- It must be flexible to adapt to changing needs
- Planning Process:
  - Establish the Need
  - Identify Governing Requirements
    - Budget, Schedule, Target Goals
  - Hypothesize and Study Potential Solutions
  - Assess Project Impacts
    - Environmental
    - Personnel
    - Financial

Planning Process

- Develop Master Plan:
  - Prioritize:
    - Implement low cost, high impact measures first
  - Phase Implementation:
    - Minimize impact to business operations
  - Develop Annual Implementation Goals & Targets
  - Document and Publish Master Plan:
    - Obtain necessary Buy-In from appropriate Stakeholders
  - Continually review and revise the plan according
- Benefit: Optimal infrastructure will ensure lower operational costs, and reliability to generate superior competitive advantage

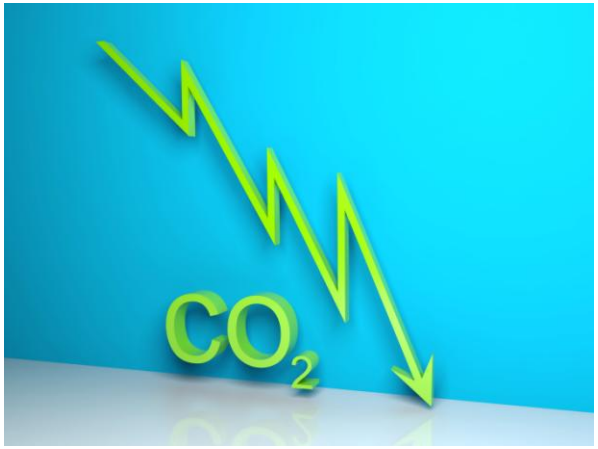
Planning Enables Sustainability

1. Utility Coordination
2. Energy Procurement
3. Sub Metering and Energy Management Dashboard
4. Energy Efficiency/Audits
5. Overall Energy Master Planning
6. Onsite Generation (Fossil and Renewable)
7. Utility Sponsored System Benefit Programs



Benefits

- Lower life cycle cost
- Increased reliability
- Increased competitive advantage
- Increased environmental sustainability



Case Studies

Norwich University, Northfield, VT

Energy Master Plan and Biomass Conversion Study

NORWICH UNIVERSITY™

Project Metrics

9 million kWh per year consumed

625,000 g of #6 fuel oil consumed

97% emissions reduction estimated for the central boiler plant

Business Challenge

- SourceOne met with Norwich University and presented several strategies to reduce energy use and costs, including participation in Efficiency Vermont's (EVT) Energy Leadership Challenge to reduce energy consumption by 7.5%.
- After signing up for the Energy Leadership Challenge, Norwich engaged SourceOne to perform a University-wide energy audit and master plan to identify energy efficiency improvements and cost savings.

Norwich University, Northfield, VT

Energy Master Plan and Biomass Conversion Study

NORWICH UNIVERSITY™

Project Metrics

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SourceOne Solution

- Evaluated all major electric and thermal energy use and identified energy efficiency improvements and ROI for each individual project.
- The energy audit identified several opportunities for energy efficiency improvements, including the central boiler plant, which was identified as the greatest emission reduction opportunity.
- SourceOne performed a Central Boiler Plant Analysis, affirming that the conversion from #6 Fuel Oil to a Biomass based source will result in lower life-cycle costs and reduced carbon footprint. The development will provide Norwich 20+ years of sustainable operations.

Norwich University, Northfield, VT

Energy Master Plan and Biomass Conversion Study

NORWICH UNIVERSITY™

Project Metrics

9 million kWh per year consumed

625,000 g of #6 fuel oil consumed

97% emissions reduction estimated for the central boiler plant

Results

- Norwich decided to advance the switch from #6 oil to biomass, which will avoid the consumption of up to 625,000 gallons of oil and emissions of sulfur dioxide associated with fuel oil and reduce CO2 emissions by up to 97.
- Following implementation of the central plant improvements and other efficiency improvements identified in the study, Norwich has successfully met EVT's challenge and reduced energy consumption by 7.5%.
- Norwich University was able to utilize Efficiency Vermont's technical and financial assistance in the planning process.

NOVARTIS
NOVARTIS INSTITUTES FOR BIOMEDICAL RESEARCH

Novartis, Cambridge, MA

Energy Management and Smart Meter Installation

Project Metrics

2.8 MW peak trigen plant size

5,650,000 BTU peak hourly hot water capacity

$9 M project estimate

$2M in est. utility incentives

550,000 square feet of space

Business Challenge

- Novartis required an expansion of their operations to accommodate increased growth.
- New 550,000 square foot campus of lab, office and retail space, requiring multiple energy forms and sources.
- Located on a four-acre parcel across from the existing campus.
- Global environmental focus in reducing carbon footprint.

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$9 M project estimate

$2M in est. utility incentives

550,000 square feet of space

SourceOne Solution

- SourceOne hired by Cannon Design to spearhead the development of a new combined heating, cooling, and power plant.
- Performed several levels of feasibility studies.
- Recommended a two 1.4 megawatt natural gas reciprocating engines to power the new campus and provide hot and chilled water to both campuses.

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Energy Management and Smart Meter Installation

Project Metrics

2.8 MW peak trigen plant size

5,650,000 BTU peak hourly hot water capacity

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$2M in est. utility incentives

550,000 square feet of space

Results

- SourceOne serving as the Owner's Project Manager to design, procure, construct, and commission the new trigeneration plant.
- Coordinating between Novartis and the local utility companies to coordinate utility connections and services.
- $600 million project broke ground in April 2012, and is expected to be completed in Spring of 2015.

City of New Bedford, MA

Energy Management Services & ESCO Owner's Representative

Business Challenge

- City of New Bedford sought energy consulting support to reduce carbon footprint, operating costs, and improve the efficiency of City-owned assets and infrastructure.
- The performance-based, multi-year Energy Management Services Project (EMSP) incorporates:
  - ✓ Guaranteed energy savings.
  - ✓ Energy Services Company (ESCO) Support Services.
  - ✓ Energy efficiency projects at 40+ sites.

Project Metrics

ESCO owner's representative

40+ facilities

City of New Bedford, MA

Energy Management Services & ESCO Owner's Representative

Project Metrics

ESCO owner's representative

40+ facilities

SourceOne Solution

- SourceOne selected to develop a strategy for energy efficiency and manage the design and installation of systems and programs to reduce energy use, emissions, and costs.
- Consulting services, including RFP development, vender selection and negotiations, and project management for implementation.
- Perform review of selected ESCO's Investment Grade Audit, incorporating energy conservation measures, energy savings, project costs and Monitoring and Verification.
- Specific projects include:
  - ✓ Conversion of 15+ buildings heated with oil to natural gas.
  - ✓ Upgrades of 8,000 streetlights to LED technology.
  - ✓ Assessment of 30+ pump stations.
  - ✓ Exploration of biomass heating for one to two buildings.
  - ✓ Other renewable energy technologies.

City of New Bedford, MA

Energy Management Services & ESCO Owner's Representative

Project Metrics

ESCO owner's representative

40+ facilities

Results

- The efficiency projects, when completed, will improve the city's
  - habitability,
  - infrastructure, and
  - reduce operating and maintenance costs.

Westwood Station, Westwood, MA

Gas and Electric Utility Infrastructure Coordination

Cabot, Cabot & Forbes

NewEngland DEVELOPMENT

Project Metrics

130 acre site

$500 M project cost

2 Million SF retail, office, residential and hotel space

Business Challenge

- 130 acres of high value real estate property, formerly the site of a failing industrial park.
- Adjacent to the Route 128 MBTA Commuter Rail / Amtrak Train Station and situated between two major interstate highways.
- Cabot, Cabot and Forbes (original project developer) was unable to attain financing in 2008, leading to a halt on the preliminary construction work and a change in ownership.
- Issues included legal challenges, last minute alterations in the project size and timing, and lack of identification of infrastructure needs prior to outset of development.
- As the new developer, New England Development (NED) acquired ownership of the project in 2010.

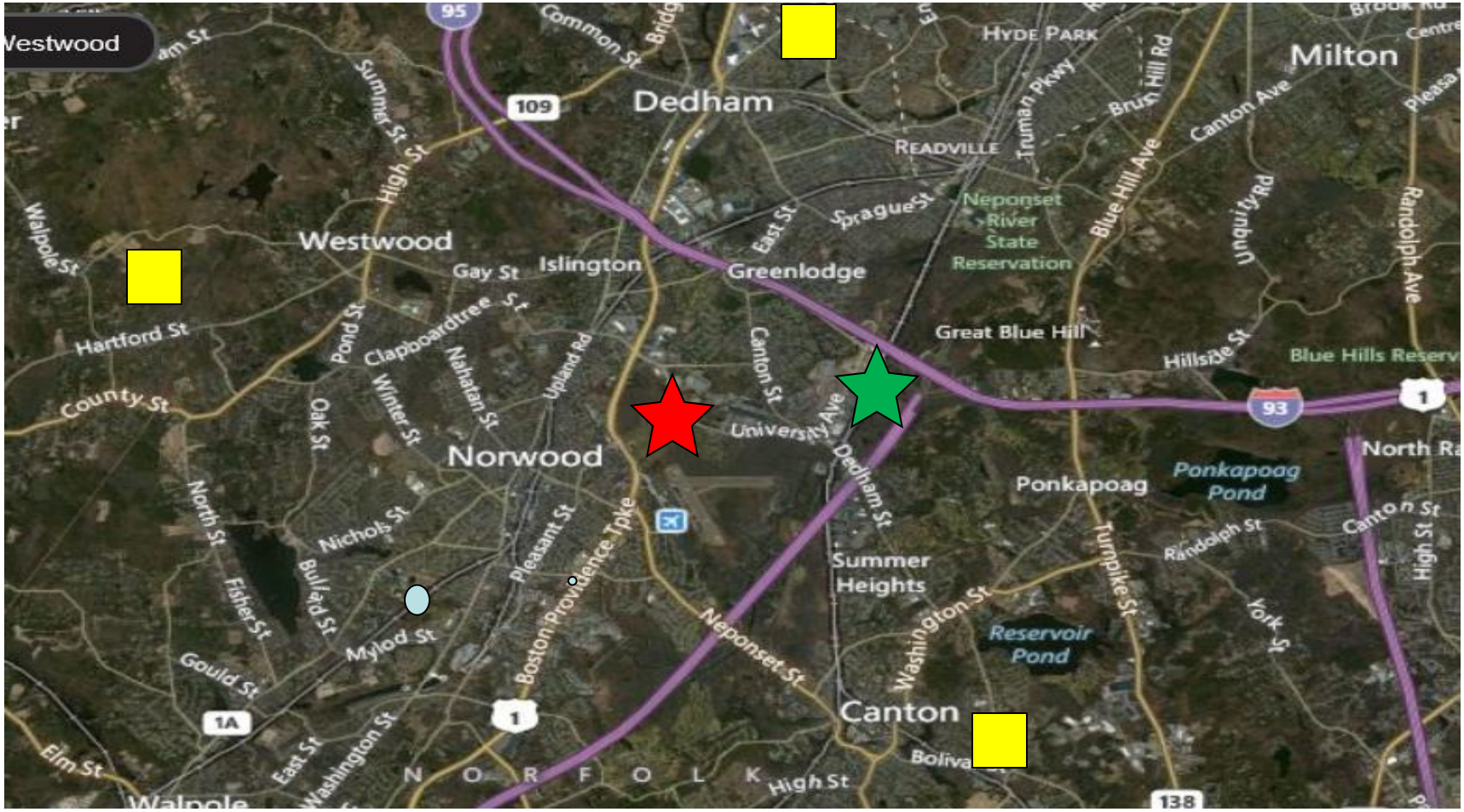
Cabot, Cabot & Forbes

NewEngland DEVELOPMENT

Westwood Station, Westwood, MA

Gas and Electric Utility Infrastructure Coordination

The Big Problem



Cabot, Cabot & Forbes

NewEngland DEVELOPMENT

Westwood Station, Westwood, MA

Gas and Electric Utility Infrastructure Coordination

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2 Million SF retail, office, residential and hotel space

SourceOne Solution

- NED sought utility coordination for the new 130 acre, 2 million square foot retail, office, residential and hotel development project, now renamed 'University Station'.
- Lack of utility infrastructure in close proximity required close coordination with the utility.
- SourceOne is coordinating with the utility for gas and electric infrastructure modifications associated with the construction activities.

Westwood Station, Westwood, MA

Gas and Electric Utility Infrastructure Coordination

Cabot, Cabot & Forbes

NewEngland DEVELOPMENT

Project Metrics

130 acre site

$500 M project cost

2 Million SF retail, office, residential and hotel space

Results

- The $500 Million University Station project is expected to generate $3 million in annual tax
- Predicted to incent the construction of more than 400 new homes in the next few years.
- As one of the biggest developments underway in Massachusetts, the project broke ground in November 2013.

Workshop

Business Challenge

- Running out of capacity and based upon historic growth and market trends, you anticipate to be fully committed by the end of 2015.
- Must maintain 99.999999% reliability, high security.
- Must be able to accommodate the needs of tenant equipment.
- New datacenter development from inception through commercial beneficial operation is 3 years. There is nothing in the existing pipeline.
- Your company is planning an IPO in the next 2 years.

Workshop (Cont.)

Key Facts

- 130 acre site
- Data Center Co-Lo Owner/ Operator
- Been in business for 15 Years and have been in a high growth phase for the past 5 years (no signs of slowing)
- Own 10 Facilities
- 3 in VT, 2 built in 1995, 1 in 2013
- 3 in NJ built between 2007 & 2012
- 4 in MA built between 2000 & 2008
- Currently at 90% Capacity
- Operating margins are slightly below market competitors
- The PUE for your portfolio is 1.8

Deliverables

- Energy Master Plan (multi-year)
- Defined Process

Additional Facts

- (Derived from Audience Questions)

Conclusion/ Q&A

- 7 P's prevail: Proper Prior Planning Prevents Pitifully Poor Performance.

- Optimal infrastructure and planning will provide:
  - Lower operational costs
  - Added reliability
  - Competitive advantage for your business
  - Reduced carbon emissions
  - Infrastructure to meet future growth Demands
  - A proactive focus on sustainability to meet energy reduction targets.