EBC Energy Resources Program:

Energy Program Developments at Massachusetts State Agencies
Welcome

John Wadsworth

Chair, EBC Energy Resources Committee

Partner, Brown Rudnick LLP
Program Introduction & Overview

Briony Angus, AICP

Program Chair & Moderator

Senior Project Manager / Associate

Tighe & Bond
EBC Energy Resources Program:

Energy Program Developments at Massachusetts State and Regional Agencies

September 22, 2017

Michael Donaghy
MBTA
Manager of Energy Efficiency
Energy Program Developments at Massachusetts State and Regional Agencies

• Agenda
  – Background
  – Energy Management
  – Distributed Generation
  – Clean Technology
  – Sustainability
  – Future Opportunities
Energy Program Developments at Massachusetts State and Regional Agencies

• **Background**
  – America’s First Subway System (1897)
  – 5\textsuperscript{th} Largest Transit Authority
  – 400 Million Trips Annually
  – 2,000 Revenue Vehicles
  – 275 Stations
  – 27 Maintenance Facilities
  – 48 Traction Power Substations
Energy Program Developments at Massachusetts State and Regional Agencies

- Energy Management
  - Utility Management
    - $42.2M 5 yr avg. utility spend
    - 450,000,000 kWh
    - Peak Demand: 70 mW
    - $0.04375/kwh
Energy Program Developments at Massachusetts State and Regional Agencies

• **Energy Management**
  
  – **Energy Efficiency**
  
  • 88 projects completed since 2010
  • Over 50M kWh saved
  • $4.8M saved to date
  • Avoided project costs of $3.9M
  • Average payback of 1.31 years
Energy Program Developments at Massachusetts State and Regional Agencies

- **Distributed Generation**
  
  - **Wind Turbines (2)**
    - 100kW & 750kW
    - >1.5M kWh total annual output
    - $150,000 annual savings
    - 19 year payback
Energy Program Developments at Massachusetts State and Regional Agencies

• Distributed Generation
  – Solar
    • June 2016 Award
    • 39 locations
    • Two Year Install Period
    • $51M in Revenue over 20 Year Term
Energy Program Developments at Massachusetts State and Regional Agencies

• **Clean Technology**
  – 32 Electric Vehicle Charging Stations
  – Hydrogen Bus
  – 254 Diesel Electric Hybrids
  – Regenerative Braking Pilot @ Airport Station
Energy Program Developments at Massachusetts State and Regional Agencies

• **Sustainability**
  – Recycling
  • Facilities
  • Transit Stations

– **ESMS ISO 14001**
  • Cabot Maintenance

– **Climate Resiliency**
  • Fenway Portal
  • Aquarium

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<th>2012</th>
<th>2016</th>
<th>% Change</th>
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<td>400</td>
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<td>Cardboard</td>
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<td>344,612</td>
<td>1,633,984</td>
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Energy Program Developments at Massachusetts State and Regional Agencies

• **Sustainable Design**
  – Orient Heights Station
  – Hingham Intermodal
  – Government Center Station
Energy Program Developments at Massachusetts State and Regional Agencies

• Future Opportunities
  – System-wide Energy Efficiency
  – System-wide Sub-metering
  – Regenerative Braking + Storage
  – Distributed Generation
THANK YOU!

Michael Donaghy
MBTA
Manager of Energy Efficiency
mdonaghy@mbta.com
617-222-1684

EBC Energy Resources Program:

Energy Program Developments at Massachusetts
State and Regional Agencies
James Doucett

Clean Energy Results Program Director
MassDEP
Clean Energy Results Program
MassDEP

Environmental Business Council
September 22, 2017

Presented By: James Doucett

An Innovative Partnership:
The Massachusetts Department of Environmental Protection
The Massachusetts Department of Energy Resources
The Massachusetts Clean Energy Center
Clean Energy Results Program

- Supports DOER and MassCEC in Achieving Commonwealth Clean Energy Goals
- Promotes Clean and Efficient Sources of Energy at MassDEP Regulated Sites (where we have authority or control)
- Utilizes MassDEP’s Unique Expertise to Overcome Permitting & Siting Obstacles
- Addresses Public Health Concerns Using Sound Science
CERP Program

1. Project-Specific Support and Coordination
   - Permitting/Compliance Assistance
   - Regulatory and Financial Assistance

2. Regulatory Review and Streamlining
   - Remove Regulatory Barriers

3. Financial Incentives
   - Grant and Loan programs

4. Broad Public Education and Engagement
   - Coordinated Outreach (DOER, MassCEC)
   - Communicate Project Benefits/Address Concerns
Wetlands

- Wetlands Program Solar PV policy – approved 9/18/17
  - Department's approach for reviewing ground-mounted solar photovoltaic systems relative to wetland jurisdiction
Renewable Energy Projects on Closed Landfills

- Post-closure Permits Approved to Date:
  92 Projects Rated at 208.7 MW
- Currently Operating:
  59 Projects Generating 137.3 MW
Renewable Energy at Closed Landfills

Cumulative Permitted Capacity
Cumulative Operating Capacity
Renewable Energy Projects on Brownfields and Contaminated Sites

- Installed solar and wind – 24 sites @ 58 MW
- Pre-determination letter issued – 12 sites @ 47.25 MW
Renewable Energy at Contaminated Sites


Total Capacity (MW):

- 2006: 0.00
- 2010: 20.00
- 2011: 30.00
- 2012: 20.00
- 2013: 50.00
- 2014: 50.00
- 2015: 50.00
- 2016: 50.00
- 2017: 59.00
Greener Cleanups

- Greener Cleanups Guidance - WSC #14150
- Greener Cleanups Awards – Year 2
- Upcoming Greener Cleanups Workshops:
  - UMass Soils Conference in October
  - EPA’s Brownfields Conference in December
Anaerobic Digestion

- Farm AD Capacity Operating
  - Jordan Farm, Rutland
  - Pine Island Farm, Sheffield
  - Barstow Farm, Hadley
  - Barway Farm, Deerfield**
Anaerobic Digestion

- Commercial and Food Manufacturing Capacity Operating:
  - Commonwealth Resource Management pilot, Crapo Hill LF
  - Stop & Shop Product Recovery Operation, Freetown
  - Ken’s Foods
  - Garelick Farms, Lynn and Franklin
Anaerobic Digestion

- Wastewater Treatment Facilities:
  - Massachusetts Water Resources Authority (MWRA) Deer Island WWTP
  - Greater Lawrence Sanitary District (GLSD)
  - MWRA Clinton WWTP
  - Pittsfield WWTP
  - Fairhaven WWTP
  - Rockland WWTP
Anaerobic Digestion

- New capacity permitted, under construction:
  - Jordan Farm – 2\textsuperscript{nd} engine
  - Jordan Heifer Farm, Spencer
  - Pine Island Farm – 2\textsuperscript{nd} engine
  - Rockwood Farm, Granville
  - Crescent Farm, Haverhill
  - Greater Lawrence Sanitary District (GLSD)
Organics Management Capacity

- Depackaging capacity - Operating:
  - WMI Boston CORe
  - EL Harvey
  - Parallel Products (liquids only)
  - RecycleWorks Inc.
  - Save That Stuff, Inc.
  - Troiano Trucking
Organics Management Capacity

- Depackaging capacity – Not yet operating:
  - Casella
  - Feed Resource Recovery
  - Harvest Power
  - Pine Island Farm
  - Vanguard Renewables

- 2017 Recycling Business Development Grants include some organics processing projects – under review
Since 2008, engaged 120 ‘energy leader’ facilities statewide (advancing energy efficiency & on-site clean energy generation)

Since 2010, saved communities over $35 million, added 32.5 MW of new clean energy generation, and reduced CO₂ emissions by over 100,000 tons
2014 Gap Funding Grants

State $1.7M in ‘Gap’ grants: move $11M of clean energy projects forward

21 facilities received grants: 13 drinking water & 8 wastewater

$7,214,300, 65%
$1,985,198, 18%
$1,737,400, 16%
$116,012, 1%

- Gap Grant Funding Approved
- Mass Save & MLP Incentives
- Other Grants
- Municipal Contribution min. 10%
2014 Gap Funding Grants

- Majority for energy efficiency (25 projects):
  - Variable speed drives,
  - Pump and motor replacements
  - Process improvements,
  - HVAC
  - Lighting

- Renewable Energy Projects
  - 1 CHP (1,500 kW)
  - 4 solar PV (497 kW)
  - 1 water source heat pump

Investing in Water Utility Energy Efficiency Yields Big Savings

MA Benefits are over 15x the MA Investment

$2.5M Investment

$40.2M Benefits

$31,164,161

$9,135,281

$45,000,000

$40,000,000

$35,000,000

$30,000,000

$25,000,000

$20,000,000

$15,000,000

$10,000,000

$5,000,000

$-
Massachusetts' Return On Investment: A Gap Funding Model for Success

Thanks to a gap funding program offered through a partnership of Massachusetts government agencies, water and wastewater facilities have overcome financial and other resource barriers and are implementing clean-energy projects.

Maximizing return on investment and reducing operating costs are primary business and government goals. This article describes a "gap funding" program approach that promotes clean and efficient energy, benefits air quality, and effectively reduces energy and operating costs at public drinking water and wastewater facilities across the Commonwealth of Massachusetts. Without gap utilities would face barriers and miss opportunities to implement beneficial projects.

Serving as a model for collaboration and innovation, Massachusetts government agencies have successfully delivered both returns and efficiencies to municipal water systems under the Clean Energy Results Program (CERP). CERP is a government-led, statewide partnership of the Massachusetts Department of Environmental Protection (MassDEP), the Massachusetts Department of Energy Resources (DOER), and the Massachusetts Clean Energy Center (MassCEC). This program helps meet major environmental protection and energy goals by advancing the deployment of renewable energy.
‘Gap Funding’ Implementation – Round II

- MassDEP, with funding assistance from MA DOER, will be offering a 2nd round of gap funding grants to implement “previously assessed” energy efficiency and clean energy generation projects at public (municipal, district, authority) drinking water and wastewater facilities.

- **Summer 2017**
  - *August 23* Statewide Survey: received 75 responses – good regional mix of facility & energy-saving project types at both large and small facilities.
Proposed Schedule

- Grant Announcement – early October
- Applications due to MassDEP – early November
  - Application period approximately 1 month
- Review applications – December
- Announce grant awards – January, 2018
Clean Energy Results Program Contacts

MassDEP:

James Doucett, James.Doucett@state.ma.us, 617.292.5868

Michael DiBara, Michael.DiBara@state.ma.us, 508.767.2885

Tom Potter, Thomas.Potter@state.ma.us, 617-292-5628

Clean Energy Results Program Website:
http://www.mass.gov/eea/agencies/massdep/climate-energy/energy/
Massachusetts Department of Energy Resources

Joanne Morin

Deputy Commissioner
Energy Policy, Planning & Analysis
MassDOER
Leading by Example (LBE) Program
MA Dept. of Energy Resources

Sept 22, 2017
Creating A Clean, Affordable and Resilient Energy Future For the Commonwealth

Agenda

• LBE Overview
• LBE Accomplishments
• What’s Next
Leading by Example - Scope

• Huge array of building types and sizes:
  ➢ 29 college and university campuses
  ➢ 18 prisons
  ➢ dozens of office buildings
  ➢ Dozens of state hospitals, youth detention centers, mental health facilities
  ➢ Hundreds of armories
  ➢ Thousands of visitor centers, highway depots, salt sheds, seasonal buildings
  ➢ 50+ state owned courthouses

• 80 million square feet of buildings
• 9-5 and 24/7 operations
• 3,000 light duty vehicles
• 85,000 employees
• Consume over 1 billion kWh of electricity – equal to 138,000 homes
• Use more than 7 million gallons of gasoline and diesel
• Emit over 1 million ton of Greenhouse Gases
Leading by Example Executive Order 484

- Executive Order 2020 Goals
  - 40% GHG emission reduction by 2020
  - 35% Energy reduction
  - 30% Renewable energy
- Mass. LEED Plus standard requires all new construction to perform 20% better than code
Why Leading by Example?

• Commonwealth state government largest energy user and GHG emitter in state
• Test and demonstrate new technologies and strategies
• Contribute to economic development and drive down costs of clean energy deployment
• Practice what we preach
LBE Tools

**Technical Assistance**
- Feasibility studies
- Implementation Grants
- Fuel efficiency calculator
- Technology exploration
- Financial analysis

**Communications & Outreach**
- LBE Council meetings
- Email Updates
- Awards & Recognition
- Information sharing
- DOER Energy Smart blogs

**Data Tracking and Analysis**
- Collect annual energy use and cost data from all agencies and public campuses
- Report on progress
- Identify priority sites for energy efficiency
- Demonstrate cost-effectiveness of strategies
Accomplishments
Creating A Clean, Affordable and Resilient Energy Future For the Commonwealth

GHG Emissions Progress

GHG Emissions from Baseline to FY16 with Targets Highlighted

Percentage Change over LBE Baseline
Square Footage vs. Total MTCO2e vs. MTCO2e/1000 SF
Creating A Clean, Affordable and Resilient Energy Future For the Commonwealth

Solar on State Properties

- 2007 – 139 kW of solar on state facilities equal to power needs of 15 homes
- 2016 – 21+ MW on state facilities equal to power needs of 3,198 homes
Building Efficiency & Cleaner Fuels

- Heating oil use decreased by 79% between 2006-2016
  - Eliminated 18,013,685 gallons
  - Fuel switching
  - combined heat and power
  - Efficiency Projects

Fuel Oil Consumption at State Facilities

- FY06: -20%
- FY07: -35%
- FY08: -21%
- FY09: -38%
- FY10: -46%
- FY11: -62%
- FY12: -72%
- FY13: -71%
- FY14: -76%
- FY15: -79%
- FY16: -79%

Gallons:
- 0
- 5,000,000
- 10,000,000
- 15,000,000
- 20,000,000
- 25,000,000
Commonwealth Building Energy Intelligence (CBEI)

- Since 2010 tracking data from 870 real-time meters at more than 20 million SF of state buildings
- Monitoring 5 minute use for electricity, NG, oil, steam data
- Identify inefficient building operations and allows for prompt response to energy variations

CBEI Results

- Implemented 105 measures, resulting in estimated 11,011 MMBtu reduction and $378,000 in annual savings
- Improving building start up and holiday scheduling, reducing demand, identifying equipment anomalies
High Performance Buildings

• Mass. LEED Plus requires LEED certification + 20% better than code

• Currently 70 LEED certified state buildings
  ➢ 60% are gold or platinum
  ➢ 8 Construction Agencies

U.S. Green Building Council Releases Annual Top 10 States for LEED Green Building

Massachusetts moves from third to first; New York rejoins ranking

(Washington, D.C.)—Jan. 25, 2017—Today, USGBC announced the Top 10 States for LEED, an annual ranking that highlights states throughout the United States that made significant strides in sustainable building design, construction and transformation over the past year. LEED is the world’s most widely used and recognized green building rating system.

Topping the list is Massachusetts, which moved from third to first place, with a total of 136 LEED-certified projects representing 3.73 square feet of certified space per resident.

USGBC, 2017
State Fleet Vehicle Efficiency

Fuel Efficiency Standard issued 2016

- Requires minimum average MPG for cars (32 MPG) and trucks/vans, SUVs (22 MPG)
- Requires minimum purchases of alternative fuel vehicles
  - State fleets installing 52 hybrid retrofits for vans from XL Hybrids based in Brighton MA, reducing fuel use by 20-25%
- 102 EV charging stations at state sites (169 ports)
  - 6 fast chargers will be installed along MassPike by end of 2017

Creating A Clean, Affordable and Resilient Energy Future For the Commonwealth
What’s Next
The Future of Solar – Solar canopies

- Significant open parking lots
- Covered parking
- No roof concerns (age, shading, obstructions, etc.)
- No use of green space
- Dozens of MW under consideration

![Graph showing installed capacity (kW)](image)

- Annual (Solar Canopy) Installed Capacity (kW)
- Annual (Non-Solar Canopy) Installed Capacity (kW)
- Cumulative Installed Capacity (kW)

Largest solar canopy structure in New England installed at UMass Amherst College (4.5 MW)

58
Significant open parking lots
Covered parking
No roof concerns (age, shading, obstructions, etc.)
No use of green space
Dozens of MW under consideration
The Future of Efficiency

• Work with DCAMM to target greater reductions at existing buildings
  ➢ Target dirtier fuels and higher energy users
• Focus on innovative approaches and technologies across entire portfolio
  ➢ Cold climate heat pumps
  ➢ Renewable thermal
  ➢ Water heating
  ➢ Envelope Improvements
  ➢ Controls and operations
Creating A Clean, Affordable and Resilient Energy Future For the Commonwealth

The Future of New Construction

• Improving on Mass. LEED+
  ➢ Zero net energy buildings
  ➢ Passive House
  ➢ Low EUI targets

ZNEB Project Examples

• Fish and Wildlife headquarters (2015)
• DCR Walden Pond Visitors Center (2016)
• Bristol Community College Lab (2016)
  ➢ Geothermal and air source heat pumps
  ➢ Super efficient envelopes
  ➢ triple pane windows
  ➢ efficient lighting and controls
  ➢ solar PV
Contact Information

www.mass.gov/eea/leadingbyexample

• **Eric Friedman**, Director
  (617) 626-1034
  eric.friedman@state.ma.us

• **Jillian DiMedio**, Assistant Director
  (617) 626-7367
  jillian.dimedio@state.ma.us

• **Trey Gowdy**, Sustainability Project Coordinator
  (617) 626-7328
  trey.gowdy@state.ma.us

• **Chelsea Kehne**, Data and Project Analyst
  (617) 626-7338
  chelsea.kehne@state.ma.us

• **Charles Tuttle**, Project Manager
  (617) 626-1043
  charles.tuttle@state.ma.us
DCAMM Energy and Sustainability Program

Presentation to EBC

Krista Lillis, Program Manager
Betsy Isenstein, Director
What Is DCAMM?

- The Division of Capital Asset Management and Maintenance (DCAMM),
- Within the Executive Office for Administration and Finance (A&F),
- Created by the legislature in 1980 to promote quality and integrity in the management and construction of the Commonwealth’s capital facilities.
MA State Facility Portfolio

- 66 million gross square feet of active space
- Over 4,300 buildings
- Estimated annual energy costs of $240 million
Massachusetts ranked #1 in energy efficiency, five years in a row
Energy & Sustainability Program Overview:

1. Manage Energy and Water Saving Projects:
   - Comprehensive Energy Design build, Performance Contract
   - Utility Vendor
   - Retro-commissioning (continuous commissioning)

2. Manage Statewide Energy saving and generating programs:
   - Demand Response (DR)
   - Forward Capacity Market (FCM)
   - Commonwealth Building Energy Intelligence (CBEI)

3. Provide Support and Assistance:
   - Advise DCAMM staff on incorporating Sustainable Design and Energy Efficiency in Major Renovation and New Construction Projects.
   - Provide Technical Assistance to other state agencies and other offices on energy efficiency and pollution prevention technology developments and program opportunities.
   - Coordinate Agency participation in Utility Companies' Conservation Programs
   - COFFEE Program
Goals

- Increased Efficiency/Reduced Cost (Savings)
- Updated Systems or Extend Life of Existing Systems/Equipment - Address Deferred Maintenance
- Balance Cost/Benefit
- Predictable Maintenance Cost and Schedule
- Improved Control
- Improved Comfort
- Quality Design Install
The Division of Capital Asset Management and Maintenance (DCAMM), within the Executive Office for Administration and Finance (A&F), was created by the legislature in 1980 to promote quality and integrity in the management and construction of the Commonwealth's capital facilities.

Accelerated Energy Program

*Accelerated Energy Program Site*
DCAMM’s Energy Retrofit Project History

Energy Project History

- Sites with Contracts Signed
- Sites with Projected Contracts Signed
- Total Value of Contracts Signed

- $40M UMass Amherst Project
- Executive Order 484 Signed
- ARRA
- AEP Phase I
- AEP Phase II
M.G.L. c. 25A: DCAMM Energy Projects

Pursuant to M.G.L.c. 25A, DCAMM awards contracts to the offeror that demonstrably possesses the skill, ability and integrity necessary to perform faithfully energy management services.

- This project is for turnkey services of design, equipment purchase, installation, commissioning, measurement and verification (M&V), warranty services, and maintenance
Comprehensive projects

• Energy Design Build
  – We have Facility Advisor do ASHRAE Level 2 Audit
  – Then HD brings design to 30% schematic

• Performance Contract (ESPC)
  – Energy Advisor to see if there are possible savings through ECMs
  – Procure ESCO to produce Investment Grade Audit (IGA).
    • Audit Contract
  – If we want to proceed we sign Construction Contract (ESA) with ESCO.
Typical Measures investigated

- Lighting System Improvements
- Lighting Controls
- Motors
- Energy Management Systems
- Domestic Water Conservation
- Variable Frequency Drives
- Insulation
- New Boilers
- Combined Heat and Power
- Kitchen Hood Controls
- Electric to Gas Heat Conversion
- Geothermal Heat Pumps
- Wind
- Solar (PV and Thermal)
- Biomass
- Ice Storage
And many more!!
Comprehensive Retrofit

UMass Lowell

Project Overview:
- 35 buildings equaling approximately 2,771,000sf.
- Comprehensive energy and water retrofit includes:
  - South Power Plant boiler replacement and optimization
  - BACnet compatible meters and controls
  - Interior/exterior lighting fixture upgrades and sensors.
  - Variable Air Volume systems
  - Replacement of chillers
  - Low-flow toilets, faucets and showerheads w/motion sensing technology
  - Solar car canopies and solar hot water systems
- Estimated construction cost: $26M
- Projected savings: $1.3M per year
- Project will address related deferred maintenance opportunities across the campus.

Pictured above: Pinanskly Hall Cooling Tower.

Pictured at Left: Boiler Tube Scaling at South Power Plant
Utility Vendor Program

Total Sites: 562 sites
Invest per Site: < $100,000
Procurement: Utility vendors and small contracts

Buildings
Include small to moderate size buildings, usually under 50,000 square feet, but some may be larger.

Work
Include audits and installation of simple fix measures (lighting, motors, thermostat and minor controls, weatherization, insulation, appliances, etc.)
Demand Response Program

• Incentives for removing power from the utility grid

• Administered by the ISO New England

• DCAMM oversees a statewide contract
  • Available to cities and towns, authorities, etc.
  • Manages the assets and deals with ISO NE.

• DCAMM enrolls state facilities in the program
  • The state facilities get incentives based on the amount of electricity they remove from the grid
  • About 50 MW enrolled
Commonwealth Building Energy Intelligence (CBEI)

**Problem:** Decentralized energy and building data across different facilities and agencies.

**Solution:** Centralized metering. Tracks & records data for electricity, natural gas, steam, hot and chilled water, and oil usage.
- Typically called EIS (Energy Information system)
- Formerly EEMS
- New Procurement

**Goals/ Benefits:**
- Improve building energy management practices; Drive operational efficiencies; lower energy costs; identify capital needs; measure & verify savings
- To date, over $3 million in savings opportunities identified.
- Other benefits include:
  - Education/public outreach, equipment preventative maintenance, project planning, baseline analysis, and equipment sizing, M&V, reporting/alerting, utility chargebacks

**Next Focus:**
- Other states and feds (GSA, VA), have seen >10-20% savings or 20-40% savings with BMS integration.
- Focusing on M&V for Energy projects and Continuous Commissioning program
Courts Morning Start Efficiency: Case Study

• CBEI identified early start-times at 4 Court facilities (between 3:45-5:15am)
• Courts Facilities team delayed start-times at 4 Court facilities in Boston, Worcester, Springfield through scheduling changes
• Building start times delayed in 15-minute increments to between 5:00-6:00am
• Saving an estimated $64,000 and 388,000 kWh of electricity annually at the Brooke Courthouse in Boston.
• Continuous process to optimize building schedules and operational efficiencies
LEED Certification and Mass LEED Plus

• LEED certification has been a focus at DCAMM for over a decade.
• First LEED Building, the Lorusso Applied Technology building at Cape Cod Community College (2006)
• Following the E.O. 484 (2007), DCAMM has accelerated the construction of certified buildings requiring all new construction and major renovation to meet:
  • Mass LEED Plus.
    • LEED Certification
    • 20% better energy performance than state building code
    • 3rd party commissioning
    • 50% outdoor and 20% indoor water reduction over baseline
Zero Net Energy Buildings

- 37 LEED certified buildings
- 2 zero net energy designed buildings constructed
- Other ZNEBS in design and construction

Division of Fisheries and Wildlife HQ
Westborough, MA
FUTURE Emphasis: Retro-commissioning and Continuous Commissioning

All applicable buildings over 50,000 square feet undergo a “retro-commissioning” process to identify and implement low-cost and no-cost energy and water conservation measures with short payback periods. - *Executive Order 484*

Cx Potential for Commonwealth

- Over 250 buildings >50,000 SF
- Over 35,000,000 Square Feet
- Targeting Built Since 1980
- 65 buildings and 7.5 MSF
- $4,500,000 Annual Savings
QUESTIONS?
Opportunities to work with the Energy Group:
Statewide Contracts Available for Agencies and Municipalities

**Facility Advisor**
- CommBuys - PRF 62
- Consultants under contract for wide variety of services
- See COMMBUYS for list of vendors and Procurement leader
- Expected to be opened in FY for new

**Solar Inspection Services**
- For PVs, annual or as needed
- Limited (under 10k) repair
- See COMMBUYS for more information

**Potentially coming soon**
- Turbine maintenance
- Solar Thermal Maintenance
- GSHP Maintenance
How to get involved:

• Track solicitations through COMMBUYS
• Get COMMBUYS training if not yet received
• Attend pre-bid/pre-proposal meetings to make connections
• Energy Consulting, design, construction and products are all procured differently. Know what you want to provide to Agencies, and learn that process
• Energy Group has Interested Party list serve
  • E-Mail: stephen.white@state.ma.us to join
• Team up with Prime contractors or consultants to learn process and get involved
• FOIA past proposals to see winning submittals
Massachusetts Department of Corrections

Jeffrey Quick, AIA

Director
Division of Resource Management
MassDOC
Background

- Division of Resource Management
  - Excellent Stewardship of the Commonwealth’s Physical Resources
  - 18 Prisons; 10,000+ inmates; 5,300+ acres; 7,000,000+ square feet of buildings.
  - All capital projects; new construction, upgrades, renovations, improvements, mission changes, emergency response, utilities, Intra/Inter Agency representation.
  - 2 PEs, 2 Architects, 1 LSP, 8 PMs, 10 Tradespersons
  - 5 WPCF, 7 Power Plants and 4 Water Systems Operations
Background

- Conservation
- ESCOs
- Sustainability Initiatives – Recycling
- Demand Response / DG / Forward Capacity
- MTC/CREBS/CEC – Renewables – PV Wind
Demand Side Revenue

• Real Time Emergency Generation (Action Group 6)
  – Every Prison has a generator
• Forward Capacity Auctions for Power Generated by Cogens
• Renewable Energy Credits for Power Generated by Wind/Solar
• Alternative Portfolio Standards for incremental upgrades to existing Energy Efficiency Hardware
• MA DOC realizes almost $100k/quarter
  – 2006 Award from ISO-NE
  – 2009 Energy Star for BCC Cogen
Renewable Energy

- 10 separate PV arrays (1.1MW) on existing lawns and old filter beds at waste treatment plants
- (2) 1.65+MW 80 meter Wind Turbines
- Solar/Thermal for staff gym hot water
- Small PV for out buildings
Innovative Financing

- Clean Renewable Bonds (IRS)
- ESCOs – financing through demonstrated savings
- FEMA – Pre Disaster Mitigation
- Rebates – GTG @ BCC, traps @ MCI-N
- ARRA
Bridgewater

112 kW

Cooling Towers

Kitchen Warehouse
NCCI - Gardner

North Tower

South Tower
Norfolk and Walpole
Low Pressure Boilers
Removal
Norfolk and Walpole
Low Pressure Boilers

Norfolk & Cedar Junction Boilers
Bridgewater Gas Turbine
NWCC WPCF Solar

Phase I – 106kW
NWCC WPCF Solar

Phase II – 150 kW
Concord WPCF Solar

64 Kw
Shirley Solar

200 kW
Cedar Junction #2 Solar

100 kW + 64kW (Phase I) = 164 kW
NCCI North Turbine
Revenue

• Since 2007 – Demand Response/RECs has earned $3,317,657.83
• Value of RECs & RTEG is subject to administrative fees by aggregators (14%+)
• Wind will generate $1.2MM per year – NCCI electric bill is ~$500k/yr.
Future Planning

• MCI Framingham/SMCC Energy Project
• Re-Enrollment of Emergency Generators under new emission requirements.
• Retro-fit/Update existing solar fields.
• Request for a study for solar canopy at Milford Headquarters.
• Bridgewater and Shirley Power Plants retrofit.
QUESTIONS?
Panel Discussion

Moderator: Briony Angus, *Tighe & Bond*

Panelists:

- Michael Donaghy, *MBTA*
- James Doucett, *MassDEP*
- Joanne Morin, *MassDOER*
- Betsy Isenstein, *DCAMM*
- Krista Lillis, *DCAMM*
- Jeffrey Quick, *MassDOC*