EBC Energy Resources Program:

Briefing by the DOER Division Directors

Environmental Business Council of New England
Energy Environment Economy
Welcome

John Wadsworth

Chair, EBC Energy Resources Committee

Partner, Brown Rudnick LLP
Program Introduction & Overview

Julie Barry

Program Chair & Moderator
Partner, Prince Lobel Tye LLP
DOER Division Presentations

- Joanne Bissetta, Green Communities
- Jillian DiMedio, Leading By Example Office
- Mike Judge, Renewable and Alternative Energy
- Will Lauwers, Emerging Technology
- Arah Schuur, Energy Efficiency
Meet the DOER Divisions

Environmental Business Council
November 30, 2017
Emerging Technology Division

- Energy Storage
- Energy Resilience
- Alternative Transportation

Will Lauwers, Division Director
## Status of ESI and State of Charge Study

<table>
<thead>
<tr>
<th>Recommendations</th>
<th>Status</th>
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</thead>
<tbody>
<tr>
<td>ESI Funding for Storage Demonstrations - $10 million</td>
<td>✓</td>
</tr>
<tr>
<td>Increase demonstration funding from $10m to $20m</td>
<td>✓</td>
</tr>
<tr>
<td>Resiliency Grants</td>
<td>✓</td>
</tr>
<tr>
<td>Solar Plus Storage Feasibility Studies</td>
<td>✓</td>
</tr>
<tr>
<td>Peak Demand Reduction Grants</td>
<td>✓</td>
</tr>
<tr>
<td>Storage in Green Communities and Leading by Example grants</td>
<td>✓</td>
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<tr>
<td>MOR-Storage rebates</td>
<td>TBD</td>
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<tr>
<td>Include Storage in the new SMART Solar Program</td>
<td>✓</td>
</tr>
<tr>
<td>Add Storage (beyond Flywheels) to the Alternative Portfolio Standard</td>
<td>✓</td>
</tr>
<tr>
<td>Energy Efficiency Programs for Peak Demand Savings</td>
<td>✓</td>
</tr>
<tr>
<td>Clarify regulatory treatment of Utility ownership of energy storage (rate case, solar ownership, grid mod)</td>
<td>✓</td>
</tr>
<tr>
<td>Energy Storage in Renewable Procurements</td>
<td>✓</td>
</tr>
<tr>
<td>• Clean Energy Procurement (~1,200 MW)</td>
<td>✓</td>
</tr>
<tr>
<td>• Off-shore Wind Procurement (1,600 MW)</td>
<td>✓</td>
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</table>
Defining Energy Resilience

- RAND study Measuring the Resilience of Energy Distribution Systems;
- “Resilience describes the state of service being provided by a system in response to a disruption. When assessing resilience, key questions would be whether the service has been degraded, how much of the service has been degraded, how quickly the service has been restored, and how completely the service has been restored. Therefore, resilience does not describe a dichotomous state of whether or not a disruption has occurred. Rather, resilience describes the degree of disruption across multiple dimensions, which could include type, quality, time, and geography of service provision.”
Community Clean Energy Resiliency Initiative

$40 Million Initiative

• **Round 1 ($7.4M)**
  • 27 Technical Assistance awards to assess energy resiliency for municipalities
  • 6 Implementation awards

• **Round 2 ($19.4M)**
  • 13 Implementation projects for municipal energy resiliency.
  • Projects include energy storage paired with solar

• **Round 3 ($14M)**
  • 3 programs:
    • Resiliency Feasibility Studies for 12 State Medical Facilities
    • Resiliency Demonstration Projects at public and private hospitals
      • $11.5 million Program Opportunity Notice Posted on 12/5/2016
    • Resiliency Tool development for community planners and administrators
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Electric Vehicles

Massachusetts has a goal of 300,000 ZEVs by 2025

Massachusetts Offers Rebates – Electric Vehicles (MOR-EV)
• Rebates up to $2,500
• Over $11 million in rebates for over 5,500 electric vehicles to date
• In 2016, the Baker-Polito Administration invested $14 million into the MOR-EV program - more than doubling it’s historic funding

Plug In America Pilot
• Partnership with New England states to host public and employer sponsored EV test drive events
• Will arrange EV test drives at offices
Program Update – MA Green Communities Program

Joanne Bissetta, Acting Director
Green Communities Division
Green Communities Division

The energy hub for all Massachusetts cities and towns, not just designated “Green Communities.”
Green Communities Division - Programs & Resources for Municipalities

• Green Communities Designation and Grant Program
• MassEnergyInsight energy tracking and analysis tool
• Municipal Energy Efficiency Program
• Municipal Energy Technical Assistance Grants
• Website filled with tools & resources

www.mass.gov/orgs/green-communities-division

Email updates via e-blasts – Sign up by sending an email to: join-ene-greencommunities@listserv.state.ma.us
MassEnergyInsight

MEI is provided to all 351 cities and towns free of charge. It will provide access to comprehensive up-to-date energy usage and cost information. Among the uses are:

(1) Benchmarking consumption and identify priority targets for efficiency investments
(2) Measure results
(3) Develop and monitor emissions inventory and track and report emissions reductions.

Standard Features of this web based, point and click system include:
• Electronic download of utility data
• Standard and custom reporting
• Integration of utility billing and usage data with building and energy end-use information
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Green Communities Designation and Grant Program

Qualification Criteria - Designation

1. Adopt as-of-right siting for RE/AE generation, R&D, or manufacturing
2. Adopt expedited permitting process
3. Create an Energy Reduction Plan to reduce energy use by 20% in 5 years
4. Purchase only fuel-efficient vehicles
5. Minimize life cycle cost in new construction → adopt the Stretch Code

Grant Funding

1. Energy Efficiency Projects
2. Renewable Energy Projects on municipal land
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Meet the Green Communities!

GREEN COMMUNITY DESIGNATIONS REACH ONE HUNDRED EIGHTY-FIVE

30 New Green Community Designations

<table>
<thead>
<tr>
<th>AGAWAM</th>
<th>CHICOPEE</th>
<th>GRANVILLE</th>
<th>NORTH ADAMS</th>
<th>SOUTHBOROUGH</th>
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<tbody>
<tr>
<td>BLANDFORD</td>
<td>CLARKSBURG</td>
<td>HAWLEY</td>
<td>NORTH ANDOVER</td>
<td>SOUTHBRIDGE</td>
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<tr>
<td>BOLTON</td>
<td>DARTMOUTH</td>
<td>MALDEN</td>
<td>NORTHBRIDGE</td>
<td>WARE</td>
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<td>BROCKTON</td>
<td>DOVER</td>
<td>MARSHFIELD</td>
<td>PLAINFIELD</td>
<td>WARREN</td>
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<tr>
<td>CHARLTON</td>
<td>ERVING</td>
<td>MEDFIELD</td>
<td>ROCKPORT</td>
<td>WESTFIELD</td>
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<td>CHELSEA</td>
<td>FITCHBURG</td>
<td>NEW BEDFORD</td>
<td>SALISBURY</td>
<td>WINCHELDON</td>
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</tbody>
</table>

- **Green** New Green Community Designation - January 2017
- **Light Green** Previously Designated Community

Massachusetts Department of Energy Resources

J. Pflister, 10-17-17
More Technical Assistance

- Funding for independent third parties who aid municipalities, in the negotiation, development and management of projects, or who perform studies to support the development of clean energy projects.

- Municipal Energy Technical Assistance (META) grants awarded to communities, water/waste water districts, regional school districts.

- Includes small grants to assist with municipal energy planning & implementation.
Outreach - Regional Coordinators

• Regional Coordinators act as direct liaisons with cities and towns on energy efficiency and renewable energy activities

• Located at each of the DEP Regional Offices:

  WERO – SPRINGFIELD: Jim Barry
  Jim.Barry@state.ma.us

  CERO – WORCESTER: Kelly Brown
  Kelly.Brown@state.ma.us

  NERO – WILMINGTON: Neal Duffy
  Neal.Duffy@state.ma.us

  SERO – LAKEVILLE: Seth Pickering
  Seth.Pickering@state.ma.us
Contact Information

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Joanne.Bissetta@state.ma.us

www.mass.gov/orgs/green-communities-division

617-626-7832

Email updates via listserv – Sign up by sending an email to:

join-ene-greencommunities@listserv.state.ma.us
Leading by Example (LBE) Program
Jillian DiMedio, Assistant Director

November 30, 2017
Leading by Example - Scope

• Robust clean energy goals for state government operations

• Portfolio includes:
  ➢ 80 million sq. ft. of buildings
    • 29 college and university campuses
    • 18 prisons, hundreds of armories
    • State hospitals, youth detention centers, office buildings, visitor centers, etc
    • 50+ state owned courthouses
  ➢ 3,000+ light duty vehicles

• MA State government:
  ➢ Consumes over 1 billion kWh of electricity
  ➢ Uses more than 7 million gallons of gasoline & diesel
  ➢ Emits over 1 million ton of GHGs
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LBE Tools

Technical Assistance
- Feasibility studies
- Implementation grants
- Project guidance
- Technology exploration
- Financial analysis

Data Tracking & Analysis
- Collect annual energy & cost data
- Report on progress
- Identify priority sites for energy efficiency
- Demonstrate cost-effectiveness of strategies

Communications & Outreach
- LBE Council meetings
- Email updates
- Awards & recognition
- Information sharing
- DOER Energy Smart blogs
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LBE Progress

- **GHG Emissions Reduction**
  - 28% reduction in GHG emissions over baseline

- **Solar at State Facilities**
  - From 100 kW to >24 MW at state facilities since 2007

- **Fuel Switching**
  - 79% reduction in heating oil, eliminating 18 million gallons

- **High Performance Buildings**
  - 72 LEED certified, 5 buildings designed to Zero Net Energy standard
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LBE Priorities

1. Solar Canopies
   - >10 MW at state facilities, dozens under consideration
   - Current grant program for SREC II projects
   - Upcoming grant program for SMART projects (2018)

2. Energy Resiliency & Storage
   - Study at 12 state-owned 24/7 medical care facilities to identify opportunities to utilize clean energy technologies to increase energy resiliency
   - Upcoming grant program (2018)

3. Renewable Thermal Technologies
   - Support installation of ASHPs, GSHPs, solar thermal & biomass at state facilities
   - Upcoming grant program (2018)
4. High Performance Buildings
   ➢ Continue progress on LEED and ZNEB-designed buildings
   ➢ Upcoming grant program for new construction (2018)

5. Building Energy Intelligence
   ➢ CBEI: tracking of energy data in real-time for electricity, NG, oil, steam

6. Advanced Vehicle Technologies & EV Charging
   ➢ Fuel Efficiency Standard for State Fleet
   ➢ EV Charging Stations at state facilities
   ➢ Current grant program

7. Feasibility Studies
   ➢ Current grant program to support the study of clean energy technologies at state facilities
Contact Information

www.mass.gov/eea/leadingbyexample

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• **Charles Tuttle**, Project Manager  
  (617) 626-1043  
  charles.tuttle@state.ma.us
DOER Renewable & Alternative Energy Division Overview

Michael Judge, Director
Renewable Portfolio Standard

• Established in 1997, first year of compliance in 2003
• Eligible technologies include solar PV, solar thermal electric, wind, ocean thermal, wave or tidal energy, fuel cells, landfill methane gas, small hydro, low-emission biomass, marine or hydrokinetic energy, and geothermal electric
• Generation Units from New England and adjacent control areas (i.e. New York, Quebec, and New Brunswick) may qualify
• Minimum Standard of 12% in 2017
• Set to increase by 1% each year going forward
• Retail electricity suppliers must provide compliance filing every July 1, 2017
2015 Compliance by Type and Location

**Fuel Type**
- Wind: 52.5%
- Solar PV: 24.9%
- Landfill Gas: 12.3%
- Biomass: 6.7%
- Marine/ Hydrokinetic: 0.001%
- Anaerobic Digester: 0.9%
- Hydro: 2.7%

**Generator Location**
- MA: 32.1%
- ME: 24.4%
- VT: 13.9%
- NH: 10.3%
- QC: 7.1%
- NY: 7.1%
- PEI: 0.2%
- CT: 0.1%
- NMISA: 4.8%
- RI: 0.01%
MA SREC I and SREC II Programs

SREC I launched in January 2010
• Designed to support 400 MW of new PV installations
• Program oversubscribed in May/June 2013
• 653 MW qualified under SREC I

SREC II – April 2014
• Maintain growth across installation sectors and manage growth to reach 1,600 MW by 2020
• SREC Factors differentiate market sectors and provide different amounts of SRECs to different types of projects.
• ‘Managed Growth’ and other sectors help control market growth.
• Both ACP Rate and Auction Price decline over time.
• Program oversubscribed in February 2016. Expanded via emergency regulation
• Program remains in place until new SMART Program is in effect

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Alternative Energy Portfolio Standard (APS)

• Requires a certain percentage of the state's electric load to be met by eligible technologies:
  ➢ Combined Heat and Power
  ➢ Flywheel storage
• DOER is in the process of adding new technologies as required by legislation
  ➢ Renewable thermal energy
    ▪ Biomass, Biofuel, Biogas
    ▪ Solar
    ▪ Heat pumps (air and ground source)
  ➢ Fuel cells
  ➢ Waste-to-Energy thermal
• Current final draft regulation incorporating new technologies expected to be promulgated on December 29, 2017
• Obligation on all retail electric suppliers
  ➢ Set at 4.25% in 2017
  ➢ Increases by 0.25% each year
## Summary of MA Portfolio Standard Programs

<table>
<thead>
<tr>
<th>RPS Class</th>
<th>Sub Class</th>
<th>Technology</th>
<th>Minimum Standard</th>
<th>2017 ACP Rate, $/MWh</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Class I</strong></td>
<td></td>
<td><strong>Wind, LFG, Biomass, Solar PV, Small Hydro, AD, etc.</strong></td>
<td>12% in 2017; increases by 1% each year</td>
<td>$67.70; increases with Consumer Price Index</td>
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<tr>
<td>(post-1997)</td>
<td></td>
<td><strong>Solar Carve-Out</strong></td>
<td>1.6313% in 2017; set by formula annually (carved out of Class I total)</td>
<td>$448; reduced annually per 10-year schedule</td>
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<td></td>
<td><strong>Solar Carve-Out II</strong></td>
<td><strong>Solar PV; 6 MW or less, in MA</strong></td>
<td>2.8628% in 2017; set by formula annually (carved out of Class I total)</td>
<td>$350; reduced annually per 10-year schedule</td>
</tr>
<tr>
<td><strong>Class II</strong></td>
<td><strong>Renewable (pre-1998)</strong></td>
<td><strong>Same as Class I</strong></td>
<td>2.5909% in 2017; set by formula annually</td>
<td>$27.79; increases with Consumer Price Index</td>
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<td></td>
<td><strong>Waste Energy</strong></td>
<td><strong>Waste to Energy Plants, in MA</strong></td>
<td>3.5%; stays constant</td>
<td>$11.12; increases with Consumer Price Index</td>
</tr>
<tr>
<td><strong>APS</strong></td>
<td></td>
<td><strong>CHP in MA, flywheels, storage, etc.</strong></td>
<td>4.25% in 2017; increases by 0.25% each year</td>
<td>$22.23; increases with Consumer Price Index</td>
</tr>
</tbody>
</table>
Solar Massachusetts Renewable Target (SMART) Program

- 1,600 MW AC declining block program
- Applies to all electric distribution companies
- Base compensation rates set by initial competitive procurement according to project size and service territory
- 10 or 20-year fixed price term depending on project capacity (10-year for small, 20-year for large)
- Compensation structure differentiated between sized-to-load and standalone systems
- Adders based on location, and those that provide unique benefits, including community solar, low-income, public, and energy storage projects
- Base compensation rates decline by set percentages each block following Block 1
- Maximum project size of 5 MW per parcel

![Illustrative Declining Block Model](image-url)
SMART Next Steps

- Final DOER regulation was promulgated on August 25, 2017
- DOER is working closely with the distribution companies and the Solar Program Administrator to ensure that:
  1. The initial 100 MW RFP process is completed successfully and on time; and
  2. The SMART Program website and Statement of Qualification Application are ready by spring 2018
- DOER will be providing updated SMART Guidelines for public comment
- DPU proceeding is now open and discovery phase should begin any day
- Most elements of proceeding (i.e. testimony, evidentiary hearings, briefs, etc.) will occur in January – April 2018
- Following model tariff approval, each distribution company will file compliance tariffs with the DPU, which will contain more details regarding specific cost recovery details and other company specific provisions
- DOER will provide more details regarding timing of transition from SREC program as the DPU proceeding unfolds
Other Programs

• The Renewable & Alternative Energy Division directly manages and coordinates closely with other agencies on many other initiatives, including, but not limited to:
  ➢ $40 million Mass Solar Loan Program with MassCEC
  ➢ $25 million Renewable Thermal Rebate programs with MassCEC
  ➢ $15 million Affordable Access to Clean and Efficient Energy (AACCE) Initiative
  ➢ $10 million ReHeat Mass Initiative
  ➢ $6 million interagency services agreement with UMass Clean Energy Extension
  ➢ $3 million Renewable Thermal Infrastructure program
  ➢ $3 million Rural Electrification Grant Program
  ➢ $1 million Agricultural Energy Grants Program with MDAR
  ➢ Clean Energy Results Program (CERP) with MassDEP
  ➢ Mohawk Trail Initiative
DOER Energy Efficiency Division Overview

Arah Schuur
Director, Energy Efficiency Division
Energy Efficiency Leadership Continues

• Ranked #1 by ACEEE for seven straight years (2011-2017) for our energy efficiency programs and policies
• 2016-2018 Three Year EE Plan has most aggressive energy efficiency goals in U.S.
  • Will deliver $8 billion in economic, environmental and energy benefits
  • 2016 achieved 111% of electric and 102% of gas goals (benefits)
• 52,000 jobs and growing
Efficiency: a resource that keeps on giving

https://www.iso-ne.com/system-planning/system-forecasting/energy-efficiency-forecast
The End of Lighting

2016 ANNUAL ELECTRIC SAVINGS OVER TIME

2016 LIFETIME ELECTRIC SAVINGS OVER TIME

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Peak Demand Reduction

Energy Efficiency Programs

• Peak Demand Reduction was one of 3 key priorities negotiated by DOER in the 2016—2018 Three Year Plan
• All four electric utility partners are demonstrating peak demand reduction activities
• Goal to include at scale demand reduction programs as part of next three year plan 2019 – 2021

DOER Peak Demand Reduction Grant

• In June, DOER awarded $4.6 million to 9 projects
## Demonstration Portfolio

<table>
<thead>
<tr>
<th></th>
<th>Residential</th>
<th>C&amp;I</th>
<th>Geotargeted</th>
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<tr>
<td>National Grid</td>
<td><strong>WiFi Tstat DLC</strong></td>
<td><strong>WiFi Tstat DLC</strong></td>
<td>Interruptible load</td>
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<td>CLC</td>
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<td><strong>BTM Thermal Storage</strong></td>
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<td></td>
<td>Behavioral+</td>
<td><strong>BTM Thermal Storage</strong></td>
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<td></td>
<td><strong>DLC on Ductless Mini-Splits</strong></td>
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<td>Unitil</td>
<td><strong>Battery storage for existing solar PV</strong></td>
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<td>Eversource</td>
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<td><strong>EMS</strong></td>
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<tr>
<td></td>
<td><strong>WiFi Tstat DLC</strong></td>
<td><strong>Software and Controls</strong></td>
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<td></td>
<td><strong>Lighting HVAC Controls</strong></td>
<td><strong>On site training</strong></td>
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<td></td>
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<td><strong>Process Audits</strong></td>
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<td></td>
<td><strong>Batteries</strong></td>
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<td><strong>Thermal Storage</strong></td>
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<td><strong>Real time info/DR</strong></td>
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<tr>
<td>DOER</td>
<td><strong>Battery storage with solar PV</strong></td>
<td><strong>Vertical market DR with BTM storage modeling</strong></td>
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<td><strong>DLC for EV chargers</strong></td>
<td><strong>Gas Demonstration</strong></td>
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<td></td>
<td><strong>Consumer research and program optimization</strong></td>
<td><strong>Battery storage with Solar PV</strong></td>
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<td></td>
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<td><strong>Substation battery</strong></td>
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<td></td>
<td></td>
<td><strong>BTM thermal storage</strong></td>
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</tbody>
</table>

* Not yet approved by DPU
+ Not sunset by DPU
LED Rapid Streetlight Conversion

- LED streetlights save municipalities money and reduce grid winter peak
- DOER is funding programs to rapidly convert over 100,000 streetlights statewide to LEDs
- Targeting inefficient municipally-owned streetlight fixtures across MA

As of Nov:
- 75 towns participating, >125,000 streetlight fixtures currently in program
- 300,000+ MWh in lifetime electric savings
- 6 towns installing advanced controls (timers, dimming, remote control)
Commercial Property Assessed Clean Energy (C-PACE)

• Commercial owners can finance energy improvements for commercial properties (C&I, 5+ unit multifamily)
• PACE will allow commercial property owners to finance energy efficiency, renewables, and gas line extensions as a tax assessment
  ➢ Financing for energy improvements will stay with the building even at sale and can be allocated to tenants in some cases
• Program is being developed by MassDevelopment / DOER
• Communities need to opt-in to establish PACE

http://www.massdevelopment.com/what-we-offer/key-initiatives/pace/
Thank You!

Arah Schuur

Arah.Schuur@massmail.state.ma.us