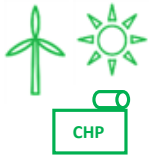
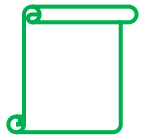
MA Leading by Example Council Meeting

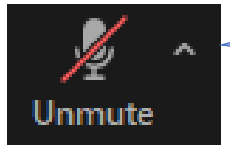
November 17, 2020

State Government Progress – as of November 2020

Greenhouse Gas (GHG) Emissions  ↓ 35% 2004 -2019	**Energy Use Intensity per Square Foot**  ↓ 14% 2004-2019	**Electricity via Renewable & Onsite Generation**  20% In 2019	**Heating Oil Consumption at State Facilities**  ↓ 85% 2006-2019
28.6 MW Installed Solar PV at State Sites  20.5 MW Since 2015	**93 LEED Certified State Buildings**  56 Since 2015	**219 EV Charging Stations at State Sites**  168 Since 2015	**Leading by Example Grants Awarded**  $12.6 M Since 2015

Using Zoom

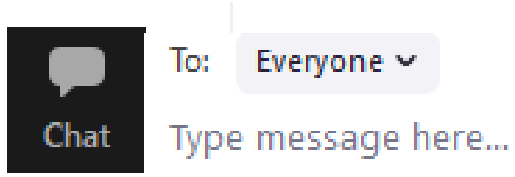
You are muted by default; please keep yourself muted if not speaking



Click the arrow to change your audio settings and switch to phone audio

Please turn your camera on if speaking

Use the chat box to ask questions and leave comments



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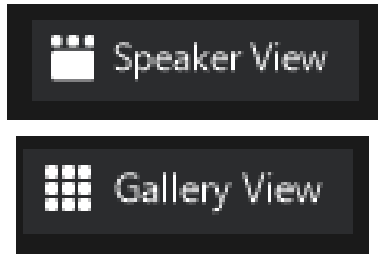

Performance Recognition 2020

In recognition for your contribution to the goals of the

Department of Energy Resources

The Commonwealth of Massachusetts presents the

2020 CITATION for OUTSTANDING PERFORMANCE

to

Chelsea Kehne

Governor

Lieutenant Governor

DOER
Massachusetts Department of Energy Resources

Agenda

Welcome and LBE Updates

Getting to Zero: What is it going to take?

Show Me the Money: Financing Energy Efficiency and Clean Energy

- Financing Models
- Mass Save Three-Year Plan
- DCAMM CEIP
- Energy-as-a-Service

Breakout Discussions

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LBE Updates

FY20 Tracking & Reporting

Many thanks to **everyone** who has submitted their FY20 form early!

Salem State University

Tracking form submission deadline is **December 18th**.

Please reach out to Chelsea on any questions or help with your tracking form!

Solar Status Update

SMART
MASSACHUSETTS SOLAR PROGRAM

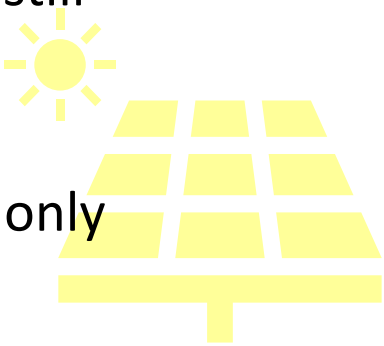
- Revised program guideline documents available here
  - Storage, land use and siting, value of energy, etc.

Large Project Capacity Status Nov. 16th

Utility	Current Block	
Eversource	5 (east)	9 (west)
National Grid	10 / 16	
Unitil	7 / 8	

LBE Solar Grant

- 7 grant projects awarded or committed
  - 7.3 MW solar, 3 MW BESS
  - 3 applications pending review
- Remaining funds limited
- Application submission still encouraged to secure a place in the queue
- Projects to be awarded only if funds remain



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Hydropower Progress

- 1,200 MW **Hydro-Québec** project cleared latest legal challenge in October 2020
- 145-mile transmission line project expected to begin construction by the end of 2020
- 20-year contract for hydropower expected to begin December 2022

Source: State House News

Advancing Offshore Wind

- DPU approved contracts for 804 MW **Mayflower Wind** project
  - Expected to be operational by December 2025
- Final permit for 800 MW **Vineyard Wind** project expected by December 2020

Source: South Coast Today

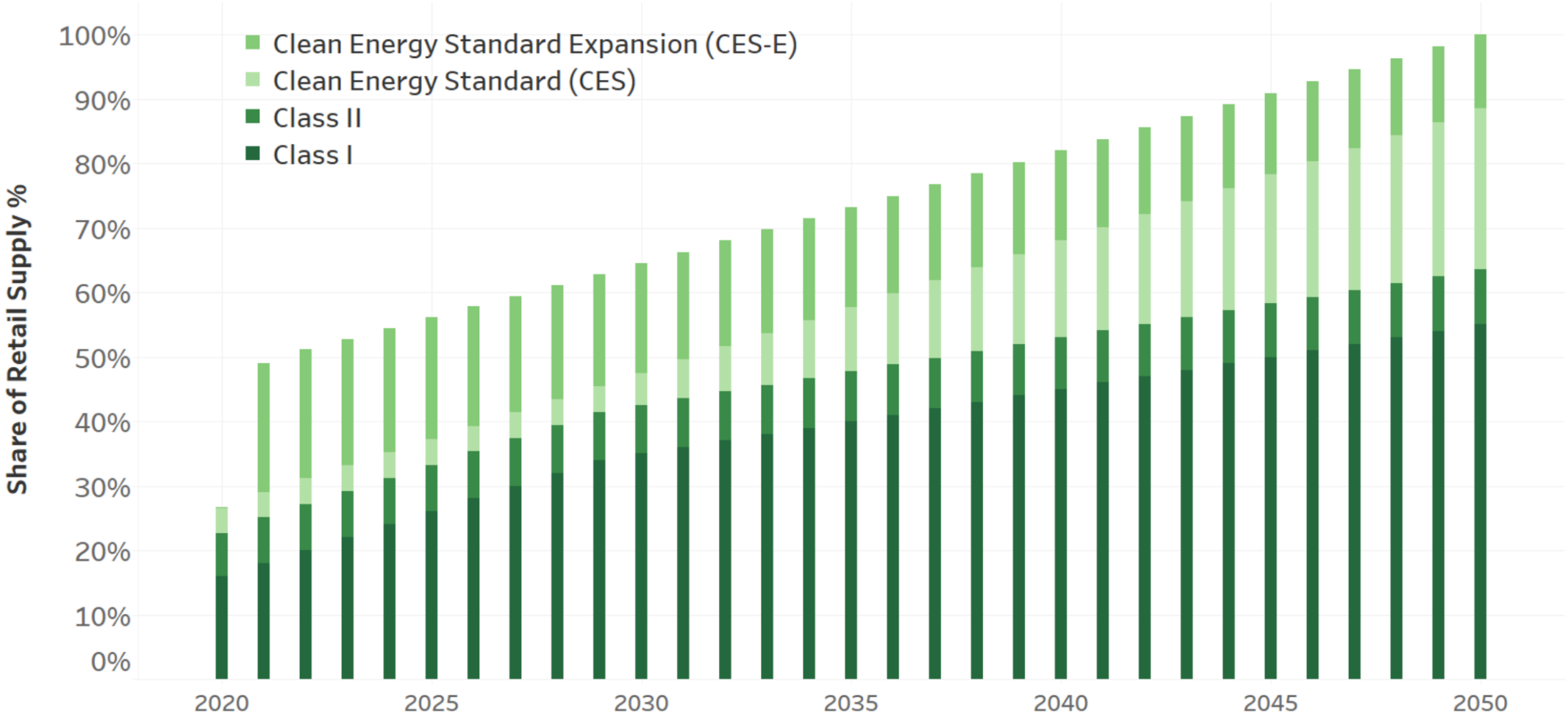
These projects will save ratepayers a combined $7.6 billion in electricity rates

Regional grid on track to provide half of MA's electricity from clean sources

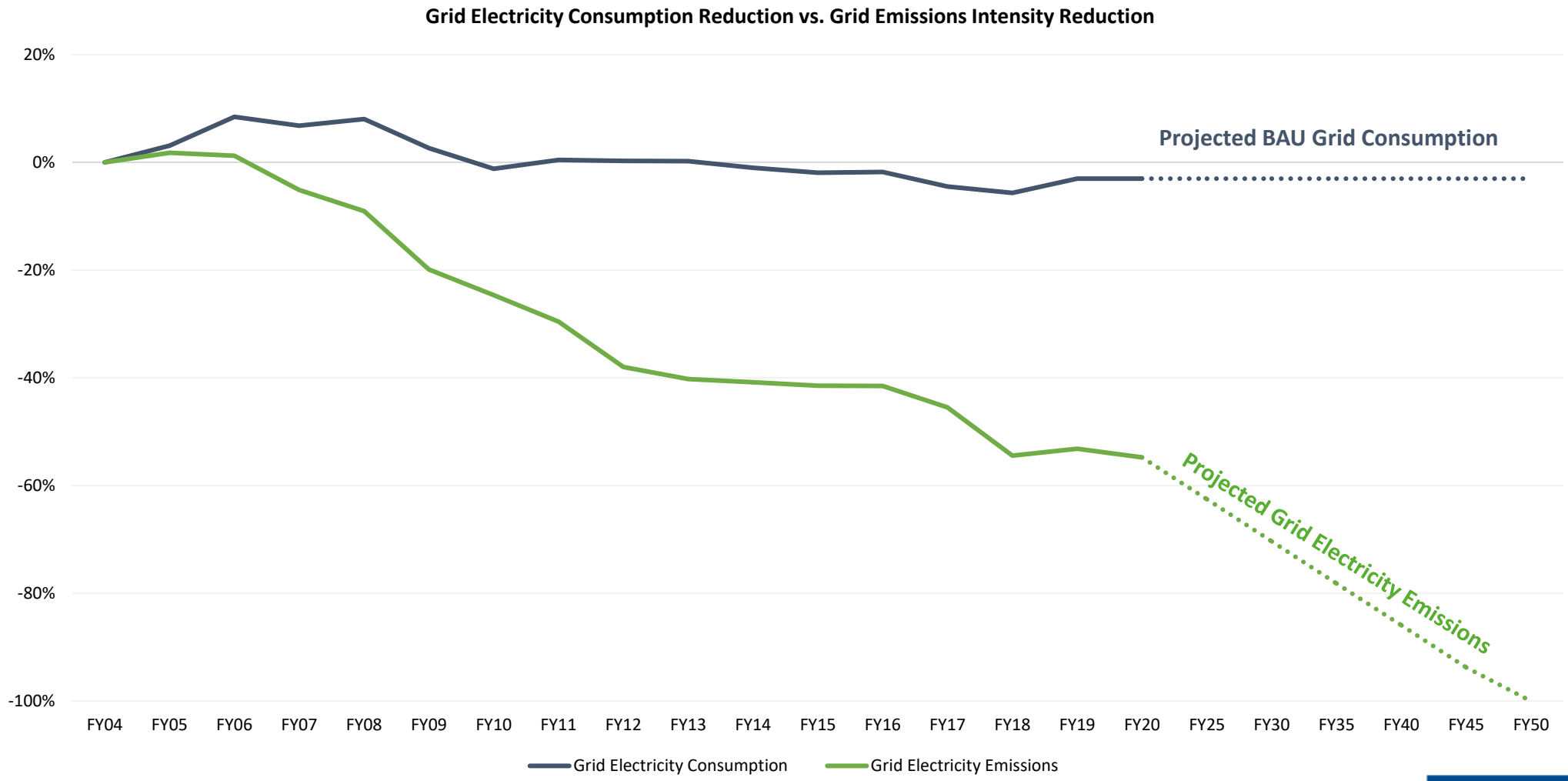
Image Source: Boston Globe

Image Source: CapeandIslands.org

Greening of the Grid: Forecasting to 2050



Impact of Greening the Grid on LBE Grid Electricity Emissions: Forecasting to 2050



Creating a Clean, Affordable and Resilient Energy Future for the Commonwealth

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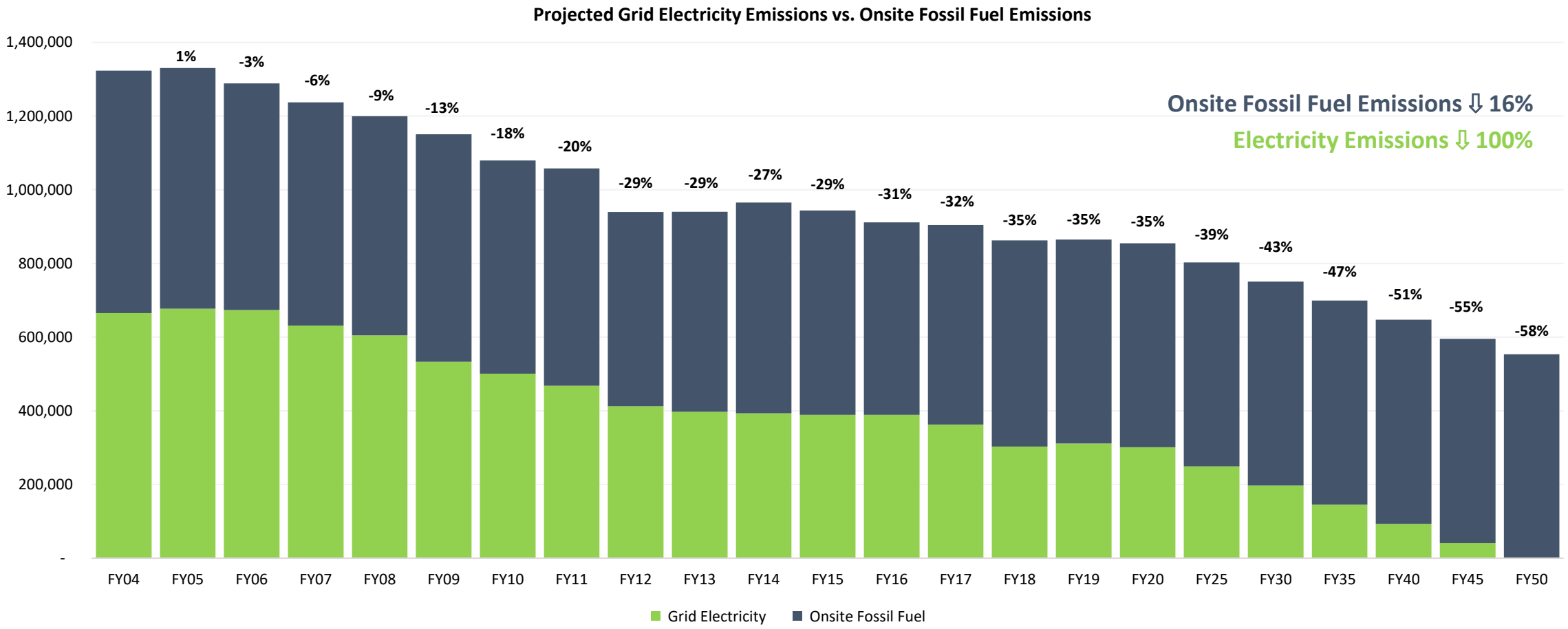
Impact of Greening the Grid on Overall LBE Emissions: Forecasting to 2050

If we assume that consumption remains the same, grid emissions in 2050 will be zero and fossil fuels will constitute 100% of total LBE portfolio GHG emissions



Sustainable BARKitecture: What makes a 'green' building?

From November 8th, 2020, onwards, the IECC2018 with MA amendments is the minimum energy code for new building permits in Massachusetts.

Electricity from clean sources

Select efficient window-wall ratio

Use sustainably sourced or recycled materials

Integrate green infrastructure

Source: Energy.gov, Mass.gov

Webinars, Events, Videos, Resources

Webinars	
November 18, 2 PM (ET) - Communicating Your Energy Plans and Achievements	Hear how and why three ENERGY STAR industrial partners implemented creative communications plans that include staff training videos, creative outreach strategies, and energy-saving challenges.
November 18, 3 PM (ET) - Gaining Speed: Post Election Outlook for Transportation Electrification	Join Plug In America and the Electrification Coalition, who work at the federal, state, and local levels, for a post-election, first look into the 2021 policy landscape for transportation electrification
November 19, 8:30-10 AM (ET) - Clean Heat – The Potential of Networked Geothermal	The DPU recently approved Eversource to install a networked GSHP pilot in an urban area with around 100 residential and commercial units. This webinar will explain the concept of "GeoMicroDistrict" heat and include presentations on proposed pilot projects from Eversource and National Grid
November 19, 1-2:30 PM (ET) - Leading the Way: Global Universities as Living Labs and Agents of Change for Climate Action & Sustainability	This webinar will explore the approaches that several global universities are taking to transform their campuses and position themselves as change agents in society with respect to climate action and sustainability.
December 1, 3-4:30 PM (ET) - Scaling Impact: Multi-Building Approaches to Carbon Reduction	Hear about pioneering developments that are integrating energy efficiency, waste heat, renewable energy, and grid interaction across multiple buildings. This webinar will explore best practices on achieving cost savings and carbon reductions at scale.

Webinars, Events, Videos, Resources

Events and Key Dates	
December, Date TBD – Leading by Example Recognition Awards	Join us in celebrating our colleagues from state agencies, public higher education institutions, municipalities for their leadership in promoting clean energy and sustainability initiatives
December 4, 5 PM (ET) – DEP Waste Ban Regulatory Amendments public comment period ends	Proposed amendments would ban mattresses and textiles from disposal, and lower commercial organics ban threshold to apply to entities generating ½ ton of organic waste per week (down from 1 ton). More info at: www.mass.gov/guides/massdep-waste-disposal-bans

You can also enjoy these videos on your own time!

- Cybertruck and the Rise of Electric Pickup Trucks
- EPA State, Local, and Tribal Webinar Series - archived webinars on everything from clean energy financing to EV trends

Meeting Spotlight

Cents and Sustainability - Financing Models for Clean Energy and Sustainability Projects

Getting to Zero

What is it Going to Take for Massachusetts State Buildings?

DIVISION OF CAPITAL ASSET MANAGEMENT & MAINTENANCE

Decarbonization – What is it going to take?

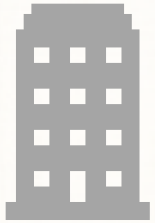
Ready the Buildings

Reduce the load (efficiency)

Low Temp Hot Water

Remove Simultaneous heat/cool

Assess redundancy



Design Systems

Central

Building-based

Hybrid

Low-Carbon Technology

Heat Pumps (electric)

Geo Exchange (ground/electric)

Storage

Renewables

Role of Gas?

Future Innovation

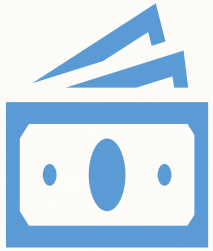
Decarbonization…

Large and Expensive

Phased

Timing

Retirement of Existing Infrastructure



Some Savings Offset First Cost

Labor

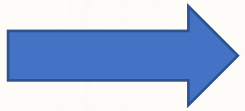
Fuel

Marginal cost

Uncertainty and Risk

What will it take?

- Money
- Knowledge
- Time
- Focus on Common Good



Be a “Good Owner”

A Good Owner …

- Knows what everyone wants
- Acts Early
- Is specific
- Asks questions… evaluate the answers

What a “good owner wants”?

- Efficient
- Net Zero
- Low Embodied Carbon
- Resilient design
- Maintainable

What does a project manager want?

On time

On budget

Fewer Changes

Happy Client

Time is money

What does the Design Team want?

Profit:

- Fees
- Low design cost: reuse from last job

Awards

- Glass
- Ample spaces

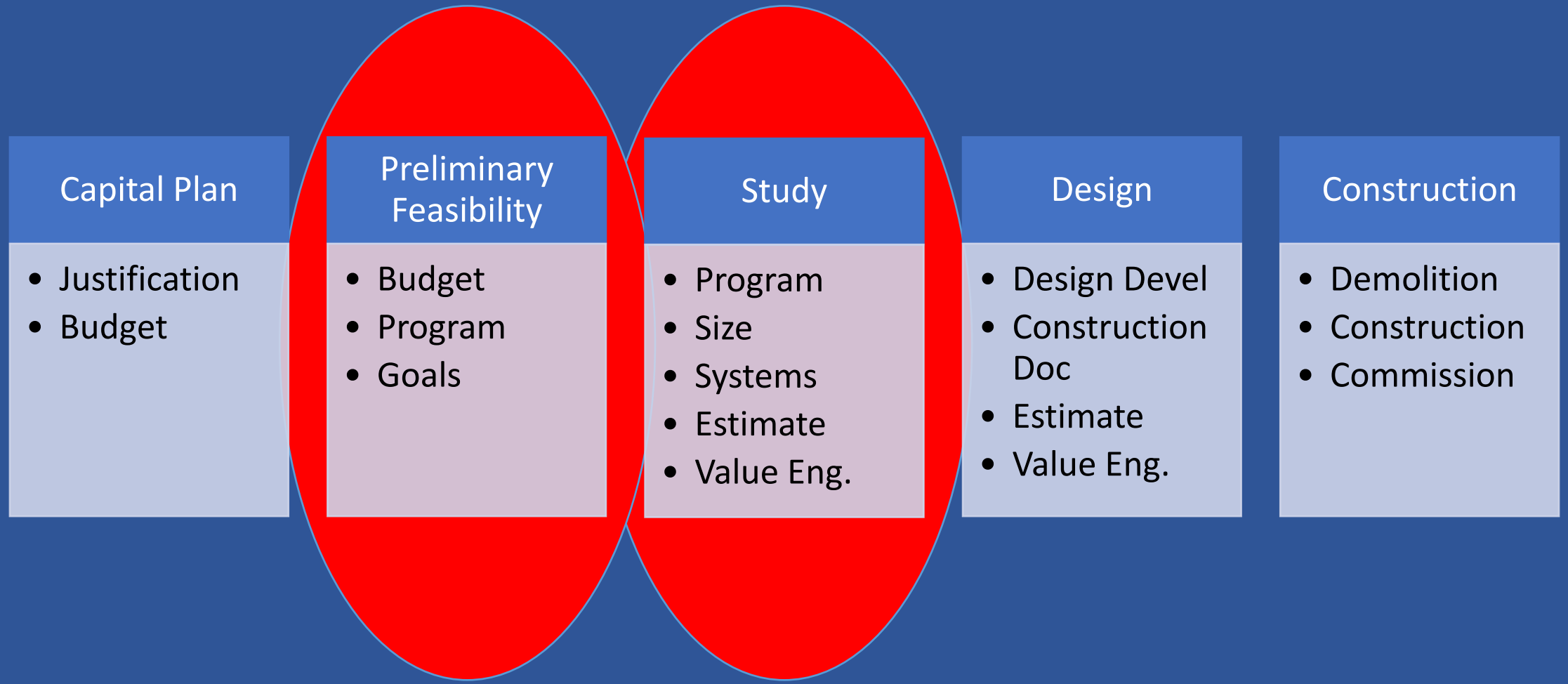
Good review

A Good Owner …

- Knows what everyone wants
- Acts Early
- Is specific
- Asks questions… evaluate the answers

Early!!!

Early!!! …
Each line that is drawn costs money to change



A Good Owner …

- Knows what everyone wants
- Acts Early
- Is specific
- Asks questions… evaluates the answers

Set Goals and Hold Teams to them

- Goals
  - Low EUI
  - Low carbon fuels
- Design assumptions
- Low carbon technology
- Low Window/Wall ration or Envelope Improvements

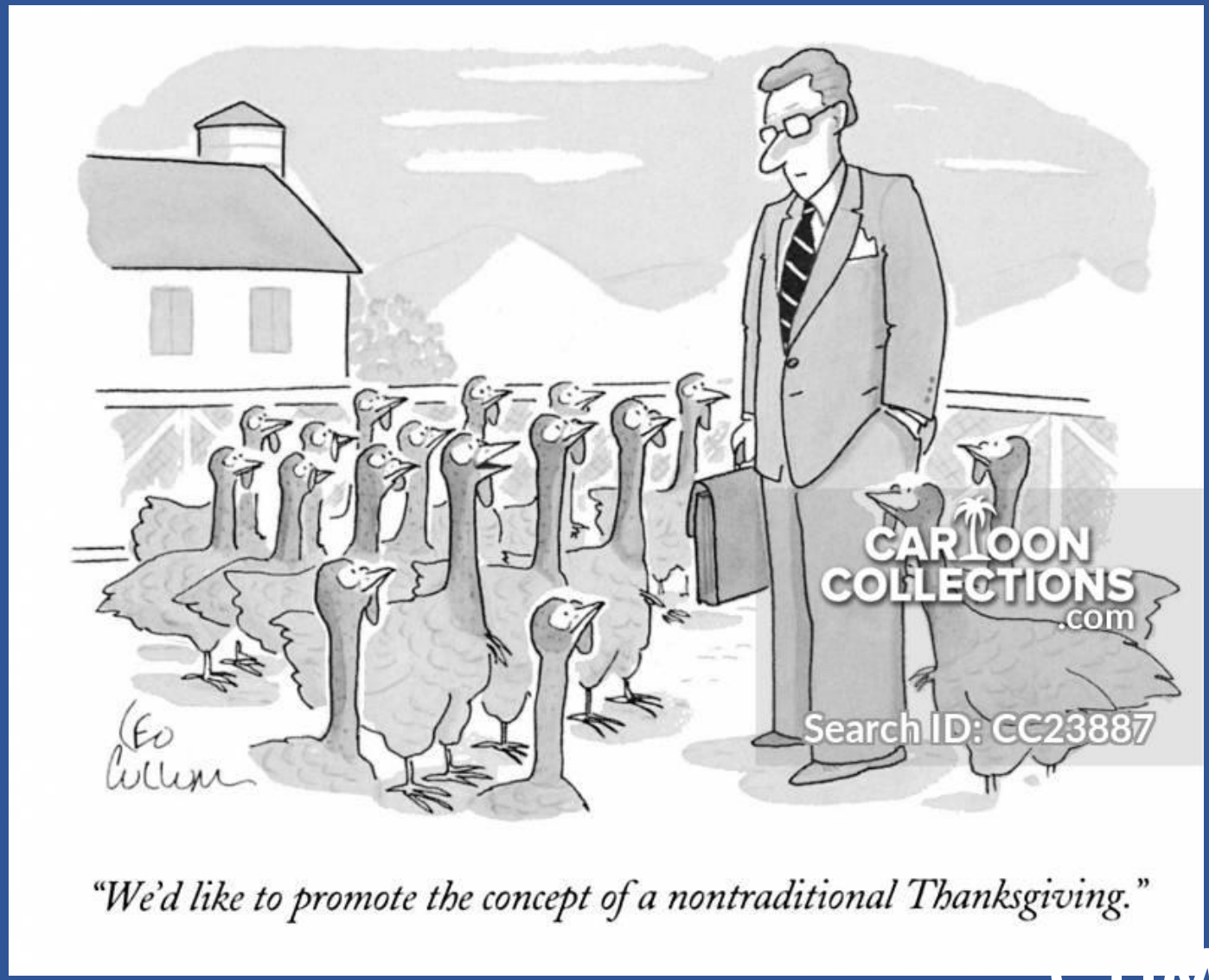
Beware!

- Design team's excuses
  - "We always do it this way"
  - "We never do it that way"
- Oversized designs
  - windows
  - building spaces (halls, corridors, etc)
  - systems
- Cost is proportional to size and complexity

Decarbonization is going to cost $$$$

- Many master plan elements don’t have any direct payback
- But we do them anyway
  - improve aesthetics
  - improved wayfinding etc
- “Saving” the planet should be worth the investment

Be Empowered to Be a Great Owner



"We'd like to promote the concept of a nontraditional Thanksgiving."

CLIMATE ACTION

Creating a Clean, Affordable and Resilient Energy Future for the Commonwealth

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Show Me The Money: Current Financing Programs

Financing Model Types

Please note this slide is intended for discussion purposes only and is not meant to be a recommendation or endorsement of any financing program or model over any other.

- Reduce upfront costs
- Some programs require repayment, usually calculated based on savings

Upfront Capital

Capital/operating budget
LBE grants
DEP EVIP grants
DCAMM CEIP
Revolving loan fund
Green banks
Green bonds
On-bill financing

Ongoing Incentives

RECs
AECs
SMART
Demand response
Clean Peak

- Payments based on ongoing monitoring and performance
- Incentives may be fixed or variable based on markets

Financing Models

- Equipment can be owned by private entity
- Upfront cost dramatically reduced/eliminated
- Financial benefit via reduced energy costs or revenue received from third-party

Third-party Ownership

Land/solar leases
Solar PPAs
Energy-as-a-service
Efficiency-as-a-service

Utility Programs

Prescriptive incentives
Custom programs
Pay-for-performance
Upstream, midstream, downstream

- Prescriptive or custom
- $ Can be provided upon project completion, after specified time, or through vendor cost reductions
- Must meet cost-effective criteria

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Mass Save Program Overview

Emily Powers, DOER

11.17.2020

What is Mass Save?

- Mass Save is the umbrella of rate payer funded energy efficiency programs in Massachusetts
- The Mass Save programs are offered by the Massachusetts Program Administrators (investor-owned utilities and Cape Light Compact JPE)
- Mass Save offers energy efficiency rebate and incentive programs for Residential, Commercial and Industrial and Income Eligible projects.
- Program information can be found at MassSave.com

What is the Three-Year Plan?

- The 2008 Green Communities Act established the Massachusetts Energy Efficiency Advisory Council (EEAC) to oversee the development, implementation, and evaluation of the energy efficiency plans for the Program Administrators.
- These plans are required to maximize economic benefits for residents and businesses through energy efficiency programs and achieve the Commonwealth's energy, climate, and environmental goals
- Every three years, the participating Program Administrators issue a Three-Year Plan that outlines the budgets, economic benefits, and energy savings for the statewide energy efficiency programs, branded as Mass Save®.

More information can be found on the EEAC website Planning Resources page: http://ma-eeac.org/planning-resources/

C&I New Buildings and Major Renovations

Program	Eligibility	Program Highlights
Path 1: Zero Net Energy/Deep Energy Savings *20,000 sq ft or more*	• Target of 25 EUI • Additions • Minimum of 20,000 sq ft of heated and cooled space	• Highest incentive level • Incentives available for both Customers and Design Teams
Path 2: Whole Building EUI Reduction *50,000 sq ft or more*	• *Must have goal of reducing EUI by 10% or more from the Mass Save baseline*	• Incentives available for both Customers and Design Teams
Path 3: Whole Buildings Streamlined *20,000 – 100,000 sq ft*	Engage early with the program to receive energy efficiency expertise when choosing Energy Conservation Measures	Custom and Design Team Incentives available
Path 4: Systems *20,000 sq ft or less*	Partial building major renovations, or projects engaging late in design or during construction	Projects that install energy efficient equipment may be eligible for prescriptive and custom incentives as well as technical assistance cost share

Visit MassSave.com for information on incentive levels and how to apply!

C&I Existing Buildings

Offering	Eligibility/Summary	Incentive Offerings
Equipment Rebates	• New equipment • End-of-life replacement • Equipment upgrades	Lighting, food service, heating, water heating, HVAC, compressed air, chillers, VSDs and custom projects
Energy & Systems Performance Optimization (ESPO)	Optimization of commercial building systems	• Low cost measures • Targeted System tuning • Whole building and process tuning
Active Demand *ConnectedSolutions*	Varies by PA (Eversource, National Grid)	Program offering varies by PA
Small Business Turnkey	Facilitated services for small businesses	• No cost energy assessment • Energy Savings Proposal • Recommended improvements installed by qualified vendor

Visit MassSave.com for information on incentive levels and how to apply!

Fall 2020 Planning Schedule

Topic	Listening Session Date	Workshop Date
Initial 2022-2024 Priorities	October 7th - 5 – 7pm	N/A
New Construction (Residential, Commercial &Industrial), Active Demand Management	October 13th – 2 – 4pm	November 5th
Income Eligible Programs	November 2nd – 9 – 11am	November 10th
Existing Buildings – C&I Focus	November 17th – 5 – 7pm	December 1st
Workforce Development Existing Buildings – Residential Focus	December 8th - 1 – 3pm December 14th – 9-11am	December 15th
Existing Buildings – Equity Focus		January 12th
Overflow Topics and Finalize Recommendations		January 20th

Question for Consideration

- Are their additional efficiency programs, equipment incentives, financing mechanisms etc. that could benefit your new construction or renovation projects?

Ways to Get Involved

- Provide public comment:
  - Written public comment can be submitted at any time to ma-eeac@mass.gov
  - Attend a public comment listening session
- Attend Three-Year Planning Workshops

Planning Resources

- Information on the Three-Year Planning process, including Workshop and Public Comment Session schedules: https://ma-eeac.org/planning-resources/
- EEAC Meeting Materials: https://ma-eeac.org/latest-council-meetings-materials/
- Questions related to the EEAC and the Three-Year Planning process can be sent to: MA-EEAC@mass.gov
- If you would like to be added to the EEAC email distribution list, email: MA-EEAC@mass.gov

2022-2024 Three Year Planning Schedule

Creating a Clean, Affordable and Resilient Energy Future for the Commonwealth

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Clean Energy Investment Program

Betsy Isenstein
Director, Energy & Sustainability

DIVISION OF CAPITAL ASSET MANAGEMENT & MAINTENANCE

Clean Energy Investment Program

- Financing mechanism that uses project savings to repay capital costs
- “Off cap” allowing access to funds without hitting debt ceiling limits
- Agency pays CEIP debt service from energy savings
- Agency signs Non-Financial ISA with DCAMM to commit to debt service

CEIP Guidelines

Eligible Participants	**Any state agency** that incurs energy and water costs in its normal operation.
Eligible Projects	Variety of state-owned projects -- lighting, heating, ventilation, air conditioning, building controls, cogeneration, power generation, others. Projects **must generate verifiable utility savings sufficient to pay for CEIP funding within the term of the project**.
Term	The **financing term for each project will be less than or equal to the useful life of major equipment or installations**, but in no event greater than 30 years. This is typically a term of 10, 15, or 20 years.
Savings	**Projected annual savings must be equal to or greater than 1.1 times annual debt service**. Savings will be independently verified to the extent practicable. Savings will be used to pay the debt service annually. Savings should be partially understood as cost avoidance.
Operating Budget	**Operating budgets will reflect the allocation of appropriate utility funds for debt service payments.**

CEIP Process

1. DCAMM verifies project savings.
2. Agency agrees to include the annual debt service in their operating budget each year.
3. A&F confirms with DCAMM that the savings are sufficient to cover debt service by at least 1.1 times (10% higher than yearly operating coverage).
4. Agency makes debt service payments yearly, typically in January. This is in addition to payments made for maintenance of new equipment.
5. A&F and DCAMM work with the agency to ensure that the funds are available for the debt service each year in the "SS subsidiary" object class in MMARS.
6. Agency prepares future budgets to include the appropriate debt service payment.

Questions? Contact Elizabeth.Isenstein@mass.gov

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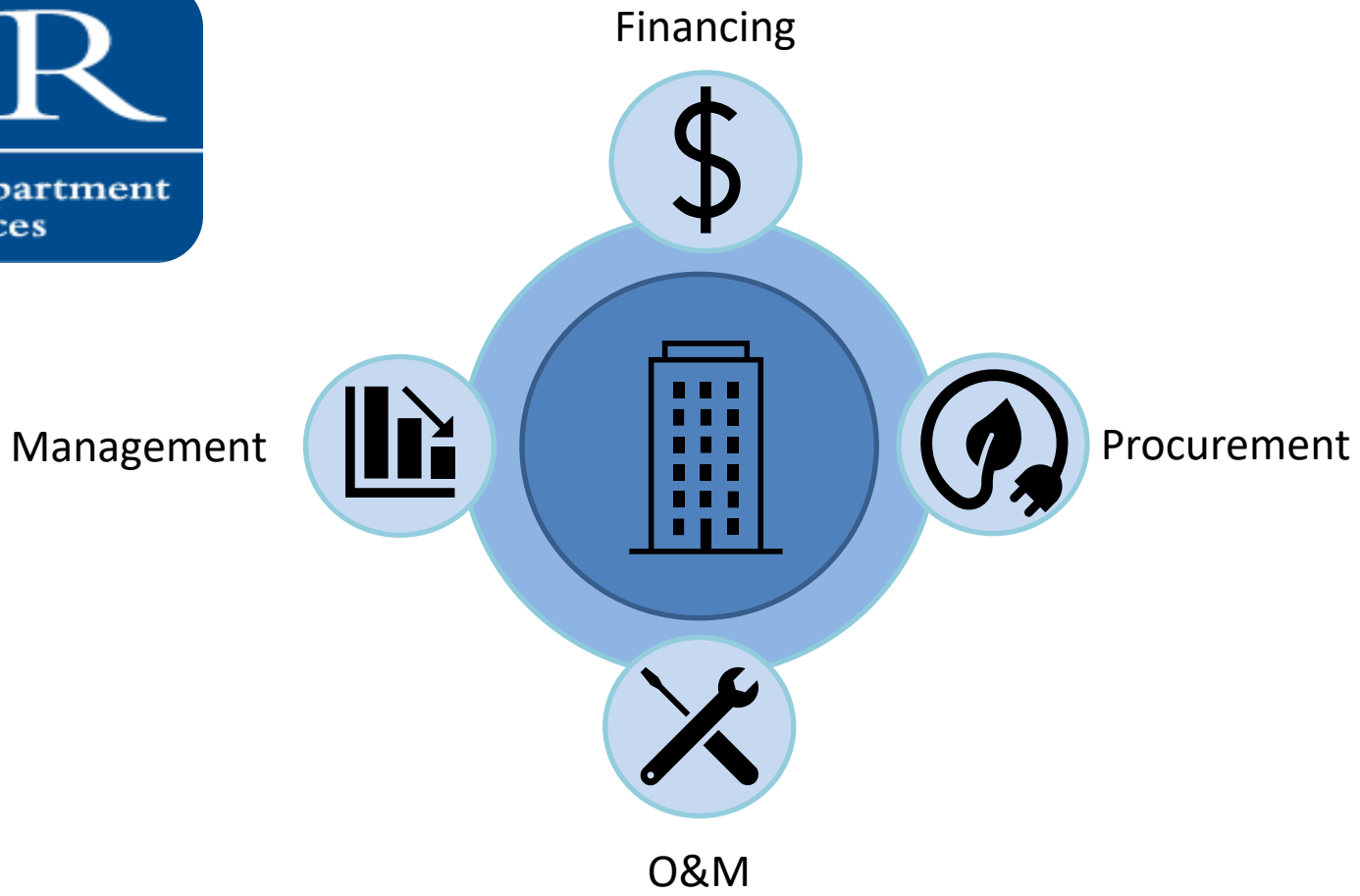


Energy-as-a-Service Agreements

Energy-as-a-Service Approach

Energy-as-a-Service (EaaS) is a broader delivery model that offers various energy-related services rather than just supplying electricity

EaaS solutions can…

1. Combine **demand management and energy efficiency** services
2. Facilitate the adoption of **renewables and other decentralized supply** sources
3. Optimize the **balance between demand + supply**

May allow sites to implement energy projects with no upfront capital expenditure

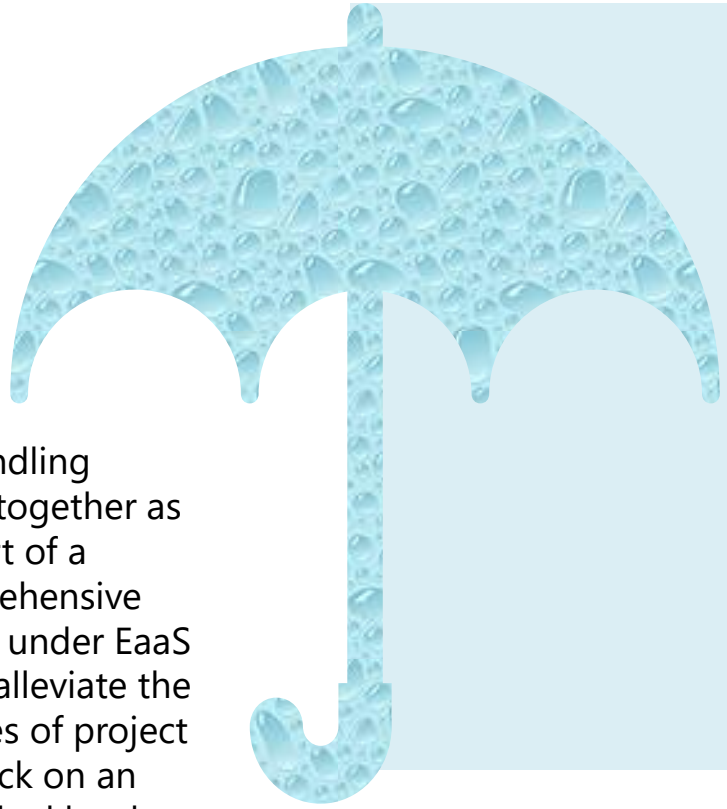
Service provider typically pays for project development, construction, energy management, and maintenance costs

Once a project is operational, the host site makes service payments to the provider

Sources: Deloitte, BBSC, IRENA

Energy-as-a-Service Elements May Include →

- Ways to save energy or make operations more energy efficient
- Alternative ways to get energy, including how it is procured, produced, and stored
- Advanced software, technologies and systems

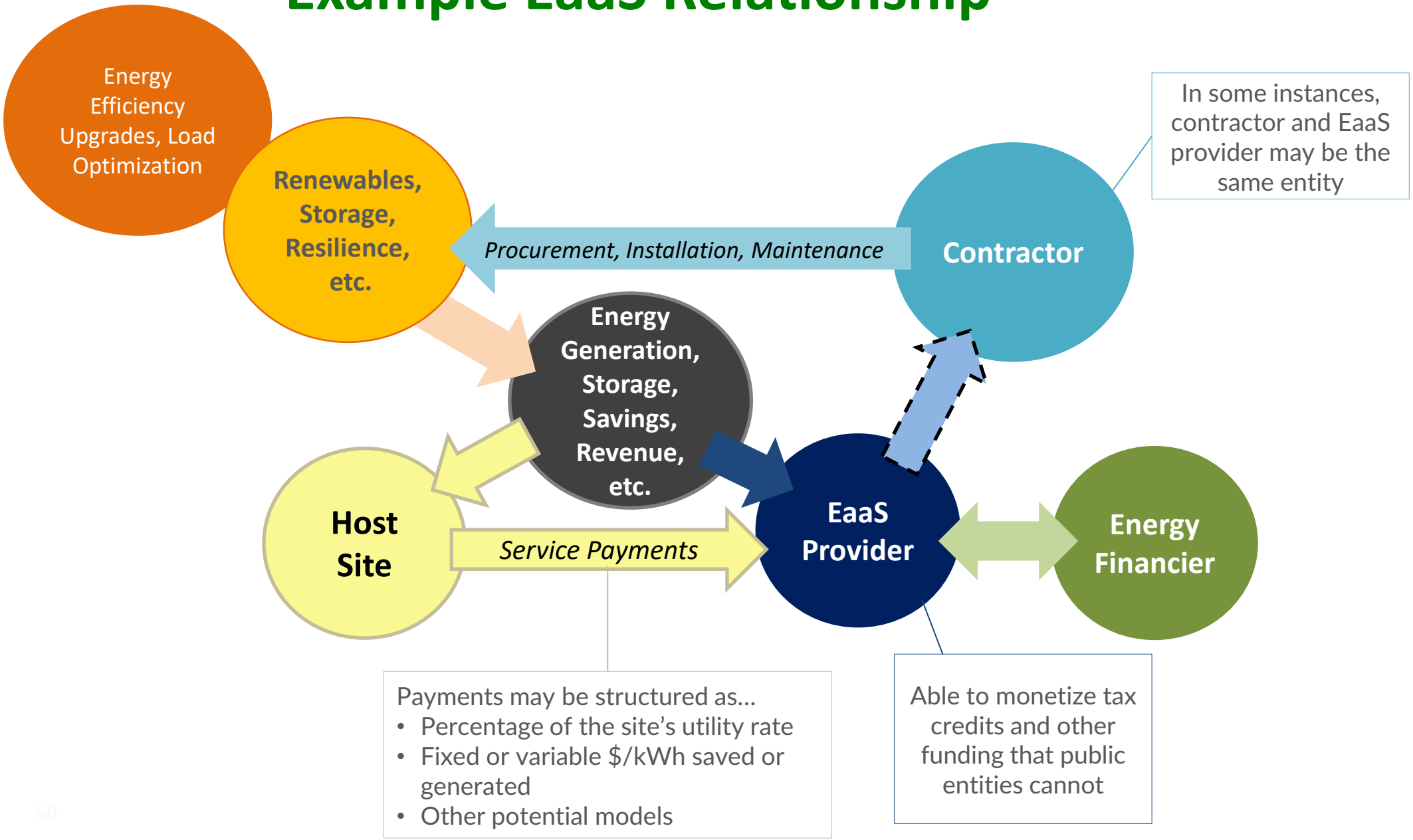


Bundling projects together as part of a comprehensive approach under EaaS can help alleviate the challenges of project payback on an individual level

- Energy procurement services
- Optimization and management services
- Power purchase agreements
- Demand response
- Battery storage-as-a-service
- DER optimization
- O&M services
- Lumens-as-a-service
- Software-as-a-service
- Fleet electrification and infrastructure
- Energy efficiency-as-a-service (e.g. ESCO model)

Sources: Deloitte, BBSC, IRENA, Markets and Markets

Example EaaS Relationship



Energy-as-a-Service Agreements

EaaS agreement structures vary as much as the projects themselves, and are impacted by factors such as…

- Host site's primary objectives
  - E.g. GHG reductions or decarbonization, resilience, cost savings, power quality, etc.
- Capital requirements
- Desired term length
- Available incentives and revenue streams
- Benefits of performance-based contract vs. fixed payment model

Potential Financial / Operational Benefits

- Flexible structure that can be customized to meet site needs/goals
- Payment only required if agreement terms are met
  - Payment format may have accounting benefits, e.g. treated as operating expense (similar to utility bill)
- Depending on agreement type, projects may not require upfront capital from host site
- Tax incentives monetized, making projects more cost-effective
  - Projects also usually eligible to claim relevant utility incentives + other revenue streams that further improve economics and increase site benefits
- EaaS provider may procure, operate, and maintain technologies
  - Minimizes performance, maintenance, and credit risks for host site
- Agreement terms and technologies can be adapted over time

Sources: NGA: Financing State LBE Efforts, Financing Options for State Buildings; Smart Energy Decisions

Potential Financial / Operational Challenges

- Requires identification of and commitment to long-term objectives and plans at site
- Best suited for projects >$1M
- Typically 5- to 20-year contract terms, but may be longer
  - Not usually suitable for leased facilities
- Long closing times
- Limited or no site equipment control
- Agreements vary significantly in terms of contract structure, method used for measuring realized savings or determining payments, and how the customer and provider share benefits

Sources: NGA: Financing State LBE Efforts, Financing Options for State Buildings; Smart Energy Decisions

Case Studies

Ohio State University (OH)

- Steam → low temp. hot water, renewable fuel CHP, renewable energy procurement
- Comprehensive energy management project with 50-year agreement (trilateral fee structure: fixed, operations, and variable)
- Vendor responsible for meeting efficiency goals, financing capital improvements, and investing in other OSU-approved projects

Bristol Hospital (CT)

- LED lighting, energy management system, power factor correction, steam trap replacements, HVAC + AHU replacement, water efficiency
- Efficiency-as-a-service agreement
- Estimated $525,000 total annual savings

UMass Boston (MA)

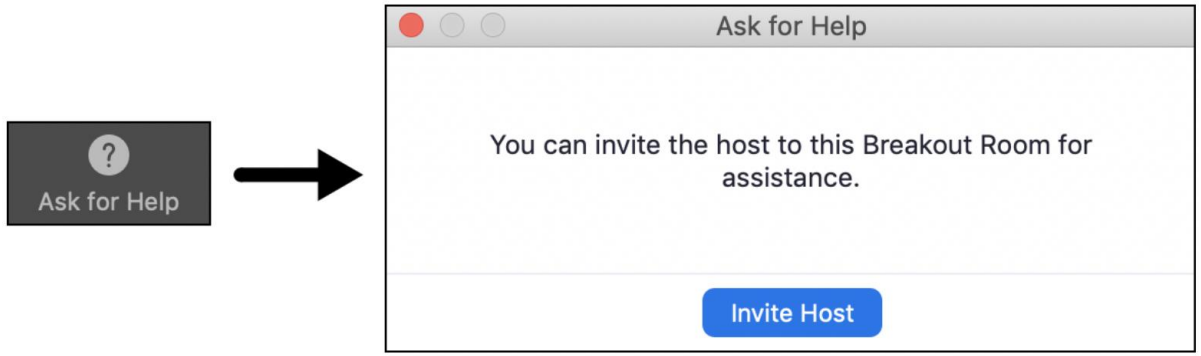
- Software-optimized, distributed energy resource system comprised of solar, battery energy storage, and smart EV charging stations
- 20-year guaranteed savings agreement; vendor owns, operates, maintains assets
- Estimated average $100,000 annual savings (energy costs, demand charges) and benefits to UMB --$1.5M over term

UMD College Park (MD)

- Seeking a new 30-year public-private partnership to meet campus decarbonization and resilience goals
- UMD would finance energy system capital improvements through a tax-exempt entity and contract with private vendor to design, engineer, and install improvements and manage, operate, and maintain UMD's energy systems

Money, Patience, Time:
Breakout Discussions on Challenges and Successes

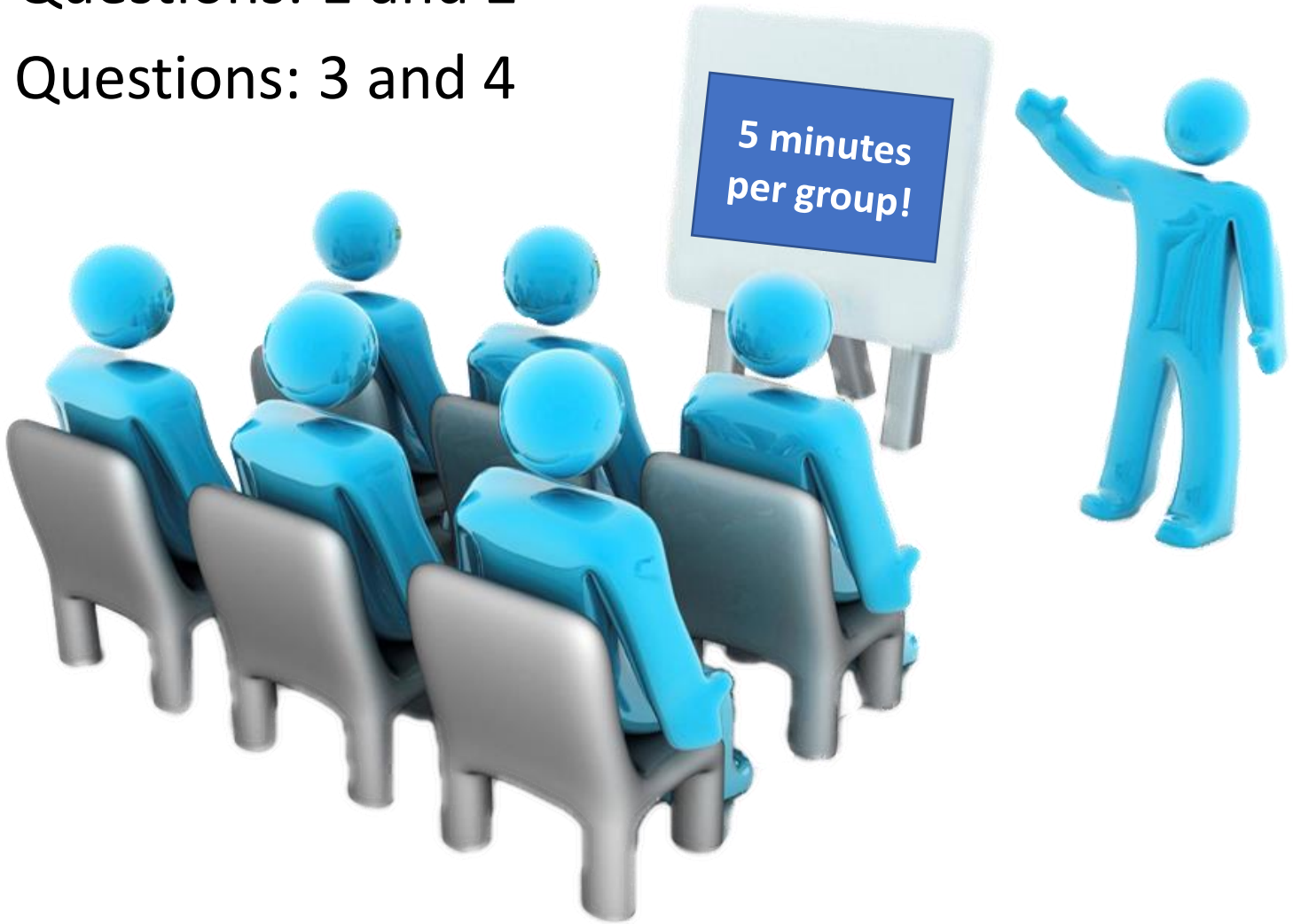
- Attendees will be sent to one of four breakout rooms for 25-minute facilitated conversations
- Please turn your cameras on while in small groups!
- Groups 1 & 2 will answer group A questions and groups 3 & 4 will answer group B questions
- One representative from each group will take notes and report-out to the big group
- If you have additional thoughts, feel free to email us after the meeting



You will get a notification when it is nearly time to return to the main group

Breakout Discussion Report-Out

- A Group Questions: 1 and 2
- B Group Questions: 3 and 4



Next LBE Council Meeting

Save the Date!

Tentative:

Tuesday, January 12

10:00 am–12:00 pm

Upcoming Tentative Meeting Dates:
March 9
May 11
July 13

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

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