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

Massachusetts Department of Energy Resources

Leading by Example Council
November 9th, 2021

Agenda:
Back (to the topic of) the Future

- Welcome
- Massachusetts Solid Waste Master Plan
- Grid Infrastructure in the Clean Energy Transition
- Embodied Carbon
- LBE Updates
- Clean Energy News

2030 Solid Waste Master Plan and Waste Ban Regulations

Leading by Example Council

November 9, 2021

Solid Waste Master Plan Overview

- Plan for adequate solid waste management capacity
- Establish aggressive waste reduction goals
  - 1.7 million ton reduction by 2030 (30% reduction)
  - 5.1 million ton reduction by 2050 (90% reduction)
- Emphasize reduction and reuse
  - First comprehensive Reduce & Reuse Workgroup & Action Plan
- Emphasize recycling market development
  - Similar Workgroup, Action Plan & Formation of New State Agency Council
- Enhanced public engagement, focused on EJ Communities

Major Changes – Draft to Final SWMP

- Plan Title – “Working Together Toward Zero Waste”
- Align with Clean Energy & Climate Plan & 2050 Decarbonization Roadmap
  - Reduce waste combustor emissions from plastics disposal
  - 2025 SWMP Program Review – explore potential for declining greenhouse gas emissions cap on Municipal Waste Combustors
- Increase engagement with Environmental Justice communities
  - Prioritize EJ communities for grant awards
  - Assistance for composting at community gardens
  - Leverage MassDEP’s Illegal Disposal Surveillance Program
  - Promote use of hybrid/electric trash & recycling collection trucks
  - Improved notice for facility permits in EJ communities

Major Changes – Draft to Final SWMP

- Work with Zero Waste Caucus to inform development of solid waste and waste reduction legislative agenda
  - Including extended producer responsibility approaches, hauler recycling service requirement
- 2025 Program Review
  - Midway check in with stakeholders to assess progress, review programs and policies, and consider adjustments
  - Will include (but not be limited to):
    - Consider disposal ban on all food waste by 2030
    - Explore potential for municipal waste combustor declining GHG emissions cap
- State Agency Recycling Market Development Council
  - Focus – how state agencies can support recycling markets and increase purchases of recycled products
  - Develop and implement new Recycling and Waste Reduction Innovations Grant Program with $1 million initial investment

Major Short-Term Initiatives

- Implement New Waste Disposal Bans
- Update Organics Action Plan – Organics Subcommittee
- Publish Revised Reduce & Reuse Action Plan
- Issue next round of Recycling Business Development Grants
- Launch Recycling Market Development Workgroup
- Launch State Agency Recycling Market Development Council
- Develop and implement new Recycling and Waste Reduction Innovations Grant Program
- Prepare solid waste regulation amendments for public comment
- Continue to implement C&D Minimum Performance Standard

New Waste Disposal Bans

- Final Regulations filed on 10/15/21 – published on 10/29/21
- Effective date of new bans will be November 1, 2022
- Will include mattresses, textiles and reduced food waste threshold (from 1 ton to ½ ton per week)
- Changed definitions for mattresses and textiles to clarify that ban only applies to clean materials
- Will follow up with additional outreach and assistance to key stakeholder groups
  - Municipalities, businesses and institutions, service providers

Waste Ban Compliance Assistance

- RecyclingWorks in Massachusetts
  - 888-254-5525
  - info@recyclingworksma.com
  - www.recyclingworksma.com

- FAC90 Contract for Mattress Recycling

Continued Engagement Opportunities

- Solid Waste Master Plan Webinar – geared more towards general public – early November TBD
- Reduce, Reuse Recycle-Palooza webinars for general public
  - Series of 5 webinars on recycling & waste reduction
  - Part of America Recycles Day events
  - 2 in evening
  - 3 at lunchtime

Continued Engagement Opportunities

- SWAC – broadening membership
  - CERO Cooperative
  - Habitat for Humanity Restore (West Roxbury)
  - Mass Food Systems Collaborative
  - Metropolitan Area Planning Council
  - Sustainable Business Network of Mass
- Recycling Market Development Workgroup & Action Plan – 1st meeting date TBD
- Reduce & Reuse Workgroup & Action Plan – next meeting date TBD
- Organics Subcommittee & Action Plan – 11/9/21
- C&D Subcommittee & Action Plan – 11/18/21

RecyclingWorks Fall 2021 WasteWise Forum:
11/10/21, 10am-12pm
Particularly relevant to institutions subject to commercial organics disposal ban

Key Links

- https://www.mass.gov/guides/solid-waste-master-plan
- https://www.mass.gov/guides/massdep-waste-disposal-bans

Massachusetts Department of Energy Resources

Updates on the Clean Energy Transition

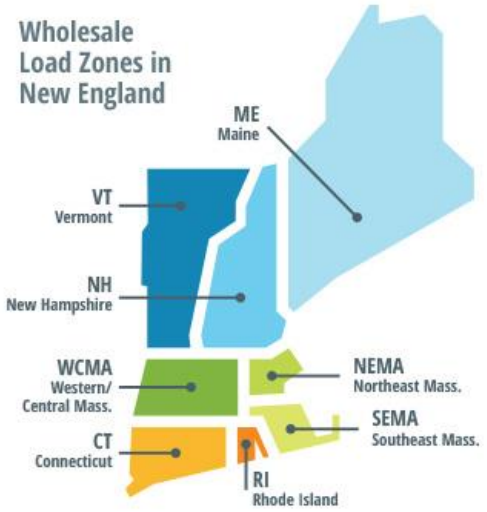
Presentation to the LBE Council

November 9, 2021

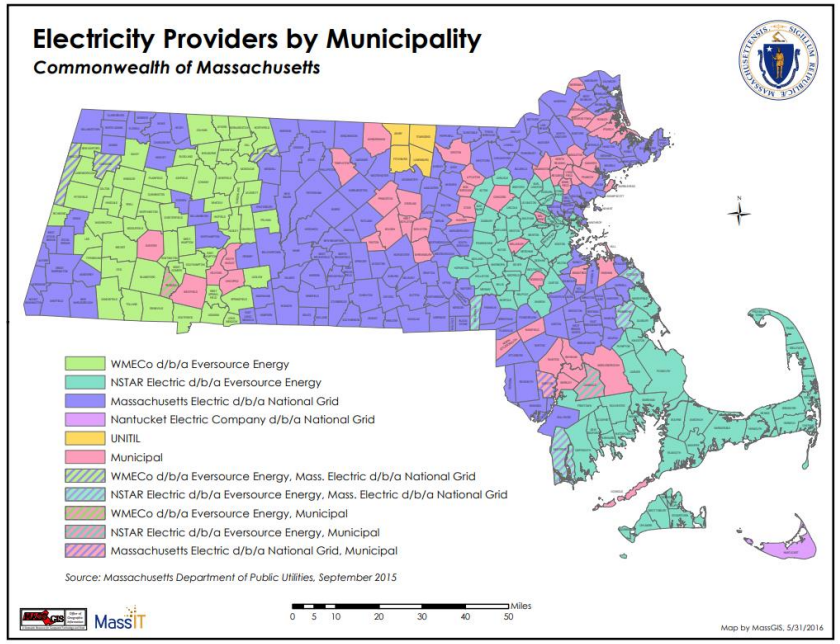
DOER Policy Mission

The Massachusetts Department of Energy Resources (DOER) develops and implements policies and programs aimed at ensuring the adequacy, security, diversity, and cost-effectiveness of the Commonwealth's energy supply to create a **clean, affordable, resilient, and equitable energy future** for all residents, businesses, communities, and institutions.

Current Planning Organizations



Source: ISO New England

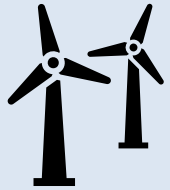


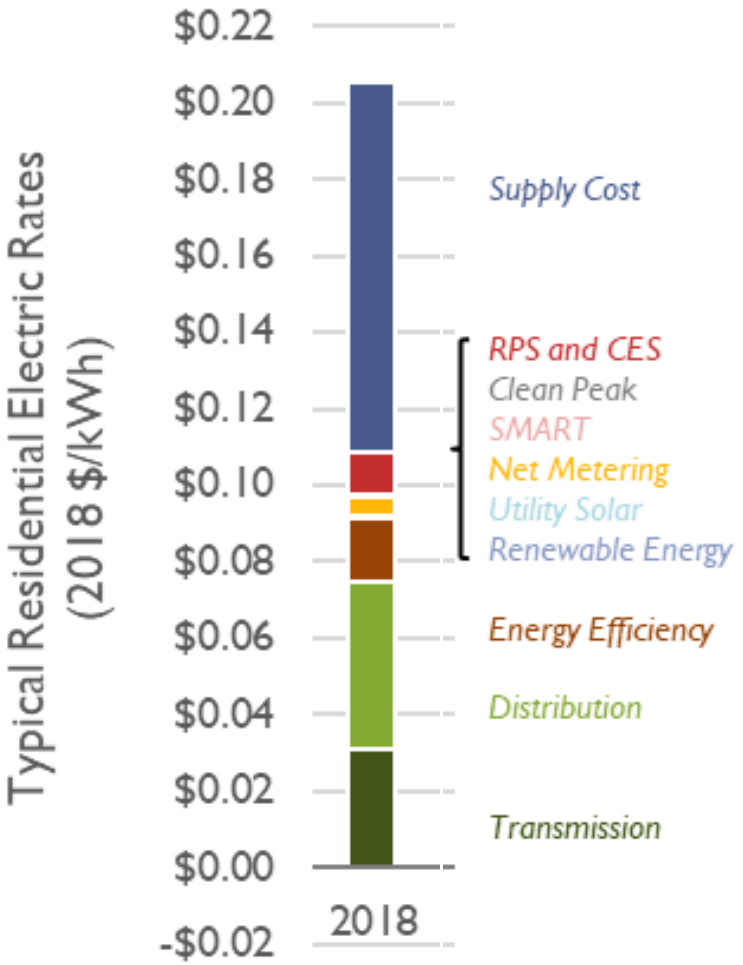
- **ISO New England (ISO-NE)** is the independent non-profit that plans and operates the regional transmission grid for the six New England states and administers the competitive wholesale electricity market.
  - ISO-NE plans for short-, medium-, and long-term impacts from energy supply and demand, including needs for generation and transmission
  - ISO-NE often utilize **market structures** and **financial incentives** to ensure reliable service

- **Electric Distribution Companies (EDCs)** (e.g. Eversource, National Grid) own and operate the local distribution network to deliver electricity to homes and businesses.
  - The EDC's must provide safe and reliable energy to its customers
  - The EDC's propose infrastructure and supply plans to the Department of Public Utilities for their approval and rate recover their costs

Policy Deliberative

Electric Bill Components

Bill Component	Cost	Charges
Supply	Cost of generating electricity 	• Wholesale Market Costs: ➢ Wholesale Energy ➢ Capacity Market ➢ Ancillary Services • Clean Energy Costs: ➢ Costs to comply with Renewable Portfolio Standards (RPS) and other state-level clean energy policies • Other Supplier Costs and Risk Premium
Delivery	Cost of delivery electricity to homes and businesses 	• Distribution (EDC poles and wires) • Transmission (ISO-NE long-distance transmission) • Clean energy policy charges (e.g. Energy Efficiency) • Reconciling Charges



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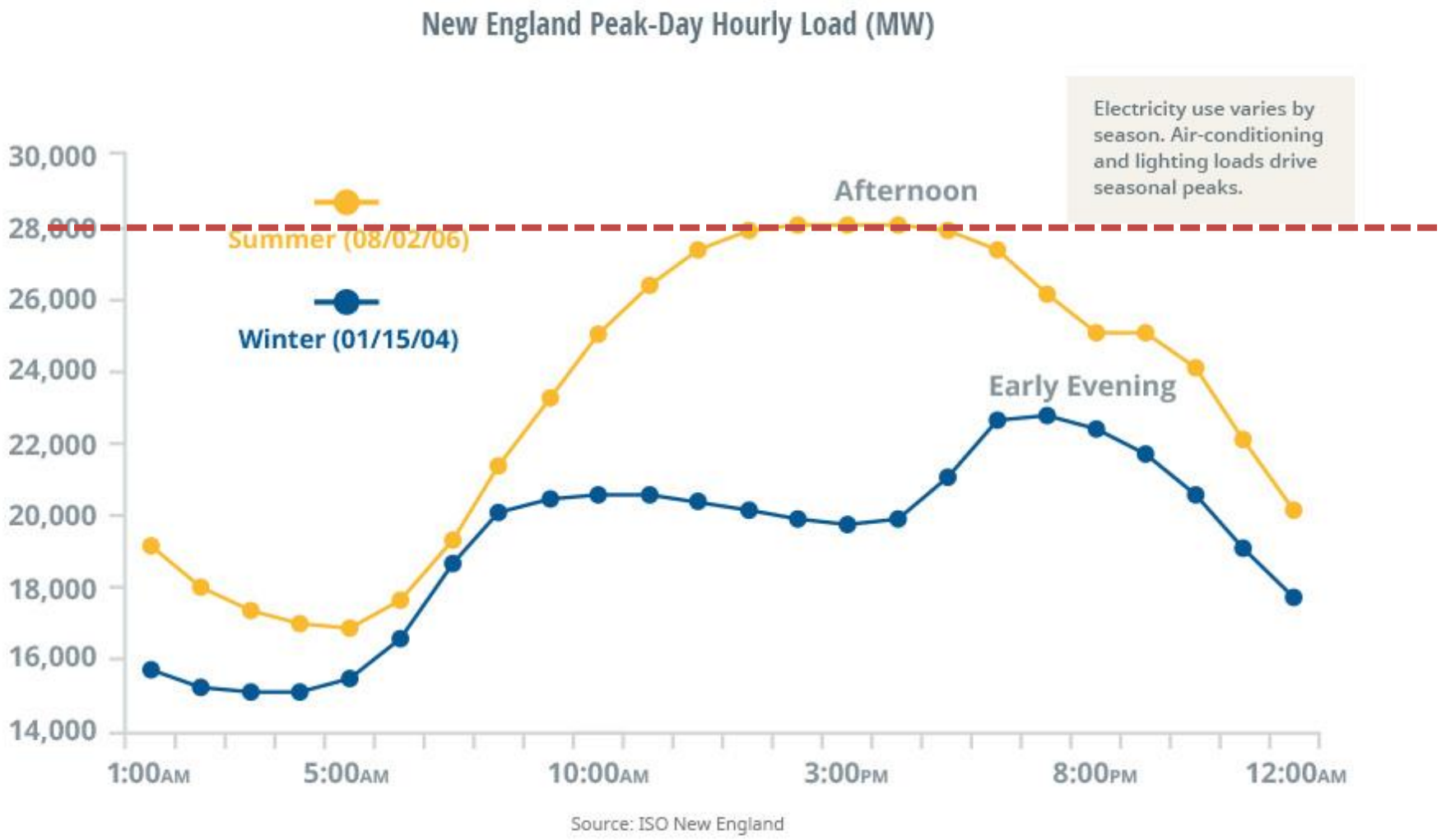
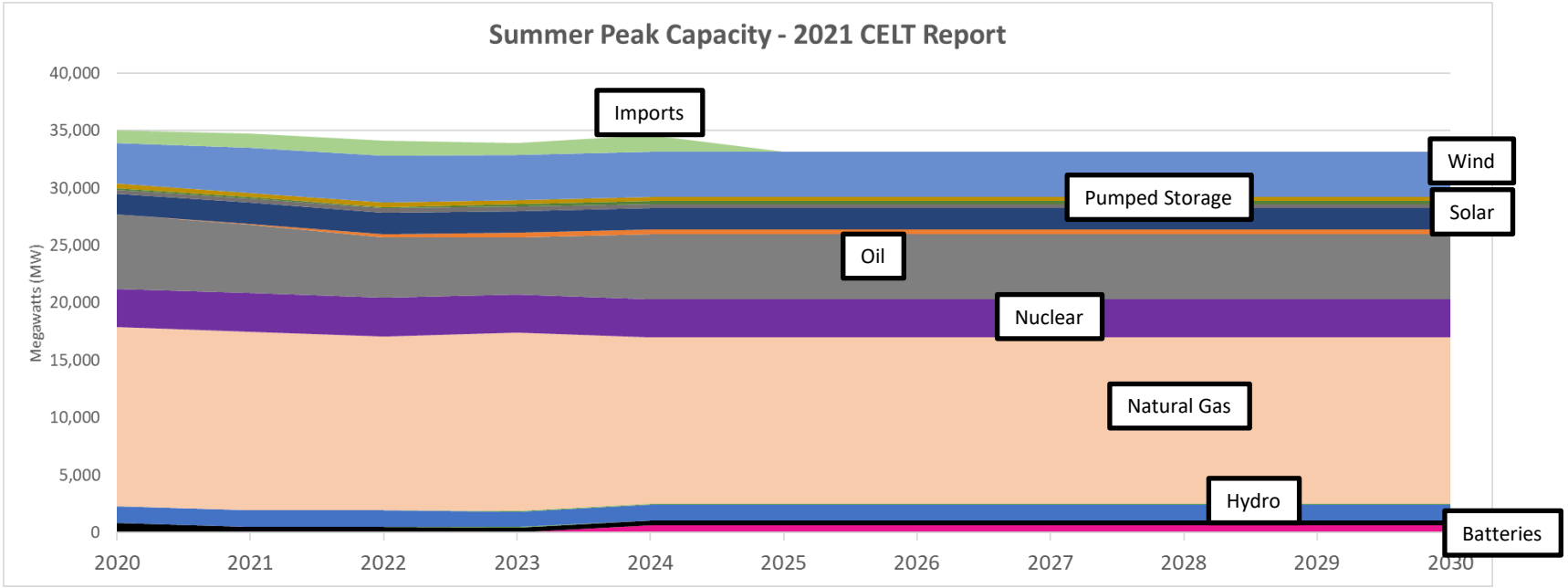
Forecasting and Meeting Demand



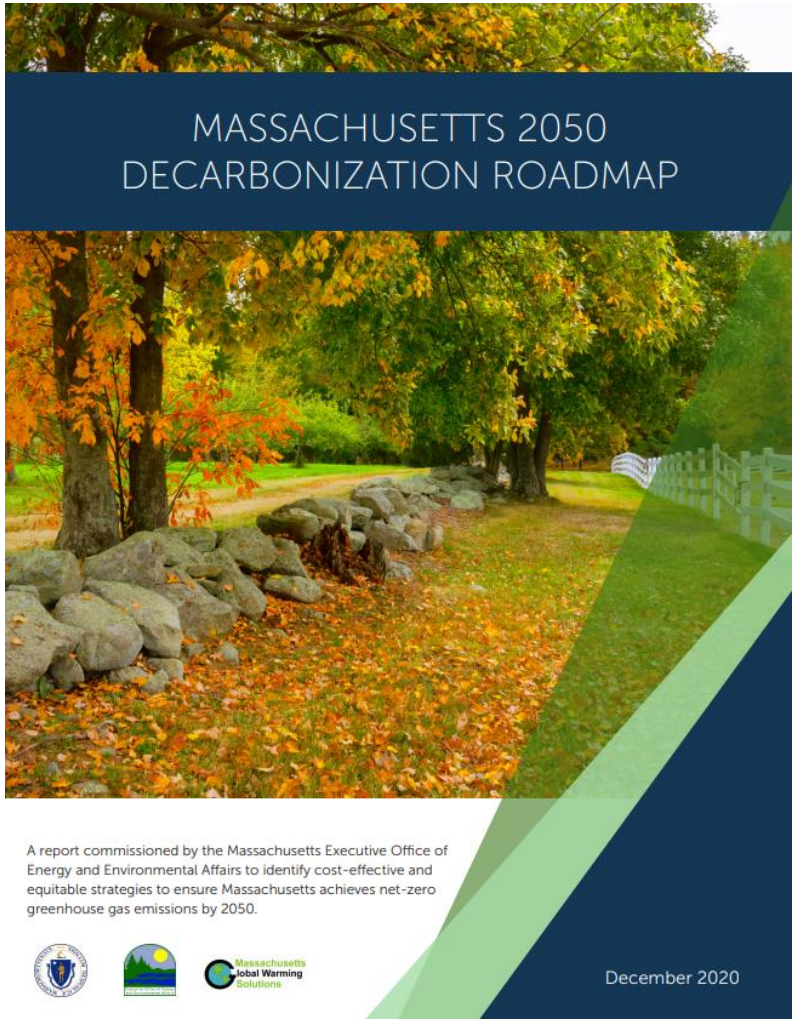
Annual Peak

Capacity Market and Ensuring Supply



- **ISO-NE** responsible for balancing electricity supply and demand on a real-time basis and planning to ensure adequate electricity supply
- As part of its planning procedures, ISO-NE determines the **Installed Capacity Requirement (ICR)**, the amount of electric capacity that is projected to be needed in the region three years out
  - This is generally done for the peak hour of the year (summer) and the capacity necessary to meet this demand
- The **Forward Capacity Market (FCM)** is used to pay resources to be available to meet the projected ICR and operate when needed once the capacity commitment period begins.
- ISO-NE reports this planning in the **Forecast Report of Capacity, Energy, Loads, and Transmission Report (CELT)**.

2050 Decarbonization Roadmap



- Massachusetts has set the ambitious goal of **Net Zero greenhouse gas emissions by 2050**
- The state undertook a **two-year planning process** to determine technical and policy pathways to achieve Net Zero
- The resulting "2050 Decarbonization Roadmap" identified **multiple viable portfolios of reliable energy supply** that can achieve the Net Zero target while maintaining a healthy, equitable, and thriving economy

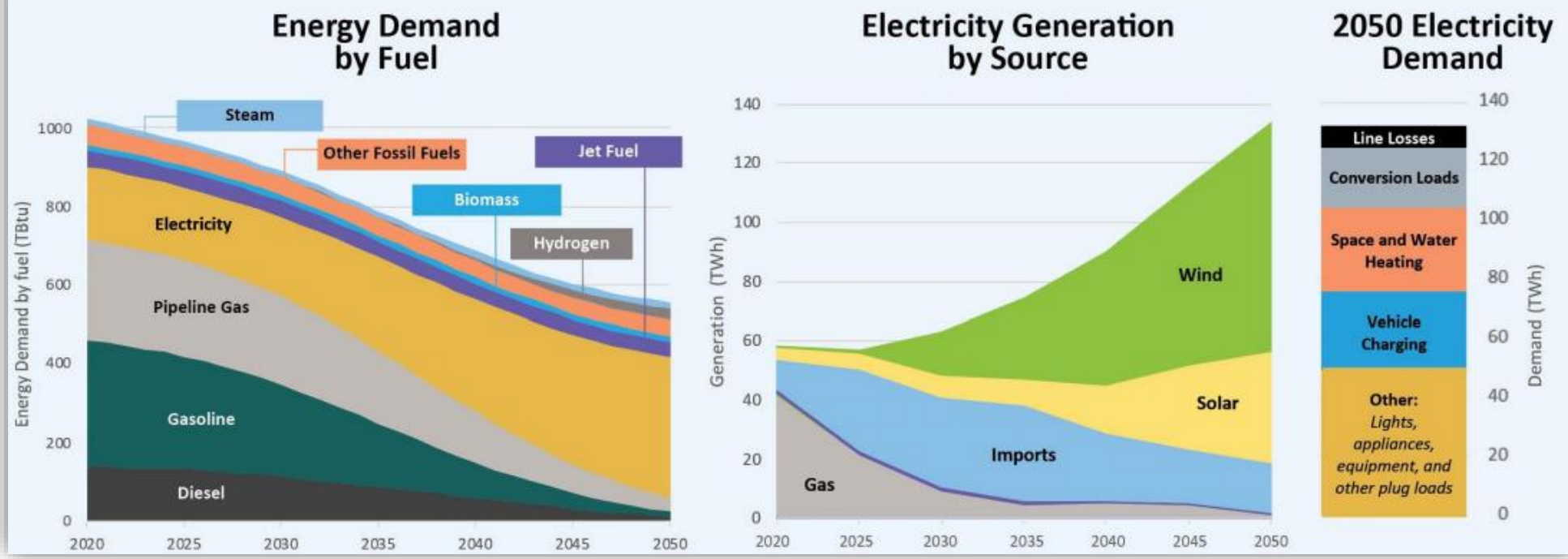
Clean Energy Supply

Energy Demand and Supply

Rapid transformation of the energy system has impacts on energy services and supply.

Over time, most building and transportation end uses are electrified resulting in monthly savings

Solar and wind generation increase dramatically through 2050



2050 Decarbonization Roadmap All-Options Scenario

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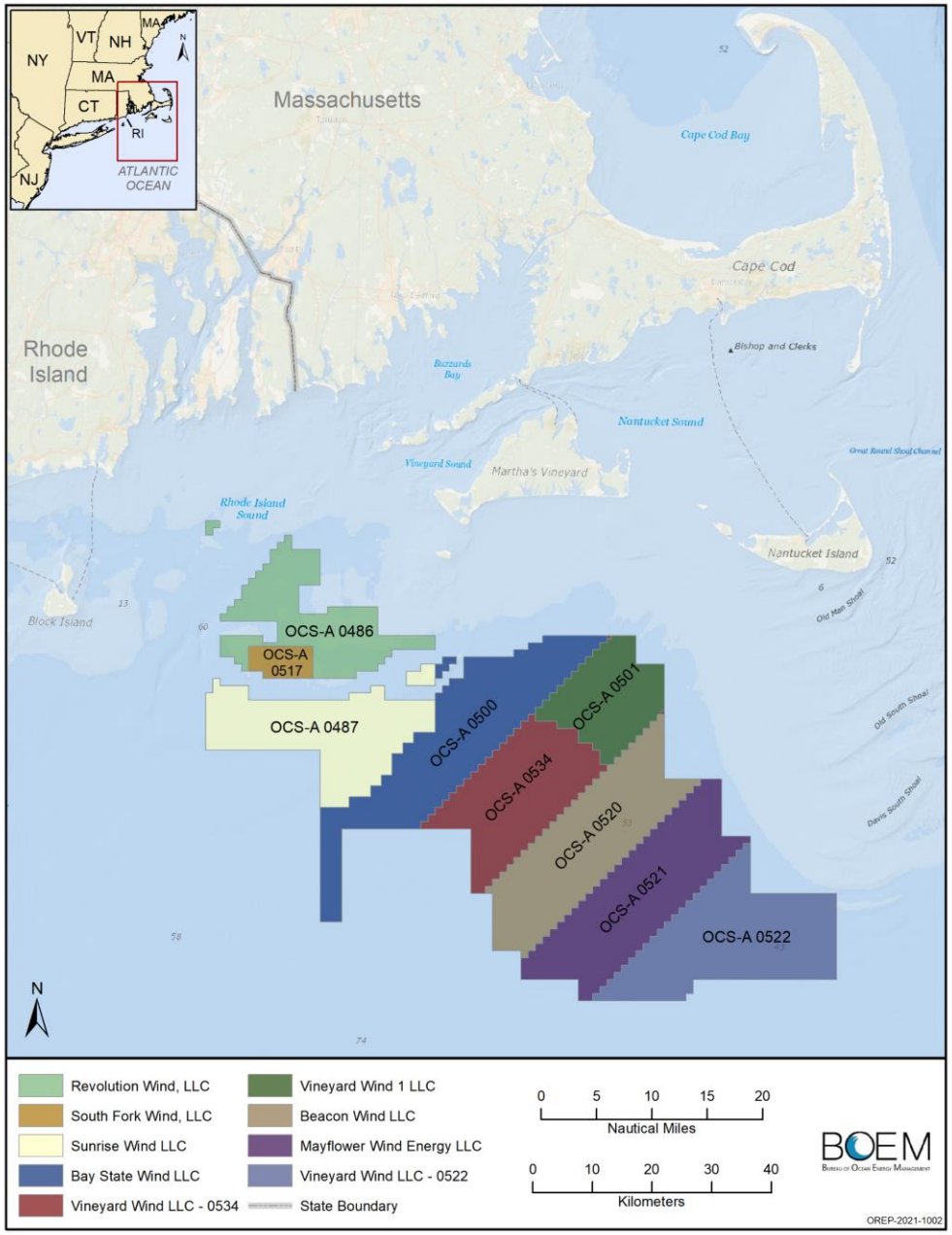
Offshore Wind



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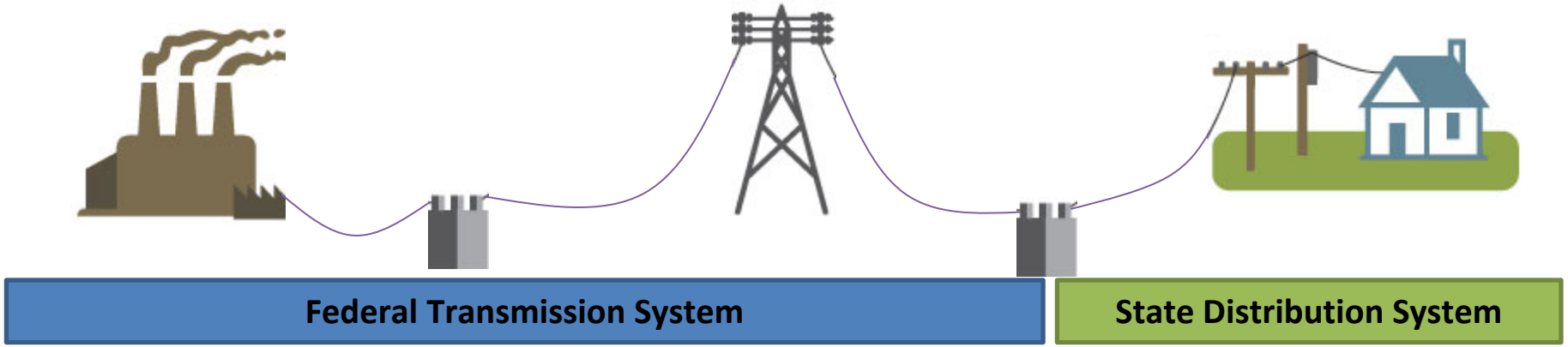
Offshore Wind Procurements

- Total current procurement target is **5600 MW of offshore wind by 2027**
- Massachusetts EDCs have contracted with 1600 MW of offshore wind projects to-date:
  - **Vineyard Wind** (800 MW): planned online date 2024
  - **Mayflower Wind** (800 MW): planned online date 2025
- Current RFP for up to 1600 MW
  - Target date for selection of project(s) is 12/17/21

More information about offshore wind procurements is available at MACleanEnergy.com

Delivery Infrastructure – "The Grid"



Grid Planning: What is plugging in and where?

- Transmission planning is completed by ISO-NE utilizing the same demand forecasting utilized in the supply planning
- Distribution system planning is completed by the Distribution Companies and is submitted to the DPU for approval

Wholesale Resources

- Solar PV
- Offshore Wind
- Large Batteries
- Fossil Fuel Generators

Distributed Resources

- Solar PV
- Electric Vehicles
- Smart Meters
- Heat Pumps

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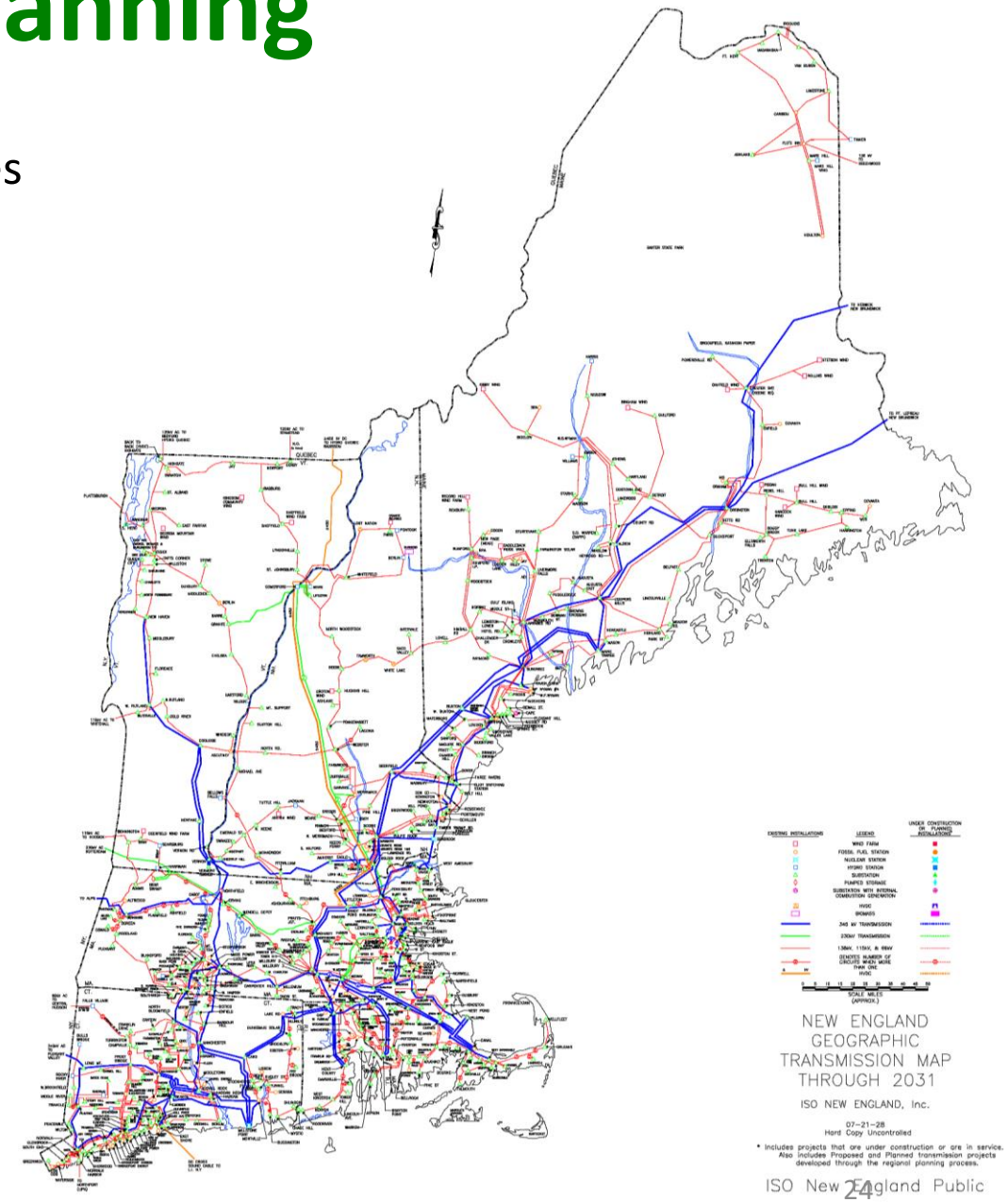
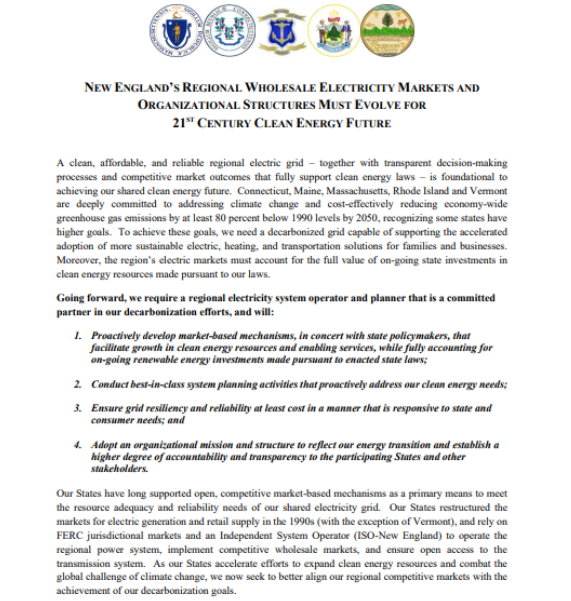
Transmission Planning

- ISO-NE produces a **Regional System Plan (RSP)** that determines needed transmission investment in the region.
  - This utilizes the forecast of demand, including the demand for electrification
- Transmission planning is conducted for **reliability, economic, and public policy** needs. Costs of large transmission upgrades are socialized across ratepayers in the region.
  - Smaller/local upgrades are paid for by customers in that area or generators causing the upgrade
- ISO-NE is currently undertaking a **Future of the Grid** study to determine the changes to the regional transmission system needed out to 2050 given states' ambitious decarbonization goals.



Transmission Updates

- The 2050 Roadmap identifies **significant transmission needs** between the New England states and neighboring regions, including eastern Canada, to achieve decarbonization by 2050, driven by new clean energy resources and electrification.
- Transmission plays a key role to balance variable renewable resources and connect demand centers to areas with high renewable resources.
- The six New England Governors released a **"Vision Statement"** in 2020 regarding desired regional transmission planning reforms to accommodate state policy goals and are working with ISO-NE on analysis & potential reforms



NEW ENGLAND'S REGIONAL WHOLESALE ELECTRICITY MARKETS AND ORGANIZATIONAL STRUCTURES MUST EVOLVE FOR 21ST CENTURY CLEAN ENERGY FUTURE

A clean, affordable, and reliable regional electric grid – together with transparent decision-making processes and competitive market outcomes that fully support clean energy laws – is foundational to achieving our shared clean energy future. Connecticut, Maine, Massachusetts, Rhode Island and Vermont are deeply committed to addressing climate change and cost-effectively reducing economy-wide greenhouse gas emissions by at least 80 percent below 1990 levels by 2050, recognizing some states have higher goals. To achieve these goals, we need a decarbonized grid capable of supporting the accelerated adoption of more sustainable electric, heating, and transportation solutions for families and businesses. Moreover, the region's electric markets must account for the full value of on-going state investments in clean energy resources made pursuant to our laws.

Going forward, we require a regional electricity system operator and planner that is a committed partner in our decarbonization efforts, and will:

1. ***Proactively develop market-based mechanisms, in concert with state policymakers, that facilitate growth in clean energy resources and enabling services, while fully accounting for on-going renewable energy investments made pursuant to enacted state laws;***
2. ***Conduct best-in-class system planning activities that proactively address our clean energy needs;***
3. ***Ensure grid resiliency and reliability at least cost in a manner that is responsive to state and consumer needs; and***
4. ***Adopt an organizational mission and structure to reflect our energy transition and establish a higher degree of accountability and transparency to the participating States and other stakeholders.***

Our States have long supported open, competitive market-based mechanisms as a primary means to meet the resource adequacy and reliability needs of our shared electricity grid. Our States restructured the markets for electric generation and retail supply in the 1990s (with the exception of Vermont), and rely on FERC jurisdictional markets and an Independent System Operator (ISO-New England) to operate the regional power system, implement competitive wholesale markets, and ensure open access to the transmission system. As our States accelerate efforts to expand clean energy resources and combat the global challenge of climate change, we now seek to better align our regional competitive markets with the achievement of our decarbonization goals.

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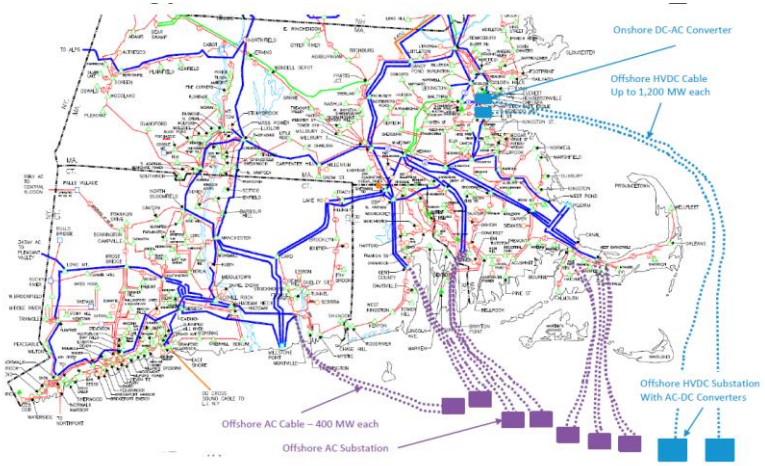


Transmission Planning Reforms

Advance Notice of Proposed Rulemaking: Building for the Future Through Electric Regional Transmission Planning and Cost Allocation and Generator Interconnection

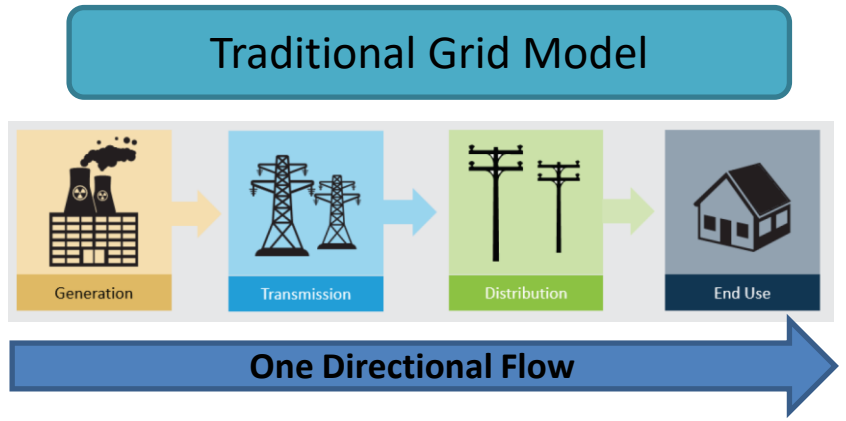
- The Federal Energy Regulatory Commission (FERC) is engaging with stakeholders on potential **reforms to federal transmission policy**, responding to state policy goals for clean energy and the changing resource mix
- DOER is engaged in this docket with FERC and collaborating with regional organizations and other state agencies
- DOER supports an **anticipatory transmission planning model** that allows for consideration of multiple benefits (not just reliability) in order to integrate clean energy resources and minimize costs to ratepayers

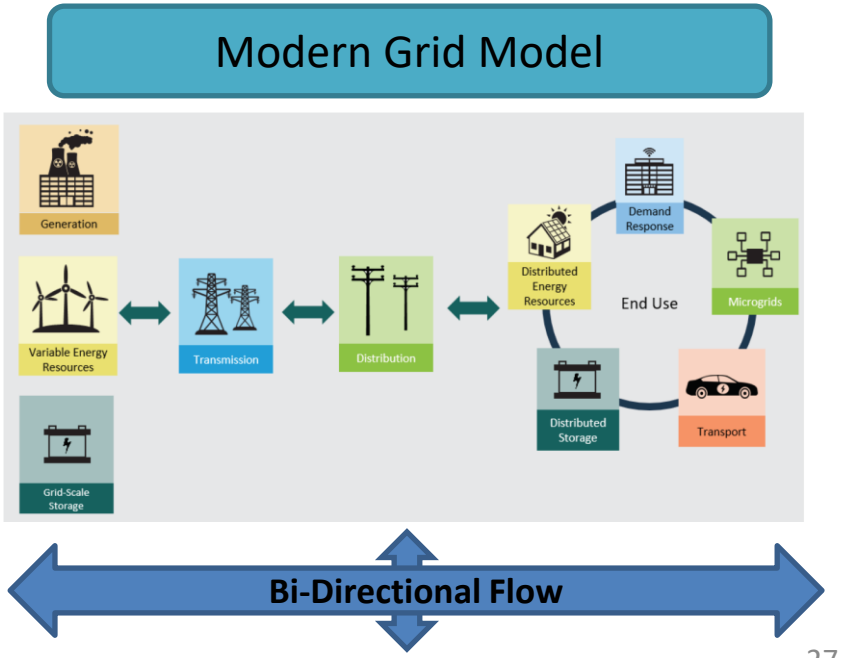
Distribution Updates

Utilities complete regular distribution system planning to ensure the safe and reliable operation of the grid.

- Traditional planning assumes that power flows from generation to the end user in one direction
  - Distribution system expands to deliver power when electricity demand is the greatest, generally summer

- An increase is distributed energy resources (DER) such as solar PV, electric vehicles, distributed storage, and electric heat pumps has challenged planning due to uncertainties
  - Increased DER may mean more upgrades and greater grid visibility
  - DER can be flexible load and thereby reducing the need for upgrades





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Distribution Planning Reforms

The DPU is investigating the possible system planning improvements and cost allocation methods to address solar and DER integration into the distribution system. Utilities and stakeholder are discussing which upgrades should be completed to meet climate goals and if ratepayers should contribute to the upgrade costs.

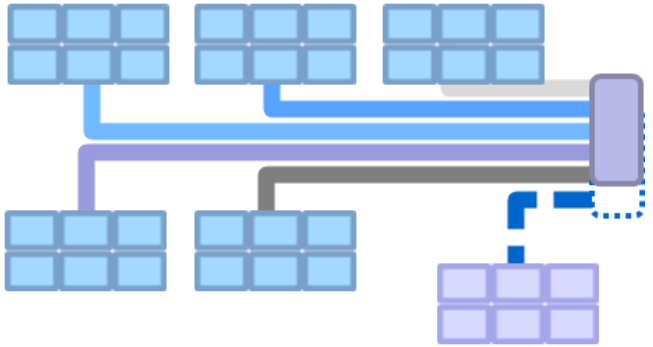
D.P.U. 20-75 – Investigation into DER Planning and Cost Allocation

Planning

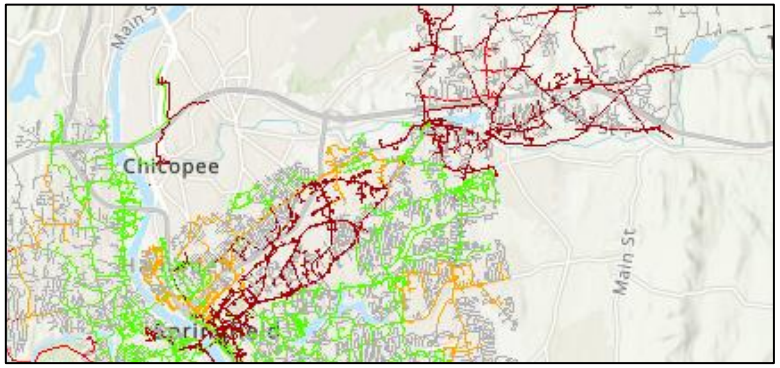
- DPU seeking optimal solutions for the interconnection of DG facilities taking a long-term planning perspective
- Proposed System Planning Processes include long-term forecasts of electrification and consideration of climate goals
- Stakeholders want ability to participate in planning and provide input on assumptions and upgrades.

Cost Allocation

- The utilities anticipate that the costs to interconnect in the next 1-1.5 years are significantly higher than historical costs



Solar seeking to interconnect onto crowded circuits and triggering expensive upgrades



Crowded circuits are mapped with high saturation in western Massachusetts

Policy Deliberative

Grid Modernization

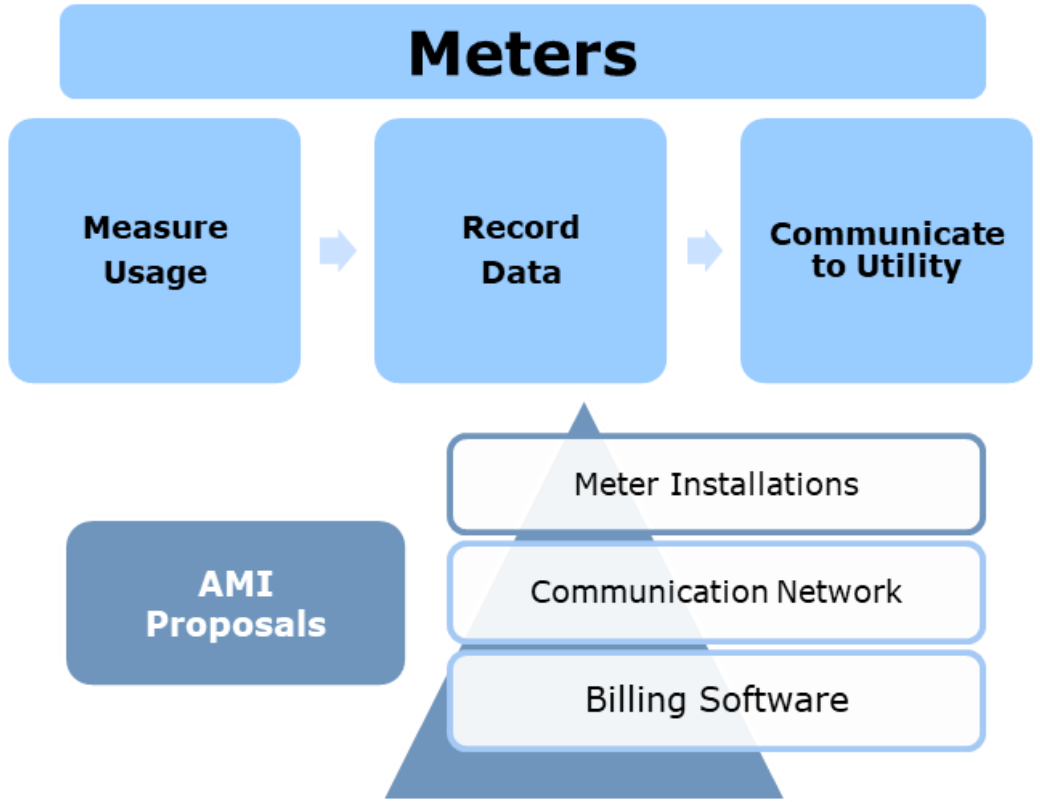
On July 1, 2021, the utilities filed Grid Modernization Plans ("GMPs") entailing 4-year investment proposals.

- Investment proposals include, but aren't limited to, utility-side grid visibility technologies, reliability improvements, and smart meters.

Advanced Metering Infrastructure

- AMI can remotely detect and inform utilities of electricity usage patterns, outages, and health of equipment.
- Investments include smart meters and capable back-end data management system.
- Statewide implementation by utilities will span multiple years
- When coupled in-home displays and smartphone applications, AMI modernizes customers' experience with power usage.

- These GMPs are publicly available and can be found at the DPU under docket numbers DPU 21-80, DPU 21-81, and DPU 21-82.
- Massachusetts is one of the last states to develop and put forth an AMI rollout plan.



Challenges of the Clean Energy Transition

- **Load growth** from electrification of transportation and heating sectors will require on-site, local, and regional system upgrades:
  - On-site infrastructure upgrades: Individual facilities
  - Local distribution grid upgrades: EDCs
  - Regional transmission upgrades: ISO-NE and transmission owners
- **Locations: Strategic deployment** of distributed generation and flexible load can help reduce the need for distribution and transmission system upgrades
- **Cost allocation:** There will be significant costs associated with updating and expanding infrastructure. How will these costs be allocated among generators, utilities, transmission operator, buildings and consumers, and ratepayers?

Questions and Discussion

Leading by Example
Reducing Embodied Carbon of Building Materials
November 9th

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Executive Order 594:

Decarbonizing and Minimizing Environmental Impacts of State Government

To maximize potential GHG emissions reductions, all new construction and substantial renovations, where possible and cost-effective, shall:

- Evaluate and implement strategies to reduce embodied carbon contained in building materials.

EMBODIED & OPERATIONAL ENERGY

source: Architecture 2030

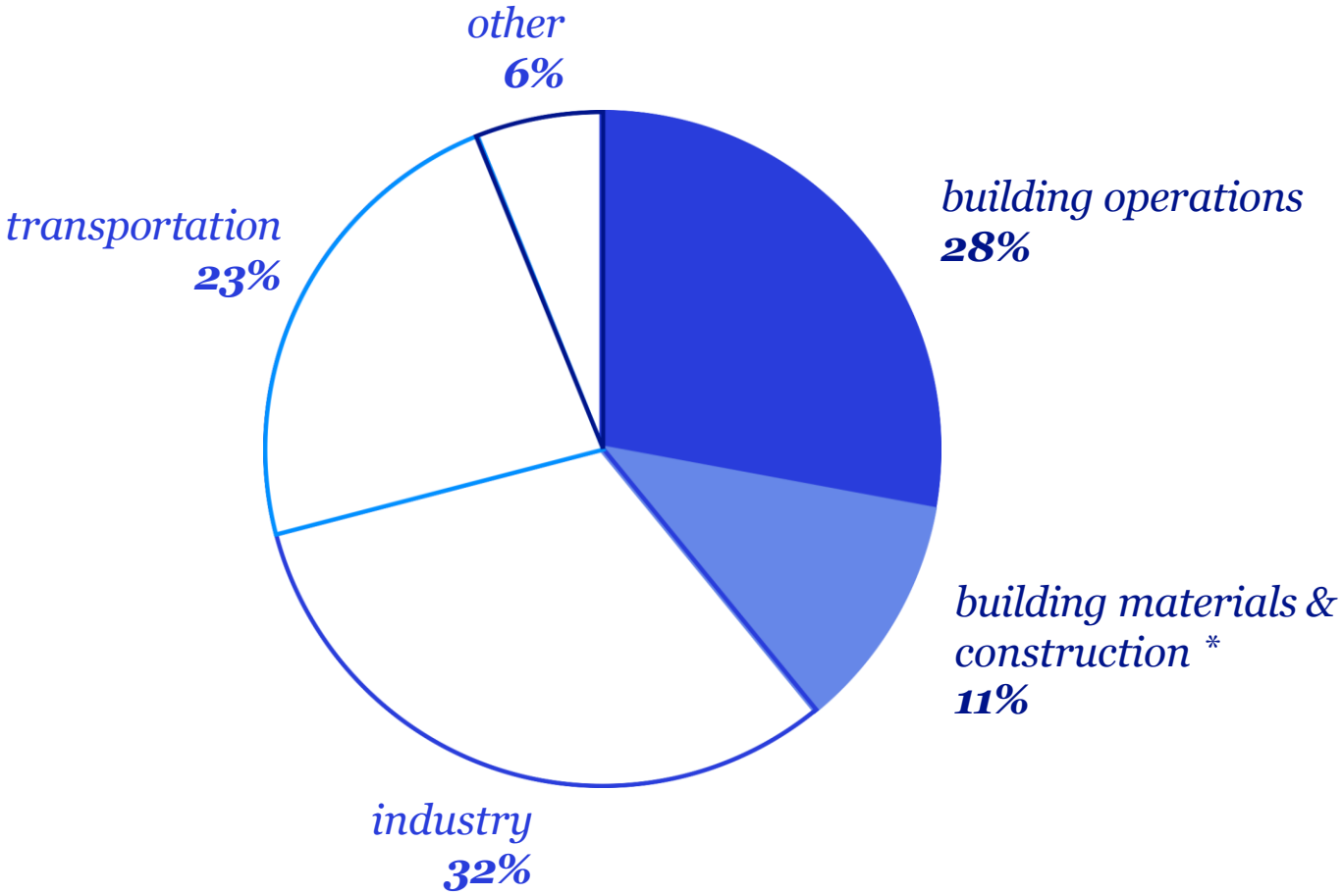
embodied energy

the energy consumed by all of the processes associated with the production of a building - such as mining natural resources, manufacturing, transporting, & construction

operational energy

the energy consumed by running a building - such as heating, cooling, lighting, & power

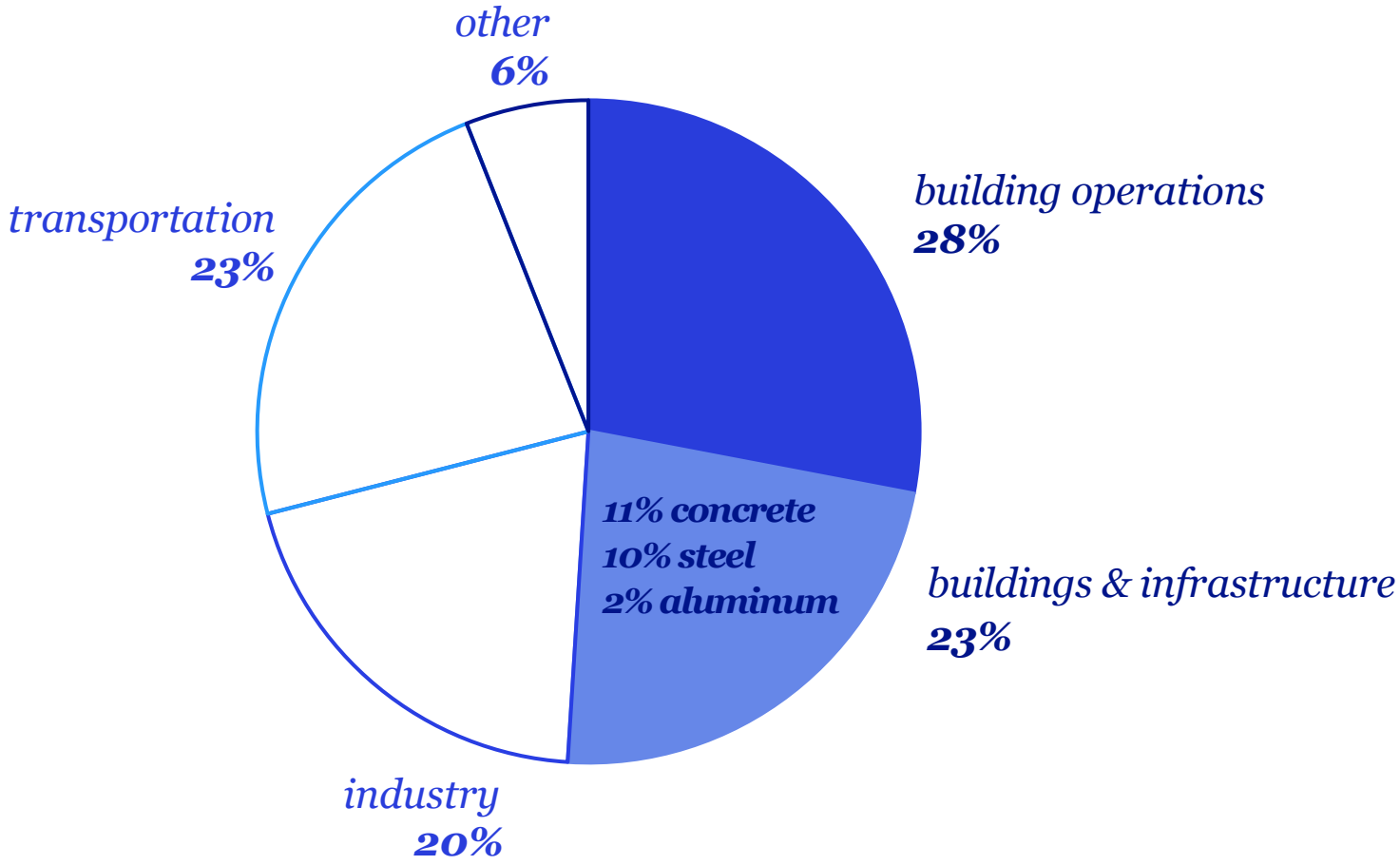
CARBON EMISSONS BY SECTOR



source: Global Alliance for Buildings and Construction. 2018 Global Status Report

**an estimate of the portion of the overall industry sector that applies to the manufacture of materials for buildings construction, such as steel, cement, and glass.*

CARBON EMISSONS BY SECTOR



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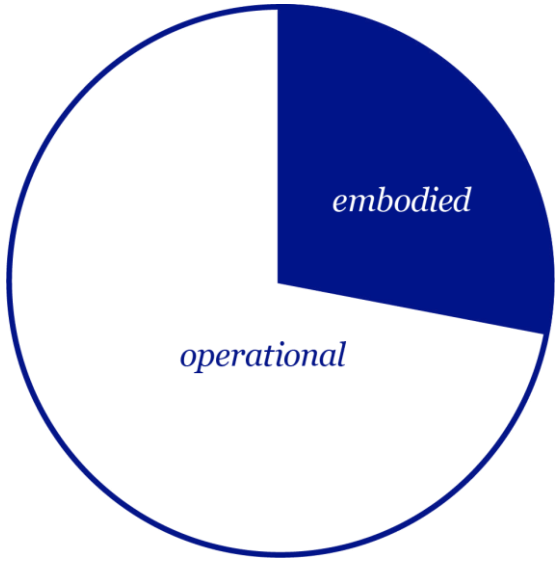
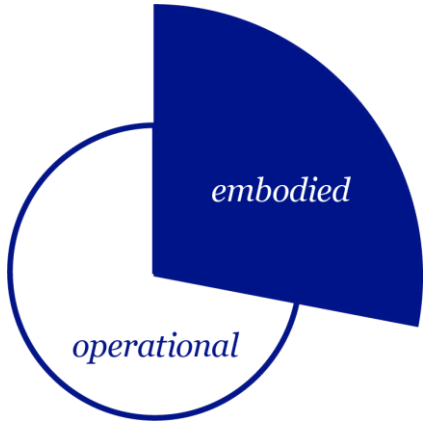
EMBODIED & OPERATIONAL ENERGY



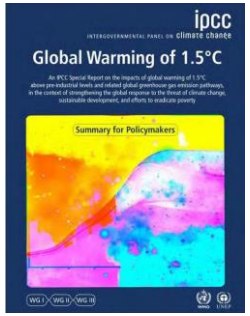
60 year lifespan
code building

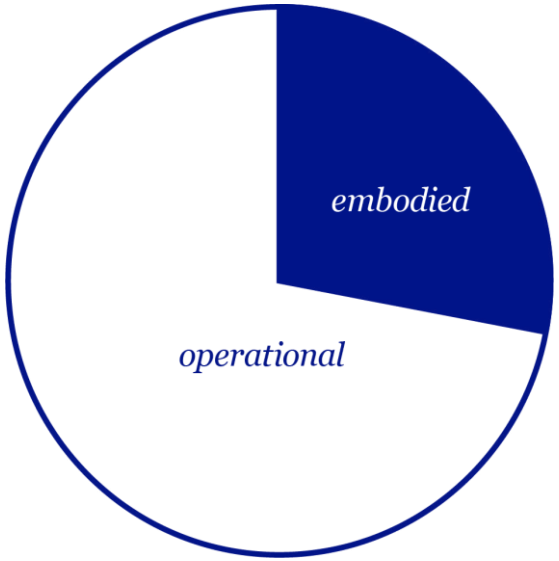


60 year lifespan
high performance building

sources: K. Simonen, Life Cycle Assessment, Routledge, 2014

EMBODIED & OPERATIONAL ENERGY





60 year lifespan
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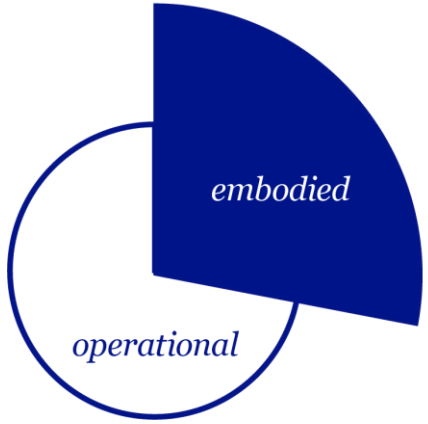

60 year lifespan
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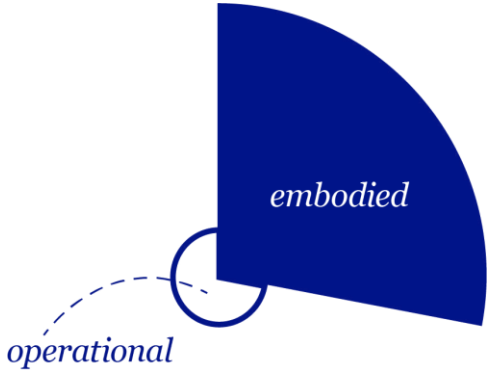
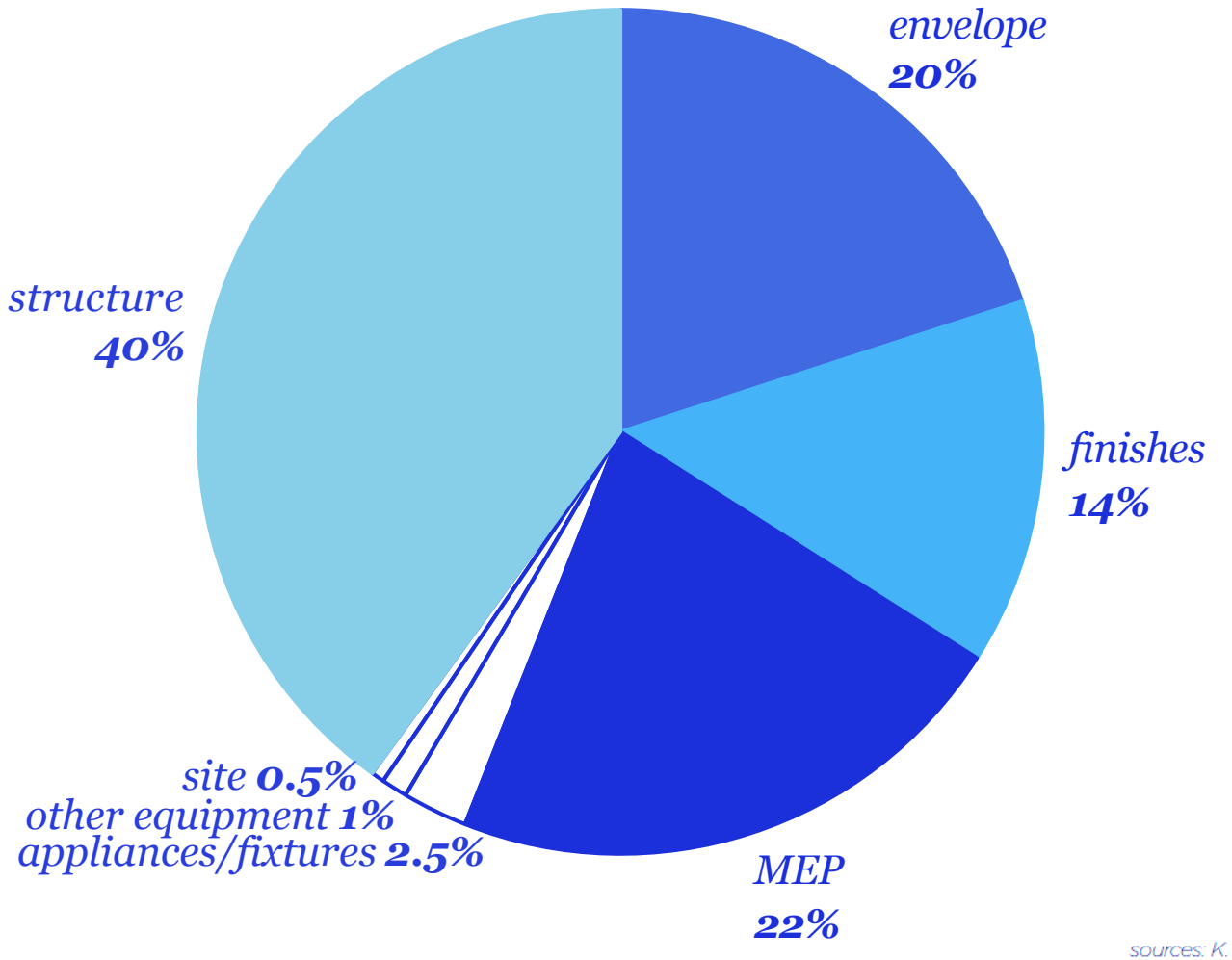


10 year lifespan
high performance building

sources: K. Simonen, Life Cycle Assessment, Routledge, 2014

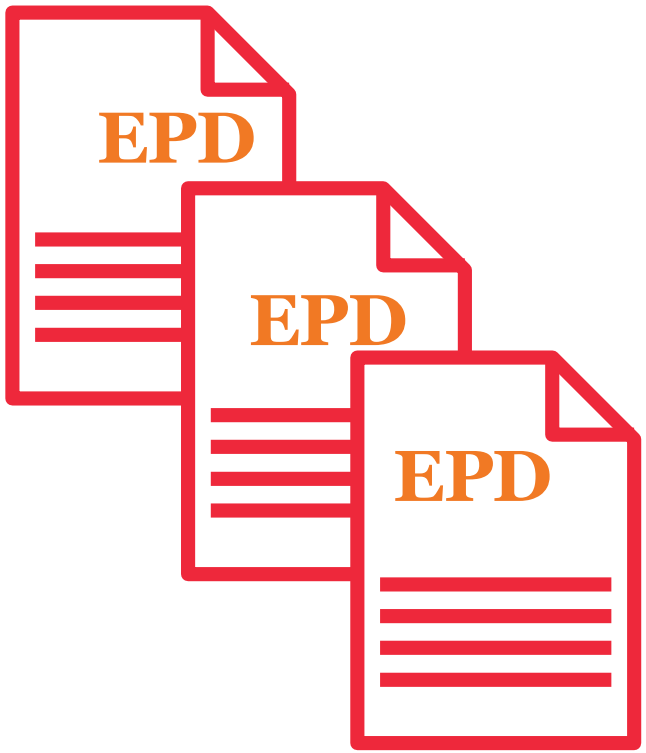
EMBODIED CARBON IN BUILDINGS



sources: K. Simonen, Testing Whole Building LCA: Research and Practice, 2015

WAYS TO MEASURE LIFE CYCLE ANALYSIS

MANUAL



vs.

SIMULATIONS

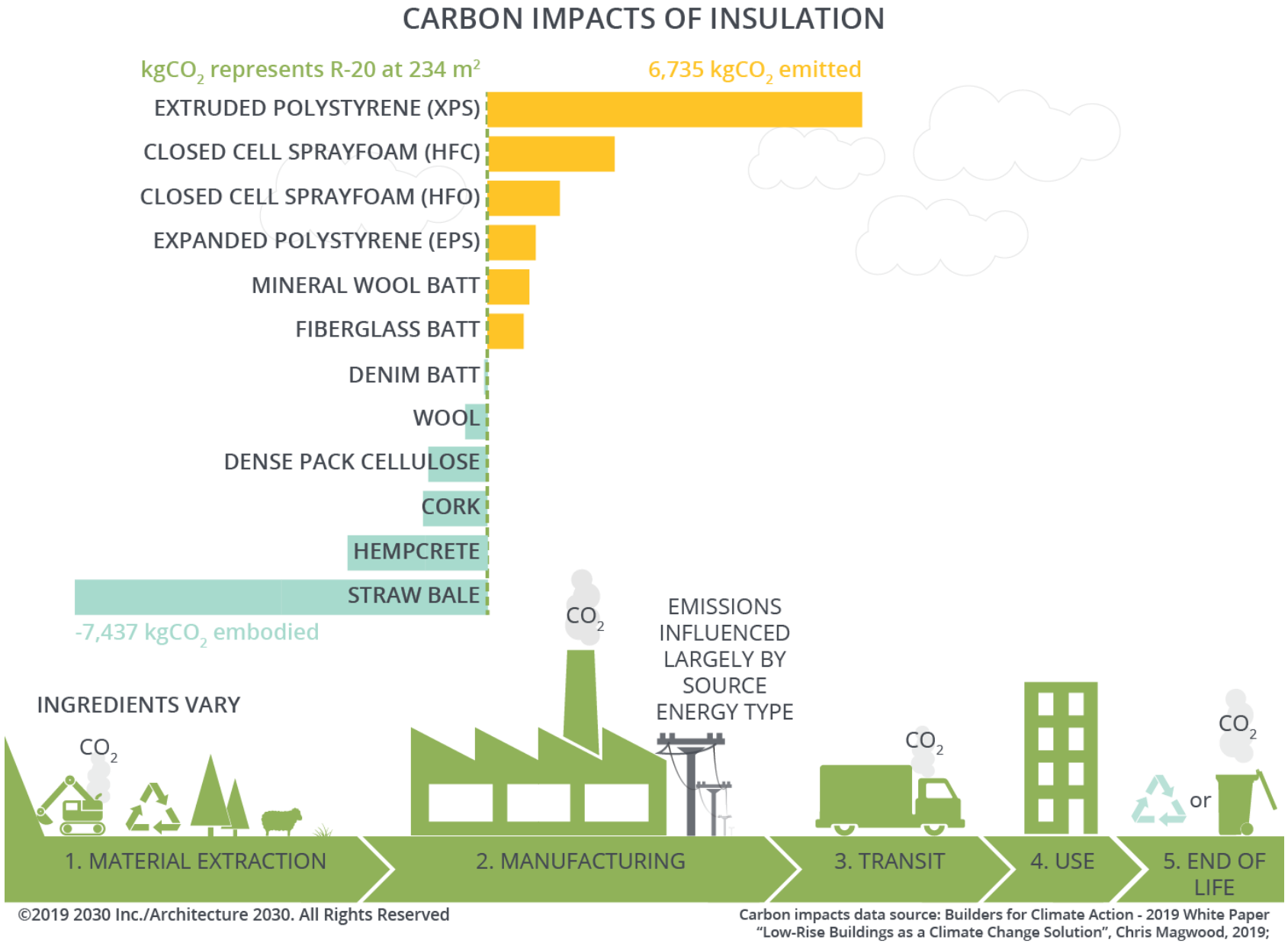
tally®

Athena Impact Estimator for Buildings

One Click LCA

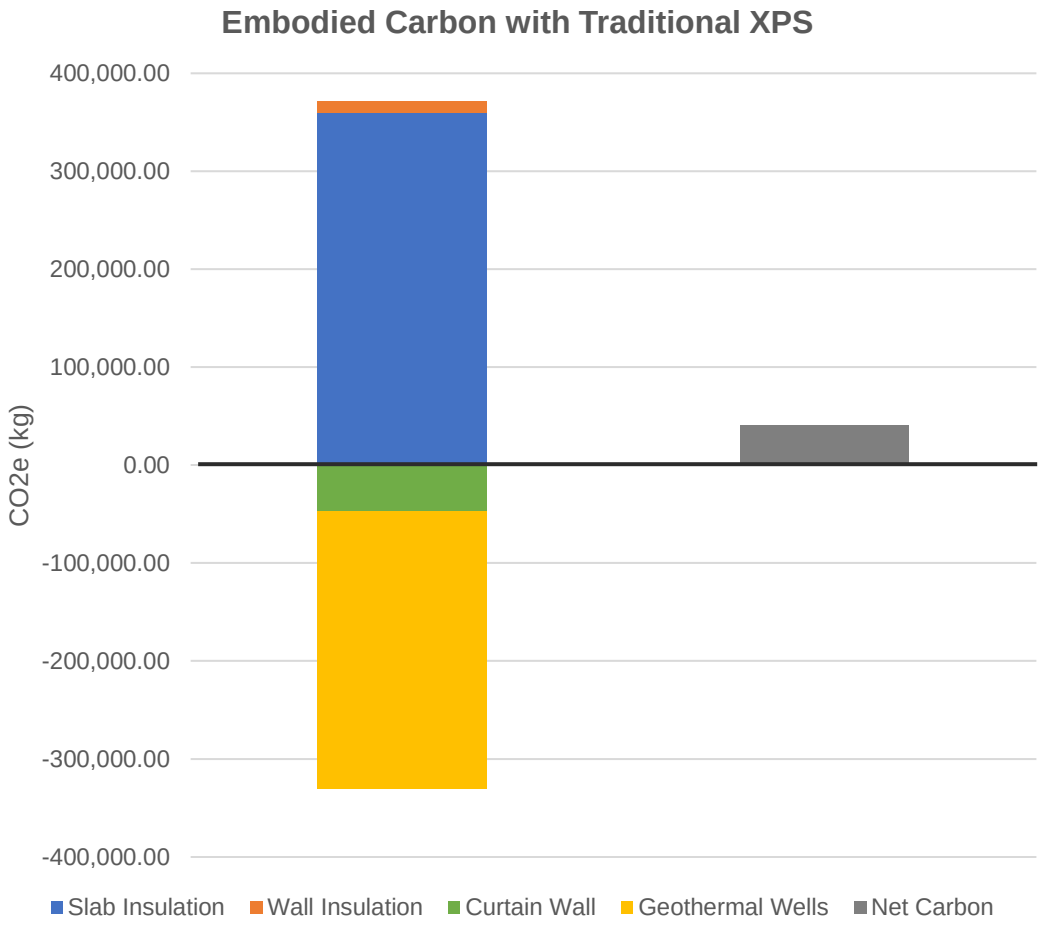
EC3
Embodied Carbon Calculator for Construction

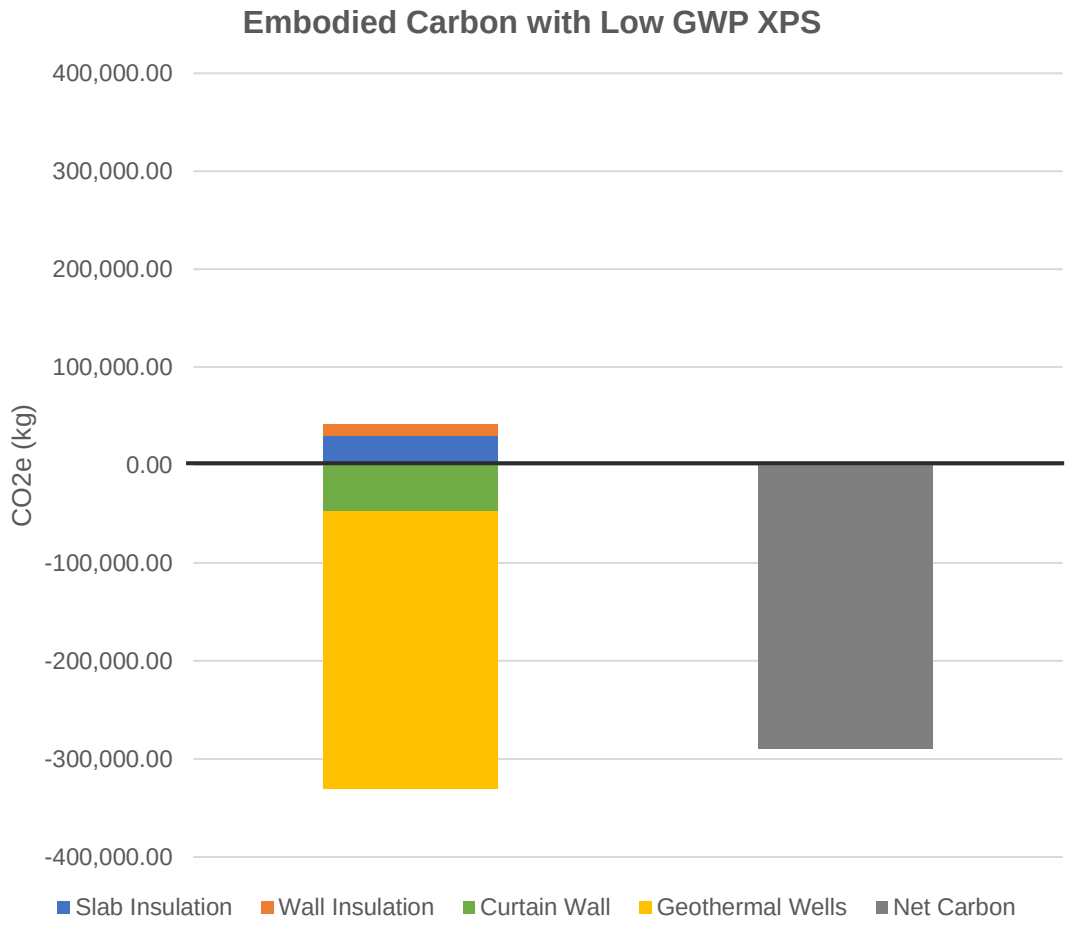
REDUCING EMBODIED CARBON - MATERIAL CHOICES



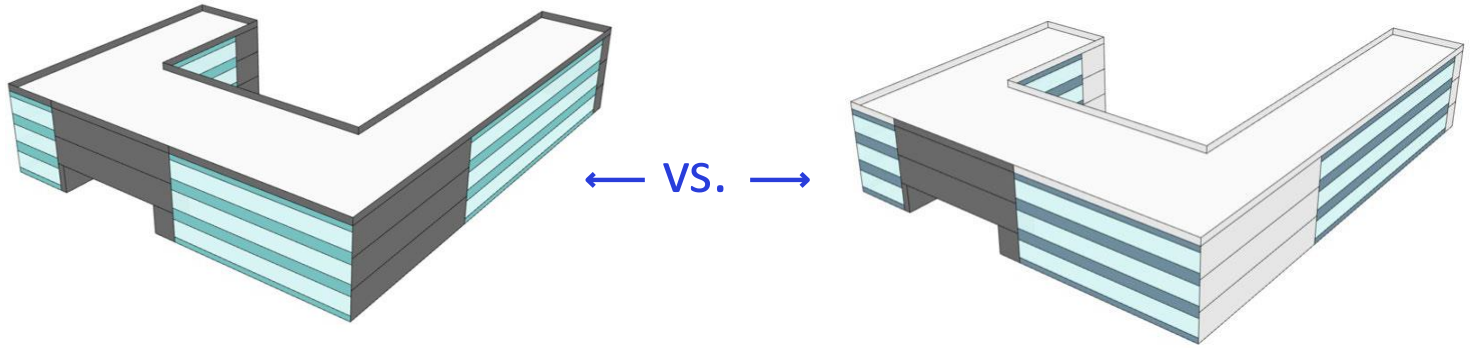
Carbon impacts data source: Builders for Climate Action - 2019 White Paper "Low-Rise Buildings as a Climate Change Solution", Chris Magwood, 2019;

REDUCING EMBODIED CARBON – MATERIAL SELECTION





EMBODIED CARBON - FAÇADE SYSTEM SELECTION



ENVELOPE CALCULATOR

◉ Initial Carbon (only Module A) ○ 60 Year (with Module D) ○ 60 Year (no Module D)

Option 1

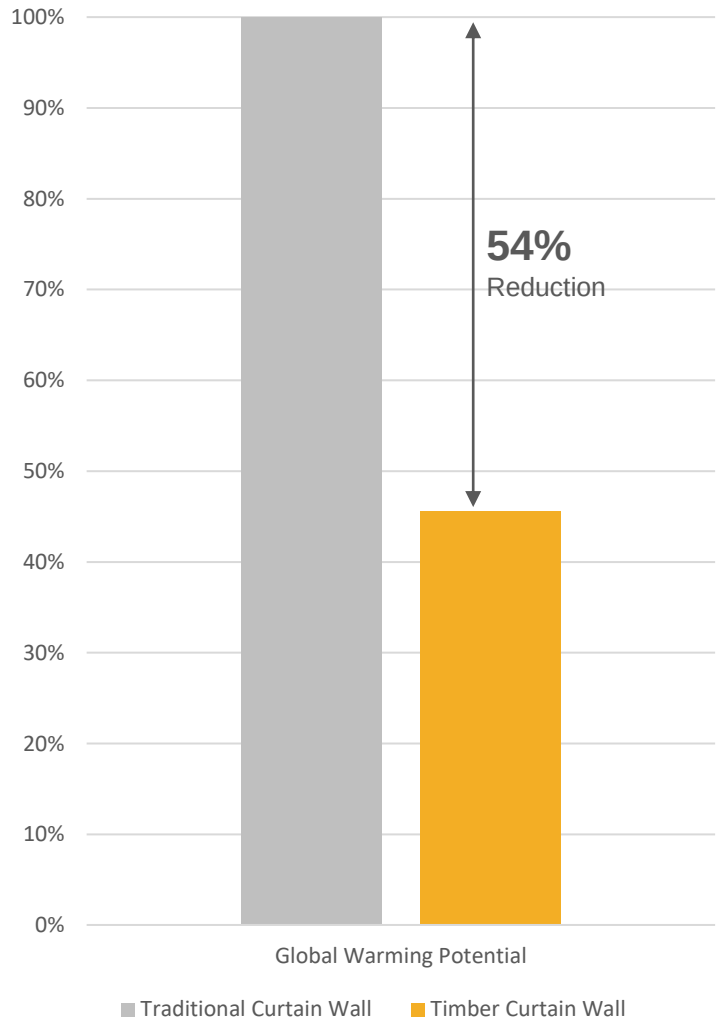
Type	Square Feet	GWP
MV - Granite	15470	286968.50
CW - Spandrel (Alum w/ Backpan)	8665	123822.85
	24,135 ft²	410,791.35 kgCO₂eq

Option 3

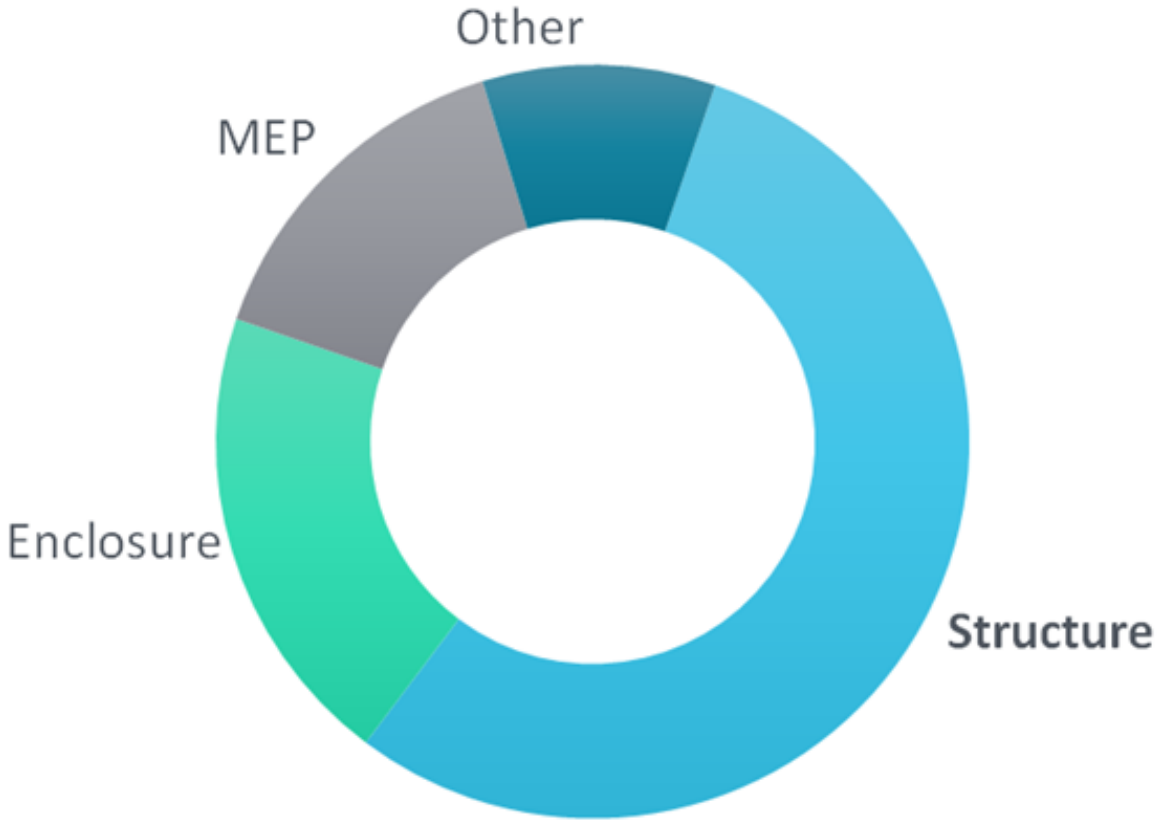
Type	Square Feet	GWP
MV - Granite	2659	49324.45
RS - Granite	12811	82502.84
RS - Formed Zinc Panel	8665	[illegible]
	24,135 ft²	189,449.54 kgCO₂eq

54% reduction in embodied carbon!

EMBODIED CARBON – ALTERNATIVE MATERIALS



Embodied Impacts for Commercial Construction



If 50% of all new embodied carbon is from the **structure**. That's about **1.9 billion metric tons CO2 per year** from the **structure** alone globally.

Embodied Carbon and Structural Materials

Structural Steel Element	Ton CO2e / Ton
Fabricated Hot-Rolled Structural Sections	1.16
Fabricated Steel Plate	1.47
Fabricated Hollow Structural Sections (HSS)	2.39

For everyone 1 ton of structural wide flange steel members produced 1.16 tons of CO_2e is emitted to the atmosphere

Embodied Impacts of Concrete

- Strong correlation between portland cement and embodied carbon
- Portland cement production
  - ➢Production of 1 ton of portland cement releases 0.9-1.0-ton CO_2e
  - ➢7-10% Global CO2 emissions
  - ➢1 CY=600lbs+/- cement
    - Concrete truck (9CY) = 2.7 tons CO_2e

Air content

Water

Cement

CRITICAL RATIO: WALTER/CEMENT (W/CM)

Fine aggregates

Coarse aggregates

Replacing Portland Cement with Supplementary Cementitious Materials (SCM)

- ***Today*** we replace portland cement
  - Direct replacement 1:1 (ish) with SCMs
  - Blended cements
  - SCMs + blended cements
- SCMs are often byproducts of industrial processes
  - Slag cement (steel making)
  - Fly ash (coal fired power plants)
  - Ground glass pozzolons
- Subject to availability / regional chain
- Can improve performance

READY-MIX SUPPLIER SAID TO ME,
"UP TO 6,000PSI ≈ 70% REPLACEMENT
ABOVE 6,000PSI ≈ 50% REPLACEMENT"

Blended Cements and Carbon Mineralization

- Portland-limestone cement
  - Blended cement with a higher limestone content than traditional portland cement
- Silica fume blend with portland cement
- Carbon mineralization
  - Injection of a CO_2 byproduct into ready-mix
  - Injected CO_2 becomes a solid material (carbonate) and increases strength of concrete – less portland cement required

Remove Prescriptive Limits in Concrete Specs

- Invoking maximum w/cm ratio when not applicable
- Invoking a minimum for cementitious content
- Restrictions on quantity of supplementary cementitious materials (SCM)
- Restrictions on characteristics of aggregates, including grading
- Restriction on type and characteristic of SCM

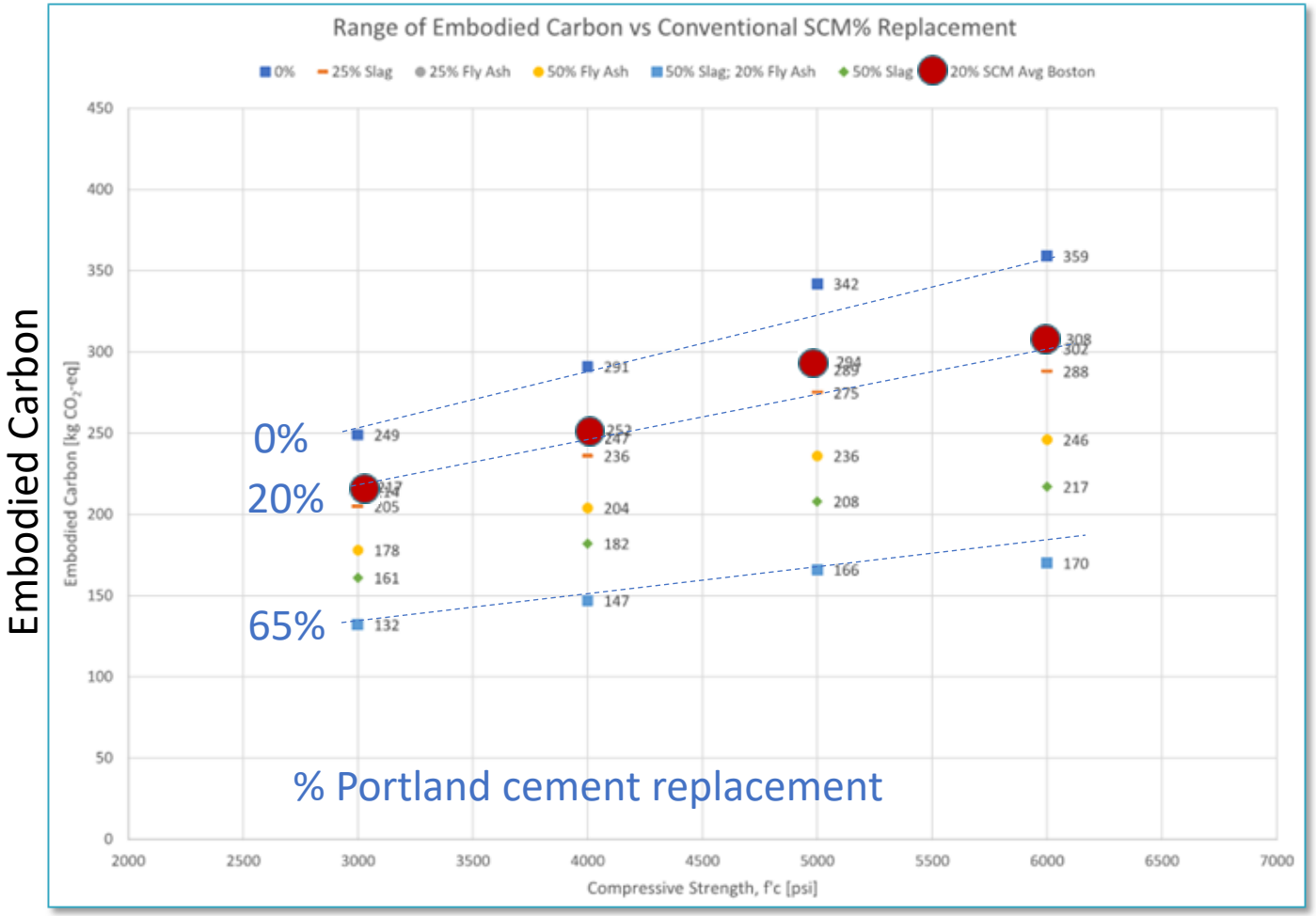
B. Fly Ash: ASTM C618, Type C or F; fly ash shall not exceed 25% of cement content by weight.

C. Granulated Blast Furnace Slag: ASTM C989 Grade 100 or 120; granulated blast furnace slag shall not exceed 33% of cementitious materials content by weight, with the combined proportion of fly ash plus granulated blast furnace slag not exceeding 33% of cementitious materials.

Compressive Strength at 28 days (PSI)	Maximum Allowable Net Water Content		Min. Cementitious Factor	
	Gal./Sack	W/C Ratio	Sacks/Cu.Yd.	Lbs./Cu.Yd.
Normalweight				
10,000	3.95	0.35	9.57	900
9,000	4.06	0.36	9.31	875
8,000	4.17	0.37	9.04	850
7,000	4.40	0.39	8.51	800
6,000	4.73	0.42	7.98	750
5,000	5.07	0.45	7.45	700
4,000	5.74	0.51	6.60	620
3,000	6.54	0.58	5.74	540
Lightweight				
4,000	as required		7.45	700

Reduction in Embodied Carbon Today

- 65% portland replacement
  - ➢≈ 30%-40% reduction
- 20% portland replacement (Eastern US average)
  - ➢≈ 10%-15% reduction
- Portland replacement rates contingent on performance requirements



Where to get more information

Leading by Example

Embodied Carbon Lunch and Learn

January 4th

- Carbon Leadership Forum
- Carbon Leadership Forum New England Hub
- Structural Engineering 2050
- BSA Embodied Carbon 101 Webinar Series

questions?

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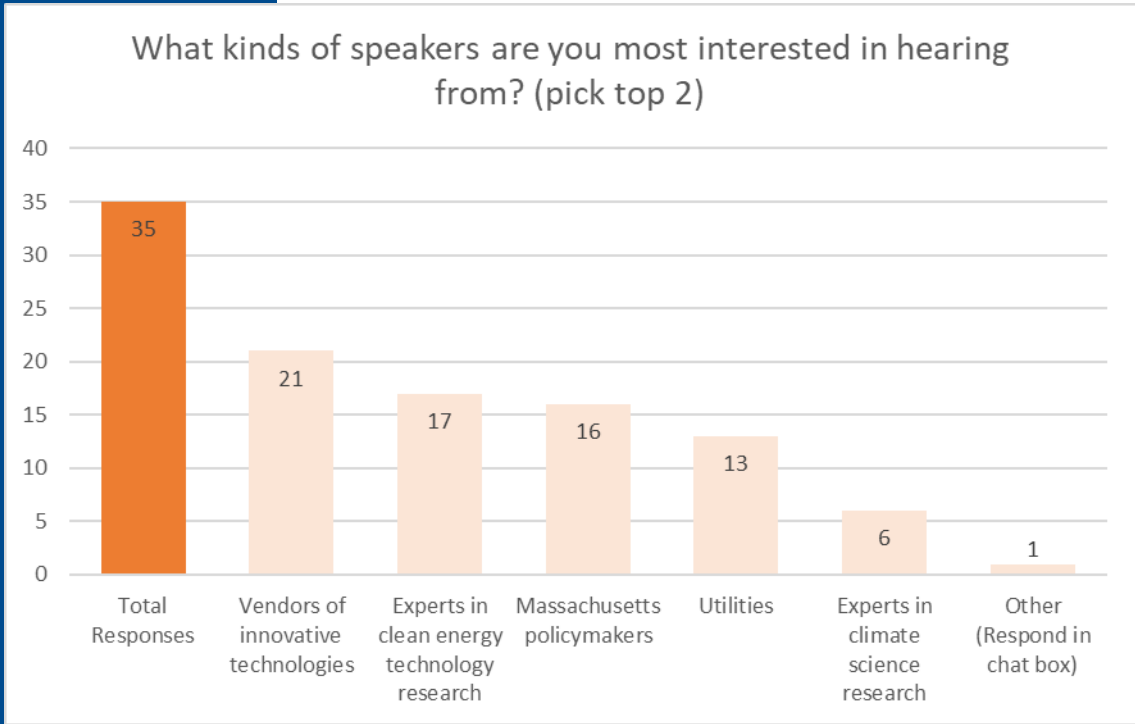
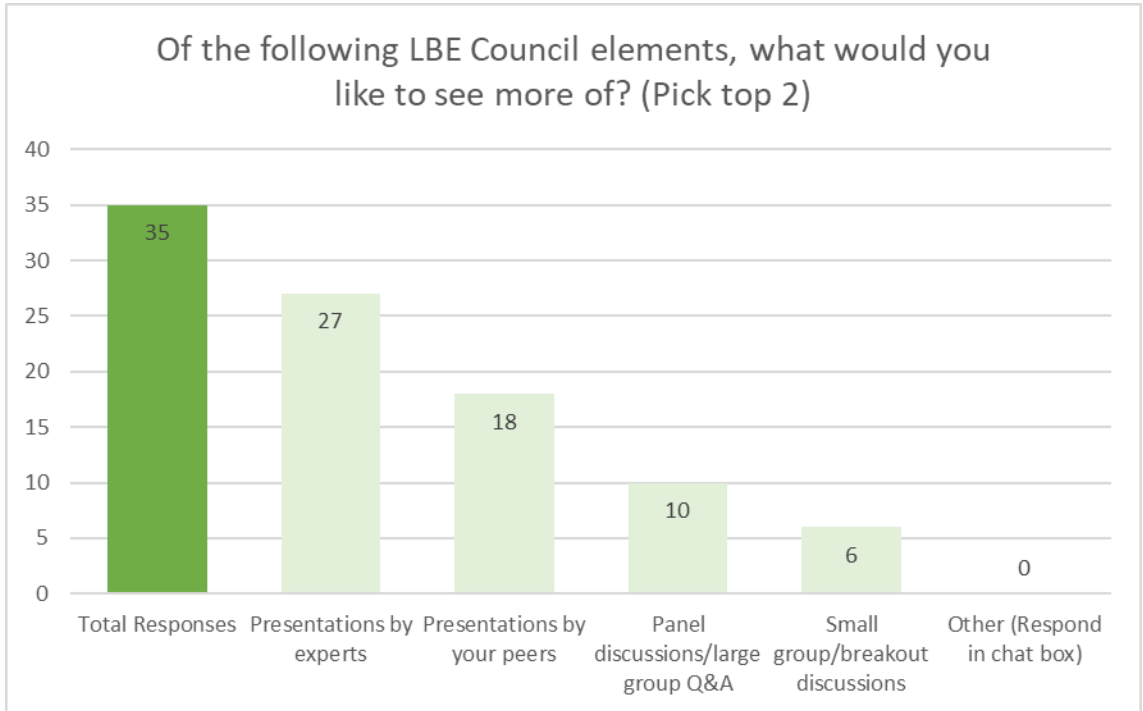
Future of LBE Council Meetings





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LBE Updates

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EO 594 Guidelines

SOON TO BE AVAILABLE ON THE LBE WEBSITE!

NEW CONSTRUCTION AND MAJOR RENOVATIONS

ZEV ACQUISITIONS

BIOFUELS

PROGRAM ADMINISTRATION

PUBLISHING SOON: EV CHARGING

UP NEXT FOR LBE STAKEHOLDER INPUT: EXISTING BUILDINGS AND SUSTAINABILITY PRIORITIES

Integrating Partner Feedback on LBE Resources

July LBE Council Meeting attendees were asked to answer two broad questions about LBE tools, guidance, technical assistance, and other support:

1) What, within each work area, has been most useful to your entity?
2) What additional support should LBE be providing?

Suggestions included…

- Streamlining data collection and reporting requirements
- Providing partner contact information to facilitate greater peer-to-peer interaction
- Offering in-person demonstrations for electric vehicles, battery-powered landscape equipment, and other technologies
- Centralizing information on funding opportunities and decarbonization strategies

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Integrating Partner Feedback on LBE Resources

Input on LBE tools, guidance, technical assistance, and other support

↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓

In Development

- Contact information for sustainability projects and state entities
- Centralized clean energy funding sources and deadlines
- Research on decarbonization strategies for unique facility types
- Various EO 594 guidelines and supplemental guidance

Ongoing

- Increased collaboration with MassCEC and focus on innovative technologies – including today's meeting!

Now Available!

- Updated FY21 tracking form that highlights key metrics
- Tentative LBE Council Meeting dates posted through July 2022; registration open for all via zoom

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Recharge MA - Mass*EVolves* Recognition Ceremony

RECHARGE|MA

Recharge Massachusetts 2021 Recognition Ceremony

2021

WEDNESDAY, NOVEMBER 17 | 11AM - 12PM

LIVE ONLINE EVENT

RSVP AT: RECHARGE-MASSACHUSETTS.ORG

- **Listen** to updates from state leaders on the work Massachusetts is doing to meet its clean air goals
- **Learn** from other program participants about their steps to boost EV adoption in Massachusetts
- **Hear** updates from state leaders on work Massachusetts is doing to ensure no one is left behind as the EV revolution unfolds

- Bridgewater State
- DCR
- Holyoke Community College
- MassDEP
- MassDOT
- MassPort
- MWRA
- UMass Amherst
- UMass Boston
- UMass Chan Medical School
- UMass Dartmouth
- UMass Lowell
- Worcester State

Register online

FY21 LBE Tracking Form Reminder

- **Due date: December 20th**

- **Tracking form categories:**
  - Contact info
  - EO 594
  - Square footage
  - Electricity consumption
  - Building fuel consumption
  - Vehicle & other fuel consumption
  - Installed clean power
  - Vehicle fleet
  - EV charging stations
  - Energy efficiency projects
  - Sustainability

☆ New/modified elements for FY21

- EO 594 short questionnaire
- Reformatted and expanded fleet section
- Combined sustainability metrics

Leading by Example Program FY21 Energy Tracking and Reporting Form

Measuring and tracking energy data for Massachusetts state agencies and public higher education is a critical component of the state's Leading by Example Program (LBE).
In order to track progress in meeting greenhouse gas, energy reduction targets, and renewable energy goals, collecting & analyzing agency and campus energy data is imperative.

With the help of your agency, Leading by Example tracks energy consumption and cost data for a variety of fuel sources in the Commonwealth, as well as information on other sustainability efforts. Please use this form to submit your agency/campus FY21 energy data to LBE. The FY21 Tracking Form divides the fuels tracked into separate tabs for easier navigation. The summary boxes below describe information requested in each tab, as well as highlights any new additions to the FY21 form. Reporting should include all owned facilities within your agency/campus and be consistent from year to year.

Thank you for working with us to track your energy and sustainability data for your facilities - we appreciate your time and effort!

The deadline for submitting the FY21 Tracking Form is December 20, 2021.
Please submit via email to Chelsea Kehne (chelsea.kehne@mass.gov).
Please contact Chelsea via email or by phone at 410-402-0992 if you need assistance in gathering your energy data.

NEW & UPDATED ELEMENTS OF FY21 TRACKING FORM	
General	Where appropriate, we have automated additional tabs to pre-populate with previously submitted data. As with last year's form, ALL pre-populated fields rely on the selection of your agency/campus from the "Contact Information" tab dropdown. If not selected, no data will pre-populate. Additionally, you will no longer be able to select your agency/campus on individual tabs. We have also condensed or removed some sheets to try simplify the reporting process.
EO 594	This tab includes a high-level overview of Executive Order 594, which was signed in April and went into effect July 1, 2021. Please review and repond to all questions regarding Executive Order 594, as they will help the LBE team track current planning strategies and identify areas where we can better support partner deacrbonization efforts.
Vehicle Fleet	This sheet has been reformatted to include three sections that cover overall fleet purchasing, a fleet overview of vehicles 14,000 lbs. gross vehicle weight rating (GVWR) or less, and a detailed fleet inventory of all vehicle classes and weights. As vehicles are a key piece of EO 594 directives and targets, we ask partners to review the instructions and provide as much information as possible to help us better track opportunities and progress for the state fleet.
Sustainability	This sheet has been reconfigured to capture various sustainability information that was previously housed in multiple sheets. The new Sustainability sheet now combines questions on waste management, water consumption and conservation, sustainable landscaping, and additional sustainability efforts at your facilities.

ENE52: No.2 Heating Fuel and APS Eligible Liquid Biofuel

*All agencies still utilizing heating oil as of July 1, 2021, shall ensure that **any heating oil product purchased shall consist of at least 10% biofuels** (i.e., B10). Said biofuels must meet the minimum fuel content specifications outlined in LBE guidance. Agencies shall work with LBE to identify opportunities to increase biofuel consumption to as high a level as is practicable. (EO594, Section 4D)*

APS-eligible B10 is available for all regions, in any quantity, upon request

B10 is a drop-in replacement for No.2 fuel oil - vendors for your zone can help ensure your equipment is properly maintained and ready for biofuel

B10 is extremely cost-competitive in Zones 5-8 (*Central/Western MA*), with varying levels of cost differential in Zones 1-4 (*Greater Boston, North Shore, South Shore, Cape*)

Higher biofuel blends (up to B100) may be procured from all vendors across the state, if appropriate for the facility

For further information, see:

- ENE52 Contract User Guide
- EO594 Guideline on biofuels
- One-pager on ENE52 Liquid Biofuels (*coming soon!*)

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Clean Energy News

Winter Heating Bills Set to Jump as Inflation Hits Home

- The Energy Information Administration predicts household heating bills could increase as much as 54% compared to last winter, depending on the fuel:
  - Natural gas: 30% increase
  - Electricity: 6% increase
  - Oil: 43% increase

- Final forecast for MA soon to be released, which predicts heating fuel expenditures for homes will be 15-50% higher than last year

Source: Associated Press

Methane Emissions in Eastern MA Higher than Estimated

- Research found that leaks from natural gas infrastructure in eastern MA are six times higher than previously estimated
- Leaks also arising from end-users, such as appliances, furnaces, and buildings

Source: WBUR

Massachusetts Clean Heat Commission

Commission, comprised of members from affordable housing, energy efficiency building design, heating fuel distribution, real estate, and more, will have until Nov 30, 2022, to come up with policy recommendations to reduce emissions from buildings

Source: Boston Globe, State House News

Public Higher Ed Institutions Expand CONNECT4WIND

- Six state schools are working to incorporate issues around MA offshore wind into curriculum and workforce development
- MOU includes Bristol Community College, Mass Maritime Academy, UMass Dartmouth, Bridgewater State University, Cape Cod Community College, and Massasoit Community College

“What do you think, is this a pretty good place for wind, yes or no?" Gov. Charlie Baker said as he pretended to be blown away by the breeze during a Wednesday visit to an offshore wind workforce training site at the New Bedford Marine Commerce Terminal.

Source: Statehouse News, UMass Dartmouth

CA Phases Out Sale of Gas Mowers, Leaf Blowers

New law will phase out sale of small off-road engines **by 2024, or as soon as feasible** – whichever comes later

Small Engines have a Big Impact!

An hour's use of a gas-powered leaf blower produces the same amount of smog-forming pollutants as driving from Los Angeles to Denver (or for us on the east coast – Boston to Atlanta) – about 1100 miles, or ~17 hours of driving

OSD OPERATIONAL SERVICES DIVISION

Contract User Guide for FAC104

FAC104: Landscaping Products, Parks and Recreation Equipment and Related Products, Supplies and Service

UPDATED: October 13, 2021

Contract #:	FAC104
MMARS MA #:	FAC104*
Initial Contract Term:	July 1, 2017 – June 30, 2019
Maximum End Date:	Two (2) year extension(s) to 2023
Current Contract Term:	July 1, 2021 – June 30, 2023
Contract Manager:	Brendan McCue, (617) 720-3146, Brendan.McCue@mass.gov
This Contract Contains:	Environmentally Preferable Products, Small Business Purchasing Program, MBE/MWBE/WBE, Service Disabled, Veteran-Owned Business
UNSPSC Codes:	See Appendix A

*The asterisk is required when referencing the contract in the Massachusetts Management Accounting Reporting System (MMARS).

Table of Contents:

(NOTE: To access hyperlinks below, scroll over desired section and CTL + Click)

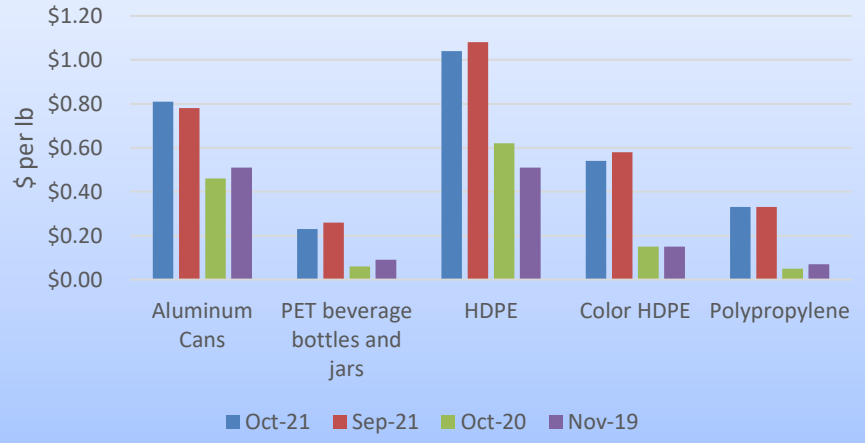
- Contract Summary
- Contract Categories & UNSPSC Codes
- Benefits and Cost Savings
- Find Bid/Contract Documents
- Who Can Use This Contract
- Subcontractors
- Construction Requirements
- Pricing, Quotes and Purchase Options
- Instructions for MMARS Users
- Environmentally Preferable Products
- Emergency Services
- Additional Information/FAQ's
- Performance and Payment Time Frames Which Exceed Contract Duration
- Strategic Sourcing Team Members
- VENDOR LIST AND INFORMATION
- Appendix A: Category Descriptions & UNSPSC Codes

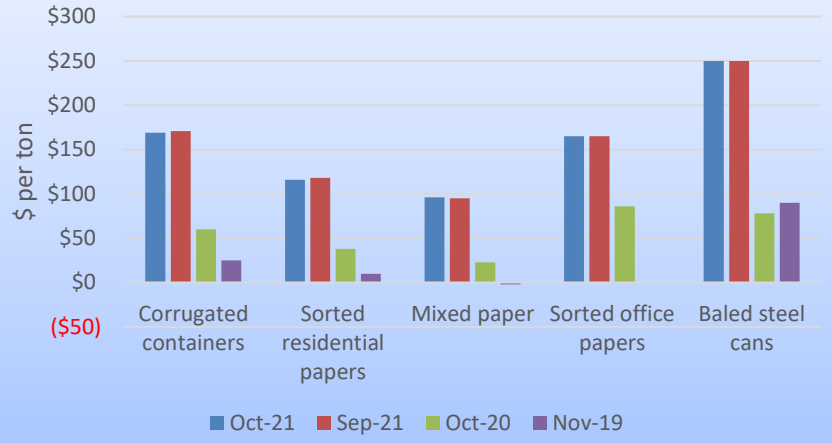
BPLE is available on statewide contract FAC104

Source: Sacramento Bee

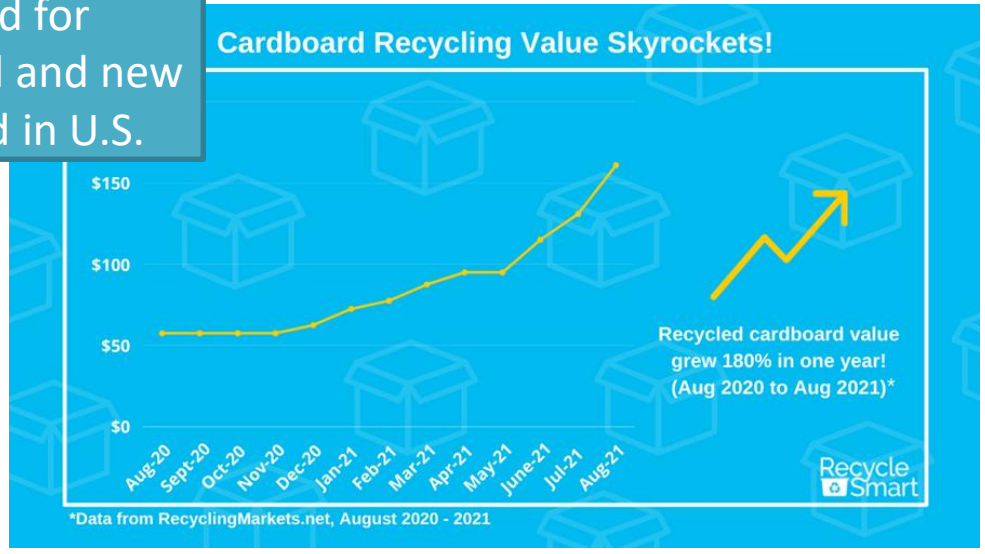
The State of Recycling Markets

The value of common recyclables has increased above pre-pandemic levels





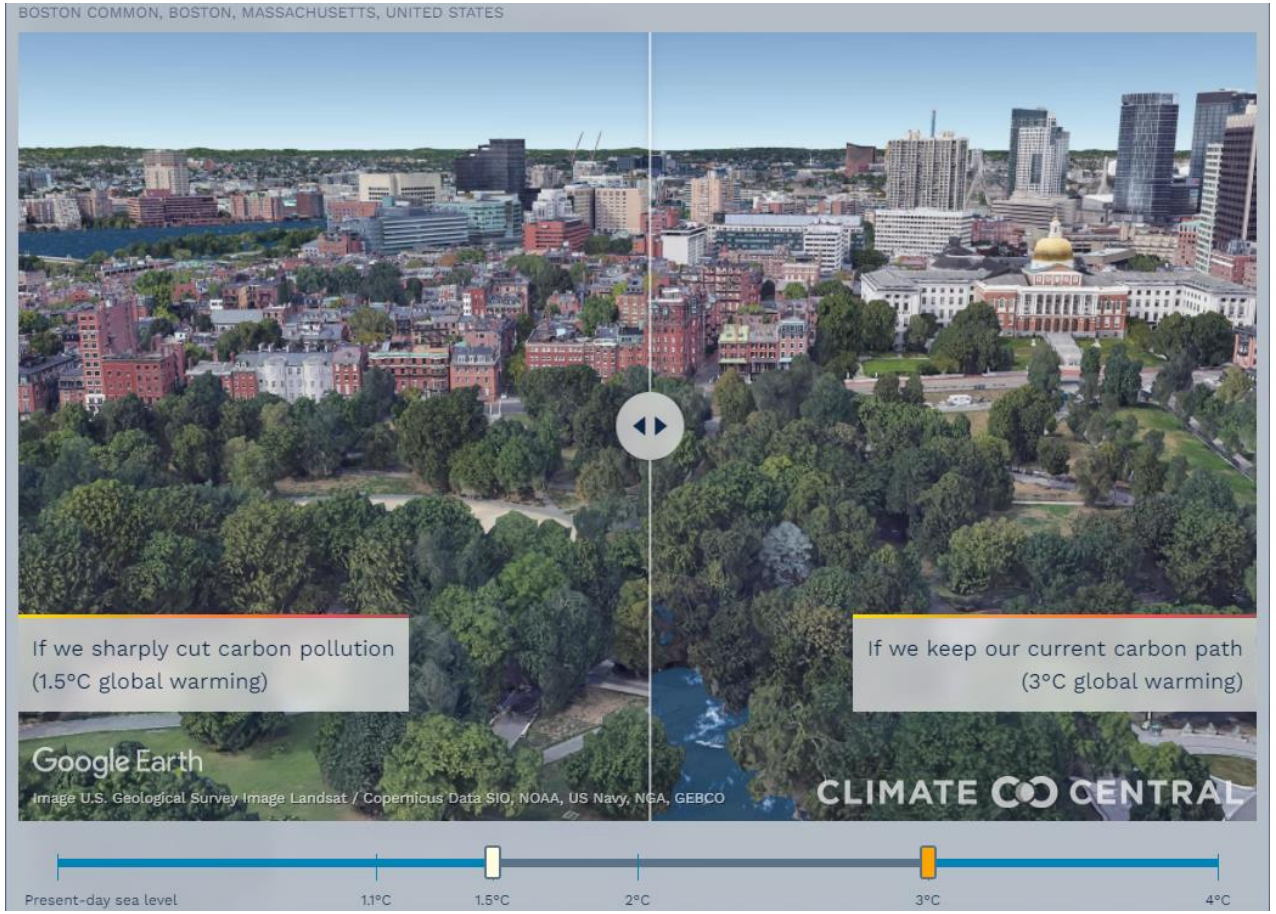
The value of cardboard increased 180% over last year as demand for deliveries increased and new fiber mills opened in U.S.



Sources:
Resource Recycling 2021
Resource Recycling 2020
Resource Recycling 2019
Resource Recycling UBC Markets
Recycle Smart

Picturing our Future

- Climate Central's Picturing our Future tool demonstrates potential impact of sea level rise at iconic locations
- Includes three Massachusetts locations: Boston Common, Edward Brooke Courthouse, and Old North Church



Next LBE Council Meeting

Save the Date!

Tentative:

Tuesday, January 11th

10:00 am–12:00 pm

Upcoming Tentative Meeting Dates:
March 8th
May 10th
July 12th

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

DOER Massachusetts Department of Energy Resources