
A FOUR-YEAR PLAN FOR CLIMATE ACTION
MAINE
WON'T WAIT
MAINE CLIMATE COUNCIL

Maine Climate Council

Maine Resource Recovery Association
Fall Workshop: Deconstruction

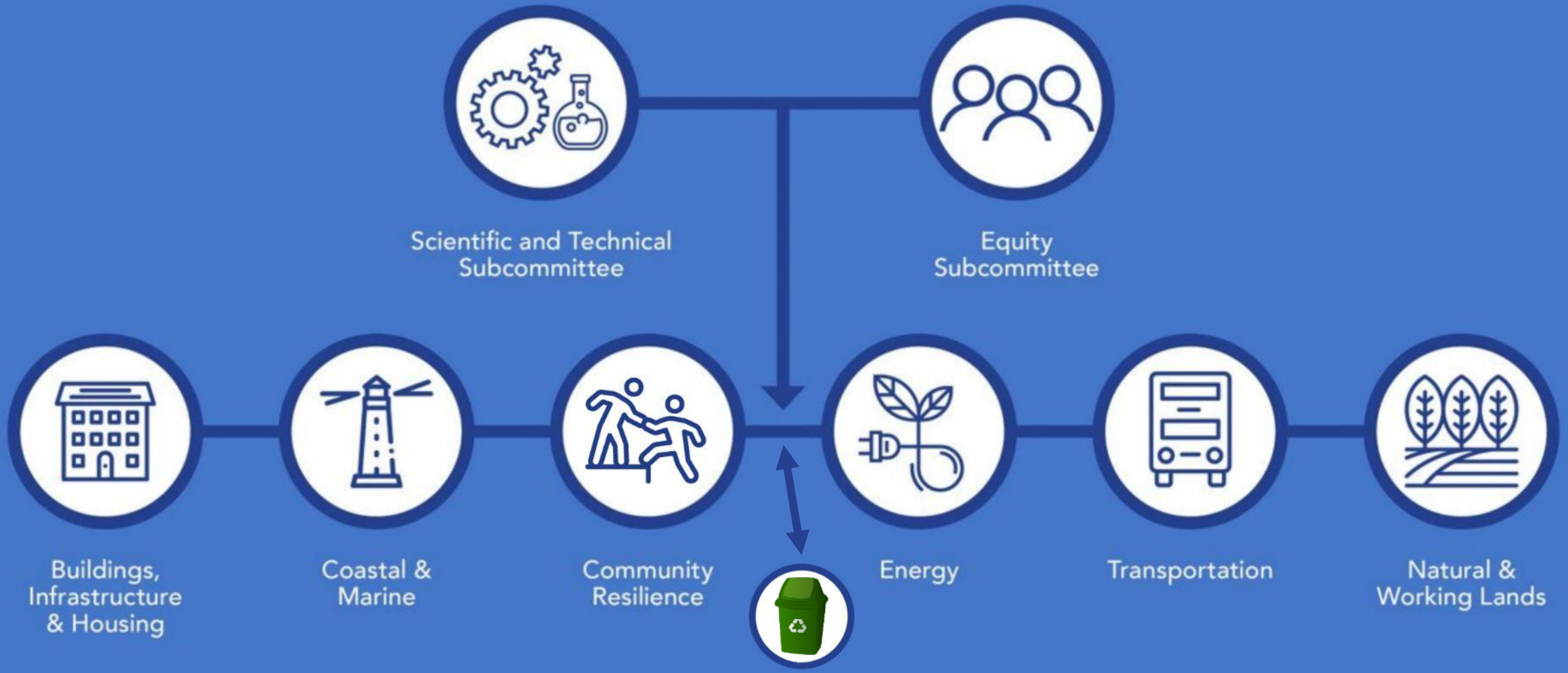
Megan Mansfield-Pryor,
Waste Management Climate Policy Advisor

GOVERNOR'S OFFICE OF
Policy Innovation and the Future

MAINE DEPARTMENT OF
Environmental Protection

Monday, October 27th, 2025

Maine Climate Council



Maine Won't Wait Goals:

1. Reduce Maine's **greenhouse gas emissions**
2. Strengthen **resilience** to climate impacts
3. Create **jobs** and **economic prosperity**
4. Bring climate action to **all Maine people**

Maine Won't Wait Strategies:

A
Embrace the future of transportation in Maine

B
Modernize Maine's buildings: energy-efficient, smart, and cost-effective homes and businesses

C
Transition to clean energy

D
Create jobs and grow Maine's economy through climate action

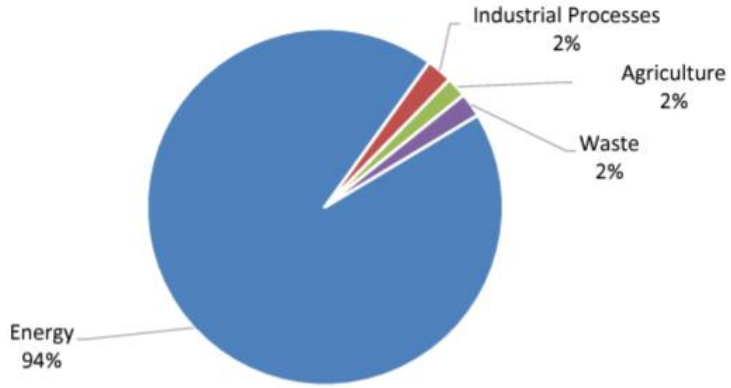
E
Protect the environment and natural and working lands and waters in Maine

F
Build healthy and resilient communities

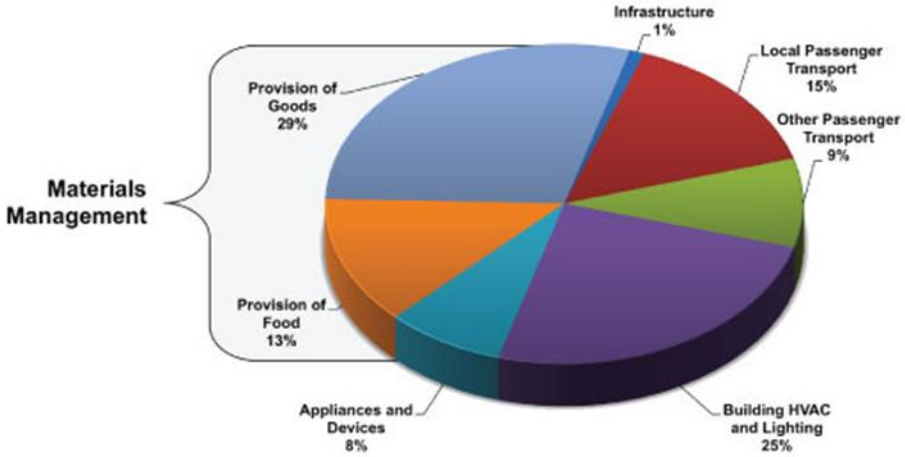
G
Engage with Maine people on climate action

Emissions are Global: Let's Think in Systems

- **Sector-based, territorial view:** Waste is a tiny sliver of our emissions! We should divert our waste streams from disposal through recycling, composting, and anaerobic digestion.
- **Systems-based, global view:** Materials management makes up a massive percent of our emissions! We should rethink how we consume and dispose of material resources.
- Construction and demolition are **significant drivers of global emissions**, consuming "roughly a third of all resources extracted every year" while producing "just under a third of all the world's waste.



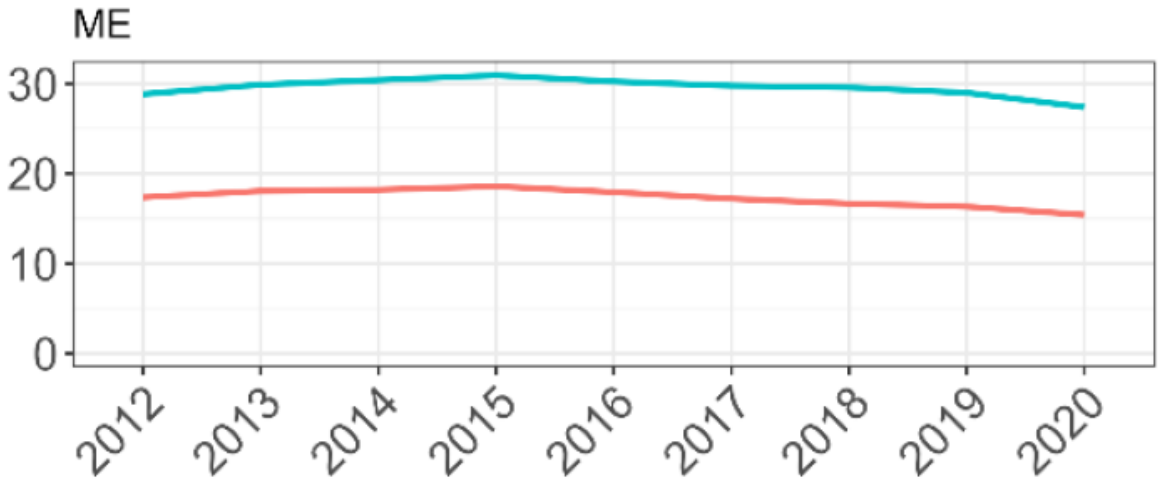
Maine's gross greenhouse gas emissions by source category, 2021 (includes biogenic emissions)



EPA's systems-based greenhouse gas inventory for U.S. emissions, 2006

Embodied Carbon & Consumption-Based Emissions

- Embodied carbon = greenhouse gas emissions (GHGs) generated in resource extraction, manufacturing, transportation, installation, maintenance, and disposal of materials used in our stuff from electronics to buildings to clothes and food. Practices that **preserve materials** reduce consumption-based emissions.
- Maine has made **great strides** in reducing territorial emissions:
  - As of 2021, GHGs were **30 percent lower than 1990** levels, surpassing the medium-term goal of 10 percent below 1990 levels by January 1, 2020.
  - **91 percent** of Maine's GHGs are offset by natural sequestration, meaning we are very close to total carbon neutrality for direct, territorial emissions!



Source: EPA Consumption-Based Greenhouse Gas Inventories for Northeastern States

- *Embodied emissions will be of **increasing interest and importance** as clean energy and energy efficiency gains reduce our operational and territorial carbon emissions.*

Promote the manufacture and use of climate-friendly building products

Actions:

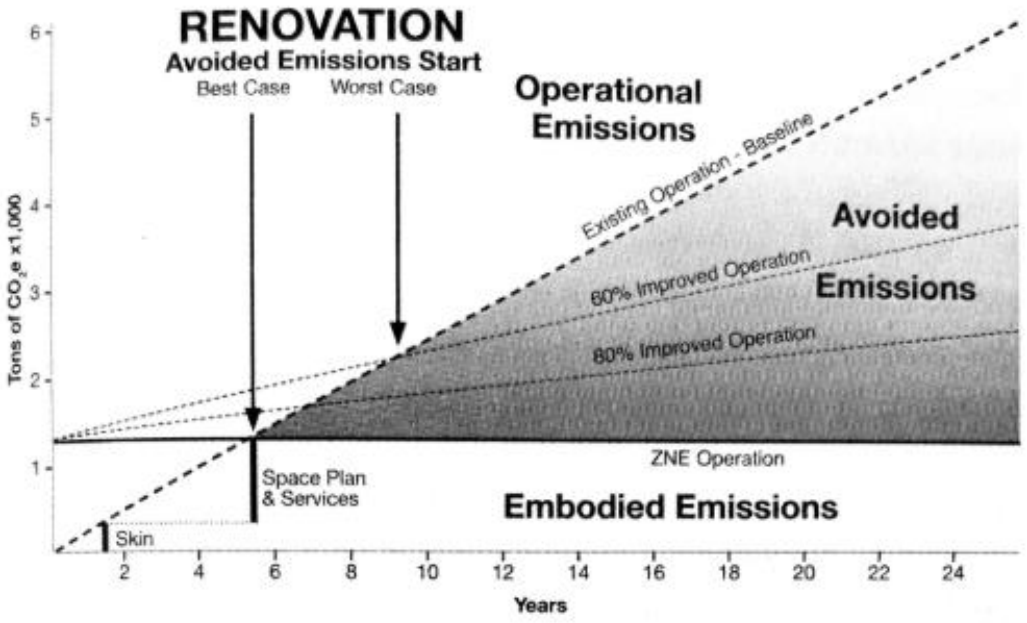
- **Divert demolition debris from landfills** by encouraging municipalities to give two weeks' notice for **salvage** opportunities
  - Posting two-weeks public notice of pending demolitions along with a **liability waiver** to reduce risk would enable building materials salvage and **reduce debris disposal**

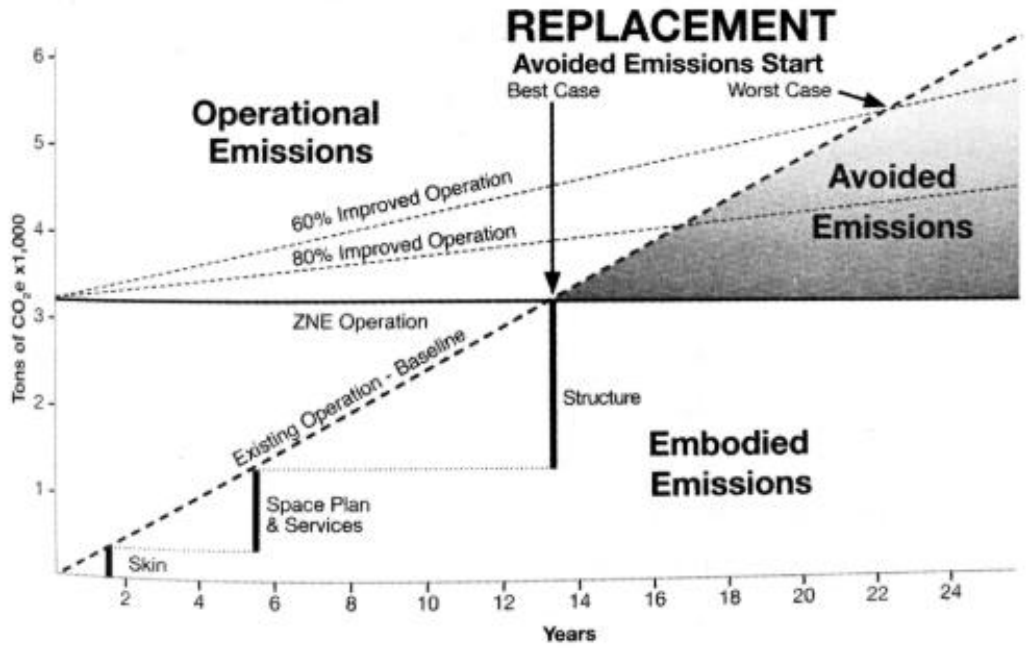
Actions:

- Require large commercial and state-funded buildings to be **designed for deconstruction** and reuse by 2030
  - Global warming potential from buildings would be **reduced by 88%** if they were designed for reuse rather than recycling

Continue to lead by example in publicly-funded buildings

- If we deconstructed the 200,000 to 300,000 homes currently being demolished in the U.S. every year, we'd have enough reclaimed lumber to build about 100,00 new homes.
- It takes about 41 trees to build the average home; why waste that wood?





"The Greenest Building is the One That's Already Built" – Carl Elefante

- One of our greatest misunderstandings in today's accepted **building-sector decarbonization beliefs** is that constructing new energy-efficient buildings reduces cumulative operational emissions (carbon released by building operation).
- In reality, **no matter how sustainably built** "…more [new] buildings equals more energy demand and carbon emissions, period."
- Every time we choose to demolish instead of preserve an older building in order to construct a new one, we contribute to carbon emissions and mountains of waste.

Takeaways from a talk by Carl Elefante (Past president of the American Institute of Architects (AIA), Author of Going for Zero: Decarbonizing the Built Environment on the Path to Our Urban Future)

Building Code Changes Enable Salvage

- Building codes require salvaged lumber to be regraded before use; a barrier that is rarely needed given superior strength and durability of typical old-growth lumber.
- Some local and state governments are updating their building codes to ensure salvaged lumber doesn't require a special process to reuse:
  - Washington State, King County, Washington, and Eugene, Oregon
- Salvaged sawn lumber in good condition and devoid of areas of decay **shall be assumed to meet the same requirements as new lumber.**
- In some cases, codes include flexibility so salvaged lumber can be used for non-load-bearing uses if durability is questionable.
- International Code Council (ICC) Digital Codes Modification to **enable use of salvaged lumber without regrading** is proposed for adoption in 2026.
- Committee Hearings to be held in Hartford, CT from April 19–28, 2026

Designing for Deconstruction

Denver's Green Building Code provides tips on how to design buildings for **adaptability and disassembly** at end of life.

a. **modular** components

b. prefabricated elements

c. multi-functional assemblies that **limit raw materials**

d. standardized fastening systems

e. **mechanical connections** in lieu of chemical adhesives

f. demountable partitions

g. Cradle to Cradle® Certified materials or equivalent

h. materials made from a **single raw material** as to avoid composite materials with adhesive or chemical bonding

Salvaged Materials are (Ultra) Low Carbon Materials

- Despite far less recognition than bio-based materials in procurement policies, salvaged materials generally have a **fraction of the embodied carbon** of similar new materials.
- Significant carbon is generated from resource extraction/harvesting, processing, and transportation of new materials.
- Emissions from salvaged materials are limited to transportation or refurbishing and are **typically minimal** compared to embodied emissions from sourcing new materials.

- **Reusing just 50,000 tons of wood flooring reduces GHGs by 141,284 (MTCO2E) - equivalent to annual emissions from 29,997 gas-powered passenger vehicles (cars, trucks, vans, SUVs)**
- **Reuse preserves the value of irreplaceable materials like heritage timber from old growth lumber**

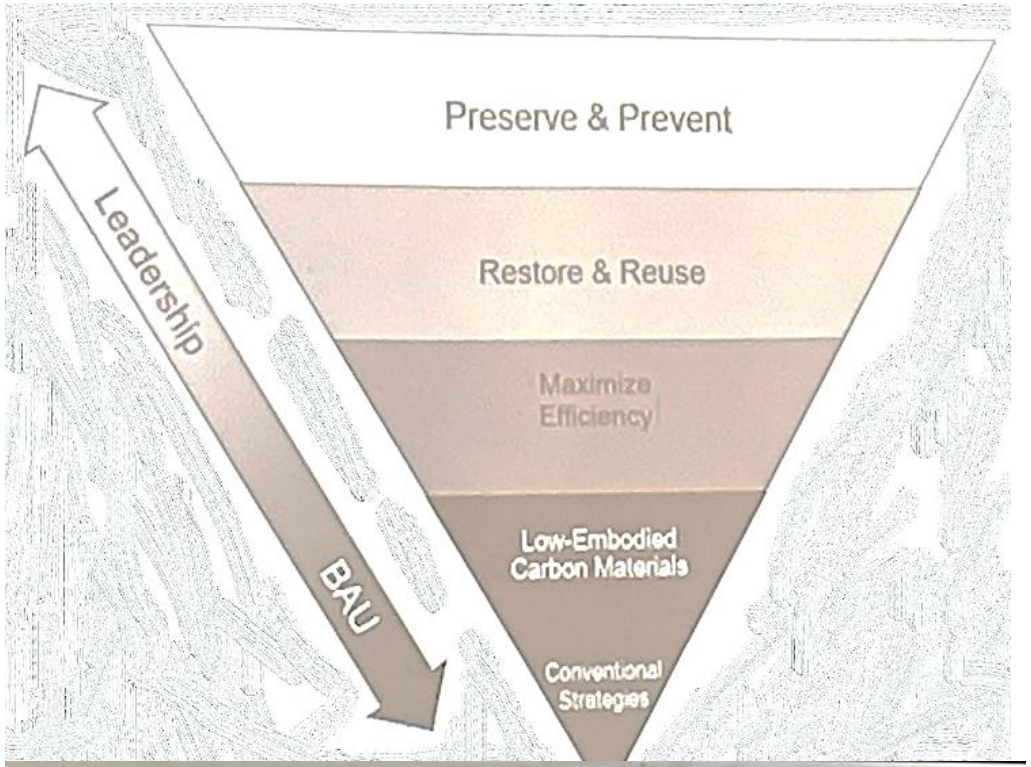
- **Procurement policies** that specifically call out salvaged materials can help **boost markets** and provide impetus for much-needed workforce development.

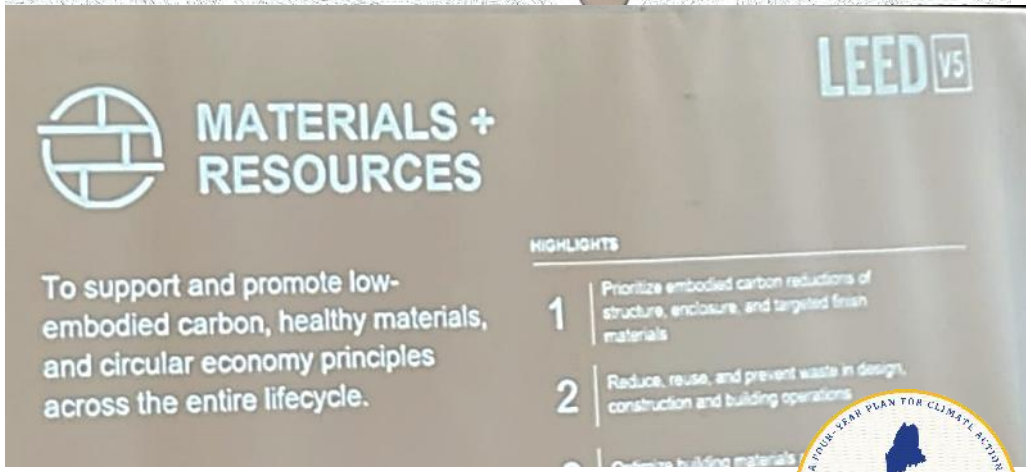
Deconstruction is Flexible

- Deconstruct and reconstruct entire buildings by labeling each piece during disassembly for fast, easy reassembly in another location
- Deconstruct and repurpose materials to build new
- Deconstruct in segments, like post-fab panels, entire roofs, rooms, etc.
- Make ADUs, preserve unique features (turrets, etc.)

LEED V5 Incentives for Reuse

- Embodied carbon for all materials and products used in the construction and renovation of buildings, as well as waste generated throughout building construction, operation and renovation **must be assessed and quantified** from a lifecycle perspective
- Equity, well-being, community, and health are **all key factors** as well as carbon emissions (operational and embodied).
- Planning for **zero waste operations** is now required.
- Credits are weighted more heavily towards **material reuse**.

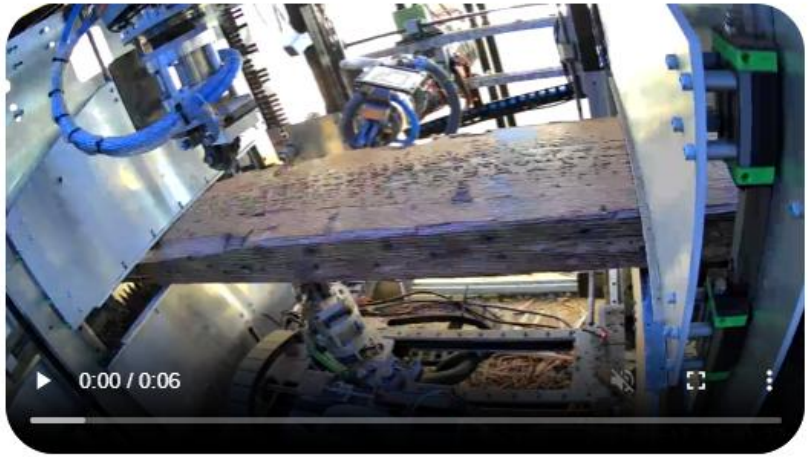




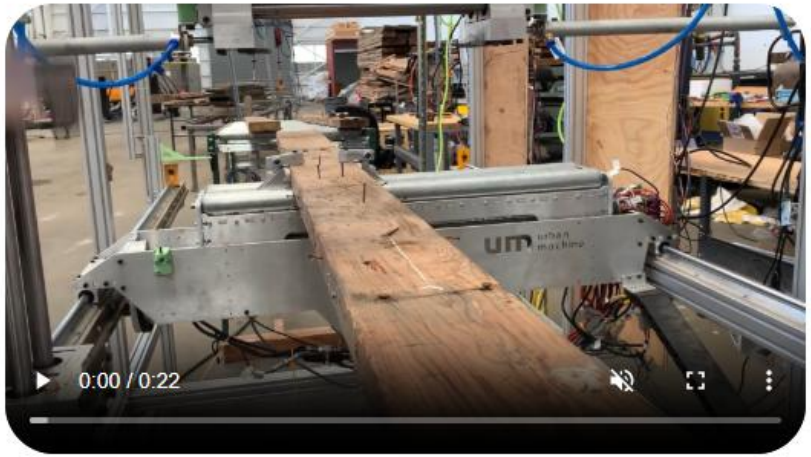
Technology Solutions Are Coming

- Urban Machine uses AI and robotics to efficiently remove bulk fasteners from dimensional lumber. As a shared resource, one machine could support multiple businesses in a region.
- AI helps users plan and execute on-site wood reclaiming process by calculating quantity and quality of onsite wood, driving down time and cost.
- Held in place by gate-like clamps, bird-beak-like pickers simultaneously extract nails and staples from all four planes of wood. Finally, the wood undergoes a quality check to ensure it is metal-free and ready for new construction.

Nail & Staple Picker



Metal Detector



Brushes

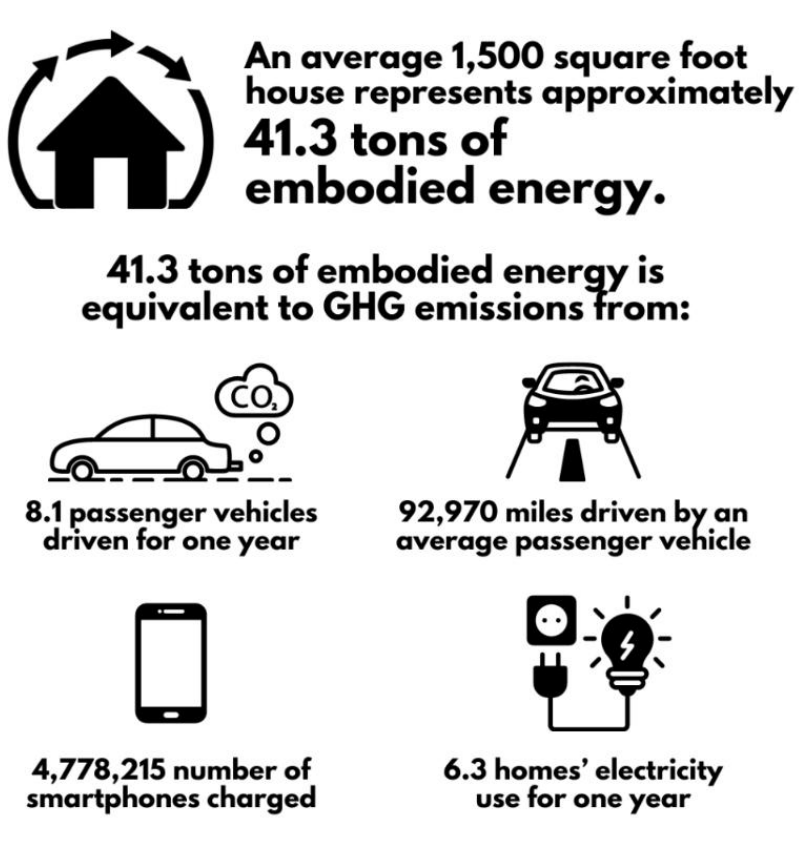
Construction & Demolition Debris Salvage Opportunities

- **90%** of construction and demolition debris is from **demolition**; only 10% is from construction scrap.
- An estimated **75% - 95% of building materials** from remodeling kitchens, bathrooms and whole homes could be reused.
- In 2022, **609,506 tons** of construction and demolition debris was **generated** in Maine; just **2.37% was diverted from landfill.**

- Data analysis is underway for a statewide Waste Characterization Study that will provide Maine with better data on materials in the **construction and demolition debris** waste stream, highlighting opportunities for diversion programs targeting specific materials.

The Triple-Bottom Line of Deconstruction

- **Social:** Lower-income communities, often communities of color, are disproportionately impacted by demolition and its **harmful side effects.** Demolition releases hazardous particulates such as lead, asbestos, mercury, arsenic, crystalline silica, into the air and may make their way into groundwater, **contaminating drinking water supply**. Spray to reduce airborne particles releases stormwater runoff with those same contaminants, again posing a risk to the water supply. Manual deconstruction is a **safer alternative**.
- **Economic :** A recent study from Cornell estimated that "converting half to three-quarters of residential building demolitions to deconstructions would have a direct economic impact of **$872 million to $1.4 billion;** create between 8,130 and 12,630 jobs; and reclaim 270,000 to 420,000 tons of materials for reuse – "all of which could **foundationally reshape an entire sector** of the New York state economy."
- **Environmental:** Building deconstruction maximizes use of material resources, generating **low-cost, low carbon building materials** for reuse, reducing waste sent to landfills, and reducing emissions both upstream from producing new materials and downstream from landfills.



Workforce Development Potential

- Reuse/refurbishment produces **300 jobs per 10,000 tons** of waste compared to 1-6 for disposal.
- Circular jobs often "cite **higher wages and better working conditions** than comparable fields, and opportunities to develop and use varied skills, from equipment repair to public outreach
- **"Deconstruction isn't just good for the planet – it creates jobs."**
  - Companies and nonprofits can offer **paid workforce training** pairing construction, deconstruction, repair, and job-readiness skills
- "Here's the truth: We're not just here to pull nails and learn tools. We're here to serve people. I teach because I want people to **feel proud of the life they're building**, not ashamed, not patched-together. Deconstruction gives people a way to see what they already have, and **teaching gives them the confidence to shape it**. I'm not just training workers. I'm helping design leaders, survivors, builders, and change-makers." – Rebuilding Exchange Educator

Photos courtesy of Rebuilding Exchange in Chicago

Barriers to Reuse: Social Norms & Low Upfront Costs

- Low upfront costs for building demolition and landfilling don't account for **true long-term costs**
- Landfill emissions and health impacts disproportionately affect vulnerable communities
- "**80% of what is landfilled** – from wooden and steel structural beams to floorboards or fixtures – still holds economic value, representing a "**massive untapped opportunity.**" – Cornell Chronicle
- What if the **cost to landfill** reflected the true cost with negative externalities (material loss, embodied carbon, landfill emissions, community and health impacts, etc.)?
  - The social costs of just one CDD landfill's **direct emissions** were estimated at **$21,405 per year.**
  - That cost jumps to **$2,035,731** yearly if upstream (consumption-based) emissions are included.
- Maine's CDD disposal fees averaged **$96 per ton** in 2022; some as low as **$17 per ton**.

"One of the biggest challenges is we're working against a system that's been **completely designed to make it easy for people to throw things away**…It's cheap to landfill materials so there's not a really strong economic incentive to look for opportunities to not throw things away…the whole system is very much geared toward making it convenient to throw things away."

- Mike Gable, President of Build Reuse (a nonprofit dedicated to building material reuse)

“We recycle bottles but throw away our houses.”

- Portland, OR Deconstruction Contractor noting the irony of Portland’s strong recycling and thrifting/reuse ethic that didn’t apply to building materials until their ordinance passed in 2016.

Tackling Deconstruction at the Local Level

- State **funding support** is available!
  - The DEP Waste Diversion Grants offers public and private entities funding to tackle any project that will keep waste out of the trash (landfill and incineration).
  - The Community Resilience Partnership's Community Action Grants *updated eligibility list aligns with Maine Won't Wait 2024 with support for salvage, deconstruction, and designing for deconstruction and reuse (88% GHG reduction!)*

Need **project ideas?** Check out:

- Sustainability Toolbox – University of Maine
- Sustainable Maine Program – Natural Resources Council of Maine
- Reduce, Reuse, Recycle Guides – Maine DEP

What's Happening in Maine:

- The **Maine Deconstruction Network**, an informal gathering of individuals seeking to grow deconstruction in Maine (formerly convened by GOPIF, now by DEP) meets monthly.
    - Developing guidance around how to design for reuse, market development, workforce development, **affordable housing,** and education and outreach are all key priorities.
- Maine is part of the **Buy Clean Partnership**, working with the U.S. Climate Alliance and other member states to actively explore collective opportunities to **procure building and construction materials** with lower embodied carbon.
- Maine Won't Wait 2024 recommendations for **designing buildings for deconstruction** and reuse and supporting deconstruction at the local level provide momentum and recognition of embodied carbon.

Want to Get Involved?

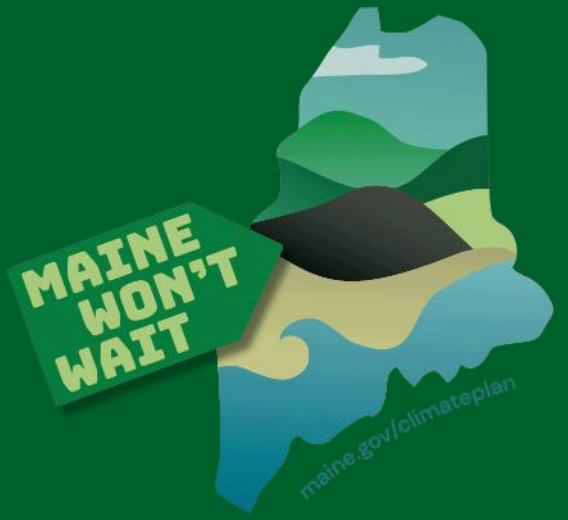
- Join the Maine Deconstruction Network! Email me at megan.e.mansfieldpryor@maine.gov to be added to our list!
- Join Build Reuse
- Join the Northeast Carbon Leaderhip Forum

The Maine Deconstruction Network is forming in 2025. Your participation is welcome!

The Network is an informal network of individuals interested in the economic opportunities and environmental benefits of building deconstruction who want to raise awareness and help Maine transition from a linear building economy to a circular one.

The network will meet on a recurring basis depending on member availability either quarterly or monthly and will work together to engage different entities in deconstruction, identify any potential opportunities to pilot deconstruction projects, consider how we can support local governments, communities, and small businesses in efforts to move towards deconstruction over demolition.

Suggested Climate Actions



- Businesses can adopt policies that prioritize use of salvaged materials as part of their climate and sustainability goals
- Municipalities can adopt policies to renovate and deconstruct buildings and repurpose building materials
- Homeowners can seek out salvaged materials for home renovation projects or donate materials from their own renovations
- Contractors, tech and vocational schools can cross-train employees, apprentices, and students with construction and deconstruction skills for a more flexible workforce with increased market opportunities

Tools for Measuring Upstream Emissions

- EPA Waste Reduction Model (WARM) Tool
- Repair Café Carbon Calculator
- CBEI Guidebook - Creating a CBEI for your city, Urban Sustainability Directors Network
- US Environmentally-Extended Input-Output (USEEIO) Models*, EPA
- Estimating consumption-based greenhouse gas emissions at the city scale, C40 Knowledge Hub
- Forum Products and Toolkits, West Coast Climate & Materials Management Forum
- Waste Impact Calculator Web App, Oregon DEQ
- Smart Tools for a Cooler Planet, Cool Climate Network

*This resource will be moving to an academic institution for preservation and continued improvement, but currently this is the available version.

Code & Ordinance Examples

- Denver Green Construction Code 2022 > 9 Materials and Resources > 901.6 Design for Deconstruction
  - ✓ **Minimum 5% salvaged materials** and designed for durability, adaptability, and disassembly
- WA State Building Code Amendments - Appendices P & Y (salvage assessments), Appendix Z (deconstruction) and "Used Sawn Lumber" section
  - ✓ Will be moving appendices to Standard Codes AND revising their tax exemption to include purchase of salvaged wood for reuse while **phasing out** tax exemption for purchase of **wood used as fuel**
- Oregon Residential Code section R104.9
  - ✓ Allows reclaimed wood reuse without regrading

To engage with the Maine Climate Council,

Follow us on Instagram @maineclimatecouncil

Sign up for our newsletter

Read the plan!

Home | Climate Impacts | The Plan | Action Guides | Maine Stories | Videos | Dashboard

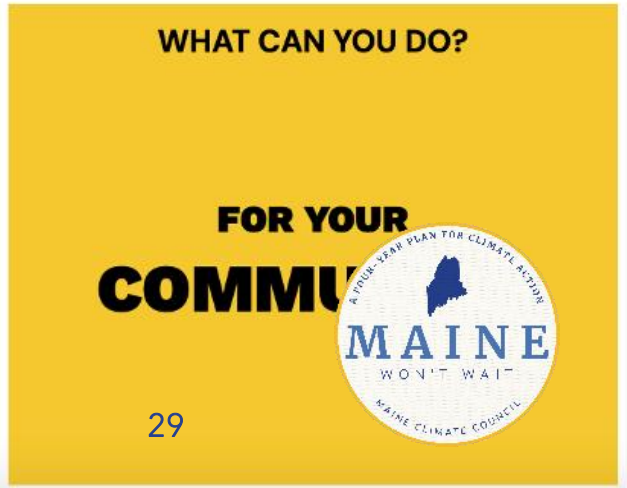
Explore Maine.gov/climateplan

Explore an interactive map showing how climate change is impacting our state's landscape, economies and recreation.

Learn about *Maine Won't Wait*, our state's climate action plan to reduce greenhouse gas emissions and secure a strong future for our people and economy.

Mainers from every corner of the state are taking action and confronting climate change.

GUIDES TO CLIMATE ACTION & INCENTIVES



Climate&Me

A new initiative to engage young Mainers in climate action

Check out the website for resources on how to get involved

Information and inspiration for young Mainers about climate change, the State's climate action plan, and how youth can get involved and make a difference.

Follow us on Instagram to learn about upcoming events @MaineClimateCouncil

Connect with initiative lead
Abigail Hayne
abigail.hayne@maine.gov