Buildings, Infrastructure & Housing (BIH) Working Group
Proposed Recommendations and Actions
DRAFT / For discussion only
Updated 5/21/24

Proposed recommendations resulting from BIH WG discussions to date:

RECOMMENDATION	ACTIONS	IMPLEMENTATION DETAILS
Continue the progress on making homes and businesses more energy efficient by investing in weatherization and heating systems	• Extend funding and financing for weatherization and electric heating and water heating systems in homes and businesses beyond 2030 • Encourage and expand education, outreach, and technical support for programs that increase uptake of weatherization, ~~and~~ clean heating, and water heating systems • Increase access and participation in energy efficiency programs for renters, low-income, and rural residents • Engage in regional and national initiatives exploring the use of state emissions standards for heating appliances. • Harmonize state sales tax policy for electric heating and heating oil **Guidance on targets** • **Maintain** existing targets for economy-wide heat pumps and weatherization • **Extend** low-income targets for heat pumps and weatherization to 2030 ○ Heat pumps: 32,000 low-income households by 2030 (13% of total)	Funding/financing details • Prioritize programs that maximize carbon reduction per dollar invested and provide benefits to low-income households. • Seek to address the limited funding for ~~Create a funding source for~~ home repairs necessary before weatherization • Extend financing to more commercial customers • Study the benefits and costs of thermal energy networks Education, outreach, and support details: • Fund and support community initiatives such as “navigator” programs, prioritizing low-income/disadvantaged communities and households. Partnerships with community-based organizations can help to increase the reach of energy programs, particularly in communities that are “hard to reach” due to financial and other barriers. • Consider the implications of the use of biomass for heating and industrial energy on Maine’s gross greenhouse gas

	○ Weatherization: 10,000 low-income households weatherized by 2030 (29% of total)	emissions. Study the potential for use of waste biomass for biofuel blends. Increasing access details: • ~~Prioritize households enrolled in the Home Energy Assistance Program (HEAP) and other state and federal means-tested programs.~~ Design energy efficiency and carbon reduction programs to be broadly accessible, including to those who face additional barriers to participation such as language barriers and renter status. • On April 30, 2024, Maine applied to the U.S. Department of Energy (DOE) for nearly $72 million to support home energy rebates for income-eligible households in the state. The Governor's Energy Office, Efficiency Maine, and MaineHousing expect that these funds will outfit approximately 4,800 low-income multifamily and manufactured homes with high-efficiency heat pumps, and an additional 2,000 market-rate homes as funds allow. Standards: • Continue work with the Ozone Transport Commission– an association of 12 states and DC, including Maine – to analyze and collaborate on strategies to reduce emissions of NOx from buildings, including building appliances. • Continue work with the building electrification task force led by Northeast States for Coordinated Air Use

		Management (NESCAUM), exchanging information on zero-emission building equipment, including model rules to address pollution from water and space heating. Tax Policy: • Give all consumers (both residential and non-residential) that use electricity for space heating and water heating the same sales tax exemption that exists for heating oil.
Establish strong systems and processes to support rapid adoption and compliance with increasingly climate-friendly building codes and standards.	• Commit to adopt new building codes to reach net-zero ~~energy~~ carbon emissions for new construction in Maine by 2035 • Support contractors and code enforcement officers through training, technical assistance, and contractor licensing, particularly in small and rural communities • Leverage voluntary standards and certifications to go "above and beyond" applicable state and federal building codes	Improving building code process: • Amend state statute governing building codes to: ○ ~~M~~move responsibility for building code adoption, ~~and~~ compliance and training to the new Office of Community Affairs (OCA) ○ ~~C~~Clarify that all funding collected through building permit fees for the purpose of training about codes should also be transferred to the OCA • ~~Amend state law to~~ ○ Set a clear deadline by which rulemakings adopting updated~~s~~ codes must be completed and take effect ~~require that we not be more than one version behind current IECC code~~

		○ Clarify that MUBEC Board members are authorized to serve until a replacement is appointed • End exemptions: Eliminat~~eing~~ the exemptions for enforcing code. • By 2028, define a stretch code that will reach net zero emissions in new construction. Direct the new Office of Community Affairs to provide enhanced support to communities to adopt the stretch code. • Track the trajectory of IECC codes toward net-zero targets (for some or all segments) and determine which sectors might lead to a more rapid transition Support contractor community: • Licensing: Require contractor licensing to accelerate adoption of and compliance with increasingly climate-smart building codes. ○ Build on the platform created by LD 1929. ○ Develop licensing training program that incorporates high performance construction techniques, IE Passive House, LEED, Building Performance Institute (BPI), etc. ○ Help contractors to achieve licensure with funding, education & training Voluntary standards: • Leverage new Section 45L Tax Credits for Zero Energy Ready Homes to reduce energy costs in the ~900 new manufactured homes that are delivered to Maine annually. Study the incremental costs and develop an incentive

		program for homes that meet the US Department of Energy (DOE) ~~Incentivize~~ Zero-Energy Ready Home (ZERH) standard for manufactured homes ~~[INSERT ADDITIONAL DETAIL HERE]~~ **Additional code details:** A 2021 analysis by the Pacific Northwest National Laboratory found a life cycle cost savings of $23,772 per home built to the 2021 IECC compared to a home built to the 2015 IECC. The same analysis estimates a statewide emissions impact of 394,600 metric tons of CO2 when using the 2021 IECC instead of the 2015 IECC.
Promote the manufacture and use of climate-friendly building products	• Building on Maine's designation as a federal Tech Hub for Forest Bioproducts, identify and address the barriers for attracting a cross-laminated timber (CLT) plant and other future bio-based materials manufacturing in Maine. • Increase awareness, educate, and provide technical assistance around embodied carbon alongside operational carbon. • ~~Study~~ Use demonstration projects and incentive programs to address the current cost gap between high-embodied carbon (e.g., steel & cement) and low-embodied (e.g., wood and bioproducts) building products. • ~~Require whole life carbon accounting for all new state-owned and funded buildings, aligned with state Lead By Example Initiatives.~~	Details on awareness, education, and technical assistance ○ Provide technical assistance to municipalities and larger institutional projects ~~specifically on these issues (via Community Resilience Partnership?)~~about whole-life carbon accounting and low-carbon building materials through programs such as the Community Resilience Partnership. ○ Contractor licensing can improve uptake and awareness ~~(link to other mention in our recommendations.)~~, as mentioned in the above recommendation. Details on addressing the cost gap ○ Invest in demonstration projects using climate-friendly building products such as cross-laminated timber (CLT)

		○ ~~Gradually p~~Phase out, where feasible, high-carbon materials, such as foam insulation, in existing and future incentive programs ○ Support ~~for~~ Maine manufacturing~~-~~ firms to produce Environmental Product Declarations. ○ Incentivize, through the Historic Preservation Tax Credit and other sources, preserving old buildings that have large amounts of embodied carbon.

Support measures that both reduce carbon and improve resilience	• Increase funding and financing options for building-scale distributed energy resources, such as solar and storage (including electric vehicle batteries that are used as energy storage)
	  ○ Set targets for building-scale solar and storage consistent with the Maine Energy Plan: Pathway to 2040 planning process currently underway by the Governor's Energy Office ~~[INSERT GUIDANCE ON SETTING TARGETS FOR SOLAR, STORAGE INSTALLED IN BUILDINGS]~~
	• Manage the impact of building loads on the grid, as recommended by the cross-cutting working group on demand management
	• Using building codes, education and outreach, and state-run resilience programs, assist Mainers to prepare their homes and businesses to be resilient in the face of climate disasters, focusing on low-income households and Mainers with the fewest resources to prepare.
	• Support coordination that will bring efficiency upgrades to buildings recovering from natural disasters
	• Create a new program to mitigate risks of oil spills from basement oil tanks
		On resilience actions:
		  ○ Multiple actions in this document support more resilient homes (stronger building codes and insulation, local energy storage, etc.)
		  ○ Maine buildings face new challenges, such as wildfire risk.
		  ○ Basic steps such as having flood insurance, a sump pump with a battery back-up, and preparing homes for external power sources are important.
		  ○ Several ideas from WG members overlap with topics addressed in the Community Resilience WG:
		  ○ Getting out of harm's way (flooding, and other risks)
		  ○ Safe spaces for communities if houses are destroyed or damaged.
		NEW LANGUAGE COMING FROM DEP, TO BE DETERMINED ~~Establish oil spill risk mitigation fund:~~
		~~to drain, remove and dispose of~~
		~~to supplement the DEP's Ground and Surface Waters Clean-up and Response Fund.~~
		  ○ ~~funded through surcharge on purchase of tanks for oil or kerosene~~

Accelerate decarbonization technologies in industrial processes	• Pilot and demonstrate new heat pump applications for industrial steam and hot water. • Maximize cost-effective deployment of membrane filtration in food production and other industrial	Details on industrial heat pumps: • Large water to water or air to water heat pump systems are capable of generating steam when using waste heat (or waste hot water).

	processes to displace combustion-driven separation processes.	• Heat pumps also can be combined with thermal storage, electric boilers, and/or batteries to generate industrial process steam • Also, new a generation of heat pump technology is emerging that may be able to cost-effectively make steam even in the absence of an existing thermal source. Details on membrane filtration: • This is proven technology with large decarbonization potential in certain heat-driven separation processes. The filtration systems can replaces heat-driven evaporative separation systems. This strategy is well-suited for food related production processes and may have for broader industrial applications. • Efficiency Maine has provided financial incentives for a spiral filtration system in a food processing facility in Maine that has been very successful. • A type of high temperature membrane filtration technology recently received a large US DOE demonstration grant for use in a paper mill in Louisiana and may be a good fit with paper mills in Maine • Survey Maine's existing industrial energy users to evaluate the feasibility and/or barriers to transitioning each to electricity or clean non-fossil derived fuels
Continue to lead by example in publicly-funded buildings	For buildings that are owned by the State of Maine: • Starting in 2024, ensure that all new state-owned buildings and major renovations use zero-emissions heating, cooling, and water	**Lead By Example** Recognizing the recent and significant federal funding for energy efficiency, transportation and clean energy investments from the Bipartisan

	heating sources and are compliant with the most recent or stretch energy codes; • By 2034, reduce GHG emissions by at least 50% from existing state buildings • Ensure that major parking-related renovations and new builds at state owned buildings include "EV Ready" parking spaces • Determine what state buildings are a good fit for advanced wood products, based on criteria being developed by the end of 2024. • Require energy and cost savings data collection for all energy efficiency and renewable energy projects in state-owned buildings • Require whole-life carbon accounting for all new state-owned and funded buildings to help the State understand embodied carbon emissions alongside operational carbon. For schools: • ~~Ensure that 100% of new school construction receiving state funding uses zero-emissions heating and cooling~~ • Establish a dedicated funding source and staff to support the new Green Schools Program to reduce energy costs in Maine's 600 existing school buildings~~s~~ through the installation of zero-emissions heating and cooling technologies and renewable energy in new and existing schools. • Develop a system to track energy and cost savings data for all school energy efficiency or renewable energy receiving state funds. **Affordable Housing**:	Infrastructure Law and the Inflation Reduction Act, there is ample opportunity for the state of Maine to continue to lead by example~~.~~. In 2024, Governor Mills issued an executive order that directs the state to commit to goals that put Maine on a pathway to decarbonize buildings statewide. The governor's order also includes goals for EV charging stations at public buildings, zero-emissions heating and cooling, and overall reductions in emissions and energy use in state buildings. **Schools**: Energy is an enormous cost for the more than 600 school buildings in Maine; by being more energy efficient, schools can help reduce GHG emissions, reduce operating costs, and improve students' learning environment through improved air quality. The state can support school decarbonization efforts through the provision of technical assistance, state and federal funding, and creating learning opportunities for school administration, teachers, and students. **Affordable Housing** The 2023 State of Maine Housing Production Needs Study found that Maine needs approximately 38,500 homes to remedy historic underproduction and will need an additional 37,900 to 45,800 homes to meet expected population growth and household change by 2030. A significant portion of these homes will need to be affordable to low- and moderate-income Mainers. Building on the promise of the advanced building standards adopted by MaineHousing, and on ample forthcoming federal funding provided through the Weatherization

	~~Building on the promise of the advanced building standards adopted by MaineHousing, and on ample forthcoming federal funding provided through the Weatherization Assistance Program and various Inflation Reduction Act programs such as the Department of Energy Home Energy Rebate programs, the Greenhouse Gas Reduction Fund, and Solar For All, the BIH working group recommends:~~ • Renovate or build 650 ~~new~~ clean and energy efficient affordable housing units per year ~~for the next ___ years~~ • Increase the percentage of affordable housing projects that utilize solar energy and battery storage. • Provide housing developers with robust guidance in accessing state and federal resources to build and renovate affordable, energy-efficient housing for low and moderate income Mainers; • Require energy and cost savings data collection for all affordable housing projects receiving state funds, to help tell the story about the benefits of climate-friendly housing for Maine residents;	Assistance Program and various Inflation Reduction Act programs such as the Department of Energy Home Energy Rebate programs, the Greenhouse Gas Reduction Fund, and Solar For All, Maine can ensure that the benefits of new energy efficient housing can reach those facing the greatest need.