

DRAFT REPORT FOR DELIBERATION
MAINE CLIMATE COUNCIL EQUITY SUBCOMMITTEE
INTERIM RECOMMENDATIONS
12-23-2021

This report is a draft for deliberation by the Equity Subcommittee of the Maine Climate Council. Recommendations will be presented to the Maine Climate Council for consideration in early 2022.

DRAFT

Letter from the co-chairs

Placeholder

1. Introduction

Historical and systemic discrimination, underrepresentation, and isolation have left some residents of Maine more vulnerable to the effects of climate change than others. Low income populations, people of color and indigenous communities, rural and geographically isolated communities, and other vulnerable Mainers face the “first and worst” impacts from climate change and may be least able to adapt.

As the Intergovernmental Panel on Climate Change has written:

Differences in vulnerability and exposure arise from non-climatic factors and from multidimensional inequalities often produced by uneven development processes.... These differences shape differential risks from climate change.... People who are socially, economically, culturally, politically, institutionally, or otherwise marginalized are especially vulnerable to climate change and also to some adaptation and mitigation responses.... This heightened vulnerability is rarely due to a single cause. Rather, it is the product of intersecting social processes that result in inequalities in socioeconomic status and income, as well as in exposure. Such social processes include, for example discrimination the basis of gender, class, ethnicity, age, and disability.¹

Given the heightened vulnerability and increased exposure to the risks associated with climate change that certain people in Maine face, the Equity Subcommittee is advancing a series of recommendations which seek to emphasize equitable and just solutions to climate challenges.

In Maine and across the world, climate change poses the greatest threat to these communities who are already marginalized. Indeed, low income communities and communities of color, among others, are often already subject to both social and environmental harm - experiencing disparities in health outcomes, and inequitable access to healthy and secure housing and reliable transportation. Due to these ongoing inequities, these communities often have a weakened capacity to respond to climate stresses and recover from climate shocks.

Equitable climate action, then, requires the thoughtful distribution of climate benefits and mitigation of climate burdens, so that policy intended to help does not instead cause further marginalization and harm. Essential to helping to deliver these equitable outcomes is participation. In order to understand the needs of Maine’s impacted and frontline communities,

¹ Intergovernmental Panel on Climate Change, “Climate Change 2014: Impacts, Adaptation, and Vulnerability: Summary for Policymakers” (2014), 6, https://www.ipcc.ch/site/assets/uploads/2018/02/ar5_wgII_spm_en.pdf

these very same communities must have a role in creating the plans and policies that will affect their current and future well-being.

By focusing on equitable implementation of Maine’s climate strategies, we can make our state more resilient to the impacts of climate change, while improving the lives of all people in Maine.

[About the Maine Climate Council](#)

The 39-member Maine Climate Council was created in law in June 2019 as proposed and signed by the Governor and supported by the Legislature. The Council is an assembly of scientists, industry leaders, bipartisan local and state officials, and engaged citizens. The Climate Council, together with more than 200 Maine people, developed a four-year climate plan, [Maine Won’t Wait](#), to put Maine on a trajectory to reduce emissions by 45% by 2030 and at least 80% by 2050, while helping ensure that Maine people, industries, and communities are resilient to the impacts of climate change. By Executive Order of Gov. Mills, the state must also achieve carbon neutrality by 2045, meaning that as much carbon as we emit each year is also sequestered or buried in our natural and working lands and waters. And lastly, the law requires that climate plans be delivered every 4 years – an ongoing process.

[About the Equity Subcommittee](#)

The Equity Subcommittee of the Maine Climate Council was established in February 2021 to support ongoing planning and implementation of the state’s climate strategies to ensure shared benefits reach diverse populations in Maine. It has been tasked with setting equity outcomes for climate actions, monitoring progress and making recommendations to the Council to ensure programs and benefits reach diverse and isolated populations and communities.

The subcommittee’s work builds on consideration of equity by the Climate Council working groups, and an [equity analysis of the Maine Climate Council’s climate strategies](#) that took place during the summer of 2020. That analysis, by the Senator George J. Mitchell Center for Sustainability Solutions at the University of Maine, placed an equity lens on the four-year climate action plan, and identified the need for further focus on ensuring climate equity for all Maine people. A list of the members of the Equity Subcommittee can be found in Appendix A.

Charge of the Equity Subcommittee

- Support **ongoing planning and implementation** of Maine’s climate strategies to ensure shared benefits across diverse populations of Maine people and to understand any concerns for implementation.
- Set **clear equity outcomes** for proposed actions, monitor progress, and make recommendations to ensure that programs and benefits reach the intended populations and communities.
- **Build on** the Equity Assessment of Working Group Recommendations, prepared by the University of Maine during the development of the climate action plan.

About the Equity Subcommittee’s Work

The Equity Subcommittee (ESC) met monthly starting in February 2021 to discuss and identify ways to equitably implement Maine’s Climate Action Plan. Meetings were open for public viewing, involved the members of the Equity Subcommittee, and were facilitated by Carole Martin in collaboration with GOPIF staff members. All meetings were held on Zoom due to the ongoing COVID-19 pandemic, and the wide range of geographic locations in which committee members were located. During the first meeting of the ESC on February 26, 2021, members discussed the mission and deliverables of the subcommittee, metrics and measurability of equity outcomes, and format for future work.² The second meeting focused on creating shared definitions of equity and environmental justice for continued use by the ESC during its work. Subsequent meetings were oriented around discussing equity in the context of the subsections of Maine Won’t Wait: Buildings, Housing and Infrastructure; Transportation; Energy; Natural and Working Lands and Waters; and Healthy and Resilient Communities, Investing in Climate Ready Infrastructure, and Engaging with Maine People and Communities about Climate Impacts and Program Opportunities, respectively. Community engagement strategies for sharing the equity recommendations were also discussed during the July and August meetings of the ESC.

The community outreach and feedback process initiated by the ESC in September of 2021 was deeply reflective of the subcommittee’s conversations about how to effectively integrate procedural equity into their own work. Procedural equity requires meaningful opportunities for participation in planning and policy development by impacted communities; in this instance, the ESC hoped to reach members of their communities who had not historically participated in climate decision making and planning. Subcommittee members utilized their own social networks and connections to educate community members regarding the charge of the ESC and solicit feedback related to the work of the ESC and draft recommendations they had written. Conversations with Maine people interested in advancing equity considerations during

² Minutes are here: <https://www.maine.gov/future/initiatives/climate/climate-council/equity-subcommittee/past-meetings>

the implementation of Maine's Climate Action Plan were then able to take place in communities across the state. Some of these conversations included:

1. A session at Farmer to Farmer - the Maine Organic Farmers and Gardeners Association annual conference - titled "Equity, Climate and Agriculture"
2. A series of conversations with folks in the marine sector, including fishermen and islanders
3. Conversations at the Maine Public Health Association's Annual Meeting (Oct, 2021) and with their Climate member section
4. A conversation with the Aroostook Community Collaborative
5. EQUITY SUBCOMMITTEE MEMBERS TO ADD OTHER CONVERSATIONS

This is in contrast to solely asking that invested community members attend certain scheduled meetings, either online or in one central location - the ESC hosted one such virtual listening session during its October meeting - recognizing that this session could be difficult to access and unfeasible for some historically underrepresented and frontline Maine communities. By centering the feedback process in Maine communities, and utilizing the social connections and strong ties held by subcommittee members, the ESC was able to operationalize their goal of advancing procedural equity in the process of generating feedback regarding the draft recommendations.

During its November meeting, the ESC discussed all of the public feedback received to date and made suggestions for additional recommendations, as well as adjustments to their existing recommendations, which are reflected below.

Hold for January

Since February, 2021 the Equity Subcommittee has:

- Generated an equity framework for assessing strategies in Maine's Climate Action Plan, *Maine Won't Wait*
- Created shared definitions for important and often utilized terminology
- Participated in conversations about environmental justice, and how it can be understood in Maine. Subcommittee members also shared their experiences with environmental justice and what it means to them and the communities they are a part of.
- Brought conversations regarding climate change and equity into their communities to generate feedback related to draft recommendations
- Produced **X number** of initial recommendations, contained herein, to present to the Maine Climate Council regarding the advancement of equity during the implementation of Maine's Climate Action Plan

This report is the interim outcome of the ESC's work to date and serves to transmit this work for consideration by the Maine Climate Council. The ESC sees this work as the beginning of a

conversation with the Climate Council and its Working Groups, focused on setting clear equity outcomes for the programs and policies proposed within Maine Won't Wait and below; and supporting ongoing planning and implementation, with a focus on the development of equity metrics which will allow the state and its partners to monitor their impact over time.

The ESC proposes the following path forward to continue this important work, which is explored in greater detail at the conclusion of this report.

1. March 2022: kick-off presentation for all members of the MCC and its working groups regarding equity, both generally and with respect to climate change. The ESC recommends that this presentation cover topics related to diversity, equity, inclusion, and justice; as well as provide an introduction to equity metrics frameworks, to guide the proposed collaboration.
2. April - September 2022: Collaboration between ESC and MCC working groups, to:
 - a. Refine recommendations, including a focus on priority programs and actions
 - b. Identify metrics to collectively monitor equitable implementation of the recommendations in Maine's climate action plan, as is called for in the Council's charge to the ESC
 - c. Identify partners for implementation of priority recommendations, as well as any challenges or barriers to implementation that must be overcome.
3. October - December 2022: development of final report to the Climate Council, containing priority actions, implementation partners, and metrics for consideration by council

Definitions and the Equity Framework

Many of these definitions were used by the Equity Subcommittee during its deliberations, and are terms which are reflected in recommendations below.

Maine's Impacted & Vulnerable Communities - The subcommittee defines vulnerable or marginalized communities as inclusive of communities of color and indigenous communities, low income Mainers, rural and otherwise geographically isolated communities, aging Mainers, LGBTQ+ and differently abled Mainers, immigrants and seasonal workers, impacted industries, and other communities who have experienced historical and ongoing systemic discrimination and underrepresentation in state policy making.

Equity - The subcommittee has adopted an approach to equity which recognizes that equal distribution of resources (funding, pollution reduction, etc.) is not sufficient. Rather, an equitable system seeks to provide increased resources to Maine's impacted and vulnerable communities, noting that the risks and effects of climate change disproportionately fall upon

these communities. Climate policies and programs should increase wellbeing, and address root causes of inequality, not exacerbate existing burdens.

Distributive equity - The subcommittee sees distributive equity as an equitable distribution of environmental benefits and burdens. Distributive equity starts by recognizing disparities in the allocation of resources, health outcomes, the inequities in living conditions and lack of political power place frontline and impacted communities at greater risk. Distributive equity strategies target resources to adaptation and mitigation affecting the communities and populations most impacted.³

Procedural equity - Procedural equity is often referred to as equitable planning and implementation. This means that the government must partner with impacted and vulnerable communities in order to allow meaningful opportunities to participate in policy development, planning, and implementation processes. This includes, but is not limited to, creating accessible opportunities for public participation, access to information, and ensuring language access is not a barrier to participation.

Contextual or historical equity - Contextual equity draws attention to root causes and factors that contribute to social vulnerabilities and recognizes that differences in power and access can prevent some communities from receiving resources or from participating in the decision-making process.⁴ A contextual equity approach suggests that recognition of socioeconomic conditions and existing injustices is critical for designing community-based adaptation strategies.⁵

Corrective equity - Corrective equity entails recognition of the “uneven playing field” that is created for some communities as a result of pre-existing economic, social, and political inequalities, as revealed by a contextual equity approach. Further, a corrective equity approach seeks to provide solutions that will not only advance climate goals, but will contribute to righting historical and ongoing manifestations of social inequity.

Community - The subcommittee has adopted a broad and inclusive definition of community, defining it as a neighborhood, municipality, tribal nation, or effective community.

³ Vermont Climate Council, Just Transitions Subcommittee. Guiding Principles for a Just Transition; Equity and Environmental Justice Working Group (November, 2020). Equity and Environmental Justice Working Group Report, Prepared for the Governor’s Council on Climate Change.

⁴ Fraser, N. (2010). *Scales of Justice: Reimagining political space in a globalizing world*. Columbia University Press; Foster, S., Leichenko, R., Hoan Nguyen, K., Blake, R., Kunreuther, H., Madajewicz, M., Petkova, E., Zimmerman, R., Corbin-Mark, C., Yeampierre, E., Tovar, A., Herrera, C., & Ravenborg, D. (2019). *New York City Panel on Climate Change 2019 Report Chapter 6: Community-Based Assessments of Adaptation and Equity*. New York City Panel on Climate Change. <https://nyaspubs.onlinelibrary.wiley.com/doi/epdf/10.1111/nyas.14009>

⁵ Schlosberg et al., 2017

Community Resilience - Resilience can be defined as the ability of a community to function in the face of adversity, to survive, and, perhaps, even to thrive.⁶ Community resilience reflects a community's capacity to "bounce forward" after an event. While events such as hurricanes may reduce a community's resilience, strengthening social infrastructure (the number and types of organizations that help vulnerable populations) or investing in physical infrastructural improvements can increase community resilience. Resilient communities intentionally develop personal and collective capacity to sustain and renew the community, and to develop new trajectories for the communities' future.

Framework developed by the equity subcommittee for assessing each strategy outlined in the Climate Action Plan

1. Who are the most **marginalized** populations affected by each issue?
2. Does the program, practice, or policy ensure both **short- and long-term** equitable outcomes?
3. Is there adequate **access to data** understand the issue, the populations affected by it and potential ways to address it?
4. Has **public health** been fully considered?
5. What are the implications of this recommendation on **Maine's emissions**?
6. Are there barriers to **access, participation, or decision making** that have not been accounted for?
7. What **cultural or mindset considerations** are essential to the success of this recommendation?
8. Is there a way to address **historical inequities** in this recommendation?
9. If this action is taken, are the **impacts to people outside of Maine** understood and adequately factored into the recommendations?

Advancing Equity through Maine's Climate Response

The work of the ESC represents an important first step to ensure that Maine's climate strategies benefit all people in Maine. The costs of inaction on climate change will be most acutely borne by Maine's frontline communities, which are least able to recover from climate-driven disruptions. Maine's climate strategies will also create benefits, such as decreased heating costs from installing heat pumps and weatherizing homes, and new job opportunities in Maine's clean energy economy. It is imperative that climate solutions reduce harm and provide

⁶ Hobfoll, S. E., Stevens, N. R., & Zalta, A. K. (2015). Expanding the science of resilience: Conserving resources in the aid of adaptation. *Psychological Inquiry*, 26(2), 174–180. doi:10.1080/1047 840X.2015.1002377

opportunities for all Maine people. Two examples of Maine’s ongoing approaches to equitable climate action are shared below:

1. Climate change is already affecting all four corners of Maine. Emergency routes and access to some communities may be cut off by sea level rise and storm surge from increased severe weather events. When a large amount of rain falls in a short amount of time, small watersheds can flood suddenly, potentially damaging culverts, roads and bridges. Flooding also puts people, homes, drinking water, and waste systems at risk. Hundreds of statewide culverts are not designed for the expected future precipitation extremes.

In order to adapt and create resilient infrastructure and communities, it is essential to support tools that help communities to assess their vulnerability to climate risks like flooding, including the effects of social, economic and demographic vulnerabilities. Maine Won’t Wait found that many towns in Maine lack the capacity and resources to prepare for climate impacts.

Recently, the state launched the new Community Resilience Partnership, to provide grants and support to municipal and tribal governments to reduce carbon emissions, transition to clean energy, and become more resilient to climate change effects such as to extreme weather, flooding, rising sea levels, public health impacts, and more. The grants will support communities to identify and address locally important priorities, ensuring that all communities in Maine, including the smallest and most vulnerable, have access to resources and support to help them reduce emissions and prepare for the effects of climate change.

(2) Extreme temperatures caused by climate change, including high heat events, will negatively impact Maine people who are already vulnerable. The health risks associated with high temperatures significantly impact older and low-income residents, who are also less likely to be able to afford improved insulation or air conditioning.⁷ Mitigating this health risk, by providing access to improved weatherization and heat pumps, which provide both clean heating *and* cooling, represents a step towards climate equity in Maine.

⁷ Gibson, M., Petticrew, M., Bambra, C., Sowden, A. J., Wright, K. E., & Whitehead, M. (2011). Housing and health inequalities: A synthesis of systematic reviews of interventions aimed at different pathways linking housing and health. *Health & Place*, 17(1), 175–184. <https://doi.org/10.1016/j.healthplace.2010.09.011>

During Climate Week 2021, Governor Mills celebrated progress in this arena as more than 28,000 heat pumps were installed in Maine buildings in the preceding year.⁸ This represents major progress towards the Governor’s ambitious goal of installing 100,000 new heat pumps by 2025. Many of these heat pumps were installed in Maine homes using rebate incentives offered through Efficiency Maine Trust; MaineHousing also offers a heat pump program for low-income residents. Weatherizing and providing technology like heat pumps, which serve as both a low-cost heating and cooling unit, can provide cost savings and improved health impacts for those populations most vulnerable to the effects of extreme weather.

These are just two examples of climate change’s unequal effects and how Maine’s responses can identify and promote solutions which help its most vulnerable populations. Through programs like the Community Resilience Partnership, and heat pump installation for low-income Maine people, the state is working to offer solutions that support communities and individuals vulnerable to the effects of climate change, and which increase their ability to adapt.

2. Equity Targets and Actions/Recommendations for the State to Consider

Layout of the report

What follows is a series of initial equity recommendations for consideration by the Maine Climate Council, and its associated working groups. The recommendations are grouped based on association with strategies put forth by the Maine Climate Council in their Climate Action Plan, *Maine Won’t Wait*.

Broad/Top Level Equity Recommendations

The ESC identified three key themes across all conversations:

- Prioritize Maine’s most impacted and frontline communities
- Ensure economic gains from climate change mitigation and adaptation flow to communities in need of support, and do not exacerbate inequality
- Create processes that support and allow for meaningful participation by members of Maine’s most impacted and frontline communities

Beyond these three themes, the ESC identified four cross-cutting recommendations that apply to strategies from all categories.

⁸ State of Maine, Office of the Governor (September 24, 2021). For Climate Week, Governor Mills Celebrates Maine’s Progress Toward Installing 100,000 Heat Pumps by 2025. <https://www.maine.gov/governor/mills/news/climate-week-governor-mills-celebrates-maines-progress-toward-installing-100000-heat-pumps>

1. The state, through its climate communications and equity work, should seek to foster a sense of shared ownership and shared prosperity in the climate transition, and should give voice to diverse understandings of climate action and impacts.

The state recognizes, through ongoing and planned efforts, that effective climate communications and adaptation should be based in collaboration and dialogue, and should take into account stakeholders' values and experiences.⁹ The charge of the ESC is to consider the role that climate change and opportunities for climate action plays in people's lives, and recognizes that climate change is experienced differently by each person in the state. The state, in its efforts towards combatting climate change, should be clear in communicating that climate action can improve the lives of all Mainers. Diverse ways of knowing and understanding climate change and its effects on Mainers lives should be recognized as legitimate. Valuing experiential, place-based, and non scientific knowledge can bring more people into climate conversations and increase sustained engagement.¹⁰

2. All state policy, program, and other decision-making processes should seek to enable equitable participation from vulnerable and historically underserved communities. Enabling equitable participation might include:
 - a. Provide stipends to vulnerable frontline and disadvantaged community members for their time, which can help members of these communities take time off work or away from other critical activities to participate in decision making processes;
 - b. Providing transportation and childcare in order to allow overburdened Maine people to attend meetings and participate in climate decision processes
 - c. Increasing access to all programs and materials in languages other than English
 - d. Producing "plain language" guides which help explain particular decisions or decision making processes
 - e. Including representative participants of impacted groups in program co-design processes, including in the areas of climate, clean energy, and resilience/adaptation planning
 - f. Utilizing existing social networks to engage communities in state decision making, and in marketing existing programs and incentives
 - g. Adjusting meeting times and locations to enable participation by diverse populations, including allowing for ongoing virtual participation in meetings

Commented [1]: Note to readers: italics are being used to visually differentiate between recommendations and contextualization, examples, etc.

Formatting will change as this report is finalized.

⁹ <https://cbey.yale.edu/our-stories/humanistic-communications-climate-change-and-cop21-oh-my>

¹⁰ Rice, J. L., Burke, B. J., & Heynen, N. (2015). Knowing Climate Change, Embodying Climate Praxis: Experiential Knowledge in Southern Appalachia. *Annals of the Association of American Geographers*, 105(2), 253–262. <https://doi.org/10.1080/00045608.2014.985628>; Banks, J. A., Au, K. H., Ball, A. F., Bell, P., Gordon, E. W., Gutiérrez, K. D., et al. (2007). "Learning in and out of school in diverse environments," in *The LIFE Center and Center for Multicultural Education* (Seattle, WA: University of Washington), 36; Canfield, K. N., Menezes, S., Matsuda, S. B., Moore, A., Mosley Austin, A. N., Dewsbury, B. M., Feliú-Mójer, M. I., McDuffie, K. W. B., Moore, K., Reich, C. A., Smith, H. M., & Taylor, C. (2020). Science Communication Demands a Critical Approach That Centers Inclusion, Equity, and Intersectionality. *Frontiers in Communication*, 5, 2. <https://doi.org/10.3389/fcomm.2020.00002>

The process for understanding climate impacts and planning climate action should include community-driven dialogue, and members of frontline communities should be empowered to engage with state agencies and within their communities to design strategies for climate action that are focused on their priorities and concerns. A study of planning board meetings in 97 towns in Massachusetts suggests that participants in local government public engagement forums are primarily older, male, longtime residents, voters in local elections, and homeowners.¹¹ Compensation for participation in planning and outreach has been shown to increase participation and foster positive relationship growth between marginalized communities and those running planning and outreach processes.¹² For example, in late 2020 the Maine Department of Agriculture, Conservation and Forestry worked with the Resources for Organizing and Social Change to engage poor and working class people to review the Interim Report on Ending Hunger in Maine By 2030, to offer feedback on its priorities, and to offer original ideas that may be missing because of its lacking perspective from communities of people who are currently experiencing poverty, hunger and food insecurity. Critically, participants in the resulting focus groups were reimbursed for their time, as well as expenses incurred engaging in the project through stipends funded from a grant made by the Elmina B. Sewell Foundation.¹³ Other examples include the city of Austin, Texas, which paid representatives of communities that have been systematically excluded on climate-related issues to be “climate ambassadors.” The ambassadors held gatherings and interviews to discuss climate challenges, and barriers to participation. Findings from these interviews were integrated into Austin’s Climate Equity Plan.¹⁴ And during Portland, Oregon’s climate action planning process, community organizations were invited to apply for a \$4,000 grant to support an organizational representative to participate in the Climate Action Plan Equity Working Group.¹⁵ Additionally, provision of childcare services can improve accessibility of and participation in public engagement events.¹⁶

Finally, to improve access to planning and participatory processes, “go where the people are.”¹⁷ Ensuring accessibility means using places that are familiar and easily reachable for target groups. Spaces chosen for outreach events must be physically accessible, and feel welcoming to participants.¹⁸

¹¹ Einstein, K., Palmer, M., & Glick, D. (2019). Who Participates in Local Government? Evidence from Meeting Minutes. *Perspectives on Politics*, 17(1), 28-46. doi:10.1017/S153759271800213X

¹² In Rochester, NY: <https://nextcity.org/urbanist-news/entry/cities-are-looking-to-get-better-community-engagement-by-paying-for-it/>; In Richmond, VA: <https://shelterforce.org/2021/02/26/paying-community-members-for-their-time/>;

¹³ <https://drive.google.com/file/d/1WTK6M22uFfRNq3nILVDTCCCHYIOb6RGW2/view>

¹⁴ <http://austintexas.gov/page/community-climate-ambassadors>

¹⁵ <https://www.portland.gov/sites/default/files/2019-07/cap-equity-case-study-web29jul.pdf>

¹⁶ <https://nextcity.org/urbanist-news/entry/offering-childcare-at-city-meetings-may-be-key-to-diversifying-civic-engage>

¹⁷ Humm, C., & Schrögel, P. (2020). Science for All? Practical Recommendations on Reaching Underserved Audiences. *Frontiers in Communication*, 5, 42. <https://doi.org/10.3389/fcomm.2020.00042>

¹⁸ Streicher, B., Unterleitner, K., and Schulze, H. (2014). Knowledge rooms — science communication in local, welcoming spaces to foster social inclusion. *JCOM* 13, C03.

https://jcom.sissa.it/archive/13/02/JCOM_1302_2014_C01/JCOM_1302_2014_C03

The way in which information is shared is equally important to ensure equitable participation. Truly inclusive communication requires utilizing engagement strategies that recognize the voices and experiences of target communities.¹⁹ Culturally-relevant expressions, metaphors,²⁰ experiences,²¹ and storytelling approaches²² can all be employed to engage communities in science based climate action conversations. Outreach material presented in the language of the target audience is critical to effective communication.²³ Communication in the native language of a target audience yields greater participation, motivation and optimism, and leads to stronger connections to concepts in the native culture.²⁴ Wording and phrasing can also present a barrier to comprehension and participation, and thus presenting plain language versions of policy or programmatic information can improve access to information.²⁵

3. All rebates which are offered for cleaner heating, transportation, or related goods and services should be offered point of sale, vs mail-in/reimbursement. Capital expenses are a barrier to the participation of low-income Mainers.

Point of sale rebates, rather than mail in or reimbursements, allow consumers without the capital for upfront costs to access clean technologies including heat pump space and water heaters, and EVs, among others.²⁶

In Maine, the Efficiency Maine Trust employs point of sale to deliver incentives where it is safe, practical, and administratively suitable, includes all electric vehicle sales, all residential lighting (LEDs), and all measures promoted through distributors (wholesalers) such as heat pump water heaters. To make efficiency measures more accessible to low-income consumers, Efficiency Maine complements the point-of-sale technique by remitting financial incentives directly to

¹⁹ Canfield, K. N., Menezes, S., Matsuda, S. B., Moore, A., Mosley Austin, A. N., Dewsbury, B. M., et al. (2020). Science communication demands a critical approach that centers inclusion, equity, and intersectionality. *Front. Commun.* 5:2. doi: 10.3389/fcomm.2020.00002

²⁰ Taylor, C., and Dewsbury, B. M. (2018). On the problem and promise of metaphor use in science and science communication. *J. Microbiol. Biol. Educ.* 19:19.1.46. doi: 10.1128/jmbe.v19i1.1538

²¹ Djonko-Moore, C. M., Leonard, J., Holifield, Q., Bailey, E. B., and Almughyrah, S. M. (2018). Using culturally relevant experiential education to enhance urban children's knowledge and engagement in science. *J. Exp. Educ.* 41, 137–153. doi: 10.1177/1053825917742164

²² Dahlstrom, M. F. (2014). Using narratives and storytelling to communicate science with nonexpert audiences. *Proc. Natl. Acad. Sci. U.S.A.* 111, 13614–13620. doi: 10.1073/pnas.1320645111

Hunter-Doniger, T., Howard, C., Harris, R., and Hall, C. (2018). STEAM through culturally relevant teaching and storytelling. *Art Educ.* 71, 46–51. doi: 10.1080/00043125.2018.1389593

²³ Márquez, M. C., & Porras, A. M. (2020). Science Communication in Multiple Languages Is Critical to Its Effectiveness. *Frontiers in Communication*, 5, 31. <https://doi.org/10.3389/fcomm.2020.00031>

²⁴ Manzini, S. T. (2000). The influences of a culturally relevant physical science curriculum on the learning experiences of African children (Master's thesis), University of Durban-Westville, Durban, South Africa.

²⁵ Dyer, Charles R.; Fairbanks, Joan E.; Greiner, M. Lynn; Barron, Kirsten; Skreen, Janet L.; Cerrillo-Ramirez, Josefina; Lee, Andrew; and Hinsee, Bill (2013) "Improving Access to Justice: Plain Language Family Law Court Forms in Washington State," *Seattle Journal for Social Justice*: Vol. 11: Iss. 3, Article 10.

²⁶ <https://www.americanprogress.org/article/decarbonize-households-america-needs-incentives-electric-appliances/>

vendors or service providers who deliver these measures and also by making financing available. Efficiency Maine uses this direct payment approach for heat pump and weatherization. The ESC notes that this requires a registered local vendor to be available, which may be challenging in geographically isolated parts of the state for certain interventions, such as weatherization.

4. The State should establish a working group to further coordinate the provision of comprehensive social services to every vulnerable household in Maine, including weatherization services. The working group should consider the adoption of a comprehensive “Crisis to Thrive” scale and the adoption of a centralized database to enable coordinated provision of services. The state should additionally develop a one-stop intake process for the coordinated provision of social services, including heating and weatherization services.

For many people, climate change and climate action can seem like foreign concepts outside of the realm of everyday worries.²⁷ The effects of climate change, especially on marginalized populations, can manifest as job loss, housing insecurity, chronic health problems, or financial insecurity.²⁸ Managing any one of these difficult situations can be all encompassing, and the broader context of climate action can seem distant and unrelatable. Pressing concerns, including health, housing, employment, and educational worries can, and often do, supersede a perceived need to engage with climate action. Knowing this, the ESC recommends taking a holistic approach to assistance and wellness for all Maine people.

In this effort, the state and its partners should look at existing resources, such as the work of [Maine’s Community Action Agencies](#), which have adopted a comprehensive service delivery model, using the [Whole Family/Two-Generation approach](#). That effort has included the adoption of a statewide crisis to thrive scale that measures participants in a minimum of seven common domains that range from housing and home energy security to financial stability and food security. Household progress is tracked through a database that is used to measure and report outcomes to several government and funding partners including Maine DHHS and MaineHousing. That software, [empowOR](#), is utilized in other states to better network community non-profit agencies and state governments so that data is accessible and presumptive eligibility for numerous programs is better facilitated.

MaineHousing has been working with the Community Action Agencies and empowOR to deliver the Emergency Rental Assistance program. Maine DHHS and MaineHousing are also currently working to develop a single entry point for clients.

Finally, the State should coordinate with Federal elected officials and departments to advocate for better coordination of funding coming to Maine to meet the needs of individual households. Measures such as the [Two-Generation Economic Empowerment Act](#), introduced in the U.S.

²⁷ Marshall, G. (2015). *Don’t even think about it: Why our brains are wired to ignore climate change*. Bloomsbury.

²⁸ <https://storymaps.arcgis.com/stories/bff12b5b6cb742a3a6dfb454200c3797>

Senate, and others, should be further explored in an effort to better meet the needs of Mainers in a more comprehensive manner.

A. Transportation Sector

In Maine, transportation accounts for 54% of state emissions.²⁹ Decarbonizing Maine's transportation sector is therefore a key step in Maine's clean energy transition, and should be done in a way that equitably distributes benefits of cleaner transportation statewide. Clean transportation options can save people money through reduced vehicle operations and maintenance costs, and contribute to better public health outcomes by reducing air pollution.

Access to transportation systems, and especially clean transportation including electric vehicles and shared transportation including public transportation, should be accessible to all people in Maine. Rural and low-income populations in Maine are chronically unable to access affordable public transportation, or personal vehicles necessary for employment and access to essential services.³⁰ For example, 72 percent of Mainers over age 65 lack access to shared or flex-route transportation options,³¹ leaving them vulnerable to effects of inadequate transportation when they stop driving.³² Additionally, about half of Maine residents live in predominantly rural areas; while these areas tend to have high rates of vehicle ownership, rural vehicles also tend to be older, less efficient and therefore less reliable and more expensive to operate than those more commonly used in urban areas.³³ In Maine, low income populations often spend large percentages of their income paying for transportation,³⁴ which further burdens them financially. Because of this, programs which incentivize clean transportation must center equity, and prioritize the needs of disadvantaged communities.

Equitable clean transportation programs can not only improve climate outcomes, they can also empower and improve the lives of communities in Maine. The ESC believes that low income residents require, and should have access to, additional grants, rebates, or loans to be able to buy a new electric car. Furthermore, renters should be able to buy an electric vehicle and have a place to charge their vehicle overnight. School districts should purchase cleaner school buses,

²⁹ https://www.maine.gov/future/sites/maine.gov.future/files/inline-files/MaineWontWait_December2020.pdf

³⁰ Mullen, C., & Marsden, G. (2016). Mobility justice in low carbon energy transitions. *Energy Research & Social Science*, 18, 109–117. <https://doi.org/10.1016/j.erss.2016.03.026>

³¹ <https://www.maine.gov/mdot/planning/docs/FinalStrategicPlan.pdf><https://www.maine.gov/mdot/planning/docs/FinalStrategicPlan.pdf>

³² <https://www.themainemonitor.org/the-drive-toward-vehicle-electrification-in-maine/>

³³ https://digitalcommons.library.umaine.edu/mcspc_transport/3/

³⁴ Marcantonio, Richard, Aaron Golub, Alex Karner, and Louise Nelson Dyble. 2017. "Confronting Inequality in Metropolitan Regions: Realizing the Promise of Civil Rights and Environmental Justice in Metropolitan Transportation Planning." *Fordham Urban Law Journal* 44: 1017–77.

and need additional funding and support to do this. This is especially important because children are more vulnerable to health impacts, such as asthma, caused by bad air quality.³⁵ Finally, the state should invest in better, low carbon, public transportation and safer places to bike, which is especially important for Mainers who don't own a car.

1. The state should explore opportunities to make clean light duty vehicle purchase and ownership affordable for low income disadvantaged Mainers. Specific suggestions include:
 - a. Assess the feasibility of a loan loss reserve program pilot for qualified-low income customers buying high efficiency vehicles or ZEV/PHEVs (DOT, EMT).

Loan Loss Reserve (LLR) programs provide loan loss coverage to financing partners such as local and regional banks and credit unions. LLR programs, often used in clean energy financing, are a form of credit enhancement that can be constructed to offer below-market-rate terms to increase participation by low income consumers, who often have poor or limited credit to access financing of a vehicle. If a borrower defaults on a loan, the loan loss reserve will reimburse the lender, up to an agreed amount of risk sharing with the private lender.

- b. Assess the feasibility of providing a rebate/feebate for, or reduction of, the excise tax levied on new and used electric and plug-in vehicles for qualified low-income vehicle owners (BMV).

This type of incentive has been successfully implemented in other states. In 2019, Washington state implemented a sales and use tax exemption for new or used EVs, clean alternative fuel or hybrid vehicles valued at less than \$45,000 (new) or \$30,000 (used).³⁶ The exemption is set to expire on July 30, 2025. In New Jersey, ZEVs sold, rented or leased are exempt from the state sales and use tax.³⁷ The sales tax exemption does not apply to hybrid electric vehicles, and only applies to vehicles which are certified pursuant to the California Air Resources Board zero emission standards for the model year.³⁸

- c. EMT, in partnership with GEO, MaineHousing, and DHHS, should consider expanding access for low-income Mainers across all clean transportation and clean heating incentive programs to include any household or individual participating in any state or federal means-tested program.

By rule, EMT defines a "low-income" household as one "that has qualified at any time in the prior 12 month period to receive assistance through any state or federal program in which low income and/or limited assets are criteria for eligibility." While this definition is sufficiently broad

³⁵ <http://www.ehhi.org/reports/diesel/diesel.pdf>

³⁶ Washington State Department of Revenue.

https://dor.wa.gov/sites/default/files/legacy/Docs/Pubs/SpecialNotices/2019/sn_19_CleanAltHybridExmpt.pdf

³⁷ <https://www.ncsl.org/research/energy/state-electric-vehicle-incentives-state-chart.aspx>

³⁸ <https://www.drivegreen.nj.gov/dg-sales-use-tax-exemption.html>

to satisfy the recommendation, EMT continues to work with state agencies, municipalities and others to find administratively efficient ways to verify eligibility while also maintaining confidentiality. To date, EMT has principally relied on privileged access to the LIHEAP list as one means of validating low-income eligibility. Another means is mailing out postage-paid, business reply cards to all addresses on the DHHS list and presuming validation of eligibility for addressees who mail those cards back to EMT. EMT is working with DHHS to develop additional methods for validating eligibility of low-income individuals

While LIHEAP eligibility is inclusive of some low and very low income Mainers, eligibility for LIHEAP does not represent the spread of underserved Maine people who are above the federal poverty level, but are unable to meet household expenses.³⁹

- d. EMT should study additional barriers for low income and disadvantaged Mainers to access clean vehicle rebates.

The ESC has identified barriers to accessing clean vehicle rebates including language barriers, and lack of financial ability to access EVs. Through targeted conversations with both low income and disadvantaged drivers and the organizations who serve/represent them, EMT should seek to understand and address these barriers, and to identify others.

While increasing ownership of high efficiency vehicles and ZEV/PHEVs has the potential to contribute to limiting emissions in Maine, equitable access to high efficiency vehicles and ZEV/PHEVs remains a challenge. Over the long term, owning a high efficiency vehicle or ZEV/PHEV reduces a household's spending on transportation, but the up-front-cost of a new or used electric vehicle, as well as costs associated with vehicle registration and charging, may make these vehicles inaccessible to low-income Mainers. Efficiency Maine's "EV Accelerator" program offers all buyers \$2,000 at purchase on new fully electric vehicles and \$1,000 on new plug-in hybrids, while also offering a higher rebate of \$5,500 and \$4,000 respectively for new vehicles as well as a \$2,500 rebate on used BEV or PHEVs for low income consumers. Of the more than 1,200 rebates given since the program launched in 2019, however, less than a handful have actually gone to low income vehicle buyers.

Additionally, access to information about incentive programs can often be a barrier for low income and disadvantaged people. Improved access requires the sharing of relevant information to reach people in multiple and culturally appropriate ways. Underserved communities can often benefit the most from the cost-saving benefits of EVs, and in some cases could also benefit from the clean air benefits of EVs.⁴⁰

2. The state should increase access to EV charging in, or adjacent to, tenant-occupied spaces, including low-income housing and senior citizen housing. This might include

³⁹ Fass, S. (2009). *Measuring Poverty in the United States*. National Center for Children in Poverty. Retrieved November 9, 2021, from <https://www.nccp.org/publication/measuring-poverty-in-the-united-states/>

⁴⁰ Pinto de Moura, Maria Cecilia, and David Reichmuth. "Inequitable Exposure to Air Pollution from Vehicles in the Northeast and Mid-Atlantic." Union of Concerned Scientists, 2019. www.ucsusa.org/northeast-air-quality-equity

offering a targeted charging grant program for landlords/tenants, exploring opportunities for EV ready building codes in all rental housing, and studying utility make ready programs or rate design as a source of funding for these improvements.

Access to charging that is reliable, convenient, and affordable is critical to enabling EV ownership. Since an estimated 80% of charging occurs at home,⁴¹ rental housing tenants often lack access to charging infrastructure due to a lack of dedicated off-street parking, an inability to afford the expense of charger installation, or a landlord's unwillingness to install a charger. Some opportunities to supply renters with improved access to EV charging might include right-of-way charging, which involves installing chargers in parking located in the public right-of-way, such as along street curbs, or alleys; multi-use parking arrangements which promote installation of EV chargers in parking lots that are used for workplaces, retail locations, public parking, etc. during the day, and could serve residential users at night when lots would otherwise be empty; and make ready programs, in which the Maine Public Utilities Commission (PUC) approves investments in the upgrades required to make the site ready for the customer to install an EV charger, and the site host is primarily responsible for investing in the charger itself.⁴² One example of a program to support EV charger deployment is the Burlington Electric Department (BED)'s EV program, which deploys EV charging stations for free to qualifying multi-unit dwellings. BED will offer an additional \$500 per property to help cover the installation costs of each station if the owner agrees to make it publicly available from 9am – 5pm.⁴³

In Maine, the Efficiency Maine Trust has identified multi-unit dwellings as a priority charging segment in their upcoming [2023-2025 Triennial Plan](#), and has an [existing grant opportunity](#) available to partially fund charging stations in the same housing types. At the same time and directed by legislation, the PUC [is investigating](#) utility rate design and associated programs, including a make-ready program proposal, to help ensure affordable EV charging. Finally, the mechanism to require EV charging stations to be installed in MaineHousing funded multi-family housing is the Qualified Allocation Plan (QAP). MaineHousing has held three stakeholder meetings in preparation to draft a new QAP early in Q1 2022.

3. The Department of Education, DEP, DOT, and local school districts, should study and recommend clean vehicle alternatives for the school bus fleet in the state. Clean vehicle incentives should prioritize funding in disadvantaged school districts.

School buses are significant investments, particularly for rural Maine communities. Funding, such as grants and subsidies, as well as technical assistance, can help school districts achieve their clean transportation goals – while resulting in positive health outcomes for students.

⁴¹ Office of Energy Efficiency & Renewable Energy. (n.d.). Charging at Home. United States Department of Energy. Retrieved from: <https://www.energy.gov/eere/electricvehicles/charging-home>

⁴² https://cadmusgroup.com/wp-content/uploads/2021/05/USDN_EVChargingAccess_UpdatedReport_Final-11.18.20-002.pdf

⁴³ <https://blog.evmatch.com/free-ev-charging-stations-from-burlington-electric-department-plus-what-other-electric-utilities-can-learn-from-our-partnership/>

The emissions from diesel fuel that school bus fleets generally rely on can have serious health impacts on children. The US EPA notes that

“older, more polluting school buses can lead to significant health risks for students who typically ride these buses for one-half to two hours a day. Children are more susceptible to air pollution than healthy adults because their respiratory systems are still developing and they have faster breathing rates. Asthma, which affects 6.3 million American school children, is the most common long-term childhood disease in America, making newer, cleaner buses an urgent priority.”⁴⁴

Clean vehicle incentives should prioritize funding in disadvantaged school districts, both those without adequate financial resources to afford cleaner buses and those which may have been disproportionately impacted by pollution and climate change.⁴⁵ Examples of targeted funding include the recent [American Rescue Plan funding](#) for electric school buses in disadvantaged school districts; while 20 Maine school districts were eligible, none had buses of sufficient age, usage, or purchase plan records in vehicle inventories or annual reports to qualify for replacement under this time-limited program.

The Maine Department of Education School Bus Purchase Program provides subsidies to help public schools purchase new school buses. The program funds about \$9M annually, allows zero- and low-emission school bus purchase, and confirmed two electric school buses to be purchased during fiscal year 2022. Other clean school bus programs include Maine DEP’s administration of the EPA’s Clean School Bus program, and grants awarded through the Diesel Emissions Reduction Act, which together have replaced over one hundred school buses since 2004, including purchasing 14 CNG school buses for Portland Public Schools. The Maine Clean School bus program assists schools in reducing student exposure to harmful diesel emissions by promoting no-idling, alternative fuels, and accelerated fleet turnover. In addition, seventy-two school bus replacements in Maine, including 46 clean diesel, 25 propane and 1 electric were also funded via the Volkswagen (VW) Diesel Emissions Settlement, of which Maine received just over \$21 million to offset existing NOx emissions. Finally, there are significant federal funding opportunities in the recently passed Infrastructure Investment and Jobs Act, including at least \$2.5 billion for zero emissions school buses to be awarded over the next 5 years.⁴⁶

4. The state and its partners should evaluate ways to incentivize the use of shared and active transportation, such as transit and shared rides as well as bikeshare programs. Options might include:

⁴⁴ <https://www.epa.gov/dera/making-school-buses-cleaner>

⁴⁵ <https://securefutures.solar/electric-buses-are-coming-soon-make-sure-they-dont-run-on-dirty-energy/>

⁴⁶ <https://stnonline.com/news/infrastructure-funds-for-school-buses-remain-unchanged-in-house-passed-bill/>

- Maine DOT, in partnership with DHHS, DOL, DECD and others, should pilot innovative clean transit programs in disadvantaged communities (ie: non-drivers, disabled, older adults, people in recovery).
- DOT, EMT, and other state agencies should consider designing a targeted e-bike pilot for vulnerable and low income Mainers.
- Maine DOT should update the Maine Complete Streets policy to further support active transportation and transit, while addressing existing safety concerns associated with the use of non-car transportation and for users with mobility aids. In this work, Maine DOT should build on the existing support it already provides to communities, such as conducting safety studies which assess the needs of all road users.
- Through its process to update Maine’s Strategic Vision of Transit, Maine DOT should study opportunities for shared rides using existing transportation programs, particularly those which might be underutilized. Maine DOT should also investigate additional types of trips that Mainers would like to be able to take using transit, as well as the barriers and challenges facing non drivers, including working with DHHS to understand health considerations for those who aren’t driving.
- Maine DOT should study the total cost of operations for electric ferries, and its impact on future customer prices, as part of its commitment to considering hybrid and fully electric ferries during all new ferry purchases
- Maine DOT should establish public educational content about public health, shared rides, and transit to address rider hesitancy

The ESC recognizes an important intersection and shared priorities between public health and mobility, and seeks to ensure that safe, affordable, and reliable access to active transportation is prioritized. Public transit and active modes of transportation in cities are key for improving health outcomes, preventing noncommunicable diseases and injuries, and reducing traffic-related emissions.⁴⁷ Since the COVID-19 pandemic began, cities across the country have seen a decrease in use of shared transportation and towards single occupant vehicle transportation.⁴⁸ A shift towards more single occupancy vehicles, especially in cities in Maine, would yield increased air pollution and consequent negative health effects, especially for those already at risk for respiratory illness.⁴⁹

As an age-friendly state, Maine engaged multiple stakeholders and community leaders throughout 2020 in drafting an Age-Friendly State Plan.⁵⁰ This plan identifies shared and innovative public transportation as a key component of quality of life for older Maine people, reducing social isolation, increasing access to goods and services, and allowing Mainers to age in communities of their choice. The plan additionally notes that mobility options need to include

⁴⁷ https://academic.oup.com/eurpub/article/31/Supplement_3/ckab164.034/6405366

⁴⁸ <https://www.theatlantic.com/ideas/archive/2020/06/fear-transit-bad-cities/612979/>

⁴⁹ <https://www.theatlantic.com/ideas/archive/2020/06/fear-transit-bad-cities/612979/>

⁵⁰ <https://www.maine.gov/dhhs/sites/maine.gov.dhhs/files/inline-files/Age-Friendly-State-Plan.pdf>

infrastructure to provide walking or wheelchair access to downtown locations, as well as support for motor vehicle transport, and that the development of new partnerships can help ensure that Mainers know how to access transportation services in their communities.⁵¹

For Maine's island communities, ferries represent critical infrastructure that is essential to all residents' ability to access work, and essential services.⁵² The timing, cost, and availability of ferries are all key aspects of ensuring equitable transportation services are available to island residents. This can be secured via investments in new, clean ferries for Maine's island communities.

To improve equitable access to clean active transportation options including e-bikes and scooters, programs that target specific key populations can be implemented. Examples of this type of program can be found in cities including Durango, CO and Detroit, MI have recently introduced pilot programs for low income workers (Durango)⁵³ and workers during the COVID-19 pandemic (Detroit).⁵⁴

5. The state should encourage employers to maintain remote access capabilities, and should provide associated funding to those low-income Mainers who have the ability to work remotely but not the necessary broadband, technology, infrastructure, or space; this may include piloting public shared working spaces and access to childcare services.

Remote work has the possible effect of reducing vehicle miles traveled, thus reducing emissions. Access to reliable broadband continues to be a barrier to remote work, especially for those in the Northern and Eastern parts of the state.⁵⁵ Steps taken to reduce this barrier include the creation of the Maine Connectivity Authority, which will invest over \$250 million worth of funds from the American Rescue Plan Act and the recently passed Infrastructure Investment and Jobs Act in broadband expansion in Maine, with goals related to affordability, speed, and equity.

This builds on Maine's High-Speed Internet Infrastructure Bond Issue, passed in July, 2020, which authorizes the issuance of \$15 million in general obligation bonds to fund projects which will expand broadband access for residents in underserved and unserved areas.⁵⁶

In addition, the Department of Economic & Community Development (DECD) has a coworking development fund, which is a grant opportunity for those interested in creating co-working spaces.⁵⁷ DECD partners with collaborative workspace businesses who are serving key roles in their local communities, creating increased opportunities for co-working spaces in Maine with

⁵¹ <https://www.maine.gov/dhhs/sites/maine.gov.dhhs/files/inline-files/Age-Friendly-State-Plan.pdf>

⁵² <https://www.islandinstitute.org/2021/10/25/a-lifeline-for-island-communities/>

⁵³ <https://www.greencarcongress.com/2021/05/20210510-nrel.html>

⁵⁴ <https://www.numo.global/news/detroit-new-mobility-pilot-provides-essential-workers-e-bikes-and-e-scooters-covid-19>

⁵⁵ <https://muninetworks.org/content/mainers-commit-broadband-expansion-15-million-internet-bond-issue>

⁵⁶ <https://muninetworks.org/content/mainers-commit-broadband-expansion-15-million-internet-bond-issue>

⁵⁷ <https://www.maine.gov/governor/mills/sites/maine.gov.decd/files/inline-files/Coworking%20Grant%20Announcement%20and%20Guidelines%20copy.pdf>

reliable broadband connection. In spite of this, it remains difficult to remedy a lack of home office space and technology challenges for remote employees.

B. Buildings Sector

Housing and climate are inherently and inextricably linked — how we live affects the climate, and the climate affects how - and where - we live. This is especially important in Maine, as heating, cooling, and lighting of buildings are responsible for almost one third of the state's greenhouse gas emissions.⁵⁸ Maine's strategies to reduce emissions by installing heat pumps, weatherizing homes and businesses will also reduce household costs. Heating and cooling of older, poorly insulated homes causes energy inefficiency, and can create health problems for inhabitants.⁵⁹ Individuals who live in unhealthy, inefficient housing stock are more likely to face health issues associated with their living situation, and are more likely to face income barriers to participation in energy efficiency upgrades.⁶⁰ In Maine, these populations are also often low income, rural, and facing other climate change related challenges in day to day life.⁶¹ Creating incentive structures and programs related to housing that specifically benefit disadvantaged populations can improve both health and energy outcomes.⁶²

Many Maine residents are renters, and renters often lack the ability to upgrade the homes they live in. For this reason, the ESC recommends that programs and incentives should aid landlords in participating in clean building, heating, and renewable energy upgrades. The state should also ensure that, when income eligible residents take advantage of clean building upgrades, energy bill assistance transfers seamlessly between energy sources. In addition, many Maine residents who are income eligible for bill assistance do not access it; the state should work to ensure that everyone who needs assistance can get it. And finally, in order to effectively promote weatherization upgrades and help disadvantaged communities access clean building funding, the state should conduct an assessment of housing stock.

1. The state, working with EMT, Maine Housing, and others, should consider developing pilot programs and incentives targeted at the adoption of clean building, heating, and

⁵⁸ https://www.maine.gov/future/sites/maine.gov.future/files/inline-files/MaineWontWait_December2020.pdf

⁵⁹ Rao, M., Prasad, S., Adshead, F., & Tissera, H. (2007). The built environment and health. *The Lancet*, 370(9593), 1111–1113. [https://doi.org/10.1016/S0140-6736\(07\)61260-4](https://doi.org/10.1016/S0140-6736(07)61260-4)

⁶⁰ Ross, L., Dreihobl, A., & Stickles, B. (2018). *The High Cost of Energy in Rural America: Household Energy Burdens and Opportunities for Energy Efficiency*. American Council for an Energy Efficient Economy. <https://www.aceee.org/sites/default/files/publications/researchreports/u1806.pdf>

⁶¹ Winner, B., MacDonald, S., Smith, L., & Juillerat, J. (n.d.). *Bridging the Rural Efficiency Gap: Expanding access to energy efficiency upgrades in remote and high energy cost communities*. Island Institute. www.islandinstitute.org/bridging-rural-efficiency-gap

⁶² Ross, Lauren, Ariel Dreihobl, and Brian Stickles. "The High Cost of Energy in Rural America: Household Energy Burdens and Opportunities for Energy Efficiency." American Council for an Energy Efficient Economy, 2018. <https://www.aceee.org/sites/default/files/publications/researchreports/u1806.pdf>.

renewable energy solutions by landlords, particularly in rural and low-income communities.

Residential housing stock is the clearest example of how buildings can affect the health and wellbeing of community members, so this is where the subcommittee focused its recommendations. Housing stock that is inefficient presents both financial and health consequences to residents⁶³ who are often low income and/or live in rural communities.⁶⁴ Incentives for landlords to upgrade to more efficient and renewable solutions can help improve the quality of housing for renters in Maine. EMT's newest Triennial Plan has identified a priority of working with landlords of properties containing multiple units.⁶⁵

2. The state should ensure that heating assistance eligible residents can seamlessly transfer heating assistance payments from fossil sources to electricity bills when participating in heat pump installations.

Heat pumps deliver heat to a home at a lower operating cost than oil or propane heating systems, thus leading to an overall decrease in energy bills. However, for those low-income Mainers who rely on heating assistance provided through LIHEAP, the process of switching assistance payments between heating sources during the heating season can be prohibitive. Those who are eligible for heating assistance should be able to adopt efficient heating technology, like heat pumps, without fear that their assistance payments will either not transfer easily between fuel sources or offer the same level of benefit for a new heating source.

3. The state, in partnership with MHSA, CAP agencies, EMT, tribal communities, and others, should conduct an assessment to identify:
 - a. those communities and individuals with the poorest, least healthy, least efficient housing stock in the state
 - b. vulnerable homeowners who are at increased risk of losing their homes due to inability to access weatherization/home retrofit services or other energy benefits, such as owners of older (20+ year) mobile homes and structurally unfit older homes
 - c. the number of unhoused or inadequately housed Maine people, including those in structurally unfit homes to help determine necessary investment in housing stock across the state

⁶³ Gibson, M., Petticrew, M., Bamba, C., Sowden, A. J., Wright, K. E., & Whitehead, M. (2011). Housing and health inequalities: A synthesis of systematic reviews of interventions aimed at different pathways linking housing and health. *Health & Place*, 17(1), 175–184. <https://doi.org/10.1016/j.healthplace.2010.09.011>

⁶⁴ Winner, B., MacDonald, S., Smith, L., & Juillerat, J. *Bridging the Rural Efficiency Gap: Expanding access to energy efficiency upgrades in remote and high energy cost communities*. Island Institute. www.islandinstitute.org/bridging-rural-efficiency-gap

⁶⁵ <https://www.energymaine.com/triennial-plan-v/>

The state should prioritize the allocation of resources for building upgrades and weatherization services for those communities, individuals, and housing types determined most vulnerable. For those homes which don't qualify for weatherization or other repair services, due to the age, type, or state of disrepair of the home, the state should assess opportunities which allow associated homeowners to access safe and efficient housing or which maintain existing housing for these individuals via program exceptions. Special attention should be paid to consideration for allowances to retrofit larger properties for zoned heating/living, for changeover of heating systems to alternative energy options, and for the opportunity to expand the number of mobile home replacements by broadening program guidelines and expanding funding.

Maine last conducted a comprehensive housing assessment in 2009; this type of reporting is essential as the state faces challenges with housing access, pricing, and age of housing stock.⁶⁶ While current resources such as Maine Housing's Affordability Indexes for Homeownership⁶⁷ and Rental properties⁶⁸, and the Maine Development Foundation's Measure of Growth report⁶⁹ provide annual updates that provide valuable insights to Maine's housing market and broader economic indicators, providing adequate, healthy, and weatherized housing for renters across Maine should be a priority for the state.

The lack of supply in both the ownership and rental housing markets has driven prices up to unprecedented levels statewide, creating significant hardships for both families and Maine's economy. The median sales price statewide has risen to \$310,000, up about 15 percent from this time last year.⁷⁰ These rapid price gains have been fueled in part by an increase in out-of-state buyers who are moving to Maine with the intention of working remotely at their existing jobs.⁷¹ The vastly increased competition for owned homes has driven many would-be purchasers into the rental market, which was already out of balance due to an inadequate supply of quality units.⁷² The most recent available data shows that Maine has the 9th largest gap in the country between the average renter's wage and the cost of a typical two-bedroom rental home.⁷³

As the number of households seeking to rent has increased, and the number of units available to rent has stayed relatively static, prices have predictably risen. That has led to challenges for

⁶⁶ <https://mainehousingcoalition.org/wp-content/uploads/2016/02/Housing-Affordability-in-Maine-Final.pdf>

⁶⁷ <https://www.mainehousing.org/policy-research/housing-data/housing-affordability-indexes>

⁶⁸ <https://www.mainehousing.org/policy-research/housing-data/affordability-indexes>

⁶⁹ <https://www.mdf.org/economic-policy-research/measures-of-growth-report/>

⁷⁰ <https://bangordailynews.com/2021/10/21/business/september-home-sales-in-maine-declined-as-prices-continued-sharp-rise/>

⁷¹ <https://www.mainepublic.org/show/maine-calling/2021-06-21/moving-to-maine-influx-of-people-from-other-states-settling-in-maine-during-the-pandemic>

⁷² <https://www.centralmaine.com/2021/06/26/our-view-maines-housing-shortage-will-survive-the-pandemic/>

⁷³ <https://reports.nlihc.org/or>

families and individuals not just in the Portland area, but in many areas across the state, including southern York County,⁷⁴ Lewiston/Auburn,⁷⁵ and the Midcoast.⁷⁶

Maine also has some of the oldest housing stock in the country with 23% of homes built before 1940, and the fifth highest per capita energy expenditure in the country.⁷⁷ Older homes and mobile homes are often less energy efficient than newer homes,⁷⁸ and across the United States, residents of mobile homes spend 70% more per square foot on energy than those living in site-built homes.⁷⁹ These high energy expenditures are often compounded by the conditions of poverty which make accessing services more difficult. Barriers to weatherization are often also health and safety hazards for inhabitants - structural damage, roof issues, mold, pests, and unsafe electrical wiring can all be causes of application deferral.⁸⁰

An example of a more comprehensive approach to supporting those seeking to gain access to weatherization programs comes from Delaware. The Delaware Pre-Weatherization Program (Pre-WAP) serves customers who would otherwise be deferred by WAP due to the condition of the home. Many potential WAP customers cannot afford the repairs that would be required to be eligible for the program, and therefore do not receive WAP assistance. By participating in this program, however, customers gain funding for repair of structural issues. The Pre-Weatherization Program will inspect homes, hire contractors, schedule repair work, and perform a quality assurance post-inspection, then re-admit these units into WAP.⁸¹

An additional example of incentives for mobile home replacement comes from Vermont, where the Champlain Housing Trust offers a specific low-interest loan product for low-income Vermonters looking to replace their unfit homes with newer, energy efficient models.⁸²

⁷⁴ <https://www.seacoastonline.com/story/news/local/2021/07/22/york-county-maine-homes-unaffordable-working-class-families/8040410002/>

⁷⁵ <https://www.sunjournal.com/2021/09/19/housing-shortage-high-rents-vex-lewiston-auburn-region/>

⁷⁶ <https://bangordailynews.com/2021/09/12/news/midcoast/desperate-for-affordable-housing-two-midcoast-communities-look-to-zoning-for-help/>

⁷⁷ Winner, B., MacDonald, S., Smith, L., & Juillerat, J. . *Bridging the Rural Efficiency Gap: Expanding access to energy efficiency upgrades in remote and high energy cost communities*. Island Institute.

www.islandinstitute.org/bridging-rural-efficiency-gap <https://www.islandinstitute.org/wp-content/uploads/2021/03/Bridging-the-Rural-Efficiency-Gap-final-report.pdf>

⁷⁸ NMR Group, Inc. 2015. "Maine Single-Family Residential Baseline Study." Reports | Efficiency Maine. September 14. Accessed October 15, 2018. <https://www.energymaine.com/docs/2015-Maine-Residential-Baseline-Study-Report-NMR.pdf>.

⁷⁹ Ross, Lauren, Ariel Drehobl, and Brian Stickle. 2018. *The High Cost of Energy in Rural America: Household Energy Burdens and Opportunities for Energy Efficiency*. July. Accessed August 6, 2018. <http://aceee.org/research-report/u1806>

⁸⁰ https://mostpolicyinitiative.org/wp-content/uploads/2021/10/MOST_WX_report_2021.pdf

⁸¹ <http://www.dnrec.delaware.gov/energy/information/otherinfo/Documents/EEAC/2020-01-08/EEAC%202020-2022%20Energy%20Efficiency%20Plans%2020200108.pdf>

⁸² <https://vermodhomes.com/affordability/>

Currently, MaineHousing provides data regarding housing characteristics of homes across Maine by county and town.⁸³ This information could be mobilized towards a targeted assessment of poor housing stock in the state, especially when considered with demographic information. By identifying communities and individuals in need of upgrades and weatherization services, the state and its partners can more effectively target energy efficiency and weatherization upgrades, thus reducing both emissions, costs of payment for energy, and health burdens.

4. Recognizing that some low-income Maine people whom are eligible for weatherization assistance or energy bill assistance including LIHEAP are currently not receiving it, and that the coordinated provision of weatherization services in households which receive energy bill assistance can decrease the overall energy burden of the household and reduce reliance on subsidies, the state, in partnership with EMT, OPA, MSHA, municipalities, and other partners, should:
 - a. Publish a baseline assessment of the number of homes which need weatherization assistance, and should develop a plan/coordinated resources to ensure that all households which receive heating and other energy bill assistance have access to retrofit, weatherization and other energy demand reduction services.
 - b. Identify and address access barriers in vulnerable populations who are eligible for LIHEAP or other energy benefits but who are not currently accessing those benefits. The ESC identified that such barriers might include linguistic isolation, literacy, and challenges related to understanding the application process, amongst others.
 - c. Assess opportunities for improvement in the administration of LIHEAP funding, including barriers to total expenditure of funds each year. These barriers might include access to contractors, and the ability to fund year-round administrative positions in CAP agencies, amongst others.

A baseline assessment of the homes in need of weatherization could be generated via the reporting suggested by the prior recommendation. This type of reporting would allow for a more comprehensive and holistic understanding of the resources necessary to support homeowners and renters in securing access to programs for both weatherization and clean energy updates. This type of holistic approach to assistance with both weatherization and energy efficiency has been adopted in Connecticut, which has set a goal of weatherizing 80 percent of homes at all income levels by 2030 and ensuring equitable access to energy efficiency and solar energy for all households.⁸⁴ A study of Missouri weatherization program access found that a lack of

⁸³ <https://www.mainehousing.org/policy-research/housing-data>

⁸⁴

https://betterbuildingsolutioncenter.energy.gov/sites/default/files/CS_CTs%20Efforts%20to%20Scale%20Up%20ERE%20LI%20Homes_FINAL_1.pdf

interaction between organizations promoting weatherization and LIHEAP offices created conditions where information for target populations was not sufficiently transparent.⁸⁵

Populations who have been historically marginalized or excluded from access to assistance programs may require additional outreach in order to enroll. Barriers including uncertainty about eligibility, lack of awareness of programs, and perceived difficulty in the application process, have kept eligible low income people from accessing heating and weatherization assistance.⁸⁶ Improved outreach efforts could include heating assistance and weatherization video testimonials⁸⁷ and fliers or brochures promoting integrated heating assistance and weatherization programs⁸⁸ in an array of languages, targeted ads, social media advertising, or transit and outdoor ads.⁸⁹ The U.S. Office of Community Services has also recently released a list of recommended actions for improved outreach to potential LIHEAP eligible households.⁹⁰ A report by the Department of Health and Human Services with the Administration for Children and Families looks specifically at strategies for outreach to families living in rural or remote areas, which is highly relevant in Maine.⁹¹

MaineHousing is in the planning stages for focus groups of HEAP households to be conducted early in 2022, to provide needed feedback to improve the program from those who use it. MaineHousing additionally meets with the Energy Council, comprised of the Community Action Agencies (CAA) that administer heating and weatherization programs, on a regular basis to discuss ways to break down barriers to access heating assistance. Among the steps already taken is contracting with translation services of materials and applications for high volume programs. Each CAA has an outreach plan that may also include some include video testimonials.

Finally, the Maine LIHEAP benefit matrix already provides the highest benefit to households with the greatest need; on average, it covers over 40% of a households heating costs. The application process for HEAP prioritizes households that have members that are children, elderly or suffer from hypothermia. Maine consistently spends down LIHEAP funds within the program guidelines; if the heating benefit is not fully expended, the funds are rolled over to the following program year and may be used for weatherization.

⁸⁵ https://mostpolicyinitiative.org/wp-content/uploads/2021/10/MOST_WX_report_2021.pdf

⁸⁶ https://mostpolicyinitiative.org/wp-content/uploads/2021/10/MOST_WX_report_2021.pdf

⁸⁷ <http://www.mocaonline.org/Weather%20documents/Ed&Nancy.mp4>

⁸⁸ "Weatherization is a win-win for Miltona man, Minnesota," Minnesota Commerce Department

⁸⁹ https://mostpolicyinitiative.org/wp-content/uploads/2021/10/MOST_WX_report_2021.pdf;

<https://www.hswsolutions.com/work/featured-projects/fuel-assistance-campaign/>

⁹⁰ https://www.acf.hhs.gov/sites/default/files/documents/ocs/TTA_LIHEAP_Grant%20One-Pager_093021.pdf

⁹¹ <https://childcareta.acf.hhs.gov/sites/default/files/public/strategies-outreach-series-strategies-for-outreach-families-living-rural-remote-areas-eng.pdf>

5. The state should collaborate with municipalities across the state to provide increased access to (and coordination of) shared services for building code development and enforcement, as well as increased training opportunities for builders/contractors, architects/designers, and local officials.

Energy efficiency standards are included in all building codes regulating new construction in Maine. It is important to extend access to this information to all building trades and professionals involved in design, equipment specifications, construction, and municipal code enforcement. Maine is experiencing a lack of municipal employees, including code enforcement officers, which can cause delays in building and construction, among other issues. To deal with this shortage, some municipalities have taken measures including “leasing” code enforcement officers from neighboring towns. Others take advantage of qualified Third-Party Inspectors (TPI), as allowed under Maine law. Further, access to training for all involved in the planning and building process should be increased. Efficiency Maine hosted a number of trainings regarding the International Energy Conservation Code (IECC), and best practices for meeting the Maine Uniform Building and Energy Code (MUBEC), which governs building construction in Maine.⁹² Improved training can create conditions for easier implementation of the new codes, which can prevent hold ups of necessary construction.

6. Maine Housing should incentivize or require, as appropriate, the construction and renovation of affordable and available housing which meets the standards or Enterprise Green Community, Passive House, or comparable standards.

Often, new efficient construction is outside of the price range accessible for low income populations. However, living in green housing is associated with improved health outcomes, as well as decreased spending on energy bills⁹³. By providing incentives, where appropriate, for construction of efficient housing for low income communities, this recommendation seeks to improve equitable access to housing options that can improve both health and financial outcomes for residents.

In 2021, Efficiency Maine Trust launched a pilot project to provide incentives for multifamily affordable housing built to Passive House standards.⁹⁴ And in Vermont, an Efficiency Vermont program works on identification of effective integration of energy efficiency services during the predevelopment and development phases of affordable multifamily housing projects, provides support to private multifamily property owners to integrate energy efficiency into long-term

⁹² <https://www.efficiencymaine.com/efficiency-maine-and-maines-office-of-state-fire-marshal-offer-training-on-changes-to-2015-international-energy-conservation-code/>

⁹³ Colton, M. D., Laurent, J. G. C., MacNaughton, P., Kane, J., Bennett-Fripp, M., Spengler, J., & Adamkiewicz, G. (2015). Health Benefits of Green Public Housing: Associations With Asthma Morbidity and Building-Related Symptoms. *American Journal of Public Health, 105*(12), 2482–2489. <https://doi.org/10.2105/AJPH.2015.302793>

⁹⁴ https://www.efficiencymaine.com/docs/ED-Report_2021-09-30.pdf

capital improvement planning, and integrates an income eligible adder incentive on qualifying new construction projects.⁹⁵

At the federal level, through the Low-Income Housing Tax Credit (LIHTC) program, U.S. states are granted federal funding to leverage investment in affordable rental housing. In Maine, this is also supplemented with new Maine Affordable Housing Tax Credits allocated through MaineHousing.⁹⁶ To effectively allocate this funding, the federal government requires that each state's housing financing authority outline criteria to determine funding priority in the form of a Qualified Allocation Plan (QAP).⁹⁷ As of 2017, 32 states had incentivized third-party green building certification programs in their QAPs. Maine Housing is currently undergoing revision of its QAP, which currently exceeds all Maine Uniform Building and Energy Code standards as it relates to energy efficiency and incentivizes the adoption of projects that attain Passive House Certification by increasing the Total Development Cost Index Caps.

Finally, existing MaineHousing programs, such as the Landlord Repair Grant may also be expanded, pending funding, to encompass certain weatherization and energy efficient upgrades.

7. Maine Housing should coordinate with other state agencies and partners who provide access to funding for, and educational resources about, clean energy technologies and services, such as solar energy, heat pumps, EVs, and weatherization activities, in order to promote adoption of those technologies and services in affordable housing developments and to market those opportunities.

This type of collaboration and coordination can create improved conditions for adoption of clean energy technologies and services, which will primarily benefit affordable housing residents. This type of coordination has been used in Massachusetts where the "Affordable Access to Clean and Efficient Energy Initiative" is a collaboration between the Department of Energy Resources (DOER), the Department of Housing and Community Development (DHCD) and the Massachusetts Clean Energy Center (MassCEC).⁹⁸

8. The state should conduct a study on the potential for gentrification and associated displacement, and should develop anti-displacement policy options for managing these and other unintended consequences associated with state programs.

⁹⁵ <https://www.efficiencyvermont.com/Media/Default/docs/plans-reports-highlights/2018/2018-savings-claim-summary.pdf>

⁹⁶ <https://www.ncsha.org/hfa-news/mainehousing-invests-30-4-million-generating-74-million-in-funds-to-build-affordable-housing/>

⁹⁷ <https://www.usgbc.org/articles/us-states-increasingly-embrace-green-affordable-housing>

⁹⁸ <https://www.mass.gov/service-details/affordable-access-to-clean-and-efficient-energy-initiative>

Gentrification is “a process of neighborhood change that includes economic change in a historically disinvested neighborhood —by means of real estate investment and new higher-income residents moving in – as well as demographic change – not only in terms of income level, but also in terms of changes in the education level or racial make-up of residents,”⁹⁹ and can affect both urban and rural areas.¹⁰⁰

In Maine, working waterfront gentrification happens often occurs as seasonal residents purchase waterfront properties and infrastructure, displacing fishermen and year-round community members.¹⁰¹ In Maine, the Working Waterfront Access Protection Program protects strategically significant working waterfront properties whose continued availability to commercial fisheries businesses are essential to the long-term future of the fisheries sector.¹⁰²

Other anti-displacement strategies come from community land trusts and cooperative housing, many of which have formed to empower community residents to build and renovate housing that is community controlled, so that it doesn’t lead to displacement and foreclosure. Examples include Dudley Street¹⁰³ in Boston’s Roxbury neighborhood; and the Champlain Housing Trust, in Burlington, VT.¹⁰⁴

9. The newly established [Clean Energy and Sustainability Accelerator](#) should consider incorporating LMI incentives (or similar mechanisms, including asset-tied financing) that lower barriers to access, particularly in tenant occupied housing. The Accelerator should additionally explore partnerships with community service organizations, such as MaineHousing and CAPs, to coordinate services and programs.

Incentives for low and middle income users are key to improving equitable adoption of clean building and energy technologies. In Connecticut, the state Department of Energy and Environmental Protection and other partners worked with the U.S. Department of Energy Clean Energy for Low-Income Communities Accelerator (CELICA) to identify opportunities to scale up energy efficiency and renewable energy programs for low-income households.¹⁰⁵ This resulted in

⁹⁹ <https://www.urbandisplacement.org/about/what-are-gentrification-and-displacement/>

¹⁰⁰ Guimond, L., & Simard, M. (2010). Gentrification and neo-rural populations in the Québec countryside: Representations of various actors. *Journal of Rural Studies*, 26(4), 449–464.

<https://doi.org/10.1016/j.irurstud.2010.06.002>

¹⁰¹ <https://umaine.edu/news/blog/2016/08/23/fishing-communities-need-prepare-gentrification-challenges-say-umaine-researchers/>

¹⁰² https://www.maine.gov/dacf/lmf/docs/wwapp/WWAPP_Workbook_2018.pdf

¹⁰³ <https://www.dudleyneighbors.org/>

¹⁰⁴ <https://cltweb.org/resources/case-studies/champlain-housing-trust/>

¹⁰⁵

https://betterbuildingsolutioncenter.energy.gov/sites/default/files/CS_CT%20Efforts%20to%20Scale%20Up%20ERE%20LI%20Homes_FINAL_1.pdf

five programs aimed at increasing low cost adoption of clean energy technologies and improving public health in low and middle income communities in the state.¹⁰⁶

In New York, [EmPower NY](#) provides no-cost energy efficiency services to households at or below 60% of the state median income, and is available to homeowners and renters. Eligible measures include in-home energy education, comprehensive home assessment, electric load reduction, air sealing, insulation, and health and safety improvements. Additionally, the [Multifamily Performance Program](#) is New York State Energy Research and Development Authority's program to address cost barriers experienced by owners of low- to moderate-income properties when implementing clean energy upgrades. The program provides incentives from \$700 to \$1,500 per unit to make improvements and is available for affordable housing buildings with more than five units.¹⁰⁷

The American Council for an Energy Efficient Economy reviewed state strategies for successful low income energy efficiency programs, and provides a useful guide of successful program summaries, including how programs were targeted to ensure effective outreach to low income and otherwise marginalized populations.¹⁰⁸ The Clean Energy States Alliance hosts a directory of state low and moderate income clean energy programs.¹⁰⁹

C. Energy Sector

Maine is transitioning towards an increasingly clean and electrified future economy, with a goal of 100% renewable electricity powering Maine's grid by 2050.¹¹⁰ As the state makes this transition, access to renewable power must be attainable for all Mainers. Policymakers should pay particular attention to engaging with low-income and disadvantaged communities to ensure that all citizens have opportunities to participate in and benefit from this clean energy transition and the economic opportunity it presents. The state should also consider sources other than utility revenues to fund clean energy initiatives. Low and moderate income customers pay a disproportionate share of their income for electricity and other fuels as compared to other income groups

Research has demonstrated that renewable energy sources can provide energy at a cost lower

¹⁰⁶ Home energy Solutions - Income Eligible Program <https://energizect.com/your-home/solutions-list/save-energy-and-money-all-year-long>

Connecticut Weatherization Assistance Program

<https://portal.ct.gov/DEEP/Energy/Weatherization/Weatherization-in-Connecticut>

Residential Solar Investment Program (RSIP) Low- and Moderate-Income Performance Based Incentive

<https://energizect.com/your-home/solutions-list/residential-solar-investment-program>

Solar for All program <https://www.ctgreenbank.com/2018-slice-award-solar-for-all/>

Smart E Loan <https://energizect.com/your-home/solutions-list/smarte>

¹⁰⁷ <https://www.nyserda.ny.gov/All-Programs/MPP-Existing-Buildings>

¹⁰⁸ https://puc.nh.gov/EESE%20Board/EERS_WG/062018_pi_wg_successful_low_income_programs.pdf

¹⁰⁹ <https://www.cesa.org/resource-library/resource/directory-of-state-low-and-moderate-clean-energy-programs/>

¹¹⁰ https://www.maine.gov/future/sites/maine.gov/future/files/inline-files/MaineWontWait_December2020.pdf

than or comparable to non-renewable sources. And the growth of a new clean-energy economy, including the creation of thousands of high-quality jobs, creates economic opportunity across Maine. Maine must take care to ensure that the transition to clean energy benefits all people in Maine.¹¹¹

When new energy infrastructure is sited in rural or low-income communities, the ESC recommends ensuring that host communities benefit from new clean power. Benefits might include access to jobs, payments in the form of taxes or otherwise, energy discounts, and other community-identified goods and services. Additionally, the ESC recommends that the process of siting new clean energy infrastructure meaningfully engage, and account for impacts in, disadvantaged and frontline communities; recognizing that, without intervention, siting decisions for new energy can raise environmental justice concerns.¹¹²

The state should also consider the future waste associated with solar photovoltaic installations and offshore wind decommissioning, especially battery disposal or reuse. Responsible waste management and recycling can prevent environmental burdens on disadvantaged communities in the future.

Where personal citizen access to clean energy is concerned, the ESC recognizes that low to moderate income customers may need additional assistance and incentives. When considering renewable energy programs, the ESC recommends considering opt out structures as opposed to opt in. Opting out, rather than opting in can reduce barriers to lower energy rates. On-bill financing can also offer ratepayers the opportunity to invest in new clean energy technology without a potentially insurmountable upfront cost. Finally, the state should consider options for ensuring equitable access to shared distributed generation projects, including community solar.

1. Communities that host large scale renewable projects should receive local clean energy benefits, as identified by the community, from those projects. The state should publish guidance to help municipalities and natural heritage industries directly impacted by this development access consistent and equitable community benefits; this guidance should include a mechanism for racial and equity analyses.

Siting of large scale renewable energy projects can present challenges as well as opportunities for communities where these projects are located. A study from Michigan suggests that regarding the siting of wind turbines, “residents who perceived a fair planning process tended to perceive greater benefits of wind turbines, job creation, and revenues for landowners specifically, while residents who perceived an unfair process perceived significantly greater

¹¹¹ Welton, S., & Eisen, J. B. (2018). *Clean Energy Justice: Charting an Emerging Agenda* (SSRN Scholarly Paper ID 3256819). Social Science Research Network. <https://papers.ssrn.com/abstract=3256819>

¹¹² Outka, U. (2010). *Siting Renewable Energy: Land Use and Regulatory Context* (SSRN Scholarly Paper ID 1567077). Social Science Research Network. <https://doi.org/10.2139/ssrn.1567077>

negative impacts, including visual and noise problems, reduction of nearby property values, and human health problems.”¹¹³

In Maine, there is a significant history of ensuring community benefits accrue to the local community, such as in Section 35-A, subsection 3454, which provides a baseline of community benefits required for wind energy installations.¹¹⁴ Further, recent clean energy procurements, required by the legislation that increased Maine’s renewable requirements, requires project scoring to include a weight of 70% for project benefits to ratepayers and a weight of 30% for benefits to the economy (including areas such as employment and excise, income, property and sales taxes).¹¹⁵ Other states have made benefits a component of energy procurements, including payments directly to local ratepayers.¹¹⁶

2. The DEP, PUC, and other responsible agencies should develop a process for reviewing equity considerations for large scale renewable energy projects, as well as associated energy infrastructure improvements.

Similarly to the prior recommendation, the ESC recognizes that siting of new energy infrastructure can lead to adverse outcomes for host communities without attention and or intervention. The Office of Renewable Energy Siting in NY requires an Environmental Justice review for large scale renewable project siting to ensure disproportionate adverse environmental impacts are not borne by potential host communities.¹¹⁷ In Maine, while the PUC does not have regulatory oversight over large scale renewable projects, it has considered environmental issues, such as GHG, when proposed transmission projects are reviewed. Recent legislation additionally allows the PUC to consider equity issues in the context of the proposals for a northern Maine transmission line.¹¹⁸

3. The state should work with utilities to explore the shift from opt-in to opt-out models for community solar (or other similar programs) project participation, where those models would provide a cleaner and less expensive electricity mix to consumers.

In Maine, community solar project participation requires users to opt in - the consumer must actively choose to join the program. Research finds people tend to stick with the default power option rather than joining new programs; in similar cases, adoption rates have been around 80

¹¹³ Mills, S. B., Bessette, D., & Smith, H. (2019). Exploring landowners’ post-construction changes in perceptions of wind energy in Michigan. *Land Use Policy*, 82, 754–762. <https://doi.org/10.1016/j.landusepol.2019.01.010>

¹¹⁴ <https://www.mainelegislature.org/legis/statutes/35-a/title35-Asec3454.html>

¹¹⁵ <https://www.mainelegislature.org/legis/statutes/35-a/title35-Asec3210-G.html>

¹¹⁶ <https://www.renewableenergyreport.com/public-service-commission/new-york-state-public-service-commission-establishes-host-community-benefit-program/>

¹¹⁷ <https://ores.ny.gov/system/files/documents/2021/03/chapter-xviii-title-19-of-nyccr-part-900-subparts-900-1-through-900-15.pdf>

¹¹⁸ <http://www.mainelegislature.org/legis/bills/getPDF.asp?paper=SP0563&item=5&snum=130>

percent when customers chose to opt out, versus 15 percent participation for opting in.¹¹⁹ For communities who are overburdened, or are unfamiliar with a clean energy program like community solar, opting in to a renewable energy project can present a barrier to participation even when participation in a renewable energy project can lower energy costs.¹²⁰ Thus, the ESC recommends exploring automatic enrollment in less expensive renewable energy projects with the option to opt out, a practice which has recently been piloted in the northeast.¹²¹ In the program, all eligible residents are automatically enrolled in the program without having to sign a contract, undergo a credit screen, or have solar panels installed on their homes. Residents can opt-out at any time without a penalty.¹²²

4. Efficiency Maine Trust should continue to work with GEO, the legislature, the PUC, and utilities, to assess the viability of on-bill financing programs to allow homeowners to borrow money for energy, weatherization, and heating systems upgrades and make repayments over time via their utility bill.

Financial barriers often keep homeowners from accessing energy upgrades.¹²³ On-bill financing can benefit families who are unable to access traditional energy upgrade programs due to upfront expenses, households who cannot easily access traditional financing programs for energy upgrades, and customers with a good utility bill payment history but bad or no credit.¹²⁴ On-bill financing that allows for a change in ownership of repayment obligation can even incentivize landlords and tenants to participate. Green Mountain Power in Vermont is piloting an on-bill financing program in partnership with NeighborWorks of Western Vermont Heat Squad program. The pilot is integrating finance thermal efficiency measures (including weatherization) on customer bills, which allows customers to pay for upgrades overtime.¹²⁵

5. The PUC and GEO should examine emerging best practices for incorporating equity into community solar and other community-owned distributed energy programs. Specifically, future renewable energy procurement processes should explore requirements for supplier/workforce diversity.

¹¹⁹ <https://emp.lbl.gov/publications/residential-customer-enrollment-time>

¹²⁰

https://betterbuildingssolutioncenter.energy.gov/sites/default/files/CS_CT%20Efforts%20to%20Scale%20Up%20ERE%20LI%20Homes_FINAL_1.pdf

¹²¹ <https://www.prnewswire.com/news-releases/finger-lakes-ny-activates-first-opt-out-community-choice-solar-program-in-the-us-301366788.html>

¹²² <https://www.prnewswire.com/news-releases/finger-lakes-ny-activates-first-opt-out-community-choice-solar-program-in-the-us-301366788.html>

¹²³

https://betterbuildingssolutioncenter.energy.gov/sites/default/files/CS_CT%20Efforts%20to%20Scale%20Up%20ERE%20LI%20Homes_FINAL_1.pdf

¹²⁴ <https://www.eesi.org/obf/main>

¹²⁵ <https://www.islandinstitute.org/wp-content/uploads/2021/03/Bridging-the-Rural-Efficiency-Gap-final-report.pdf>

Barriers to participation in community solar and other community-owned distributed energy programs for low to moderate income customers range from being a renter rather than homeowner, to language barriers, lack of Internet access, and constraints on resources and time.¹²⁶ Policy measures can address these barriers and create opportunities for low to moderate income customers to participate, allowing for energy bill reduction; the Interstate Renewable Energy Council has produced a [report](#) which addresses this challenge and proposes possible solutions.

The [Community Renewables Pilot Program](#) in Rhode Island is administered by the Commerce Corporation, and acts as a first-come-first-served, rolling-basis application process for owners of community solar projects to pass discounted rates on to low-to-moderate-income and basic residential customers.¹²⁷ Other programs include Solar For All, a NY program which provides income-eligible households with monthly credits on electricity bills up to \$15/month, with no up-front costs to participate in community solar projects; and NY Sun, which offers an Inclusive Community Solar Adder, an incentive available for community solar projects metered as community distributed generation serving low-to-moderate income households, regulated affordable housing, and nonprofits serving disadvantaged and environmental justice communities.¹²⁸

6. DEP, in partnership with other state departments, should work with the legislature and with other northeastern states to study opportunities and challenges associated with PV and offshore wind decommissioning, with a specific focus on battery disposal and the development of secondary battery markets in Maine. These studies should consider location of, and impacts from, potential future disposal facilities within marginalized communities and communities of color.

To ensure disposal of material related to solar PV and offshore wind does not disproportionately harm overburdened populations, the ESC recommends assessing decommissioning and recycling practices for batteries and solar panels. Effective October 18, 2021, Maine law requires developers of solar power projects that occupy three or more acres to have an approved decommissioning plan and accompanying financial assurance sufficient to cover the cost decommissioning as outlined in the plan. The law applies to projects on which construction starts on or after October 1, 2021, as well as to projects that undergo a transfer of ownership after October 1, 2021.¹²⁹

In addition, when the Maine Legislature created the Maine Wind Energy Act, they included requirements that wind energy projects must be decommissioned, or removed, after the useful

¹²⁶ https://www.energy.gov/sites/default/files/2016/04/f30/IREC-LMI-Guidelines-Model-Provisions_FINAL.pdf

¹²⁷ <https://commerceri.com/wp-content/uploads/2018/05/Community-Renewables-Requests-5.11.18-1.pdf>

¹²⁸ <https://www.nysed.gov/All-Programs/NY-Sun/Contractors/Dashboards-and-incentives/Inclusive-Community-Solar-Adder>

¹²⁹ <https://www.maine.gov/dep/land/solar-decommissioning/index.html>

life of the turbines, and that decommissioning costs be funded by the project owner. These decommissioning provisions provide a level of protection to the State of Maine and taxpayers if project owners fail to remove unwanted turbines. In 2018, the Maine DEP created a new rule chapter to provide further definition to the Maine Wind Energy Act standards. The Maine DEP's Chapter 382 Rule – Wind Energy Act Standards, includes a section that defines decommissioning, specifies what is required in a decommissioning plan, describes when decommissioning would be triggered, lays out what types of financial assurance are required, and other matters. Finally, given the ban on the development of offshore wind in Maine state waters, it is important to note that the Bureau of Ocean Energy Management in the U.S. Department of Interior has regulatory authority over decommissioning of offshore wind projects in federal waters bordering Maine. Their regulations require a Construction and Operations Plan that includes decommissioning, and also provide a number of requirements regarding the decommissioning, including financial assurance requirements and removal obligations.

With regards to the siting of waste disposal facilities, a 2020 addition to DEP Chapter 400 rules on landfill siting incorporates explicit consideration of environmental justice in impacted communities.¹³⁰

Finally, at the federal level, a Department of Energy Initiative, launched by the Office of Energy Efficiency & Renewable Energy, [created the first R&D center for lithium ion battery recycling in the nation](#). "ReCell" will test new recycling practices in battery manufacturing, with the aim of piloting and eventually bringing successful methods to industry-scale. Maine is coordinating with other states through the Northeast Recycling Council and the Product Stewardship Council to develop a model program for EV battery recycling. States including Massachusetts, California and New York have also set up study groups to discuss safe handling of EV battery decommissioning.¹³¹

7. GEO, the PUC, OPA, MaineHousing and other partners, should conduct a comprehensive assessment of energy burden and energy reliability across Maine. This assessment should identify actions which reduce energy burden and increase energy reliability for the most vulnerable Mainers and for those experiencing disproportionate burden, both through the revision of existing programs and in the adoption of new programs and proposals, and should establish measurable targets for reduction of energy burden and the improvement of reliability over time.

A household's energy burden can be understood as the percentage of income spent on energy bills. Maine has one of the highest average energy burdens in the country, but the burden is not equitably distributed with poorer, more rural households much larger portions of their income

¹³⁰ <https://www.maine.gov/sos/cec/rules/06/chaps06.htm>

¹³¹ <https://www.ncsl.org/research/transportation/electric-vehicle-batteries-recycling-magazine2020.aspx>

on energy bills.¹³² Census data shows that on a national average, low-income households have an energy burden three times higher than non-low-income households.¹³³ This results in less money for these low-income households to spend on other essential needs, such as food, transportation and healthcare. A 2019 study for the Maine Office of the Public Advocate studied Maine’s Low Income Energy Burden and found that several counties in Maine had low income energy burdens at or above 20 percent of income.¹³⁴ And while the Maine PUC and the Maine State Housing Authority currently administer a statewide Low-Income Assistance Program (LIAP), which disburses more than \$7 million annually to assist qualified low-income customers with their electric bills, the state is considering a significant increase in funding due to persistent energy burdens.

In Oregon, the Department of Energy, PUC and Oregon Housing and Community Services partnered on a ten year plan to reduce the energy burden on low income populations in the state while prioritizing energy efficiency to achieve that reduction.¹³⁵ An index was generated to determine areas with high energy burden; factors in the index included “affordability hardship due to low household income (economic driver); poor home energy efficiency due to older home vintage (physical driver); and housing inequity issues due to ethnicity/race (systemic driver).”^{136, 137}

D. Grow Maine’s Clean Energy Economy

Overall, the ESC recommends ensuring that the workforce opportunities associated with Maine’s transition to clean energy are equitably distributed. Additionally, there is a focus on ensuring that Maine’s natural heritage industries, including farming and agriculture, fisheries and aquaculture, and forestry and forest products are supported by the state, and are economically viable and welcoming to diverse new potential workers. The ESC frames these recommendations under the ideal of a **just transition**.¹³⁸ This means seeking just pathways to transition towards jobs and economies outside of industries polluting the air and the environment, working towards strengthening the health and adaptive capacity of workers, and uplifting their communities.¹³⁹ It also means leaving no one behind, so recommendations

¹³² <https://www.islandinstitute.org/wp-content/uploads/2021/03/Bridging-the-Rural-Efficiency-Gap-final-report.pdf>

¹³³ <https://www.energy.gov/eere/slsc/maps/lead-tool>

¹³⁴ <https://www.maine.gov/meopa/sites/maine.gov.meopa/files/inline-files/Maine%20Low%20Income%20Energy%20Burden%20Study%20June%202019.pdf>

¹³⁵ <https://www.oregon.gov/energy/Get-Involved/Documents/2018-BEEWG-Ten-Year-Plan-Energy-Burden.pdf>

¹³⁶ <https://www.oregon.gov/energy/Get-Involved/Documents/2018-BEEWG-Ten-Year-Plan-Energy-Burden.pdf>

¹³⁷ <https://www.oregon.gov/energy/Get-Involved/Documents/2018-BEEWG-AHA-Guide-Methodology.pdf>

¹³⁸ <http://jtalliance.org/what-is-just-transition/>

¹³⁹ Schlosberg, D., Collins, L. B., & Niemeyer, S. (2017). Adaptation policy and community discourse: Risk, vulnerability, and just transformation. *Environmental Politics*, 26(3), 413–437. <https://doi.org/10.1080/09644016.2017.1287628>

presented here represent the needs of those most underprivileged. By committing to a just transition, benefits and burdens associated with climate change and resulting policy can be distributed equitably.

The ESC recommends that farming, fishing, forestry jobs, and clean energy jobs¹⁴⁰ are made available to diverse Mainers including people of color, women, New Mainers, people living in rural areas, and those with low paying jobs who may want to switch careers. A strong workforce requires both training and support. Training for jobs in the clean energy sector should be provided for free or offered as paid training to ensure access to these career paths for diverse Maine communities. In addition, students should be able to learn about clean energy jobs in school, especially well paying jobs that might not require a college education. Additionally, the state should provide free transportation and childcare for workers who need it.

Further, climate change is making aspects of natural heritage professions more difficult, and the state should help workers in these industries adapt. New clean technology, like electric tractors and outboard engines, and solar arrays for businesses, represents one such adaptation pathway that can assist workers in natural heritage industries. These technologies are often expensive and workers can be unsure if they will work for their business; the state should assist these industries in piloting climate-friendly technology. Where adaptation cannot overcome the barriers presented by a changing climate, the state should offer training and assistance to workers who might lose their jobs due to climate change, ensuring that they can access new well-paying jobs.

1. The state should study the current demographic makeup of Maine’s natural heritage industry workers, and should identify opportunities and drivers of change which support increased diversity within these industries, while building job security for those workers already engaged in these sectors. The state should study barriers to new Mainers and other marginalized farmers, fishers, and foresters who wish to enter heritage industries, including lack of access to capital, lack of access to land, and immigration/visa requirements which limit ability to relocate with family member. The state should also seek to identify, recognize, and leverage unique skills that New Mainers may bring to these critical state industries. Finally, the state should help workers, land managers, and business owners understand the impact of climate change and associated hazards, such as extreme heat, on current workers.

The state should identify and support key partners, such as Cultivating Community, Mano en Mano, Prosperity Maine, Four Directions Development Corporation, CEI’s Women’s Business

¹⁴⁰ Clean energy jobs include a wide range of well-paying jobs such as installing solar panels, auditing energy efficiency, developing electric vehicles, advanced manufacturing, and upgrading utility lines, amongst others.

Center, and others, that work with immigrant communities, communities of color, Native Americans, and women to ensure access to vital support systems as part of Maine's efforts to attract and support diverse perspectives and workers in natural heritage industries.¹⁴¹ Already, growth in Maine's farming industry is driven by younger farmers and new Mainers, with local programs such as Cultivating Community's New American Sustainable Agriculture Project providing a refugee and immigrant farmer training program, based out of two incubator farms in Lisbon and Falmouth¹⁴²; and Maine Farmland Trust offering a number of educational services and low cost financing to new farmers.¹⁴³

Additionally, the state should evaluate credentialing pathways—including license and work experience reciprocity for new and returning Mainers and requirements for individuals entering clean energy and natural heritage industries – to ensure Maine is able to attract and develop high-skilled workers who want to participate in Maine's clean energy and natural heritage industries.¹⁴⁴

With respect to those entering fisheries, some fishermen in southern New England have addressed challenges with current crew shortage by hiring more recent immigrants or H2B visa workers. In many coastal communities, this type of hiring requires supporting services and infrastructure that do not currently exist.

2. The state should study the current demographic make-up of clean energy sector workers, and opportunities to increase access to these jobs for underserved communities. Clean energy workforce training opportunities should seek to recruit women and people of color, and should be accessible to Mainers from across the state. Such training opportunities should decrease barriers to entry for disadvantaged Mainers, through the provision of wrap-around services, payment for training opportunities, and other opportunities. Additionally:
 - a. GOPIF and GEO should partner with DOL to provide info on clean energy career and job training opportunities to unemployed/underemployed Mainers.
 - b. The state should explore barriers to entry into clean energy careers related to licensure, and should align with best practices informed by both industry partners and other states/jurisdictions.
 - c. The state, in partnership with CTEs, community colleges, other training partners, and industry partners, should conduct a statewide study of workforce availability to meet current and projected needs for energy assessments, audits, electricians, and weatherization technicians. This study should assess any projected workforce shortages across the state and should recommend training programs/pathways and other mechanisms designed to increase access to well-

¹⁴¹ https://www.maine.gov/future/sites/maine.gov.future/files/inline-files/Maine%20ERC%20Report_FINAL_11242020.pdf

¹⁴² <https://www.cultivatingcommunity.org/programs/farmer-training/>

¹⁴³ <https://www.maineFarmlandtrust.org/farmland-access-new/beginning-farmer-services-2/>

¹⁴⁴ https://www.maine.gov/future/sites/maine.gov.future/files/inline-files/Maine%20ERC%20Report_FINAL_11242020.pdf

paying jobs in these fields for historically disadvantaged or underemployed Mainers, similar to the approach being taken in Maine and other state programs, such as California's High Road Training Partnerships.^{145, 146}

New employment opportunities created in the clean energy sector should be available to all Mainers, and should specifically seek to create employment opportunities for diverse Mainers. This will not occur without intervention, as can be seen from national data on employment in the clean energy sector. Within the solar workforce in the United States in 2018, for example, 26.3% of workers were women and 7.6% of workers were black or African American, both percentages that are well below the national average for all occupations.¹⁴⁷ Similarly, women and black or African Americans, respectively, represent 24% and 8% of the US energy efficiency workforce.¹⁴⁸

This work is underway in Maine. For example, BW Research is currently performing an analysis for the Offshore Wind Roadmap process on the clean energy sector workforce, and opportunities specific for the offshore wind industry; GEO expects to expand this type of analysis to the clean energy sector as a whole in 2022. In addition, in November 2021 Governor Mills unveiled a new Clean Energy Partnership, backed by \$5.5 million from the Maine Jobs and Recovery Plan, to provide career training opportunities, like apprenticeships, that will equip Maine people with the skills to fill good-paying jobs in Maine's growing clean energy sector.¹⁴⁹ Finally, the Franklin and Somerset Counties' STEM Pilot Project, funded by the NECEC Stipulating Agreement with the state, kicked off in the spring of 2021. This program serves as the launch of the state's career exploration program, an opportunity to encourage education/training opportunities in clean energy and advance the goals of the Children's Cabinet. The project supports vocational and innovative programs in science, technology, engineering and math for students in the Franklin and Somerset Counties' School Districts. Programs include: career exploration opportunities, STEM camps, paid internships and scholarships for Maine Community Colleges and other higher education institutions serving students from these counties. If successful, similar programs could be utilized across the state.

Critical wrap-around services for worker training programs seeking to increase diversity in the clean energy sector include services for mental health, substance abuse disorders, and trauma informed care for workers, in addition to the services identified by the ESC.¹⁵⁰

¹⁴⁵ <https://www.maine.gov/covid19/maine-jobs-and-recovery-plan>

¹⁴⁶ <https://cwdb.ca.gov/initiatives/high-road-training-partnerships/>

¹⁴⁷ National Solar Jobs Census 2018 (Solar Foundation, 2018).

¹⁴⁸ U.S. Energy and Employment Report (US Department of Energy, 2017).

¹⁴⁹ <https://www.maine.gov/governor/mills/news/governor-mills-announces-maine-jobs-recovery-plan-initiatives-cut-energy-costs-maine-families>

¹⁵⁰ <https://risingsunopp.org/faq/>

Rambert, R. L. (2021). Public Policy Considerations for Building an Equitable Clean Energy Workforce. Environmental Justice, env.2021.0057. <https://doi.org/10.1089/env.2021.0057>

3. In partnership with the Department of Labor, DECD, private industry, and others, the state should develop a comprehensive approach to just transition, including adopting a comprehensive definition and prioritizing workforce retraining initiatives, especially in those industries and communities most threatened by climate change. These retraining programs must be developed in close collaboration with impacted communities and industries.

Vulnerability of jobs in certain industries threatened by climate change can be addressed through 'just transition' initiatives. Chicago will invest in companies that hire and retain displaced fossil fuel workers and traditionally marginalized workers to manufacture clean energy infrastructure at a prevailing wage with comprehensive benefits, while Colorado has created both a [Just Transition Office](#) and [Just Transition Advisory Committee](#).^{151, 152} Outside of fossil fuel related retraining, Massachusetts is partnering with existing training programs for marine workers (including the Massachusetts Maritime Academy, the Northeast Maritime Institute, New England Maritime Inc., and Marine Safety Training Inc.) to retrain construction workers to participate in offshore wind development.¹⁵³

4. The state should study how climate driven uncertainty will continue to impact the fishing industry, and should identify current and additional opportunities for diversification (aquaculture, shellfish, etc.) within this industry for those workers at risk of losing their jobs/livelihoods. The state should prioritize investments in economic diversification in the most vulnerable communities first, with a focus on increasing diverse participation in these industries.

Climate driven effects will continue to impact Maine's fishing industries. The lobster industry may face challenges including expanding market pressures, unpredictable changes in market prices, and warming in the Gulf of Maine.¹⁵⁴ Additionally, climate driven changes are likely to cause vulnerability to over-fishing, which can drive price volatility.^{155 156} Recommendations to boost resilience provided by fishermen can be found in a 2014 report called "In Their Own Words" from the University of Maine¹⁵⁷.

¹⁵¹ <https://chicago.legistar.com/LegislationDetail.aspx?ID=3886265&GUID=081AC4BD-E6F4-4789-AD80-53BF25764855&Options=Advanced&Search=>

¹⁵² <https://www.governor.state.nm.us/2019/03/22/governor-signs-landmark-energy-legislation-establishing-new-mexico-as-a-national-leader-in-renewable-transition-efforts/>

¹⁵³ <https://files.masscec.com/2018%20MassCEC%20Workforce%20Study.pdf>

¹⁵⁴ Henry, A. M., & Johnson, T. R. (2015). *Understanding Social Resilience in the Maine Lobster Industry*. *Marine and Coastal Fisheries*, 7(1), 33–43. <https://doi.org/10.1080/19425120.2014.984086>

¹⁵⁵ Dayton, A. (May 2018). *Assessing Economic Performance of Maine's Lobster Fleet Under Changing Ecosystem Conditions in the Gulf of Maine*. 225. <https://digitalcommons.library.umaine.edu/cgi/viewcontent.cgi?article=3994&context=etd>

¹⁵⁶ <https://digitalcommons.library.umaine.edu/cgi/viewcontent.cgi?article=3994&context=etd> (pg 132)

¹⁵⁷ <https://seagrant.umaine.edu/wp-content/uploads/sites/467/2019/03/2014-in-their-own-words-fishermens-perspectives-community-resilience.pdf>

Aquaculture is one potentially viable diversification strategy.¹⁵⁸ As of 2017, 24% of aquaculture businesses in Maine started operating in the past 2 years and 45% started in the past 5 years, investing \$10.8 million in the sector in the last 3 years.¹⁵⁹ L.D. 1438 (128th Legis. 2017) reduced the regulatory constraints on aquaculture to allow for further diversification.¹⁶⁰ Maine's aquaculture exports are predicted to increase by an additional \$230 - \$800 million by 2025.¹⁶¹ Barriers to aquaculture include business start-up costs, environmental permitting costs, time and labor, delayed returns on investment, cultural differences (and public stigma) between wild-capture fisheries and aquaculture, hands on training and business planning, and the fact that Maine's primary fishery, lobster, remains highly valuable.¹⁶² To address some of these challenges, Maine's Department of Marine Resources is currently funding programming to support business development in the aquaculture sector, supported by seafood specific relief funds in the 2021 Consolidated Appropriations Act. In addition, Maine has a variety of educational programs available through many partners for those considering aquacultural businesses.¹⁶³

Seaweed harvesting represents another potentially viable diversification strategy. Harvest activity along Maine's rocky-intertidal zone of rockweed and seaweed was found to have minimal impact on blue carbon sinks at its current harvest rate (5.4-6.8 tons/yr), although the overall preservation and health of these ecosystems as a whole is crucial to maintaining this sink.¹⁶⁴ An additional challenge associated with seaweed harvesting is the need to develop an expanded market for the product; the Maine Seaweed Exchange provides education, advocacy, and support to seaweed growers at all stages to help expand opportunities.¹⁶⁵

5. In partnership with the University of Maine Cooperative Extension and the private sector, as well as with the Resolve To End Hunger in Maine by 2030, the state should explore agricultural opportunities associated with growing new crops sustainably in a changing Maine climate. In addition, the state should further consider the way that climate risks will affect the food supply chain in Maine, and should explore opportunities to ensure that Maine grown food can mitigate supply chain risks while improving access to food for all Mainers, especially marginalized communities.

¹⁵⁸ [Stoll, J. S., Leslie, H. M., Britsch, M. L., & Cleaver, C. M. \(2019\). Evaluating aquaculture as a diversification strategy for Maine's commercial fishing sector in the face of change. Marine Policy, 107, 103583. https://doi.org/10.1016/j.marpol.2019.103583](https://doi.org/10.1016/j.marpol.2019.103583)

¹⁵⁹ <https://umaine.edu/aquaculture/wp-content/uploads/sites/572/2017/01/Aquaculture-Econ-Report.pdf>

¹⁶⁰ <https://legislature.maine.gov/legis/bills/getPDF.asp?paper=HP0993&item=3&snum=128>

¹⁶¹ <https://focusmaine.org/focusmaine-2-2-2-2/>

¹⁶² [Stoll, J. S., Leslie, H. M., Britsch, M. L., & Cleaver, C. M. \(2019\). Evaluating aquaculture as a diversification strategy for Maine's commercial fishing sector in the face of change. Marine Policy, 107, 103583. https://doi.org/10.1016/j.marpol.2019.103583](https://doi.org/10.1016/j.marpol.2019.103583)

¹⁶³ <https://www.maineaquaculture.org/educational-resources/>

¹⁶⁴ [Phillippi, A., Tran, K., Perna, A. 2014. Does intertidal canopy removal of *Ascophyllum nodosum* alter the community structure beneath? Journal of Experimental Marine Biology and Ecology 461:53-60.](https://doi.org/10.1016/j.jembe.2014.05.004)

¹⁶⁵ <http://www.maineaquaculture.org/>

As the state's agricultural sector experiences climate change, the viability of crop species will change with the climate.¹⁶⁶ To ensure that Maine farms can continue to produce food for Maine people, the ESC found that it will be necessary to ensure that farmers are aware of opportunities for growing new crops that will benefit from a longer growing season, which Maine is expected to experience due to a changing climate. Region-wide opportunities for northeastern sustainable farming in a warming climate include expanding vine fruit production, small grain crops, and apple orchards, especially as the west becomes increasingly vulnerable.¹⁶⁷ A 2015 report by the Northeast Hub of the USDA identifies needed adaptation strategies for each crop category and corresponding research and extension needs.¹⁶⁸ NY, PA, and CT have piloted projects exploring new crop production in partnership with Extension networks.¹⁶⁹ Currently, UMaine Extension partners with Sustainable Agriculture Research and Education (SARE) which pilots opportunities to grow new crop varieties like melon production.¹⁷⁰ Other programs that work to further climate adaptation for new crops include the Maine Climate and Ag Network¹⁷¹ and the Maine Climate Change Adaptation Providers Network.¹⁷² Maine's recently passed LD 437 establishes a state Healthy Soil Program which seeks to improve the health, yield, and profitability of the state's agricultural soils and commodities by promoting use of soil health practices. Improved soil health can increase yield,¹⁷³ which would support the economic interests of farmers in the state, as well as improving distribution of Maine grown food.

6. The state should support natural heritage industries in pursuit of value added environmentally friendly certifications, such as B Corps and Certified Organic, as well as ownership structures such as cooperatives.

Lack of information and technical support, and increased perceived risk are barriers to farmers pursuing organic certification.¹⁷⁴ The state should continue to support research, extension, and technical support work that trains farmers on the basics of organic production and makes a transition to organic less burdensome.¹⁷⁵ This could be done in collaboration with the Northeast Sustainable Agriculture Research and Education (SARE) program or University of Maine Cooperative Extension.

¹⁶⁶ <https://doi.org/10.1371/journal.pone.0198623>

¹⁶⁷ <https://naldc.nal.usda.gov/download/6965350/PDF>

¹⁶⁸ <https://naldc.nal.usda.gov/download/6965350/PDF>

¹⁶⁹ <https://naldc.nal.usda.gov/download/6965350/PDF>

¹⁷⁰ <https://northeast.sare.org/sare-in-your-state/maine/>

¹⁷¹ <https://umaine.edu/climate-ag/tools/>

¹⁷² <https://seagrant.umaine.edu/wp-content/uploads/sites/467/2020/06/2020-ME-CCAP-Summary.pdf>

¹⁷³ Nunes, M. R., van Es, H. M., Schindelbeck, R., Ristow, A. J., & Ryan, M. (2018). No-till and cropping system diversification improve soil health and crop yield. *Geoderma*, 328, 30–43.

<https://doi.org/10.1016/j.geoderma.2018.04.031>

¹⁷⁴ Duram, Leslie A., and Kelli L. Larson. 2001. Agriculture Research and Alternative Farmers' Information Needs. *Professional Geographer* 53(1):84-96.

¹⁷⁵ https://opensiuc.lib.siu.edu/cgi/viewcontent.cgi?referer=&httpsredir=1&article=1018&context=gers_pubs

Benefit corporations adopt a shared framework of responsible environmental practices and ethical workforce development. In June, 2021, L.D. 846 directed the Department of the Secretary of State to develop website information to promote Benefit Corporations in the state. The resolution is intended to increase awareness of benefit corporation status, the framework and its meaning and intention, and to provide transparent and easy-to-use directions to support businesses exploring the option of establishing themselves as benefit corporations.¹⁷⁶

Democratic ownership structures, including cooperatives, are a prevalent business model in the seafood industry, primarily among lobster harvesters. Cooperatives allow for joint ownership, engagement in company decision making, and often can facilitate the improvement of working conditions.¹⁷⁷ The state should support businesses interested in cooperative business models, including Employee Stock Ownership Plans, which have a long history in Maine.¹⁷⁸

7. The State should continue to provide incentives for, and should pilot, clean technology and clean fuels transitions in natural heritage industries, particularly for small businesses and self-employed individuals who otherwise lack the necessary resources to transition to new technology. Pilots should enable business owners to learn about appropriate and available clean technology, and should facilitate peer-to-peer learning.

Those in natural heritage industries in Maine are both vulnerable to the effects of climate change, and often motivated to move towards solutions. One example of this recommendation in action already is the use of biofuels by some Maine lobstermen,¹⁷⁹ and solar panels on the roofs of wharfs, seafood distribution centers, and farm buildings across the state.¹⁸⁰ Continued financial and technical support is needed for increased implementation of clean technology and clean fuels by natural heritage industries across the state. California led a successful state-wide agricultural technology demonstration program, though it was not selective to clean technology.¹⁸¹ At a regional level, New England Sustainable Agriculture Research and Education issues grants which could be specified for clean technology.¹⁸²

E. Natural and Working Lands and Waters

Maine's natural and working lands and waters represent livelihoods and recreational opportunities for many Maine people, and climate change and development are threatening the forests, fields, and waters that are so essential to the state. Maine's natural and working lands also sequester significant amounts of carbon, and are key to achieving the state's carbon

¹⁷⁶ <https://legislature.maine.gov/legis/bills/getPDF.asp?paper=HP0614&item=3&snun=130>

¹⁷⁷ <https://ncbaclusa.coop/resources/what-is-a-co-op/>

¹⁷⁸ <https://bangordailynews.com/2019/06/15/opinion/employee-ownership-works-for-maine/>

¹⁷⁹ <https://howwerespond.aas.org/community-spotlight/fisheries-in-maine-rally-to-reduce-their-carbon-footprint-and-increase-sustainability/>

¹⁸⁰ <https://www.facebook.com/bumblerootorganicfarm/posts/6072422286133316>

¹⁸¹ https://www.epa.gov/sites/default/files/2017-11/documents/cba2017-ca_farm_demo_network.pdf

¹⁸² <https://www.sare.org/grants/>

neutrality goals. One of the priorities of the ESC in considering Maine's natural and working lands is ensuring equitable access to the bountiful natural resources and places in the state, improving the lives and health of people in Maine. Additionally, low income or disadvantaged communities should receive preference in funding related to expanding or preserving natural areas, especially if they currently have less access to natural areas than better resourced communities. The state's natural resource agencies should continue to explore opportunities for repatriation, cooperative ownership and management of land with tribal nations. And where knowledge and data is concerned, data regarding climate change risks and outcomes should be shared with tribes, foresters, landowners, loggers, farmers, fishermen, and communities. This data sharing and mutual benefit from data collection will support practitioners in making proactive, informed decisions to combat climate change. Finally, it is important that any future policy regarding carbon not disproportionately impact workers in these important heritage industries.

1. The state should explore the distribution of green space and access to it, especially in historically disadvantaged communities. This should include assessing the diversity of visitorship at state owned parks and other sites, access to working and recreational waterfronts, and equitable participation in the [Land for Maine's Future](#) program.

*Access to greenspace improves mental and physical wellbeing, enhances immunity, and improves social capital and community.*¹⁸³ *When disadvantaged communities have access to greenspace, these benefits can lessen the health equity gap understood to exist between those with and those without access to greenspace.*¹⁸⁴ *In Maine, according to the Trust for Public Land, 89% of Portland, Maine residents live within a 10 minute walk to a park; in Augusta, 14%; 55% in Lewiston, 55% in Bangor; and 44% in Auburn.*¹⁸⁵ *The Land for Maine's Future program does not currently have a mechanism to address equitable access to the program for a diversity of participants.*

*While the Maine Bureau of Parks and Lands tracks visitorship, it does not track diversity or demographics of visitors, or access-related metrics such as location from which the visitor travelled or means of travel/access. While the 2020-2025 Maine State Comprehensive Outdoor Recreation Plan identified race and diversity as important in planning state park recreational opportunities, BPL has not yet established a diversity and inclusion goal or criteria for increasing access to parks for all Maine people.*¹⁸⁶ *In this effort, Maine could look to the Diversity, Equity,*

¹⁸³ James, P., Banay, R. F., Hart, J. E., & Laden, F. (2015). A Review of the Health Benefits of Greenness. *Current Epidemiology Reports*, 2(2), 131–142. <https://doi.org/10.1007/s40471-015-0043-7>

¹⁸⁴ Kabisch, N., Korn, H., Stadler, J., & Bonn, A. (2017). Nature-Based Solutions to Climate Change Adaptation in Urban Areas—Linkages Between Science, Policy and Practice. In N. Kabisch, H. Korn, J. Stadler, & A. Bonn (Eds.), *Nature-Based Solutions to Climate Change Adaptation in Urban Areas* (pp. 1–11). Springer International Publishing. https://doi.org/10.1007/978-3-319-56091-5_1

¹⁸⁵ <https://www.tpl.org/parkscore>

¹⁸⁶ https://www.maine.gov/dacf/parks/publications_maps/docs/2020_ME_SCORP_final_1_2_2020.pdf

and Inclusion plan at the Vermont Agency of Natural Resources,¹⁸⁷ the Connect Kids to Parks program, which provides higher levels of funding for parks visits by students in disadvantaged NY school districts,¹⁸⁸ and park-specific demographic studies in other state parks.¹⁸⁹

The Maine Department of Inland Fisheries and Wildlife has focused on improved water access near population centers for the past several years, understanding that these are often the locations where there are relatively significant populations of new Mainers and underserved communities. The Water Access Program's long-term goal is to provide a fully accessible water access facility within 10 miles of each of the state's sixteen county seats. The most recent example is the new Togus Pond Family Fishing Facility in Augusta (completed fall of 2021).¹⁹⁰ The Togus facility is fully ADA compliant and includes parking, hand-carry launch sites, and casting platforms on Togus and Lower Togus Ponds. The facility also includes an ADA trailer launch on Togus Pond. Additionally, MDIFW has recently completed a similar facility on Lily Pond in New Gloucester located within 10-miles of the Lewiston/Auburn population center; and is working with a commercial landowner to develop a family fishing area in Greene approximately 6.5 miles from Lewiston/Auburn.

Similarly, MDIFW has a goal of providing accessible Wildlife Management Areas within an hour's drive of Maine's population centers. Recent land acquisitions in Livermore and Augusta have directly contributed to this goal and ongoing strategic land acquisition planning will better enable the Department to serve other communities in the near future.

2. Working together with tribal representatives, the state's natural resource agencies should continue to explore opportunities for repatriation, cooperative ownership and management of land with tribal nations. Tribal stewardship of lands can help the state achieve its land and climate goals.

The ESC supports continued collaboration between the state of Maine and Tribal Nations. Examples of ongoing collaboration with natural resource agencies include:

- Collaborative research on various species with the Department of Inland Fish and Wildlife
- Migratory fish management projects with the Department of Marine Resources

¹⁸⁷ <https://anr.vermont.gov/diversity-equity-inclusion>

¹⁸⁸ <https://parks.ny.gov/environment/connect-kids/grant-program.aspx>

¹⁸⁹ <https://www.openspaceinstitute.org/news/lakefront-park-attracts-culturally-diverse-visitors-from-throughout-region>

¹⁹⁰ Edwards, K. (2020, May 13). New state boat launch, accessible family fishing area approved for Togus Pond in Augusta. *Kennebec Journal and Morning Sentinel*. <https://www.centralmaine.com/2020/05/13/new-state-boat-launch-accessible-family-fishing-area-approved-for-togus-pond-in-augusta/>

- *Management and renaming of culturally-significant parks with the Bureau of Public Lands*¹⁹¹
- 3. The state should incorporate equity considerations into grant scoring for all natural-space related grants, such as criteria which prioritize use of funding for street trees in town centers and urban areas, particularly in low income or otherwise disadvantaged communities.

*While Maine has Project Canopy*¹⁹², a grant program available to state, county, and municipal governments, educational institutions, and non-profit organizations for developing and implementing community forestry projects and programs, this grant program does not yet distinguish between differently resourced communities.

*In New York, the NY State Office of Parks, Recreation & Historic Preservation (OPRHP) Environmental Protection Fund Grants Program for Parks, Preservation and Heritage has put forth grant selection criteria that explicitly accounts for potential impact of the project and community need. Scores are based on whether the project will primarily serve a densely populated area, an area where a substantial proportion of the population is of low income, and/or a population that is otherwise disadvantaged or underserved with respect to existing recreational opportunities.*¹⁹³ *The Michigan Department of Natural Resources Urban and Community Forestry Program gives priority consideration to low income communities, distressed communities as defined by the [Economic Innovation Group's Distressed Communities Index](#), and low tree equity areas as defined by the [Tree Equity Score](#).*^{194, 195, 196}

- 4. Future consideration of carbon pricing mechanisms by the Maine Climate Council should take into account potential opportunities and challenges for Maine-based industries, particularly natural heritage industries and others heavily dependent on high-carbon fuels and/or highly vulnerable to climate changes.

Maine Won't Wait does not recommend a carbon pricing mechanism. If Maine considers such a mechanism in the future, the ESC recommends considering the potential for disproportionate impacts of future local, state, or federal carbon pricing regimes on industries heavily dependent on fossil fuels, including fisheries, particularly where those industries might have an important role in culture or carbon sequestration. Following the precedent of the Canadian government, Maine could consider including a provision that exempts commercial fisheries (not recreational fishers) in any future carbon tax or fee imposed. Canada's current GHG Pollution Pricing Act lists

¹⁹¹ https://legislature.maine.gov/legis/bills/display_ps.asp?LD=1591&snum=130

¹⁹² https://www.maine.gov/dacf/mfs/policy_management/project_canopy/grants/index.html

¹⁹³ <https://www.parks.ny.gov/documents/grants/GrantSelectionCriteria2021.pdf>

¹⁹⁴ https://www.michigan.gov/documents/dnr/PR4107_731104_7.pdf

¹⁹⁵ <https://treeequityscore.org/>

¹⁹⁶ <https://eig.org/dci>

exemptions for fishers under Division 2 Subdivision A General Application of Charge to Fuel and Combustible Waste.¹⁹⁷

5. The State should encourage just principles for climate, environmental, and socioeconomic data collection and ownership through the climate research and monitoring hub and in state agency climate research/monitoring work, and should prioritize community participatory approaches in data collection which ensure transparency and build trust. Data principles might include but not be limited to:
 - a. Disaggregation of data by age, race, ethnicity, gender, disability, geography, and other sociodemographic factors.
 - b. The State should encourage the collection of climate and environmental data at scales relevant to Mainers, including those in natural heritage industries such as farming, and encourage the sharing of data in an accessible way, for example through the establishment of a coastal and marine information exchange.
 - c. The state's climate data platform should value and honor the role of traditional ecological knowledge, especially from tribal nations.

Data collected for monitoring climate change, both in communities and in natural resource contexts, should be made available to interested parties including municipalities for community decision making. The Maine Office of GIS (MEGIS) maintains an online GeoLibrary Data Catalog and a variety of online maps to provide geographic information collected by all state agencies in a single, publicly accessible repository. Outside of Maine, Sonoma County operates SoCo Data, which is a collaborative process that brings decision makers and scientists together in a bottom-up approach where public stakeholders make connections between the database climate goals/projects in the county.¹⁹⁸

As it pertains specifically to indigenous knowledge and data, "Indigenous data sovereignty is the right of a nation to govern the collection, ownership, and application of its own data. It derives from tribes' inherent right to govern their peoples, lands, and resources."¹⁹⁹ Data governance is the process by which a tribal nation enacts data sovereignty.²⁰⁰ Frameworks for understanding indigenous data sovereignty are spearheaded by the [United States Indigenous Data Sovereignty Network \(USIDSN\)](#). Additionally, The University of Arizona published a research report with over a dozen recommendations for building a trusted database, with the central theme being the tribal involvement and oversight in the data collection and monitoring process.²⁰¹

¹⁹⁷ <https://www.google.com/url?q=https://laws-lois.justice.gc.ca/eng/acts/G-11.55/index.html&sa=D&source=docs&ust=1636760842221000&usg=AOvVaw2zNO2pEuVmtbx28RL3MvV5>

¹⁹⁸ <https://data.sonomacounty.ca.gov>

¹⁹⁹ <https://nni.arizona.edu/programs-projects/policy-analysis-research/indigenous-data-sovereignty-and-governance>

²⁰⁰

https://static1.squarespace.com/static/5d2633cb0ef5e4000134fa02/t/5d72d78216365660a9ce856c/1567807363174/policy_brief_data_governance_for_native_nation_rebuilding_version_2.pdf

²⁰¹ Carroll, S. R., Rodriguez-Lonebear, D., & Martinez, A. (2019). Indigenous Data Governance: Strategies from United States Native Nations. *Data Science Journal*, 18(1), 31. DOI: <http://doi.org/10.5334/dsj-2019-031>

F. Engaging Maine People and Communities and Resilient Infrastructure

Climate change impacts the health and safety of Maine people, including through exposure to extreme heat, drought, poor air quality, increased allergens, sea level rise, storms and flooding, and food security, among other impacts.²⁰² Due to historic and ongoing disempowerment and lack of access to resources, these health impacts will disproportionately affect frontline communities, since they are often both more exposed and more sensitive to climate health risks.²⁰³ A limited capacity to respond to these health risks, such as an inability to invest in air conditioning to escape heat, or have resources to rebuild after a disaster event, often exacerbates the problem, causing further harm.²⁰⁴

Resilience planning is a key step towards mitigating potential health impacts, and communities who know best about their health concerns should be involved in these resilience planning processes. Because climate change can feel abstract, involving all communities, even those who do not have high level climate knowledge, is important; no Maine community should be left behind. This is also true in the event of a natural disaster - hazard alert systems should be updated to take into account communities' differing ability to respond in the face of immediate climate hazards. The ESC also recognizes that air quality impacts the health of all Mainers, and recommends idling reduction, improved air quality monitoring for allergens, and assessments of health outcomes associated with heating fuel options in homes and at work .

1. The state should continue to support development of climate resilience planning guidance for communities, and should provide assistance to communities and regional entities who support them to run these planning processes. This guidance should include the development of a consolidated list of organizations that provide resources for community resilience and climate action. Guides and process assistance should be made available in languages other than English.

Recently, the state launched the new Community Resilience Partnership, to provide grants and support to municipal and tribal governments to reduce carbon emissions, transition to clean energy, and become more resilient to climate change effects such as to extreme weather, flooding, rising sea levels, public health impacts, and more. The grants will support communities to identify and address locally important priorities, ensuring that all communities in Maine,

²⁰² https://www.apha.org/-/media/Files/PDF/topics/climate/Guide_Section4.ashx

²⁰³ https://www.apha.org/-/media/Files/PDF/topics/climate/Guide_Section2.ashx

²⁰⁴ https://www.apha.org/-/media/Files/PDF/topics/climate/Guide_Section2.ashx

including the smallest and most vulnerable, have access to resources and support to help them reduce emissions and prepare for the effects of climate change.

Massachusetts provides another example of a climate resilience planning guide in its [Municipal Vulnerability Preparedness Program](#) created through Executive Order 569: Establishing an integrated Climate Change Strategy for the Commonwealth.²⁰⁵ This program provides planning and "action" grants that support frontline communities. The associated Case Study slide deck describes that 82% of municipalities have participated and have received a total of \$33 million in planning & action grants during the first three years of the program.²⁰⁶ The Rhode Island Department of Health (DOH) Health Equity Zone Initiative has directed more than \$10.4 million in funding from the federal Centers for Disease Control to nine community-led [Health Equity Zones](#) designed to promote the building of healthier, more resilient communities. They have also created a [Toolkit for Building Healthy and Resilient Communities](#). As part of the program, the state identified nine communities with high rates of health disparities and is collaborating with local officials and community-based partners to develop community-specific action plans.²⁰⁷ Three of the nine zones also have focused efforts on assessing climate change impacts to public health.

In Maine, the University of Maine's Climate Change Adaptation Providers Network hosts a website which offers information and best practices to assist communities in building local climate resilience in Maine.²⁰⁸ Additionally, MDIFW hosts the Beginning with Habitat Program, a landscape conservation planning program collaboratively coordinated by Maine's natural resource agencies and non-governmental organization partners. The program is free and open to all Maine municipalities and organizations seeking to increase resiliency and sustainability of local land use decisions. Beginning with Habitat offers participants detailed information regarding local lands and waters, and provides example approaches and tools employed to best balance growth needs with preservation of ecosystem services and equitable public access.

2. State climate vulnerability funding programs should establish equity metrics to ensure that equitable amounts of funding and other assistance reach communities across Maine. At a minimum, to establish such metrics, state climate vulnerability funding programs should track program participation data by age, race, ethnicity, gender, disability, geography, and other community sociodemographic factors.

Maine communities have both variable experience with and staff capacity to access state climate funding opportunities, as well as different valuation of climate and environmental action within their own hierarchy of needs. Given this, some communities will be unable or

²⁰⁵ <https://www.mass.gov/executive-orders/no-569-establishing-an-integrated-climate-change-strategy-for-the-commonwealth>

²⁰⁶ <https://www.mass.gov/doc/mvp-webinar-recording-fy21-funding-round/download>

²⁰⁷ <https://health.ri.gov/publications/brochures/HealthEquityZones.pdf>

²⁰⁸ <https://extension.umaine.edu/climatesolutions/>

unwilling to access state climate vulnerability funding programs, even as those programs seek to engage them in climate solutions. The ESC recommends establishment of metrics, goals, and targeted outreach to ensure equitable funding reaches all Maine communities who need it. Many federal grants already prioritize building climate resilience in disadvantaged communities,²⁰⁹ with additional targeted funding allocated through the Biden administration's recovery programs in 2021.²¹⁰

3. Citizen climate action groups should be supported and empowered to access climate planning and funding opportunities.

Through the State of Maine's recently launched Community Resilience Partnership, communities and municipalities can access grant funding and other support to pursue climate mitigation, adaptation, and resiliency projects.²¹¹ To be eligible for the program, municipalities or tribal governments must establish or designate either a citizen committee or a municipal or tribal government employee to coordinate activities to reduce energy use and costs, transition to clean energy and make the community more resilient to climate change.

The ESC supports citizen climate action groups, such as the [municipal climate change advisory committee in Dover Foxcroft](#), in their work towards climate action. Municipalities are often overburdened, and thus the creation of citizen climate action groups allows for climate action on a municipal level without increased effort on the part of town employees. The state should build partnerships with these citizen climate action groups and committees to increase access and promote inclusive decision making and outreach around climate adaptation, mitigation, and resilience opportunities.

California's EJ4Climate Grant Program provides funding directly to community-based organizations to help them develop community-driven solutions to adapt to the impacts of climate change, in underserved, vulnerable, and indigenous communities.²¹²

4. The state's natural hazard emergency alert system should take into account variability in people's ability to respond, and should offer a menu of options for risk reduction. The state should increase information about accessing this program in vulnerable communities, and make climate-related information also available through the Maine Health Alert Network System when relevant.

²⁰⁹ <https://www.law.georgetown.edu/salpal/federal-grants-can-impact-state-and-local-policy-to-build-climate-change-resilience-in-vulnerable-communities/>

²¹⁰ [whitehouse.gov/briefing-room/statements-releases/2021/08/09/fact-sheet-biden-administration-announces-nearly-5-billion-in-resilience-funding-to-help-communities-prepare-for-extreme-weather-and-climate-related-disasters/](https://www.whitehouse.gov/briefing-room/statements-releases/2021/08/09/fact-sheet-biden-administration-announces-nearly-5-billion-in-resilience-funding-to-help-communities-prepare-for-extreme-weather-and-climate-related-disasters/)

²¹¹ <https://www.maine.gov/future/climate/community-resilience-partnership>

²¹² http://www.cec.org/files/documents/ej4climate/2021_ej4climate_call_for_proposals.pdf

Frontline communities are at higher risk of exposure to natural hazards, and due to systemic oppression possess limited ability to respond to these natural hazards.²¹³ In Maine, there are currently three different types of alert messaging platforms: television, radio, and wireless; these represent the most direct ways to receive natural hazard related alerts.²¹⁴ A current project in midcoast Maine is aiming to strengthen connections between emergency management, conservation, social service, and municipal sectors to better prepare, respond, and recover from storms and to better serve residents whose circumstances make them more vulnerable to storm impacts.²¹⁵

In September of 2021, the Occupational Safety and Health Administration (OSHA) of the United States Department of Labor announced enhanced and expanded measures to protect workers from hazards of extreme heat.²¹⁶ On days when a recognized heat temperature can result in increased risks of heat-related illnesses, employers are encouraged to implement intervention methods, including regularly taking breaks for water, rest, shade, training workers on how to identify common symptoms and what to do when a worker suspects a heat-related illness is occurring, and taking periodic measurements to determine workers' heat exposure. There is still more to do in terms of strengthening alert systems so that non-English speakers and people who don't have access to computers are still receiving alerts. Drexel University hosts the National Resource Center on Advancing Emergency Preparedness for Culturally Diverse Communities, which has resources related to alert system challenges and solutions.²¹⁷

Age, gender, race/ethnicity and socioeconomic status are associated with differences in perceived risk of natural disasters, as well as how individuals obtain and react to information about natural disasters, extreme weather and environmental conditions.²¹⁸ Previous research on broadcast warnings about extreme weather events and natural disasters identifies target audiences by demographic characteristics that are associated with increased vulnerability to health impacts (e.g., age, race/ethnicity).²¹⁹ Delivery channels for these messages have included internet-based interventions, media sources (television, radio, newspaper) and printed materials.²²⁰ Qualitative research among residents of cities with racial/ethnic- and SES-related

²¹³ Steichenv, Lorah, Jacquelin Patterson, and Katherine Taylor. "In the Eye of the Storm: A People's Guide to Transforming Crisis and Advancing Equity in the Disaster Continuum." NAACP Environmental and Climate Justice Program, 2018. https://live-naacp-site.pantheon.io/wp-content/uploads/2018/09/NAACP_InTheEyeOfTheStorm.pdf.

²¹⁴ State of Maine EAS. (2017). *Emergency Alert System Plan for the State of Maine*. http://www.mab.org/wp-content/uploads/2021/10/Maine-EAS-State-Plan-2017_FCCapproval.pdf

²¹⁵ <https://www.wellsreserve.org/project/social-resilience-project>

²¹⁶ <https://www.osha.gov/news/newsreleases/national/09202021>

²¹⁷ <https://diversitypreparedness.org>

²¹⁸ <https://ascelibrary.org/doi/10.1061/%28ASCE%291527-6988%282007%298%3A3%2861%29>

²¹⁹ <https://ascelibrary.org/doi/10.1061/%28ASCE%291527-6988%282007%298%3A3%2861%29>;
<https://www.mdpi.com/1660-4601/8/12/4623>

²²⁰ Frumkin H, Hess J, Luber G, Malilay J, McGeehin M. Climate change: the public health response. *Am J Public Health*. 2008;98(3):435–45; Lowe D, Ebi KL, Forsberg B. Heatwave early warning systems and adaptation advice to reduce human health consequences of heatwaves. *Int J Environ Res Public Health*. 2011;8(12):4623–48

disparities in heat-related morbidity and mortality described how cooling practices during heat waves may vary according to differences in risk perceptions, resources and social norms.²²¹ Another qualitative study conducted among low-SES racial and ethnic minorities observed that respondents were especially attuned to the effects of local, acute environmental health risks (e.g., sanitation).²²²

5. The Maine CDC should study the opportunity to use community health readiness assessments to assess ability to adapt or respond to climate vulnerability, as well as to include climate risk in a hospital's hazard vulnerability analysis.

The Community Readiness Model is a tool which helps communities assess their level of readiness to address a particular issue and implement actions to increase readiness levels. The model defines stages of readiness from the lowest (1 = no awareness about the issue) to the highest (9 = high level of community ownership).²²³ Understanding a community's level of readiness can help identify the most effective actions to successfully address the issue at hand. This model was successfully used by the city of Missoula, Montana to determine one specific climate risk, Missoula's readiness to address the health impacts of wildfire smoke on sensitive groups.²²⁴

6. The MECDC, in partnership with Maine DEP, should consider developing guidance for evaluating multi-pollutant cumulative impact in environmental justice populations and mixed-use zones.

As directed by recent legislation, the Governor's Office of Policy Innovation and the Future is currently undergoing work to define environmental justice, environmental justice populations, and frontline communities and to apply those definitions to decision making at the Maine DEP and PUC. The ESC recognizes this ongoing work, and suggests further consideration of cumulative impact as these definitions and actions proceed.

The evaluation of cumulative impact, or an analysis, characterization, and possible quantification of the combined risks to health or the environment from multiple agents or stressors, can help identify whether and how proposed development might impact already vulnerable populations.²²⁵ There are many approaches to cumulative risk assessment;²²⁶ the

²²¹ Sampson NR, Gronlund CJ, Buxton MA, et al. Staying cool in a changing climate: Reaching vulnerable populations during heat events. *Glob Environ Chang.* 2013;23(2):475–84.

²²² Taylor-Clark K, Koh H, Viswanath K. Perceptions of environmental health risks and communication barriers among low-SEP and racial/ethnic minority communities. *J Health Care Poor Underserved.* 2007;18(4 Suppl):165–83.

²²³ <https://communityreadiness.org>

²²⁴ https://www.missoulaclimate.org/uploads/4/3/2/6/43267085/communityreadinessreport_climatesmartmsla_spring2016.pdf

²²⁵ U.S. Environmental Protection Agency Office of Research and Development. Risk Assessment Forum, Framework for Cumulative Risk Assessment. [(accessed on 22 April 2015)]; Available online:

<http://www.epa.gov/raf/publications/framework-cra.htm>.

²²⁶ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4454925/>

MassDEP is currently developing guidance with regards to new air permits,²²⁷ New Jersey's new environmental justice law requires cumulative impact analysis in EJ communities,²²⁸ and Minnesota's Pollution Control Agency also addresses these additive impacts, as well as explaining their approach clearly to the public.²²⁹

In addition to developing guidance for evaluation of project impact in disadvantaged communities, procedural equity requires that those communities be notified about such impact and invited to participate in decision making. One approach to this is seen in Massachusetts. Per the [Transition Rules for Public Involvement Requirements for Environmental Justice Populations](#), "all Environmental Notification Forms (ENFs) and Expanded Environmental Notification Forms (EENFs) filed with the Massachusetts EPA Office must provide a narrative identifying environmental justice (EJ) populations within 1 mile of the project site and describing whether the project is reasonably likely to negatively affect such EJ populations. If the project is anticipated to affect air quality, the ENF/EENF shall identify EJ populations within 5 miles of the project site and describe whether the project is reasonably likely to negatively affect such EJ populations."²³⁰ The new EJ law in New Jersey, referenced above, has similar procedural requirements.²³¹

7. DEP, MECDC, the University of Maine, and other partners should work together to explore opportunities to gather increasingly local air quality data across Maine communities; and to provide additional information about the relationship between pollutant exposure and health impact.

Maine has one of the highest rates of asthma in the country: 12% compared to 9% nationally.²³² Currently, air quality monitoring data are unavailable in Franklin, Lincoln, Piscataquis, Sagadahoc, Somerset and Waldo counties.²³³ However, some of the most significant burdens of lung-related illness are in these areas, in addition to disparities in health care access.²³⁴ Additionally, investments in air quality monitoring often correlate with population density rather than measured air quality.

Previous to 2021, Maine had no data on pollen in the state. Due to longer warm seasons caused by climate change, pollen seasons in North America have lengthened by 20 days and pollen

²²⁷ <https://www.mass.gov/info-details/cumulative-impact-analysis-in-air-quality-permitting>

²²⁸ <https://www.eesi.org/articles/view/new-jersey-strives-to-address-cumulative-impacts-of-pollution-in-environmental-justice-legislation>

²²⁹ <https://www.pca.state.mn.us/air/cumulative-impact-analysis>

²³⁰ <https://www.mass.gov/doc/transition-rules-for-public-involvement-requirements-for-environmental-justice-populations-june-2021/download>

²³¹ <https://www.eesi.org/articles/view/new-jersey-strives-to-address-cumulative-impacts-of-pollution-in-environmental-justice-legislation>

²³² <https://www.themainemonitor.org/maines-pollen-problem-is-nothing-to-sneeze-at/>

²³³ https://www.maine.gov/future/sites/maine.gov/future/files/inline-files/PublicHealthSubgroup_FinalStrategyRecommendations_June2020.pdf

²³⁴ https://www.maine.gov/future/sites/maine.gov/future/files/inline-files/PublicHealthSubgroup_FinalStrategyRecommendations_June2020.pdf

concentrations have increased 21% since 1990.²³⁵ A grant from Maine's CDC will provide resources for increased allergen monitoring, which can provide necessary information about pollen count to those experiencing respiratory illness.²³⁶ Finally, the US EPA also recently made more grant funding available for enhanced air monitoring through the American Recovery Plan.²³⁷

8. Maine DEP should encourage idling restrictions and promulgate model municipal policy in densely populated urban and village areas, and in other areas determined to experience disproportionate exposure to and harm from transportation emissions (schools, hospitals, etc). Maine DEP should also study opportunities for increased enforcement and education related to existing initiatives.

According to the U.S. Department of Energy, heavy- and light-duty vehicles waste 6 billion gallons of fuel each year through idling.²³⁸ Many states, including Colorado, Connecticut, Delaware, Maryland, Massachusetts, New Hampshire, New Jersey, Texas and Vermont limit idling to between three and five minutes for most vehicles.²³⁹ Idling restrictions are especially important for school buses and around schools since vehicle emissions are more concentrated near the ground, where children breathe, and poor air quality can contribute to asthma and other ailments, especially in children.²⁴⁰

While Maine does have both school bus specific²⁴¹ and general idling policies for commercial vehicles²⁴², these policies are often not as protective as in other states, have many exemptions, and are in practice difficult if not impossible to enforce. The enforcement challenge plagues many jurisdictions, though some promising results have been seen in jurisdictions like New York City and Washington, D.C., which have both empowered citizens to report idling violations, in some cases in exchange for receiving a percentage of the penalty assessed.^{243, 244} Other promising enforcement approaches include the potential for automated enforcement, provision of data to help change driver behavior, and increasing the quantity of no/low emissions zones in dense vehicle areas.²⁴⁵

9. The state should study health outcomes in low income or rural communities primarily dependent on either fossil fuel or wood combustion for heating.

²³⁵ <https://www.themainemonitor.org/maines-pollen-problem-is-nothing-to-sneeze-at/>

²³⁶ <https://legislature.maine.gov/bills/getPDF.asp?paper=HP0119&item=7&snum=130>

²³⁷ <https://www.epa.gov/arp/enhanced-air-quality-monitoring-funding-under-arp>

²³⁸ https://afdc.energy.gov/files/u/publication/idling_personal_vehicles.pdf

²³⁹ <https://www.ncsl.org/research/environment-and-natural-resources/putting-the-brakes-on-idling-vehicles.aspx>

²⁴⁰ https://afdc.energy.gov/files/u/publication/idling_personal_vehicles.pdf

²⁴¹ https://www11.maine.gov/dep/air/mobile/documents/no_idling_policy.pdf

²⁴² <http://www.mainelegislature.org/legis/statutes/38/title38sec585-L.html>

²⁴³ <https://www.bloomberg.com/news/features/2021-08-10/can-cities-finally-win-the-war-on-vehicle-idling>

²⁴⁴ <https://doee.dc.gov/service/engine-anti-idling-law>

²⁴⁵ <https://www.bloomberg.com/news/features/2021-08-10/can-cities-finally-win-the-war-on-vehicle-idling>

Maine leads the nation in use of fossil fuel based heating sources, with 61.3% of the population using heating oil.²⁴⁶ Since heating oil prices can change drastically, and upfront payment costs for oil delivery are often high, this heating source is unstable and often expensive, particularly for low income users. Combined with the effects of living in poorly weatherized homes, this can create health risks for residents.²⁴⁷ In addition, both oil heat and wood heat are associated with decline in air quality, which can lead to negative health effects.²⁴⁸ Health effects associated with wood heat include “burning eyes, runny nose, and illnesses, such as bronchitis. Fine particles can make asthma symptoms worse and trigger asthma attacks. Fine particles can also trigger heart attacks, stroke, irregular heart rhythms, and heart failure, especially in people who are already at risk for these conditions.”²⁴⁹ Thus, in addition to education about indoor air quality, an additional strategy could be a wood stove exchange program. This type of program would reduce carbon and other greenhouse gas emissions, as well as limiting emissions causing health impacts because of the higher efficiency of newer wood stoves.²⁵⁰ Vermont has accelerated the adoption of advanced wood heat to replace high-greenhouse-gas emitting systems through measures that include providing low-income rebates on clean advanced wood heat through a heating assistance fee on new high-greenhouse-gas heating systems.²⁵¹

10. The state should study health impacts associated with industrial facility siting decisions in frontline communities.

*Investigation and remediation of existing contamination at and surrounding industrial facilities is guided by health-based screening levels developed by the US EPA and Maine CDC. However, these activities are often limited to locations where there are viable responsible parties to pay the costs, while the sites of bankrupt operators languish. Maine should develop a comprehensive study of, and approach to remediation of, potential toxic contamination around past, current, and future industrial sites.*²⁵²

G. Engaging Maine People and Communities and Resilient Infrastructure

Functioning infrastructure in Maine is a basic requirement for public safety and health, thriving state and local economies, and the flow of people, goods, and information. As the state works towards improving the climate resiliency of roadways, bridges, and waterfronts across the state, the distribution of these improvements must be equitable. All Maine communities, regardless of their population or finances, deserve climate smart, working infrastructure that

²⁴⁶ <https://www.islandinstitute.org/wp-content/uploads/2021/03/Bridging-the-Rural-Efficiency-Gap-final-report.pdf>

²⁴⁷ Jackson, R. J., Dannenberg, A. L., & Frumkin, H. (2013). Health and the Built Environment: 10 Years After. *American Journal of Public Health*, 103(9), 1542–1544. <https://doi.org/10.2105/AJPH.2013.301482>

²⁴⁸ <https://www.cpsc.gov/Safety-Education/Safety-Guides/Home/The-Inside-Story-A-Guide-to-Indoor-Air-Quality>; <https://www.nytimes.com/2010/01/01/science/earth/01pollute.html>

²⁴⁹ <https://www.epa.gov/burnwise/wood-smoke-and-your-health>

²⁵⁰ <https://www.epa.gov/indoor-air-quality-iaq/wood-smoke>

²⁵¹ <https://www.vpr.org/vpr-news/2019-05-17/did-it-work-vermonts-wood-stove-change-out-program>

²⁵² <https://www.pressherald.com/2021/07/18/trail-of-forever-chemicals-leads-to-maine-paper-mills/>

will keep them safe and provide a secure foundation for health, and economic success. Disadvantaged communities often lack access to opportunities for improving infrastructure due to financial or other barriers.²⁵³ This can lead to negative outcomes in the case of natural disasters, compounding the effects of systemic disinvestment.²⁵⁴ Financial assistance programs, outreach, and preemptive support allow for increased engagement by disadvantaged communities throughout the climate adaptation process. To ensure that communities with less capacity and less money for climate assessments achieve positive outcomes, funding should be available, and the state should assist with identifying infrastructure which is potentially vulnerable to climate change. The ESC also recognizes that the process of accessing funding for climate resilience projects requires money for planning and engineering, and recommends that the state support municipalities in identifying that initial investment. Where individual citizens are concerned, the state should adopt programs and guidance to help citizens better understand climate risk.

1. The state should compile a list of vulnerable infrastructure identified through prior, current, and future planning processes at the local and regional level, and develop a plan for assessing this infrastructure for climate vulnerability as well as funding infrastructure resilience upgrades. When determining which infrastructure to upgrade first, the state should prioritize infrastructure which is both critical and identified as important to the host community.

Critical infrastructure includes telecommunications, energy, transportation, and water, and is essential for economic and social functioning of a municipality. Climate change has the potential to directly damage infrastructure via sea level rise, intense precipitation, extreme heat and increases in hurricane intensity,²⁵⁵ and critical infrastructure should be upgraded first to ensure that it does not fail during an emergency, leaving vulnerable Mainers with access to critical services.

One source of information about existing vulnerabilities might be the state's Hazard Mitigation planning process. The Maine Emergency Management Agency (MEMA) assists communities with developing and updating Hazard Mitigation Plans; these documents include information about community vulnerabilities to various natural hazards and mitigation actions that they propose to reduce their long-term risk. This information is originally collected by communities and their counties based on their own interpretation of vulnerability to floods, severe storms, wildfire, drought, landslides, and other prominent hazards in Maine. MEMA is currently developing a digital database of these mitigation actions. The database will contain information about the type of project, its location, the hazard being mitigated, expected costs and time

²⁵³ <https://www.brookings.edu/research/prioritize-people-not-projects-addressing-the-harms-of-legacy-infrastructure-in-the-covid-19-recovery/>

²⁵⁴ Ryder, S. (2017). A bridge to challenging environmental inequality: Intersectionality, environmental justice, and disaster vulnerability. *Social Thought & Research*, 34, 85–115.

²⁵⁵ <https://nca2014.globalchange.gov/highlights/report-findings/infrastructure>

frame, responsible agencies, available funding sources, progress towards completion, and a brief description of project scope. Projects listed in these Hazard Mitigation Plans are eligible for financial support through FEMA mitigation assistance grants.

2. Maine Won't Wait recommends that, by 2023, the state complete a statewide infrastructure-vulnerability assessment. Assets identified in the plan include transportation infrastructure (including roads, bridges, culverts, airports, railroads, ferries, ports and wharfs, maintenance facilities, and public transit systems); water infrastructure (including drinking-water systems, wastewater treatment facilities, and dams and stormwater management assets); energy infrastructure (including electricity generation, storage, and transmission; and fuel supply infrastructure); communications infrastructure (including landline, mobile, and broadband); and community infrastructure (including health systems; public housing; state, tribal, and municipal government buildings; food systems; solid-waste systems, etc.). The ESC recommends that, in addition to the water infrastructure identified above, the state assess the climate vulnerability of groundwater systems and wells in vulnerable communities where there exists potential exposure to increased rates of salinization (due to sea level rise or coastal storms) or increased levels of arsenic (due to more frequent drought).

It is important that areas that are geographically vulnerable to salinization due to sea level rise, or flooding from extreme weather events, are aware of the threats and have access to solutions. On Maine's islands, saltwater intrusion is already occurring; island communities need both further information and clarity on responsibility and opportunities to address the problem.²⁵⁶ Furthermore, extreme weather events can produce flood waters that can increase sewer overflows, carry soil erosion particles, agricultural runoff, chemical contaminants, and bacteria into surface waters and wells which can lead to gastrointestinal illness and chemical exposures from recreational contact or consumption of untreated drinking water.²⁵⁷ While Maine Won't Wait requires comprehensive climate vulnerability analyses to be completed on certain classes of water infrastructure, including drinking-water systems, wastewater treatment facilities, and dams and stormwater management assets) the ESC recommends that wells be added to that list. The University of Nebraska, Lincoln hosts a "Well Water Safety" website, which shares resources for private well users in the event of a flood emergency, including water treatment options, and strategies to protect wells from floodwater.²⁵⁸

3. The state should identify priority communities for piloting the infrastructure adaptation fund, as well as prioritization criteria to apply to competing projects and other proposals. Consideration should be given to factors including climate vulnerability and

²⁵⁶ <https://www.islandinstitute.org/working-waterfront/water-harvesting-as-a-solution-for-island-communities/>

²⁵⁷ https://www.maine.gov/future/sites/maine.gov/future/files/inline-files/PublicHealthSubgroup_FinalStrategyRecommendations_June2020.pdf

²⁵⁸ <https://disaster.unl.edu/well-water-safety>

risk, but also sociodemographic factors, income level, planning and engineering capacity, and cultural/historic significance of infrastructure, amongst other factors.

Coastal and low income communities often face barriers to updating infrastructure including limited project funding in small communities, and potential lack of expertise for seeking additional funding.²⁵⁹ Given these challenges, the ESC recommends state prioritization of adaptation funds for infrastructure that is relied upon by underserved communities. In order to identify areas to prioritize for public investment in climate smart infrastructure, communities should be ranked based on their level of capacity to adapt, and their level of disadvantage (as understood by demographic variables).²⁶⁰ Some processes for identifying priority communities for infrastructure adaptation include the American Society of Civil Engineers [Infrastructure Report Card](#), which does not include equity considerations but points to specific situations in which infrastructure is in need of repair; and GIS analysis of factors including social vulnerability, green space, air quality, storm-water runoff mitigation capacity, flood sensitive areas, and flood sensitive buildings, all of which were used to make recommendations for new infrastructure placement in Ghent, Netherlands and Detroit, Michigan.²⁶¹

4. In addition to providing project funding, the state's new infrastructure adaptation fund should identify funding for risk assessment, planning, and engineering design, particularly in communities with limited resources.

Maine currently has a backlog of 1,798 infrastructure adaptation projects listed across all sixteen counties at a proposed cost of \$325 million.²⁶² The ESC is interested in assisting communities with limited resources (both financial and in terms of human capacity) in accessing funding for infrastructure adaptation and the steps that come before infrastructure adaptation (including risk assessment, planning, engineering design). In both funding and pre-development assistance, attention must be directed toward communities where high social and climate vulnerability overlap with low capacity to develop project pipelines and limited access to funding.

5. The state should help municipalities raise long term funding for long-term infrastructure projects.

Project funding for climate adaptive infrastructure projects often comes in the form of one year grants. However, many essential resilience focused infrastructure projects (ie bridge

²⁵⁹ <https://coastadapt.com.au/barriers-to-adapting-climate-change>

²⁶⁰ <https://www.tandfonline-com.wv-o-ursus-proxy02.ursus.maine.edu/doi/full/10.1080/13549839.2017.1345878>

²⁶¹ Li, L., Uyttenhove, P., & Van Eetvelde, V. (2020). Planning green infrastructure to mitigate urban surface water flooding risk – A methodology to identify priority areas applied in the city of Ghent. *Landscape and Urban Planning*, 194, 103703. <https://doi.org/10.1016/j.landurbplan.2019.103703>; Meerow, S., & Newell, J. P. (2017). Spatial planning for multifunctional green infrastructure: Growing resilience in Detroit. *Landscape and Urban Planning*, 159, 62–75. <https://doi.org/10.1016/j.landurbplan.2016.10.005>

²⁶² https://www.maine.gov/future/sites/maine.gov/future/files/inline-files/MCC_DRAFT_DetailedOutlineClimateActionPlan_Oct19_2020.pdf

replacement or dam upgrades) are long term projects. Thus, communities often face difficulties in funding these longer term projects. Currently, the Maine Municipal Bonds Bank offers longer term low cost financing for municipalities for projects including school renovation, and safe drinking water.²⁶³ The state should work with the Maine Municipal Bonds Bank to enhance lending opportunities for infrastructure projects that support community resilience. In New York, the Environmental Facilities Corporation (EFC) offers a number of financing programs including both short and long-term financings and interest-free financing and grants for qualifying communities with demonstrated financial hardship.²⁶⁴ The EFC also offers grants for green stormwater infrastructure projects which can cover up to 90% of eligible project costs in a municipality that meets the median household income criteria, or that serves, protects, or benefits an environmental justice area.²⁶⁵

6. The state should explore the development of a menu of resilient infrastructure project recommendations, as well as expand on existing centralized lists of vendors to provide vulnerability assessment, planning, design, and construction services.

*Due to limited capacity and/or funding, municipalities may experience difficulty identifying partners for adaptive infrastructure work from assessment through building. The ESC recommends developing a list based on the approach taken by existing EMT or MDOT approved vendor lists, and/or the creation of prequalified resiliency vendor lists by DAFS, who may choose to follow models of other jurisdictions like NYC.*²⁶⁶

7. The state should consider mandating a climate risk disclosure requirement for certain investments.

This recommendation applies to both consumers and insurers. On the consumer end, disclosures are recommended for borrowing decisions/loans for both homes and business and capital investments subject to climate risk. This might include [flood zone risk disclosure requirements](#) during home sales, or information about potential income diversification for workers in natural heritage industries affected by climate change. Currently, many states including Maine have no statutory or regulatory requirement that a seller must disclose a property's flood risks or past flood damages to a potential buyer.²⁶⁷ Additionally, the state could consider offering an optional financial literacy course for disadvantaged/low income Mainers making borrowing decisions, including state-secured loans or insurance products (such as a loan loss reserve for vehicle loans). Maine offers such a literacy program for first time homebuyers through MaineHousing's hoMEworks Homebuyer Education classes.²⁶⁸ Several other states have passed

²⁶³ [http://www.mainebondbank.com/\(X1\)S\(tocrjzqobuodyg4ftdg3loif\)\)/Programs.aspx](http://www.mainebondbank.com/(X1)S(tocrjzqobuodyg4ftdg3loif))/Programs.aspx)

²⁶⁴ <https://efc.ny.gov/dwsrf>

²⁶⁵ <https://efc.ny.gov/green-stormwater-infrastructure#funding>

²⁶⁶ <https://www1.nyc.gov/site/ddc/about/press-releases/2019/pr-070119-escr.page>

²⁶⁷ <https://www.nrdc.org/flood-disclosure-map>

²⁶⁸ <https://www.mainehousing.org/education/home/homeworks-homebuyer-education-classes>

legislation to support financial literacy programs for low income residents, and seek to expand banking services and lending options for underserved communities.^{269, 270}

For insurers, this recommendation involves climate literacy training for lenders. The [Task Force on Climate Related Financial Disclosures](#) published a comprehensive report describing voluntary, consistent climate-related financial disclosures useful to investors, lenders, and insurance underwriters in understanding material risks.²⁷¹

H. Engaging Maine People and Communities and Resilient Infrastructure

The ESC discussed engaging with Maine people and communities about climate impacts and program opportunities with a **social resilience framework** in mind.²⁷² In this context, resilience can be defined as the ability of a person or a community to function in the face of adversity, to survive, and, perhaps, even to thrive.²⁷³ The ability of a community, city, neighborhood, or town to be resilient depends on the community's capability to learn from past shocks, and incorporate learning into plans for better future protection and improvement of risk reduction measures.²⁷⁴ Information gathered from past shocks must be responsibly mobilized for increased equitable outcomes to ensure that communities who experience a shock once are not also subject to repeat experiences of the same negative outcome.

Though Maine communities are already resilient in many ways, much can be done to increase the resilience capacity of individuals and communities, particularly in response to climate change. The factors that can enhance resilience range from personal action to community programs, and beyond. From supporting personal mental health resilience, to including all communities in resilience planning, to creating education and outreach materials in many languages, the state can support robust physical and social infrastructure for improved resilience across the state.

1. Climate engagement opportunities offered by the state and its partners should be accessible across all forms of media, and should be delivered through trusted partners to reach frontline populations. In designing and offering programs to reach these target populations (i.e., neighborhoods with low literacy, high linguistic isolation, high elderly

²⁶⁹ https://www.dfs.ny.gov/reports_and_publications/press_releases/pr202110071

²⁷⁰ https://leginfo.ca.gov/faces/billNavClient.xhtml?bill_id=200720080AB2123

²⁷¹ <https://assets.bbhub.io/company/sites/60/2021/10/FINAL-2017-TCFD-Report.pdf>

²⁷² Faulkner, L., Brown, K., & Quinn, T. (2018). Analyzing community resilience as an emergent property of dynamic social-ecological systems. *Ecology and Society*, 23(1). <https://doi.org/10.5751/ES-09784-230124>

²⁷³ Hobfoll, S. E., Stevens, N. R., & Zalta, A. K. (2015). Expanding the science of resilience: Conserving resources in the aid of adaptation. *Psychological Inquiry*, 26(2), 174–180. doi:10.1080/1047840X.2015.1002377

²⁷⁴ <https://www.unisdr.org/2005/wcdr/intergover/official-doc/L-docs/Hyogo-framework-for-action-english.pdf>

or youth populations, etc.), the state should work in close partnership with on-the-ground organizations.

The ESC recommends that climate information come from trusted sources, and be understandable to target audiences in order to be usable in frontline communities. Trusted partners, including churches and other faith-based organizations, and non-profits can act as ‘bridge’ organizations to facilitate engagement and convey messages about climate change to frontline communities.²⁷⁵ Using places and buildings that are familiar, easily reachable and accessible, can improve both access to information, and audience receptiveness.²⁷⁶ Climate change information should also be shared in many languages as research has shown that sharing scientific language in the native language of a target audience yields greater participation, motivation and optimism, and leads to stronger connections to concepts in the native culture.²⁷⁷

2. The state should explore opportunities to use its climate communications to build psychological resilience to climate change. This should include access to free psychological resilience resources geared towards addressing climate-driven trauma.

Since the effects of climate change will be disproportionately felt by frontline communities, so will the effects of climate driven trauma. Climate change can affect mental health directly, through personal experience of living through a disaster or facing climate-driven unemployment; and indirectly, through experiences of climate disaster storytelling and “doom and gloom” reporting.²⁷⁸

In addition to being less able to respond and adapt to climate risks, vulnerable populations are often unable to access mental health resources, and specifically mental health resources related to climate change and building psychological resilience. According to the American Psychological Association, “Compromised physical health can be a source of stress that threatens psychological wellbeing. Mental health problems can threaten physical health, such as weakening the immune system. Community health and well-being are interconnected with both. And, structural and systemic inequity and disinvestment shape all forms of health.”²⁷⁹ Building psychological resilience is a part of the process of engaging people in work around creating resilient communities - involvement can help combat the denial and passivity²⁸⁰ and

²⁷⁵ <https://greenlining.org/wp-content/uploads/2021/10/Fighting-Climate-Change-and-Redlining-with-Transformative-Climate-Communities-Final-Report.pdf>

²⁷⁶ <https://www.frontiersin.org/articles/10.3389/fcomm.2020.00042/full#B31>

²⁷⁷ <https://www.frontiersin.org/articles/10.3389/fcomm.2020.00031/full#B32>

²⁷⁸

²⁷⁹ <https://www.apa.org/news/press/releases/mental-health-climate-change.pdf>

²⁸⁰ Ojala, M. (2012). How do children cope with global climate change? Coping strategies, engagement, and well-being. *Journal of Environmental Psychology*, 32(3), 225–233. doi:10.1016/j.jenvp.2012.02.004; Van Zomeren, M., Spears, R., & Leach, C. W. (2010). Experimental evidence for a dual pathway model analysis of coping with the climate crisis. *Journal of Environmental Psychology*, 30(4), 339–346. doi:10.1016/j.jenvp.2010.02.006

decrease skepticism that some communities feel toward help from outsiders, especially government or local agency officials.²⁸¹

3. Volunteer Maine should incorporate equity into plans for the Maine Climate Corps program. Equitable measures might include multilingual or otherwise targeted outreach, provision of wrap-around services to ensure equitable participation, and focused recruitment of corps members from communities experiencing marginalization.

If the Maine Climate Corps is developed as a program through AmeriCorps, the benefits that AmeriCorps offers to those who serve should be equitable. Health care, and accommodations for individuals with disabilities are all aspects of paid support for AmeriCorps members, as are mental health care and a living allowance of between \$16,000 and \$21,000.²⁸²

3. Conclusion and Next Steps

This report is the interim outcome of the Equity Subcommittee's work to date. It is the beginning of a conversation between the subcommittee, the Maine Climate Council, and its working groups, focused on setting clear equity outcomes for the programs and policies proposed within Maine Won't Wait and above; and supporting ongoing planning and implementation, with a focus on the development of equity metrics which will allow the state and its partners to monitor impact over time.

After the Maine Climate Council receives these recommendations in February (2022), the ESC proposes a continuation of this work in partnership between its members and the MCC working groups. Refinement of recommendations presented herein will be a primary task of the collaboration, as we work to focus on top priorities within each working group. Equally important will be the establishment of metrics for ensuring measurable change; the ESC will work with working group members to propose metrics that will allow us to collectively monitor successful implementation of equity recommendations. Such metrics may relate to incentive programs, clean energy investments, program participation, and funding for climate-focused incentives to go to priority populations. Finally, to the extent possible, the ESC and working groups should identify responsible state, quasi-state, and non-state partners for implementation of priority recommendations, as well as any challenges or barriers to implementation that must be overcome.

²⁸¹ Phadke, R., Manning, C., & Burlager, S. (2015). Making it personal: Diversity and deliberation in climate adaptation planning. *Climate Risk Management*, 9, 62–76.

²⁸² <https://americorps.gov/members-volunteers/vista/benefits>

The ESC suggests that the outcome of this collaboration be a final report to the climate council, containing collective priority recommendations, implementation partners, and recommended metrics, by the end of 2022.

This collaboration will be supported at the outset with a joint presentation for all members of the MCC and its working groups regarding equity, both generally and with respect to climate change. The ESC recommends that this training cover topics related to diversity, equity, inclusion, justice, and implicit bias; as well as provide an introduction to equity metrics frameworks, to guide the collaboration moving forward. The ESC recommends that such training be offered moving forward, to help ensure that vulnerable and historically underserved communities continue to be centered throughout Maine's ongoing climate planning process. Additionally, both as it relates to the ongoing work of the council and otherwise, the ESC recommends that, to the extent possible, membership on climate decision-making bodies should be diverse and representative of Indigenous populations, people of color, limited English proficient residents, New Americans, and low-income residents. Moreover, these decision-making bodies should strive to include membership of these demographic groups that is at least as high as the general population within the state.

We recognize that the ESC's work is occurring in parallel with other important, equity driven work in the state. One key piece of legislation is [LD 1682](#), which proposes a stakeholder process to define environmental justice, environmental justice populations, and frontline communities, and which will focus on the intersections between social vulnerability and environmental and climate risk. The legislation will also help inform guidance to help state agencies assess whether and how agency actions lead to equitable distribution of resources and equitable outcomes, while reducing disproportionate burdens, including through the use of cumulative impact analyses where applicable.

The [Permanent Commission on the Status of Racial, Indigenous and Maine Tribal Populations](#) represents another critical process occurring parallel to the work of the ESC. As an independent entity, the Permanent Commission, which was established in 2019, has a mission to examine racial disparities across all systems and to specifically work at improving the status and outcomes for the historically disadvantaged racial, Indigenous, and tribal populations in the State. In providing recommendations, the Permanent Commission is empowered to advise all three branches of the Maine government.²⁸³ Where the focus of the ESC is on the intersections of climate change and equity, the focus areas for the Permanent Commission cast a broader

²⁸³ https://www.maine.gov/labor/pcrit/reports/2020_LegReport.pdf

net, examining possible impacts of racial disparities in ten policy areas including education, criminal justice, and tribal sovereignty, among others.²⁸⁴ Both LD 1682 and the work of the permanent commission represent arenas in which the state's ongoing commitment to equity expand beyond the purview of the ESC. Together, these processes will help support a more just and secure future for all Maine people.

4. Appendices

Appendix A: Members of the Maine Climate Council Equity Subcommittee

Co-chairs of the Subcommittee are Ambassador Maulian Dana of the Penobscot Nation and Gabriela Alcalde, Executive Director of the Elmina B. Sewall Foundation. Members of the Equity Subcommittee represent the entire State and a variety of communities, industries, and interests. The full member list is below:

Maine Legislators

- Senator Craig Hickman, D-Winthrop
- Senator Jeffrey Timberlake, R-Androscoggin
- Representative Tom Martin, R-Greene
- Representative Rachel Talbot Ross, D-Portland

Co-Chairs

- Ambassador Maulian Dana, Penobscot Nation
- Gabriela Alcalde, Executive Director of the Elmina B. Sewall Foundation

Additional Members

- Becca Boulos, Maine Public Health Association; Maine Climate Council Community Resilience Planning, Public Health, and Emergency Management Working Group
- Curt Brown, Ready Seafood
- Shanna Cox, Lewiston Auburn Chamber of Commerce
- Lesley Fernow, Central Hall Commons
- Steve Golieb, Maine Climate Council; Town Councilor for the Town of Millinocket
- Corey Hinton, Drummond Woodsum
- Amara Ifeji, Maine Environmental Education Association
- Melissa Law, Maine Climate Council; Owner of Bumbleroot Organic Farm
- Suzanne MacDonald, Island Institute
- Matt Marks, Maine Climate Council; Executive Director of the Associated General Contractors of Maine

²⁸⁴ https://www.maine.gov/labor/pcrit/reports/2020_LegReport.pdf

- Gabe McPhail, Town of Vinalhaven
- Fortunat Mueller, Revision Energy
- Jason Parent, Aroostook County Action Program
- Ambureen Rana, Maine Equal Justice
- Darren Ranco, University of Maine
- Isaiah Reid, University of Maine at Farmington Student; Permanent Commission on the Status of Racial, Indigenous and Maine Tribal Populations
- Jonathan Rubin, University of Maine
- Matt Schlobohm, Maine Climate Council; Executive Director of the Maine AFL-CIO
- Adelaide Taylor, Revision Energy
- Claudette Townsend, Dead River
- Ania Wright, Maine Climate Council Representative of Maine Youth; Sierra Club Maine

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