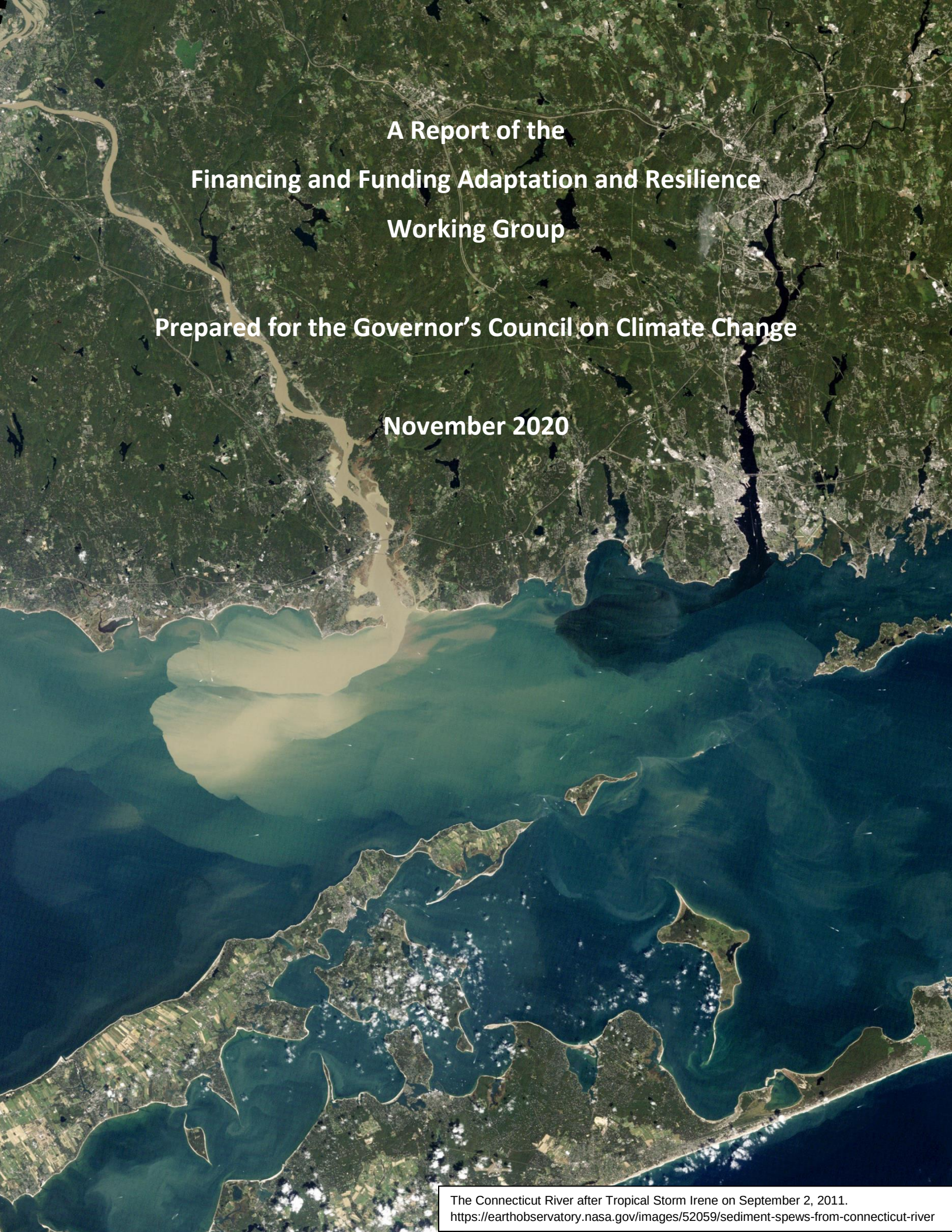
A Report of the Financing and Funding Adaptation and Resilience Working Group

Prepared for the Governor's Council on Climate Change

November 2020



The Connecticut River after Tropical Storm Irene on September 2, 2011.
https://earthobservatory.nasa.gov/images/52059/sediment-spews-from-connecticut-river

Financing and Funding Adaptation and Resilience Working Group

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List of Acronyms

ADU	Accessory Dwelling Unit
AGI	Adjusted Gross Income
BCA	Benefit Cost Analysis
BRIC	FEMA Building Resilient Infrastructure and Communities program
CDBG-DR	Community Development Block Grant Disaster Recovery
CDC	Community Design Center
CDCs	Community Development Corporations
CDFI	Community Development Financial Institution
CGA	Connecticut General Assembly
CHFA	Connecticut Housing Finance Authority
CIA	Community Investment Act
CIRCA	Connecticut Institute for Resilience and Climate Adaptation
CJ	Climate justice
COG	Council of Government
C-PACE	Commercial Property Assessed Clean Energy
CRS	FEMA Community Rating System
DAS	CT Department of Administrative Services
DEEP	CT Department of Energy and Environmental Protection
DECD	CT Department of Economic Community Development
DESPP	CT Department of Emergency Services and Public Protection
DOH	CT Department of Housing

DOI	CT Department of Insurance
DOT	CT Department of Transportation
EJ	Environmental justice
ESCO	Energy Services Company
ESPC	Energy Savings Performance Contract
FEMA	Federal Emergency Management Agency
FEMP	Federal Energy Management Program
FMA	Flood Mitigation Assistance
GC3	Governor's Council on Climate Change
GHG	Greenhouse Gas
HES	Home Energy Solution
HMA	Hazard Mitigation Assistance
HMGP	Hazard Mitigation Grant Program
HUD	U.S Department of Housing and Urban Development
MS4	Municipal Separate Storm Sewer System
NBS	Nature-based solutions
NFIP	National Flood Insurance Program
NFWF LISFF	National Fish and Wildlife Foundation's Long Island Sound Futures Fund
NGO	Non-governmental organization
NJ DEP	New Jersey Department of Environmental Protection
NJIT	New Jersey Institute of Technology
NOAA	National Oceanic and Atmospheric Administration

OPM	CT Office of Policy and Management
OSWA	Open Space and Watershed Land Acquisition Grant Program
RGGI	Regional Greenhouse Gas Initiative
RL	Repetitive Loss
RNHT	Recreation and Natural Heritage Trust Program
SFDU	Single family dwelling unit
SRF	State Revolving Funds
SRL	Severe Repetitive Loss
TELP	Tax-Exempt Lease Purchase
TIF	Tax Increment Financing
TNC	The Nature Conservancy
USACE	United States Army Corps of Engineers
USDA NRCS	U.S. Department of Agriculture Natural Resources Conservation Service
USEPA	U.S. Environmental Protection Agency

Executive Summary

This report reflects the deliberations of the Financing and Funding Adaptation and resilience Working Group of the Governor's Council on Climate Change to carry out the charge under Executive Order 3[1] of making "recommendations and proposals for funding sources and financing mechanisms to advance investment in recommended strategies."

The Working Group integrated direct participation and report review comments from the Equity and Environmental Justice Working Group in order to address the views and needs of environmental justice communities, including low-income and communities of color and other vulnerable communities that are disproportionately impacted by the effects of climate change. Due to the recognition of ongoing inequities, we viewed our charge through an equity lens. This resulted in the recommendations included in this report to prioritize improvement in social equity outcomes and the protection of vulnerable communities whenever public resources fund and finance resilience and climate adaptation program and projects in Connecticut in partnership with philanthropic foundations, non-profit or for-profit corporations, or municipal, state, tribal, and federal government.

This report summarizes immediate actions the State should take to advance investment in climate adaptation and resilience. It draws and builds upon the findings of several similar reports reviewing financing and funding options for resilience from within Connecticut and around the country.[2,3,4] We used a high-level systems approach identifying a large spectrum of financing mechanisms that are available and emerging to protect people from climate risks. The diversity of options reflects the diversity of the Working Group's members and their areas of expertise as well as the scope of the need and therefore the tools necessary to address immediate risks. This report is meant to serve as a guide to state leaders now and in the future.

Framing. The report frames the needs for climate resilience financing and funding through discussion of unmet disaster recovery needs following numerous past storms with national disaster declarations in Connecticut. The report notes that insured assets are at greater risk from climate change, and reviews the impact of climate change on the financial markets. These impacts include the current regulatory practice of not informing investors of physical and transitional climate risks, warnings of a potential mortgage default crisis, and the potential downgrading of state and municipal bond ratings due to increasing costs if adequate, dedicated and recurring funding sources are not budgeted and invested to address the impacts of climate change. The recent public health and economic impacts of COVID-19 and Isaias are also discussed as the current context within which these issues may be viewed at the state and federal level.

Findings. The Working Group reviews focus topics of its deliberations, including barriers to financing, an insurance perspective on climate risks, the integration of equity and public health benefits with nature-based solutions, engaging foundations and philanthropic organizations to

partner with the public and private sector on capacity building investments in communities, and assessing the equity impacts of financing and funding mechanisms as positive, neutral or negative to distressed communities.

Barriers. Identified barriers were largely drawn from previous reports as well as the experience of Working Group members. These barriers include the disproportionate impacts on vulnerable communities, an increase in the racial wealth gap of whites and people of color after disasters, inadequate information on costs and benefits of addressing climate change, incorrect pricing of climate risk, collective action challenges, capital budget constraints, limited ability to borrow funds, misaligned incentives, difficulty obtaining grant funding, unpredictability in cost-sharing, and the need for capacity-building and training tools.

Insurance. Several areas are highlighted that could be further explored as a focus area for insurance product development, including adjusting the rate to risk, investing in pre-disaster mitigation, aligning land use policies with insurance risk, improving building standards and ensuring adherence to those standards, improving the take-up of flood insurance, educating consumers, correcting a lack of incentives for following codes and creating incentives for high-performance buildings.

Nature-based Solutions. All strategies for implementing and financing of adaptation programs and projects should be mindful of the limitations of hardening and armoring approaches, such as sea walls, rip rap, river channeling, and other 'grey infrastructure' options, and the benefits of nature-based solutions (NBS) and 'green infrastructure' or 'living shoreline' strategies. Armoring is essential and effective in some situations, but can also exacerbate flooding. Hard structures can also significantly degrade or destroy tidal wetlands and flats, river floodplains, and other natural habitats that can protect human infrastructure by absorbing and reducing storm and flood surge. Restoration of tidal marshes and beach dunes, providing urban street-side rain gardens, removal of high hazard dams, replacement of undersized road culverts, and other NBS can provide effective protection of neighborhoods, roads, and critical community infrastructure and enhanced amenities for people and habitat for wildlife. A predictable steady investment in NBS provides multiple societal benefits, including flood control, urban workforce development, and increased wildlife. Planners, agencies, and non-profits compiled a database of nearly 500 proposed NBS projects in Connecticut that need funding. Federal resilience funding sources from FEMA and NOAA also prioritize projects that integrate NBS.

Foundations and Philanthropy. Communities face many potential funding challenges when it comes to adaptation and resilience. Among these are the inability to meet qualifications for different funding sources, limited capacity to research funding sources, changing technology, competition with other organizations, narrowness in grant scoping, changing funding priorities, funding limitations and restrictions, and/or funding shortfalls. Foundations and the philanthropic community provide a complementary funding pathway for financing climate adaptation and resilience programs and projects that can work alone or in partnership with state and federal funding sources. They may be particularly well suited to addressing these challenges at the community scale. In Connecticut that capacity includes engaging communities of color in decision-making; taking the long view on partnerships; advancing policy, knowledge

and practice; funding planning and demonstration grants; providing required non-federal or non-state matching funds; and impact investing.

Equity Lens. Equity starts by recognizing that there are disparities and inequities in living conditions, which have been exacerbated by historical inequities and societal practices. Some communities lack resources, political power, and access to higher education, or have poor health outcomes that place these low-income communities and communities of color at greater risk and limits their capacity to adapt to climate change. Climate change poses the greatest threat to the vulnerable communities that are least responsible for it. Conversely, those who have contributed the most to climate change are better positioned to protect themselves from its impacts. The Financing and Funding Adaptation and Resilience and Equity and Environmental Justice Working Groups of the Governor's Council on Climate Change are committed to continuously assessing whether existing, new, emerging, or expanded climate funding and financing mechanisms are sufficient and available to improve the needs of vulnerable communities. These mechanisms are significant, but are they sufficient and attainable for those who need them the most? To that end, these Working Groups, guided by the Environmental Justice Public Participation Guidance, and Guidance on Remote Engagement for Public Participation developed a process to address these issues that is ongoing.

Recommendations for Financing and Funding Options. The recommended options for financing and funding adaptation and resilience are summarized below and reflect ideas from several previous reviews of the same topic and the perspectives and experience of the members of the Working Group. The recommendations are organized under five strategies with recommended implementation actions under each strategy. The complete recommendations in the main body of the report include a brief description of the recommendation, a list of implementation entities, an equity lens with a review of equity issues and protection of vulnerable communities, and the scale of funding associated with the action.

Strategy 1. Build the governance structure necessary to allow for effective and efficient financing and funding.

Funding alone does not result in implementable projects. We need a government that leads and facilitates the development of projects at the state, regional and municipal scale and prioritizes the protection of vulnerable communities.

Recommended Implementation Actions

- Adopt Policy of No Less than 40% of all Spending on Adaptation and Resilience to Benefit Vulnerable Communities
- Increase Connecticut's Competitiveness for Securing Federal Funds for Resilience
- Convene the Insurance Industry on Carbon Neutral Investment Policies
- Incentivize Private Developers and Businesses to Implement Resilience Standards and Disaster Preparedness

- Require the Disclosure of Physical and Transitional Climate Risks at the State and Municipal Level
- State-funded and Initiated Infrastructure and Buildings Projects Should Lead by Example to Establish and Meet Climate Adaptation and Resilience Standards
- Create Central Governance Authority for the Funding, Financing, and Operations of Resilience Infrastructure Projects
- Build Outreach and Capacity and Tracking for the Increased Uptake of Flood Insurance

Strategy 2. Generate Revenue Sources to Pay for Resilience Projects and Programs

Adaptation and resilience projects and programs savings come in the form of avoided losses making it fundamentally more difficult to fund the financing of loans or bonds for these projects with financial losses avoided or savings from lower costs of insurance. In order to finance projects, it is necessary to establish other revenue sources for the funds that will save the state and municipalities dollars in avoided loss, while maintaining or improving bond ratings.

Recommended Implementation Actions

- Establish Resilience Fees to Provide Revenue Sources for Adaptation and resilience Funding and a Source of Matching Funds for Grants.
    - Types of Fees:
        - Transaction Fee - Municipal Conveyance Fee.
        - User Fee - Wastewater use fee.
        - Licensing and Permitting Fees – Built environment.
        - Retail fees – Built environment.
- Establish Carbon Fee to Provide Revenue Sources for Adaptation and resilience Funding
- Increase Funding for Community Investment Act (CIA)
- Create Guidance to Use Tax Increment Financing (TIF) Districts for Resilience
- Approve Legislation to Allow Municipalities Statewide to Form Stormwater Utilities to Fund Resilient Infrastructure
- Authorize a State-level Climate Change and Costal Resiliency Reserve Fund Managed by the Treasurer of the State of Connecticut
- Approve Legislation for Property Assessed Resiliency with C-PACE
- Promote the Bundling of Climate Adaptation and resilience Measures into Energy Savings Performance Contracts (ESPCs)

Strategy 3. Supply Grants and Loans to Fund Resilience Projects and Programs

Connecticut needs to establish a program of grants and loans at the state level to fund projects and/or provide a source of matching funds for federal grants. These programs are largely supported by state bond financing backed by taxpayer dollars, but funds could also be backed by the revenue-generating mechanisms in Strategy 2.

Recommended Implementation Actions

- Create an Environmental Infrastructure Bank
- Provide State General Obligation Bonds as Green Bonds for Financing for Adaptation and resilience Programs and Projects and Matching Funds for Federal Grants
- Implement the 10% of the State Revolving Loan Funds that can be Used to Finance Green Infrastructure, Flood Control and Microgrid Projects
- Incentivize Connecticut's Insurance Industry to Promote and Grow the Catastrophe Bond Market and Pilot a Resilience Bond Program
- Revolving Loan Fund for 1-6 Family Affordable Housing Purchase and Rehabilitation
- Financing for Resilient Housing Upgrades Including Construction of Accessory Dwelling Units (ADUs) and Home Elevation

Strategy 4. Investigate the use of tax credit programs and property tax abatement programs to incentivize the private sector to invest in community resilience

Tax credits have been successful in spurring development and may also be used to incentivize or attract investment in resilience projects.

Recommended Implementation Actions

- Investigate the Use of the New Market Tax Credit, Opportunity Zones, Public Act 490 Connecticut's Current Use Law and the 4% Low-Income Housing Tax Credit for Resilience Investments

Strategy 5. Engage the Foundation and Philanthropic Community as a Funding and Financing Partner

The foundation and philanthropic community in Connecticut, with its network of community partners, is uniquely positioned to take an important role in both meeting climate change goals and building the capacity to implement social, racial and environmental justice.

Recommended Implementation Actions

- Convene Connecticut's Community Foundation and Philanthropic Leaders
- Assess Connecticut's capacity for implementation and advancement of climate change initiatives at the community level and with environmental justice communities
- Launch a statewide campaign for Just Climate Change Engagement
- Initiate a statewide pool of foundation and tax credit funds to provide matching funds for federal and state grants and funding for resilience projects.
- Continue disaster recovery and preparedness philanthropy with a long-term vision for climate resilience.
- Increase individual, crowd sourcing and corporate giving
- Promote the CT State Neighborhood Investment Act Tax Credits for Resilience.
- Facilitate the relationship building and partnerships among the state government, foundations in our state and national foundations.

Existing Funding and Financing Mechanisms. Funding and financing mechanisms that are available for or adaptable to investing in climate adaptation and resilience are not easily ranked in priority for meeting Connecticut's needs. A one size fits all financing program is unlikely to be effective given the resilience project variables of owner(s), complexity, scope of work, budget, environmental conditions, stakeholders and regulatory process. A combination of funding and financing approaches and options are needed, and we have proposed many available alternatives.

Tables of existing state and federal funding and financing programs that may be used are provided in **Appendix I.** In order to facilitate the selection and effective use of these existing programs, the funding type, project cost range, term, equity impact score and funding source are summarized. A funding program's focus on pre- or post-disaster mitigation, adaptation and resilience, the type of project phase the program focuses on (e.g. planning vs. design or construction) and whether a formal cost benefit analysis method is required are also summarized. The tables provide a brief evaluation of fairness and affordability to payers and social equity impact and if the program is eligible to make community lifelines more resilient.

Appendix II includes supplementary information on the recommendations, including a table of funding type, range, term and source. It also discusses whether the program focuses on pre or post disaster mitigation, adaptation and resilience, the type of work phase the program focuses on (e.g. planning vs. implementation) and whether a cost benefit analysis is required.

Appendix III includes the types of funding required to meet resiliency benchmarks and the recommendations provided by a limited set of recommendations from the GC3 Adaptation Working Groups. We received preliminary feedback from the Environmental Equity and Justice Working Group, input from Energy Efficiency and Equity Practitioners, the Working and Natural Lands Working Group Forests Subgroup and organizations engaged in implementing nature-based solutions for our cities, rivers, and coastline.

Robust state and federal funding, leadership and the creation of new financing mechanisms are required to accelerate community resilience progress, stay ahead of associated climate threats and protect our most vulnerable neighbors from accelerating heat, health, and flooding threats. Specifically, funding is needed to:

- Strengthen environmental justice organizations and support diverse community engagement, and bring diverse leadership into designing and implementing resilience projects.
- Protect our vulnerable low- and moderate-income communities from lead and mold health threats and accelerating increases in summer heat stress within their own homes.[5]

- Permanently protect threatened forests that serve as carbon sinks and reduce flood risks. Greatly accelerate the design and implementation of nature-based solutions in urban areas to green, cool and clean the air and water and to protect and restore natural habitats.

Robust state funding will open up access to federal grant programs, some of which now go un-tapped. An ongoing state investment will create market certainties that in turn create opportunities to develop leadership, and jobs for disadvantaged communities. All of these projects create plentiful and largely well-paid jobs. Finally, robust state funding can attract private philanthropy to support this effort and open up the potential for public-private funding that can further accelerate project and program implementation. While more discussion and planning are necessary, preliminary feedback from these limited Working Groups suggests that a state investment in the range of $2-3 million per year for environmental justice and community planning activities and $35 million per year for nature-based solutions is warranted. Although energy is not the focus of this Working Group, we recognize that for our low-income populations that are most vulnerable to climate change, energy efficiency is of particular importance and will continue to rise in importance with increased cooling costs as climate change drives temperatures up. The funding gap for energy efficiency is on the order of several hundred million per year (see Appendix III). No cost estimates were provided for infrastructure and land use or public health and safety, but resilience infrastructure investments alone are on the order of tens of millions per project as shown by planned projects in Bridgeport[6] and New Haven,[7] demonstrating that funding adaptation and resilience is a significant capital investment that is required to achieve transformative resiliency results that will protect all of us, especially our most vulnerable, from the ravages of climate change.

Framing the Need for Climate Resilience Financing and Funding

While Connecticut has been diligent with its forward-looking investments in recovering with resilience from Sandy, the state does not currently have a funded[1] state grant or loan program for resilience projects and programs. Connecticut's neighboring states of Rhode Island[8] and Massachusetts[9] are dedicating bond funds towards launching resilience planning and project programs. Both of these states are also reviewing financing programs to further efforts in their state. In order to keep pace with our state's pressing needs and continue to be a leader in our region on resilience, additional funding and financing resources must be identified to move projects forward. The Financing and Funding Adaptation and Resilience Working Group was charged with identifying these sources and ensuring they promote equity and environmental justice while prioritizing the protection of vulnerable communities, disproportionately impacted by the effects of climate change.

While the challenges of climate change and recommendations of the other GC3 Working Groups are the main driver for financing and funding adaptation and resilience measures, our Working Group identified additional potential impacts of climate change on our fiscal health that further support the need to invest.

Unmet Recovery Need Following Storms

In the aftermath of Superstorm Sandy, Connecticut received $159 million in funding from the U.S. Department of Housing and Urban Development (HUD) Community Development Block Grant Disaster Recovery (CDBG-DR) for housing rehabilitation and elevation and resilient infrastructure investments. Those federal recovery funds left over more than $158 million in assessed unmet recovery needs from housing ($135,789,167) and infrastructure ($22,360,508). This unmet need included eight public housing properties (815 units) in the 100-year floodplain.[10] If Connecticut were to assess all resilient repair needs, the additional need would be in the hundreds of millions of dollars. Recognizing the importance of looking ahead to future climate change needs, over $9 million of the disaster recovery funds were used for the development of 32 flood mitigation and resiliency plans.[11] Those plans and many others across the state have identified dozens of projects in coastal municipalities alone in need of funding.

Insured Assets at Great Risk from Climate Change and Extreme Weather

In 2019, global economic losses due to weather disasters totaled US $229 billion, of which US $71 billion in losses were covered by private and government-sponsored insurance.[12] Thus, the

[1] When the first draft of this report was released for public comment on 9/22/2020, there was no authorization for a fund for resiliency projects, however, with the passage of PA 20-5, there is now a "microgrid and resilience grant and loan pilot program to support local distributed energy generation for critical facilities or resilience projects." The bill authorized the program, but did not include any additional funds for the program.

gap in protection totaled US $158 billion. The unmet needs from underinsurance are material relative to the total economic impacts of weather-related losses. For Connecticut, the estimated insured value of the coastal property exposures in 2018 was $754 billion,[13] which makes the state the 6th highest of the Atlantic and Gulf states. As a percentage of a state's total insured values, Connecticut is 2nd only to Florida with coastal property making up 66% of its statewide total insured value.[14] Climate change and severe weather events coupled with continued underinsurance to protect against losses and underinvestment to mitigate the associated risks suggest the gap between economic losses and covered losses will tend to increase over time.

Investors Want to Know Our Climate Risk

Investors and financial institutions are quickly realizing the risks climate change poses to their business models. Last month, a letter was published by Ceres Accelerator, a group of more than 30 investors and financial institutions who manage over $1 trillion in assets outlining the threats of climate change to the global financial system. The letter states, "the climate crisis poses a systemic threat to financial markets and the real economy, with significant disruptive consequences on asset valuations and our nation's economic stability."[15] Without regulated environmental reporting, investors today often make investment decisions with imperfect information about the climate risks of the asset into which they are investing. This imperfect information creates the risk that future climate regulation or environmental events could disproportionately impact one investment over another. In extreme cases, environmental events could cause some investments to become virtually worthless overnight. The investors in the Ceres letter worry that this potential volatility is not currently priced into the market because of the lack of required climate transparency creating serious climate vulnerability in our financial markets. The letter therefore proposes 51 regulatory suggestions, many focused on increasing environmental transparency such as mandating that companies report the physical locations of their assets and their projected greenhouse gas emissions.

A Potential Mortgage Crisis Along the Coast

Climate change poses an additional risk to the financial markets, this time by way of the residential housing market. The ability of the residential mortgage market to take down the global financial system was evident in the last financial crisis and some experts are worried that climate change is creating similar systematic risk again.[16] The typical residential mortgage has a 30-year term in order to lower monthly payments and prevent the need for a near-term capital event for homebuyers. This typical loan term creates climate uncertainty since predicting sea level rise and other environmental impacts over the next 30 years is difficult even for sophisticated scientists let alone the average home buyer and residential underwriter. Experts worry about the percentage of these mortgages that will end up in default if assets lose significant value due to sea level rise, floods or other environmental events. Threats of widespread climate-driven default are not just a risk to banks and other lenders, but to American taxpayers as many residential mortgages are sold to and backed by government-sponsored entities such as Fannie Mae and Freddie Mac.

State and Municipal Bond Ratings Can Be Negatively Affected by Climate Change

Climate risks are attracting the attention of state and municipal bond markets. Bond markets traditionally offer capital to state and local governments for investment in infrastructure and services, while providing stable returns for investors. However, ratings agencies are increasingly requiring disclosure of climate related risks from state Treasurer's offices, including in Connecticut, which has the potential to negatively impact credit ratings and increase borrowing costs for state and municipal governments across the country. Here in Connecticut, many coastal towns have high value neighborhoods, properties, and critical infrastructure that are facing increasing flood risks due to sea level rise. In towns where these assets contribute an outsized proportion to grand lists and property tax rolls, this escalating flood risk represents a financial exposure for state and municipal budgets. While much investment has been made in understanding and planning for climate change in Connecticut, a sustained commitment of technical and financial resources will be needed to solve these challenges, and our efforts will be measured against those of our peers. It is vitally important that our state and local communities demonstrate an understanding of this exposure, along with a proactive approach to addressing climate driven risks. By doing so, we will ensure Connecticut is a good investment into the future.

COVID-19 and Isaias

In the months since the Financing and Funding Adaptation and Resilience Working Group first began our deliberations, the State of Connecticut has endured two disasters, the public health and economic fallout of the COVID-19 pandemic and extensive power outages and property damage from Tropical Storm Isaias. Each has occurred in the context of a changing climate in Connecticut, where extreme heat[17] and poor air quality[18] have worsened the effects of both disasters. We are in a very different economic situation than we were just prior to the pandemic and our state is suffering greatly, but climate change has not gone away. Recommending additional funding to proactively address the impacts of climate change at a time of health and economic hardship is not something the members of this Working Group take lightly. At the same time our recovery from the pandemic and the storm is an opportunity we did not want, but it is one that we now have, to move forward with greater resilience. A recovery program that creates social and economic resilience with an equity lens for setting priorities and makes our residents better prepared for climate change is a winning strategy for our near, medium and longer-term prosperity. An investment in climate resilience and social equity recognizes and addresses the underlying conditions that disproportionately worsened the effects of a pandemic and a storm on our vulnerable populations. It is the challenge of our time that we must courageously take on.

Findings of the Financing and Funding Adaptation and Resilience Working Group

The following sections include the Working Group's findings on barriers to financing, an insurance perspective on climate risks, the integration of equity with nature-based solutions, engaging foundation and philanthropic organizations, and assessing the equity of financing and funding mechanisms. These findings reflect the discussions in our meetings over the course of 2020 and highlight issues of import to the Working Group's membership.

Barriers to Financing and Funding Adaptation and Resilience

Communities in Connecticut face a number of obstacles and challenges to securing the necessary funding to adequately plan and implement strategies that mitigate the impacts of climate change. In order to best develop financing recommendations, an understanding of these barriers needs to be explored.

Disproportionate impacts on vulnerable communities. Research indicates that climate change related events such as flooding, heat waves, and drought, have a disproportionate effect on people of color and low- to moderate-income communities.[19] Vulnerable communities have a heightened degree of exposure to impacts and limited capacity to minimize and respond to them. Climate change poses the greatest threat to vulnerable communities that are least responsible for it. Conversely, those who have contributed the most to climate change are better positioned to protect themselves from its impacts. Vulnerable communities face historic and ongoing injustices including, but not limited to, restricted access to credit and homeownership, inadequate public and private investment, and discriminatory development-related decision-making and policy processes enabling pollution within these communities. Given this reality, climate funding and financing mechanisms for adaptation and resilience must acknowledge these equity disparities and overcome them by prioritizing approaches that reduce these inequities. Ensuring that resources (e.g., technical assistance) and public and private investment are sufficient and available to vulnerable communities will enable them to live, learn, and work in resilient communities.

Disaster recovery funding programs are increasing the racial wealth gap of whites and people of color. A study in 2018 by Rice University and University of Pittsburgh[20] concluded that FEMA disaster recovery aid in 20 U.S. Counties increased inequality of wealth, finding that whites accumulate more wealth after natural disasters while residents of color accumulate less. The study's results indicated that two major social challenges – wealth inequality and rising costs of natural disasters – are "increasingly and dynamically connected." They hope the research will encourage further examination of wealth inequality in the U.S. and development of solutions to address the problem. We recommend that Connecticut develop equity lens policies and

practices that create more equitable approaches to investing in economic development, climate adaptation, resilience, community lifelines, disaster recovery and our people to build a just and more resilient society.

Inadequate information on costs and benefits.[21] Development of benefit-cost analysis for priority resilience projects is essential to accessing funding through any public or private financing mechanism. The lack of a standard model for understanding costs and benefits with regard to reducing climate risks is a barrier to moving projects from the preliminary planning stage to "shovel ready" and ultimately to implementation. The co-benefits of more innovative approaches to resilience, such as green infrastructure and nature-based solutions, are difficult to monetize, and therefore are not easily reflected in traditional benefit cost analysis models. For example, the benefits associated with improved air quality and cooling from urban tree cover in Connecticut cities, increased water quality due to wetland conservation, or increased public access to quality open space for recreation, may be difficult to fully quantify under existing benefit frameworks.

Incorrect pricing of climate risk.[22] Accurate pricing of climate risk creates incentives for investment in more resilient infrastructure and communities. However, FEMA's National Flood Insurance Program (NFIP) undervalues the true actuarial costs of flooding in order to keep insurance policies affordable. This distorts market signals for home mortgage lenders, buyers and sellers, and results in a public subsidy for risky development in floodplains. FEMA's modeling and pricing also relies on historical data of where floods have previously occurred. It does not t account for increases in the frequency of flooding due to sea level rise and extreme precipitation. This is particularly true in Connecticut where many municipalities rely on the tax revenue from high value coastal homes that are located or developed in floodplains. More transparent and clear information on the risks and costs of flooding would create value for investments in resilience, or shift development away from flood-prone areas.

Collective action challenges.[23] Even when there is agreement on the need for investments in resilience, conflicts can arise around what priorities should be funded relative to who pays and who benefits; as well as, who maintains responsibility for implementation. Consensus and coordination can be challenging, particularly for large publicly funded infrastructure projects. The Resilient Connecticut Planning Framework being developed by CIRCA, which is being funded by HUD's Community Development Block Grant National Disaster Resilience program,[24] leverages the planning and grant administration resources of four regional Councils of Governments (COGs) to help build consensus for resiliency pilot projects with regional significance. The participation of the COGs in capacity building for their member municipalities includes managing the procurement and contract administration for multi-community Natural Hazard Mitigation Plans in several regions of Connecticut. The adaptive capacity required for municipal grant application writing and project management teams to access all the necessary funding from federal or state sources is likely limited in the short term, as it requires the need for cohesive partnerships. Continued and committed public dialogue at a scale appropriate for decision making is needed to maintain support from stakeholders and obtain the necessary funding for projects.

Capital budget constraints.[25] Because the returns on investment and associated risks are lesser known to investors, upfront capital can be difficult to attain, even if resiliency projects make economic sense. Since resiliency projects often provide benefits in the form of avoided future losses, the predictable revenue streams required for paying back loans for resiliency investments can be difficult to generate. Additionally, other important benefits of adaptation and resiliency projects such as enhanced water quality, open space, and healthy wetlands may be hard to monetize. Municipalities face competing priorities to fund improvements to aging infrastructure, which can limit the availability of upfront capital needed to get projects off the ground or provide matching funds for federal grants and loans.

Limited ability to borrow funds.[26] Often entities such as municipal governments face limitations in how much debt can be issued to borrow funds for resilience. Projects often run into issues with the ability to utilize borrowed funds because an organization's borrowing capacity is directly correlated with its ability to obtain upfront capital as well as maintain sustainable revenue streams that can be used to pay back loans.

Misaligned incentives.[27,28] State and local governments often must weigh competing incentives around development and resilience. Municipalities have a strong incentive to increase their tax base through development, even if intensifying development in and around floodplains might exacerbate longer-term risks from climate change. Municipalities that invest in large-scale flood protection may not directly recoup their costs from the value of the privately-owned buildings that are protected. Federal support programs - in the form of subsidized flood insurance and disaster recovery funding - can result in a disincentive for local governments to make more proactive investments in resilience or to enact more restrictive zoning and building codes at the local level. There is often a misalignment between the government entities charged with implementing resiliency measures and the entities that receive the future savings.

Difficulty obtaining grant funding.[29] Grant funding can be, and has been, an important source of money to push resiliency efforts forward at the state, regional, and local level in Connecticut. However, significant planning and technical support capacity is needed to develop proposals, provide coordination, maintain compliance, and manage projects. Municipal staff are often overburdened with the immediate needs of local government and may not have the knowledge or capacity to fully utilize existing grant funds for projects. Grant programs often require matching funds, which can be difficult for municipalities to put forth. In the absence of matching funds and the planning/technical support capacity to leverage existing grants, Connecticut will be less competitive for these programs relative to other states, and consequently leave money on the table. As there is no more funding for the Matching Funds grant program that CIRCA previously administered (that leveraged an additional $1.4 million in additional project funding),[30] there is a need to re-visit a source for matching fund availability. Demand for funding exceeded both the CIRCA Matching Funds and Municipal Resilience grants capacity and CT now largely relies on federal disaster recovery funding to continue its resilience programs while RI, MA and NY have launched proactive pre-disaster funding programs for municipalities and state agencies to plan and implement climate adaptation projects.

Unpredictability in cost-sharing. Cost-sharing between the federal, and state and local governments is common in programs that develop and maintain the infrastructure of the economy and society. The approach recognizes a shared responsibility and ensures there is a broad appreciation of the significance of the project. Cost-sharing formulae vary widely and are often criticized for increasing administrative costs and biasing against less wealthy areas. The advantages of a cost-sharing program include an increase of the available funds (more projects), and a more effective allocation of resources to projects that are priorities for all parties. In the case of the FEMA Public Assistance program and its well-established policy of covering up to 75% of projects costs and requiring at least a 25% match, forty states have already developed policies to provide at least a portion of the cost-share for that assistance after a disaster.[31] Florida covers the entire 25%, for example, Missouri provides 10%, and California 19%. A clear statement of policy and source of funding in Connecticut would reduce the uncertainty in costs and encourage municipalities to accelerate their adaptation projects. The policy should recognize the disparity in wealth and the State's interest in the development and demonstration of novel and nature-based adaptation approaches.

Need for capacity building and training tools. In recent years, resources have been directed toward development of technical tools that illustrate and assess the effects of sea level rise, storm surge, and vulnerability for a variety of resilience topics (e.g. heat sensitivity, coastal and inland flooding, living shorelines, critical infrastructure). However, many technical tools are underutilized due to a lack of awareness about their availability and/or the understanding of how to use them to improve and inform decision making, resilience planning and project design at appropriate and multiple scales. Support for development of training materials/modules is needed to increase understanding of vulnerabilities and build capacity for project design and implementation. Many aspects of resilience such as cutting-edge building technology, life-cycle analysis, health impact analysis, and community capacity building have not been advanced sufficiently for Connecticut to be competitive for national demonstration and research funding. CIRCA has modeled an initiative that has resulted in the knowledge and capacity necessary to secure funding for sea level rise. NJIT's Center for Building Knowledge[32] and affiliated Center for Resilient Design provides this capacity in New Jersey as does the Gulf Coast Community Design Studio[33] in Mississippi.

The Insurance Perspective on the Financial Risk of Climate Change

Improving the nation's preparedness for climate disasters allows the country to take a more proactive approach to building a more resilient infrastructure and mitigate the financial risk posed by climate change from an insurance perspective.

Rate to Risk. The current rating structure does not comprehensively account for the risk of losses due to extreme weather events in many coastal and other floodplain areas.

Pre-Disaster Hazard Mitigation. A critical component to building resiliency is to be prepared for and to mitigate against losses before a catastrophe occurs. Investment in mitigation and targeted incentives could improve community resiliency across the U.S.

Land Use Policies. The National Flood Insurance Program has paid millions of dollars in claims to rebuild repetitive loss properties which might otherwise have been avoided with more stringent land use policies.

Building standards. Differing existing building standards do not uniformly mitigate the risk of severe weather to property and lives. Adopting and enforcing better building codes for both new and existing property construction for increased uniformity across communities should be considered.

Take-up Rate of the National Flood Insurance Program (NFIP). It is estimated that approximately 50% of single-family homes located in the 100-year floodplains are covered by flood insurance. It is also estimated that more than 29 million properties have at least a high or moderate risk of flooding and only 5 million policyholders in the NFIP.[34] Removing any barriers to encourage a private flood market solution would be helpful.

Adherence to standards. The Federal Emergency Management Agency (FEMA) estimates that between 30% and 42% of buildings in floodplains are not in full compliance to standards.[35]

Consumer education. Potential home and property owners may not fully understand the risks to and costs of certain properties associated with damage from severe weather events before purchasing.

Lack of incentive to mitigate risk. Certain programs may not provide incentives for the insureds to invest in building materials and follow building codes designed to limit the risk of damage from severe weather events.

Reducing or removing barriers in closing the gap in risk mitigation from losses resulting from severe weather events will support financing greater resilience in the face of the potential impacts of climate change. As the Insurance Capital of the World' Connecticut is uniquely situated to address these challenges going forward.

Investing in Equitable Nature-based Solutions to Improve Resiliency

Imperative of Equitable Nature-Based Solutions

The Connecticut Physical Climate Science Assessment Report[36] found the following historic and projected changes in precipitation that nature-based solutions can help manage.

- Annual precipitation over most of the state has increased, with the largest increase experienced in summer (since 1950) or fall (since 1895) and a slight decrease during winter.
- Projected changes in precipitation for the high CO_2 (RCP8.5) scenario show that:
    - Annual precipitation across the state is projected to increase (8.5% and 9.5%, by mid- and late-century respectively), with the greatest increase projected for winter (13.4% & 16.3% respectively) and spring (10% and 16.5% respectively) and inconclusive changes in the other two seasons.
    - Several extreme precipitation indices are projected to increase, including the number of days with more than 1 inch of precipitation (N_1inch), number of heavy precipitation days (N99), fraction of total precipitation accounted for by heavy precipitation (F99), and the maximum 1-day and 5-day precipitation (R1d, R5d), all indicating a substantial increase of flood risk by mid-century

Connecticut is also planning for up to 20 inches of sea level rise by 2050,[37] which will worsen coastal erosion and coastal flooding.

Our communities and the land they live on are deeply intertwined, and so in order to build a safe place for Connecticut residents to live and work, the ecosystems surrounding them must be strong and healthy to survive the worsening climate crisis.

Nature-Based Solutions are a strategy to enhance communities' capacities to withstand climate disasters while promoting healthy ecosystems. Substantial state funding is required to finance the necessary projects successfully. This investment has many benefits for Connecticut residents, including job creation, property value increases, insurance reduction, and significantly lessened disaster rebuilding costs. A study by Restore America's Estuaries[38] showed that between 32 to 20 jobs were created per $1 million spent as opposed to 7 to 5 jobs for road infrastructure projects or the oil and gas sector. This demonstrated that nature-based projects have a very high labor component, employing three to five times more workers.

Categories and Strategies of Nature-based Solutions

Reduce climate related stormwater flooding and pollution

Rain Gardens - Polluted stormwater rushes off impervious surfaces (pavement, etc.), down pipes and out into our rivers. DEEP recognizes polluted stormwater as Connecticut's greatest remaining source of water pollution.[39] The amount of runoff is directly linked to the amount of

impervious surface area., therefore our oldest urban neighborhoods—often home to the most vulnerable populations—are at the greatest risk.

To combat these issues one highly visible and popular nature-based solution is to create rain gardens and bioswales. These constructed gardens collect rain water, and absorb it back into the ground and groundwater system. They filter out pollution while greening our neighborhoods and reducing localized urban heat islands. Many raingardens in Connecticut have been installed in urban neighborhoods, including 200 built or planned in New Haven[40] and in public spaces like Beardsley Zoo in Bridgeport.[41]

A re-entry program in New Haven is providing jobs for recently incarcerated members of the community through installing these rain gardens. A recent study[42] with the Yale Forestry School determined that neighborhood-scale installations in New Haven reduced peak flooding events in surrounding neighborhoods.[43]

Figure 1.Senator Blumenthal, Congresswoman DeLauro and Senator Murphy pose with workers employed to install rain gardens.

Restorative Stormwater Infrastructure. Restorative stormwater infrastructure is a technique widely used in the Chesapeake Bay watershed to control large volumes of polluted stormwater in the space between the stormwater end of the pipe and their river and stream systems. It is proving to be a highly effective way of slowing down and absorbing large volumes of polluting stormwater with the promise of reducing inland flooding peaks.[44]

Municipal Support Needed to Meet Green Infrastructure Stormwater Mandate. By 2022, our federally enforceable municipal stormwater permit (MS4) mandates that 121 municipalities in Connecticut install green infrastructure at a scale to absorb 1% of runoff from their impervious surfaces.[45] This regulation will reduce peak flood flows, clean up Connecticut's waterways, and set us on a path toward community resilience.

Restoring Rivers, Reducing Flooding

Remove high hazard dams. Pictured below is the transformation of a hazardous dam that was removed to restore the natural landscape and water flow of the surrounding area. A severe storm could have destroyed the dam, disastrously flooding Westville, New Haven. Instead, there is a new walking trail adjacent to the beautifully restored West River and a thriving aquatic community.[46] There are over 400 state-owned dams that could undergo this transformation. Dam removal can improve sediment transport and create cooler stream temperatures, allowing threatened cold-water fish species to survive longer in the face of rising water temperatures brought on by climate change.

Figure 2. Before dam removal (left) and after dam removal (right) on the West River in the Westville neighborhood of New Haven.

In May of this year, a high hazard dam collapsed in Michigan, causing an estimated $175 million in damages.[47] Depending on their size, repairing or replacing some collapsed dams can cost between $10 and $500 million dollars.

Assess and Replace Flood Producing Undersized Road Culverts. Undersized road culverts become water blockages, causing flooding during extreme precipitation events. The first step to protecting communities from flooding is to complete a diameter and length inventory of the hundreds of culverts that are located downriver from floodplains and floodways containing significant community infrastructure. The resulting volume discharge potential of these culverts can be compared to anticipated peak flow volume associated with the waterway that flows through them. The resulting analysis will create a priority list for replacement of hazardous culverts, which will create the co-benefit of increased waterway connectivity that will allow for increased fish and wildlife migration and habitat improvement.

Building Community Coastal Resilience

As a result of climate change, coastal communities will face fierce winds, coastal flooding from sea level rise and storm surge, and inland flooding from intensified precipitation events. As a result, the demands for funding to engineer and implement already identified coastal community resilience projects is enormous. Four regional Councils of Governments and the Nature Conservancy jointly researched projects in 30 Connecticut communities. In total, they identified 400 coastal resilience projects. The vast majority of these projects remain at the conceptual level, requiring more planning for engineering and implementation. Upon completion, these projects will reduce the risk of property destruction, enhance the health of the ecosystem, and improve public amenity. Below is a map from that project of the possible projects only in the New Haven/West Haven area.[48]

Three examples of nature-based coastal resilience projects in the New Haven area

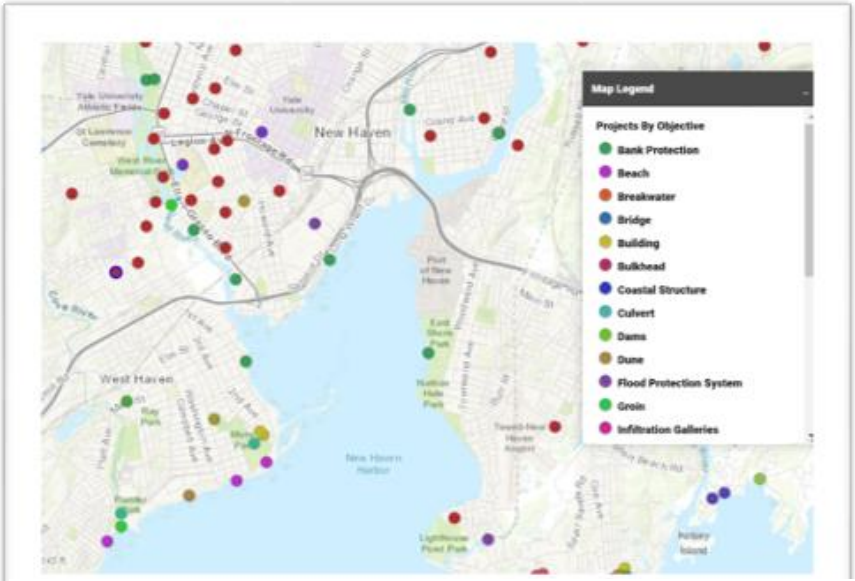

Figure 3. Identified resilience projects in the New Haven and West Haven area.

The first project is the enhancement of the West Haven beach area. The natural barrier of the beach between the inhabited area and the harbor was restored and can handle bigger storm surges and sea level rise. The shoreline will erode more slowly, water quality will be enhanced, the habitat will improve for its wildlife, and the community will have a visibly more beautiful waterfront. West Haven is a low- to moderate-income suburb. Its public beaches are visited and enjoyed by a wide diversity of community members from the greater New Haven area. This project has funding support from the Army Corps and federal match.

Figure 4. Conceptual design for dune restoration to protect West Haven's shorefront community.

A second project that could be completed is replacing the tidal marsh habitat behind Sandy Point in West Haven using clean sediments from the dredging of New Haven Harbor's navigational channel. This project offers multiple co-benefits, including storm wave suppression for New Haven, wildlife and fish benefits, utilizing the dredged materials, and improving the area as a recreational fishing location.

A third project is a ⅔ mile shoreline erosion

control project along East Shore Park in New Haven. This project was fully funded through state resiliency project bonding, and never would have been implemented without this state funding. Upon project completion, thousands of New Haven residents will have access to new beach pockets and tidal wetlands. Currently, residents are blocked from accessing the dangerous conditions posed by an eroding, slumping shoreline without trails or public amenities.

Monitoring for Adaptive Management

We suggest there be a small amount of state funding designated for long term monitoring of the efficacy of these nature-based projects. This data will pay dividends in providing evidence of effectiveness and improving design and approaches. Moreover, to further ensure efficacy, we recommend that the Long Island Sound Study or DEEP provide incentives and leadership in coordinating a regional community of experts on urban, coastal, and riverine based nature-based projects, with a priority of including and fostering diverse leadership and participation. The river restoration working group, formed under the Long Island Sound Study has been a highly successful model that has allowed practitioners and agency experts to learn and improve restoration techniques.

Figure 5. A group of Connecticut residents pose for a picture after planting a rain garden for their neighborhood.

Engaging the Foundation and Philanthropic Community

Communities face many potential funding challenges when it comes to adaptation and resilience. Among these are the inability to meet qualifications for different funding sources, limited research capacity to search for the suite of funding sources available to them, changing technology, competition with other organizations, narrowness in grant scoping, changing funding priorities, funding limitations and restrictions, and/or funding shortfalls. Foundations and the philanthropic community provide a complementary funding pathway for financing climate adaptation and resilience programs and projects that can work alone or in partnership with state and federal funding sources, but that may be particularly well suited to addressing these challenges at the community scale. In Connecticut that capacity includes:

Engaging communities of color in decision-making. Community foundations serve as local conveners and can help build coalitions at the grassroots community level.

Taking the long view on partnerships. Foundations can follow the development and implementation of regional or municipal projects over many years.

Advancing policy, knowledge and practice including testing and researching concepts and ideas for evidence-based climate action. This translational role can advance research and theory from the academy to both practice and community knowledge and to policy makers and researchers.

Funding planning and demonstration grants. Community and private foundations are a source of funds for nonprofits, studies, and implementation of resiliency projects (e.g. TNC's *Southeastern Connecticut Regional Resilience Guidebook*[49]). Council of Governments (COGs) can also write proposals to foundations for regional and municipal projects as well as administer resulting grants.

Providing required non-federal or non-state matching funds. Philanthropic dollars can be tapped for resilience projects that require a local match to a state or federal grant. Increasingly federal agencies are encouraging and incentivizing private matching funds (e.g. FEMA Building Resilient Infrastructure and Communities (BRIC) program). Forming partnerships between the state and foundation or philanthropic organizations for resilience projects can increase the state's competitiveness in these national award competitions.

Impact Investing. Socially minded philanthropic donors and foundations can support environmental projects for a defined return on their investment, for example as in the case of the Social Venture Partners.[50]

Assessing the Equity of Climate Financing and Funding Mechanisms

A Process for Determining Resource Sufficiency and Availability for Climate Adaptation and Resiliency of Vulnerable Communities

Equity starts by recognizing there are disparities and inequities in living conditions. Some communities lack resources such as political power and access to higher education. Poor health outcomes place low-income communities and communities of color at greater risk and limit their capacity to adapt to climate change. Climate change poses the greatest threat to vulnerable communities that are least responsible for it, or conversely, those who have contributed the most to climate change are better positioned to protect themselves from its impacts.

The Financing and Funding Adaptation and Resilience, and Equity and Environmental Justice Working Groups of the Governor's Council on Climate Change, are committed to continuously assessing whether existing, new, emerging, or expanded climate funding and financing mechanisms are sufficient and available to improve the needs of vulnerable communities. These mechanisms are significant, but are they enough and attainable for those who need them the most?

To that end, these Working Groups, guided by the Environmental Justice Public Participation Guidance, and Guidance on Remote Engagement for Public Participation, have developed a process to:

1. Identify an initial set of criteria to assess the funding and financing mechanisms;
2. Engage public participation from vulnerable communities to modify and determine the adequacy of the initial set of criteria over a disaster lifecycle;
3. Revise the initial set of criteria based on the inclusion and decision-making of vulnerable communities to develop equity criteria;
4. Apply the new equity criteria to discern the sufficiency of the funding and financing mechanisms; and
5. Determine how the funding and financing mechanisms can be used or modified in ways that improve or prioritize the resiliency of vulnerable communities.

The existing and new and emerging financing and funding sections of this report as well as the recommendations include evaluations of equity impacts and the prioritization of vulnerable communities that are disproportionately impacted by the effects of climate change. These evaluations are based on a review of the literature that is included in the references section of this report. Particular consideration is addressed to equitable sharing of the costs of resilience measures (for example avoiding or modifying financing programs that would be regressive) and the prioritization of vulnerable communities in funding and financing programs. The process above will further inform the evaluations of equity of climate funding and financing mechanisms taking place during the fall of 2020.

Recommendations for Financing and Funding Adaptation and Resilience

Strategy 1. Build the governance structure necessary to allow for effective and efficient financing and funding.

Funding alone does not result in implementable projects. We need a government that leads and facilitates the development of projects at the state, regional and municipal scale and prioritizes the protection of vulnerable communities.

Adopt Policy of No Less than 40% of all Spending on Adaptation and Resilience to Benefit Vulnerable Communities	
Recommended Implementation Action Description	No less than 40% of adaptation and resilience spending, including both existing and new funding and financing programs, should benefit vulnerable communities as defined by PA 20-5,[51] including environmental justice communities, distressed communities as defined by DECD,[52] and as further defined by the GC3 Equity and Environmental Justice Working Group. Furthermore, at a minimum, of any outreach, capacity-building and planning grants for adaptation and resilience, the first $500,000 should be utilized for those same communities to ensure their participation and inclusion in the adaptation and resilience planning and implementation process. With this commitment Connecticut would be the first state to commit to an all-inclusive goal of investing in climate adaptation and resilience in those communities that will feel the effects of climate change first and worst. A similar goal has been enacted in neighboring New York State, but focused primarily on energy. In 2019 New York State adopted the Climate Leadership and Community Protection Act, "the Climate Act" that "requires the state to invest or direct resources in a manner designed to ensure that disadvantaged communities to receive at least 35 percent, with the goal of 40 percent, of overall benefits of spending on: Clean energy and energy efficiency programs Projects or investments in the areas of housing, workforce development, pollution reduction, low-income energy assistance, energy, transportation, and economic development."[53] New York formed a Climate Justice Advisory Group to assist them with planning on how to meet this goal.
Implementation Entities	State agencies and CGA

Equity Impact[2]	(+) Making a commitment in statute to the 40% goal would ensure that the state prioritizes the protection of vulnerable communities disproportionately impacted by the effects of climate change.
Scale of Funding	Not applicable

Increase Connecticut's Competitiveness for Securing Federal Funds for Resilience	
Recommended Implementation Action Description	Enhance state, regional, and municipal capacity to be competitive for federal awards by reducing barriers to obtaining federal funding, including, but not limited to, 1) improving access to support for planning, design and engineering for project feasibility and benefit-cost analysis; 2) identifying a "project pipeline" through previous inventories, SAFR, COGs, and municipalities so that these projects can be effectively/efficiently positioned for grant funding when available, use decision support criteria to assess near, mid, and long-term project viability, and engage the Resilient Connecticut's Planning Framework as a way to prioritize strategies using PERSIST criteria[54]; 3) establishing a matching funds program for federal funds; 4) creating a task force charged with identifying any barriers or needs; 5) appointing resilience coordinators in the state agency counterparts for each federal agency engaged in resilience funding; 6) advocating for federal adaptation and resilience programs; 7) creating a web-based project eligibility screening tool to facilitate the process of finding grants, loans and other financing mechanisms for funding climate adaptation and resilience; and 8) building a network of diverse entrepreneurs, experts in cutting edge research, technologies and innovative practices. Federal programs are historically the largest source of adaptation and resilience funding in Connecticut and investing in capacity here will likely result in a good return on investment.
Implementation Entities	State agencies, CIRCA, CGA
Equity Impact	(+) Use of federal funds ensures that vulnerable communities do not have to bear the costs of the project. Equity can be improved by prioritizing vulnerable communities for technical assistance in applying for federal funds, as well as reducing cost share by distressed communities. Consider developing a not-for-profit Community Design Center to maximize

[2] *Equity Impact:* Equity Lens Criteria is positively impacted (+), Equity Lens Criteria is positively and negatively impacted or unchanged (0), and Equity Lens Criteria is negatively impacted (-)

	participatory design to advance project development in vulnerable communities.
Scale of Funding	Tens of millions to a few hundred thousand depending on the federal funding source. FEMA BRIC can provide up to $10 million per project. NFWF LISFF maximum award of $250K.

Convene the Insurance Industry on Carbon Neutral Investment Policies	
Recommended Implementation Action Description	Hold a conference with the insurance industry and state regulators identifying different strategies where the industry can assist states in reducing reliance on fossil fuels, as well as understanding how insurers can assist in mitigating the impacts of climate change on property. This conference will include a discussion on: 1) increasing disclosure of climate-related risk and calling for more actions like those taken by The Hartford[55] and Chub Limited (NYSE:CB)[56] and 2) identify alternative methods to protect communities through Catastrophe (CAT) Bonds and other risk transfer vehicles. Connecticut is an active participant in a voluntary leadership role in the National Association of Insurance Commissioners (NAIC) the Climate and Resiliency (EX) Task Force,[57] which serves as the coordinating NAIC body for discussion and engagement on climate-related risk and resiliency issues, promoting an ongoing dialogue among state insurance regulators, industry, and other stakeholders. The Working Group recognizes that insurers are an important party in assisting states in reducing carbon emissions as they insure and invest in fossil fuel producers and utilities (estimated to be over $247 Billion in 2019[58]). The industry also serves an important economic role by funding disaster recovery and rebuilding efforts that create greater resiliency in the state. The Insurance Dept. and DEEP will work together with other entities to engage the insurance industry on ways to promote carbon neutral investment strategies that will reduce losses due to property damages from the impacts of climate change caused by the burning of fossil fuels releasing greenhouse gases.
Implementation Entities	DOI, DEEP, Green Bank, Insurance Industry including our domestic insurers, State Regulators, other entities as identified.
Equity Impact	(+) Improved air quality and health from reductions in emissions of coal-fired power plants and fossil fuels. Promoting climate disclosure allows for greater transparency for the public on the risks of climate change to both the industry and policyholders.

Scale of Funding	The estimated investment and underwriting of fossil fuels is $247 Billion.

Incentivize Private Developers and Businesses to Implement Resilience Standards and Disaster Preparedness	
Recommended Implementation Action Description	Incentives could include: 1) providing technical assistance and access to resources; 2) ensuring that any state assistance provided to businesses requires implementation of climate adaptation and resilience standards; and 3) including climate risk as part of credit rating for state loans consistent with the policy of the Rhode Island Infrastructure Bank. Although private businesses are largely unregulated with respect to floodplain management statutes, we know businesses suffer the impacts of climate change and natural disasters and those damages impact the people of Connecticut through the loss of jobs, services, and tax dollars to pay for recovery.
Implementation Entities	DECD and Green Bank for loan instruments. DEEP, DOI and CIRCA for technical assistance.
Equity Impact	(+) Private dollar investment means that low-income communities are not paying. Small, minority-owned businesses may need additional assistance to ensure they are not disproportionately burdened by the cost of becoming resilient, but resilience investment should help with flood insurance costs and avoiding losses after a disaster. Strategies that provide the most direct benefit to local and minority business should be prioritized.
Scale of Funding	Millions of dollars in bond funds for grants and loans to businesses and private developers.

Require the Disclosure of Physical and Transitional Climate Risks at the State and Municipal Level	
Recommended Implementation Action Description	Private investors are increasingly asking that states and municipalities disclose their climate risk to investors. This disclosure should be required and made public to demonstrate the cost effectiveness of adaptation and resilience interventions. Since the benefits of resilience investments are realized by avoiding the costs of climate change or a natural disaster, disclosing climate risks or the cost of doing nothing, allows us to put a price on it and better value adaptation and resilience. The results of the disclosure and investing in interventions to address that risk should allow the state to unlock more capital investment dollars at better interest rates

	going forward and avoid losses. Both of those outcomes equate to a realized cost savings from adaptation and resilience.
Implementation Entities	Municipal governments, Office of the Treasury
Equity Impact	(0) Climate disclosures could have a near-term impact on property value, but also draw attention to where investments need to be made in vulnerable communities. The methods used in the disclosure should incorporate analysis of vulnerable communities.
Scale of Funding	A downgraded credit rating can impact all state and municipal borrowing on the scale of billions of dollars across the state.

State-funded and Initiated Infrastructure and Buildings Projects Should Lead by Example to Establish and Meet Climate Adaptation and Resilience Standards	
Recommended Implementation Action Description	Connecticut invests billions of state and federal dollars on new and upgraded infrastructure and buildings. Those investments should be leveraged to incorporate climate resiliency standards. The dollar amounts associated with regular investments in infrastructure and building far exceed any special resilience or adaptation program the state might implement, therefore incorporating resilience standards into those programs represents a large potential source of resilience funding. Currently in Connecticut most state funded or initiated infrastructure projects in the floodplain are subject to the floodplain management statute that was updated in 2018 to account for up to two feet of sea level rise by 2050. Sustainability initiatives have led to more resilient building standards for energy, but resilience should be looked at across the board to ensure building and infrastructure investments can weather and not contribute to climate change. All new construction should be minimum net zero in operations and the state should implement a strategy to move towards net zero life cycle net zero carbon contribution.
Implementation Entities	CGA, DAS, DOT, DEEP
Equity Impact	(+) Ensuring that public projects in vulnerable communities incorporate resilience means those communities are better protected from the impacts of climate change. Resilience standards should focus on the protection of vulnerable communities by prohibiting poor-quality, short-term, resource - inefficient development that inevitably costs more in the long-term and negatively impacts vulnerable communities.

Scale of Funding	Billions of dollars for capital projects.

Create Central Governance Authority for the Funding, Financing, and Operations of Resilience Infrastructure Projects	
Recommended Implementation Action Description	Flooding is the largest source of damage from natural disasters in Connecticut and yet our ability to finance and fund projects to address this risk is not clearly defined in any state agency's mandate. With no clear lead agency in this arena, federal dollars to fund such projects may be left on the table, despite the increasing need for them in Connecticut. Establishing authority within a state agency or the creation of a new agency or entity with this authority will make Connecticut more competitive for federal funds that are only available to the state and allow for the implementation of regional solutions. An example of a program set up this way is the NJ DEP Bureau of Flood Engineering, Flood Risk Mitigation Unit. Creating an authority can also be taken at a local scale. In Maryland, SB457, effective July 1, 2020, now makes it possible for local governments to create a 'Resilience Authority' to issue bonds, collect fees, accept funds from local government or state government, purchase land, and own, operate and maintain resilient infrastructure projects. Ordinances for Resilience Authorities are currently being proposed by Charles County and Anne Arundel County government administrators to enact Resilience Authority By-laws addressing members, standard operating procedures and criteria for eligible resilience projects. Existing resilience infrastructure projects addressing flood risk in Connecticut are under the authority of the municipalities where they are located. Municipal flood and erosion control boards established under CT Gen Stat § 25-84 currently provide municipalities in Connecticut with many of the authorities needed to undertake resilience projects. However, this statute does not incorporate language on resilience to climate change or nature-based solutions, but could be amended to be more in line with today's approaches to climate adaptation and resilience.
Implementation Entities	CGA
Equity Impact	(0) Moving these projects into a more centralized process should allow for better prioritization of vulnerable communities.
Scale of Funding	Large-scale resilience infrastructure projects for flood protection can cost in the tens of millions for flood walls and pump stations, but comparable green infrastructure solutions can cost considerably less, on the order of less than $1 million.

Build Outreach and Capacity and Tracking for the Increased Uptake of Flood Insurance	
Recommended Implementation Action Description	Flood insurance is an adaptation and resilience tool that is underutilized in Connecticut. Not only does flood insurance provide a means to recover from flood damage, but it also sets up a structure to incentivize behaviors that lower the risk of flooding such as elevating homes or reducing community flood risk. Savings on flood insurance can be used as a financing mechanism to pay for adaptation and resilience measures. In order to ensure Connecticut takes full advantage of flood insurance coverage: 1) Connecticut should partner with FEMA to ensure the Risk Rating 2.0 Program is rolled out and implemented effectively in order to avoid coverage disruption. 2) Consideration should be given to developing a community flood insurance program as an additional layer of coverage alongside the National Flood Insurance Program (NFIP). Such a program, creatively designed using insurance vehicles, could ultimately protect the community by providing a greater level of flood insurance uptake for business owners and residents. 3) Assistance should be provided to communities to help them qualify for greater flood credits under the FEMA Community Rating System (CRS) program. This is a 10-point program where the more credits a community qualifies for, the greater the savings on a FEMA NFIP flood insurance policy. The credits are derived from actions that lower the risk of flooding across a community thereby providing a financial benefit from reduced premiums and a reduced risk of damage from floods for residents and business owners within those communities. 4) Connecticut should partner with FEMA on communicating the benefits of flood insurance and in attaining FEMA's moonshot goal in Connecticut of doubling the number of properties covered by flood insurance by 2022. 5) Connecticut should use these and other strategies, where appropriate, to help insure existing renters, existing residential property owners and existing small business property owners who are currently not insured for flooding damages by NFIP due to lack of a federally backed mortgage, ignorance of the flood risk or inability to afford of flood insurance.

	6) In using any of these strategies, Connecticut should avoid the flaws in the NFIP which result in public subsidy for costly and risky development and/or redevelopment in floodplains.
Implementation Entities	DEEP, DOI, DESPP
Equity Impact	(0) Moving these projects into a more centralized process should allow for better prioritization of vulnerable communities.
Scale of Funding	The CRS program provides discounts ranging from 5% to 45% of premiums. WestCOG estimated a total savings in premiums of nearly $1 million annually, if a regional CRS program was implemented to move all of the municipalities in WestCOG into the CRS program at the introductory level with a 5% savings. In 2017, New Haven achieved a class 7 CRS rating, the highest in the state, affording their city's NFIP policyholders a 15% discount on insurance.

Strategy 2. Generate Revenue Sources to Pay for Resilience Projects and Programs

Adaptation and resilience projects and programs savings come in the form of avoided losses making it fundamentally more difficult to fund the financing of loans or bonds for these projects with financial losses avoided or savings from lower costs of insurance. In order to finance projects, it is necessary to establish other revenue sources for the funds that will save the state and municipalities dollars in avoided loss, while maintaining or improving bond ratings.

Establish Resilience Fees to Provide Revenue Sources for Adaptation and resilience Funding and a Source of Matching Funds for Grants	
Recommended Implementation Action Description	Fees can be used as a source of direct funding for projects or as a mechanism to pay off a bond in place of taxes. Fees may be collected in a number of ways, including, but not limited to, transactions, use of systems, licensing, permitting, and sales. Considerations for determining the appropriate vehicle for a fee assessment may include linking the fee to the individuals or sectors benefiting from the outcomes of the fee or assessing the fee against individuals or sectors that contribute to the problem the fee addresses. In either case, resilience fee revenues should be tied to establishing an appropriation to implement resilience projects and programs and should not be diverted for other purposes. Examples include: *Transaction Fee - Municipal Buyer's Conveyance Fee.* Legislative authority needed to allow municipalities to establish a local conveyance fee that would be paid for by the real estate buyer at the time of property transfer. Enable, but do not require, municipalities to establish a progressive conveyance fee (e.g., up to 1% for buyers of real property on the portion of a sale in excess of $150,000) for a dedicated adaptation and resilience fund for projects and programs that address impacts climate change impacts inn that municipality. *Note this idea was first proposed specifically for a Community Conservation Fund related to adaptation, stewardship and resilience. *User Fee - Wastewater Use Fee.* A fee to be assessed on a monthly basis for individual homes or equivalent dwelling units as users of a wastewater system. In Maryland, a fee was assessed for the creation of the Chesapeake Bay Restoration fund.[59] The $5 monthly fee generates an estimated $100 million per year. The fee collection allows for a financial hardship fee waiver. It was also referred to as the 'flush tax.' *Licensing and Permitting Fees – Built environment.* Connecticut requires licensure in many sectors related to the built environment. The built

	environment exacerbates climate impacts and benefits from adaptation and resilience projects and programs. *Retail fees - Built environment.* Similar to licensing and permitting fees on the built environment, product sales for the built environment are another potentially appropriate area for fees. Sales tax could be increased on products and used for adaptation and resilience programs.
Implementation Entities	CGA for legislative authority in most cases
Equity Impact	(0) Fees can be designed to be more or less equitable. They will raise costs for those paying the fee and therefore ability to pay should be accounted for in any fee assessment. Fees will always be assessed on a much smaller subset of the state's population than funding resilience through a bond backed by state income taxes, for example, which means that special care must be taken to ensure the group singled out is not unfairly or unjustly burdened by that cost.
Scale of Funding	Depends on the amount of the fee and how often it is assessed, over what population and for what projects.

Establish Carbon Fee to Provide Revenue Sources for Adaptation and resilience Funding	
Recommended Implementation Action Description	Implement an economy-wide cost of carbon that assesses the carbon content of fossil fuels and sets a price per ton of carbon emitted. A carbon price policy represents the greatest opportunity to raise revenue while reducing economy-wide GHG emissions. A carbon fee charges a fee based on the amount of CO_2 emissions released through fossil fuel combustion. Revenues generated from a carbon fee can be reinvested in climate change adaptation and mitigation efforts. A state-wide carbon fee could support bond financing and ties the costs of adaptation and resilience to the cause of climate change, human-induced carbon emissions. Mechanisms for pricing carbon include the Transportation and Climate Initiative[60] or fees of carbon products like the Petroleum Gross Earnings Tax.[61]
Implementation Entities	CGA
Equity Impact	(0) The carbon fee (and all fees) would have to address the ability to pay so that it does not disproportionately burden vulnerable communities. This issue could be addressed either on the front end of who pays the fee or on the back end on how the revenue generated is distributed, for example, by providing rebates to vulnerable populations. An additional benefit of a

	carbon fee over a sewer use fee, for example, is that the fees are distributed over a much broader population, but broadening who pays also means potentially disproportionately subsidizing those who benefit.
Scale of Funding	Hundreds of millions of dollars

Increase Funding for Community Investment Act (CIA)	
Recommended Implementation Action Description	Legislative authority to increase the surcharge on local recording fee from $40 to $50. Increasing fee by $10 would add an estimated $5 million per year to the total CIA account. This additional funding could be dedicated to nature-based solutions, as well as a staff position at CT DEEP or a contracted non-profit to administer the program. This fee could be used to integrate further resiliency efforts into existing categories and/or create a new resiliency account as a new program could be easier to administer.
Implementation Entities	CGA, state agencies to administer funds
Equity Impact	(0) A nominal recording fee is not likely to have a large impact on vulnerable communities.
Scale of Funding	$5 million per year

Create Guidance to Use Tax Increment Financing (TIF) Districts for Resilience	
Recommended Implementation Action Description	Tax Increment Financing (TIF) districts are authorized for use in Connecticut, but should be promoted as a tool for financing resilience projects in the state. TIF districts use increased market value of property and capital improvements that come from public-private partnership investments to a specific geographic area to fund that investment. A TIF district captures the future net economic value increase from the investment through district-level taxes or fees. TIF districts could, in principle, finance neighborhood-scale resilience projects. The current statutory authority does not explicitly call out the use of TIF districts for resilience projects, but municipal bond funds in Stamford, CT, backed by a TIF district, funded improvements in Mill River Park, which restored the natural floodplain of the Mill River and reduced the risk of flooding downtown.[62] The funding for the TIF district came solely from new economic development increasing aggregate property values, rather than an increase in property value from the resilience improvement. Bundling

	resilience improvements in with economic development may be a more reliable funding source than relying on property value increases from resilience investments alone.
Implementation Entities	DECD and non-profit Connecticut Main Street Center for technical assistance
Equity Impact	(-) TIF districts are one of the most narrowly-defined financing mechanisms for who pays. If a resilience improvement is needed in a neighborhood entirely made up of a low-income vulnerable population, then raising their property values in order to collect more taxes is a negative impact. However, the use of TIF districts can be a more equitable solution in areas where those who benefit and have the resources to pay for that benefit do so. Public monies can be prioritized for vulnerable communities with less ability to pay. A challenge here is that solely relying on TIF districts for resilience improvements means that wealthy areas will be the only neighborhoods to see an increase in resilience.
Scale of Funding	A TIF-backed bond could be in the millions of dollars range, but the amount of funding from the bond to a resilience project is more likely in the hundreds of thousands of dollars range.

Approve Legislation to Allow Municipalities Statewide to Form Stormwater Utilities to Fund Resilient Infrastructure	
Recommended Implementation Action Description	CT Gen Stat § 22a-497 established the creation of a municipal stormwater authority pilot program, but limited the municipalities who could participate. The recommendation is to modify the statute so that all municipalities have the legal authority to establish a stormwater utility. Stormwater utilities collect fees from all property owners. Fees may be based on sewer use or amount of impervious cover (impervious cover leads to greater stormwater runoff). The fees fund infrastructure investments to reduce stormwater runoff, which may include grey infrastructure solutions such as pumps or upgraded sewers and green infrastructure like rain gardens and bioswales, that allow for stormwater to soak into the ground rather than becoming runoff. The motivation for stormwater utilities in Connecticut to date has been tied to the Municipal Separate Storm Sewer System (MS4) permit, which is primarily about water quality, however, stormwater backups and runoff cause flooding, which also makes stormwater infrastructure investments a resilience strategy.
Implementation Entities	CGA, municipalities, DEEP

Equity Impact	(+) In 2019 the City of New London became the first and only municipality to adopt a stormwater utility.[63] In order to address stormwater runoff, a stormwater utility fee was more equitable than raising property taxes because all real property owners, even those exempted from property taxes, pay the fee based on amount of impervious cover. In 2019, CGA HB7408 proposed an expansion of the existing stormwater pilot program and mandated that a fee be assessed on all real property and required considerations that would promote green infrastructure solutions by tying fees to areas of impervious cover. Property owners could reduce their fees by reducing impervious cover, which has the benefit of reduced flooding in vulnerable communities and with green infrastructure solutions like rain gardens or tree boxes, a dual benefit of cleaner air and cooler temperatures as impervious cover like pavement contributes to heat island effects in urban areas. There is however a concern that upland municipalities may not have an incentive under this structure to address stormwater generated within their boundaries that impacts more vulnerable communities where this runoff causes flooding. Stormwater is a local and regional challenge.
Scale of Funding	In New London the stormwater utility fee would generate an estimated $1.3 million per year in revenue.[64]

Authorize a State-level Climate Change and Costal Resiliency Reserve Fund Managed by the Treasurer of the State of Connecticut	
Recommended Implementation Action Description	Expand Public Act 19-77 - ACT AUTHORIZING MUNICIPAL CLIMATE CHANGE AND COASTAL RESILIENCY RESERVE FUNDS to authorize, by legislation, a state-level Climate Change and Costal Resiliency Reserve Fund to be managed by the Treasurer of the State of Connecticut. This legislation would authorize the Treasurer of the State of Connecticut to manage such investments on behalf of municipalities and the state of Connecticut. The General Assembly passed, and Governor Lamont signed into law, PA 19-77.[65] This act authorized the municipal investment funds for coastal resilience now known as municipal "Climate Change and Costal Resiliency Reserve Funds" or "CRF Funds." Public Act 19-77 has already been well received, but municipalities have yet to work through the administrative process of setting up these investment funds. The Town of Branford has approximately $1.6 million in their CRF Fund, but they have not yet hired pension managers to create an account and invest the assets.[66] Additional work with the Office of the State Treasurer and other constituents is needed to resolve some outstanding issues. For example:

	• What is the size of state-wide fund; • What types of strategic investments that should be pursued; and • What are the liquidity aspects of such a fund? Additionally, more outreach is needed to municipal officials to determine if they have the extra money needed to make such investments and whether investment returns would be high enough to justify program.
Implementation Entities	CGA, OTT, Municipalities
Equity Impact	(0) The use of municipal funds means that the cost is shared across all taxpayers in a municipality, thereby spreading out the cost burden, but only certain municipalities may have the resources to put towards this fund and the additional resources of the state to invest in it further benefits those municipalities. However, providing more instruments for municipalities with the means to address resilience challenges themselves can also free up state and federal funds for municipalities without sufficient resources to address resilience needs in their community.
Scale of Funding	Depends on the number of municipalities participating and their funding availability for investment.

Approve Legislation for Property Assessed Resiliency with C-PACE	
Recommended Implementation Action Description	Commercial Property Assessed Clean Energy (C-PACE) is an innovative financing solution from the Connecticut Green Bank ("Green Bank") that makes clean energy improvements to properties safe, accessible, and affordable. The recommendation of Property Assessed Resiliency would be included within and expand the purview of the C-PACE public policy to include resiliency as a qualifying commercial real property measure. The Green Bank would consult with DEEP and CIRCA to develop program eligibility criteria for financing of resilience improvements that are consistent with state environmental resource protection and community resiliency goals, and the program would require each resiliency project to conduct a resiliency study on the qualifying commercial real property that assesses the resiliency costs savings from such improvements over the useful life of the measures.
Implementation Entities	Green Bank, DEEP, CIRCA and the private sector
Equity Impact	(+) C-PACE is applicable to nearly all non-residential buildings, including non-profits and houses of worship that can offer critical social services and strengthen social bonds, both of which contribute to community resilience.

	135 of 169 cities and towns have opted into C-PACE in Connecticut. Only 4 of DECD designated distressed communities have not yet opted into C-PACE.
Scale of Funding	Hundreds of millions of dollars invested.

Promote the Bundling of Climate Adaptation and resilience Measures into Energy Savings Performance Contracts (ESPCs)	
Recommended Implementation Action Description	Owners of properties with large energy usage can hire an Energy Services Company (ESCO) and an Owner's Representative to assist the owner in procuring financing, installation, operation, and maintenance of building retrofits involving onsite energy generation, energy efficiency, and water conservation related capital improvements. The ESCO can access long-term financing methods such as Tax-Exempt Lease Purchase (TELP) commercial loan or bonds for these projects with limited or no up-front costs to the owner. Cash flow to the ESCO from the energy savings pays down the financing over the term of the TELP. Resilience measures related to energy such as the installation of microgrids or battery storage can be integrated into the capital projects financed by an ESPC.
Implementation Entities	DEEP
Equity Impact	(0) This mode of financing is not likely to be available to low income vulnerable communities, but the increased resilience of public infrastructure utilities can benefit vulnerable communities, if they are serviced by those facilities.
Scale of Funding	Millions of dollars in energy resilience measures.

Strategy 3. Supply Grants and Loans to Fund Resilience Projects and Programs

Connecticut needs to establish a program of grants and loans at the state level to fund projects and/or provide a source of matching funds for federal grants. These programs are largely supported by state bond financing backed by taxpayer dollars, but funds could also be backed by the revenue-generating mechanisms in Strategy 2.

Create an Environmental Infrastructure Bank	
Recommended Implementation Action Description	Expand purview of Green Bank to include Environmental Infrastructure. The recommendation of Environmental Infrastructure Bank would be included within and expand the purview of the Green Bank public policy to include "environmental infrastructure" as an area of investment. Environmental infrastructure would include, but not be limited to climate adaptation and resiliency as proposed to the state legislature in 2020. The policy would create an Environmental Infrastructure Fund, separate from the Clean Energy and Regional Greenhouse Gas Initiative funds overseen by the Green Bank – as well as the Clean Water and Clean Drinking Water funds administered by DEEP and the Office of the Treasurer– and be able to access potential federal resources that the Green Bank has been advocating for. The policy would enable the Green Bank to use its existing bonding authority to finance environmental infrastructure projects, and provide low-cost financing and credit enhancement mechanisms for projects and technologies. For the past several years, the Connecticut Green Bank has been advocating for the creation of a National Climate Bank that would provide low-cost and long-term capital from the federal government to states to finance projects to confront climate change (i.e., mitigation and adaptation projects). As part of the $1.5 trillion green infrastructure bill passed by the House of Representatives (i.e., Moving Forward Act"), a $20 billion "Clean Energy and Sustainability Accelerator" was included, with a focus on GHG emission reductions, job creation and just transition, and increasing investment in vulnerable communities.
Implementation Entities	Green Bank, DEEP, DECD, CGA
Equity Impact	(+) As a loan program focused on environmental infrastructure the bank has the potential to fund public works projects to benefit vulnerable communities. These loans would still have to be paid off and therefore taxes or a fee structure would be needed as a revenue source (see Strategy 2) and the payback mechanism would need to be equitable. The Green Bank is a national model when it comes to vulnerable communities. Its focus of increasing and accelerating investment in distressed and vulnerable communities serves as a foundation to the National Climate Bank.

Scale of Funding	Loans could range is size depending on the project type.

Provide State General Obligation Bonds as Green Bonds for Financing for Adaptation and resilience Programs and Projects and Matching Funds for Federal Grants	
Recommended Implementation Action Description	The bond should fund a program to allocate resilience funds on a competitive basis to projects and allow administrative and program delivery costs, as is the case with comparable programs at the federal level (e.g. FEMA Pre-Disaster Mitigation program (now called BRIC) and the HUD CDBG-DR program). The program could be administered by the state or another entity approved and overseen by the state. State agencies, municipalities, non-profits and academic institutions should be eligible to receive funds through the program. The bond funds could be allocated to public engagement, planning and educational programs as well as built projects. The funds should be utilized to meet non-federal match in applications for federal grant awards. State bonds are the mechanism by which our neighboring states of Massachusetts, Rhode Island, and New York are funding their resilience programs. In Connecticut, PA20-5[67] "establish[ed] a microgrid and resilience grant and loan pilot program to support local distributed energy generation for critical facilities or resilience projects." This program authorizes the use of state bond funds for this purpose. UConn CIRCA successfully carried out the Municipal Resilience Grants and Matching Funds programs backed by a settlement with the state.
Implementation Entities	CGA, OPM, Bond Commissions
Equity Impact	(+) General obligation bonds spread the cost over all state taxpayers and therefore represents a minimal incremental cost to any individual person, lowering the potential for a disproportionate impact on a low-income vulnerable community. The bond funds could be prioritized for programs and projects supporting vulnerable communities without asking those communities to pay for the entire cost and could also potentially be used for administrative costs for the community managing the project.
Scale of Funding	Tens to hundreds of millions for the bond. Massachusetts passed a bond bill in 2018 including $500 million for adaptation projects and programs that is funding their resilience planning and action grants program. On July 29 Rhode Island announced $4.4 million for projects from their Climate Resilience Funds backed by the Green Economy and Clean Water Bond. New York proposed, and the state legislature passed, a $3 billion "Restore Mother Nature" bond including funds for resilience initiatives to be placed

	on the November ballot, but it has since been removed by the state budget director citing COVID-19 impacts.

Implement the 10% of the State Revolving Loan Funds that can be Used to Finance Green Infrastructure, Flood Control and Microgrid Projects	
Recommended Implementation Action Description	The State has the ability to utilize up to 10% of revolving loan funds to support green infrastructure, flood control, and microgrid projects. The state should fully fund the revolving loan fund programs and provide technical assistance to municipalities to expand the use of green infrastructure and flood resilience projects. Green infrastructure approaches have been shown to be effective in reducing flooding and erosion, and they offer co-benefits like cooling in cities, reducing stormwater pollutants and increasing public access to the shoreline and surface waters. The 10% allocation could be leveraged for matching funds to federal resilience grants targeting nature-based solutions to mitigate natural disasters such as the FEMA Building Resilient Infrastructure and Communities (BRIC) program offering $500 million in funds for these projects nationwide in FY20.
Implementation Entities	DEEP
Equity Impact	(+) Green infrastructure improvements offer co-benefits to communities of removing impervious cover and greening urban landscapes, which can clean air and reduce heat island effects. The current green infrastructure set aside in the Clean Water Fund prioritizes combined sewer communities often located in low-income neighborhoods. The green infrastructure set aside offers a higher grant to loan ratio to lower the repayment costs. If paired with federal grant funds for a nature-based solution, then a much smaller loan would be needed to fully fund a project.
Scale of Funding	Tens of millions of dollars.

Incentivize Connecticut's Insurance Industry to Promote and Grow the Catastrophe Bond Market and Pilot a Resilience Bond Program	
Recommended Implementation	Resilience bonds[68] modify the existing catastrophe bond insurance market to capture the savings from a lowered risk of insurance payouts and then use that value as rebates to invest in resilient infrastructure projects. Catastrophe bonds bring together insurance and investment. Investors in

Action Description	the bonds receive payments with interest unless a catastrophe, like a hurricane with storm surge, occurs and the principal invested is then used to cover losses. These bonds are usually short term on the order of 3 to 4 years. In 2013, one year after Superstorm Sandy, the New York MTA purchased a $200 million parametric catastrophe bond to insure themselves against losses and provide funds to make repairs in the event of a storm surge.[69] The insurance industry has been the building block for our economy by helping rebuild after a loss. Catastrophe Bonds and Resilience Bonds are insurance-linked securities and can be used by federal, state and municipal governments in many ways to allow private investors to fund the rebuilding of green and grey infrastructure and resiliency projects when the storm event that causes property damage exceeds a threshold-criteria (triggering event) during the term of the bond that are defined in the Resilience or Catastrophe Bond agreement. One example has been a Catastrophe Bond that was developed to insure a coral reef off of Central America coast, which was financed by the tourist industry in Central America as it depends largely on tourists diving near the reef. The bond is designed based on certain triggers being met when a hurricane strikes in the area. Once met, money is distributed and used to make repairs to the reef.[70] The first Resilience Bond was issued in 2019 by the European Bank for Reconstruction and Development (EBRD) as a five-year climate resilience bond rated AAA (by Moody's/S&P/Fitch) at 1.625% which raised US$700 million. The first orderbook's distribution statistics saw demand from 15 countries (58% from Europe, 28% from North America and 14% from Asia) from over 40 accounts (32% asset managers, 31% central banks/official institutions, 28% banks, 9% insurance and pension funds).[71]
Implementation Entities	Municipalities or private entities
Equity Impact	(0) Catastrophe bonds and Resilience Bonds are focused on insurance coverage for large private or municipal entities.
Scale of Funding	Hundreds of millions in payout in the event of a natural disaster.

Revolving Loan Fund for 1-6 Family Affordable Housing Purchase and Rehabilitation	
Recommended Implementation Action Description	A loan product that allows both purchase and rehabilitation is required to stop the unjust deterioration in cities, inner ring suburbs and rural communities. A revolving loan pool should be established with funding by DOH, CHFA and others that would be administered by CDFIs (Community

	Development Financial Institutions) and Community Development Corporations (CDCs) to finance purchase and subsequent rehabilitation (including undertaking resilience measures) of functionally obsolescent and deteriorated housing. Loans would be taken out following the completion of rehabilitation by traditional homebuyer and other mortgage financing. The loan program would be supported by technical assistance through a newly established Community Design Center (CDC) that would work in partnership with CDCs.
Implementation Entities	DOH, CHFA, CDFIs and CDCs
Equity Impact	(+) Let's not lose the embedded energy, affordable housing stock, and financial equity accumulated largely by Black and other People of Color in our existing 1-6 family building stock due to functional obsolescence, impacts of climate change and deterioration. Preservation of walkable communities is especially important to climate change goals as is avoiding the need to build expensive and energy-intensive replacement housing. There is a desperate need for easy-to-use resource for financing, grant funds and technical assistance for rehabilitation of these properties. Due to gaps in existing financing additional loan products supported by technical assistance are required to serve the needs of middle-income as well as low/moderate-income families.
Scale of Funding	Hundreds of thousands on a per project basis.

Financing for Resilient Housing Upgrades Including Construction of Accessory Dwelling Units (ADUs) and Home Elevation	
Recommended Implementation Action Description	COVID-19 has brought to focus the needs for families, caregivers, and others to live in close proximity. Connecticut should provide the financing and regulatory relief for housing to meet this need. In most cases this will reduce transportation, increase resilience and reduce energy use for housing as well as meet social justice goals. This product would also be useful to allow existing homeowners to make the necessary repairs for sale of their home to a next generation of homeowners. Building a second mortgage product for repairs, upgrades, addition of ADUs and resilience measures supported by technical assistance should be achievable. Existing solar and energy conservation program administered by the Green Banks can serve as a model for this initiative. After Superstorm Sandy, Connecticut capitalized the Shore Up Connecticut[72] low interest loan program using state bond funds, run by the Housing Development Fund, for homeowners and small businesses in the coastal floodplain to elevate

	structures and utilities. Only 12 loans were given out at that time, but it was released at a time when federal recovery dollars were also widely available. The state might consider reupping this program or partnering with private banks to promote loan programs for resilience retrofits for private homeowners.
Implementation Entities	DOH, CHFA, Municipalities and CGA
Equity Impact	(+) A low-interest second mortgage product could be developed to diversify housing stock and increase resilience. Higher density housing with ADUs would make more affordable options in Connecticut municipalities and create a more resilient community.
Scale of Funding	Hundreds of thousands on a per project basis.

Strategy 4. Investigate the use of tax credit programs and property tax abatement programs to incentivize the private sector to invest in community resilience.

Tax credits have been successful in spurring development and may also be used to incentivize or attract investment in resilience projects.

Investigate the Use of the New Market Tax Credit, Opportunity Zones, Public Act 490 Connecticut's Current Use Law and the 4% Low-Income Housing Tax Credit for Resilience Investments	
Recommended Implementation Action Description	Three of these tax credit programs are utilized in Connecticut to promote investment in low-income communities. Although there is no explicit integration of climate resilience in these tax credit programs, community resilience initiatives or investments could be integrated into projects or programs built with tax credits. Connecticut should investigate opportunities to maximize resilience within its tax credit programs due to their focus on low-income communities who are also disproportionately impacted by climate change. As an Opportunity Zone example, the Norfolk Solar II QOZ Fund[73] in Virginia is now available to commercial investors. The investment partners have identified an estimated $150 million worth of potential sites needing 90 MW of solar energy. These private investment partners expect to create over 200 clean energy jobs in Opportunity Zones. Recognizing the many public benefits that conserved, undeveloped land offers Connecticut residents including carbon sequestration for climate adaptation and resiliency benefits, evaluate increasing property tax abatement benefits for owners of farm, forest, and open space based on an assessment of their carbon sequestration services being provided on these properties. This policy change is consistent with the current State policy in Public Act 490[74] that these owners *not* be burdened by excessive property tax assessment that is not representative of the owner's current land-use. Public Act 490 is Connecticut's current – use law (Connecticut General Statutes Sections 12-107a through 12-107g) that allows a farm, woodlot, or open space land to be assessed at its use value, rather than its fair market or highest and best use value for purposes of local property taxation.
Implementation Entities	DECD, DOH, CHFA, Municipalities
Equity Impact	(+) The above tax credit programs are used to promote economic development in low-income communities where resilience investments are also needed. If appropriate projects can be identified to utilize these programs, then they are likely to benefit vulnerable communities. The Public Act 490 tax abatement program could be modified to reward owners' higher rates of property tax abatement when they provide

	increasing levels of carbon sequestration services on their farm, wood lot or open space land as an incentive to increase their rate of carbon sequestration services as a climate resiliency benefit for the public in urban and more developed areas of the state.
Scale of Funding	Tax credits can be worth millions of dollars to investors but also impact tax revenue to the state.

Strategy 5. Engage the Foundation and Philanthropic Community as a Funding and Financing Partner

The foundation and philanthropic community in Connecticut, with its network of community partners, is uniquely positioned to take an important role in both meeting climate change goals and building the capacity to implement social, racial and environmental justice.

Engage the Foundation and Philanthropic Community as a Funding and Financing Partner	
Recommended Implementation Action Description	*Convene Connecticut's Community Foundation and Philanthropic Leaders* in an intensive workshop to address investing in community capacity building, and annual climate adaptation training of environmental justice organizations with the goal of establishing an ongoing partnering relationship and Working Group among the stakeholders. *Assess Connecticut's capacity for implementation and advancement of climate change initiatives at the community level and with environmental justice communities*, to be coordinated with the recently initiated assessment of housing needs, including capacity required for implementation and the established need for increasing inclusiveness. *Launch a statewide campaign for Just Climate Change Engagement.* This effort could integrate the approaches from the Frameworks Institute. Undertake a strategic initiative to increase available funding for Just Climate Change engagement including developing a new grant pool specific to addressing identified gaps, developing new contributors, providing additional giving platforms, leveraging existing resources such as the Neighborhood Assistance Act and advancing knowledge in the next stage of implementation (i.e. building social capital and sequestering carbon). *Initiate a statewide pool of foundation and tax credit funds to provide matching funds for federal and state grants and funding for resilience projects.* Managing a fund like this requires significant coordination with grantees and funding organizations who all have different needs and timelines, but the proof of concept has been done through the Matching Funds Program at CIRCA and the Community Match Program at Sustainable CT. *Continue disaster recovery and preparedness philanthropy with a long-term vision for climate resilience.* Community foundations can quickly raise funds from their donors and constituents to distribute emergency funds in response to a disaster, such as a hurricane. Community foundations may consider setting aside or channeling their disaster fundraising towards resilience projects with a lasting impact, similar to the direction the federal government is taking with the 6% set aside of disaster appropriations for

	pre-disaster mitigation and the formation of the HUD CDBG Mitigation Program also funded by disaster appropriations. *Increase individual, crowd sourcing and corporate giving* for climate resilience and related environmental justice projects. *Promote the CT State Neighborhood Investment Act Tax Credits for Resilience.* Corporations can contribute $150K to programs up to through the CT State Neighborhood Investment Act Tax Credits that would be useful for regional or municipal programs. These tax credits can be married to foundation grants and/or used as matching funds for larger federal grants or for funding smaller projects outright. *Facilitate the relationship building and partnerships among the state government, foundations in our state and national foundations.* In addition to community foundations, the State should seek deep, long-term affiliation with national foundations for significant grants for projects, or a series of projects, to support early stages of project conception and development.
Implementation Entities	State agencies
Equity Impact	(0) Today, many of these programs do not fund environmental justice activities. This may be an opportunity to engage with community and private foundations to proactively fund environmental justice, climate justice and environmental health programs. This would also create an opportunity for donors to support these programs through traditional philanthropic organizations.
Scale of Funding	Philanthropic foundations can be a good opportunity for funding to build community awareness and support as well as begin the development of a project to position it for other funding sources.

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[2] https://www.greenribboncommission.org/wp-content/uploads/2018/04/Financing-Climate-Resilience-April-2018.pdf
[3] http://climatechange.ri.gov/documents/resilientrhody18.pdf
[4] http://nsglc.olemiss.edu/sglpj/vol8no1/3-french-et-al.pdf
[5] Our aging housing stock that is home to many of our low and moderate most vulnerable neighbors provides a tremendous opportunity for cost-effective energy efficiency investments. These neighborhoods, facing multiple life stressors, require consistent community-based outreach to engage

them in weatherization and energy efficiency programs. Moreover, these services are denied twice as often in these neighborhoods when compared to middle income areas because of higher incidence of mold, asbestos or lead found in typically older homes. Finally, these aging structures typically lack both significant insulation and air conditioning, thereby increasing health related extreme heat exposure that we are living into due to climate change. Investing in a healthy, comfortable housing stock for our most vulnerable by eliminating environmental threats, providing deep energy efficiency services and investing in electric high efficiency heating/cooling heat pump split systems is a quadruple win: (a) adaptation: by protecting our most vulnerable populations from accelerating heat exposure(b) community health:

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[11] https://portal.ct.gov/DOH/DOH/Sandy-Pages/Sandy-Programs/Planning/Planning-Tranche-One and https://portal.ct.gov/DOH/DOH/Sandy-Pages/Sandy-Programs/Planning/Planning-Tranche-Two

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[55] In December 2019, The Hartford announced it would no longer insure or invest in companies that generate more than 25 percent of their revenues from thermal coal mining or more than 25 percent of their energy production from coal. In addition, the company announced it will also stop insuring and investing in companies that generate more than 25 percent of their revenues directly from the extraction of oil from tar sands." https://s0.hfdstatic.com/sites/the_hartford/files/statement-on-climate-change.pdf
[56] July 1, 2019, Chubb Limited (NYSE: CB) announced that it has adopted a new policy concerning coal-related underwriting and investment. With the new policy, the company will no longer underwrite the construction and operation of new coal-fired power plants or new risks for companies that generate more than 30% of their revenues from coal mining or energy production from coal. Insurance coverage for existing coal-plant risks that exceed this threshold will be phased out by 2022, and for utilities beginning in 2022. In addition, Chubb will not make new debt or equity investments in companies that generate more than 30% of revenues from thermal coal mining or energy production from coal. https://www.chubb.com/_global-assets/documents/chubb-environmental-report.pdf
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Appendix I. Existing Financing and Funding Mechanisms for Climate Adaptation and Resilience

Table 1 and 2 below contain list of the existing financing and funding program at the state and federal level that have clear links to adaptation and resilience. In order to facilitate the use of these existing programs, this report tabulates the funding type, range, term and source. It also discusses whether the program focuses on pre- or post- disaster mitigation, adaptation and resilience, the type of work phase the program focuses on (e.g. planning vs. implementation) and whether a cost benefit analysis is required. The tables provide a brief evaluation of fairness and equity and how the program connects to community lifelines. Community lifelines are referenced by the US Federal Emergency Management Agency in their Building Resilient Infrastructure and Communities Program that is the largest source of federal grant funding for adaptation and resilience projects outside of funds provided due to a declared disaster. Community lifelines enable the continuous operation of critical government and business functions and are essential to human health and safety or economic security. FEMA identifies community lifelines as safety and security; food, water, shelter; health and medical; energy; communications; transportation; and hazardous material. Although clearly framed from an emergency response perspective, community lifelines provide a useful evaluation of whether a funding or financing program is addressing these critical needs.

Legend for Table 1 and 2

Key Screening Factors of Existing Funding Mechanisms Table

Funding Type: (L) Loan, (G) Grant, (B) Bond, (I) Insurance Backed Security, (CE) Credit Enhancement

Funding Range: 1000's $, ex. 5,000= 5,000,000 unless otherwise stated as $5 million

Funding Term: in years, ex. 1, 3, 5, 10, 20 or more

Federal Funding Source: (+) Dedicated not subject to annual committee appropriations, (-) Discretionary, subject to annual committee appropriations

Federal Programs Administered by State: Examples FEMA, HUD, NOAA, (Yes/No)

Pre- or Post- Disaster Mitigation, Adaptation, Resilience: Pre, Post, Both

Work Phase: (P) Planning/Capacity Building, (FS) Feasibility Study, (D) Design, Permit, (C) Construction, (R) Retrofit/Renovate (O) Operate & Maintain, (Z) Land Use Zoning Ordinance (BC) Building Code

Cost Benefit Analysis Required: (Yes/No)

Fairness to Payers: Less Ability to Pay Payers pay less or none, and High Ability to Pay Payers pay more (+), All Payers pay the same but may result in insufficient fund amount to meet total need (0) , Less Ability to Pay Payers pay unaffordable amount and High Ability to Pay Payers pay none or insufficient amount (-)

Equity Impact: Equity Lens Criteria is positively impacted (+), Equity Lens Criteria is positively and negatively impacted or unchanged (0), and Equity Lens Criteria is negatively impacted (-)

Community Lifelines Impact: One or more of 7 Community Lifelines are positively impacted for increased resilience (+), One or more of 7 Community Lifelines are stabilized but resilience is unchanged (0), One or more of & Community Lifelines are destabilized or negatively impacted for resilience (-)

Table 1. Existing State Financing and Funding Mechanisms for Climate Adaptation and Resilience

Funding Mechanism (Funding Source/Agency) Grant (G) Loan (L)	**Match % (0-100)**	**Funding Range (1000s)/Term Period/Dedicated (+) or Discretionary Funding Source (-)**	**Projects Completed in CT? /Administered by State of CT**	**Pre- or Post-Disaster Mitigation Adaptation Resilience**	**Work Phase**	**Cost Benefit Analysis Required**	**Fairness to Payers**	**Equity Impact/Community Lifelines Impact**
Green Bonds (CT Green Bank, State Bond Commission, Municipalities/Political Subdivisions), (B)	NA	Limited by debt caps, 15, 20, 30 years or more terms. (-)	Yes/Yes	Both	All	No	0	(-) Distressed communities may have lower bond rating and pay higher rate; (+) Green projects could be prioritized for community lifelines; (+) Green Bank prioritizes equity impact.
General Obligation Bonds (State Bond Commission, Municipalities/ Political Subdivisions/(B)	NA	Limited by debt caps 15, 20, 30 years or more terms. (-)	Yes/Yes	Both	All	No	0	(-) Distressed communities may have lower bond rating and pay higher rate; (+) Green projects funded could be prioritized for community lifelines.

Funding Mechanism (Funding Source/Agency) Grant (G) Loan (L)	Match % (0-100)	Funding Range (1000s)/Term Period/Dedicated (+) or Discretionary Funding Source (-)	Projects Completed in CT? /Administered by State of CT	Pre- or Post-Disaster Mitigation Adaptation Resilience	Work Phase	Cost Benefit Analysis Required	Fairness to Payers	Equity Impact/Community Lifelines Impact
Public Private Partnerships (CT Green Bank and State)	NA	C-PACE, nearly $175 million of capital invested - supporting over 300 projects, over $285 million of estimated avoided energy costs over the life of the projects, and projects located in 135 participating cities and towns.	Yes/No	Both	All	Yes	0	(+/+) Green projects could be prioritized for community lifelines and equity. Currently, only 4 of DECD designated distressed communities have not yet opted into C-PACE.
CIRCA Municipal Grant Program (CIRCA) (G) Discontinued 2017	25%	Grant awards between $20 and $50 depending on annual funds available. (-)	Yes/Yes	Both	P, FS, D, Z	No	0	(+) Equity impact considered when ranking proposals; (+) Community lifelines eligible.
Microgrids Grants (DEEP), (G) CT Green Bank (L)	NA	$18 million in 2013 for 9 Projects, Grant Round in 2019 on hold.	Yes/Yes	Both	All except O	No	0	(0) Awards do not consider equity; (+) Microgrids protect power supply for

Funding Mechanism (Funding Source/Agency) Grant (G) Loan (L)	**Match % (0-100)**	**Funding Range (1000s)/Term Period/Dedicated (+) or Discretionary Funding Source (-)**	**Projects Completed in CT? /Administered by State of CT**	**Pre- or Post-Disaster Mitigation Adaptation Resilience**	**Work Phase**	**Cost Benefit Analysis Required**	**Fairness to Payers**	**Equity Impact/Community Lifelines Impact**
								community lifelines.
Tax Increment Financing (TIF) Municipalities and Political Subdivisions	100%	Project dependent. (-)	Yes/No	Both	All	No	0	(0) Can finance affordable housing, based on raising property values, gentrification possible; (0) Can improve or increase need for community lifelines.

Table 2. Existing State Financing and Funding Mechanisms for Climate Adaptation and Resilience

Funding Mechanism (Funding Source/Agency) Grant (G) Loan (L)	**Match % (0-100)**	**Funding Range (1000s)/Term Period/Dedicated (+) or Discretionary Funding Source (-)**	**Projects Completed in CT? /Administered by State of CT**	**Pre- or Post-Disaster Mitigation Adaptation Resilience**	**Work Phase**	**Cost Benefit Analysis Required**	**Fairness to Payers**	**Equity Impact/Community Lifelines Impact**
Regional Conservation Partnership Program (USDA NRCS), (G)	50%	Grant awards between $250 and $10,000 for up to 5-year terms. $1.5 billion total funding dedicated over 5-year period.	No/No	Both	All	No	0	(+) Subawards typically limited to property owners below AGI thresholds.
Watershed Operations and Flood Prevention Program (USDA NRCS)	0%	$197 million is discretionary funding and $47 million in mandatory funding in FY19	Yes/No	Both	All	Yes	0	(+) Equity impact considered when ranking proposals.
Long Island Sound Futures Fund (National Fish & Wildlife Foundation/USEPA)	50%	Grant awards between $20 and $500 for up to 2-year terms	Yes/No	Both	All	No	0	(0) Grant awards do not consider equity issues.
National Fish and Wildlife Federation	50%	Grant awards between $100 and $500 for up	Unknown/No	Both	All	No	0	(+) Equity impact considered when ranking proposals.

Funding Mechanism (Funding Source/Agency) Grant (G) Loan (L)	**Match % (0-100)**	**Funding Range (1000s)/Term Period/Dedicated (+) or Discretionary Funding Source (-)**	**Projects Completed in CT? /Administered by State of CT**	**Pre- or Post-Disaster Mitigation Adaptation Resilience**	**Work Phase**	**Cost Benefit Analysis Required**	**Fairness to Payers**	**Equity Impact/Community Lifelines Impact**
Resilient Communities (Wells Fargo), (G)		to 2-year terms. $3 million dedicated for 2020.						
Emergency Watershed Protection-Floodplain Easements (USDA NRCS), (G)	100%	$435 million in FY19 and 20 Supplementary Funds, assigned to natural disasters	Yes/No	Post	All except O	No	0	(1) Awards do not consider equity
Rural Development-Water & Environmental Program (USDA), (G&L)	100%	$153 million awarded in FY20	Yes/No	Both	All except O	No	0	(+) Awards based on median household income
Building Resilient Infrastructure and Communities (BRIC) (FEMA) (G)	10% to 25%	Up to 6% annual set aside from post disaster grant funding (+) State, territory and tribal set asides and national competition for	Yes as Pre-Disaster Mitigation Program /No	Pre (must have a national declared disaster in past 7 years from application date)	All except O	Yes, including eligible mitigation projects that are cost-effective based on	0	(+) Focus on community lifelines and partnerships with shared responsibilities and lower 10% match for small impoverished communities (pop. less than 3000 and average income less than 80%

Funding Mechanism (Funding Source/Agency) Grant (G) Loan (L)	Match % (0-100)	Funding Range (1000s)/Term Period/Dedicated (+) or Discretionary Funding Source (-)	Projects Completed in CT? /Administered by State of CT	Pre- or Post-Disaster Mitigation Adaptation Resilience	Work Phase	Cost Benefit Analysis Required	Fairness to Payers	Equity Impact/Community Lifelines Impact
		balance, large and small grants, 3 years with extensions for large multi-phase projects, $350-500 million expected in FY20				FEMA's pre-calculated benefits (see FEMA pre-calculated benefits table for more details)		national average). Some projects are eligible for environmental and social benefits in BCA.
Flood Mitigation Assistance (FMA) (FEMA) (G)	0%-SRL 10%-RL 25%-HMA	$160 million total in FY20, (-) $ 4 million for Project Scoping or $600,000 for Sub-applicant for Community scale projects and relocations $70 million for Community Flood Mitigation Projects ($30	Yes/Yes	Pre	All except O and FS	Yes, including eligible mitigation projects that are cost-effective based on FEMA's pre-calculated benefits (see	0	(+) FY20 Policy favors neighborhood buy-outs for relocations. Priority for federal share of up to $250,000 for projects at single family dwelling units (SFDUs) and less than $750,000 for acquisitions of SFDUs

Funding Mechanism (Funding Source/Agency) Grant (G) Loan (L)	Match % (0-100)	Funding Range (1000s)/Term Period/Dedicated (+) or Discretionary Funding Source (-)	Projects Completed in CT? /Administered by State of CT	Pre- or Post-Disaster Mitigation Adaptation Resilience	Work Phase	Cost Benefit Analysis Required	Fairness to Payers	Equity Impact/Community Lifelines Impact
		million per project cap) $86 million for Technical Assistance, Flood Hazard Mitigation Planning and Individual Flood Mitigation Projects.				FEMA pre-calculated benefits table for more details).		
Hazard Mitigation Grant Program (HMGP) (FEMA) (G)	25%	Allocated using a "sliding scale" formula based on the percentage of funds spent on FEMA Public Assistance and Individual Assistance for each Presidentially declared disaster. The formula provides up to 15% of the first	Yes/Yes	Post	All except O and FS per HMP	Yes, including eligible mitigation projects that are cost-effective based on FEMA's pre-calculated benefits (see FEMA	0	(-) A study in 2018 by Rice University and University of Pittsburgh concluded that FEMA disaster recovery aid in 20 U.S. Counties increased inequality of wealth, finding that whites accumulate more wealth after natural disasters while residents of color accumulate less.

Funding Mechanism (Funding Source/Agency) Grant (G) Loan (L)	Match % (0-100)	Funding Range (1000s)/Term Period/Dedicated (+) or Discretionary Funding Source (-)	Projects Completed in CT? /Administered by State of CT	Pre- or Post-Disaster Mitigation Adaptation Resilience	Work Phase	Cost Benefit Analysis Required	Fairness to Payers	Equity Impact/Community Lifelines Impact
		$2 billion of estimated aggregate amounts of disaster assistance, up to 10% for amounts between $2 billion and $10 billion, and 7.5% for amounts between $10 billion and $35.333 billion. (-)				pre-calculated benefits table for more details)		
Public Assistance (PA) 406 Mitigation (FEMA) (G)	75%	Funding amounts based on the damage estimates for each presidentially declared disaster.	Yes/Yes	Post	D, C, R	Yes	0	(-) A study in 2018 by Rice University and University of Pittsburgh concluded that FEMA disaster recovery aid in 20 U.S. Counties increased inequality of wealth, finding that whites accumulate more wealth after natural

Funding Mechanism (Funding Source/Agency) Grant (G) Loan (L)	Match % (0-100)	Funding Range (1000s)/Term Period/Dedicated (+) or Discretionary Funding Source (-)	Projects Completed in CT? /Administered by State of CT	Pre- or Post-Disaster Mitigation Adaptation Resilience	Work Phase	Cost Benefit Analysis Required	Fairness to Payers	Equity Impact/Community Lifelines Impact
								disasters while residents of color accumulate less.
National and Emergency Coastal Resilience Fund (NOAA/NFWF) (G)	100%	$31 million FY20 (-) no maximum, but $2 million restoration average cap.	Unknown/No	Both	All	No	0	(+) Capacity building grants.
Clean Water State Revolving Fund (EPA) (L) (G)	Repayment starts 12 months after construction, can match with FEMA and USDA	30-year low interest loans with subsidies as grants, small to large loans, $158 million was largest loan in 2019.	Yes/Yes	N/A	All	No	0	(+) Technical assistance and capacity building.

Funding Mechanism (Funding Source/Agency) Grant (G) Loan (L)	Match % (0-100)	Funding Range (1000s)/Term Period/Dedicated (+) or Discretionary Funding Source (-)	Projects Completed in CT? /Administered by State of CT	Pre- or Post-Disaster Mitigation Adaptation Resilience	Work Phase	Cost Benefit Analysis Required	Fairness to Payers	Equity Impact/Community Lifelines Impact
Community Development Block Grant (CDBG) (HUD) (G)	0% Grant can be used For FEMA 25% match	Grants for municipalities in areas with 51% Low/Moderate Income Population, allocated by formula in CT totaled 13.4 million in 2019	Yes/Yes	Both	All except O	No	+	(+) Supports community lifeline facilities and emergency protective measures for infectious diseases.
CDBG – Disaster Recovery (HUD) (G)	0%	Grants for Community Resilience Plans and Mitigation.	Yes/Yes	Post	All except O	Yes	+	(+) Supports community engagement in low/moderate income areas and community lifelines.
CDBG- Section 108 Loan Guarantees (HUD) (L) (CE)	N/A	$300 million loan commitment ceiling, match with New Markets Tax Credits (NMTC), Low Income Housing Tax Credits (LIHTC), and Opportunity	Unknown/Unknown	Both	All except O	No	+	(+) Supports community engagement in low/moderate income areas, economic development and community lifelines.

Funding Mechanism (Funding Source/Agency) Grant (G) Loan (L)	**Match % (0-100)**	**Funding Range (1000s)/Term Period/Dedicated (+) or Discretionary Funding Source (-)**	**Projects Completed in CT? /Administered by State of CT**	**Pre- or Post-Disaster Mitigation Adaptation Resilience**	**Work Phase**	**Cost Benefit Analysis Required**	**Fairness to Payers**	**Equity Impact/Community Lifelines Impact**
		Zone equity investments.						
Flood Resilience and Risk Reduction (G)	Varies 50%	$1.8 billion of funding in FY20, project specific funding for levees, dams, dune restoration for riverine and coastal flood resiliency.	Proposed in New Haven/No	Post typically, Pre is allowed	All except O	Yes BCR method under revision	0	(0) Protects community lifelines, areas of national economic benefits and environmental benefits.
Better Utilizing Investments to Leverage Development (DOT) (G)	20%	$1 billion annually since 2009	Unknown/Yes	Both	All except C, O	No	0	(0) A transportation community lifeline is the primary benefit with special credit for rural transit for economic development.
Section 103 Hurricane and Storm Damage Reduction (USACE)	100% (Feasibility Study) 65% (Final Design and	Maximum Federal Cost for planning, design and construction of any single project is $10 million. Feasibility study	Yes/Yes	Both	FS, D, C, R	Yes	0	(0)

Funding Mechanism (Funding Source/Agency) Grant (G) Loan (L)	Match % (0-100)	Funding Range (1000s)/Term Period/Dedicated (+) or Discretionary Funding Source (-)	Projects Completed in CT? /Administered by State of CT	Pre- or Post-Disaster Mitigation Adaptation Resilience	Work Phase	Cost Benefit Analysis Required	Fairness to Payers	Equity Impact/Community Lifelines Impact
	Construction)	is 100% funded up to $100k. Costs over $100k are 50/50.						
Section 204 Ecosystem Restoration in Connection with Dredging	100% (Feasibility Study) 65% (Final Design and Construction)	$10 million maximum per project	Yes/Yes	Both	FS, D, C, R	Yes	0	(0)
Section 205 Flood Damage Reduction Projects	100% (Feasibility Study) 65% (Final Design and Construction)	Maximum Federal Cost for planning, design and construction of any single project is $10 million. Feasibility study is 100% funded up to $100k. Costs over $100k are 50/50.	Yes/Yes	Both	FS, D, C, R	Yes	0	(0)

Appendix II. Supplementary Information on Recommended Financing and Funding Strategies

Appendix II

Table 1. Further analysis of the elements of proposed new or enhanced financing and funding recommendations (consider adding a column to identify which mechanism is best positioned to be implemented in the short vs. long term)

Funding Mechanism (Funding Source/Agency) Grant (G) Loan (L)	Match % (0-100)	Funding Range /Term Period/Dedicated (+) or Discretionary Funding Source (-)	Projects Completed in CT? /Administered by State of CT	Pre- or Post- Disaster Mitigation Adaptation Resilience	CBA	Fairness to Payers	work phase	Equity Impact/Community Lifelines Impact	Capital	Match	Local fund
Local Authorizations Stormwater Authority Authorization	0%		no/no	both	yes	(+)			high	yes	yes
Local conveyance tax authorization											

Funding Mechanism (Funding Source/Agency) Grant (G) Loan (L)	Match % (0-100)	Funding Range /Term Period/Dedicated (+) or Discretionary Funding Source (-)	Projects Completed in CT? /Administered by State of CT	Pre- or Post- Disaster Mitigation Adaptation Resilience	CBA	Fairness to Payers	work phase	Equity Impact/Community Lifelines Impact	Capital	Match	Local fund
State Funding: New Appropriation - State bonds for nature-based solutions and urban tree and forest protection (bonding)	0%	$70 million	yes/yes	both	yes	(+)			low	no	no
Water/resilience flush tax (tax)	0%	$50-70 million from $60 per household "flush tax "	no/no	pre	yes	(+)			high	yes	yes
catastrophe bonds (bonding)	0%	(+)	no/no	post	yes	(+)			low	no	no
Shore up Connecticut (L)	0%	$10,000 to $300,000 with 15-year term, 2.75 % fixed interest rate (2.894% APR) 1% origination fee (+)	yes/no	post	no	0			low	yes	no

Funding Mechanism (Funding Source/Agency) Grant (G) Loan (L)	Match % (0-100)	Funding Range /Term Period/Dedicated (+) or Discretionary Funding Source (-)	Projects Completed in CT? /Administered by State of CT	Pre- or Post- Disaster Mitigation Adaptation Resilience	CBA	Fairness to Payers	work phase	Equity Impact/Community Lifelines Impact	Capital	Match	Local fund
Resilience Energy Saving Performance (FEMP) (G)	0%	(+)	no/no	pre	yes	0			low	no	no
Clean water revolving loans (L)	20%		yes/yes	pre	yes	0			high	requires 20%	yes
drinking water revolving loans (L)	20%	ct. deadline for 2021 past	yes/yes	pre	yes	0			high	requires 20%	yes
"no net loss"	0%	Developers/state make payments to mitigation fund for unavoidable forest conversion and other natural lands - “no-net-loss of forest” laws (+)	no/no	both	yes	0			low	no	yes

Funding Mechanism (Funding Source/Agency) Grant (G) Loan (L)	Match % (0-100)	Funding Range /Term Period/Dedicated (+) or Discretionary Funding Source (-)	Projects Completed in CT? /Administered by State of CT	Pre- or Post- Disaster Mitigation Adaptation Resilience	CBA	Fairness to Payers	work phase	Equity Impact/Community Lifelines Impact	Capital	Match	Local fund
"no net loss"	0%	Developers/state make payments to a mitigation fund for unavoidable conversion of forest and other natural lands - "no-net-loss of forest" laws (+)	no/no	both	yes	0			low	no	yes
enable municipalities to institute buyer conveyance fee	0%		no/no	both	yes	(+)			high	yes	yes
Urban Forest Carbon Credit	0%		no/no	both	yes	0			high	yes	yes
General sales tax increase	0%	74.8million for increase of general sales tax by .125% (from 6.35% – 6.475%)	yes/yes	both	yes	0			high	yes	no

Funding Mechanism (Funding Source/Agency) Grant (G) Loan (L)	Match % (0-100)	Funding Range /Term Period/Dedicated (+) or Discretionary Funding Source (-)	Projects Completed in CT? /Administered by State of CT	Pre- or Post- Disaster Mitigation Adaptation Resilience	CBA	Fairness to Payers	work phase	Equity Impact/Community Lifelines Impact	Capital	Match	Local fund
Enhance existing land conservation programs - more specific climate-related criteria into selection of projects/level of funding	0%	increase from $3-7.5 million to $25 million for OSWA and RNHT and $10 million for the Recreational Trails Program. (+)	yes/yes	pre	yes	0			low	no	yes
Increase funding for Community Investment Act (CIA)	0%	$1.5 million for an increase from $40 to $50 on local recording fee	yes/yes	pre	yes	0			low	no	yes
Mandate use of existing state revolving funds set aside for land conservation	0%	Up to 10% of SRF can be used for land conservation	yes/yes	pre	no	(+)			low	no	yes

Funding Mechanism (Funding Source/Agency) Grant (G) Loan (L)	Match % (0-100)	Funding Range /Term Period/Dedicated (+) or Discretionary Funding Source (-)	Projects Completed in CT? /Administered by State of CT	Pre- or Post- Disaster Mitigation Adaptation Resilience	CBA	Fairness to Payers	work phase	Equity Impact/Community Lifelines Impact	Capital	Match	Local fund
Explore strategies for making limited use of RGGI funds for forest land conservation, primarily through the offset provision in the existing program, provided offsets are not encouraged as a substitute for compliance.	0%	As permitted in existing regulations, invest CO_2 allowance auctions as offsets, where compliance is not feasible, to fund DEEP land protection effort or other environmental projects (+)	yes/yes	pre	yes	0			low	no	yes
Expand corporate tax credit for donations/bargain sale of open space to individuals for land that meets certain climate mitigation criteria and/or for forest carbon services	0%		no/no	pre	yes	0			low	no	no

collaboration with private non-profits	0%	collaborate with non-profits to offset costs of administration	no/no	both	yes	0			low	no	no

Elaborations on and rationales for a few of these funding streams:

Triple the Petroleum Products Gross Earnings Tax and dedicate the new 16.2 cent per gallon rate for climate mitigation and adaptation purposes.

Annual funding per year: approximate $520 million

Rationale: Burning of petroleum products is the root cause of global warming. Imposing an additional tax to pay for measures needed to make the State and its most vulnerable citizens safe in the face of climate change when petroleum costs are at historic lows. For background on tax see OLR white paper.[3]

Resilience Water Fund (Flush Tax)

We propose a new water resilience fund that would be created through a flush tax, modeled after one such that is levied by Maryland. This would consist of a $60 fee for any household or business that owns and operates at least one toilet facility. The estimated revenue could be between $50 and $70 million dollars per annually.

This project has high capitalization potential. Low- and moderate-income (LMI) households could be made eligible for a partial or full state income tax reduction from the tax as to not burden those who should not be expected to spare that 60 dollars. This tax would offer an assured stream of funds that would be used to ensure a higher quality of water in Connecticut, returning the investment back to Connecticut residents. We recommend that this tax be directed to all other resilience project needs, with an emphasis on projects with high community equity benefits.

[3] https://www.cga.ct.gov/2018/rpt/pdf/2018-R-0054.pdf

Appendix III. Cost Estimates for Adaptation and Resilience Strategies

Equity and Environmental Justice Working Group

Equitable Energy Efficiency Goals and Funding to Create Safe and Warm Homes
*Although the primary charge to the Financing Resilience Working Group was to identify funding and financing resources for adaptation and resilience rather than reducing carbon emissions, the Working Group recognizes that especially for low- and moderate-income households energy efficiency represents a resilience pathway by lowering cost burdens and improving public health. Energy efficiency also directly addresses climate resiliency particularly with rising cooling costs as temperatures warm.

Funding need: $544,350,000/year (see calculations below)

Building Environmental Justice and Community Capacity

Funding need: $2,835,000/year (see calculations below)

Building Community Capacity to Administer and Implement State and Federal Grants

Funding need: $6 million/year for a 10-year program (see calculations below)

Financing and Funding Adaptation and Resilience Working Group

Nature Based Solutions with Equity Focus

Funding need: $35 million resilience fund

Working and Natural Lands Working Group

Protecting Forests (Forests Subgroup)

Funding need: $35 million/year in state funding & $10 million in local revenues through a mixture of local authorizations to permit (not mandate) local municipalities to provide matching share.

Science and Technology Working Group

No financial estimates provided

Infrastructure and Land Use Adaptation Working Group

No financial estimates provided

Public Health Working Group

No financial estimates provided

Wetlands Working Group

No financial estimates provided

Rivers Working Group

No financial estimates provided

<u>Details on Cost Estimates/Funding Needs from Working Groups</u>

<u>Forests Working Lands Subgroup</u>

Top Priority Recommended Actions and Possible Funding Mechanisms

Enhance Existing Programs

1. Enhance existing land conservation programs, incorporating more specific climate-related criteria into selection of projects/level of funding
    a. Historically got **$3 - $7.5 million** in bond authorization, but realistically requires about **$25 million** in annual bond authorizations for OSWA and RNHT and **$10 million** for the Recreational Trails Program.
2. Increase funding for Community Investment Act (CIA)
    a. Increase surcharge on local recording fee from **$40 to $50**
    b. Add **$1.5 million** for urban forest improvements and DEEP staff salaries to administer these programs
3. Expand Urban Green and Community Garden Program to include urban forest improvement projects
    a. DEEP's Urban Green and Community Garden Program already provides assistance enhancing urban spaces
    b. Expand this to **specifically fund urban forest improvement projects**
4. Utilize a portion of state revolving funds for land conservation/green infrastructure projects
    a. **Up to 10%** of SRF may be used for this purpose
    b. Need legislative action to **mandate** the use of that 10% for green infrastructure
    c. In 2019, S.B. No. 927 proposed the Green Bank should expand its investment into green infrastructure
5. Explore strategies for making limited use of use of Regional Greenhouse Gas Initiative (RGGI) funds to forest land conservation, primarily through the offset provision in the existing program, provided offsets are not encouraged as a substitute for compliance.

As permitted in existing regulations, **invest CO2 allowance auctions** as offsets, where compliance is not feasible to fund initiatives that will clearly enhance carbon sequestration, such as DEEP land protection projects, scientific studies related to forest science (including an assessment of current forest management practices and policies and impacts on climate mitigation goals), forest stewardship, public education and outreach programs promoting the importance of resilient forests, amongst many other possibilities relating to land sector activities.

New Revenue Options

Tax and Other Incentives

1. **Expand corporate tax credit** for donations/bargain sale of open space to individuals for land that meets certain climate mitigation criteria and/or for forest carbon services
    a. Final report will include criteria for such climate mitigation actions
    b. Consider transferable tax credits for conservation easement donations
2. Enable Compensatory Mitigation for state and local projects
    a. Developers make payments to a mitigation fund if unavoidable conversion of forest and other natural lands occurs - **"no-net-loss of forest" laws**
    b. Apply to private and public disturbance of land
3. Increase Connecticut sales tax to fund new land conservation efforts and other outdoor reaction and land stewardship projects
    a. Increase general sales tax by **.125% (from 6.35% – 6.475%)**
    b. This increase would cost families an average of **$47** per year
    c. Generate an additional estimated **$78.4 million** for land conservation
    d. Alternative: allocate percentage of existing sales tax to such activities
4. **Carbon Tax**
    a. Tax on power plants, developments and any other projects (even sustainable energy infrastructure projects) responsible for greenhouse gas emissions or CO2 storage losses
    b. Revenue used to pay for climate initiatives such as forest carbon mitigation
    c. If other subgroups are suggesting a carbon tax, then a portion of the revenue should go to investments in natural climate solutions.
5. Allow municipalities to establish a **local buyer's conveyance fee** in order to create a local fund for climate resilience and mitigation projects

Private - Public Partnership Pilot Programs

1. Using the New York State Conservation Partnership Program as a model, Connecticut would partner with a private non-profit organization to offer competitive matching grants to qualified Connecticut land trusts for support in administering land conservation projects.
    a. **State bonding** - could be packaged as part of a larger green bond program.
    b. DEEP personal services agreements with NGOs to provide direct services to municipalities and other NGOs for grant writing, grant administration, and project administration.
2. Urban Forest Carbon Credit Project

Value carbon credit (metric tons of CO2 captured in urban forests) including quantifiable ecosystem and other co-benefits associated with urban trees (stormwater reduction, air quality, energy savings, health and equity benefits, as well as employment); value the carbon revenue; establish a value per year; and sell the carbon credits to garner funding for local preservation, planting, restoration and other projects.

Equitable Energy Efficiency Goals and Funding to Create Safe and Warm Homes

Although the primary charge to the Financing Resilience Working Group was to identify funding and financing resources for adaptation and resilience rather than reducing carbon emissions, the Working Group recognizes that especially for low- and moderate-income households energy efficiency represents a resilience pathway by lowering cost burdens and improving public health.

Estimated total cost: **824,350,000/year**

We currently generate approximately **$280,000,000** in energy efficiency funds. This leaves a balance of **$544,350,000** in new revenue needed each year[4].

Breakdown of Outcomes from Investments:

1. Provide safe and warm home program benefits. **By 2030, provide benefits to 85% of owner occupied low/moderate households with income under $50,000 (186,000 households) and 50% of renter low- and moderate-income households (140,000 households[5]). With this total goal of 326,000 low- and moderate-income households over a 9-year period**, the program will require no net outlay of household income while receiving the full services identified below. Cost: **$543,0000,0000 /year, an estimated $15,000 per household[6]**
2. Continue to provide the balance of households with current level of services, but coordinate and improve service delivery: Cost: $250,000/year
3. Program marketing: market planning and implementation to penetrate these markets and increase demand. Cost: **$750,000/year**
4. Financing arm needed to supply this demand. Cost: **$350,000/year**

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[4] The energy efficiency rate on electric bills generates approximately $260 million/year. Funds from the Regional Greenhouse Gas Initiative generate approximately $20 million/year.

[5] Number of household calculation derived from 2013 data supplied in: https://www.ct.gov/opm/lib/opm/hhs/interagency_council_on_affordable_housing/meeting_2013_12-03/final-report-11-12-13.pdf See: p. 20, Table 3.3.

[6] To reach 326,000 households over 9 years the program must average a penetration of 36,222 households/year. At an average cost of $15,000/household that equals $543,330,000/year

5. Safe and home service delivery to include:
    a. A single application format that is consistent with other LOM income services utilized by the largest segment of this target customer audience;
    b. Safe home services to include:
        i. Safe home services: installation of the most cost-effective services needed to remove human health threats found in the home, including: lead, asbestos, mold, antiquated knob and tube electrical.
        ii. Energy Efficiency with solar on top
            1. a consistent DEEP energy efficiency program that incorporates the best of our weatherization/HES programs with follow up DEEP building envelope measures subsidized and financed so that low- or middle-income households are guaranteed continual utility savings
            2. Evaluation and installation of dual system high efficiency electric heat pumps where feasible;
            3. Replacement of old, inefficient refrigeration, clothes dryers or other high energy use, inefficient household appliances;
            4. Combine as necessary subsidization of roof replacement with renewable rooftop solar opportunities.

<u>Building Environmental Justice and Community Capacity</u>

6. Developing Community Capacity - Environmental justice, grant and project administration and community delivery services: **Total Need: $2,835,000 every year.** Provide training for environmental justice residents on climate justice (CJ) so they can engage meaningfully in the GC3 process.
        i. **$500k** for 1-2 years of effort; needed every (5) years.
        ii. 6-10 **$50-$75K** grants to community organizations to provide 40 hours of CJ training to 20 people every (5) years for a total **estimated $360k** investment.
        iii. Aimed at training low income people of color primarily, but can include low income whites or disabled individuals
    b. Establish a permanent environmental justice presence across all Connecticut
        i. **$2 million** annually spread across multiple organizations
        ii. DEEP or preferably private foundation will administer funds

c. Energy efficiency and renewable energy programs run by community-based organizations who can do outreach in culturally appropriate manners and with understanding complex housing assistance for residents which require coordination between multiple LMI assistance programs.
d. Total of **$475k**, distributed on a country by county basis
e. **$75k** to New Haven, Fairfield, and Hartford.
f. **$50k** to other 4 counties
g. Annual statewide EJ mapping and posting on a website: **$10K**/year

Building Community Capacity to Administer and Implement State and Federal Grants

7. Grant and project administrative capacity building and support: **$6 million/year A** 10-year program to train and support grant writing and administration, finance oversight and project management capacity focused on distressed municipalities. Eligible entities should include NGOs, municipalities and COGs who are committed to diverse workforce development and regional project delivery.

   Grant amounts needed per year to fund: 30 total mix of municipalities, NGOs, COGs:
   Average grants of **$200,000/year x 30 = $6 million/year x 10 years**
   Or
   $60 million over 10 years

<u>Nature Based Solutions with Equity Focus</u>

$35 Million Resilience Fund:

As previously stated, 400 coastal projects in 30 communities have been identified, and demonstrate the need for a large-scale investment to begin to ensure the resiliency of Connecticut. This program must be administered in a flexible and effective manner. Any legislative authorization must allow for third party administration and incorporate an allowable use of up to 10% of funds for administrative purposes. In the recent past (2014-2017) the DEEP was authorized to expend $40 million in general obligation bonds for these purposes and was unable to locate internal resources necessary to administer these funds as a competitive community grant program. We must incubate the best techniques as well as quality workforce opportunities, and regional implementation. Specifically, we must authorize NGO's and COGs to be eligible to apply for grants with municipal support.

We propose the establishment of a resiliency fund offering **$35 million/year** in competitive grants available to municipalities and NGOs and COGs with municipal support that:

1. Provide 66% of the funding as outright grants to distressed LOM income communities
2. Provide matching grants for MS4 communities across the state to meet key impervious surface treatment, stormwater pollution reduction and peak flood reduction targets;
3. Evaluate and prioritize the replacement of road culverts causing river/upstream flooding;
4. Provide engineering and project implementation funds to match federal programs for coastal and riverine nature-based solutions such as shoreline softening, tidal marsh enhancement, removal of high hazard dams, nature-based flood storage solutions.

Key outcomes by 2030:

a. 72 coastal resilience and riverine resilience competitive projects engineered or completed with 45 in distressed communities.[7]
b. 19.8 billion gallons of flood peaking and polluted stormwater is captured and absorbed into the groundwater system in 121 municipalities across the state - the equivalent of preventing and cleaning up 1,833 Exxon Valdez oil tankers filled with stormwater polluted flood waters from reaching our rivers and streams each year.[8]
c. Prioritization for DOT replacement of flood causing undersized culverts throughout the State and engineering guidelines for their replacement in hand. A dozen of the worst of these flood causing projects are replaced costing $2 million per year.

Protecting Forests:

Forests play a crucial role in carbon emission reduction and climate risk mitigation. Trees store carbon from the atmosphere, while also absorbing and preventing rain water from eroding and flooding downstream systems. Forests are one of nature's best protectors of downstream urbanized development in floodplains from peak flooding. To protect our communities from hazardous and costly flood events, the forests of Connecticut must increase protections for these critical ecosystems and the rejuvenate of deforested areas, especially urban communities.

<u>Funding needs:</u>

- **$35 million/year** in state funding

[7] $28 million/year for 9 years (FY 2022-FY 2030) yields a total of $252 million in state funding. This should be matched by a combination of federal funds (for low/moderate income communities) and local funds on a 1:1 ratio. Thus the total project pool grows to $504 million. At an average cost of $7 million/project, this should fund a total of 72 projects over the 9 year period.

[8] municipal support for MS4 program: $10 million/year

- **$10 million** in local revenues through a mixture of local authorizations to permit (not mandate) local municipalities to provide matching share

Key Outcomes:

- Urban forestry: plant 720,000 trees in distressed neighborhoods in coordination with parallel rain garden efforts.[9]
- Permanently protect 2,500 new acres of forest across the state.[10]

[9] Set aside $8 million/year in state funding or $72 million from FY 2022-FY 2030. At an estimated cost of $100/tree total cost in planting and 2 year maintenance and replacement, these funds will fund the planting of 720,000 urban trees.

[10] A total investment of $38 million/year over 9 years will yield $342 million between FY 2022 and FY 2030. At an average of $14,000/acre, this should purchase and permanently protect $25,000 acres of forest and ecologically valuable land.

Summary of Changes from Draft Report to Final Report

In response to feedback received during the public review period and in subsequent deliberation of the Financing and Funding Adaptation and Resilience Working Group members, the following significant changes were made between the draft report issued for public review and the final report.

- In the first paragraph of the Framing section of the report, a footnote was added that:

  "When the first draft of this report was released for public comment on 9/22/2020, there was no authorization for a fund for resiliency projects, however, with the passage of PA 20-5, there is now a "microgrid and resilience grant and loan pilot program to support local distributed energy generation for critical facilities or resilience projects." The bill authorized the program, but did not include any additional funds for the program."

- Under Barriers and Difficulty Obtaining Grant Funding, the following text was added:

  As there is no more funding for the Matching Funds grant program that CIRCA previously administered (that leveraged an additional $1.4 million in additional project funding),[75] there is a need to re-visit a source for matching fund availability. Demand for funding exceeded both the CIRCA Matching Funds and Municipal Resilience grants capacity and CT now largely relies on federal disaster recovery funding to continue its resilience programs while RI, MA and NY have launched proactive pre-disaster funding programs for municipalities and state agencies to plan and implement climate adaptation projects."

- Two new barriers were added in the Barriers section as follows:

  Unpredictability in cost-sharing. Cost-sharing between the federal, and state and local governments is common in programs that develop and maintain the infrastructure of the economy and society. The approach recognizes a shared responsibility and ensures there is a broad appreciation of the significance of the project. Cost-sharing formulae vary widely and are often criticized for increasing administrative costs and biasing against less wealthy areas. The advantages of a cost-sharing program include an increase of the available funds (more projects), and a more effective allocation of resources to projects that are priorities for all parties. In the case of the FEMA Public Assistance program and its well-established policy of covering up to 75% of projects costs and requiring at least a 25% match, forty states have already developed policies to provide at least a portion of the cost-share for that assistance after a disaster.[76] Florida covers the entire 25%, for example, Missouri provides 10%, and California 19%. A clear statement of policy and source of funding in Connecticut would reduce the uncertainty in costs and encourage municipalities to accelerate their adaptation projects. The policy should recognize the disparity in wealth and the State's interest in the development and demonstration of novel and nature-based adaptation approaches.

Need for capacity building and training tools. In recent years, resources have been directed toward development of technical tools that illustrate and assess the effects of sea level rise, storm surge, and vulnerability for a variety of resilience topics (e.g. heat sensitivity, coastal and inland flooding, living shorelines, critical infrastructure). However, many technical tools are underutilized due to a lack of awareness about their availability and/or the understanding of how to use them to improve and inform decision making, resilience planning and project design at appropriate and multiple scales. Support for development of training materials/modules is needed to increase understanding of vulnerabilities and build capacity for project design and implementation. Many aspects of resilience such as cutting-edge building technology, life-cycle analysis, health impact analysis, and community capacity building have not been advanced sufficiently for Connecticut to be competitive for national demonstration and research funding. CIRCA has modeled an initiative that has resulted in the knowledge and capacity necessary to secure funding for sea level rise. NJIT's Center for Building Knowledge[77] and affiliated Center for Resilient Design provides this capacity in New Jersey as does the Gulf Coast Community Design Studio[78] in Mississippi.

- Under Strategy 1. Build the governance structure necessary to allow for effective and efficient financing and funding, the following recommendation was added:

Adopt Policy of No Less than 40% of all Spending on Adaptation and Resilience to Benefit Vulnerable Communities	
Recommended Implementation Action Description	No less than 40% of adaptation and resilience spending, including both existing and new funding and financing programs, should benefit vulnerable communities as defined by PA 20-5,[79] including environmental justice communities, distressed communities as defined by DECD,[80] and as further defined by the GC3 Equity and Environmental Justice Working Group. Furthermore, at a minimum, of any outreach, capacity-building and planning grants for adaptation and resilience, the first $500,000 should be utilized for those same communities to ensure their participation and inclusion in the adaptation and resilience planning and implementation process. With this commitment Connecticut would be the first state to commit to an all-inclusive goal of investing in climate adaptation and resilience in those communities that will feel the effects of climate change first and worst. A similar goal has been enacted in neighboring New York State, but focused primarily on energy. In 2019 New York State adopted the Climate Leadership and Community Protection Act, "the Climate Act" that "requires the state to invest or direct resources in a manner designed to ensure that disadvantaged communities to receive at least 35 percent, with the goal of 40 percent, of overall benefits of spending on:

	Clean energy and energy efficiency programs Projects or investments in the areas of housing, workforce development, pollution reduction, low-income energy assistance, energy, transportation, and economic development."[81] New York formed a Climate Justice Advisory Group to assist them with planning on how to meet this goal.
Implementation Entities	State agencies and CGA
Equity Impact[11]	(+) Making a commitment in statute to the 40% goal would ensure that the state prioritizes the protection of vulnerable communities disproportionately impacted by the effects of climate change.
Scale of Funding	Not applicable

- Under the recommendation, Increase Connecticut's Competitiveness for Securing Federal Funds for Resilience, the following text was added:
  2) identifying a "project pipeline" through previous inventories, SAFR, COGs, and municipalities so that these projects can be effectively/efficiently positioned for grant funding when available, use decision support criteria to assess near, mid, and long-term project viability, and engage the Resilient Connecticut's Planning Framework as a way to prioritize strategies using PERSIST criteria

- Under Strategy 1. Build the governance structure necessary to allow for effective and efficient financing and funding, the following recommendation was added:

Convene the Insurance Industry on Carbon Neutral Investment Policies	
Recommended Implementation Action Description	Hold a conference with the insurance industry and state regulators identifying different strategies where the industry can assist states in reducing reliance on fossil fuels, as well as understanding how insurers can assist in mitigating the impacts of climate change on property. This conference will include a discussion on: 1) increasing disclosure of climate-related risk and calling for more actions like those taken by The Hartford[82] and Chub Limited (NYSE:CB)[83] and 2) identify alternative methods to protect communities through Catastrophe (CAT) Bonds and other risk transfer vehicles.

[11] *Equity Impact:* Equity Lens Criteria is positively impacted (+), Equity Lens Criteria is positively and negatively impacted or unchanged (0), and Equity Lens Criteria is negatively impacted (-)

	Connecticut is an active participant in a voluntary leadership role in the National Association of Insurance Commissioners (NAIC) the Climate and Resiliency (EX) Task Force,[84] which serves as the coordinating NAIC body for discussion and engagement on climate-related risk and resiliency issues, promoting an ongoing dialogue among state insurance regulators, industry, and other stakeholders. The Working Group recognizes that insurers are an important party in assisting states in reducing carbon emissions as they insure and invest in fossil fuel producers and utilities (estimated to be over $247 Billion in 2019[85]). The industry also serves an important economic role by funding disaster recovery and rebuilding efforts that create greater resiliency in the state. The Insurance Dept. and DEEP will work together with other entities to engage the insurance industry on ways to promote carbon neutral investment strategies that will reduce losses due to property damages from the impacts of climate change caused by the burning of fossil fuels releasing greenhouse gases.
Implementation Entities	DOI, DEEP, Green Bank, Insurance Industry including our domestic insurers, State Regulators, other entities as identified.
Equity Impact	(+) Improved air quality and health from reductions in emissions of coal-fired power plants and fossil fuels. Promoting climate disclosure allows for greater transparency for the public on the risks of climate change to both the industry and policyholders.
Scale of Funding	The estimated investment and underwriting of fossil fuels is $247 Billion.

- Under the recommendation *Create Central Governance Authority for the Funding, Financing, and Operations of Resilience Infrastructure Projects*, the description section was amended and now reads:

  Creating an authority can also be taken at a local scale. In Maryland, SB457, effective July 1, 2020, now makes it possible for local governments to create a 'Resilience Authority' to issue bonds, collect fees, accept funds from local government or state government, purchase land, and own, operate and maintain resilient infrastructure projects. Ordinances for Resilience Authorities are currently being proposed by Charles County and Anne Arundel County government administrators to enact Resilience Authority By-laws addressing members, standard operating procedures and criteria for eligible resilience projects.

  Existing resilience infrastructure projects addressing flood risk in Connecticut are under the authority of the municipalities where they are located. Municipal flood and erosion control boards established under CT Gen Stat § 25-84 currently provide municipalities in Connecticut with many of the authorities needed to undertake resilience projects.

However, this statute does not incorporate language on resilience to climate change or nature-based solutions, but could be amended to be more in line with today's approaches to climate adaptation and resilience.

Under the recommendation *Build Outreach and Capacity and Tracking for the Increased Uptake of Flood Insurance*, the following text was added:

5) Connecticut should use these and other strategies, where appropriate, to help insure existing renters, existing residential property owners and existing small business property owners who are currently not insured for flooding damages by NFIP due to lack of a federally backed mortgage, ignorance of the flood risk or inability to afford of flood insurance.

6) In using any of these strategies, Connecticut should avoid the flaws in the NFIP which result in public subsidy for costly and risky development and/or redevelopment in floodplains.

- Under Strategy 2. *Generate Revenue Sources to Pay for Resilience Projects and Programs*, the following recommendation was added:

Authorize a State-level Climate Change and Costal Resiliency Reserve Fund Managed by the Treasurer of the State of Connecticut	
Recommended Implementation Action Description	Expand Public Act 19-77 - ACT AUTHORIZING MUNICIPAL CLIMATE CHANGE AND COASTAL RESILIENCY RESERVE FUNDS to authorize, by legislation, a state-level Climate Change and Costal Resiliency Reserve Fund to be managed by the Treasurer of the State of Connecticut. This legislation would authorize the Treasurer of the State of Connecticut to manage such investments on behalf of municipalities and the state of Connecticut. The General Assembly passed, and Governor Lamont signed into law, PA 19-77.[86] This act authorized the municipal investment funds for coastal resilience now known as municipal "Climate Change and Costal Resiliency Reserve Funds" or "CRF Funds." Public Act 19-77 has already been well received, but municipalities have yet to work through the administrative process of setting up these investment funds. The Town of Branford has approximately $1.6 million in their CRF Fund, but they have not yet hired pension managers to create an account and invest the assets.[87] Additional work with the Office of the State Treasurer and other constituents is needed to resolve some outstanding issues. For example: • What is the size of state-wide fund; • What types of strategic investments that should be pursued; and • What are the liquidity aspects of such a fund?

	Additionally, more outreach is needed to municipal officials to determine if they have the extra money needed to make such investments and whether investment returns would be high enough to justify program.
Implementation Entities	CGA, OTT, Municipalities
Equity Impact	(0) The use of municipal funds means that the cost is shared across all taxpayers in a municipality, thereby spreading out the cost burden, but only certain municipalities may have the resources to put towards this fund and the additional resources of the state to invest in it further benefits those municipalities. However, providing more instruments for municipalities with the means to address resilience challenges themselves can also free up state and federal funds for municipalities without sufficient resources to address resilience needs in their community.
Scale of Funding	Depends on the number of municipalities participating and their funding availability for investment.

- Under the recommendation, *Provide State General Obligation Bonds as Green Bonds for Financing for Adaptation and resilience Programs and Projects and Matching Funds for Federal Grants*, the following text was added:

  In Connecticut, PA20-5[88] "establish[ed] a microgrid and resilience grant and loan pilot program to support local distributed energy generation for critical facilities or resilience projects." This program authorizes the use of state bond funds for this purpose.

- Under the recommendation, *Incentivize Connecticut's Insurance Industry to Promote and Grow the Catastrophe Bond Market and Pilot a Resilience Bond Program*, the following text was added to the description:

  The insurance industry has been the building block for our economy by helping rebuild after a loss. Catastrophe Bonds and Resilience Bonds are insurance-linked securities and can be used by federal, state and municipal governments in many ways to allow private investors to fund the rebuilding of green and grey infrastructure and resiliency projects when the storm event that causes property damage exceeds a threshold-criteria (triggering event) during the term of the bond that are defined in the Resilience or Catastrophe Bond agreement. One example has been a Catastrophe Bond that was developed to insure a coral reef off of Central America coast, which was financed by the tourist industry in Central America as it depends largely on tourists diving near the reef. The bond is designed based on certain triggers being met when a hurricane strikes in the area. Once met, money is distributed and used to make repairs to the reef.[89] The first Resilience Bond was issued in 2019 by the European Bank for Reconstruction and Development (EBRD) as a five-year climate resilience bond rated AAA (by Moody's/S&P/Fitch) at 1.625% which raised US$700 million. The first orderbook's distribution statistics saw demand from 15 countries (58% from Europe, 28% from North

America and 14% from Asia) from over 40 accounts (32% asset managers, 31% central banks/official institutions, 28% banks, 9% insurance and pension funds).

- The title of the following recommendation was amended and the text below was added.

  New title: Investigate the Use of the New Market Tax Credit, Opportunity Zones, Public Act 490 Connecticut's Current Use Law and the 4% Low-Income Housing Tax Credit for Resilience Investments

  Added text in description: Recognizing the many public benefits that conserved, undeveloped land offers Connecticut residents including carbon sequestration for climate adaptation and resiliency benefits, evaluate increasing property tax abatement benefits for owners of farm, forest, and open space based on an assessment of their carbon sequestration services being provided on these properties. This policy change is consistent with the current State policy in Public Act 490[90] that these owners *not* be burdened by excessive property tax assessment that is not representative of the owner's current land-use. Public Act 490 is Connecticut's current – use law (Connecticut General Statutes Sections 12-107a through 12-107g) that allows a farm, woodlot, or open space land to be assessed at its use value, rather than its fair market or highest and best use value for purposes of local property taxation.

  Added text in Equity Impact: The Public Act 490 tax abatement program could be modified to reward owners' higher rates of property tax abatement when they provide increasing levels of carbon sequestration services on their farm, wood lot or open space land as an incentive to increase their rate of carbon sequestration services as a climate resiliency benefit for the public in urban and more developed areas of the state.

- Under Appendix III, Forests Working Lands Subgroup, #5 was amended and now reads as follows:

  5. Explore strategies for making limited use of the Regional Greenhouse Gas Initiative (RGGI) funds to forest land conservation, primarily through the offset provision in the existing program, provided offsets are not encouraged as a substitute for compliance.

  As permitted in existing regulations, **invest CO2 allowance auctions** as offsets, where compliance is not feasible to fund initiatives that will clearly enhance carbon sequestration, such as DEEP land protection projects, scientific studies related to forest science (including an assessment of current forest management practices and policies and impacts on climate mitigation goals), forest stewardship, public education and outreach programs promoting the importance of resilient forests, amongst many other possibilities relating to land sector activities. [91]

[75] https://circa.uconn.edu/funds/

[76] McBride (2020) https://www.nga.org/wp-content/uploads/2020/04/NGA-Memo_Cost-Share_Final.pdf

[77] https://centers.njit.edu/cbk/new-homepage/
[78] http://gccds.org/
[79] https://www.cga.ct.gov/2020/ACT/PA/PDF/2020PA-00005-R00HB-07006SS3-PA.PDF
[80]https://portal.ct.gov/DECD/Content/About_DECD/Research-and-Publications/02_Review_Publications/Distressed-Municipalities
[81] https://climate.ny.gov/Climate-Justice-Working-Group
[82] In December 2019, The Hartford announced it would no longer insure or invest in companies that generate more than 25 percent of their revenues from thermal coal mining or more than 25 percent of their energy production from coal. In addition, the company announced it will also stop insuring and investing in companies that generate more than 25 percent of their revenues directly from the extraction of oil from tar sands." https://s0.hfdstatic.com/sites/the_hartford/files/statement-on-climate-change.pdf
[83] July 1, 2019, Chubb Limited (NYSE: CB) announced that it has adopted a new policy concerning coal-related underwriting and investment. With the new policy, the company will no longer underwrite the construction and operation of new coal-fired power plants or new risks for companies that generate more than 30% of their revenues from coal mining or energy production from coal. Insurance coverage for existing coal-plant risks that exceed this threshold will be phased out by 2022, and for utilities beginning in 2022. In addition, Chubb will not make new debt or equity investments in companies that generate more than 30% of revenues from thermal coal mining or energy production from coal. https://www.chubb.com/_global-assets/documents/chubb-environmental-report.pdf
[84] https://content.naic.org/cmte_ex_climate_resiliency_tf.htm
[85]
https://static1.squarespace.com/static/5b7c9307f79392b49031d551/t/5ee91cda6da30a7559a8a88f/1592335594339/Ensuring+the+Climate+Crisis_final+.pdf
[86] https://www.cga.ct.gov/2019/act/pa/pdf/2019PA-00117-R00HB-07424-PA.pdf
[87] Personal communication with James Finch, Director of the Finance Department, October 28, 2020.
[88] https://www.cga.ct.gov/2020/ACT/PA/PDF/2020PA-00005-R00HB-07006SS3-PA.PDF
[89] https://www.artemis.bm/news/swiss-re-nature-conservancy-partner-for-parametric-coral-reef-insurance/
[90] https://portal.ct.gov/DOAG/Commissioner/Commissioner/Public-Act-490---The-Basics
[91] https://www.acclimatise.uk.com/2020/06/02/why-climate-resilience-bonds-can-make-a-significant-contribution-to-financing-climate-change-adaptation-initiatives/

Summary of Written Feedback

For the readers' reference, the following is a summary of excerpted comments relevant to the Financing and Funding Adaptation and Resilience Working Group Report.

Financing and Funding Adaptation and Resilience Working Group Compiled Comments

James Finch 10/14/2020

I write as a follow up to the recent webinar in which the draft report developed by the Financing Resilience and Adaptation Group shared their draft report. My limited understanding is that pursuant to an Executive Order the group was charged with recommending proposals for funding sources and financing mechanisms to advance investment in climate resilience and adaptation.

In response to the invitation for comment I provide the following proposal:

Background:

In 2019 Public Act No. 19-77: "An Act Authorizing Municipal Climate Change and Coastal Resiliency Reserve Funds" was signed into law. This law was created based on a belief that future exposures and costs associated with climate change represent a long-term liability, and the prudent approach, therefore, is to begin the process of funding and investing assets today to address this liability. Municipalities could make annual appropriations into the fund and invest the assets using a long-term investment strategy. This approach seeks to match the assets to the liabilities while providing an added funding source to supplement more conventional methods such as bonding and grants. As an example, the legislation permits a 50% equity allocation. Historically a portfolio consisting of 50% in equities and 50% in bonds resulted in an annual return of 8.4% (based on results of a 1926-2017 Vanguard Group Study). While past history does not guarantee future returns, it is worth noting that an 8.4% return could grow $1 million invested today to $11.2 million over a thirty-year time period.

Challenges to Communities:

Communities looking to create and invest funds for the purpose of funding adaptive infrastructure face significant challenges as many municipalities find their resources constrained by rising labor costs, pension and debt service costs and a declining property tax base. Alternatively, communities with stronger balance sheets may be inclined to create Coastal Resilient Reserve Funds however the administrative tasks of establishing the fund, hiring investment managers and managing the act of rebalancing the portfolio to comply with the statute when assets are bought and redeemed presents additional challenges.

Proposal and Thoughts for a Solution:

In 1972 the State Treasurer created the Short-Term Investment Fund (STIF) as an investment vehicle for the state and political subdivisions to invest their cash reserves. The fund provided daily access to participant's balances while managing the underlying investments and reporting needs.

My recommendation is for the State Treasurer to replicate the overwhelming success of the STIF fund by using this model to create an investment pool for Coastal Resiliency Funds. The portfolio could be managed by the Treasurer in accordance with the investment parameters outlined in PA 19-77. In doing so the State could potentially absorb the costs of managing the fund and provide a vehicle for all municipalities and political subdivisions to participate. While this may be initially deemed to benefit wealthier communities, (Similar to STIF) fewer wealthy towns and cities would be encouraged to participate with smaller balances. This approach could be adopted by other states which in turn could provide favorable consideration when determining the ESG ratings (Environmental, Social and Governance) ratings of the State and the political subdivisions.

Thank you for considering this recommendation and perhaps finding a space for it in the final report. As always free to contact me with any questions, comments or clarifications.

James Finch 10/19/2020

I write as a follow up to the recent webinar in which the draft report developed by the Financing Resilience and Adaptation Group shared their draft report. My limited understanding is that pursuant to an Executive Order the group was charged with recommending proposals for funding sources and financing mechanisms to advance investment in climate resilience and adaptation.

In response to the invitation for comment I provide the following proposal:

<u>Background:</u>
In 2019 Public Act No. 19-77: "An Act Authorizing Municipal Climate Change and Coastal Resiliency Reserve Funds" was signed into law. This law was created based on a belief that future exposures and costs associated with climate change represent a long-term liability, and the prudent approach, therefore, is to begin the process of funding and investing assets today to address this liability. Municipalities could make annual appropriations into the fund and invest the assets using a long-term investment strategy. This approach seeks to match the assets to the liabilities while providing an added funding source to supplement more conventional methods such as bonding and grants. As an example, the legislation permits a 50%equity allocation. Historically a portfolio consisting of 50% in equities and 50% in bonds resulted in an annual return of 8.4% (based on results of a 1926-2017 Vanguard Group Study). While past history does not guarantee future returns, it is worth noting that an 8.4% return could grow $1 million invested today to $11.2million over a thirty-year time period.

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Communities looking to create and invest funds for the purpose of funding adaptive infrastructure face significant challenges as many municipalities find their resources constrained by rising labor costs, pension and debt service costs and a declining property tax base. Alternatively, communities with stronger balance sheets may be inclined to create Coastal Resilient Reserve Funds however the administrative tasks of establishing the fund, hiring investment managers and managing the act of rebalancing the portfolio to comply with the statute when assets are bought and redeemed presents additional challenges.

Proposal and Thoughts for a Solution:
In 1972 the State Treasurer created the Short-Term Investment Fund (STIF) as an investment vehicle for the state and political subdivisions to invest their cash reserves. The fund provided daily access to participant's balances while managing the underlying investments and reporting needs. My recommendation is for the State Treasurer to replicate the overwhelming success of the STIF fund by using this model to create an investment pool for Coastal Resiliency Funds. The portfolio could be managed by the Treasurer in accordance with the investment parameters outlined in PA 19-77. In doing so the State could potentially absorb the costs of managing the fund and provide a vehicle for all municipalities and political subdivisions to participate. While this may be initially deemed to benefit wealthier communities,(Similar to STIF) fewer wealthy towns and cities would be encouraged to participate with smaller balances. This approach could be adopted by other states which in turn could provide favorable consideration when determining the ESG ratings (Environmental, Social and Governance) ratings of the State and the political subdivisions. Thank you for considering this recommendation and perhaps finding a space for it in the final report. As always free to contact me with any questions, comments or clarifications.

Diane Hoffman 10/21/20

Dear Financing and Funding Adaptation and Resilience Working Group,
Thank you all for your long hours, hard work and very in-depth report. I am very thankful we have volunteers such as yourselves who are knowledgeable about this area and are willing to donate your time to this critical effort.
The following are my concerns:

1. I ask that you please support the EEJ Top Priority Action: Develop and fund a community engagement strategy to inform the 2021 GC3 planning process and implementation, including support in the form of grants for partnering community-based, non-governmental organizations to design the community engagement process, receive training, and co-develop recommendations to ensure meaningful input and equitable approaches to mitigation and adaption. Both public and private funding should be pursued. I truly believe that our vulnerable communities must be supported in this way so they can fulfill their important role in helping our state address the crisis we find ourselves in.

2. According to the Forestry Working Group draft report (page 14), 71% of the state's woodlands are privately owned by individuals/families, corporate landholders, and land trusts. These entities should receive incentives to keep their forested land undisturbed.

3. Trees should be viewed as a public asset as the services they provide benefit the entire neighborhood/ community as is custom in England. Non-forest private property owners should be required to pay a permit fee to remove any healthy tree, as certified by a certified arborist. In addition, Realtors should be required to disclose tree regulations that affect trees on private property that is being purchased. This will have several co-benefits: property owner will learn tree regulations for their town and state; trees will not be destroyed after the property is purchased thus protecting the character and ecology of the neighborhood; needed funds will be collected by the town if regulations are violated.

   *Require realtors to get a signed disclosure form that informs the buyer of state and local regulations regarding trees on their property from new property owners before the closing to be included in the closing papers.
   *Copy of signed disclosure form given to town tree warden.
   *Fine realtors who don't disclose and fine property owners who don't obey regulations. All fines should be used for tree planting and care.
   *Tree Warden responsible for enforcement of tree regulations.

4. Page 20 of the Forestry Working Group report calls for the Creation and funding of a Connecticut Youth Conservation Corps. This is an excellent suggestion and should be funded. Members of our vulnerable communities should be recruited to participate in this conservation corp.
5. As called for by CCAG – Please Prioritize equity in all recommendations of this workgroup. At least40% of all new programs should benefit low-income communities and communities of color that have suffered from decades of intentional structural racism, disinvestment, red lining, discrimination, segregation, and many other injustices.
6. As called for by CCAG- Please Ensure funding for low-income equitable access to Flood Insurance and Resilience Bonds (as recommended on page 30 and 42) by requiring that 1) insurance companies pay a tax for each fossil fuel company or project that they underwrite, 2) insurance companies pay a tax on the profits from investments in fossil fuel companies, and 3) a portion of any proceeds received as a result of the state's lawsuits against fossil fuel companies. Taxes should be set at a level that ensures the adequacy of funding.
7. As called for by CCAG- Please Require that insurance companies:
   a. Immediately cease insuring new coal projects and coal companies, unless they are engaged in a rapid transition process away from coal to clean energy of no more than two years.
   b. Immediately cease insuring new oil or gas expansion projects.
   c. Commit to phasing out insurance for oil and gas companies in line with a 1.5ºC pathway.

d. Divest all assets from coal companies and oil and gas companies that are not in line with a1.5ºC pathway, including assets managed for third parties.
e. Bring stewardship activities, membership of trade associations and public positions as a shareholder and corporate citizen more broadly in line with a 1.5ºC pathway in a transparent way. This must include forceful advocacy for a green and just recovery from COVID-19.

8. As called for by CCAG- Please Reintroduce and enact SB 345 that requiring the Insurance Commissioner to (1) annually conduct a study on issues related to climate change and report the results of such study to the joint standing committee of the General Assembly having cognizance of matters relating to insurance, and (2) assess the feasibility of collecting and reporting additional data concerning climate change.
9. Lastly please support carbon pricing to seriously address the cost of carbon producing activities and meaningfully reduce them and "Ensure that the revenues generated are invested in programs that reduce the pollution burden on LMI communities and address any potential adverse economic impacts of the program" as called for on page 44 of the EEJ report.

Please also see: https://www.ucsusa.org/resources/carbon-pricing-101#:~:text=The%20resulting%20interaction%20between%20the,sector%20or%20the%20whole%20economy.

Rick Newton 10/19/2020

First –let me say thanks to all working on this effort. I know that a lot of time was put in to create these reports. Some specific comments and then general comment at the end:

Financing –

- p35 –legislation to allow for creation of storm water utilities: I would suggest a bit broader legislation. In Stonington, we have a Climate Change Task Force. We tried to get it changed to commission status and give it some authority to carry out duties but were told there was no enabling state statute authorizing climate change commissions. Some towns, including Stonington, have Flood and Erosion Control Boards that have fairly significant powers, though Stonington's is in name only (Board of Select men can fulfill duties if population < 25,000). Stonington also has a Storm Water Task Force. Maybe re--write the FECB statutes to have a combined Climate Change, Storm Water and Flood and Erosion Control Board as the duties would seem to overlap and it would be easier for towns to fill the slots on one commission rather than three separate commissions.
- Finance group members may be interested in reading "A New Coast" by Jeffrey Peterson. It is a comprehensive look at our changing

coast and solutions (many involve changes at the federal level, which I agree with).

General – there is a massive amount of material in the reports. I admit I didn't read all though all of them I tried to at least read the executive summaries. We are running out of time –by the time the governor gets the final report there will be 9 years left until 2030 which is the next important target date in Executive Order #3. I'm wondering if each committee / sub--committee can list their top two or three priorities considering likelihood of being accomplished and greatest impact towards the goals. What should Connecticut be doing in 2021 to have the greatest impact?

CIRCA Staff 10/21/2020

Introduction

CIRCA was established in 2014 as a collaboration of UCONN and CT DEEP to increase the resilience and sustainability of vulnerable communities to the growing impacts of climate change on the natural, built, and human environment. In collaboration with the State Agencies Fostering Resilience (SAFR) group, which includes CT DEEP, DOH, DOT, and DEMHS, CIRCA leads interdisciplinary research, stakeholder outreach, and technical assistance program to towns and state agencies. Since 2014 CIRCA has raised approximately $15,000,000 to support its work, most of it from the federal government. Products included projections of sea-level rise, precipitation, temperature for Connecticut, and many more mapping and planning resources available at https://CIRCA.uconn.edu. Through the Resilient Connecticut project (https://resilientconnecticut.uconn.edu/), CIRCA and SAFR are developing an adaptation planning process in Fairfield and New Haven Counties that can be replicated across the State. To inform the GC3 process, the CIRCA faculty and staff have reviewed the draft reports from working groups and respectfully offer the following comments for your consideration.

Financing Adaptation and Resilience

We applaud the diverse and well-articulated details in each of the five strategies and the well-organized tables that identify the action, implementation entities, equity impact, and funding scale. It would also help if each table (or using an overview table like Appendix II) were to identify which strategies are best positioned to be implemented in the short term (the coming years) vs. longer-term (5-10 years). We fully support the Financing Working Group's recommendation that implementing and financing adaptation programs should encourage (where feasible) nature-based solutions (NBS). We believe that there is a strong case that the State should prioritize such projects for subsidies in the near-term to establish their utility and limitations and to build capacity in local engineering and construction businesses. However, there is a compelling need for adaptation projects of all types. In many, well-tested solutions are practical, necessary, and only require funding. Only funding NBS projects is unlikely to yield

the most adaptation value. We recommend that the working group consider proposing broad guidelines for allocating adaptation project costs between federal, State, and local governments and private property owners. Clearer expectations may reduce the incentive to wait for the availability of new federal or State funds. Of course, equity would require recognition of the heterogeneity in wealth across the State. Financing for more education, outreach, and training in resilience and adaptation planning for municipal staff and consultants will also accelerate adaptation. We also recommend that the committee recommend a process for prioritizing projects and an interagency task force to assist in developing funding strategies.

We highly recommend Strategy 3's approach (p32) to "Provide State General Obligation Bonds as Green Bonds for Financing for Resilience and Adaptation Programs and Projects and Matching Funds for Federal Grants". With direct support and funding from CT DEEP, CIRCA ran both a Municipal Resilience and Matching Funds Grant program in Connecticut from 2014-2019 and had far more applicants than funding allowed for awards. These competitive grant programs were both popular as they allowed local implementation of resilience projects and matching funds required by other funding applications. For example, CIRCA funded 18 grants through its Municipal Resilience Grant Program totaling $745K, leveraging an additional $400K. CIRCA's Matching Funds grant awards of $330K to 11 projects leveraged approximately $1.4 million in additional project funding. While these amounts were impactful, Connecticut can look to neighboring states, especially Massachusetts, where 82% of the State's communities participate in their Municipal Vulnerability Preparedness (MVP) Program. This year, $11.6 million in grants were awarded to cities and towns through this program. Massachusetts is proposing to spend $1 billion on climate resilience by 2022, and Connecticut must anticipate the need for a similar level of investment to minimize the impacts of climate change.

Multiple Commenters with the following verbatim text

a. Immediately cease insuring new coal projects and coal companies, unless they are engaged in a rapid transition process away from coal to clean energy of no more than two years.
b. Immediately cease insuring new oil or gas expansion projects.
c. Commit to phasing out insurance for oil and gas companies in line with a 1.5ºC pathway.
d. Divest all assets from coal companies and oil and gas companies that are not in line with a 1.5ºC pathway, including assets managed for third parties.
e. Bring stewardship activities, membership of trade associations and public positions as a shareholder and corporate citizen more broadly in line with a1.5ºC pathway in a transparent way. This must include forceful advocacy for a green and just recovery from COVID-19.

Adelheid Koepfer 10/7/2020

Dear Chair and members of the G3C Financing and Funding Resilience and Adaptation working group:
Thank you for your work on the draft report and the countless hours you put in for our stat's future.

However, I am concerned that the recommendation part of your report lacks mentioning the role of the insurance industry, which is quite a factor in CT. How can you incentivize the insurance industry to make even more profit from the coming disasters, while they at the same time make money financing these disasters?
I ask that the Financing & Funding Resilience and Adaptation working group include the following recommendations in their final report:

1. Require that insurance companies:
    a. Immediately cease insuring new coal projects and coal companies, unless they are engaged in a rapid transition process away from coal to clean energy of no more than two years.
    b. Immediately cease insuring new oil or gas expansion projects, like the planned Killingly gas plant.
    c. Commit to phasing out insurance for oil and gas companies in line with a 1.5ºC pathway.
    d. Divest all assets from coal companies and oil and gas companies that are not in line with a 1.5ºC pathway, including assets managed for third parties.
    e. Bring stewardship activities, membership of trade associations and public positions as a shareholder and corporate citizen more broadly in line with a 1.5ºC pathway in a transparent way. This must include forceful advocacy for a green and just recovery from COVID-19.
2. Reintroduce and enact SB 345 introduced in the Connecticut legislature in 2020 to require the Insurance Commissioner to (1) annually conduct a study on issues related to climate change and report the results of such study to the joint standing committee of the General Assembly having cognizance of matters relating to insurance, and (2) assess the feasibility of collecting and reporting additional data concerning climate change.

Insurance companies should invest in insuring our future (e.g. renewable energy, and electric vehicles, trucks and school buses), not destroying it (funding fossil fuels)!

Samantha Dynowski (Sierra Club CT) 10/21/2020

The GC3 Financing and Funding Adaptation and Resilience Working Group report completely ignores the role insurance companies are playing in fueling the climate crisis. Connecticut insurers invest over $247 billion in fossil fuels and insure untold numbers of fossil fuel projects[12]. Even more troubling, this working group is making recommendations to allow insurance companies to profit from the very climate crisis they are financing. Those recommendations are: Incentivize Connecticut's Insurance Industry to Promote and Grow the Catastrophe Bond Market and Pilot a Resilience Bond Program (page 42); Build Outreach and Capacity and Tracking for the Increased Uptake of Flood Insurance (page 30).
We urge the insurance industry to:

[12] https://www.insureourfuture.us/ct-insurance-report

f. Immediately cease insuring new coal projects and coal companies, unless they are engaged in a rapid transition process away from coal to clean energy of no more than two years.
g. Immediately cease insuring new oil or gas expansion projects.
h. Commit to phasing out insurance for oil and gas companies in line with a 1.5ºC pathway.
i. Divest all assets from coal companies and oil and gas companies that are not in line with a 1.5ºC pathway, including assets managed for third parties.
j. Bring stewardship activities, membership of trade associations and public positions as a shareholder and corporate citizen more broadly in line with a1.5ºC pathway in a transparent way. This must include forceful advocacy for a green and just recovery from COVID-19.

We also urge that equity be prioritized in all recommendations of this workgroup. At least 40% of all new programs should benefit low-income communities and communities of color that have suffered from decades of intentional structural racism, disinvestment, red lining, discrimination, segregation, and many other injustices.

Sharon Huttner 10/7/20

1. Prioritize equity in all recommendations of this workgroup. At least 40% of all new programs should benefit low-income communities and communities of color that have suffered from decades of intentional structural racism, disinvestment, red lining, discrimination, segregation, and many other injustices.
2. Ensure funding for low-income equitable access to Flood Insurance and Resilience Bonds (as recommended on page 30 and 42) by requiring that 1) insurance companies pay a tax for each fossil fuel company or project that they underwrite, 2) insurance companies pay a tax on the profits from investments in fossil fuel companies, and 3) a portion of any proceeds received as a result of the state's lawsuits against fossil fuel companies. Taxes should be set at a level that ensures the adequacy of funding.
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5. Bring stewardship activities, membership of trade associations and public positions as a shareholder and corporate citizen more broadly in line with a 1.5ºC pathway in a transparent way. This must include forceful advocacy for a green and just recovery from COVID-19.

4. Reintroduce and enact SB 345 introduced in the Connecticut legislature in 2020 to require the Insurance Commissioner to (1) annually conduct a study on issues related to climate change and report the results of such study to the joint standing committee of the General Assembly

having cognizance of matters relating to insurance, and (2) assess the feasibility of collecting and reporting additional data concerning climate change.

Richard J. Koda 10/9/2020 (also multiple commenters with verbatim text)

FINANCE AND ADAPTATION

I agree with Audubon's strategies for adapting to climate change and providing financing opportunities include:

Building the governance structure to allow for effective and efficient financing and funding. Some examples include:

- Increasing Connecticut's capacity and competitiveness for securing federal funds for resilience
- Creating a central governance authority for the funding, financing and operations of resilience infrastructure projects
- Requiring the disclosure of physical and transitional climate risks at the state and municipal level

Generating revenue sources to pay for resilience projects and programs. Some examples include:

- Establishing 'resilience fees' to provide revenue sources for resilience and adaptation funds and matching funds for grants. Resilience fee options include:
    - Transaction Fee -Municipal Conveyance Fee
    - Increase funding for Community Investment Act (CIA)
    - Create guidance to use Tax Increment Financing (TIF) Districts for resilience
    - Promote the bundling of climate resilience and adaptation measures into Energy Savings Performance Contracts (ESPCs)

Supplying grants, matching funds for federal grants and loans to fund resilience projects and programs. Some examples include:

- Creating an Environmental Infrastructure Bank.
- Providing State general obligation bond funding as green bonds for financing resilience and adaptation programs and projects and providing matching funds for federal grants.
- Implementing 10% of the State Revolving Loan Funds that can be used to finance green infrastructure projects
- Expanding eligibility to flood control and microgrid projects.

Investigating the use of tax credit programs to incent the private sector to invest in community resilience. Some examples include:

- Investigating Opportunity Zones for clean energy projects and job creation.
- Promoting the CT State Neighborhood Investment Act Tax Credits for use of climate resilience

Engaging the foundation and philanthropic community as a funding and financing partner. Some examples include:

- Convening Connecticut's Community Foundation leaders to address investing in community capacity building, and annual climate adaptation training of environmental justice organizations
- Assessing Connecticut's capacity for implementation and advancement of climate change initiatives at the community level and with environmental justice communities
- Launching a statewide campaign for Just Climate Change Engagement. Undertaking a strategic initiative to increase available funding for Just Climate Change engagement
- Increasing individual, crowd sourcing and corporate giving for climate resilience
- Facilitating relationship building and partnerships among the state government, foundations in state and national foundation

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Walker Holmes, Trust for Public Land 10/21/2020

<u>Financing Adaptation and Resilience</u>

General Comments:

- Kudos to the working group for a thorough analysis of funding for nature-based solutions/natural climate solutions through an equity lens. The analysis of the funding mechanisms includes implications for underserved communities; it is important to remember that existing funding mechanisms can be amended to become more equitable. For example, the Denver CO climate measure being considered this November is a sales tax, a very regressive option. For this reason the program, and even the ballot language, ensures that 50% of the revenues generated will be used for investments in traditionally underserved communities, i.e.,those facing the largest challenges from a changing climate).
- The Trust for Public Land believes in three key ingredients for funding mechanisms to be successful: elected official support; demonstrable need/threat/benefit for revenue proposed; on-the-ground coalition of advocates. We strongly recommend robust community outreach as well as polling, to ensure that the need is fully understood and that mechanisms will generate enough funding to fit the need.
- Nature-based solutions/natural climate solutions are about more than mitigating the effects of climate chance and protecting ecosystems. Natural climate solutions provide critical co-benefits that are not currently emphasized in this draft report: thriving communities, health, and wellness. With natural climate solutions, we can provide close-to home parks for Connecticut residents who currently have no park access. We can create green schoolyards that offer the triple benefits of outdoor play, environmental education, and green infrastructure. And we can create opportunities for all people to experience the physical and mental health benefits that nature provides.
- We concur with the importance of understanding the costs and benefits of natural climate solutions, as well as the return on investment and associated risks; we suggest that conservation economics analyses be sought to assist with this information gap.

Comments on Funding Mechanisms:

- In lieu of a detailed commentary on all funding mechanisms, we offer select comments on a handful of the mechanisms considered in the report based on our experience with similar mechanisms in other states; we look forward to additional consideration and discussion.
- Wastewater Use Fee: Large potential, as a small fee can generate large dollar amounts.
- Carbon tax: This mechanism has great potential and we hope to see more of these implemented across the country. The concept tends to make sense to voters, due to its similarity to the"polluters pay" principle.
- Community Investment Act: Increasing funding for this mechanism has huge upside. The CIA has funded incredible work in Connecticut since its inception; current funding levels are not commensurate with the ambitious goals and challenges at play in present times.
- TIFs: We echo this concern from the report: "A challenge here is that solely relying on TIF Districts for resilience improvements means that wealthy areas will be the only neighborhoods to see an increase in resilience."
- Stormwater Authorities: Acritical funding source for green infrastructure implementation in other geographies, including parks and green schoolyards (both of which have substantial co-benefits).
- Create an Environmental Infrastructure Bank: We support this idea. CT Green Bank has achieved much-deserved notoriety in green energy. Expanding its purview has great potential. For example, the Rhode Island Infrastructure Bank's broad infrastructure mandate has led to significant progress in natural climate solutions.
- Green bonds: A go-to option, depending on electorate and debt service.
- State Revolving Fund: Fully funding the 10% state revolving loan funds for green infrastructure has great benefit. Vermont recently reworked its State Revolving Fund program with the result that more funding becomes available for climate-related strategies, specifically conservation. Maine and New Hampshire area also in the process.
- Incentivize CT's insurance industry to promote and grow the catastrophe bond market and pilot a resilience bond program: A concept worthy of further study.
- Revolving loan fund for 1-6 Family Affordable Housing: A mechanism with notable equity strength. Associated additional urban green spaces would have substantial co-benefits.
- Regarding next steps: The Trust for Public Land looks forward to participating in further discussion and analysis of financing mechanisms. For background, The Trust for Public Land help selected officials, government executives, legislatures, land trusts, and public agencies research and evaluate conservation finance options and design ballot and legislative measures that reflect public priorities. Since 1996, we've helped pass over 572 measures—82 percent of those we've worked on—that generated $80billion for parks and conservation. The following online tools may be useful references:

- Conservation Almanac: a website for discovering, analyzing, and mapping the results of federal, state, and local land conservation funding. http://conservationalmanac.org/
- Landvote®: a searchable online database of all state and local conservation ballot measures since 1988. http://landvote.org

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Mary Pelletier 10/21/20

Financing Adaptation and Resilience–

- Park Watershed enthusiastically supports establishing a municipal storm water authority pilot program. Incentives for municipalities that collaborate on formation of regional watershed storm water authorities would be especially helpful with respect to the Park River regional watershed, which stretches across even of the eight voting member District (MDC) municipalities. State incentives for stormwater authorities that foster collaboration among municipalities within regional watersheds would be conducive to strategic regional cooperation that is necessary to the advancement of effective watershed stewardship. This comment includes issues related to Rivers, and Infrastructure and Land Use Adaptation.
- Financing for local innovation that root economic prosperity into Connecticut communities is needed. While state and federal financing policy strategies are critical, there is a pressing need for funding that can support growth and prosperity in diverse communities. State support is needed to bolster neighborhood economic sustainability and prosperity, rather than required daily commuting would also minimize fossil fuel usage in transportation. In addition to funding projects that build/revitalizes walkable communities, State leaders could encourage design schools to explore how 21stcentury cultural values can learn from 19thurban relationships that might alter20thcentury car-dependent development conventions. This comment includes issues related to Infrastructure and Land Use Adaptation.
- Offer incentives for municipalities that successfully participate in Sustainable CT, as well as incentives for municipalities that periodically amend/update (within less than a decade) Plans of Conservation & Development with respect to current climate research and emergency preparation planning.
- Provide small-scale state funding, for a wide array of local, environmental efforts that may not yet be recognized planning conventions. Programs that support distribution of small-scale grant funding such as the Watershed Assistance Small Grants are needed to support pilot projects that engender innovative strategies.
- Identify and utilize a process framework through which diverse citizen stakeholders, professionals and staff from multiple CT DEEP Bureaus, can collaborate equitably to merge the GC3 recommendations into place-based projects with measurable, cost-effective goals. Perhaps the “lean” methodology can be adapted to identify and merge issues with respect to site-specific projects that through collaboration can achieve exponential results.

Emily Alexander, Connecticut League of Conservation Voters 10/16/2020

Many of the goals of the Financing Adaptation and Resilience working group are addressed in other reports. A main goal for this group would be to:

1. Establish a carbon fee to provide a revenue source for resilience and adaptation funding. Funding for climate mitigation and adaptation should be provided by the root cause of climate issues.
2. Approve legislation to allow individual municipalities Statewide to form stormwater utilities to fund resilient infrastructure.

Frogard Ryan, The Natural Conservancy 10/21/2020

<u>Financing and Funding Adaptation and Resilience Work Group Report</u>

The Financing and Funding Adaptation Work Group report includes many critical and clearly crafted assessments of the challenges that Connecticut faces regarding the impacts of climate change, as well as crucial recommendations to address those challenges before they become disasters. There are several sections and aspects of this report that warrant strong support and attention; we would call out three in particular:

- The focus on Nature-based Solutions (NbS) is critical to ensure that Connecticut utilizes existing and future natural assets to address climate adaptation in the most sustainable and resilient ways possible. While the discussion of NbS may be more precisely appropriate for inclusion in the Adaptation and Planning Implementation Workgroup report, it is certainly relevant to the Financing report, and is crucial for inclusion in any final GC3 reports.
- The emphasis on Environmental Equity and Justice reflects Executive Order #3, and the pertinent recommendations are an essential start to ensuring that Connecticut adequately prepares for the impacts of climate change and addresses historical inequities that have resulted in communities of color bearing a disproportionate share of those impacts.
- The sections on insurance provide very clear background and sound recommendations regarding an industry that will be deeply affected by the impacts of climate change and that has to play a crucial role in helping residents, businesses, and communities prepare for and recover from, those impacts.

Substantive comments (please note that CAPITALIZED words are suggested for insertion or addition)

- On page 6 in the Executive Summary, and on page 25, this sentence would be more informative and relevant if it included a shortened description of the factors included on page 15 in the discussion of Disproportionate impacts on vulnerable communities:
    - Equity starts by recognizing that there are disparities and inequities in living conditions, WHICH HAVE BEEN EXACERBATED BY HISTORICAL INEQUITIES IN GOVERNMENT POLICIES AND SOCIETAL PRACTICES.

- This sentence in the first paragraph on page 20 is not correct. It could be corrected as so: “Additionally, the cost of maintaining Many LARGE OR HAZARDOUS damS is about $2,000 annually.”
- The recommendations on page 28 under State-funded and Initiated Infrastructure and Buildings Projects are critical, but primarily address new infrastructure investments that the state and municipalities make. We should ensure that the Adaptation Planning Work Group report addresses existing infrastructure and prioritizes that which is in most critical need of resilience upgrades.
- On page 30, under “Build Outreach and Capacity and Tracking for the Increased Uptake of Flood Insurance”, this recommendation should include brief explicit reiteration of the serious flaws in the NFIP program mentioned on page 16:
    - “2) Consideration should be given to developing a community flood insurance program as an additional layer of coverage alongside the National Flood Insurance Program (NFIP). Such a program, creatively designed using insurance vehicles, AND AVOIDING THE FLAWS IN THE NFIP WHICH RESULT IN PUBLIC SUBSIDY FOR COSTLY AND RISKY DEVELOPMENTAND/OR REDEVELOPMENTIN FLOODPLAINS, could ultimately protect the community by providing a greater level of flood insurance uptake for business owners and residents.
- Under that same section, recommendation 3, which reads “Assistance should be provided to communities to help them qualify for greater flood credits under the FEMA Community Rating System (CRS) program.” is critical, but the recommendation should include what is necessary to provide such assistance, such as increased agency staff, if that is the need.
- Appendices II and III, on pages 69 and 72, include recommendations by the Forests and Working Lands Subgroups to “Expand use of Regional Greenhouse Gas Initiative (RGGI) funds to forest land conservation.” While The Nature Conservancy strongly supports forest conservation, the role that healthy forests play in sequestering carbon from the atmosphere, and initiatives that increase forest resilience, we are also very concerned about the many attempts that have been made to utilize RGGI revenues for purposes other than those for which the program was originally established. When the original RGGI statutes, which are now in Section 22a-200c, were developed in 2007, The Nature Conservancy proposed that the phrase “measures to...mitigate the impacts of climate change”, meaning resilience and adaptation initiatives, be included in paragraph (c) (22a-200c(c)), which as passed, reads:
    - “The regulations adopted pursuant to subsection (a) of this section may include provisions to cover the reasonable administrative costs associated with the implementation of the Regional Greenhouse Gas Initiative in Connecticut and to fund assessment and planning of measures to reduce emissions, mitigate the impacts of climate change and to cover the reasonable administrative costs of state agencies associated with the adoption of regulations, plans and policies in accordance with section 22a-200a. Such costs shall not exceed seven and one-half per cent of the total

projected allowance value....” We would note that RGGI funds have never in actual practice been used for resilience and adaptation, and would support, as we did in 2007, a use of a limited amount of the funds, as provided in the statutes, for such initiatives. We recommend, however, that this proposal in Appendices II and III note the statutory limit on the use of RGGI funds for adaptation, and that this work group recommendation be focused on using funds within the statutory limit, and not on expanding that limit. Connecticut’s RGGI regulations also allow the use of initiatives for “Sequestration of Carbon due to Afforestation” as offsets for utilities to meet emission requirements. Due to various factors, the use of offsets has been non-existent or very limited. We would support a very limited use of RGGI funds directly for carbon sequestration, but only for projects that clearly demonstrate sequestration benefits. Comments regarding syntax, semantics, or grammar(please note that CAPITALIZED words are suggested for insertion or addition)

- On the first page of the Executive Summary, this lengthy sentence would be more readable if broken apart, perhaps as so:
    - Framing: The report frames the needs for climate resilience financing and funding through a discussion of unmet disaster recovery needs following numerous past storms with national disaster declarations in Connecticut., THE REPORT notES thAT insured assets are at greater risk from climate change, and reviewS the impact of climate change on the financial markets., THESE IMPACTS include the current regulatory practice of not informing investors of physical and transitional climate risks, warnings of a potential mortgage default crisis, and the potential downgrading of state and municipal bond ratings due to increasing costs if adequate, dedicated and recurring funding sources are not budgeted and invested in proactive natural hazard mitigation and climate resilience projects from planning through operation.
- On Page 8, spell out the abbreviation of “ADU” –Accessory Dwelling Unit.
- This sentence on page 10 does not appear to be a complete sentence:
    - While more discussion and planning are necessary, preliminary feedback from these limited work groups suggests that a state invest~~ing~~MENT in the range of $2-3 million per year for environmental justice and community planning activities and $35 million per year for nature-based solutions WOULD BE NEEDED TO ADDRESS CRITICAL GAPS.

- The phrase “leading the way” in this sentence “While Connecticut has been leading the way...” at the beginning of page 12 is unduly vague. It would better be phrased: “While Connecticut has been leading the way DILIGENT with its forward-looking investments in recovering with resilience from Sandy,...”
- On page 12, under “Unmet Recovery Needs following Storms”, this “sentence”: “$158 million in identified unmet recovery needs after Sandy” is not a complete sentence and repeats what was stated earlier in the paragraph. It is redundant and unnecessary.

- This sentence on page 17, under “Difficulty Obtaining Grant Funding”, should be changed to read: “In ~~m~~Many aspects of resilience such as cutting-edge building technology, life-cycle analysis, health impact analysis, and community capacity building have not been advanced SUFFICIENTLY FOR CONNECTICUT to be competitive for national demonstration and research funding.” The following sentence “CIRCA has modeled an initiative that has resulted in the knowledge and capacity necessary to secure funding for sea level rise.” needs to be clearer as to what CIRCA is doing regarding sea level rise. It could be assumed that it is primarily research, but will CIRCA also be doing planning or implementation of protective measures? If not, which entities or organizations will in fact be on point for planning and implementation? Clarity would be welcomed here in this section.
- On page 18; although much of the previous sections have addressed Connecticut conditions, it is assumed, but not clear, that the “Take-up Rate of the National Flood Insurance Program (NFIP)” section refers to national statistics. That could be made clearer by editing: “It is estimated that approximately 50% of single-family homes located in the 100-year floodplains INTHE NATION[?] IN CONNECTICUT [?] are covered by flood insurance. It is also estimated that more than 29 million properties NATIONALLY have at least a high or moderate risk of flooding and THERE ARE only 5 million policyholders in the NFIP.
- On page 19, this sentence does not include the number of feet or projected sea level rise: “Connecticut is also planning for up to _____ feet of sea level rise by 2050, which will worsen coastal erosion and coastal flooding.”
- In the second paragraph on page 20, this sentence should read: “These constructed gardens collecting rainwater AND absorbing it back into the ground and groundwater system.”
- In the first paragraph on page 21, this sentence should read: “The shoreline will erode MORE slowLY~~er~~,”
- Two minor edits are needed on page 23: “We suggest there be a small amount of state funding designated for long term monitoring OF the efficacy of these nature-based solution projects.” And “The river restoration working group, formed under the Long Island Sound Study has been a highly a successful model that has allowed practitioners and agency experts to learn and improve restoration techniques AND LINK FUNDING DIRECTLY WITH COLLECTIVELY AGREED UPON, PRIORITY PROJECTS.”
- This sentence in the box on page 27 under “Incentivize Private Developers...” is unclear and may be clearer if “for example” is deleted: “Although private businesses are largely unregulated with respect to floodplain management statutes, for example, we know businesses suffer the impacts of climate change and natural disasters and those damages impact the people of Connecticut through the loss of jobs, services, and tax dollars to pay for recovery.”
- The reference to $1 million in this sentence on page 30 under “Create Central Governance Authority” sounds artificially precise in a sentence that is otherwise vague. It may be improved with wording such as: “Large-scale resilience infrastructure projects for flood protection can cost in the tens of millions for flood walls and pump stations,

but COMPARABLE green infrastructure solutions can COST CONSIDERABLY LESS, ON THE ORDER OF be less than $1 million."

- On page 76, under Nature-based Solutions, this sentence is unclear and should be worded: "Any legislative authorization must allow for third party administration and incorporate an allowable USE OF UP TO 10% OF FUNDS FOR administrative PURPOSES fee of 10%."
- Since some readers will only consult Appendix II and not Appendix I, Table 1 in Appendix II, which starts on page 64 would benefit from an explanation of the headings, similar to that provided in Appendix 1, either by noting to refer back to Appendix 1, or repeating that Legend with added terms not included in the one for Appendix I. For example, there are two headings in Appendix II which refer to "match"; a description of what each means would be helpful.

Thomas Kaput 10/21/20 (and multiple commenters with verbatim text)

Dear Climate Change Bureau CT DEEP Climate Change Bureau,

Connecticut has ambitious climate targets, and I support our state's goals of reducing greenhouse gas emissions and planning for a resilient and equitable future. The draft reports of the Governor's Council on Climate Change work groups are an important step in achieving those goals.

I particularly support these recommendations, and urge their inclusion in the final reports:

- Strengthen alignment between the state's decision-making and its greenhouse gas reduction goals. All regulatory decisions should be evaluated for consistency with meeting Global Warming Solutions Act targets.
- Move climate adaptation and resiliency measures—like nature-based solutions, forest and wetland protection, urban green infrastructure and tree planting, and making low/moderate income housing energy efficient and healthy—from demonstration project scale to widespread adoption and protection.
- Support robust, equitable state funding and financing (leveraged and matched by federal and local sources) for emissions reduction and adaptation programs. This is a large ($150-600 million/year) investment. Promising sources include:

a) adopting the Transportation & Climate Initiative (up to $250 m/yr) and increasing the petroleum gross profits tax(~$100 m/yr). Connecticut can help ensure robust TCI implementation that drives down emissions while re investing auction proceeds in other high-impact and equitable programs;

b) increasing or re-directing state bonding (up to $70 m/yr);

c) adopting the Maryland "flush tax" model (up to $75 m/yr).

- Reduce storm water pollution and flooding, and help municipalities afford green infrastructure and resiliency investments, by passing statewide enabling legislation for storm water authorities.
- Target future building projects to already-developed areas, and prioritize the conservation and preservation of naturally-resilient coastal marsh, dunes, and forests.
- Develop and fund a community engagement strategy to inform the 2021 GC3 process and implementation, including grants for community-based NGOs partners and ensuring environmental justice perspectives are integral to the process. The reports could be made even

stronger. Please consider these additions and modifications to build the ambitious climate mitigation, resilience, and justice plan Connecticut needs:

- Emphasize the importance and urgency of strong climate mitigation action, by:
a) highlighting the current and projected impacts of climate change in Connecticut, including health and economic impacts;
b) identifying the greenhouse gas reduction potential of suggested projects;
c) prioritizing, among the many valuable ideas in the reports, the highest-impact polices that will be most effective in driving down emissions and transitioning to a carbon-free economy.- Eliminate, not just "phase down," biomass as an eligible resource in the Renewable Portfolio Standard (RPS). If we are to achieve our climate goals, we can't keep subsidizing dirty energy sources.
- Add dams to the proposed statewide GIS database of culverts, flood gates, tide gates, and other water control structures, and create a dynamic list that prioritizes structures for replacement, removal, and/or modification—including identifying dams that are vulnerable to our changing climate, and ensuring culverts can handle 100-year floods and allow migratory fish to pass.
- Encourage municipalities to adopt green infrastructure as a first-choice solution to flooding and storm water pollution.
Together, this suite of policies can reduce Connecticut's contribution to climate change and help our region adapt to the changes that are already occurring—while protecting public health, generating good jobs, and protecting vulnerable communities from storms, flooding, and air pollution.

Alexander Herpst 10/21/2020

Ensure funding for low-income equitable access by:

- Requiring insurance companies pay a tax for each fossil fuel company or project that they underwrite,
- Insurance companies pay a tax on the profits from investments in fossil fuel companies,
- A portion of any proceeds received as a result of the state's lawsuits against fossil fuel companies is invested in low-income communities.

Require that insurance companies:

- Immediately cease insuring new coal projects and coal companies, unless they are engaged in a rapid transition process away from coal to clean energy for no more than two years.
- Immediately cease insuring new oil or gas expansion projects.
- Commit to phasing out insurance for oil and gas companies in line with a 1.5ºC pathway.
- Divest all assets from coal companies and oil and gas companies that are not in line with a 1.5ºC pathway, including assets managed for third parties.
- Bring stewardship activities, membership of trade associations and public positions as a shareholder and corporate citizen more broadly in line with a 1.5ºC pathway in a

transparent way. This must include forceful advocacy for a green and just recovery from COVID-19.

Aaron Goode 10/21/2020

I hope the GC3 will consider this article in finalizing its report.
https://e360.yale.edu/features/how-a-climate-corps-could-put-youth-to-work-in-greening-america

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10/7/2020 Financing and Funding Adaptation & Resilience Breakout Session Chat Record Comments

From Tanya Dwyer : Have we considered off-sets e.g. companies that cannot get to carbon neutral immediately can pay farmers for carbon sink credits. CT or private company like Nori can track the carbon sinking and carbon credits with block chain technology for transparency. Sorry if this is already in the repost, I'm not familiar with the recs yet!

From Mary Pelletier : It would be helpful to have pilot projects in multiple locations, inland and coastal, so as to explore a range of implementation strategies.

From Joseph Wraithwall : For those who are interested, I believe the source of that funding for Resilient Connecticut was the National Disaster Resilience Competition from the federal Housing and Urban Development Agency using Community Development Block Grants.

From Mary Pelletier : In order to be more competitive for federal, and foundation funding, there needs to be collaborative support from local, state and regional environmental organizations. Incentive funding for collaboration might help

From FRogard Ryan : Can we learn from what MA and RI are providing in terms of funding of Community Resilience building and subsequent projects?
From Kimberly Stoner : Also - insurance companies - it would benefit them to invest in resilience projects instead of putting billions in investment in fossil fuel companies.

From Amy Paterson : Enabling legislation (i.e. not a mandate) to give municipalities the option to establish a buyer's conveyance fee program would allow them to raise funds for the resilience fund, as well as nature-based solutions including land conservation. This is a recommendation in the Forest Sub-Group Report.

From Curt Johnson : Equity needs be considered as Jim Finch describes. Maybe tiered approach.

From David Blatt : Or perhaps equity suggests that no state funds be spent to secure affluent coastal residential communities at all. They can raise their own funds to put into their 19-77 accounts.

From Allen Kratz : Link to Mass. news release announcing $11.1M in Massachusetts Municipal Vulnerability Preparedness program: https://www.mass.gov/news/baker-politoadministration-awards-111-million-in-climate-change-funding-to-cities-and-towns

From Kris Kuhn : What about funding and finance of renewables and the development of a green work-force?

From David Blatt : Why tax insurance companies for insuring fossil fuel industries instead of taxing fossil fuel industries directly? I.e., carbon tax.

From Lynn Johnson : Have we reached out to Insurance Companies to ask them to be a part of the conversation?

From Mary Pelletier : What about offer incentives to insurance companies that prioritize green energy and municipalities that advance green infrastructure. Perhaps incentives would be more effective than fees.

From Joseph Wraithwall : If there is legislation to enable resilience improvements via a PACE program, the program should also expand to residential properties. CA has done this solely for residential properties in county-run PACE programs, and Maryland is expected to pass a much larger program in their next legislative session. This isn't a priority financing option, and benefits would be small, but I would imagine it makes more sense to write it broadly rather in case legislation is developed.

From Mary Pelletier : Funding from the State to municipalities could prioritize municipalities where planners genuinely implement greener projects

From Samantha Dynowski : Mary: Insurance companies are helping cause the climate crisis by investing in fossil fuel companies, so I don't feel we should be incentivizing them to make profits. They shouldn't have us coming and going
From Mary Pelletier : Please include the need for the State to focus funding spent managing state properties to adhere to green best practices. In addition, the State can also encourage municipalities receiving State funding advance comprehensive planning for climate resiliency. Stormwater authorities would be very helpful. However there needs to be expanded public education about the benefits of a stormwater authorities, so as to encourage state elected officials to approve stormwater utilities.
Perhaps this group ought to outline a schedule of action. As noted previously, it would be helpful to recommend 4-6 pilot projects that involve a comprehensive consolidation of ALL the GC3 Working Group recommendations. By selecting 4-6 pilot watersheds, 2- 3 that flow through coastal cities and 2-3 inland watersheds, such as the North Branch Park River, that flow

through rural, suburban and inland communities, the GC3 can consolidate recommendations for exponential benefits, and to increase innovation, collaboration and visible improvement/change.

From Tanya Dwyer : Nori is a blockchain company in the Northwest that is working with large farmers to create carbon credits that are verified as scientific carbon sink Nori.com

From Rebecca French : Developers (i.e. private sector is a critical area). I think we are going to look at this area in more detail in 2021 in incentives we provide to developers at the state level. If a state agency provides any funding they are required to be consistent with floodplain management rules, but if there are no state dollars involve only the municipality has a say

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10/7/2020 Public Health & Safety and Financing & Funding Adaptation & Resilience Working Groups Meeting Chat Record Comments

From Curt Johnson : It's great you have identified extreme heat and other areas of health threat. I do not see anything about the public health threats related to flooding. Inland and coastal flooding due to increased extreme rain downbursts and coastal flooding are identified as major physical threats facing CT and NE according to the most recent national climate assessment. Vulnerable communities are often in these flood prone areas. Nature based solutions are important. Please include. Healthy homes should include combo of energy efficiency (included) AND split system heat pump system installation. These split systems save electricity and include built in AC at its most cost-effective. Indoor air quality/ventilation can also be improved with split systems. Focusing this effort on low/mod income is critical. Mold abatement and asbestos/lead cost effective abatement needs to be part of healthy homes.

From Anthony Allen : I'll second that, Curt, particularly in areas where overflows of combined storm and sewer systems are becoming more likely as heavy rain events become more likely due to climate change. These overflows dump huge amounts of raw sewage and other pollutants into waterways used for recreation, fishing, and/or water supplies.

From Samantha Dynowski : Agree that Connecticut is where insurance could take on the climate crisis. Yet our insurance companies are investing $247 billion in fossil fuels and insuring fossil fuel projects. https://www.insureourfuture.us/ct-insurance-report
Require that insurance companies: Immediately cease insuring new coal projects and coal companies, unless they are engaged in a rapid transition process away from coal to clean energy of no more than two years. Immediately cease insuring new oil or gas expansion projects. Commit to phasing out insurance for oil and gas companies in line with a 1.5ºC pathway. Divest all assets from coal companies and oil and gas companies that are not in line with a 1.5ºC pathway, including assets managed for third parties. Bring stewardship activities, membership of trade associations and public positions as a shareholder and corporate citizen more broadly in line with a 1.5ºC pathway in a transparent way. This must include forceful advocacy for a green and just recovery from COVID-19.

From Mary Pelletier : On-going prioritization funding climate resilience research and preparedness on coastal communities - rather than recognizing the need to invest in preparing inland communities for population shifts is fundamentally problematic.

From denise savageau : FEMA's model relies on municipalities and/or nonprofits to be the applicants and bear the risk if the subappliant (homeowner) fails in the project. This needs to be addressed.

From Suzi Ruhl : Did you explore the application of NEPA to consider equity and environmental justice in federal projects, programming and funding?

From Samantha Dynowski : How about a fee on insurance companies that insure climate destroying fossil fuel projects?

From David Blatt : Tying resilience fees to resilience projects is noble and logically unassailable, but the legislature has routinely plundered special funds.

From Diane Keefe : Why is their no recommendation to increase the gas tax to generate local matches or improve resources for public transportation and bicycling facilities in our cities. The state of PA collects 58 cents per gallon. we only charge 38 cents. If we redirerct all the proceeds to low income communities it will be progressive not regressive

From Curt Johnson : Note that thee is an addendum to the finance/funding committee report that identifies the large funding need; importance for evaluating petroleum based taxes coodinaed with the TCI effot and considering Maryland's "flush tax" for water resilience projects There is a large built up need. While Bryan is right, there are over 400 nature based/flood adaptation efforts identified, these projects ARE ALMOST ALLNOT FUNIDED, EVEN TO THE ENGINEERING EFFORT.

From Anthony Allen : Was there an assessment of the potential of environmental impact bonds as a funding opportunity for nature-based resilience projects?

From Aaron goode : need state to authorize stormwater utilities and user fees at local level

From Suzi Ruhl : did you address the issue of access to resources distinct from the availability of resources? vulnerable communities often lack the capacity to apply for existing funding.

From Samantha Dynowski : How will you prioritize funding in a way the benefit low-income communities and communities of color that have suffered from decades of intentional structural racism, disinvestment, red lining, discrimination, segregation, and many other injustices

From James Finch : Standard and Poor's issues an annual report on municipal green bonds and resiliencey

From Samantha Dynowski : NY's landmark climate law requires at least 35% of benefit go to vulnerable communities. Funding and financing in CT should follow suit.

From Anne Hulick : Are there innovative ways to engage healthcare systems to engage and work on these issues and incentivize them to do so?

From Amy Velasquez : Only problem with the gas tax is it already has a history of being hijacked from its original intent

From Suzi Ruhl : Also the HUD-DOT-EPA Partnership for Sustainable Communities offers funding models.