SIERRA CLUB
MAINE CHAPTER

PO Box 88
Belfast, ME 04915
Phone: (207) 761-5616
www.sierraclub.org/maine

To: Committee on Environment and Natural Resources

From: John Fitzgerald, Sierra Club Maine

Date: April 20, 2023

Re: Testimony in Support of LD 1058; **An Act to Advance Greenhouse Gas Removal as an Economic Development Strategy in Maine**

Dear Senator Brenner, Representative Gramlich, and members of the Committee on Environment and Natural Resources:

My name is John Fitzgerald, and I am submitting the following testimony on behalf of Sierra Club Maine, representing over 22,000 supporters and members statewide. Founded in 1892, Sierra Club is one of our nation's oldest and largest environmental organizations. We work diligently to amplify the power of our 3.8 million members nationwide as we work towards combating climate change and promoting a just and sustainable economy. we move towards addressing climate changing strategies. To that end, we urge the Committee to vote 'ought to pass' on LD 1058: *An Act to Advance Greenhouse Gas Removal as an Economic Development Strategy in Maine.*

Maine's Sierra Club Chapter thanks you for taking up LD 1058 in this hearing. We also want to thank Senator Chip Curry for his foresight in seeing the opportunities for innovation and economic development in greenhouse gas removal methods that are part of a rapidly growing business and have many immediate co-benefits for the health and well-being of the people of Maine.

Science now recognizes that reducing our emissions of these climate pollutants is not enough to protect us from extremely dangerous levels of heat. In fact, as the world passed just 1.1 degrees Celsius of warming over the past two years temperatures in the Northwestern U.S. reached 120 degrees and are predicted to do the same this month. Forest fires in California made worse by that heat caused smoke that came to Maine so thick we could smell it and see it in Blue Hill, Sedgwick, and throughout down-east Maine. These next several years will be critical to keep accelerating feedback loops from driving the climate to overstep tipping points and to spiral out of control. Therefore, we urgently need not only to cut emissions but also to remove and reduce the concentrations of GHGs that have accumulated already.

On Thursday afternoon April 20th, in fact, the National Academies of Sciences, Arts and Engineering convened the first of several meetings of experts to determine the best ways of removing methane from the atmosphere, entitled "Atmospheric Methane Removal: Development of a Research Agenda (Committee Meeting #1)."

Removing GHGs has other health benefits. These include reducing ground level ozone, of which methane is a part, and reducing nitrous oxide that has recently been shown to not only have the already known health impacts but to also increase bone loss in postmenopausal women.[1]

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[1] "Air pollution and decreased bone mineral density among Women's Health Initiative participants" – https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9938170/

The term Greenhouse Gasses (GHGs) applies to several different gasses known to cause the warming of the earth by acting like blankets keeping heat from leaving the surface and lower atmosphere and escaping into space.[2] We also recommend that the committee amend the bill to include "black carbon" or "black soot" (which is the particulate material emitted from gas and diesel engines, coal-fired power plants, and other fossil fuel sources) so as to be included within the scope of GHGs addressed by the Program. Black carbon particulates are not only dangerous for people and animals as a particulate that harms our lungs and hearts, but also land on arctic snow and ice making them reflect less sunshine and absorb more heat.[3]

Maine has an opportunity through L.D. 1058 to not only work to address the climate crisis, but also take advantage of Federal funding and increase its leadership. On the subsequent pages, we go into further detail on these benefits, but they can be summarized as follows:

1) Enacting this bill will prepare Maine to receive multiple millions of Federal dollars beginning this year and extending for at least a decade for work that will improve the health, well-being and productivity of Maine's people and our economy;
2) Enacting this bill will ensure that Maine will have a broad program that will last beyond any one Governor and serve the people for many years to come;
3) Enacting this bill will make Maine – from its universities, farms and forests to ships and the sea – a leader in the fast-growing global industry of removing climate pollutants and do our part to restore and maintain a healthy climate.

We think Maine can be a leader in all of the above, and move from receiving more climate and air pollution from the states to our south and west to being a leader in removing that pollution for the good of the nation and the world. We encourage the committee to review the benefits on subsequent pages, and we are available ahead of and for any future work sessions to provide more clarification or information. Included below is a more detailed version of my testimony and a list of organizations assisting states and communities in accessing Federal funding. Thank you for your time and consideration, and again we urge you to vote 'ought to pass' on L.D. 1058.

Sincerely,

John Fitzgerald
Sierra Club Maine
Legislative Team Co-Chair and Executive Committee member

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[2] The Kyoto Protocol covered six named gasses but these are now consolidated into four: Carbon Dioxide, Methane, Nitrous Oxide and Fluorocarbons. See, https://www.epa.gov/ghgemissions/overview-greenhouse-gases. The US Environmental Protection Agency reports annually on sources and sinks (removal processes) of greenhouse gasses, See, https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks. The European Union's executive branch produces and updates a summary each August of the technical and policy aspects of climate change addressing the human caused emissions of greenhouse gasses but it largely omitted the fact that methane levels have risen from .76 parts per million to nearly 2 ppm during the industrial era, mostly in recent decades, and that nearly half of that methane appeared to be from warming wetlands, newly formed lakes in the far north, and melting permafrost. It also measured methane's impact over 100 years at about 20 times that of CO2 while the most important impact of methane comes in the ten-to-twenty-year period after its release making it over 80 times as powerful as CO2. See, https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Climate_change_-_driving_forces#Total_emissions.2C_main_breakdowns_by_source_and_general_drivers.

[3] The Climate and Clean Air Coalition, a group that combines nations, non-government organizations and intergovernmental organizations summarizes the role of black carbon and what to do about it well in this report: https://www.ccacoalition.org/en/slcps/black-carbon. Black soot also contributes to the arctic warming four times faster than the global average, melting the arctic ice faster, hastening sea level rise and interfering with the Gulf Stream, among other things

L.D. 1058 Summary and Benefits

LD1058 would require the Department of the Environment, in cooperation with other departments, to develop and, no later than May 1, 2024, implement a greenhouse gas removal program to:

> *Research, develop, assess and deploy methods of removing greenhouse gasses through the implementation of incentives, collaborations, educational initiatives, rules, programs or other activities within the jurisdiction of relevant state agencies, with consideration given to similar methods developed or proposed by the United States Department of Agriculture, the United States Department of Energy, the United States Environmental Protection Agency and other federal agencies and other public or private entities;*

It would also require the program to develop the expertise and partnerships to support GHG removal and secure federal and other funding to support the removal of GHGs.

Help Accessing Federal Funding to be Offered This Year Is Available

Passing L.D. 1058 will ensure that Maine is able to take full advantage of the billions of Federal dollars being made available to States this year.

Maine's own Rep. Chellie Pingree, as a senior member of the House Agriculture Committee helped to make sure that the Inflation Reduction Act contained among the most powerful language in the IRA directing the USDA to sequester, remove and destroy methane, carbon dioxide, nitrous oxides and other GHGs and providing billions of dollars over the next decade to help rural communities and farmers do just that. The Natural Resource Conservation Service recently asked for public comment on how to allocate its $19+ Billion dollars for that work.[4]

The USDA request for comment used the language of the IRA directly in the underlined passage:

> Additionally, NRCS is requesting feedback to help identify strategies and provide recommendations on how to maximize, target, monitor, and quantify improvements to soil carbon, reductions in nitrogen losses, and the reduction, capture, avoidance, or sequestration of carbon dioxide, methane or nitrous oxide emissions associated with agricultural production (emphasis added).

The EPA is also expected to release a "funding opportunity" in early summer of this year (2023) for $27 Billion in Greenhouse Reduction grants and technical assistance. Of that amount, states, towns and tribes are eligible for $7 Billion and non-profits – especially green banks supporting GHG reduction investments -- for the remaining 20 Billion.[5]

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[4] Federal Register :: Request for Public Input About Implementation of the Inflation Reduction Act Funding

[5] https://sam.gov/fal/cffd228dd8a34254b68d497672a5235e/view – "**Objectives:**
Section 60103 of Public Law 117-169, 136 Stat. 1818 (August 16, 2022), commonly known as the Inflation Reduction Act of 2022 (IRA), added Section 134 to the Clean Air Act, 42 U.S.C. § 7434, to establish the Greenhouse Gas Reduction Fund (GGRF). The GGRF will make funding available on a competitive basis for financial and technical assistance for projects that reduce or avoid greenhouse gas emissions and other forms of air

There are now several organizations dedicated to helping states and towns gain access to these Federal funds. (See appendix A). As a former Congressional aide and counsel, I must say that our delegation has among the best constituent services staffers and would urge the Committee to seek their help as well.

Many states are enacting both budgets and programs to qualify for IRA funding and tax credits:

- Washington State jumped on the EPA's announcement of grants from a $5 billion dollar fund so the legislature is budgeting funding up front to match IRA funds for reducing GHGs. At Washington University scientists are developing ways of removing GHGs, including safely harnessing naturally occurring methane eating microbes.
- California is in the process of budgeting far more than Washington State.
- Minnesota is set to pass a $156 Million dollar Minnesota State Competitiveness Fund to match Federal Infrastructure and IRA funds with an emphasis on GHG reduction[6].

Adding Funds to Prime the Pump for Federal Matching Funds

While LD 1058 does not provide funds itself, the Committee may want to consider supporting empowering the Governor's Office of Policy, Innovation, and the Future (GOPIF)to use a portion of the $3 million dollars in planning funds that we understand they expect to receive shortly from the EPA as a grant to pay for planning to use each state's portion of a $5 Billion fund from the IRA for "reducing greenhouse gasses" to plan specifically to staff up the Interagency Program called for in this bill, and to support GOPIF in asking the EPA for additional funds that are expected soon to begin to do the GHG removal research, development and deployment called for in LD1058.

Knowing how much money is already scheduled to be available from the IRA the Committee may also want to consider authorizing funds in the bill itself. That would simply be "priming the pump" as we used to say, so we can pump what we need after that. Those making judgements on fiscal notes could see that a timely investment now would prepare Maine to receive far more in the near future.

An April 5th letter to the Washington State legislature from an array of businesses, scientific and non-profit groups operating in Washington State can also make the case for Maine creating, by statute, a program that will build on the good CO2 reduction work of "Maine Can't Wait", expand that work to all GHGs, and continue to work from Administration to Administration.

I have also added to their bulleted list methods based on the work of scientists across the globe over the past few years. For more on methane removal methods, see: Catalog of methods posed at Catalog of Research Funding Needs to Advance Methane Removal and https://www.sparkclimate.org/methane-removal/potential-approaches.

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pollution, with a particular emphasis on projects in low-income and disadvantaged communities. The overarching objectives of the GGRF are to (1) reduce emissions of greenhouse gases and other air pollutants; (2) deliver benefits to low-income and disadvantaged communities; and (3) mobilize financing and private capital to stimulate additional deployment of greenhouse gas and air pollution reducing projects.

[6]https://www.lmc.org/news-publications/news/all/funding-to-assist-cities-with-energy-related-grant-programs-passes-senate-heads-to-governor/

Prabhu Energy Labs with help from the EPA and Canadian organizations among others offers systems that destroy methane near sources like landfills[7], provide most of their own operating energy and, and in some cases, generate additional electric energy in the process, See, https://www.prabhuenergy.com/.

Ambient Carbon is a company based in Denmark, led by two Americans, that is offering for field tests a process for removing methane from near the sources such as cattle barns, coal mines and sewage treatment plants – https://ambientcarbon.com/.

As our friends in Washington State told their legislators, Maine is also well-positioned to drive substantial economic development through greenhouse gas removal due to advantages such as its growing technology sector, relevant geological and marine resources, and large forestry and agriculture sectors. There are countless opportunities for climate leadership in Maine. Below, we outline a few of them to highlight the promise and potential that RD&D funding can unlock, though this list is far from exhaustive:

- Near source methane capture, use and/or destruction by oxidation or catalysis at sewage treatment plants, natural gas storage and transmission pipelines, natural gas fired power plants, livestock and dairy barns and waste pits, etc.
- Direct air capture and underground mineralization of CO2;
- Surface mineralization of atmospheric CO2 through enhanced rock weathering techniques to enhance cropland and/or beaches, offering new revenue opportunities to tribes, coastal communities, and farmers across the state;
- Sequestration of CO2 in low carbon concrete and pre-formed concrete building materials, or in carbon black and graphite industrial products;
- Large scale kelp forest restoration and seaweed farming;
- Nitrous Oxide removal in agriculture;
- Selection and planting of fast CO2-sequestering native tree species;
- Increasing organic carbon stored in soils through regenerative agriculture practices;
- Pyrolysis of renewable biogas to provide clean-burning hydrogen fuel while also sequestering atmospheric carbon; and
- Methane oxidation and black soot removal to reduce atmospheric methane and black soot concentrations using ship-based methods that could be installed or retrofitted by Bath Iron Works, for example, to make Portland and other Maine ports global models of greenhouse gas removal.

Further information on Sierra Club policy regarding greenhouse gas removal can be found here: https://www.sierraclub.org/sites/default/files/2020-Sierra-Club-Climate-Resilience-Policy.pdf

Adding the Duty to Assess – But Not Yet Deploy -- Other Climate Interventions

Some leading climate scientists in a group called the Healthy Climate Action Coalition early this month warned against the catastrophic impacts of climate change and called for urgent action to

[7] In order not to increase polluted water leakage from landfills it is important to reduce liquids in landfills. Some methane capturing systems at landfills encourage water to increase methane creation from the organic matter in the landfill. The Prabu and Ambient Carbon systems do not require that. Ultimately food wastes should not be landfilled but separated from other wastes. That is the requirement in much of Europe where separate bins are provided for different waste types.

directly cool the climate.[8] They say that there are several methods of "Direct Climate Cooling (DCC)" that could dramatically cool the climate as we work to reduce greenhouse gas (GHG) emissions and remove GHG from the atmosphere and oceans. Given that some of these methods are not as easy to manage and control as others, it would be wise to add to the work of the Program the job of reviewing climate interventions that are not limited to GHG removal and reporting to the Governor, the Legislature and the public on their findings in order to ensure we are promoting and using the best technologies.

Maine Can Join the Global Leaders

The Committee should know that the US is expected to lead in adopting standards and incentives to reduce methane under the Methane Pledge and that the Pledge requires an annual assessment of the standards and incentives adopted and the progress made. We are also expected to partner with developing countries to share the credit for GHG removal projects under Article 6.4 of the Paris Agreement. On Thursday, April 20th President Biden announced a major international initiative to increase in funding for GHG reduction and removal[9].

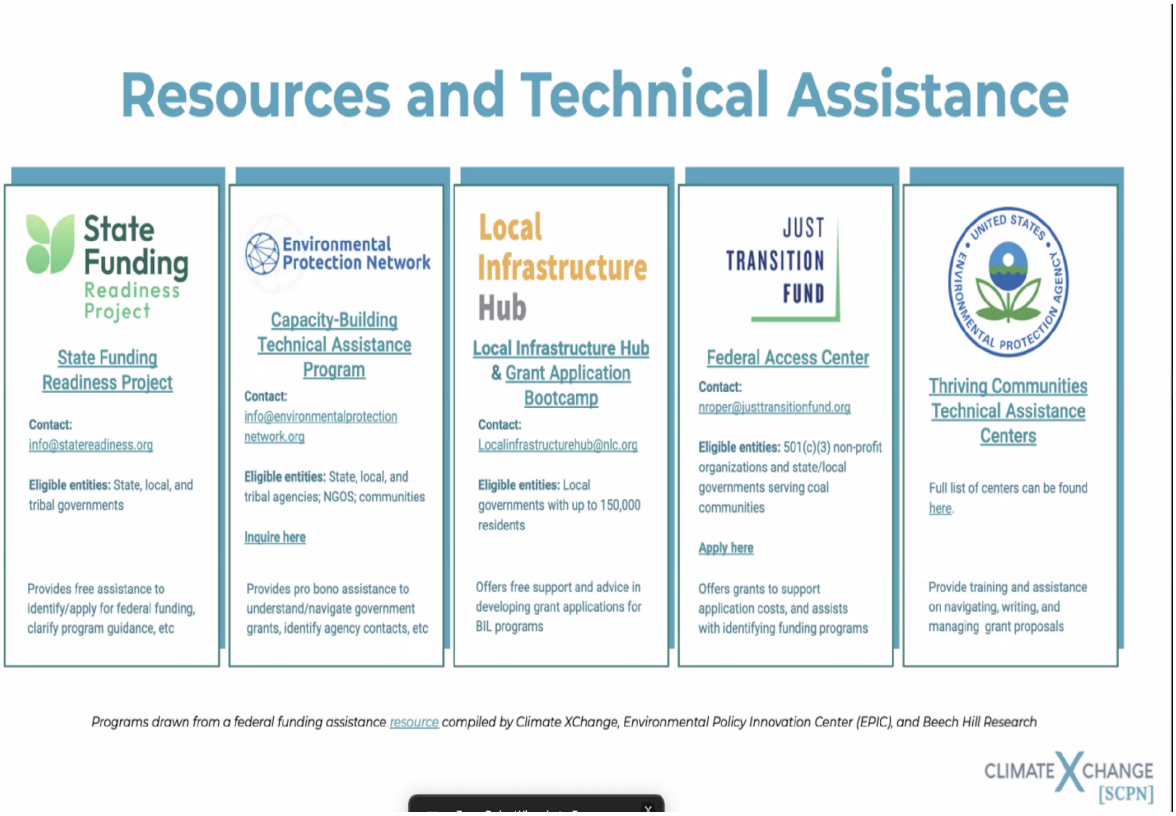
It is our understanding that the U.S. and other countries may also be asked to consider joining a Greenhouse Gas Removal Pledge as a side agreement like the Methane Pledge, at this fall's Conference of the Parties to the UNFCCC and Paris Agreement.

Appendix A

[8] https://docs.google.com/document/d/1TowThwi6j6cX3iLGBRrj22D30cYhKa_9/edit.

[9] FACT SHEET: President Biden to Catalyze Global Climate Action through the Major Economies Forum on Energy and Climate | The White House

The following screen-shot is from a webinar on how to obtain Federal Greenhouse Gas Reduction



Funds held on April 19th, 2023. It shows several organizations devoted to helping access these funds.