June 1, 2021

VIA ELECTRONIC MAIL

Ms. Stacy Knapp Emissions Inventory Section Manager Maine Department of Environmental Protection 17 State House Station Augusta, ME 04333

#### **Re:** Comments Regarding Proposed Chapter 167 of the Department of Environmental Protection's Regulations, Tracking and Reporting Gross and Net Annual Greenhouse Gas Emissions

#### Dear Ms. Knapp,

Conservation Law Foundation ("CLF"), Acadia Center, Natural Resources Council of Maine, and The Nature Conservancy in Maine, appreciate the opportunity to comment on the Maine Department of Environmental Protection's ("DEP") proposed rule establishing methods for measuring and estimating greenhouse gas emissions from various source categories and for calculating gross and net annual greenhouse gas emissions for the State of Maine. We strongly support the State's efforts to adopt rules to track and report to the Legislature on annual greenhouse gas emissions (GHG) as required by 38 M.R.S.A. §576-A. However, we offer these comments on ways the State can improve its proposed rules to ensure that the tracking and reporting of gross and net greenhouse gases is accurate and comprehensive.

Founded in 1966, CLF is a nonprofit, member-supported, environmental advocacy organization working to create solutions that preserve our natural resources, protect public health, and promote thriving communities for all in New England. CLF works to counter climate change by cutting pollution from our vehicles, creating alternatives to driving, and pushing for more affordable and equitable public transportation options. CLF also works to reduce greenhouse gas emissions in the building sector by advocating in favor of increased energy efficiency and electrification and promotes policies that support renewable energy development and end the use of fossil fuels in electricity generation across the region.

<u>Acadia Center</u> is a non-profit, research and advocacy organization committed to advancing the clean energy future by offering real-world solutions to the climate crisis. Acadia Center tackles complex problems, identifies clear recommendations for reforms, and advocates to create significant change that supports a low-carbon economy across the Northeast which can then be a model for application elsewhere. Acadia Center identifies regional, state, and local improvements that will dramatically reduce carbon pollution and improve quality of life throughout the Northeastern United States.

The Natural Resources Council of Maine (NRCM) is a non-profit membership and advocacy organization that works on the full range of environmental and energy issues that affect Maine's

environment, economy, and people. NRCM is strongly focused on policies and programs that would reduce greenhouse gas emissions and decarbonize our energy systems. NRCM advocates for the enactment of environmental protection, clean energy, and climate action policies by the Maine Legislature, and played a significant role in achieving passage of the An Act to Promote Clean Energy Jobs and to Establish the Maine Climate Council (LD 1679, which directed the Department of Environmental Protection to develop these rules.

The Nature Conservancy is a nonprofit conservation organization dedicated to conserving the lands and waters on which all life depends. Guided by science, we create innovative, on-the-ground solutions to our world's toughest challenges so that nature and people can thrive together. Working in more than 70 countries, we use a collaborative approach that engages local communities, governments, the private sector, and other partners. The Nature Conservancy has been leading conservation in Maine for more than 60 years and is the 12th largest landowner in the state, owning and managing roughly 275,000 acres. We also work across Maine to restore rivers and streams, partner with fishermen in the Gulf of Maine to rebuild groundfish populations, and develop innovative solutions to address our changing climate.

### **1.** The rules should use a "hybrid" approach for estimating greenhouse gas emissions from electric power generation.

The proposed rules suggest that DEP would only track and report emissions from electricity generated in Maine. Specifically, the proposed rules state that "Gross greenhouse gas emissions' means the sum of all anthropogenic greenhouse gas emissions released to the atmosphere by *all sources within the State each year*" and that "Estimates of gross GHG emissions shall include emissions of the gases identified in section 2 (covered greenhouse gases) of this Chapter from *sources within the geographic boundaries of the State of Maine*." Proposed Chapter 167(1)(N), 167(4)(A) (emphasis added). Accordingly, the proposed rules would only include emissions from electricity generated "within the geographic boundaries of the State of Maine." *Id.* 

This approach, however, would underestimate Maine's emissions from electricity generation. In particular, because Maine is a net importer of electricity,<sup>1</sup> the proposed regulations would not account for emissions from imported electricity. Therefore, Maine should adopt a "hybrid" approach that not only tracks GHG emissions generated within the State, but also the emissions from energy imported into the state. Under a "hybrid" method, all of the GHG emissions from Maine's power plants would be attributed to Maine, and any imported energy emissions would also be included in Maine's gross emissions total. Massachusetts and New York use similar

<sup>&</sup>lt;sup>1</sup> Maine Electricity Profile 2019, U.S. Energy Information Administration (US EIA) (November 2, 2020), available at <u>https://www.eia.gov/electricity/state/maine/index.php</u>; see Eighth Biennial Report on Progress toward Greenhouse Gas Reduction Goals, Maine DEP, at 10 (January 13, 2020), available at https://www.maine.gov/dep/commissioners-office/kpi/details.html?id=606898.

"hybrid" methods for estimating emissions from electricity generation.<sup>2</sup> Rhode Island and Connecticut also use variants of the "hybrid" approach.<sup>3</sup>

Under a "hybrid" method, Maine's imported energy emissions could be calculated by apportioning to Maine a share of any excess generation from each ISO New England (ISO-NE) state that generates more electricity than it uses. Likewise, Maine would be apportioned a share of the net annual imports into the ISO-NE grid from the New York, New Brunswick, and Quebec grids. Massachusetts, similarly, uses a hybrid technique that estimates emissions from imported electricity by apportioning the state a share of emissions from electricity exporting ISO-NE states.<sup>4</sup>

Adopting a "hybrid" accounting method for electric generation would require Maine to account for the GHG emissions of the electricity it imports and avoid undercounting emissions resulting from electricity consumption in Maine. It would also bring Maine into conformity with other states in the region, which would be necessary in the event that regional-based solutions to decarbonizing our economy are developed in the future.

Additionally, the proposed rule does not address emissions from line-loss from the electric transmission and distribution system. Line-loss has been estimated to amount to as much as five percent of electricity transmitted and distributed throughout the U.S.<sup>5</sup> If electricity is being imported into Maine for use in Maine and the emissions from the quantity of electricity lost in the transmission and distribution system is not adequately accounted for, then the state will not arrive at an accurate estimate of electric sector emissions. This is because, Maine would only account for out-of-state emissions associated with the difference between what is generated instate, without accounting for any electricity lost between when the imported electricity is generated out-of-state and actually consumed in Maine. The State,

<sup>&</sup>lt;sup>2</sup> Mass. Dep't of Envtl. Prot., *Statewide Greenhouse Gas Emissions Level: 1990 Baseline and 2020 Business as Usual Projection Update*, at 13–14 (July 2016), *available at <u>https://www.mass.gov/doc/statewide-greenhouse-gas-ghg-emissions-baseline-projection-update-including-appendices-a-b/download; N.Y. State Energy Research & Dev. Auth., N.Y. State Greenhouse Gas Inventory: 1990-2016 at pdf 24-27 (July 2019), <i>available at <u>https://www.nyserda.ny.gov/About/Publications/EA-Reports-and-Studies/Greenhouse-Gas-Inventory</u>.*</u>

<sup>&</sup>lt;sup>3</sup> Rhode Island Dept. of Envtl. Mgmt., 2016 R.I. Greenhouse Gas Emissions Inventory, at 11 (December 20, 2019), available at http://www.dem.ri.gov/programs/air/ghg-emissions-inventory.php; Conn. Governor's Council on Climate Change, GC3 Exploratory Report, at 34 (March 2016), available at https://portal.ct.gov/-/media/DEEP/climatechange/GC3/GC3ExploratoryReport2016pdf.pdf; Conn. Dept. of Energy & Envtl. Prot., 2017 Conn. Greenhouse Gas Emissions Inventory, at 1-2. (2020), available at https://portal.ct.gov/-/media/DEEP/climatechange/2017 GHG Inventory/2017 GHG Inventory.pdf.

<sup>&</sup>lt;sup>4</sup> See Mass. Dep't of Envtl. Prot., *Statewide Greenhouse Gas Emissions Level: 1990 Baseline and 2020 Business as Usual Projection Update*, at 13–14 (July 2016), *available at <u>https://www.mass.gov/doc/statewide-greenhouse-gas-ghg-emissions-baseline-projection-update-including-appendices-a-b/download.*</u>

<sup>&</sup>lt;sup>5</sup> How much electricity is lost in electricity transmission and distribution in the United States?, U.S. EIA (November 18, 2020), available at.

https://www.eia.gov/tools/faqs/faq.php?id=105&t=3#:~:text=The%20U.S.%20Energy%20Information%20Administ ration,in%20the%20State%20Electricity%20Profiles.

therefore, should consider including a definition of line-loss in the proposed rule and include proposed line-loss estimates and emissions correctives to account for those resulting emissions.

### 2. The proposed rules do not appear to adequately consider methane leaks involved in natural gas distribution and transmission.

The proposed rules state that the EPA State Inventory Tool (SIT) natural gas and oil module should be "used to calculate  $CH_4$  and  $CO_2$  emissions from all phases of natural gas systems (including production, transmission, venting and flaring, and distribution)." Proposed Chapter 167(1)(N), 167(4)(A). However, the SIT natural gas module does not adequately account for natural gas emissions because it underestimates emissions from methane leaks.<sup>6</sup> Indeed, in DEP's most recent biennial report on progress toward GHG reduction goals, which was submitted to the Maine Legislature in January 2020, although DEP estimated emissions from natural gas combustion using the SIT module, it appears that DEP did not attempt to account for emissions resulting from methane leaks from natural gas systems.<sup>7</sup>

Natural gas is approximately 90% methane, and natural gas leaks occur at nearly every step of the production, transmission, and distribution process. Methane is an extremely potent GHG, with a Global Warming Potential ("GWP") 86 times that of carbon dioxide per unit mass over a 20-year time horizon.<sup>8</sup> A 20-year, as opposed to a 100-year GWP time horizon, reflects the limited time we have to preserve a livable planet.<sup>9</sup> In fact, as demonstrated by the chart below, when accounting for leakage through the gas distribution system, gas may be as harmful or worse for the climate than burning oil or coal.

<sup>8</sup> See Climate Change 2013: The Physical Science Basics, Intergovernmental Panel on Climate Change, at 714 (2013), available at <u>https://www.ipcc.ch/site/assets/uploads/2018/02/WG1AR5\_all\_final.pdf</u>.

<sup>&</sup>lt;sup>6</sup> Lost and Unaccounted for Gas, ICF International (Prepared for Mass. Dep't of Pub. Utilities), at 44, 51 (December 23, 2014), available at https://www.mass.gov/doc/icf-international-report-lost-and-unaccounted-for-gas/download; Mass. Dep't of Envtl. Prot., *Statewide Greenhouse Gas Emissions Level: 1990 Baseline and 2020 Business as Usual Projection Update*, at 13–14 (July 2016), available at https://www.mass.gov/doc/statewide-greenhouse-gas-ghg-emissions-baseline-projection-update-including-appendices-a-b/download.

<sup>&</sup>lt;sup>7</sup> Eighth Biennial Report on Progress toward Greenhouse Gas Reduction Goals, Maine DEP, at 5-11 (January 13, 2020), available at https://www.maine.gov/dep/commissioners-office/kpi/details.html?id=606898.

<sup>&</sup>lt;sup>9</sup> Deeper Decarbonization in the Ocean State: The 2019 Rhode Island Greenhouse Gas Reduction Study, Stockholm Envtl. Inst. & Brown Univ. Climate and Dev. Lab, at 14 (2019), available at <u>https://www.sei.org/wpcontent/uploads/2019/09/deeper-decarbonization-in-the-ocean-state.pdf</u> ("Many climate impacts, such as the melting of the permafrost and polar ice caps, are likely to worsen sharply in the next 20 years, and are expected to create cascades of worsening problems . . . . [T]o prioritize prevention of near-term warming and impacts, the 20-year time horizon is a more rigorous reflection of what we need to do to assure a livable planet in general terms, and to stop runaway sea level rise and other impacts . . . .").



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Thus, minor changes in modeled natural gas leakage rates can result in large impacts on the overall emissions inventory.

Moreover, by way of example, a recent report by the Stockholm Environmental Institute and Brown University's Climate and Development Lab argued convincingly that the leakage rate used in Rhode Island's GHG accounting had been significantly underestimated.<sup>10</sup> The report based its modeling on a 2015 study of gas leaks in Boston, which found a leakage rate of 2.7%.<sup>11</sup> This was substantially higher than the 0.66% rate used in Rhode Island's prior modeling.

If Maine does not properly account for methane leaks from its natural gas transportation and distribution systems, then it will vastly undercount its GHG emissions. Maine must also take steps to better account for historic and current levels of methane emissions that do not undercount methane leaks. Therefore, the proposed rules should be revised to include more accurate estimates of methane leaks from the natural gas system.

<sup>&</sup>lt;sup>10</sup> See Deeper Decarbonization in the Ocean State: The 2019 Rhode Island Greenhouse Gas Reduction Study, Stockholm Envtl. Inst. & Brown Univ. Climate and Dev. Lab, at 20–23 (2019), available at https://www.sei.org/wp-content/uploads/2019/09/deeper-decarbonization-in-the-ocean-state.pdf; see also Rhode Island Greenhouse Gas Emissions Reduction Plan, R.I. Exec. Coordinating Council on Climate Change (2016), available at http://climatechange.ri.gov/documents/ec4-ghg-emissions-reduction-plan-final-draft-2016-12-29clean.pdf (using data that assumes a lower gas leakage rate).

<sup>&</sup>lt;sup>11</sup> See Kathryn McKain et al., *Methane Emissions from Natural Gas Infrastructure and Use in the Urban Region of Boston, Massachusetts* (2015), *available at* https://www.pnas.org/content/pnas/112/7/1941.full.pdf.

Maine should consider adopting a method similar to that used by Massachusetts DEP to measure methane leaks. As observed in Massachusetts DEP's *Statewide Greenhouse Gas Emissions Level: 1990 Baseline and 2020 Business As Usual Projection Update*, the SIT natural gas and oil systems module "does not contain certain values needed to determine leak emissions from the transmission or distribution of natural gas."<sup>12</sup> Thus, to calculate emissions factors for natural gas systems, Massachusetts uses a combination of emission factors from the SIT, from a report prepared by ICF International, and from an April 2015 study that measured equipment emissions to estimate current emission factors.<sup>13</sup> These emissions factors are also combined with data on the most recent miles of pipeline, number of services, and number of metering and regulating stations.<sup>14</sup> With regard to miles of pipeline, the emissions factors vary depending on whether pipeline is made from cast iron, cathodically-protected steel, cathodically unprotected steel, plastic, etc.<sup>15</sup> While Maine's natural gas transmission and distribution system is newer than Massachusetts' system, Maine's system is still leak prone and a Massachusetts-type accounting method would take the age of Maine's system into consideration.

In sum, to avoid significantly undercounting emissions from natural gas systems, Maine should consider adopting an approach like that employed by Massachusetts for measuring methane leaks.

## **3.** The proposed rules appear to assume that impoundment hydropower facilities produce no GHG emissions.

The proposed rule does not recognize the biogenic carbon and methane emissions that result from impoundment-style hydroelectric power dams. All boreal, cold northern impoundment dams release greenhouse gases, especially methane and carbon dioxide.<sup>16</sup> While emissions vary

<sup>14</sup> Id.

<sup>15</sup> *Id.* at 17-18.

<sup>16</sup> Illisa B. Ocko & Steven P. Hamburg, *Climate Impacts of Hydropower: Enormous Differences among Facilities and over Time*, 53 *Envtl. Sci. & Tech.* 14070–82 (December 3, 2019), *available at* <u>https://doi.org/10.1021/acs.est.9b05083</u>; A. Levasseur, S. Mercier-Blais, Y.T. Prairie, A. Tremblay, C. Turpin, *Improving the accuracy of electricity carbon footprint: Estimation of hydroelectric reservoir greenhouse gas emissions.* 136 Renewable and Sustainable Energy Reviews 110433 (2021), *available at* <u>https://doi.org/10.1016/j.rser.2020.110433</u>; Laura Scherer & Stephan Pfister, *Hydropower's Biogenic Carbon Footprint, PLOS One* (September 14, 2016), *available at* https://doi.org/10.1371/journal.pone.0161947.

<sup>&</sup>lt;sup>12</sup> Mass. Dep't of Envtl. Prot., *Statewide Greenhouse Gas Emissions Level: 1990 Baseline and 2020 Business As Usual Projection Update*, at 17 (July 2016), *available at <u>https://www.mass.gov/doc/statewide-greenhouse-gas-ghg-emissions-baseline-projection-update-including-appendices-a-b/download; see also Lost and Unaccounted for Gas*, ICF International (Prepared for Mass. Dep't of Pub. Utilities) (December 23, 2014), *available at <u>https://www.mass.gov/doc/icf-international-report-lost-and-unaccounted-for-gas/download</u>.*</u>

<sup>&</sup>lt;sup>13</sup> Mass. Dep't of Envtl. Prot., *Statewide Greenhouse Gas Emissions Level: 1990 Baseline and 2020 Business As Usual Projection Update*, at 18 (July 2016), *available at* <u>https://www.mass.gov/doc/statewide-greenhouse-gas-ghg-emissions-baseline-projection-update-including-appendices-a-b/download</u>.

based on a dam's age, surface area, depth, pre-impoundment clearing, altitude, and other physical conditions, the State should not automatically assume that all hydroelectric power is low-or-zero carbon. Newer (less than 10 years old) impoundment style dams release a large amount of methane and carbon dioxide as a result of the decomposition of submerged biogenic material. Ignoring methane and CO<sub>2</sub> emissions from impoundment style dams may cause the State to miscalculate state-wide emissions and emissions from hydropower electricity.

Accordingly, to the extent possible, the rules should account for GHG emissions from electricity production by producers and importers of hydropower that use impoundment facilities and those emissions should be included in the inventory. The definition of "biogenic emissions" at Proposed Chapter 167(1)(B) should be updated to include biogenic emissions that result from impoundment-style dams. In addition, any imported electricity from Canada that is largely hydropower-sourced should not be assumed to be zero-carbon electricity.

#### 4. The proposed rules appropriately would measure and track carbon sinks.

Because the rules will measure *net* GHG emissions, there are, correctly, proposed rules for accounting for carbon sinks; *e.g.*, forests, vegetation, soils, etc. The proposed rules specifically mandate that Maine include estimates of sequestration from forests, wetlands, soil, and inland and coastal waters. We note that 38 M.R.S.A. §576-A(4)(D) contemplates the possibility of establishing carbon offset programs, specifically stating that DEP may adopt rules for "establish[ing] a mechanism for crediting voluntary measures that quantifiably and reliably sequester additional carbon in forests, farms and coastal lands in the State or by the use of materials that sequester additional carbon," and look forward to commenting on any proposed future rules establishing a carbon offset program.<sup>17</sup>

## 5. While the proposed rules appropriately include provisions for estimating the GHG emissions from biogenic sources, such as biomass, these rules should be clarified to ensure that such emissions are accurately accounted for.

Biogenic sources, including biomass used for electricity production, are a significant source of GHG emissions,<sup>18</sup> and the proposed rules appropriately include provisions for estimating these GHG emissions. However, the rules should clarify how biogenic emissions will be reported. The proposed rules state that emission factors from 40 C.F.R. Part 98 should be used to calculate

<sup>&</sup>lt;sup>17</sup> Should the State develop a carbon offset program as contemplated by 38 M.R.S.A. §576-A(4)(D), then any carbon offset should be *Real*, in that carbon sequestration has actually occurred; *Verified*, in that the offset is recorded and tracked by a reputable entity; *Permanent*, in that the sequestered carbon is not re-released in the future; and *Additional*, in that the carbon being sequestered would not have been but for this measure.

<sup>&</sup>lt;sup>18</sup> Thomas Walker et al., *Biomass Sustainability and Carbon Policy Study*, Manomet Center for Conservation Studies (Prepared for Mass. Dep't of Energy Res.), at 27, 96-112 (June 2010), *available at* <u>https://www.mass.gov/doc/manometbiomassreportchapter1pdf/download</u>.

biogenic emissions from wood and wood waste used in the industrial, electric power, and commercial sectors. *See* Proposed Chapter 167(4)(A)(3)(a)(i)-(ii). The rules should specify which emission factors from 40 C.F.R. 98 should be used to calculate biogenic emissions.

Moreover, because 40 C.F.R. Part 98 exempts biomass sources from GHG reporting requirements in certain instances, *see, e.g.*, 40 C.F.R. §98.2(b)(2), the Maine tracking and reporting rules should clarify that there are no exemptions for biogenic emissions reporting and that *all* biogenic emissions from wood and wood waste used in the industrial, electric power, and commercial sectors must be included in GHG inventory estimates. DEP's most recent biennial report on progress toward GHG reduction goals, submitted to the Maine Legislature in January 2020, did not include emissions from biomass combustion;<sup>19</sup> in order to develop an accurate account of Maine's emissions, all of Maine's emissions from biomass combustion should be included in the inventory.

# 6. The proposed rules should be revised to include language to require that gross annual GHG emissions be compared to Maine's mandates for gross GHG emissions levels established pursuant to 38 M.R.S.A. §576-A.

Proposed Chapter 167(5)(B)(3) states that "[f]inal *net* GHG emissions shall be compared to the Maine goal of carbon neutrality by 2045 and reported for all years in the period of 1990-2045." *Id.* (emphasis added). However, 38 M.R.S.A. §576-A(1), (3) provides that by 2030, "the State shall reduce *gross* annual greenhouse gas emissions to at least 45% below the 1990 gross annual greenhouse gas emissions level," and that by 2050, "the State shall reduce *gross* annual greenhouse gas emissions to at least 80% below the 1990 gross annual greenhouse gas emissions to at least 80% below the 1990 gross annual greenhouse gas emissions level." *Id.* (emphasis added).

Although 38 M.R.S.A. §576-A(4) requires DEP to adopt rules to *track and report* annual net GHG emissions and Governor Mills issued an executive order in 2019 seeking to achieve carbon neutrality by 2045,<sup>20</sup> the proposed final sentence of the regulations may be construed to suggest that Maine *only* has a goal of carbon neutrality, rather than a statutory mandate of achieving an 80% reduction in *gross* GHG emissions by 2050, with interim mandates for reductions in GHG emission prior to that date. The proposed rules' reference to reaching carbon neutrality by 2045 could also be misconstrued to imply that Maine can "net out" any greenhouse gas emissions, as opposed to only the last 20% as permitted under current law.

Therefore, language should be added under Proposed Chapter 167(4) to require that the annual calculations of gross GHG emissions conducted under the proposed rules be compared to Maine's mandates for gross GHG emissions reductions established pursuant to 38 M.R.S.A. §576-A. This will ensure consistency with the proposed reporting of net annual emissions

<sup>&</sup>lt;sup>19</sup> Eighth Biennial Report on Progress toward Greenhouse Gas Reduction Goals, Maine DEP, at 4-5 (January 13, 2020), available at <u>https://www.maine.gov/dep/commissioners-office/kpi/details.html?id=606898</u>.

<sup>&</sup>lt;sup>20</sup> Office of Governor Janet T. Mills, Exec. Order No. 10 FY 19/20 (September 23, 2019).

relative to the carbon neutrality goal and consistency with the requirements of 38 M.R.S.A. Chapter 3-A.

Thank you for your consideration of the proposed changes outlined above. We appreciate the work of DEP in drafting these proposed rules and DEP's consideration of our joint comments.

Sincerely,

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