

This document has been prepared as part of the implementation project of **Legal Pathways to Deep Decarbonization** (Michael B. Gerrard and John C. Dernbach, eds. Environmental Law Institute [2019]) (LPDD). For background information on the project, see <https://lpdd.org>

IMPOSITION OF A TAX ON THE GREENHOUSE GAS CONTENT OF FOSSIL FUELS USED BY COMMERCIAL SHIPPING VESSELS IN ARCTIC CIRCLE WATERS

I. Introduction

Pursuant to the Protocol for the Sabin Center's Legal Pathways to Deep Decarbonization Project, Allen & Overy (A&O) drafted model legislation based on recommendations from the book *Legal Pathways to Deep Decarbonization*. A&O selected the recommendation from Chapter 17 on Shipping that Congress should consider imposing special requirements on shipping in the Arctic. In response to this recommendation, A&O drafted a proposal to amend the Internal Revenue Code of 1986 to introduce a tax on the greenhouse gas content of fossil fuels used by commercial shipping vessels in Arctic Circle waters (the **Arctic Shipping Tax Act** or the **Bill**).

II. Background

The prospect of an ice-free Arctic Ocean continues to draw nearer as climate change hastens the melting of Arctic sea-ice. Estimates indicate minimum levels of Arctic ice have declined 33% since 1979.¹ The loss of snow and ice cover and thawing of permafrost have contributed to the Arctic region warming at twice the global rate, leaving its fragile environment particularly vulnerable to the effects of greenhouse gas (GHG) emissions.²

Thinning polar sea ice, however, presents a significant commercial opportunity for the international shipping industry, as the opening of new Arctic routes has the potential to dramatically shorten voyages and increase profits. Shipping routes such as the Northwest Passage north of Canada and the Northeast Passage north of Russia, including the Northern Sea Route, were previously inaccessible without the assistance of an icebreaker except during the summer melting season.³ In 2018, however, a Norwegian ship traveling from South Korea to France crossed the Northern Sea Route without an icebreaker in the winter, while reducing the typical distance of such a journey by three thousand nautical miles.⁴

Experts estimate that while the Northern Sea Route reduces voyage distance by approximately 40% between Northern Europe and Japan, there are also “no general climate benefits to utilizing the Northern Sea Route, even with cleaner fuels, since the additional impact of emissions in the Arctic more than offsets the effect of shorter voyages.”⁵ As recent studies indicate that overall shipping activity in the Arctic will increase by more than 50% between 2012 and 2050 due to the cost savings per ton of freight transported from using the shorter Arctic shipping routes,⁶ policymakers will have to find ways to mitigate the significant local and global environmental impacts presented by such a trade-off.⁷

At the 10th Arctic Council Ministerial Meeting in 2017, foreign ministers signed the Fairbanks Declaration, which attests that the pace and scale of continued Arctic warming depend on future releases of GHG emissions and short-lived climate pollutants, and reaffirms the pressing global need to limit such emissions. Shipping voyages through Arctic waters emit GHGs and other pollutants directly into the Arctic environment and disturb

¹ U.S. Global Change Research Program. “[Arctic Sea Ice Extent](#).”

² UN Environment – Climate & Clean Air Coalition. “[Arctic Countries Commit to Reduce Black Carbon Emissions by as Much as a Third](#).” May 12, 2017.

³ European Federation for Transport and Environment AISBL. “[Arctic Shipping | Transport & Environment](#).”

⁴ Eoin Bannon. “[Fears for Arctic ecosystem as shipping milestone reached](#).” European Federation for Transport and Environment AISBL. February 28, 2018.

⁵ Haakon Lindstad, Ryan M. Bright, and Anders H. Strømman. “[Economic savings linked to future Arctic shipping trade are at odds with climate change mitigation](#).” Transport Policy, Volume 45, Pages 24-30. January 2016.

⁶ European Federation for Transport and Environment AISBL. “[Arctic Shipping | Transport & Environment](#).”

⁷ Haakon Lindstad, Ryan M. Bright, and Anders H. Strømman. “[Economic savings linked to future Arctic shipping trade are at odds with climate change mitigation](#).” Transport Policy, Volume 45, Pages 24-30. January 2016.

the sea-ice cover, reducing the albedo effect and thus perpetuating and accelerating dangerous cycles of global warming through positive feedback loops.⁸ In particular, such voyages release black carbon, a soot particle byproduct of fuel combustion, which, when deposited onto ice, absorbs heat and blocks ice's usual reflective properties, leading to an increase in the absorption of the sun's rays.⁹ This reaction reduces the albedo effect thereby contributing to ice melting and subsequent increases in warming.¹⁰ Diesel fuel engines—prevalent among commercial ships—are one of the primary emitters of black carbon aerosols.¹¹ In the Fairbanks Declaration, the Arctic Council nations, including the United States, set targets to limit black carbon emissions between 25 and 33 percent below 2013 levels by 2025 in a bid to slow Arctic warming.¹² According to recent reports, however, the United States has pulled out from joint reduction targets, thus hampering multilateral efforts to address climate change in the Arctic.¹³

In addition, research shows that in 2015, heavy fuel oil (HFO) made up 57% of the nearly half million tonnes of fuel consumed by ships in the International Maritime Organization (IMO) Arctic, with general cargo vessels consuming the most HFO, followed by oil tankers and cruise ships.¹⁴ HFO is a highly viscous marine fuel composed of compounds that are not prone to environmental degradation, and which break down particularly slowly in colder marine environments like the Arctic.¹⁵ Combustion of HFOs produces high levels of pollutants such as particulate matter, black carbon, sulphur dioxide (SO₂), and nitrogen oxide (N₂O), which endanger Arctic ecosystems and pose substantial risks to the region's indigenous residents who depend on marine resources.¹⁶ Experts recognize the serious consequences associated with a HFO spill in the Arctic, as the region's lack of infrastructure, its various navigational hazards, and its extreme weather conditions inhibit prompt spill response efforts, while HFO's composition renders it extremely difficult to recover from the environment.¹⁷ Though the international shipping community has banned the use of HFOs in the Antarctic, regulators have yet to agree on adopting a similar ban in the Arctic.¹⁸

Beyond the risks associated with fuel combustion in the Arctic, large shipping vessels in the Arctic are disruptive in and of themselves, as they can exacerbate damage to fragile ice sheets and harm the approximately forty-two Arctic marine mammal subpopulations directly exposed to open-water vessel transits.¹⁹ Over the long term, Arctic shipping may also contribute to the risk of methane (CH₄) slip, either through the leakage of unburned gas from engines fueled by liquefied natural gas (LNG) into the atmosphere²⁰ or through the escape of methane produced by subglacial biological activity, which is trapped in ice beds until the ice cover melts.²¹ Stringent regulation of commercial shipping in the Arctic is thus necessary to mitigate the severe environmental risks such activity poses to the Arctic region and the world at large.

III. Carbon Pricing Schemes and Arctic Shipping Emissions

Because Arctic shipping has the potential to significantly increase the rate of global warming, the U.S. Congress should institute its own measures in the face of stagnant multilateral efforts to enact regulation. A carbon tax on Arctic shipping emissions could effectively mitigate the negative consequences of Arctic shipping, though the

⁸ U.S. Global Change Research Program. "[Arctic Sea Ice Extent](#)."

⁹ UN Environment – Climate & Clean Air Coalition. "[Arctic Countries Commit to Reduce Black Carbon Emissions by as Much as a Third](#)." May 12, 2017.

¹⁰ *Id.*

¹¹ Tomsk Polytechnic University. "[Scientists discovered where black carbon comes from in the Arctic in winter and summer](#)." American Association for the Advancement of Science. February 15, 2019.

¹² UN Environment – Climate & Clean Air Coalition. "[Arctic Countries Commit to Reduce Black Carbon Emissions by as Much as a Third](#)." May 12, 2017.

¹³ Tarmo Virski and Anne Kauranen. "[Arctic black carbon work hampered by U.S. and Russia, says Finland](#)." Reuters. March 20, 2019.

¹⁴ International Council on Clean Transportation (ICCT), Climate Works Foundation. "[Prevalence of heavy fuel oil and black carbon in Arctic shipping, 2015 to 2025](#)." UN Environment – Climate & Clean Air Coalition. 2017.

¹⁵ Clean Arctic Alliance. "[HFO-Free Arctic](#)." 2020.

¹⁶ *Id.*

¹⁷ *Id.*

¹⁸ Anastassios Adamopoulos. "[IMO facing call to adopt HFO ban in Arctic](#)." Lloyd's List. January 14, 2020.

¹⁹ Donna D. W. Hauser, Kristin L. Laidre, and Harry L. Stern. "[Vulnerability of Arctic marine mammals to vessel traffic in the increasingly ice-free Northwest Passage and Northern Sea Route](#)." Proceedings of the National Academy of Sciences of the United States of America. July 17, 2018.

²⁰ The Maritime Executive. "[Methane Slip Significant for Spark Ignition Engines](#)." March 1, 2016.

²¹ University of Bristol. "[Melting ice sheets release tons of methane into the atmosphere](#)." Science Daily. January 3, 2019.

political feasibility of such measures remains in question. Carbon taxes function by setting a price per unit of carbon emissions that is levied on the production, distribution, or use of fossil fuels. By directly obligating emitters to bear the costs of the social harm caused by their pollution, carbon taxes incentivize polluters to reduce emissions and find more efficient alternative energy sources.

Though climate assessments typically focus on CO₂ emissions, various other pollutants, including N₂O, SO₂, and CH₄, also exacerbate global warming.²² As such, some carbon tax proposals have employed carbon dioxide equivalent (CO₂-e) as a measurement in their carbon tax calculations rather than only assessing CO₂ emissions.²³ CO₂-e is a term used to describe different GHGs using a common unit, signifying the amount of CO₂ that would have the equivalent warming impact of any quantity or type of GHG.²⁴ This focus on the climate impact or Global Warming Potential (GWP) of GHG emissions thus offers a more holistic method through which polluters can be held accountable for the effects of their emissions in terms of contributing to anthropogenic climate change and harming the environment.²⁵ Such an approach is particularly relevant in the context of imposing a carbon tax on maritime transport in the Arctic, as “exhaust gas from ship engines [usually] contains carbon monoxide, sulphur oxides, nitrogen oxides, methane, organic carbon and black carbon...all of which have adverse effects on [the] climate.”²⁶

In increasing numbers, economists have joined forces with environmental experts to firmly support carbon taxation as the most cost-effective lever to reduce carbon emissions at the scale and speed necessary to address climate change.²⁷ Carbon taxes may also have advantages over regulations that directly restrict certain types of production or fuel use, as they allow businesses the opportunity to determine the most effective way to adapt to environmental costs.²⁸ The Energy Information Administration estimates that a tax rate of \$25 per metric ton of carbon could reduce U.S. carbon emissions by as much as 28% from 2012 to 2030.²⁹ Imposing a carbon tax on commercial shipping in the Arctic therefore has the potential to act as a sufficient deterrent to increased rates of Arctic shipping due to the cost and time savings associated with newly accessible Arctic shipping routes.

IV. Overview of the Proposed Bill

The proposed Arctic Shipping Tax Act would impose a tax on the greenhouse gas content of fossil fuels used by commercial shipping vessels engaged in international shipping in Arctic Circle waters in the thirty days prior to calling at a United States port. The Bill limits its scope to Arctic Circle waters in order to ensure the tax is imposed within a clearly defined geographical boundary that will encompass the main Arctic shipping routes. The concept of port jurisdiction under international law—also codified in U.S. statute—forms the legal basis for the Bill’s regulation of Arctic shipping. Port jurisdiction enables the U.S. government to impose regulations on any ship that docks at a U.S. port.

The Bill institutes a 30-day window in which the tax applies to preclude any tax avoidance loopholes that could arise if the tax were imposed on covered vessels in Arctic Circle waters following departure from the “originating” port of the covered vessel. In such case, vessels would be able to dock at the port of another country prior to calling at a U.S. port in order to avoid the tax on their Arctic shipping emissions. The length of the 30-day window is modeled on the 2018 voyage of *Venta Maersk*, the first large container ship to journey through the Arctic Ocean, sailing from the Russian Far East region to a German port by way of the Northern Sea Route in only 23 days.³⁰ As suggested by such an example, the Bill’s imposition of a tax on vessels that have traversed

²² European Commission. “[Shorter climate routes not necessarily more climate friendly.](#)” Science for Environmental Policy, Issue 436. November 19, 2015.

²³ H.R.763 — 116th Congress (2019-2020). [Energy Innovation and Carbon Dividend Act of 2019](#). January 24, 2019.

²⁴ Matthew Brander. “[Greenhouse Gases, CO₂, CO₂e, and Carbon: What Do All These Terms Mean?](#)” *Econometrica*. August 2012.

²⁵ European Commission. “[Shorter climate routes not necessarily more climate friendly.](#)” Science for Environmental Policy, Issue 436. November 19, 2015.

²⁶ *Id.*

²⁷ The Wall Street Journal. “[Economists’ Statement on Carbon Dividends.](#)” January 17, 2019.

²⁸ Leslie Hook. “[Surge in US economists’ support for carbon tax to tackle emissions.](#)” *Financial Times*. February 17, 2019.

²⁹ Michael B. Gerrard and John C. Dernbach. “[Legal Pathways to Deep Decarbonization.](#)” Chapter 2. Environmental Law Institute. March 2019.

³⁰ Avery Thompson. “[A Container Ship Is Sailing Through the Arctic for the First Time.](#)” *Popular Mechanics*. September 18, 2018.

Arctic Circle waters in the 30 days prior to calling at a U.S. port will likely be sufficient to cover most, if not all, Arctic shipping voyages.

The Bill also establishes that the tax will only apply to commercial shipping vessels engaged in “international shipping,” which is defined as “all ships calling at United States ports that have called at the port of any other country prior to calling at a U.S. port.” The tax levied under the Bill exclusively applies to vessels engaged in international shipping in order to narrow the scope of the tax to large commercial voyages crossing through the Arctic Circle, and to avoid discriminately taxing the U.S. domestic shipping industry in areas in close proximity to or within the Arctic Circle. In Alaska, for example, the northern portion of the state is located within the Arctic Circle, and many Alaskan municipalities are primarily accessed via marine transportation. The imposition of an Arctic shipping tax that covers vessels engaged in inter-Alaskan commercial shipping would thus impose a significant economic burden on local producers and consumers who depend upon shipping for essential commodities. The definition of international shipping used in the Bill also precludes the aforementioned tax evasion loophole by ensuring that those vessels covered under the tax will remain subject to the tax even if they have docked at the port of another country prior to calling at a U.S. port.

The amount of the tax is calculated as the greenhouse gas content of the covered fuel used multiplied by the carbon tax rate. This subsection is based upon the Energy Innovation and Carbon Dividend Act of 2019 (**H.R.763**), and similarly employs carbon dioxide equivalent as the metric used to calculate the greenhouse gas content of covered fuels so as to more fully address the climate impact of GHG emissions. The initial rate of the tax is set at \$10 and will increase annually over the course of a ramp-up period by \$5 until the tax rate reaches \$25. Ten years after the initial imposition of the tax, the tax rate will reach the goal rate of \$30. The low initial tax rate and subsequent ramp-up period are intended to lessen the immediate financial impact of the tax on commercial shipping companies and other relevant actors.

The ramp-up period established in the Bill follows the model of Canadian province British Columbia’s Carbon Tax Act, which began in July 2008 at a rate of CAD 10 per metric ton of carbon and increased annually by increments of CAD 5 towards its goal price of CAD 50 per ton of carbon in 2021.³¹ Widely considered the standard-bearer for carbon pricing schemes in the Western Hemisphere, the successful implementation of British Columbia’s carbon tax demonstrates that it is possible to reduce emissions alongside economic growth. From 2007 to 2016, British Columbia’s real GDP grew by 19%, while net emissions declined by 3.7%.³² On this basis, the Bill establishes a ramp-up period that takes into account projected future growth in vessel traffic in the Arctic as a result of increasingly ice-free Arctic shipping routes.

Because of the relative novelty of Arctic shipping, there is not yet sufficient data on the actual cost and time differentials between Arctic routes and traditional routes that do not pass through Arctic Circle waters, particularly where the routes involve stops at U.S. ports. However, it is clear that as the sea-ice cover continues to diminish, the Arctic is likely to be a faster, more direct route between Asia and ports in Europe and North America during certain seasons.³³ According to a recent study, the frequency of navigable periods in the Arctic will double by midcentury for standard open water vessels, with routes across the central Arctic becoming available.³⁴ By late century, moderately ice-strengthened vessels are likely to enable Arctic transits for 10 to 12 months out of the year.³⁵ The study projects that European routes to Asia via the Arctic will be 10 days faster on average than alternatives by midcentury, while North American routes are likely be four days faster.³⁶ As data on the average cost savings from Arctic shipping emerges over time, legislators ought to consider such figures in respect of the rate of the tax and amend the Bill as necessary to ensure the rate of the tax acts as a sufficient deterrent to the widespread adoption of Arctic shipping practices.

³¹ Carbon Tax Center. “[British Columbia / Canada.](#)”

³² Government of British Columbia. “[British Columbia’s Carbon Tax.](#)”

³³ Jugal K. Patel and Henry Fountain. “[As Arctic Ice Vanishes, New Shipping Routes Open.](#)” *The New York Times*. May 3, 2017.

³⁴ N. Melia, K. Haines, and E. Hawkins. “[Sea ice decline and 21st century trans-Arctic shipping routes.](#)” *Geophysical Research Letters*, Volume 43, Issue 18. August 23, 2016.

³⁵ *Id.*

³⁶ *Id.*

The Bill stipulates that the tax is to be paid by the owners or agents of a covered vessel, which would encompass the operator or lessee, only once before the vessel commences discharging or loading at the U.S. port at which it has docked. The timing of the imposition of the tax is modeled on a provision in the New York Terminal Conference (NYTC) Tariff, which grants the NYTC the right to require payment in full of any and all charges before cargo leaves the terminal facility.³⁷ In § 4474, the Bill provides a list of definitions, including “covered vessel,” “commercial cargo,” and “port,” as well as specified exceptions for each definition. The purpose of these definitions and exceptions is to clarify the circumstances under which the tax may or may not apply. The language and format of those definitions are based on the Harbor Maintenance Tax.³⁸ In addition, § 4474 includes several definitions adopted from H.R.763, including the definitions for “carbon dioxide equivalent,” “covered fuel,” “crude oil,” “global warming potential,” “greenhouse gas,” and “greenhouse gas content.”

In § 4475, the Bill sets out provisions relating to enforcement, including recordkeeping and penalties. The recordkeeping provision requires commercial vessels to be equipped with technology that would allow them to accurately track their geographical location, including in Arctic Circle waters, and to record the vessel’s use of covered fuels while traversing Arctic waters. Resolution MEPC.282(70) (the **Resolution**) of the IMO’s Marine Environment Protection Committee indicates that the necessary technology exists for vessels to track their fuel usage as required under the Bill.³⁹ According to the Resolution, amendments to MARPOL Annex VI mandating a data collection system for fuel oil at the IMO entered into force on March 1, 2018.⁴⁰ Starting with calendar year 2019, as part of a Ship Energy Efficient Management Plan, vessels of 5,000 gross tonnage or greater are required to track and record consumption data for each type of fuel used as well as data relevant to the energy efficiency of ships, including distance travelled,⁴¹ and submit such information to their flag states and the IMO.⁴²

In addition, the prevalence of ship GPS navigation suggests that commercial shipping vessels are likely to possess the technological capacity necessary to track their point of entry into and exit from the Arctic Circle during a voyage.⁴³ The penalty for inaccurate recordkeeping or outright failure to pay the tax is a fine of \$75 per unit of greenhouse gas content of covered fuels used in Arctic Circle waters, or \$75,000, whichever is greater. The structure of the penalty price in the Bill reflects that of oil and hazardous substance liability under U.S. Code Title 33,⁴⁴ however the penalty amounts have been reduced to correspond with the harm associated with recordkeeping or tax non-compliance.

V. Potential Challenges

The Bill may face opposition due to various external factors. Though it is widely accepted that carbon pricing schemes can be an effective tool to reduce emissions, it is difficult to predict the extent to which a carbon tax on Arctic shipping emissions would combat the environmental threats facing the Arctic. Globally, the adoption of carbon pricing regulation has involved substantial challenges, particularly in the United States where there is significant resistance against such proposals. Though eleven U.S. states have active carbon pricing programs, efforts to implement such a scheme at the federal level have been stymied by political opposition.⁴⁵

In January 2019, Congressman Ted Deutch of Florida introduced H.R.763, the Energy Innovation and Carbon Dividend Act of 2019, in the House of Representatives. The bill would impose a fee on the carbon content of fuels that contribute to GHG emissions where the fee is equal to the GHG content of the fuel multiplied by the carbon

³⁷ New York Terminal Conference. “[Material Terminal Schedule No. 011408.](#)” August 15, 2019.

³⁸ 26 U.S. Code § 4462.

³⁹ Marine Environment Protection Committee of the International Maritime Organization. “[Resolution MEPC.282\(70\) – 2016 Guidelines for the Development of a Ship Energy Efficiency Management Plan \(SEEMP\).](#)” Adopted October 28, 2016.

⁴⁰ *Id.*

⁴¹ European Commission. “[MEMO: 72nd session of the Marine Environment Protection Committee \(MEPC 70\) at the International Maritime Organization \(IMO\).](#)” April 13, 2018.

⁴² International Maritime Organization. “[Energy Efficiency Measures.](#)”

⁴³ Bright Hub Engineering. “[Marine Global Positioning System – GPS Navigation made simple.](#)” January 20, 2009.

⁴⁴ 33 U.S. Code § 1321.

⁴⁵ Center for Climate and Energy Solutions. “[U.S. State Carbon Pricing Policies.](#)” June 2020.

fee rate.⁴⁶ The carbon fee rate would begin at \$15 and increase by \$10 each year, subject to further adjustments based on progress towards meeting specified emissions reduction targets.⁴⁷ Notably, under H.R.763, the fees collected would be deposited into a Carbon Dividend Trust Fund and used for administrative expenses and divided payments to U.S. residents.⁴⁸ Such a tax rebate mechanism is designed to offset the financial burden of the fees on consumers. Since its introduction, however, H.R.763 has not progressed further in Congress, in part due to partisan opposition. Though the proposed Bill specifically targets Arctic shipping and is thus significantly more limited and targeted in scope, there is reason to expect that it would face comparable opposition to H.R.763.

With respect to the legislation itself, the proposed Bill may not provide sufficient coverage of all requisite concerns despite best efforts to address relevant issues and mitigate any unintended consequences. For example, despite including language to exclusively limit the scope of the bill to international commercial shipping, certain communities, such as those in Alaska located in close proximity to or within the Arctic Circle, may still be discriminately impacted by the proposed tax. On the basis of port jurisdiction, the U.S. can regulate all ships that call at U.S. ports as long as the regulation is in accordance with the general principles of non-discrimination, good faith, and non-abuse of right. As such, the Bill could be subject to challenge if it is determined to be discriminatory. The proposed definition of international shipping may be sufficient to prevent harm to Alaskan communities and the local Alaskan economy, however this would depend on the level at which vessels engaged in international shipping, as defined, call at Alaskan ports. In addition, with respect to the proposed penalty for non-compliance, the penalty amount has been arbitrarily selected due to the difficulty of locating comparable precedents.

Finally, the Bill does not address revenue allocation or establish a dedicated use for the revenue of the tax, which may present a significant political drawback. The fee dividend provided to all U.S. residents under H.R.763 does not have the same applicability in the context of this Bill, as the effects of a tax on Arctic shipping are likely to be localized in effect, primarily impacting the shipping industry and the communities that depend on this industry. As such, a dedicated use for the tax revenue from the Bill wherein the revenue is allocated towards efforts to enforce environmental regulations in the Arctic or towards other environmental protection efforts or research is a preferred alternative, particularly as it would further contribute to global decarbonization efforts. However, such a dedicated use would also involve significant inter-agency coordination to implement and would likely face substantial resistance from industry groups affected by the tax. As such, the Bill in its current form does not include a dedicated use for the tax revenue from the Bill. Legislators are encouraged to consider amending the Bill as necessary in the future to institute a dedicated use for the revenue of the Arctic shipping tax.

VI. Conclusion

The Arctic requires immediate attention and swift legislative action. Due to the environmental risks detailed above, including GHG emissions, black carbon, and HFOs, the Arctic is confronting severe climate warming, the effects of which reverberate worldwide. The population, health, and overall well-being of Arctic marine animal populations and indigenous communities are seriously at risk. As the sea-ice cover continues to melt and shipping lanes open up further, Arctic shipping will grow increasingly prevalent and pose a severe threat to the environment. In order to combat this nascent trend, the Arctic Shipping Tax Act should be imminently considered by the U.S. legislature and passed into law.

⁴⁶ H.R.763 — 116th Congress (2019-2020). [Energy Innovation and Carbon Dividend Act of 2019](#). January 24, 2019.

⁴⁷ *Id.*

⁴⁸ H.R.763 — 116th Congress (2019-2020). [Energy Innovation and Carbon Dividend Act of 2019](#). January 24, 2019.