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DETERMINATION OF STATEWIDE EMISSIONS LIMIT FOR 2050

Pursuant to the Global Warming Solutions Act (Chapter 298 of the Acts of 2008, "GWSA," and as codified at M.G.L. c. 21N, "Chapter 21N"), and having consulted with the Department of Environmental Protection and Department of Energy Resources, **I hereby establish a 2050 statewide emissions limit of net zero greenhouse gas emissions** defined as follows:

> A level of statewide greenhouse gas emissions that is equal in quantity to the amount of carbon dioxide or its equivalent that is removed from the atmosphere and stored annually by, or attributable to, the Commonwealth; provided, however, that in no event shall the level of emissions be greater than a level that is 85 percent below the 1990 level.

Background

In 2007, United Nations Intergovernmental Panel on Climate Change (IPCC) determined that global greenhouse gas (GHG) emissions should be reduced to a level "at least 80% below 1990 levels by 2050" in order to stabilize global atmospheric carbon dioxide (CO_2) concentrations at levels consistent with no more than a 2°C rise in global mean temperature above pre-industrial levels. That level was set in order to avoid a range of damaging and extreme (and in some cases irreversible) impacts to ecosystems, economies, and human communities around the world associated with greater than such a 2°C temperature increase.[1] While the IPCC recognized the need for both mitigation and adaptation, it concluded that "unmitigated climate change would, in the long term, be likely to exceed the capacity of natural, managed and human systems to adapt."[2]

In August 2008, Massachusetts adopted the IPCC's mid-century global emissions reduction target when it became one of the first states in the nation to create a comprehensive legal and regulatory emissions reduction framework for the purpose of addressing climate

[1] IPCC, *4th Assessment Report: Mitigation of Climate Change (Contribution of Working Group III)* (2007).
[2] IPCC, *4th Assessment Report: Synthesis Report* (2007).

change. Referencing the best-available science, including that from IPCC, the GWSA required among other things the adoption by January 1, 2011 of a 2020 statewide GHG emissions limit "between 10 per cent and 25 per cent below the 1990 emissions level" and the subsequent adoption of a 2050 emissions limit for the Commonwealth that is "at least 80 per cent below the 1990 level."[3]

Secretary of Energy and Environmental Affairs Ian A. Bowles issued a determination letter dated December 28, 2010, establishing the Commonwealth's legally binding statewide GHG emissions limit for 2020 at 25% below the 1990 level after determining it a responsible and achievable emissions reduction level that would, among other things, maximize opportunities to realize cost savings, increase energy independence, and promote growth in clean energy jobs in Massachusetts.[4]

Since the GWSA was passed, the Commonwealth has thrived while maintaining nation-leading rates of GHG emissions reductions. As detailed in the Commonwealth's 2018 Global Warming Solutions Act 10-Year Progress Report, Massachusetts' Gross State Product (GSP) increased by more than $91 billion (21%) from 2008 to 2017, and the Commonwealth's clean energy industry employs more than 110,000 people while contributing $13.2 billion (or about 2.5% of the annual GSP) to the Commonwealth's economy. Massachusetts has reduced its annual statewide GHG emissions by the equivalent of 21.1 million metric tons of CO_2 equivalent, achieving in 2017 emissions 22.4% below the 1990 level.

In October 2018 pursuant to direction given by the signatories of the 2016 Paris Agreement,[5] including the United States, the IPCC published its *Special Report on Global Warming of 1.5°C*. The report contains an assessment of the best available scientific, technical and socio-economic literature relevant to global warming of 1.5°C as well as a comparison between the likely impacts of global warming of 1.5°C and 2°C above pre-industrial levels. The report found that many, if not most, of the damaging, extreme and in some cases irreversible impacts that previously motivated global action to limit global warming to 2°C above pre-industrial levels are likely to occur unless such warming is limited to the lower level of 1.5°C.[6] Based on the results of integrated assessment modeling of 90 different global mitigation pathway scenarios, the IPCC determined that global GHG emissions reductions of at least net zero by 2050 were required to stabilize global atmospheric CO_2 concentrations at levels consistent with no more than a 1.5°C rise in global mean temperature above pre-industrial levels.[7]

Since at least April 2019, the Executive Office of Energy and Environmental Affairs (EEA), in consultation with the Department of Environmental Protection (MassDEP), the Department of Energy Resources (DOER) and other Commonwealth agencies, has been engaged in a planning process (2050 Decarbonization Roadmap) supported by quantitative pathway scenario analysis to identify technically and economically viable strategies for Massachusetts to reduce its GHG emissions by at least 80% in 2050, including pathways capable of achieving net

[3] Chapter 21N § 3(b) & 4(a); GWSA § 15.
[4] EEA, *Determination of Greenhouse Gas Emissions Limit for 2020* (Dec. 28, 2010).
[5] Decision of the 21st Conference of Parties of the United Nations Framework Convention on Climate Change to adopt the Paris Agreement (Jan. 29, 2016), para. 21.
[6] IPCC, *Special Report on Global Warming of 1.5°C* (Oct. 2018), Chap. 3 ("Impacts of 1.5°C of Global Warming on Natural and Human Systems").
[7] *Id.* at Chap. 2 ("Mitigation Pathways Compatible with 1.5°C in the Context of Sustainable Development").

zero emissions in 2050. On January 21, 2020, Governor Baker announced the Commonwealth's intent to pursue the more aggressive net zero target to further reduce emissions.

Recognizing the value that other stakeholders could bring to that process and the importance of the 2050 limit to the Commonwealth, EEA posted a Request for Comments on February 26, 2020, seeking additional consultation and comments from the public by April 10, 2020. The request contained a draft of this determination letter, requesting comment on the proposed 2050 net zero statewide emissions limit definition as well as the "not greater than" level of 2050 statewide greenhouse gas emissions to be included therein. A series of seven listening sessions across the Commonwealth were planned in support of EEA's public consultation and comment effort; however only two (in Worcester and Fall River) were held before the series was suspended for public health and safety.[8] EEA subsequently conducted a statewide listening session by webinar on March 27, which was afterward made available online. EEA has reviewed the more than 1,000 individual comment submissions received and I have considered that valuable input in making this determination.

Statutory Mandate

The GWSA "was passed to address the grave threats that climate change poses to the health, economy, and natural resources of the Commonwealth. The act is designed to make Massachusetts a national, and even international, leader in the efforts to reduce the greenhouse gas emissions that cause climate change."[9] The GWSA designates the Secretary of Energy and Environmental Affairs (Secretary) and MassDEP as the entities primarily responsible for implementing the act.

The GWSA requires that the Secretary shall, in consultation with MassDEP and the Department of Energy Resources (DOER), adopt separate statewide GHG emissions limits for 2020, 2030, 2040 and 2050.

Findings of Fact

Based on my expertise and experience as Secretary and before that Undersecretary for Climate Change, including representing Massachusetts in the U.S. Climate Alliance since June 2017; the findings and recommendations in the Massachusetts Clean Energy and Climate Plan for 2020, as updated; the findings and recommendations in the 2018 Massachusetts Global Warming Solutions Act 10-Year Progress Report; the findings and recommendations of the 2018 Massachusetts State Hazard Mitigation and Climate Adaptation Plan; the findings and recommendations of the IPCC 5th Assessment Report (2014) and Special Report on Global Warming of 1.5°C; and regional and Massachusetts-specific quantitative analysis conducted as part of EEA's 2050 Decarbonization Roadmap effort, I make the following findings:

- As identified and described by the IPCC, global warming and its associated climate change remain a grave threat to the health, economy, citizens, and natural resources of the Commonwealth.

[8] *See* COVID-19 Order No. 13 (March 23, 2020) (among other things, temporarily prohibiting gatherings of more than 10 people).
[9] *New England Power Generators Assoc. v. Dept. of Envt'l Prot.*, 480 Mass. 398, 399 (2018).

- The Commonwealth and its people are already experiencing damaging and life-threatening impacts caused by climate change.
- Sea level rise and increased storm-severity and frequency particularly threaten the Commonwealth's more than 3 million coastal residents with loss of life and potentially hundreds of billions of dollars of economic damage by 2100 if climate change is not mitigated.
- Inland flooding associated with unmitigated climate change threatens the health and welfare of citizens across the entire Commonwealth, with property damage estimates exceeding $60 billion.
- Unless mitigated on the pace, scale and scope identified by the IPCC, climate change is likely to exceed the capacity of natural, managed and human systems globally and in the Commonwealth to adapt to it.
- In order to avoid significantly damaging and potentially irreversible climate change, global atmospheric CO_2 concentrations should be stabilized at levels consistent with no more than a 1.5°C rise in global mean temperature above pre-industrial levels.
- To ensure no more than a 1.5°C rise in global mean temperature above pre-industrial levels, global GHG emissions should be reduced to at least net zero in 2050.
- Although it will require the rapid decarbonization of the Commonwealth's energy system, multiple technically viable pathways exist that are capable of economically and equitably delivering net zero statewide GHG emissions in 2050.
- A statewide emissions level of at least 85% below the 1990 level and complementary negative emissions level by or attributable to the Commonwealth are technically feasible using existing technologies including the protection and enhancement of natural sequestration resources in the Commonwealth and regionally.
- As it has to date, emissions reduction activity on the pace and scale recommended by the IPCC is likely to continue to present the Commonwealth with increased opportunities to realize cost savings and increased energy independence, and to promote growth in clean energy jobs in Massachusetts.

Determination of 2050 Limit

Based on the findings above, I hereby determine that net zero emissions by 2050, as defined above, is a reasonable and appropriate 2050 statewide emissions limit necessary to adequately protect the health, economy, people and natural resources of the Commonwealth and maintain Massachusetts critically important role as a national and international leader in the global effort to reduce the greenhouse gas emissions that cause climate change in a manner consistent with the goals of the GWSA.

4/22/2020
Date

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