Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
and
Department of Environmental Protection

Response to Comment on:

310 CMR 7.74 *Reducing CO_2 Emissions from Electricity Generating Facilities*

310 CMR 7.75 *Clean Energy Standard*

August 2017

Regulatory Authority:

M.G.L. c. 21A, §§ 2, 8, and 16
M.G.L. c. 21N, §§ 2(a)(5), 3(b)-(d), 4, and 7
and M.G.L. c. 111, §§ 2C and 142A – 142E

Corrected

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I. INTRODUCTION

This Response to Comment (RTC) document includes detailed responses to comments received on two new electricity sector regulations that the Massachusetts Department of Environmental Protection (MassDEP) and the Massachusetts Executive Office of Energy & Environmental Affairs (EEA) are establishing. The following are being jointly promulgated by the two agencies, with requirements effective in 2018:

- A new regulation ("Clean Energy Standard" or CES) will require retail electricity sellers to annually demonstrate the use of clean energy to generate an annually increasing percentage of their electricity sales (310 CMR 7.75).
- A new regulation ("Reducing CO_2 Emissions from Electricity Generating Facilities") will require large power plants in Massachusetts to comply with an annually declining limit (i.e., a "cap") on GHG emissions, thereby ensuring that clean energy programs, including the proposed Clean Energy Standard, reduce emissions in the state (310 CMR 7.74).

These two regulations are part of a larger rule-making that includes six regulations designed to ensure compliance with the Global Warming Solutions Act (GWSA). The other four regulations are discussed briefly below to provide context, but detailed comments and responses are included in separate response to comment documents.

This RTC also addresses two topics that were addressed by multiple commenters. First, updated data is presented to show that the regulations will ensure compliance with the GWSA emission limit for 2020. Second, legal issues raised by commenters in relation to 310 CMR 7.74 and 310 CMR 7.75 are addressed within the detailed comment and response summaries for those regulations. In some cases, these topics may be relevant for the other four regulations, but are discussed here because they were raised most often by commenters in relation to the electricity sector regulations.

This RTC begins with a background section that describes all six regulations, explains how the various agencies coordinated in development of the regulations, summarizes a 2016 court decision and Governor Baker's executive order that requires promulgation of these regulations, and updates calculations showing how the regulations work together to ensure compliance with the GWSA emission limit for 2020. Detailed comment summaries and responses follow for comments received on 310 CMR 7.74 and 310 CMR 7.75.

Additional information about the regulations is included in the Background Document (Technical Support Document or TSD) that was published when MassDEP proposed the regulations in 2016.[1]

[1] The TSD is available at http://www.mass.gov/eea/agencies/massdep/air/climate/section3d-comments.html.

II. LIST OF COMMENTERS

350 Massachusetts
Acadia Center
Advanced Biofuels USA
Advanced Energy Economy
Agnew, David
Agnew, Mary
Alliance for Industrial Efficiency
Archard, Kathryn
Arnoldi, Harriet
Associated Industries of Massachusetts (AIM)
Azarovitz, Janet
Bandler, Willa
Barrows, F. Jay (Rep.)
Barton, Donald
Bay State Gas Company
Bellafiore, Margaret
Belmont Municipal Light Department
Berkshire Gas Company
Better Environmental Solutions
Biomass Power Association
Bird, Melissa
Borrego Solar Systems, Inc.
Boston Climate Action Network
Boyle, Brian
Brainerd, Tim
Braintree Electric Light Department (BELD)
Britt, Carolyn
Brookfield Renewable
Burt, Lucile
Calpine Corporation
Cape Downwinders
Carbon Engineering
Ceres
Chicopee Electric Light Department
Clean Air Task Force (CATF)
Clean Water Action (CWA)
Climate Action Brookline
Climate XChange
Cogentrix Essential Power Investments, LLC
Columbia Gas
Concord Municipal Light Plant
Conservation Law Foundation
Curtis, Daniel
Danvers Municipal Light
Davis, Sabrina
Dean, Jack
Delano, Peter
Dighton Power
Domenici, Scott
Dominion Resources, Inc.
Dow, David
Dwyer, James (Rep.)
Dynegy
E2
Edwards, Jennifer
Eilbert, Natasha
Elders Climate Action
Energy Consumers Alliance of New England (ECANE)
Environment, MA
Environmental League of Massachusetts (ELM)
Eversource
Exelon
Faynshteyn, Nikolas
Feener, Kori
Ferguson, Kimberly (Rep.)
Ferry, Sarah
Fitchburg Gas and Electric Light Company
Flanagan, Jennifer (Sen.)
Flike, Kimberlee
Footprint Salem Harbor Development LP
Fox, Jean
Galkowski, Jan
Gallagher, Trish
Garb, James
Gates, Laurie
Georgetown Municipal Light Department
Gerke, Bill
Gobi, Anne (Sen.)
Grabbe, Alexandra
Graca, Wendy
Green Berkshires, Inc.
Groton Electric Light Department
Groveland Electric Light Department
Haley, Linda
Harrington, Shelia (Rep.)
Harvard School of Public Health
Hay, Stephen (Rep.)
Hingham Municipal Lighting Plant
Hively, Jan
Holden Municipal Light Department
Holt, Michael
Honore, Andrea
HQ Energy Services
Hudson Light and Power Department
Illes, Linda
Institute for Policy Integrity at NYU School of Law (NYU IPI)
ISO New England (ISO-NE)
Jones River Watershed Association (JRWA)
Jones, Bradley (Rep.)
Kane, Hannah (Rep.)
Kanzer, Bill
Keith, Michelle
Kolek, Carol
Kubit, Kathy
LaBate, Victoria
Lauenstein, Paul
Liberty Utilities
Littleton Electric Light and Water Department
Logan, Nan
Machaver, Bob
Magenau, Carolyn
Mallinson, Don
Mansfield Municipal Electric Department
Mardirosian, Raffi
Marum, Eileen

Massachusetts Municipal Wholesale Electric Company (MMWEC)
Massachusetts Water Resources Authority (MWRA)
Medeiros, Rachel
Meschino, Joan (Rep.)
Metropolitan Area Planning Council (MAPC)
Middleborough Gas & Electric Department
Middleton Electric Light Department
MIT Nuclear Science and Engineering
ML3 Consulting
Moore, Michael (Sen.)
Morgan, Alex
Municipal Electric Association of MA (MEAM)
Nalcor Energy
National Grid
Naughton, Harold (Rep.)
New England Power Generators Association (NEPGA)
NextEra Energy Resources (NEER)
Nichols, John
Northeast Clean Energy Council (NECEC)
Northeast Clean Heat and Power Initiative (NECHPI)
Norwood Light and Broadband Department
Norwood Municipal Light Department
NRG Canal 3 Development LLC
NRG Energy, Inc.
Nussbaum, Melissa
O'Day, James (Rep.)
O'Hare, Meghan
Office of Attorney General (AGO)
Piercy, Marge
Pilgrim Citizens Advisory Council (PCAC)
Pilgrim Legislative Advisory Coalition (PLAC)
Pilgrim Watch
Pollock, Nira
PowerOptions
Princeton Municipal Light Department
Rado, Barbara
Reading Municipal Light Department
Regnante, Rosalie
Relay Power
RENEW Northeast
Retail Energy Supply Association (RESA)
Roscoe, Lee
Rosenkranz, A.
Rowley Municipal Lighting Plant
Salvucci, Frederick
Shaw, Marie
Short, Michael
Shrewsbury Electric & Cable Operations
Sierra Club
Sierra Club, MA Chapter
Simenas, Scott
Simon, Jane
Southey, Lynn
Sowers, Betsy
Stella, Juan
Sterling
Sterling Municipal Light Department Board of Commissioners
Swanson, Amy
Tabors Caramanis Rudkevich
Tabors, Richard
Talen Energy Corporation
Talin, Jim
Tarr, Bruce (Sen.)
Taunton Municipal Lighting Plant
Templeton Municipal Light and Water Plant
The Enviro Show
Town of Weymouth
Trimble, Suzanna
UMass
Union of Concerned Scientists (UCS) (Individual Form Letters)
US Green Building Council (USGBC)
Veolia North America
Vitol
Vivante, Lydia
Wellesley Municipal Light Plant
Wengronowitz, Bobby
West Boylston Municipal Light Plant
Westfield Gas & Electric Light Department
Whipps, Susannah (Rep.)
White, Robert
Woodbury, Hani
Wright, Mary
Zlotnik, Jonathan (Rep.)

F-S, Louisa
Higgins, [No first name provided]
[No last name provided], Alex
[No last name provided], Cindy
[No last name provided], Peggy
[No last name provided], Rachel

III. BACKGROUND

On December 16, 2016, MassDEP, as directed and approved by the Secretary of EEA, and in consultation with the Department of Energy Resources (DOER), the Department of Public Utilities (DPU), and the Secretary of Administration and Finance (ANF), proposed six new regulations and amendments that limit or reduce greenhouse gas (GHG) emissions in Massachusetts. These regulations, which target emissions from multiple categories of sources, were described in the TSD that was issued with the proposed new regulations. The regulations addressed sulfur hexafluoride (SF_6) emissions from gas-insulated switchgear, methane (CH_4) emissions from the natural gas distribution network, carbon dioxide (CO_2) emissions from electricity generation facilities, and CO_2 emissions from the transportation sector.

In the final regulations and Response to Comment documents, which have been prepared in consultation with DOER, DPU, and ANF, MassDEP is promulgating four non-electric sector regulations, and EEA and MassDEP are jointly promulgating two electric sector regulations. The non-electric sector regulations are: (1) amendments to 310 CMR 7.72 (SF_6 emissions from gas-insulated switchgear); (2) amendments to 310 CMR 60.05 establishing CO_2 limits on MassDOT operations; (3) new regulation at 310 CMR 60.06 (imposition of CO_2 limits on the state-owned fleet of passenger vehicles); and (4) new regulation at 310 CMR 7.73 (CH_4 limits on the natural gas pipeline distribution system). The electric sector regulations are: (1) new regulation at 310 CMR 7.74 (electricity generating facility CO_2 emissions limits); and (2) new regulation at 310 CMR 7.75 (Clean Energy Standard or CES), which are being promulgated by MassDEP and the Secretary. [2]

MassDEP held seven public hearings in 2017 on February 6, 2017, (4 hearings) and February 8, 2017, (3 hearings) and set a public comment period extending to February 24, 2017, on the proposed regulations. Comments were submitted from over 900 stakeholders, including state agencies and authorities, regional transportation organizations, municipalities and municipal electricity organizations, owners and operators of investor-owned utilities, retail electricity sellers, competitive electricity suppliers, owners and operators of natural gas distribution systems, owners and operators of gas-insulated switchgear, trade and industry organizations, the New England regional transmission organization, municipal organizations, environmental advocates and citizens, individually and in affiliation with advocacy groups.

Many positive comments were received on all of the proposed non-electric sector regulations. In addition, MassDEP received helpful submissions of corrected and updated data from regulated parties that assisted the agency in finalizing achievable limits in all of these regulations, but also will ensure sufficient GHG emissions reductions by 2020 to meet the GWSA limit of 25% reduction in GHG emissions from 1990 GHG emissions levels. MassDEP also appreciates the

[2] Prior to the filing of the proposed regulations with the Secretary of the Commonwealth on December 16, 2017, MassDEP met multiple times with DOER and DPU to consult on the informal stakeholder comment and to ensure that the proposal minimized adverse impacts to the regional electricity grid and was compatible with the RGGI and RPS programs. MassDEP met with EEA, DOER and DPU to resolve any issues or concerns with respect to these impacts, and MassDEP also consulted with ANF as well in particular as to economic impacts of the proposals. MassDEP sought and obtained approval from EEA and ANF prior to the filing of the electric sector regulations.

constructive criticism contained in many comments that ranged from improving clarity to the substance of the program design. MassDEP has sought to improve the regulations in response.

As to the proposed electricity sector regulations, a number of comments supporting the regulations were also received; however, some commenters from many of the regulated facilities, their trade organizations, the regional transmission organization, municipal electric boards and organizations, and the Conservation Law Foundation and other environmental advocates raised some questions about the legal authority to adopt the electric sector regulations and about the key design elements of the proposed regulations, particularly as to the proposed 310 CMR 7.74. Therefore, EEA and MassDEP are including responses to these comments in the relevant sections of this RTC.[3] In addition, given the number of concerns expressed in the comments about the impact of its proposed electric sector regulations on GHG emissions and on costs, MassDEP contracted with expert consultants to analyze the emissions and cost impacts of the final regulations. The resulting study demonstrates that impacts to wholesale electricity prices and retail utility bills will be small and that GHG emissions will be reduced, and, therefore, the study supports MassDEP's original analysis in the TSD and the design of the final electric sector regulations. The study is appended to this Response to Comment as *Appendix A* and referenced below (as the "Electricity Bill and CO_2 Emissions Impacts Study").

MassDEP also received a number of comments that did not directly address any of the six proposed regulations. Such comments included support for additional policies and regulations, including implementing a Low Carbon Fuel Standard (Carbon Engineering), addressing emissions from heating fuels (Sierra Club), regulating GHG emissions from the building sector (USGBC), and banning logging on public lands to promote carbon sequestration (The Enviro Show); support for regulating over the long-term (Better Environmental Solutions) and changing the GWSA to extend the sunset date for regulations to 2030 (350 Massachusetts); opposition to a proposed natural gas compressor station (ECANE, private citizen, Town of Weymouth); and a request to increase the availability of GHG emissions data related to the GWSA (private citizen). MassDEP is not responding to these comments in detail because they do not specifically address any of the proposed regulations, but the comments were considered, and are posted on MassDEP's web site along with all of the other comments received.[4]

A. EEA and MassDEP's Collaboration and Consultation

EEA and MassDEP have worked in concert throughout the effort to establish the draft regulations, review and incorporate public comments where appropriate and prepare final regulations for promulgation. Prior to proposing the regulations, EEA and MassDEP co-hosted a meeting with DOER and DPU in the Fall of 2016 to get feedback on the policy approaches for setting the emissions levels and limits on greenhouse gases in the electric sector and limits on emissions from the natural gas pipeline system to present for public comment.

In addition, as to 310 CMR 7.74 and 310 CMR 7.75, prior to the filing of the proposed regulations with the Secretary of the Commonwealth on December 16, 2016. EEA worked with MassDEP to develop materials to help explain the design of the electric sector programs to

[3] The Secretary concurs with the responses to comments in this document.
[4] Comments are posted at http://www.mass.gov/eea/agencies/massdep/air/climate/section3d-comments.html.

stakeholders. In November of 2016, MassDEP hosted two stakeholder meetings at which draft proposed regulations and other materials were discussed. EEA attended those stakeholder meetings and then discussed with MassDEP the informal comments received from those meetings. EEA and MassDEP also presented information to the GWSA Implementation Advisory Committee in the Fall of 2016 to update stakeholders on the status of the potential draft regulations and to solicit input. MassDEP met multiple times with DOER and DPU to consult on informal stakeholder comments received after those November meetings to ensure that the December proposed regulations minimized adverse impacts to the regional electric grid and was compatible with the RGGI and RPS programs. EEA and MassDEP met with DOER and DPU to resolve any issues and concerns with respect to these impacts, and EEA and MassDEP met with ANF in particular to discuss the potential economic impacts of the proposals in December of 2016 prior to issuance of the public hearing draft.

After the close of the public comment period on February 24, 2017, MassDEP established a series of frequent, almost weekly, meetings with DOER and DPU to work through public comment on the proposed electric sector regulations to ensure that the final regulations would work harmoniously with the RGGI program, the RPS program and would minimize adverse impacts to the regional electric grid. EEA and MassDEP also met with DOER and DPU to ensure that the final GHG emissions levels and limits imposed by the regulations would be consistent with EEA's overall policy approach as articulated in EEA's Massachusetts Clean Energy and Climate Plan for 2020 and its update and with the Governor's Executive Order No. 569.

EEA and MassDEP developed joint messages on the work that was being done to establish these regulations after the issuance of the public comment draft. In multiple meetings chaired or hosted by EEA (e.g., the GWSA Implementation Advisory Committee) EEA and MassDEP provided updates on implementation of the Governor's Executive Order No. 569 (discussed in more detail below) and the development of the regulations.

MassDEP also had multiple meetings and discussions with ISO-NE, and was joined on one occasion by EEA. EEA and MassDEP brought back the ISO's concerns to DOER and DPU to determine how to ensure that the final regulations would take into account the regional nature of the electric grid and minimize any adverse effects on its functioning. The agencies were particularly mindful of electric grid reliability, impacts on wholesale prices, the potential for leakage (increases in regional emissions resulting from restriction of the operation of Massachusetts-based power plants), and residential, commercial and industrial utility bill impacts. EEA and MassDEP also considered impacts on Regional Greenhouse Gas Initiative markets, impacts on Renewable Portfolio Standard markets, and allowance and certificate prices in the design of the final regulations. EEA and MassDEP reviewed all of the public comment and jointly finalized the electric sector regulations and this Response to Comment document. The policy and costs impacts were presented to ANF by EEA and MassDEP, and ANF approved the regulations as well.

B. Legal and Regulatory Context

MassDEP in concert with EEA proposed the new regulations and amendments to 310 CMR 7.00 *Air Pollution Control* and 310 CMR 60.00 *Air Pollution Control for Mobile Sources,* in accordance with the following mandates: (1) M.G.L. c. 21N, commonly known as the Massachusetts Global Warming Solutions Act (GWSA); (2) the Massachusetts Supreme Judicial Court's May 2016 decision in Kain v. Department of Environmental Protection, 474 Mass. 278 (2016), which clarified the scope, intent and requirements of the GWSA, particularly the requirement to adopt regulations pursuant to Section 3(d); and (3) Governor Baker's September 2016 Executive Order 569 ("Establishing an Integrated Climate Change Strategy for the Commonwealth"). MassDEP also proposed these regulations pursuant to its statutory authority at M.G. L. c. 21A, §§ 2, 8 and 16, and M.G.L. c. 111, § 2C and 142A *et seq*., which provide MassDEP with broad authority to prevent, control, abate and enforce against conditions of air pollution in the Commonwealth.

Global Warming Solutions Act

The GWSA, partially codified at M.G.L. c. 21N, was signed into law in August 2008 to address the challenges of climate change. The GWSA requires a reduction of greenhouse gas (GHG)[5] emissions in Massachusetts to "a 2050 statewide emissions limit that is at least 80 per cent below the 1990 level." *See* M.G.L. c. 21N, § 3(b)(4). In accordance with the GWSA, the Secretary of EEA set a 2020 statewide GHG emissions reduction limit of 25%[6] and also issued the *Massachusetts Clean Energy and Climate Plan for 2020* (2020 CECP) in 2010, which established strategies and policies to achieve the 2020 limit. EEA issued a 2020 CECP update (2020 CECP Update, dated December 31, 2015)[7] to add new policy strategies and revise or eliminate others to ensure the 2020 limit would be met. In March of 2017, MassDEP issued its 2014 GHG Inventory pursuant to the GWSA.[8]

EEA and its agencies, including MassDEP, have implemented the 2020 CECP strategies, and these strategies have resulted in substantial progress towards the 2020 limit - an overall reduction of GHG emissions of 19.7% below 1990 GHG emissions levels through 2013, as noted in the TSD,[9] and an overall reductions of 21.0% through 2014 as documented by MassDEP's most recent inventory. This means that an additional 4.0% in GHG emissions, rather than the 5.3% reduction noted in the TSD, must be achieved by the end of the year 2020. This is summarized by the following Figure 1. Taken from the Massachusetts GHG inventory, Figure 1 shows that 2014 emissions were 21.0% below 1990 emissions, so 4.0% GHG emissions reductions are needed between 2014 and 2020:

Figure 1: Reductions in Massachusetts GHG Emissions from 1990 as of 2014

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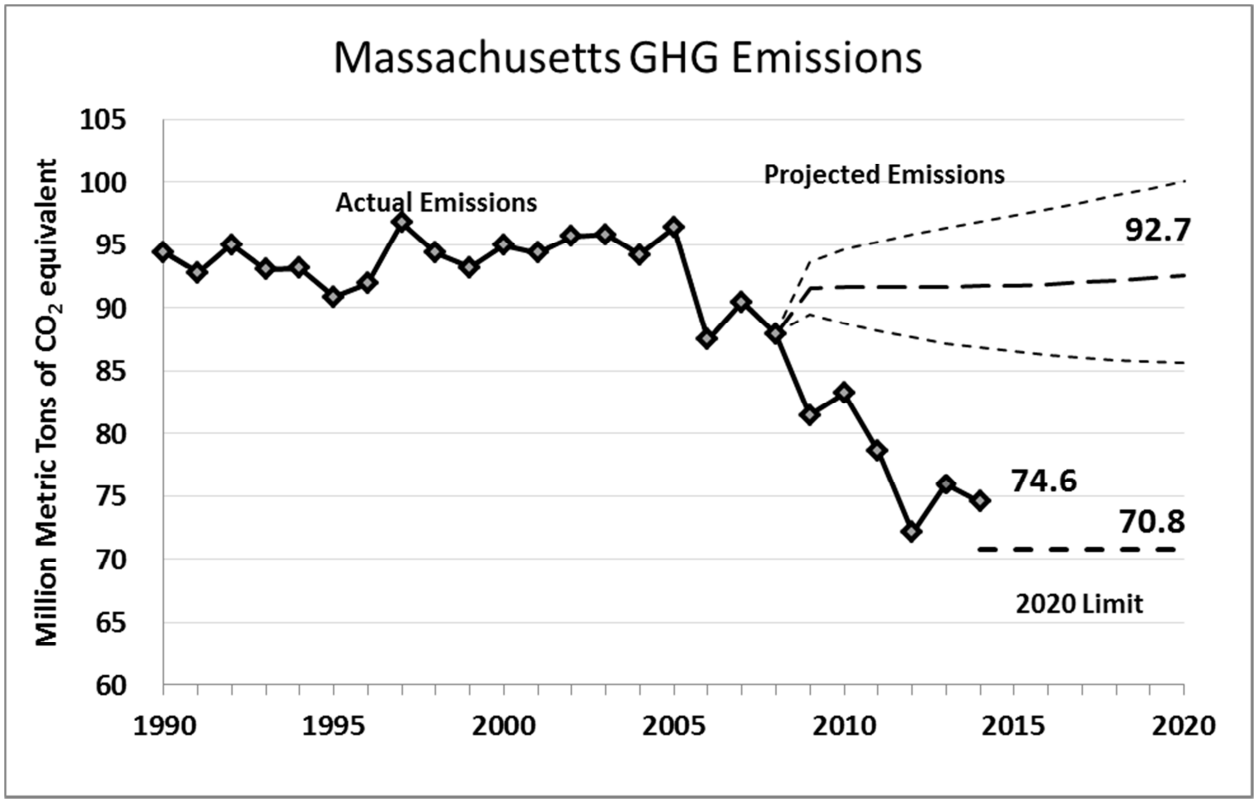
[5] Note that GHGs include carbon dioxide or CO_2, methane or CH_4, sulfur hexafluoride or SF_6 and other gases.
[6] December 28, 2010 Secretary of Energy and Environmental Affairs' Determination of Greenhouse Gas Limit for 2020 at http://www.mass.gov/eea/docs/eea/energy/2020-ghg-limit-dec29-2010.pdf.
[7] The CECP Update is available at http://www.mass.gov/eea/docs/eea/energy/cecp-for-2020.pdf.
[8] *Statewide Greenhouse Gas Emissions Level: 1990 Baseline and 2020 Business As Usual Projection Update*, July 2016, at http://www.mass.gov/eea/docs/dep/air/climate/gwsa-update-16.pdf.
[9] 2013 was the latest year for which MassDEP had complete GHG emissions data as of the date of issuance of the TSD in December 2016.



Kain v. DEP Decision

On May 17, 2016, MassDEP was directed by the Supreme Judicial Court in the Kain v. DEP decision, 474 Mass. 278 (2016) to adopt and implement regulations that comply with the requirements of Section 3(d) of the GWSA to ensure that the 2020 limit is met. Section 3(d) provides as follows:

> The department [of environmental protection] shall promulgate regulations establishing a desired level of declining annual aggregate emission limits for sources or categories of sources that emit greenhouse gas emissions.

The Supreme Judicial Court issued a ruling interpreting the meaning of M.G.L. c. 21N, §3(d) for the first time, holding that Section 3(d):

> … requires the department to promulgate regulations that address multiple sources or categories of sources of greenhouse gas emissions, impose a limit on emissions that may be released, limit the aggregate emissions released from each group of regulated sources or categories of sources, set emission limits for each year, and set limits that decline on an annual basis.

See Kain, 474 Mass. at 300. The court held that the enforceable GHG emissions limits must be an annually declining mass-based limit, not a rate-based emissions limit. Id. at 287-289. Moreover, the court held that the GHG emissions limits must include aggregate limits on the entire chosen category of sources so that any new source would be included within the annually

declining mass-based limit for the category. Id. Finally, the Kain court ruled that the annually declining aggregate GHG emissions limit must address emissions within the borders of Massachusetts.

In addition, the Supreme Judicial Court interpreted the purpose of the GWSA as a whole and the role of Section 3(d) regulations within that overarching purpose. The Court held that the annually-declining, mass-based GHG emissions limits must "ensure that legally mandated reductions are realized by the 2020 deadline," since "[t]he purpose of [the GWSA] is to attain actual, measurable, and permanent emissions reductions in the Commonwealth." In its ruling, the court made clear that MassDEP must promulgate Section 3(d) regulations that, along with the other strategies adopted under the 2020 CECP, ensure sufficient progress to meet the GWSA 2020 limit.[10]

In summary, the Court's decision in Kain directed MassDEP to propose regulations under Section 3(d) of the GWSA that would create GHG emissions limits that: (1) are mass-based limits; (2) decline annually; (3) limit the aggregate emission levels of existing and new sources within a category; (4) are enforceable; and (5) ensure reductions within Massachusetts to meet the 2020 GWSA GHG emissions limit.

Executive Order No. 569

To ensure the directives of the Supreme Judicial Court in Kain would be met in a timely manner and to achieve other goals related to climate change, Governor Baker issued Executive Order No. 569 on September 16, 2016.[11] The Executive Order states in part in section 2:

> The Department of Environmental Protection shall promulgate final regulations that satisfy the mandate of Section 3(d) of [M.G.L. c. 21N] by August 11, 2017, having designed such regulations to ensure that the Commonwealth meets the 2020 statewide emissions limit mandated by the GWSA….
>
> [T]he Department of Environmental Protection shall:…revise the Global Warming Solutions Act requirements for the Massachusetts Department of Transportation set forth in 310 C.M.R. 60.05 to establish declining aggregate emission limits…[and] consider limits on emissions from, among other sources or categories of sources, the following: (i) leaks from the natural gas distribution system; (ii) new, expanded, or renewed emissions

[10] Kain, 474 Mass. at 300 ("The purpose of *G.L. c. 21N* is to attain actual, measurable, and permanent emissions reductions in the Commonwealth, and the Legislature included *§ 3 (d)* in the statute to ensure that legally mandated reductions are realized by the 2020 deadline"); however, the Court made clear that Section 3(d) regulations could be combined with other types of measures to achieve the 2020 limit. *Id*. at 285 ("Thus, to reach the twenty-five per cent reduction level by 2020, the Commonwealth would have to implement additional measures to achieve approximately seven per cent in further emissions reductions. The parties agree that these reductions need not be attributable solely to regulations passed pursuant to *§ 3 (d)*, but rather recognize that a variety of policies and programs, including actions taken under other statutory programs, such as the Green Communities Act, *G. L. c. 7, § 9A*, may produce measurable reductions").

[11] Executive Order No. 569 at http://www.mass.gov/governor/legislationexecorder/execorders/executive-order-no-569.html.

permits or approvals; (iii) the transportation sector or subsets of the transportation sector, including the Commonwealth's vehicle fleet; and (iv) gas insulated switchgear;

The six regulations that were proposed on December 16, 2016, were in response to this directive.

GWSA GHG Emissions Limits for 2020 and 2050

The Kain decision and the Executive Order highlight the importance of meeting both the 2020 goal of 25% GHG emissions reductions and "the corresponding limit for 2050 [of] 80% below the 1990 level of emissions." See E.O. No. 569, preamble. The Kain court noted the importance of the overall 2050 80% GHG emissions reductions limit, as cited by EEA in a 2013 Progress Report on the 2020 CECP, in that "[t]he act established a comprehensive framework to address the effects of climate change in the Commonwealth by reducing emissions to levels that scientific evidence had suggested were needed to avoid the most damaging impacts of climate change." *See* Kain, 474 Mass. at 281-82 (citing Executive Office of Energy & Environmental Affairs, Commonwealth of Massachusetts Global Warming Solutions Act 5-Year Progress Report at 17) (Dec. 30, 2013) (Progress Report). The Executive Order also highlighted the central role of the electric sector by stating that "the generation and consumption of energy continues to be a significant contributor to greenhouse gas emissions in the Commonwealth, and there is significant potential for reducing emissions through continued diversification of our energy portfolio." See E.O. No. 569, preamble. In addition, the Executive Order highlighted the importance of reducing transportation sector emissions, the largest sector of GHG emissions in the Commonwealth at present. To carry out these more global directives, MassDEP, like all other agencies in the Secretariat, was directed by the Secretary as the lead coordinator of GWSA strategies to develop and "analyze emission reduction pathways for reducing emissions at least 80% by 2050."[12]

Therefore, the directives in the Kain decision and in the Executive Order are consistent with the policy directions set forth in the 2020 CECP and its update in terms of the importance of reducing GHG emissions in the electric sector in particular. EEA stated in the 2020 CECP Update that "[a] common conclusion across past 2050 planning studies, including the study that was completed to support the original CECP, is that the only viable path to deep reductions in GHG emissions is through a combination of reduced energy consumption (through increased energy efficiency in vehicles and buildings), expanded availability of clean electricity, and electrification of the transportation and heating sectors… The scope of the challenge can be summarized in three words: reduce, electrify, and decarbonize."[13] The importance of the electric sector in achieving GHG emissions reductions for the Commonwealth as a whole cannot be minimized.

Proposed Regulations

MassDEP designed the proposed regulations in concert with EEA in order to address the directives of the Secretary in the 2020 CECP, its Update and Progress Report, the Supreme

[12] See 2020 CECP Update at p. 18.
[13] See 2020 CECP Update at p. 16.

Judicial Court decision in Kain and the Executive Order, to ensure the achievement of the GWSA's 2020 GHG limit. Further, the regulations are meant to set the Commonwealth on a course to achieve the 2050 GWSA limit of at least an 80% reduction in statewide GHG emissions. In order to achieve that goal, the Commonwealth must achieve a significant reduction in GHG emissions from transportation, the heating of buildings, and the electric sector. Since a significant percentage of vehicles and building systems must be electrified as a way to reduce GHG emissions, EEA and MassDEP's regulations must first focus on achieving GHG reductions from the electric sector.

Given the central role of the electric sector in reducing GHG emissions across the Commonwealth, MassDEP, as approved by the Secretary, and after consultation with DOER, DPU, and ANF, proposed, and now finalizes with EEA and with the approval of ANF, the Reducing CO_2 Emissions from Electricity Generating Facilities regulation at 310 CMR 7.74, with declining annual aggregate CO_2 limits on electricity generating facilities out to 2050, and the Clean Energy Standard at 310 CMR 7.75, with increasingly stringent standards for the incorporation of clean energy into the Commonwealth's "energy portfolio" extending to 2050 as well. These two electric sector regulations are designed to work together to ensure the reduction of greenhouse gas emissions, and they establish the trajectory for reductions of GHG emissions from generating facilities and retail sellers of electricity, which are critical to the achievement of the state-wide 2020 and 2050 GHG emissions reductions mandated by the GWSA. Specifically, 310 CMR 7.74 will limit emissions from power plants in Massachusetts, and 310 CMR 7.75 complements 310 CMR 7.74 by increasing the amount of clean, non-emitting energy supplied to the regional electricity system and available for consumption in Massachusetts. In exercising their broad authority under M.G.L. c. 21N, §§ 3(c) and 3(d), EEA and MassDEP have determined that the emissions limits imposed on in-state electricity generating facilities along with other climate policies and programs, including 310 CMR 7.75, will ensure achievement of the emissions reduction limits as established under M.G.L. c. 21N, and that the 310 CMR 7.74 and 7.75 limits and levels will minimize adverse impacts to the regional electricity grid, including leakage[14], and are consistent with regional programs such as RGGI and RPS.

Pursuant to Sections 3, 4 and 7 of the GWSA, 310 CMR 7.74 and 7.75 were also designed to protect public health and the environment and to maximize environmental benefits by establishing limits and levels that will assist in reducing greenhouse gases to meet the GWSA limits (including in those communities already adversely impacted by air pollution)[15], and to minimize costs and to maximize economic benefits to the extent possible. In response to public comment claiming that the electric sector regulations would increase greenhouse gas emissions and thereby cause adverse impacts on public health and the environment, and public comment that costs impacts were excessive, EEA and MassDEP commissioned an analysis of the emissions and cost impacts of 310 CMR 7.74 and 310 CMR 7.75. That analysis demonstrated that the regulations would reduce greenhouse gas emissions over time, both within the borders of Massachusetts and across the New England electricity system region. The study also showed

[14] The GWSA defines leakage as "the offset of a reduction in emissions of greenhouse gases within the commonwealth by an increase in emissions of greenhouse gases outside the commonwealth."

[15] Finalization of 310 CMR 7.75 and 310 CMR 7.74 will also have beneficial effects on criteria pollutants over the term of the programs by reducing the contributions of combustion-based energy generation to the production of electricity.

that retail customer costs and impacts to wholesale electricity prices would be small. The analysis did not identify any impacts to allowance prices for the RGGI program, and showed that impacts to prices for renewable energy certificates (RECs) for the RPS program would be within acceptable ranges. Finally, EEA and MassDEP have consulted ANF on the impacts of these electric sector regulations and the use of market-based mechanisms, such as an allowance auction in 310 CMR 7.74 and an alternative compliance payment (ACP) in 310 CMR 7.75. Together, these mechanisms provide flexibility for the regulated community while ensuring that the regulations achieve cost-effective emissions reductions in Massachusetts.

C. Update of Expected GHG Emission Reductions

The TSD includes an analysis of how the regulations will work together to ensure compliance with the GWSA requirement to reduce emissions 25% by 2020, relative to 1990 emissions. Specifically, it explains how, using the 2013 MassDEP GHG Inventory that was available at the time of the proposal, MassDEP designed a "package of proposed regulations to achieve an estimated 7.2% total reductions in GHG emissions in order to meet the 5.3% GHG emissions reductions needed between 2013 and 2020 to meet the GWSA 2020 limit."[16]

Since the proposal was published, MassDEP has published its 2014 GHG inventory. In order to confirm the conclusion that the package will ensure that emissions are reduced by 2020 as required by the GWSA, MassDEP updated the calculations included in the TSD by incorporating the new 2014 data. This updating process also required recalculating the amount of reductions expected from 2014 (instead of 2013) to 2020 from each regulation and other measures in the 2020 CECP Update. The figure and tables below include the results of this update, with the 2013 estimates included in the TSD provided for reference.

Tables 1-3 below include updated estimates of the amount of emissions reductions that will be realized by 2020 and are attributable to MassDEP regulations. Each table includes a column with the 2013-2020 estimate that was included in the TSD, and an additional column with updated estimates for the 2014-2020 time period. For additional information please refer to the TSD, as the analytical approach, observations, and conclusions described in the TSD have not changed.

Table 1: Projected GHG Emissions Reductions from 1990 Baseline (after 2013-2014 and through 2020) and Indication of Likely Contribution from Proposed MassDEP GWSA Regulations

MassDEP Regulation	Estimated Reductions 2013-2020 (% of 1990)	Estimated Reductions 2014-2020 (% of 1990)
Transportation Sector Regulations	3.1%	3.0%
Electricity Sector Regulations	4.0%	3.1%
Methane Leaks from Gas Distribution	0.05%	0.04%

[16] See TSD, p. 11.

System		
Gas Insulated Switchgear	0.01%	0.01%
Total	7.2%	6.2%

Table 2: Transportation Sector - Expected GHG Emissions Reductions from 1990 Baseline (after 2013-2014 and through 2020)

Source of Reductions	**Estimated Reductions 2013-2020 (% of 1990)**	**Estimated Reductions 2014-2020 (% of 1990)**
Vehicle GHG Standards (310 CMR 7.40) (Calculated in a manner consistent with the 2020 CECP Update)	3.1%	3.0%
Requirements for Transportation	0.01%	0.01%
State Vehicle Fleet (310 CMR 60.06) (Reflects potential purchases of efficient/electric vehicles)	< 0.01%	< 0.01%
Total	**3.1%**	**3.0%**

Table 3: Electric Sector - Expected GHG Emissions Reductions from 1990 Baseline (after 2013-2014 and through 2020)

Source of Reductions	**Estimated Reductions 2013-2020 (% of 1990)**	**Estimated Reductions 2014-2020 (% of 1990)**
Coal-Fired Power Plant Retirements (Net of gas generation increase compensating for Brayton, Salem, Mt. Tom, Pilgrim shutdowns)	-0.2%	-0.9%
New Renewable Energy (Estimate reflects RPS compliance and surplus in-region renewables)	2.0%	2.0%*
All Cost Effective Energy Efficiency + Appliance Standards (Net of projected 2020 electric vehicle load)	2.2%	2.0%
Total	**4.0%**	**3.1%**

*There is a decrease of approximately 0.1% when updating the reductions from a 2013 to 2014 baseline, which is not apparent due to rounding.

The updated information in Tables 1-3 and Figure 1 supports the conclusion that, when analyzed with respect to the updated 2014 emissions data, the package of final regulations will achieve an estimated 6.2% total reductions in GHG emissions in order to meet the 4.0% GHG emissions reductions needed between 2014 and 2020 to meet the GWSA 2020 limit.

As stated in the TSD, "Designing these regulations to reduce emissions by more than the required [percentage]. . . will help control for variables that could result in additional electric power demand or increases in vehicle miles traveled."[17] This analytical approach and conclusion remains valid, and ensures that the 2020 GHG limits mandated by the GWSA will be met with a reasonable degree of certainty.

As discussed in section III-B of this RTC, electricity sector emissions merit particular attention in the near term (because they represent the largest reductions listed above) and in the long term (because additional electricity will be needed to power electric vehicles and heat homes). Furthermore, as discussed in chapters IV and V of this RTC, the proposed electricity sector regulations were the subject of significant public comment.

For these reasons, in addition to updating the analysis listed above, MassDEP commissioned the Electricity Bill and CO_2 Emissions Impacts Study to assist in the evaluation of comments. A team of experienced analysts was selected for their particular expertise in analyzing clean energy programs in New England, and representatives of DOER and DPU participated in selecting the project team and guiding the project.[18] In general, the results of the study show that the electricity sector reductions listed above are achievable by 2020, and that the specific limits included in the electricity regulations appropriately ensure compliance with the GWSA 2020 limit while recognizing the importance of providing clean, reliable, and affordable electricity to residents and businesses. Additional information about these results is included in the relevant sections, and the final Electricity Bill and CO_2 Emissions Impacts Study is attached to this RTC as *Appendix A*.

IV. 310 CMR 7.75: CLEAN ENERGY STANDARD

A. General Comments

Comment: In addition to the technical comments discussed below, several commenters stated that 310 CMR 7.75 should not be finalized (AIM, Eversource, National Grid, PowerOptions, others), while several others expressed support for the proposal (Brookfield, E2, ELM, HQUS, MassEnergy, others). In general, opponents of the regulation described it as unnecessary and costly, with one suggesting that a focus on the electricity sector is not appropriate given past emission reductions from the sector (Eversource). Several supporters acknowledged the role of the CES in achieving the GWSA-mandated 2020 emission limit (Acadia Center, HQUS).

[17] See TSD, p. 11.

[18] The Electricity Bill and CO_2 Emissions Impacts Study was completed by Synapse Energy Economics, with participation by Sustainable Energy Advantage and Eastern Research Group.

Response: EEA and MassDEP are finalizing 310 CMR 7.75 to address climate change and the requirements of the GWSA. As explained in the TSD, and verified by the Electricity Bill and CO_2 Emissions Impacts Study, the combined effect of 310 CMR 7.75 and 310 CMR 7.74 will be to reduce emissions. The role of 310 CMR 7.75 is to ensure that sufficient clean energy is available from the regional electricity system as a whole to provide reliable and affordable electricity; as discussed in section V of this RTC, 310 CMR 7.74 is necessary to address the GWSA requirement to ensure that emission reductions are realized in Massachusetts. 310 CMR 7.74 and 310 CMR 7.75 also reflect the regional nature of the electric grid and the GWSA requirement to reduce GHG emissions from electricity imports.

Specific issues raised by commenters are discussed in detail below. MassDEP also notes that the final CES regulation retains proposed requirements to complete a review of options for addressing existing clean energy generators in 2017, and to review all aspects of the program in 2021. Some of the issues raised by commenters related to stringency, eligibility, vintage dates, credit markets, and other issues will be considered during those reviews.

Comment: Commenters submitted a range of views regarding stringency of the CES. One commenter stated that the annual CES standard that reaches 80% by 2050 should be reduced because competitive suppliers do not have the ability to directly reduce emissions. The commenter suggested that the CES be structured to only account for the emission reduction shortfalls of other programs (RESA). Other commenters suggested that the CES should be set near or at 100% by 2050 (350 Massachusetts, E2, Elders Climate Action, MAPC), and that the proposed stringency is not sufficient to achieve the required reductions by 2020 (Climate XChange). Another commenter requested additional information regarding how MassDEP estimated emissions reductions from the CES in 2020, suggesting that this additional information was necessary to confirm whether the combined stringency of 310 CMR 7.74 and 310 CMR 7.75 is sufficient to ensure compliance with the GWSA 2020 limit (CLF).

Response: The final CES retains the 80% standard in 2050, as proposed. EEA and MassDEP disagree with the assertion that regulating competitive suppliers does not help directly reduce emissions. In the same way that the RPS requirements provide incentives for new renewable energy development, the CES requirements will provide a degree of regulatory certainty for clean energy development, ensuring a market for the associated attributes over the long term. The CES reduces GHG emissions by lessening the need for fossil generation of electricity; Massachusetts' and numerous other states' experiences with RPS programs show that market certainty for clean energy attributes supports development of clean generation resources over time.

The CES was promulgated as part of a regulatory package that includes 310 CMR 7.74, which limits CO_2 emissions from electricity generators located in Massachusetts. As explained in the TSD, 310 CMR 7.74 and 7.75 are designed to work in tandem to reduce emissions from the electricity sector from electricity generated within and outside Massachusetts; the specific levels set in both regulations are consistent with the need to decarbonize the electric sector over time, as identified in the 2020 CECP Update and acknowledged in the TSD.

A specific estimate of the combined contribution of the CES and RPS to achieving the GWSA 2020 limit was included in the TSD. This contribution was calculated in a manner consistent with the approach used in the CECP Update. Specifically, an emission factor representative of the average per-MWh emissions rate of Massachusetts generators subject to Regional Greenhouse Gas Initiative (RGGI) whose primary fuel is natural gas (931 lbs/MWh, based on 2014 data) was multiplied by the number of MWh of clean energy to determine avoided emissions. As explained in section I-B of this RTC, this calculation was updated to reflect more current data from 2014, and this updated analysis confirms that the combined effect of the two electric sector regulations, the four other GWSA Section 3(d) regulations and other existing 2020 CECP policies will ensure that the GWSA 2020 limit is met.

Comment: One commenter suggested that the CES should set a fixed percentage of clean energy to be procured each year *above* that year's RPS standard in order to accommodate potential future increases to the RPS standard (Acadia Center). Another commenter suggested including a formal review in the regulation that would give MassDEP the authority to amend the CES in the event of increases to RPS (NECEC).

Response: As proposed, the CES sets total percentages of clean energy that must be procured each year *including* the RPS standard; if RPS were to increase, RPS-eligible resources would account for a greater portion of CES compliance. As noted above, this approach is appropriate because the clean energy procurement levels set in the CES are established based on anticipated levels of clean energy in future years, *inclusive* of renewable energy. Therefore, the proposed approach to stringency, under which all clean energy would count toward CES compliance is included in the final regulation. However, issues related to stringency may be revisited as part of the program review in 2021 that was included in the proposal and is being retained in the final regulation. This approach will also allow time for additional stakeholder engagement on specific design elements that were not addressed by commenters if the RPS standard were increased.

B. Eligibility & Applicability

Comment: Numerous commenters raised the inclusion or exclusion of Municipal Electric Departments (MEDs)/Municipal Light Boards (MLBs) as part of the final CES. Those supporting the inclusion of MEDs/MLBs assert that clean energy should be supported by all Massachusetts ratepayers, (Eversource) and that covering all retail electricity providers strengthens the overall CES (CWA, MassEnergy, private citizen). Those opposed argue that language in M.G.L. c. 21N demonstrates the Legislature did not intend to subject MEDs/MLBs to any provisions of the statute other than the GHG emissions reporting section (§2(a)(5)) where MEDs/MLBs are explicitly mentioned. The commenters extend the argument to conclude that the GWSA does not give MassDEP authority to impose a CES on MEDs/MLBs (numerous MEDs/MLBs,[19] numerous elected officials). Numerous MEDs/MLBs also expressed concerns

[19] Chicopee Electric Light, elected officials (Hannah Kane, Harold Naughton, James O'Day, Michael Moore), Holden Municipal Light Department, Municipal Electric Association of MA, Princeton Municipal Light Department, Several MLPs (Belmont Municipal Light Department, Braintree Electric Light Department, Concord Municipal Light Plant, Georgetown Municipal Light Department, Groveland Electric Light Department, Hingham Municipal Lighting Plant, Hudson Light and Power Department, Littleton Electric Light & Water Department, Middleborough Gas & Electric Department, Middleton Electric Light Department, Norwood Light & Broadband

with the particular approach proposed for calculating their compliance obligations, in many cases highlighting voluntary emission reductions achieved through the use of clean electricity.

Response: The final CES does not include requirements for MEDs/MLBs beyond already-required emissions reporting for the following two reasons: (1) In the proposed regulations, MEDs/MLBs were not required to comply until 2021, so their exclusion from the final CES will not affect compliance with the GWSA-mandated emission reductions by 2020; (2) MassDEP is considering options for achieving reductions from MEDs/MLBs after 2020, and also intends to address this topic in late 2017 in the context of the required review of options for including existing (pre-2010) resources in the CES. Future consideration of the inclusion of MEDs/MLBs in the CES is appropriate because many MEDs/MLBs currently own or contract with existing clean generators, as documented in the emission reports that they submit to MassDEP pursuant to 310 CMR 7.71.

M.G.L. c. 21N sets out a scheme for EEA and MassDEP to monitor and regulate emissions of greenhouse gases with the ultimate goal of reducing those emissions statewide by at least 80% by 2050. Section 2 of the statute states that MassDEP shall adopt regulations "to require the reporting and verification of statewide greenhouse gas emissions and to monitor and enforce compliance with this chapter." Section 2 also lists the entities that are required to report greenhouse gas emissions. See, M.G.L. c. 21N, § 2(a)(5).

Section 2(a)(5) requires reporting of emissions from sources of electricity consumed or imported into the Commonwealth and expressly includes MEDs/MLBs as one of the entities required to report. M.G.L. c. 21N, Section 2(a) (5) reads as follows:

> Section 2. (a) The department shall monitor and regulate emissions of greenhouse gases with the goal of reducing those emissions. The department shall adopt regulations to require the reporting and verification of statewide greenhouse gas emissions and to monitor and enforce compliance with this chapter. The regulations shall: … (5) require reporting of greenhouse gas emissions from generation sources producing all electricity consumed, including transmission and distribution line losses from electricity generated within the commonwealth or imported from outside the commonwealth; **provided, however, that this requirement shall apply to all retail sellers of electricity, including electric utilities, municipal electric departments and municipal light boards** as defined in section 1 of chapter 164A.... (emphasis added)

Section 3(c) gives authority to EEA and MassDEP to set "emissions levels and limits" on the "electric sector," a very broad term, that has no exclusions of any particular entities within that sector. Given the central role of the electric sector in achieving the required GWSA GHG emissions reductions of 25% and at least 80% by 2020 and 2050, respectively, it would be inconsistent with the goals of the entire GWSA scheme to exempt parts of the electric sector from regulations that require reductions in GHG emissions from that sector.

Department, Rowley Municipal Lighting Plant, Wellesley Municipal Light Plant, and Westfield Gas & Electric Department), Shrewsbury Electric and Cable Operations, Sterling, Sterling Municipal Light Department, Taunton Municipal Light Plant, Vitol, West Boylston Municipal Light Plant.

As noted above, the stakeholder process planned for 2017 will provide an opportunity for MassDEP to elaborate on its authority and to solicit input from affected stakeholders.

In addition to the changes noted above, the final regulation moves GHG reporting for all retail sellers from 310 CMR 7.71 to 310 CMR 7.75 beginning with 2018 calendar year emissions, including the reporting requirements for MEDs/MLBs, as proposed. Since MEDs/MLBs will not have a CES compliance obligation in the finalized 310 CMR 7.75, they will not be submitting the annual clean energy resource report required of electric utilities and competitive suppliers by 310 CMR 7.75(9)(b). In order to allow MEDs/MLBs to continue to report their use of clean energy, the optional MED/MLB clean energy reporting provisions of 310 CMR 7.71 were added to the final 310 CMR 7.75. To make reporting easier for all retail sellers, two reporting provisions are being finalized as proposed: (1) submitting mandatory GHG emissions reports by a specific deadline (September 15), and (2) using emission factors provided by MassDEP to calculate GHGs from emitting electricity generators.

Comment: Several commenters noted that competitive suppliers often enter into multi-year contracts with their customers, and that existing contracts may not have been written to account for the CES. They proposed "grandfathering" in order to exempt MWh already committed to customers under existing contracts from their compliance obligation. One commenter cited similar treatment of existing contracts by the DOER during development of the SREC and RPS solar carve-out programs (PowerOptions). Specific suggestions included grandfathering all contracts with effective dates 30 days after the final CES is promulgated (Calpine) and delaying implementation of the CES until 2021 (RESA).

Response: EEA and MassDEP acknowledge the existence of multi-year contracts between end-use customers and competitive suppliers that extend beyond the CES's initial compliance dates, beginning in 2018. While the terms of some or all of these contracts can be modified in the event of new regulatory requirements, a certain degree of "grandfathering" is appropriate to protect electricity customers from unanticipated price increases. To this end, EEA and MassDEP, after consultation with DOER, has included limited grandfathering in the final CES. Specifically, electricity sold under contracts in effect prior to the date 310 CMR 7.75 was promulgated will be deducted from the 2018 and 2019 compliance obligations, provided the electricity was sold at a price specified in the contract. However, to ensure that this provision does not endanger compliance with the GWSA's 2020 GHG emission reduction requirement of 25% below 1990 levels, the requirement that 20% of electricity sales come from CES-eligible sources must be met in full in 2020, regardless of whether existing contracts extend into or beyond 2020. This strikes the appropriate balance between providing flexibility to regulated entities and ensuring compliance with the GWSA's mandated 2020 GHG emission reductions.

Comment: Several organizations and individuals commented on the inclusion or exclusion of nuclear power. Those in favor of including nuclear power in the CES cited its ability to generate large quantities of electricity with no direct GHG emissions (MIT Nuclear Science and Engineering, NEER, private citizen). Those opposed focused primarily on Pilgrim Nuclear Power Station, commenting that existing nuclear generation should not be added to the proposed regulation (Cape Downwinders, Climate Action Brookline, PCAC, Pilgrim Watch, numerous

private citizens). Some commenters also stated that the CES should not accommodate new nuclear generation due to waste management concerns and other issues that are not captured by the CES's GHG emission-based eligibility threshold (Environment MA, JRWA, PLAC). Additional commenters voiced support for the proposed technology-neutral eligibility based on a GHG emissions threshold (CATF, NYU IPI).

Response: The final regulation maintains the technology-neutral approach outlined in the proposal whereby eligibility is determined based on an electricity generator's ability to meet a GHG emissions threshold. A technology-neutral emissions standard is the appropriate approach for determining eligibility under the CES, which is designed to reduce GHG emissions from the electricity sector over the long term, pursuant to the GWSA. As described in the TSD that accompanied the proposal, certain technologies that are not RPS-eligible may qualify under this eligibility criterion. The treatment of existing resources more broadly is a topic that will be addressed in the review of existing resources required in the final CES.

Comment: Two commenters suggested eliminating the 2010 eligibility date that prevents pre-2010 generators from earning CECs, and instead only allowing resources that are constructed after the promulgation of the CES to be eligible to generate CECs (Borrego Solar Systems, MAPC). One of these commenters cited concerns about lost incremental emission reductions, shuffling, and the potential for windfall profits.

Response: The final CES includes eligibility of resources that commenced commercial operation after 2010, as proposed. As indicated in the TSD, this date reflects the intent to capture resources that came online after the December 2010 publication of the Massachusetts Clean Energy and Climate Plan for 2020 where the concept of a Massachusetts CES was first put forth as a GWSA strategy (referred to in the 2020 CECP as a Clean Energy Performance Standard). In response to the specific suggestion of using the promulgation date of 310 CMR 7.75 as the eligibility cutoff, EEA and MassDEP point for precedent to other RPS and CES programs that have set eligibility dates at some point in the past in order to avoid a regulatory precedent whereby project developers potentially delay construction in anticipation of a future rule-making that may result in the project's ability to generate clean energy attributes. The RGGI program also allowed crediting for reductions that occurred after the program was announced but before it became effective.

Comment: Several commenters stated that the eligibility threshold requiring qualified generators to limit emissions to 50% below the most efficient natural gas combined cycle (NGCC) facility is not stringent enough to ensure compliance with the requirement to reduce emissions by 80% by 2050 (CLF, MAPC, RENEW Northeast, Sierra Club). Several commenters specifically suggested that eligibility be limited to those resources that qualify for RPS Class I. One commenter stated that the 50% below NGCC threshold is appropriate because it would exclude biomass projects that do not adequately reduce emissions while including those that "can deliver real, meaningful CO_2 reductions" (CATF). One commenter suggested using a longer time period than the proposed 20 years for assessing lifecycle emissions, citing precedent for using a 100-year evaluation period (HQUS).

Response: The eligibility threshold of 50% below NGCC emissions, based on the 20-year time period, is retained as proposed in the final regulation, after consultation with DOER. This threshold, including the 20-year time period, is identical to the one used by DOER to qualify biomass-fueled generators for the RPS program, providing consistency among Massachusetts' clean energy policies. This will support development of current and future clean energy technologies that do not qualify for RPS Class I but do result in significant emission reductions compared to the best available fossil fuel generators. In setting the threshold, EEA and MassDEP also considered the fact that the technologies most likely to qualify have lifecycle emissions profiles that are well below the 50% threshold, but not equal to zero. Therefore, setting a lower emissions threshold could add significant administrative complexity and uncertainty for these technologies and would likely result in the same projects being qualified (and therefore not provide additional emission reductions). As indicated in the TSD, MassDEP, after consultation with DOER, is confident that Canadian hydroelectric resources meet the emissions threshold.

With regard to the appropriate time period over which to assess emissions, EEA and MassDEP considered three factors: (1) the need to ensure that biomass resources that do not qualify for RPS because of high lifecycle emissions do not qualify for the CES, (2) the precedent for using 20-30 year time periods for evaluating lifecycle emissions of liquid biofuels,[20] and (3) the GWSA requirement to reduce emissions by 2050. Consistent with these considerations, MassDEP is finalizing a 20-year evaluation period, as proposed.

Comment: One commenter suggested limiting eligibility to resources in the ISO-NE control area or adjacent control areas (ELM). Other commenters suggested loosening the requirements for resources located outside New England, for example with respect to technical requirements related to the use of NERC tags and participation in the ISO-NE forward capacity market (Eversource, HQUS, Nalcor, NECEC). One commenter voiced support for the requirement that generation from a control area that is not adjacent to the ISO-NE control area be transmitted through a dedicated transmission line (private citizen).

Response: The proposed regulatory provisions related to geographic eligibility are being retained in the final regulation. Under these provisions, qualified resources must be located in New England or an adjacent control area, unless connected by a dedicated transmission line to one of those areas. The agencies made this decision after consultation with DOER. As explained in the TSD, this approach is consistent with the RPS program, which will simplify administration for MassDEP and regulated parties. Similarly, by connecting a clean generator, or group of clean generators, directly to New England or an adjacent control area, a dedicated transmission line would provide a mechanism to ensure that the same benefits are realized in New England and Massachusetts when CES resources are located outside the regions allowed under the RPS regulation.

Requirements related to participation in capacity markets are being retained to ensure that clean generators reduce emissions without adversely affecting electric reliability in New England by withholding imports when they are most needed to ensure reliability.

[20] For example, 20-30 year time frames have been used by the California Air Resources Board, the US Environmental Protection Agency, and various European initiatives and academic studies.

Comment: One commenter suggested including existing, non-RPS eligible hydroelectric units and APS-eligible resources in the CES (NECEC). Another advocated revising references to DOER's RPS regulation so that biomass generators that do not meet RPS efficiency requirements can qualify for CES if they meet the emission threshold (Biomass Power Association).

Response: Existing resources, including small non-RPS eligible hydroelectric generators, will be examined in the review of existing resources that MassDEP will complete in 2017, as discussed below. The final regulation does not include any changes related to APS-eligible resources, but MassDEP notes that it does not appear that any APS-eligible resources can qualify for CES based on the emission threshold. With regard to potential new biomass or small hydroelectric units that are excluded from RPS because they do not meet technology-specific requirements such as the biomass efficiency requirement, the final regulation retains the proposed exclusion to reduce administrative costs and maintain consistency between the CES and RPS for these project types.

C. Flexibility

Comment: Some commenters supported the inclusion of an option for regulated entities to comply by making Alternative Compliance Payments (ACP). Other commenters advocated eliminating the ACP option, or, at minimum, disallowing the use of ACP for compliance in 2020 to ensure that the 2020 CES requirement is met using CECs not ACPs (CLF, ECANE, NECEC). Other commenters noted the importance of an ACP for compliance flexibility, price control, and protection against potential market power issues (NYU IPI, PowerOptions). One commenter suggested that ACP funds be used to support zero-emission generation in Massachusetts (MAPC). One commenter on the proposed ACP rate noted that non-RPS eligible clean generation may not require as much "premium support," apparently suggesting that the ACP should be set at a relatively low level (Eversource).

Response: EEA and MassDEP are retaining an ACP option in the CES to provide compliance flexibility as well as a price ceiling on CECs by offering a compliance option that would cost no more than a fraction of the RPS ACP price in a given year. The agencies are making one change to the ACP provisions to address the importance of meeting the 2020 target: for years 2018 – 2020, the ACP rate is being increased to 75% of RPS amount, thereby reducing the likelihood that compliance will occur through ACPs. Beginning in 2021, the ACP rate will revert to 50% of the RPS rate, as proposed.

The final ACP price levels are consistent with, but higher than, the anticipated price of available RECs, as observed by DOER and in futures prices available on the website of the Intercontinental Exchange trading platform (www.theice.com). Therefore, compliance should occur using CECs, not ACPs.

Another reason that the agencies do not expect the use of ACPs in 2020 is that EEA and MassDEP determined prior to the rule-making in consultation with DOER that there is currently a significant surplus of renewable energy supply available. This assessment was shared with stakeholders before proposing 310 CMR 7.75, and there was no adverse comment on this issue.

In addition, the surplus of in-region renewable energy supply and has since been confirmed by Sustainable Energy Advantage[21] and Synapse Energy Economics.[22]

As finalized, ACP funds will be directed to support the Commonwealth's efforts to reduce GHG emissions and to address other harmful effects of climate change, including supporting adaptation efforts in those communities that are most adversely affected. By closely targeting the use of any ACP funds to the types of program and projects that will directly reduce GHG emissions and mitigate the harms of such emissions, EEA and MassDEP will further ensure that the statutory purposes of the GWSA are met.

The Electricity Bill and CO_2 Emissions Impacts Study discussed in Section III-C and V-B of this RTC considered the proposed ACP rate, and also addressed the impacts of a higher ACP rate. This analysis supports EEA and MassDEP's conclusion that the ACP will not be utilized in 2018 - 2020 because there is sufficient renewable energy available to meet the standard without the use of ACPs, but shows the potential for some use of ACPs for compliance in 2021 - 2022, when the ACP rate is lower but new imported hydroelectricity is not yet available. Specifically, the study projects:

- REC prices remain below 75% of the RPS rate in 2018 – 2020 under base case and higher electricity sales projections, so the ACP is not utilized for compliance in those years (see Figures 9 and 13).
- In 2021 – 2022, REC prices rise to near the ACP rate of 50% of the RPS rate under higher electricity sales projections, suggesting that the ACP could limit bill impacts in those years (see Figure 13).

Comment: One commenter suggested removing banking of CECs from the CES (CLF). The commenter stated that allowing the use of banked CECs in 2020 could reduce the amount of clean energy that must be delivered to Massachusetts in 2020, resulting in increased emissions in that year. One commenter supported banking but not borrowing (NYU IPI).

Response: EEA and MassDEP agree with the commenter regarding the importance of controlling emissions in 2020 and are therefore revising the banking provisions in 310 CMR 7.75 so that the use of banked of CECs is not allowed until 2021. Allowing the use of banked CECs for compliance beginning in 2021 is appropriate because it could provide an additional incentive to reduce emissions in 2020. Because the banking provisions in DOER's RPS regulation are not affected by this rulemaking, they will continue to allow banking of excess RECs, providing flexibility and supporting operation of the broader REC market. The CES does not include borrowing.

D. Prices & Costs

Comment: Some commenters voiced concern that the CES will result in increased electricity costs to ratepayers. Several commenters cited costs of other clean energy programs, such as renewable energy mandates, as evidence that costs of such programs are already high and should

[21] See http://www.raabassociates.org/Articles/Grace%20Presentation%203.24.17%20final.pdf , slide 12.
[22] See http://www.synapse-energy.com/about-us/blog/analysis-massachusetts-rps, Figure 7, p. 18.

not be increased further (Eversource). One of these commenters noted that electricity prices could increase if new clean energy (offshore wind and hydroelectricity) is not procured as expected (AIM).

Response: EEA and MassDEP recognize the potential for cost increases as a result of new requirements for clean energy procurement. For the TSD, DOER and MassDEP had estimated that the direct costs to retail electricity sellers of purchasing additional RECs in 2018 – 2020 could amount to approximately 1% of electricity bills. A more recent study of RPS expansion in Massachusetts and Connecticut, which could be expected to have similar costs, suggested possible bill impacts for the typical residential customer of $0.15 to $2.17 per month.[23] The high end of this range exceeds the estimate included in the TSD, but may be more reflective of the potential costs of implementing the final regulation, which includes a higher ACP price than the proposal. Therefore, a range of 1 – 2% of electricity bills may be more appropriate for the cost of implementing the final regulation. Also, as noted in the TSD, the GWSA requires emissions reductions, so not implementing the CES could require implementation of other policies with potentially higher costs.

The Electricity Bill and CO_2 Emissions Impacts Study, discussed in Sections III-C and V-B of this RTC, generally supports EEA's and MassDEP's initial conclusion that sufficient renewable energy is available to support compliance with 310 CMR 7.75, and that impacts on electricity consumers are likely to amount to less than 2% of current electricity bills in almost all cases. Specifically, for the aggregate emission limits finalized in 310 CMR 7.74, the study projects:

- Bill impacts are projected to be 0 – 1.5% of electricity bills for all years and rate classes, with impacts of up to 2.1% possible under a higher electricity sales scenario (see ES-Figure 2).
- REC prices are projected to increase to approximately $30 - $40 per MWh in some years, compared to the very low prices projected in the reference case (see Figure 9, Table 4, Figure 13, Table 6).
- Renewable generation is projected to increase in New England (see Table 3).

Comment: One commenter raised concerns about the potential for generators of clean energy attributes demanded by the CES to exert substantial market power, potentially suppressing credit prices (PowerOptions).

Response: The requirements of the final CES were determined in consultation with DOER and DPU, agencies with experience implementing the RPS. Therefore, EEA and MassDEP expect the CEC market to function efficiently under the CES, and do not anticipate adverse market outcomes such as price suppression. MassDEP also notes that laws and regulations that ensure competitive electricity markets may preclude pricing strategies described by the commenter.

[23] See http://www.synapse-energy.com/about-us/blog/analysis-massachusetts-rps, p. v.

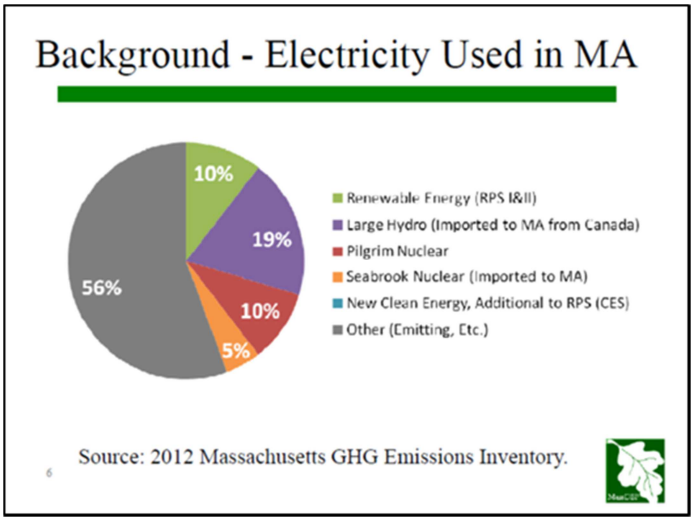
E. Existing Resources

Comment: Several commenters requested that MassDEP remove the requirement for clean generators to have commenced operation after 2010 (Brookfield, Dominion, Eversource, NEER, NEPGA). These commenters cited the importance of existing (pre-2010) generators to the achievement of emission reductions, along with fairness, as reasons for making this change. Few other commenters addressed the status of existing generators, except that the many commenters who advocated against including nuclear power in the CES focused particularly on the Pilgrim nuclear power plant. Two commenters suggested allowing existing clean generators smaller than 100 MW to qualify (Brookfield, RENEW Northeast). The only commenter that explicitly addressed MassDEP's proposed review of existing resources in the CES suggested that the CES regulation not be finalized until after that review is complete (Eversource).

Response: The purpose of the CES is to reduce emissions by supporting the increased use of new clean generators to generate electricity consumed in Massachusetts. Limiting eligibility to post-2010 generators is consistent with this purpose. However, as explained in the TSD, reducing emissions requires that new clean generators replace existing GHG-emitting generators, not existing clean generators. Therefore, MassDEP proposed, and will complete, a review of options for including existing clean generators in the CES. This review will commence in late 2017 and involve interested stakeholders, including those commenting on this aspect of the proposed regulation.

One option that MassDEP may consider in the review could be amending 310 CMR 7.75 to add a separate requirement to support existing clean generators (a "CES-E"). The purpose of the CES-E would be to encourage existing clean generators to continue to generate electricity for consumption in Massachusetts at current or historic levels.

Massachusetts' GHG inventory includes information about electricity consumed in Massachusetts, including imported electricity. The graph below, from a presentation shared with stakeholders in 2014, provides a rough accounting of the major contributors. The graph reflects the approach to accounting for imported electricity used in the GHG inventory, under which a significant fraction of emissions from power plants in New Hampshire (NH) are assigned to Massachusetts (because NH is a net exporter of electricity on an annual basis), but not from Connecticut (CT) (because CT is not a significant exporter in most years). Reflecting this approach, the graph shows that Massachusetts receives significant quantities of non-emitting electricity each year from the Seabrook nuclear power plant (in NH), but not the Millstone plant (in CT). Similarly, Massachusetts receives a large share of the electricity imported from Canada to New England because Massachusetts is by far the largest net electricity importer of the New England states.



A CES-E regulation structured in a manner consistent with the GHG inventory could help maintain the amount of clean electricity imported to Massachusetts from existing clean generators at current levels. For example, a CES-E could be structured to:

- Require retail electricity sellers to annually purchase clean energy certificates ("CEC-Es") from existing clean generators in amounts consistent with recent historical data, with quantities specified in MWh for each category of existing clean generator (e.g., hydroelectric generators in Canada).[24]
- Allow generators to qualify to create CEC-Es if they:
    - Do not participate in other clean energy programs such as state energy portfolio standard programs.
    - Are located in a state or region from which Massachusetts has consistently imported significant quantities of potentially eligible electricity in recent years.
    - Commenced commercial operation after 1990. This requirement would be consistent with the GWSA requirement to reduce emissions between 1990 and 2050. In particular, it would acknowledge the importance of reducing emissions with respect to a 1990 baseline, and increase the likelihood that generators supported by the CES-E will remain operational through 2050. As the Pilgrim nuclear power plant commenced commercial operation before 1990, this restriction would also be responsive to comments received on the inclusion of nuclear power in the CES.
- Include an alternative compliance payment (ACP) option to limit impacts on electricity rates. The per-MWh ACP amount could be set at a relatively low level (e.g., 10% of the RPS Class I ACP amount, or ≈ $7/MWh), reflecting the fact that the existing hydroelectric and nuclear generators that would be supported by the program have relatively low operating costs, and that their clean attributes (CEC-Es) are not valued in other markets.

[24] While not discussed in this response to comments, the review may consider issues unique to MEDs/MLBs, such as issues related to their long-term contracts with existing clean generators.

The required review of options for including existing clean generators in the CES will include consideration of whether a CES-E can help maintain emissions reductions over time, how the CES-E structure described above compares with other options, and potential bill impacts of a CES-E. The review will also consider technical issues such as the treatment of various categories of hydroelectricity, interactions with other clean energy policies, and whether any limits on generator capacity (i.e., < 100 MW) would be appropriate.

V. 310 CMR 7.74: REDUCING CO_2 EMISSIONS FROM ELECTRICITY GENERATING FACILITIES

A. General Comments

Comment: In addition to the many technical comments discussed below, several commenters stated that MassDEP should not finalize 310 CMR 7.74 (Dynegy, NEPGA, PowerOptions, Vitol, others), while several others expressed support for the proposal (Brookfield, CWA, E2, ELM, private citizen, others). In general, opponents of the regulations described it as unnecessary and potentially detrimental, with many citing potential negative impacts on electricity costs and emissions, and suggesting that a focus on the transportation sector would be more appropriate given the amount that the electricity sector has already reduced GHG emissions. Supporters cited the importance of addressing climate change and complying with the GWSA.

Response: As discussed in detail in Section III of this RTC, EEA and MassDEP are finalizing 310 CMR 7.74 to address climate change in accordance with the requirements of the GWSA, the Kain decision, the 2020 CECP and its Update, and Executive Order No. 569. As explained in the TSD, and verified by the Electricity Bill and CO_2 Emissions Impacts Study, the combined effect of 310 CMR 7.74 and 310 CMR 7.75 will be to reduce emissions. The role of 310 CMR 7.74 is to address the GWSA requirement to ensure that emission reductions are realized in Massachusetts; as discussed in section IV of this RTC, 310 CMR 7.75 is necessary to ensure that sufficient clean energy is available to provide reliable and affordable electricity. 310 CMR 7.74 and 7.75 also reflect the regional nature of the electric grid and the GWSA requirement to account for the emissions from electricity imports.

Specific issues raised by commenters are discussed in detail below. MassDEP's approach to addressing transportation sector emissions is discussed in a separate RTC covering 310 CMR 60.05 and 60.06.

Comment: Several commenters stated that 310 CMR 7.74 should not take effect for three years after promulgation to ensure that EGUs can address commitments made in the ISO-NE forward capacity markets (EPI, NEPGA).

Response: EEA and MassDEP are not delaying implementation of 310 CMR 7.74 to address forward capacity market commitments. These commitments require facilities to participate in ISO-NE's energy markets with penalties for reduced real-time availability during most needed hours. The cap-and-trade structure of 310 CMR 7.74 provides sufficient flexibility to allow facilities to meet these commitments while complying with 310 CMR 7.74, because facilities can purchase the allowances that they need to operate consistently with ISO-NE commitments (i.e.,

from other facilities 2018, or through auctions in later years). As with other commitments (e.g., other environmental regulations, fuel contracts, etc.), facilities can reflect any costs associated with 310 CMR 7.74 in bids and thereby ensure compliance with capacity commitments and 310 CMR 7.74. Furthermore, even though such exceptions have not proven necessary in other allowance trading programs such as RGGI, MassDEP is adding an "emergency deferred compliance" option (discussed below) to ensure that 310 CMR 7.74 does not interfere with the reliable operation of the electric grid. MassDEP also notes that ISO-NE, which administers the forward capacity market, did not identify a need to delay implementation of 310 CMR 7.74 to accommodate the forward capacity market schedule, and that making the change requested by commenters could set a troublesome precedent for unnecessarily delaying the implementation of regulations to accommodate schedules over which the agencies have no control.

Comment: Two commenters addressed the relationship between 310 CMR 7.74 and the RGGI program. One of these commenters expressed concern that the two programs are not compatible, (Vitol) and the other suggested that MassDEP should retire RGGI allowances representing reductions caused by 310 CMR 7.74 to prevent emissions from increasing in other states (NYU IPI). Several other commenters representing facilities expressed a strong preference for the RGGI program's regional approach over the single state approach of 310 CMR 7.74, stating the RGGI provides greater flexibility and is more compatible with regional electricity markets (Calpine, Dynegy, Exelon, others).

Response: 310 CMR 7.74 is compatible with, but distinct from, RGGI. Specifically, RGGI controls emissions in the RGGI region but does not restrict emissions in any particular state. Conversely, 310 CMR 7.74 controls emissions in Massachusetts but not in other states. As long as each facility complies with the allowance holding requirements of both regulations emissions in Massachusetts and the RGGI region will remain below regulatory limits.

Retiring RGGI allowances to prevent leakage is not necessary because other Massachusetts clean energy programs including 310 CMR 7.75 will reduce emissions regionally. Requiring facilities to retire excess RGGI allowances could create uncertainty in the RGGI market because it could change the supply of RGGI allowances available across the region.

More generally, as stated in the TSD, 310 CMR 7.74 can be implemented without any impact to RGGI. This is based on EEA's and MassDEP's experience implementing various regulatory programs that constrain the operation of facilities subject to 310 CMR 7.74 and RGGI, and the fact that none of the modeling efforts discussed in Section V-B of this RTC, including the Electricity Bill and CO_2 Emissions Impacts Study, identified issues complying with both regulations.

Comment: Many commenters expressed concern about the potential impact of the regulation on wholesale electricity prices and regional emissions, in many cases referencing modeling completed by ISO-NE (AIM, Dynegy, EPI, Exelon, Footprint/NRG Canal, NEPGA, R. Tabors, Stony Brook Energy Center, TMLP).

Response: Issues identified in these comments are addressed at a technical level in the TSD and below. Specifically, the TSD explains how the emission limits included in 310 CMR 7.74 were

determined based on an assessment of changes that are expected to occur in the electric sector because of energy efficiency, new clean energy (including the impact of the CES), and power plant retirements. In general, this approach to establishing the stringency of the regulation, along with the inherent flexibility of the electric grid to shift generation among efficient generators during hours of low electricity demand, minimizes the potential for the regulation to have significant impacts on electricity prices or regional emissions. As explained in detail below, ISO-NE's comments and modeling support this assessment. In particular, modeling of the regional electric grid submitted by ISO-NE projects that emissions will be well below the limits established by 310 CMR 7.74 in 2025 (the only year analyzed by ISO-NE) whether or not 310 CMR 7.74 is implemented, suggesting that 310 CMR 7.74 may not have any impact on prices or regional emissions in that year. Even ISO-NE's modeled cases that assume some impacts from 310 CMR 7.74 show impacts on prices and regional emissions that are small compared to normal year-to-year variability. In addition, the Electricity Bill and CO_2 Emissions Impacts Study reached similar conclusions.

B. Technical Comments on Potential Impacts on Prices and Emissions

Comment: Several commenters modeled potential impacts of 310 CMR 7.74 on the regional electric grid, and included quantitative modeling results in their comments (Dynegy, ISO-NE, NRG, R. Tabors). As described by the commenters, these modeling results showed that limiting emissions from EGUs in Massachusetts could increase emissions in surrounding states and regionally, and that regional wholesale electricity prices could also increase. Other commenters referenced these modeling results, particular ISO-NE's, which ISO-NE published prior to the public comment deadline. The following paragraphs summarize the technical results of these modeling efforts; additional discussion of how these results were interpreted by commenters is included elsewhere in this document.

ISO-NE operates the regional electric grid. To analyze the potential impacts of 310 CMR 7.74, ISO-NE adapted two reference scenarios that were modeled for the purpose of conducting 2016 economic studies of the projected operation of the regional electricity grid. ISO-NE performs these modeling analyses as part of its overall management of the regional electricity grid. The purpose of these economic studies is to assist ISO-NE in conducting long-term planning for generation and transmission resources needed to provide a reliable electricity supply. The 2016 modeled scenarios were developed with extensive stakeholder input.

In order to study the impact of new Massachusetts energy policies to purchase large amounts of hydroelectricity and offshore wind power (required by the 2016 Energy Bill) and the impacts of the proposed regulation, 310 CMR 7.74, ISO-NE also developed four additional reference cases to represent the additional hydroelectricity imports and offshore wind, and then modeled the effects of a $2/ton allowance price (as a proxy for the impact of 310 CMR 7.74) on each of the six reference scenarios, for a total of twelve scenarios. The only year that ISO-NE studied was 2025 (detailed numerical results were provided in an attachment to ISO-NE's comment letter – see slide 22).

- Projected emissions were below 310 CMR 7.74 aggregate limits in all scenarios. Across the twelve model runs, "Emissions from MA Affected Generation" varied between 4,734

and 7,777 thousand short tons of CO_2, or 4.3 - 7.1 MMT, well below the 2025 aggregate limit of 7.5 MMT in 310 CMR 7.74. Notably, projected emissions were already below the proposed limit even in scenarios that did not include any representation of 310 CMR 7.74. This means that the regulation would not result in additional emission reductions in 2025 beyond those reflected in the reference case.

- Observed price increases were small, and price decreases were observed in one scenario. Six of the model runs included a price of $2/ton of CO_2 emissions to represent potential impacts that 310 CMR 7.74 could have if it were to require additional emissions reductions in a particular year. Most of these model runs showed increases in wholesale electricity prices and regional emissions equal to less than 1% of reference case values. One scenario that included expected hydroelectricity imports and offshore wind actually showed a slight decrease in electricity prices.
- Small regional emissions increases were observed when impacts of 310 CMR 7.74 were isolated from other policies and modeled using an allowance price. The six scenarios that analyze a $2/ton allowance price (but not 310 CMR 7.75 or the specific emission limits proposed in 310 CMR 7.74) showed reductions from affected generators in Massachusetts of 8-16% (0.5 – 0.9 MMT) compared to reference case emissions, but also showed that these reductions would be offset by increases in emissions from other states (i.e., cause "leakage").
- Scenarios that reflect the impacts of the Energy Bill show significant reductions, regardless of the treatment of 310 CMR 7.74. Comparison of four model runs that did not include additional hydroelectricity imports and offshore wind with eight otherwise identical model runs that did include additional hydroelectricity imports and offshore wind show significant CO_2 emission reductions from adding hydroelectricity imports and offshore wind. These reductions were apparent in all scenarios, both inside and outside of Massachusetts, regardless of whether an allowance price was included. In all cases, the primary impact of a $2/ton allowance price was to increase the portion of these emission reductions that occur in Massachusetts.

Tabors Caramanis Rudkevich

Tabors Caramanis Rudkevich simulated the regional electric grid, evaluating the impact of the 310 CMR 7.74 emission limits compared to a reference scenario without 310 CMR 7.74. The comments included detailed numerical results presented in graphical form, including the reference case.

- Reference scenarios project emissions below the 310 CMR 7.74 aggregate limits in every year except 2018 and 2019.
- The new facility limit was modeled as an independent constraint that could not be overcome by purchases of additional credits, and shown to be binding in every year. This assumption resulted in small modeled emissions increases in other New England states in every year.
- Total annual costs to consumers in New England were projected to range from $10 – 80 million. Most of this cost resulted from the assumption that new facilities would not purchase credits from existing facilities.

- For model years 2018 – 2020, equivalent CO_2 prices of $0.45 – 1.10 per ton were reported, corresponding to projected credit (or allowances) prices.

Dynegy

Dynegy used a production cost model to study regulatory impacts in 2018, 2020, and 2025. Specifically, "successive iterations of the model were run, placing an increasing cost of CO_2 emissions on Massachusetts generators covered by the proposed regulations until the aggregate CO_2 emissions from Massachusetts generators were driven to match the aggregate CO_2 emission limits defined by the proposed regulations." The results were then compared to a reference case.

- The iterative process described above yielded CO_2 prices of $9 – 21 per ton.
- Compared to the reference scenario, the modeling projected reductions in Massachusetts electricity generation of 27 – 44%, with generation shifting to other New England states, and wholesale price increases of 6 – 15%.
- The impact on regional emissions in 2025 was described as "flat" or increasing "slightly." No information was provided about regional emissions in other years.

NRG

NRG cited modeling results showing costs to consumers in New England of $360 million between 2018 and 2020, but did not provide additional information.

Response: EEA and MassDEP appreciate the time and resources that commenters devoted to studying 310 CMR 7.74, and their willingness to share this information. Potential cost and emissions impacts were acknowledged in general terms in the TSD. The TSD stated "Any incremental costs would be associated with ensuring that reductions caused by these Massachusetts policies that might otherwise occur elsewhere in New England occur in Massachusetts. Such costs are expected to be minimal because of the flexibility inherent in the regional electric grid to shift generation among EGUs in New England during times of low demand."[25]

EEA and MassDEP note that commenters' analysis of modeling results appears to have been directed primarily at confirming that emissions and cost impacts could occur, rather than evaluating whether the impacts are likely to occur given the way 310 CMR 7.74 was designed to ensure reductions caused by other clean energy programs. In addition, commenters' models do not appear to have been designed to determine whether the magnitude of any impacts would be significant enough to require changes to 310 CMR 7.74. Commenters also generally did not address the broader purpose of 310 CMR 7.74, which is to complement other clean energy policies, including the CES, by ensuring reductions that would otherwise occur. Fortunately, commenters shared modeling results that MassDEP used to independently evaluate these questions.

[25] During times of low electricity demand, some efficient generators do not operate. Because these generators have low operating costs, switching among them will not significantly impact regional electricity prices.

MassDEP's technical review of the commenters' modeling results concludes that 310 CMR 7.74 is very unlikely to result in costs or emissions increases exceeding 1% in any year (compared to reference case prices and emissions), and that such impacts are likely to be equal to zero in some or many years. The commenters' model results overall also demonstrate that, when considered in combination with other policies, 310 CMR 7.74 can serve its purpose of ensuring that reductions from other clean energy policies are realized in Massachusetts. The technical basis for these conclusions is summarized in the following paragraphs:

- The regulation does not require reductions beyond levels projected under reference case assumptions. As noted above, quantitative modeling by ISO-NE and Tabors Caramanis Rudkevich suggests that the regulation will not require emissions to be reduced below reference case levels, at least in 2025. Furthermore, Tabors Caramanis Rudkevich's modeling shows reference case emissions very close to the 2020 aggregate emissions limit. These results support the limit-setting approach described in the TSD, under which the 2020 aggregate limit in 310 CMR 7.74 was explicitly established consistent with estimated 2020 electric-sector emissions due to policies in the 2020 CECP Update and the CES, and the reduction schedule for other years was established with the purpose of ensuring that anticipated reductions occur by setting an enforceable limit, not by delivering additional reductions.
- If 310 CMR 7.74 requires emission reductions in a year, cost impacts are likely to be small. Commenters provided helpful information regarding the potential magnitude of compliance costs. For example, one of the scenarios studied by ISO-NE projected that a $2/ton allowance price would reduce emissions well below levels required by 310 CMR 7.74 and increase wholesale electricity prices by $0.35/MWh. Similarly, NRG reported potential costs of $360 million over a three year period across New England. While significant, these costs amount to increases of less than 1% of Massachusetts retail prices (≈ $140 - $160/MWh) and regional retail sales (≈ $14 - $18 billion per year).[26] MassDEP also notes that costs would not be incurred in years in which the regulation would not be binding, and that ISO-NE studied one scenario in which a regulatory constraint resulted in lower electricity prices, suggesting that any cost increases modeled by ISO-NE can be considered worst-case, not expected, outcomes.
- Regional reductions caused by Massachusetts' policies are stringent enough to allow compliance with 310 CMR 7.74, even if 310 CMR 7.74 requires emission reductions in Massachusetts in some years. Modeling by ISO-NE suggests how 310 CMR 7.74 could achieve its purpose of ensuring that other Massachusetts clean energy policies reduce emissions in Massachusetts. Specifically, all scenarios show emissions reductions in New England of more than 5 MMT from imported hydroelectricity and offshore wind contracted under Massachusetts' policies by 2025. Without any allowance price, reductions from EGUs located in Massachusetts are less than 2 MMT, with the remaining reductions occurring in other New England states. However, when a non-zero allowance price is added, reductions from EGUs located in Massachusetts exceed 2.5 MMT. In other words, reductions occur across New England in all cases, but the allowance requirement increases the portion of the reductions that occur in Massachusetts. MassDEP also notes that since ISO-NE modeling projects that 310 CMR 7.74 will not

[26] Costs are approximate based on recent per-kWh retail electricity prices from multiple sources, and more than 100 million MWh in annual regional electricity sales.

require emissions reductions in 2025 (as discussed above), any shifting of emissions reductions among states should be considered a possible, not a projected, outcome. The magnitude of the reductions in emissions from EGUs located in Massachusetts is at least 0.5 MMT in each scenario. The ability to shift emissions among states at moderate cost is also illustrated in the modeling results submitted by Tabors Caramanis Rudkevich, which show shifts in emissions of 0.5-1.5 MMT associated with price impacts smaller than those reported by NRG and ISO-NE.[27]

- Larger impacts projected by Dynegy are not supported by other commenters and do not appear relevant. Unlike ISO-NE and Tabors Caramanis Rudkevich, Dynegy did not include enough information about the reference case that was used as a comparison point for evaluating policy impacts. Dynegy's statement that 310 CMR 7.74 would reduce Massachusetts generation by 44% in 2025 shows, indirectly, that Dynegy used a very different reference case than ISO-NE and Tabors Caramanis Rudkevich, both of which used reference cases showing that compliance with 310 CMR 7.74 would not require any emissions reductions in 2025. The projection of 44% reductions also conflicts with ISO-NE scenarios, in which generation reductions of less than 5% bring modeled emissions well below levels required by 310 CMR 7.75 in 2025. The unexplained inconsistency with ISO-NE's modeling is particularly notable, given ISO-NE's reliance on publically-vetted assumptions and the fact that the ISO-NE modeling results were available to Dynegy in advance of the comment deadline and cited in Dynegy's own comments. A possible reason for the discrepancy could be that Dynegy did not fully reflect important clean energy policies, such as RGGI, in its reference case. If true, this would also support MassDEP's approach to establishing aggregate emissions limits, under which 310 CMR 7.74 "ensures" reductions from other policies and does not (as assumed by Dynegy) result in significant additional reductions.

As discussed in Section I-C of this RTC, MassDEP also commissioned the Electricity Bill and CO_2 Emissions Impacts Study to better understand issues raised by commenters. The study considered the combined effects of 310 CMR 7.74 and 310 CMR 7.75, as finalized, and includes additional analysis of the impact of possible higher electricity demand and a lower (more stringent) emissions limit.

In general, the study confirms MassDEP's assessment of the expected impacts of implementing 310 CMR 7.74, along with 310 CMR 7.75. The combined impact of the two regulations on electricity bills is discussed in Section IV of this RTC. In relation to 310 CMR 7.74, the study projects the following impacts between now and 2020, with lesser impacts in later years:

- In all scenarios, the combined effect of 310 CMR 7.74 and 310 CMR 7.75 is to reduce emissions, with larger reductions occurring under higher electricity demand projections (see Figure 4, Table 16, Figure 12, Table 19).
- Under base-case electricity demand projections that are consistent with the 2020 CECP Update, compliance with the aggregate emissions limits 310 CMR 7.74 is not projected

[27] MassDEP also notes that, while not reflected in this analysis, attribute tracking requirements in contracts and 310 CMR 7.75 will ensure that MWh from hydroelectricity imports and offshore wind supported by Massachusetts policies will be fully accounted for in MassDEP's GHG inventory.

to require any incremental emission reductions (see Figure 3). Projected allowance prices are therefore zero.

- Under higher electricity demand projections derived from ISO-NE projections, complying with the aggregate emissions limits in 310 CMR 7.74 requires incremental emission reductions in 2018 only (see Figure 11). Projected allowance prices are $1.16 in 2018.
- If 310 CMR 7.74 had been finalized with a lower aggregate emissions limit, incremental reductions would be required in additional years, and allowance prices would be significantly higher, particular under higher demand projections (see Figure 15).
- The results are not affected significantly by different RGGI allowance price projections.
- Impacts on wholesale electricity prices are not significant compared to historical year-to-year variations (see Figure 8).

Comment: Several commenters questioned whether, when considered in the context of the regional electricity market, 310 CMR 7.74 will reduce emissions. Many of these commenters referenced analysis of the regulation submitted by ISO-NE. Most commenters focused on the possibility that 310 CMR 7.74 could result in a net increase in regional emissions, but the possibility of "leakage" (emissions increases outside of Massachusetts) was also addressed by many commenters (AIM, Dynegy, ELM, Exelon, Footprint/NRG, MMWEC, NEPGA, NRG, PowerOptions, private citizen, Stony Brook Energy Center, Talen, Vitol).

Response: As stated in the TSD that was published with the proposal, "The purpose of [310 CMR 7.74] is to ensure that the impacts of clean energy programs, including energy efficiency programs and programs that support renewable energy, are fully reflected in reductions in GHG emissions from in-state electricity generation facilities and in MassDEP's GHG inventory." As explained below, 310 CMR 7.74 is structured in a manner consistent with this purpose. In other words, MassDEP proposed 310 CMR 7.74 to "ensure" an outcome that will be largely driven by other policies, not to be a primary driver of emission reductions. Specifically, as explained in the TSD, "in establishing the 2020 aggregate limit" MassDEP analyzed "changes that will occur in Massachusetts by 2020" and proposed an annual aggregate GHG emissions limit consistent with those changes.

Modeling results submitted by ISO-NE and described above are instructive in understanding how 310 CMR 7.74 can "ensure" that Massachusetts' clean energy policies reduce emissions in Massachusetts. Those modeling results show the impact of adding "1,200 MW of hydro imports from Quebec into New England plus 1,600 MW of offshore wind," as is expected to occur in the 2020s because of the mandates of the Energy Bill. ISO-NE projects that these policies will reduce emissions in all New England states. However, the results differ with respect to how the reductions would be distributed across New England. Specifically, under ISO-NE's reference cases (without 310 CMR 7.74), approximately two-thirds of the reductions occur in New England states other than Massachusetts, but under ISO-NE's policy cases (with 310 CMR 7.74), the fraction is closer to one half. These results are presented here to show how the regulation could achieve its stated purpose of ensuring in-state reductions from Massachusetts' policies; however, as discussed below, because ISO-NE analyzed the impacts of a $2/ton allowance price instead of MassDEP's proposed emissions limits, the numerical results should not be considered projected outcomes.

Furthermore, EEA and MassDEP note that ISO-NE's 2025 modeling results show emissions below the aggregate emissions limits in all modeled scenarios, including reference cases without 310 CMR 7.74. In its modeling, ISO-NE represented 310 CMR 7.74 by imposing an allowance price of $2/ton of CO_2, regardless of whether any emissions reductions would be necessary to achieve compliance with 310 CMR 7.74. This approach may support academic study of potential impacts of a limit on emissions from EGUs in Massachusetts, but does not represent a quantitative analysis of 310 CMR 7.74. A quantitative analysis of 310 CMR 7.74 would necessarily require consideration of the particular emission limits in the regulation. Since 310 CMR 7.74 would not require reductions beyond those observed in ISO-NE's reference case, such analysis would likely yield projected impacts on emissions of zero. MassDEP notes that this result would be consistent with the stated purpose of 310 CMR 7.74, which is to ensure emissions reductions, not cause them.

ISO-NE explicitly addresses the applicability of its analytical results in its comments: "It appears that the state will have difficulty meeting its desired carbon emission reductions from the electricity sector if it relies solely on the regulation because these limits, if they are binding, actually increase the emissions associated with Massachusetts electricity consumption." Specifically, as discussed above, EEA and MassDEP are not relying "solely" on 310 CMR 7.74, and ISO-NE's analysis suggests that the regulation may not be "binding."[28] Therefore, EEA's and MassDEP's interpretation of these modeling results does not support the conclusion that "the state will have difficulty meeting its desired carbon emission reductions from the electricity sector."

These issues were also addressed explicitly in the TSD, which stated that the 2020 emissions limit was chosen based on "changes that will occur in Massachusetts by 2020" and that "costs are expected to be minimal because of the flexibility inherent in the regional electric grid to shift generation among EGUs in New England during times of low demand." In other words, 310 CMR 7.74 is intended to ensure the impact of other electric-sector policies in the 2020 CECP Update and the CES, in the context of the regional electric grid, not reduce emissions independently from those policies.

A specific concern raised by some commenters is the possibility that a binding emissions limit on in-state generators could increase emissions regionally. This could occur if constraining generation of efficient in-state generators results in the substitution of higher-emitting out-of-state generators to meet electricity demand. For example, this was one conclusion of the ISO-NE's modeling of a $2/ton CO_2 price. The discussion above largely addresses this concern: The regulation is designed to ensure GHG emissions reductions from other Massachusetts policies and will not in and of itself result in leakage. Therefore, it is only appropriate to analyze its effect in combination with other policies that will reduce emissions, not in isolation.

EEA and MassDEP also note that several commenters modeled possible increases in regional emissions. All of these commenters acknowledged uncertainty regarding whether these increases would occur at all. ISO-NE and Tabors described the magnitude of the increases observed in

[28] In this context, "binding" means that, absent the regulation, emissions would not exceed regulatory limits.

their modeling as "modest" (ISO-NE), or "minor" (Tabors Caramanis Rudkevich). Even Dynegy described the impact on overall regional emissions as "slight."

As discussed above, the Electricity Bill and CO_2 Emissions Impacts Study supports the conclusion that the combined impact of 310 CMR 7.74 and 310 CMR 7.75 is to reduce emissions in both Massachusetts and New England. Because MassDEP is promulgating both regulations, the Electricity Bill and CO_2 Emissions Impacts Study did not attempt to replicate commenters' analyses of the impact of implementing 310 CMR 7.74 without 310 CMR 7.75. However, in order to isolate the impacts of 310 CMR 7.74 and study the impacts identified by commenters, MassDEP analyzed the impact of a lower emissions limit suggested by one commenter. Specifically, in reference to the lower aggregate emissions limit that MassDEP did not include in the final regulation, the study projects:

- Compared to the aggregate emissions limit included in the final regulation, a lower limit reduces fossil generation in Massachusetts, but increases fossil generation in other New England states by a comparable amount (see Figure 15, Figure 16).
- Shifting fossil generation to other New England states can result in less emission reductions in New England (i.e., increase emissions relative to a higher aggregate emissions limit), but this effect is very small relative to the combined reductions from 310 CMR 7.74 and 310 CMR 7.75, and is only observed under higher electricity sales projections in 2018 (see Figure 16).

As described above and in the TSD, MassDEP determined the 310 CMR 7.74 aggregate emissions limit, and is promulgating 310 CMR 7.75 along with 310 CMR 7.74, so that 310 CMR 7.74 will "ensure" emissions reductions consistent with other clean energy policies by setting legally enforceable limits, but not cause additional reductions directly. The modeling results summarized above, including the Electricity Bill and CO_2 Emissions Impacts Study, illustrate the importance of this approach, and why EEA and MassDEP decided not to reduce the proposed aggregate emissions limit in response to those comments that argued for a more stringent limit. Furthermore, as noted above, in all scenarios, only a portion of the emissions reductions from 310 CMR 7.74 and 310 CMR 7.75 occur in Massachusetts, with the remainder occurring in other New England states. This outcome demonstrates why EEA and MassDEP did not increase the proposed aggregate limits, as suggested by other commenters. Specifically, finalizing a higher aggregate emission limit would reduce the likelihood that 310 CMR 7.74 and 310 CMR 7.75 will reduce emissions in Massachusetts, as necessary to ensure compliance with the GWSA 2020 emissions limit.

Finally, EEA and MassDEP note that the regulatory requirement to complete a review of 310 CMR 7.74 in 2021, including evaluation of emissions and cost impacts, and an opportunity for public comment, will provide an opportunity to revisit this issue based on actual experience implementing 310 CMR 7.74.

Comment: Several commenters suggested that the GWSA requires that any increases in emissions outside of Massachusetts caused by 310 CMR 7.74 be reflected in MassDEP's GHG inventory when determining compliance with GWSA reductions requirements (Cogentrix, Dynegy, Talen). In particular, one commenter (NEPGA) made the claim that ISO-NE modeling

shows that 310 CMR 7.74 could increase "statewide GHG emissions," which must be limited under the GWSA.

Response: MassDEP's approach to assessing statewide GHG emissions in its GHG inventory is documented in detailed spreadsheets on MassDEP's web site, and has already been subject to required public comment periods. While MassDEP's GHG inventory approach is not subject to comment in this rulemaking, MassDEP is providing the following technical information to help commenters better understand why it would not be appropriate to reflect all regional emissions impacts of this proposed rule-making in MassDEP's GHG inventory.

- MassDEP's approach to calculating electricity sector emissions in the GHG inventory counts all emissions from EGUs located in Massachusetts (consistent with Massachusetts's role as an electricity importer), along with a fraction of emissions from EGUs located in New England states that export electricity (representing electricity consumed in Massachusetts) in accordance with the accounting approach that was subject to public comment prior to finalization. According to this accounting system, only a subset of any out-of-state emissions increases caused by 310 CMR 7.74 would be reflected in the statewide GHG inventory.
- The GHG inventory is an after-the-fact assessment of emissions based on actual reported data. Impacts of 310 CMR 7.74 will be reflected in the inventory to the extent that it affects actual emissions and generation in Massachusetts and other states. In contrast, modeling results showing emissions increases caused by 310 CMR 7.74 are based on comparison of two different modeling scenarios, and are therefore not appropriate for inclusion in the GHG inventory. By analogy, the effects of fuel prices on GHG emissions can be studied through modeling of multiple scenarios with different fuel prices, but the GHG inventory reflects actual emissions affected by the actual prices that occurred in the inventory year. Consistent with best practice across jurisdictions and pollutants, MassDEP's GHG inventory is based on actual, not modeled emissions.
- Commenters that support reflecting modeled regional emissions increases from 310 CMR 7.74 in MassDEP's GHG inventory do not appear to support treating regional emission decreases caused by other Massachusetts policies similarly. For example, no commenter suggested applying a similar analytical approach to 310 CMR 7.75, which was proposed for the specific purpose of providing clean electricity to reduce emissions, including emissions from electricity imported into Massachusetts. Therefore, because the GHG inventory must address all similar emissions sources using a consistent approach, commenters' suggestion that MassDEP somehow explicitly include modeled impacts of 310 CMR 7.74 would not be appropriate even if the other two issues discussed above could somehow be addressed.

C. Applicability and Monitoring

Comment: Two commenters recommended that MassDEP avoid referencing 40 CFR Part 98, US EPA's GHG reporting Program (ELM, Sierra Club).

Response: EEA and MassDEP agree with the comment and have removed references to 40 CFR Part 98 from the final regulation. These references have been replaced with references to the

emissions reporting requirements of the Massachusetts CO_2 Budget Trading Program at 310 CMR 7.70 (the RGGI program regulations). This change will simplify administration for facilities and MassDEP, as the same emissions data from a facility will be used to assess compliance with 310 CMR 7.74 and 310 CMR 7.70. One consequence of this change is that only CO_2 emissions will be reported and used to determine compliance. This is appropriate because the vast majority of emissions reported to US EPA by EGUs are emissions of CO_2, and because EEA and MassDEP are reducing the aggregate emissions limits slightly to address the fact that the proposed aggregate emissions limits were based on the combined emissions of all GHGs reported to US EPA. Two other changes result from the replacement of references to 40 CMR Part 98 with references to 310 CMR 7.70: (1) the exemption for facilities with consistently low emissions that is included in 40 CFR Part 98 will no longer apply, and (2) provisions of 310 CMR 7.70 that exempt emissions associated with the production of useful thermal energy will now apply to 310 CMR 7.74.

A spreadsheet showing how the final aggregate emissions limits were calculated to address these changes is attached to this RTC as *Appendix B.*

Comment: Several commenters requested that MassDEP exempt facilities that produce useful thermal energy in addition to electricity, or that emissions associated with the production of useful thermal energy be subtracted from facilities' compliance obligations. According to these commenters, the conversion of waste heat to useful thermal energy should be encouraged because it avoids the need to burn other fuels for heating (AEC, Alliance for Industrial Efficiency, NECEC, Northeast CHP Initiative).

Response: EEA and MassDEP agree that the conversion of waste heat to useful thermal energy is beneficial, but does not consider it appropriate to completely exclude large sources of emissions from electricity generation that are regulated under RGGI from the obligation to comply with 310 CMR 7.74. Therefore, as discussed above, the final regulation allows facilities to subtract emissions associated with the production of useful thermal energy from facilities' compliance obligations. This approach will account for emissions attributable to electricity production, but ensure that 310 CMR 7.74 does not discourage facilities from producing useful thermal energy from their waste heat. This will also make 310 CMR 7.74 more consistent with the RGGI program, which also uses this same approach to useful thermal energy.

Comment: One commenter requested that the Deer Island facility be removed from the list of facilities subject to 310 CMR 7.74. According to this commenter, Deer Island is unique in that the purpose of the EGUs is to provide emergency backup power for critical infrastructure, and the facility would have been exempt from the proposed regulation because of its history of low emissions (MWRA).

Response: The final regulations exempt the Deer Island facility. In the TSD, MassDEP explicitly requested comment on exempting facilities that "have a primary purpose other than electricity generation." This comment explicitly addresses that request. The commenter also pointed out that they have low enough emissions to allow them to opt out of federal GHG reporting in the future, such that if 310 CMR 7.74 applicability remained tied to the federal reporting program, the facility would not be subject to 310 CMR 7.74. MassDEP notes the

potential for a change in the facility's operations in the future; should such a change result in significantly increased emissions, 310 CMR 7.74 could be amended in the future to include the Deer Island facility.

Comment: Several commenters addressed the unique situation of new facilities that have, or will have, binding GHG emission limits in their MassDEP permits (ISO-NE). According to these commenters, such facilities should not be required to comply with 310 CMR 7.74 (Footprint/NRG Canal). A particular concern raised by these commenters was that replacing limits in permits with the facility-specific limits in 310 CMR 7.74 would limit their operations much more than their permits would.

Response: EEA and MassDEP are including new facilities within the aggregate emissions limits as proposed. This is necessary to ensure compliance with the GWSA, which requires reductions in total statewide GHG emissions, inclusive of emissions from new facilities, and the Kain decision, which requires declining GHG emissions limits that include emissions from new sources within a chosen category of regulated sources. In response to the concern that 310 CMR 7.74 could limit the operation of these facilities, MassDEP notes that developers of new facilities have claimed that operation of their facilities will reduce the need to operate other, higher emitting, facilities. This fact is important because the final regulation includes the flexibility to shift emissions among facilities, including new facilities, as long as the aggregate limit for the year is not exceeded. New facilities can take advantage of this opportunity and comply as long as they own the necessary number of allowances. Therefore, the final regulation will not exempt new facilities with GHG emission limits in their permits, and the final regulation includes language that clarifies that the requirements of 310 CMR 7.74 replace and supersede GHG limits in electricity generating facility's permits.

Comment: One commenter suggested exempting low capacity factor units, based on their low annual total emissions (NRG).

Response: Because these units are not required to operate at low capacity factors, they must be included to ensure that 310 CMR 7.74 adequately controls emissions from the electricity sector.

Comment: Several commenters advocated adding additional facility categories to the regulation, such as Municipal Waste Combustors (MAPC, private citizen).

Response: Applicability is limited to EGUs in the final regulation. Adding source categories could complicate program design, an issue identified by many commenters.

D. Aggregate GHG Emissions Limits

Comment: Several commenters stated that 310 CMR 7.74 should not remain in effect after 2020 (Calpine, NEPGA, NRG), while others supported retaining the proposed post-2020 limits (CWA).

Response: EEA and MassDEP have retained emissions limits through 2050 to support long term planning by the electric power industry. As noted in the TSD and the 2020 CECP Update, it will

be necessary to largely or completely decarbonize electricity production by 2050 to meet the goals of the GWSA. Given the long planning horizons and large capital investments that characterize the electricity sector, providing a clear signal that progress toward this goal must be sustained across the entire 2021 – 2050 time frame will encourage investments that are compatible with achievement of the GWSA's 2050 reduction requirement. The requirement to complete a review of 310 CMR 7.74 in 2021 will provide an opportunity to adjust the proposed numerical emissions limits to ensure compatibility with the 2030 statewide GHG emissions limit that will be finalized in 2020 under the GWSA, and to reflect experience implementing the program in 2018 – 2020.

Comment: Several commenters suggested that the proposed emission limits are overly stringent (AIM, Dynegy, NEPGA). For example, one of these commenters suggested that the 2020 aggregate emissions limit should be raised to 12.5 MMT (NRG).

Response: EEA and MassDEP are not increasing the numerical emission limits. As described in the TSD, the proposed limits were established based on analysis of changes in the electricity sector anticipated in 2020, including changes caused by the CES and other Massachusetts clean energy programs. The TSD also describes how the proposed numerical emissions limits are compatible with the GWSA requirement to reduce emissions 25% from 1990 levels in 2020. Commenters who advocated increasing the limits did not directly address this analytical approach. For example, the commenter who advocated 12.5 MMT as a 2020 emissions limit noted that this is the amount of emissions that occurred in 2013, but provided no reasoning to explain why the final limit should not reflect changes that have or will happen by 2020.

Comment: One commenter asserted that "Kain-compliance" can only be achieved if the 2020 aggregate emissions limit is reduced to 7.0 - 8.0 MMTCO_2e (CLF). This assertion is based on an analysis of information in a table reproduced from the 2020 CECP Update that acknowledges the possibility that emissions from sectors other than electricity could remain relatively constant between 2013 and 2020 when normal variations in weather, consumer behavior, policy implementation, etc. are considered. In particular, the table references a potential range of transportation emissions of 29-32 MMT CO_2e. According to the commenter, a limit of 7.0 - 8.0 MMTCO_2e would ensure compliance with the GWSA requirement to reduce emission by 25% relative to 1990 levels by 2020, even if no reductions are achieved in other sectors by 2020.

Expert testimony submitted as an appendix to these comments suggested a specific technical approach to addressing uncertainty. Specifically, according to this commenter, "For an estimated range of expected future emissions to then satisfy the requirement of ensuring a 25 percent reduction from 1990 emission levels by 2020, it is necessary that the high end of the reasonably expected range of future emissions be no greater than the 2020 limit . . . for purposes of ensuring a 2020 statewide limit of 70.8 million metric tons, [transportation's] 2020 emissions are expected to be as high as 32.0 million metric tons." As evidence for this assertion, the commenter provides the following excerpt from the 2020 CECP Update: "recognizing the historic increase in VMT from 1990 to 2013 of 22%, it remains possible that an increase in VMT will offset some or all of these benefits. Therefore, accounting for these trends and recent emission data, 29–32 MMT CO_2e appears to be a robust range for 2020."

According to this commenter, a limit of 7.0 MMTCO_2e appears necessary based on the ability of the proposed version of 310 CMR 7.75 to reduce emissions and analysis provided in the TSD, but a limit as high as 8.0 MMT CO_2 could be appropriate if MassDEP revises 310 CMR 7.75 to limit flexibility and provides additional information about clean energy that will be available in 2020.

Response: As discussed in section III-C of this RTC, EEA and MassDEP have considered uncertainty and concluded that the regulations will ensure compliance with the GWSA requirement to reduce emission by 25% relative to 1990 levels by 2020.

With regard to the commenters' analysis, EEA and MassDEP note that the claim that it "remains possible" that transportation emissions could be as high as 32 MMTCO2e does not imply that 32 MMT CO_2e is within the "reasonably expected range" that that is suggested as the appropriate test. Outcomes outside of the "reasonably expected range" will always "remain possible." 32 MMT CO_2e for the transportation sector remains possible, but, given the existence of vehicle emissions standards that are anticipated to deliver large reductions in emissions by 2020, the "reasonably expected range" is bounded by the highest emissions level recently experienced in the past, which is listed in the referenced table from the 2020 CECP Update as 31.2 MMT CO_2e. The expectation that these standards will provide additional emissions reductions before 2020 is supported by analysis completed to support this rulemaking and described in the TSD.

Substituting 31.2 MMT for 32 MMT in the commenter's analysis suggests that a 2020 limit 0.8 MMT higher than CLF's proposed 2020 limit of 8.0 MMT should meet the suggested "reasonably expected range" test. The 2020 limit of 8.66 MMT CO_2e in the proposed regulation should therefore meet the commenter's suggested standard for "Kain-compliance" as long as 310 CMR 7.75 is revised as suggested by the commenter. Issues related to 310 CMR 7.75 are addressed elsewhere in this document, along with the additional information requested by the commenter.

More generally, the comments appear to conflate four possible standards for considering uncertainty: "reasonably expected range," "remains possible," "robust range," and "expected to be as high as." These words can be used to describe uncertainty, but EEA and MassDEP do not agree that they are more appropriate than the approach described in the TSD, under which the regulations are designed to reduce emissions "beyond the required" amount to "ensure that the GWSA 2020 limit is achieved with a reasonable degree of certainty." As discussed in Section III-C of this RTC, MassDEP also reviewed 2014 GHG Inventory data that was not available when the 2020 CECP Update was published or when 310 CMR 7.74 was proposed. This data supports the assessment above, as 2014 transportation emissions were 29.3 MMT CO_2e.

In summary, EEA and MassDEP agree with the commenter that there are other possible approaches to addressing uncertainty, but do not agree that the approach suggested by the commenter requires revisions to any of the proposed regulations, or to the overall conclusion that the proposed regulations will ensure that required emissions reductions are realized by 2020 with a reasonable degree of certainty.

Comment: Several commenters suggested that the rate at which the aggregate emissions limits in 310 CMR 7.74 decrease over time should be increased, for example from 2.5% per year to 5%, to achieve additional reductions over the long term (ECA, Environment MA, private citizen).

Response: The 2.5% reduction schedule included in the proposal is retained in the final regulation. As discussed in the TSD, this schedule will achieve necessary reductions by 2050, and may be revised based on the results of the program review scheduled for 2021.

E. Individual Facility Emission Limits, Allocation, and Auctions

Comment: Many commenters addressed the proposed approach to limiting emissions from facilities, which combined limits on emissions from individual facilities with a system of tradable over-compliance credits. A common theme among these commenters was that approaches to enforcing the aggregate emissions limits differ with respect to the degree to which they would support a flexible, efficient market. According to these commenters, poor program design could lead to anti-competitive behavior such as "hoarding." Commenters who addressed the merits of particular approaches offered differing assessments regarding which approach would be most likely to result in such adverse outcomes. Several commenters expressed support for auctions, referencing the RGGI experience and suggesting that auctions could provide economic efficiency and market liquidity (CLF, Dynegy, ELM, Exelon, ISO-NE, NYU IPI, Veolia), but other commenters provided reasons why auctions could be problematic, including the need to resolve difficult auction design issues (Calpine, NRG, TMLP). A few commenters cited potential benefits of using an allowance trading approach in lieu of the proposed over compliance credit system, regardless of whether auctions are used to distribute allowances (Calpine, Exelon, NRG).

Response: EEA and MassDEP are finalizing 310 CMR 7.74 as an allowance trading program, but will utilize allowance auctions to distribute allowances beginning in 2019. In reaching the conclusion that allowance auctions are preferable, EEA and MassDEP considered and agree with the strongly supportive comments of ISO-NE, and comments from both environmental advocates and electricity generators. In acknowledgement of comments that reference the RGGI experience, the auction requirements in the final regulation are nearly identical to DOER's existing RGGI auction regulations, except that the following changes are included to provide additional flexibility regarding auction design and maintain consistency with other 310 CMR 7.74 trading provisions.

- EEA/MassDEP may allow a single bidder to purchase as many as 50% of the allowances available for sale in a particular auction, unless a market monitor or auction administrator advises a more stringent limitation.
- EEA/ MassDEP may implement an auction without a minimum reserve price.
- EEA/MassDEP could qualify bidders based on successful qualification for RGGI auctions, instead of separately pursuant to 310 CMR 7.74.
- Consistent with the proposal to limit OCC trading, participation in auctions would be limited to electricity generating facilities regulated pursuant to 310 CMR 7.74.

In response to comments regarding the need for careful consideration of various auction design parameters, EEA and MassDEP will develop auction requirements using a two or three step process in 2017 and 2018. Specifically, as a first step, EEA and MassDEP have finalized in 310 CMR 7.74 basic auction requirements that can support auctioning in 2019. Second, in late 2017, MassDEP will complete an analysis of various auction design parameters, such as auction timing, reserve price, eligibility, etc. This analysis will provide an opportunity for stakeholder input and a technical basis for regulatory amendments. Third, in 2018, MassDEP/EEA will publish final auction documents, including bidder requirements and instructions, a draft auction notice, etc., and, as necessary, propose and finalize amendments to 310 CMR 7.74. Throughout this process, EEA and MassDEP intend to draw on experience implementing RGGI auctions, so stakeholders who wish to participate in the auction design process should review existing RGGI auction regulations and supporting documents for potential applicability to 310 CMR 7.74.

In order to allow sufficient time for a stakeholder process to address these auction design parameters, the implementation of auctions is delayed until 2019. For the first year of the program, 2018, the final regulations will implement an allowance trading program, with allocations based on the proposed individual facility emissions limits. This approach has enabled EEA and MassDEP to retain many aspects of the proposal, but address commenters' concern that the fact that OCCs would not have been available until after the end of the compliance year could impede development of a liquid market for allowances. MassDEP will work to have an allowance tracking system in place as early as practicable in 2018. Since the allocations are established in regulation, facilities will know their allocation before the beginning of 2018, and can begin planning for compliance and allowance trading before the tracking system is in place.

As finalized, auction proceeds will be directed to support the Commonwealth's efforts to reduce GHG emissions and to address other harmful effects of climate change, including supporting adaptation efforts in those communities that are most adversely affected. By closely targeting the use of any proceeds to the types of program and projects that will directly reduce GHG emissions and mitigate the harms of such emissions, EEA and MassDEP will further ensure that the statutory purposes of the GWSA are met.

Another change included in the final regulation is a provision to require reporting of transaction prices. Such prices could help to ensure market liquidity if aggregated price information is published to support price formation. The information could also be useful to a market monitor.

Comment: Many commenters requested changes to the proposed methodology for setting emission limits for individual facilities. These requests included:

- Historical performance is inappropriate because of anticipated changes in the electricity sector, such as increased renewables (Exelon).
- Heat rates or nameplate capacities would be preferable to the proposed approach (Exelon).
- Past reductions should be recognized (several MLPs, in reference to Stony Brook Energy Center).
- New facilities should comply but should not receive separate limits or allocations (MAPC).

- To avoid impacts of anomalous years, the highest year or years over a five year period should be considered instead of simply averaging three years of data (Cogentrix, NRG, Talen, TMLP, Veolia).
- Emissions should be used instead of generation (NRG).
- Production of useful thermal energy should be recognized (Veolia).
- Provide limits at least five years in advance (BELD).
- Increase (NRG) or decrease (CATF, Talen) the size of the limit for new facilities.

Several commenters also requested updates or corrections to the data used to calculate facility-specific emissions limits (Calpine, Stony Brook Energy Center, Talen, Veolia).

Response: As stated above, except for 2018, the final regulation will include an auction-based allowance trading program that does not require setting emissions limits for individual EGUs. For 2018, the final regulation uses the proposed approach to determining emissions limits to determine allowance allocations, as discussed above.

In general, compared to alternatives offered by commenters, the allocations acknowledge generator efficiency and consistent operation over time, qualities that are important to the reliable and cost-effective operation of the electric grid. Furthermore, when MassDEP analyzed specific suggestions to base allocations on the highest year or years over a multi-year year period, the result was to reduce allocations significantly for numerous facilities, including, in some cases, facilities that requested increases to their allocations.

Other than minor changes to the aggregate limit discussed elsewhere in this document, the only changes in the final regulations to the emissions limits for 2018 are:

- As appropriate, calculations are being updated to reflect the best available data sources.
- A mechanism is being added to allow the distribution of a portion of new facility aggregate emissions allowances to existing facilities on November 15, based on a calculation as to whether, before the end of the year, the new facility aggregate emissions limit will be fully utilized in a particular year. This will improve market liquidity by making allowances available to facilities before the end of the year.

A spreadsheet showing how the final emission limits for 2018 were calculated is attached to this RTC as *Appendix B*.

F. Flexibility, Reliability, and Trading

Comment: Many commenters raised concerns about whether the proposed regulation would unnecessarily interfere with EGUs' operational flexibility. In general, commenters focused on market liquidity, asserting that, because of the structure and small size of the allowance market, EGUs would not be confident that trading opportunities would materialize. Some of these comments focused on the proposed over-compliance credit system, raising particular concerns about the fact that, unlike emissions allowances, over-compliance credits are not created until after the end of each compliance year. Others raised broader concerns that would apply even

under an allowance trading system like those that have been used successfully to address a variety of air pollutants, including concerns about the small number of market participants.

Commenters noted that constraining EGUs' operational flexibility would reduce economic efficiency and could compromise the reliability of the New England electric grid. Commenters suggested several additional flexibility mechanisms that MassDEP could implement to address these concerns, including an alternative compliance payment option (CLF, Dynegy, Exelon, MMWEC, NRG and several MLPs), a reliability exemption (Calpine, NEPGA, Talen), an option to "borrow" from future compliance periods under certain conditions without penalty (BELD, ISO-NE, NRG), and multi-year compliance periods (Calpine, Talen, Veolia). Several commenters also argued against additional compliance options, particularly regarding the possibility that allowing alternative compliance payments in lieu of emission reductions would compromise the environmental integrity of the program and its ability to ensure compliance with the 2020 emissions limit (CLF, NYU IPI, Sierra Club).

Response: The TSD solicited comment on the potential need for additional flexibility. These comments are responsive to that request. In considering these comments, EEA and MassDEP focused, in particular, on comments related to the need to allow the electric grid to operate reliably because of the importance of a reliable electricity supply to public health and safety and the mandates of the GWSA, Section 3(c).

In response to these concerns, EEA and MassDEP are adding an option for "emergency deferred compliance." Under the final regulation, a facility that does not fully comply with 310 CMR 7.74 for a particular year because its availability was needed to ensure the reliable operation of the electric grid during the last 45 days of any calendar year may elect to postpone a portion of its compliance obligation until the following year's compliance deadline. In order to ensure that this option is only used when other compliance options have been exhausted, only emissions that occur during an identified reliability-related "emergency" may be deferred, and any facility that elects to utilize this option will be required to surrender allowances equal to twice the amount of its deferred compliance obligation. Limiting the availability of deferred compliance is consistent with comments by ISO-NE and others who referenced reliability as the primary reason for additional flexibility.

The final regulation defines "emergency" based on the issuance by ISO-NE of an alert to market participants that "an abnormal condition affecting the reliability of the power system exists or is anticipated" (i.e., "Master Local Control Center Procedure No. 2" under current ISO-NE operating procedures). The use of the emergency deferred compliance option is limited to those emergencies that affect Massachusetts and that occur in the last 45 days of each year. This is appropriate because for events that occur earlier in the year, facilities will have sufficient time to manage operations and allowance holdings to achieve compliance by the end of the year. MassDEP will provide additional guidance to facilities regarding exactly how emergency deferred compliance will be implemented. The final regulation does not reference an "order to operate" because, based on consultations with representative of ISO-NE, it was determined that referencing a specific reliability-related ISO-NE procedure would provide a simple and transparent basis for implementing emergency deferred compliance.

The two-for-one deferred compliance option was selected over other "borrowing" options proposed by commenters to discourage facilities from unnecessarily deferring compliance when sufficient allowances are available. This will ensure that any additional emissions that occur in one year will be more than offset by reduced emissions the next year. This approach strikes the appropriate balance between addressing the need to provide compliance flexibility, and the need to provide strong incentives for facilities to manage operations in a manner consistent with achievement of the aggregate emissions limits specified for each year in the regulation.

EEA and MassDEP also carefully considered commenters' suggestions regarding alternative compliance payments and multi-year compliance periods. One reason that these options were not selected is that MassDEP must address the need to impose a binding regulatory limit on emissions that declines each year, a requirement for regulations promulgated pursuant to GWSA Section 3(d).

In considering the need for additional flexibility, EEA and MassDEP also considered the submitted modeling results showing reference case emissions (i.e., emissions without 310 CMR 7.74) near or below aggregate emissions limits in 310 CMR 7.74 in 2020 (R. Tabors) and 2025 (ISO-NE). These modeling results show that 310 CMR 7.74 is unlikely to significantly constrain grid operations, and that the limited flexibility offered by the emergency deferred compliance option will be sufficient to address any potential exceptions to this general conclusion. This conclusion is also supported by the Electricity Bill and CO_2 Emissions Impacts Study.

Comment: Two commenters suggested that MassDEP should eliminate proposed "banking" provisions, which allow facilities to retain allowances for use in future years. According to these commenters, banking reduces the ability of the regulation to ensure a particular emissions outcome in a particular year, as required by GWSA. One commenter also cited experience with RGGI, where regulatory amendments were necessary to address a very large allowance bank (CLF, Sierra Club). One commenter expressed support for banking (NYU IPI).

Response: Banking rewards early emissions reductions and is, therefore, appropriate to ensure the best possible environmental outcome. Specifically, if allowances "expire" at the end of each year, facilities are not rewarded for reducing emissions below required levels. In other words, removing banking provisions would create a "use-them-or-lose them" dynamic in which reducing emissions could result in the expiration of unused allowances. Furthermore, banking can encourage facilities to reduce emissions more than required so that they can bank allowances for use in future years, when compliance might otherwise be more difficult. While the total amount of emissions does not change, banking has a small environmental benefit because it delays emissions impacts and, thereby, reduces the amount of climate change that occurs by any particular future date.

However, EEA and MassDEP also agree with commenters who noted that excessive banking can compromise the ability of the regulation to reduce emissions over time, a particular concern given the GWSA requirement that regulations promulgated pursuant to section 3(d) include emission limits that decline annually. In order to address this concern, the final regulation only allows banking to the extent that it does not conflict with the requirement to reduce emissions annually. Specifically, the final regulation has been revised to include annual numerical limits on

the total number of allowances that may be retained each year for future use, along with a formula to ensure that the number of allowances that each facility can retain for future use is limited in a way that enforces this annual limit. In the regulation, the annual numerical limits on banking are expressed as a fraction of the prior year's aggregate emissions limit, and at the time when allowances are deducted from accounts to demonstrate compliance, additional allowances are deducted if necessary to ensure that the number of remaining allowances is less than the specified fraction of the total number of allowances in each account.

Comment: Two commenters suggested that the annual compliance deadline should be aligned with the June – May time period used by ISO-NE's forward capacity market. One of these commenters noted that, compared to December, May is a time of the year during which other stressors on grid operations, such as constraints on natural gas transmission capacity, are less pronounced (ISO-NE). The other commenter who supported this change stated that, in order to ensure compliance with the GWSA requirement to require annual emissions reductions, it would be necessary to calculate "half-year" aggregate emissions limits (CLF).

Response: Given the modeling results from commenters and the results of the Electricity Bill and CO_2 Emissions Impacts Study, EEA and MassDEP are confident that the design of the final regulation contains sufficient flexibility to enable reliable operation of the electric grid. Changing the compliance deadline to May 31, or adding an additional compliance deadline at that date, would unnecessarily complicate implementation for facilities and the agencies. EEA and MassDEP also considered issues of consistency with the RGGI program, which is also established on a calendar year compliance year basis (albeit a 3-year calendar year system), and using a calendar year basis is more consistent with RGGI. As finalized, the regulation allows EGUs to utilize compliance reporting for the RGGI program for 310 CMR 7.74. Regulated facilities under 310 CMR 7.74 can also align their planning for compliance with their RGGI compliance planning with consistent use of calendar year compliance basis. If the compliance year were changed to a June to May period, these advantages in streamlined compliance would be lost. The commenter that supported "half-year" aggregate emissions limits did not explain how the limits could be enforced without reducing the amount of flexibility available to facilities to manage operations across a twelve-month period or, alternatively, how the benefit of avoiding a December 31 compliance deadline could be achieved while ensuring consistency with the GWSA requirement to require annual emissions reductions. Finally, the GWSA requires an annual calendar year GHG Inventory to determine compliance with the GWSA's 2020 and 2050 GHG emissions limit mandates, and changing the 310 CMR 7.74 to an ISO-based compliance year would complicate calculation of GWSA compliance.

G. Legal Issues

Comment: MassDEP received comments challenging the legal basis for 310 CMR 7.74 (NEPGA, Dynegy, Talen Energy Corporation, Cogentrix, NRG Energy, Inc.). One of these commenters provided detailed arguments (NEPGA), with other commenters referencing NEPGA's comments rather than providing additional legal analysis.

With respect to legal authority, these commenters contended that 310 CMR 7.74 is "based on a flawed understanding of the provisions of the Global Warming Solutions Act (GWSA) and the

Supreme Judicial Court's decision in Kain v. DEP, 474 Mass. 278 (2016)" and that such regulations are precluded by the GWSA and Kain. The commenters argue that the Court in Kain directly addressed and ruled on this issue, and that Kain prohibits MassDEP from regulating the electric sector pursuant to Section 3(d). Commenters also contend that in accordance with Kain, Section 3(c) also prohibits MassDEP from regulating the electric sector with an in-state emissions limit.

The commenters also argued that 310 CMR 7.74 is arbitrary and capricious, and that the regulation would cause an increase in overall regional GHG emissions and significant increases in utility bills.

Response: EEA and MassDEP disagree with these commenters, and EEA and MassDEP understand the language of Sections 3(c) and 3(d) of the GWSA to grant both agencies broad authority to promulgate regulations that set GHG emissions levels and limits on the electric sector and give the authority to craft annually declining GHG limits for all sources and categories of sources in the Commonwealth, including the electric sector. In addition, there is a broader context in which MassDEP's and the Secretary's authority to promulgate the regulations at 310 CMR 7.74 must be viewed -- namely, the broad missions granted to both agencies.

As for MassDEP, the Legislature gave the agency a broad mandate to establish a statewide comprehensive air quality program in its enabling statutes at M.G.L. c. 21A, §§ 2 and 8 and in the Massachusetts Clean Air Act at M.G.L. c. 111, §§ 142A *et seq*. These statutes grant broad authorities and discretion to MassDEP to establish a statewide program to regulate air contaminants and conditions of air pollution to protect public health and the environment. Given the broad language of the statutes, MassDEP has promulgated a broad definition of air contaminants in its Air Pollution Control regulations at 310 CMR 7.00 that includes greenhouse gas (GHG) emissions.[29] Under the broad grant of authority from the Legislature under these statutes, MassDEP could promulgate 310 CMR 7.74 without further statutory authorization.

In 2008, the Legislature enacted the Global Warming Solutions Act, codified at M.G.L. c. 21N (GWSA), and added a key role to MassDEP's mission: to assist the Secretary of Energy and Environment in reducing GHG emissions in the Commonwealth to a level 25% below 1990 GHG emissions level in 2020 and at least 80% below such levels in 2050.[30] This mission included the authority to promulgate regulations pursuant to both Sections 3(c) and 3(d) of M.G.L. c. 21N. In its May 17, 2016 decision in Kain, the Supreme Judicial Court directed MassDEP to promulgate regulations that establish declining annual aggregate GHG emissions limits on multiple categories of GHG emissions sources within the Commonwealth pursuant to Section 3(d) of the GWSA. On September 16, 2016, the Governor directed MassDEP in Executive Order 569 to proactively institute new programs to reduce GHG emissions to meet the goals of the Global Warming Solutions Act (M.G.L. c. 21N) to reduce GHG emissions 25% below 1990 GHG emissions levels in 2020 and by at least 80% in 2050. MassDEP proposed 310 CMR 7.74 pursuant to all of this statutory authority and in response to the directives of the highest court and the Governor of the Commonwealth.

[29] See 310 CMR 7:00 Definitions

[30] This mission was reinforced by language added to MassDEP's enabling statutes at M.G.L. c. 21A, § 8.

Similarly, the Secretary has been granted wide-ranging authority to set policy on environmental matters, including protection of the atmosphere from contamination, by its own enabling statute. M.G.L. c. 21A.[31] The Secretary is also granted the power to set energy sector policy by this same statute. This broad mission included regulation of GHG emissions prior to the enactment of the GWSA, but the GWSA granted the additional and specific mission to EEA to set the limits for GHG emissions reduction for the years 2020, 2030 and 2040 in order to achieve the overall statutorily mandated limit of an 80% reduction. In addition, the GWSA granted EEA the authority to establish a statewide Clean Energy and Climate Plan (the 2020 CECP) and to establish the policies, program and strategies in that plan that must be implemented to achieve the required reductions. See M.G.L. c. 21N.[32] In addition, the Legislature also granted authority to EEA to promulgate regulations to set "emissions levels and limits" on the electric sector in Section 3(c) in addition to the same regulatory authority granted to MassDEP. The Secretary is joining with MassDEP to promulgate the final regulations at 310 CMR 7.74 to establish the electric sector limits in that regulation with the full authority of EEA as the lead decision-maker for air quality, energy and climate change policy in the Commonwealth.

Turning to the commenters' challenges to the basis for 310 CMR 7.74 in the GWSA, Section 3(c) of the GWSA provides:

> (c) Emissions levels and limits associated with the electric sector shall be established by the executive office [of energy and environmental affairs] and the department [of environmental protection], in consultation with the department of energy resources, based on consumption and purchases of electricity from the regional electric grid, taking into account the regional greenhouse gas initiative and the renewable portfolio standard.

M.G.L. c. 21N § 3(c). The plain language of this section, which does not define the "electric sector," beyond the ordinary meaning of these words,[33] conveys extremely broad authority and discretion for EEA and MassDEP to set "emissions levels and limits" on any party in the electric sector, provided that DOER is consulted and provided that the agencies base the substantive decision-making process of setting the "levels and limits" on the "consumption and purchases of electricity from the regional electric grid" and in consideration of RGGI and the RPS programs. Section (c) does not itself say how the agencies should weigh these considerations in exercising their judgment or otherwise limit the means by which the agencies can regulate GHG emissions from the electric sector. In particular, Section 3(c) does not prohibit EEA and MassDEP from

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[31] Note in particular, M.G.L. c. 21A, § 2(2) ("provide for the management of air...to assure the protection of such resources within the commonwealth, realizing that providing...clean air to breathe is a basic mandate"), 2(9) (regulation of planned development to promote best usage of air resources), 2(10) (prevention and abatement of air pollution or environmental degradation), 2(17) (development of energy policy and programs), and 2(30) oversight of commonwealth efforts to address and diminish the impacts of climate change by implementation of the GWSA).

[32] Note in particular, M.G.L. c. 21N, §§ 3(b) and 4.

[33] See definitions of "sector" and "electric" in Webster's Third New International Dictionary (2002) at p. 2053 and p. 731, respectively, which indicate that the term "electric sector" would include all parties related to the production of electricity:

Sector: noun: ...

1.D: a sociological, economic, or political subdivision of society <public sector>

Electric: adj

1.A: of, relating to, or produced by electricity <electric supply> <electric output> <electrical industry> <electrical shock> ...

adopting the in-state, annually, declining, mass-based GHG limits contemplated by Section 3(d) on the electric sector.

In fact, the Legislature included in Section 3(c) a second concept beyond the "limits" authorized by Section 3(d) for restraints on the electric sector -- namely the concept of establishing "emissions levels." The word "level" is a word with many meanings, and the inclusion of this word further broadens EEA's and MassDEP's authority over the electric sector.[34] Therefore, the commenters' arguments that the language of Section 3(c) limits the agencies' authority are not supported by the agencies' considered interpretation of the text.

While EEA and MassDEP disagree with comments stating that the electric sector is not subject to Section 3(d) since that Section does not itself exempt the electric sector from the categories of sources that can be regulated under it, the agencies' issuance of the regulations pursuant to both Section 3(c) and 3(d), after consulting with DOER and based on the considerations set forth in Section 3(c), moot that particular question.

EEA and MassDEP concur with the commenters' reading of the GWSA, and the Kain decision, that to a certain extent, EEA and MassDEP must regulate the electric sector differently than other sectors. That difference is reflected in the procedural and substantive requirements of Section 3(c). Section 3(c) requires EEA and MassDEP to base regulations of the electric sector upon "consumption and purchases of electricity" from the regional grid. EEA and MassDEP also interpret Section 3(c) and other provisions of the GWSA to mean that any regulation of the electric sector should take the regional nature of the electricity grid into account and seek to minimize adverse impacts to the grid, including minimization of leakage, in setting GHG emissions levels and limits pursuant to Section 3(c) or 3(d).[35] EEA and MassDEP also agree with the commenters that when establishing levels and limits on the electric sector, it must take into account the RGGI and RPS programs as required by Section 3(c), which EEA and MassDEP interpret to mean that it should seek to harmonize, to the extent possible, the requirements of any new regulations on the electric sector with those of RGGI and RPS.

However, the agencies disagree with the commenters' position that Section 3(c) requires that any emission levels or limits on the electric sector must be designed to impose regional limits, not in-state limits, like RGGI and RPS. Nothing in the text expressly bars the agencies from establishing in-state limits under Section 3(c), and an interpretation that read such a bar into Section 3(c)'s silence on the issue would be inconsistent with both the broad grant of authority to EEA and MassDEP to set "emissions levels and limits" on the "electric sector" and the GWSA's overall purposes. MassDEP has consistently contended that Sections 3(c) and 3(d) of the GWSA

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[34] The most relevant meanings of the word "level" in Webster's Third New International Dictionary (2002) at p. 13—are"

10. the magnitude of a quantity considered in relation to an arbitrary reference value; or

__. a position in a scale or rank (as of achievement, significance, or value.

This means that the agency could set the magnitude of total or individual GHG emissions quantities in relation to many types of values, or could set GHG emissions limits for each individual source in a ranked series. This would certainly include annually, declining, mass-based values as a permissible emissions level on the electric sector under the authority of Section 3(c).

[35] EEA and MassDEP note the provisions of Section 4(a), 5 (with respect to leakage) and 9 of the GWSA.

can be read together to regulate the electric sector to good effect in achieving the GWSA goals, and the Kain decision does not preclude harmonizing the language of the two sections.

In making its arguments, NEPGA quotes a portion of the Kain decision, which is *dicta*, and argues that the SJC rejected the RGGI regulations on the basis that any regulation of the electric sector under the authority of the GWSA must rely solely on Section 3(c):

> [Moreover,] §3(c), specifically ***carves out a separate process*** by which emissions levels and limits associated with the electric sector are established in consultation with the secretary and the Department of Energy Resources and are to take into account the RGGI. [Quoting the text of §3(c).] By doing so, the Legislature recognized that a significant part of the electric sector would already be subject to regulations associated with the RGGI. The RGGI is also addressed extensively in G. L. c. 21A, §22, ***lending further support to the conclusion that the Legislature intended to treat emission reductions associated with the electric sector differently from other reductions in other sectors of the economy.*** Kain at 297 (emphasis added).

First, simply because Section 3(c) sets out separate procedures for regulation of the electric sector does not mean that Section 3(c) prohibits a Section 3(d) type of emissions limit on the electric sector, provided that EEA and MassDEP can design Section 3(d) limits that also take into consideration the consumption and purchases from the electricity grid and the RGGI and RPS programs.

Second, NEPGA's quote from Kain is irrelevant because the SJC in Kain was never presented with the question of whether the GWSA allows the imposition of a Section 3(d) GHG limit upon the electric sector. The SJC ruled only on the question of whether the GHG emissions limits as designed in the RGGI regulations complied with the requirements of Section 3(d).[36] Therefore, the Kain decision did not hold that the electric sector could not be regulated pursuant to Section 3(c) alone or in combination with Section 3(d), read together, and, in fact, the SJC left the door open to possible consideration of a joint application of Sections 3(c) and 3(d).[37]

Since the interpretation of the language of Section 3(c) was outside the scope of the Kain holdings, and since the plain language of the statute does not preclude imposition of a Section 3(d) limit on the electric sector, EEA and MassDEP can reasonably interpret the statute to harmonize the language in Sections 3(c) and 3(d), and adopt regulations in accordance with the procedural and substantive requirements of the two statutory sections. Given the central role of

[36] The Kain court's holding with respect to the RGGI regulation was that: (1) the RGGI regulation was established under a separate statute, G.L. c. 21A, § 22, and could not be counted as being established under G.L. c. 21N, § 3(d); (2) the RGGI regulations, while achieving important reductions in GHG emissions, were taken into account by the Legislature as part of the "business as usual" projection under the GWSA and cannot be counted towards the additional GHG emissions reductions the Legislature envisioned under Section 3(d) of the GWSA; and (3) the RGGI program effects GHG emissions reductions across the entire region of participating states and not solely reductions within the Commonwealth of Massachusetts, a requirement of Section 3(d). *See* Kain at 297.

[37] The SJC prefaced the third basis for its holding that the RGGI regulations did not qualify as Section 3(d) regulations on the phrase "even if the Legislature intended for §§ 3 (c) and 3 (d) to be construed together," leaving open the possibility that the SJC could later hold that the Legislature did intend the sections to be read together to regulate the electric sector.

the electric sector, as annunciated by the Secretary in the 2020 CECP and 2020 CECP Update, and as reinforced by the Governor in Executive Order No. 569,the in-state annually declining aggregate GHG emissions limit on the electric sector generating facilities established by 310 CMR 7.74 is important to set the electric sector on a course to meet the 2020 and the 2050 GWSA limits. MassDEP, as approved by EEA, established the design of the limits and consulted with DOER and DPU in reaching this decision prior to proposing the electric sector regulation at 310 CMR 7.74. EEA and MassDEP now establish the final limits on emissions from fossil-fueled electricity generators through promulgation of 310 CMR 7.74, after additional consultations with DOER and DPU on how to address commenters' concerns. The agencies are also promulgating 310 CMR 7.75 to establish a Clean Energy Standard to work with 310 CMR 7.74 to ensure sufficient clean energy to meet the GWSA 2020 and 2050 limits and to minimize impacts to the regional grid, REC/CEC markets and wholesale and retail customer costs.

As stated in the TSD to the rule-making, 310 CMR 7.74 was designed with a CO_2 limit that is an enforceable backstop to ensure that GHG emissions reductions in the electricity generating sector would occur in Massachusetts, rather than in other New England states, and 310 CMR 7.74 and 7.75 together were designed to achieve GHG reductions at the rate of reductions necessary to meet the GWSA 2020 limit. Therefore, EEA and MassDEP have established electric sector limits and levels in 310 CMR 7.74 and 310 CMR 7.75 that comply with both the requirements of M.G.L. c. 21N, §§ 3(c) and 3(d).

Appendix A. Electricity Bill and CO_2 Emissions Impacts Study

Appendix B. Calculation of Final Aggregate Emissions Limits